

2018

Learn Serve Lead
Austin, Texas
November 2-6



MCAT Update Session

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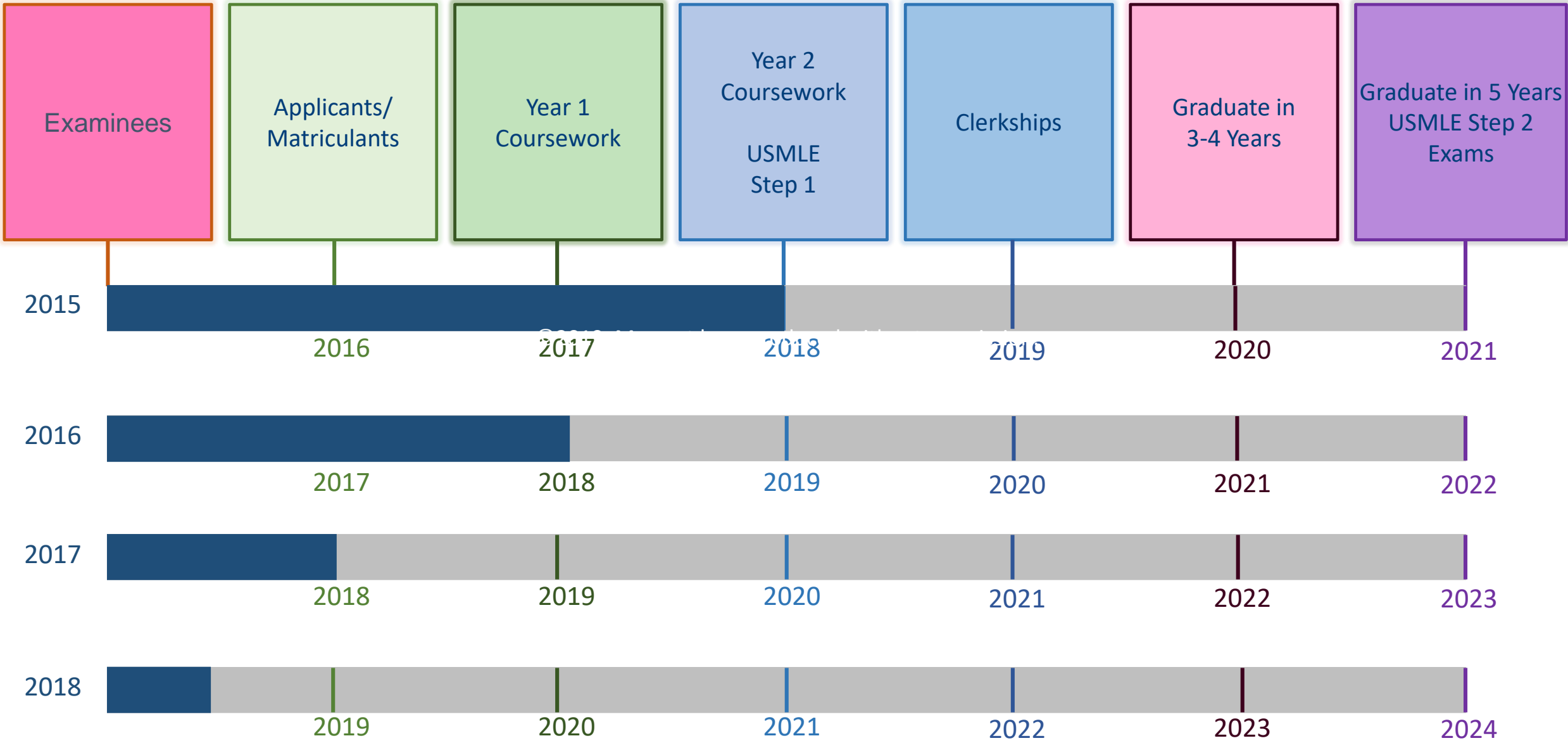
November 4, 2018

Association of
American Medical Colleges

What will we talk about today?

- What do we know about applicants to the classes you admitted in 2017 and 2018?
- What do we know about this year's test takers (many of whom are in your current applicant pool)?
- How are we helping students prepare?
- What are we learning about the impact, use, and predictive validity of the new exam?
- Q&A

2018 examinees were the fourth cohort to take this version of the MCAT exam

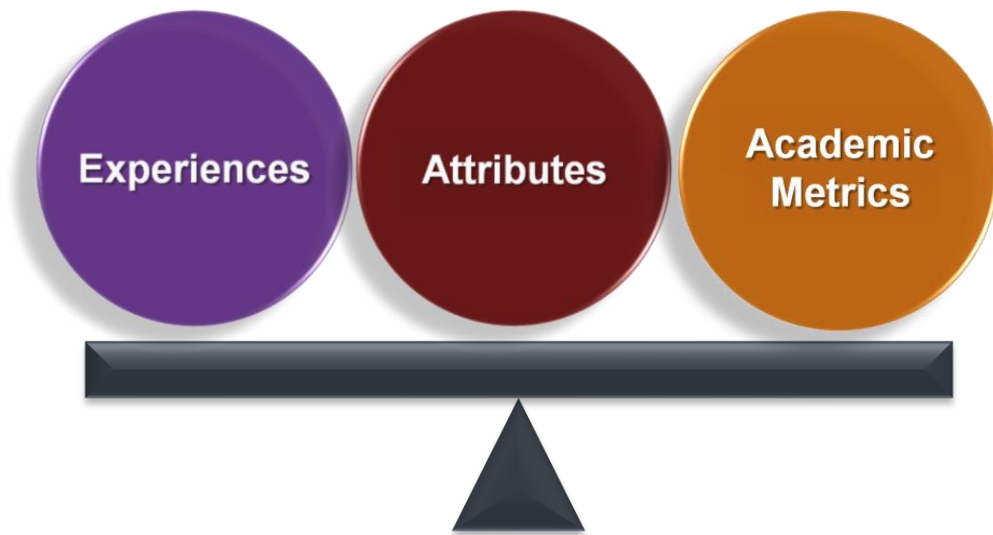


What do we know about applicants to the classes you admitted in 2017 and 2018?

Your admissions committees build classes that help meet your schools' missions, goals, and diversity interests



They give individualized consideration to each applicant



- How they might contribute to teaching and learning at your school and to the practice of medicine
- How they help balance the class across the criteria needed by your school to achieve desired outcomes

Admissions committees used holistic review practices to put MCAT scores in context in 2017-2018 selection

Percentage and Number of 2017-2018 Applicants Accepted into at Least One Medical School, by New MCAT Total Score and Undergraduate GPA Range

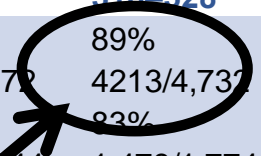
| GPA Total | MCAT Total | | | | | | | | | | All |
|-----------------------|------------|----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|---------------|
| | 472-485 | 486-489 | 490-493 | 494-497 | 498-501 | 502-505 | 506-509 | 510-513 | 514-517 | 518-528 | |
| 3.80-4.00 | 3% | 3% | 8% | 19% | 31% | 51% | 64% | 76% | 83% | 89% | 66% |
| | 3/107 | 7/217 | 40/482 | 204/1,061 | 668/2,141 | 1782/3,500 | 3207/5,009 | 4,156/5,492 | 3971/4,772 | 4213/4,732 | 18,251/27,524 |
| 3.60-3.79 | 0% | 1% | 5% | 13% | 25% | 36% | 51% | 66% | 75% | 83% | 48% |
| | 0/250 | 6/416 | 40/884 | 221/1,692 | 707/2,869 | 1,520/4,177 | 2,538/4,929 | 3,014/4,549 | 2,209/2,944 | 1,478/1,774 | 11,733/24,484 |
| 3.40-3.59 | 1% | 1% | 4% | 10% | 19% | 28% | 38% | 52% | 63% | 71% | 32% |
| | 5/382 | 7/577 | 41/1,108 | 190/1,865 | 510/2,691 | 939/3,366 | 1,359/3,554 | 1,475/2,835 | 979/1,559 | 565/791 | 6,070/18,728 |
| 3.20-3.39 | <1% | <1% | 3% | 8% | 16% | 22% | 30% | 40% | 50% | 58% | 22% |
| | 1/455 | 2/559 | 26/1,001 | 118/1,483 | 290/1,864 | 471/2,138 | 584/1,919 | 556/1,383 | 347/695 | 158/273 | 2,553/11,770 |
| 3.00-3.19 | <1% | 1% | 2% | 6% | 13% | 22% | 26% | 35% | 42% | 46% | 16% |
| | 1/499 | 5/515 | 13/710 | 62/959 | 136/1,070 | 223/1,034 | 237/908 | 228/650 | 103/245 | 57/123 | 1,065/6,713 |
| 2.80-2.99 | 1% | 1% | 2% | 5% | 7% | 16% | 21% | 25% | 28% | 39% | 9% |
| | 3/459 | 2/367 | 9/439 | 23/481 | 37/504 | 75/462 | 76/361 | 48/190 | 31/110 | 14/36 | 318/3,409 |
| 2.60-2.79 | 0% | 1% | <1% | 4% | 9% | 18% | 14% | 16% | 43% | -- | 7% |
| | 0/306 | 2/212 | 1/278 | 10/254 | 22/257 | 31/175 | 17/124 | 11/69 | 18/42 | -- | 117/1,726 |
| 2.40-2.59 | 0% | 1% | 2% | 4% | 3% | 17% | 26% | 27% | 30% | -- | 5% |
| | 0/229 | 1/120 | 2/122 | 5/124 | 3/87 | 11/63 | 10/39 | 8/30 | 3/10 | -- | 45/830 |
| 2.20-2.39 | 0% | 0% | 0% | 3% | 12% | 23% | 10% | 14% | -- | -- | 5% |
| | 0/126 | 0/67 | 0/55 | 1/37 | 4/34 | 6/26 | 2/21 | 2/14 | -- | -- | 19/387 |
| 2.00-2.19 | 0% | 0% | 5% | 0% | -- | 9% | -- | -- | -- | -- | 1% |
| | 0/76 | 0/22 | 1/20 | 0/18 | -- | 1/11 | -- | -- | -- | -- | 2/159 |
| less than 2.00 | 0% | -- | 10% | -- | -- | -- | -- | -- | -- | -- | 1% |
| | 0/38 | -- | 1/10 | -- | -- | -- | -- | -- | -- | -- | 1/67 |
| All | <1% | 1% | 3% | 10% | 21% | 34% | 48% | 62% | 74% | 84% | 42% |
| | 13/2,927 | 32/3,081 | 174/5,109 | 834/7,981 | 2,377/11,522 | 5,059/14,953 | 8,030/16,868 | 9,498/15,217 | 7,663/10,381 | 6,494/7,758 | 40,174/95,797 |

Some 2017 and 2018 applicants w/ high UGPAs and MCATs weren't accepted

Percentage and Number of 2017-2018 Applicants Accepted into at Least One Medical School, by New MCAT Total Score and Undergraduate GPA Range

| GPA Total | MCAT Total | | | | | | | | | | All |
|-----------------------|------------|----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|---------------|
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| 3.20-3.39 | <1% | <1% | 3% | 8% | 16% | 22% | 30% | 44% | 54% | 58% | 22% |
| | 1/455 | 2/559 | 26/1,001 | 118/1,483 | 290/1,864 | 471/2,138 | 587/2,138 | 795/2,138 | 1,095/2,138 | 158/273 | 2,553/11,770 |
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11% of applicants with GPAs at or above 3.8 and MCAT scores at or above 518 were not admitted into any medical schools



Other 2017 and 2018 applicants with modest credentials were accepted

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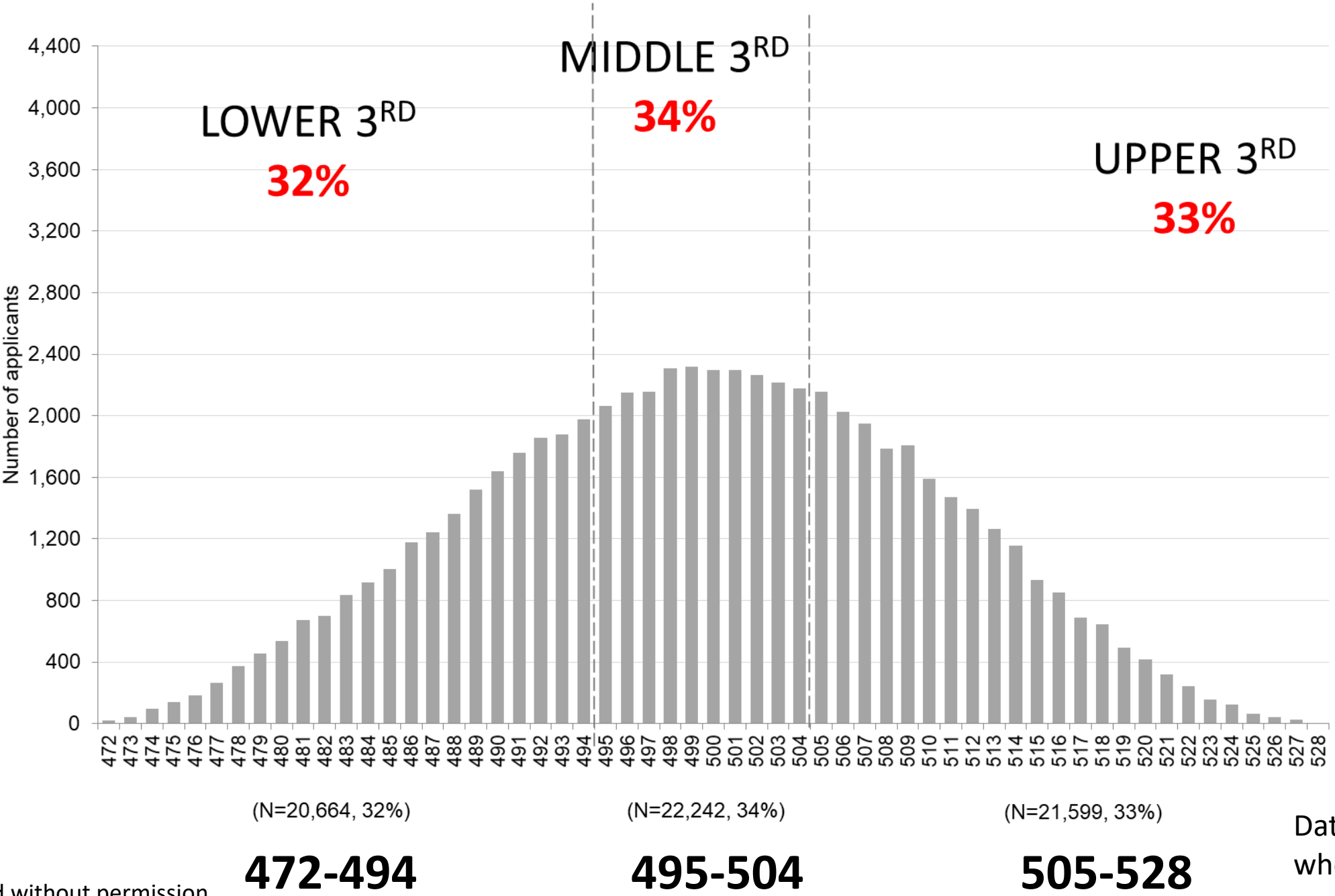
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| | 0/254 | | | 22/257 | 31/175 | 17/124 | 11/69 | 18/42 | -- | -- | 117/1,726 |
| 2.40-2.59 | | | | 3% | 3% | 17% | 26% | 27% | 30% | -- | 5% |
| | | | | 24 | 3/87 | 11/63 | 10/39 | 8/30 | 3/10 | -- | 45/830 |
| 2.20-2.39 | | | | 12% | 12% | 23% | 10% | 14% | -- | -- | 5% |
| | | | | 57 | 4/34 | 6/26 | 2/21 | 2/14 | -- | -- | 19/387 |
| 2.00-2.19 | 0% | | | 9% | -- | 9% | -- | -- | -- | -- | 1% |
| | 0/18 | | | 1/11 | -- | 1/11 | -- | -- | -- | -- | 2/159 |
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13% of applicants with GPAs 3.00 - 3.19 and MCAT scores 498-501 were admitted into at least one medical school

Is there room to increase diversity?

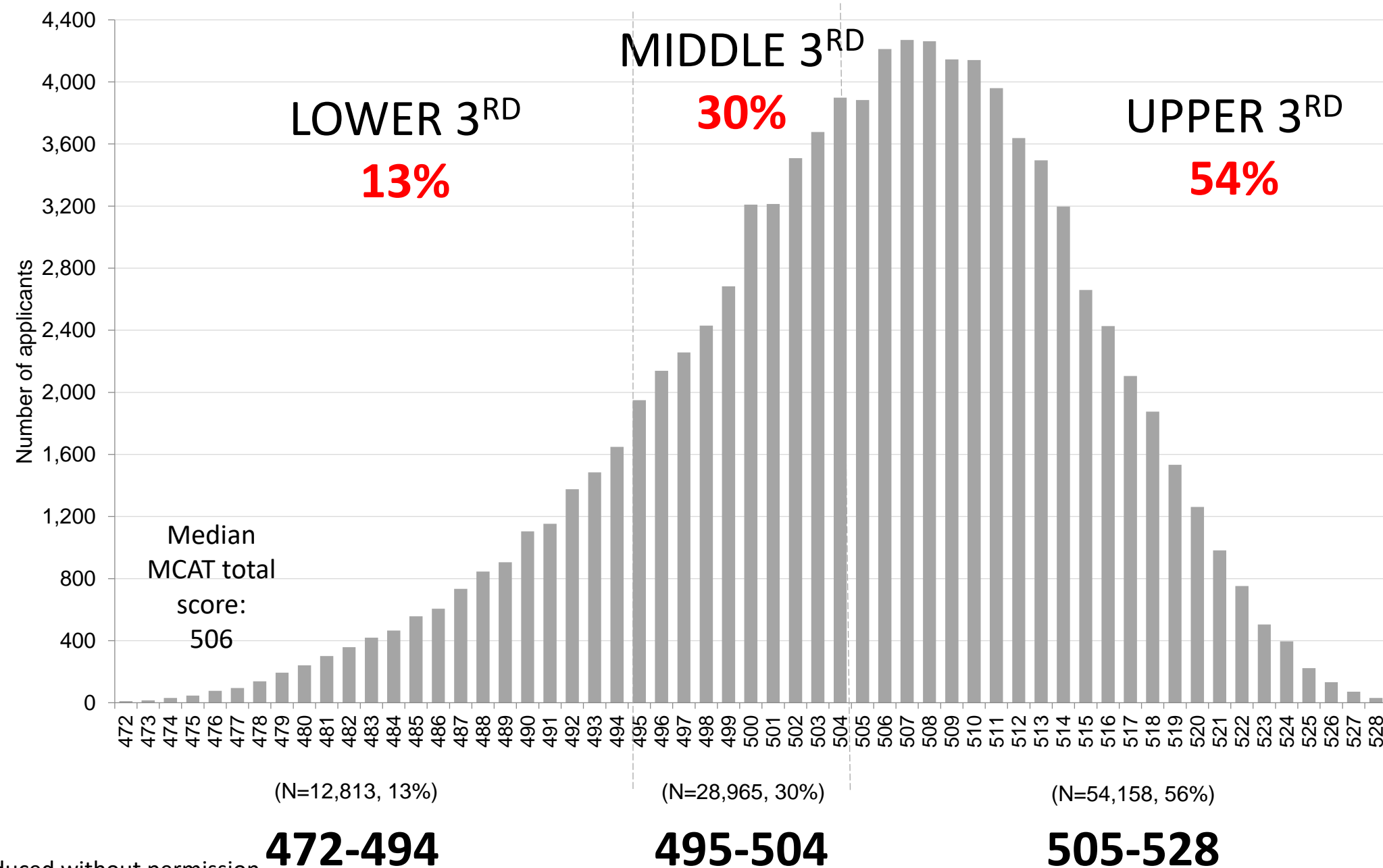
Let's look at the characteristics of applicants with scores in different parts of the MCAT score distribution

To help answer this question, we divided the distribution of examinees' scores into three equal parts



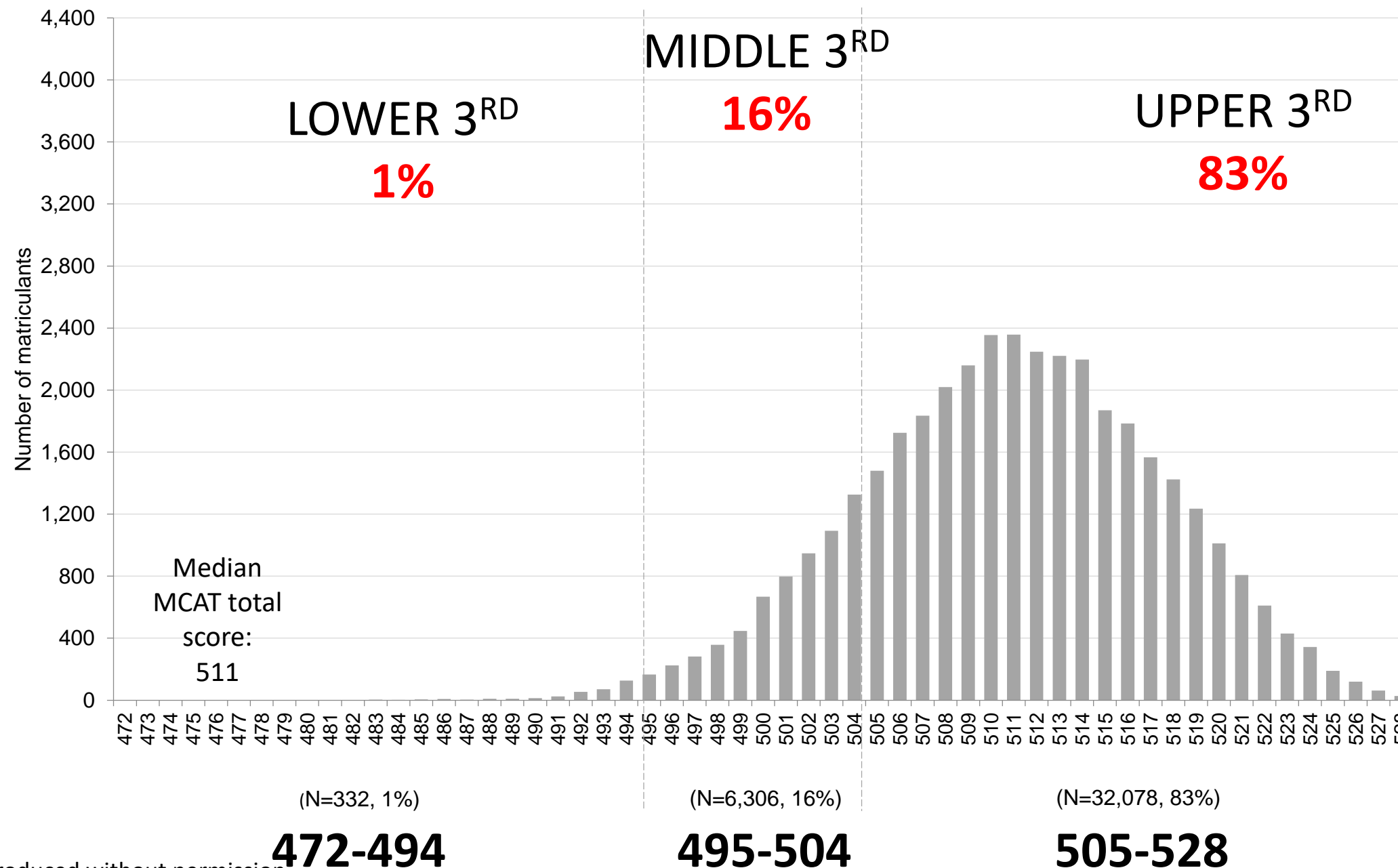
About 30% of the 2017 and 2018 applicants had MCAT scores in the middle third of the score scale

Number of 2017-2018 applicants at all U.S. MD-granting medical schools, by MCAT total score

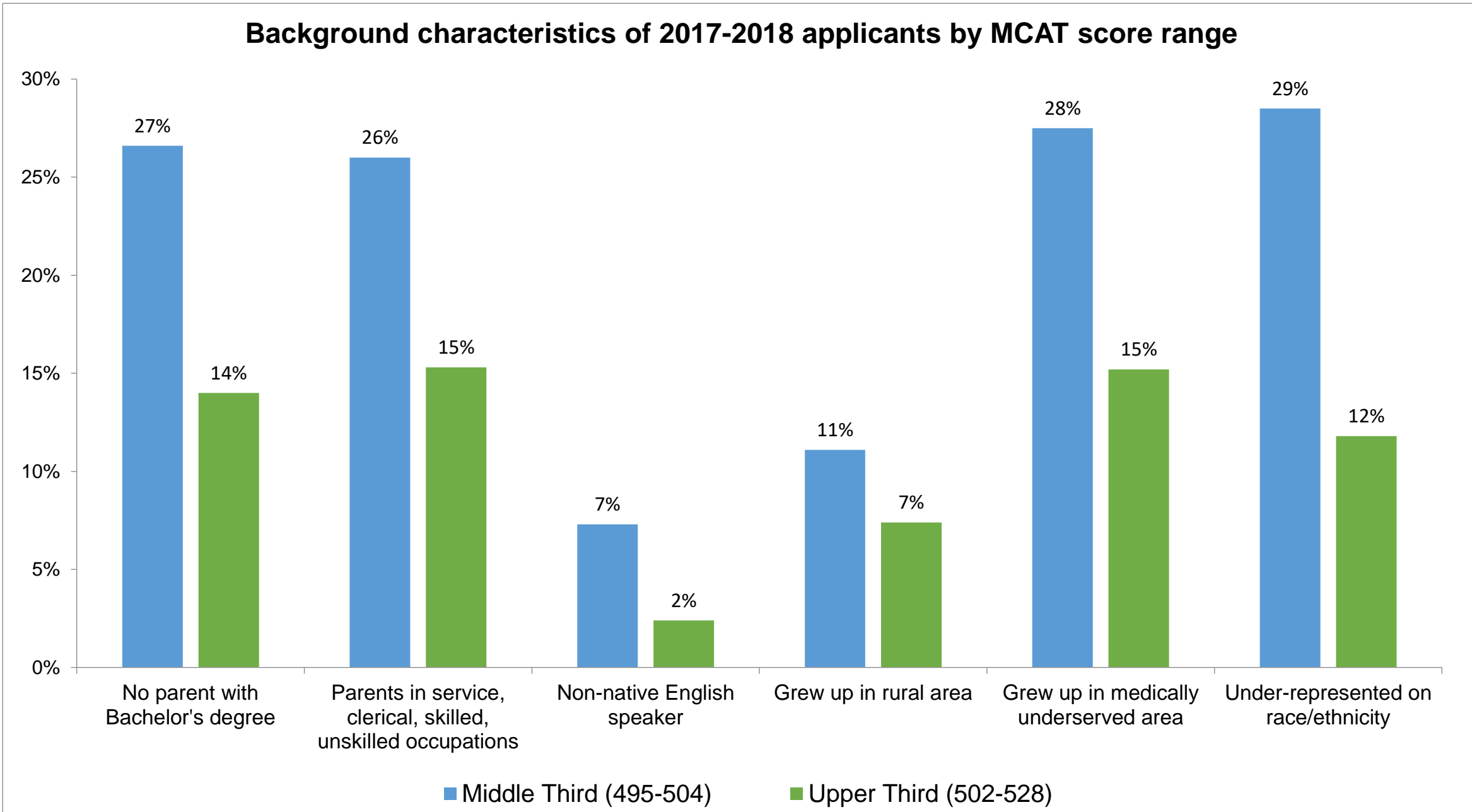


About 15% of 2017 and 2018 matriculants had MCAT scores in the middle third of the score scale

Number of 2017-2018 matriculants at all U.S. MD-granting medical schools, by MCAT total score



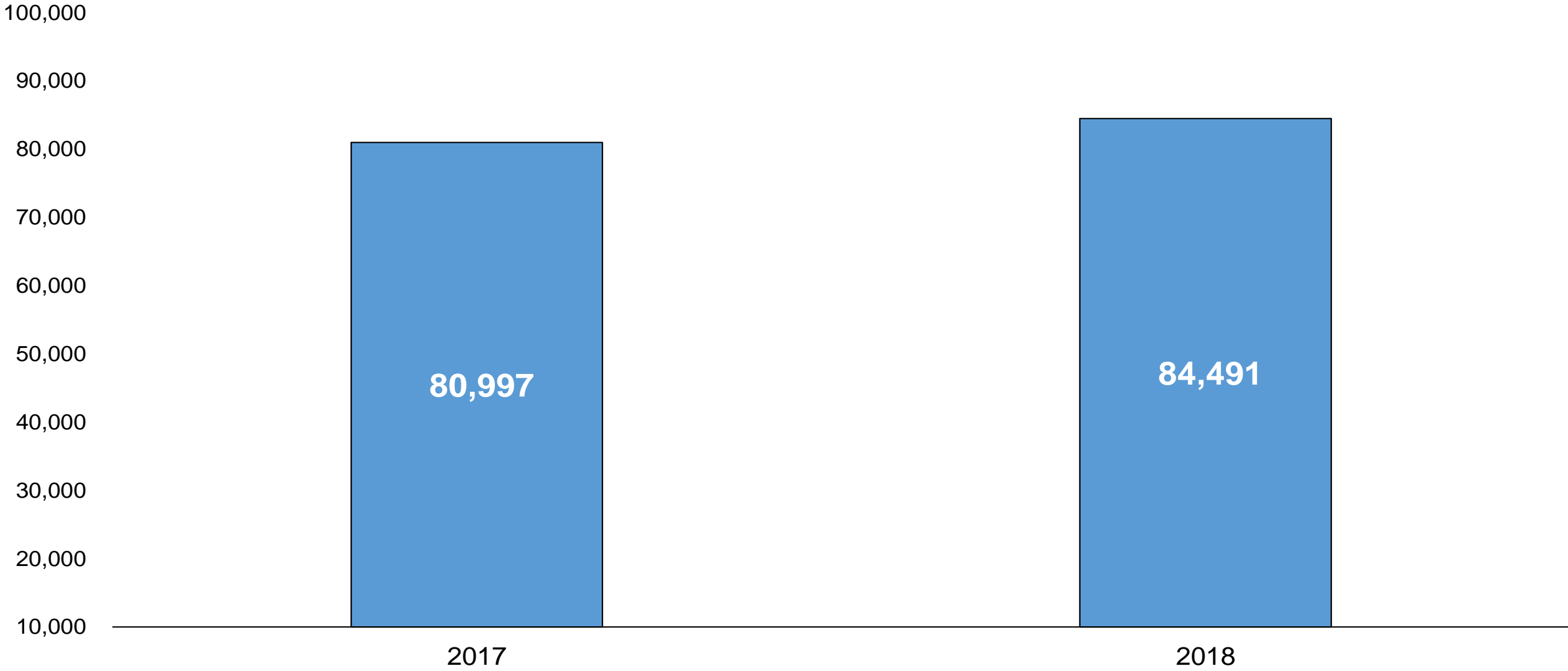
Considering applicants with a wide range of MCAT scores will give your committees flexibility in building diverse classes



**What do we know about this year's test takers
(many of whom are in your current
applicant pool)?**

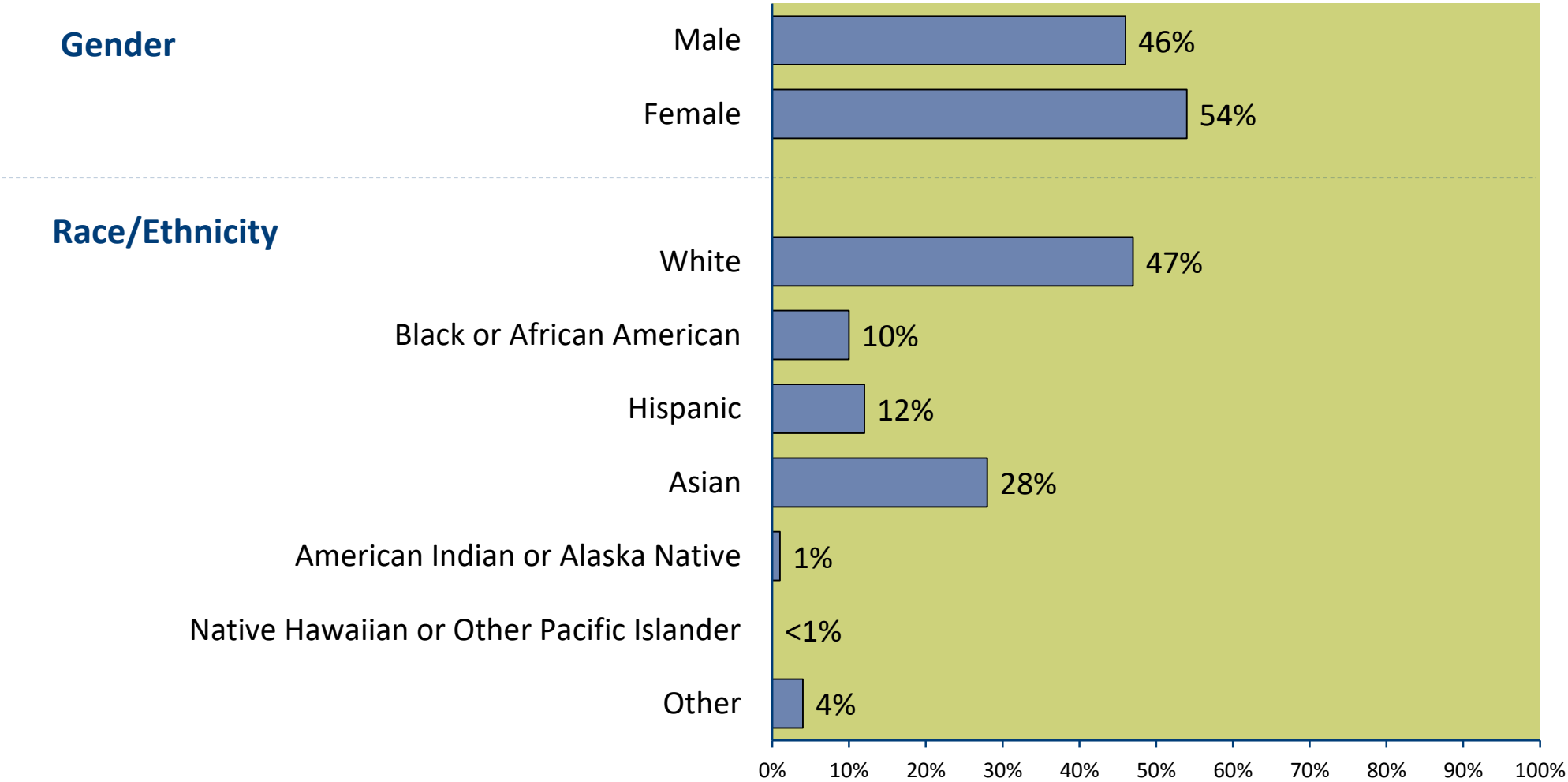
4% more examinees tested in 2018 than in 2017

Unique Examinees with Scores



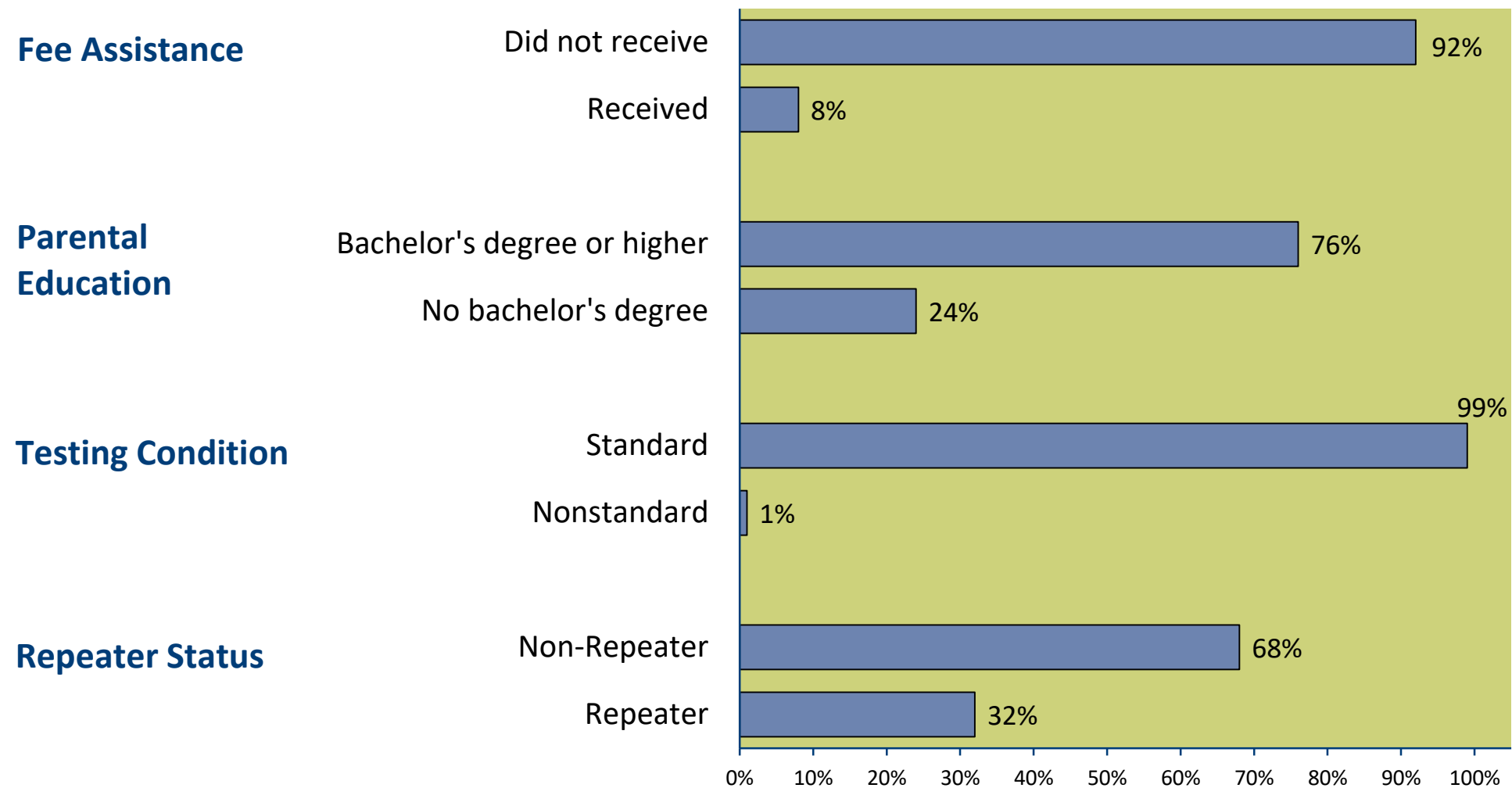
Examinees tested in the same proportions as the past

Percentage of Examinees (2016-2018) Taking the New MCAT Exam by Gender, Race/Ethnicity (N = 206,299)



Examinees tested in the same proportions as the past

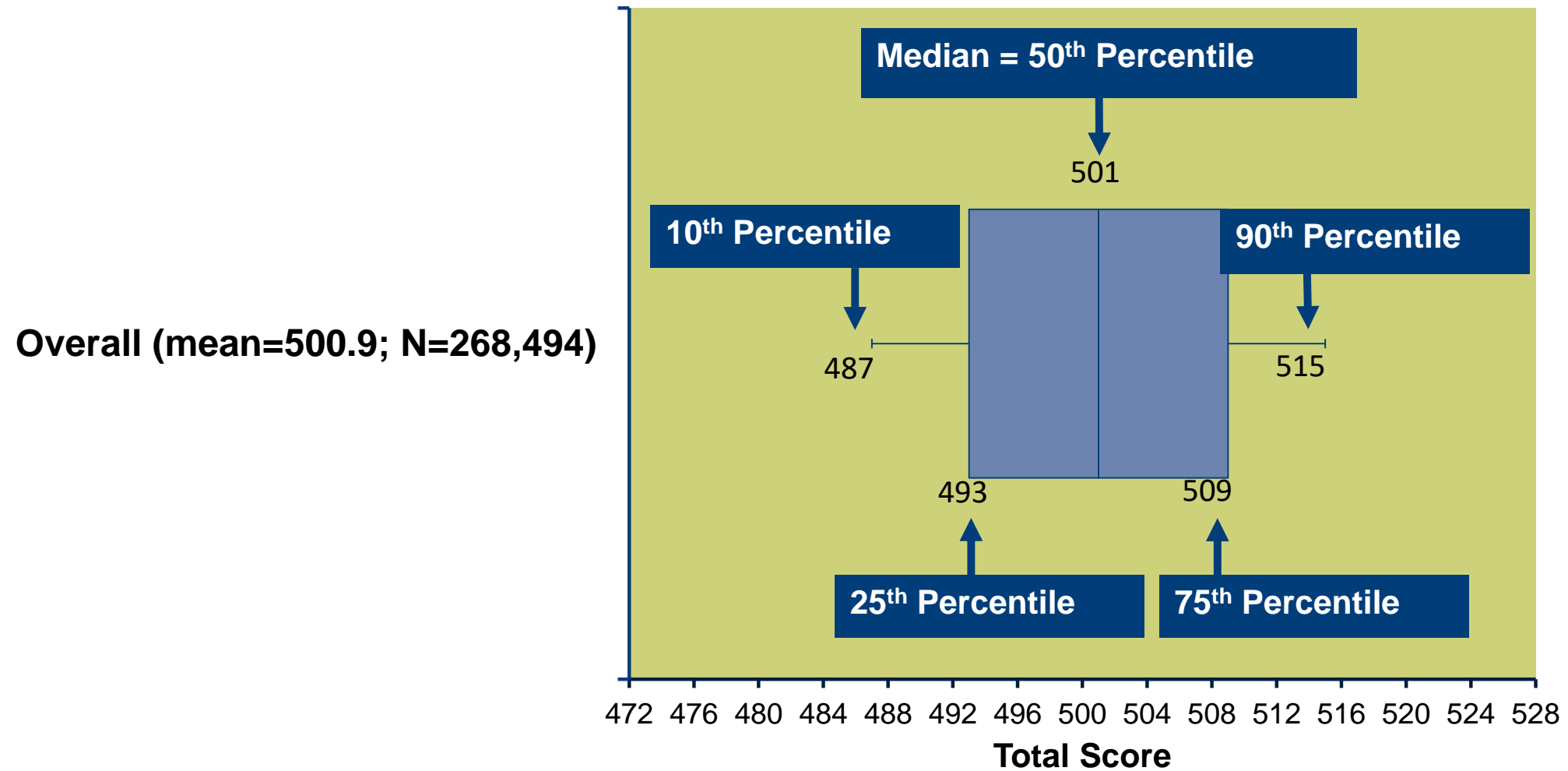
Percentage of Examinees (2016-2018) Taking the New MCAT Exam by Fee Assistance, Parental Education, Testing Condition, and Repeater Status (N = 206,299)



How well did examinees score in 2016-2018?

Box-and-whisker plots help describe score distributions

MCAT total scores for exams administered in 2016-2018



There was a wide range of scores overall and w/in group for examinees testing in 2016-2018

Overall

Total (mean = 500.9; N = 268,494)

Gender

Male (mean = 502.5; N = 119,250)

Female (mean = 499.6; N = 148,486)

Race/Ethnicity

White (mean = 502.6; N = 116,447)

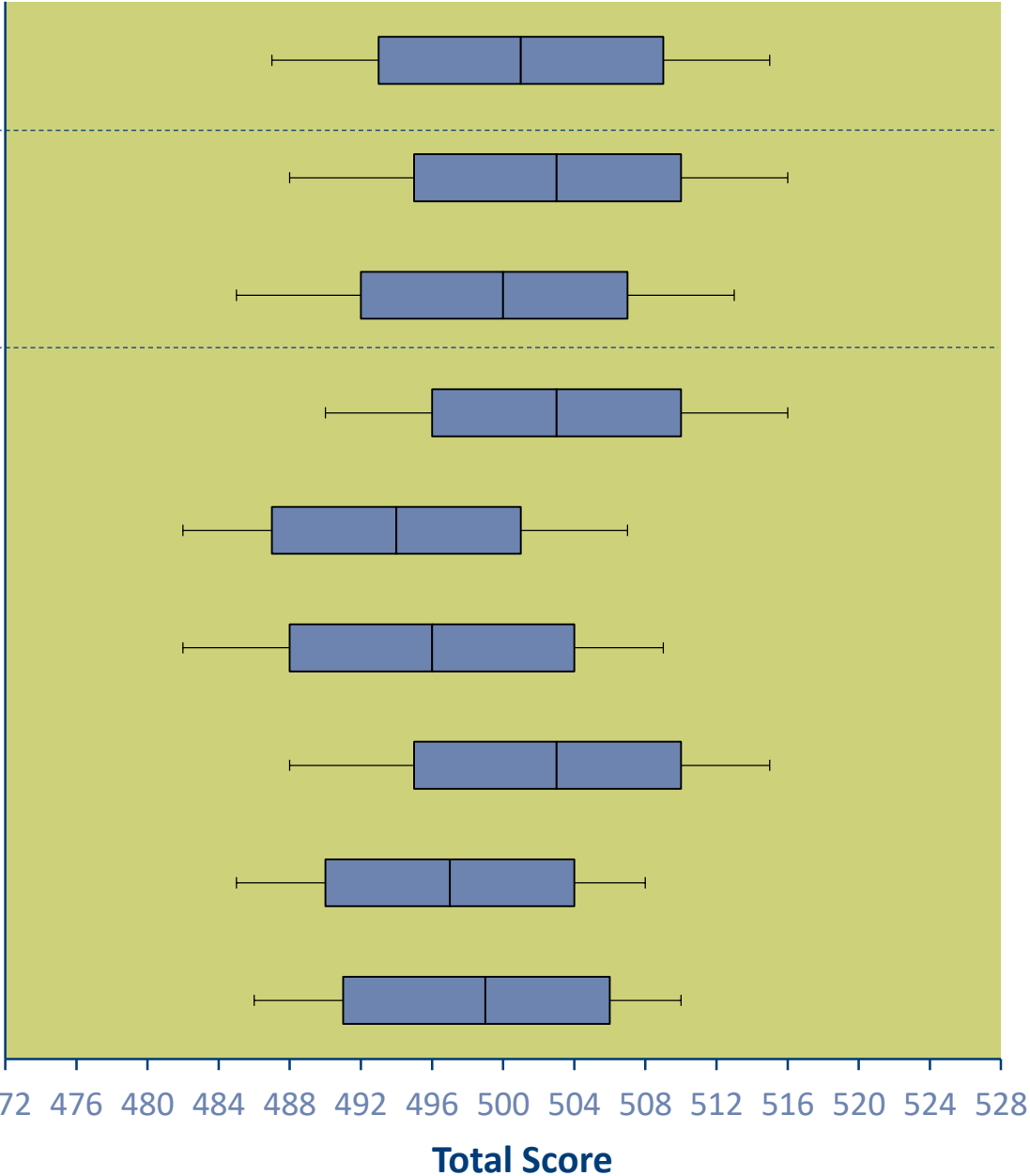
Black or African American (mean = 494; N = 27,544)

Hispanic (mean = 496.1; N = 29,772)

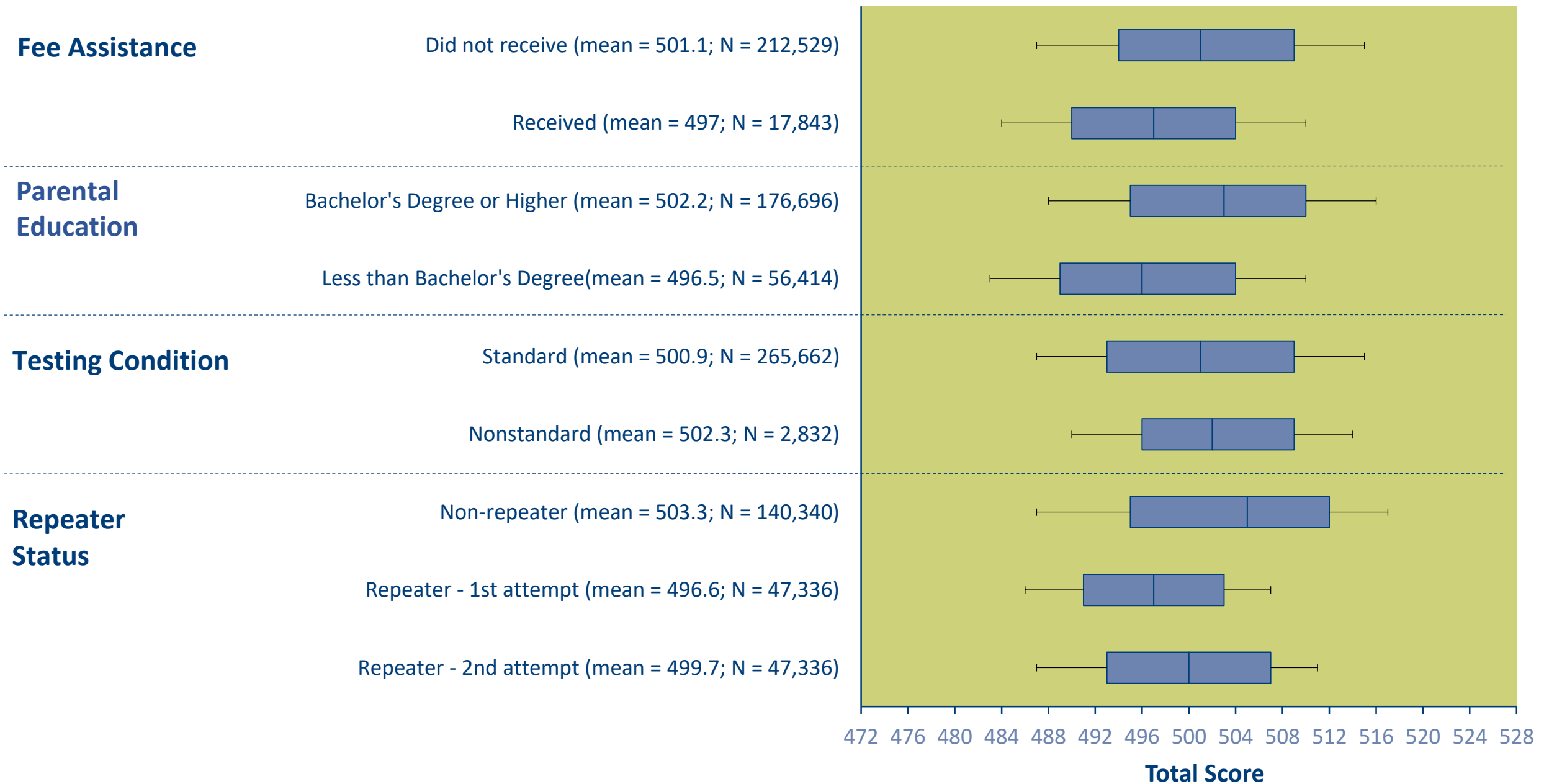
Asian (mean = 502.5; N = 74,035)

American Indian or Alaska Native (mean = 497.3; N = 2,937)

Native Hawaiian or Other Pacific Islander (mean = 498.8; N = 863)



There was a wide range of scores overall and w/in group for examinees testing in 2016-2018



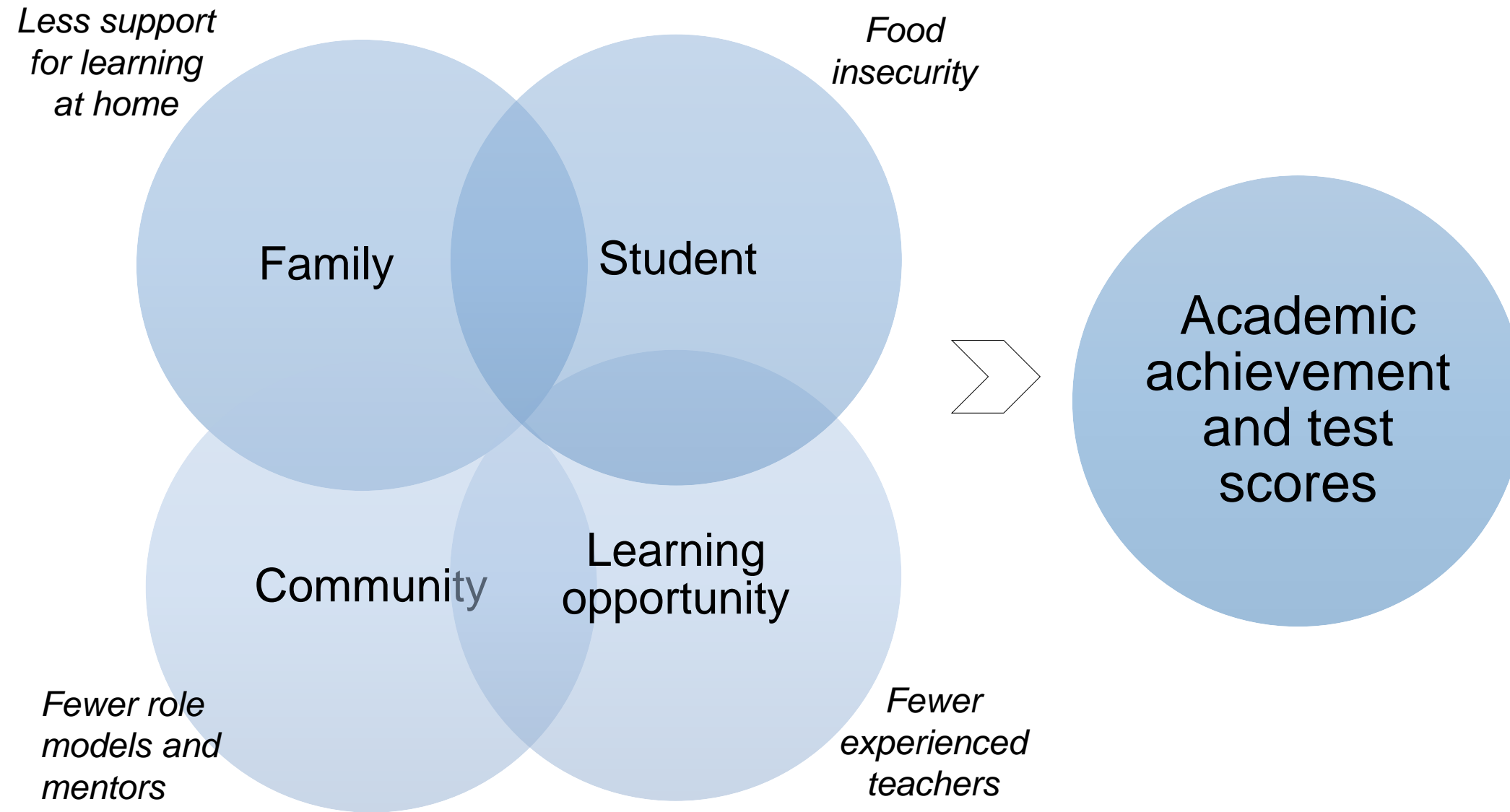
Group differences in academic achievement are associated with societal inequalities

- ❑ MCAT, LSAT, GMAT, GRE and other admissions tests show population group differences.
- ❑ Undergraduate GPAs of medical school applicants show similar group differences.
- ❑ Societal inequalities likely contribute to the differences seen across the spectrum of exams.
 - MCAT scores show comparable prediction for medical students from different sociodemographic backgrounds.

Davis D et al. Acad Med. 2013;88:593

Dietrichson, J., Martin B., Filges, T., and Jorgensen, AMK (2017). Academic interventions for elementary and middle school students with low socioeconomic status: A systematic review and meta-analysis. Review of Educational Research. 87, 243-283.

At a population level, students from some groups are more likely to experience inequality



How are we helping students prepare?

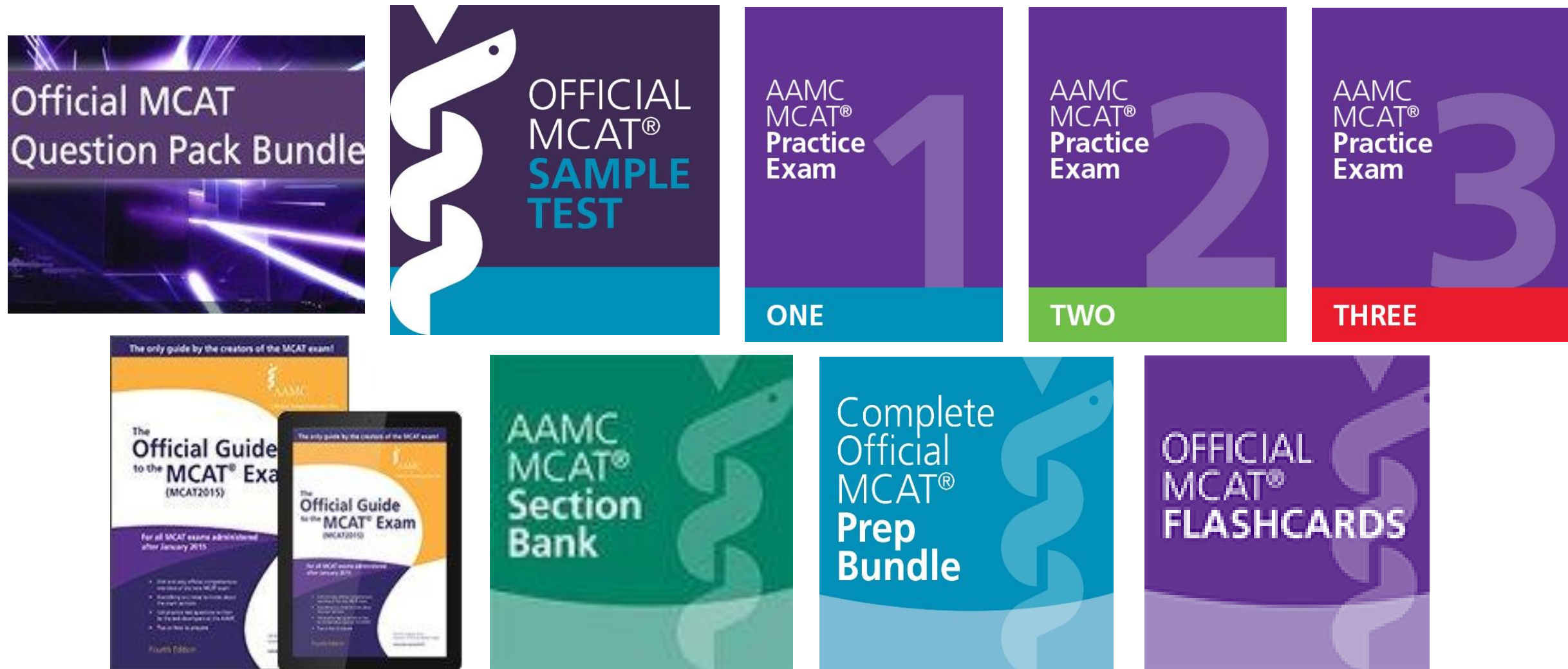
The new test blueprints were developed with fairness in mind

- ❑ Tests concepts widely taught at undergraduate institutions, including minority-serving and under-resourced institutions
- ❑ Tests psychology and sociology concepts like discrimination, stereotype threat, and socio-economic inequalities
- ❑ Gives increased attention to population health, studies of diverse cultures, and ethics
- ❑ Balances the percentage of questions devoted to natural sciences concepts with the percentage devoted to behavioral and social sciences concepts and information processing
- ❑ Gives examinees more working time per question

Outreach strategies target underrepresented groups

- ❑ Outreach directly to students from sociodemographic groups underrepresented in medicine
- ❑ Outreach to students through their advisors, with a particular focus on faculty at under-resourced institutions
- ❑ Monthly newsletter *Premed Navigator* with important information, resources, and tips
- ❑ Work with pre-health advisors on the MCAT Validity Committee to share findings and promote resources, such as the “Find an Advisor” resource for students at schools with no access to an advisor (volunteer.advisor@naahp.org)

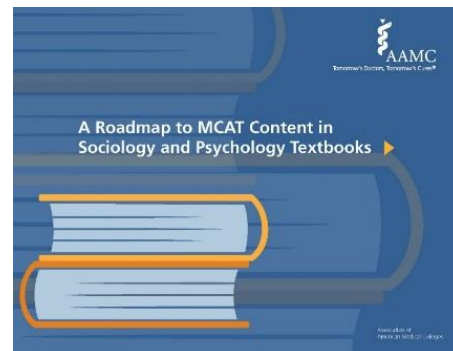
AAMC offers a number of low-cost practice materials (most of which are free to students with financial need)



[Students-residents.aamc.org/mcatprep](https://students-residents.aamc.org/mcatprep)

Khan Academy tutorials and some AAMC resources are free

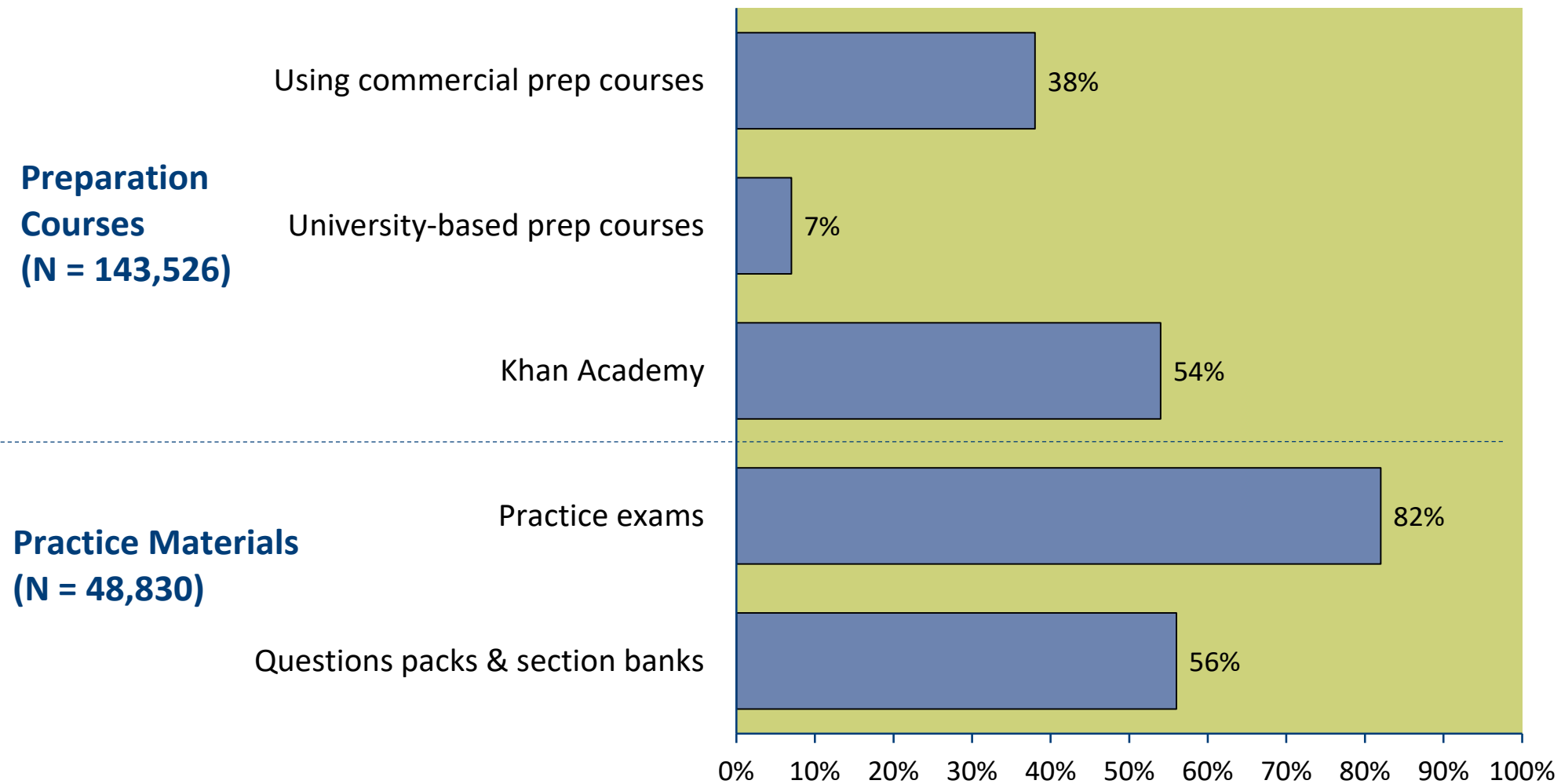
- ❑ The Khan Academy has over 1,100 free tutorials on exam content
- ❑ Free practice materials and resources on AAMC's website:
 - *What's on the MCAT Exam?* Interactive Content Outline
 - Roadmaps to MCAT Content in Biochemistry, Psychology, and Sociology Textbooks
 - *Guide to Creating a Study Plan*
 - *How I Prepared for the MCAT Exam* Testimonials
 - AAMC Pre-Med Navigator



[Students-residents.aamc.org/mcatprep](https://students-residents.aamc.org/mcatprep)

Many examinees took preparation courses, used Khan tutorials and practice materials

Percentage of Respondents (2017-2018) Completing Preparation Courses and Using Practice Materials



What are we learning about the fairness, impact, use, and predictive validity of the new exam?

21 medical schools are working together to evaluate the new exam



UNIVERSITY
of HAWAII®
MĀNOA

University of California
San Francisco



School of Medicine



UNIFORMED SERVICES UNIVERSITY
of the Health Sciences
F. Edward Hébert School of Medicine



THE OHIO STATE UNIVERSITY
COLLEGE OF MEDICINE



THE UNIVERSITY
OF ARIZONA



UIC COLLEGE OF
MEDICINE



MOREHOUSE
SCHOOL OF MEDICINE



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RUTGERS

Robert Wood Johnson
Medical School



Faculty of Medicine



UNC
SCHOOL OF MEDICINE



Philadelphia College of
Osteopathic Medicine



STANFORD
SCHOOL OF MEDICINE
Stanford University Medical Center



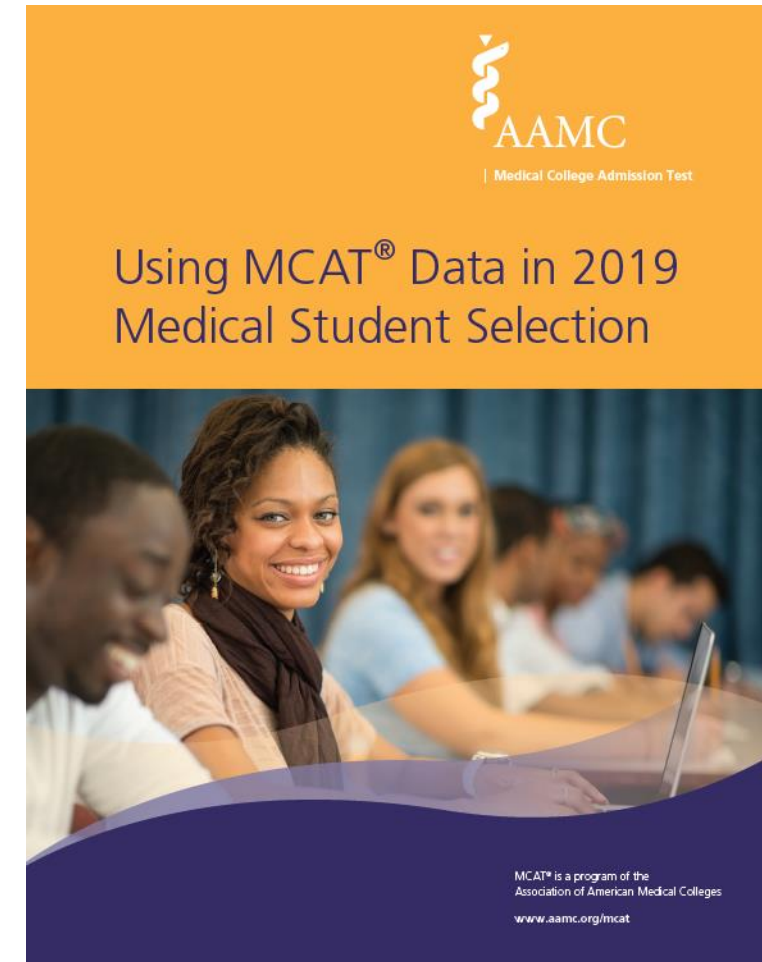
UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE



Tulane
University
SCHOOL OF MEDICINE

The MCAT validity research addresses multiple goals

- ❑ Provides evidence about the value of the new MCAT exam in admissions decisions
- ❑ Answers questions about the fairness and consequences of introducing the new MCAT exam for examinees, applicants, and medical students
- ❑ Presents data to admissions officers that they can act on to improve their admissions decisions
- ❑ Uses findings about the needs of aspiring physicians from underrepresented backgrounds to improve test preparation resources and outreach



The MCAT validity agenda includes three broad research topics



**Academic
Preparation,
Diversity, and
Fairness**

**Admissions Decision
Making**

**Predicting Academic
Performance**

Let's zoom in on the research on academic preparation



Academic Preparation, Diversity, and Fairness



Admissions Decision Making



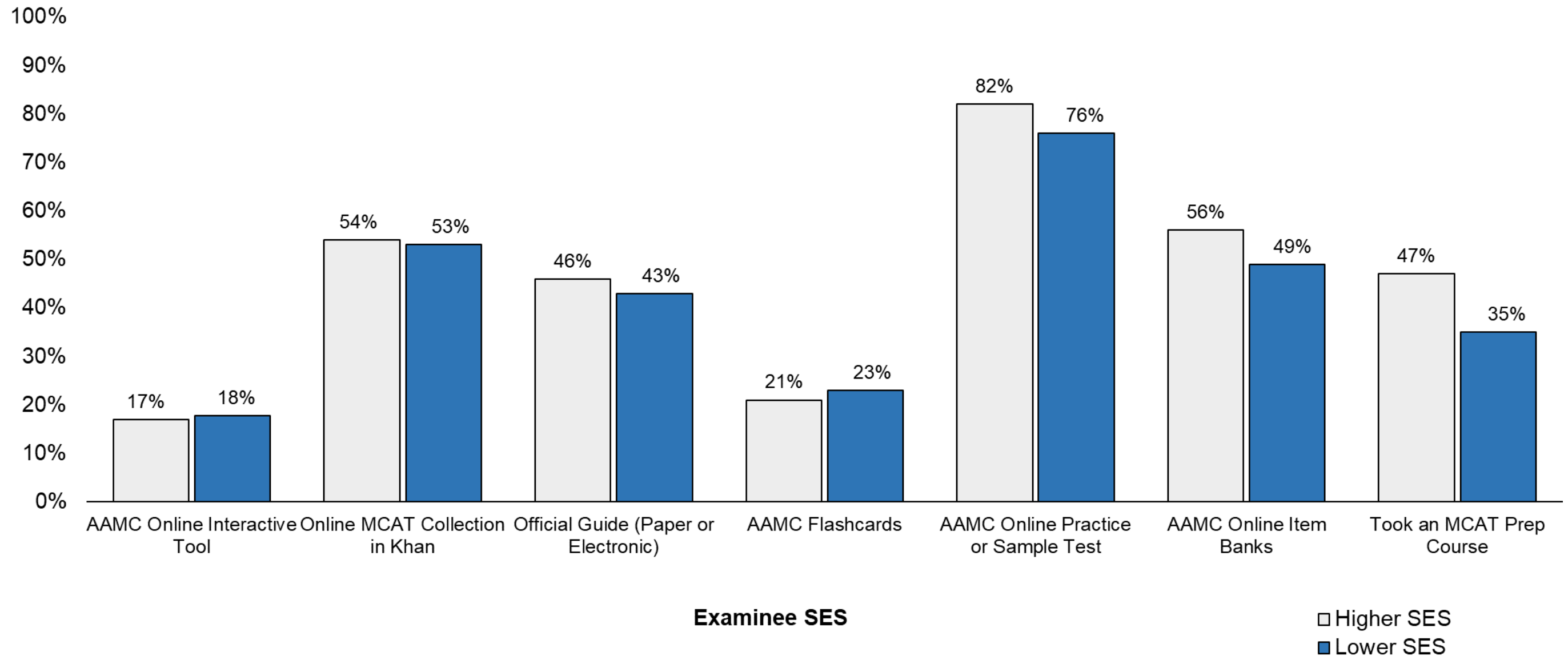
Predicting Academic Performance

What are we doing to understand students' preparation strategies and barriers?

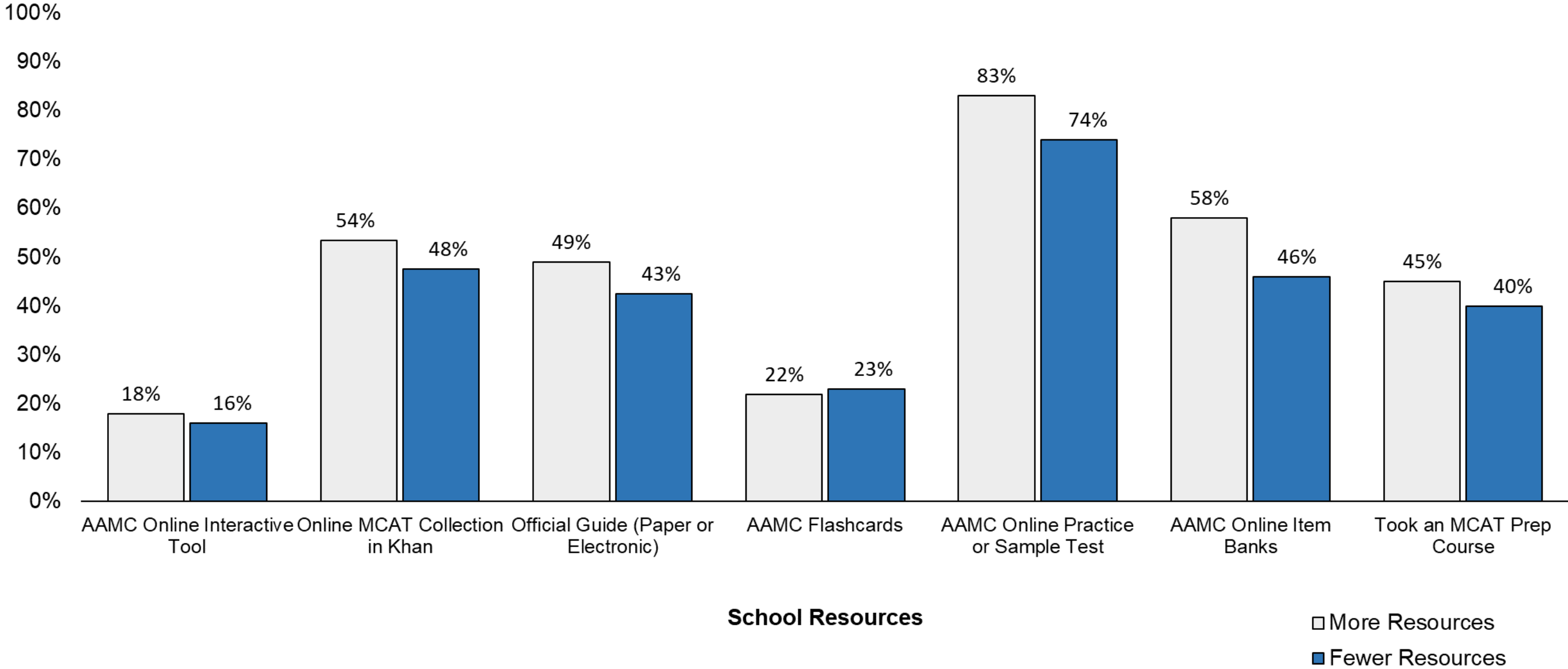
We are conducting qualitative and quantitative research to understand students' preparation strategies and barriers

- Do students from different sociodemographic groups use preparation resources at similar rates?
- What is easy and difficult for examinees when they prepare for the MCAT exam?
- What is easy and difficult about using the AAMC's free and low-cost materials to prepare for the MCAT exam?
- What unique barriers are faced by examinees from sociodemographic groups underrepresented in medicine?
- What additional resources and information do examinees and their advisors need?

Use of most preparation resources is slightly lower for examinees from lower-SES backgrounds



Use of most preparation resources is slightly lower for examinees from schools with fewer resources



Interviews suggested hypotheses for the challenges faced by examinees

Some students...

- May lack the time to use resources because of work or family obligations
- May lack reliable access to computers or the internet to use the online preparation resources
- May lack access to quiet study places to concentrate on preparation
- May not be able to afford even the low-cost resources
- May not know how to create and execute a study plan
- May not know what resources are available or understand how to use them strategically

The next step is to revise the PMQ to learn more about these potential challenges

- How examinees develop and implement study plans
 - Building in enough time to fully prepare
 - Breaking preparation into small chunks
 - Scheduling breaks to manage burnout
- Preparation strategies, such as
 - Pre-exam study tailored to areas of weakness
 - Use of practice questions to check progress and reflect on understanding

The next step is to revise the PMQ to learn more about these potential challenges

- Preparation for the exam day, such as
 - Simulating the test day experience
 - Building endurance for the full test day
 - Planning food and drinks for scheduled breaks
 - Getting proper rest and nutrition the night before
- We will try out the new survey questions in 2019, and collect population data from examinees starting in 2020

Let's zoom in on the research on predictive validity



Academic Preparation, Diversity, and Fairness



Admissions Decision Making



Predicting Academic Performance

How well did the new scores predict students' academic performance in the first two years of medical school?

We are presenting validity findings for four pre-clerkship outcomes

| Performance Outcome | Type of Outcome | Source of Outcome Data |
|--|------------------------|-------------------------------|
| Progression to Clerkship On Time | Pass/Fail | National |
| Passing the Step 1 Exam on the 1 st Attempt | Pass/Fail | National |
| Summative Performance Across Pre-Clerkship Courses | Continuous | Validity Schools |
| Scores on Step 1 from the 1 st Attempt | Continuous | National |

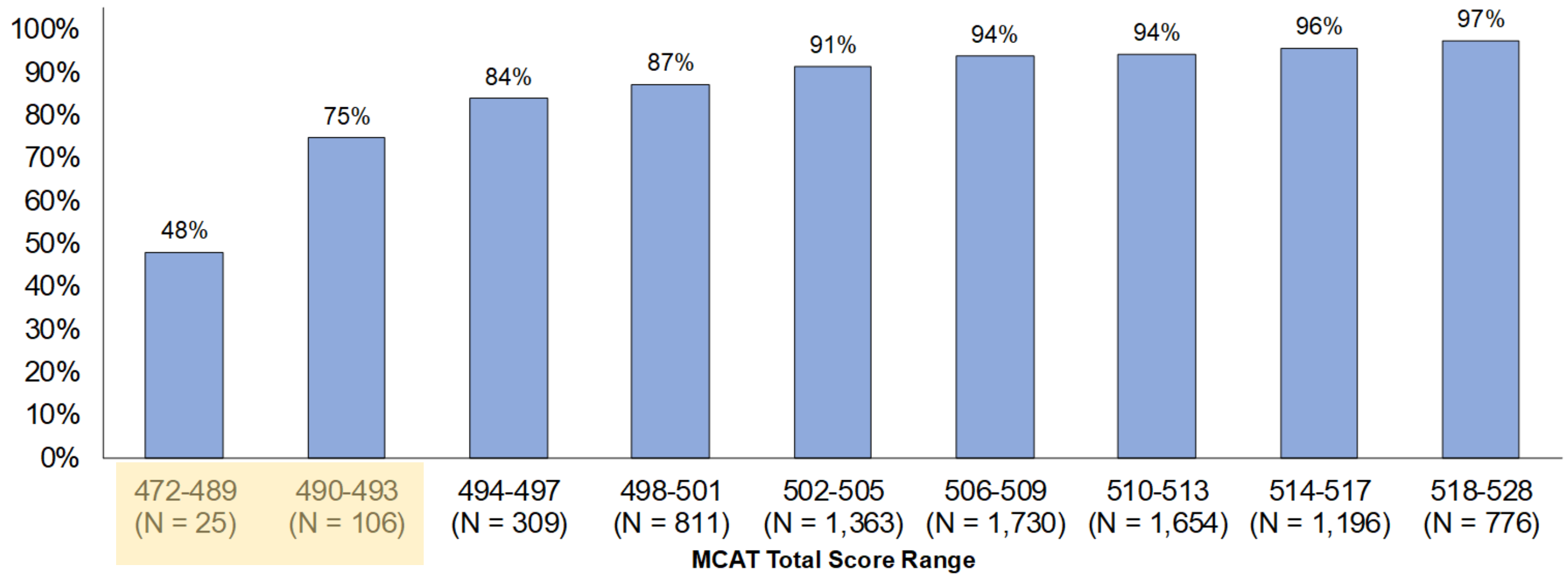
**How Well Do MCAT Scores
Predict Performance on the Pass/Fail Outcomes?**

Progression to Clerkship on Time

Passing the Step 1 Exam on the First Attempt

Nationally, 2016 entrants with a wide range of scores progressed to clerkships on time

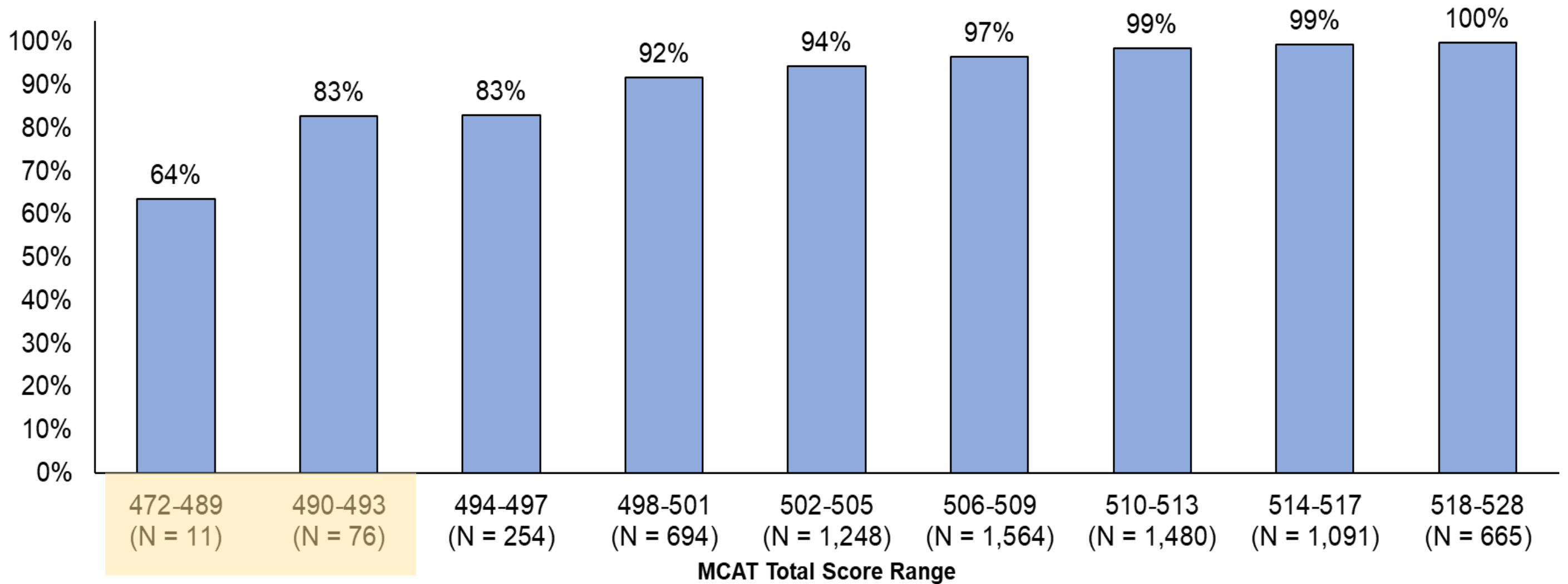
% of 2016 Entering Medical Students Who Progressed to Clerkship on Time



Note: The number of students with scores below 494 is too small to interpret meaningful differences in their progression rate compared with those who scored at or above 494.

Nationally, 2016 entrants with a wide range of scores passed the Step 1 exam on the first attempt

% of 2016 Entering Medical Students Who Passed USMLE Step 1 on the First Attempt



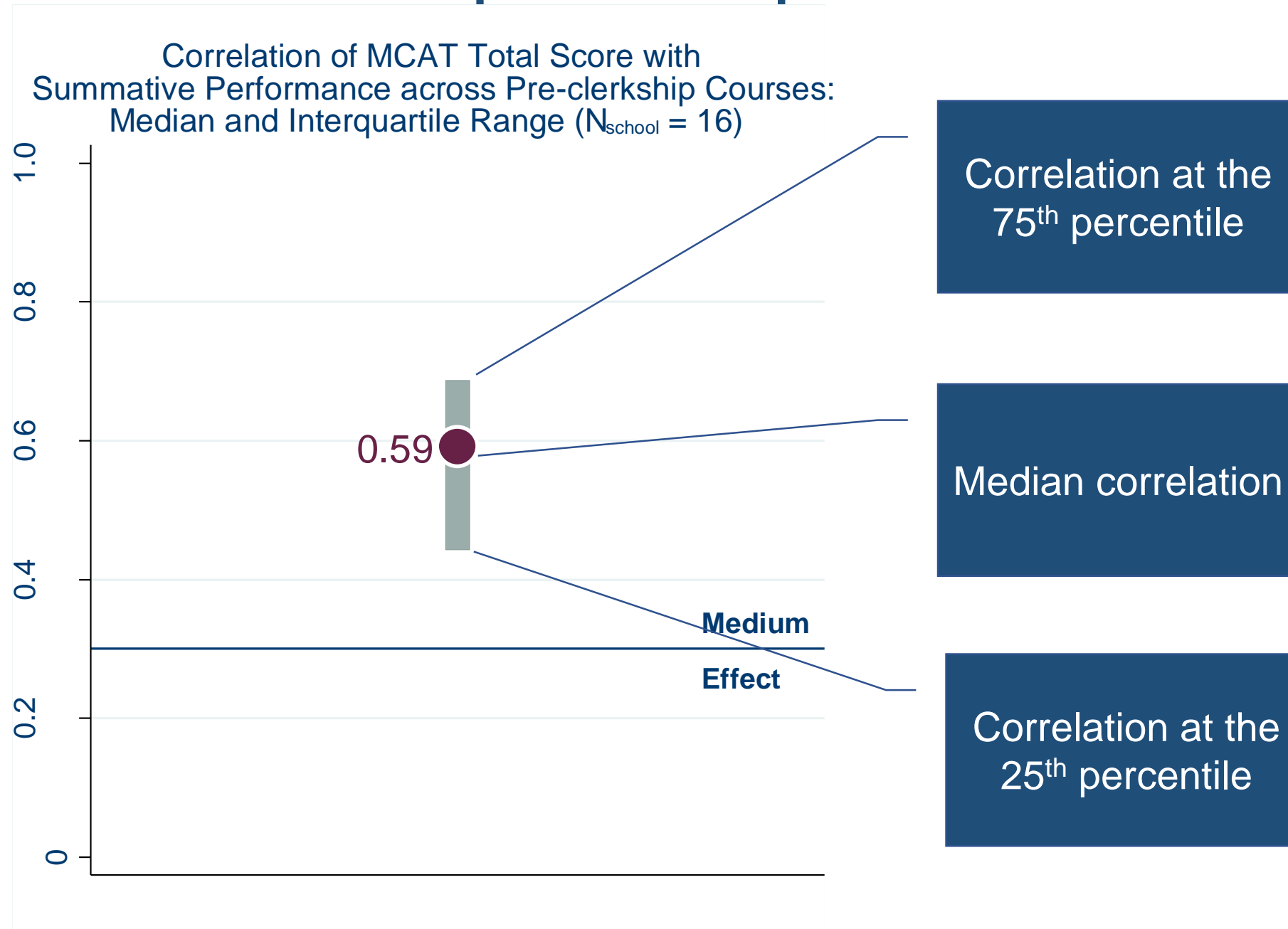
Note: The number of students with scores below 494 is too small to interpret meaningful differences in their progression rate compared with those who scored at or above 494.

**How Well Do MCAT Scores
Predict Performance on the Continuous Outcomes?**

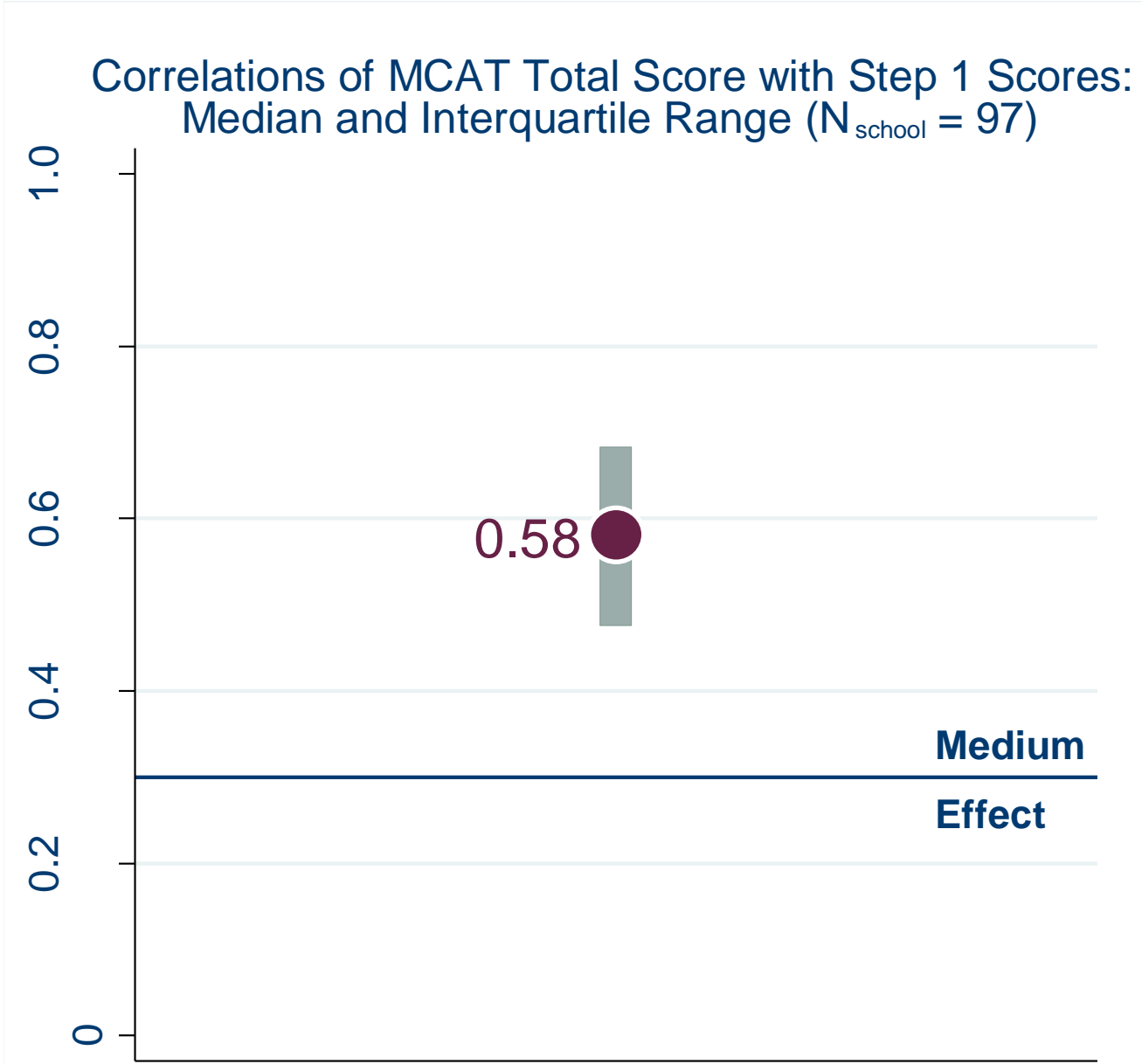
Summative Performance Across Pre-clerkship Courses

Scores from the Step 1 Exam (First Attempt)

At validity schools, MCAT total scores show medium to large correlations with 2016 entrants' performance across pre-clerkship courses



At MD-granting medical schools, MCAT total scores also show medium to large correlations with 2016 entrants' Step 1 scores



Note: Schools that do not have 30 or more students' Step 1 scores were excluded from the analysis.

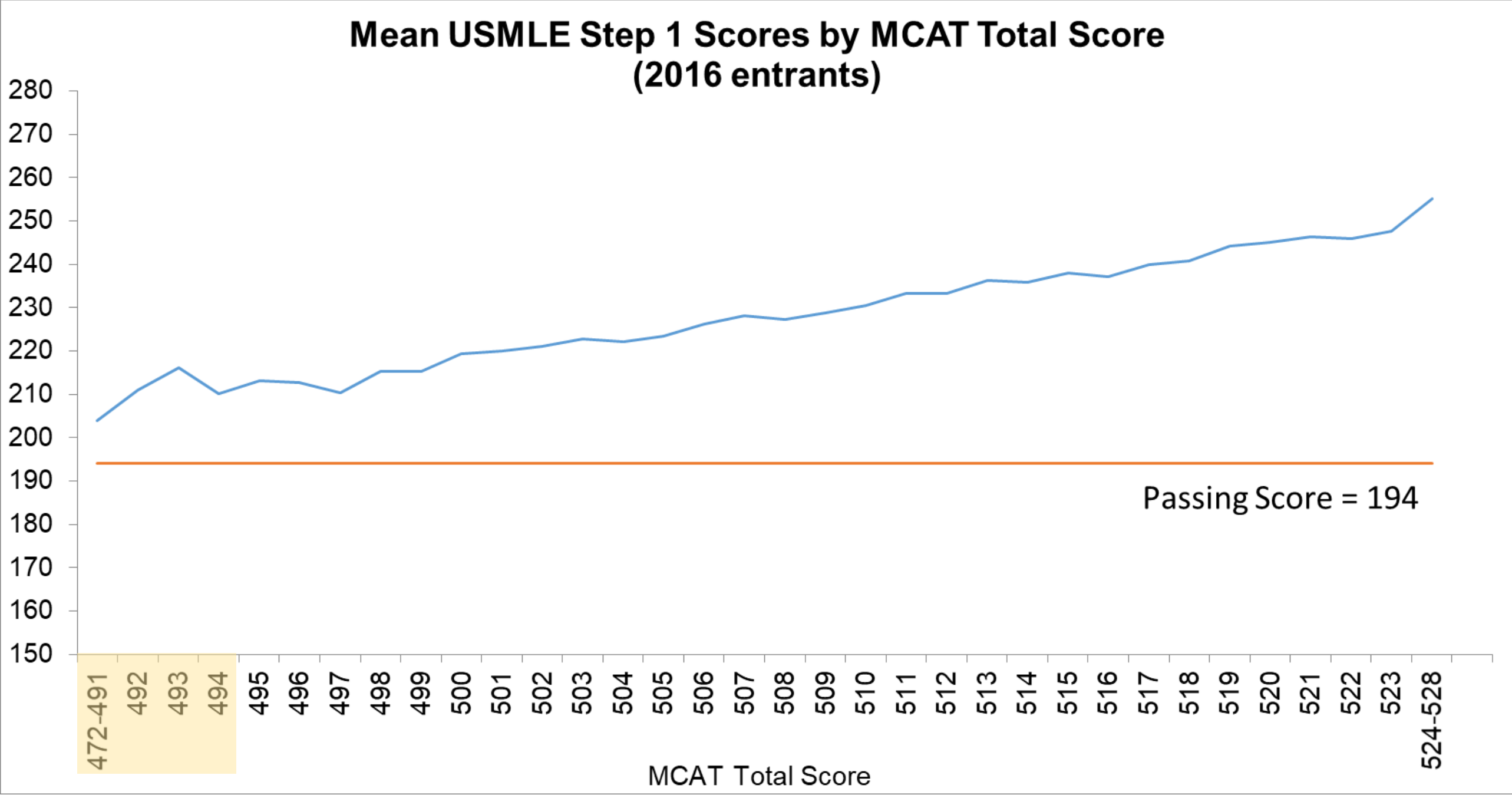
These validities compare well to those for other admissions tests

| Author (Year) | Exam | Type of Exam Score | Type of Outcome | Median Validity Coefficient | Unit of Analysis |
|--------------------------------|--------------------------|--------------------|--|-----------------------------|----------------------------------|
| AAMC (2018) | New MCAT (2016 entrants) | Total score | Performance across pre-clerkship courses | .59 | School (N _{school} =16) |
| AAMC (2018) | Old MCAT (2015 entrants) | Total score | Performance across pre-clerkship courses | .54 | School (N _{school} =17) |
| Talento-Miller & Rudner (2005) | GMAT | Total score | Mid-program grades | .47 | Study (N _{study} = 272) |

Reference:

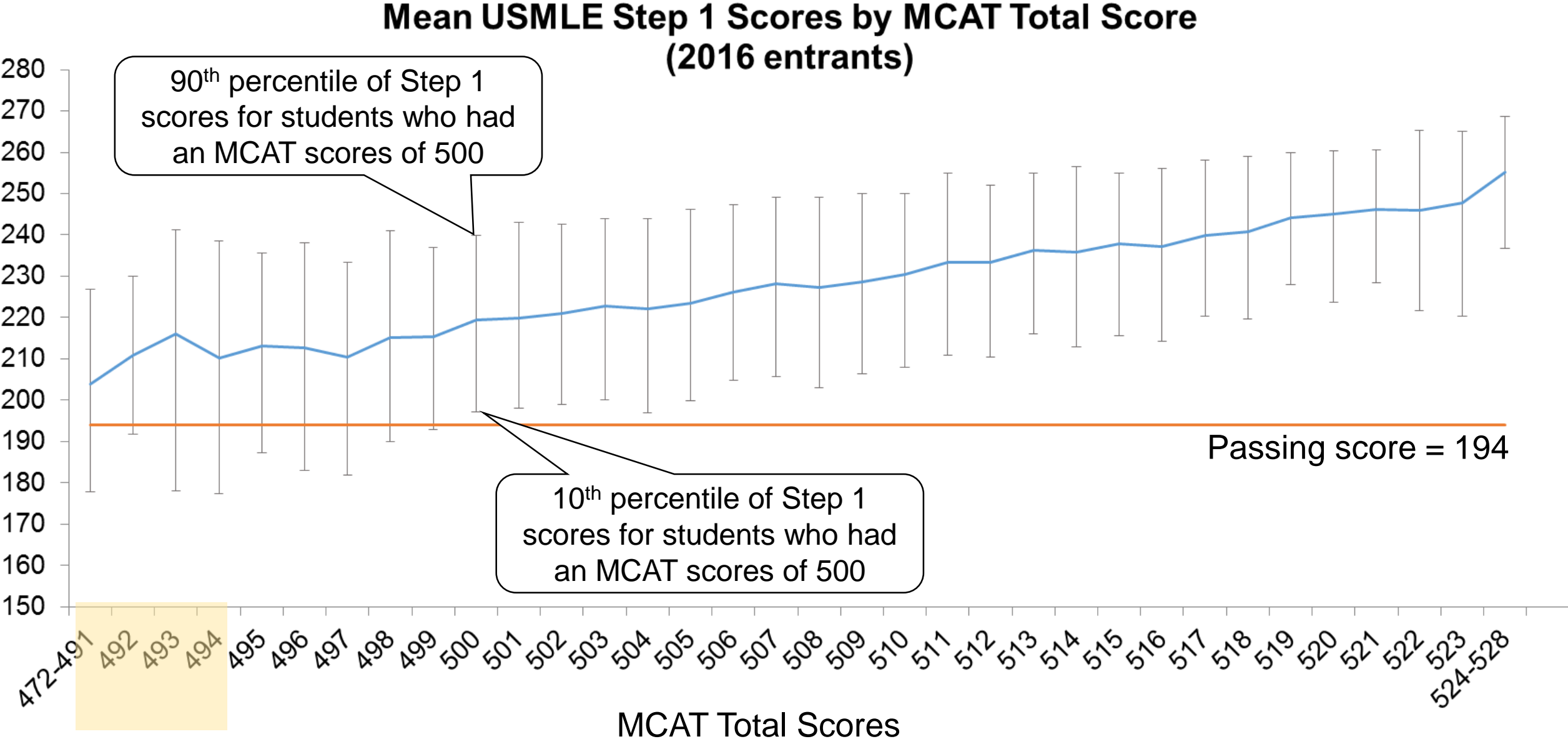
1. Talento-Miller, E. & Rudner, L. M. (2005). GMAT validity study summary report for 1997 to 2004. Retrieved from https://www.gmac.com/-/media/files/gmac/research/validity-and-testing/rr0506_vsssummaryreport.pdf

Nationally and on average, 2016 entrants with higher MCAT scores obtained higher Step 1 scores



Note: The number of students with scores below 494 is too small to interpret meaningful differences in their mean Step 1 scores compared with those who scored at or above 494.

At every MCAT total score, some students performed better than expected, and others performed less well



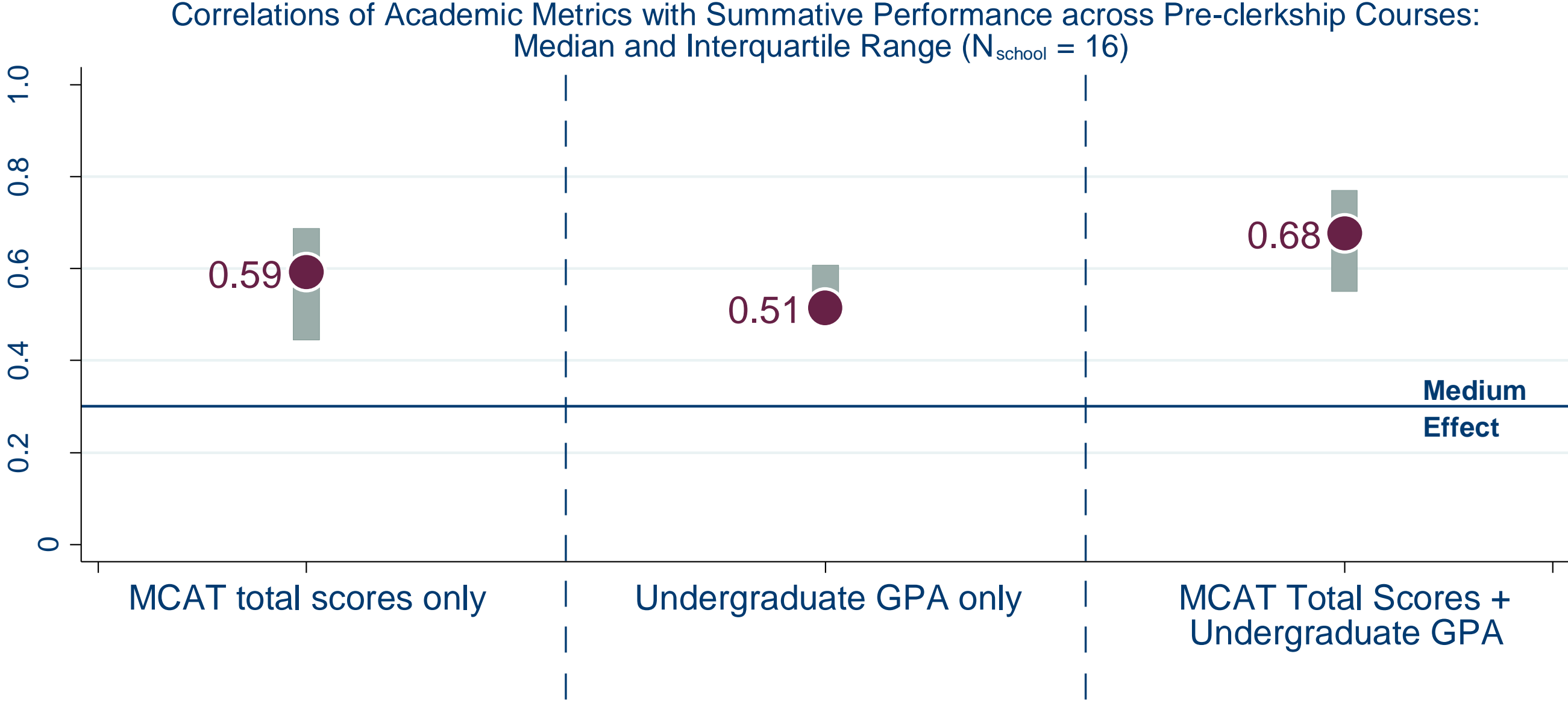
Note: The number of students with scores below 494 is too small to interpret meaningful differences in their mean Step 1 scores compared with those who scored at or above 494.

MCAT scores provide comparable prediction for students from different sociodemographic backgrounds

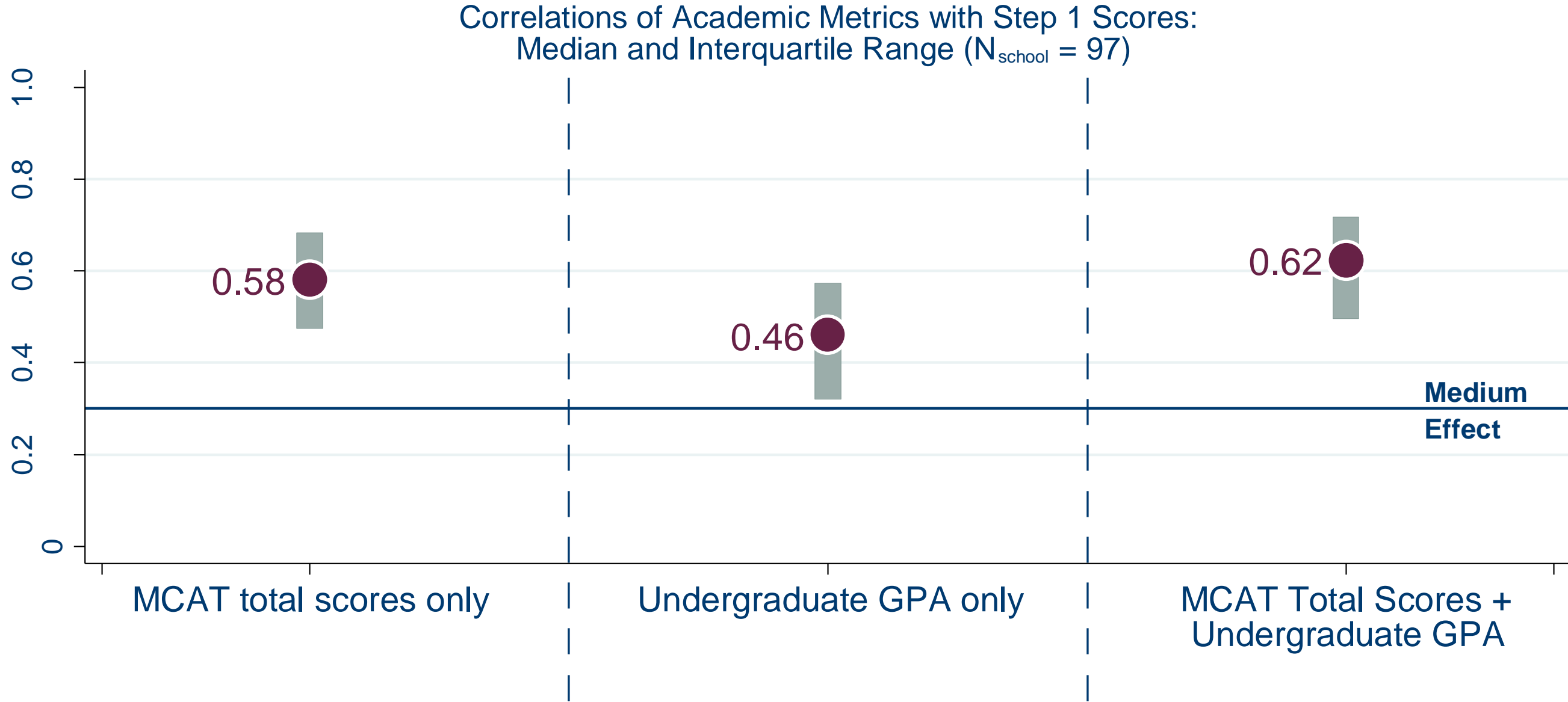
- ❑ Research studied these early relationships for students grouped by:
 - Race/ethnicity
 - Socioeconomic status
 - Gender
- ❑ So far, MCAT scores neither over- nor under-predict the performance of students from these groups based on two types of performance outcomes:
 - National outcome: Progression to M2 and clerkship on time
 - Validity school outcome: Performance across pre-clerkship courses

**Together MCAT scores and GPAs provide
better information than either alone**

At the validity schools, MCAT scores and UGPAs predict 2016 entrants' performance across pre-clerkship courses. Combined, they predict better than either one alone



At MD-granting medical schools, MCAT scores and UGPAs predict 2016 entrants' Step 1 scores. Combined, they predict better than either one alone



Note: Schools that do not have 30 or more students' Step 1 scores were excluded from the analysis.

What we have learned so far

- ❑ Students with a wide range of MCAT scores progressed to their clerkships and passed the Step 1 exam at high rates.
 - You identified students with the right mix of experiences, attributes, and academic preparation at these score ranges capable of succeeding at your schools
- ❑ MCAT scores do a good job of predicting medical students' pre-clerkship and Step 1 performance.
- ❑ MCAT scores show comparable prediction for medical students from different sociodemographic backgrounds.
- ❑ MCAT scores and UGPAs predict students' pre-clerkship and Step 1 performance well. Combined, they predict better than either one alone.
- ❑ MCAT scores are only one signal of student's preparation for medical school.
 - At every MCAT total score, some students do better than expected, some do less well than expected

We have a lot more to learn about how students do in their clerkships, on their future USMLE exams, and their graduation from undergraduate medical school

Interested in learning more about the MCAT validity research from your colleagues?

Evaluating the Impact, Use, and Predictive Validity of the New MCAT Exam

Sunday, November 4, 2018

3:00 PM – 4:15 PM

(Convention Center: Ballroom G)

Speakers:

Catherine Lucey, MD, Vice Dean for Education (moderator)
University of California, San Francisco School of Medicine

Jorge Girotti, PhD, MHA, Associate Dean for Admissions and Special Curricular Programs
University of Illinois College of Medicine

Kristen Goodell, MD, Associate Dean for Admissions
Boston University, School of Medicine

Joshua Hanson, MD, Associate Dean for Student Affairs, Associate Professor
The University of Texas School of Medicine at San Antonio

Questions?



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