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Investigating the "Brain-Drain" Phenomenon in Maryland

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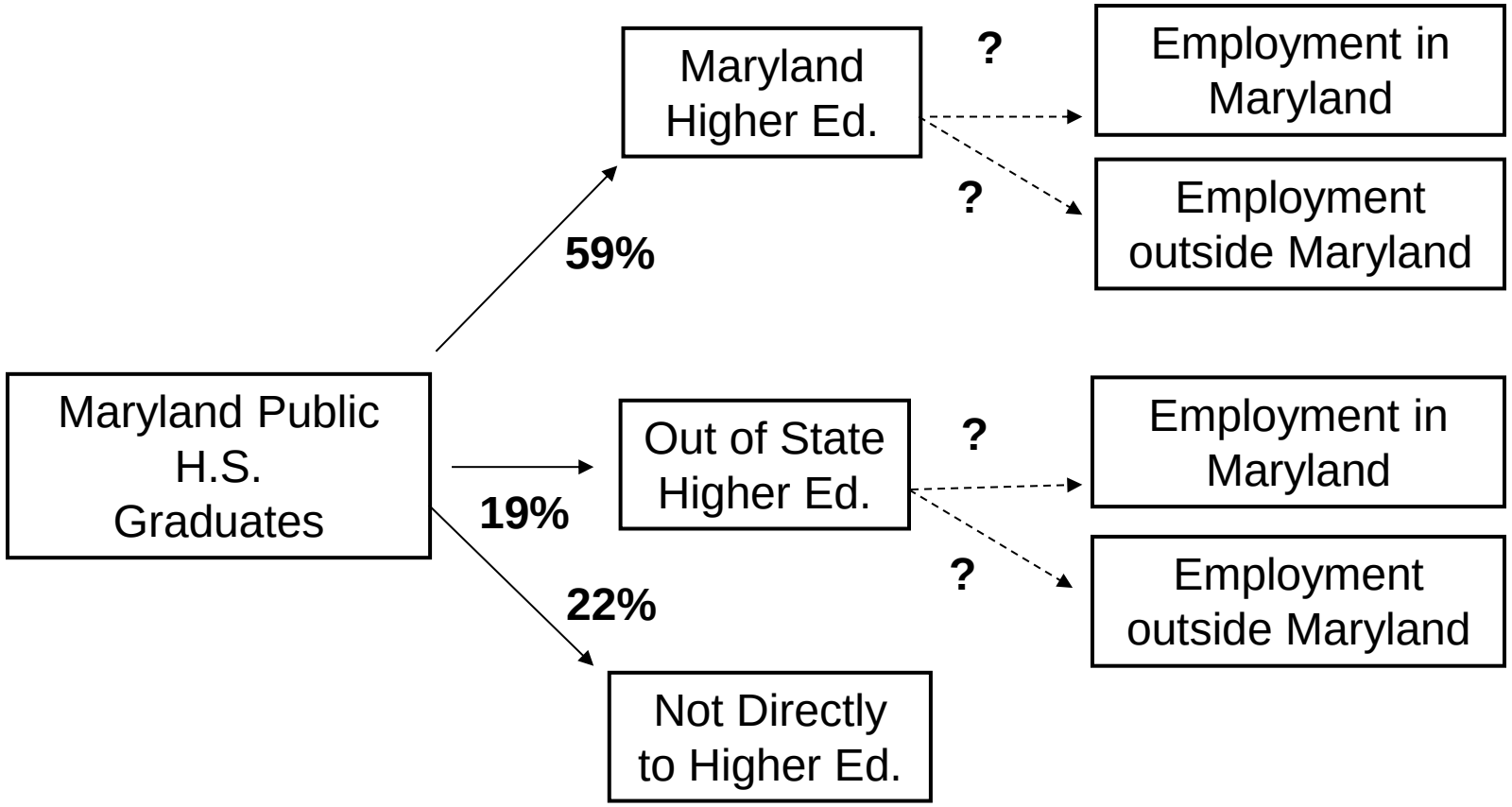
"Brain drain"



Source: 2008-2009 graduation year numbers in *Initial Postsecondary Enrollments - In-State vs. Out-of-State* dashboard; viewed at mldscenter.maryland.gov on 15Mar2017

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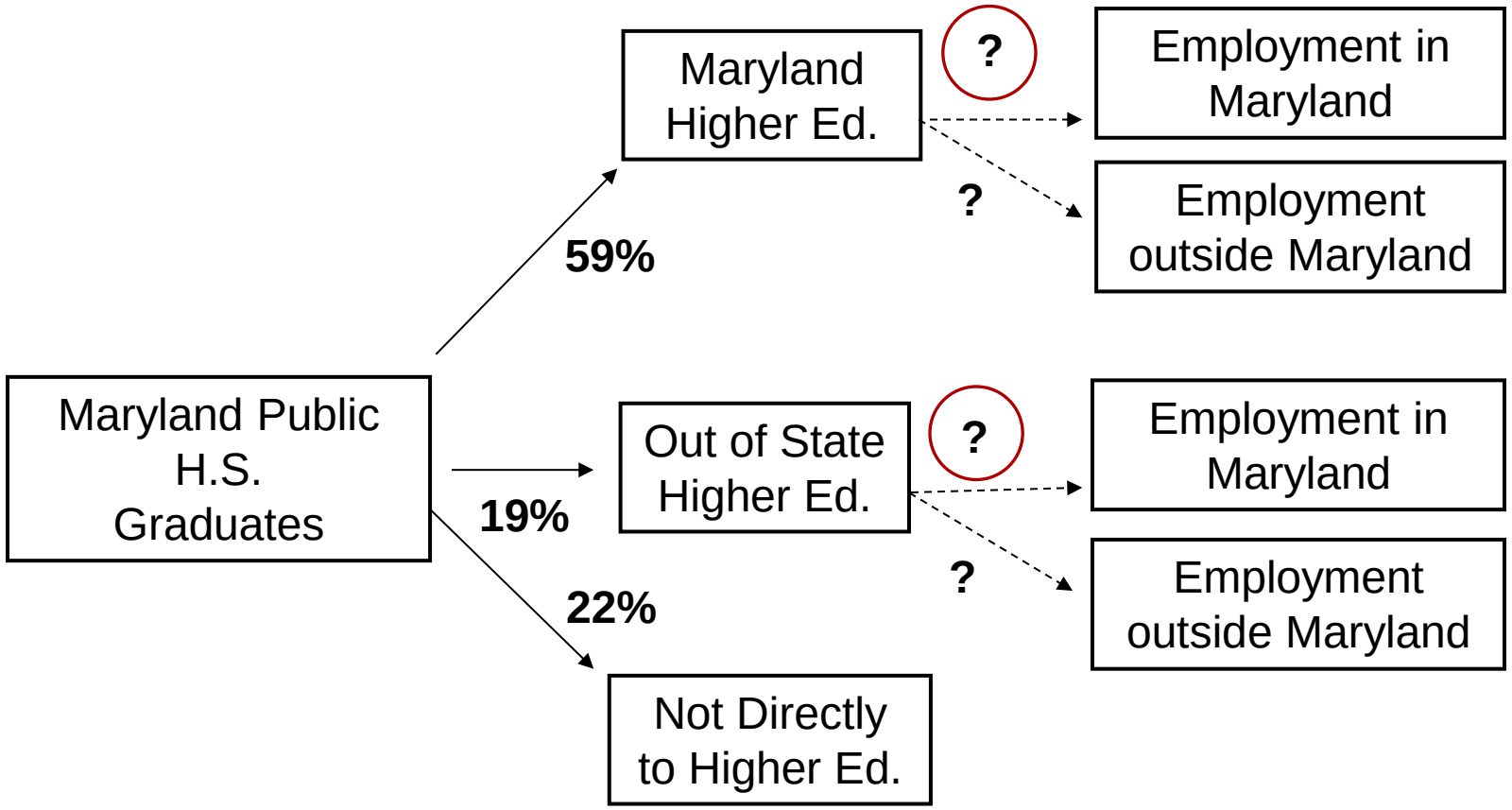

Source: 2008-2009 graduation year numbers in *Initial Postsecondary Enrollments - In-State vs. Out-of-State* dashboard; viewed at mldscenter.maryland.gov on 15Mar2017

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Method

- Use deidentified data from the Maryland Longitudinal Data System Center
- Impute missing data to retain as many students as possible for analyses
- Correct for any differences between students attending in-state vs. out-of-state colleges using propensity score matching

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Data housed in the MLDS Center

Person Info		
Race/ Ethnicity	Gender	Citizenship

(pre)K-12 (MSDE)				
Grades	Attendance	Courses	Assessments	Status

Postsecondary (MHEC and NSC)

Workforce (DLLR)

2007-2008 – 2015-2016

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Data Scope and Limitations

- K-12 student data are from Maryland public schools
  - No private school students
  - No home schooled students
- Out-of-state higher education records are available only for Maryland public school students (National Student Clearinghouse)

Data Scope and Limitations (cont'd)

- Workforce data do not include:
  - Federal employees (including military)
  - Private contractors
  - Self-employed
- Data are linked in the system for five years following the last Maryland education record in the system*

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Research Questions

- Do students who go out-of-state for college differ from those who stay in-state?
- Does location of the institution change likelihood of working in Maryland?
- Do students who attend college out-of-state and go on to work in Maryland differ from students who attend collge in-state and go on to work in Maryland?

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Selecting cohorts for analysis

- Time span needs to be wide enough to provide opportunity for completing college education and finding employment
- Limitations to the data linking – 5 year window
- Disparity in 2-year and 4-year institution attendance
  - Analyses focused on students who enrolled at 4-year institutions

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Available Data

- High school assessments
  - e.g., AP/IB, SAT/ACT
- Demographic info
  - e.g., Gender, Ethnicity
- School info
  - e.g., FARMS count, Total enrollment

Data cleaning

- Included: students who completed HS in 2008-2010, attended PS starting in 2011 or earlier
- Extremely sparse variables excluded from analyses
- ACT scores converted to SAT scores
- Highest AP/IB scores and proficiency captured
- Under-represented minority variable created consistent with the NIH definition of URM in Sciences (http://grants.nih.gov/training/faq_diversity.htm#867)

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In-state Attendees and Out-of-state Attendees: Achievement

- MD HS students who attended colleges in Maryland:
  - ~3% more likely to complete USM and occupational program course requirements
  - Slightly more likely to take the SAT or ACT
  - Slightly less likely to have IB and AP credits
  - Had lower SAT/ACT scores

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In-state Attendees and Out-of-state Attendees: Demographics

- MD HS students who attended Maryland colleges:
  - Were more likely to be underrepresented minorities
  - Slightly less likely to be female

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In-state Attendees and Out-of-state Attendees: HS Characteristics

- Maryland HS students who attended Maryland colleges went to high schools:
  - That had higher FARMS counts and lower total enrollment and SSIS counts
  - That were slightly more likely to have met their performance and attendance goals or to be magnet schools

Data imputation

- Allows for values to be estimated where actual data are missing
- Multiple imputation
  - All potentially informative variables are included in the imputation model
  - Other variables are used to estimate missing values based on observed relationships
  - Several sets of data are created to represent the inherent uncertainty of the missing values

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Results of data imputation

- Twenty datasets created
- "Missing" scores on tests like the SAT/ACT and highest AP score were coded into indicators of having a test score
  - The interaction between the indicator and the test score was used in the propensity score matching analysis
- Some missing values for HS characteristics and achievement variables (e.g., Science Indicator)

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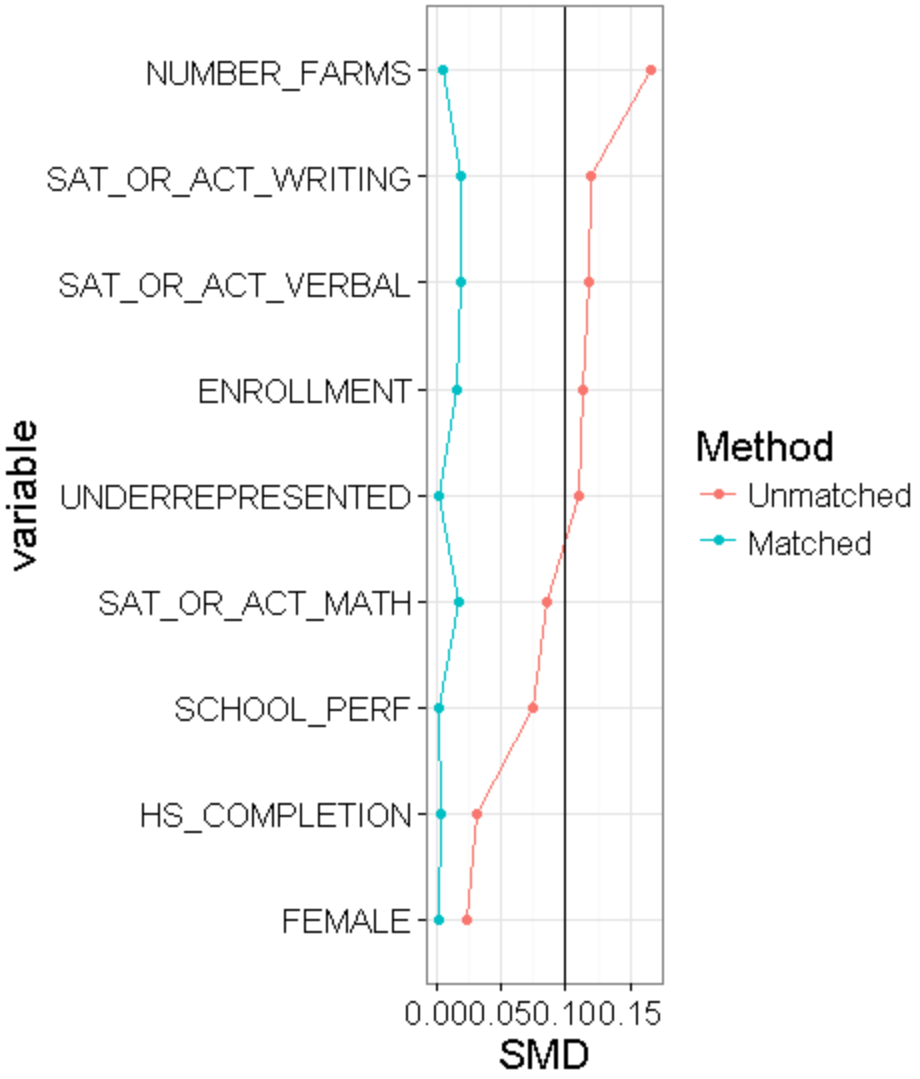
Propensity Score Matching

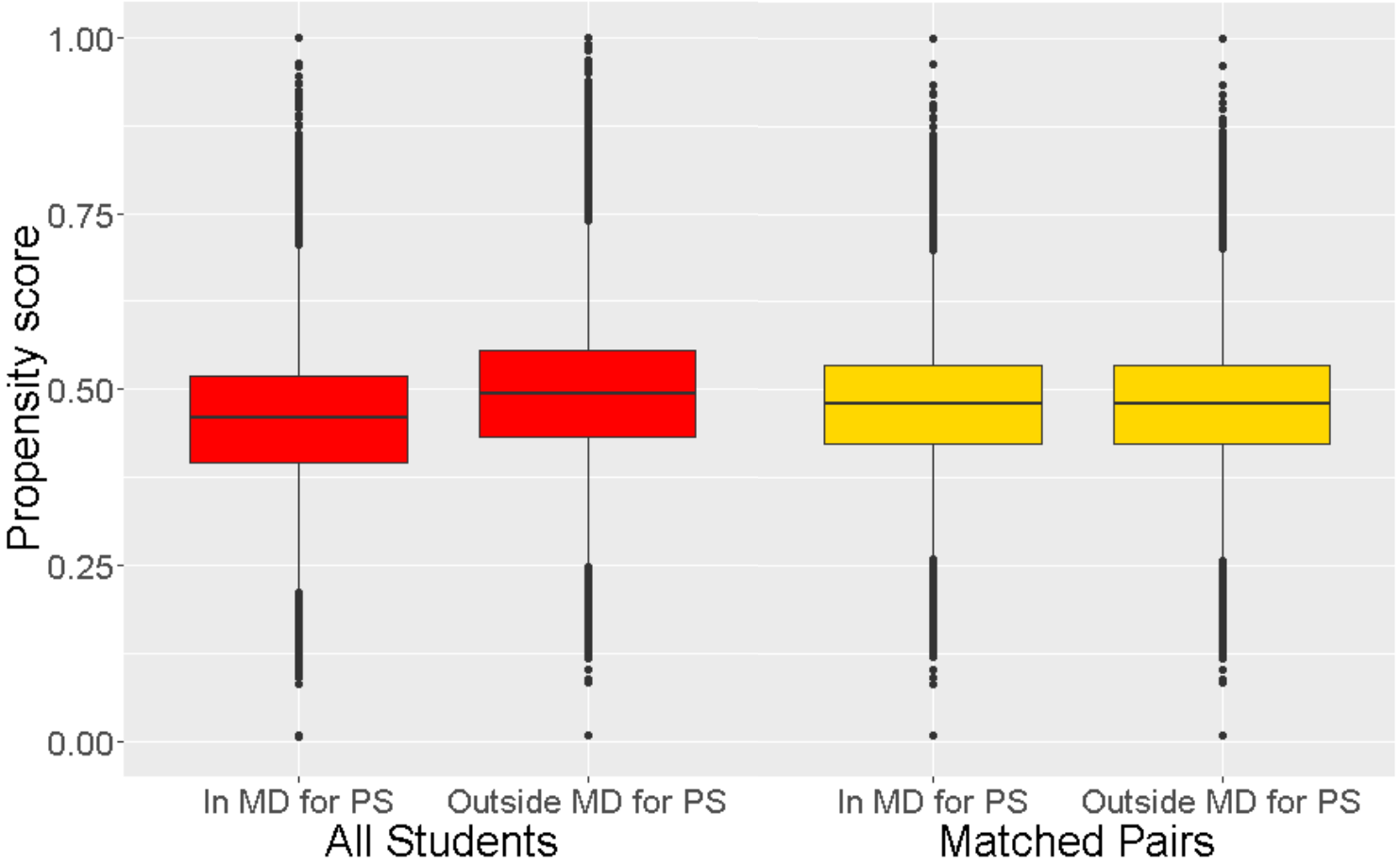
- Investigate impact of programs/treatments when experimental design is NOT used
- Attempts to match "treated" group members to "untreated" group members based on probability of being in the "treated" group
- Used to match students who went out-of-state and students who stayed in-state for college

Results of propensity score matching: SMD

86.6% of students retained after matching



Results of propensity score matching: Propensity score distributions



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Predicting MD employment

- Model predicting employment in MD following the last term in college
  - Any person with a record of employment in MD in the fall quarter following their last term of college or later counted as "employed"
  - Due to data access restrictions, employment info more than 5 years after HS graduation unavailable
- Whether the student attended college in Maryland or out-of-state was the sole predictor

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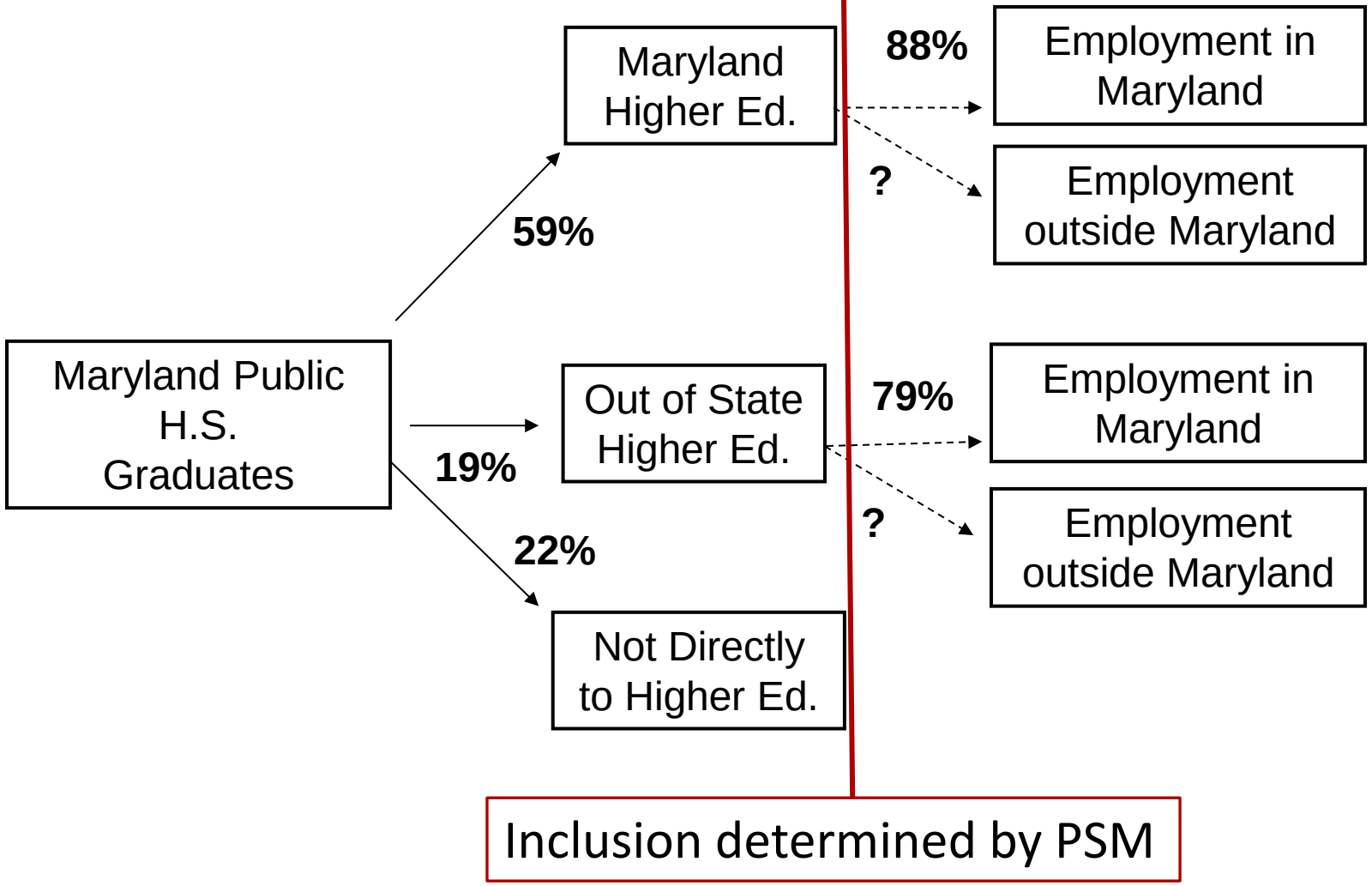
Is there brain drain?



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Comparing MD workers based on college location

- Slightly fewer under-represented minorities who attend PS out-of-state appear in employment data
- Slightly lower SAT or ACT scores and less likely to have taken an AP course compared to students who attended an in-state college
- Other differences negligible

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Conclusions

- MD public HS students who attend in-state post-secondary colleges differ from those who go out-of-state for college
- Some evidence for brain-drain even after controlling for these differences
- URM students who attend out-of-state colleges are slightly less likely to join the MD workforce after college
- Out-of-state college students who join the MD workforce after college tend to have slightly lower SAT/ACT test scores than in-state students who join the workforce

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Limitations of the current analyses

- Focus on initial college enrollment
- Students who attended college for 5+ years
- Federal employment differences

Next steps

- Investigate the relationship between in-state and out-of-state college attendance and type of MD employment
- Expore which states (outside MD) a student attends college and how this impacts likelihood of working in MD
- Exploring college achievement as a intervening factor in the relationship between college location and employment in MD

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Acknowledgement

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Thank you! Questions?

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