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A quantitative analysis of Chinese student success: Statistically examining the past to plan for the future

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University of Manitoba
Nottingham, England, April 20, 2013

An assessment of the Academic English Language Program for University and College Entrance (AEPUCE)

1. Background (University of Manitoba and the English language program)
2. Study objectives
3. Statistical Methods and Data
 - Chinese (A and IN)
 - L5 UM
4. Results
 - Statistical analysis of Graduation (A vs. IN) and GPA
5. Discussion



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- Founded in 1877
- Research intensive (U15), medical doctoral university
- 29,181 students including 4,185 graduate students
- 11.2% international students from over 100 countries



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ENGLISH LANGUAGE CENTRE

- Intensive Academic English Program
- Part-time courses for students in degree study
- **CanTEST**© (Canadian Test of English for Scholars and Trainees)
- **SpeakEASY** – Speech tutorials for professors
- Homestay Program



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INTENSIVE ACADEMIC ENGLISH PROGRAM

- Five levels
- Averaging 220-260 students per term
- 24 hours per week for 14 weeks of instruction
- Program starts September, January, and May
- 40 to 50% of students are in Level 5
- 25 to 30% of students are in Level 4



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AEPUCE LEVEL 5

- AEPUCE - Academic English Program for University and College Entrance
- Meets the language requirement for Universities of Manitoba and Winnipeg, and Red River College
 - **taught at all three institutions**
- Has a class size limit of 12
- Successful completion is determined by 65% in course work and tests in each of the four skill areas taught separately
- Has a successful completion rate of 90%



STUDY OBJECTIVES

- To assess differences in “academic performance” between Chinese students who were enrolled in the **AEPUCE level 5 program (A)** and those that were not **(IN)**
 - “**Academic performance**” defined as:
 - i. The odds of completing a degree program within three, four, five or six years
 - ii. GPA averaged over completed study period
GPA = Grade Point Average,
scores range from 0 to 4.5



STATISTICAL METHODS

1. **Survival analysis** was used to statistically assess the proportion of A and IN students who completed a degree program as a function of time (≤ 6 years)
 - Determine statistical significance ($p \leq 0.05$)



STATISTICAL METHODS

- **Survival analysis (definition):** Statistical method used to examine “**mortality**” as a time-dependent function.
- Time 1, all individuals are present
- At each time step the cumulative number that “leave” is reported
 - Those remaining are called “**survivors**”
- This method has commonly been applied to medical or ecological data
- APPLICATION AS A TOOL TO EXAMINE ACADEMIC PERFORMANCE IS **NOVEL!**



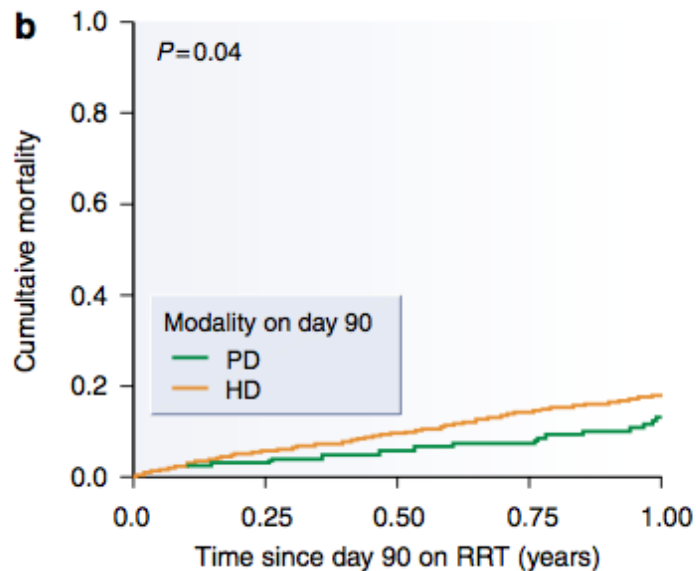
STATISTICAL METHODS

- Modification for academic student data:
 - i. **Mortality** = *number of students that have completed a degree program or have dropped out*
 - ii. **Survivors** = *those that have not left (over the stated study period)*



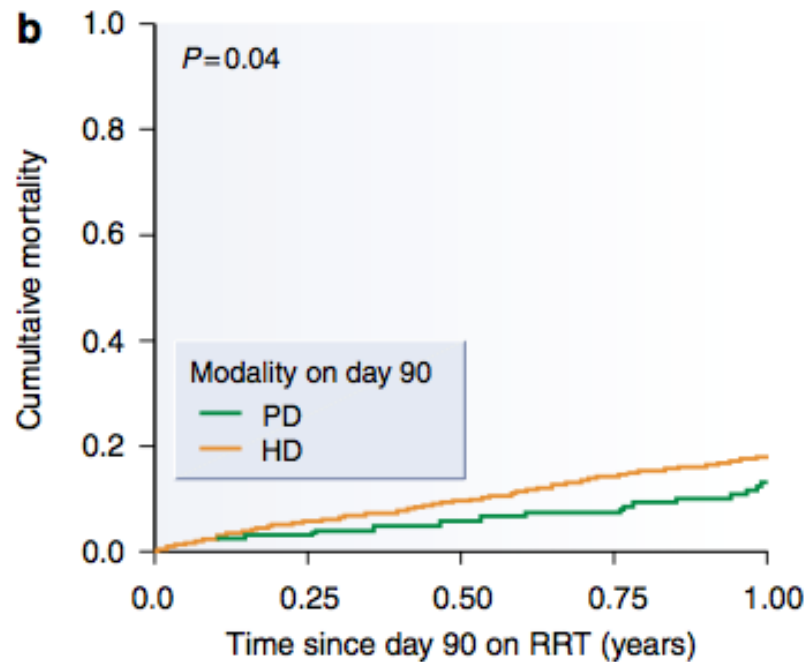
STATISTICAL METHODS

- Graph “mortality versus time”:
 - At time 1, all individuals present (0% “mortality”)
 - At time n , the number of individuals who have left will be greater than zero
 - Multiple statistical comparisons possible



STATISTICAL METHODS

- In this study the number who have left will be identified as the proportion of students who have successfully completed a degree (at a given year)

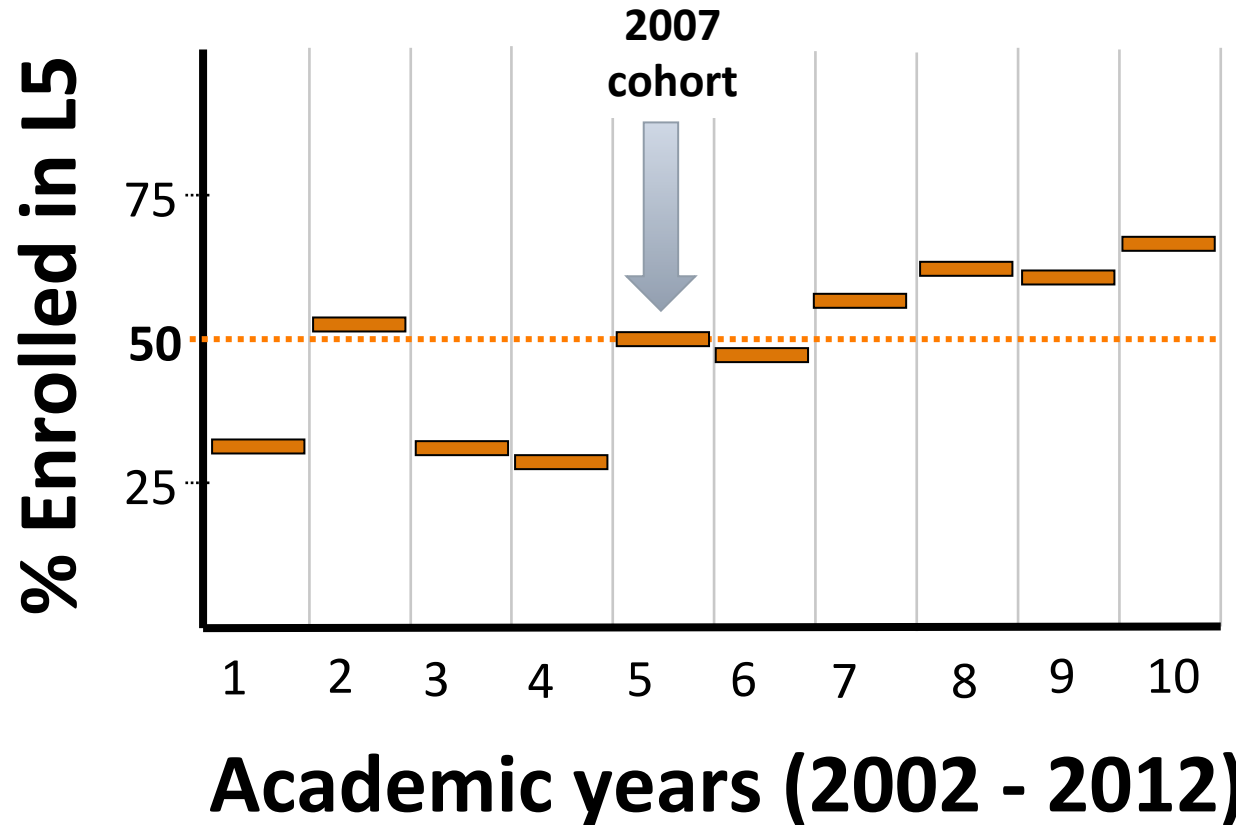


STATISTICAL METHODS

- **Assumptions:**
 - 1) Single cohort (individuals from time 1 should be similar)
 - 2) Groups created using the cohort must be approximately of equal size (50:50 ratio)
- *Thus we needed to select a single cohort (defined by admission year) that had nearly 50% A (AEPUCE) students and IN (non-AEPUCE) students*



PERCENT OF CHINESE STUDENTS ADMITTED TO AEPUCE – L5

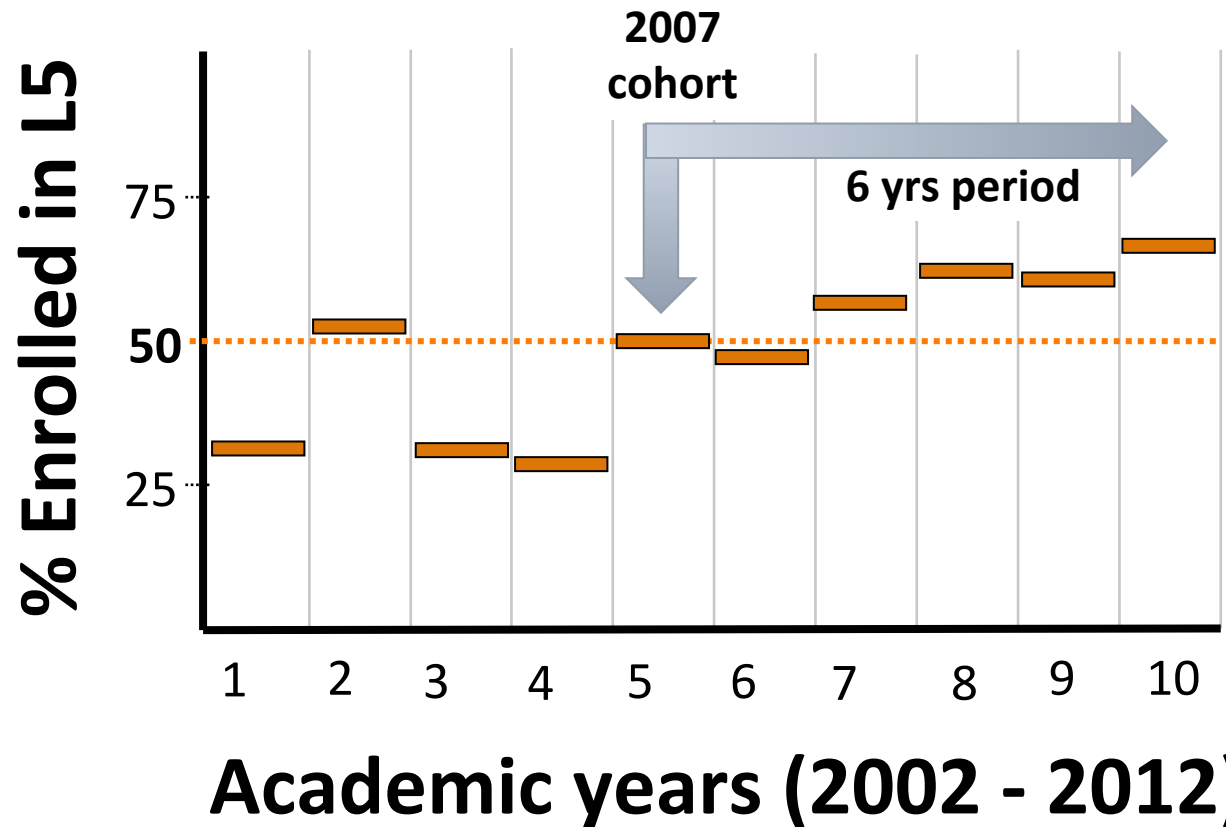


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PERCENT OF CHINESE STUDENTS ADMITTED TO THE AEPUCE – L5



WHAT ARE THE TRENDS IN THE 2007 COHORT DATA

1. How many have completed a degree?
2. Is there a difference between those who were enrolled in the AEPUCE program (i.e., the “A”students)?



RESULTS

2007 cohort ($n = 204$)



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RESULTS

2007 cohort ($n = 204$)

A
 $n = 103$

IN
 $n = 101$



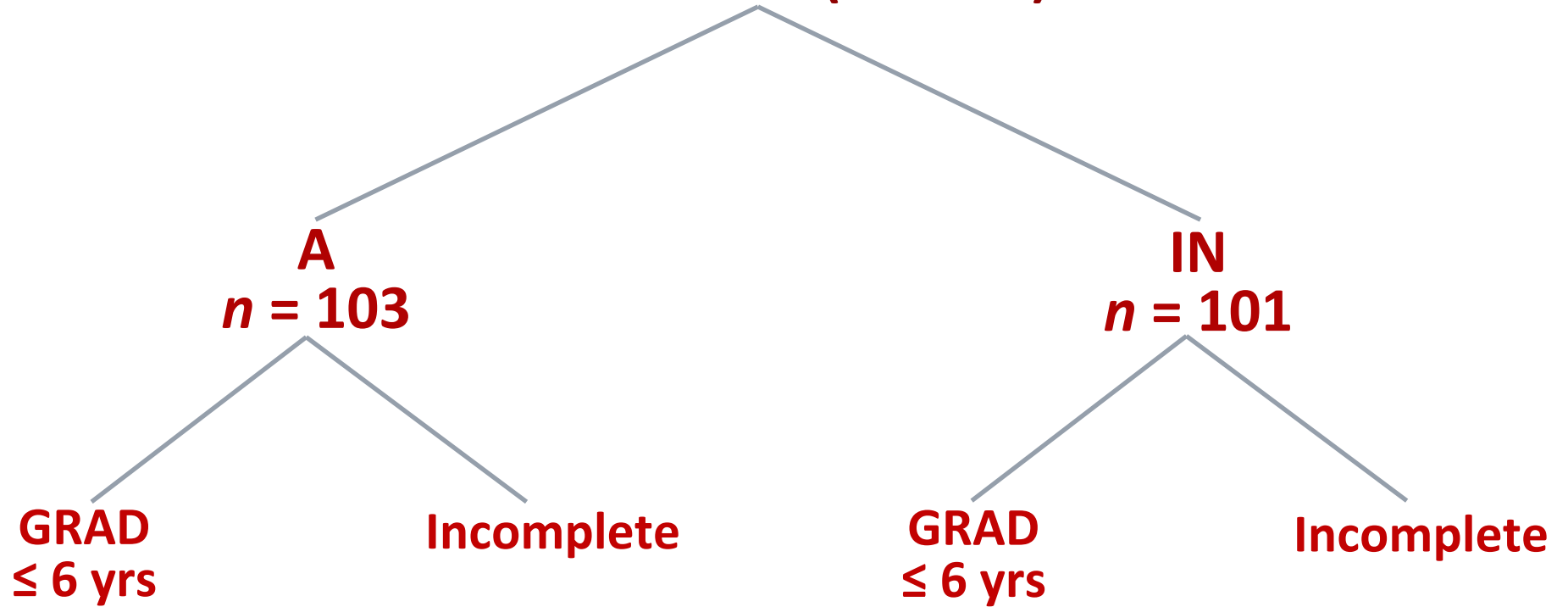
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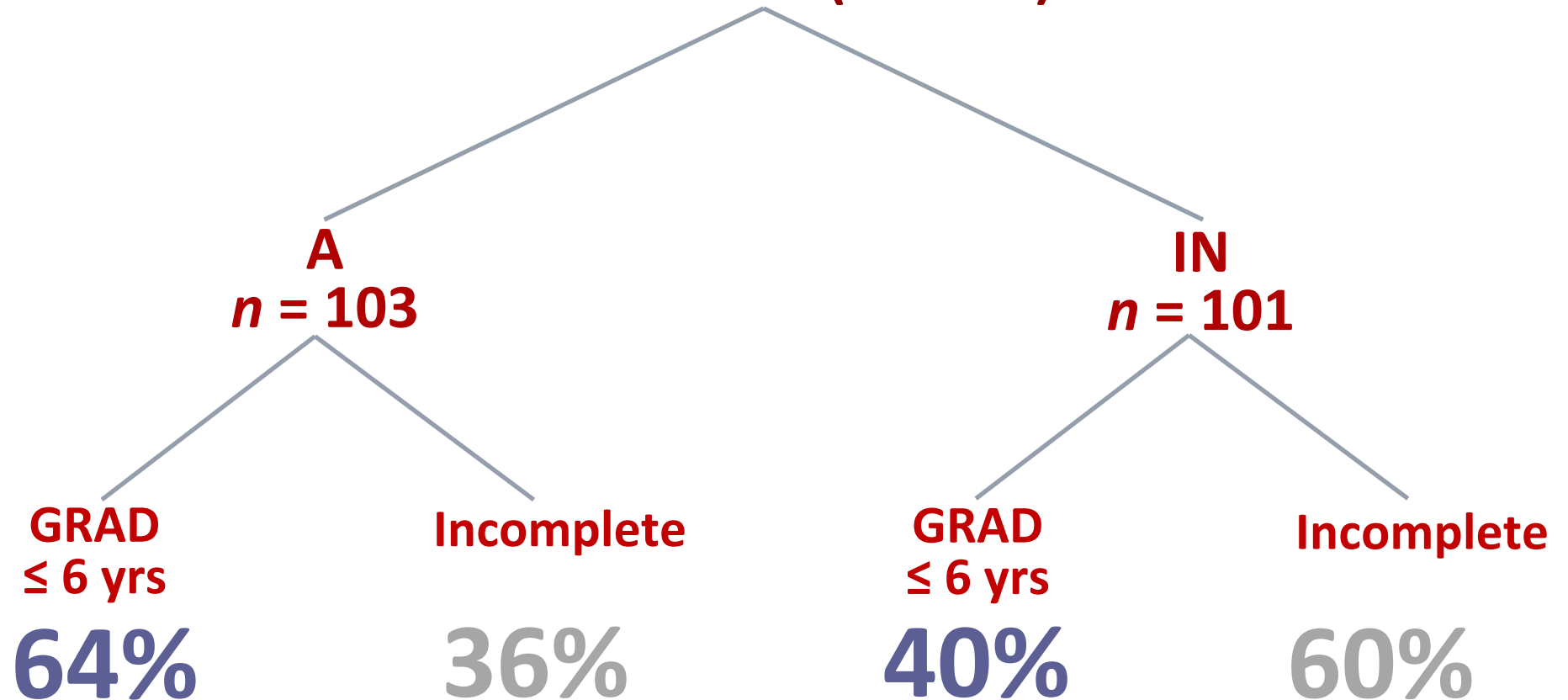
RESULTS

2007 cohort ($n = 204$)



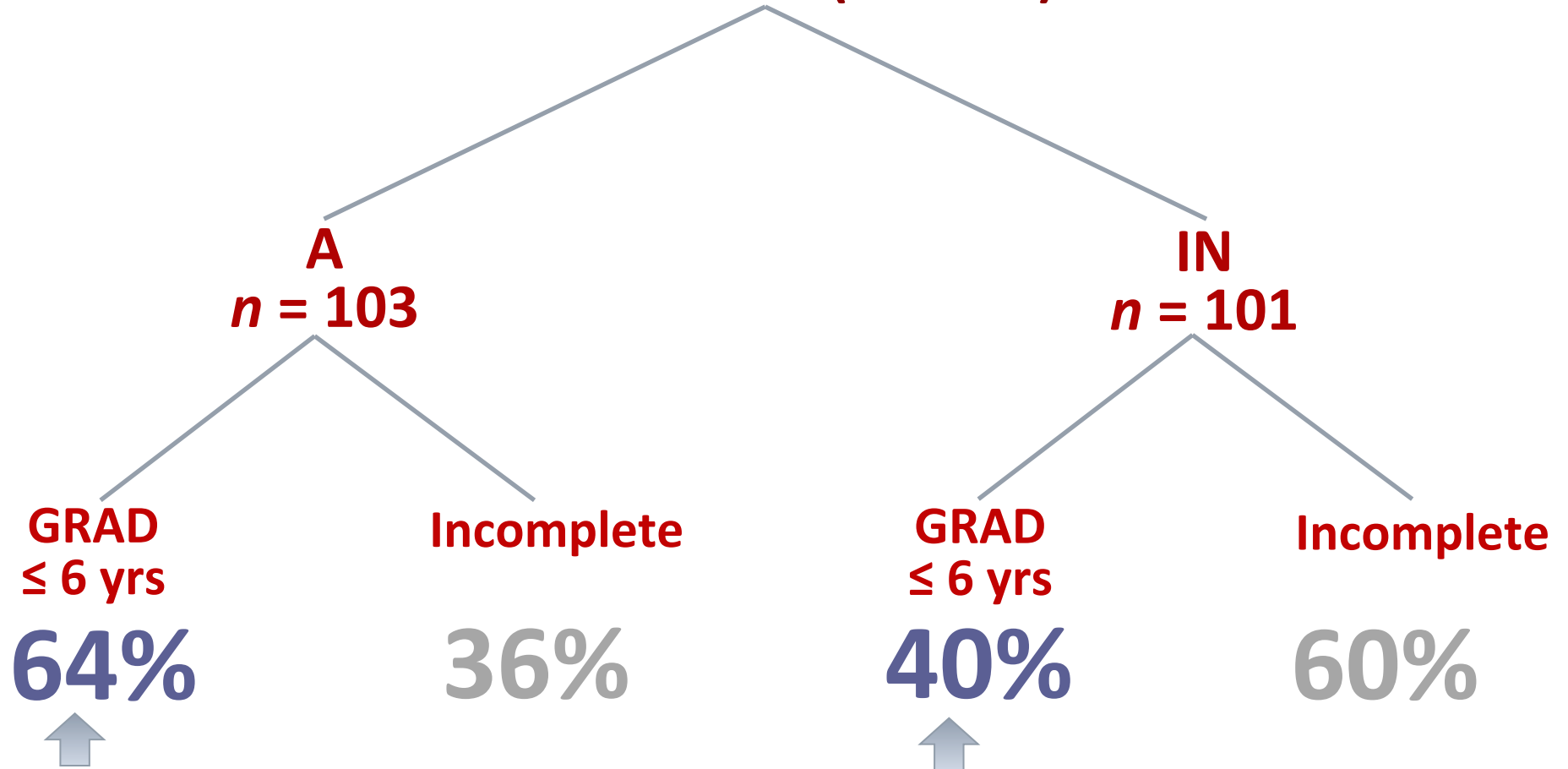
RESULTS

2007 cohort ($n = 204$)



RESULTS

2007 cohort ($n = 204$)



DEGREE COMPLETION (2007 COHORT)

“Survival analysis”

Is there a difference in the rate of
graduation ?

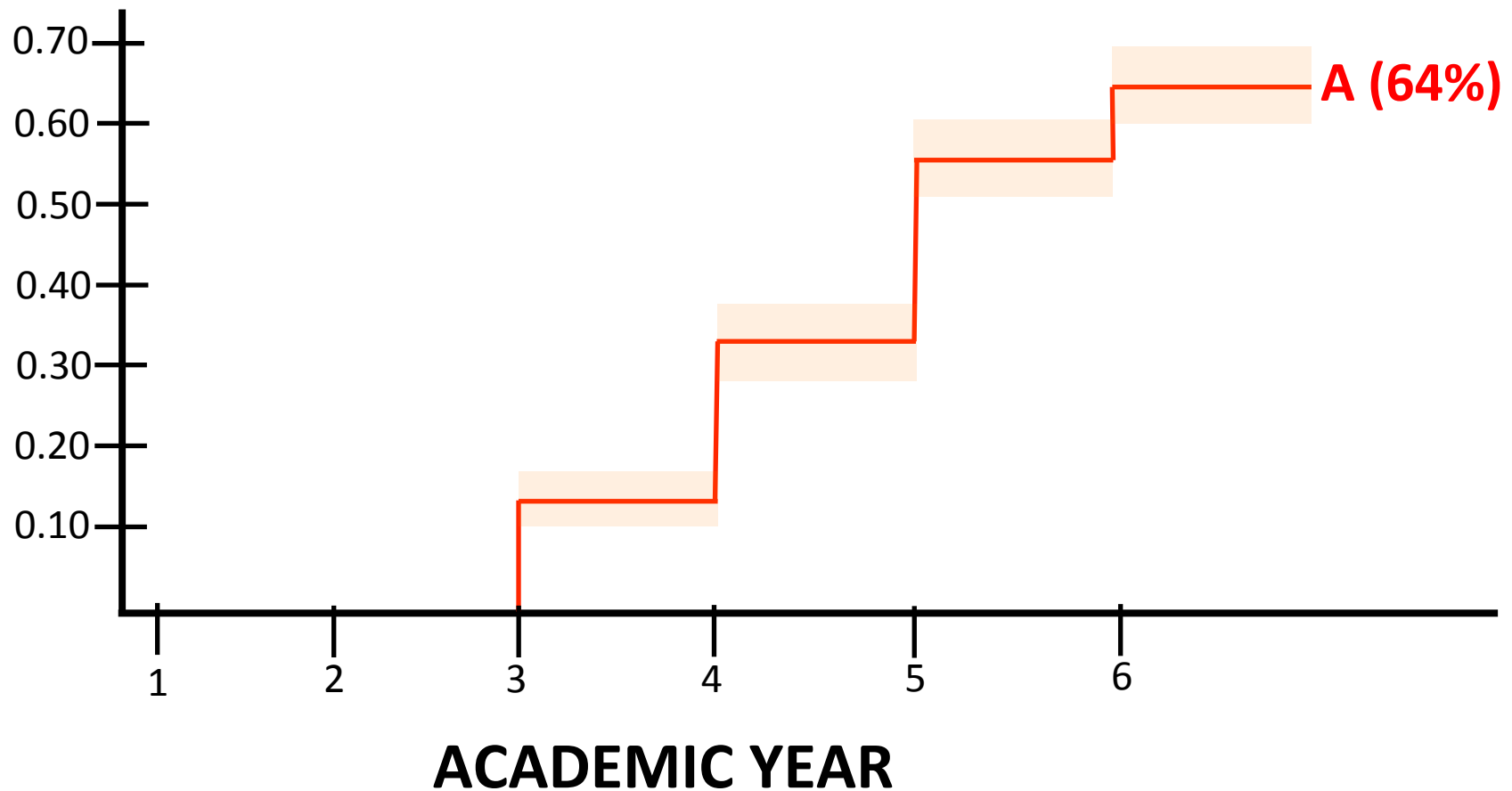


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PROPORTION THAT COMPLETED A DEGREE (2007 COHORT)

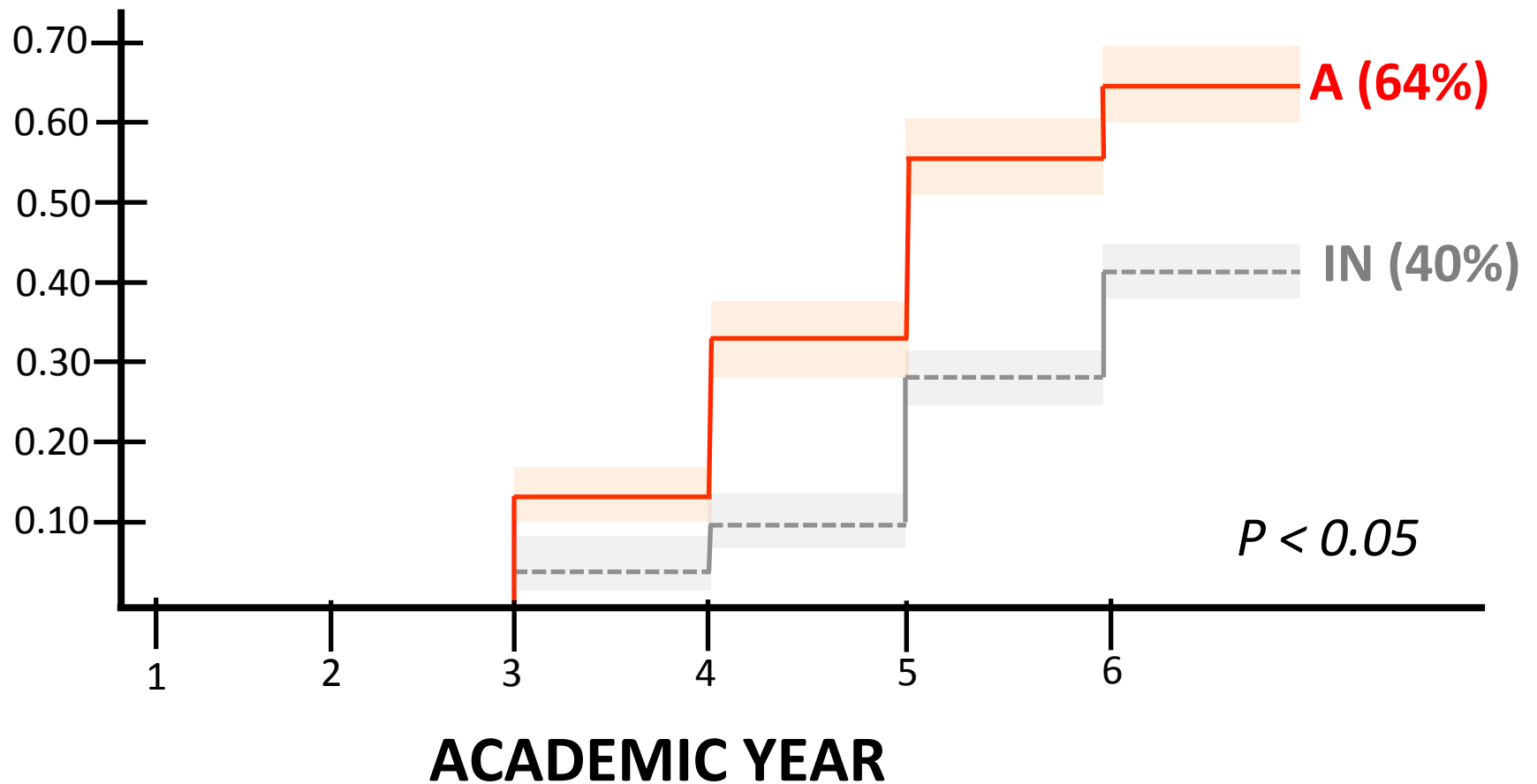


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PROPORTION THAT COMPLETED A DEGREE (2007 COHORT)



GPA COMPARISON

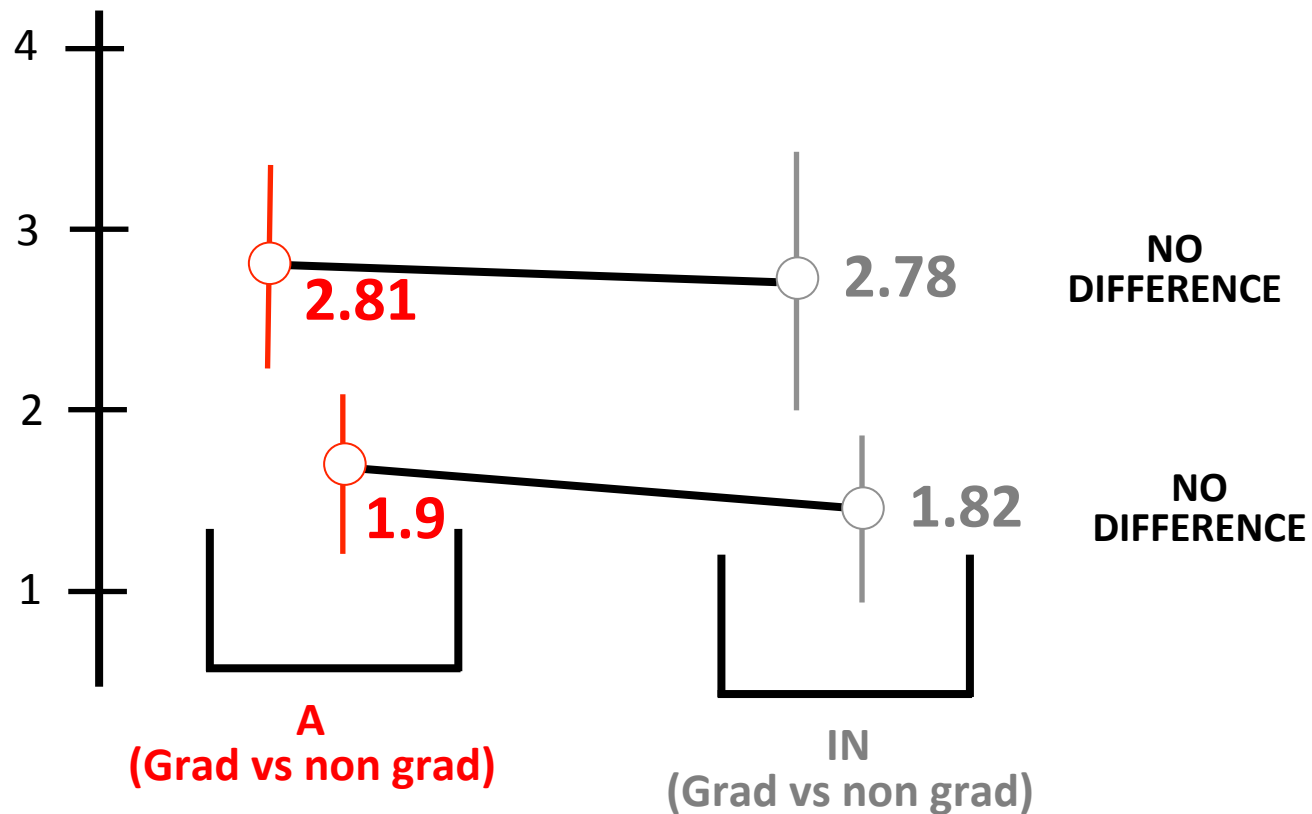


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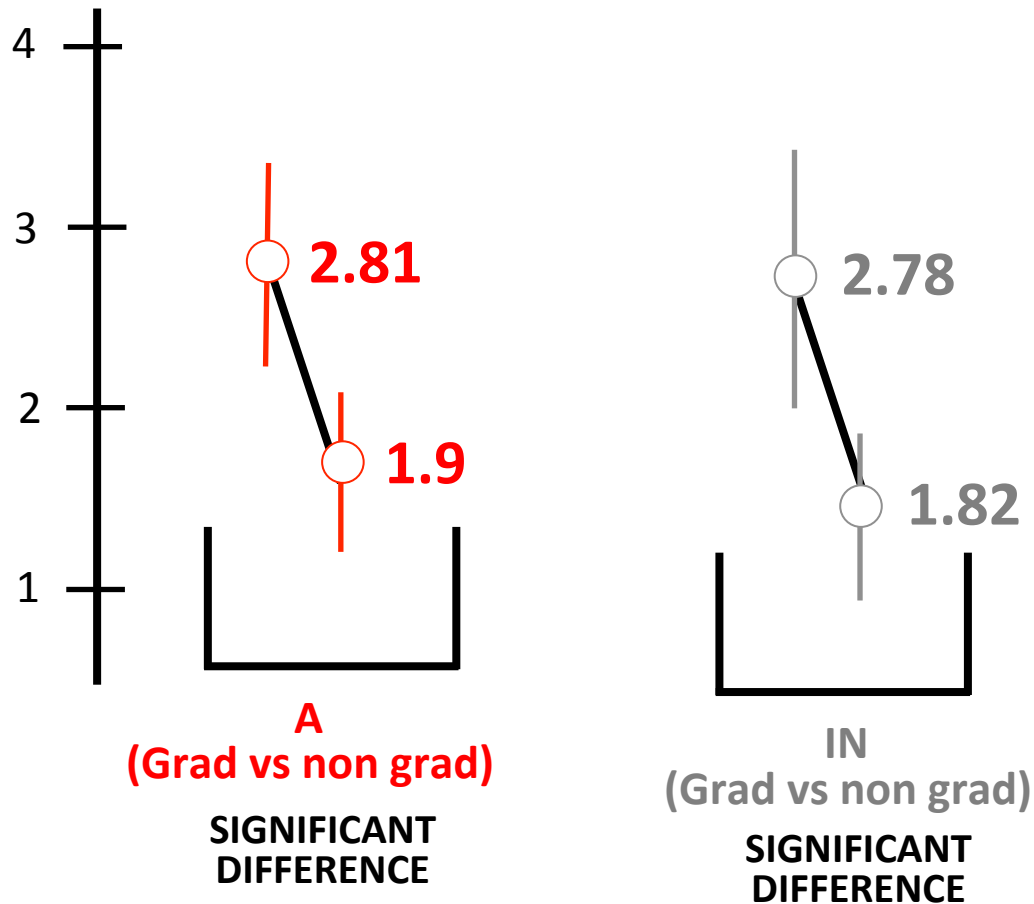


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GPA (upon degree completion or 6 yrs)



GPA (upon degree completion or 6 yrs)



CAN WE GENERALIZE THESE RESULTS?



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RESULTS / DISCUSSION

- Small sample sizes is often a problem with single cohort studies
- How confident can we be about our results
 - Can we infer these results to the population (those who have enrolled since 2002)
- Statistical inference procedures (using t-distributions) were employed to assess the statistical confidence of our results



RESULTS / DISCUSSION

- The 2007 Rates of attrition, degree completion and GPA results were compared using the 2002-2006 pooled student data (for Chinese students)
- In all cases the pooled 2002-2006 results were within the 95% confidence limits of the 2007 cohort.
- This provides statistical evidence that the 2007 student cohort results were representative of the population



RESULTS / DISCUSSION

COMPARISON WITH CANADIAN STUDENTS (2007)

- Canadian Students enrolled at the University of Manitoba (2007), $n = 3,584$
- Proportion that completed a degree within six years **36%**
- Mean GPA = **3.3 ± 0.54**



DEGREE COMPLETION (2007 COHORT)

“Survival analysis”

How different are the trends of
Chinese students compared to
Canadian students?

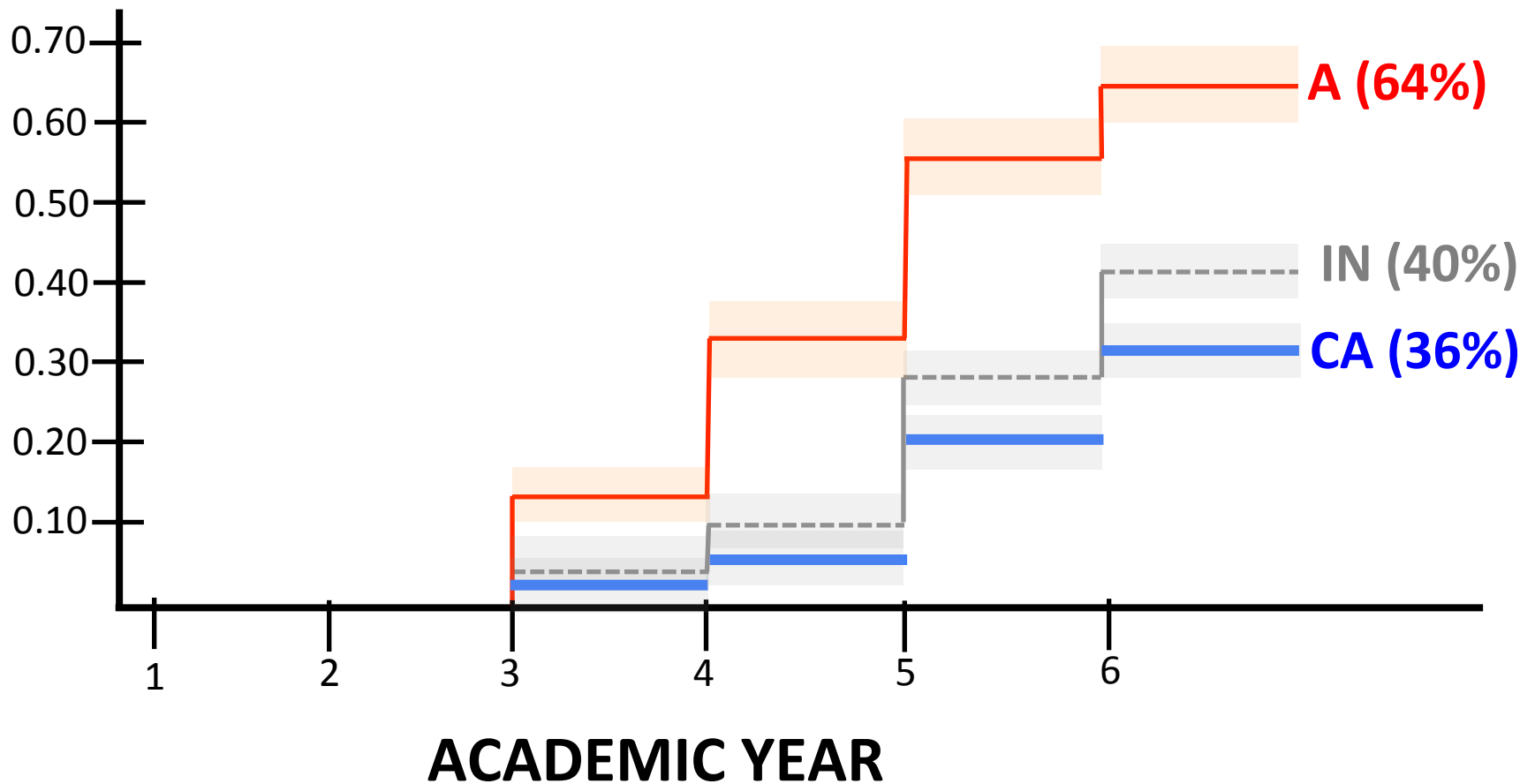


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PROPORTION THAT COMPLETED A DEGREE (COMPARED TO CANADIAN STUDENTS)

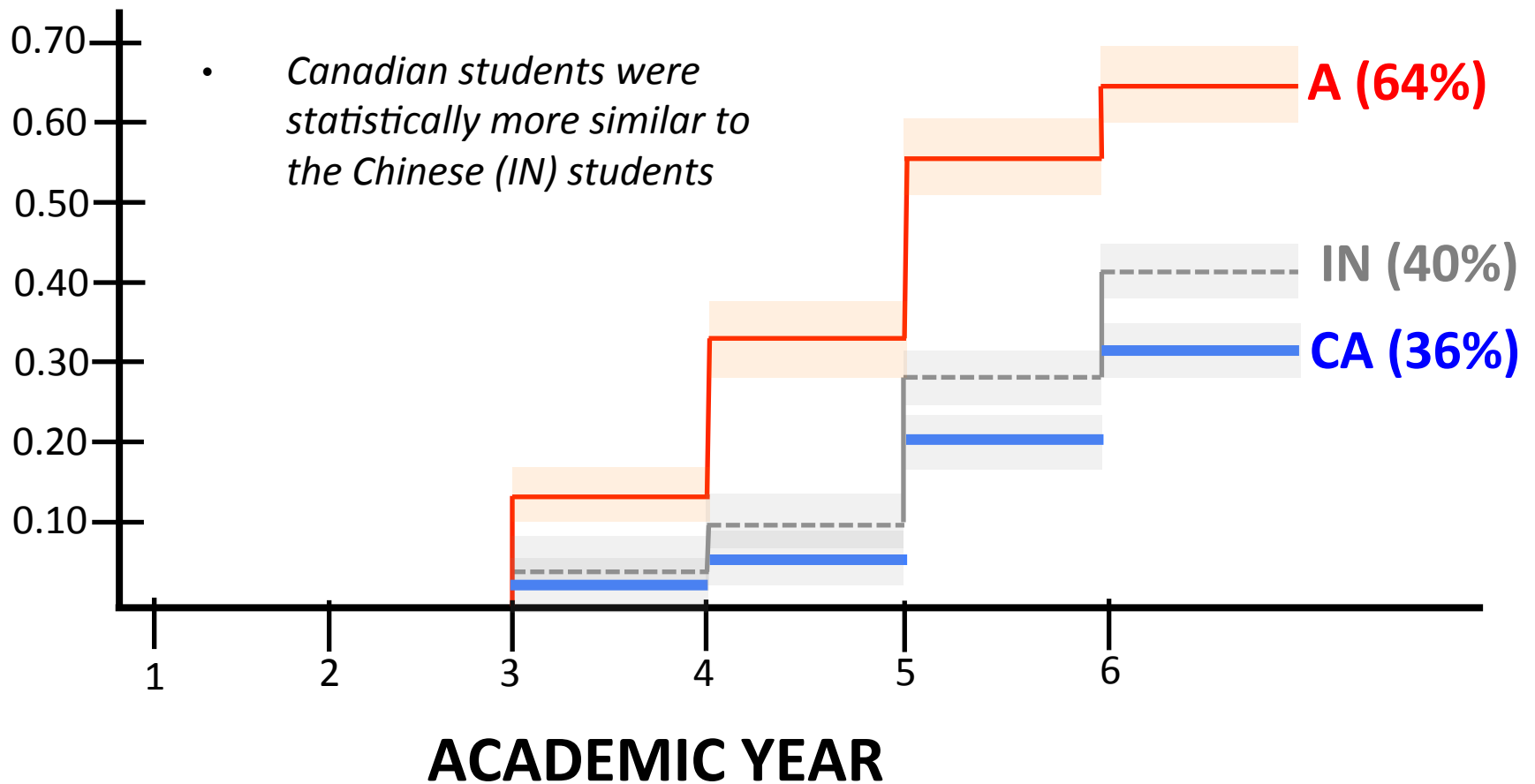


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PROPORTION THAT COMPLETED A DEGREE (COMPARED TO CANADIAN STUDENTS)



GPA COMPARISON (Chinese (A vs IN) and Canadian)

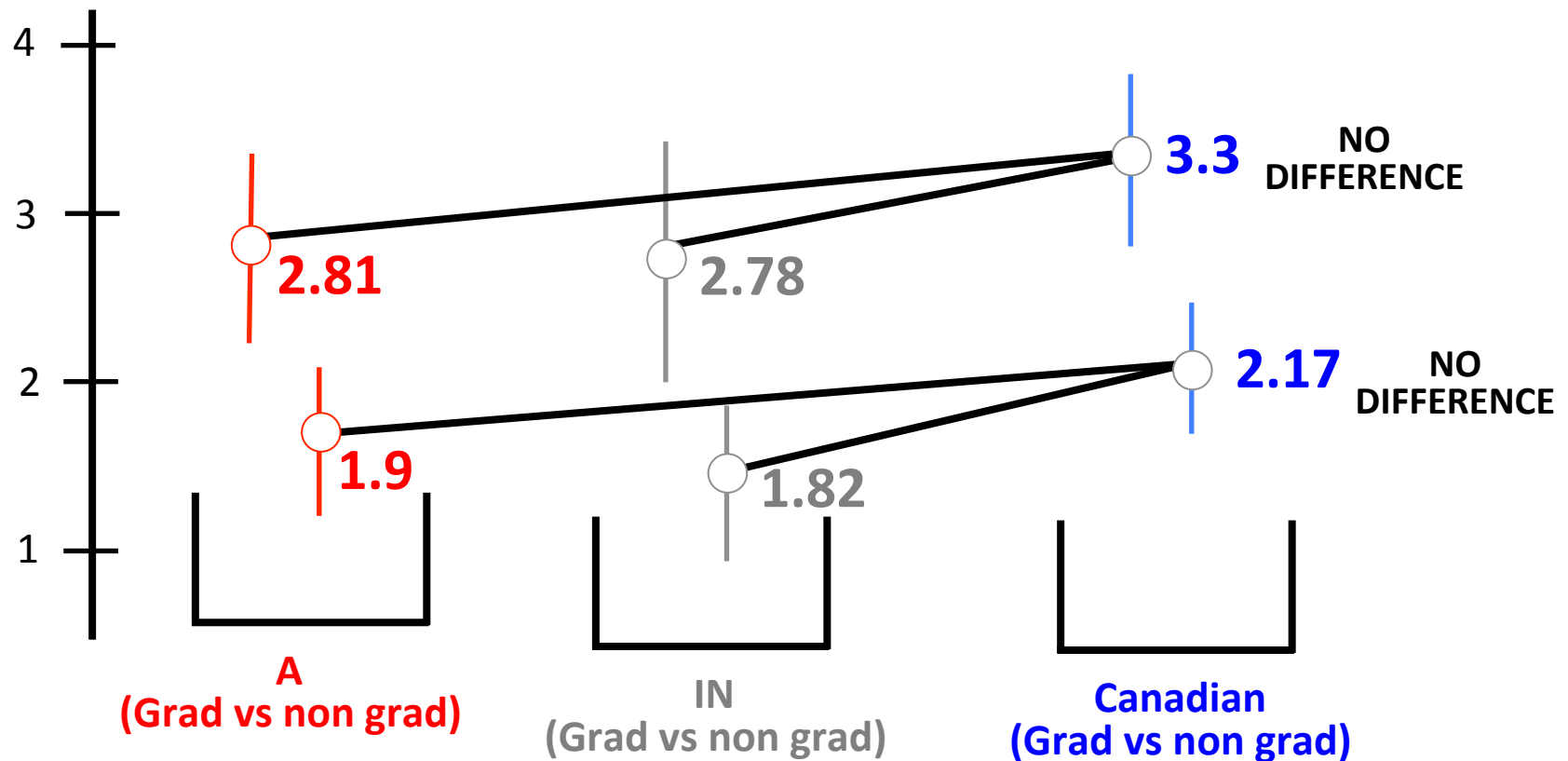


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GPA (upon degree completion or 6 yrs)



IMPLICATIONS OF STUDY AND FURTHER WORK



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RESULTS / DISCUSSION

- Language proficiency tests only test for language. What else do full time EAP programs provide?
 - Academic Skills
 - Attributional Retraining
(Dyck & Schonwetter, 2002)
 - Early Inclusion
- What are the implications for NES students?



Questions?

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