

can we do better?

with input from...

... grad curriculum committee tom bowman

... grad admission committee adrian, ali, allison, brittany, david, hai
indrani, kelly, matthias, ovijit, sindy, tom

... and many others strategic planning, reggie, ron, sheri, ken



update on our graduate admission & curriculum

discussion @graduate admission committee

- ... 'does anybody need master students?'
- ... 'fpce doesn't, i guess.'
- ... 'bme doesn't.'
- ... 'thermo doesn't either.'
- ... 'm&c doesn't really.'
- ... 'design does, for the machine shop...
and all others do, too, as TA's.'

graduate / mechanical engineering

Rank	School	Tuition	Enrollment (eng)	Score
1	MIT	\$43,210	3,174	4.9
1	Stanford	\$45,480	3,517	4.9
3	Caltech	\$39,990	569	4.7
3	Berkeley	\$11,220 / \$26,322	1,936	4.7
5	GA Tech	\$11,324 / \$27,330	4,576	4.5
5	UIUC	\$16,744 / \$30,246	3,154	4.5
5	UMich	\$22,322 / \$41,998	3,178	4.5
8	Cornell	\$29,530	1,812	4.2
8	Princeton	\$40,170	576	4.2
10	Carnegie Mellon	\$40,000	3,157	4.1

national rankings

undergrad / mechanical engineering

Rank	School	Tuition	Enrollment (total)	Acceptance
1	MIT	\$43,498	11,189	9.0%
2	UMich	\$13,819 / \$40,496	43,426	36.6%
3	GA Tech	\$10,650 / \$29,954	21,557	54.9%
4	Stanford	\$43,245	18,217	6.6%
4	Berkeley	\$12,864 / \$35,742	35,899	18.0%
6	UIUC	\$15,258 / \$29,640	44,520	63.3%
7	Purdue	\$9,992 / \$28,794	39,256	61.3%
8	Caltech	\$41,538	2,243	11.8%
9	TU Austin	\$9,790 / \$33,824	52,186	46.8%
10	Cornell	\$45,359	21,424	16.6%

national rankings

can we do better
in undergraduate education ...

can we do better
in undergraduate education ...

... without
sacrificing graduate education?

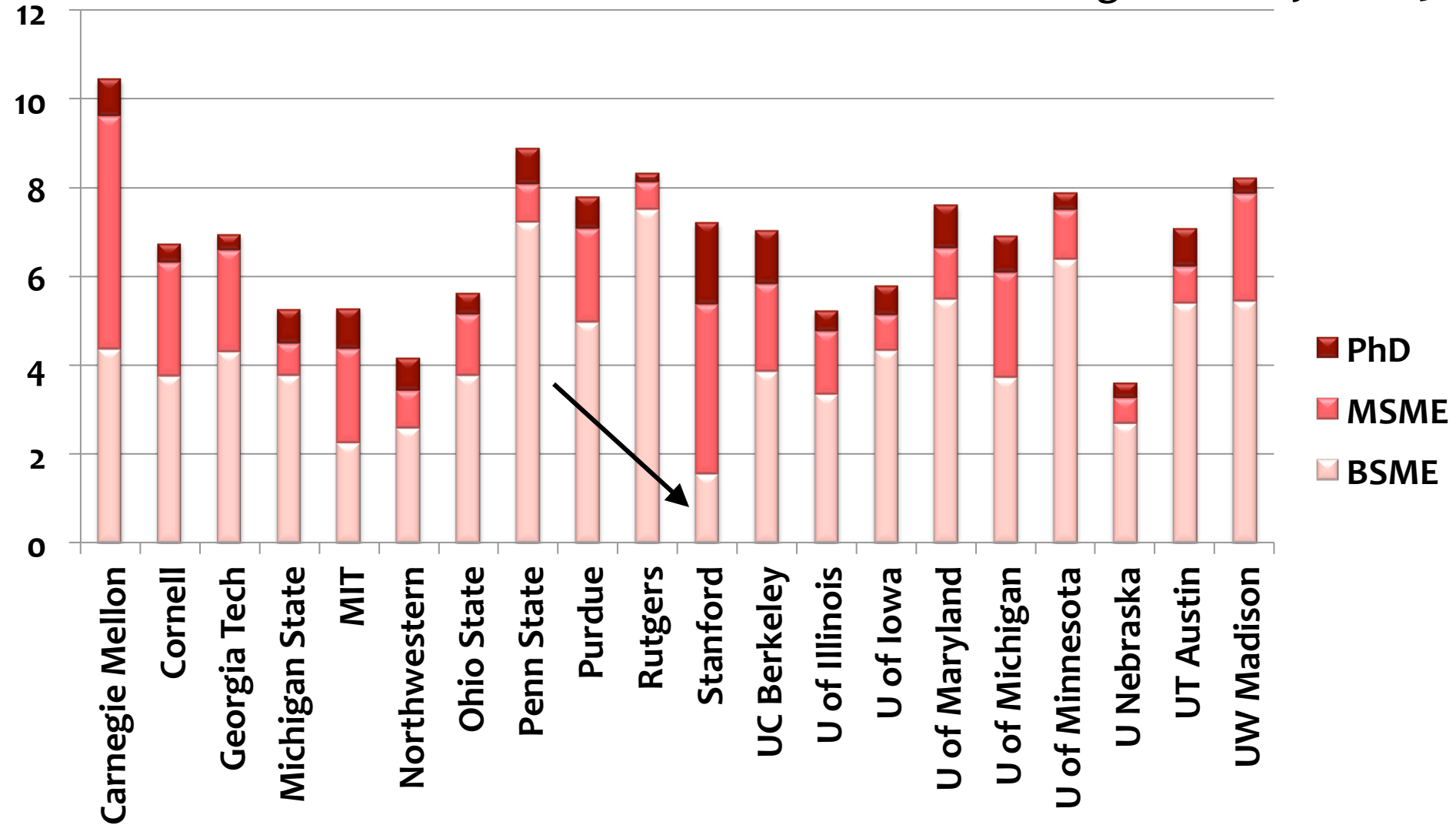
are we admitting the right **number** of students?

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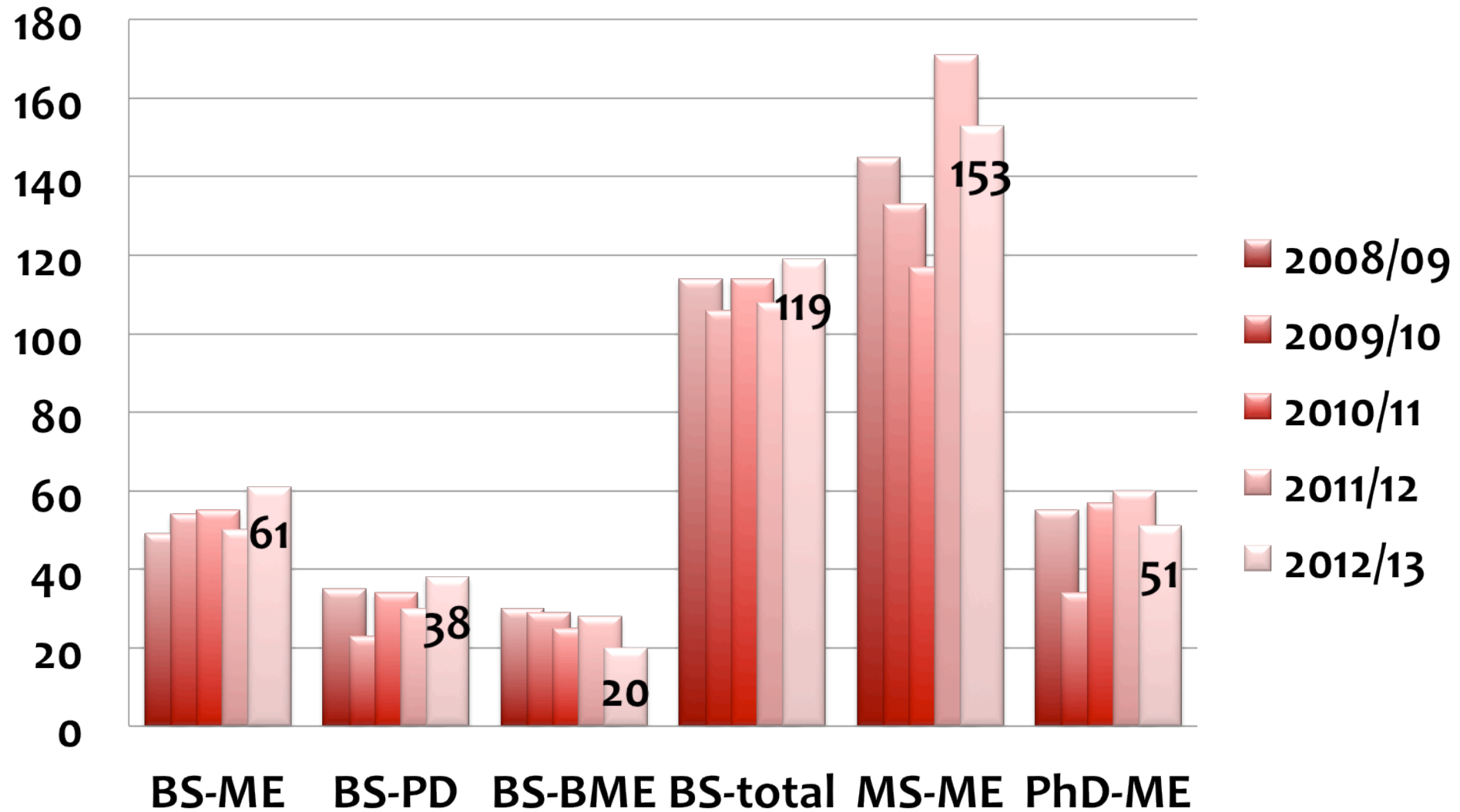
ME degrees per faculty

statistics based big 10+ survey 2012/13



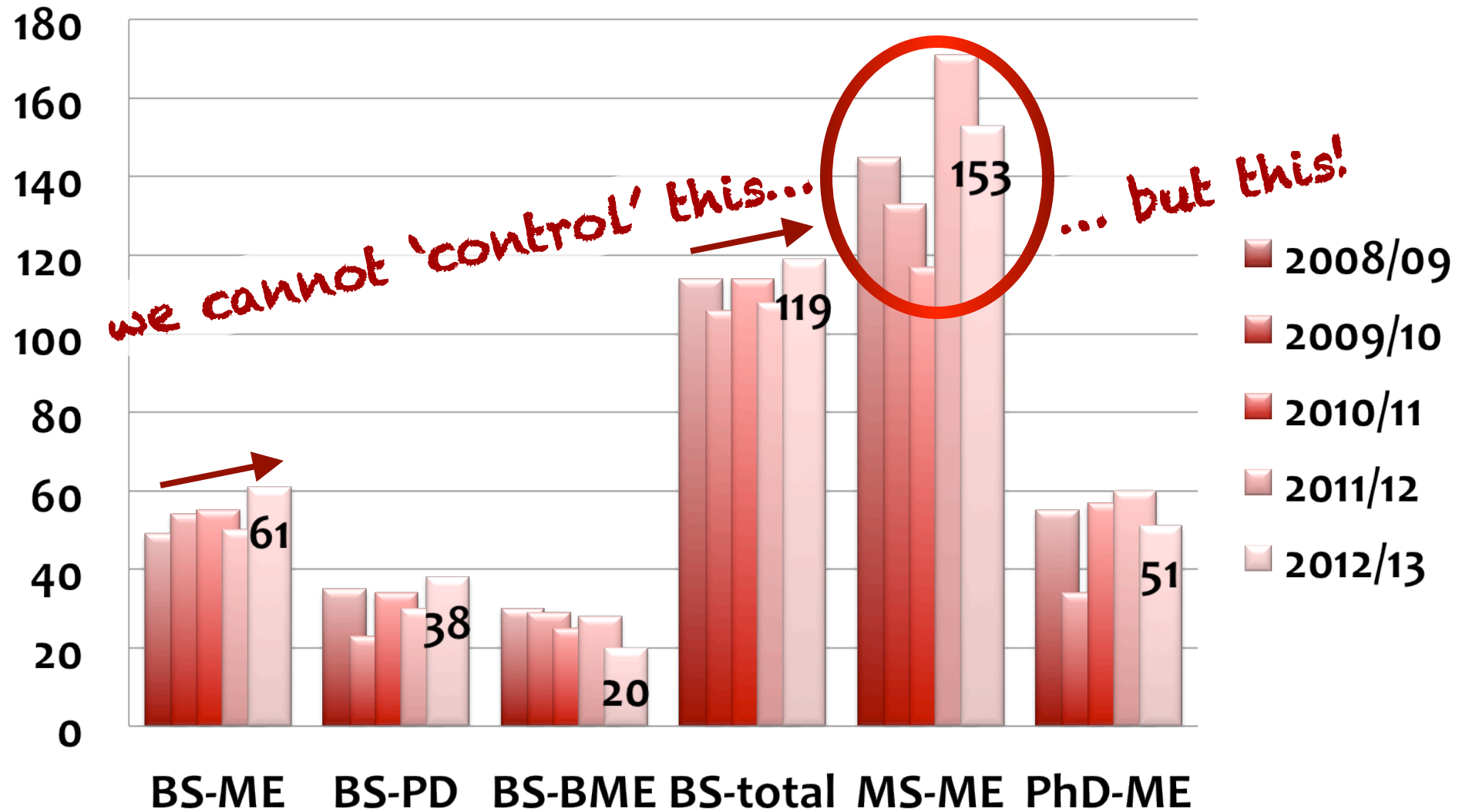
mechanical engineering

ME degrees



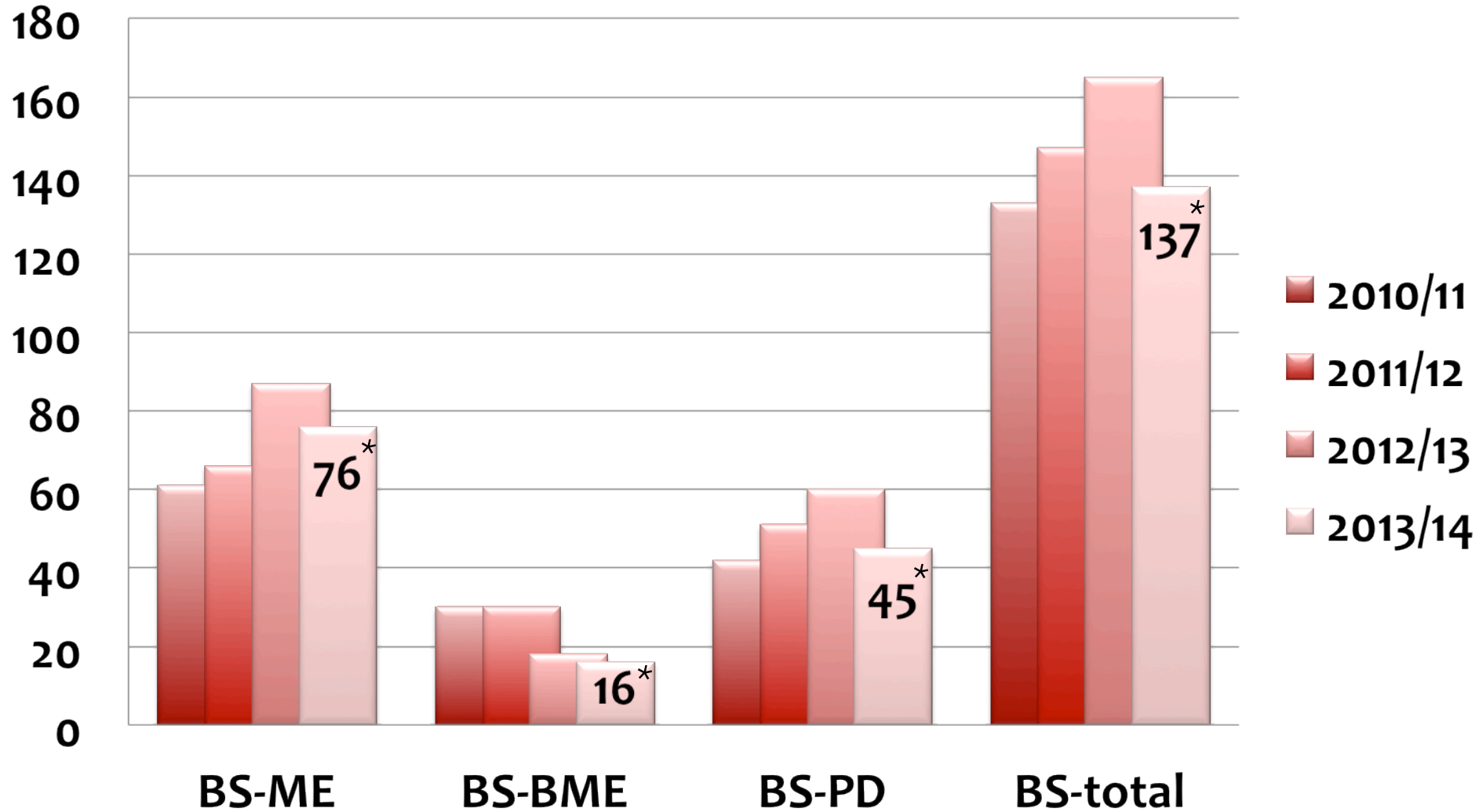
mechanical engineering

are we admitting the right **number** of students?



mechanical engineering

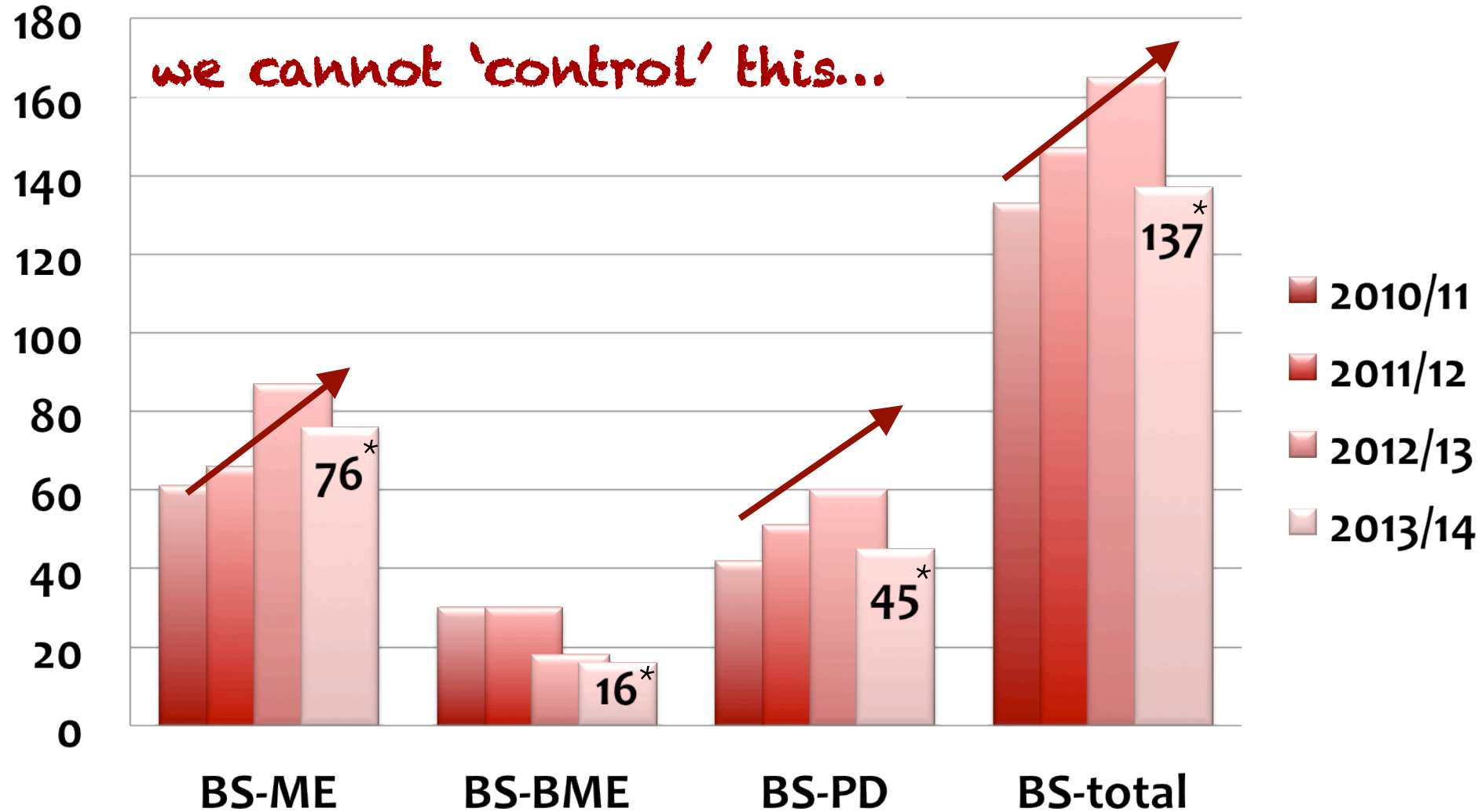
undergrad declaration



* 04/29/14; expected to increase until mid-june

undergraduate

undergrad declaration

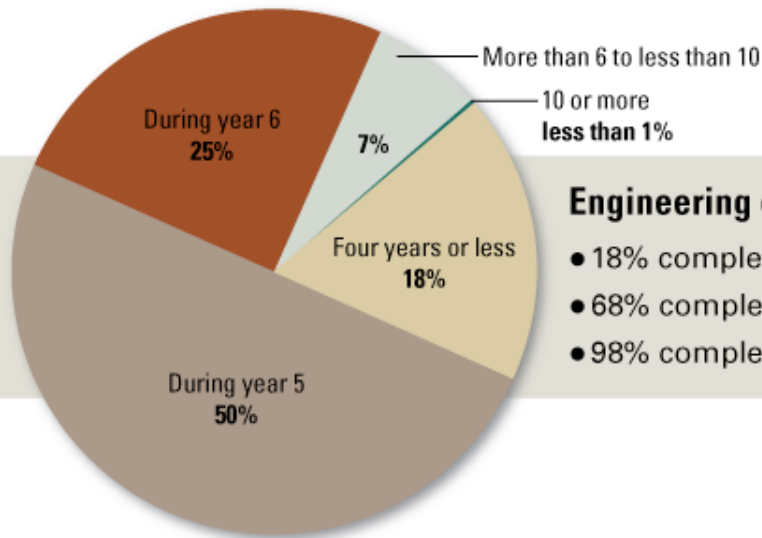


* 04/29/14; expected to increase until mid-june

undergraduate

co-term @school of engineering

... but this!



Engineering coterm time to degree

- 18% complete both degrees within 4 years.
- 68% complete both degrees within 5 years.
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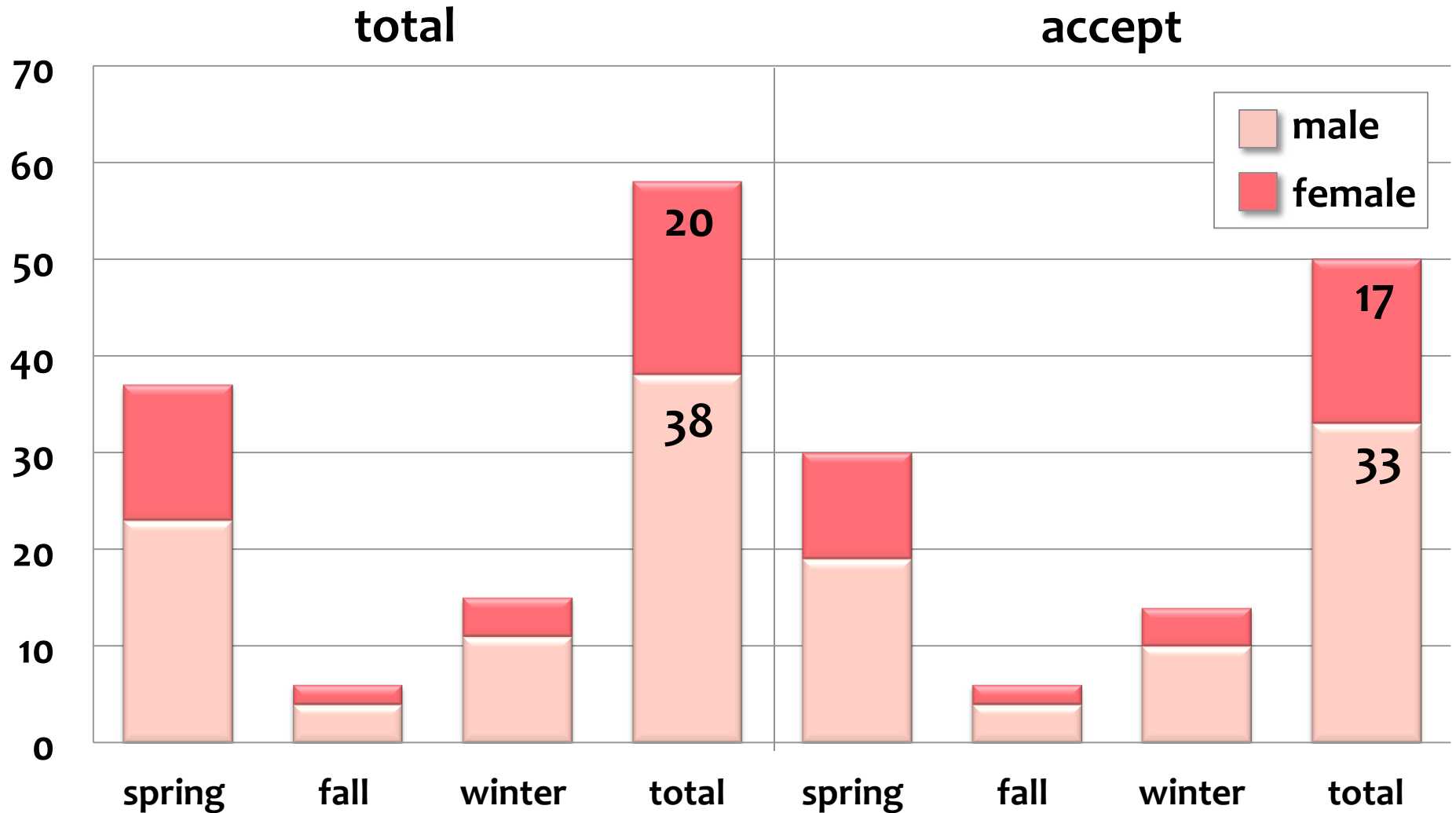
- ... **40 percent of SoE undergraduates choose co-term to**
 - ... gain a deeper understanding of undergraduate major
 - ... expand engineering perspective and/or skills
 - ... increase career perspectives with master's degree
 - ... combine w/undergrad opportunities / overseas / research
- opportunity: SoE Dean's pilot program spring 2014**

co-term



coterm-ME - applications

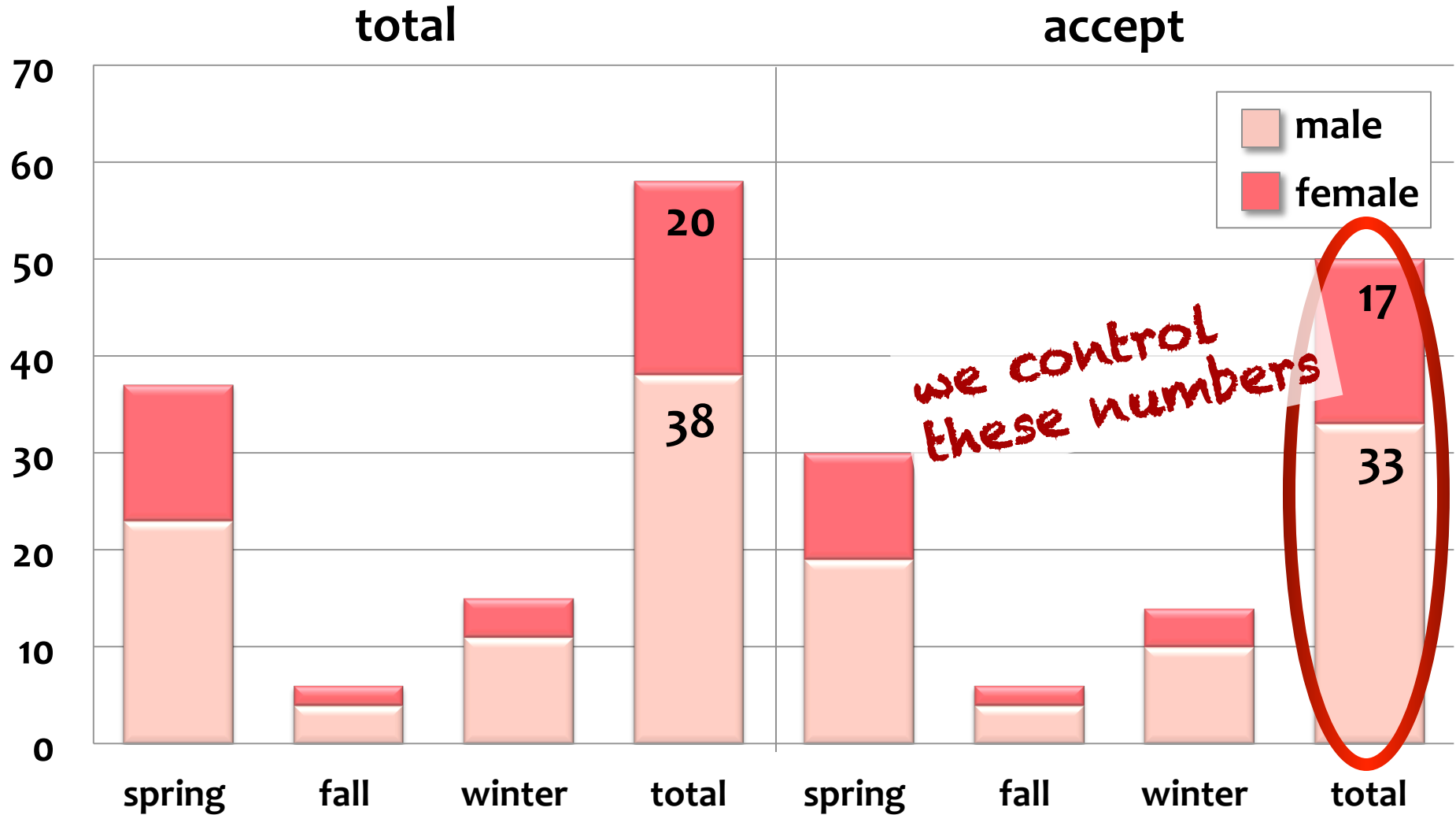
statistics based on all 58 co-term appl's 2013



co-term

are we admitting the right **number** of students?

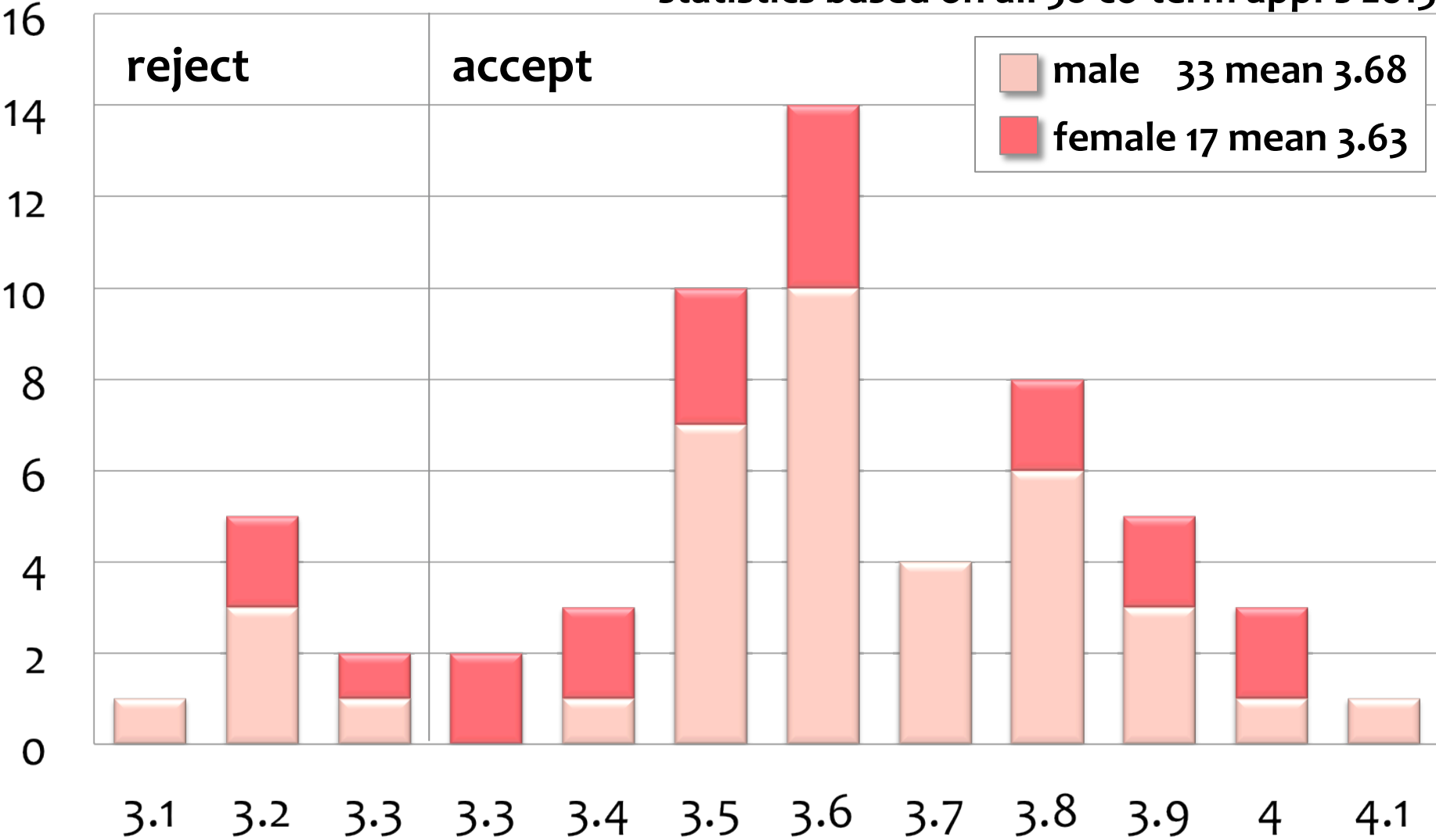
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co-term

co-term-ME - undergrad GPA

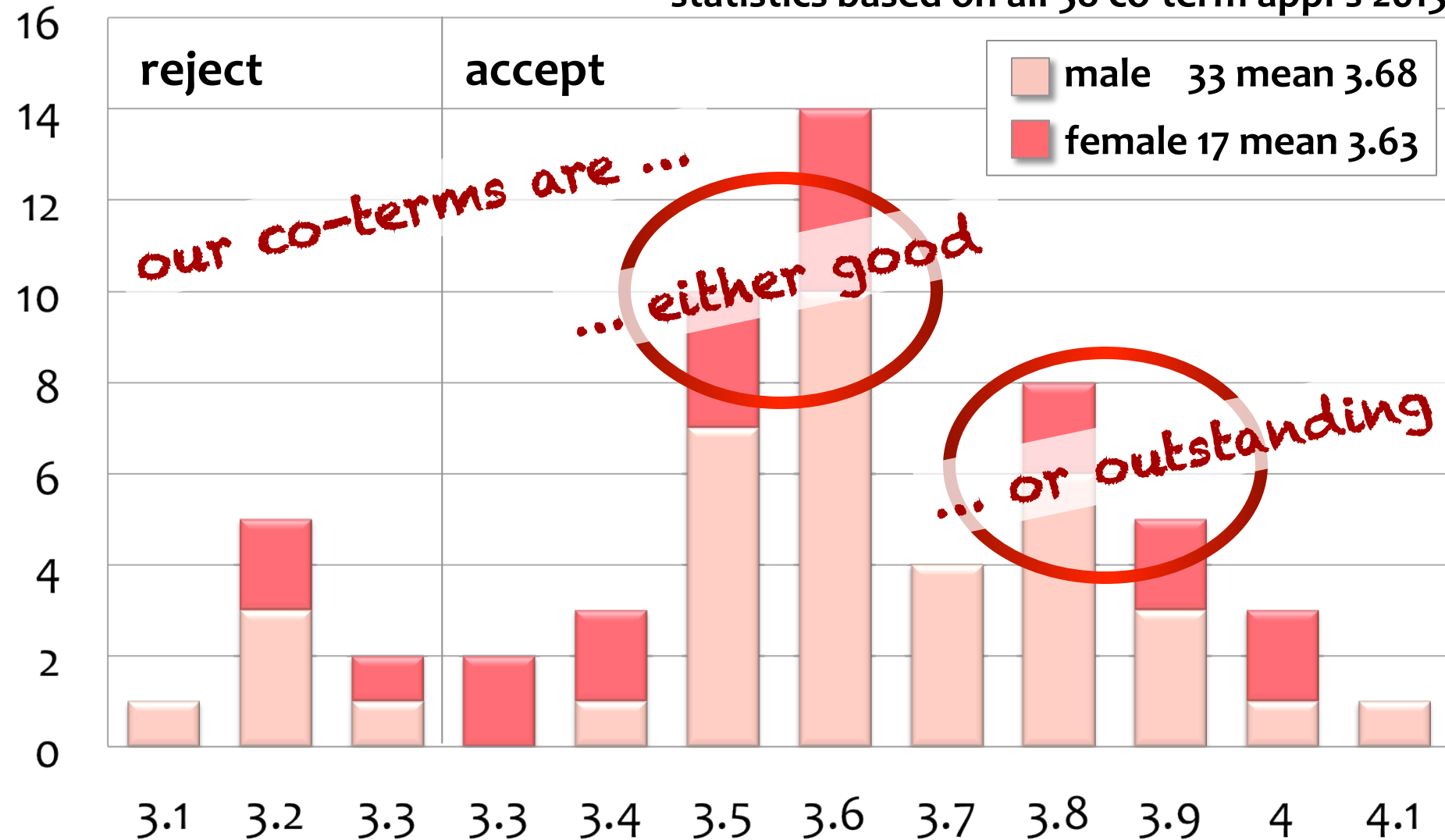
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co-term

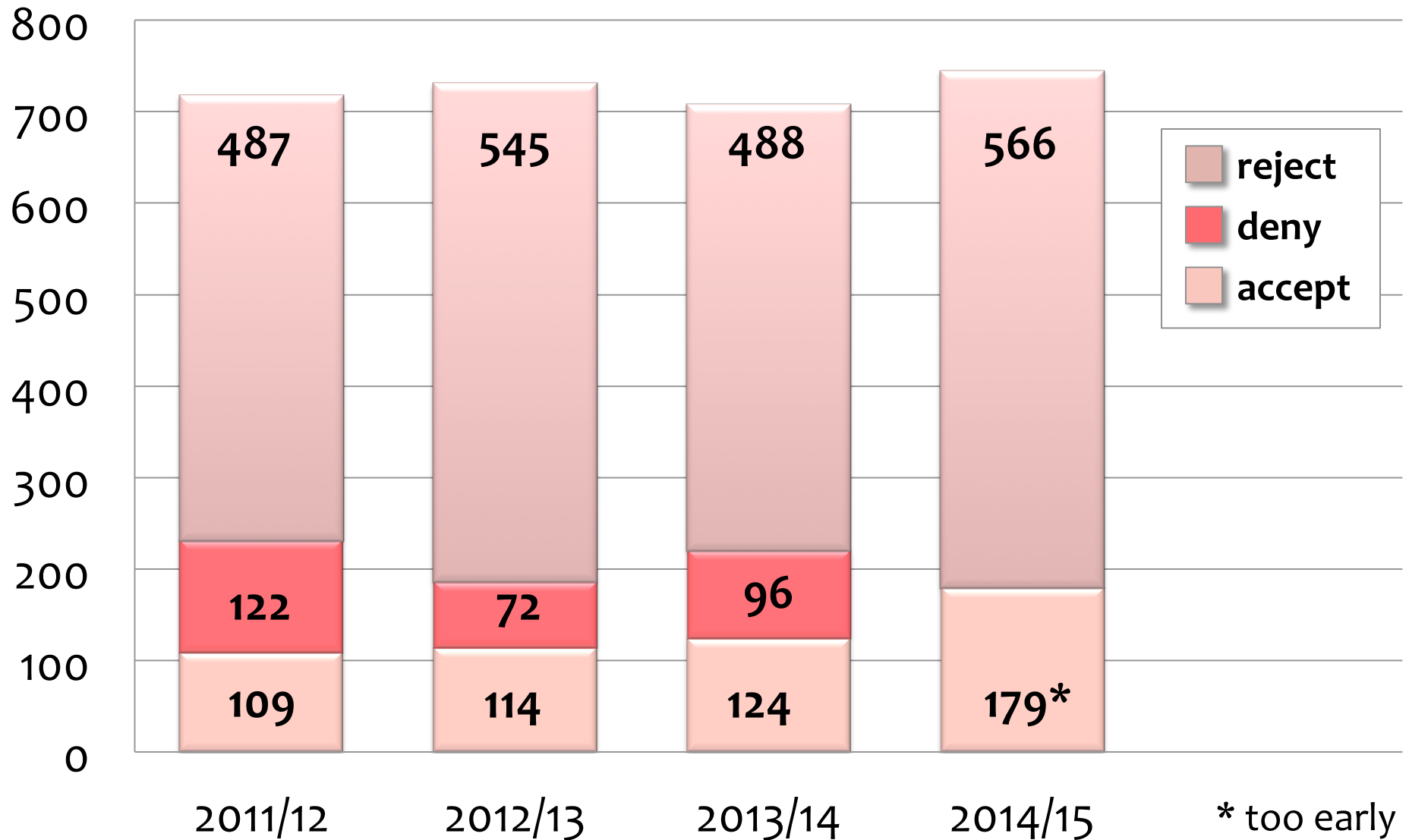
co-term-ME - undergrad GPA

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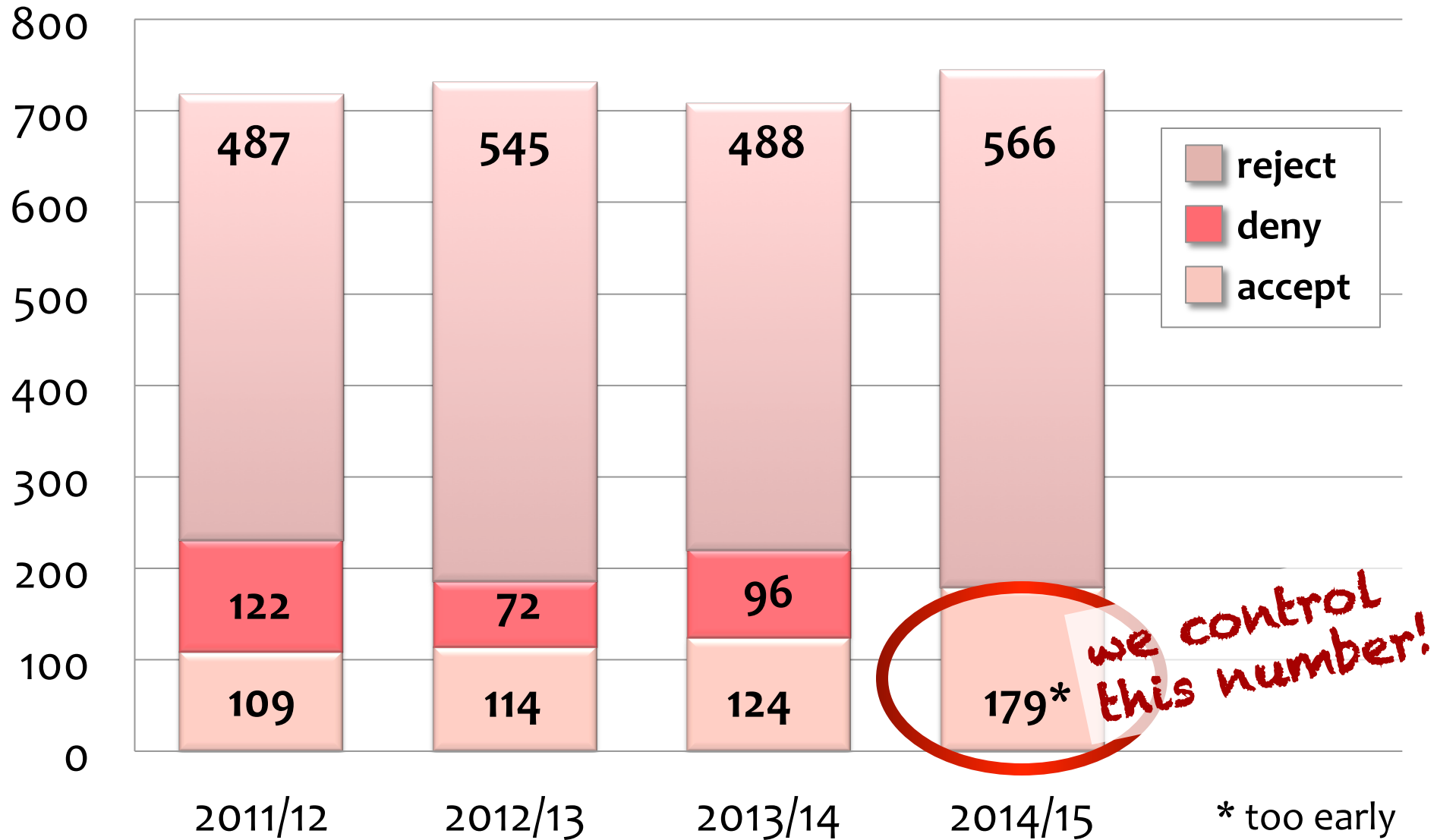


co-term

MS-ME applications

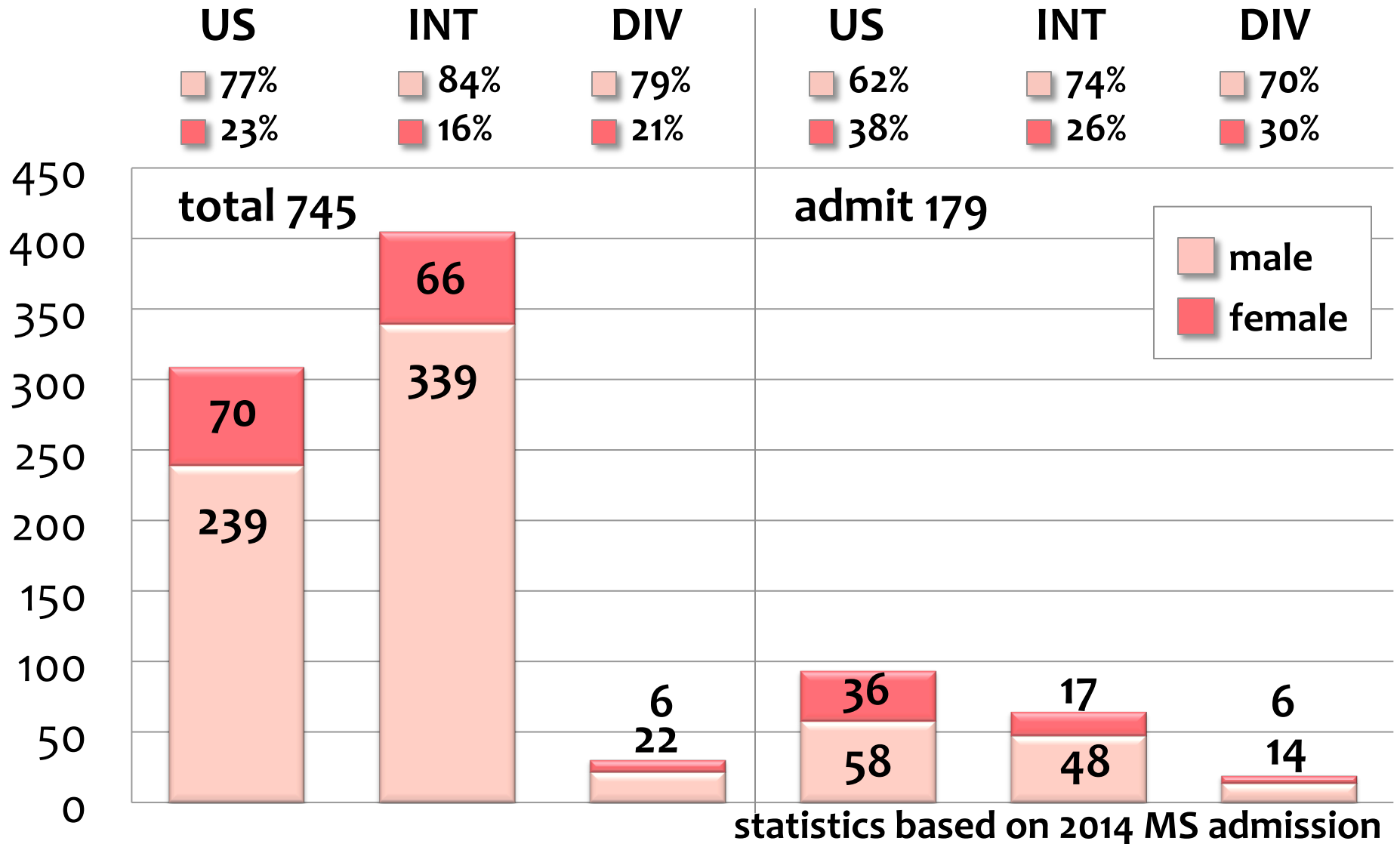


are we admitting the right **number** of students?



masters

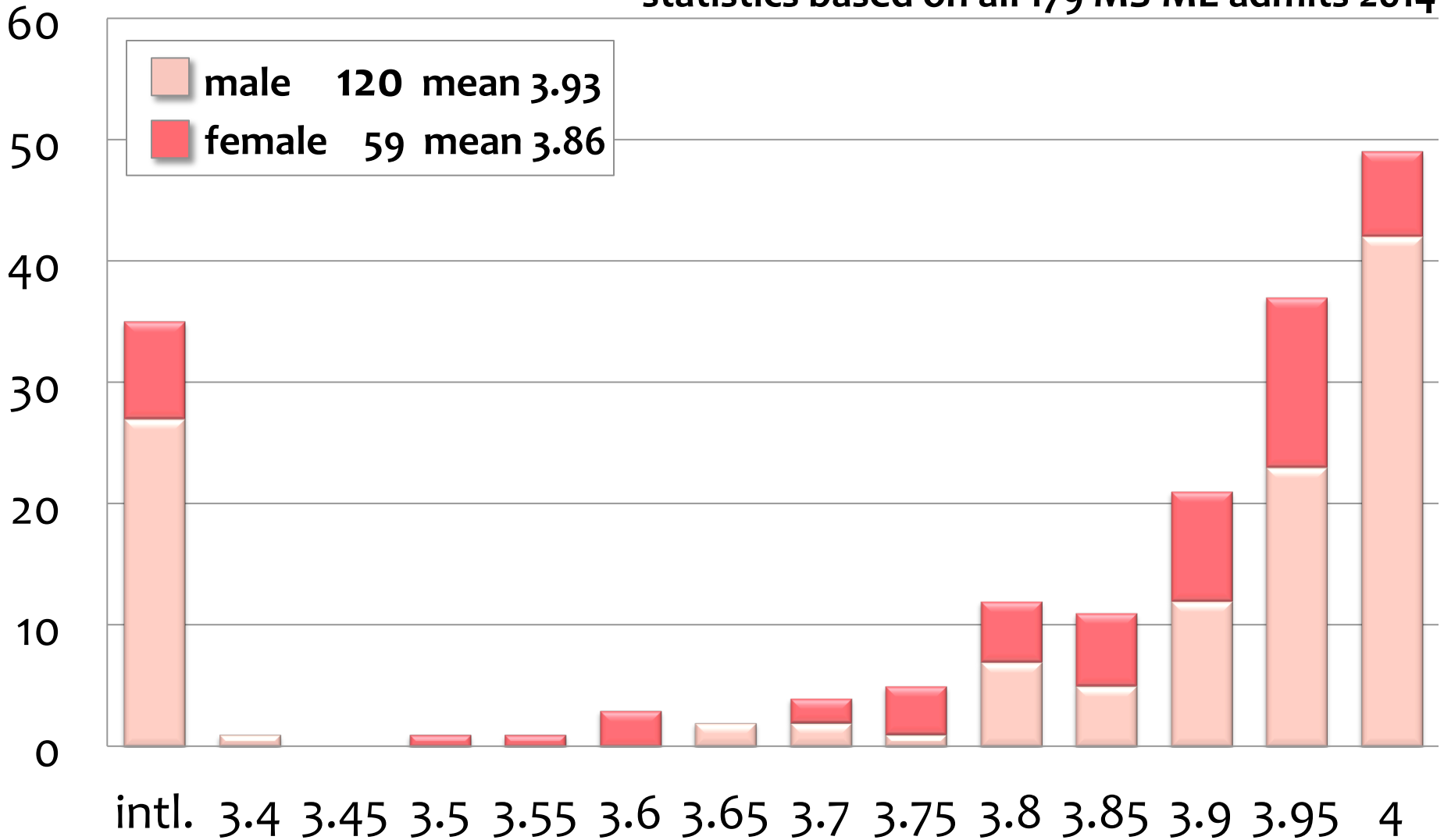
are we admitting the right **number** of students?



statistics based on 2014 MS admission

MS-ME - undergrad GPA

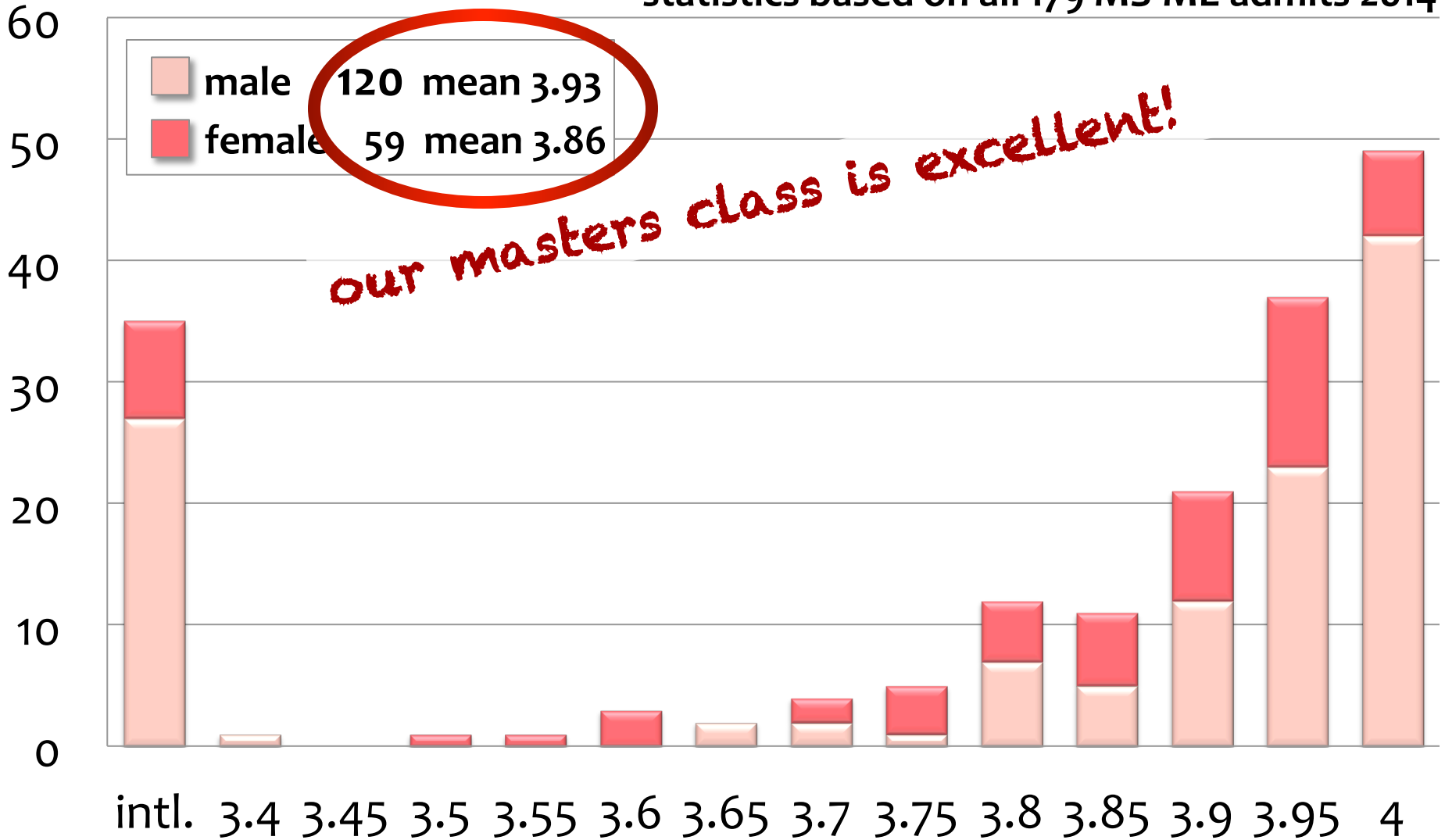
statistics based on all 179 MS-ME admits 2014



masters

MS-ME - undergrad GPA

statistics based on all 179 MS-ME admits 2014



masters

can we do better
in scientific diversity ...

can we do better
in scientific diversity ...

... without
sacrificing gender/ethnic diversity?

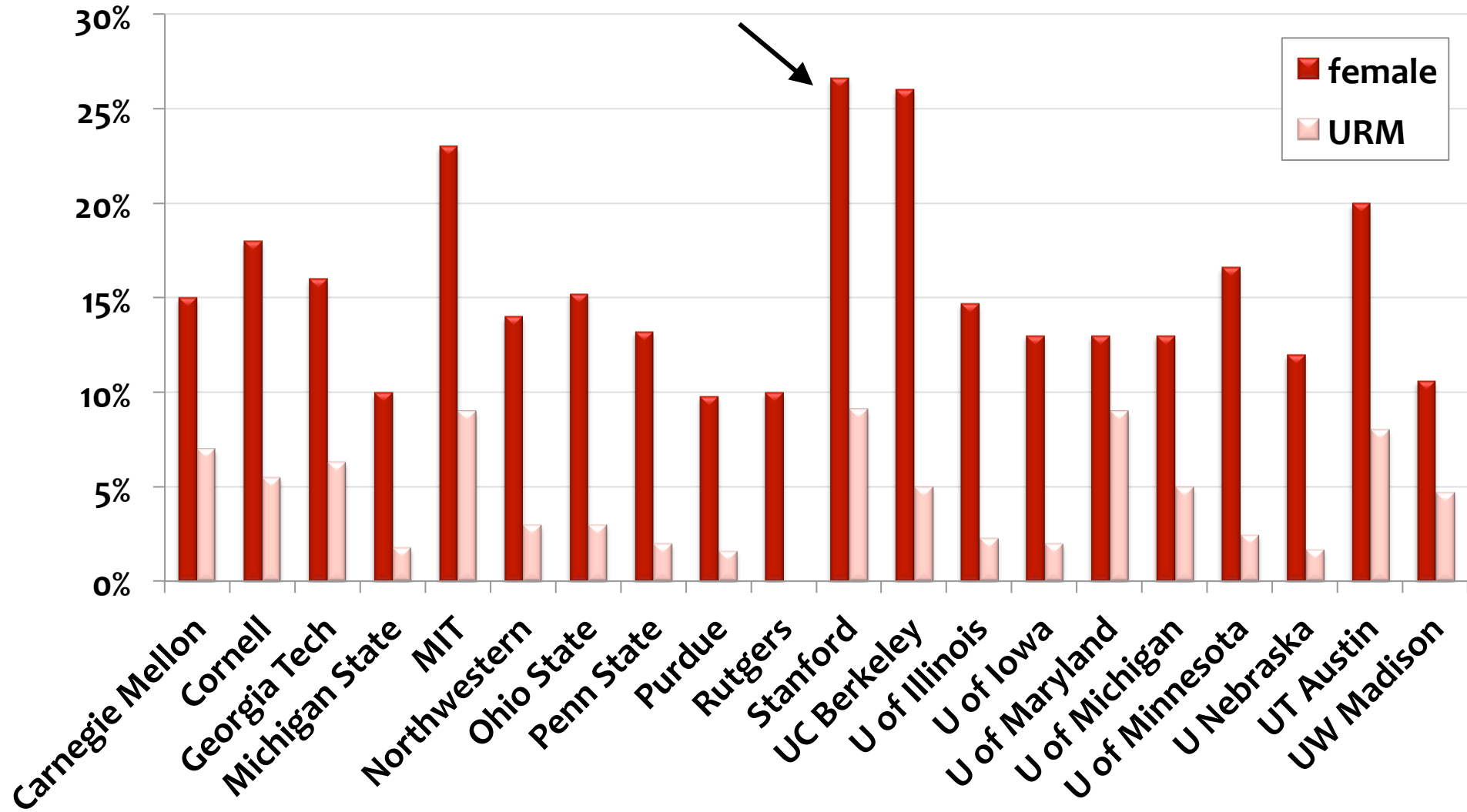
are we admitting the right **group** of students?

can we do better
in scientific diversity ...

... without
sacrificing gender/ethnic diversity?

ME graduate diversity

statistics based big 10+ survey 2012/13



mechanical engineering

ME - gender diversity

BS-ME

78%
22%

BS-PD

50%
50%

BS-BME

67%
33%

BS-total

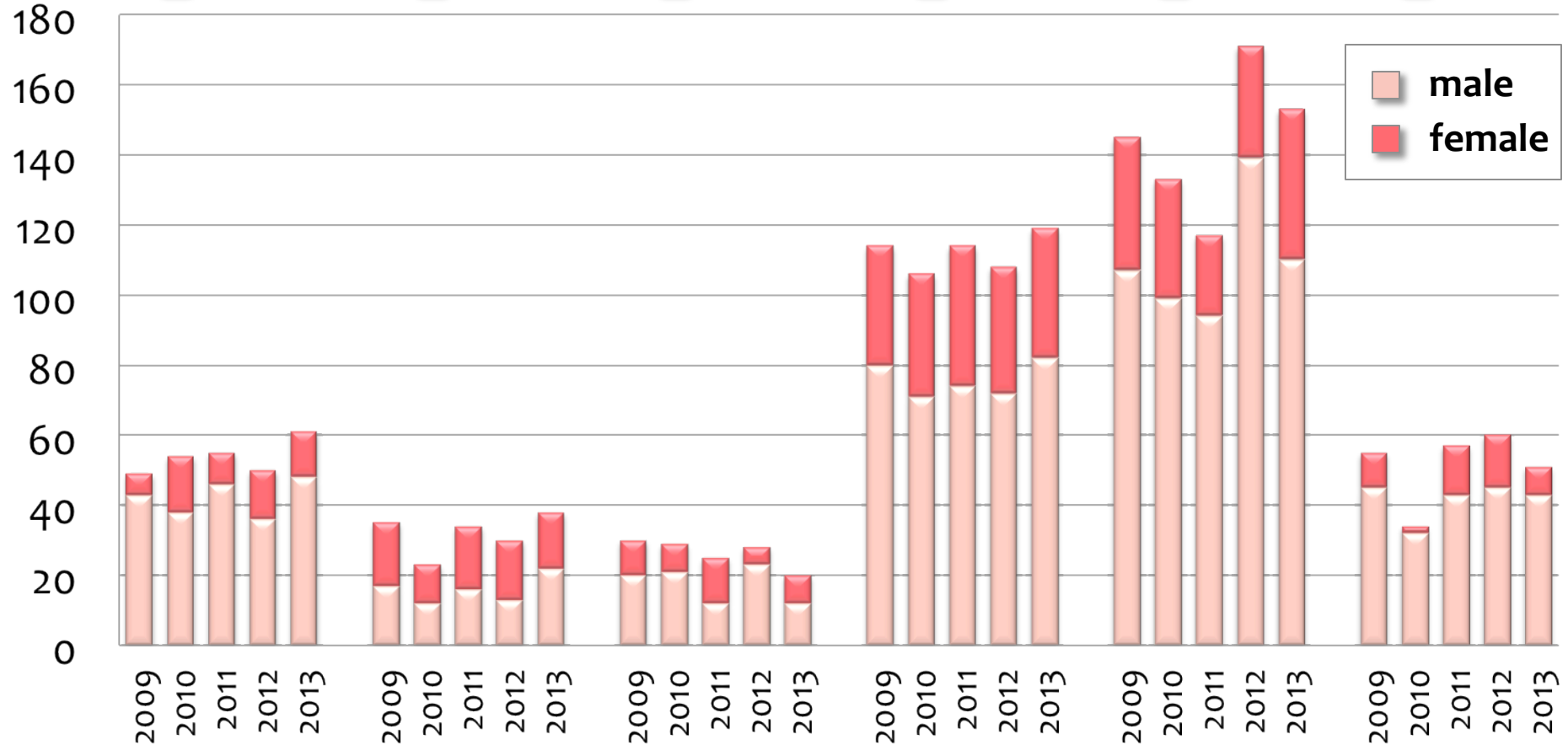
68%
32%

MS-ME

76%
24%

PhD-ME

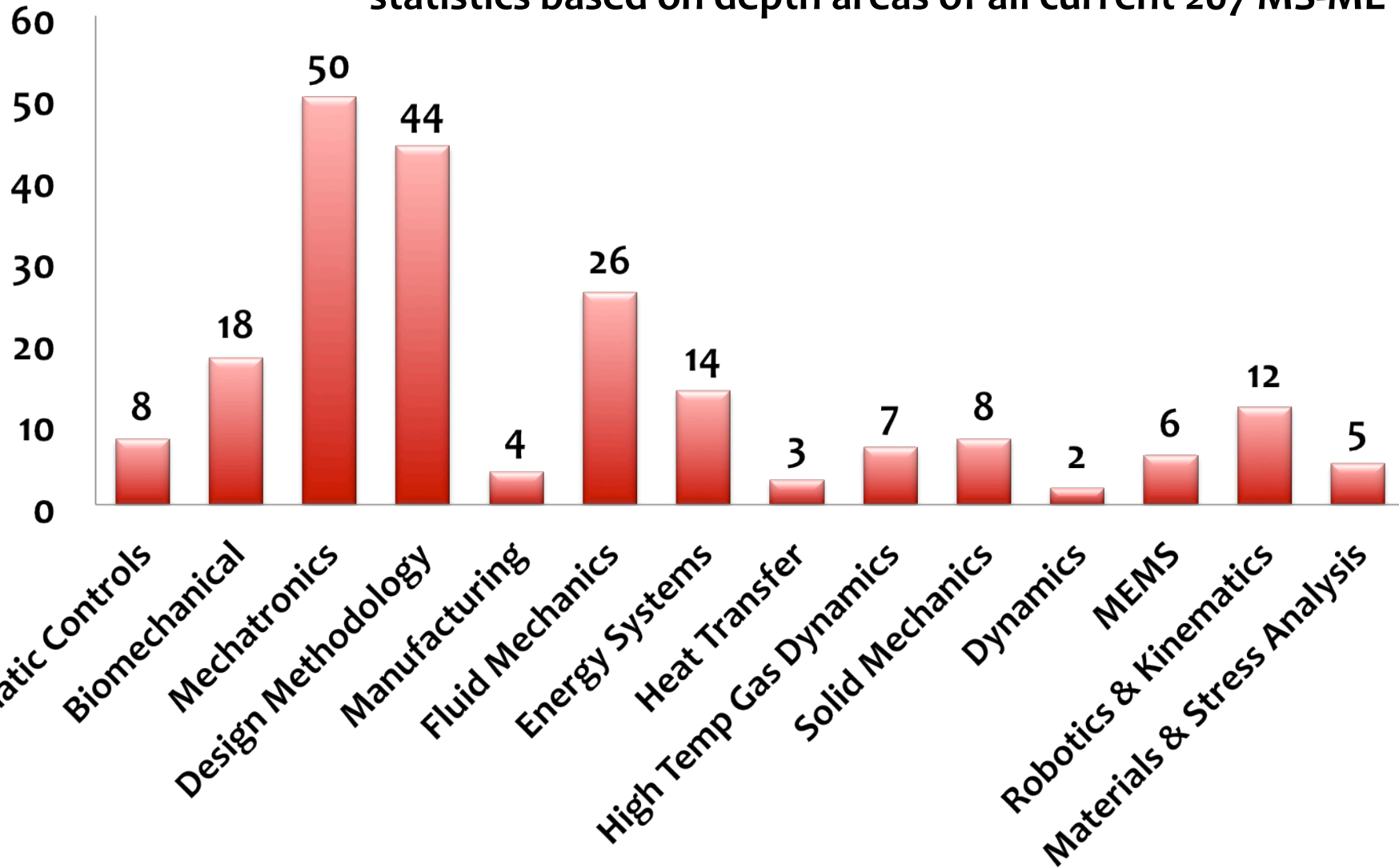
81%
19%



mechanical engineering

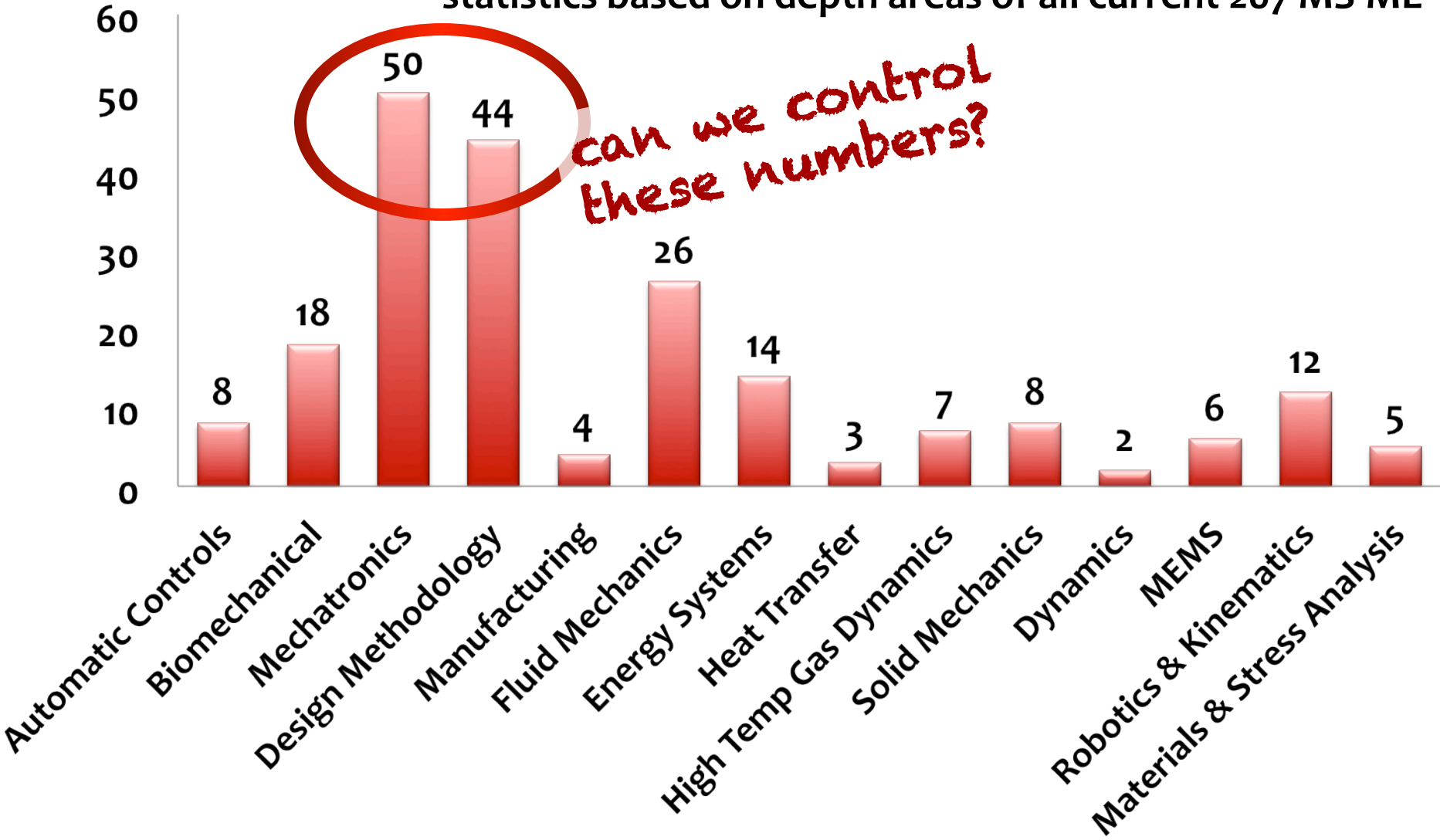
MS-ME - scientific diversity

statistics based on depth areas of all current 207 MS-ME



are we admitting the right **group** of students?

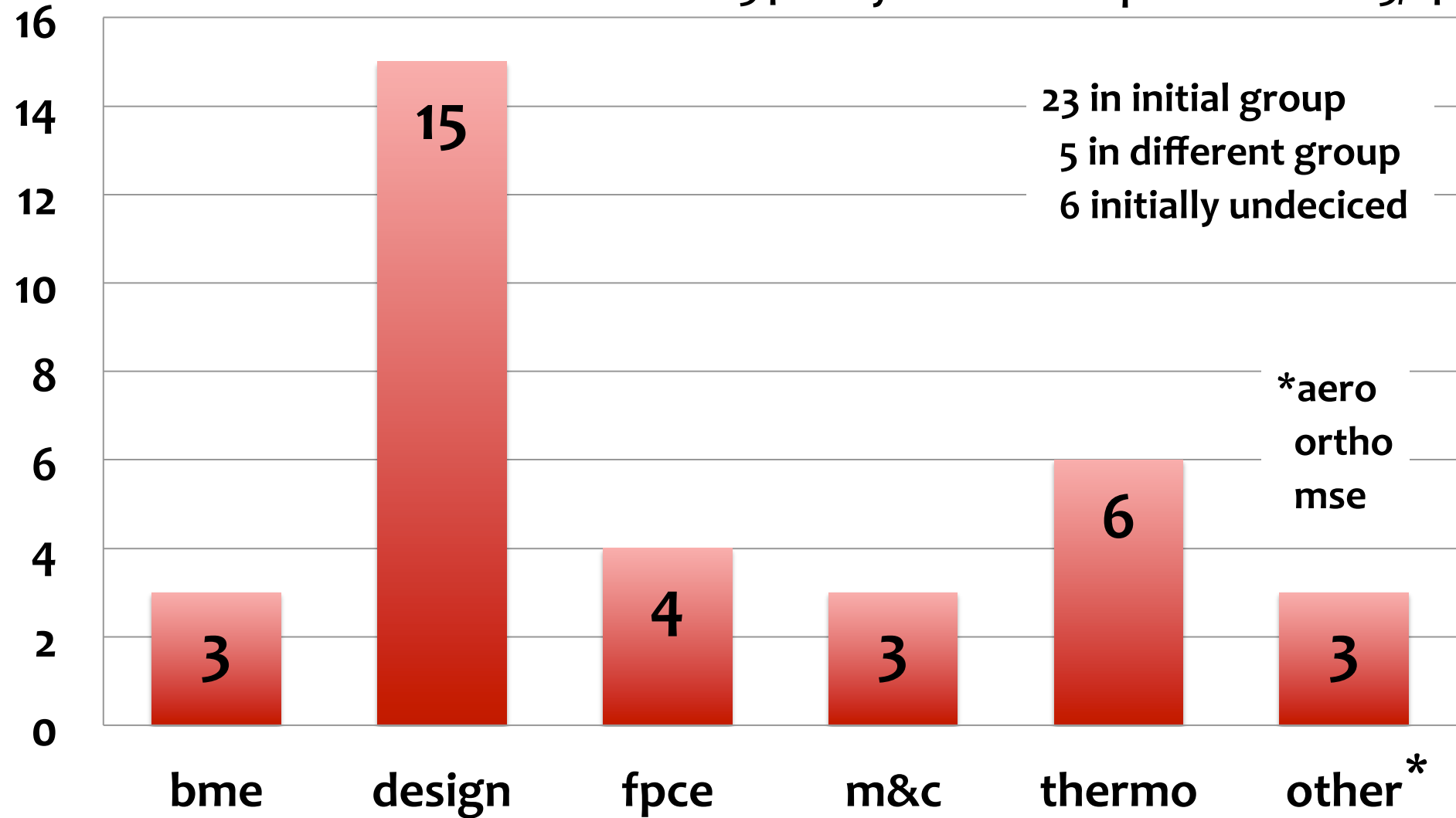
statistics based on depth areas of all current 207 MS-ME



masters

PhD-ME - scientific diversity

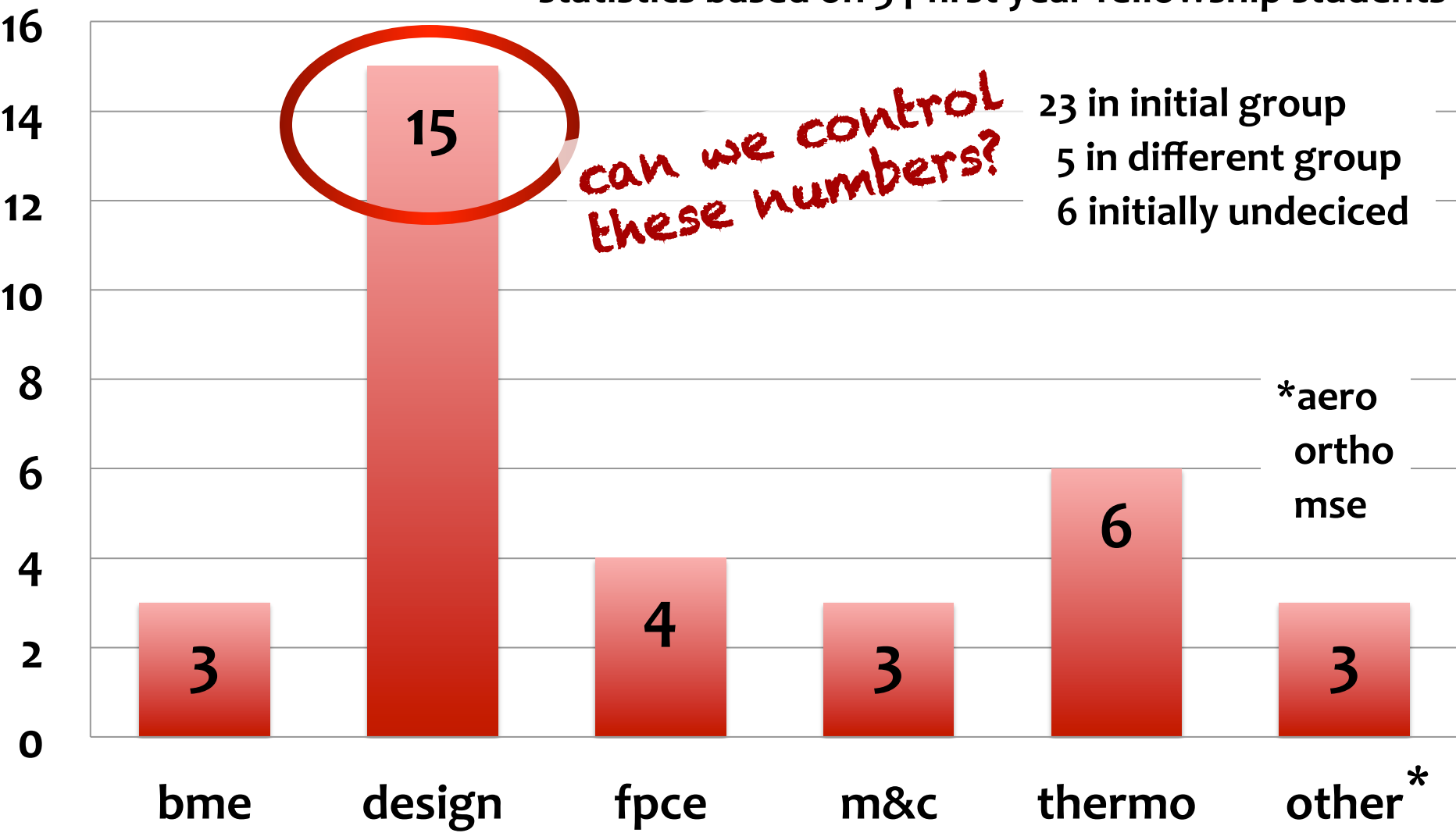
statistics based on 34 first year fellowship students 2013/14



fellowship students

are we admitting the right **group** of students?

statistics based on 34 first year fellowship students



fellowship students

can we improve scientific diversity?

<u>X</u>	Acoustics		
<u>X</u>	Biomechanics		
	Combustion science	<input type="checkbox"/> theory/computational	<input type="checkbox"/> experimental
<u>X</u>	Controls	<input checked="" type="checkbox"/> theory/computational	<input checked="" type="checkbox"/> experimental
<u>X</u>	Design of mechanical systems†		
<u>X</u>	Design of thermal and fluid systems		
<u>X</u>	Energy Science		
<u>X</u>	Fluid Mechanics	<input checked="" type="checkbox"/> theory/computational	<input checked="" type="checkbox"/> experimental
<u>X</u>	Solid Mechanics	<input checked="" type="checkbox"/> theory/computational	<input checked="" type="checkbox"/> experimental
<u>X</u>	Heat Transfer	<input checked="" type="checkbox"/> theory/computational	<input checked="" type="checkbox"/> experimental
	Manufacturing		
<u>X</u>	Microelectromechanical systems (MEMS)		
	Plasma Science		
	Propulsion	<input type="checkbox"/> air breathing	<input type="checkbox"/> space
<u>X</u>	Robotics		
<u>X</u>	Sensing and diagnostics		

immediate improvements -1-

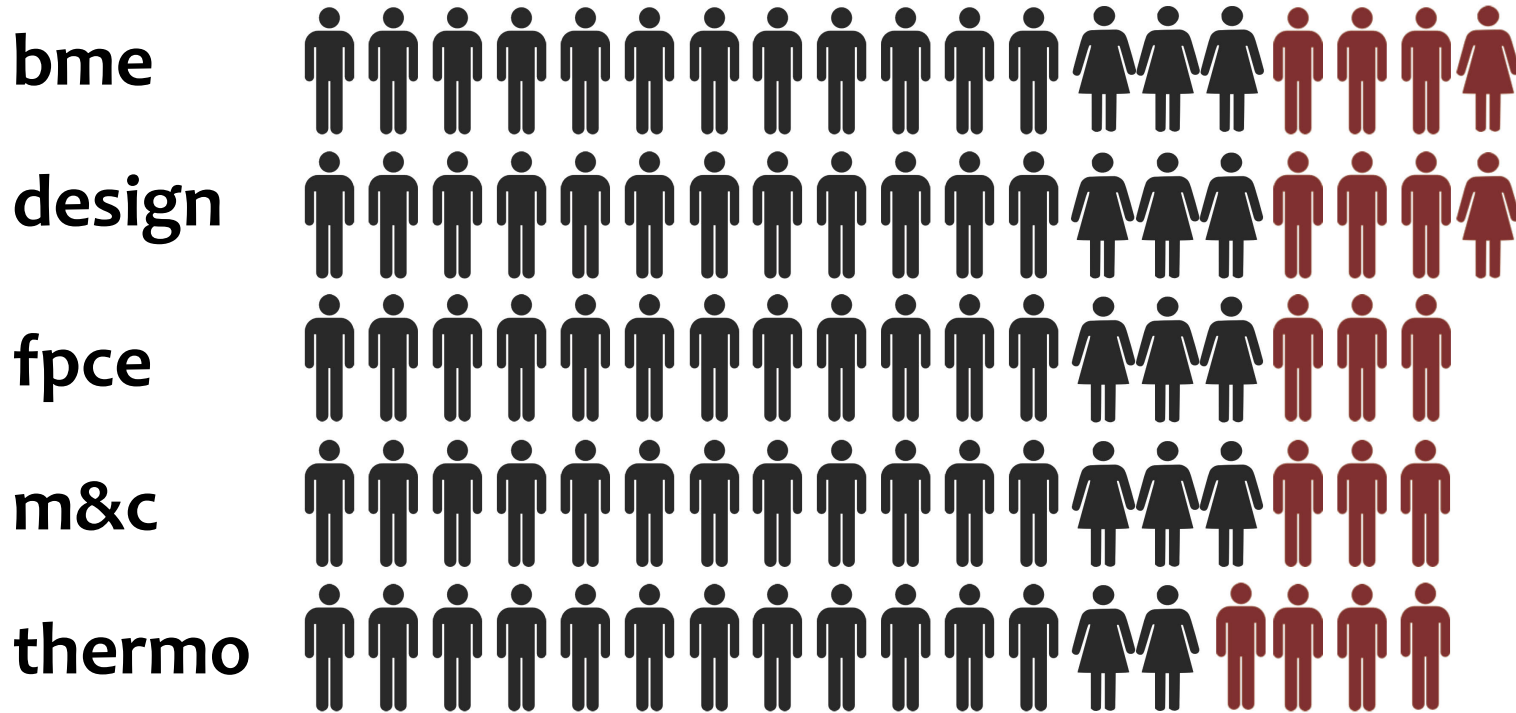
can we improve scientific diversity?

<input checked="" type="checkbox"/>	Acoustics		
<input checked="" type="checkbox"/>	Biomechanics		
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<input checked="" type="checkbox"/>	Controls	<input checked="" type="checkbox"/> theory/computational	<input checked="" type="checkbox"/> experimental
<input type="checkbox"/>	Biomechanical Engineering		
<input checked="" type="checkbox"/>	Design		
<input checked="" type="checkbox"/>	Flow Physics and Computational Engineering		
<input type="checkbox"/>	Mechanics and Computation		
<input checked="" type="checkbox"/>	Thermosciences		
<input type="checkbox"/>	Plasma Science		
<input type="checkbox"/>	Propulsion	<input type="checkbox"/> air breathing	<input type="checkbox"/> space
<input checked="" type="checkbox"/>	Robotics		
<input checked="" type="checkbox"/>	Sensing and diagnostics		

immediate improvements -1-

can we improve scientific diversity?

184+184+184+184+184 applications in total



... by decentralizing the admission process?

immediate improvements -1-

can we improve our screening process?

- from 912 to 179 admits based on one single read
- current grad students want to be involved
- computer science has student committee for pre-screening
- should we invite students to pre-screen our applications?

more involvement / more transparency / thorough review



immediate improvements -2-

can we improve community?

graduation speakers 2014 - nominations

BS-ME michelle teo

MS-ME michael bunne

BS-ME patrick mc cullough

MS-ME nami gheidar

BS-PD phounsouk sivilay

MS-ME wyles vance

BS-PD monica vu

MS-PD elizabeth marshman

BS-BME ben rhyne

nominate your students or advisees!

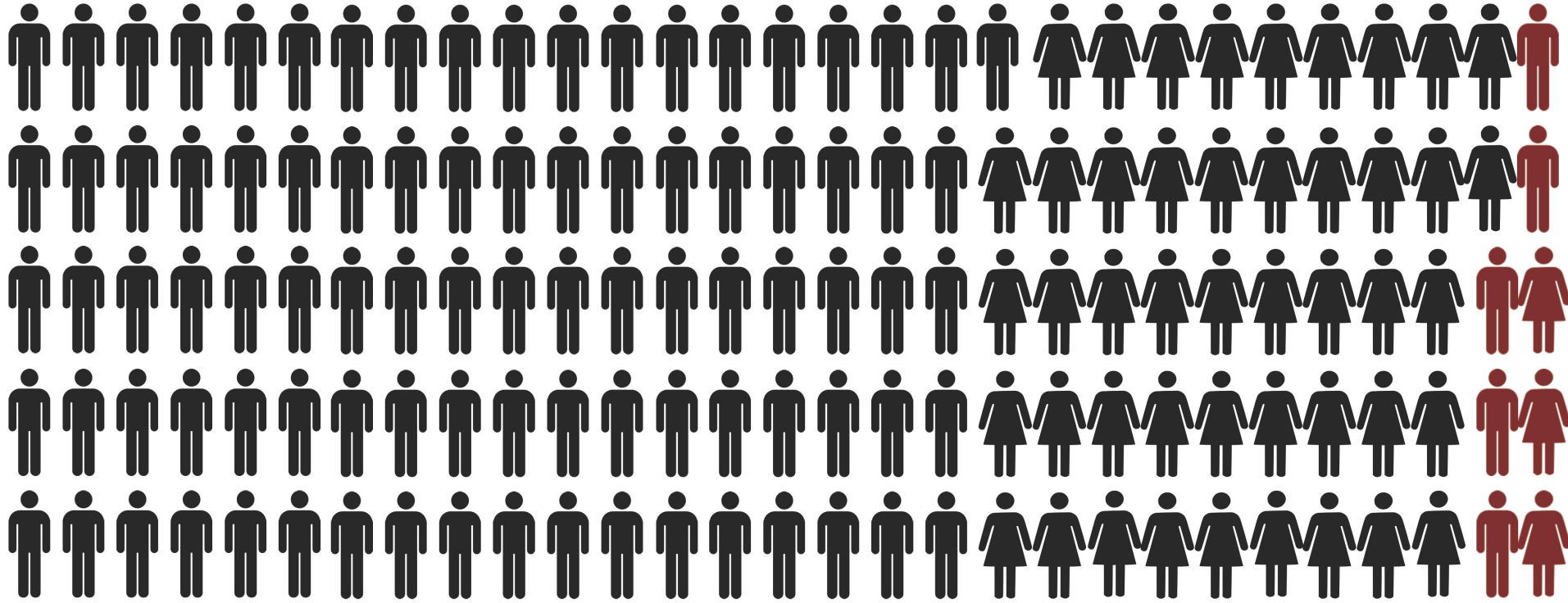






immediate improvements -3-

can we have a fully funded MS class?

14 SGFs, 18 SoEs, 8 3D

298 quarters of financial aid



ms-me: 183  95  phd: 10  5 





thinking big -1-

can we have a fully funded MS class?

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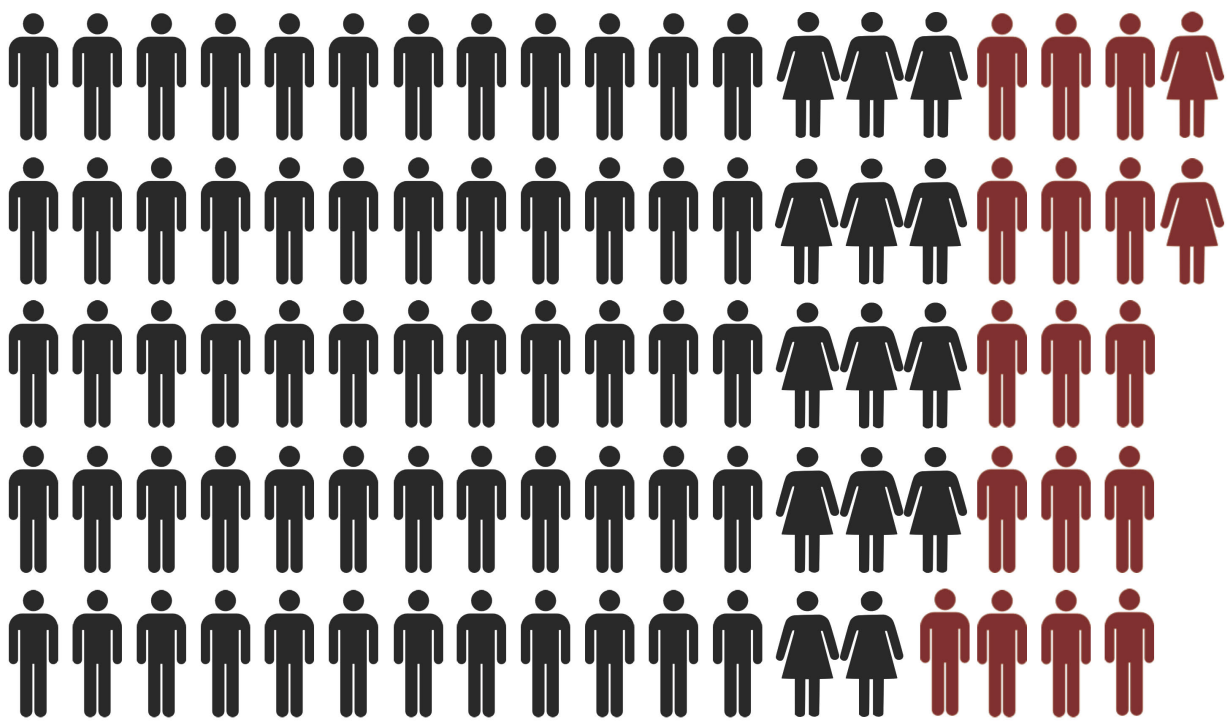






ms-me: 183  95  phd: 10  5 

thinking big -1-

can we establish a two-track MS/PhD system?

921 applications in total



msme: 600  145  phd: 157  19 

thinking big -2-

can we establish a two-track MS/PhD system?

921 applications in total



terminal ms: 200  50  ms/phd:  550  121

thinking big -2-

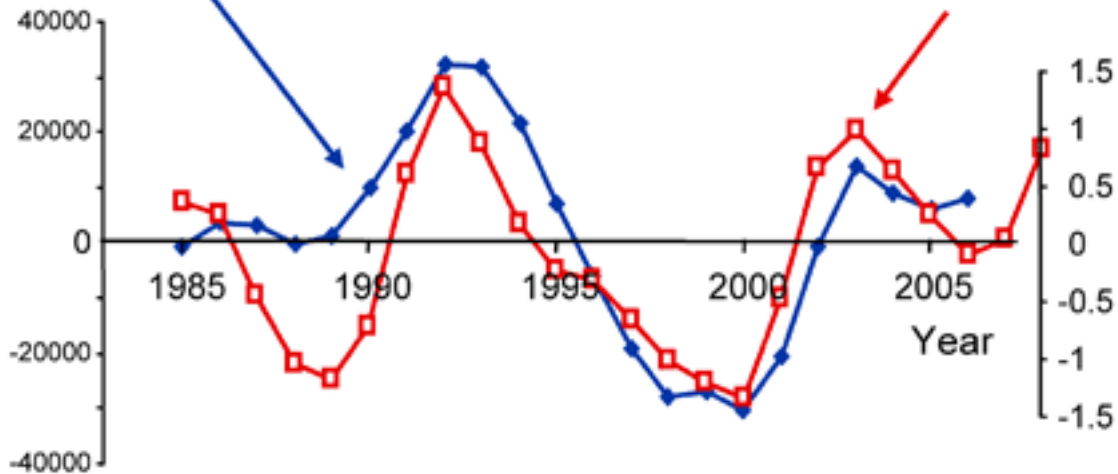
are we admitting the right
number and group of students?

... special thanks to kelly, brittany, and indrani

can we do better?

Fluctuations in Grad Student Enrollment (Science & Engineering)

Fluctuations in the Unemployment Rate



Correlation Coefficient:

$$\rho = 0.75583$$

(that's pretty high)

JORGE CHAM © 2008

grad school is for suckers! wall street here i come!



Guess Who's Coming to Grad School?

Sources: NSF/Bureau of Labor Statistics. Fluctuations obtained by subtracting the mean regression line from the absolute values.

WWW.PHDCOMICS.COM

i always wanted to go to grad school...



update on our graduate admission & curriculum

graduate / school of engineering

Rank	School	Tuition	Enrollment (total)	Enrollment (eng)
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national rankings

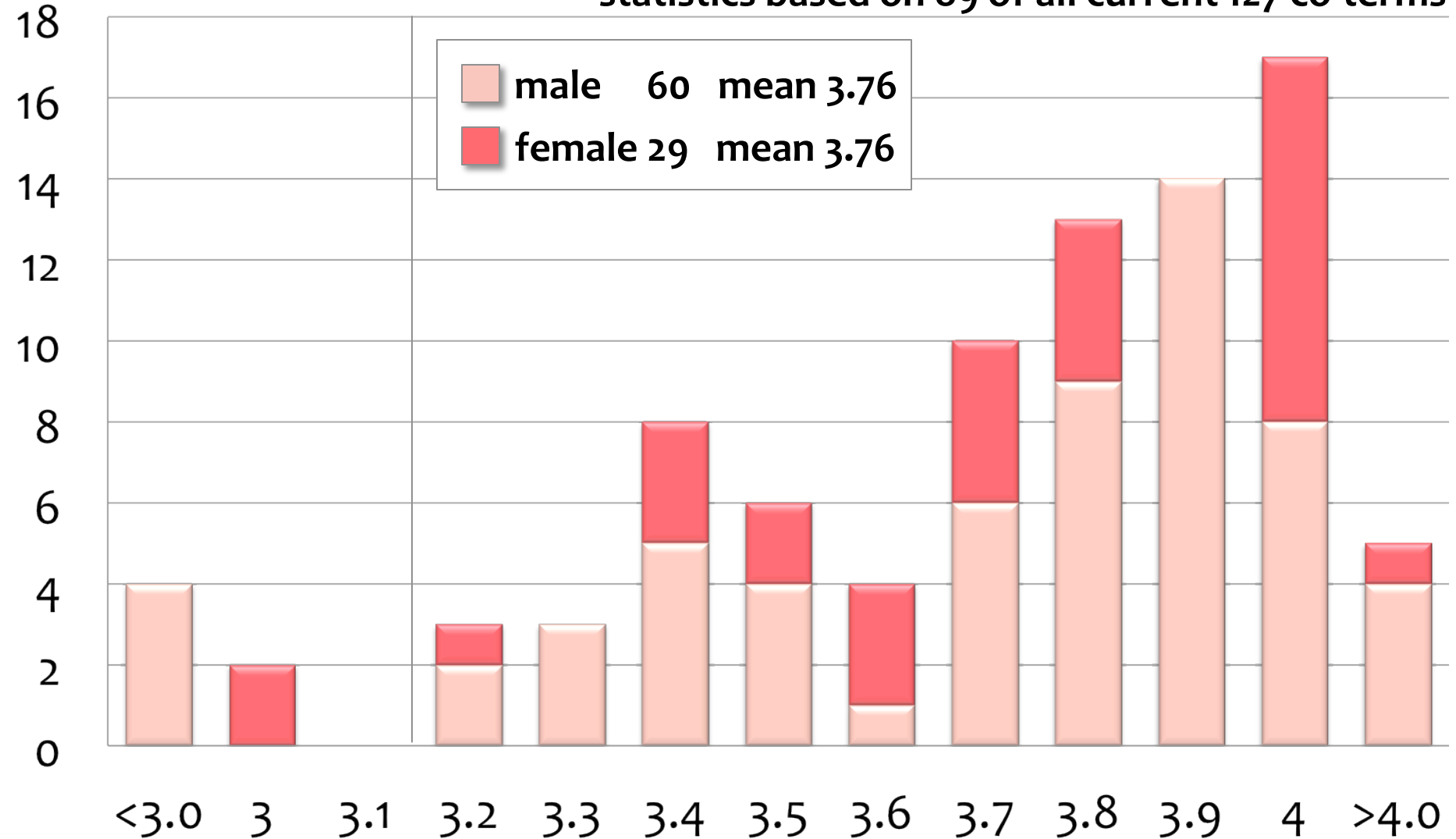
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national rankings

co-term-ME - graduate GPA

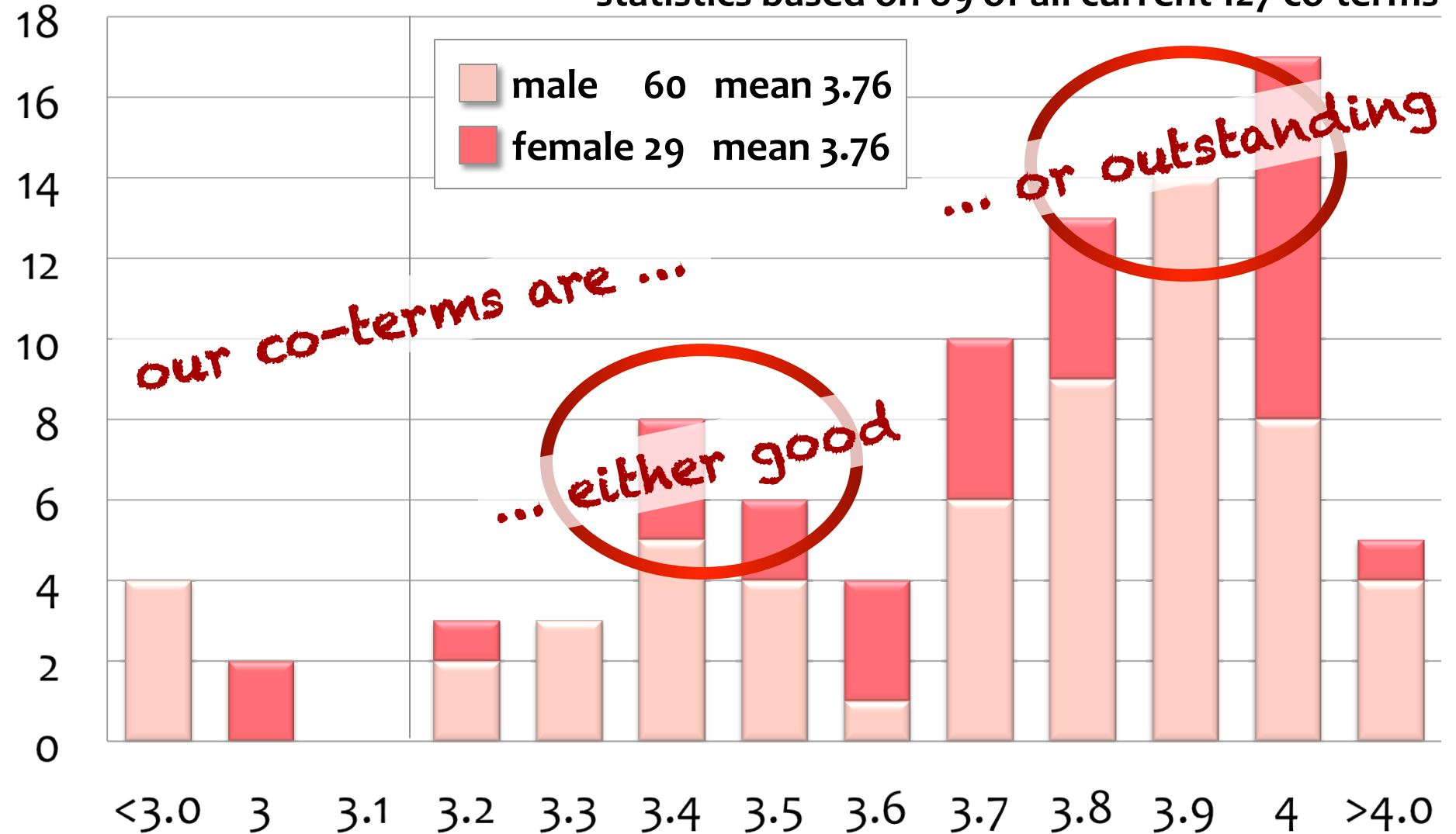
statistics based on 89 of all current 127 co-terms



co-term

co-term-ME - graduate GPA

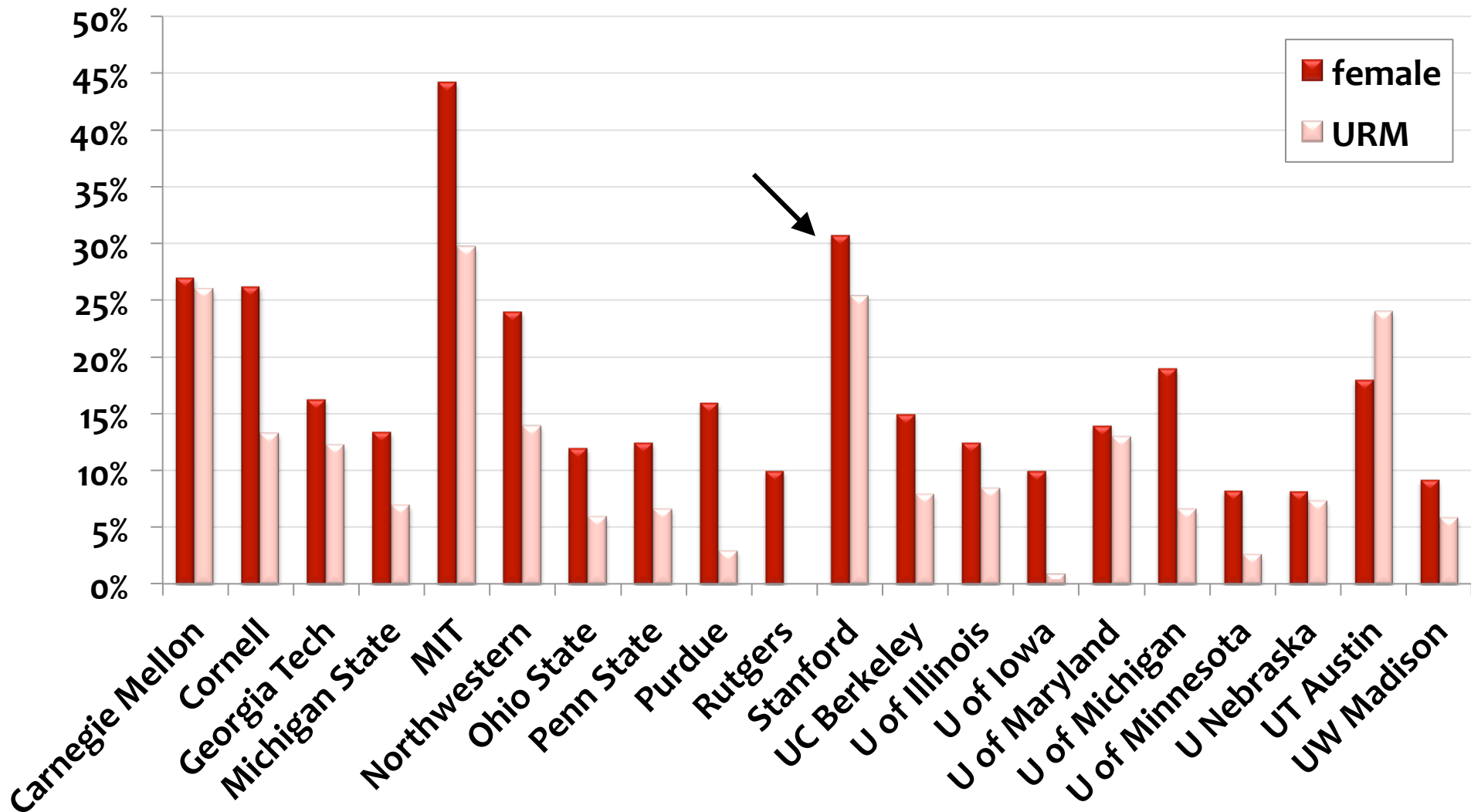
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co-term

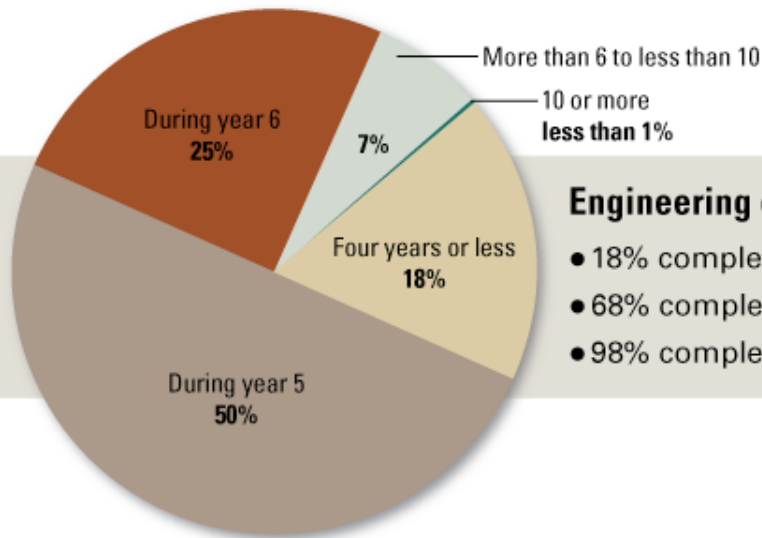
ME undergraduate diversity

statistics based big 10+ survey 2012/13



mechanical engineering

co-term @school of engineering



Engineering coterm time to degree

- 18% complete both degrees within 4 years.
- 68% complete both degrees within 5 years.
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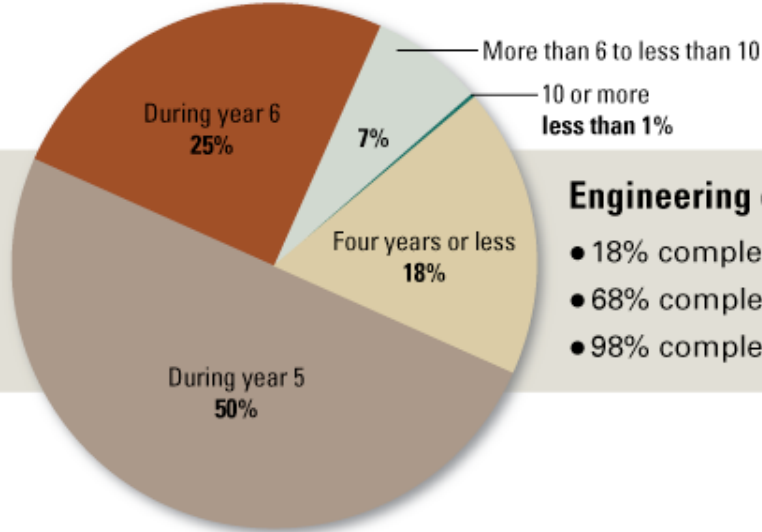
motivation: SoE Dean's pilot program spring 2014

- ... new funding opportunities for co-term students
- ... for undergraduates w/substantial financial need
- ... faculty committee reviews applications and selects 10-15
- ... awards 1/2 graduate fellowship/assistantship for 3 quarters

co-term



co-term @school of engineering



Engineering coterm time to degree

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- ... 40 percent of SoE undergraduates choose co-term to
- ... gain a deeper understanding of undergraduate engineering
- ... expand engineering perspective
- ... increase career preparation
- ... complete a master's degree
- ... pursue opportunities / overseas / research

... either graduate early or graduate late

co-term

