



# Geography, Race, and Academics in Illinois' New Teacher Pipeline

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# Teacher Race and Academics



Results from ***The Student Has Become the Teacher: Tracking the Racial Diversity and Academic Composition of the Teacher Supply Pipeline*** (2013) by Bradford R. White, Karen J. DeAngelis, and Eric J. Lichtenberger

Available online at <http://www.siue.edu/ierc/>

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# Background

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- **Studies show that academically skilled teachers and racial/ethnic minority teachers can have positive effects on student outcomes** (*see, e.g., Dee, 2004; Hanushek, Kain, O'Brien, & Rivkin, 2005; Rockoff, Jacob, Kane, & Staiger 2011*).
- **Policy efforts aim to improve both the academic caliber and diversity of new teachers** (e.g. CAEP, IL P-20, TFA, GYO, etc.)
- **Concerns have been raised regarding states' and districts' ability to improve the academic qualifications and diversity of teachers simultaneously.**
- **How do we design policies and practices to improve the supply of academically skilled and racially/ethnically diverse individuals into teaching?**

# The IERC teacher supply pipeline study

- To find out, we track the 2002 and 2003 cohorts (N=225,196) of Illinois high school students for about 10 years through five stages (college-going, 4-year college enrollment, bachelor's degree completion, teacher certification, and teaching employment in an Illinois public school)

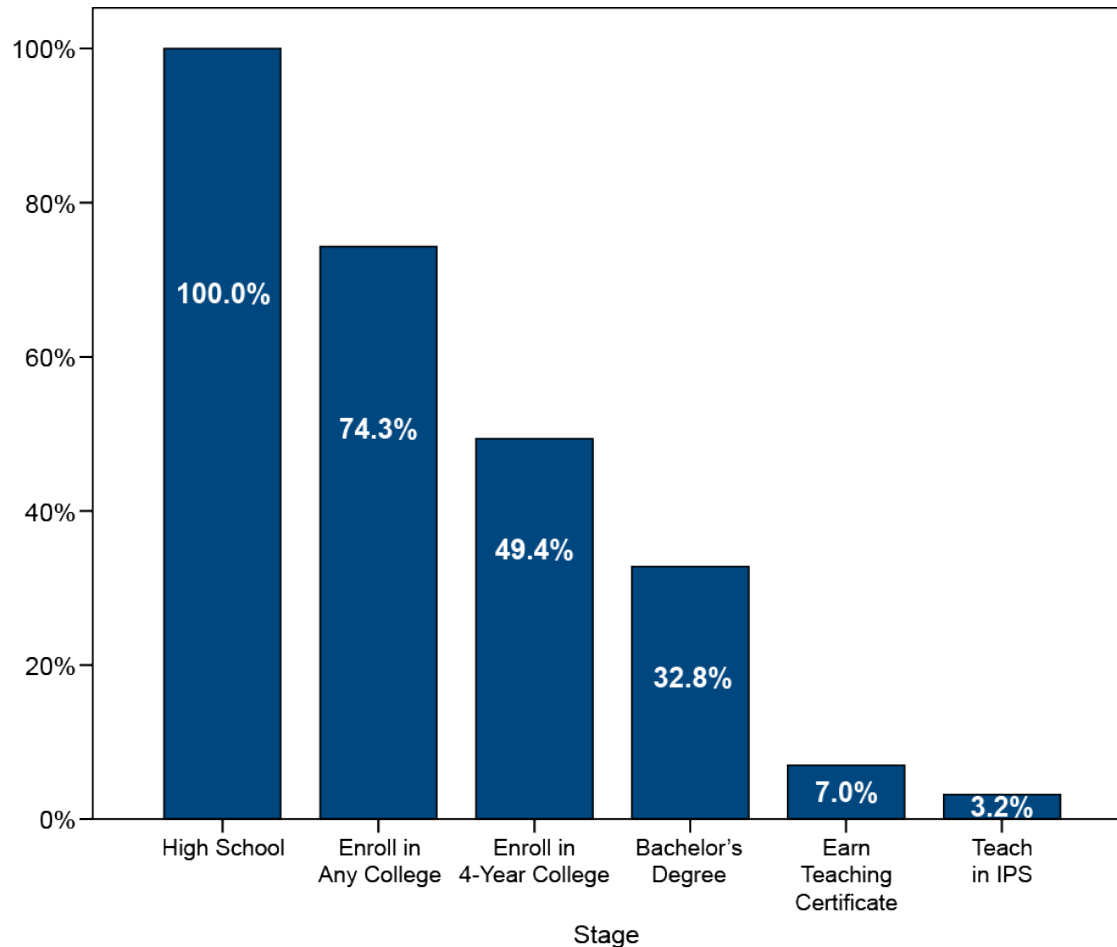
Figure 1.

## *Conceptual Model of Stages in the Teacher Pipeline*



- We examine changes in the composition of the pipeline to measure the extent to which each stage in the new teacher pipeline affects our ability to attract a diverse, academically skilled teaching force

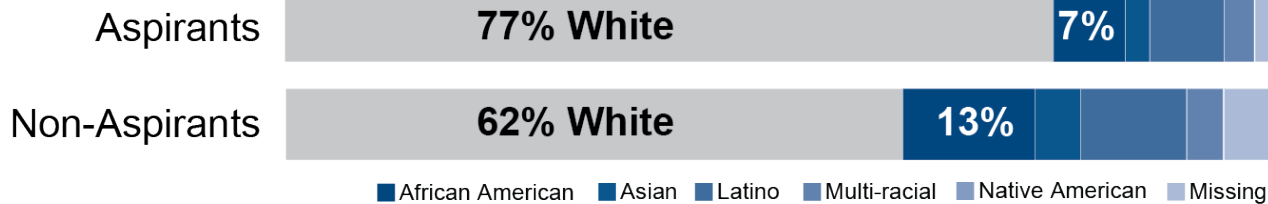
# What proportion of students progresses through each stage of the pipeline?



- 3.2% (7,209) of the 225,196 students from these cohorts became teachers in Illinois public schools

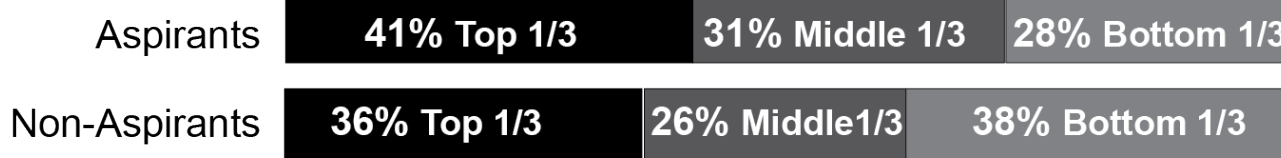
# Who is interested in teaching during high school?

## Race/Ethnicity

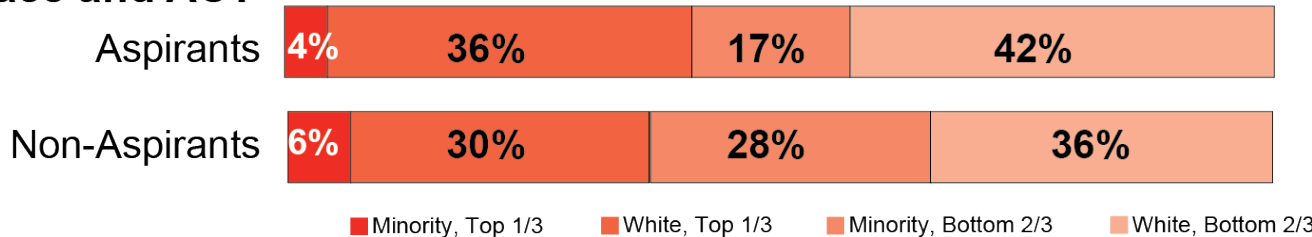


- Based on anticipated major or career from ACT questionnaire
- Non-white students and students from the bottom 1/3 of the ACT distribution (and men) were underrepresented amongst aspirants

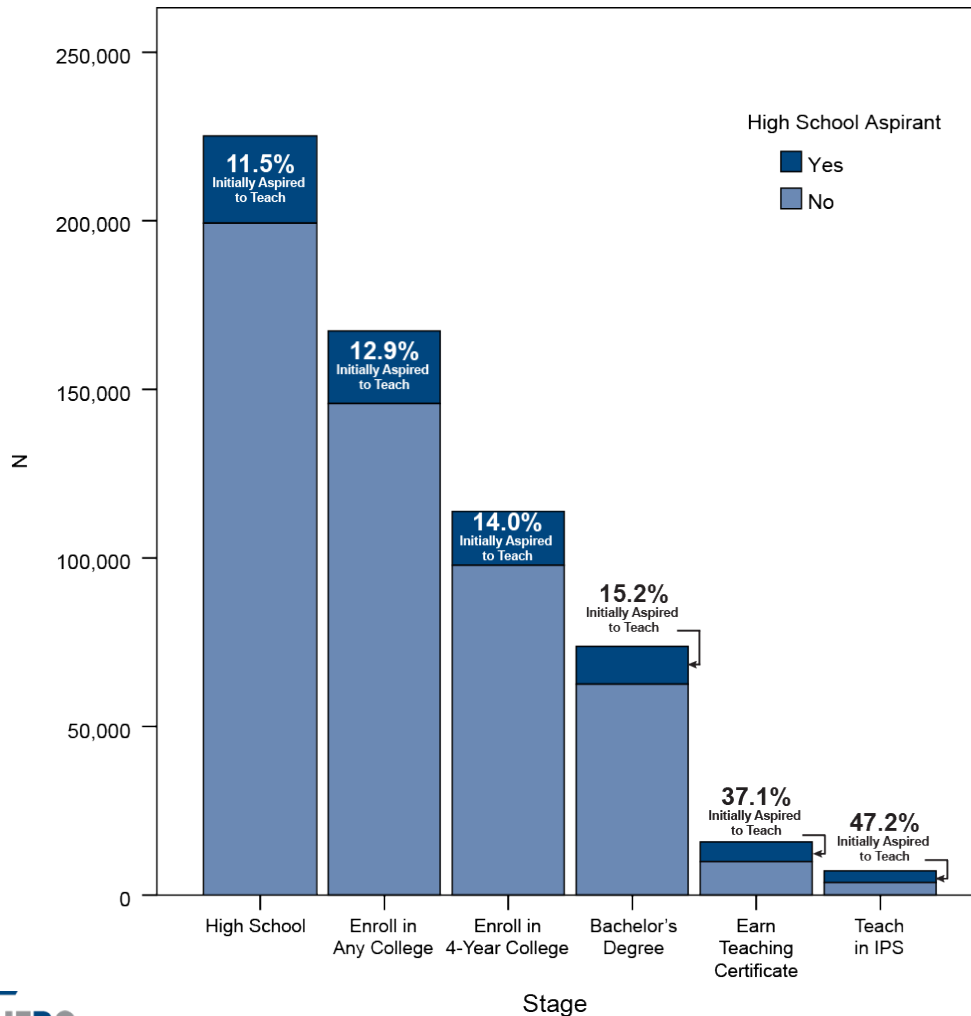
## ACT Composite



## Race and ACT

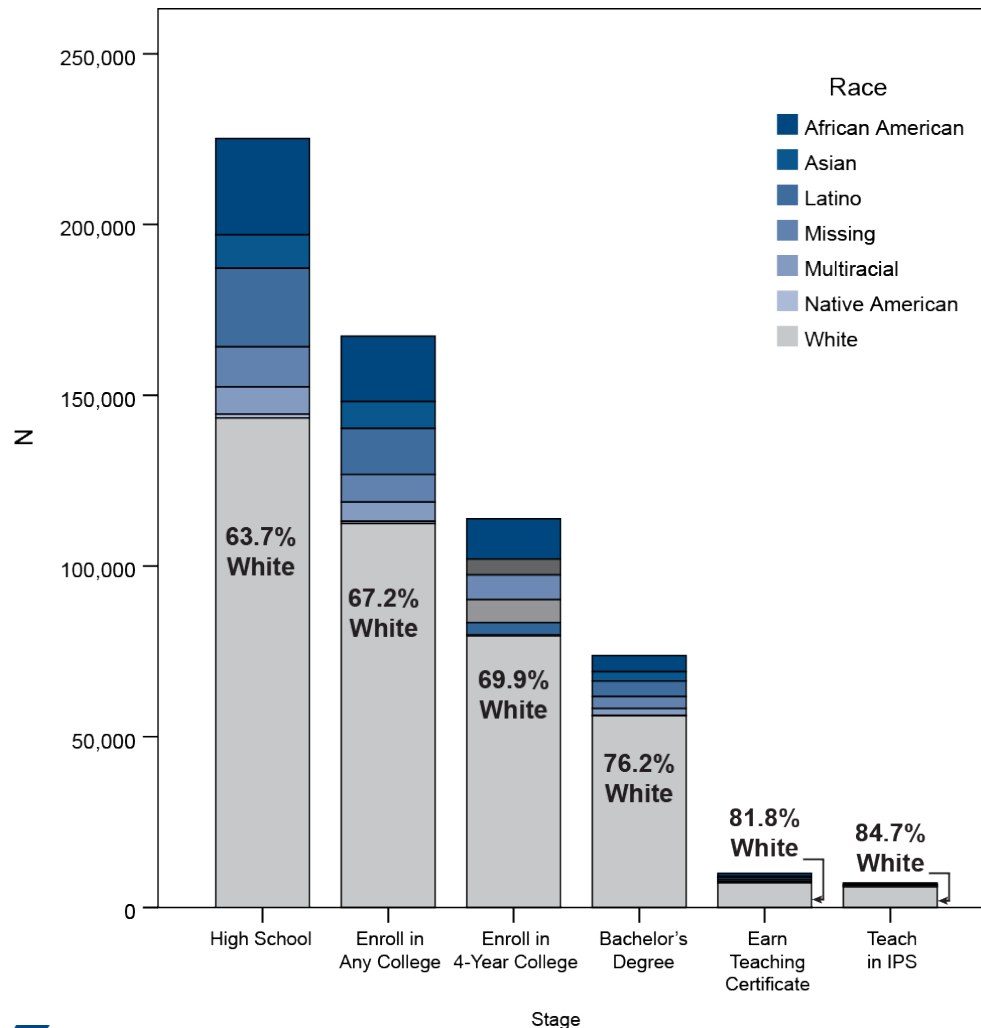


# High school aspirations matter.



- Students who aspired to become teachers while in high school advanced to each successive stage in the teacher pipeline at higher rates than non-aspirants.
- But still, only 13% of those who aspired to teach while in high school eventually became teachers, and more than half of the teachers from this study did not aspire to teach while in high school.

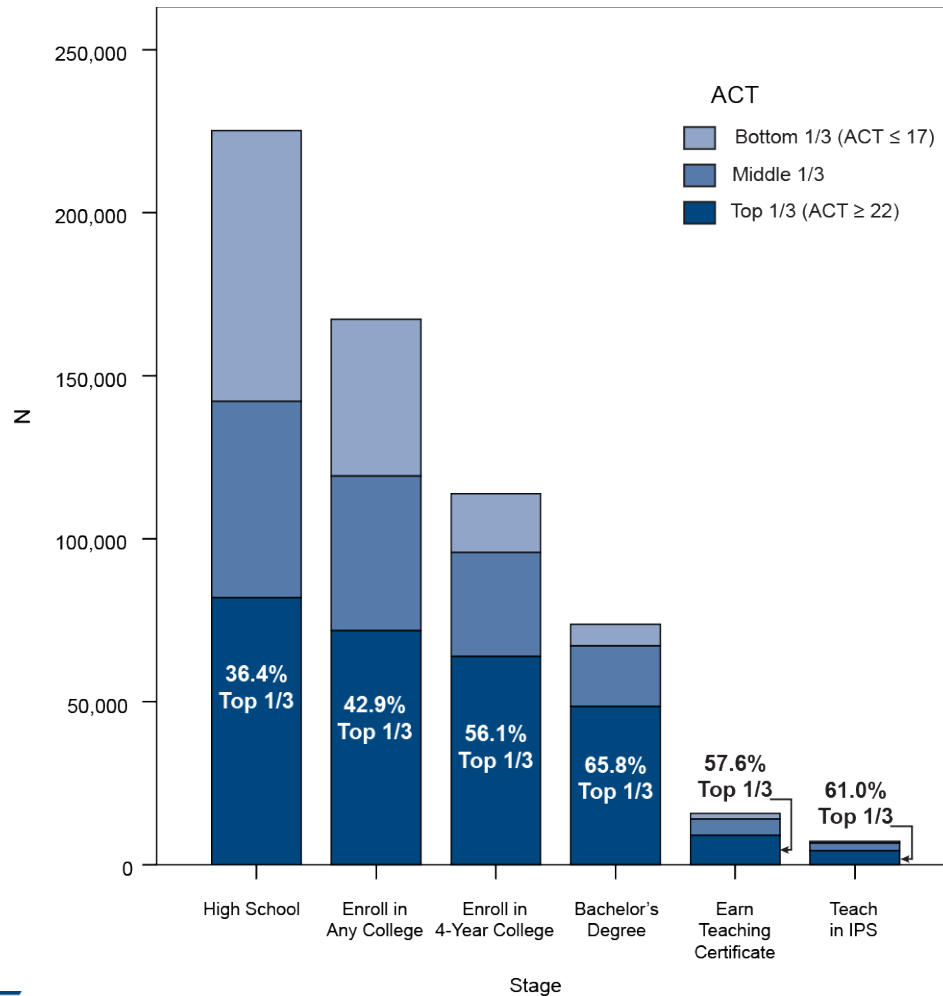
# How does the racial/ethnic composition of the pipeline change at each stage?



- White students make up increasingly larger proportions of the pipeline at each stage (63.7% of high schoolers → 84.7% of teachers)
- The underrepresentation of racial/ethnic minorities throughout the college pipeline has been widely documented



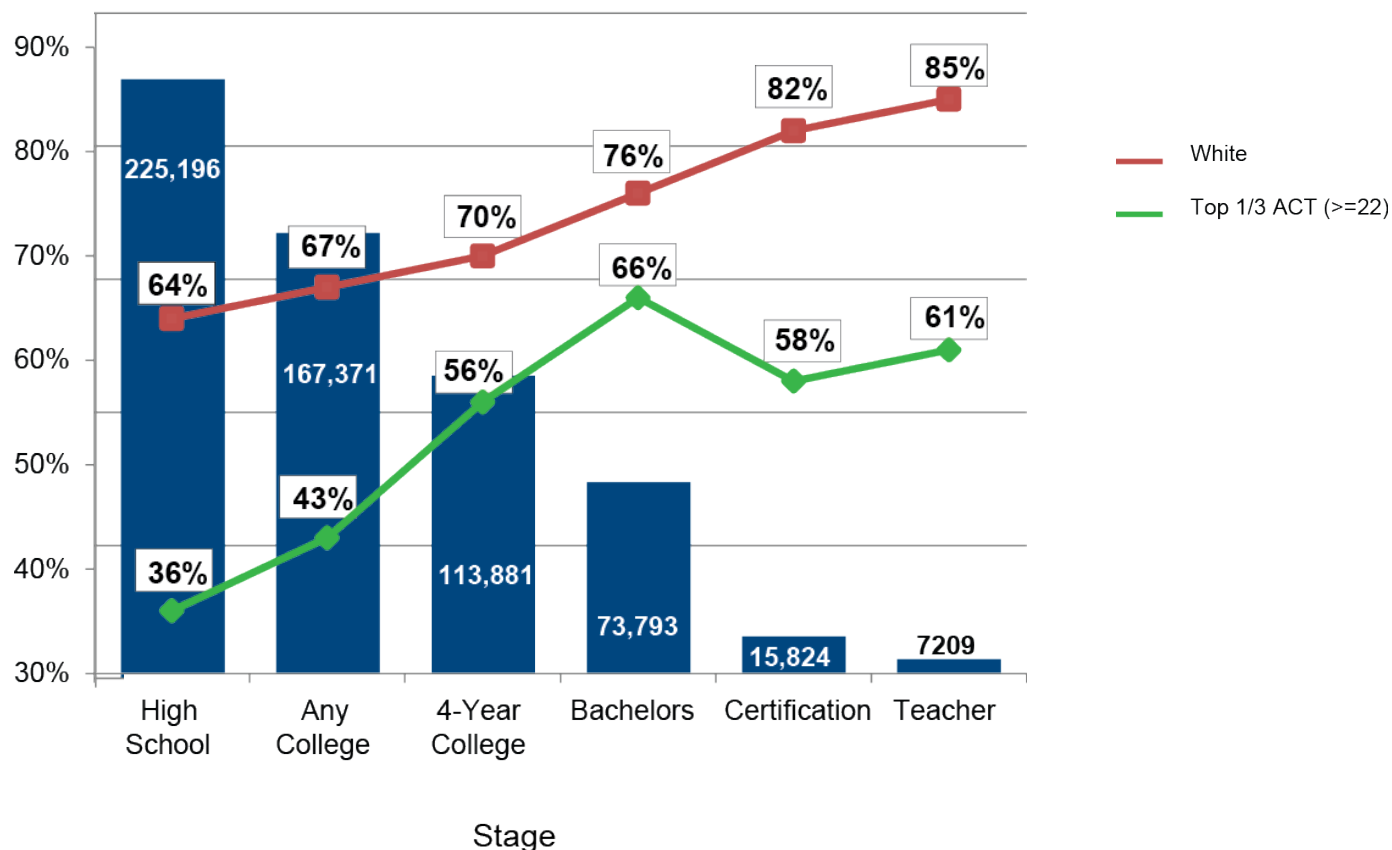
# How does the academic composition of the pipeline change at each stage?



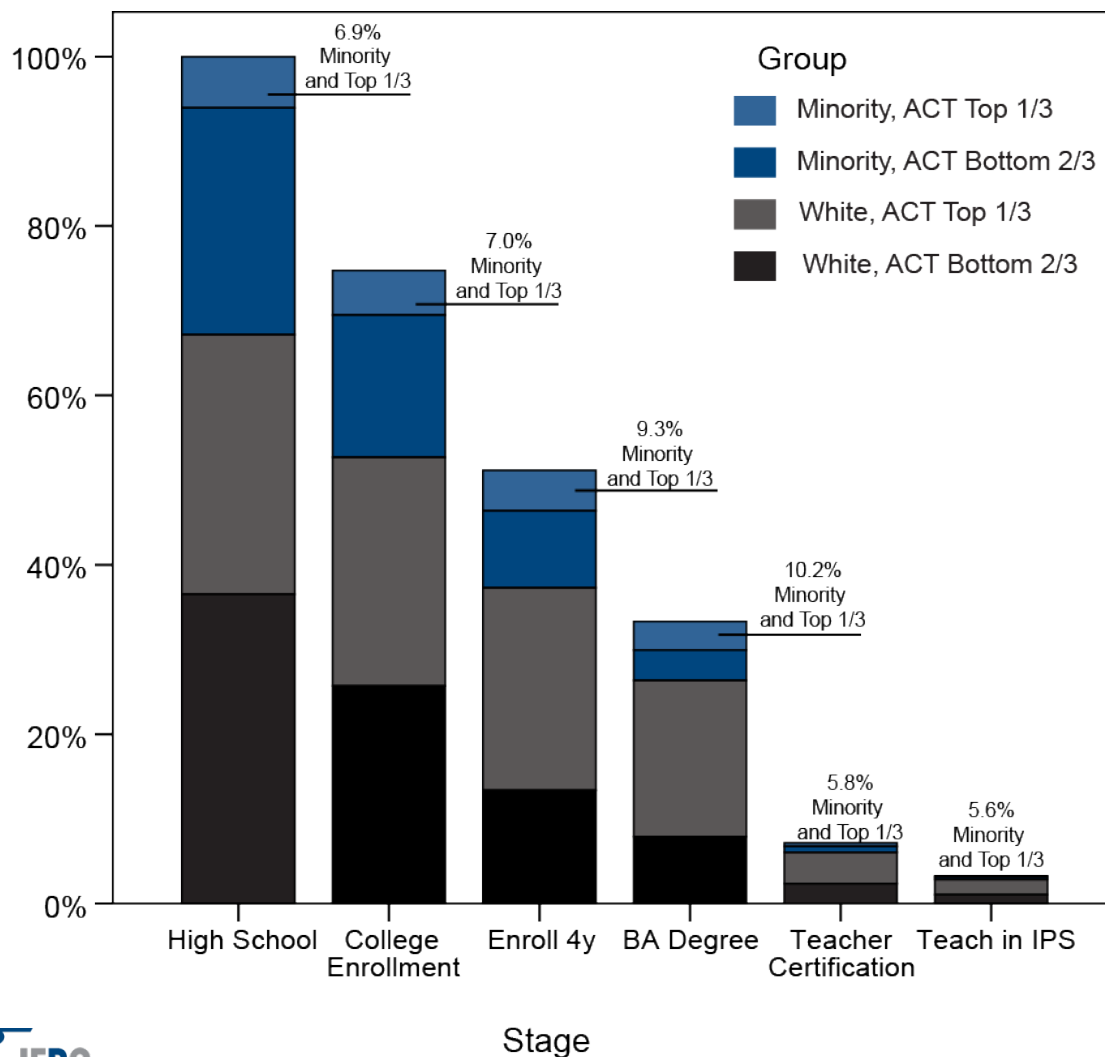
- Students from the top 1/3 of the ACT distribution make up an increasingly larger share of the pipeline – until the certification stage

# Changing composition of the pipeline by race/ethnicity and academics

- The pipeline gets “whiter” at each stage
- The pipeline gets “smarter” through college and more academically mediocre thereafter



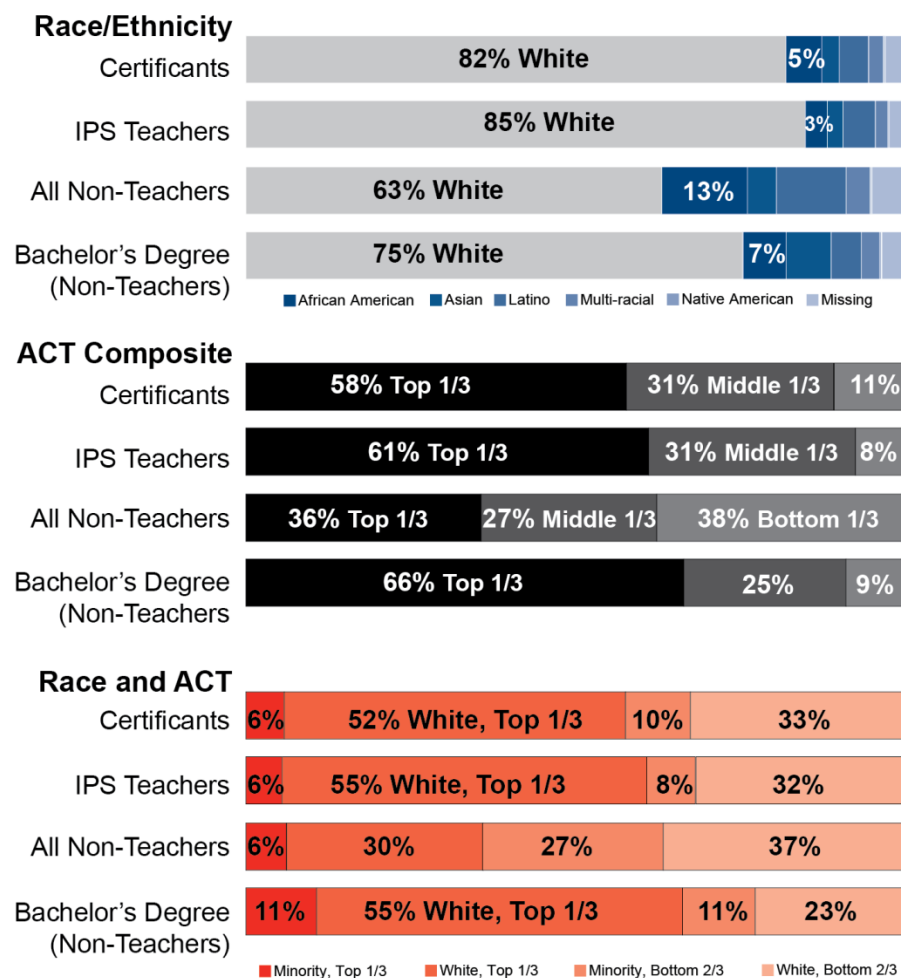
# How does the racial and academic composition of the pipeline change at each stage?



- The group of minority students from the top 1/3 of the ACT distribution is relatively small from the outset
- ...but increases proportionally throughout the college pipeline
- ...before dropping nearly in half at the certification stage.

# How do teachers differ from non-teachers?

It depends on your comparison group...



- Less diverse than their HS peers, but much stronger academically
- Academically similar to other bachelor's degree earners, but still less racially/ethnically diverse
- Comparing certificants to other BA earners (probably the most apt comparison) shows that certificants lag in both diversity and academics

# Summary

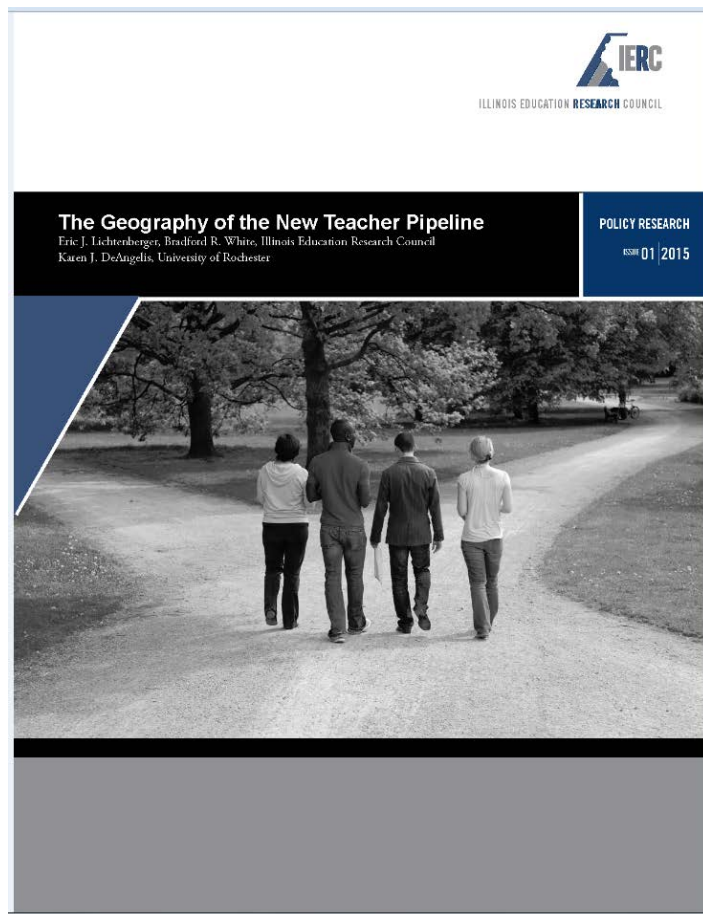
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- Compositional changes occurred at each stage of the new teacher pipeline and a relatively a small percentage (3%) of students became public school teachers
- Academic preparation plays a role in progress through the pipeline, but other factors – like aspirations – also have a large impact
- The transition from the certification stage to the employment stage (teaching in an Illinois public school) appeared to be one of the most critical stages in the pipeline.
- Whites generally progressed through the college pipeline, aspired to teach, and transitioned to certification and teaching at greater rates than racial/ethnic minorities
- Academically skilled students generally progressed through the college pipeline at greater rates but earned teacher certification at lower rates
- As a result, teachers who emerged from these cohorts were generally less diverse than non-teachers and tended to be from the middle of the ACT distribution

# Policy Recommendations

- **Any initiatives intended to increase the academic qualifications of teachers should not neglect teacher diversity, and any efforts that focus on boosting teacher diversity must not neglect teacher academics.** Some promising sources of academically skilled and racially/ethnically diverse candidates identified by this study include:
  - Highly competitive colleges
  - Alternative certification routes
  - Out-of-state institutions (or efforts to reduce outmigration to begin with)
- Other recommendations include:
  - Recruitment efforts – both during high school and continue into college
  - Holding teacher preparation programs accountable for both the quality and diversity of the teachers they train
  - Statewide initiative to fund teacher preparation programs that target high-achieving minority candidates
- A **comprehensive strategy** must also include efforts to improve the educational opportunities and outcomes for minority students from early childhood through postsecondary education.

# The Geography of the New Teacher Pipeline



Results from a forthcoming IERC report  
by Eric J. Lichtenberger, Bradford R.  
White, and Karen J. DeAngelis

Soon to be available online at  
<http://www.siue.edu/ierc/>

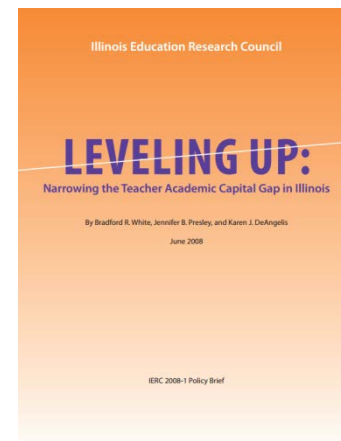
# The role of geography in the new teacher pipeline

- **Student characteristics and college access, enrollment, and completion patterns differ widely between regions in Illinois**
  - CPS students as a whole are more diverse and have lower ACT scores compared to the rest of the state
  - Students in southern IL are more likely to enroll in 2-year colleges and less likely to earn bachelor's degrees (all else being equal)
- **Teacher labor markets are considerably more constrained geographically than those of similarly-aged college graduates in non-teaching occupations (*Boyd et al., 2005; Reininger, 2012*)**
  - About 60% of first-year public school teachers work in schools within 15 miles of “home” (where they attended HS) and 85% work within 40 miles
  - Urban teachers, non-White teachers, and teachers with weaker academic qualifications tend to be even *less* mobile



# The distribution of teacher characteristics

- New teachers also tend to choose schools with high proportions of students sharing their race and from similar socio-economic backgrounds (*Cannata, 2008; Engel 2014*)
- Younger workers tend to have more geographic mobility than older workers, so initial sorting is likely to persist to some extent
- Unequal distribution of student characteristics + teachers' preferences for geographic and social familiarity + relatively little mobility after initial placement =
- Inequitable distribution of teacher characteristics, whereby the highest need students are typically the most shortchanged, largely due to the initial match of teachers to schools in their first teaching jobs
  - Summarized in a previous IERC report, ***Leveling Up: Narrowing the Teacher Academic Capital Gap in Illinois*** (2008) by Bradford R. White, Jennifer B. Presley, & Karen J. DeAngelis

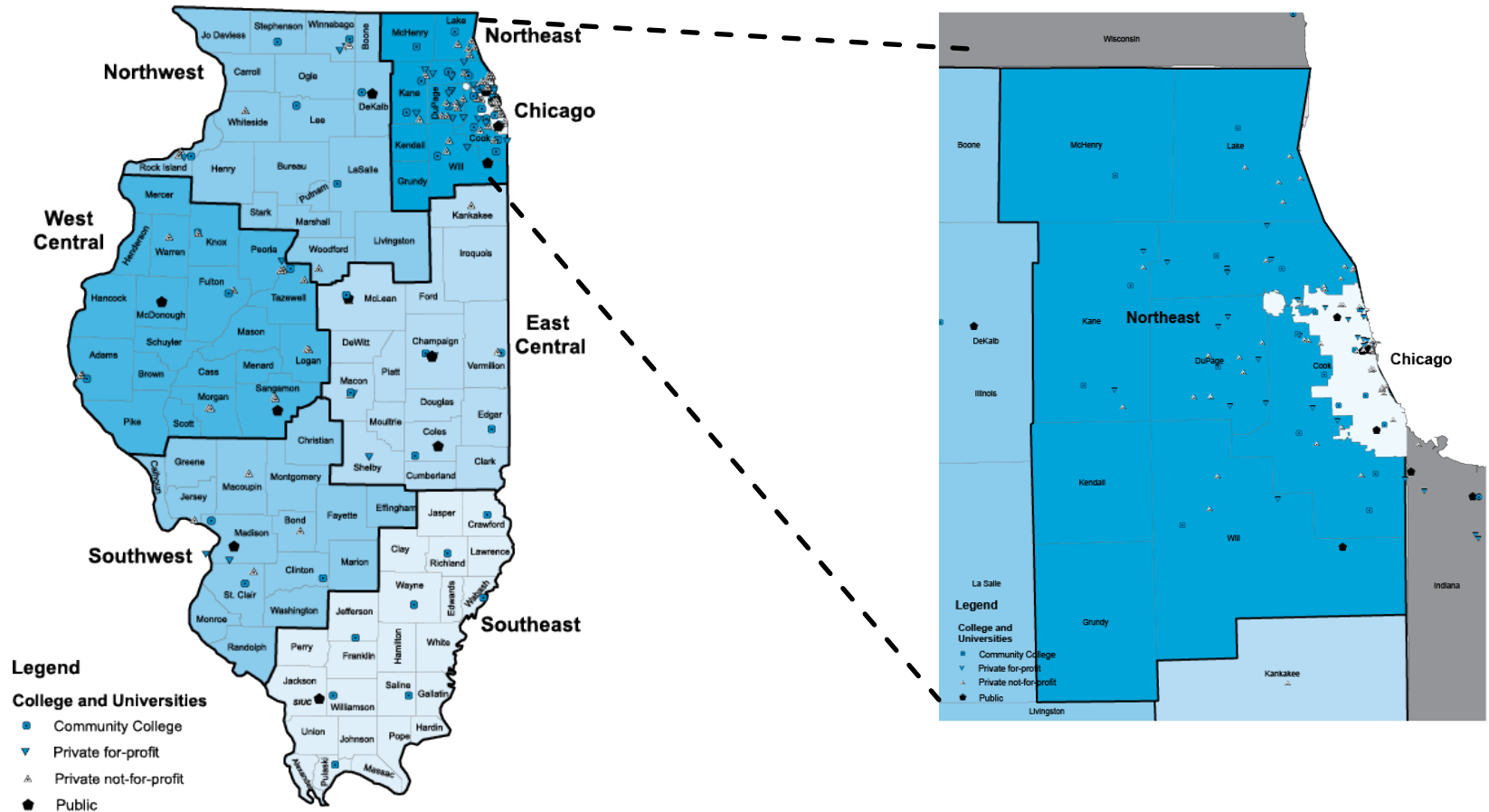


# Questions

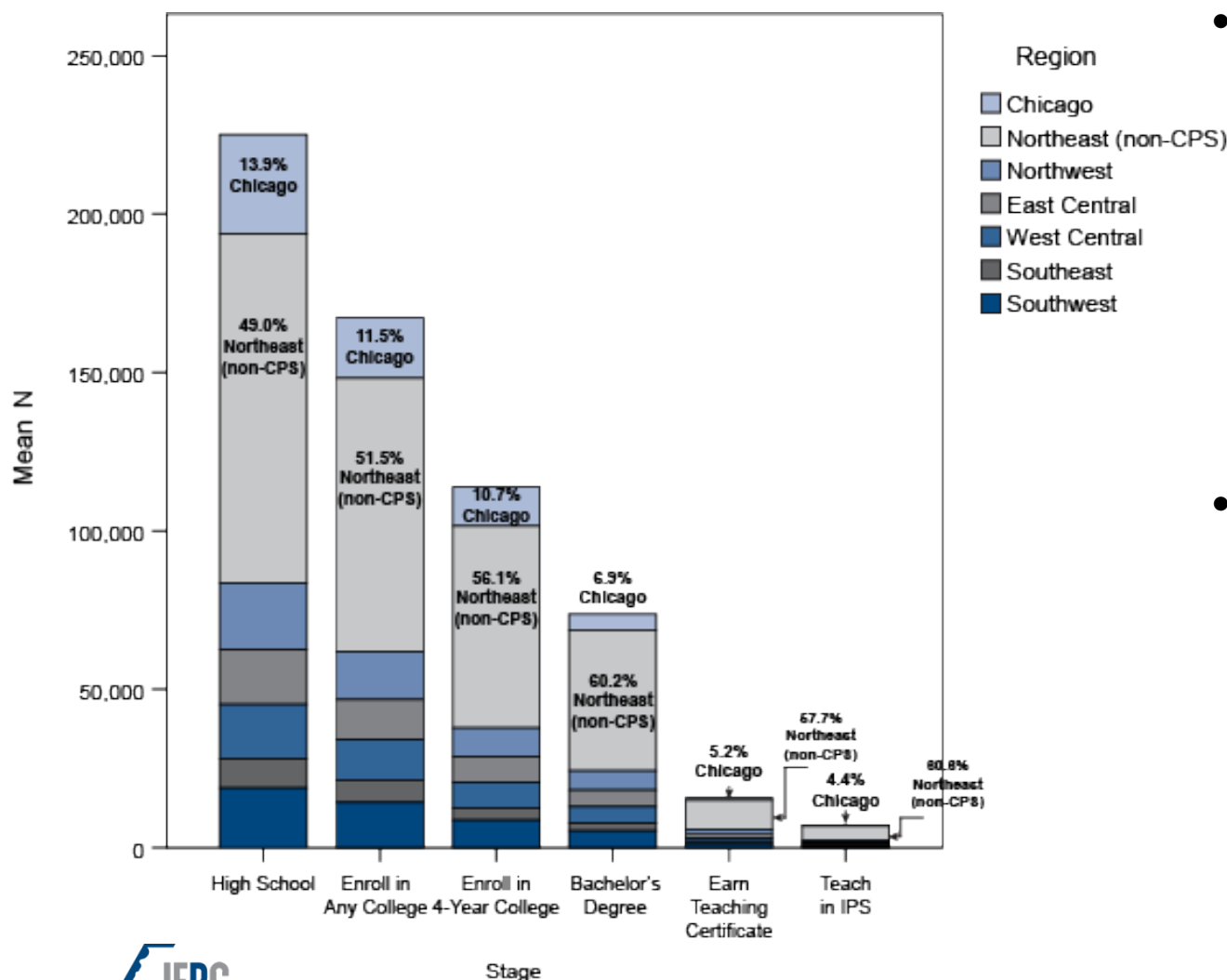
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- To what extent does geography explain changes to the composition of Illinois' new teacher workforce?
- **How do the race/ethnicity and academic characteristics of teachers who emerge from each region differ?**
- How do the numbers of teachers produced in each region compare with the number of teachers needed in each region? Is there a geographic mismatch between the preferred teaching location (schools geographically and demographically similar to home) and location of available jobs?
  - Does this help explain why we lose 50% of certificants during the transition from certification to employment?
  - If there is a shortage, what types of teachers are “imported” to the region and where do they come from? If there is an excess, what types of teachers are “exported” from the region and where do they go?
- **Is there a cycle of underqualified teachers and low student achievement in hard-to-staff, disadvantaged regions?**

# We divide Illinois into 7 geographic regions



# How does the geographic composition of the pipeline change at each stage?



- Throughout the college pipeline, the proportion of students who graduated from CPS school drops, while the proportion who started in the rest of the NE region grows.
- In the end, only 4% of teachers started in CPS (compared to 14% of HS students) and over 60% of the teachers started in the NE (compared to 49% of HS students)

# Who emerges from the new teacher pipeline in each region?

|   | REGION     |            |            |            |            |            |            |
|---|------------|------------|------------|------------|------------|------------|------------|
|   | CPS        | NE         | NW         | WC         | EC         | SW         | SE         |
| <b>% of HS students in region who are White</b>                             | <b>8%</b>  | <b>64%</b> | <b>83%</b> | <b>84%</b> | <b>86%</b> | <b>89%</b> | <b>82%</b> |
| <b><i>% of teachers produced by region who are White</i></b>                | <b>16%</b> | <b>84%</b> | <b>93%</b> | <b>95%</b> | <b>93%</b> | <b>94%</b> | <b>98%</b> |
| <b>% of HS students in region from the Top 1/3 ACT</b>                      | <b>13%</b> | <b>44%</b> | <b>35%</b> | <b>38%</b> | <b>35%</b> | <b>29%</b> | <b>34%</b> |
| <b><i>% of teachers produced by region who are from the Top 1/3 ACT</i></b> | <b>36%</b> | <b>66%</b> | <b>55%</b> | <b>54%</b> | <b>61%</b> | <b>56%</b> | <b>50%</b> |

- **% White and % Top 1/3 ACT increase considerably in each region, but substantial differences between regions remain**

# The geography of supply & demand

|                            | CPS | NE  | NW | WC | EC | SW | SE |
|----------------------------|-----|-----|----|----|----|----|----|
| % of All HS Students       | 14% | 49% | 9% | 8% | 8% | 8% | 4% |
| % of All Teachers Produced | 4%  | 61% | 9% | 8% | 7% | 7% | 4% |

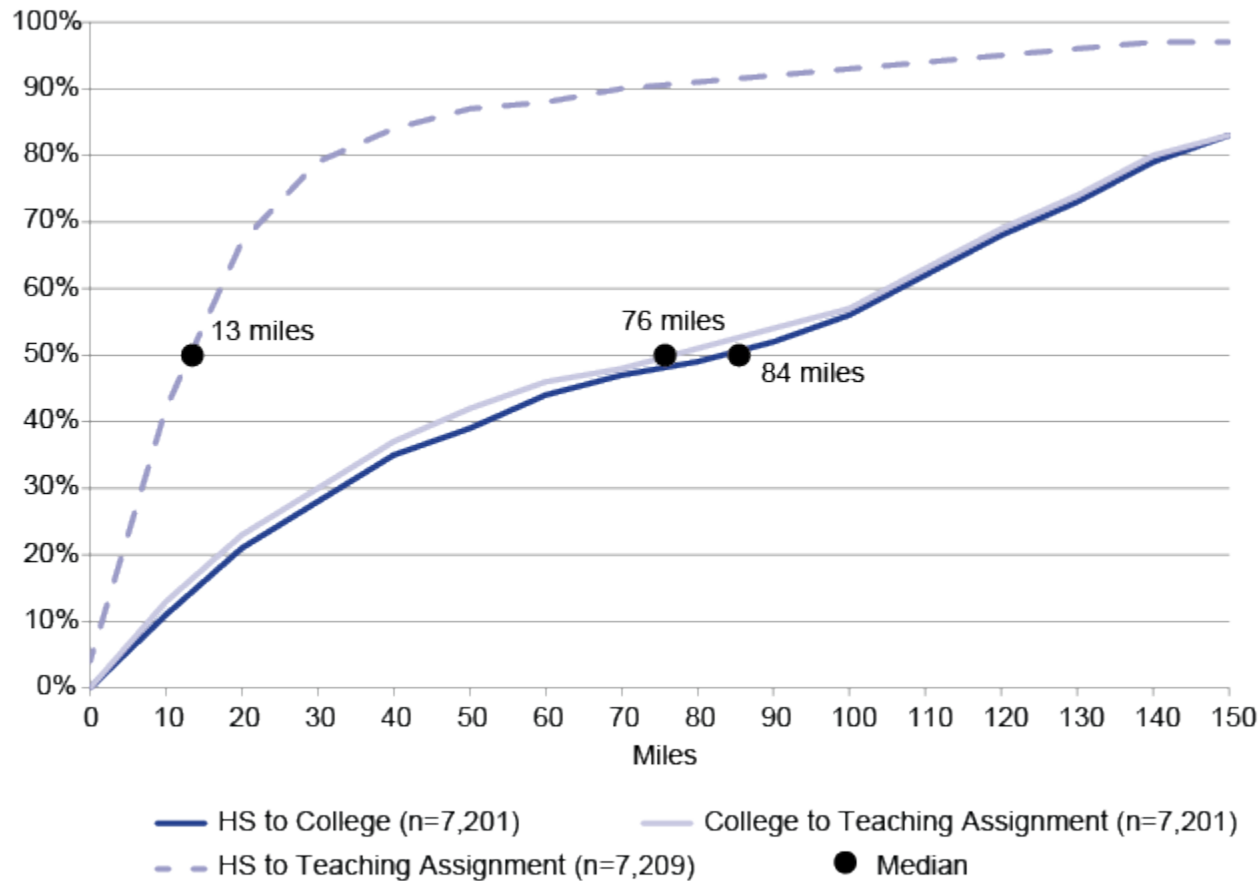
- Chicago under-produces teachers (relative to the size of their student population), whereas the rest of the Northeast over-produces
- Yet, certificants from Chicago transitioned to teaching at the *lowest rates*, and certificants from the Northeast transition to teaching at the *highest rates* (relative to all other regions)

|  | CPS | NE  | NW  | WC  | EC  | SW  | SE  |
|--|-----|-----|-----|-----|-----|-----|-----|
| % of certificants from this region who progressed to teaching in IPS | 38% | 48% | 47% | 43% | 42% | 40% | 40% |

# Methodology for Geography Study

- **THESE ANALYSES FOCUS SOLELY ON THE TEACHERS (N=7,209) WHO EMERGED FROM OUR COHORTS**
- **WE USE THE LOCATION OF THE HIGH SCHOOL FROM WHICH A STUDENT GRADUATED AS A PROXY FOR HIS/HER “HOMETOWN”**
- **We used latitude and longitude coordinates to calculate distances between three key points in the new teacher pipeline:**
  - Hometown (high school) & college (BA granting institution)
  - College & first teaching assignment
  - Home & first teaching assignment
- **We also examined the differences between some of the *characteristics* associated with the three points:**
  - How many new teachers obtain their first teaching job in a school or district with similar characteristics as where they graduated high school?
  - What is the flow of new teachers between those three points based on region?

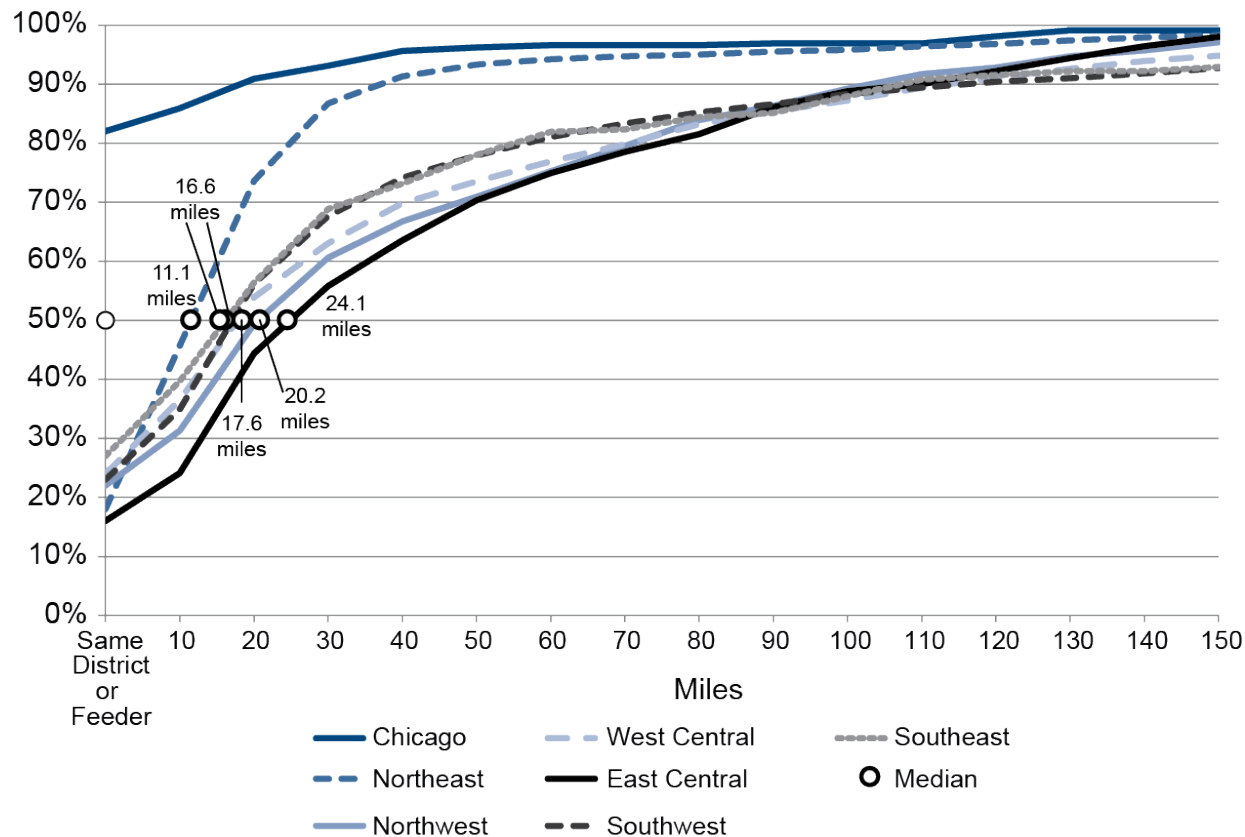
# Distances between Home, College, and First Teaching Assignment



- Teachers tend to travel considerably further from home to attend college than they do for their first teaching position

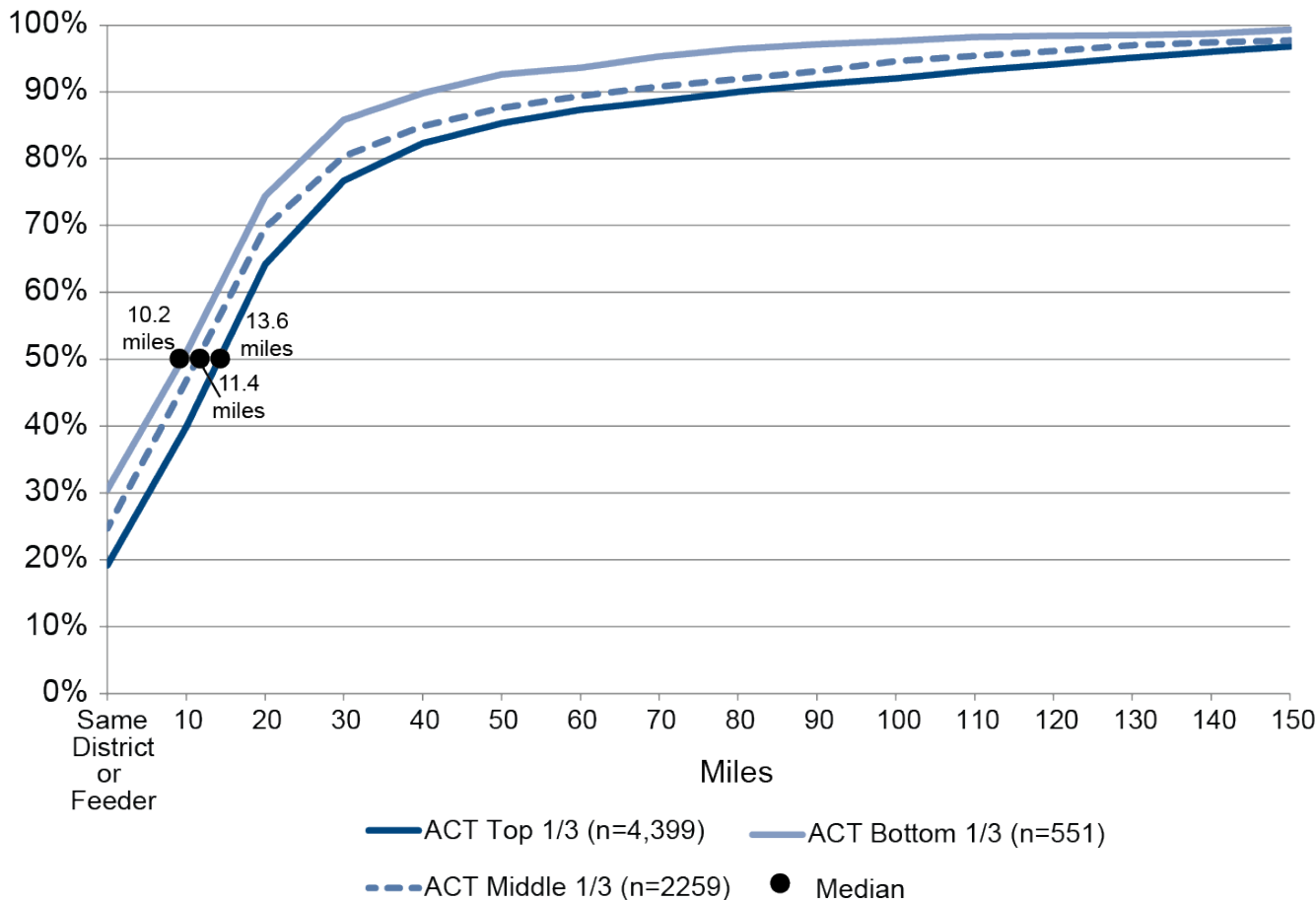


# Median Distance by Home Region



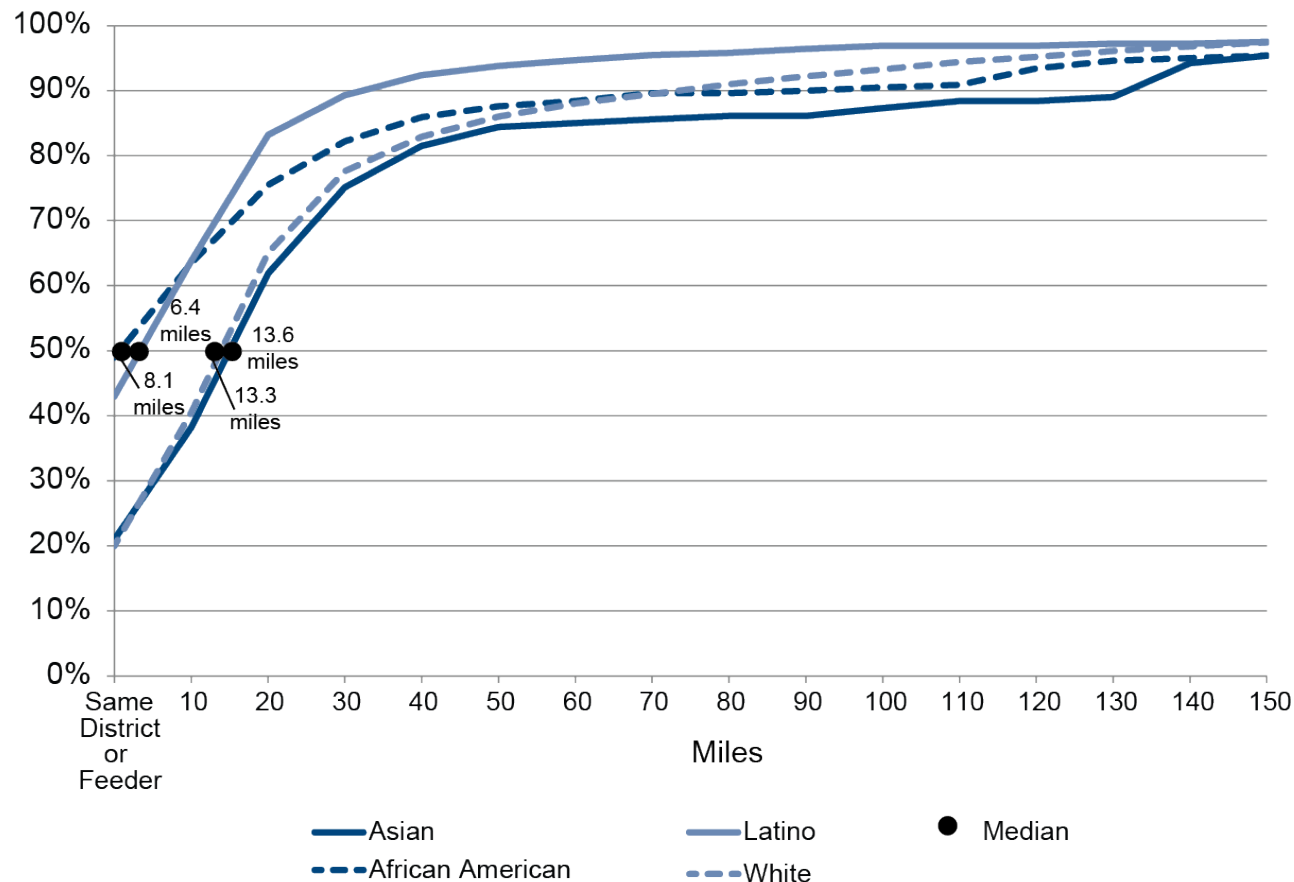
- Teachers from Chicago were the least mobile by a considerable degree (more than 50% began teaching in CPS)
- Teachers from the Northeast (who were the most mobile for college) still tended to start teaching quite close to home

# Median Distance by ACT



- New teachers with higher ACT scores were slightly more mobile than their counterparts with lower ACT scores

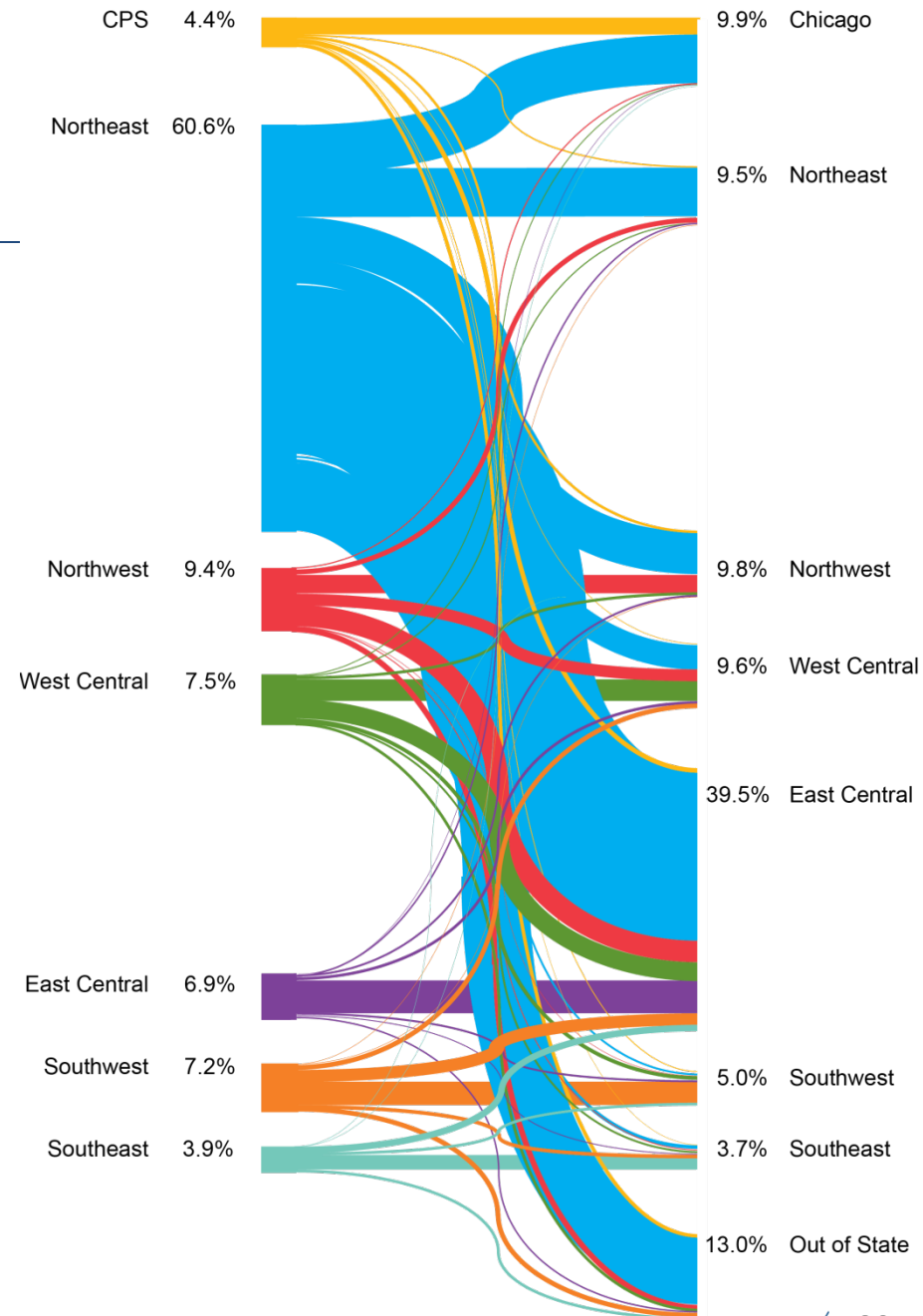
# Median Distance by Race/Ethnicity



- Latino and African-American teachers were less mobile than White and Asian-American teachers

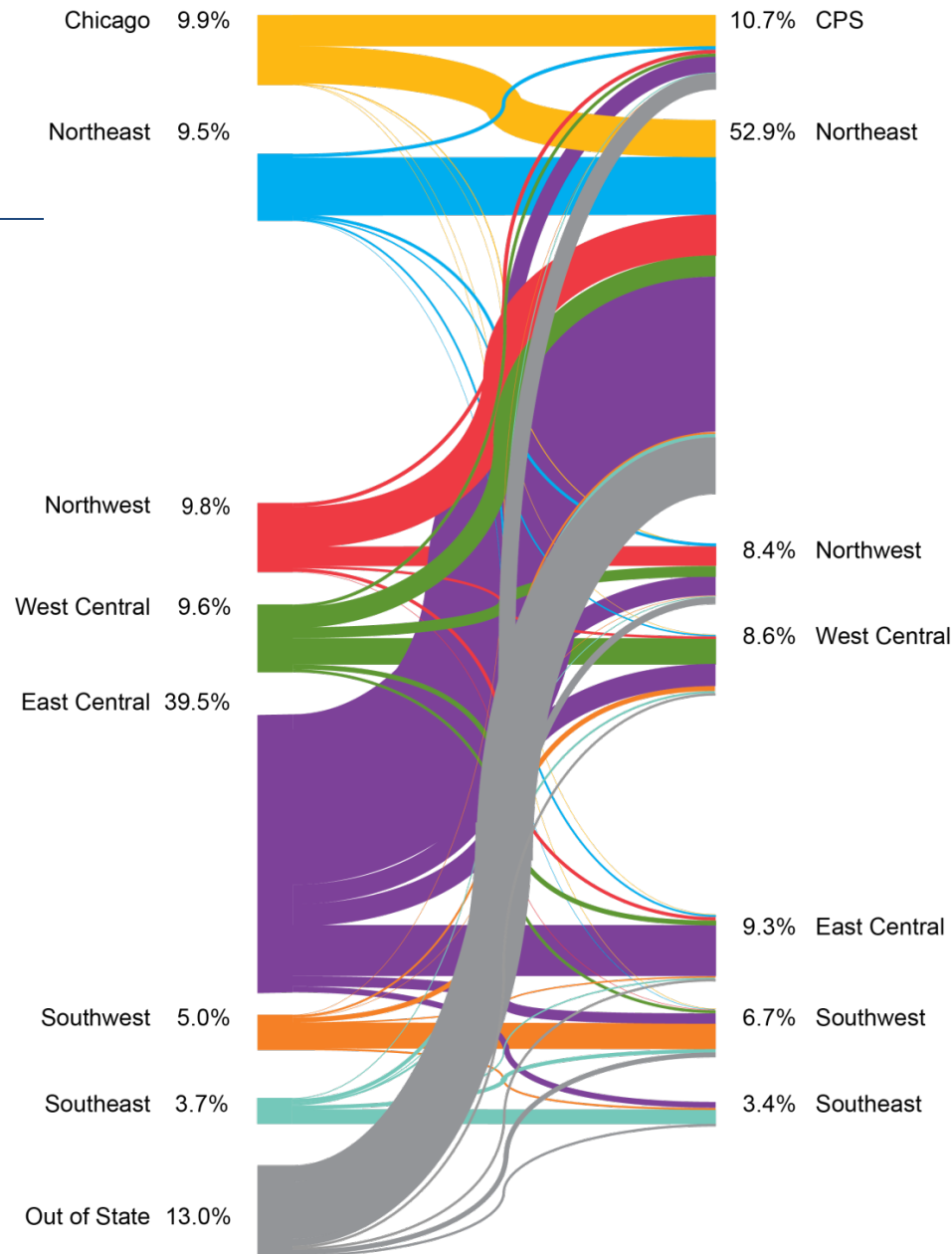
# Flow from Home to College

- Sankey diagrams – depict size and direction of flow from one region to another
- While most new teachers graduated from HS in the Northeast region, the greatest number of new teachers earned their degree in the East Central region
- The second most popular college “region” for Illinois teachers was out-of-state



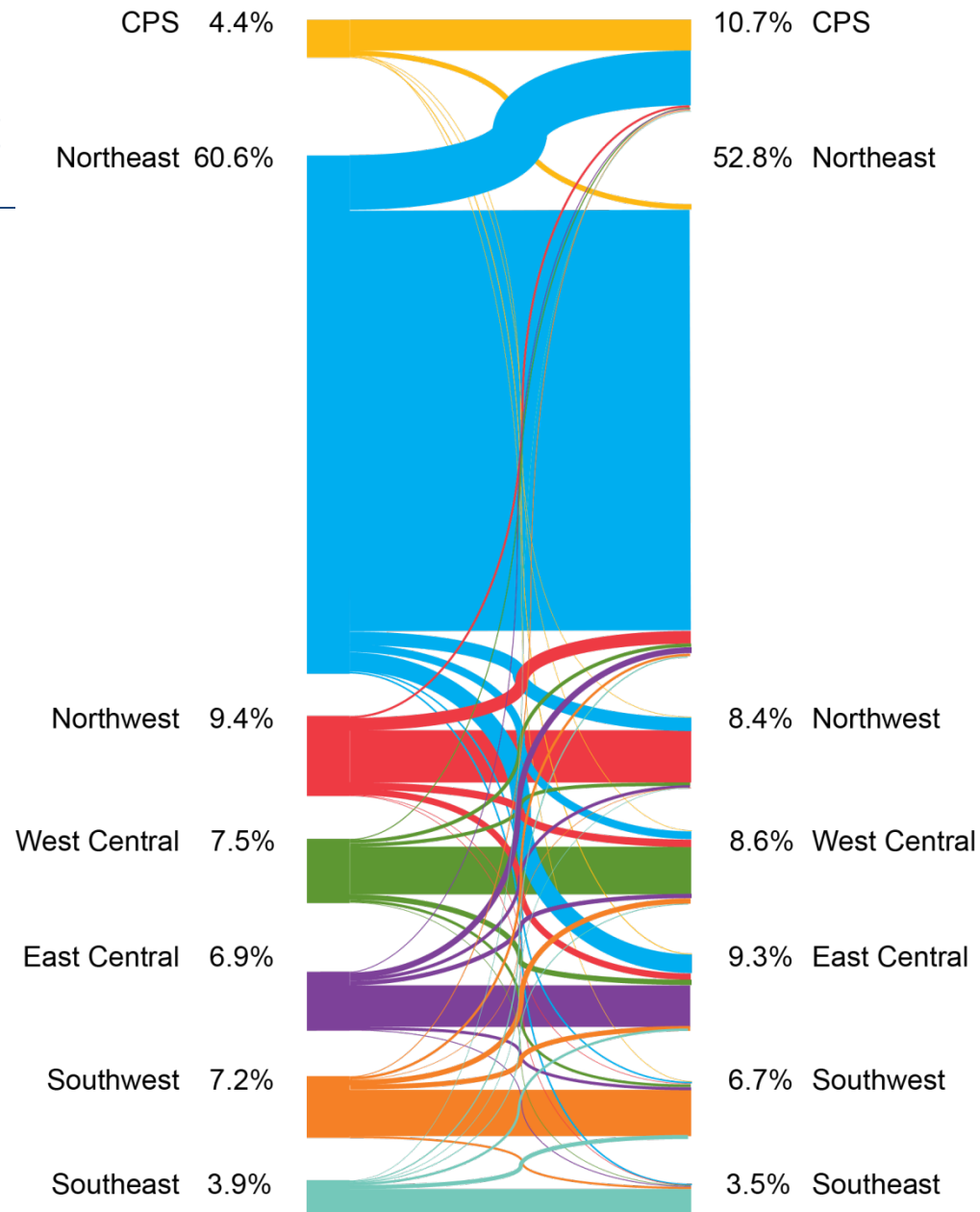
# Flow from College to First Teaching Assignment

- Substantial movement from colleges in the East Central to teaching in schools outside of this region
- Substantial movement to teaching at schools in Chicago and the Northeast from colleges outside of these regions



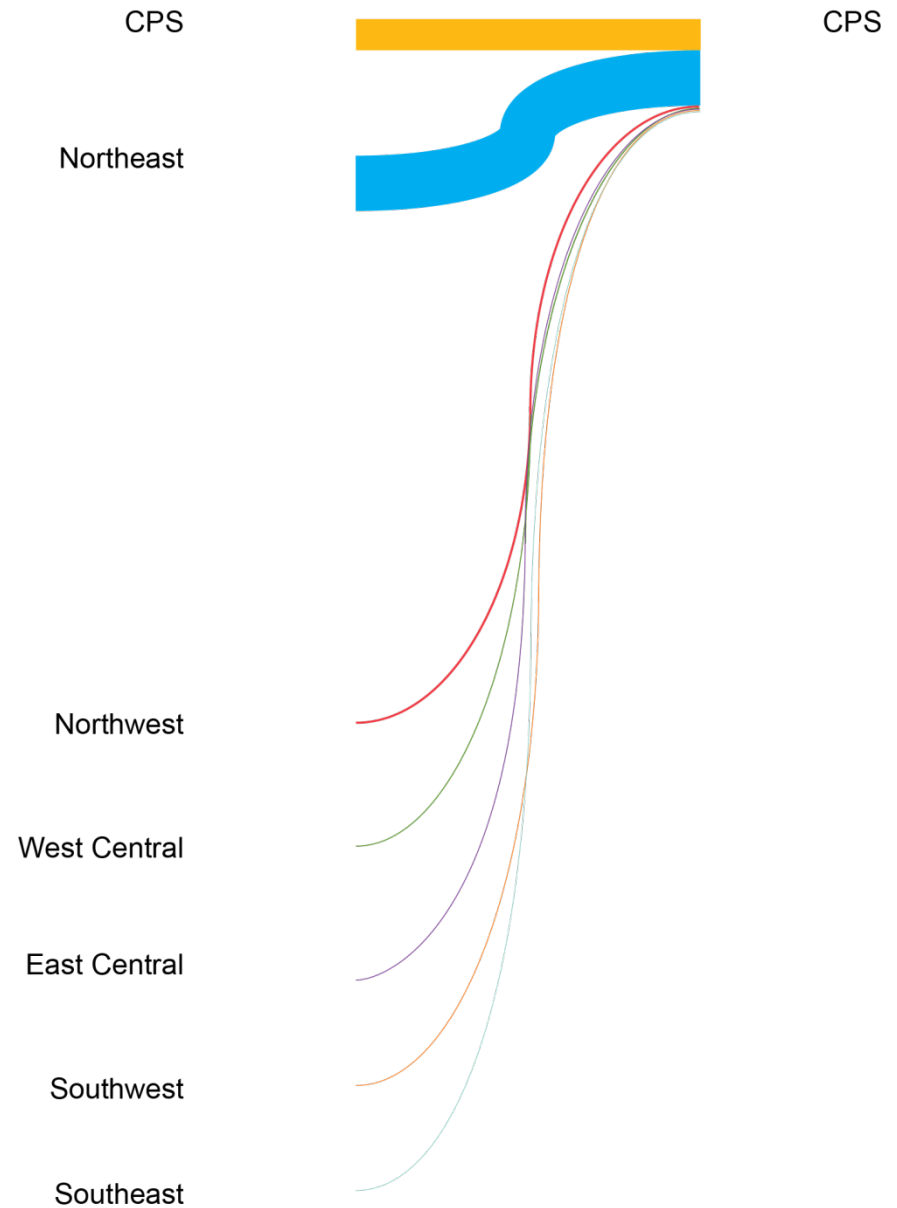
# Flow from Home to First Teaching Assignment

- The vast majority of the new teachers in each region graduated from high schools in that region...
- ...except for Chicago. Only a **third** of new CPS teachers graduated from CPS high schools
- Very limited movement into or out of the Southeast and Southwest regions



# Flow from the Northeast region to CPS

- New teachers who attended HS in the Northeast region and began teaching in CPS
- Were they more or less diverse than their peers from the Northeast who stayed in the Northeast to teach?
- Were they more or less academically qualified than their peers from the Northeast who stayed in the Northeast to teach?
- How do they compare with native Chicago teachers?



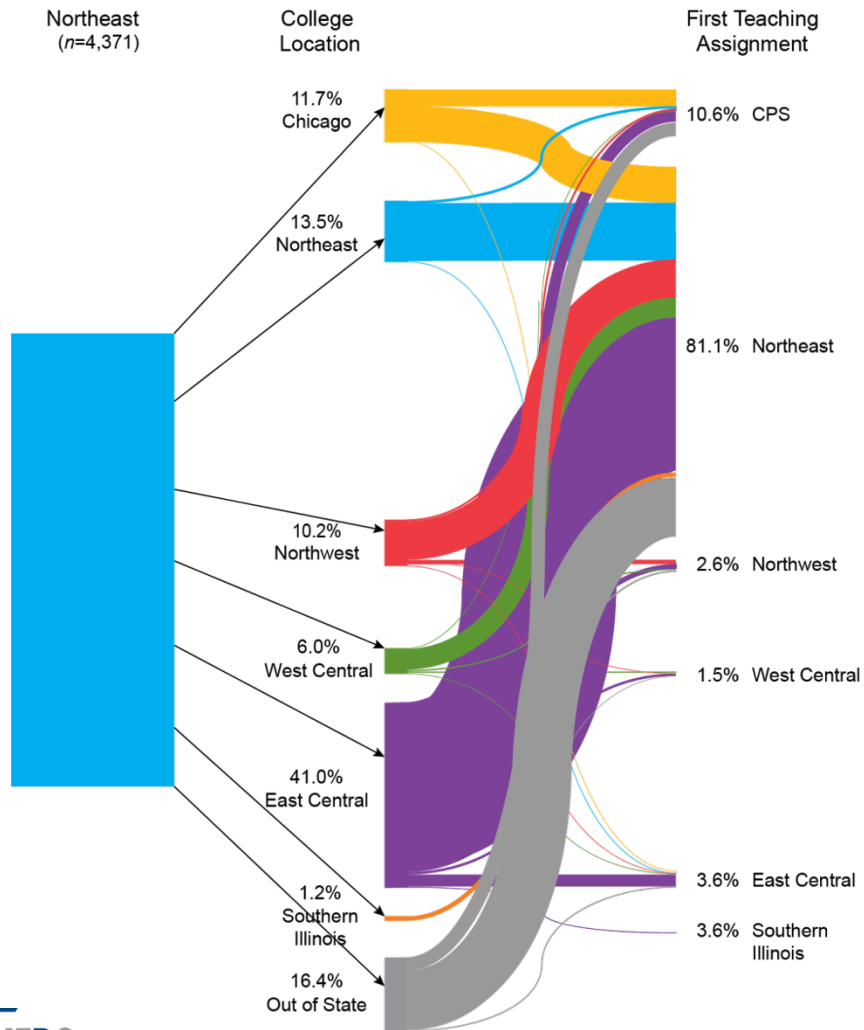
# Flow from the Northeast to CPS

|                    | NE → NE      | NE → CPS    | CPS → CPS   |
|--------------------|--------------|-------------|-------------|
| <i>N</i>           | <b>3,547</b> | <b>463</b>  | <b>261</b>  |
| Bottom 1/3 ACT     | <b>7%</b>    | <b>6%</b>   | <b>18%</b>  |
| Middle 1/3 ACT     | <b>29%</b>   | <b>22%</b>  | <b>47%</b>  |
| Top 1/3 ACT        | <b>64%</b>   | <b>73%</b>  | <b>35%</b>  |
| Mean ACT Composite | <b>23.2</b>  | <b>24.0</b> | <b>20.9</b> |
| Asian American     | <b>2%</b>    | <b>9%</b>   | <b>8%</b>   |
| Black              | <b>2%</b>    | <b>7%</b>   | <b>31%</b>  |
| Hispanic           | <b>5%</b>    | <b>6%</b>   | <b>38%</b>  |
| Missing            | <b>3%</b>    | <b>4%</b>   | <b>4%</b>   |
| Multi-Racial       | <b>2%</b>    | <b>4%</b>   | <b>4%</b>   |
| Native American    | <b>—</b>     | <b>—</b>    | <b>—</b>    |
| White              | <b>86%</b>   | <b>71%</b>  | <b>16%</b>  |

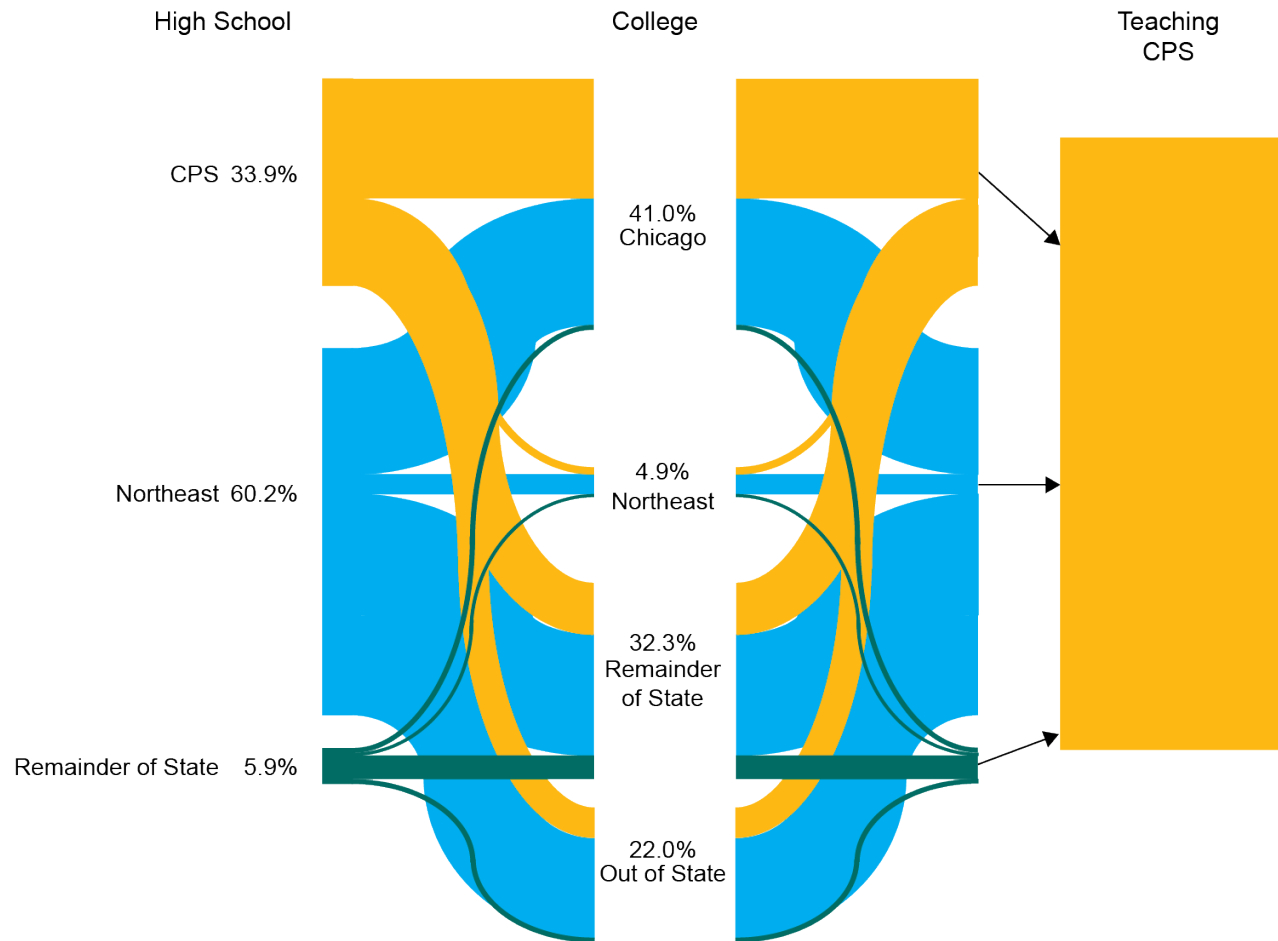
New CPS teachers from the Northeast were more diverse than their peers who stayed in the NE (but much less diverse than native CPS teachers)



# Flow from the Northeast to college and teaching



# Flow from high school and college to CPS



# Race/Ethnicity and School Demographics of First Teaching Assignment

| Teacher Race/Ethnicity | Mean % White | Mean % Black | Mean % Hispanic | Mean % Asian |
|------------------------|--------------|--------------|-----------------|--------------|
| White                  | 63.5         | 13.5         | 16.1            | 4.0          |
| Black                  | 15.8         | 69.5         | 11.0            | 1.9          |
| Hispanic               | 27.3         | 16.2         | 50.0            | 4.1          |
| Asian                  | 40.1         | 21.8         | 28.5            | 6.9          |

New teachers tend to begin their careers in schools with higher proportions of same-race students.

# Teacher Academics and School Demographics

| Teacher ACT Composite | School Demographics of First Teaching Assignment |            |                                  |                           |
|-----------------------|--|------------|----------------------------------|---------------------------|
|                       | Mean % White                                     | Mean % FRL | % High Minority (75%+ Non-White) | % High Poverty (50%+ FRL) |
| Top 1/3               | 59.8%  | 41.0%      | 19.4%                            | 34.6%                     |
| Middle 1/3            | 58.1%  | 48.2%      | 22.3%                            | 43.1%                     |
| Bottom 1/3            | 53.6%  | 54.0%      | 27.1%                            | 52.3%                     |

Teachers from the bottom 1/3 of the ACT distribution tend to begin teaching in schools with larger proportions of poor and non-White students

# Demographics of First Teaching Assignment by Teachers' High School Demographics

| Teacher Attended High Minority (75% Non-White) High School | Demographics of First Teaching Assignment |                  |
|--|---|------------------|
|  | High Minority (75%+ Non-White)            | Mean % Non-White |
| No   | 17.3%                                     | 38.9%            |
| Yes  | 85.0%                                     | 89.8%            |

- The vast majority of teachers who graduated from high-minority or high-poverty schools begin teaching in schools with similar demographics...

| Teacher Attended High Poverty (50%+ FRL) High School | School Poverty Composition of First Teaching Assignment |            |
|--|---|------------|
|  | % High Poverty (50%+ FRL)                               | Mean % FRL |
| No   | 36.0%   | 42.4%      |
| Yes  | 81.6%   | 73.9%      |

- ...but so do sizeable proportions of teachers who did not graduate from disadvantaged high schools (In fact, most teachers who start teaching in disadvantaged schools did not attend such schools themselves)

# Demographics of First Teaching Assignment by Teachers' HS Demographics and Teacher Characteristics

| Teacher Attended High Minority (75%+ Non-White) High School | School Racial Composition of First Teaching Assignment |                                  |                  |
|---|--|----------------------------------|------------------|
|   | Teacher Race/Ethnicity                                 | % High Minority (75%+ Non-White) | Mean % Non-White |
| No  | White  | 13%                              | 32.0%            |
|   | African American                                       | 46%                              | 64.8%            |
|   | Latino   | 33%                              | 56.9%            |
|   | Asian American   | 27%                              | 50.9%            |
|   | Native American  | (N<10)                           | (N<10)           |
|   | Multi-Racial   | 21%                              | 41.6%            |
|   | Missing  | 22%                              | 43.4%            |
| Yes   | White  | 24%                              | 50.5%            |
|   | African American                                       | 78%                              | 86.4%            |
|   | Latino   | 67%                              | 78.9%            |
|   | Asian American   | 52%                              | 68.8%            |
|   | Native American  | (N<10)                           | (N<10)           |
|   | Multi-Racial   | 43%                              | 64.4%            |
|   | Missing  | 45%                              | 63.4%            |

- A small proportion of White teachers begins teaching in a high minority school – even among those who graduated from a high minority high school...
- ...but a large proportion of top 1/3 ACT teachers begin in high poverty schools – especially among those who graduated from a high poverty high school

| Graduated from a High Poverty (50%+ FRL) HS | ACT Composite | First Teaching Assignment in High Poverty School |
|---|---------------|--|
|   |               |  |
| No  | Top 1/3       | 33.2%  |
|   | Middle 1/3    | 39.3%  |
|   | Bottom 1/3    | 46.4%  |
| Yes   | Top 1/3       | 74.0%  |
|   | Middle 1/3    | 83.9%  |
|   | Bottom 1/3    | 91.4%  |

# Shifting demographics over time

|                    | Overall | Teaching in Same School | Teaching in Same District or Feeder | Teaching in Same Region |           |           |              |              |           |           |
|--------------------|---------|-------------------------|-------------------------------------|-------------------------|-----------|-----------|--------------|--------------|-----------|-----------|
|                    |         |                         |                                     | CPS                     | Northeast | Northwest | West Central | East Central | Southwest | Southeast |
| N                  | 7,003   | 286                     | 1,609                               | 260                     | 3,473     | 414       | 388          | 330          | 365       | 190       |
| % White            | -72.5   | -28.0                   | -36.3                               | -104.7                  | -91.5     | -62.2     | -54.5        | -69.9        | -70.0     | -40.1     |
| % African American | 41.6    | 10.6                    | 15.1                                | 30.8                    | 38.6      | 18.1      | 31.0         | 49.0         | 53.5      | 15.7      |
| % Latino           | 49.4    | 18.4                    | 24.3                                | 18.3                    | 69.3      | 48.3      | 39.0         | 46.2         | 28.7      | 34.3      |
| % Asian            | -11.5   | 5.8                     | -6.0                                | -61.5                   | -6.2      | 11.7      | 14.8         | 27.5         | 0.0       | 0.0       |
| % ELL              | 60.2    | 26.1                    | 60.1                                | 82.9                    | 71.3      | 22.9      | 55.9         | 62.5         | 53.7      | 61.1      |
| % Low Income       | 110.5   | 74.4                    | 79.1                                | 125.1                   | 105.5     | 105.1     | 135.9        | 131.3        | 134.2     | 149.0     |

Cells are shaded according to their differences from zero. Proportional Retraction



Proportional Growth



- Across all regions, teachers tend to begin their careers at schools that are more disadvantaged than the schools from which they graduated (especially with regard to English proficiency and poverty) ...
- This holds true even for teachers returning to the same school from which they graduated

# Summary

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- Similar to existing studies, we find that new Illinois teachers generally begin teaching in schools that are both geographically and demographically familiar
  - Labor markets for new teachers are quite small geographically – and even smaller for non-White teachers and teachers with weaker academic backgrounds)
  - Nonetheless, due to Illinois' shifting student demographics, these teachers tend began their careers at schools that are more disadvantaged than the schools from which they graduated – even those who returned to teach at their alma maters
- The vast majority of the new teachers in each region graduated from high schools in that region
  - Except for Chicago, where only a third of new teachers were native to CPS
  - And despite the fact that there is substantial mobility between home & college and between college & initial teaching placement
- Chicago tends to under-produce new teachers and the Northeast region tends to over-produce new teachers (relative to the size of their student population).
  - But the teachers who are “imported” to Chicago from the Northeast region tend to have substantially higher academic qualifications and are more diverse than those who remain in the Northeast





## ***Illinois Education Research Council***

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