

Technical Notes

Data sources

The following technical note provides information that describes calculations in the data visualization. The visualization draws upon publicly available information from the U.S. Department of Education’s Common Core of Data (CCD). The information used in this visualization was current as of February, 2017.

Race/ethnicity groups

We used the race/ethnicity groups provided by the Indiana Department of Education. The categories “Asian” and “Hawaiian Native/Pacific Islander Students” were combined in order to allow comparisons prior to 2009/10 (when Indiana began reporting the numbers separately). Note that Indiana did not report multiracial data to CCD in 2009/10 and prior years.

“Non-white” is calculated as the sum of enrollments in all race/ethnicity groups with the exception of white. While it does not reflect a race/ethnic group, it is analytically useful in Indiana where White students make up the vast majority of students in many school corporations.

Free (or reduced price) lunch figures

The 2014/15 school year was the first year that Indiana schools could participate in the Community Eligibility Provision that allows certain schools to provide all students with free meals. This may result in discrepancies between the reported percentage of students that receive free meals and the percentage that meet income requirements. Descriptive statistics and an examination of participating schools did not reveal a marked increase in the reported percentage of low income students, nor an increase in the number of schools reporting 100% of students enrolled in the program. A list of affected schools may be found here:

<http://www.cbpp.org/research/community-eligibility-database-take-up-of-community-eligibility-this-school-year>

Maps

Schools are not shown on maps where latitude and longitude data was not available. This primarily affects schools that closed before 2000/01, the first year of available coordinate data from NCES. These schools are included in other analyses using county and corporation identifier data. The number of schools affected by year are as follows:

year	Number of schools
1987/88	212
1989/90	178
1994/95	98
1999/00	21

Formulas

We use the exposure rate to measure the exposure of one category of students (e.g., White students) to another (e.g., students receiving free lunch). More generally, the formula (Orfield & Ee, 2015) for calculating the exposure rates of a student in group A to students in group B is:

$$P = \sum_{i=1}^N \frac{a_i b_i}{A t_i}$$

Unevenness between and within school districts (H)

In measuring unevenness between and within school corporations we used Theil's entropy index, as outlined in Reardon, Yun, and Eitle (2000). For income based segregation we used the groups "free lunch" and not free lunch ("paid lunch" + "reduced price meals" where applicable). Because of the low prevalence of most race/ethnic groups in Indiana, we used White and non-White groups in calculating the index based on race.

More specifically, we use formula (5) to decompose county segregation into the within district and between district components:

$$H_{county} = H_D + \frac{\sum_{d=1}^k T_d E_d H_d}{TE}$$

Where H_D refers to the between district component of segregation, H_{county} is the index calculated over all schools in the county. H_d refers to the segregation within each school district in the county. E refers to the entropy of the county and E_i refers to the entropy of each district. T_d refers to the enrollment of each district and T refers to the total enrollment in the county.

The following formula calculates the population's entropy, which is used as a measure of diversity:

$$E = \sum_{r=1}^n Q_r \ln \frac{1}{Q_r}$$

Where Q_r is the proportion of the school made up of each group r. It also defines the product to equal 0 when $Q_r=0$.

District and county segregation measures may be obtained from the formula below:

$$H_d \text{ or } H_{county} = \frac{\sum_{i=1}^k t_i (E - E_i)}{TE}$$

Here E refers to the entropy of the entire system (district or county) and E_i refers to the entropy of each school in the system (calculated above). t_i refers to the enrollment of the school and T refers to the enrollment in the of the entire system (district or county).

For districts that span multiple counties, county segregation is decomposed using district segregation measures that were developed only for schools within the relevant county. This was

determined by the county that schools are located in as defined by NCES. It may exclude districts (and effectively counties) that serve students in multiple counties, but where all schools are located in a single county.

This affects the following counties: Dearborn, Franklin, Fulton, Grant, Henry, Jasper, Kosciusko, LaPorte, Madison, Marshall, Miami, Newton, Porter, Pulaski, Ripley, Rush, St. Joseph, White, and Whitley. Districts that span multiple counties include: Batesville Comm. Sch. Corp., C.A. Beard Memorial Sch. Corp., Culver Comm. Sch. Corp., Madison-Grant United Sch. Corp., Michigan City Area Schools, New Prairie United Sch. Corp., North Newton Sch. Corp., Oak Hill United Sch. Corp., Sunman-Dearborn Comm. Sch. Corp., Tippecanoe Valley Sch. Corp., Tri-County Sch. Corp., Union-North United Sch. Corp., Whitko Comm. Sch. Corp.

Other Note for 2009/10

In 2009/10, the sum of student enrollment by race/ethnicity is less than the total enrollment. Percentages by race were reported as compared to the sum of student enrollment for each reported race/ethnicity group.

Works cited

Orfield, G. & Ee, J. (2015). Connecticut school integration: moving forward as the Northeast retreats. The Civil Rights Project.

Reardon, S.F., Yun, J.T., & Eitle, T.M. (2000). The changing structure of school segregation: Measurement and evidence of multiracial metropolitan-area school segregation, 1989-1995. *Demography*, 37(3), 351-364.