

Zoned-In and Zoned-Out: Changes in School Attendance Zones over Time

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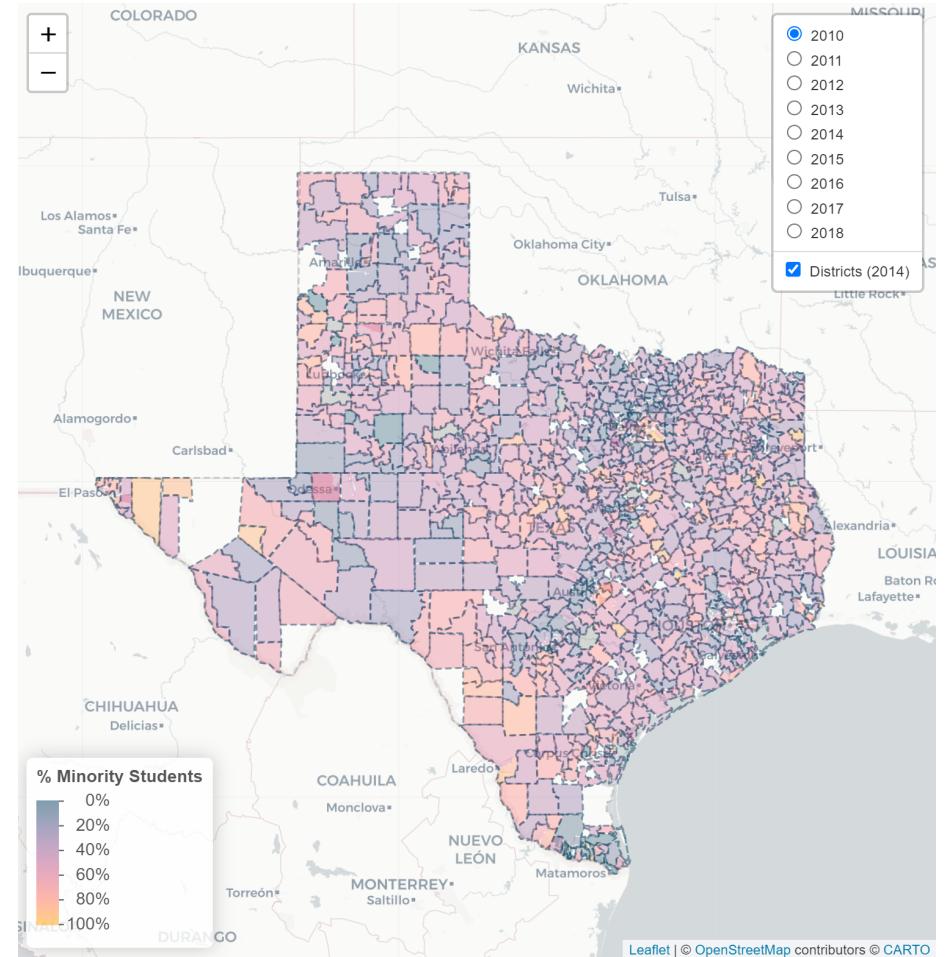
Attendance zones, new schools, and segregation

- Schools can either **attract** or **push away** residents depending on socioeconomic characteristics
(Hasan & Kumar, 2019; Gibbons, Machin, & Silva 2013; Figlio & Lucas, 2004)
- Neighborhoods have important effects on **long-term outcomes** (Chetty et al. 2020)
- **Racial and socioeconomic disparities** in the school system also have long-term effects on students (Reardon, 2016; Billings et al., 2014)

New public schools opening → Changes in attendance zones

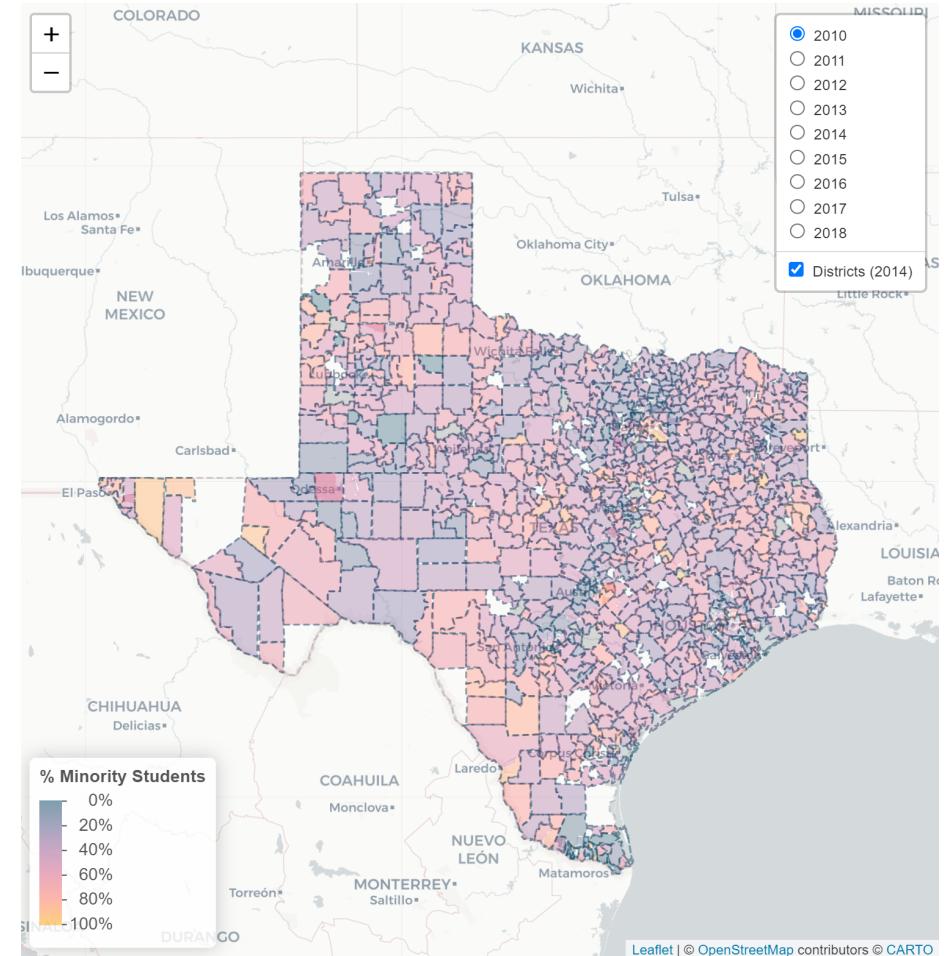
This paper

- How do **changes in attendance zones (AZ)** affect:
 - Zoned-in areas (i.e. neighborhoods)?
 - Zoned-out areas (i.e. neighborhoods and schools)?



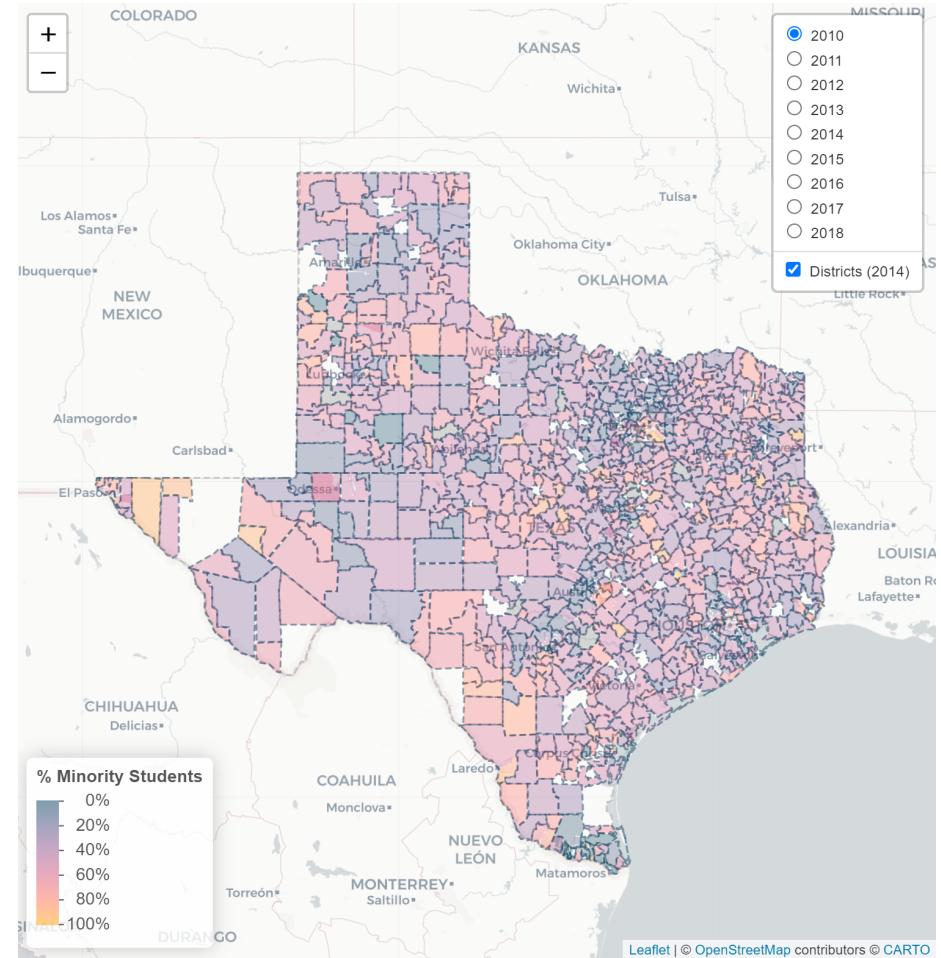
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- **New high schools** in Texas that changed AZ → mostly gentrified areas



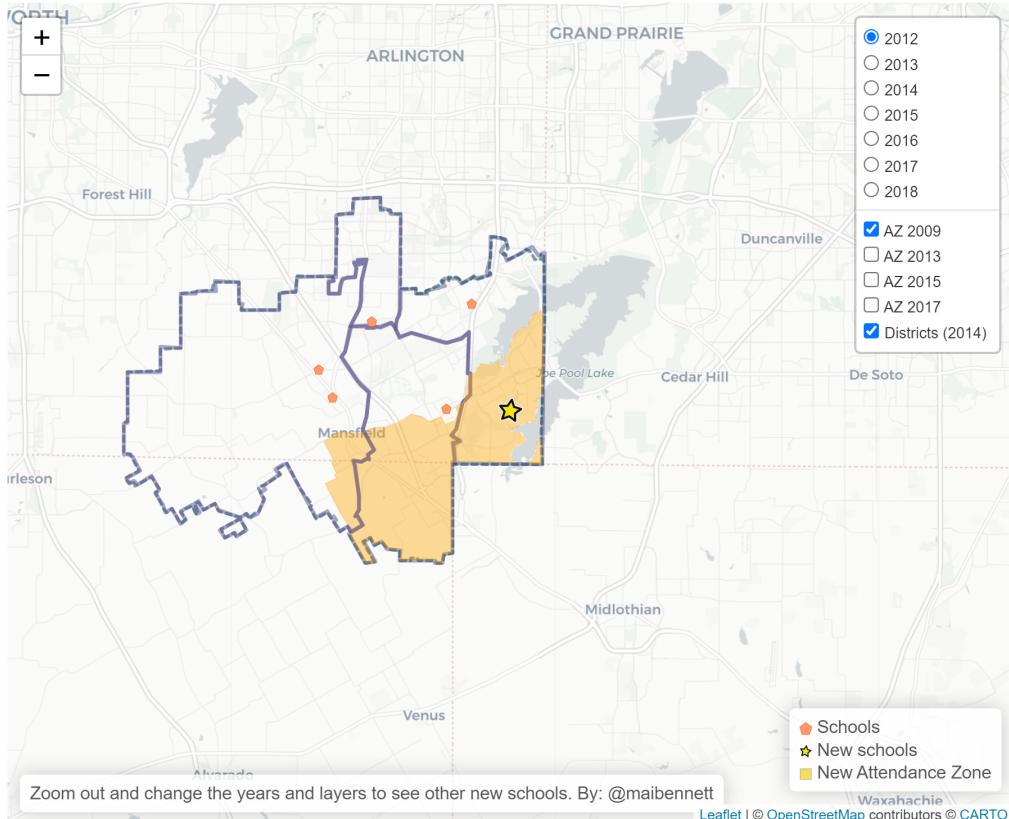
This paper

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 - Zoned-in areas (i.e. neighborhoods)?
 - Zoned-out areas (i.e. neighborhoods and schools)?
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- **Outcomes of interest:**
 - Differences in scores and score gaps between race/ethnicity
 - Differences in school composition
 - Differences in neighborhood composition

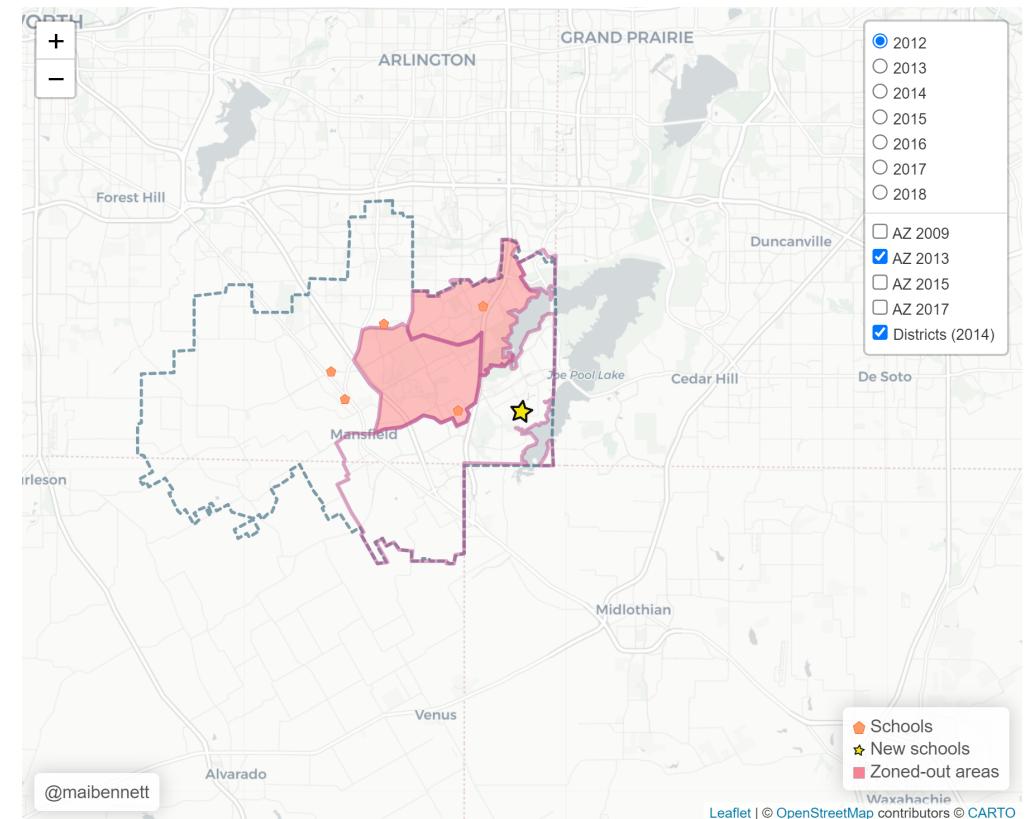


What do we mean by zoned-in and zoned-out areas?

Zoned-in area: Attendance zone for a new school S'

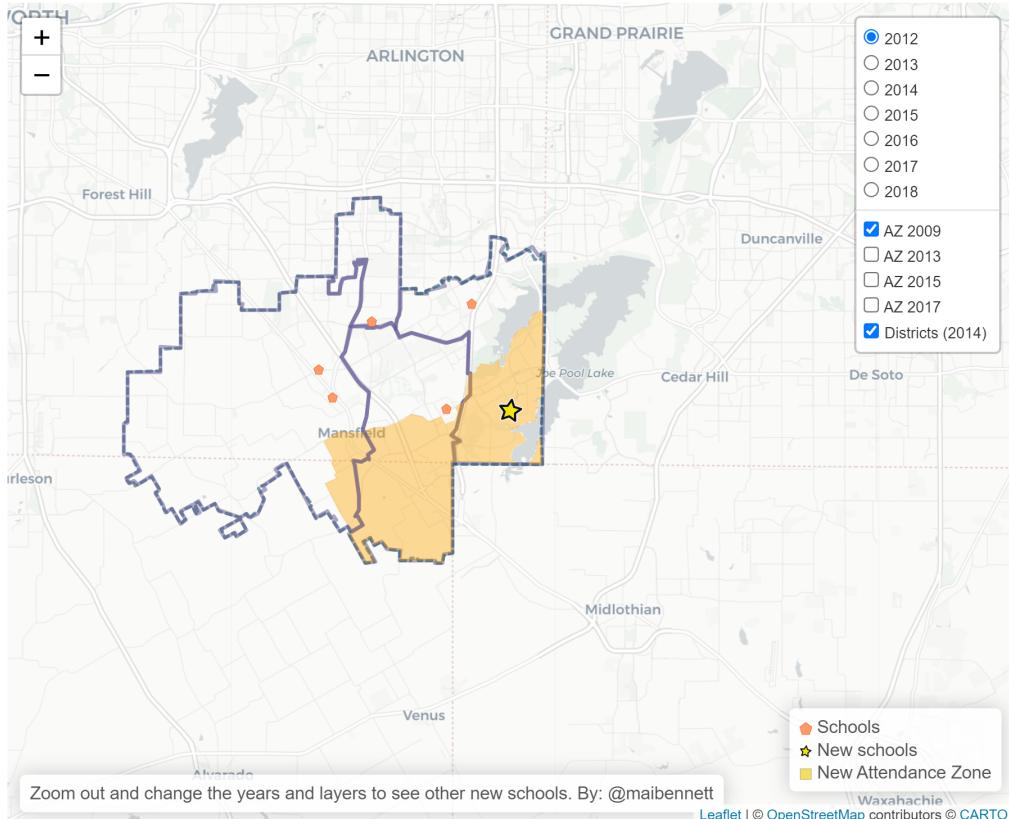


Zoned-out area: New attendance zone for school S after the opening of schools S' .

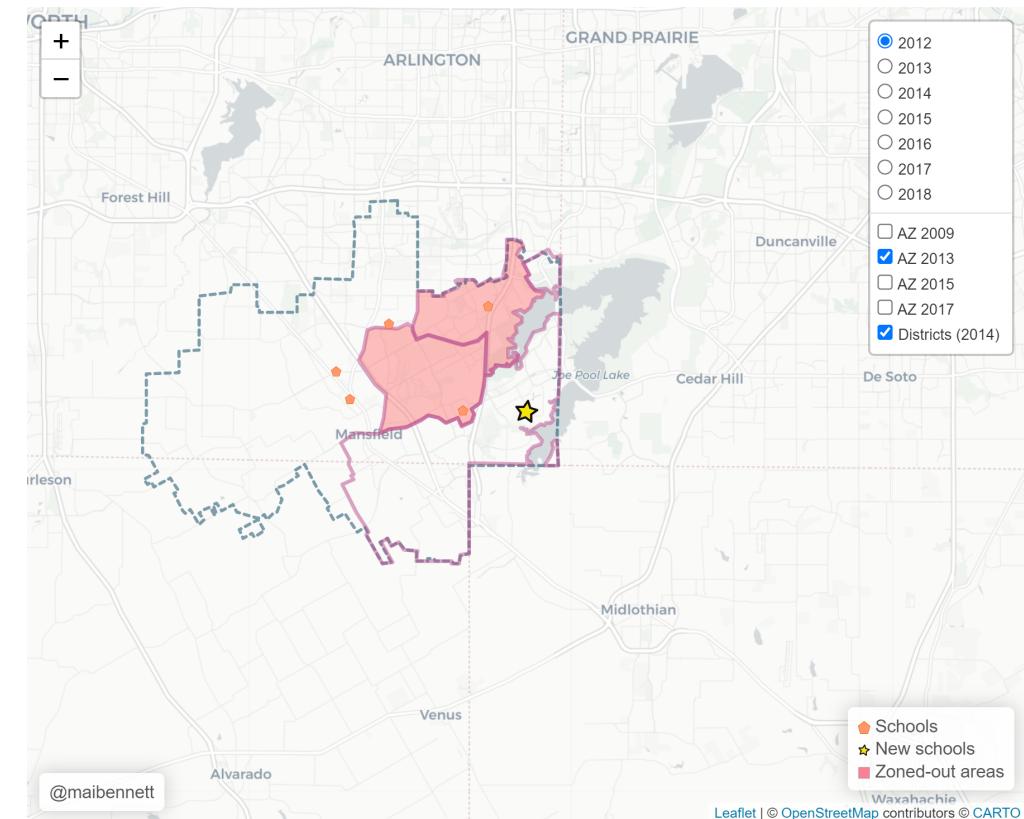


What do we mean by zoned-in and zoned-out areas?

Zoned-in area: Attendance zone for a new school S'



Spillover school: School which had a part of their catchment area zoned-in to S' .



Data

- **Common Core Data (CCD) [2005-2019]**: Administrative data from NCES, including demographic and socioeconomic characteristics of schools.
- **Texas Education Agency (TEA) data [2005-2019]**: Performance data for schools over time.
- **Attendance zones maps [2009-2017]**: Geographic data for school boundaries over time from SABS, SABINS, and Maponics.
- **Census and American Community Survey (ACS) data [2010-2019]**: Demographic information at the census tract level
- **Housing Prices data [2005-2019]**: Information about housing prices over time from CoreLogic and Zillow (*coming soon*).

Identification Strategy: An Augmented Synthetic Control Method

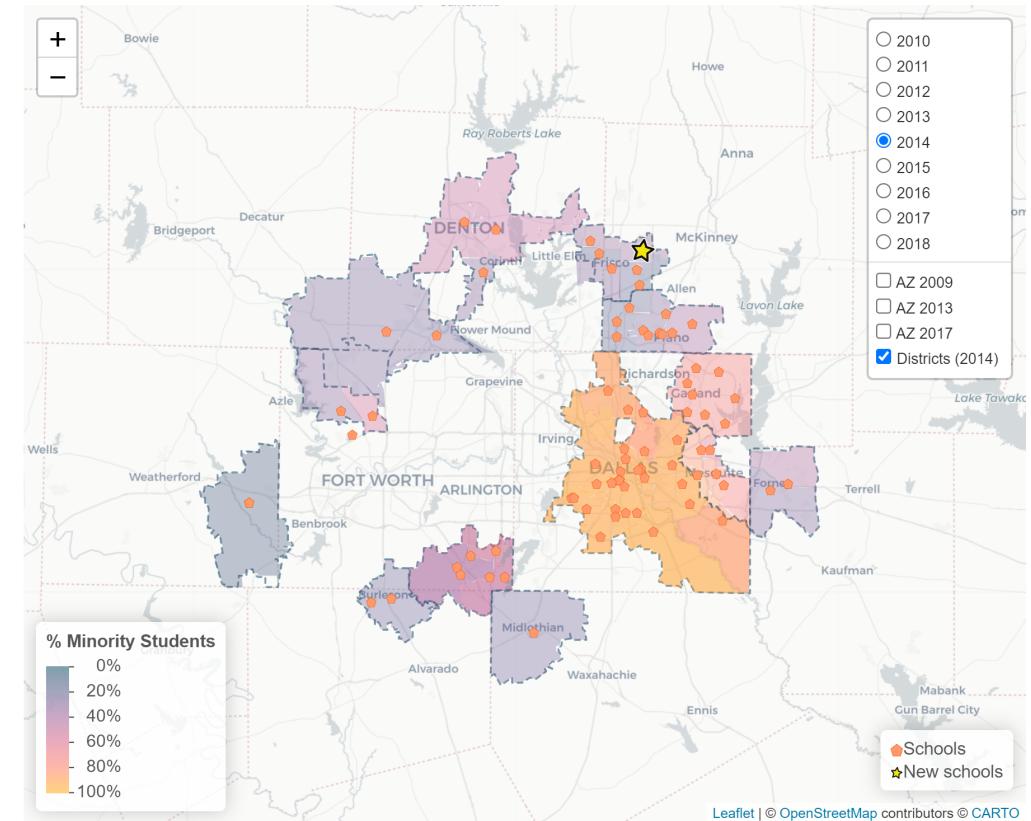
- Use a **weighted average** of similar districts/schools/AZ/neighborhoods to create a comparison group for affected areas.
- Under **Augmented Synthetic Control Method** (ASCM) (Ben-Michael et al., 2020) there is a correction for poor fit:

$$\hat{Y}_{1T}^{aug}(0) = \sum_{W_i=0} \gamma_i Y_{iT} + (\hat{m}_{iT}(\mathbf{X}_i) - \sum_{W_i=0} \gamma_i \hat{m}_{iT}(\mathbf{X}_i))$$

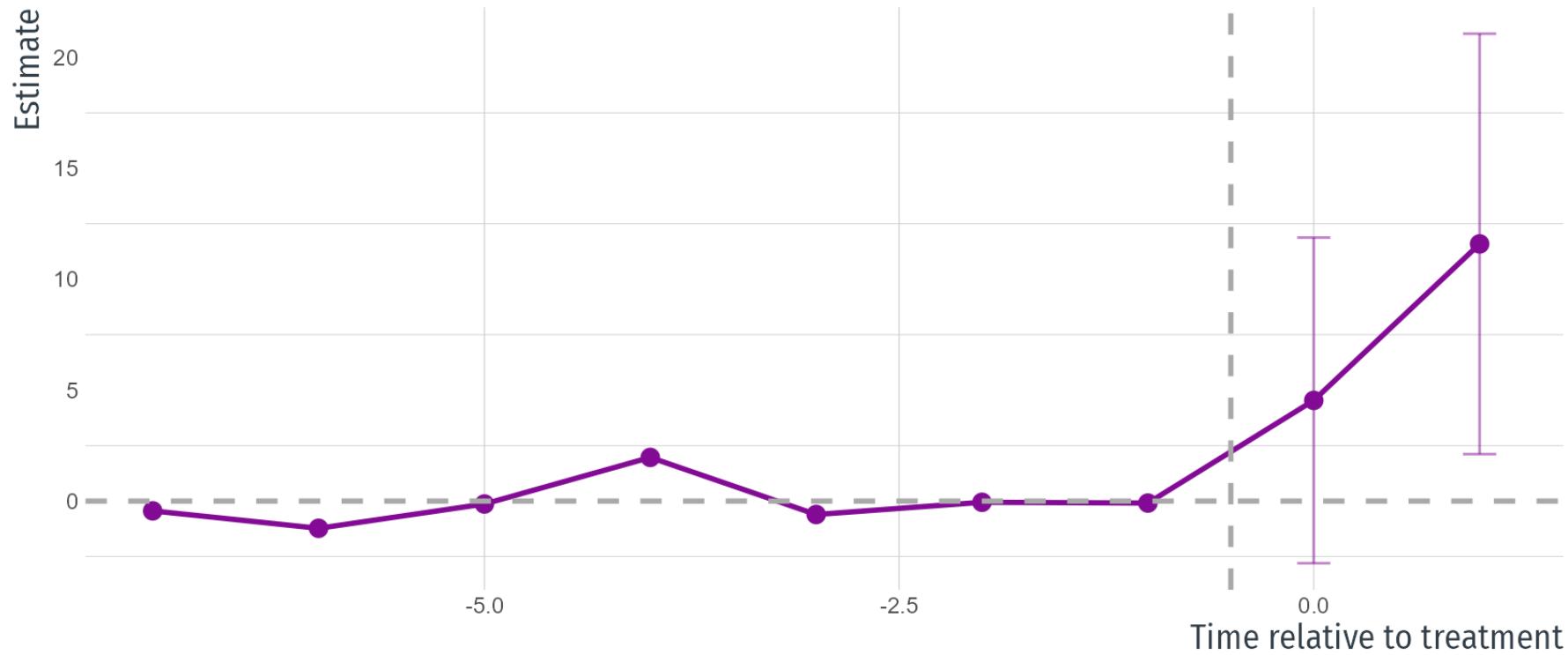
- m_{iT} : Estimator for $Y_{iT}(0)$
- Extrapolation for "bias correction".
- If ridge regression is used → penalization for extrapolation.
- Proposal of **sensitivity analysis to hidden bias** (Rosenbaum, 2002; Keele et al., 2019):
 - *How much should an unobserved confounder affect the probability of treatment (i.e. new school opening there vs in a control area) to explain away the results we find?*

Broader picture: What happens to districts?

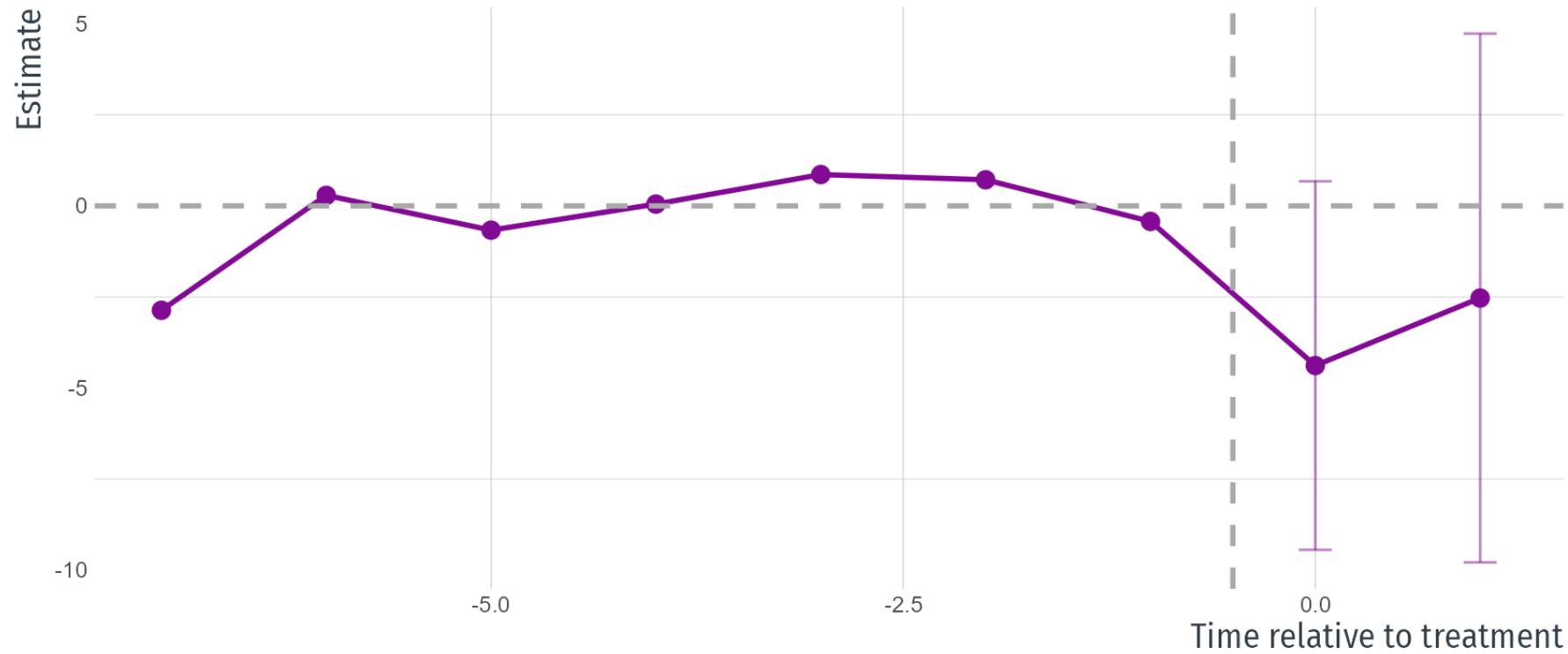
- Compare districts with a new school between 2012 and 2016 vs districts with no new schools.
- ASCM for different characteristics, adjusting for other baseline covariates (e.g. number of schools, enrollment, %FRPL, % race/ethnicity)



Districts with new schools increase gap in Math

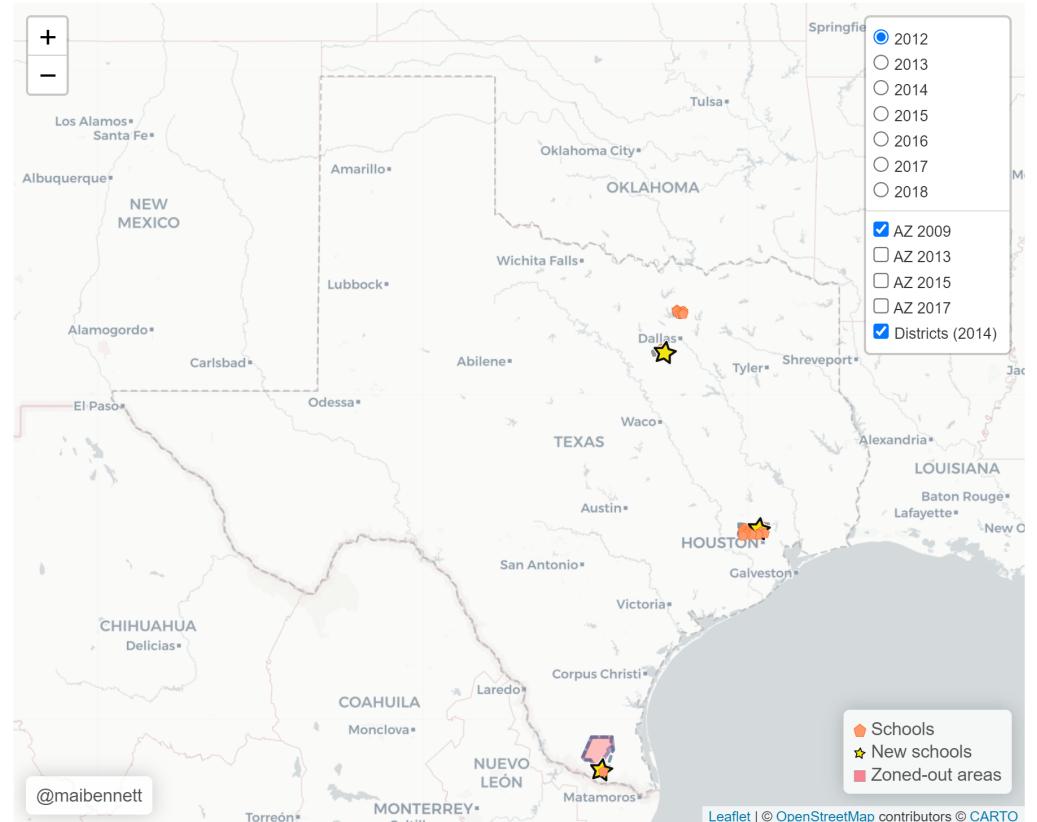


... no significant change in Reading



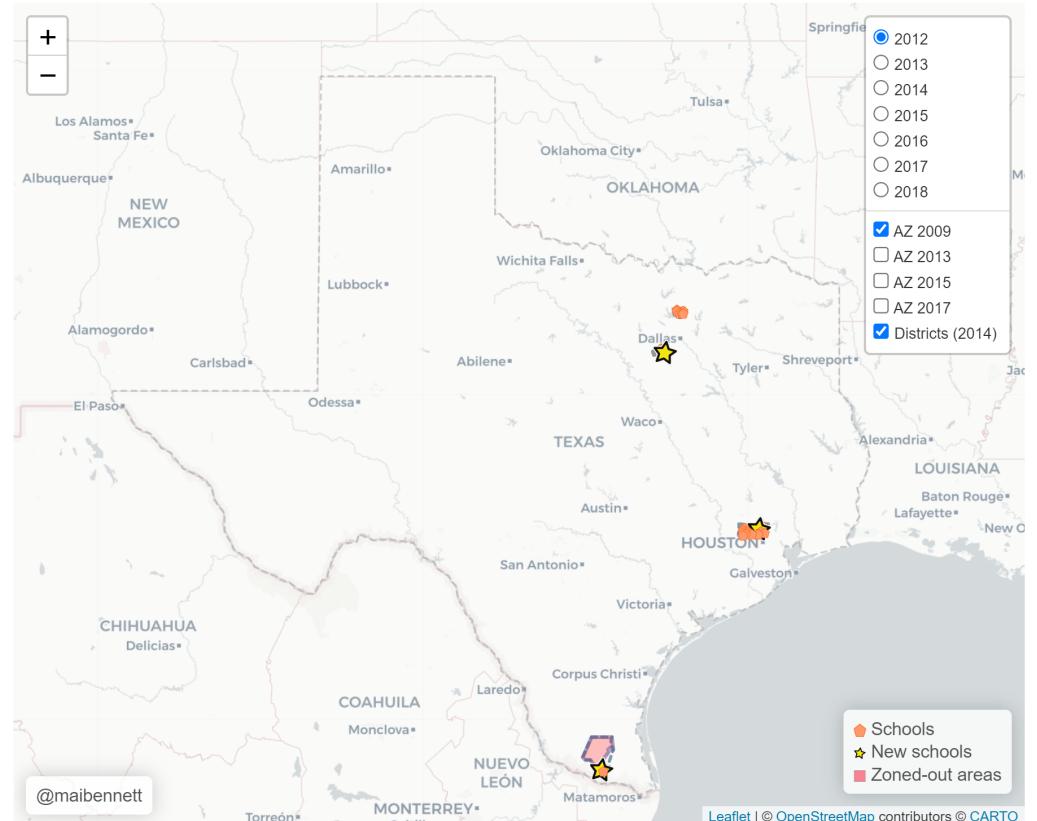
What happens within districts?

- Identify **6 new high schools** between 2012-2016 that change AZ.
- Compare attendance zones *within districts* to create a counterfactual.



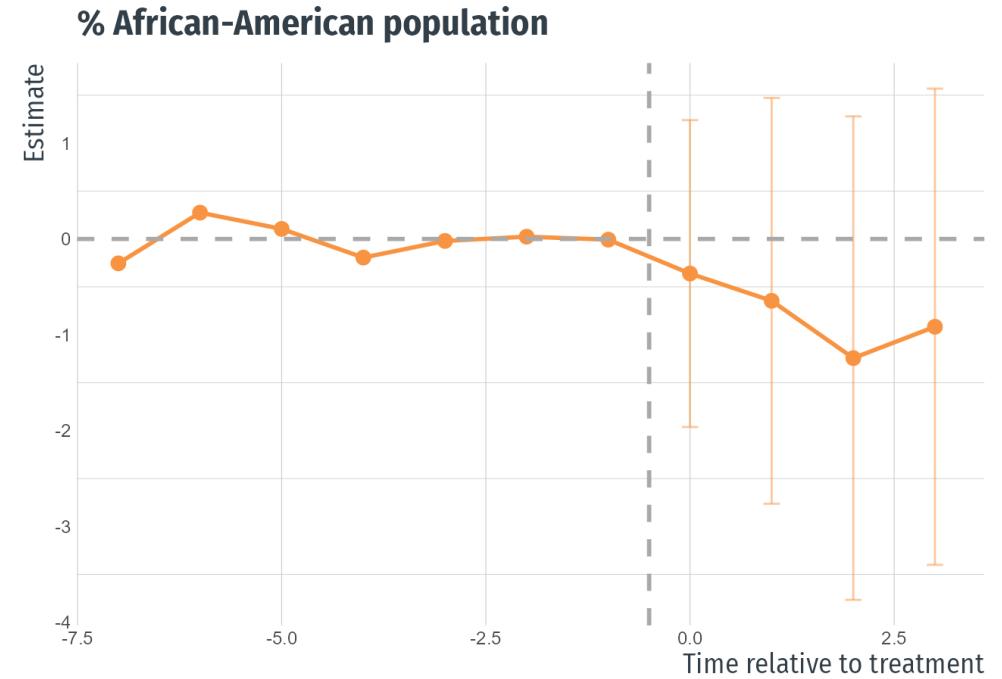
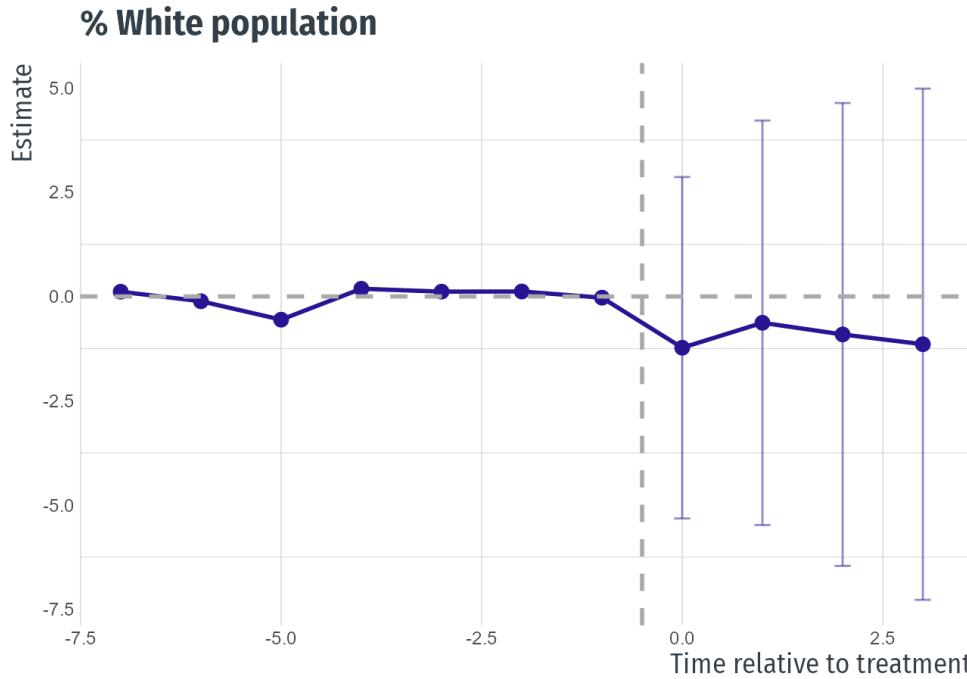
What happens within districts?

- Identify **6 new high schools** between 2012-2016 that change AZ.
- Compare attendance zones *within districts* to create a counterfactual.
- **Important caveat:**
 - Limited sample size → under-powered.
 - Trends are suggestive.



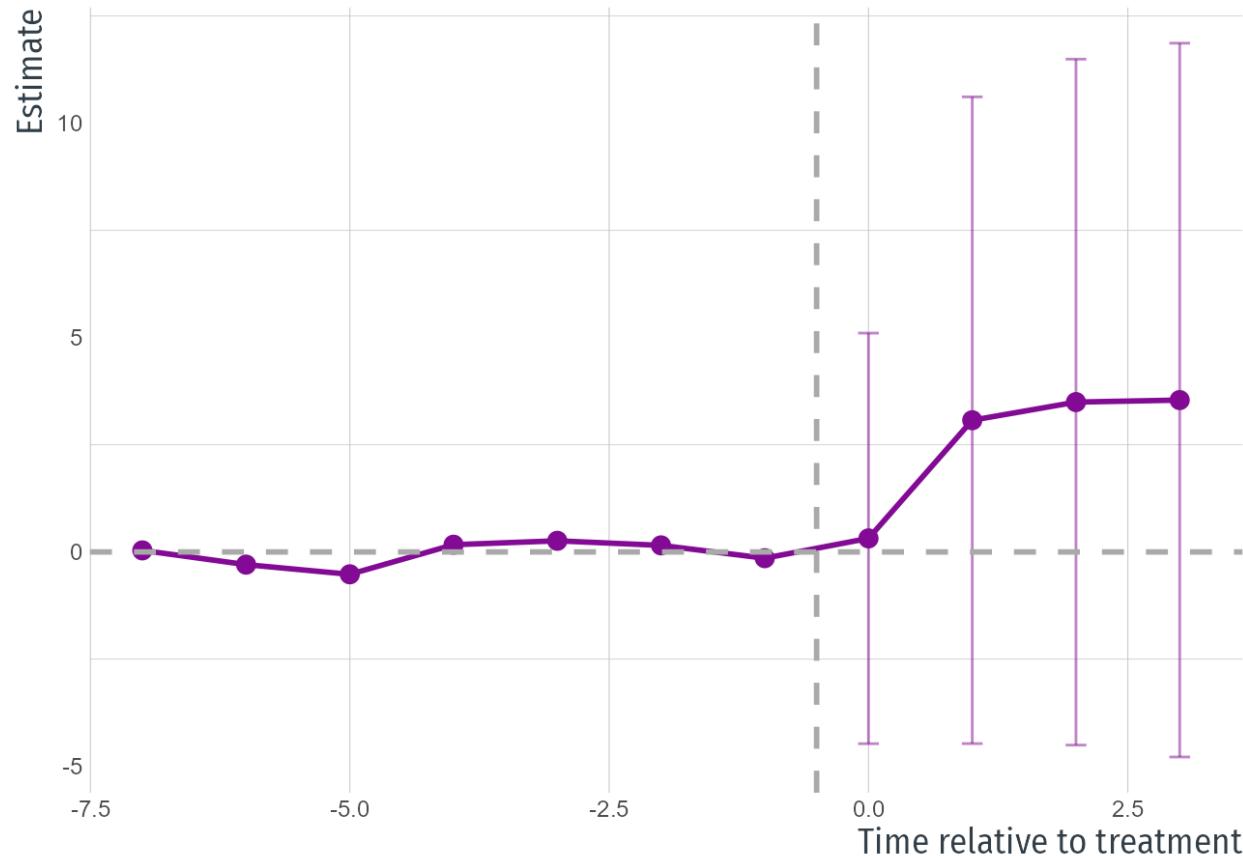
Zoned-in Areas: How do neighborhoods change?

- No major changes in % white population (left) or % African American population (right)



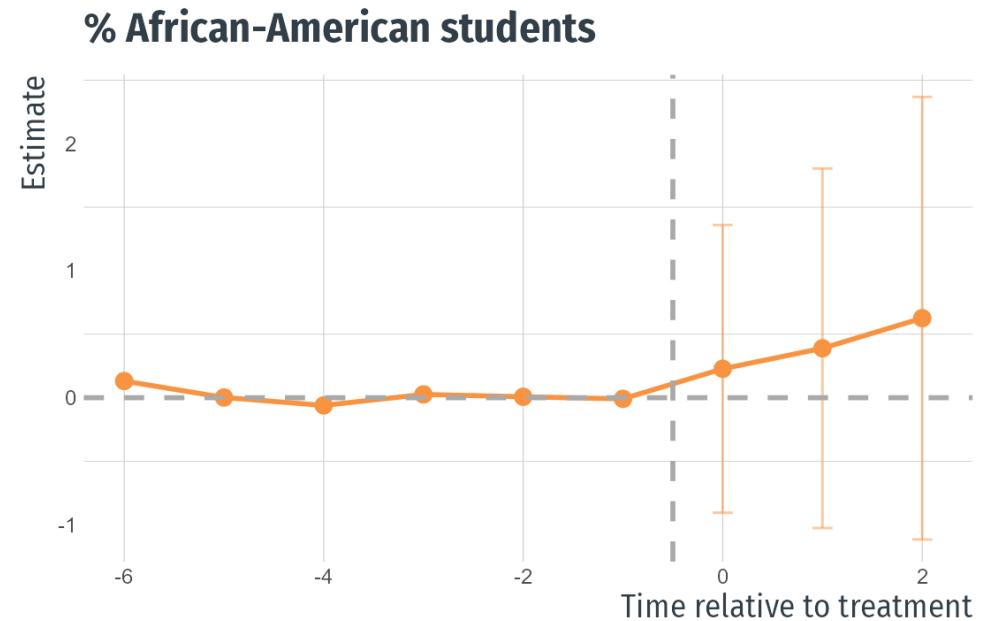
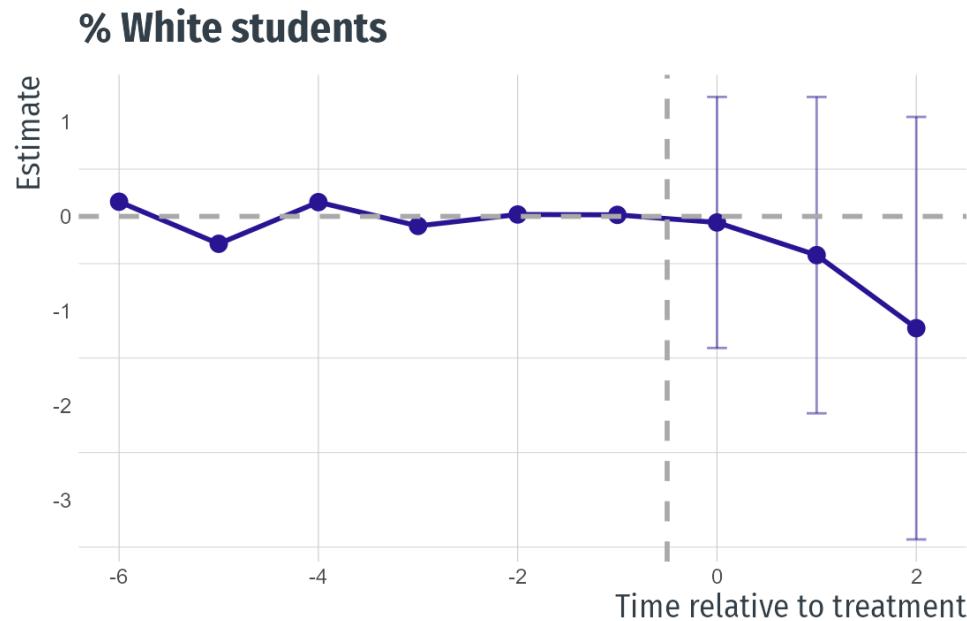
Zoned-in Areas: How do neighborhoods change?

- Suggestive increase in % of college educated population



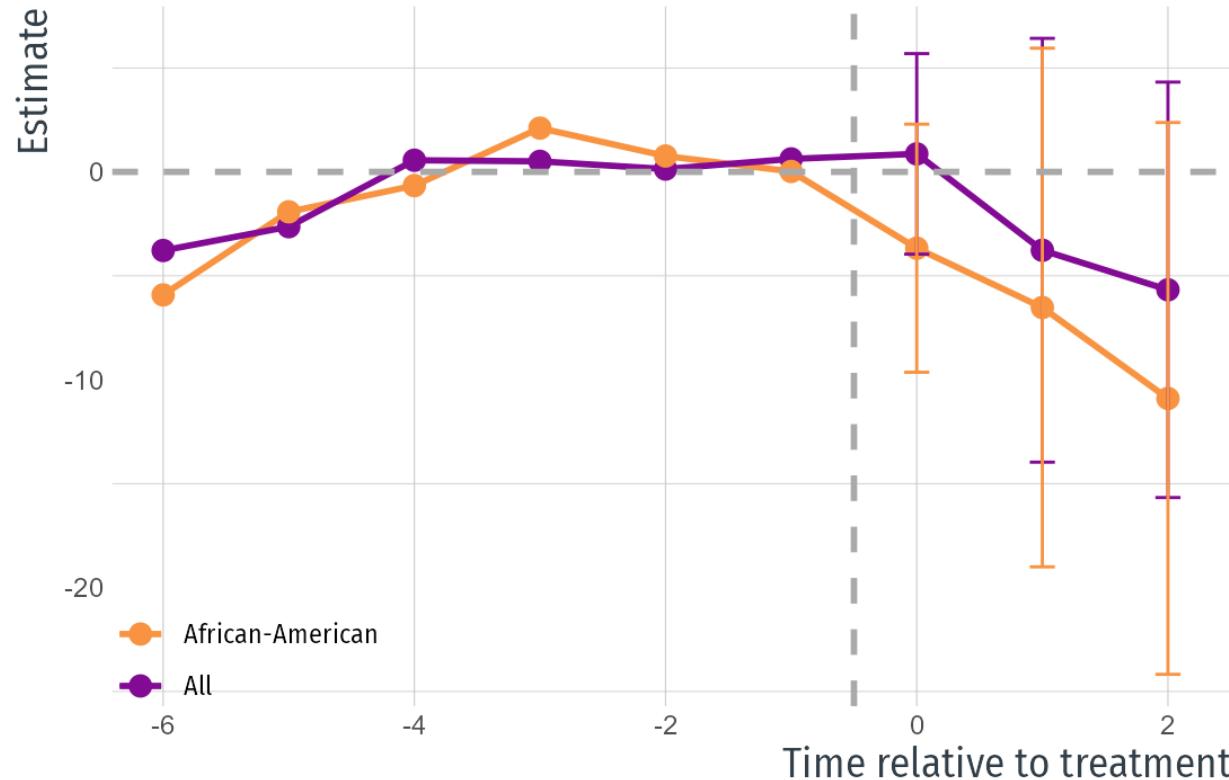
Zoned-out Areas: How are schools affected?

- **Demographics:** Decreasing trend in white students enrollment (left) vs increasing trend in African American enrollment (right).



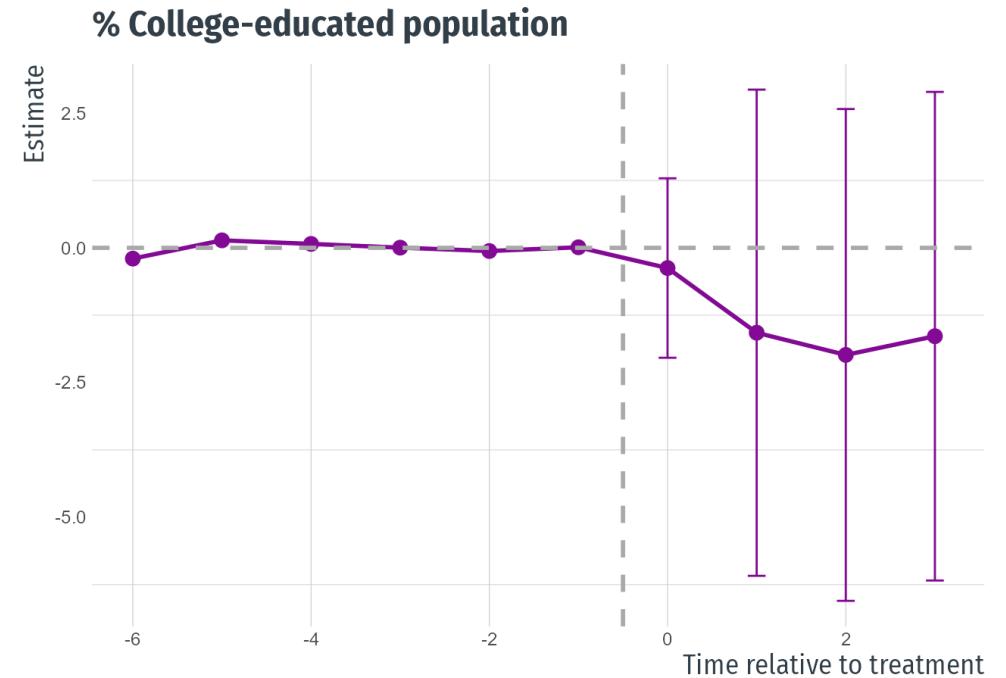
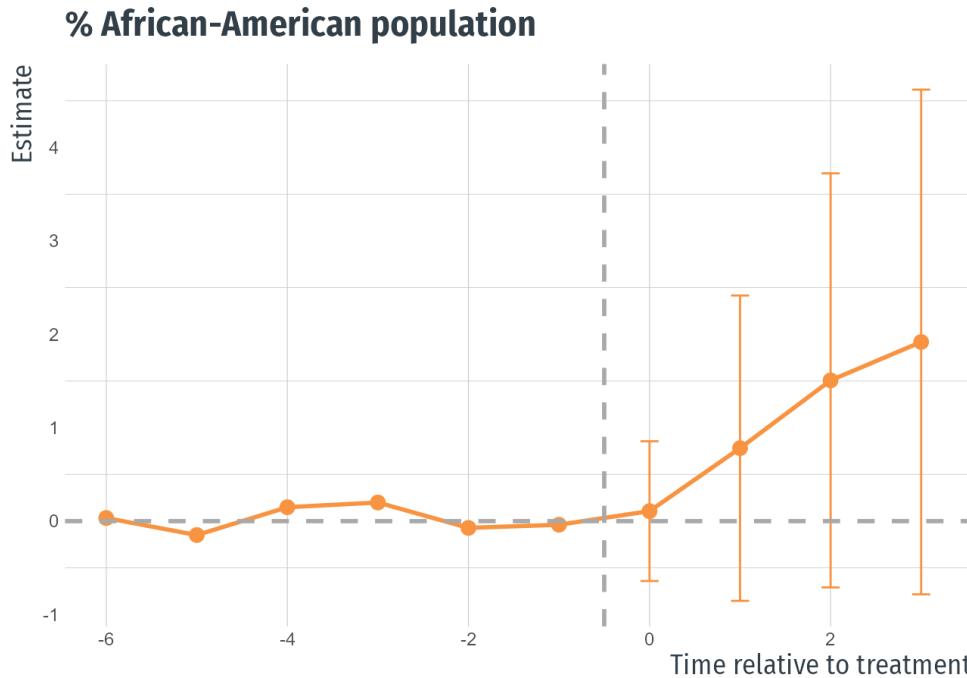
Zoned-out Areas: How are schools affected?

- **Performance:** Decreasing trend % of proficiency (sharper for African American students).



Zoned-out Areas: What about neighborhoods?

- Increasing trend in % of African-American population (left) and decreasing trend in % college-educated population (right).



Wrapping up

- Attendance zones have a huge role in **shaping neighborhoods** and nearby areas.
- Importance of understanding the effects of **new schools** and their location and boundaries.
- Effects of housing prices? Long-run outcomes?
- **Next steps:**
 - Include other states (e.g. CA)
 - Analyze housing prices over time.
 - Heterogeneity in effect for gentrified neighborhoods?

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