

# How Admissions Officers Use MCAT Predictive Validity Findings in Student Selection

November 11, 2019




# Today's speakers

## Facilitator:

- **Catherine Lucey, MD**  
Vice Dean for Education  
University of California, San Francisco School of Medicine

## Speakers:

- **Leila Amiri, PhD**  
Assistant Dean for Admissions and Recruitment  
University of Illinois College of Medicine
- **Joshua Hanson, MD, MPH**  
Associate Dean for Student Affairs, Associate Professor, School of Medicine  
University of Texas Health San Antonio  
Joe R. and Teresa Lozano Long School of Medicine
- **Cynthia Searcy, PhD**  
Senior Director, MCAT Research and Development  
Association of American Medical Colleges



# Today we will present MCAT validity findings and learn how two schools use these validity data in program evaluation and refinement

- ☐ How do MCAT scores and undergraduate GPAs compare for applicants from different backgrounds?
- ☐ How well do MCAT scores and undergraduate GPAs predict medical students' preclerkship and Step 1 performance, and progression to year 3?
- ☐ What are the advantages of considering applicants with a wider range of MCAT scores?
- ☐ How do admissions and student affairs officers at two medical schools use validity data to improve the selection and support of their students?

See your MCAT Validity Data Report for citations from recently published articles.





# Medical education is a public good

Medical education is responsible for:

- ☐ Preparing a physician workforce that meets the needs of our increasingly diverse nation, and
- ☐ Producing physician-citizens who will participate in and advance our democracy.

Medical schools can accomplish this by:

- ☐ Building a physician workforce that is diverse and inclusive with respect to race, ethnicity, and all the rich identities that exist within our communities, and
- ☐ Examining how MCAT scores are used to evaluate aspiring physicians and gauge the impact of their use on medical student diversity.



# Diversity is a core driver of high quality health care

- ❑ Minority physicians are significantly more likely to practice primary care and in underserved areas.
- ❑ When patients see a physician of the same race/ethnicity or if they speak their native language, it fosters greater trust, improves communication, and often adherence to treatment.
- ❑ Medical students agree that there are benefits of a diverse student body, including the opportunity to learn from others from different backgrounds and the preparation to care for a diverse society.
- ❑ Medical school faculty from minority groups are more likely to focus on health disparity research.
- ❑ Our workforce benefits when physicians with diverse perspectives and backgrounds have the opportunity to take on leadership roles in government and healthcare.

# Group differences in academic achievement are associated with educational and social inequalities

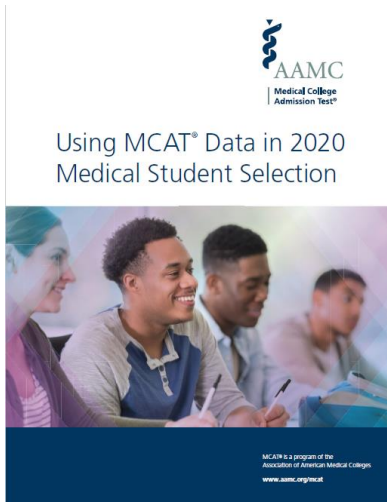
Compared with non URM examinees, those under-represented in medicine are:

- More likely to experience adverse environmental factors (poverty, food insecurity, low-quality day care, inadequate access to healthcare)
- More likely to have had disrupted or low-quality K-12 education
- Less likely to have high-quality exam prep experiences or advising experiences in college

- ❑ Undergraduate GPAs and MCAT scores (as well as LSAT, GMAT, GRE, and other standardized tests) show population group differences.
- ❑ The presence of differences does not equate to test bias (i.e., construct irrelevant content or alterations in administration).
- ❑ Structural racism and privilege likely contribute to the differences seen across the educational continuum.

**How do MCAT scores and  
undergraduate GPAs  
compare for applicants from  
different backgrounds?**

# Pick up a copy of the admissions guide and new data report, and share your input

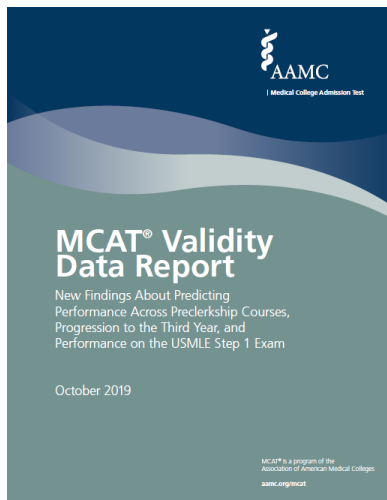


Most recent  
guide to using  
MCAT scores in  
medical student  
selection



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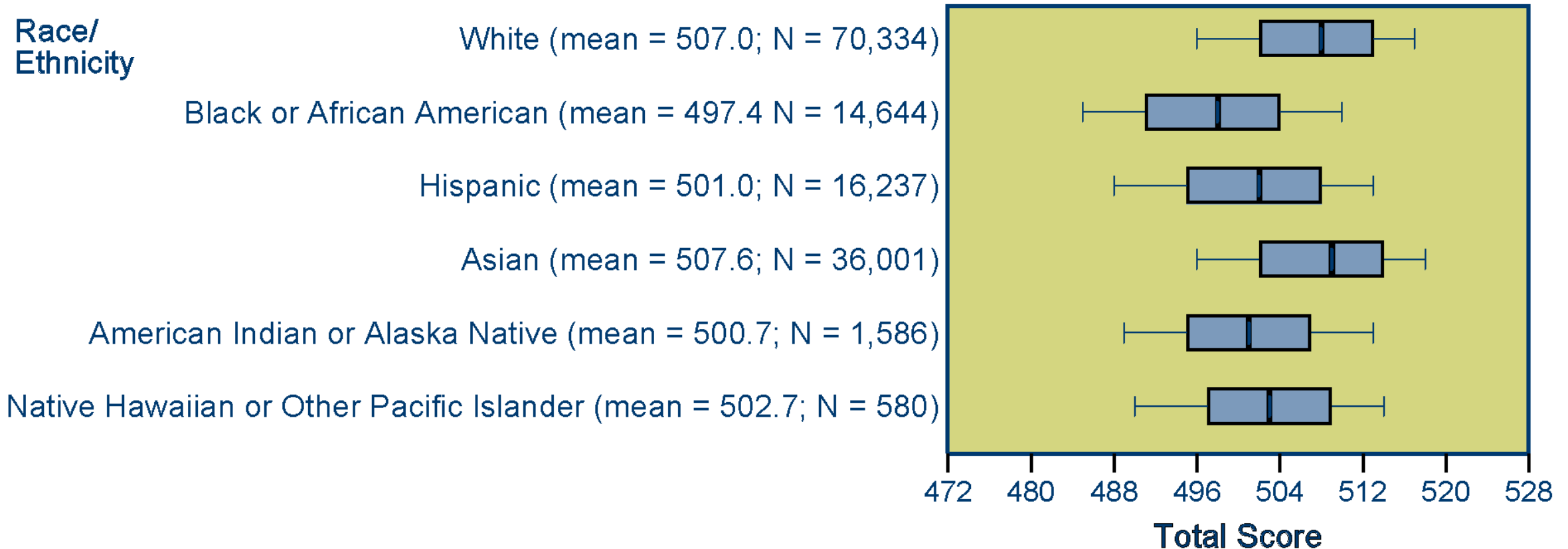
Feedback form



Up-to-date  
findings on the  
predictive validity  
of the MCAT exam



# There are group differences in the average MCAT scores of 2017, 2018, and 2019 applicants



# The group differences in applicants' average undergraduate GPAs mirror those in MCAT scores

Race/  
Ethnicity

White (mean = 3.6; N = 70,334)

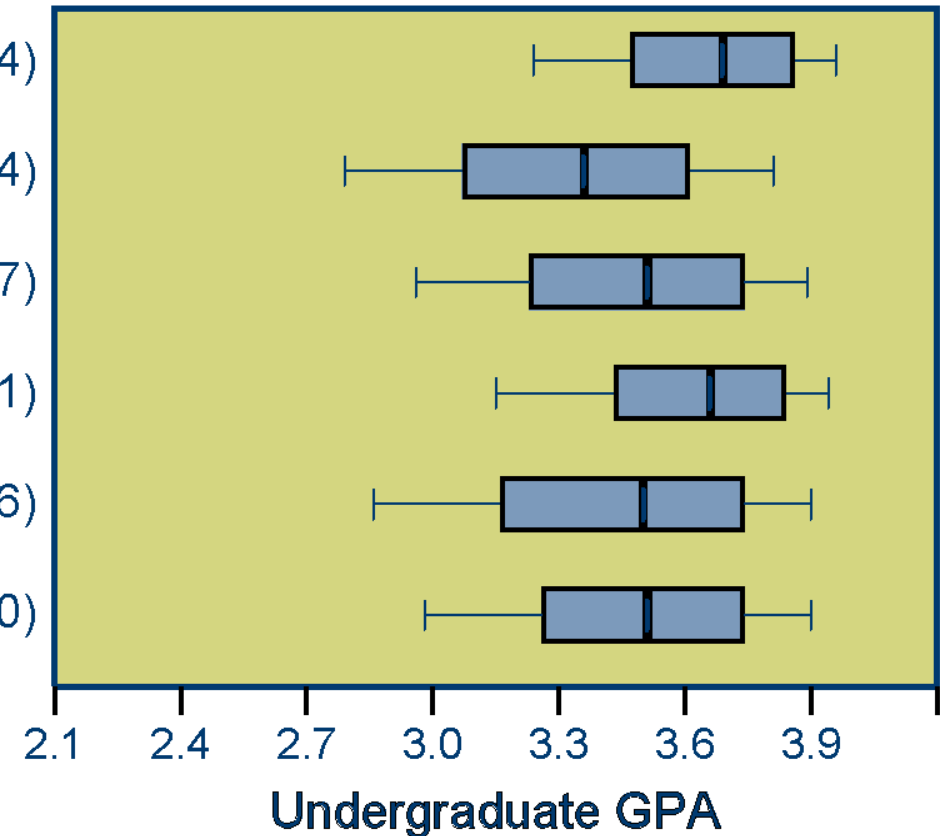
Black or African American (mean = 3.3 N = 14,644)

Hispanic (mean = 3.5; N = 16,237)

Asian (mean = 3.6; N = 36,001)

American Indian or Alaska Native (mean = 3.4; N = 1,586)

Native Hawaiian or Other Pacific Islander (mean = 3.5; N = 580)



# Opportunities to learn are central to MCAT preparation and performance

- ❑ The MCAT exam tests concepts widely taught at undergraduate institutions, including minority-serving and under-resourced institutions.
- ❑ Examinees have access to many official free or low-cost preparation resources.
- ❑ The Khan Academy MCAT Collection includes 1,100 videos and 3,000 review questions that teach tested concepts to help students prepare for the exam.
- ❑ Outreach strategies to students and their advisors target underrepresented groups.



# Gaps in students' preparation for the MCAT exam suggest there's more work to do

- ❑ Students from lower-SES background and who attend undergraduate institutions with fewer resources use many of the AAMC's free and low-cost resources at lower rates than their more resourced peers.
  - There are similar gaps in students' preparation for the SAT
- ❑ These students may face more barriers
  - Affording even low-cost resources
  - Making time for preparation because of work and family obligations
- ❑ The MCAT Validity Committee is conducting qualitative and quantitative research to learn more about students' preparation strategies and challenges

Research findings will inform future outreach and resource development.



How well do MCAT scores and undergraduate GPAs predict medical students' preclerkship and Step 1 performance, and progression to year 3?

# Representatives from medical schools and pre-health programs are evaluating the MCAT exam



So far, they've evaluated the predictive validity of MCAT scores and undergraduate GPAs in relation to five preclerkship outcomes

Performance Outcome	Type of Outcome	Source of Outcome Data
Performance Across Preclerkship Courses	Continuous	17 Validity Schools
Step 1 scores from the 1 <sup>st</sup> Attempt	Continuous	National
Passing the Step 1 Exam on the 1 <sup>st</sup> Attempt	Pass/Fail	National
Progression to M3 On Time and within 1 Extra year	Pass/Fail	National

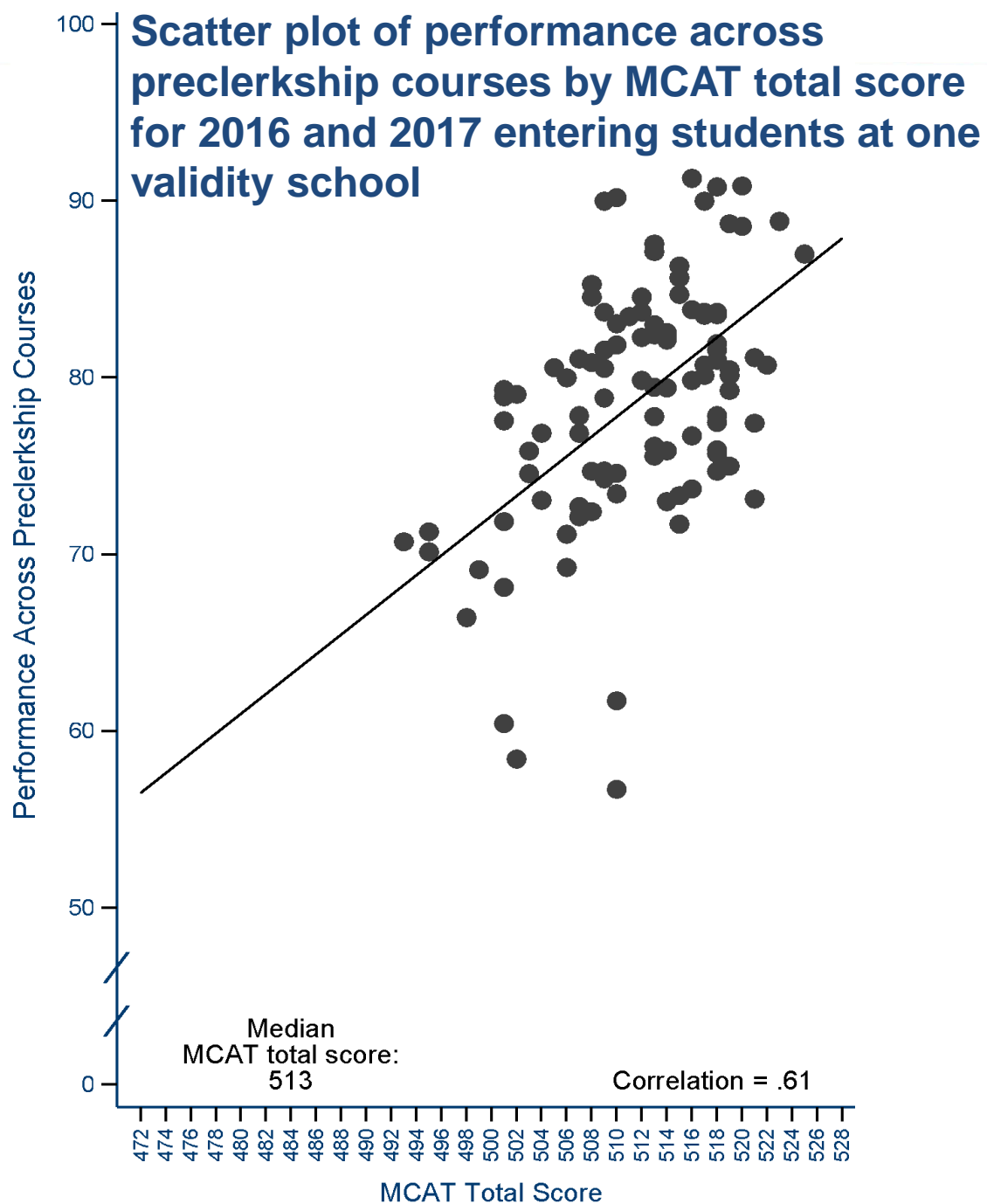
# The next few slides show that MCAT scores and undergraduate GPAs provide good and more complete information about students' readiness for medical school than either alone

- ❑ MCAT scores show medium to large correlations with medical students' performance in their preclerkship courses, on the Step 1 exam, and in progressing to clerkships on time or within one extra year.
- ❑ Predictive validity data show that applicants from different demographic and socioeconomic backgrounds who enter medical school with the same MCAT scores have similar academic outcomes.
- ❑ MCAT scores predict performance comparably for students from racial/ethnic minority and majority groups, for those from lower- and higher-SES backgrounds, and for males and females.
- ❑ Using MCAT scores in combination with undergraduate GPAs provides more complete information about students' likely performance in medical school.

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.



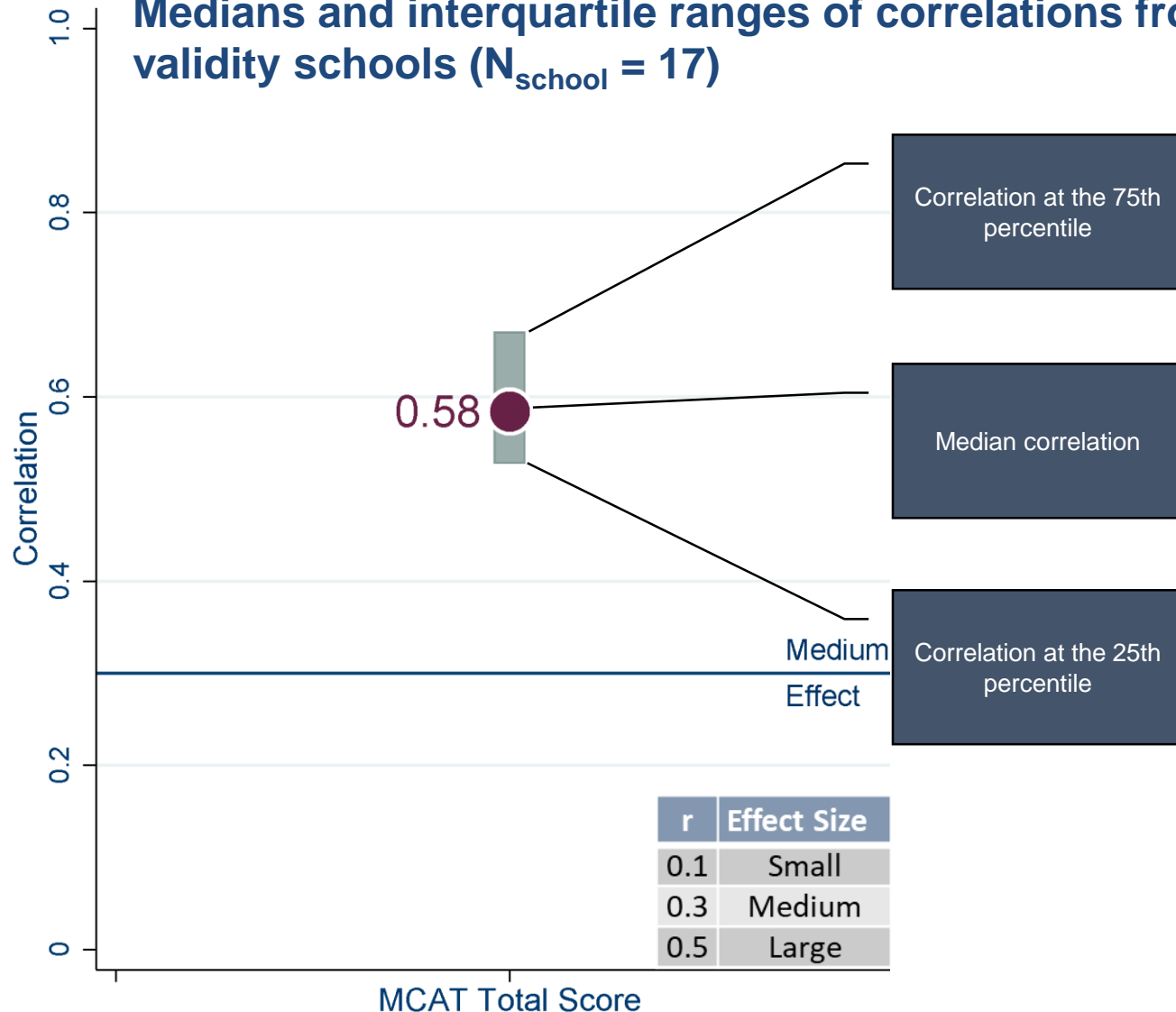
# Validity Schools: Performance Across Preclerkship Courses



At this validity school, students with higher MCAT scores had better outcomes in preclerkship courses

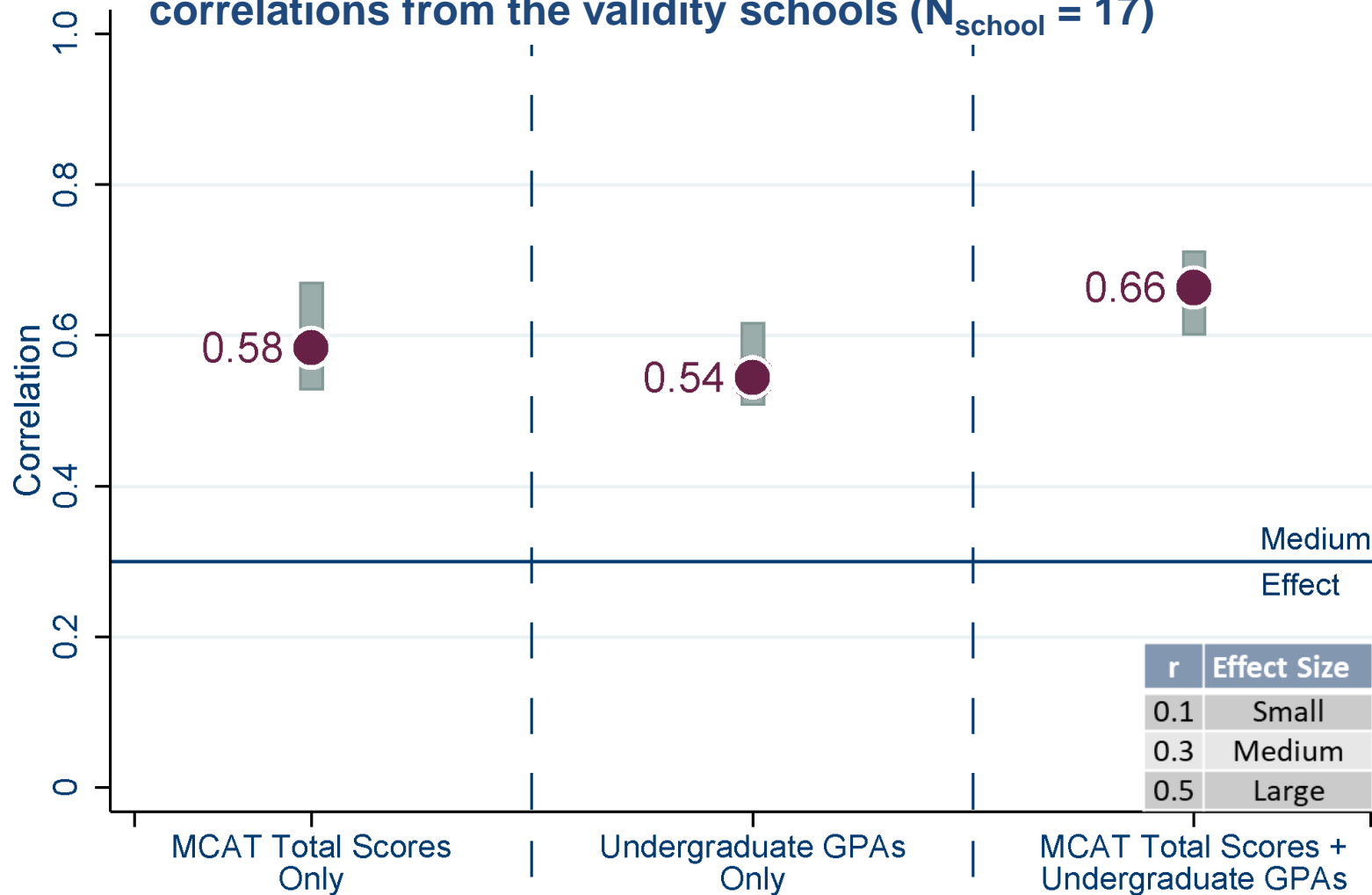
*At every MCAT total score, some students performed better than expected, and others performed less well*

**Correlations of 2016 and 2017 entering students' MCAT scores with performance across preclerkship courses: Medians and interquartile ranges of correlations from the validity schools ( $N_{\text{school}} = 17$ )**



At the validity schools, MCAT total scores show medium to large correlations with 2016 and 2017 entrants' performance across preclerkship courses

**Correlations of 2016 and 2017 entering students' academic metrics with performance across preclerkship courses: Medians and interquartile ranges of correlations from the validity schools ( $N_{\text{school}} = 17$ )**

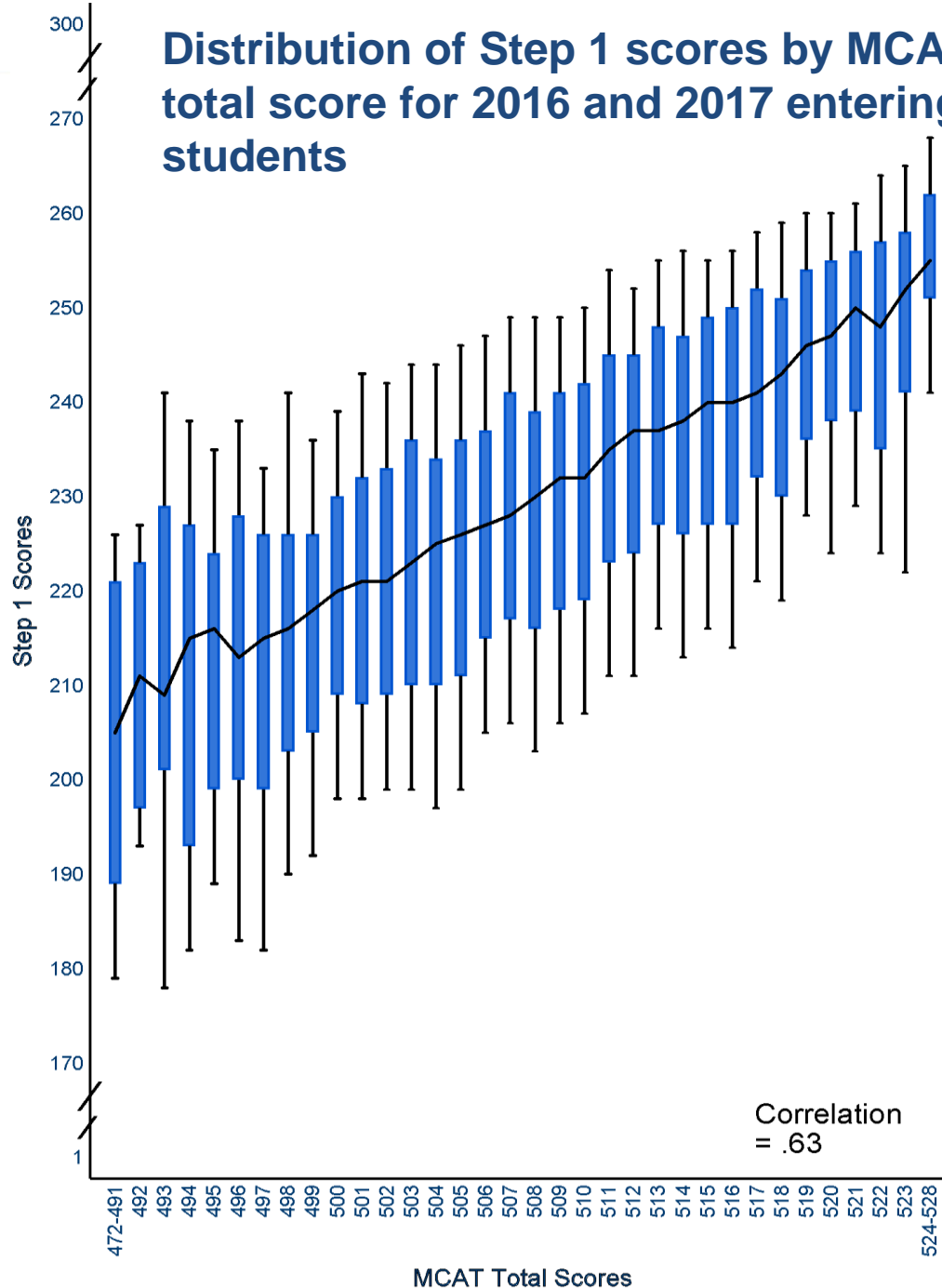


At the validity schools, MCAT scores and undergraduate GPAs predict 2016 and 2017 entrants' performance better than either one alone



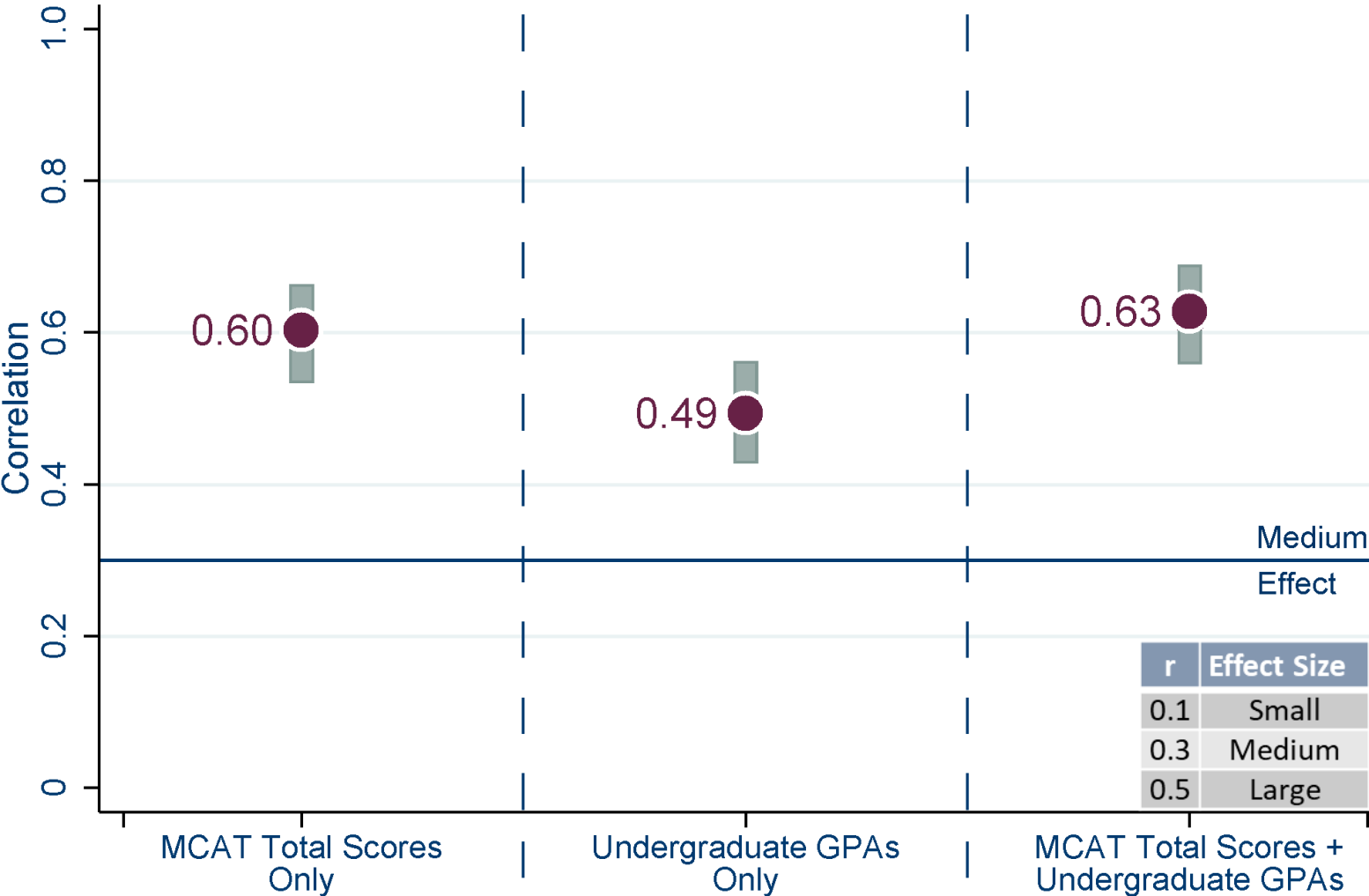
# National Data: Step 1 Scores and Pass Rates

**Distribution of Step 1 scores by MCAT total score for 2016 and 2017 entering students**



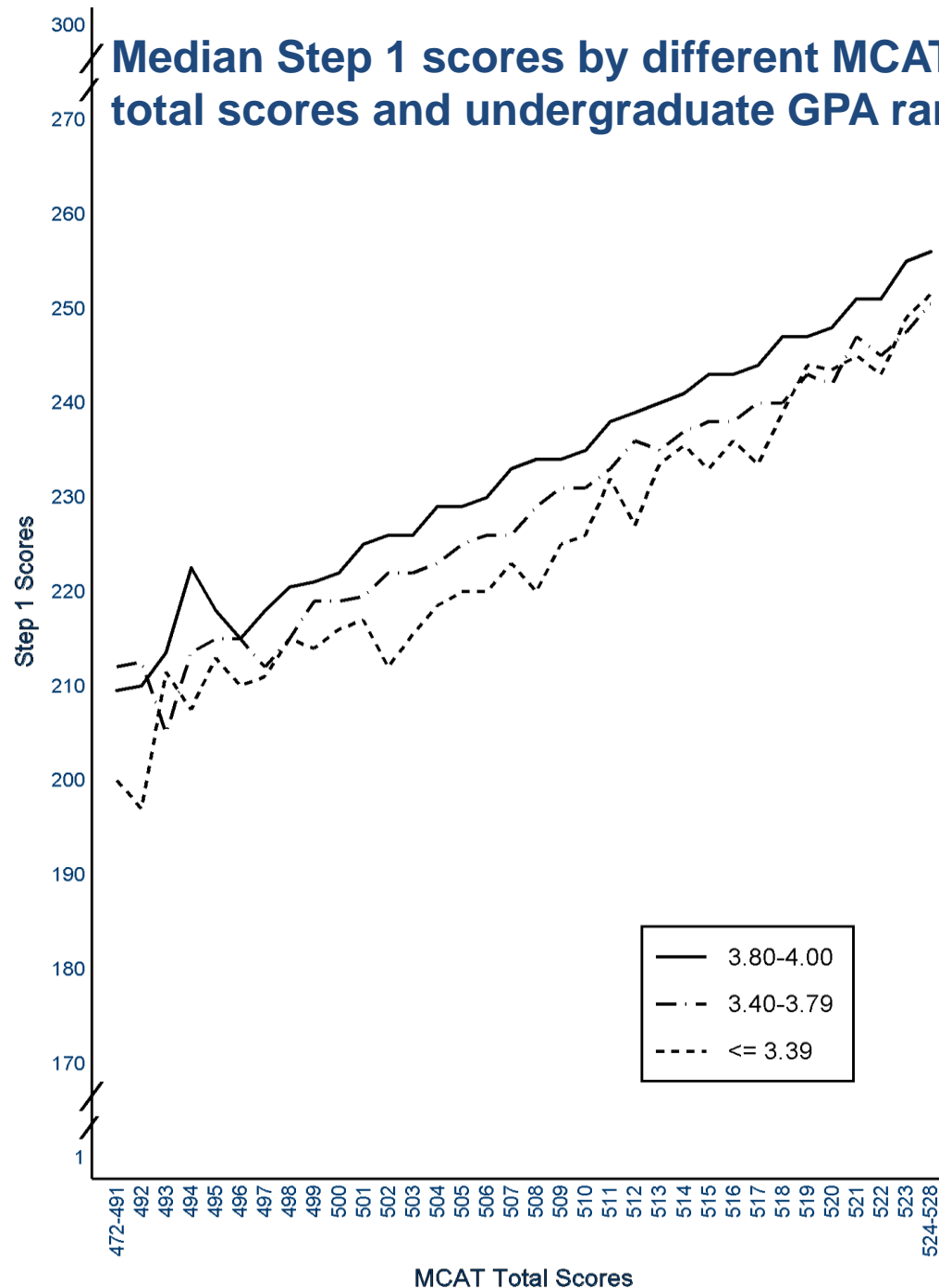
Nationally and on average, 2016 and 2017 entrants with higher MCAT scores had higher Step 1 scores

Correlations of 2016 and 2017 entering students' academic metrics with Step 1 scores: Medians and interquartile ranges of correlations from 143 U.S. medical schools



MCAT scores and undergraduate GPAs predict 2016 and 2017 entrants' Step 1 scores better than either one alone

# Median Step 1 scores by different MCAT total scores and undergraduate GPA ranges



This slide shows the same result graphically



# MCAT scores and undergraduate GPAs tell more about 2016 and 2017 entering students' Step 1 pass rates on the 1st attempt

Percentage and number of 2016 and 2017 entering students admitted with scores from the current MCAT exam who passed the Step 1 exam on the first attempt, by MCAT total score and undergraduate GPA range

GPA Total	MCAT Total										
	472-485	486-489	490-493	494-497	498-501	502-505	506-509	510-513	514-517	518-528	All
3.80-4.00	--	--	88% 35/40	91% 153/169	94% 527/562	97% 1,264/1,309	98% 1,975/2,021	99% 2,324/2,348	>99% 2,009/2,014	>99% 1,685/1,690	98% 9,977/10,159
3.60-3.79	--	--	86% 37/43	86% 155/180	91% 461/507	96% 969/1,014	97% 1,491/1,541	99% 1,636/1,660	>99% 1,139/1,147	>99% 654/656	97% 6,546/6,752
3.40-3.59	--	--	82% 28/34	80% 104/130	92% 341/372	93% 582/627	96% 760/792	99% 808/817	>99% 488/491	>99% 270/271	96% 3,384/3,540
3.20-3.39	--	--	75% 15/20	87% 67/77	91% 178/196	93% 292/314	96% 325/340	95% 286/301	>99% 210/212	100% 84/84	94% 1,458/1,549
3.00-3.19	--	--	--	88% 30/34	87% 77/89	92% 137/149	94% 117/124	100% 111/111	95% 54/57	100% 27/27	93% 558/600
2.80-2.99	--	--	--	82% 9/11	89% 25/28	96% 47/49	95% 38/40	96% 27/28	100% 13/13	--	93% 171/183
2.60-2.79	--	--	--	--	90% 9/10	83% 15/18	80% 12/15	--	--	--	86% 65/76
2.40-2.59	--	--	--	--	--	--	--	--	--	--	90% 26/29
2.20-2.39	--	--	--	--	--	--	--	--	--	--	--
2.00-2.19	--	--	--	--	--	--	--	--	--	--	--
less than 2.00	--	--	--	--	--	--	--	--	--	--	--
All	30% 3/10	67% 14/21	84% 125/149	86% 523/611	92% 1,622/1,768	95% 3,314/3,489	97% 4,727/4,882	99% 5,207/5,280	>99% 3,923/3,944	>99% 2,736/2,744	97% 22,194/22,898

# National Data: Progression to Clerkships

# MCAT scores and undergraduate GPAs help predict 2016 entering students' on-time progression to year 3

Percentage and number of 2016 entering students admitted with scores from the current MCAT exam who progressed to year 3 on time, by MCAT total score and undergraduate GPA range

GPA Total	MCAT Total										
	472-485	486-489	490-493	494-497	498-501	502-505	506-509	510-513	514-517	518-528	All
3.80-4.00		--	75% 21/28	85% 68/80	91% 215/237	93% 460/497	96% 685/717	96% 695/724	97% 529/548	98% 437/446	95% 3,111/3,278
3.60-3.79		--	81% 26/32	87% 76/87	89% 203/229	93% 347/372	95% 491/519	95% 449/474	95% 328/344	97% 162/167	93% 2,083/2,228
3.40-3.59	--	--	74% 17/23	80% 55/69	87% 153/175	91% 209/229	89% 230/257	96% 226/235	96% 137/143	94% 63/67	91% 1,092/1,201
3.20-3.39	--	--	79% 11/14	81% 35/43	83% 69/83	89% 100/112	93% 102/110	97% 86/89	93% 57/61	100% 21/21	90% 486/540
3.00-3.19	--	--	--	86% 12/14	80% 32/40	86% 48/56	85% 35/41	79% 27/34	91% 20/22	--	84% 188/224
2.80-2.99	--	--	--	--	85% 17/20	87% 20/23	--	--	--	--	84% 62/74
2.60-2.79	--	--	--	--	--	--	--	--	--	--	80% 24/30
2.40-2.59	--	--	--	--	--	--	--	--	--	--	79% 11/14
2.20-2.39	--	--	--	--	--	--	--	--	--	--	--
2.00-2.19	--	--	--	--	--	--	--	--	--	--	--
less than 2.00	--	--	--	--	--	--	--	--	--	--	--
All	30% 3/10	71% 10/14	76% 80/105	84% 257/305	88% 695/792	92% 1,190/1,298	94% 1,554/1,659	95% 1,494/1,568	96% 1,079/1,126	97% 697/715	93% 7,059/7,592

# Most students progressed to year 3 within 1 extra year

Percentage and number of 2016 entering students admitted with scores from the current MCAT exam who progressed to year 3 within one additional year, by 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		--	89% 25/28	95% 76/80	97% 230/237	98% 485/497	98% 705/717	98% 710/724	99% 540/548	>99% 442/446	98% 3,214/3,278
3.60-3.79		--	88% 28/32	93% 81/87	96% 220/229	98% 363/372	98% 509/519	98% 466/474	98% 337/344	>99% 166/167	97% 2,172/2,228
3.40-3.59	--	--	91% 21/23	88% 61/69	97% 170/175	97% 223/229	96% 248/257	>99% 233/235	98% 140/143	97% 65/67	97% 1,163/1,201
3.20-3.39	--	--	79% 11/14	88% 38/43	92% 76/83	96% 108/112	97% 107/110	99% 88/89	98% 60/61	100% 21/21	95% 514/540
3.00-3.19	--	--	--	100% 14/14	88% 35/40	93% 52/56	93% 38/41	88% 30/34	95% 21/22	--	92% 206/224
2.80-2.99	--	--	--	--	90% 18/20	100% 23/23	--	--	--	--	95% 70/74
2.60-2.79	--	--	--	--	--	--	--	--	--	--	100% 30/30
2.40-2.59	--	--	--	--	--	--	--	--	--	--	100% 14/14
2.20-2.39	--	--	--	--	--	--	--	--	--	--	--
2.00-2.19	--	--	--	--	--	--	--	--	--	--	--
less than 2.00	--	--	--	--	--	--	--	--	--	--	--
All	60% 6/10	79% 11/14	89% 93/105	92% 282/305	96% 757/792	97% 1,262/1,298	98% 1,621/1,659	98% 1,539/1,568	98% 1,106/1,126	>99% 708/715	97% 7,385/7,592

# MCAT scores provide comparable prediction for students from different sociodemographic backgrounds

- ❑ Research studied early relationships for students grouped by race/ethnicity, SES, and gender.
- ❑ So far, MCAT scores neither over- nor under-predict the performance of students from these groups on:
  - Validity school outcome: Performance across pre-clerkship courses
  - National outcomes: Step 1 scores and pass rates and progression to M3 (on time and within 1 extra year).

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.

# Levers for change



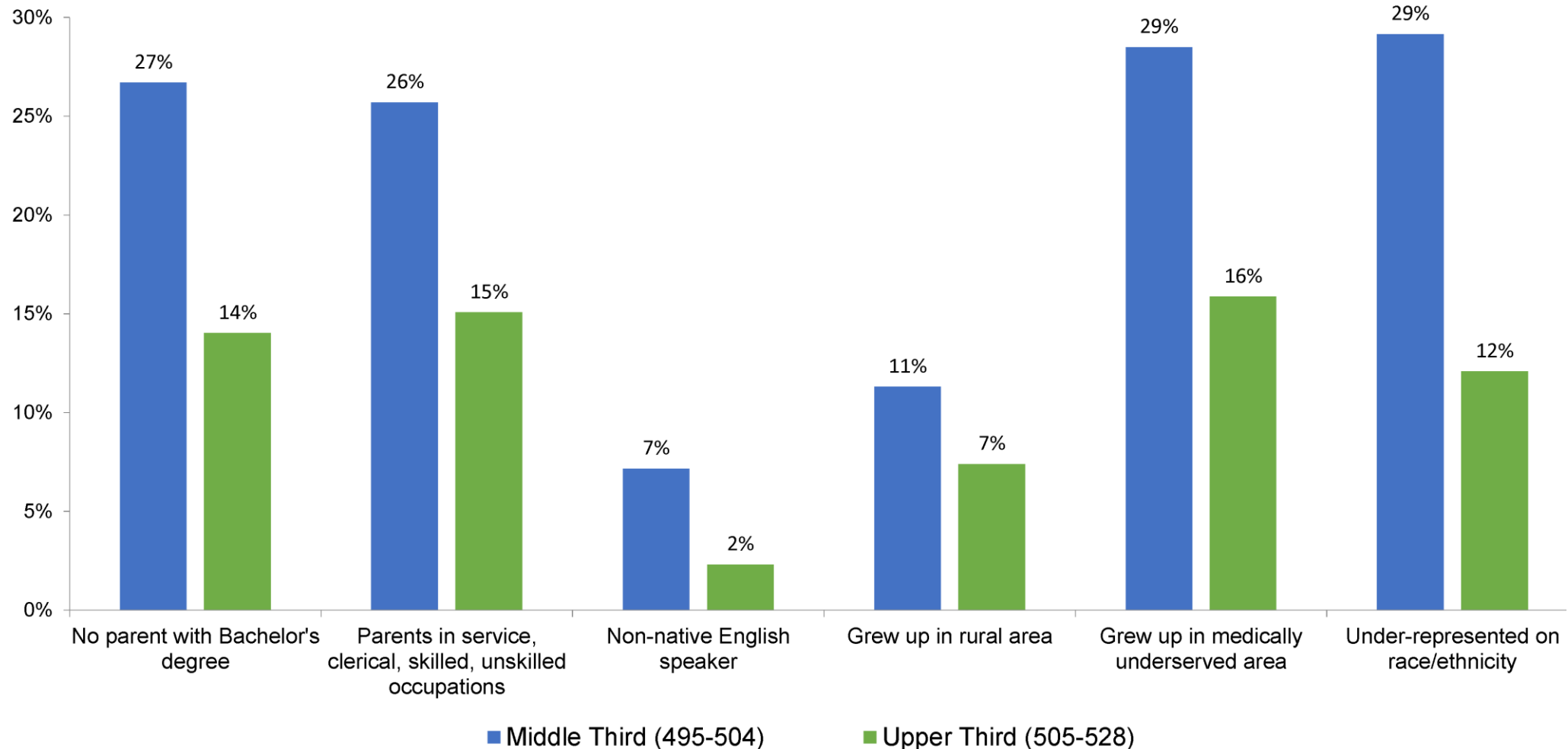
Leaders in medical education can address the impact of unequal opportunity on the diversity of the physician workforce using 3 critical levers:

- ❑ Through pipeline programs and partnerships with communities and schools that support URiM students to successfully apply to medical school.
- ❑ By building medical school curricula that train the next generation of physician-citizens to better understand the root causes of healthcare disparities and address the healthcare needs of a diverse patient population.
- ❑ By identifying the full range of MCAT scores associated with success at your school.

**What are the advantages of considering applicants with a wider range of MCAT scores?**

# Considering applicants with a wider range of MCAT scores gives you more flexibility to build classes that meet your missions, goals, and diversity interests

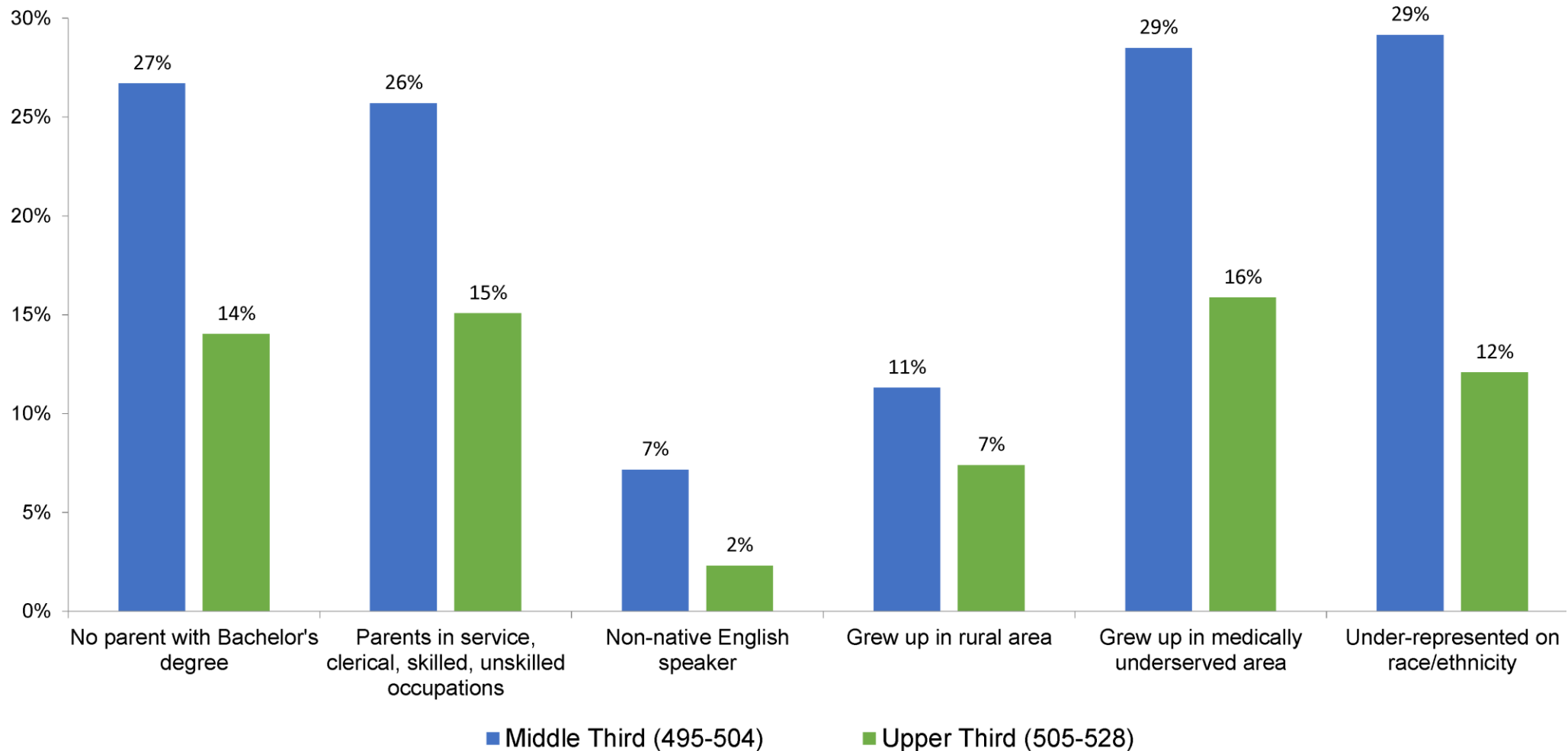
Background characteristics of 2017-2019 applicants, by MCAT score range



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# Many of these applicants are diverse on multiple characteristics

Background characteristics of 2017-2019 applicants, by MCAT score range



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We just showed that most 2016 entrants -- including those with MCAT scores in the middle third of the MCAT scale -- progressed to year 3 within 1 extra year

Percentage and number of 2016 entering students admitted with scores from the current MCAT exam who progressed to year 3 within one additional year, by MCAT total score and undergraduate GPA range

GPA Total	MCAT Total										
	472-485	486-489	490-493	494-497	498-501	502-505	506-509	510-513	514-517	518-528	All
3.80-4.00		--	89% 25/28	95% 76/80	97% 230/237	98% 485/497	98% 705/717	98% 710/724	99% 540/548	>99% 442/446	98% 3,214/3,278
3.60-3.79		--	88% 28/32	93% 81/87	96% 220/229	98% 363/372	98% 509/519	98% 466/474	98% 337/344	>99% 166/167	97% 2,172/2,228
3.40-3.59	--	--	91% 21/23	88% 61/69	97% 170/175	97% 223/229	96% 248/257	>99% 233/235	98% 140/143	97% 65/67	97% 1,163/1,201
3.20-3.39	--	--	79% 11/14	88% 38/43	92% 76/83	96% 108/112	97% 107/110	99% 88/89	98% 60/61	100% 21/21	95% 514/540
3.00-3.19	--	--	--	100% 14/14	88% 35/40	93% 52/56	93% 38/41	88% 30/34	95% 21/22	--	92% 206/224
2.80-2.99	--	--	--	--	90% 18/20	100% 23/23	--	--	--	--	95% 70/74
2.60-2.79	--	--	--	--	--	--	--	--	--	--	100% 30/30
2.40-2.59	--	--	--	--	--	--	--	--	--	--	100% 14/14
2.20-2.39	--	--	--	--	--	--	--	--	--	--	--
2.00-2.19	--	--	--	--	--	--	--	--	--	--	--
less than 2.00	--	--	--	--	--	--	--	--	--	--	--
All	60% 6/10	79% 11/14	89% 93/105	92% 282/305	96% 757/792	97% 1,262/1,298	98% 1,621/1,659	98% 1,539/1,568	98% 1,106/1,126	>99% 708/715	97% 7,385/7,592

Lower Third  
(472 to 494)

86% Progressed

Middle Third  
(495 to 504)

96% Progressed

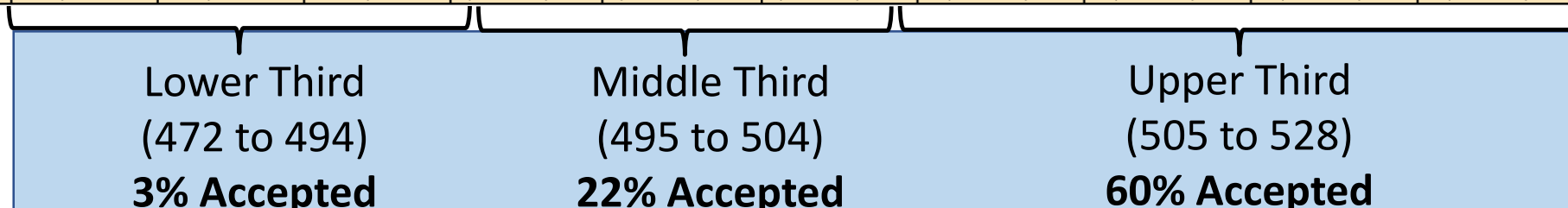
Upper Third  
(505 to 528)

98% Progressed

# And yet, only 22% of applicants with scores in the middle third are accepted into medical school

Percentage and number of 2017, 2018, and 2019 applicants Accepted into at least one medical school, by 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	
<b>3.80-4.00</b>	3% 4/159	3% 9/320	8% 58/726	19% 298/1,584	31% 1,007/3,272	48% 2,603/5,435	62% 4,945/7,957	75% 6,573/8,778	82% 6,312/7,711	88% 6,893/7,848	66% 28,702/43,790
<b>3.60-3.79</b>	1% 3/382	1% 8/613	4% 55/1,313	12% 300/2,492	24% 1,017/4,251	35% 2,181/6,291	50% 3,770/7,565	65% 4,670/7,228	74% 3,526/4,793	81% 2,364/2,924	47% 17,894/37,852
<b>3.40-3.59</b>	1% 5/570	1% 10/846	3% 53/1,593	10% 266/2,683	19% 748/4,023	26% 1,340/5,059	37% 2,034/5,472	51% 2,290/4,497	62% 1,552/2,494	70% 881/1,252	32% 9,179/28,489
<b>3.20-3.39</b>	<1% 1/705	1% 6/835	2% 35/1,474	7% 155/2,183	15% 424/2,821	22% 683/3,176	30% 865/2,921	40% 865/2,170	51% 571/1,123	57% 252/443	22% 3,857/17,851
<b>3.00-3.19</b>	<1% 3/777	1% 7/743	2% 17/1,030	7% 94/1,433	14% 226/1,596	21% 327/1,591	25% 359/1,411	34% 339/1,004	41% 168/408	50% 100/201	16% 1,640/10,194
<b>2.80-2.99</b>	1% 5/673	1% 3/549	2% 14/659	4% 30/700	9% 67/756	17% 126/737	23% 132/565	27% 86/324	28% 48/169	41% 24/58	10% 535/5,190
<b>2.60-2.79</b>	0% 0/468	1% 4/320	1% 2/396	3% 11/354	8% 34/401	16% 44/267	18% 33/186	19% 21/113	40% 23/57	33% 6/18	7% 178/2,580
<b>2.40-2.59</b>	0% 0/331	1% 1/176	2% 3/175	5% 8/170	4% 5/124	13% 12/93	25% 17/69	26% 12/46	25% 4/16	--	5% 64/1,206
<b>2.20-2.39</b>	0% 0/194	0% 0/96	0% 0/83	3% 2/61	11% 5/44	21% 8/39	16% 5/32	14% 3/21	--	--	5% 29/579
<b>2.00-2.19</b>	0% 0/107	0% 0/30	3% 1/29	0% 0/20	--	8% 1/13	--	--	--	--	1% 3/221
<b>less than 2.00</b>	0% 0/51	7% 1/14	7% 1/14	0% 0/10	--	--	--	--	--	--	2% 2/94
<b>All</b>	<1% 21/4,417	1% 49/4,542	3% 239/7,492	10% 1,164/11,690	20% 3,533/17,297	32% 7,325/22,703	46% 12,160/26,187	61% 14,859/24,186	73% 12,209/16,779	83% 10,524/12,753	42% 62,083/148,046





# Admissions is local

- ❑ Admissions committees select students with the MCAT scores and undergraduate GPAs that spell success at their school.
- ❑ Class size, curriculum, student support resources, and the learning environment all contribute to decisions about the range of preparation needed to succeed at your school.
- ❑ Some schools accept few (or no) students with scores in the middle of the MCAT total score scale, while others select more than 20% from that range.
- ❑ The data presented today suggest that schools could and should consider a wider range of applicants, in a principled way, to produce the capable, diverse physician workforce our nation needs.

**How do admissions and student affairs officers at two medical schools use validity data to improve the selection and support of their students?**


Tell us about the University of  
Illinois College of Medicine and  
the Long School of Medicine at  
UT Health San Antonio



**Leila Amiri, PhD**  
Assistant Dean for Admissions and Recruitment  
University of Illinois College of Medicine



**THE UNIVERSITY OF ILLINOIS**  
**COLLEGE OF MEDICINE**  
**CHICAGO PEORIA ROCKFORD URBANA**



**Joshua Hanson, MD, MPH**  
Associate Dean for Student Affairs  
Associate Professor, School of Medicine  
University of Texas Health San Antonio  
Joe R. and Teresa Lozano Long School of Medicine

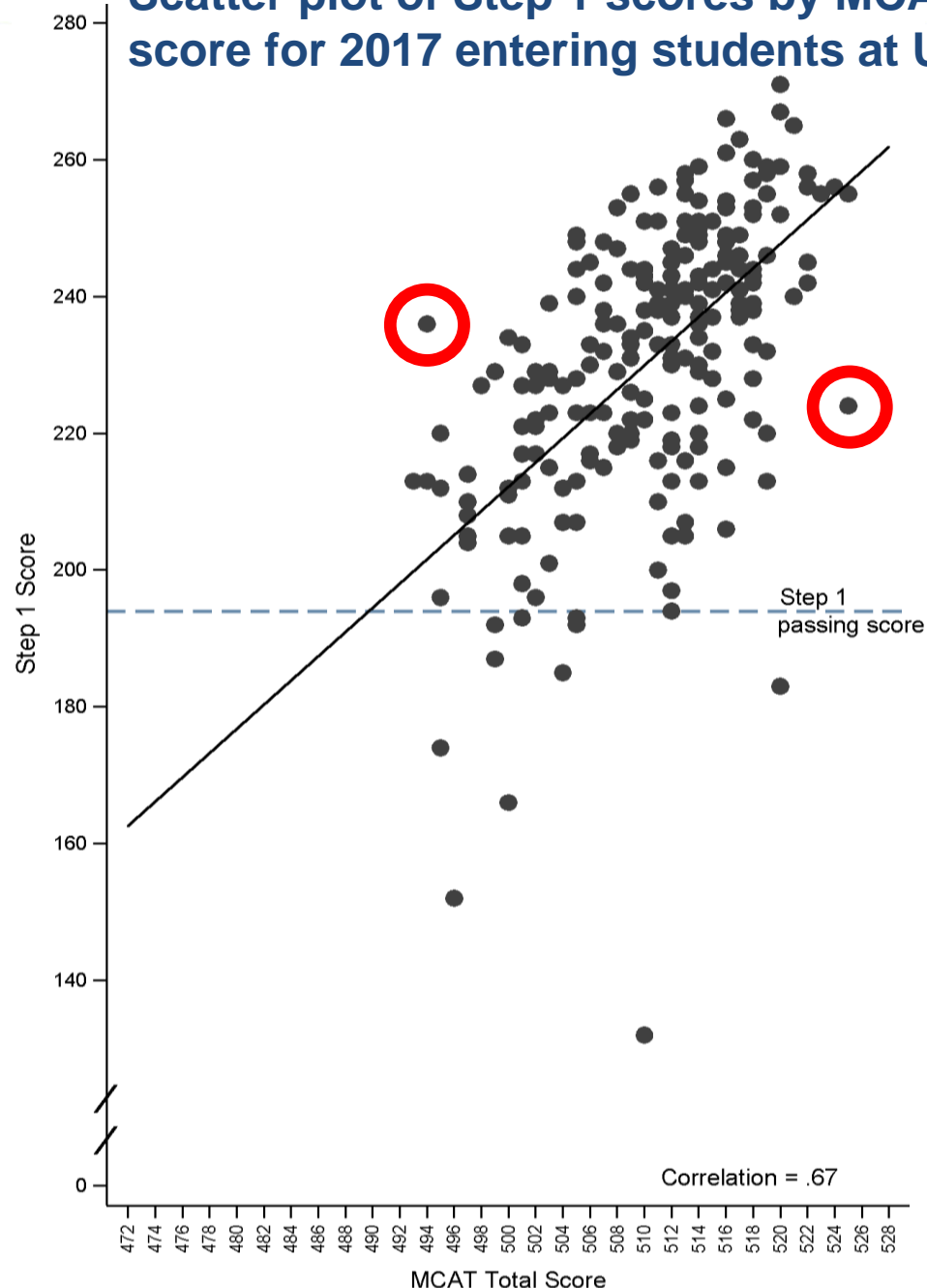


Leila, what strategies does your school use to ensure you admit students who will contribute to the University of Illinois College of Medicine's mission and goals?



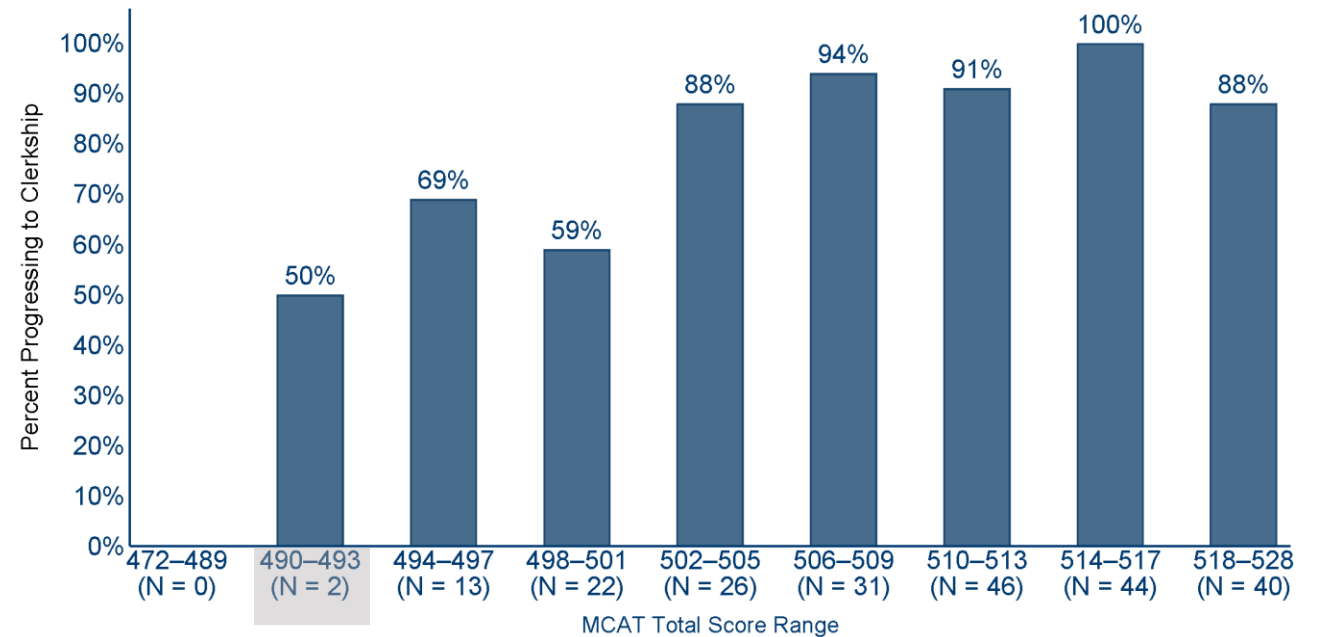
How will you use MCAT validity data to evaluate and refine the University of Illinois College of Medicine's admissions process?

Scatter plot of Step 1 scores by MCAT total score for 2017 entering students at U of Ill.



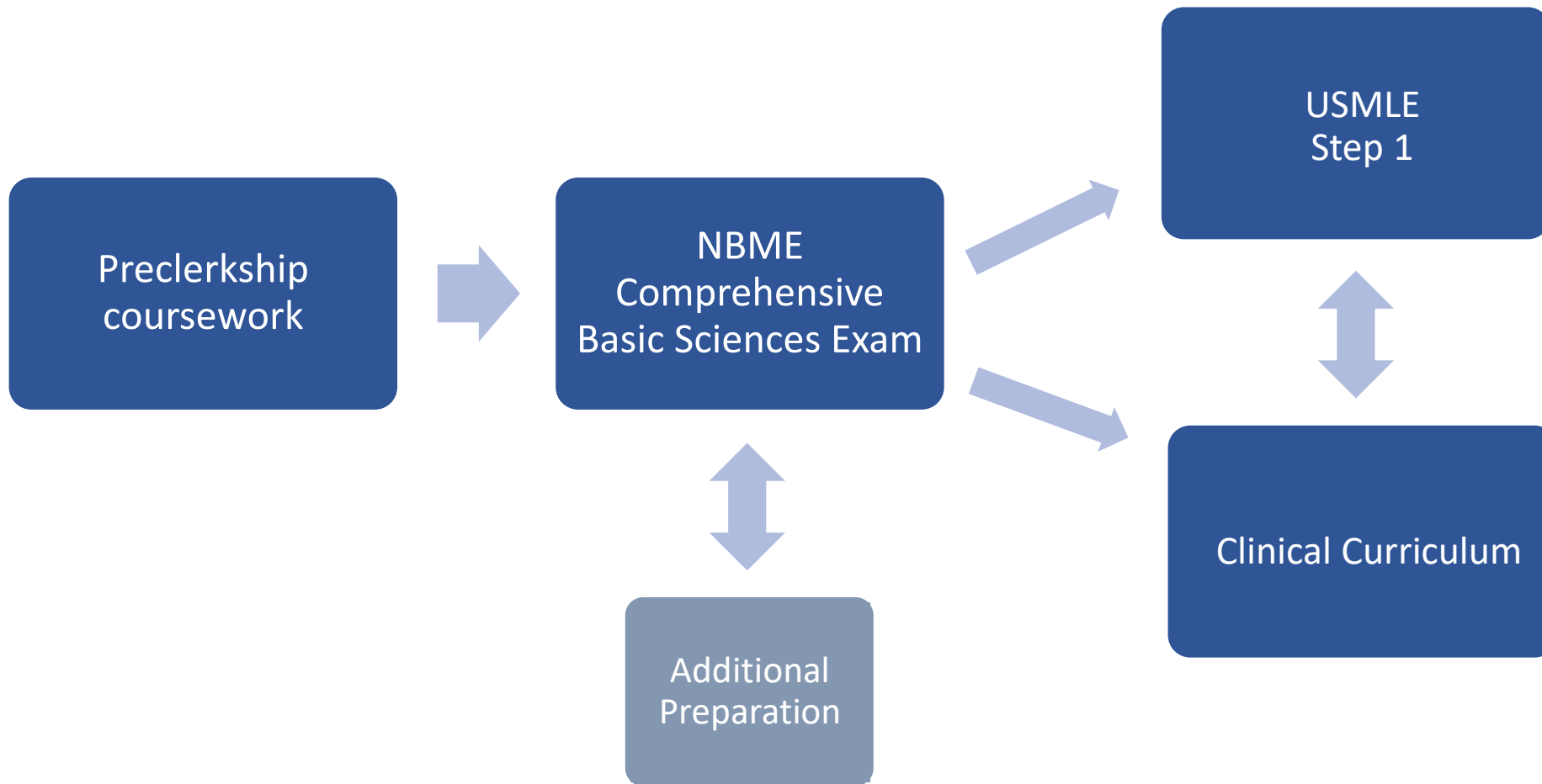
My school is studying validity data for the first cohort to take our new curriculum

Percentage of 2017 entering students at U of Ill. who progressed to year 3 on time, by MCAT total score range

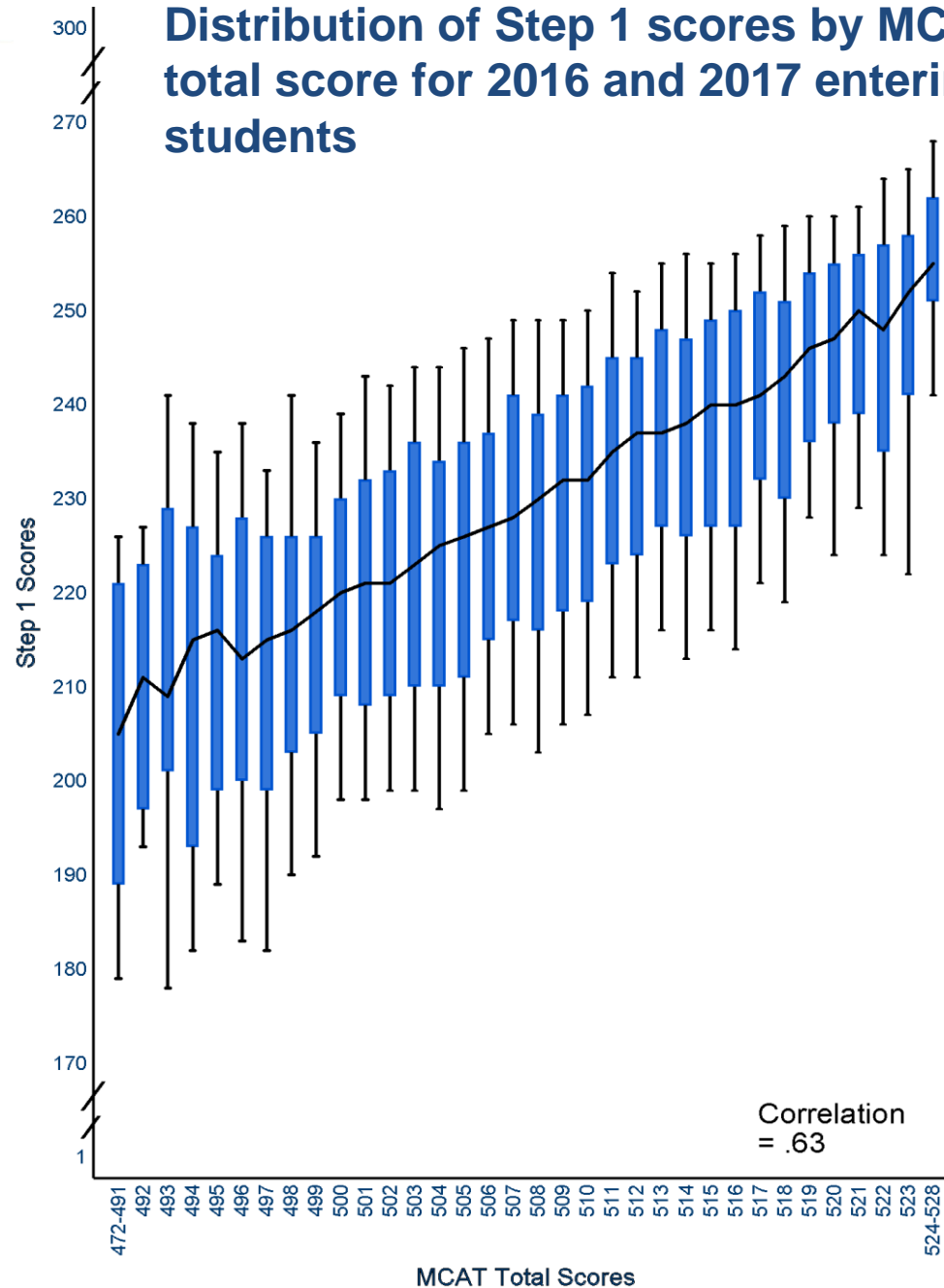


Josh, how does your school use MCAT validity data to evaluate and refine the student support provided at the Long School of Medicine at UT Health San Antonio?

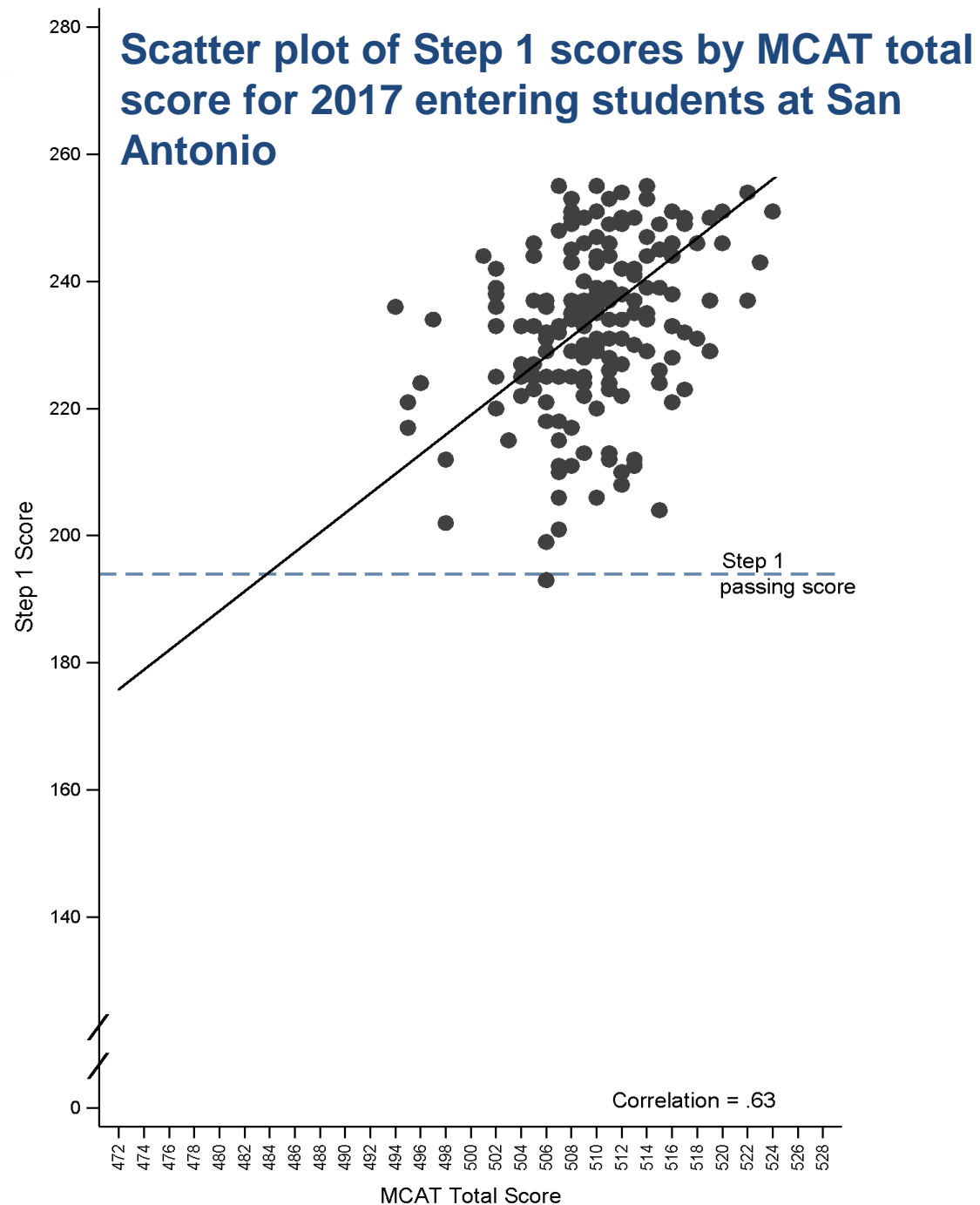
We use MCAT validity data to counsel students and prepare them for the Step 1 exam, and to refine our academic support for future classes



## Distribution of Step 1 scores by MCAT total score for 2016 and 2017 entering students

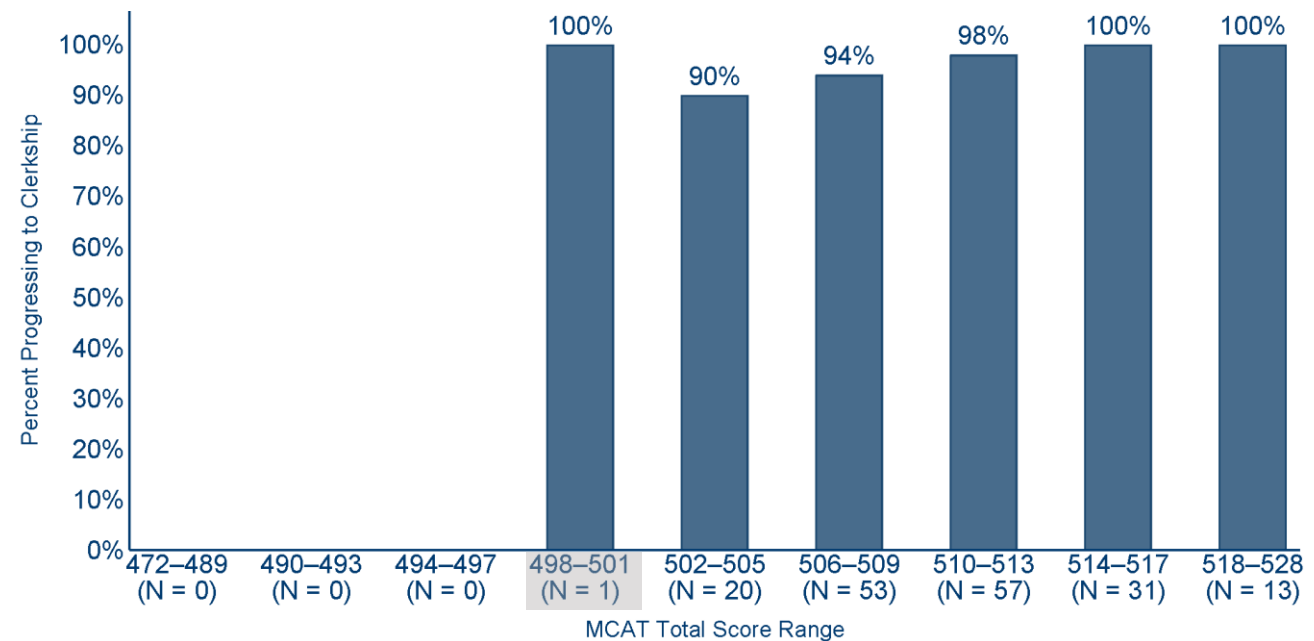


Each year, we use national validity data from the previous year to help us advise our students on possible Step 1 outcomes



Our students' success on Step 1 and on-time progression to Year 3 help us determine student support resources for the next year

### Percentage of 2017 entering students at San Antonio who progressed to year 3 on time, by MCAT total score range



What are the secrets of success at the Long School of Medicine at UT Health San Antonio in admitting, educating, and supporting your students?



Leila, what is one important lesson you learned through your work with the MCAT validity findings?

Josh, what is one important lesson you learned through your work with the MCAT validity findings?



# Questions?

- ☐ For more discussion after this session, visit the MCAT team from 3:00 to 4:00 pm near the Registration Desk.
- ☐ *Please complete the feedback form at your table about the validity data and future research you'd like to see.*

## Contact Us

[mcativity@aamc.org](mailto:mcativity@aamc.org)

<https://www.aamc.org/services/mcat-admissions-officers>



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