Truth & Consequences

Opting Out of Calculus I and Subsequent Student Success

Constance A. Pierson, Ph.D.
Assistant Director, Office of Institutional Research
UMBC

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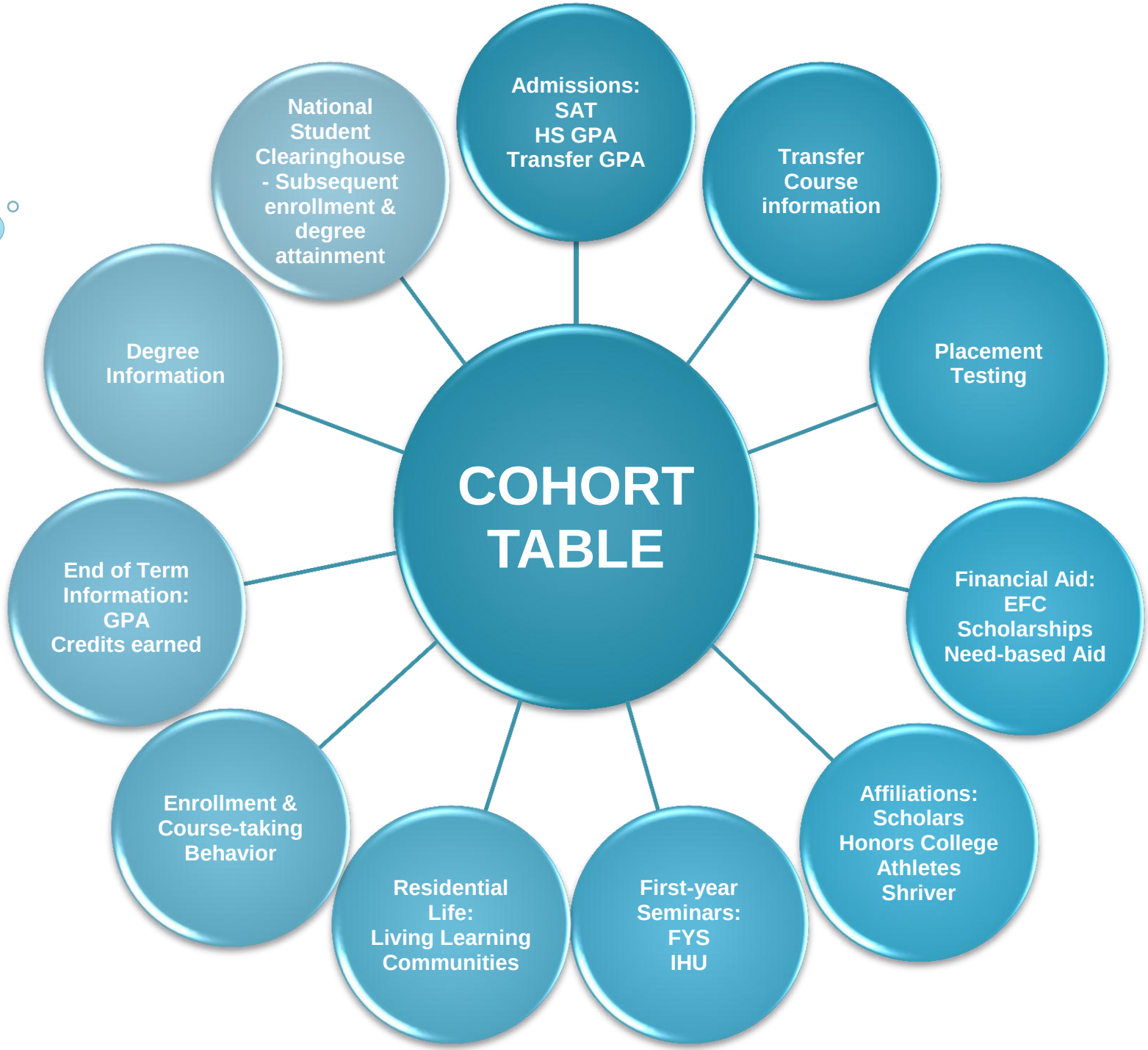
The research loop
(AKA …the questions keep coming….)

Cohort table-

developed to track student persistence & performance


COHORT TABLE
Admissions: SAT HS GPA Transfer GPA
Transfer Course information
Placement Testing
Financial Aid: EFC Scholarships Need-based Aid
Affiliations: Scholars Honors College Athletes Shriver
First-year Seminars: FYS IHU
Residential Life: Living Learning Communities
Enrollment & Course-taking Behavior
End of Term Information: GPA Credits earned
Degree Information
National Student Clearinghouse - Subsequent enrollment & degree attainment

Previously Established Baseline Model of Six-Year Graduation

Factors related to graduating within 6 years

- High School GPA
- Math Placement
- Affiliation
  - Scholars' programs
  - Athletes
  - Honors College
- AP Credit
- Dorm Status
- Sex
- Geographic origin
- Major Area
- UMBC Merit scholarship
- Expected Family Contribution
- Difficulty of coursework

So, how did we come to this?

Previous study:
Calc II grades positively related to six-year grad rate

Administration believes those who opt out Calc I will not perform as well in the long run

So…we study it!

What others have to say…

- AP students do just as well
  (Morgan & Ramist, 1998)
- Even when control for ability
  (Dodd et al, 2002)
- AP students higher 5 year grad rates
  (Dougherty et al, 2006)

This study…

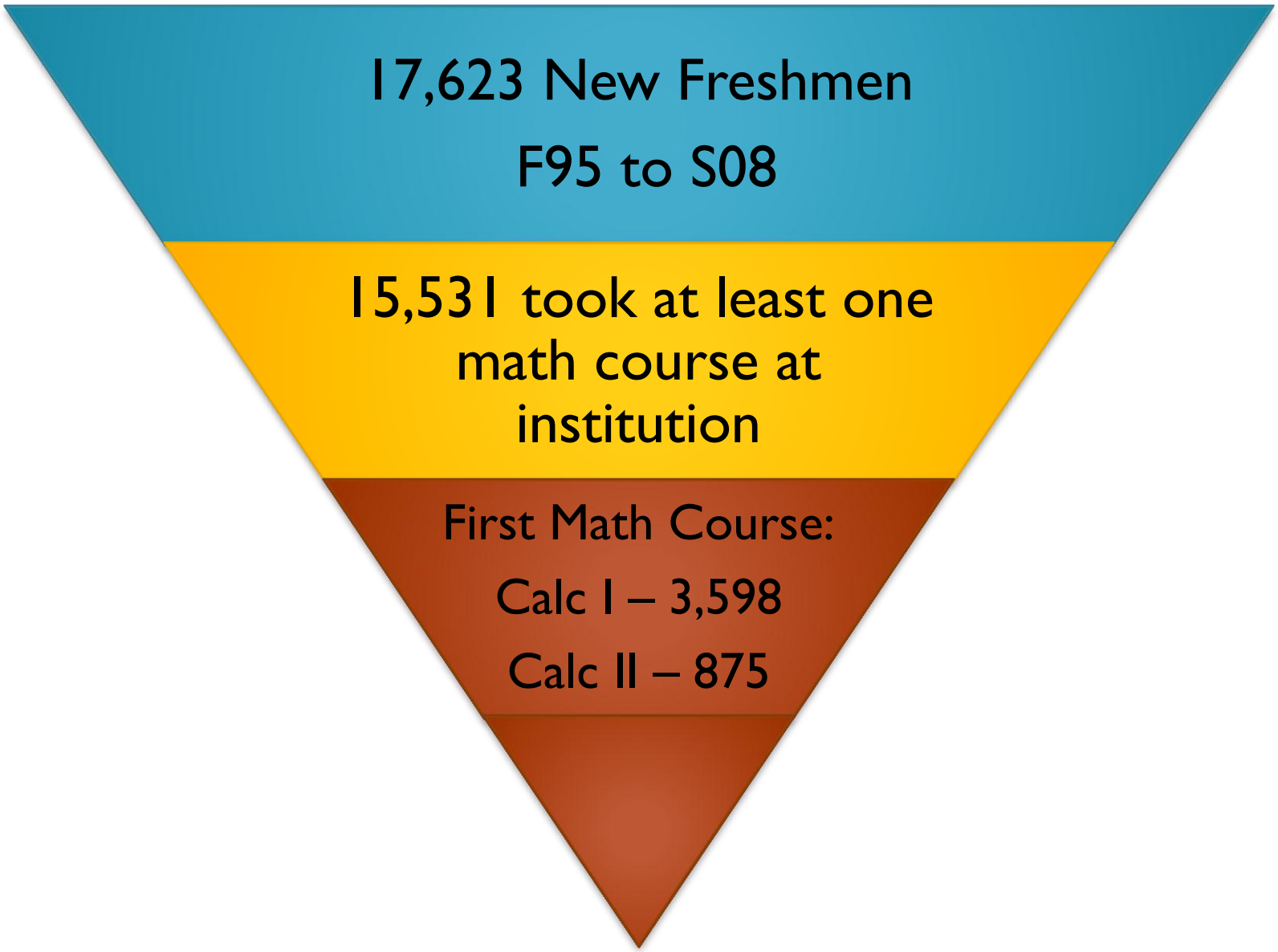
- Focus on new freshmen
- Look at MATH courses taken
- Compare progress for:

  Students starting in
  Calc I vs. Calc II

Outcomes of interest…

- Math performance
- 1st-yr retention rate
- 6-yr graduation rate
- Graduate school

The Data


17,623 New Freshmen
F95 to S08
15,531 took at least one math course at institution
First Math Course:
Calc I – 3,598
Calc II – 875

Four groups of interest…

CALC I/ no AP (n=2,593)

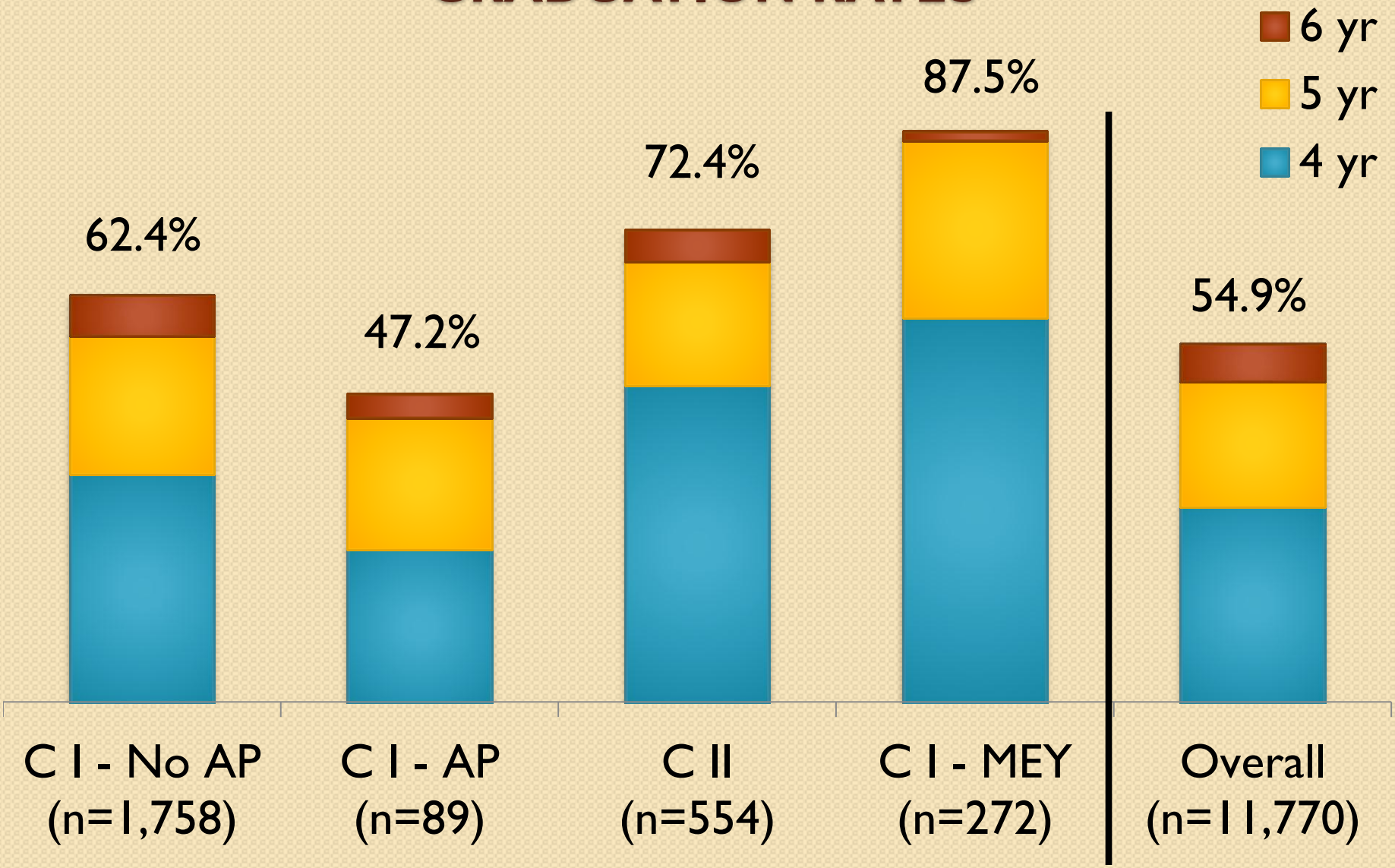
CALC I/ AP I or II (n=180)

CALC I/ MEY (n=375)

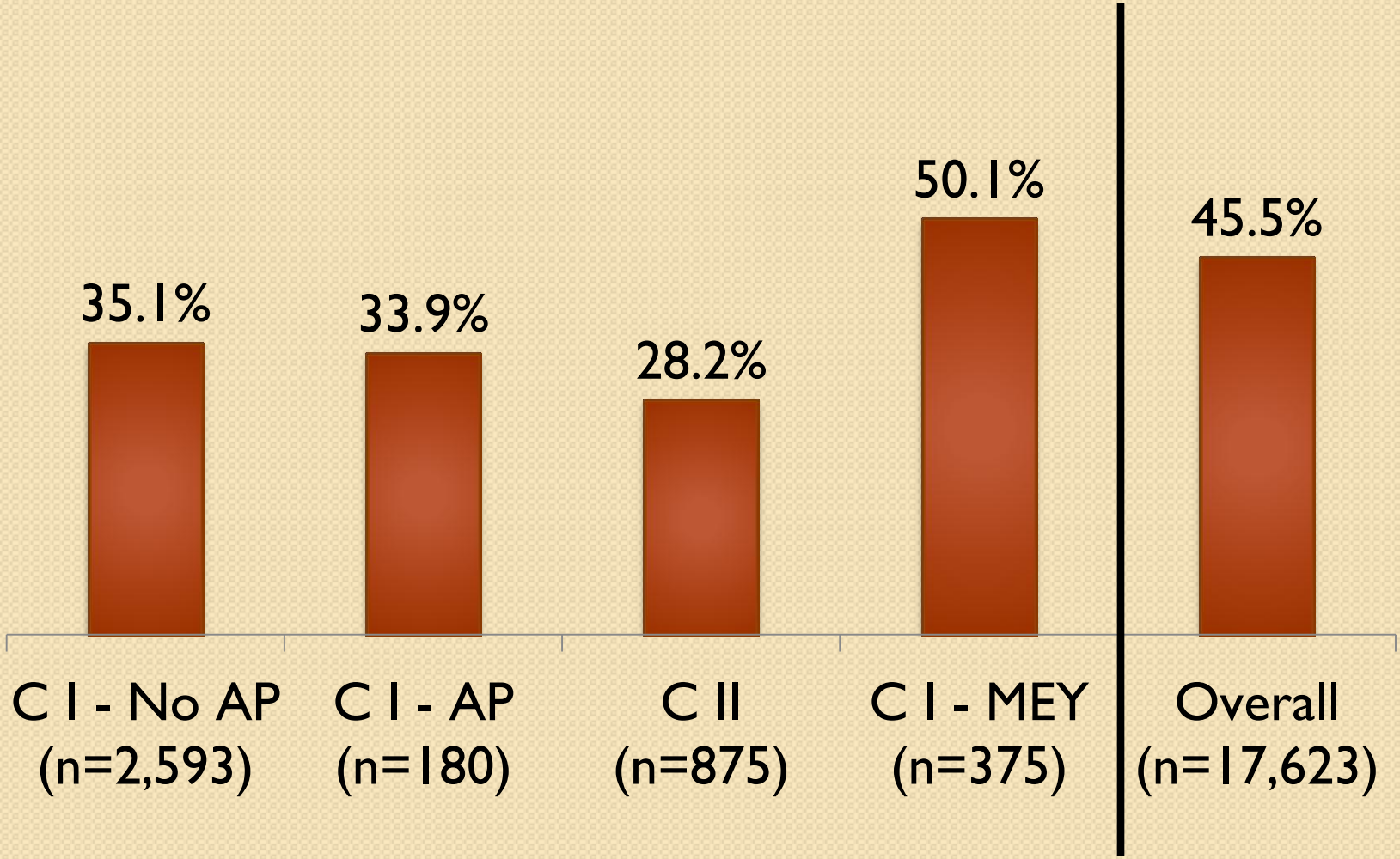
CALC II (n=875)

FALL 1995 TO FALL 2003 COHORTS ONLY

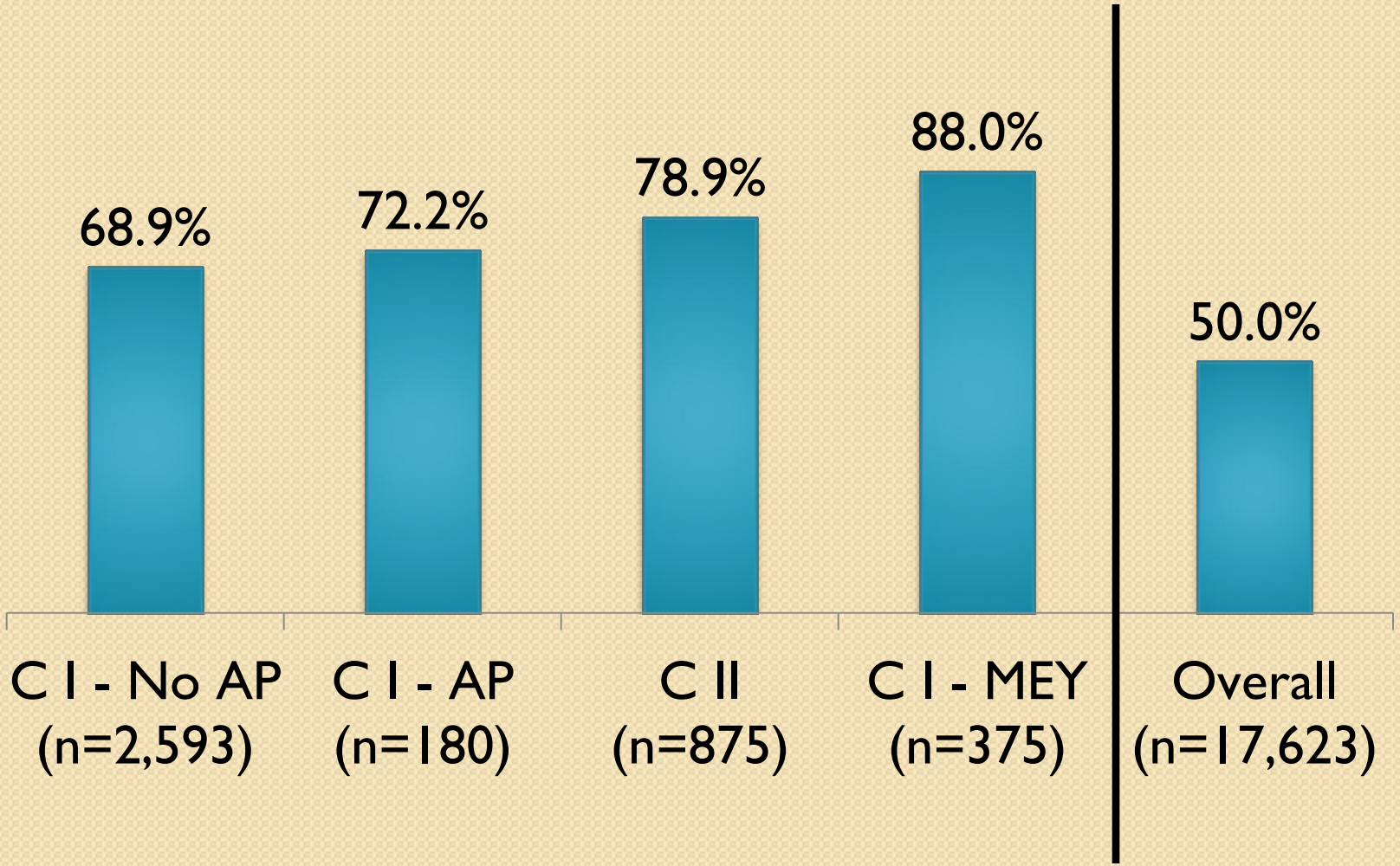
GRADUATION RATES



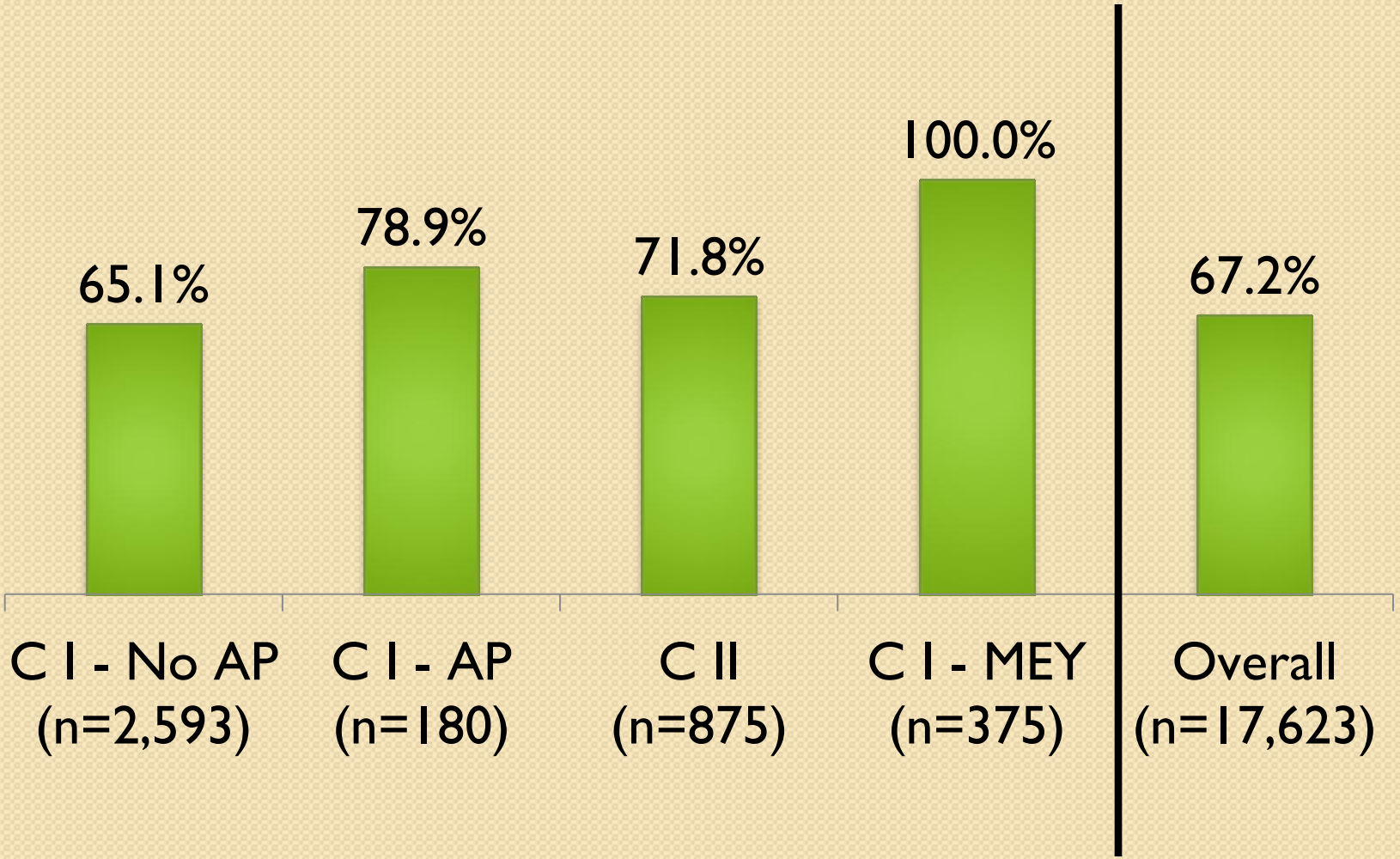
% Female


35.1%
33.9%
28.2%
50.1%
45.5%
C I - No AP (n=2,593)
C I - AP (n=180)
C II (n=875)
C I - MEY (n=375)
Overall (n=17,623)

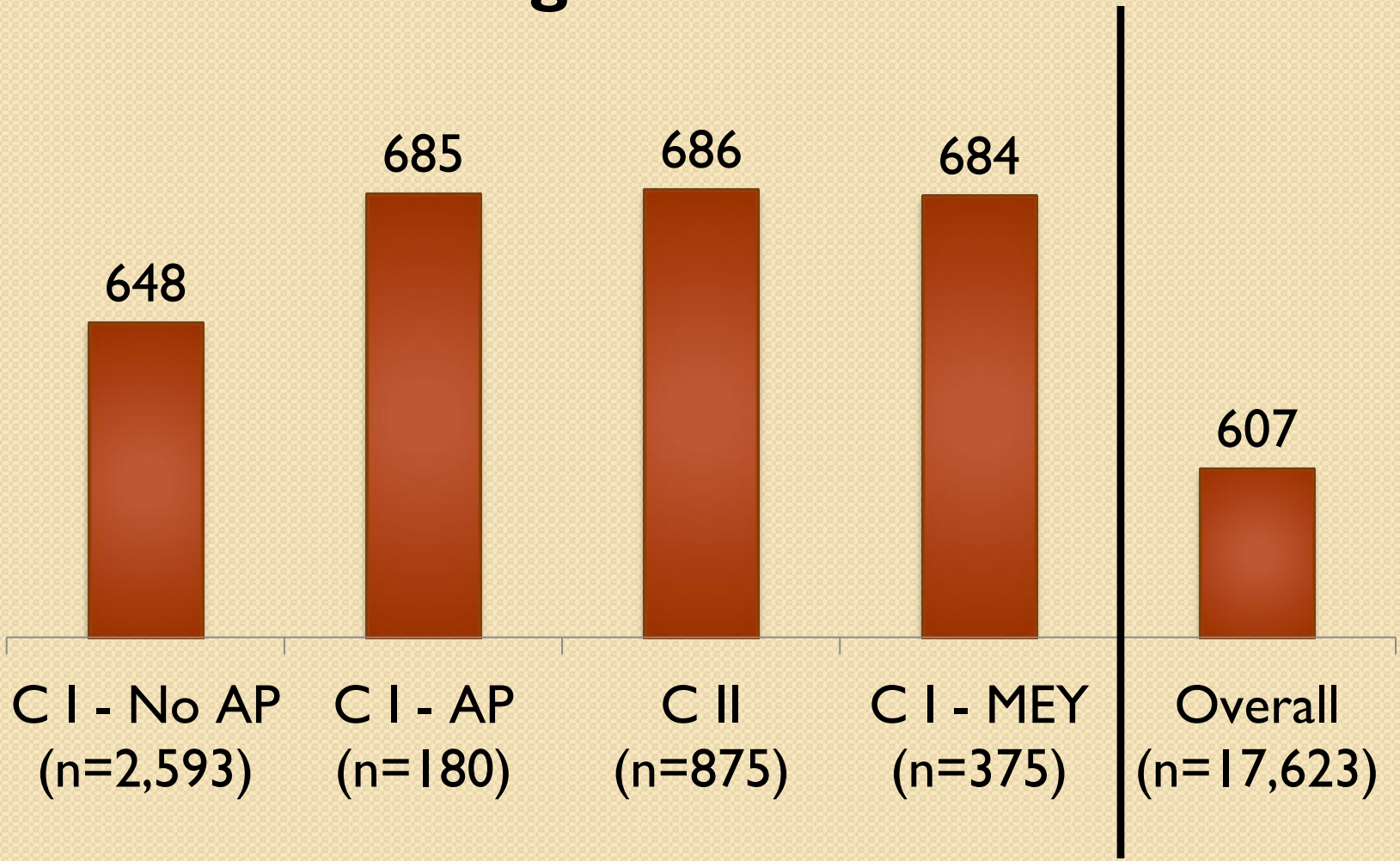
% STEM


68.9%
72.2%
78.9%
88.0%
50.0%
C I - No AP (n=2,593)
C I - AP (n=180)
C II (n=875)
C I - MEY (n=375)
Overall (n=17,623)

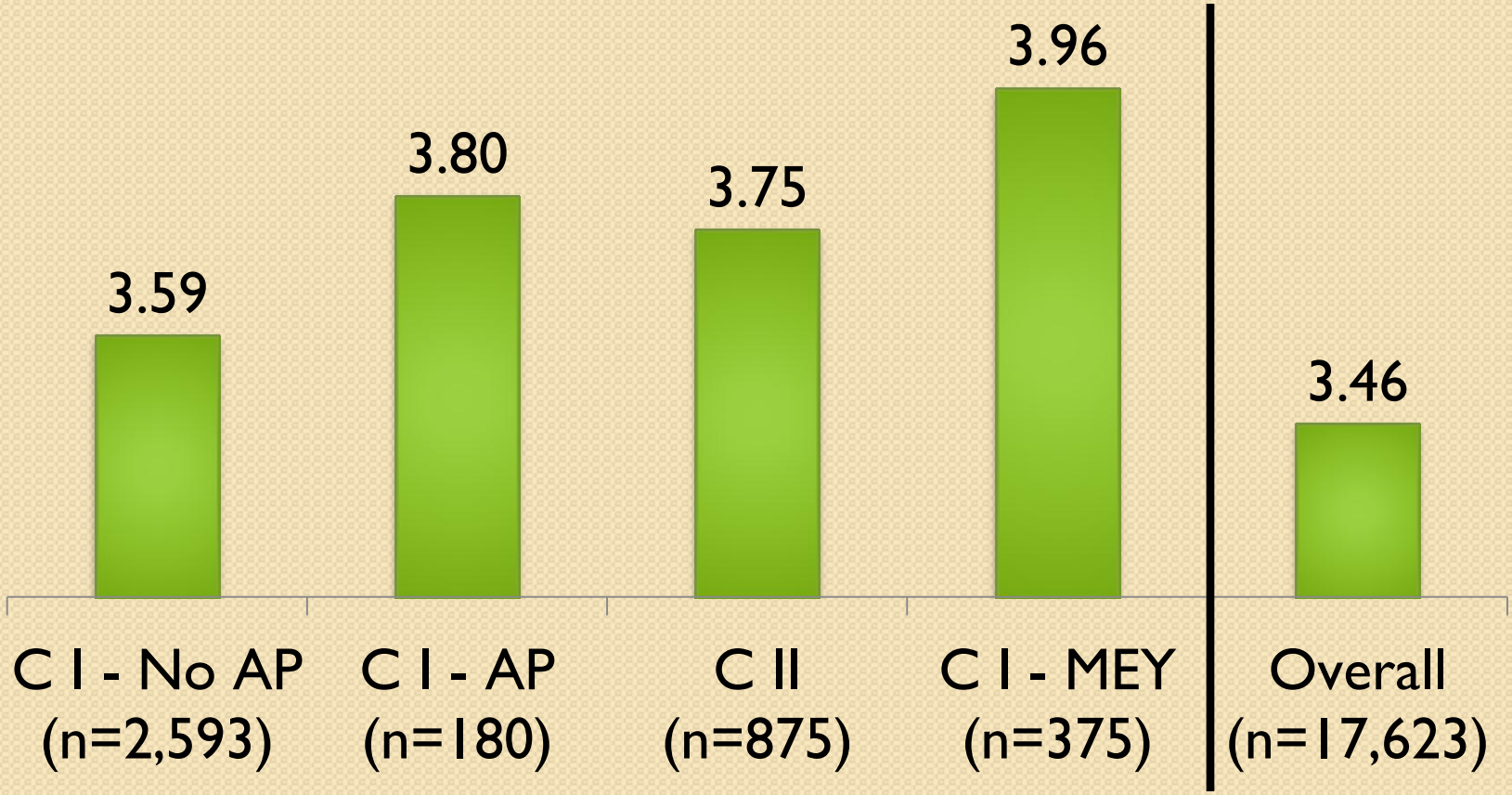
% in Residence Halls



Average MATH SAT

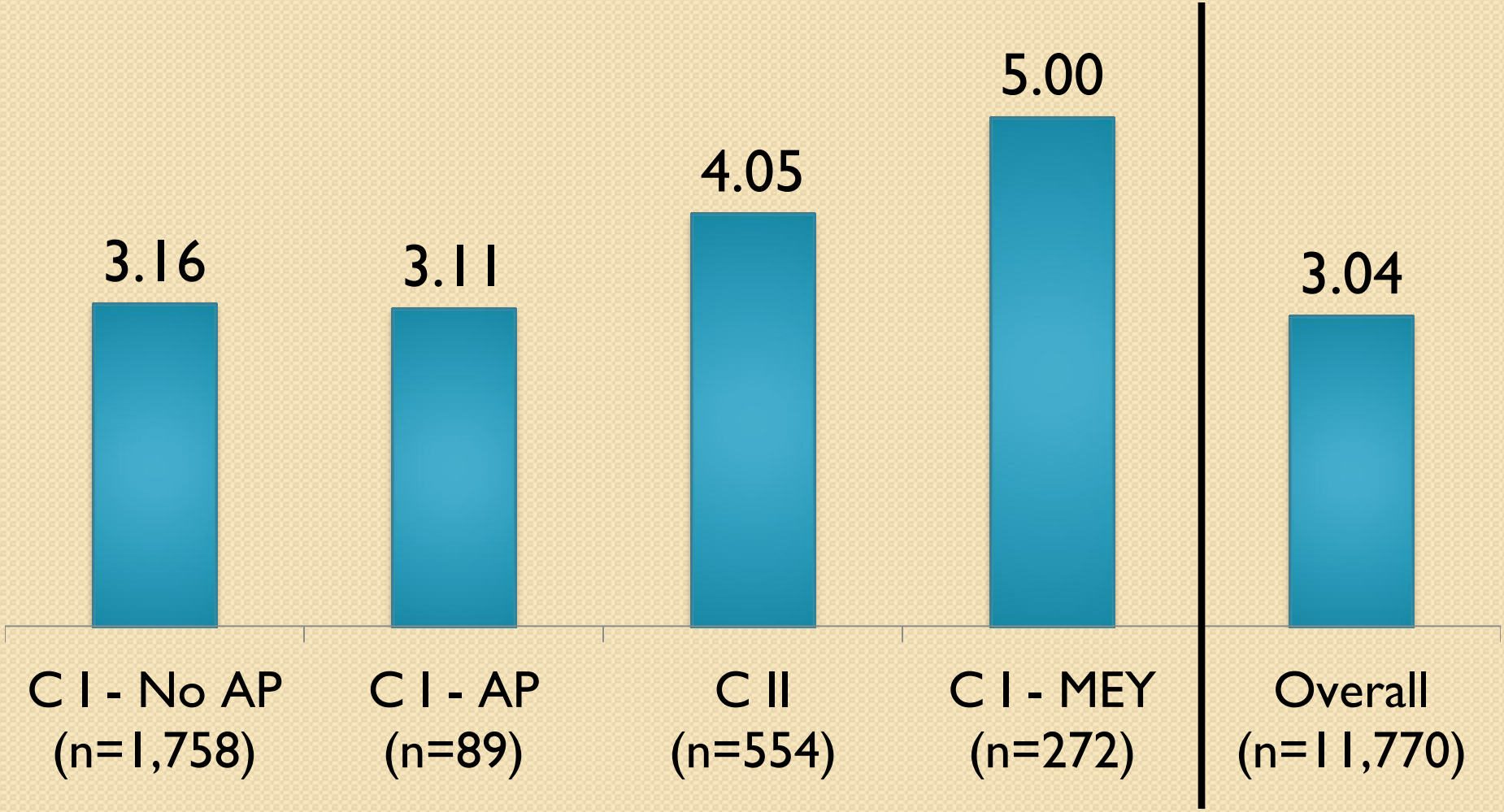


Average HS Grade Point Average

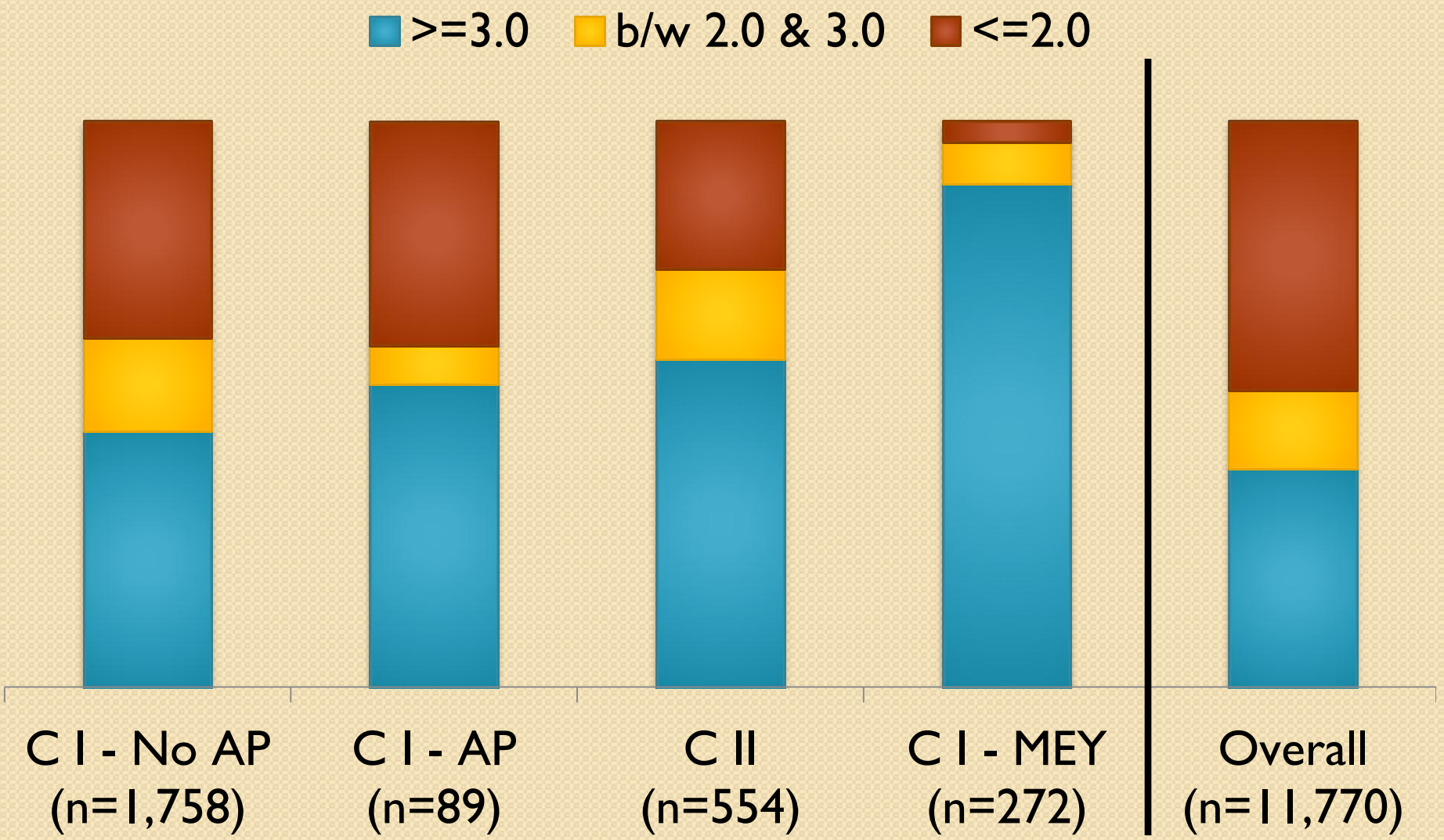


FALL 1995 TO FALL 2003 COHORTS ONLY

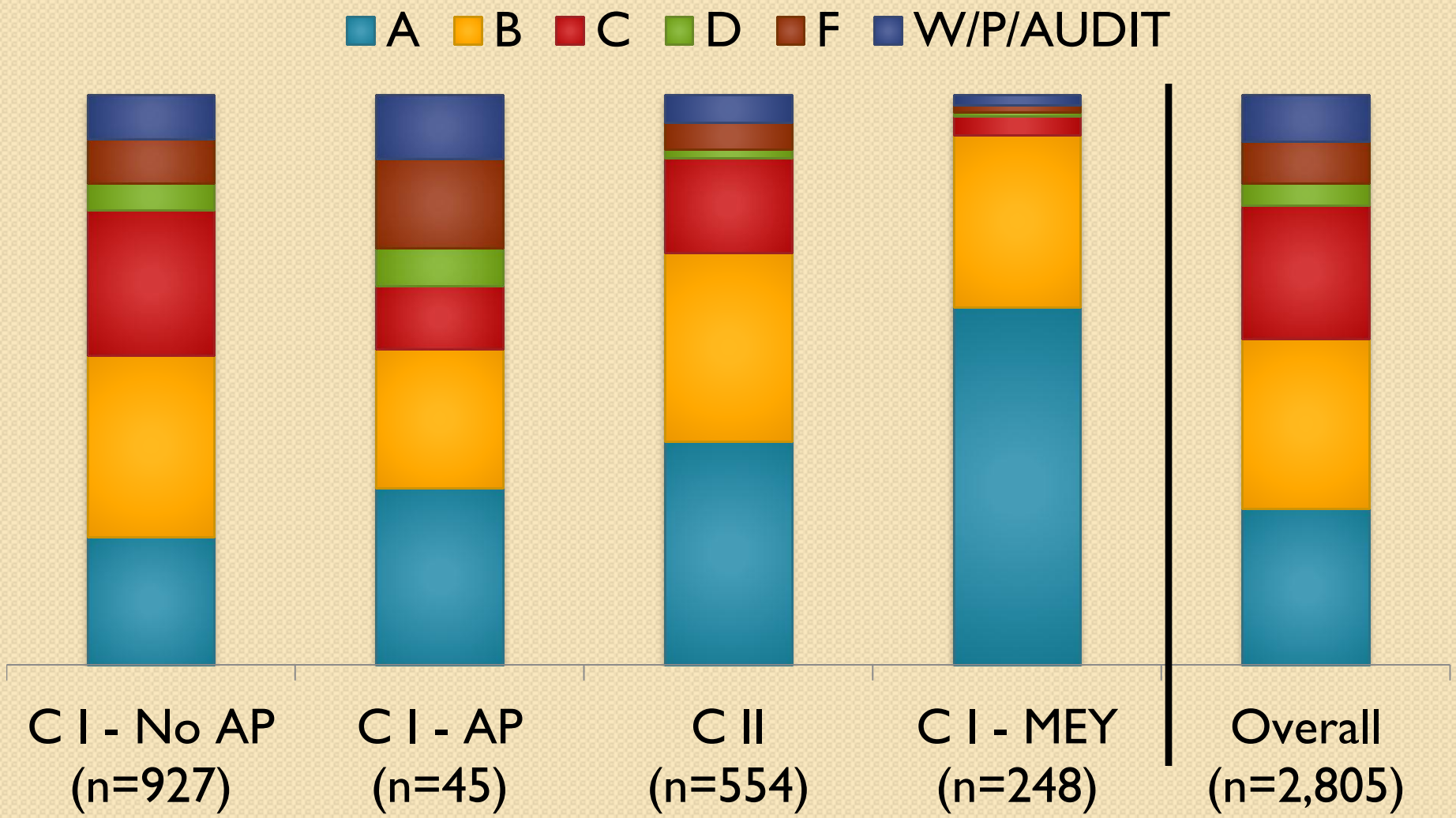
Average # Math Courses



FALL 1995 TO FALL 2003 COHORTS ONLY
MATH GPA

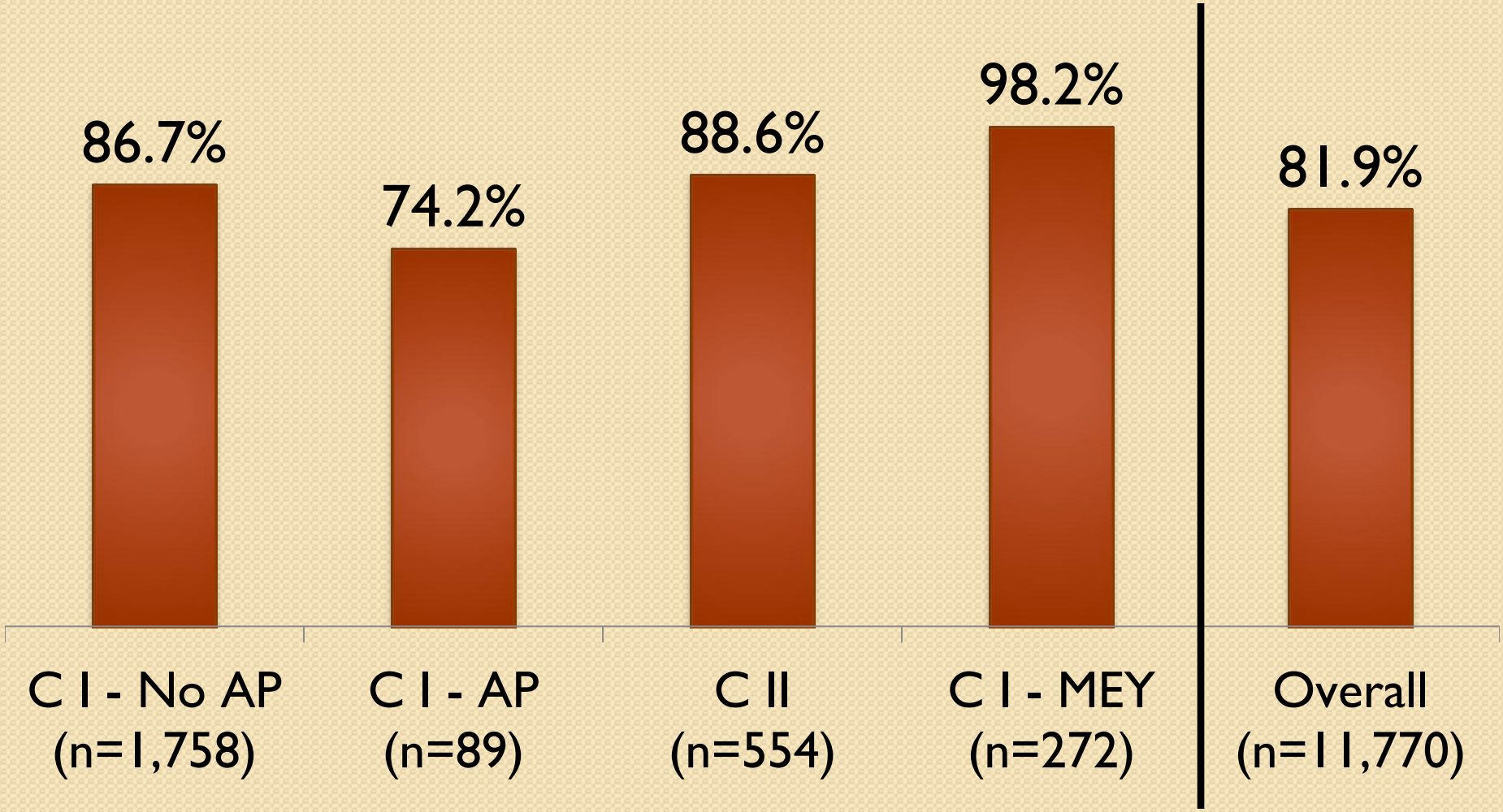


FALL 1995 TO FALL 2003 COHORTS ONLY
GRADE IN CALC II BY FIRST MATH COURSE



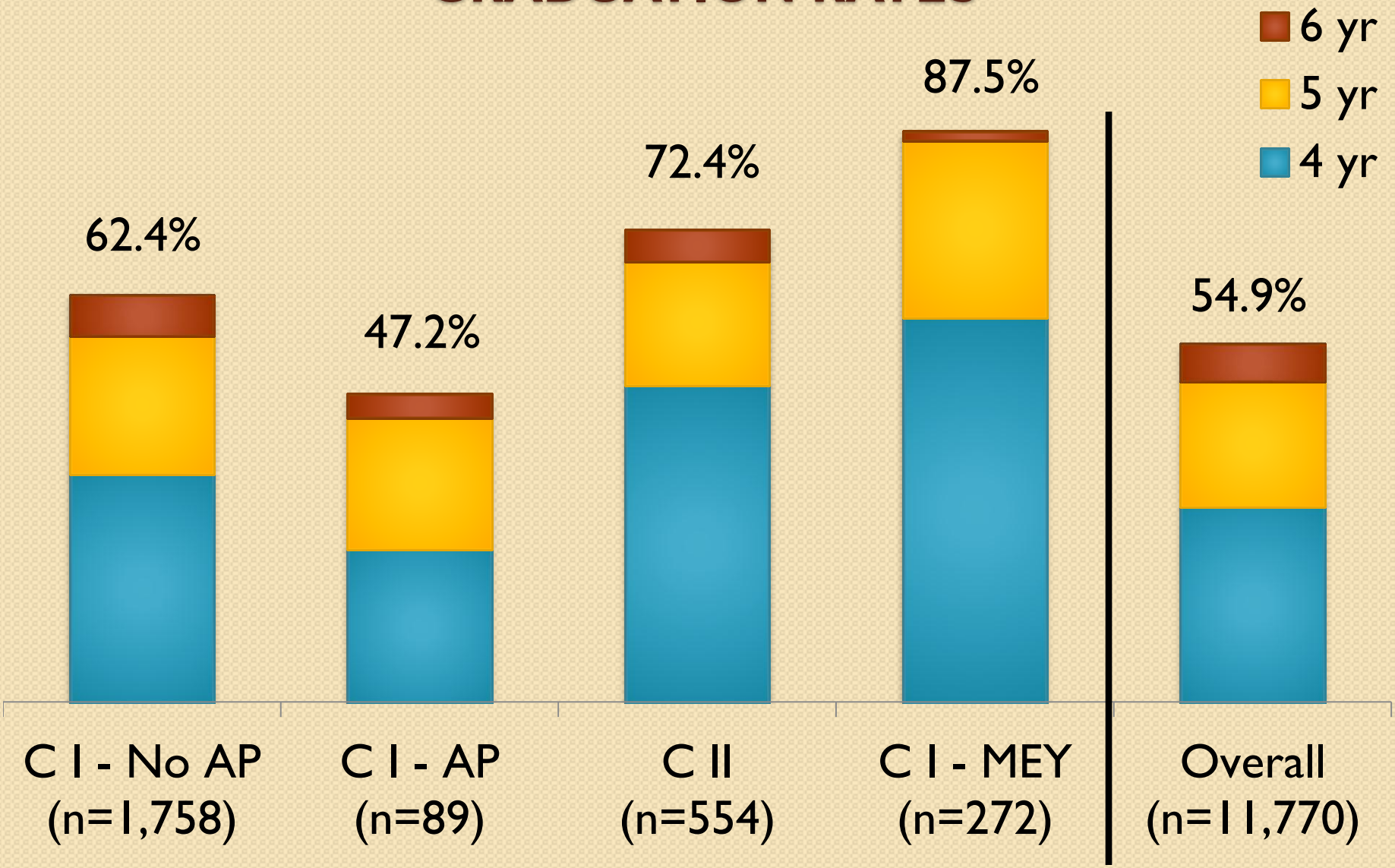
FALL 1995 TO FALL 2003 COHORTS ONLY

% Retained After One Year



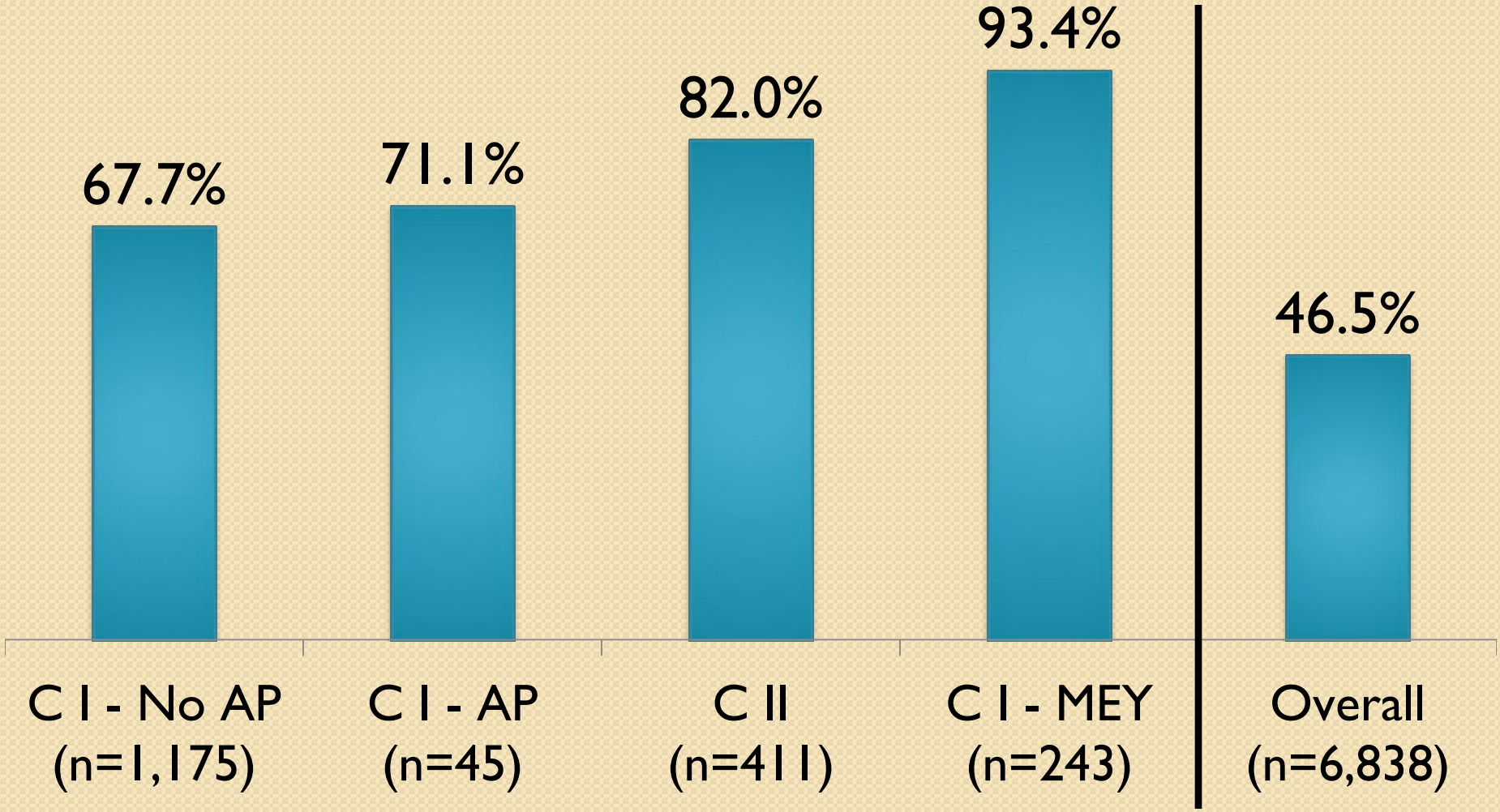
FALL 1995 TO FALL 2003 COHORTS ONLY

GRADUATION RATES



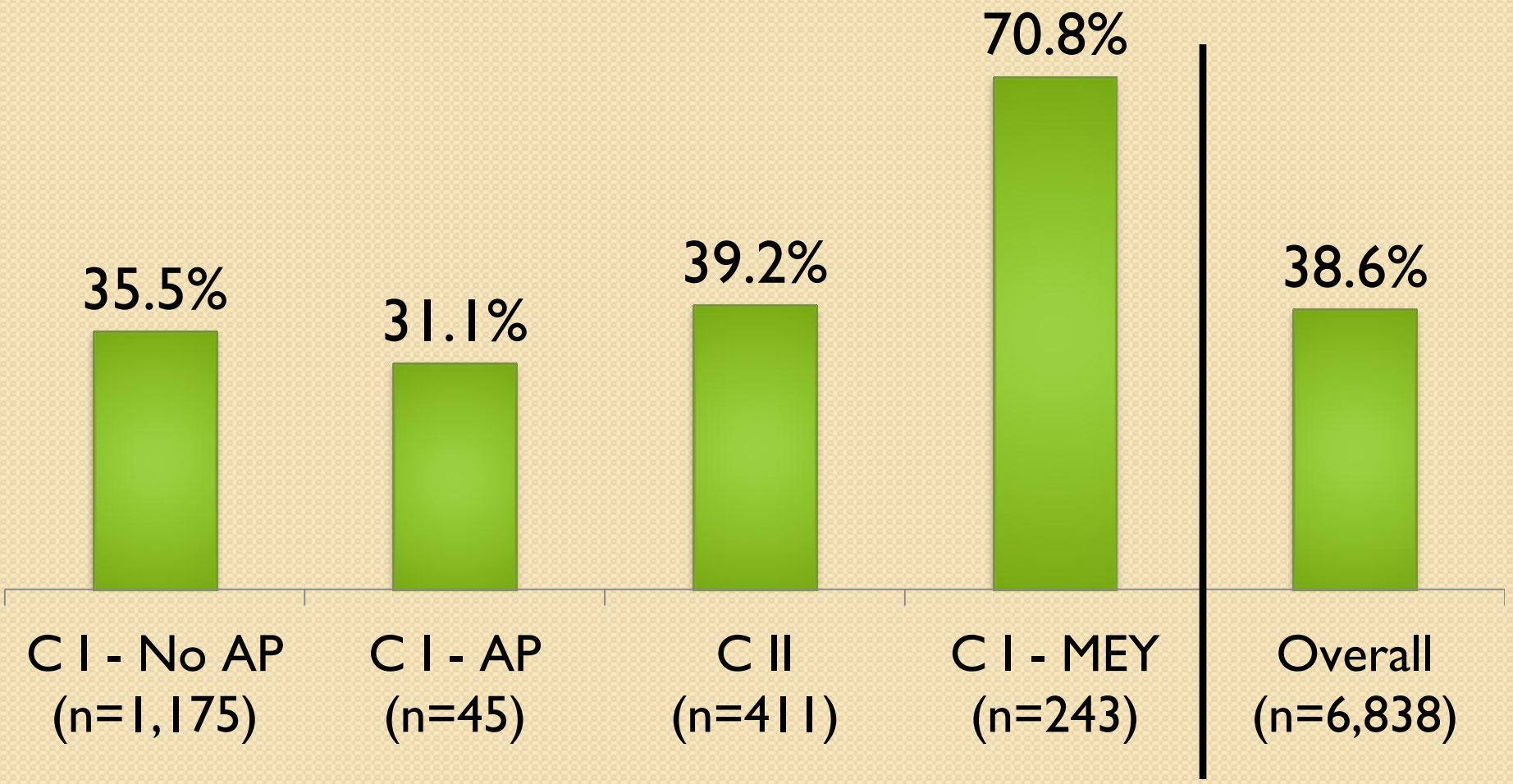
FALL 1995 TO FALL 2003 COHORTS ONLY

% of Bach Degrees in STEM Field



FALL 1995 TO FALL 2003 COHORTS ONLY

% Enrolling In School Again After Bachelor's Degree Attained per National Student Clearinghouse



The Truth…

Skipping Calc I doesn't appear to have negative **consequences**

What's up with the CALC I /AP group?

- 47.2% six-year graduation rate
  - 66.7% for females (n=30)
  - 37.3% for males (n=59)
    - 37 don't graduate w/in 6 years
    - 3 graduate after 6 years

34 Lost Students

Final GPA	N	# enroll elsewhere	Degrees earned
<=2.0	19	6	1 Bach, 1 AA
b/w 2.0 & 3.0	7	4	2 Bach, 1 AA
>=3.0	8	8	5 Bach, 1 Master's
Total	34	18	

- 50% (17) enrolled for one year or less
  - 10 left with a cumulative gpa <=2.0
  - 5 left with a cumulative gpa >=3.0

Next Steps…

- Further investigate low graduation rate for Calc I /AP group

- Transfer students