Medical Student Selection

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KEYWORDS

- Medical students • Medical schools • Admissions • Selection • MCAT • GPA
- Personal statement • Interviews

KEY POINTS

- Medical school admissions rely heavily on The Medical College Admissions Test and grade point averages to evaluate applicants.
- Personal statements and letters of recommendation evaluations are not standardized and their usefulness is unclear.
- Interviews for medical school are moving to multiple mini interview models with rapid adoption of virtual interviews in the era of coronavirus disease 2019.
- Medical schools show little progress with increasing diversity of students.

INTRODUCTION

Selecting medical students is an incredibly important responsibility because it shapes the future of the medical profession. Medical students represent a huge investment as it takes years to train individuals from the beginning of medical school to the completion of graduate medical education. They are an important potential societal resource, because they will care for our future ailing patients. Our physician workforce must be prepared to serve an increasingly diverse community. Therefore, racial, ethnic, and gender diversity among our future physicians is paramount for relating to patients. We must strive to select students with not only diverse backgrounds and experiences, but also with diverse interests and strengths to fill all the necessary niches within the broad field of medicine. In addition to future clinicians, some will be educators, teaching the students and residents of the future; some will be researchers, pushing the science of medicine forward; and some will be leaders, guiding organizations and the business of medicine. Being granted admission to medical school is a privilege and selecting medical students should be approached with care and thoughtfulness.

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GRADUATION AND ATTRITION OF MEDICAL STUDENTS

Determining medical student selection is somewhat variable depending on the priorities of individual institutions. However, metrics available in the United States indicate that the students admitted to medical school are generally successful. The American Association of Medical Colleges (AAMC) reports 4-year graduation rates have been stable, between 82% to 84%, and 96% of students finish by 6 years after matriculation.[1] The US Medical License Examination (USMLE) pass rates are similarly high for first-time examinees with an MD degree; in 2018 and 2019, the individual board examination pass rates were as follows: 96% to 97% for USMLE 1, 97% to 98% for USMLE 2 Clinical Knowledge, 95% for USMLE 2 Clinical Skills, and 98% for USMLE 3.[2] Of the students entering the national residency match program in 2020, 91% matched into their preferred residency specialty. Surgical applicants had overall lower match rates, ranging between 72% and 83%, depending on the surgical subspecialty.[3]

In 1965, the AAMC reported medical school attrition was 9%.[4] More recently, much lower attrition rates have has been reported, approximately 3% per year over the last 20 years, with most students citing nonacademic reasons for leaving medical school.[1] However, a systematic review published in 2011 found struggling academically may be strongly associated with medical student dropout.[5] In 2007, a report released by the AAMC demonstrated attrition rates differed by race/ethnicity, with Black, African American, Native American, Hispanic, and Latino students having higher attrition rates than White and Asian students.[6] Additionally, medical students from lower socioeconomic status backgrounds were also more likely to leave medical school in the first 2 years.[7] Although the great majority of medical students graduate, attrition is costly to the individual students, medical schools, and society at large; therefore, there is a collective interest to select students who will be successful.

Medical School Applications

The American Medical College Application Service serves as a centralized application processing service and most US medical schools use the American Medical College Application Service application as their primary application.[8] Some medical schools have additional secondary applications that contain specific questions pertinent to the individual institutions. Finally, most schools have an interview component to the application process. The individual components to the application (Table 1) and their effects on medical student selection and performance are discussed elsewhere in this article.

Table 1
Medical school application process

AMCAS Application	Secondary Application	Interview
Sociodemographics	School-specific essays	Institution specific
Education		
MCAT		
Extracurricular experiences		
Personal statement		
LORs		

Abbreviations: ASMCAS, American Medical College Application Service; MCAT, Medical College Admission Test.

Sociodemographics

The demographics of applicants to medical school have experienced significant changes over the past 40 years, with an increase from approximately 36,000 total applicants per year, to now approximately 53,000 applicants per year.[9] In the past 5 years, however, the number of applicants has remained relatively stable, and the matriculation rate has increased steadily.[10]

Age and gender

The age of applicants has remained stable over the past few years, with an average age of 24 years old, and is similar for both men and women applicants.[11] The gender of applicants historically has been majority male; however, in the early 2000s there was a decrease in male applicants as compared with female applicants.[12,13] This trend led to a fairly equal number of male and female applicants, until the 2017–2018 application cycle, which saw for the first time fewer male applicants as compared with female applicants, and this trend has continued.[12]

Minority status

Over the last 4 application cycles, the numbers of under-represented minorities (URM) has increased slightly, with the greatest increase in Asian and Hispanic applicants, and a steady number of Black or African American applicants.[14] White applicants remain the largest proportion of total applicants to medical school; however, the numbers of White applicants has decreased in the last year.[14]

There has been a national effort to increase the representation of minorities within medical schools, with a range of strategies for increasing minority representation.[15] The factors that have been shown to increase the likelihood of minorities applying to medical school include elementary school success, parental influence, and financial support.[13] Specifically, the success of African American men applying to medical school may be related to prior exposure to medicine and a strong social support system.[16]

The performance of URM applicants before medical school has been shown to be different as compared with White applicants, with URM students having lower admissions scores based on their academic performance.[17] Although URM students may have lower grades in the gateway courses for application to medical school, they have a higher completion rate of these undergraduate courses when compared with White students.[18] Finally, adjusting the admission's criteria from grade based to attribute based to increase the diversity of selected students has not been shown to improve admission rates for URM.[19] However, by creating a more holistic application process that is less focused on grades does increase the diversity of students interviewed for medical school.

Disparities

There are also certain characteristics of applicants that affect application rates and acceptance rates to medical school outside of undergraduate performance. Notably, there is a selection bias for applicants with parents who are doctors, even though they may have lower examination scores.[20] Additionally, the geographic setting of applicants seems to play a role in the likelihood of applying to medical school. Although applicants from both rural and urban areas demonstrate similar undergraduate scores and have similar admission rates, there are fewer rural students applying to medical school as compared with applicants from urban areas.[21,22]

Education

Grade point average

The undergraduate grade point average (GPA) is historically weighted heavily as a fundamental criterion for the admission decision to medical school. There has been

a slight increase in the average GPA of medical school applicants over the past 4 application cycles, from 3.56 to 3.60.[23] As such, when a medical school interviewer knows the applicant's GPA, it has been shown to lead to higher interview scores, even though the GPA is not a direct component of those scores.[24] More recently, however, the importance of GPA in the admissions process has been highly debated, with arguments made that medical schools place too much emphasis on this factor. However, the majority of data suggest that the GPA does, to a varying degree, correlate with medical school performance.[25–28] The greatest correlation between undergraduate GPA and medical school performance is seen in the early years of medical school, where performance is largely measured by test taking rather than clinical skill.[29] It is less clear, however, if student performance in the preclinical years of medical school translates to their performance during the clinical years of medical school.[30] Finally, there are data suggesting a correlation between undergraduate GPA and USMLE scores, especially USMLE Step 1.[31]

Major

Most medical schools require the completion of certain undergraduate classes; however, these requirements vary based on the school.[32] Premedical requisite classes are typically related to the sciences and, therefore, most applicants are those with biological science majors, making up 58% of applicants during the 2020–2021 cycle.[33] Within this same application cycle, 28% of applicants were nonscience majors, indicating that these students remain a significant percentage of the applicant pool.[33] Nonscience major applicants have been shown to experience less of a sense of preparedness in applying to medical school and lower scores in early training.[34]

Undergraduate institutions

The type of undergraduate program that applicants apply from is also an area of interest to medical schools. Most notably, attending a private undergraduate college may improve the likelihood of admission to medical school, independent of their academic performance.[35] Additionally, for African American applicants, attending an historically Black university or college improves the likelihood of admission to medical school.[36] There is also evidence that medical students who attended liberal arts colleges tend to have lower medical school grades as compared with university graduates; however, liberal arts graduates are more likely to be accepted in to honorary organizations such as the Alpha Omega Alpha society.[37] Finally, although there has not been shown to be differences in performance for applicants from community-focused colleges, these students have demonstrated higher levels of agreeableness and conscientiousness based on study data.[38]

Graduate degrees

The most common graduate degree of students applying to medical school are premedical preparatory degrees, termed postbaccalaureate premedical programs or special masters programs. These courses are designed to enhance applicants' preparedness for medical school and increase their chances of admission. Approximately 15% of matriculants to medical school previously acquired such a degree.[39] Although these degrees may lead to additional time and expenses for the applicant, they have been shown to be successful in increasing the diversity of the matriculant class, because a disproportionate number of postbaccalaureate premedical program graduates include URMs.[40] Importantly, these same applicants have been shown to be more likely to practice in underserved areas as physicians.[39]

Medical College Admissions Test Scores

Correlation with board scores

In addition to the applicants' GPA, The Medical College Admissions Test (MCAT) scores remain a fundamental aspect of admission criteria for medical school. Average total MCAT scores over the last 4 application cycles has increased from 504.7 to 506.4.[23] There has been extensive research into the correlation of MCAT scores and subsequent medical student success, with general agreement that there is at least some correlation between MCAT scores and USMLE scores.[31,41–43] This finding is particularly true for USMLE Step 1 scores.[44] As for medical school performance, MCAT scores have not been shown to correlate with this measure.[25,27] However, MCAT scores do correlate with success in graduating from medical school.[45]

There are a few exceptions to the correlation between MCAT scores and USMLE scores. Specifically, the verbal reasoning scores are less predictive of board scores when English is not the primary language of the student.[46] Additionally, students who require accommodations for completing the MCAT owing to disabilities may have lower board scores than would be expected when compared with their MCAT scores.[47] Finally, and in contrast with the trends seen with GPA scores, when a medical school interviewer is aware of the applicant's MCAT score, there does not seem to be an influence on their interview score.[24]

Disparities between age, sex, race, and socioeconomic status

The relationship between MCAT scores and applicant demographics remains a topic of interest for medical schools. In terms of gender, male applicants on average have higher MCAT scores without differences in GPA or medical school performance as compared with female applicants.[48] Additionally, when medical schools accept more midrange MCAT scores, this factor has been shown to lead to an increase in the diversity of the matriculating class.[49] Finally, there is evidence that applicants from underdeveloped or rural areas may have lower MCAT scores,[50] but that participation in MCAT preparatory courses may improve rural students' scores and subsequently encourage practice in underserved communities.[51]

Reapplicants

Changes to the application

After significant investment in applying to medical school, some applicants, unfortunately, do not receive an admission. This factor leads to a pool of applicants who are considered reapplicants and who must now compete with first-time applicants. Overall, most reapplicants demonstrate improvements in test scores and admission scores, leading to higher admission rates than first-time applicants.[52]

Matriculation success rate

Students who choose to reapply to medical school are typically those with higher initial undergraduate scores and are less likely to be from a rural area.[52] If, however, applicants had an alternative graduate degree program plan, they were less likely to reapply to medical school.[53] Additionally, if they had high education debt, they were also less likely to reapply, suggesting an inability to afford the process.[53]

Extracurricular Experience

Extracurricular experience is a key aspect of medical school admission scores, yet its weight in the admission decision varies by school. Female applicants typically report greater participation in extracurricular activities.[54] Those with more extracurricular activity experience before medical school are more likely to demonstrate persistent

extracurricular activities during medical school, and additionally have higher medical school performance.[55] In contrast, liberal arts students tend to participate in fewer extracurricular activities during medical school but are more likely to be in honorary organizations such as the American Osteopathic Association.[37]

Patient exposure
Although most medical school applicants have no prior experience in health care, a proportion of applicants come from another branch in the health care industry. Importantly, these applicants with prior medical training have higher percentages of matriculation.[20] If there is no direct experience in health care, shadowing practicing physicians is one way applicants may demonstrate exposure to the health care field.

Research
Research is another area of the medical school admission score whose weight varies by school, and applicants who participate in premedical research programs have higher medical school acceptance rates, even with lower GPAs.[56]

Community service
Community service is another aspect of extracurricular activities considered by admission scores. For applicants who are women, who volunteered at multiple types of organizations, and who participated in these service opportunities for more than 2 years, they are shown to be more likely to pursue community service opportunities while in medical school.[57]

PERSONAL STATEMENT

The personal statement requires medical school applicants to describe themselves in a brief and unique essay. Premedical programs place an emphasis on beginning writing the statement early, continually rewriting it, and reflecting deeply on what to write about.[58] This aspect of the application causes a level of discomfort and stress for applicants, because it requires skills not necessarily seen elsewhere in the application, which has led to a concerning number of applicants plagiarizing.[59] In contrast with the focus placed on the personal statement before applying, admission committees have not been shown to weigh this aspect of the application heavily; in fact, it is typically viewed as one of the least important aspects of the application by those making the application decision.[60,61] One reason for this finding may be that the evidence for the predictive validity of personal statements on the success of medical students is weak and varied.[62] Personal statements have been seen as a tool to measure the interpersonal skills of applicants; however, they have not been shown to fulfill this goal.[63] Although medical schools continue to require personal statements from their applicants, the criteria used for evaluating them are not standardized and their usefulness remains unclear.[62]

SCHOOL-SPECIFIC ESSAYS

There is a paucity of research on whether secondary application essays are valid indicators of medical students' future performance. Dong and colleagues[64] designed a study that demonstrated that none of the medical school performance indicators were significantly correlated with the essay scores. This finding calls into question the usefulness of matriculation essays, a resource-intensive admission requirement. Furthermore, the fee structure for secondary applications can also add up quickly. Students are required to pay up to US$150 for secondary applications per school.[65] In 2019, 36.7% of those entering medical school spent more than US $2000 on

secondary applications.[66] Because the validity is marginal at best and significant costs exist, secondary applications should not be sent out until adequate screening of the applicants is completed.

SOCIAL MEDIA

Little is known about the use of social media and its role in medical school admissions. The AAMC has a statement on their webpage "how social media can affect your application."[67] Students are advised to assume the admissions committees do look up applicants online.

LETTERS OF RECOMMENDATION

Letters of recommendation (LORs) are a standard component of a medical school application. According to American Medical College Application Service guidelines, students may upload multiple letters and select which letters to send to which schools.[8] Letters may be written by undergraduate faculty, employers, and supervisors, among others. These LORs, as part of a holistic review, are intended to strengthen an application by demonstrating how an applicant's personal characteristics are indicative of future success in medical school and beyond.[68] LORs may indicate whether a candidate has the grit or hardiness that, in conjunction with a disadvantaged background, has been considered an indirect indicator of future success.[69] However, there is room for interpretation of LORs owing in part to variability in content, structure, and letter writers themselves. There is also an associated cost in time spent by the admissions committee reviewing LORs.[62]

The literature suggests that LORs do not predict performance in medical school consistently.[62,70,71] In a unique attempt to try to answer the age-old LOR question, DeZee and associates[70] designed a study to assess newly graduated medical students in the top and bottom of the class and re-review their initial LORs by blind reviewers. After reviewing 437 LORs for 76 unique characteristics, only a few characteristics were actually helpful. Being rated as "the best" among peers and having an employer or supervisor as the LOR author were both associated with being in the top of the class, whereas a nonpositive comment was associated with being in the bottom of the class. The authors concluded LORs have limited value to admission committees, because very few LOR characteristics predict how students perform during medical school.[70]

Currently, there is not a standardized format for LORs as part of the medical school application. Owing to the free-form nature, it may be difficult to interpret letters and use them effectively to differentiate between 2 candidates. Albanese and colleagues[72] proposed the use of a standard letter format or the development of national guidelines for letters, either of which would help to increase the ease of evaluation by the admissions committee. They go further and propose the use of an electronic letters system to address concerns of fraudulent letters, including letters written by an applicant and signed by the letter writer or text copied from a previously written letter for a successful applicant.[72] The consensus suggests that LORs provide little added value to an application because the content of the letters do not predict student performance.[73]

INTERVIEW PROCESS

The interview process is a standard component of medical school applications, whether to allopathic, osteopathic, or offshore medical school programs. GPA and MCAT scores are the 2 most common screening tools used by the admissions

committee to evaluate to whom an interview invitation should be extended. The interview itself serves multiple purposes: for the applicant to collect data on a particular program or institution, for the applicant and program alike to present a human side during an otherwise impersonal process, and for programs to evaluate an applicant's communication skills and noncognitive abilities. Interview formats vary widely, from a traditional one-to-one interview that may range from structured questions to free-form dialogue, to a panel interview, to the highly structured objective structured clinical examination-style multiple mini interview format. The use of interviews, traditional or a multiple mini interview format, virtual or in-person, is listed as one means of achieving a holistic review of the applicant (AAMC).[74]

The validity of interviews is questionable at best. Traditional interviews have not consistently demonstrated positive predictive validity, with the exception of applicants rated extremely highly or extremely poorly.[73] Traditional interviews with structured questions are more reliable when interviewers are provided with training, standardized questions, and a rating system.[72] A recent multidisciplinary meta-analytic study to evaluate fairness and validity of interviews and holistic reviews in medical school admissions was conducted with 33 studies included.[75] The interview reliability (approximately 0.42) was low to moderate, which significantly limits its validity. This finding has been confirmed by more than 100 studies examining interview validity that collectively show interview scores to be only moderately correlated with important outcome variables.[75]

The Multiple Mini Interview

Since the MMI was piloted and validated at McMaster University, its popularity has grown with incorporation into the admissions processes of medical schools throughout the United States and globally. The MMI scores for medical school admissions positively predicted communication skills in clinical scenarios like objective structured clinical examination performance, and GPA was the most consistent predictor of performance on multiple-choice question examinations of medical knowledge.[76] The MMI significantly predicted clinical decision-making in the objective structured clinical examination, which was not predicted by other noncognitive assessments or undergraduate GPA.[77] There was no difference in score leniency based on interviewer and applicant gender.[78] Overall, the MMI was well-accepted with a high internal reliability with an optimal number of stations and s well-structured scoring system.[79,80] The MMI use is supported as a means of decreasing bias in the selection of medical school candidates.[81] In addition, the inclusion of a writing station in the MMI allows for the evaluation of applicant communication skills that may otherwise not be tested in an interview setting. The cost and logistics MMI interviews are offset by optimizing the number of stations and interviewers.[82]

Barriers have been identified with the MMI process. They include cultural and language barriers between interviewers and applicants, and logistic feasibility.[80,83] Unfortunately, the MMI did not always increase the diversity of applicants offered interviews or admissions because the MMI alone cannot undo the diversity-limiting effects of the GPA.[84,85]

Situational Judgment Tests

Computer-based Assessment for Sampling Personal characteristics (CASPer) is an on-line, video-based screening test. It is an situational judgment test made up of 12 sections with a video-based or word-based scenario with 3 open-ended questions. CASPer assesses collaboration, communication, empathy, equity, ethics, motivation, problem solving, professionalism, resilience, and self-awareness.[86] The inclusion of

an situational judgment test such as CASPer in the admissions process has the potential to widen access to medical education for URMs.[87] The incorporation of situational judgment test as an additional nonacademic evaluation may assist medical schools with a more holistic review of applicants while observing social distancing recommendations in the time of a pandemic.[88] Further research is needed to determine the predictive validity and future role of video situational judgment test in medical school admissions.[73]

Use of Patients

Patients have been invited to participate in a novel structured interview process. The response was very positive for the patients as well as for the applicants.[89]

Personality Traits

The association between perfectionism and depression in the medical profession can ultimately influence physicians' performance negatively. In medical students, maladaptive perfectionism relates to distress and lower academic performance. In a review of 22 studies on personality, the big five traits (openness, conscientiousness, extroversion, agreeableness, and neuroticism) may correlate with various aspects of medical school performance.[62] Computerized personality test incorporation in the interview process has demonstrated significantly higher personality traits of honesty–humility, extraversion, agreeableness, and openness to experience, and lower traits in emotionality.[90] There is no significant correlation between personality tests and the MMI, and personality measures as a part of the selection process may not be predictive of noncognitive skills.[91] Emotional intelligence was correlated with some, but not all, measures of success during medical school matriculation and none of the measures associated with medical school admissions.[92]

Video Conference Role

Technology is now integral to the administration of multiple admissions tools, including the Medical College Admission Test, situational judgment tests, and standardized video interviews. Consequently, today's admissions landscape is transforming into an online, globally interconnected marketplace for health professions admissions tools.[93] Asynchronous video format applications are increasing in popularity. A recent student demonstrated video conference tools can adequately evaluate leadership, innovation, social change, and creativity.[94]

Before the coronavirus disease 2019 pandemic, only 3 of 147 US allopathic programs offered video conference or telephone interviews in lieu of an in-person interview on campus. The University of New Mexico's experience with video conference interviews found no difference in the diversity of applicants admitted based on interview modality. This technology allowed for increased faculty involvement by rural and community physicians who would otherwise be unable to interview applicants owing to distance and clinical duties.[95] In light of the coronavirus disease 2019 pandemic and efforts to limit face-to-face contact, the AAMC has launched a new video interview assessment tool intended to be used in conjunction with other selection criteria and not in lieu of an in-person (or virtual) interview at any specific medical school. The Video Interview Tool for Admissions is a 1-time interview in which applicants must answer 6 questions designed to evaluate the core competencies as a part of the holistic review outlined by the AAMC.[96] Any applicant invited to interview is asked to also complete the Video Interview Tool for Admissions interview, which is then accessible to all other programs to which the applicant applied. This process is intended to support the medical schools' admission trend toward a holistic review of an applicant and

the evaluation of personal characteristics that may be missed by other components of the application.

Importantly, 45% of medical school matriculants in 2019 reported spending more than $1000 on interview-related expenses alone.[66] With the transition to virtual interviewing, this change may make some institutions more accessible, although schools should remain cognizant of different means of accessing technology.[88] Further research is needed to look at the cost effectiveness of virtual interviews and their impact on the diversity of future medical school classes, because this factor significantly decreases the cost of applying to medical school for applicants and may remove a barrier for those applicants who self-select as an URM or coming from a disadvantaged background.

The Impact of Blinding the Interviewers from the Medical College Admissions Test and Grade Point Average

Although MCAT scores accounted for some variation in interview scores for both cohorts, only access to GPA significantly influenced interviewers' scores when looking at interaction effects. Withholding academic metrics from interviewers' files may promote an assessment of nonacademic characteristics independently from academic metrics.[24]

Applicant Preference

In a systematic literature review, applicants generally support interviews and MMIs, judging them to be relevant and fair.[80,83] Applicants felt the MMI structure eliminated cultural, gender, and age bias, and assessed noncognitive skills more effectively.[83] In the cases where a hybrid format of traditional and MMI interviews were introduced, applicants rated the MMI portions positively in voluntary postinterview surveys.[97] Applicants generally did not support panel interviews as a part of the traditional format, citing that the imbalance of numbers of faculty to applicant seems intimidating; women and persons of color are particularly critical of the use of panel formats.[72]

There is emerging evidence that situational judgment tests are also well-regarded, but aptitude tests less so. Aptitude tests and academic records were valued in decisions of whom to call to interview. Medical students prefer interview-based selection over cognitive aptitude tests.[80]

DIFFERENCES IN APPLICATION TO TYPE OF MEDICAL SCHOOL

There is a paucity of literature comparing applicants to US allopathic programs, US osteopathic programs, and offshore medical schools. In 2008, approximately two-thirds of applicants to osteopathic programs also applied to allopathic programs; however, only one-seventh of allopathic program applicants also applied to osteopathic programs. Notably, as many as 72% of first-time applicants to offshore medical schools did not apply or had not ever applied to US allopathic or osteopathic programs. Ninety percent of all first-time applicants had applied to a US allopathic program.[98] There are currently no more recent data comparing applicant characteristics to offshore medical schools versus US allopathic and osteopathic programs. Research efforts have focused on comparing student performance with USMLE first time pass rates ranging from 19.4% to 84.4%, depending on country of medical school.[99] St. George's University, an offshore medical school located in the Caribbean, is certified by the Educational Commission for Foreign Medical Graduates and reports the average GPA and MCAT scores of their classes along with their admissions criteria. The variation in stent performance is also seen in match rates. St.

Table 2
Matriculant data from 2018-2019 based on school type [100,103,104]

	US Allopathic	US Osteopathic	St Georges University
Undergraduate GPA	3.72	3.54	3.3
Science GPA	3.65	3.43	3.1
Nonscience GPA	3.8	3.65	(Not provided)
MCAT overall	511.2	503.83	497
CPBS	127.7	125.79	124
CARS	127.1	125.36	124
BBLS	128	126.16	124
PSBB	128.3	126.52	125
Total women	11,160	4118	3110
Total men	10,454	4317	3236

Abbreviations: BBLS, Biological and Biochemical Foundations of Living Systems; CARS, Critical Analysis and Reasoning Skills; CPBS, Chemical and Physical Foundations of Biological Systems; MCAT, Medical College Admission Test; PSBB, Psychological; Social, and Biological Foundations of Behavior.

George's boasts a 93% residency match rate, including international students who do not intend to pursue residency or practice in the United States after graduation.[100] For comparison, US allopathic programs had an overall 93% match rate, osteopathic programs a 91% match rate, and all offshore medical schools had an overall 61% match rate (**Table 2**).[101]

ENROLLMENT MANAGEMENT MODELS

Although medical educators seem to believe admission to medical school should be governed, at least in part, by human judgment, there has been no systematic presentation of evidence suggesting it improves selection.[75] A meta-analyses of more than 150 studies demonstrate that mechanical/formula-based selection decisions actually produce better results than decisions made with holistic/clinical methods involving human judgment.[75] The use of holistic review as a method of incorporating human judgment is not a valid alternative to mechanical/statistical approaches; the evidence indicates clearly that mechanistic methods are more predictive, reliable, cost efficient, and transparent.[75] In another example, the enrollment predictions using the enrollment management model were at least as accurate as the expert human estimates. This information can be readily exported for a real-time dashboard system to drive recruitment behaviors.[102]

SUMMARY

Moving beyond the standardized MCAT and GPA to select the best students for medical school admission is challenging. LORS, personal statements, and secondary applications essays continue to be used uniformly in medical student applications and selection despite questionable data validity. Although most medical schools tout holistic application reviews with a focus on the mission of the school, little evidence exists that this process is actually happening. Additionally, progress to improve access to URM has been slow, and additional efforts are needed to increase diversity in medical schools. Interviews for medical school acceptance are rapidly changing in this era

of coronavirus disease 2019, with an increased emphasis on virtual interviewing. Increasing data support the use of MMIs and structured interviews over unstructured one-on-one interviews. Evidence is also increasing for the role of enrollment management models in the selection of medical students. Additional research is needed in the realm of artificial intelligence applicability in medical student selection.

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