Rationales for a Lottery Among the Qualified to Select Medical Trainees: Decades of Dutch Experience

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Graduate medical education's obsession with choosing the "best" applicants, among many candidates for a finite number of positions, has produced a frustrating and time-consuming recruitment process. That many applicants or programs may be disappointed by this process seems unavoidable. Medical schools and residency programs expend enormous amounts of time and effort as well. When no valid, rational choice among roughly equal candidates can be made, a random choice—a lottery—emerges. At a time when the selection for US residency programs can no longer rely on United States Medical Licensing Examination (USMLE) Step 1 scores as a filter—from 2022 they will only be reported pass/fail[1–4]—it may be worth considering the rationales for a lottery system.

Tyrannies of Metrics and Merit

First, educators who read *The Tyranny of Metrics* by Jerry Z. Muller and *The Tyranny of Merit* by Michael J. Sandel may rethink medical student and resident selection processes.[5,6] Historian Muller explains how the measurement of performance frequently leads to "metric fixation," a shift from what is important to what is measurable, with the unintended consequence of metrics-based rewards that no longer serve the intended purpose of the performance. Harvard philosopher Sandel elaborates on how the universal fixation on merit feeds the illusion that success and failure in life can all be attributed to one's own efforts and talents, or failures thereof. This merit fixation disregards how opportunities, luck, and family background also shape success. It wrongly leaves those who do not succeed with a sense of humiliation and resentment, with far-reaching societal consequences. Both authors discuss examples of the disruptive effects of these fixations on professional and societal structures, including medicine and education. Both authors show how individuals and institutions tend to "game" procedures and standards in order to enter and complete higher education, through pretended individual merit or superior institutional metrics when these may not be warranted. This leads Sandel to propose a lottery among the qualified as a selection procedure for prestigious universities such as Harvard and Stanford.[7]

The Dutch Lottery for Medical School Selection

A lottery, as a method to determine who will be admitted to medical school or residency, may sound an absurd proposition to many. A lottery appears to devalue motivation, disregard high effort and talent, and randomly block freedom of career choice. However, The Netherlands has decades of experience with this method. The Dutch government applied a lottery system nationally for admission to all medical schools in 1972. This system was abandoned in 2017 after an appeal but will now be reinstalled in 2023 as a legitimate procedure for the selection of students.

Until 1972, the admission to Dutch medical schools, which have a 6-year program not preceded by baccalaureate education, was freely accessible for applicants with the proper secondary schooling (note that the Dutch government pays for most of medical education). When applicants increased in number and their costs became substantial, the Dutch government introduced a *numerus fixus*, a restricted total number of positions, derived from predictions of future physician need. After years of debate, politicians settled on a "weighted lottery" system for admissions. The average score on a national final secondary examination determined the weighting. Students with an outstanding score would triple their chances compared to those with a just-pass score. Declined candidates could reenter the lottery for 2 subsequent years. For decades schools and the public were generally satisfied with this procedure to determine the one-third of all applicants (on average across decades) for whom there was space at a Dutch medical school. The lottery procedure was smoothly conducted by a government agency, until 1996. That year an outstanding high school graduate was turned down 3 times and appealed the decision. Political and

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societal anger arose and led to a gradual replacement of the lottery, initially with a local qualitative selection process in parallel with a national weighted lottery. In 2 decades, the national lottery system was abandoned altogether; legislation prohibited medical schools from using a lottery as of 2017. Surprisingly, in 2020, a parliamentary majority voted to allow schools to use a lottery system, and thus reinstalled lottery processes as a legitimate method of selection. The law is effective in 2023.[8]

Rationales for Lottery Systems

The 1996 Dutch debate demonstrated an aversion among students, parents, politicians, and institutions against a lottery for medical school admission. This may reflect a historical, cultural, and societal development of *individualization*: any career path should be possible for anyone with high motivation and adequate abilities.

In contrast, a respected Dutch psychometrician and selection expert, Pieter Drenth, former president of the Royal Netherlands Academy of Arts and Sciences and of All European Academies, regularly voiced the more rational argument that, when selection is needed only because of quantitative reasons, and most or all applicants meet the required criteria, a lottery must remain a serious option. The lottery option is needed to counter the disadvantages of qualitative criteria,[9,10] which are both difficult to measure and apply in an unbiased manner. Indeed, there are several arguments that favor a lottery system,[11] and 5 conditions may shape how we consider these arguments.

1. When Differences Between Applicants Are Spurious

Making reliable and justified distinctions within a pool of applicants who have all been successful in highly selective prior education is hardly, if at all, possible. This holds true for most Dutch medical school applicants. When medical graduates, all of whom have completed a long and difficult educational trajectory, apply in massive numbers to residency programs, the ability of programs to differentiate among them is also limited. Differences among students are often spurious or irrelevant. Then suggesting that selection processes can determine which students are most suitable for the program vs those who fail to meet standards may even be ethically questionable. When a fixed number of spaces must be filled, the *number* rather than the *quality* of applicants determines the criterion used for admission.

In an era of competency-based medical education, efforts to bring all medical school graduates to meet high standards may prove more beneficial than highlighting differences among graduates.[12] A time-variable, individualized curriculum might support high quality of graduates and health care more than an institutionalized "failure to fail" students who do not meet highest standards.[13,14] The current Dutch medical workforce has nearly all been admitted to medical school through a weighted lottery in a more time-variable curricula. While we cannot know whether a different admission procedure would have led to a better workforce, Dutch health care scores highly, including higher than the United States, in international comparisons.[15,16]

2. When Equity Among Applicants Is a Priority

While selection committees usually aim to provide fair and equal chances for all candidates, any procedure that uses specific criteria benefits some groups over others and often disadvantages underrepresented groups. If selection criteria include areas, such as test scores, that may be affected by preparation (eg, expensive tutoring, more affordable by the wealthy), some candidates benefit more than others. The Dutch government justified reinstalling a lottery because of concerns over a lack of diversity among admitted higher education students.

3. When a Diverse Workforce Is a Priority

Concerns that the medical workforce does not reflect society's gender and ethnic composition adds to the fairness-for-applicants argument in favor of a lottery. In addition, the medical workforce itself is not homogeneous. Society needs family doctors, pediatricians, radiologists, anesthesiologists, neurosurgeons, and virologists, to name a few. Selection for medical school based on uniform criteria suggests that society needs just one species of doctors, rather than a wide variety. A need for variety is no different within medical specialties: some graduates may remain in a general specialty while others continue to subspecialty training, and some will practice in academic environments while others practice in communities of varying sizes.

4. When the Overt Message of Collaboration Collides With a Hidden Culture of Competition

Striving for excellence is regarded as desirable among students and faculty, but it is often translated into competing to outperform other students on prespecified metrics. These competitive achievements are then used in curriculum vitae (CVs) and application letters.

Meanwhile, attitudes and skills to collaborate feature prominently in learning objectives throughout medical and residency curricula. A simultaneous hidden culture of fixation on competitive metrics sends mixed messages of competition versus collaboration. The high prevalence of stress and burnout among medical students and residents, with serious risks of hampered professional development, may well be caused by a continuous focus on rankings and CV building to excel in comparison with others, at the cost of collaboration.[17]

5. When There Is No Convincing Evidence to Support Selection on Qualitative Factors

Dutch scholars have compared various medical school selection procedures with a weighted lottery. Five doctoral dissertations completed from 2016 to 2020 (most by government-subsidized researchers) and numerous publications show mixed results.[18–22] Although there is some indication that students who chose to be admitted through selection criteria performed somewhat better in medical school than those admitted through a lottery, the results are generally inconclusive. No differences among students after graduation from medical school have been reported.

Concluding Thoughts

Applicants for medical school and residency generally prefer selection criteria over a lottery system and find rejections that feel beyond their control difficult to accept. However, the suggestion that "if you really want to, you can get into medical school" denies reality, when there are more applicants than positions. For example, the Netherlands has had a 1:3 acceptance ratio over 35 years of admissions. Many rejected applicants would have undoubtedly been excellent physicians, just as the vast majority of Dutch students admitted through a lottery have become doctors providing high-quality health care. There is no indication that countries applying elaborate selection procedures have built better health care systems.

When all applicants qualify through demonstrated competence, Sandel's lottery among the qualified is defensible. Whether admitted through lottery or chosen by a residency selection committee or performance test, not being selected remains painful. But students must also accept that not all opportunities are always available, and a redirection of life may bring more joy and satisfaction than a continuous battle against competitors.

This editorial is not a plea to minimize differences among learners or to disregard unique strengths of individuals. On the contrary, every learner should be stimulated to excel in unique ways. What is problematic is when individuals are forced to conform and compete with others on limited criteria that do not correlate well with the competencies that really matter, to health care quality and to patients.

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