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Using program-level completion metrics to support inclusive postgraduate cultures

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Discipline-specific postgraduate degree completion is important but difficult to determine across programs

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Discipline-specific postgraduate degree completion is important but difficult to determine across programs

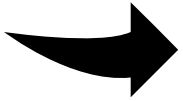
- Existing data is limited
- Data is often aggregated, which can hide trends between groups of students
- Tracking individual students is resource-intensive when done at scale.

We can estimate these efficiently with commonly-collected data.

What information we need

Degrees awarded (US Integrated Postsecondary Education Data System)

Total number of students (US Survey of Graduate Students and Postdoctorates in Science and Engineering)



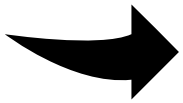
Number of new students (US Survey of Graduate Students and Postdoctorates in Science and Engineering)

Data in today's talk: N = 173 universities

Annual retention rate


total students last year

\+


new students this year

\-


students awarded degrees last year

\-


students who left the program without a degree

=


total students this year

Annual retention rate

total students last year + new students this year - students awarded degrees last year - total students this year = students who left the program without a degree

Retention rate: $1 - \frac{\text{students who left the program without a degree}}{\text{total students last year}}$

Bridges et al. 2024

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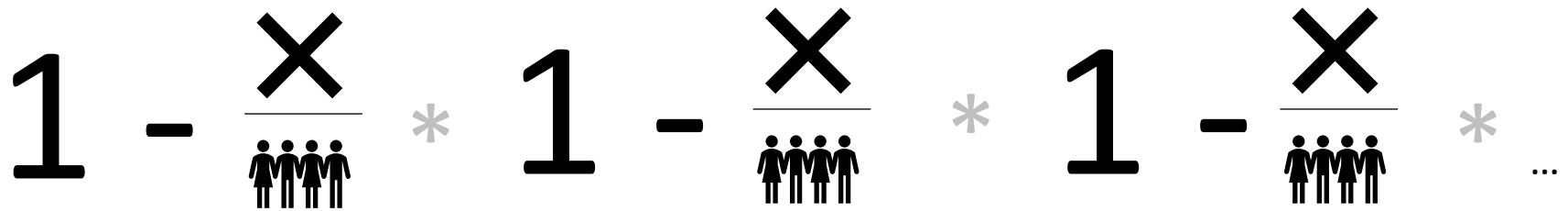
Completion rate

Multiply *N* retention rates together to get the program completion rate, where *N* is the typical program length

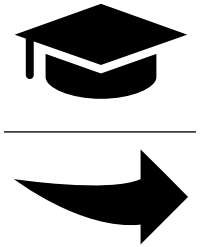


For Physics PhDs* in US, *N*~6 years

*Physics PhDs include ~2 years master + 4 years of research

AIP Physics Trends, 2025

PhD Completion Rate

PhD Completion Rate: 

Degrees award *N* years later*

New students this year*

* average numbers over +/- 1 year for better results

Bridges et al. 2024

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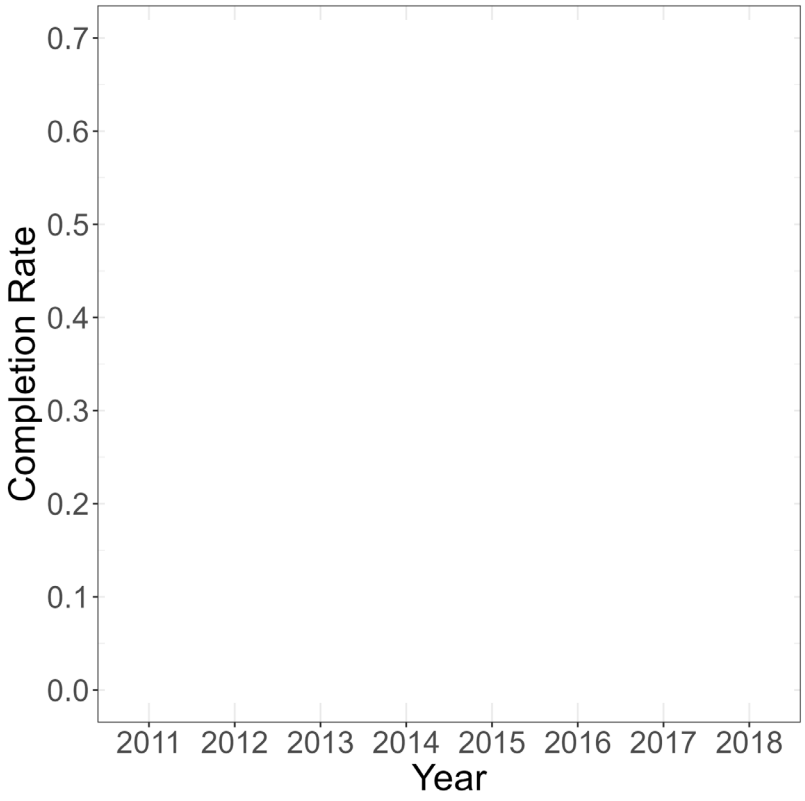
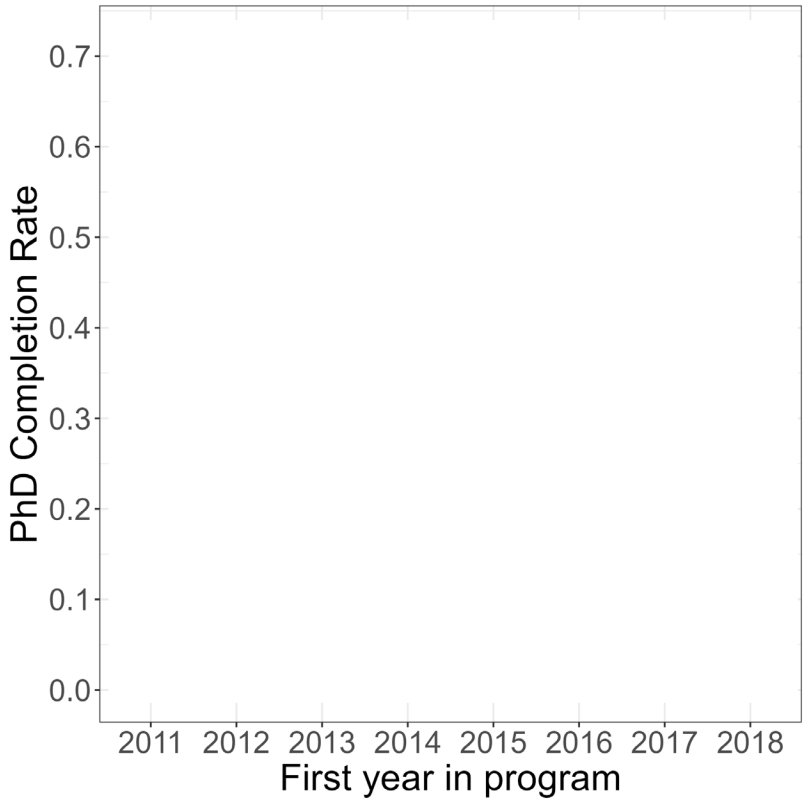
Estimated completion rates in physics





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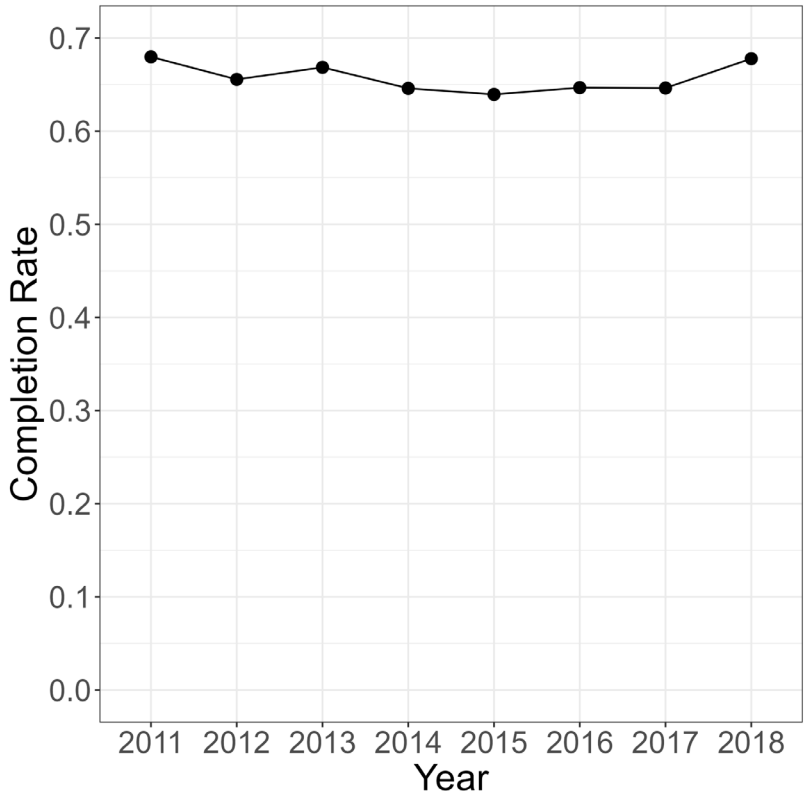
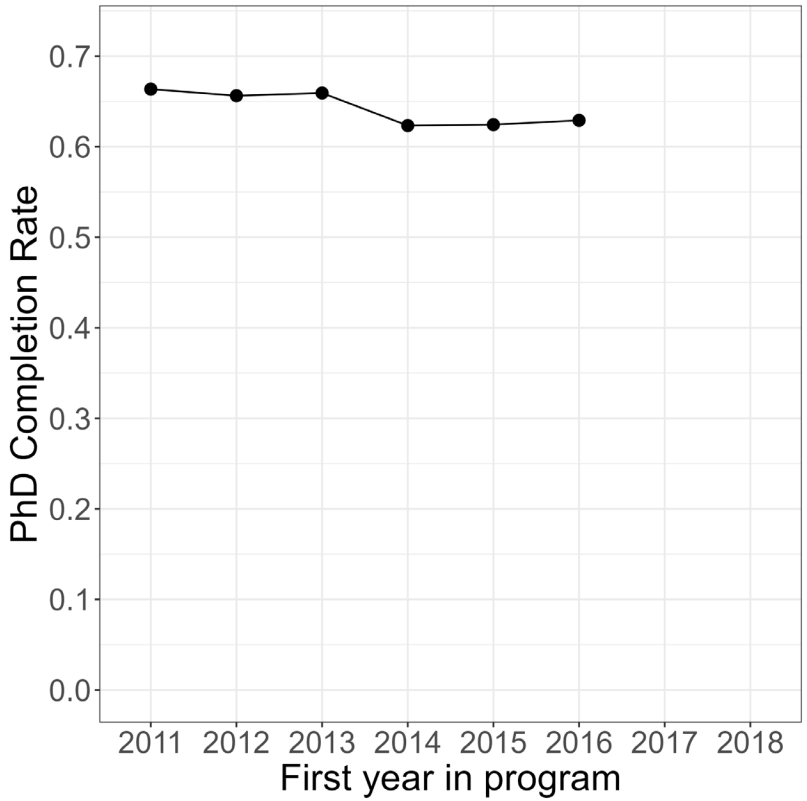
Estimated completion rates in physics are around 65% and largely constant





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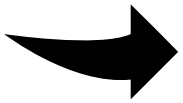
Strength of approach: we can investigate specific groups

For each group, we need:

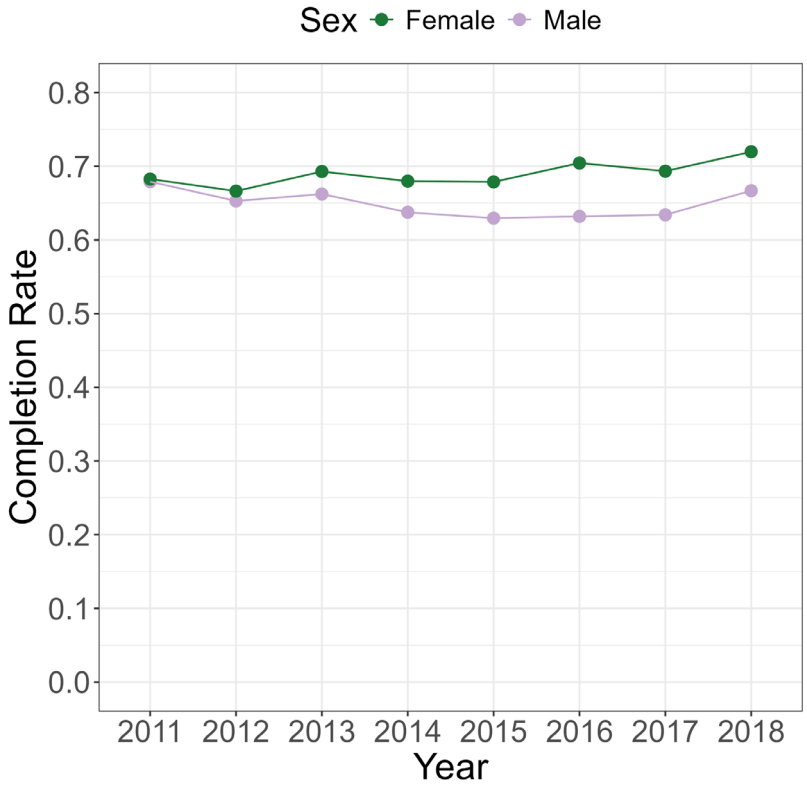
Degrees awarded

Total number of students



Number of new students

Female students have a slightly higher completion rate than male students and it largely increases over time



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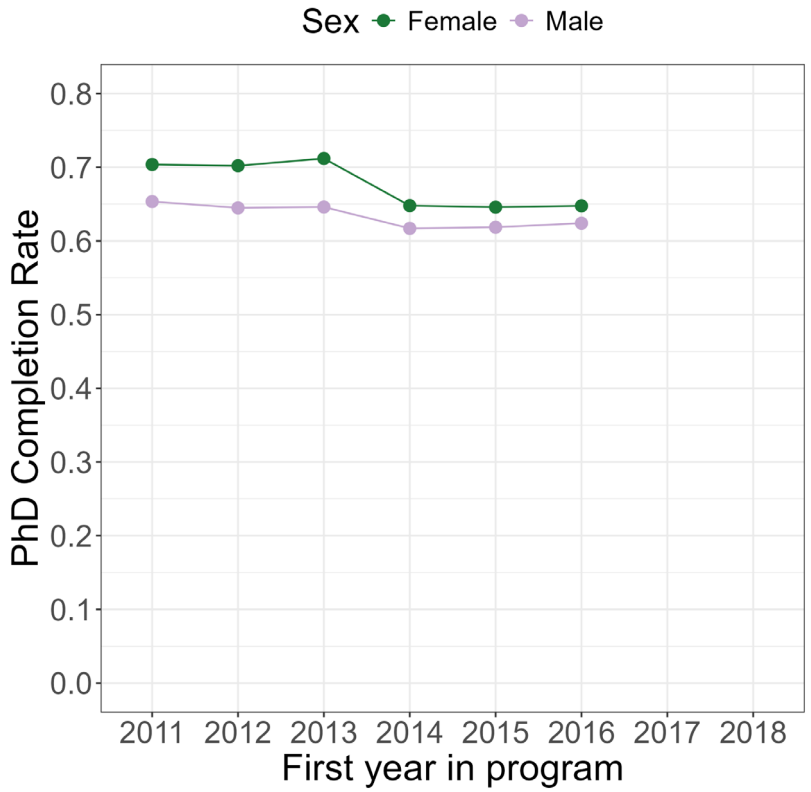
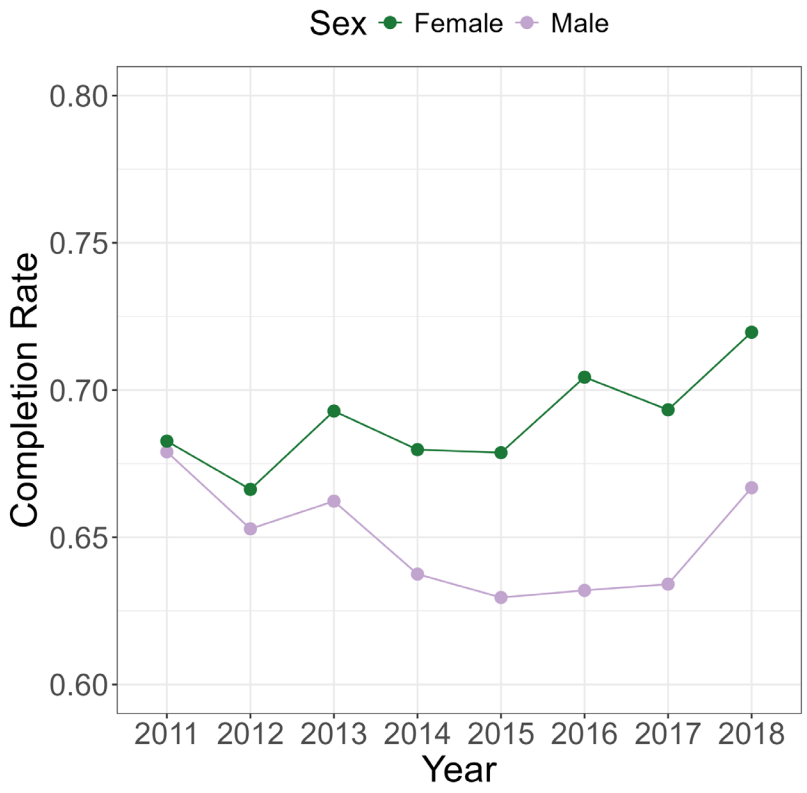
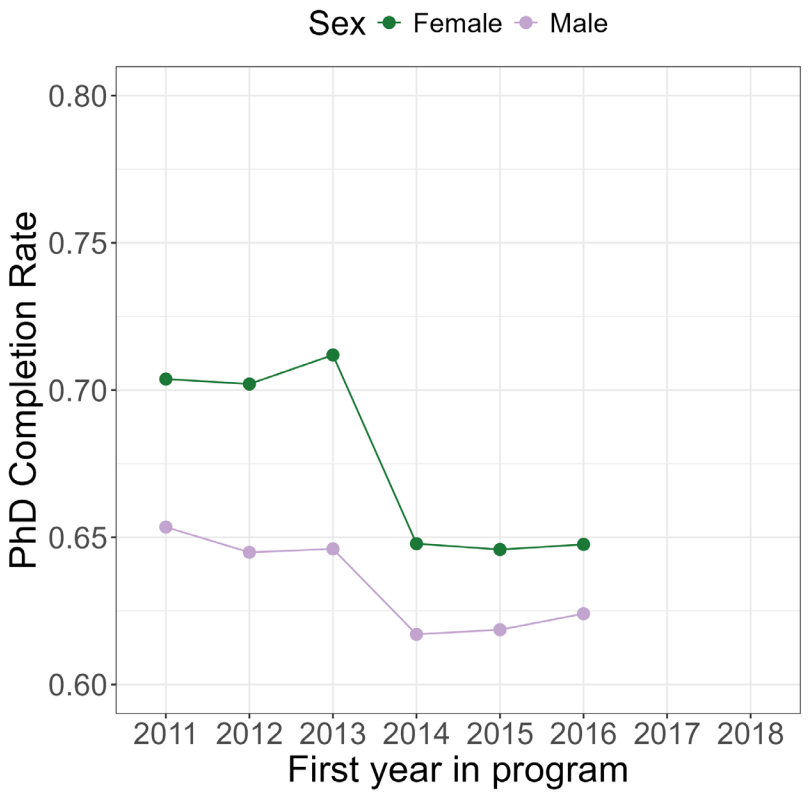
Female students have a slightly higher PhD completion rate than male students but that rate decreases over time



Zooming in: similar but different conclusions





What's next: specific groups of students

- race/ethnicity
- sex x race/ethnicity

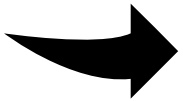
Longer term: connect completion rates to program practices

- Groupings can also be by program
- Identify programs with higher completion rates and lower completion rates
- Compare program practices to identify potential high-impact ones for PhD completion

Takeaway: With three simple numbers, you too can determine degree completion

Degrees awarded

Total number of students



Number of new students

Takeaway: With three simple numbers (🎓👥➡), you too can determine degree completion

But there are some caveats:

- data required over many years
- careful consideration of which data to include

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