

Technical Appendix to  
*Prison Gerrymandering Distorts Representation*<sup>1</sup>

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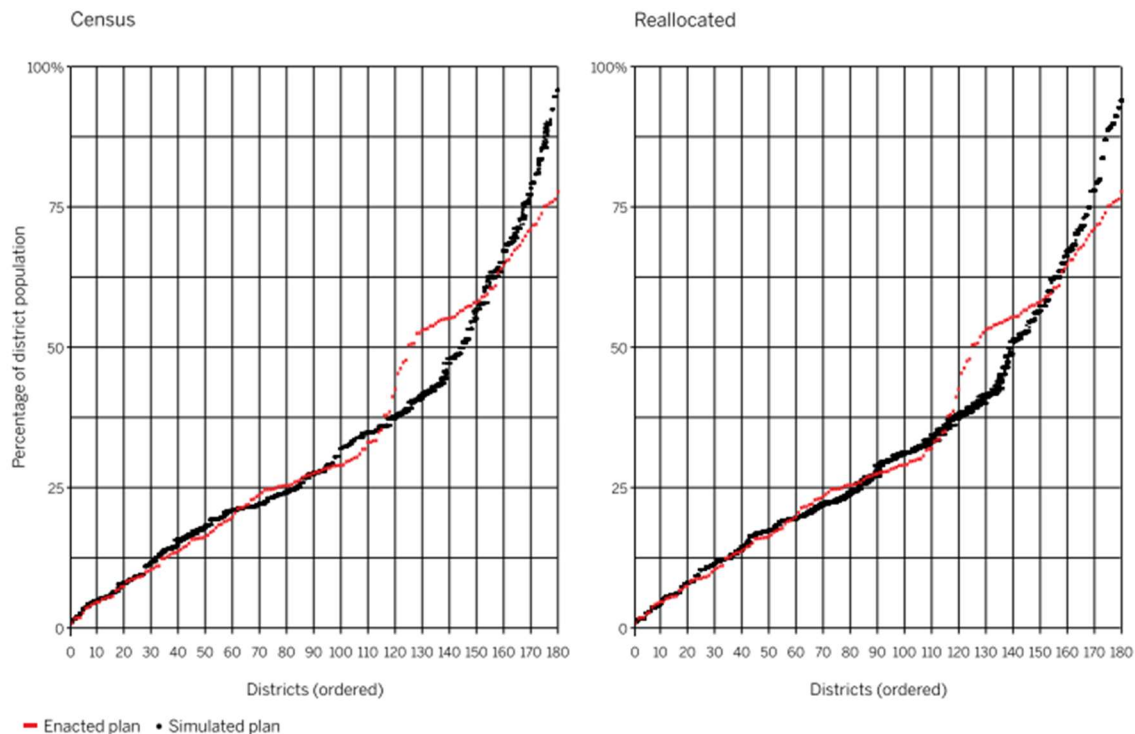
## A.1 Simulations Comparison with Enacted Districts

In some states we see one or both sets of simulations drawing noticeably fewer majority districts of a certain demographic (Latino, Black, or Democrat) than there are in the current enacted plan. This discrepancy is apparent for a couple of reasons, one being that these simulations are done using precincts as the building block, as opposed to actual census blocks. Also, the simulations are constrained in a way that human map drawers are not, so we end up with fewer districts that are substantially more densely populated with the demographic of interest. As discussed in the Insight report that this appendix accompanies, a 2009 study showed that “when partisan preferences are spatially dependent and partisanship is highly correlated with population density, any districting scheme that generates relatively compact, contiguous districts will tend to produce bias against the urban party.”<sup>2</sup> This phenomenon may be applied to other demographics that follow similar patterns of spatial dependence.

Human map drawers can be more intentional in splitting up areas that are densely populated with a particular demographic to create more majority districts of that characteristic. Using Georgia as an example, the plots below show how, compared with enacted districts, the 30 most Black districts are much more Black in both sets of simulations than in the enacted plan; the enacted plan has a more diffuse Black population and therefore is able to have a greater number of Black-majority districts, while the simulations pack the districts. These condensed Black areas are primarily in metro Atlanta as well as around Valdosta University.

Figure A1

### Georgia's Black Population in Simulations Compared with Enacted Districts



**Note:** The districts are ordered according to Black population percentage. Each dot represents the Black population of a district in one simulation.

Of important note, these simulations show the potential of incarcerated population reallocation to increase representation across specific populations. Even if map drawers were to pack districts, they would still end up with more packed districts of the demographic of interest (Black districts in the example above) using reallocated data than they would if using traditional census data. However, as we do have people drawing more realistic and representative maps, such as the current state legislative ones, we can expect to see an increase in representation when counting incarcerated populations at their homes.

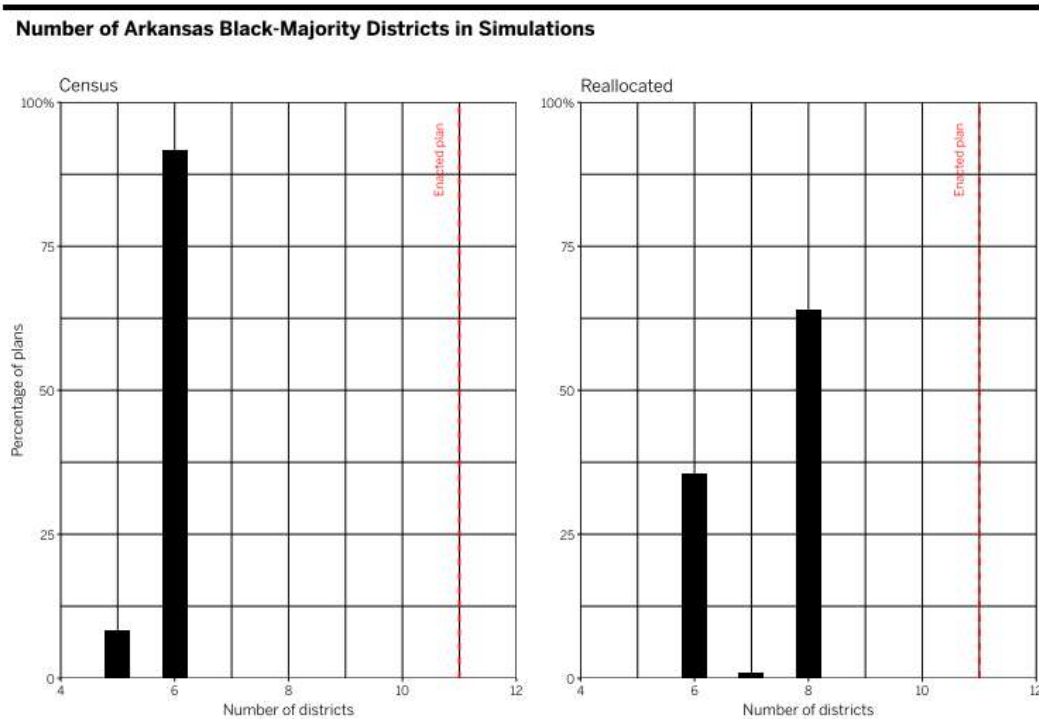
## A.2 Arkansas

### Black Districts

The bar graphs in figure A2 show a comparison of the number of majority districts of the specific demographic, in this case Black-majority districts, in the simulations using traditional census data (left) and reallocated data (right). The graphs have the number of majority districts on the x-axis and the percentage of simulations that have that many majority districts on the y-axis. The red dotted line shows how many majority districts of the demographic, in this case how many Black-majority districts, are in the currently enacted plan in the state. See above for a discussion of discrepancies between simulations and enacted plans.

So, in the example below, 92% of Arkansas simulations using census data have six Black-majority districts, and 8% have five Black-majority districts; 64% of Arkansas simulations using reallocated data have eight Black-majority districts, 1% have seven Black-majority districts, and around 35% have six Black-majority districts. The enacted plan has eleven Black-majority districts.

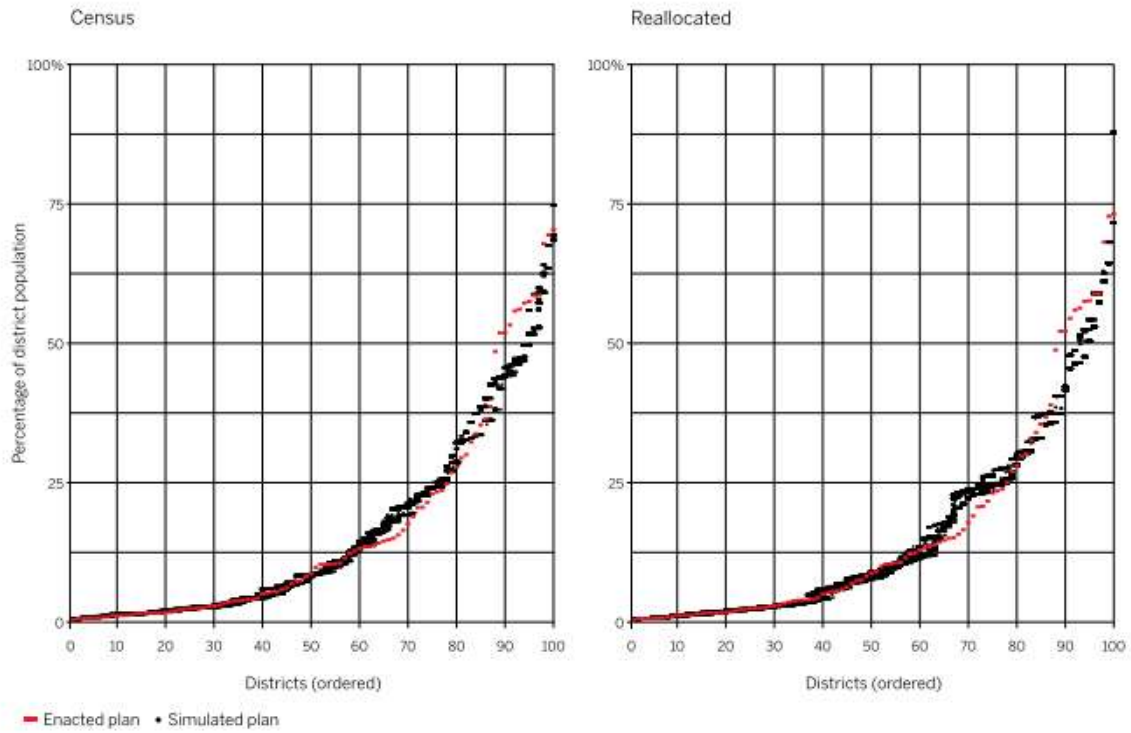
**Figure A2**



In figure A3, the jitterplots compare the percentage of the demographic of interest in each district in the simulations — both traditional census (left) and reallocated (right) — with the demographic of interest in the enacted plan according to the respective data. The x-axis orders the districts from those containing the lowest percentage of the demographic, in this case the least Black district, to those with the highest percentage of the demographic, in this case the most Black district, within each simulation. The y-axis represents the percentage of the district population that is of the studied demographic. Each black dot represents one district within one simulation. The red lines represent the district composition under the enacted plan, using the respective data for calculation (i.e., the census data graph shows the percentage of the district population that is Black using traditional census data, and the reallocated graph shows the percentage of the district population that is Black using reallocated data).

Figure A3

Arkansas's Black Population in Simulations Compared with Enacted Districts



**Note:** The districts are ordered according to Black population percentage. Each dot represents the Black population of a district in one simulation.

Latino Districts

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

Figure A4

Number of Arkansas Latino-Majority Districts in Simulations

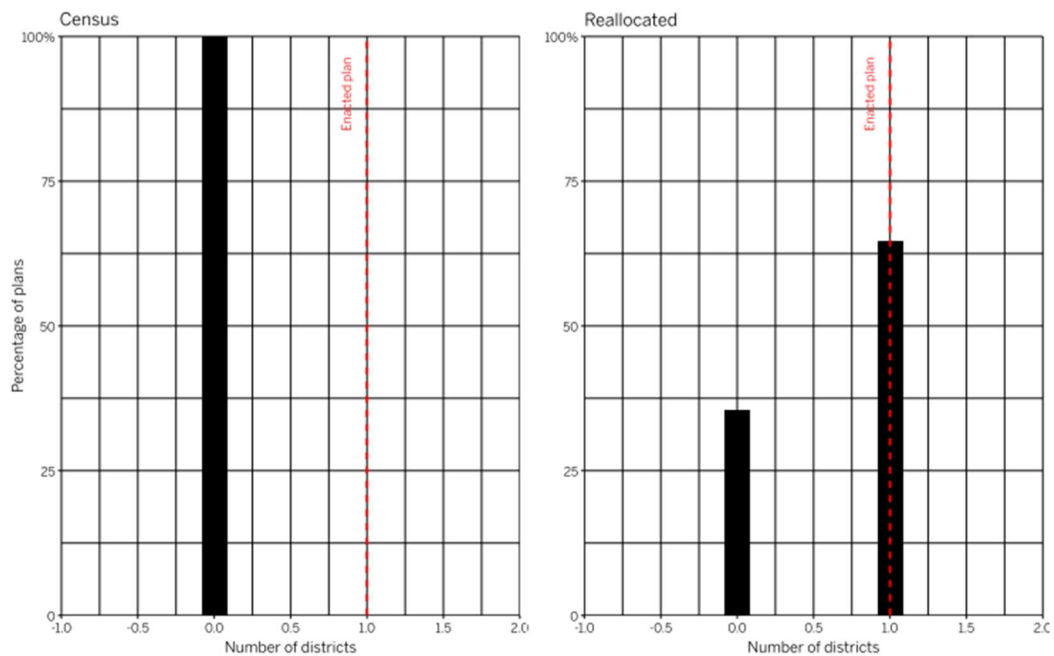
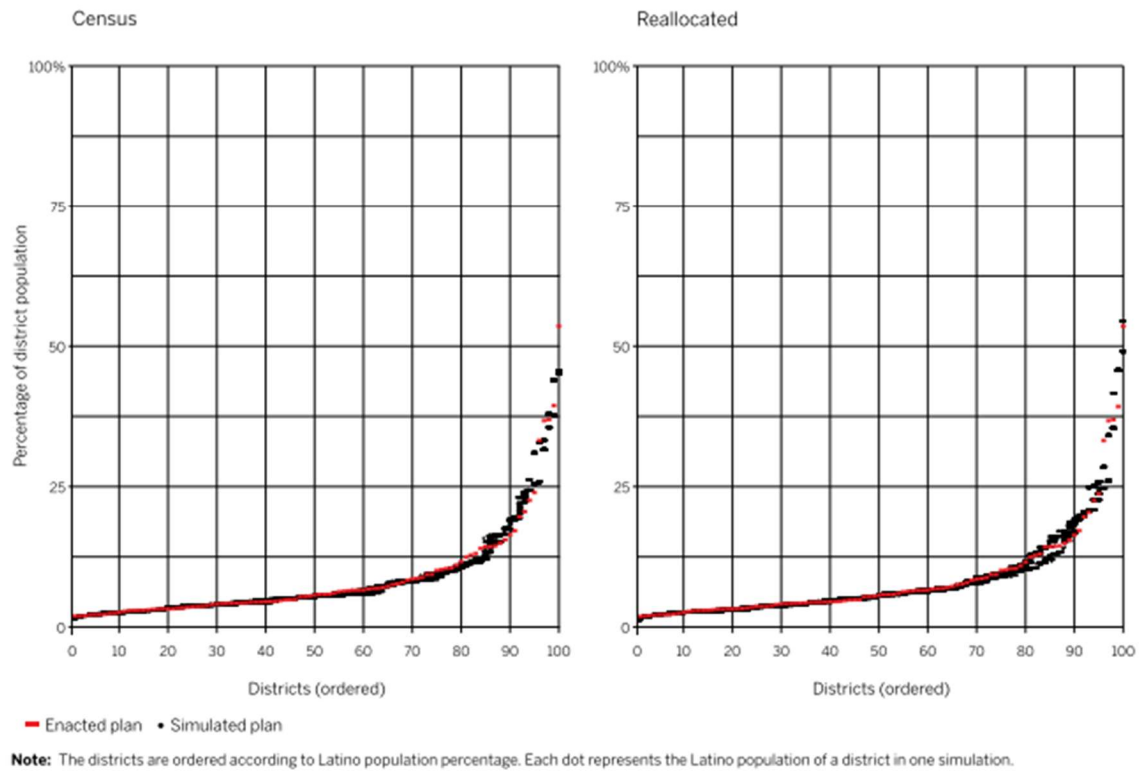


Figure A5

Arkansas's Latino Population in Simulations Compared with Enacted Districts



Democratic Districts

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

Figure A6

Number of Arkansas Democratic-Majority Districts in Simulations

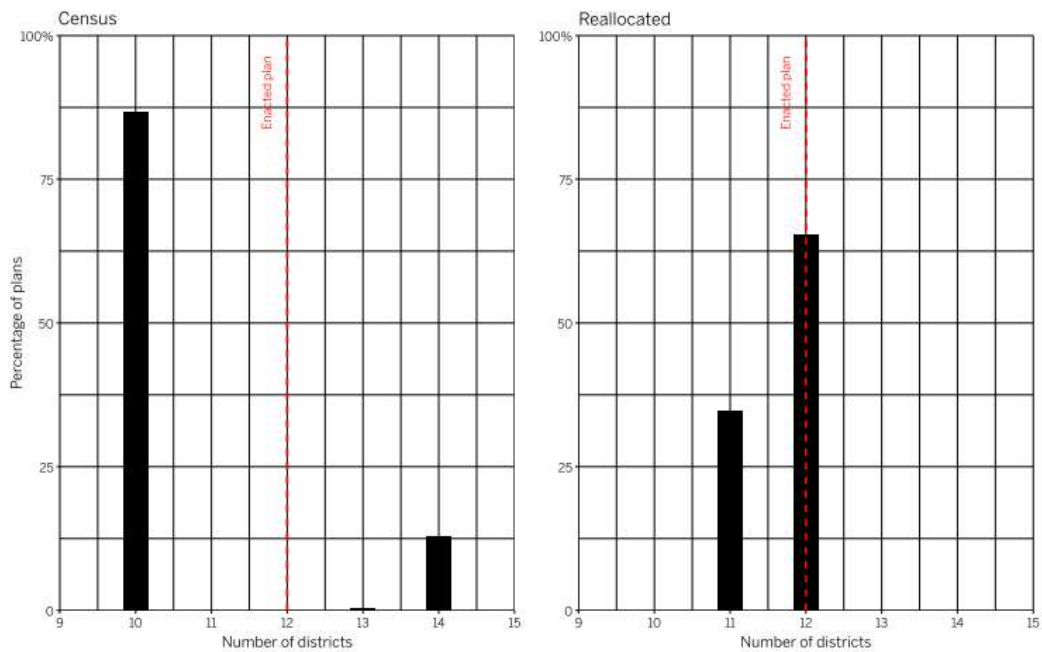
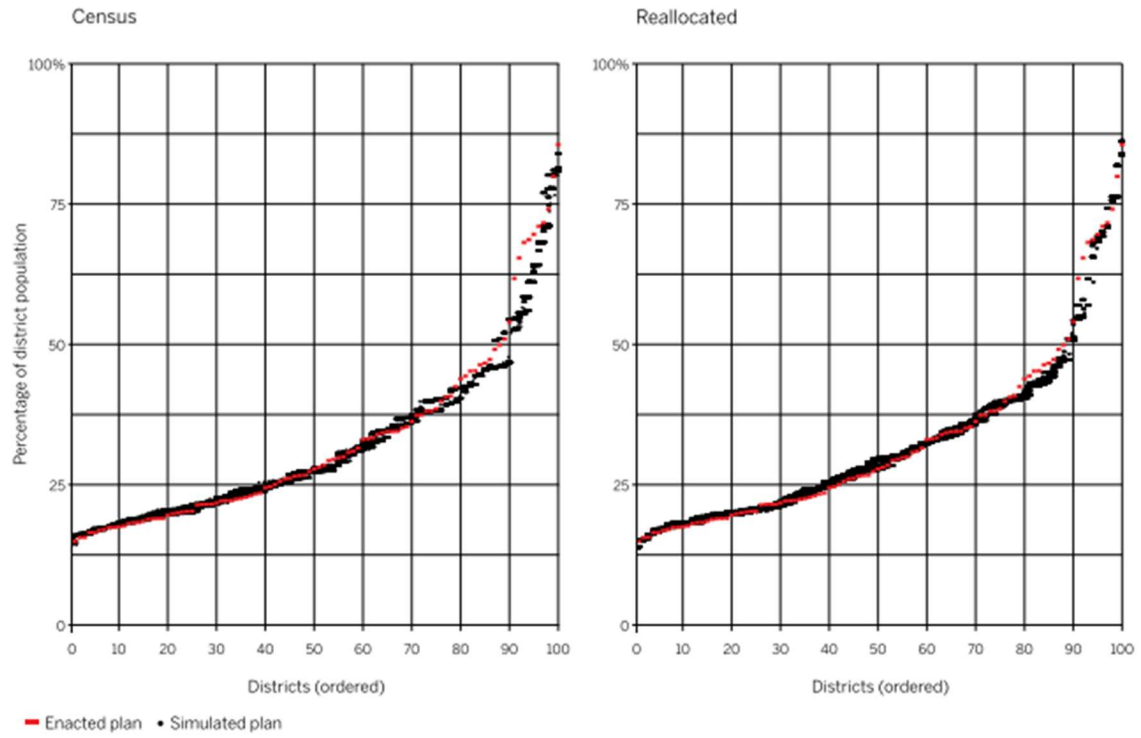


Figure A7

Arkansas's Democratic Population in Simulations Compared with Enacted Districts

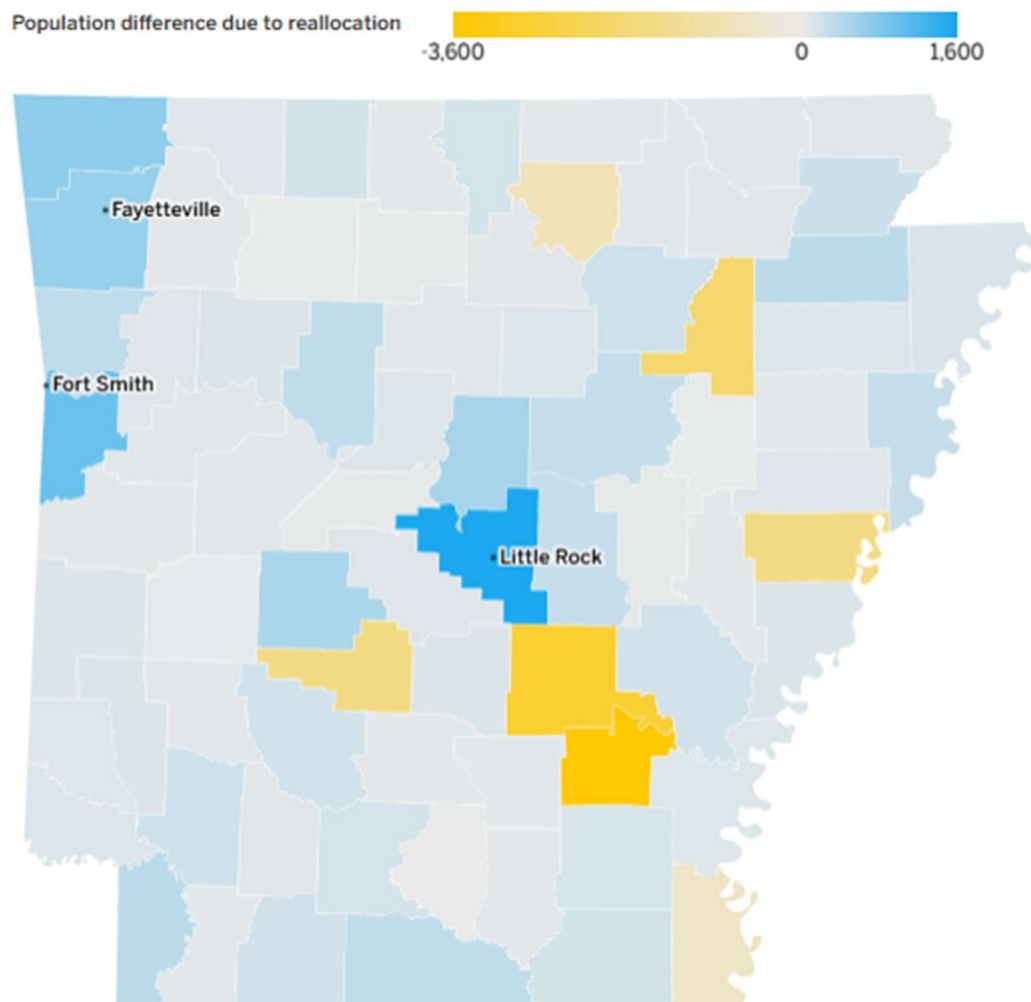


**Note:** The districts are ordered according to Democratic population percentage. Each dot represents the Democratic population of a district in one simulation.

Figure A8

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**Arkansas County Population Changes Due to Reallocation of Incarcerated Populations**



# A.3 Arizona

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A9

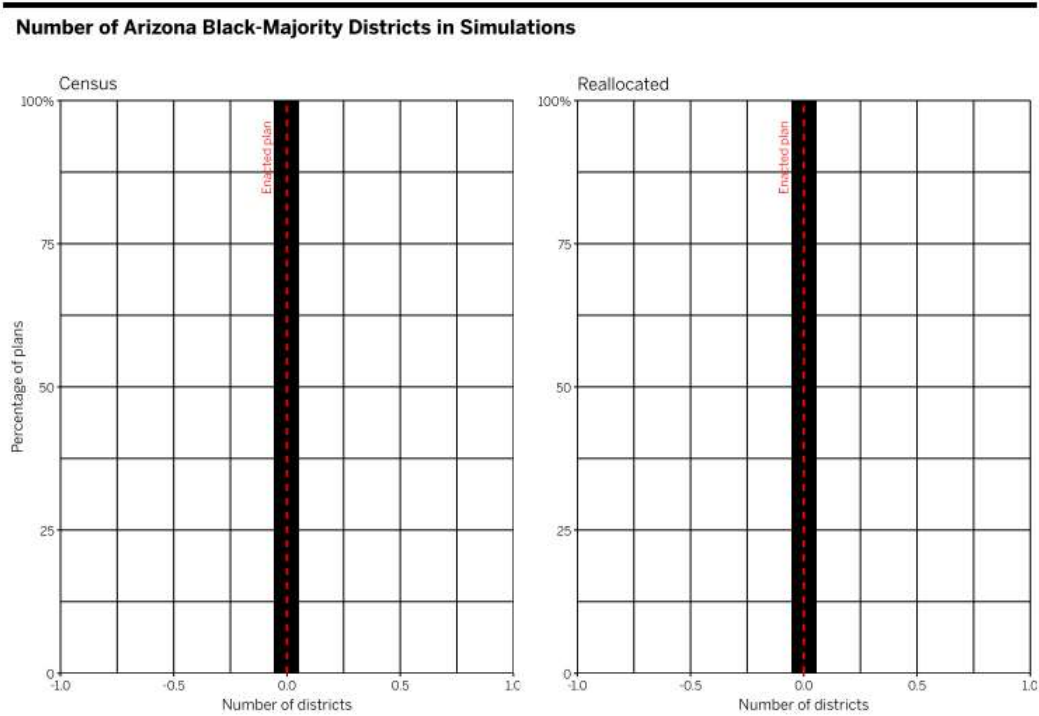


Figure A10

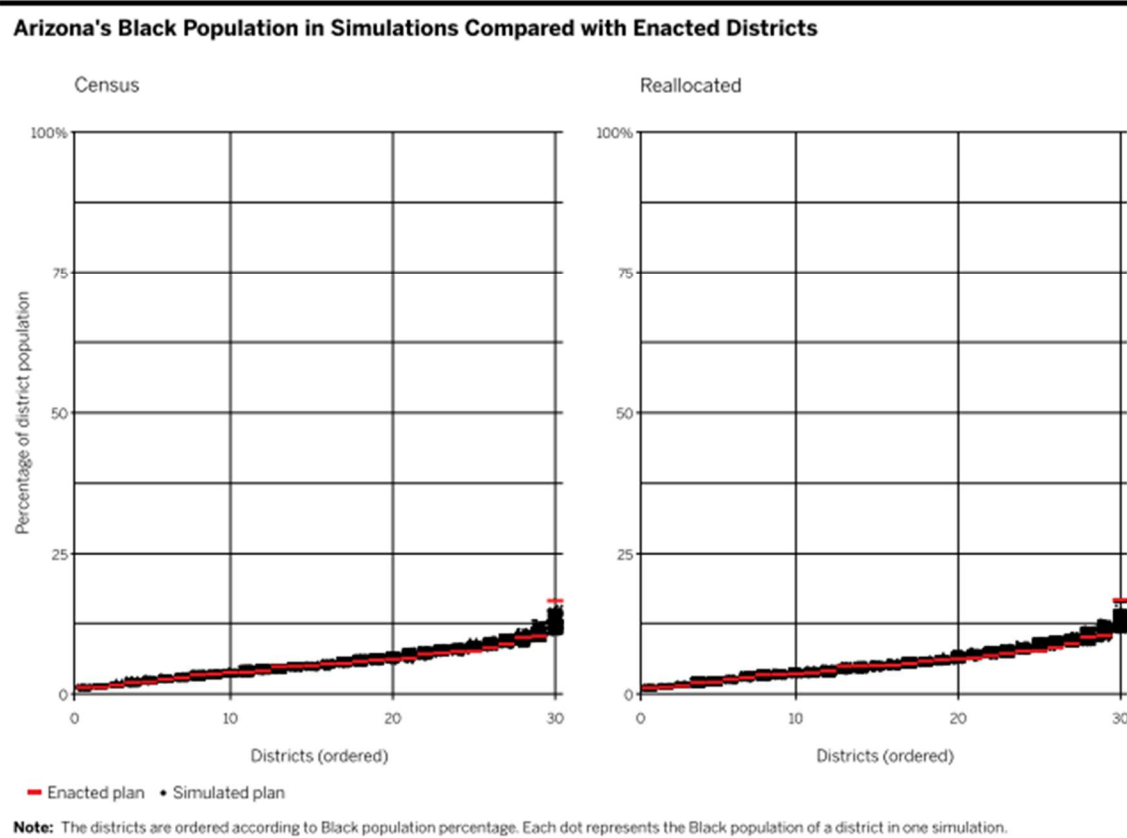




Figure A11

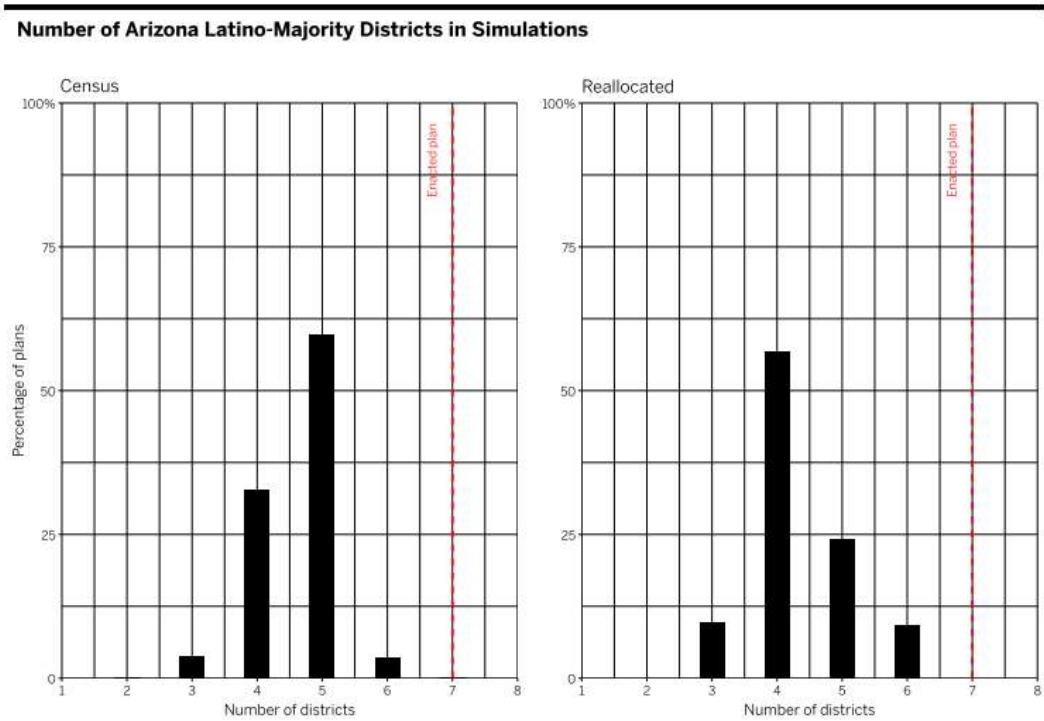


Figure A12

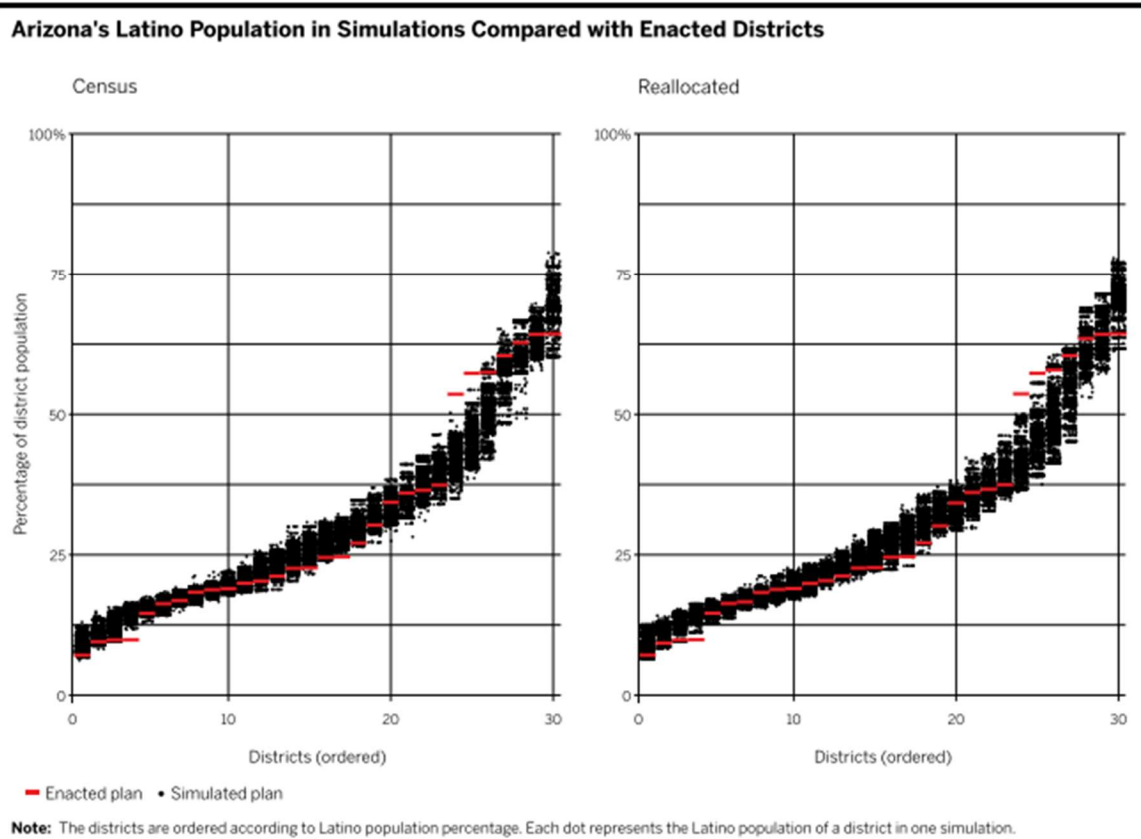


Figure A13

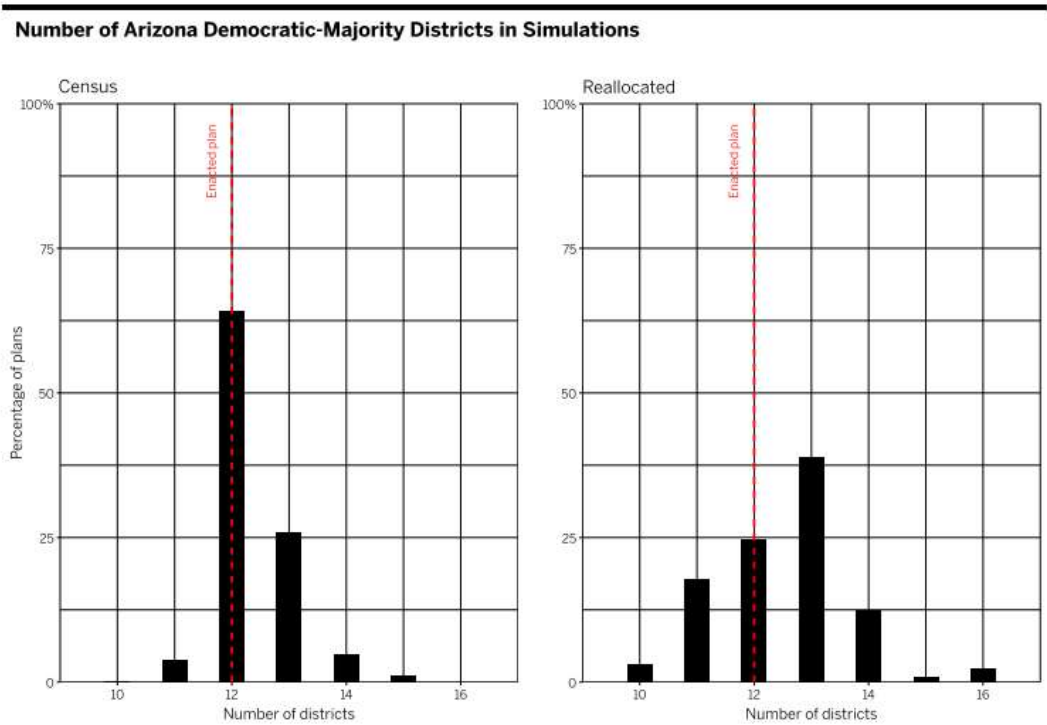


Figure A14

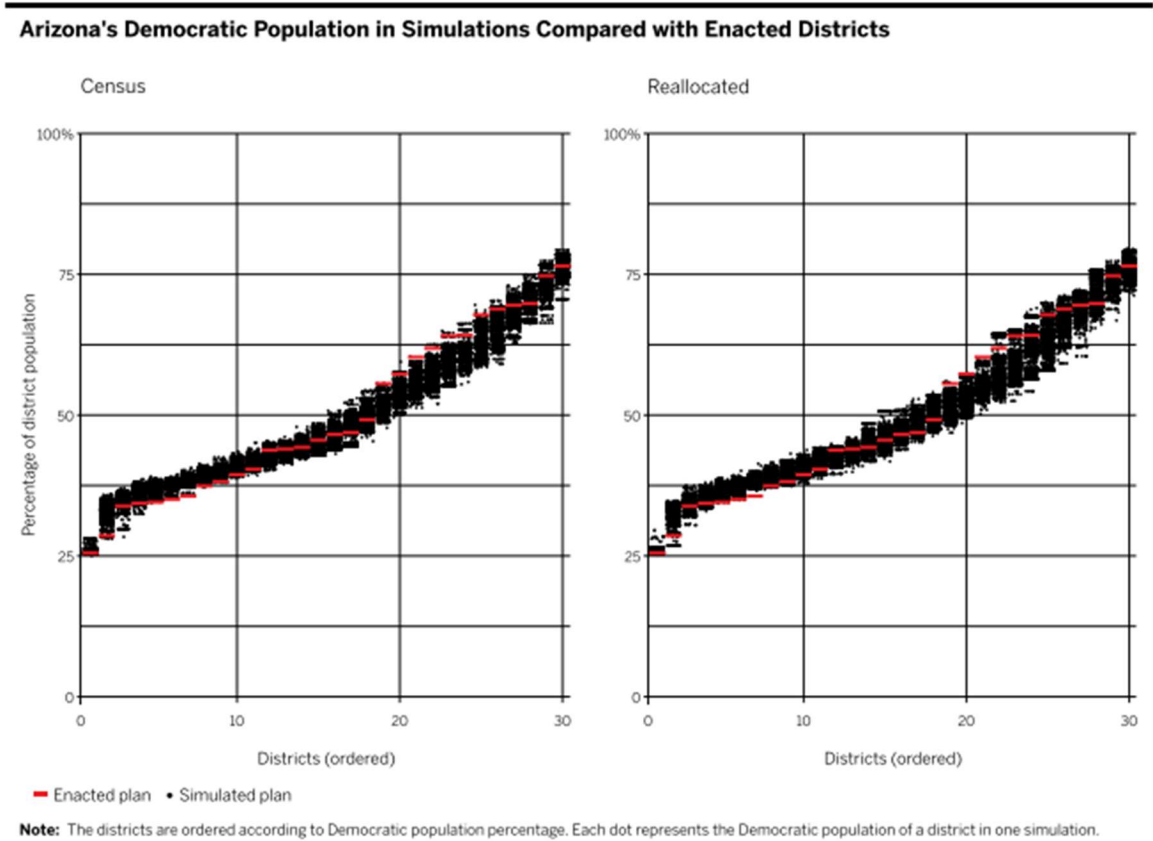
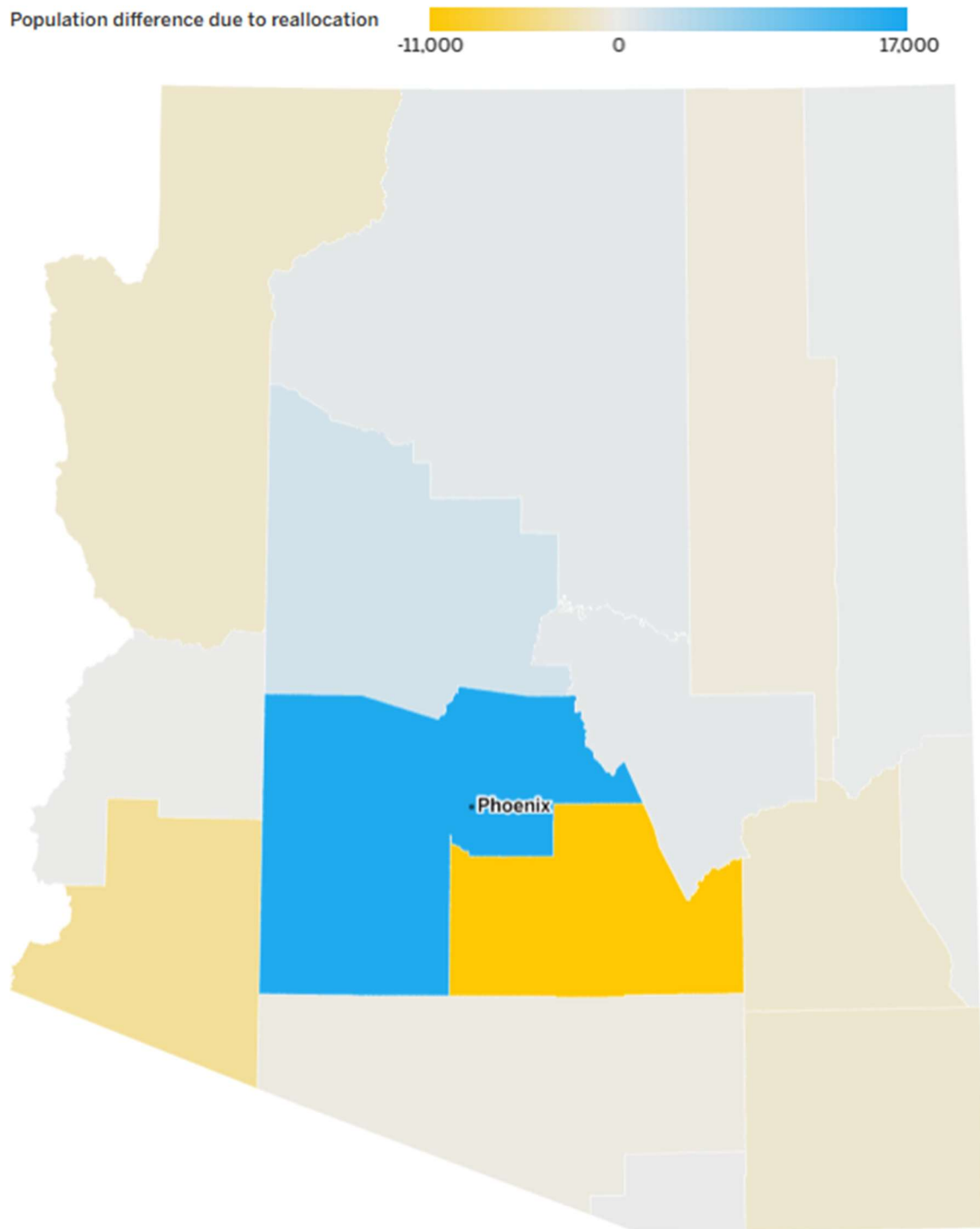


Figure A15

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**Arizona County Population Changes Due to Reallocation of  
Incarcerated Populations**



# A.4 Georgia

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A16

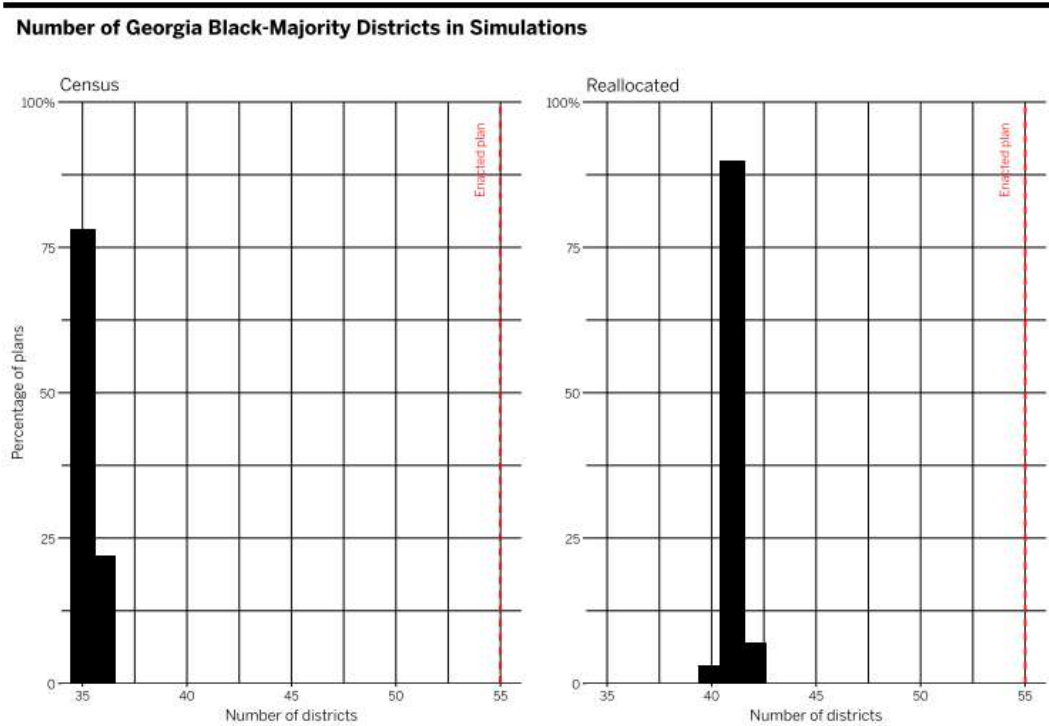


Figure A1

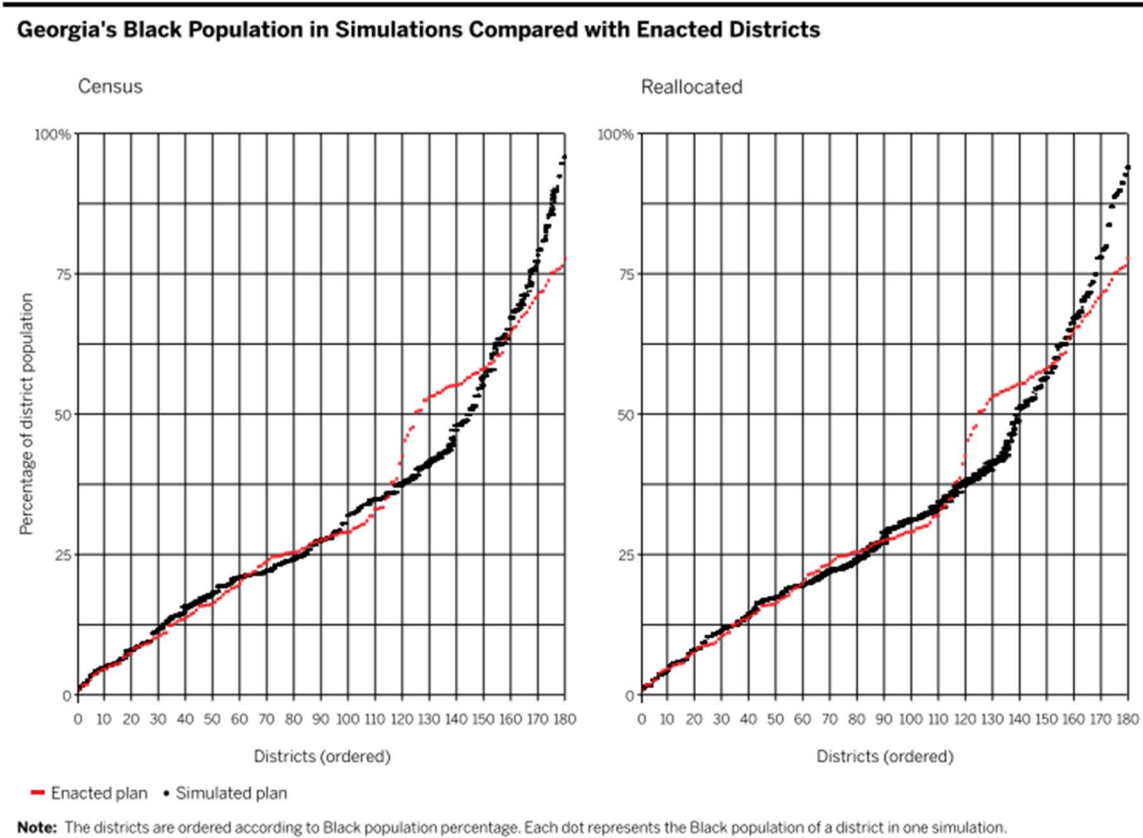


Figure A17

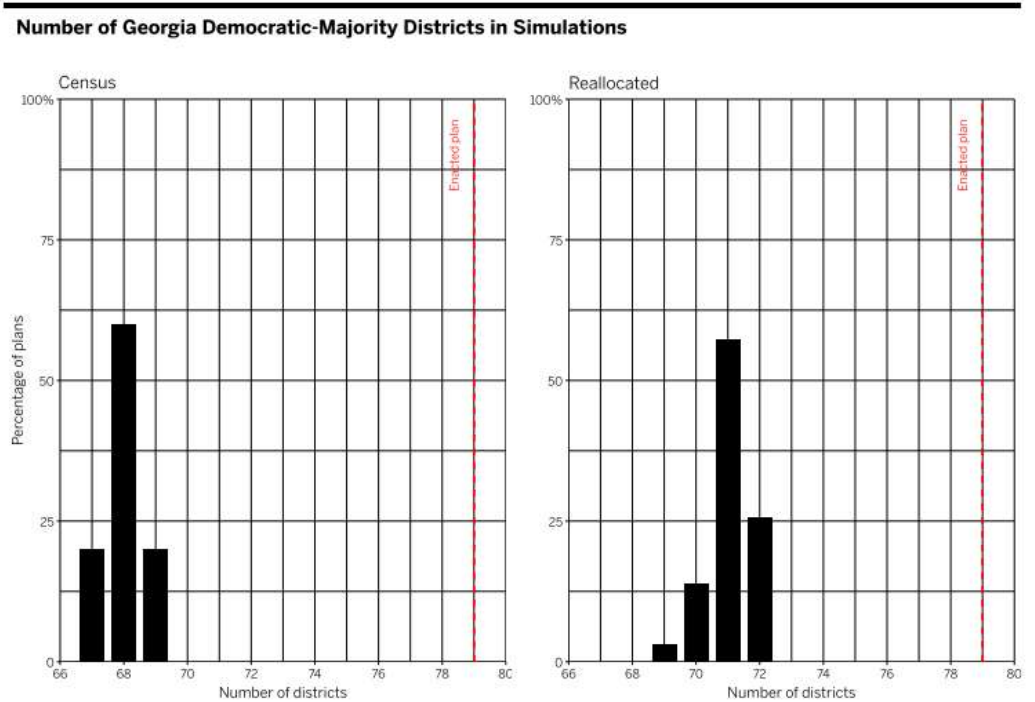


Figure A18

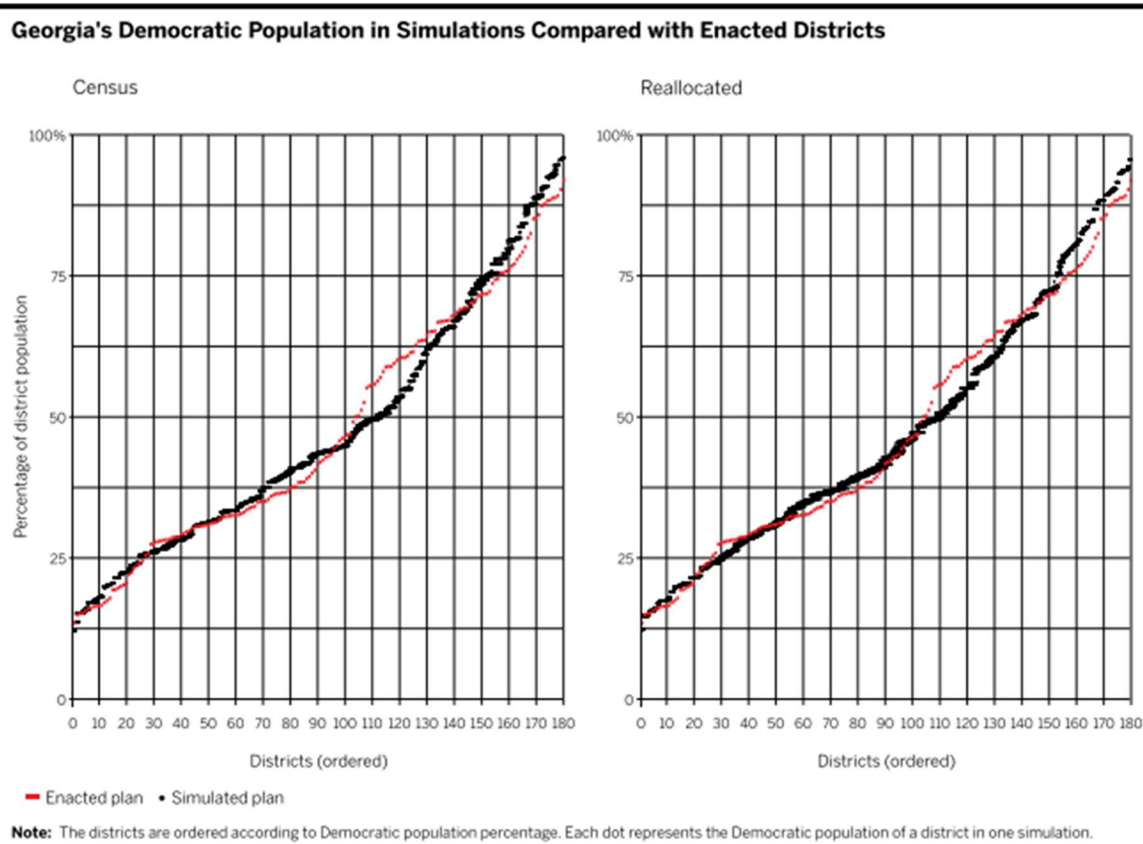
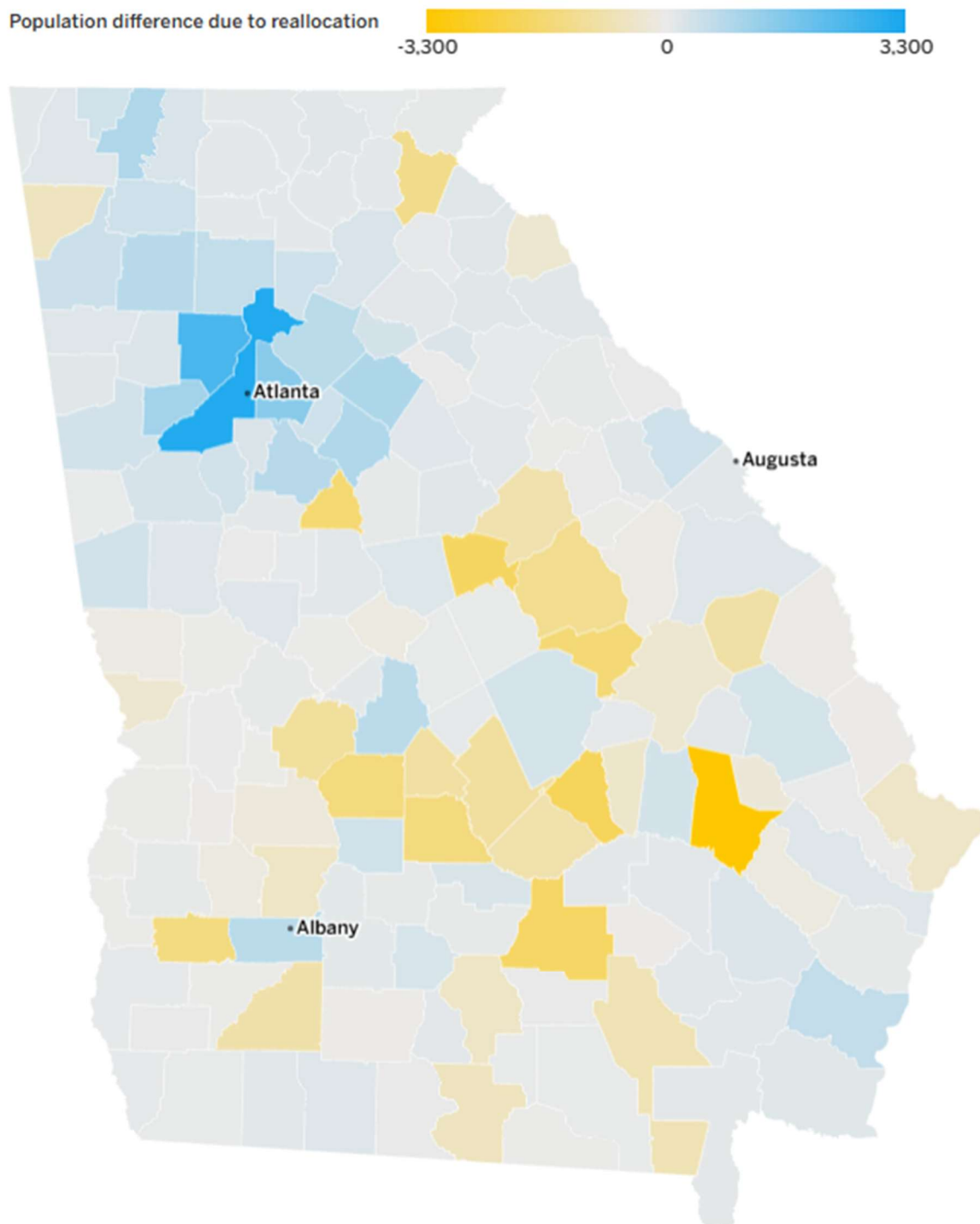


Figure A19

## Georgia County Population Changes Due to Reallocation of Incarcerated Populations



# A.5 Illinois

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A20

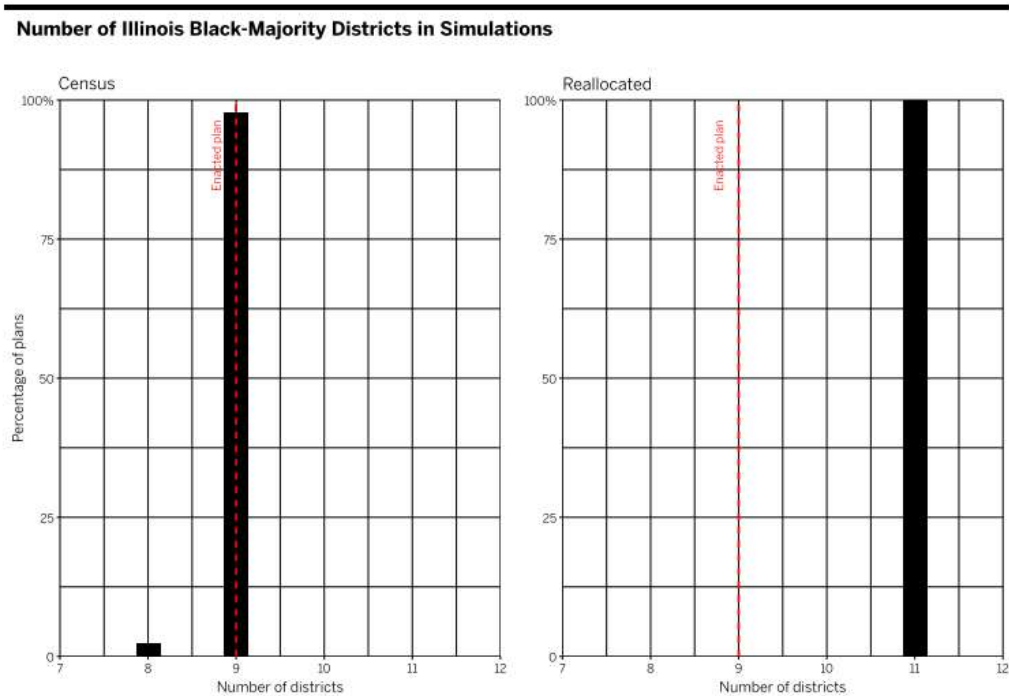


Figure A21

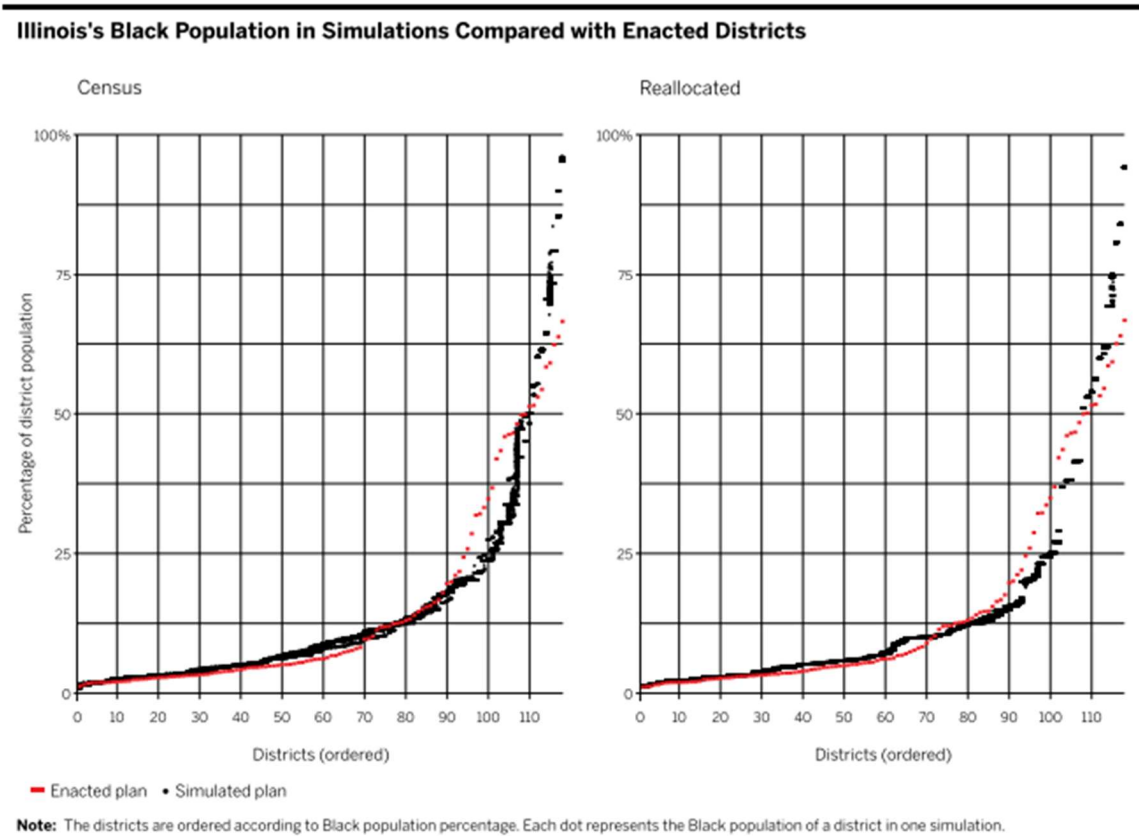


Figure A22

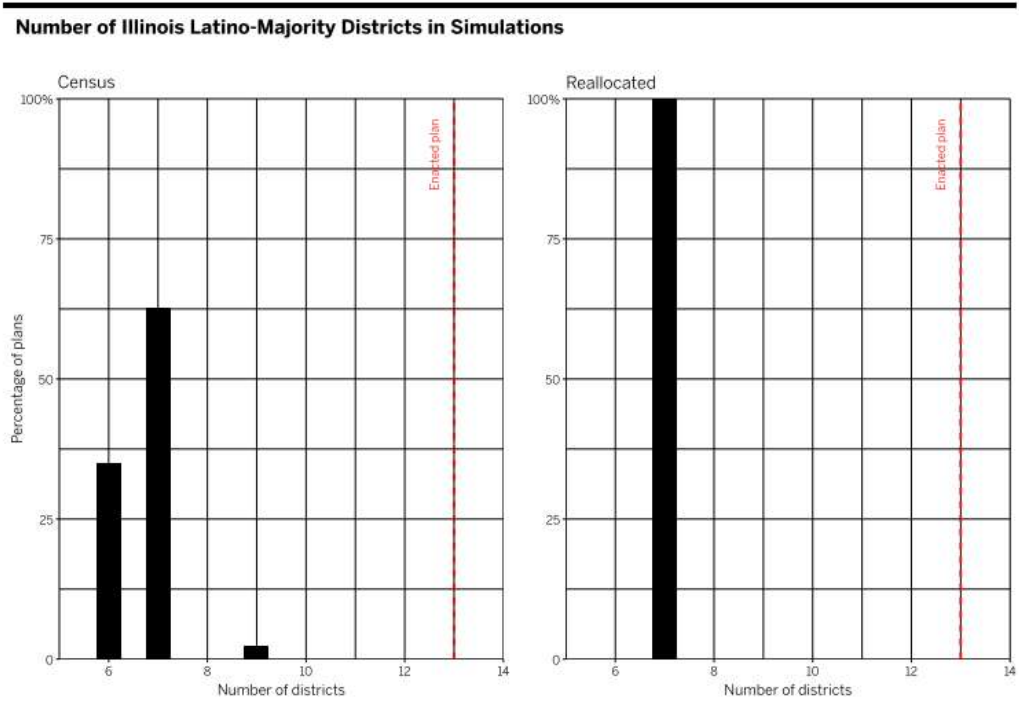


Figure A23

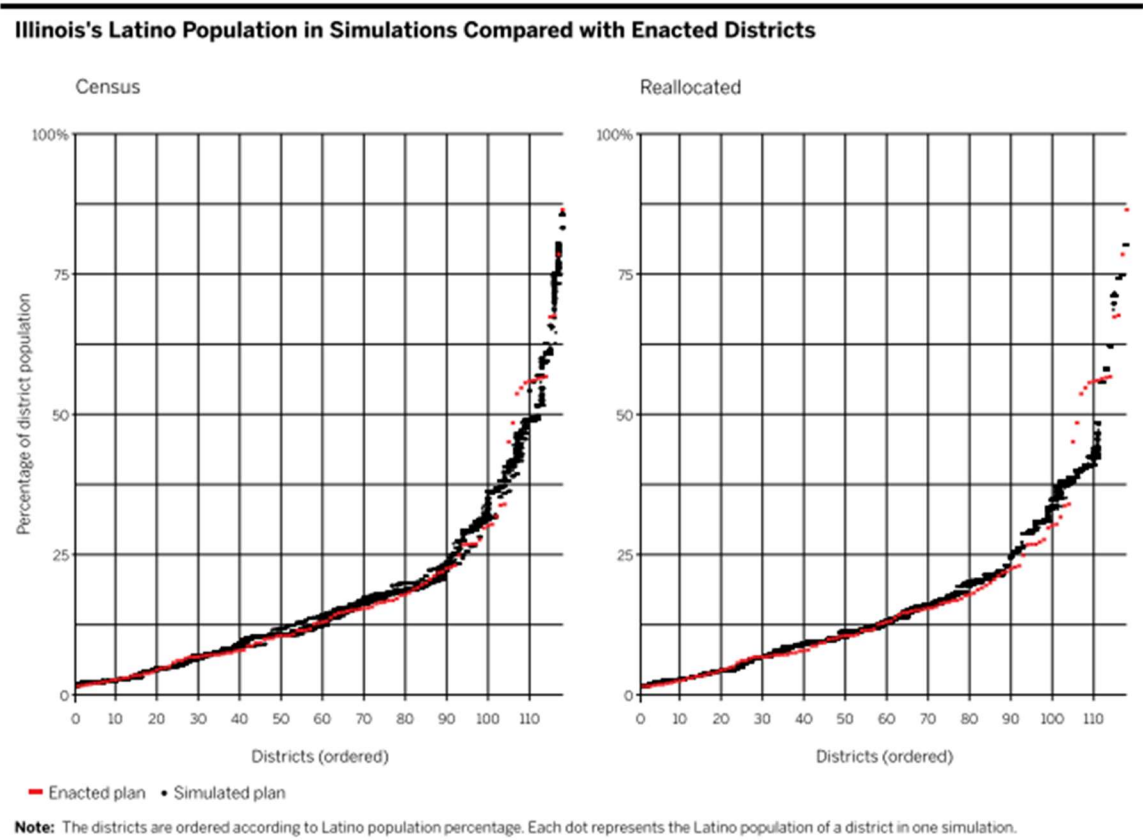




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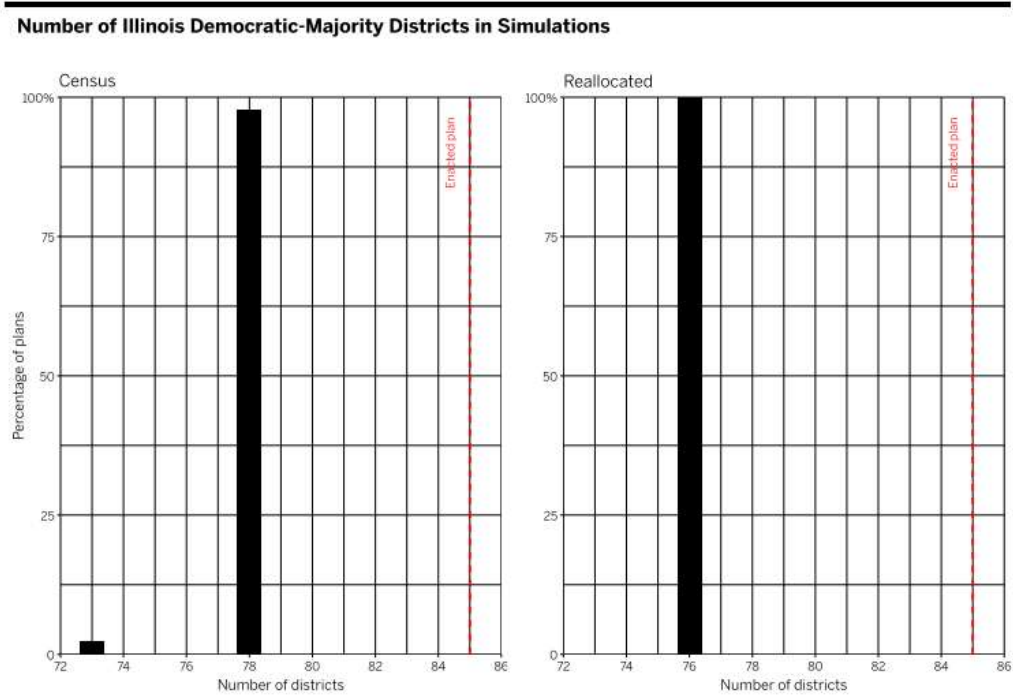
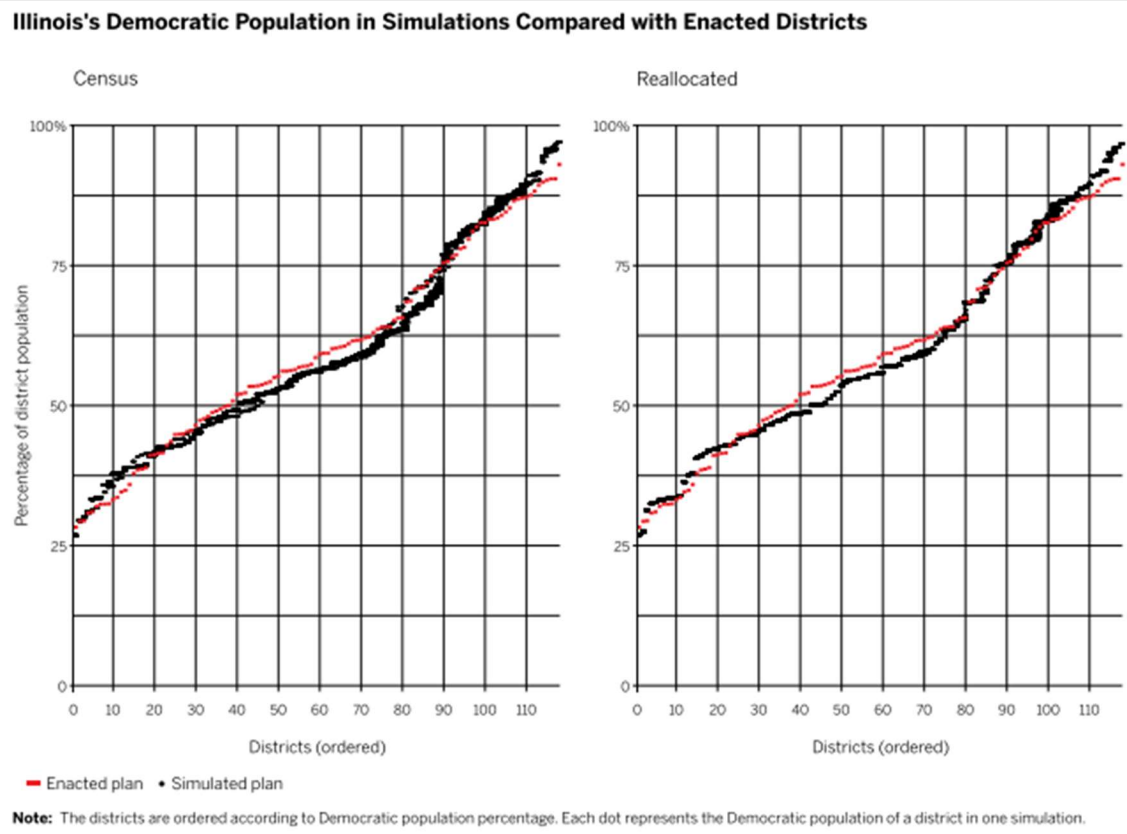
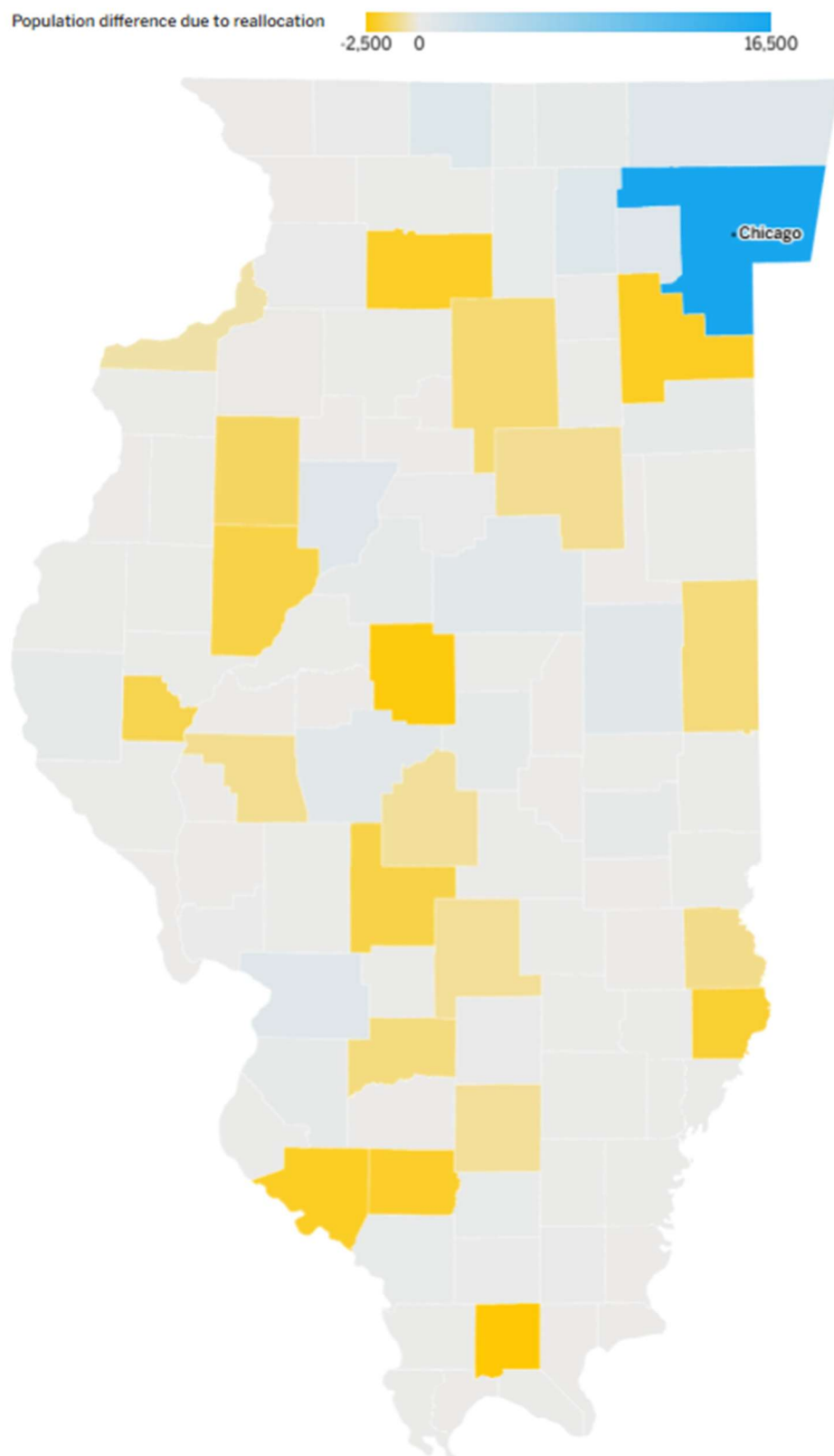
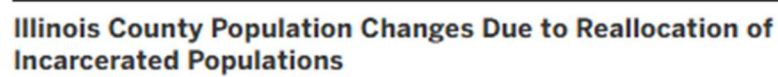


Figure A25



## County Population Change

**Figure A26**



# A.6 Louisiana

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A27

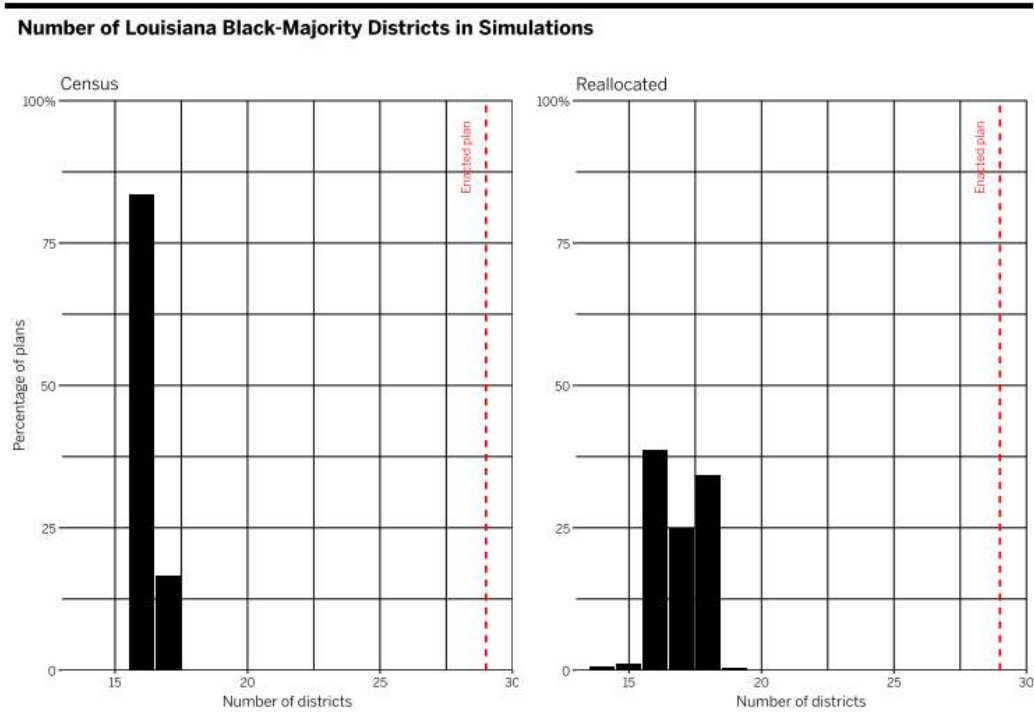


Figure A28

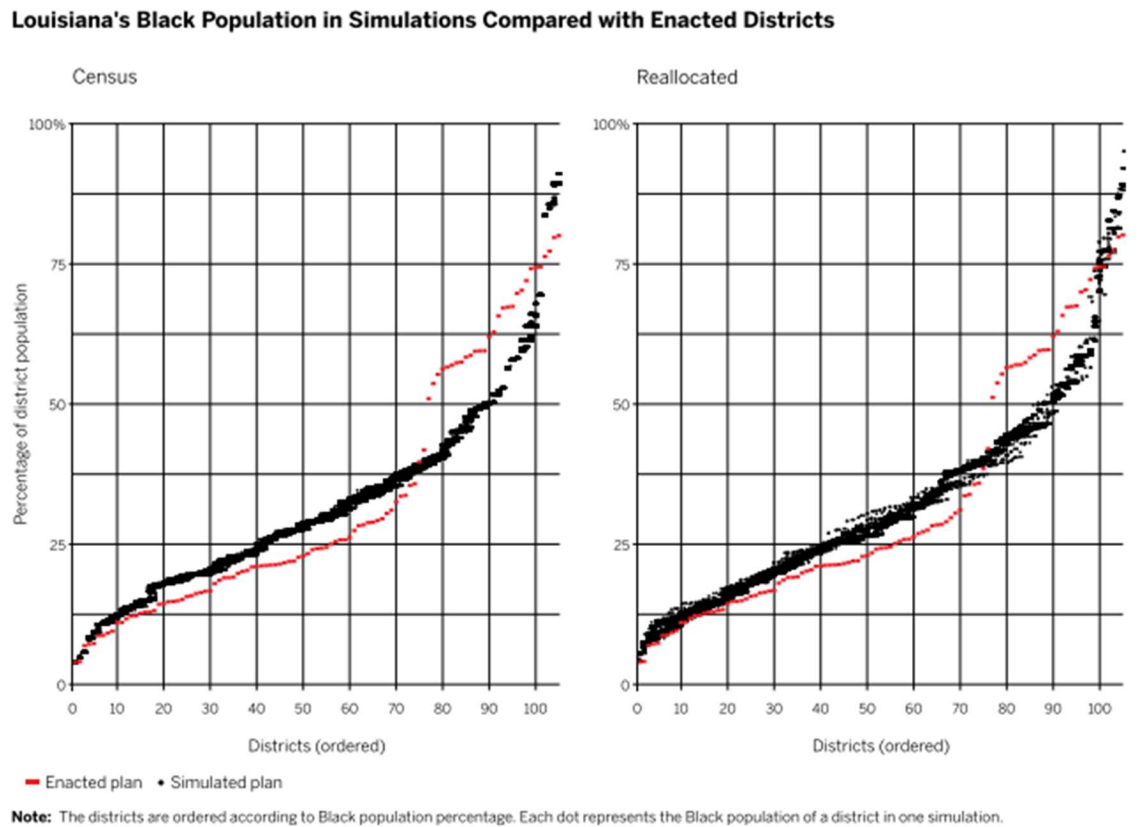


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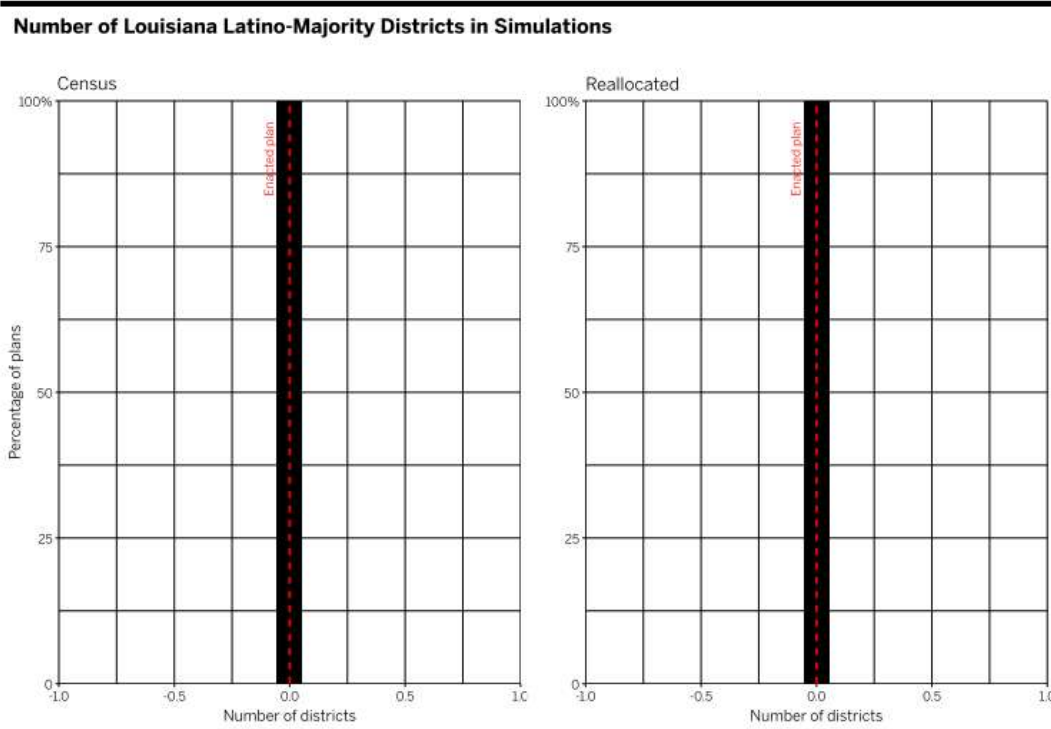


Figure A30

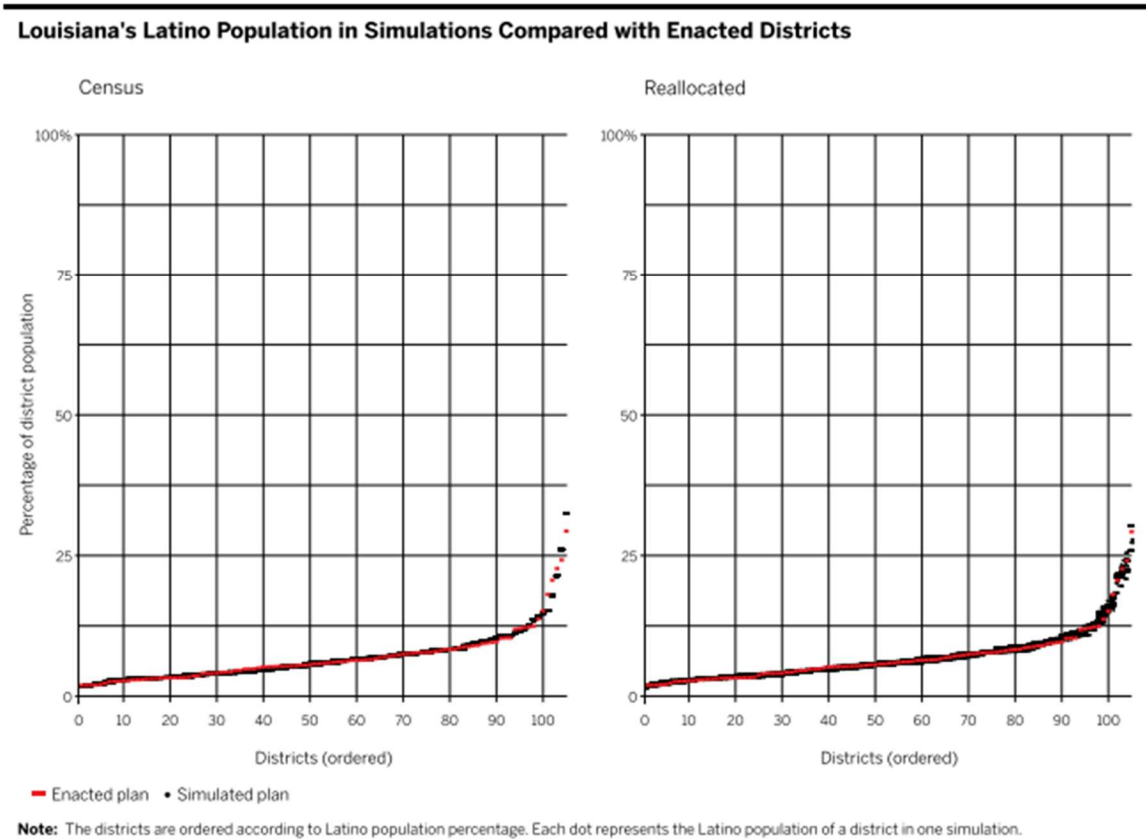


Figure A31

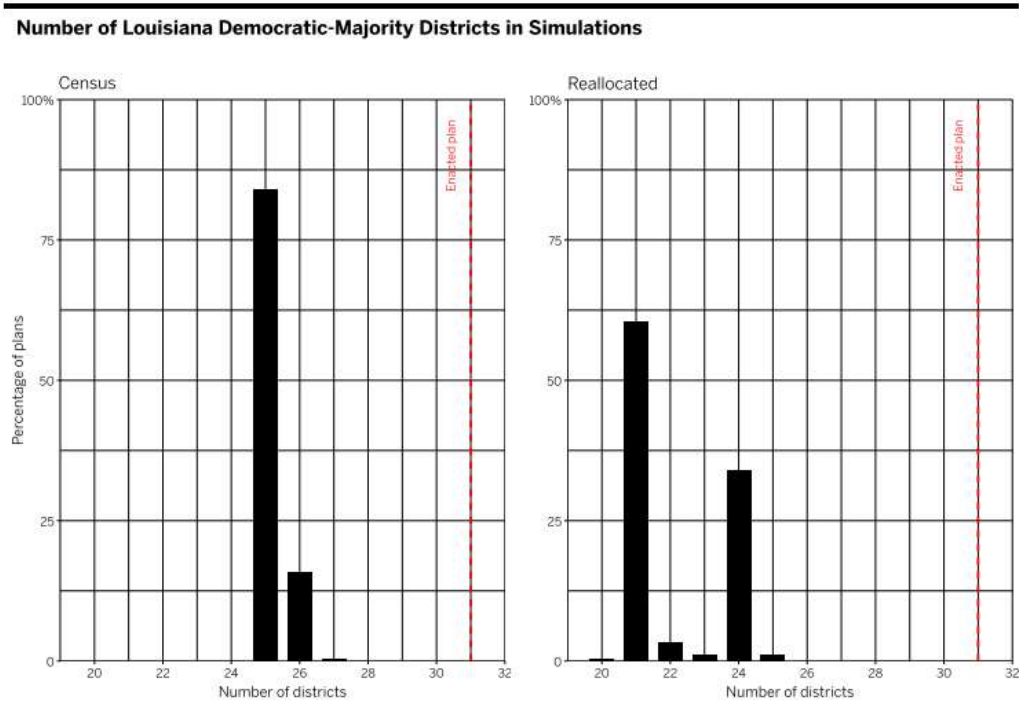
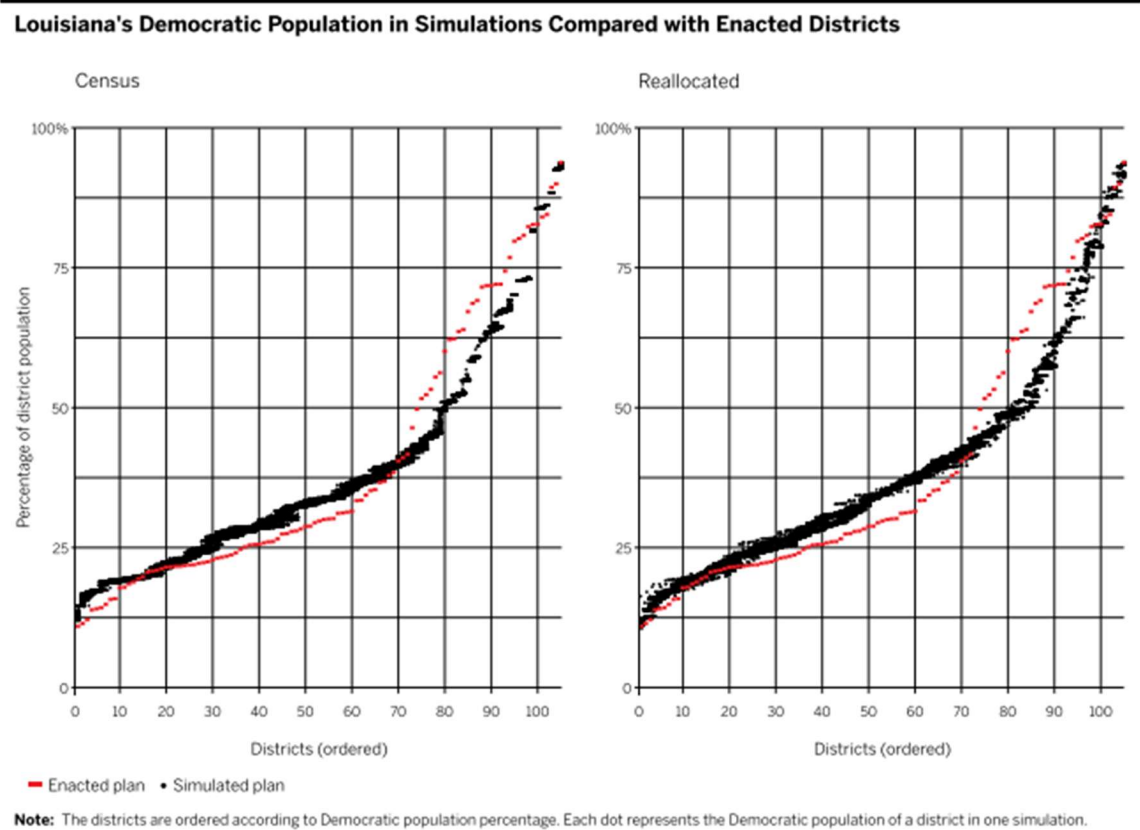
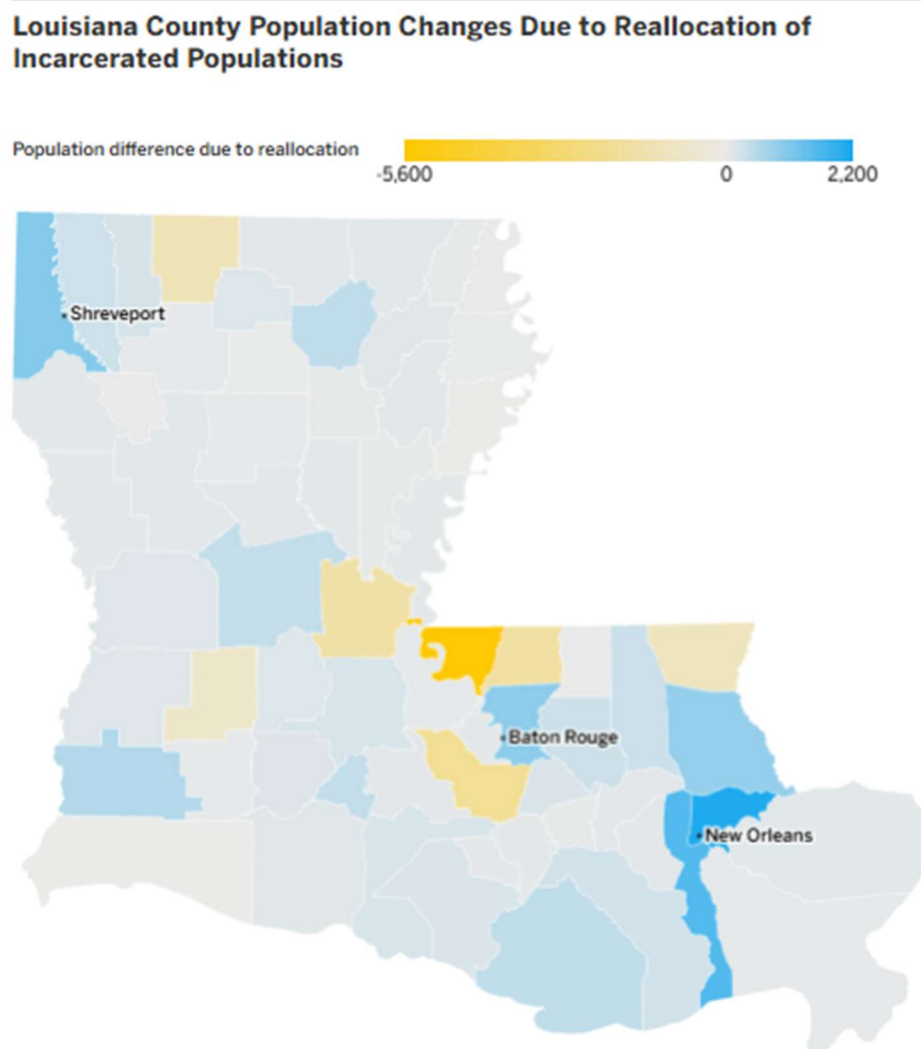


Figure A32



## County Population Change

**Figure A33**



# A.7 Mississippi

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A34

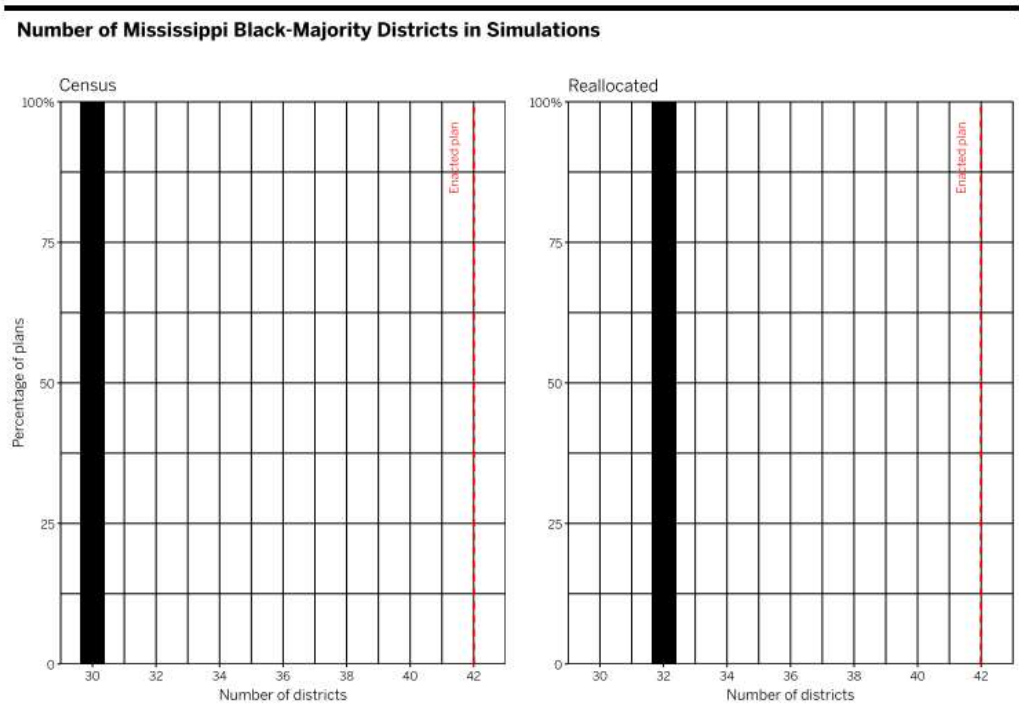


Figure A35

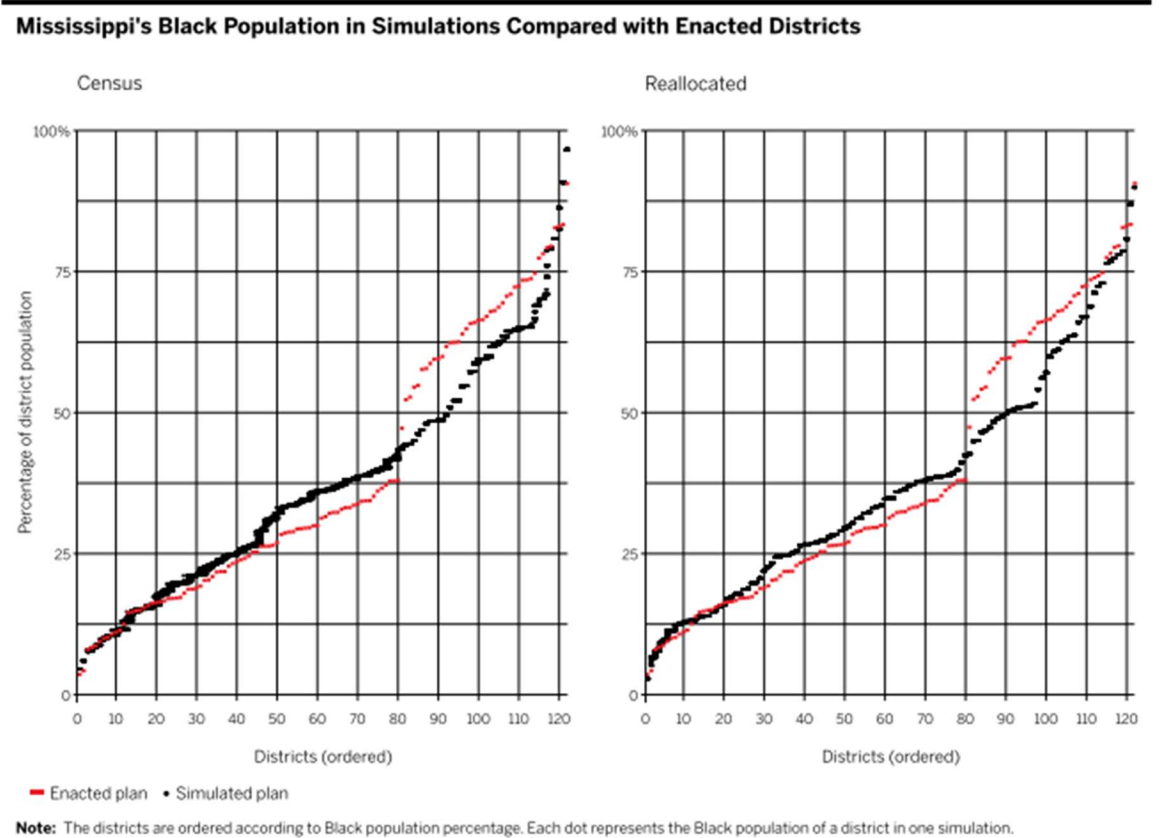


Figure A36

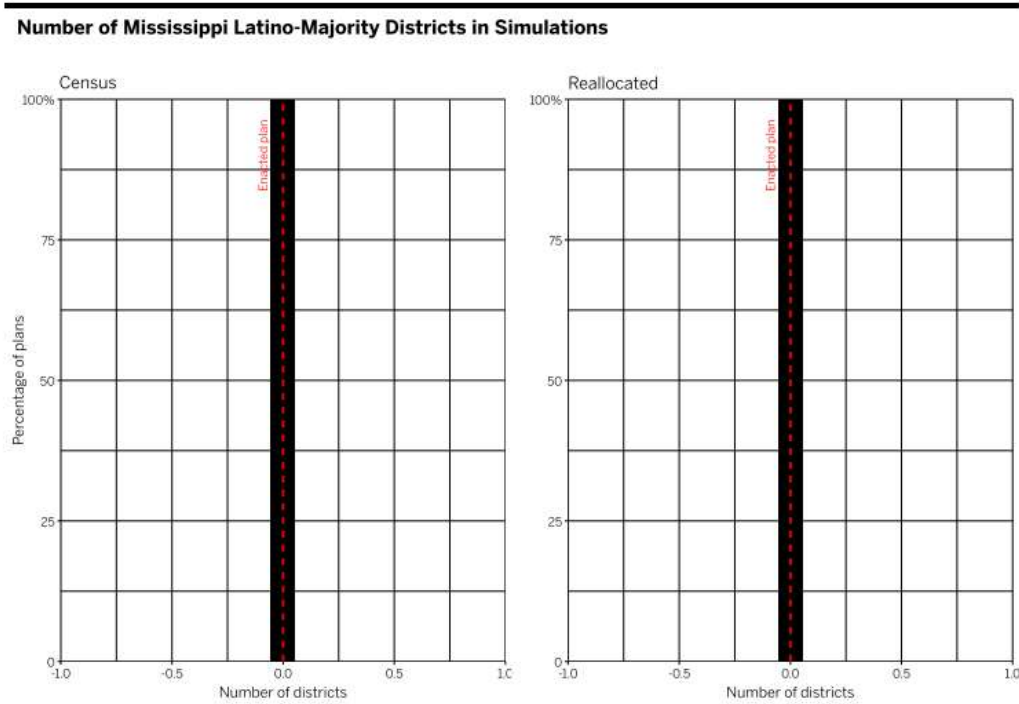


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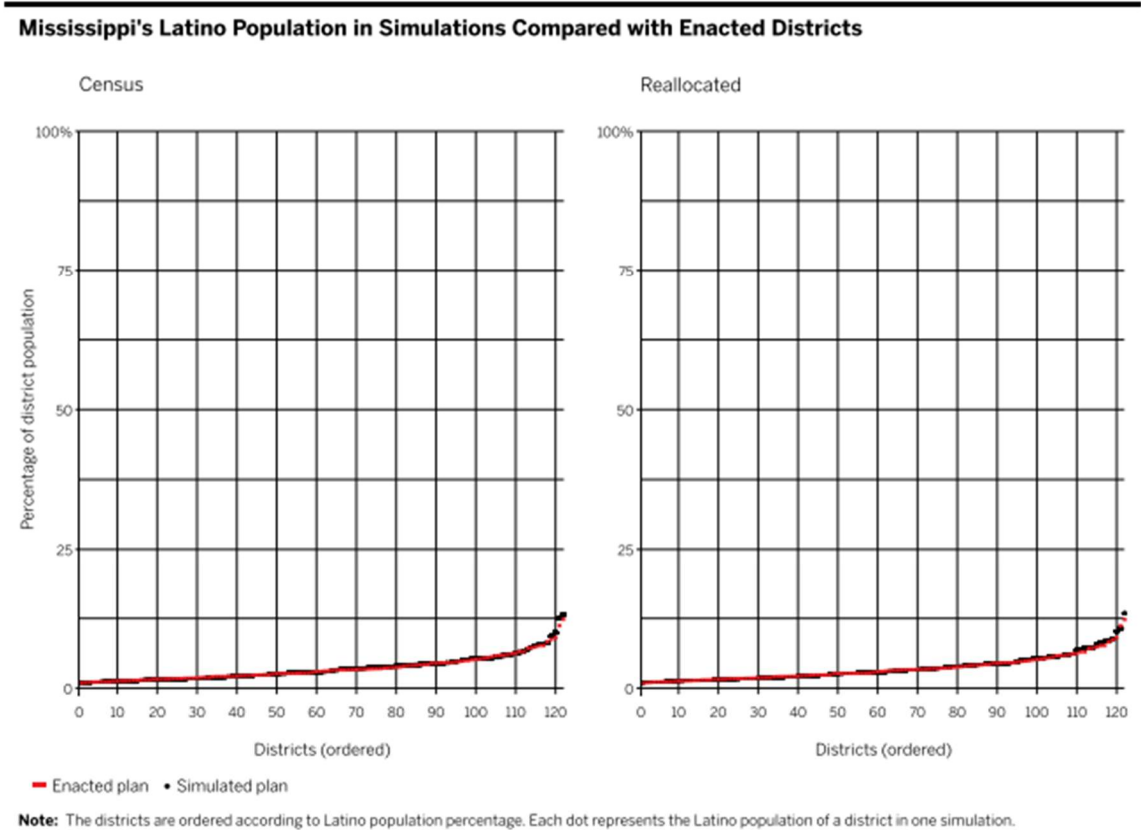




Figure A38

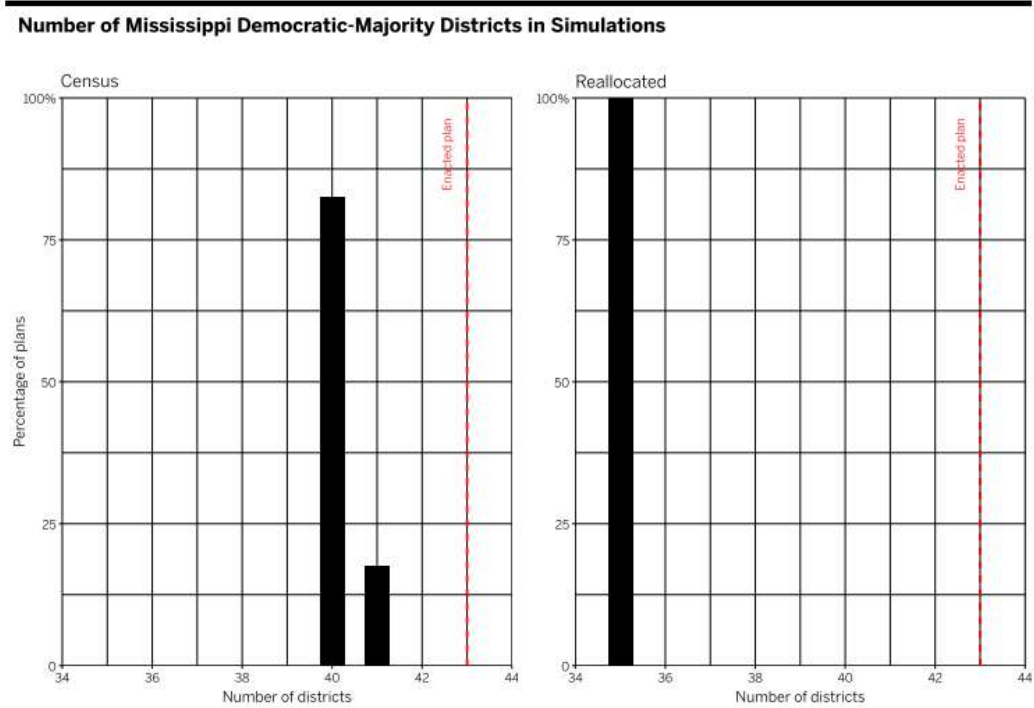
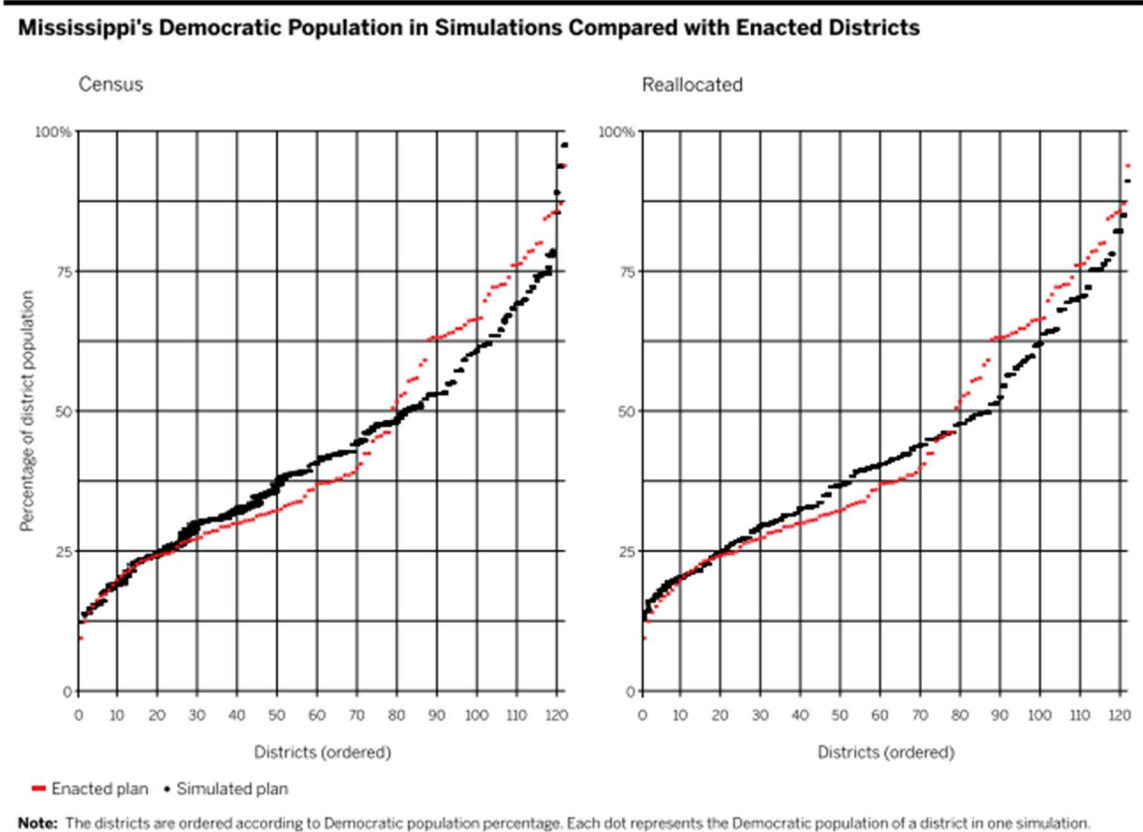
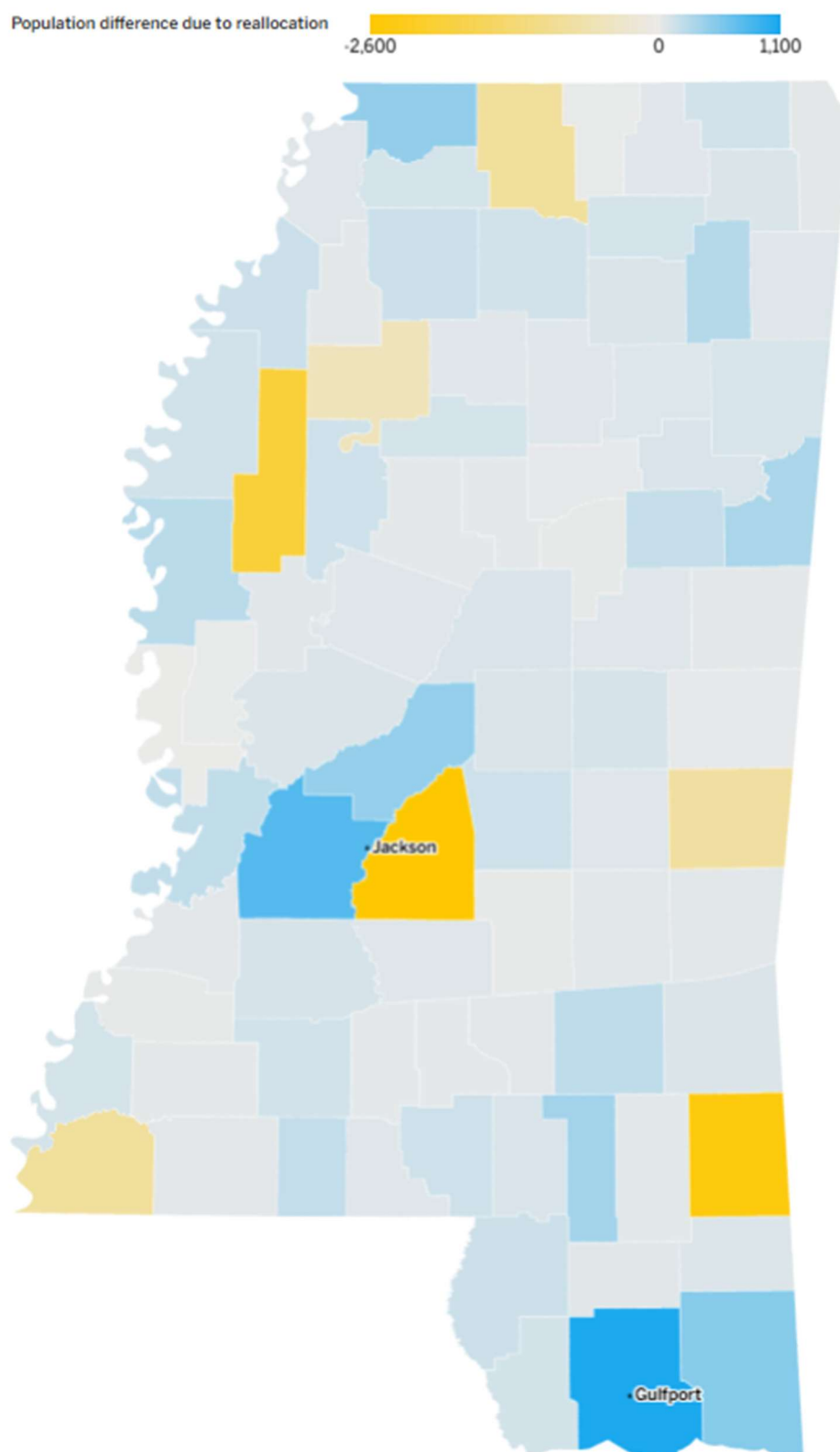


Figure A39



## County Population Change

**Figure A40**



# A.8 North Carolina

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A41

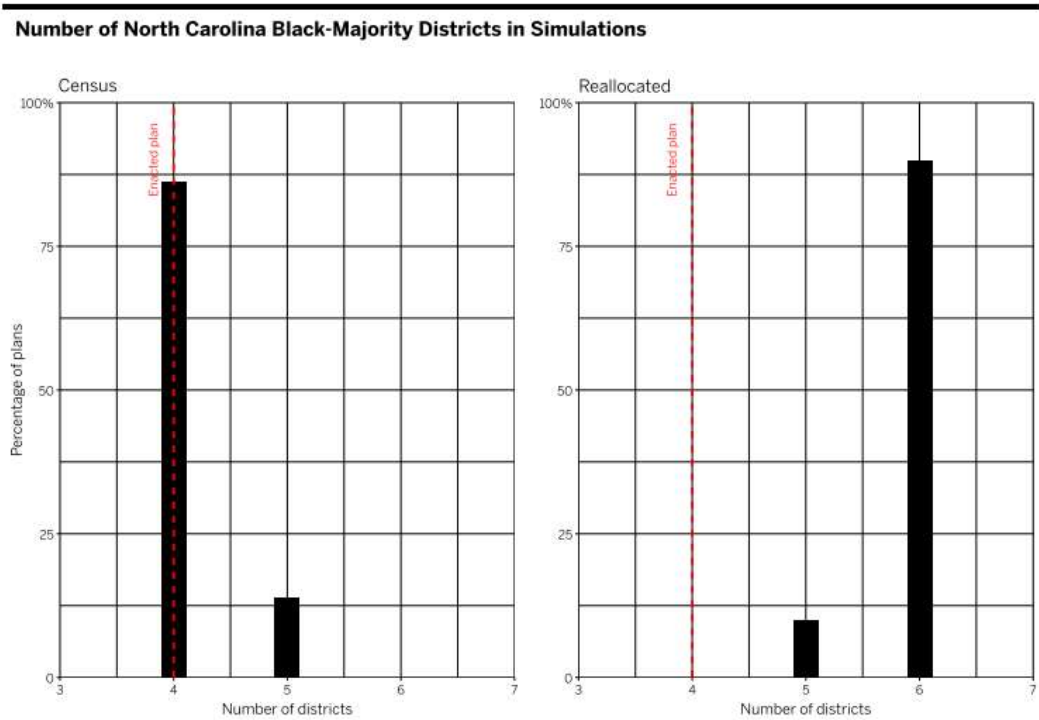


Figure A42

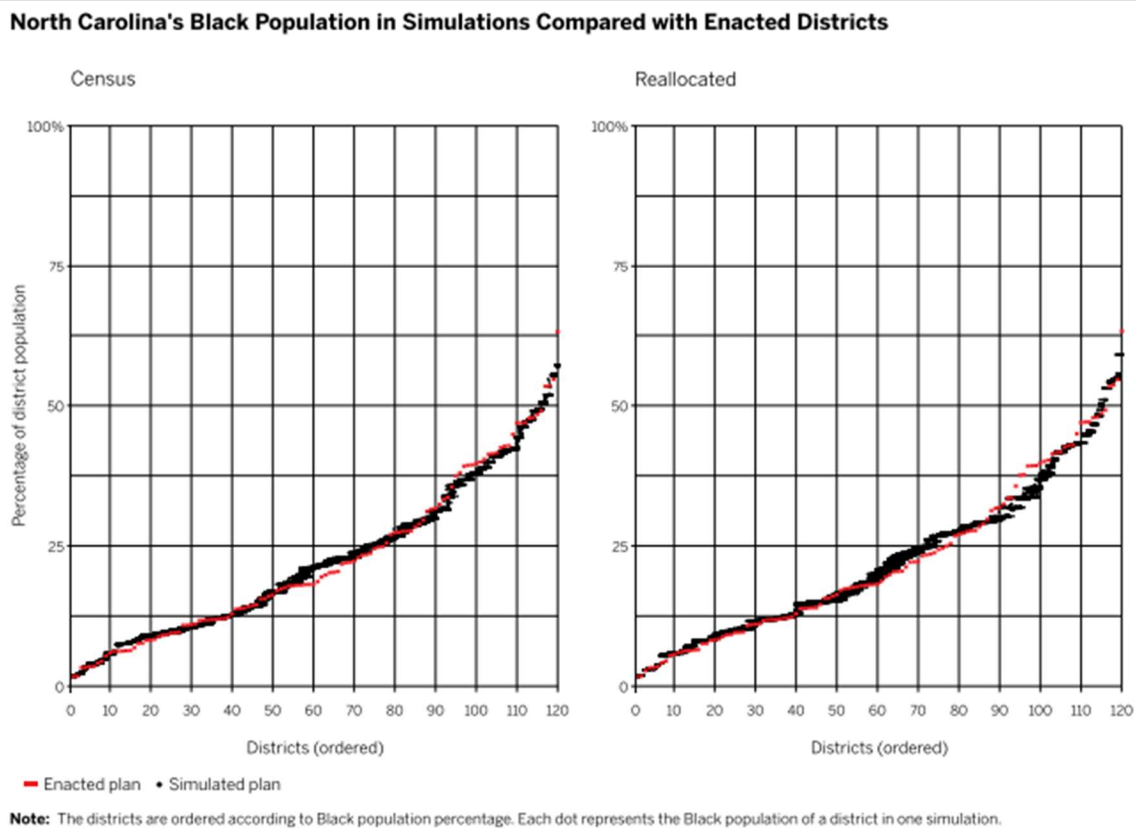


Figure A43

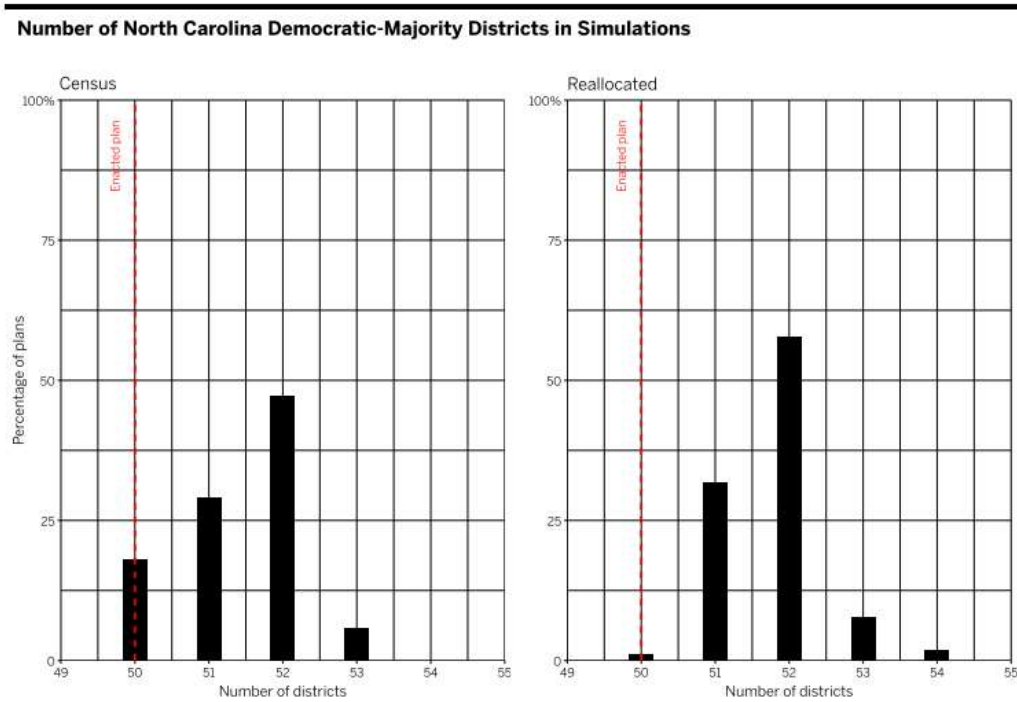
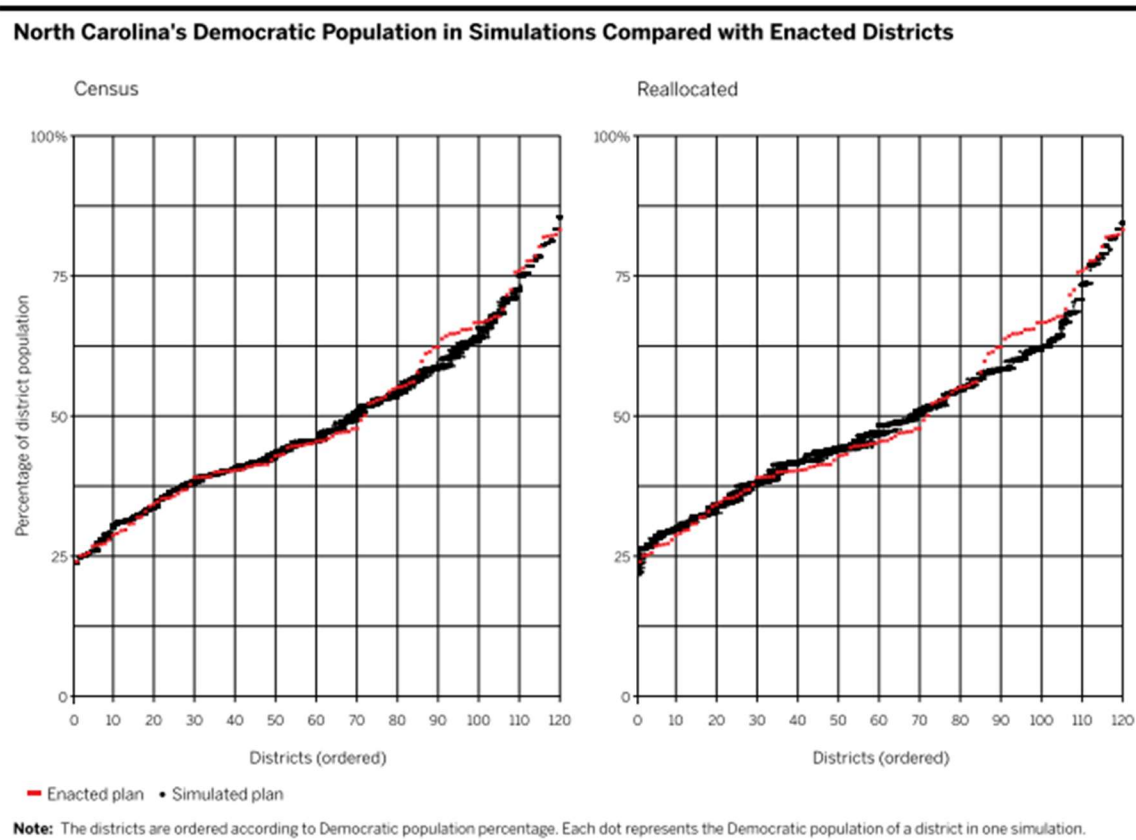
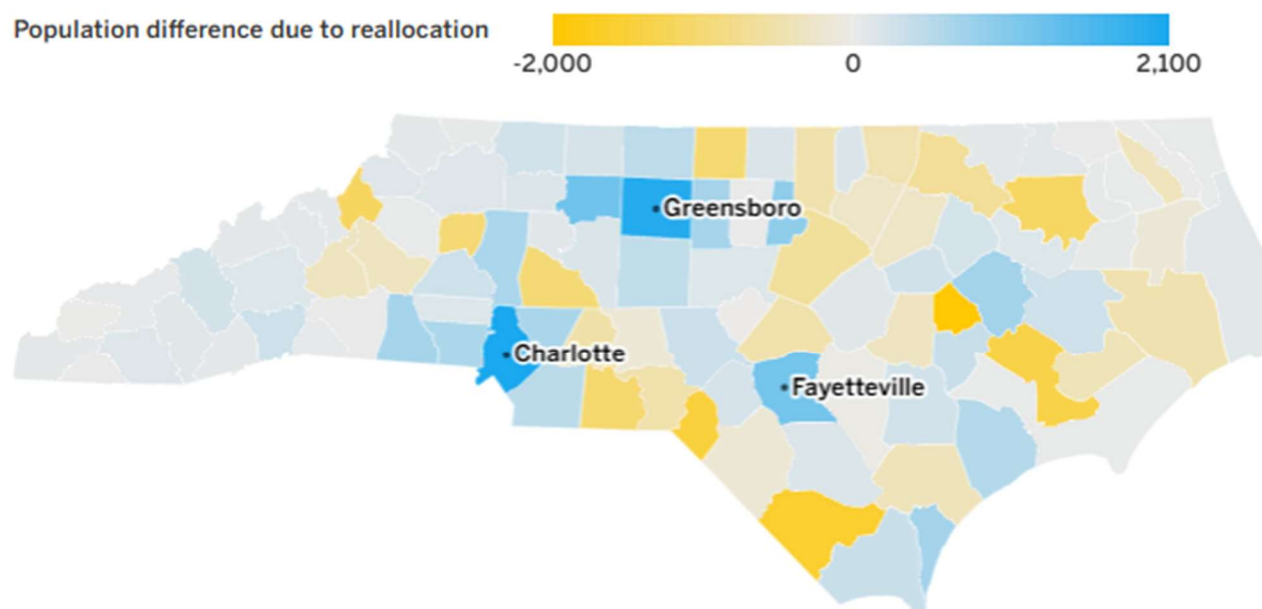


Figure A44



**Figure A45**

## North Carolina County Population Changes Due to Reallocation of Incarcerated Populations



# A.9 New Mexico

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A46

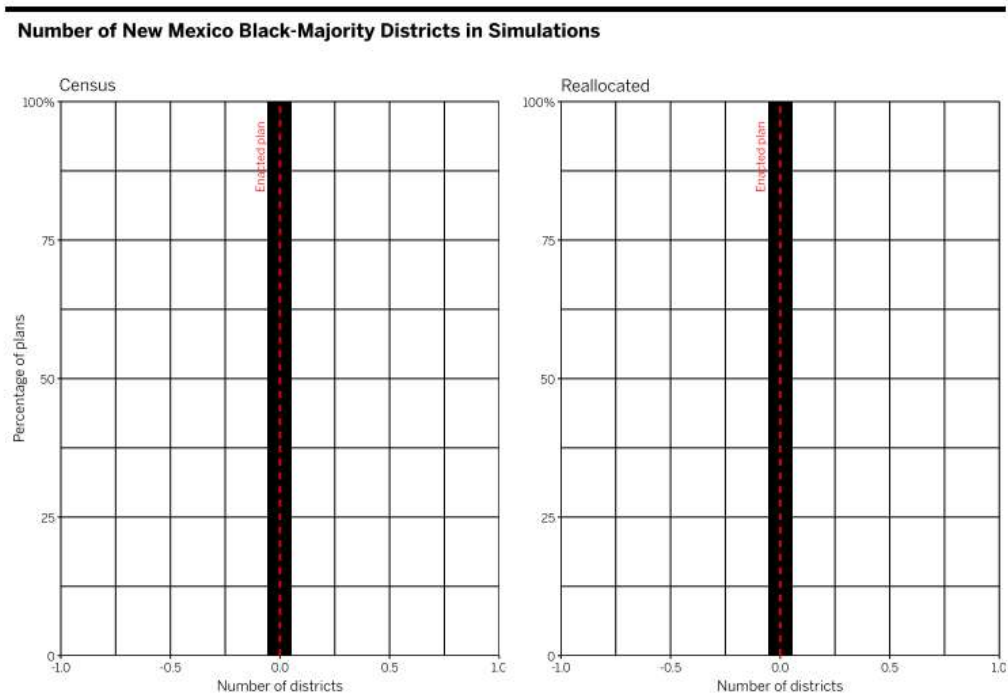


Figure A47

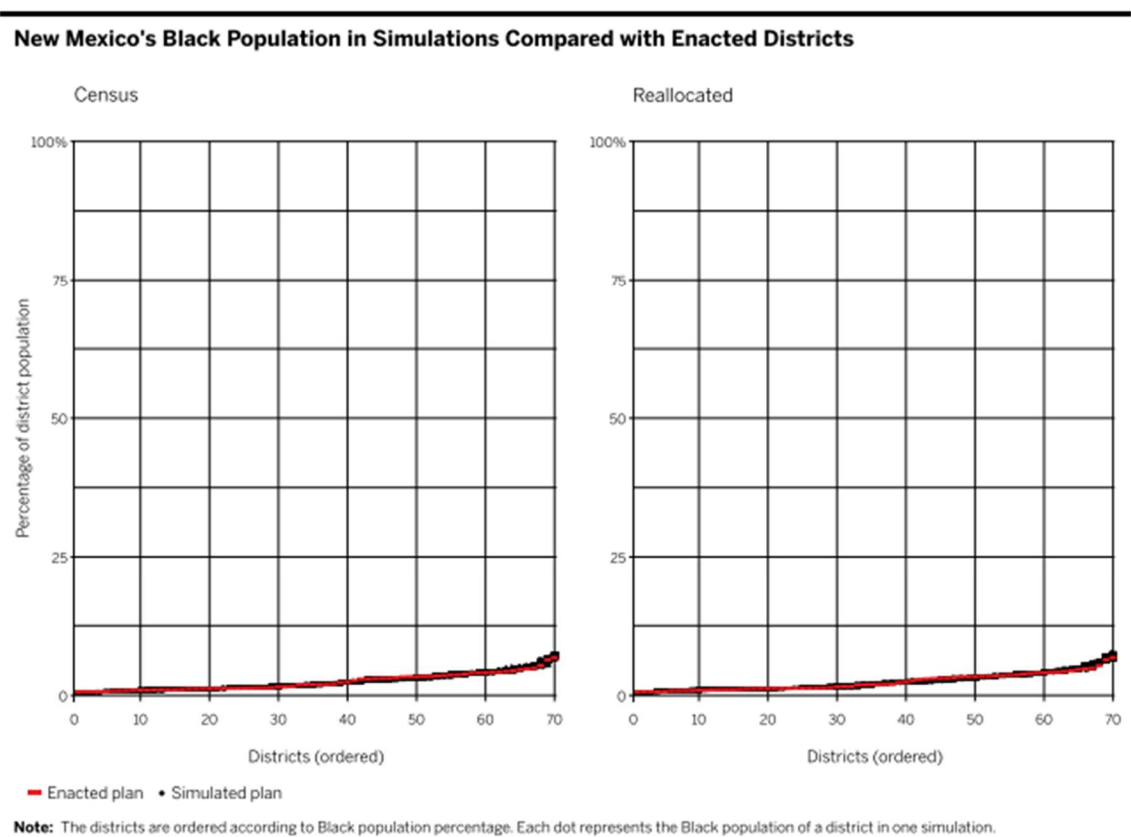


Figure A48

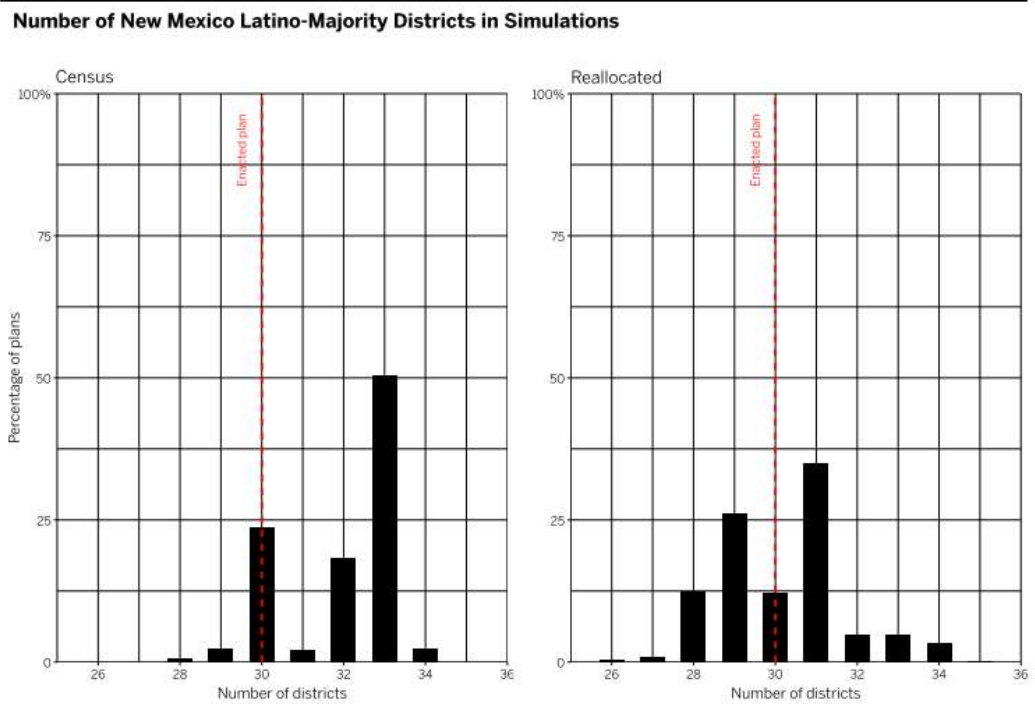


Figure A49

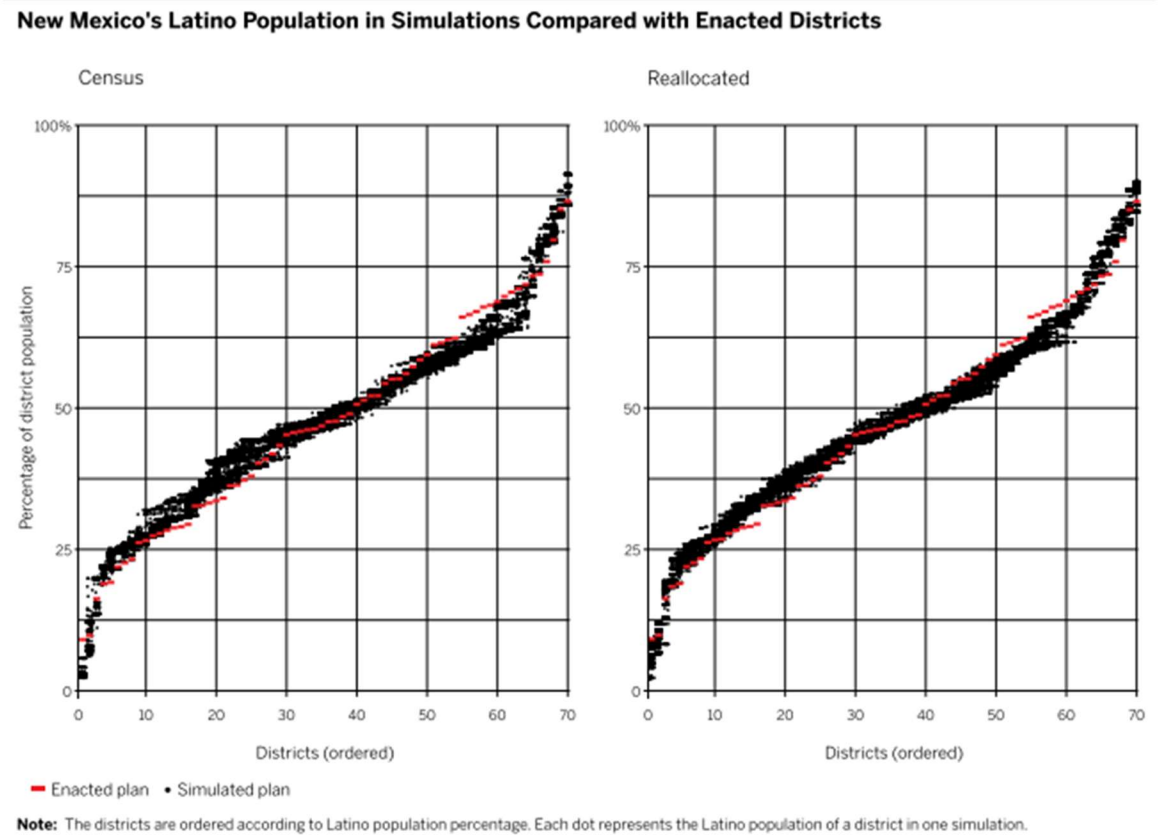


Figure A50

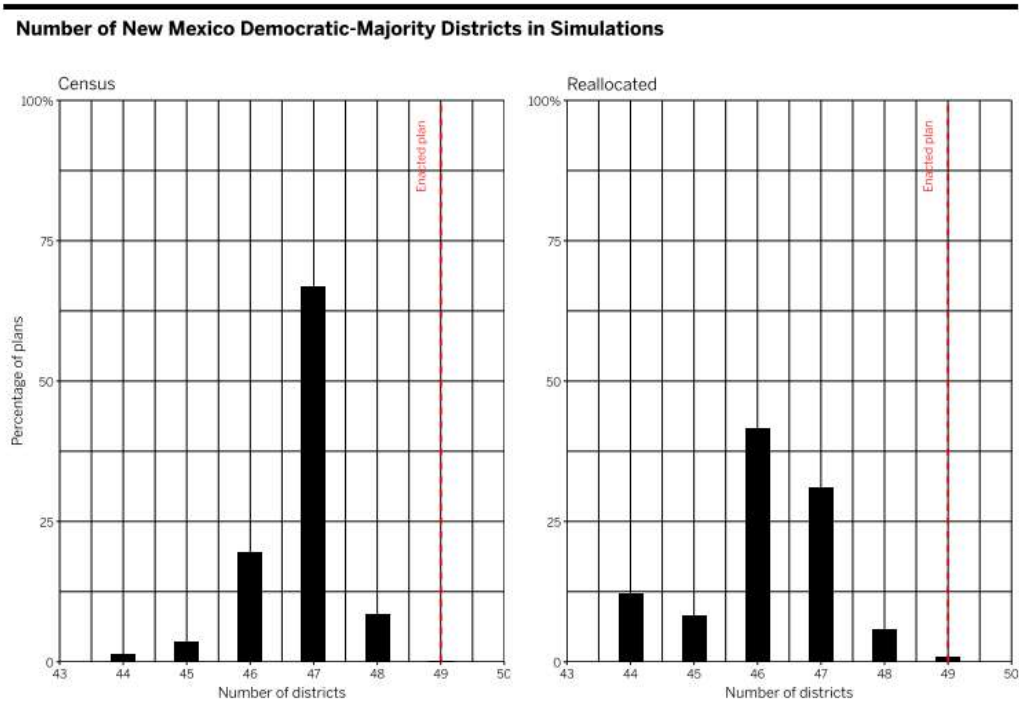
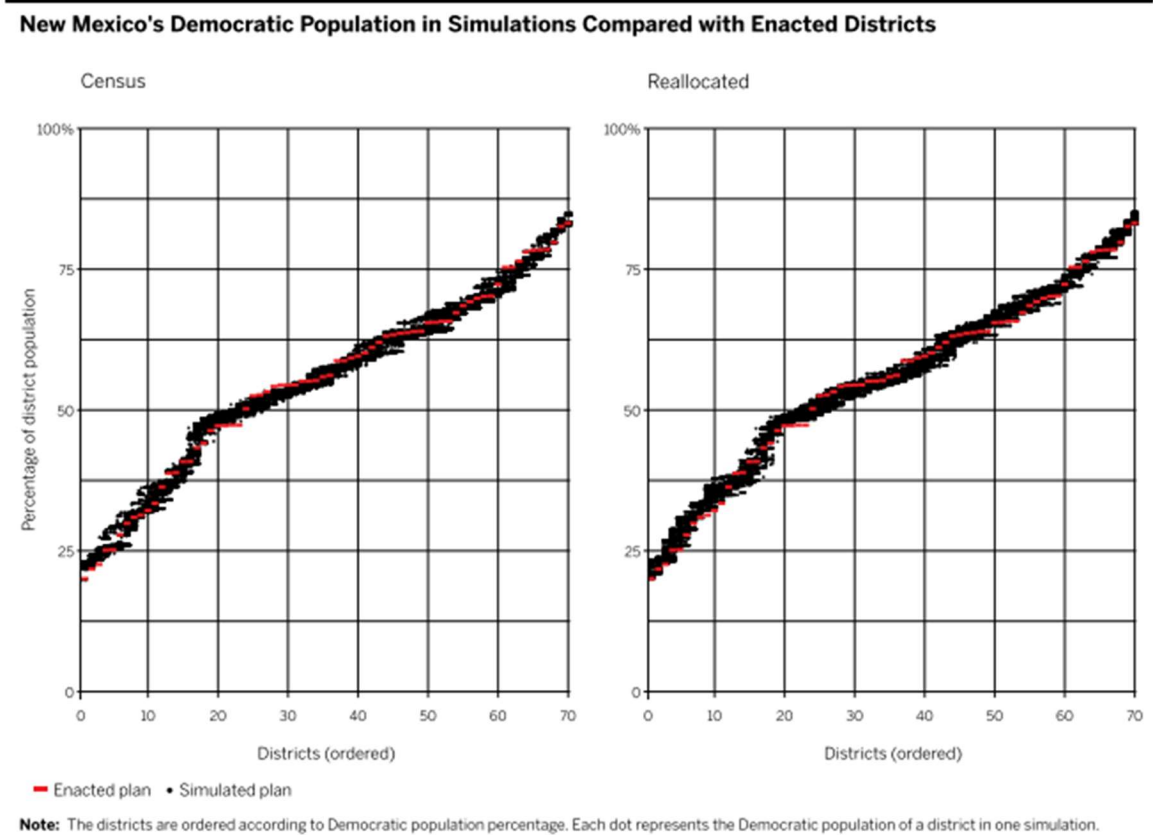


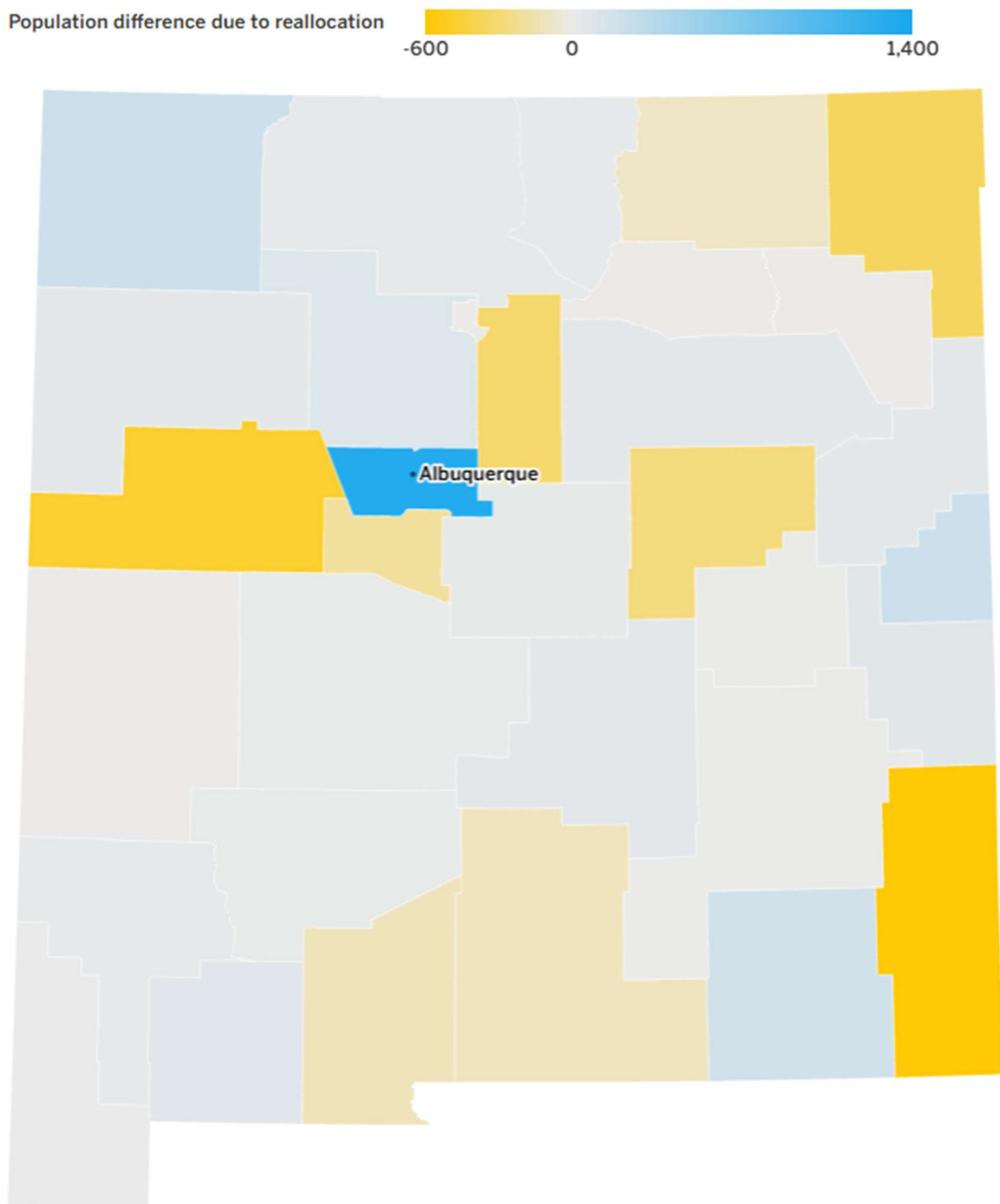
Figure A51





**Figure A52**

## New Mexico County Population Changes Due to Reallocation of Incarcerated Populations



# A.10 Ohio

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A53

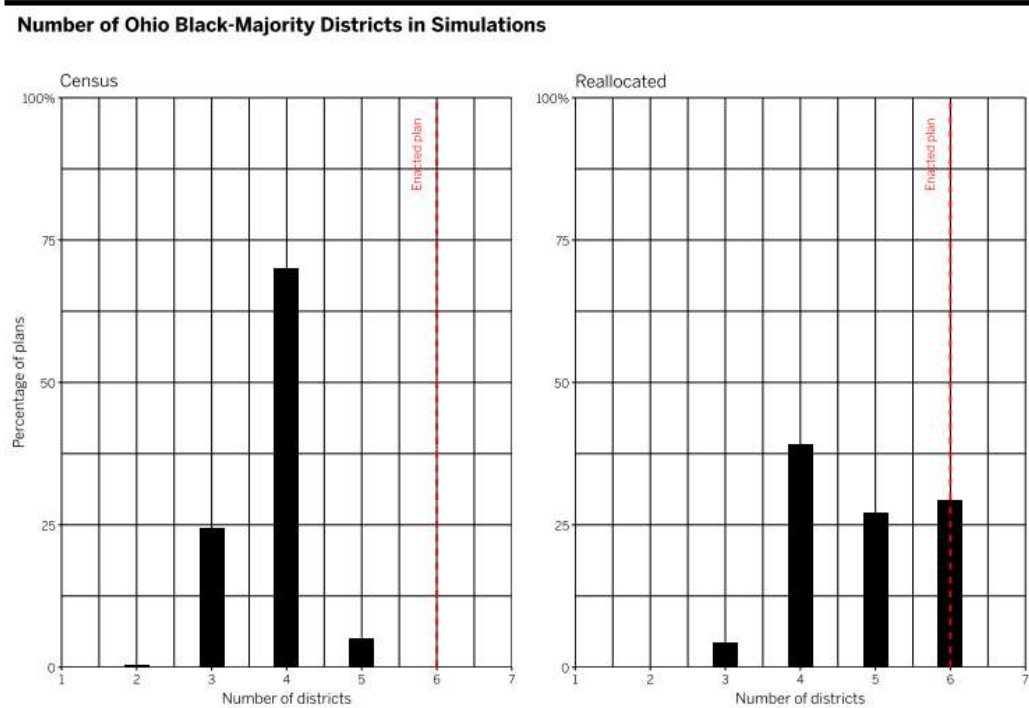


Figure A54

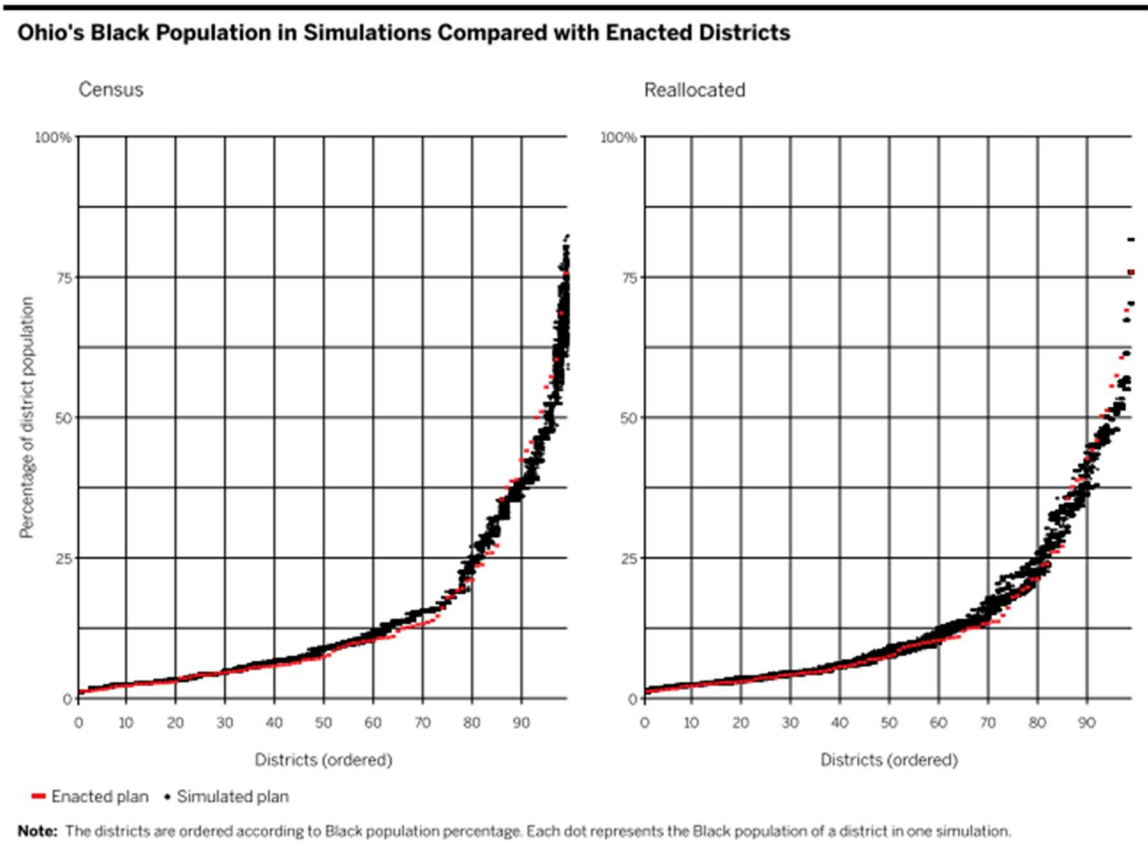


Figure A55

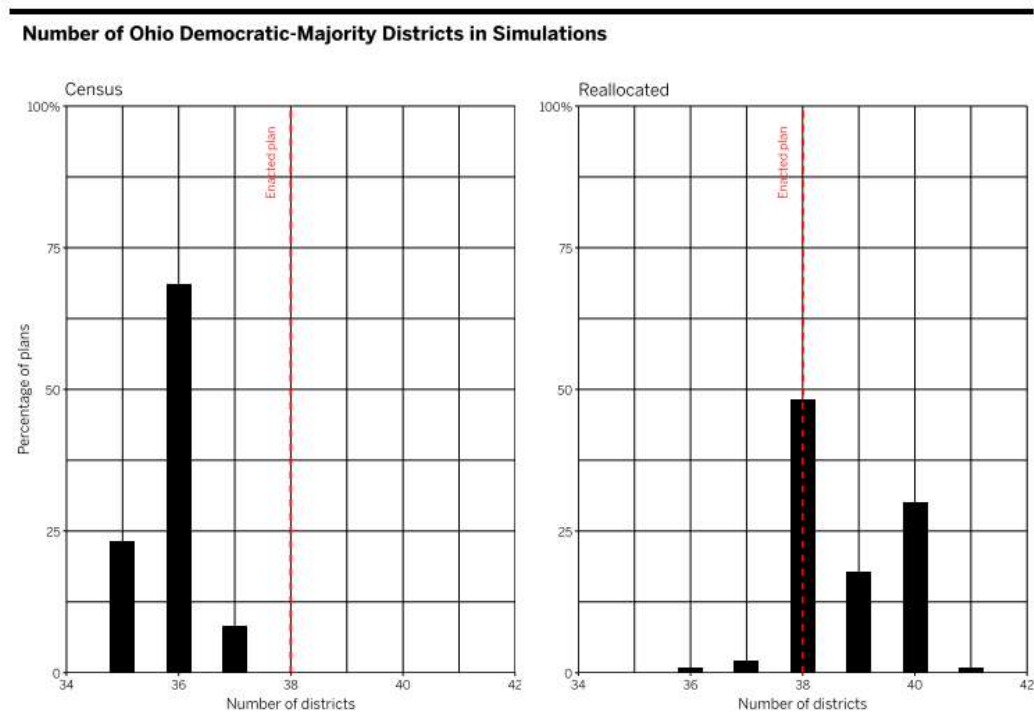


Figure A56

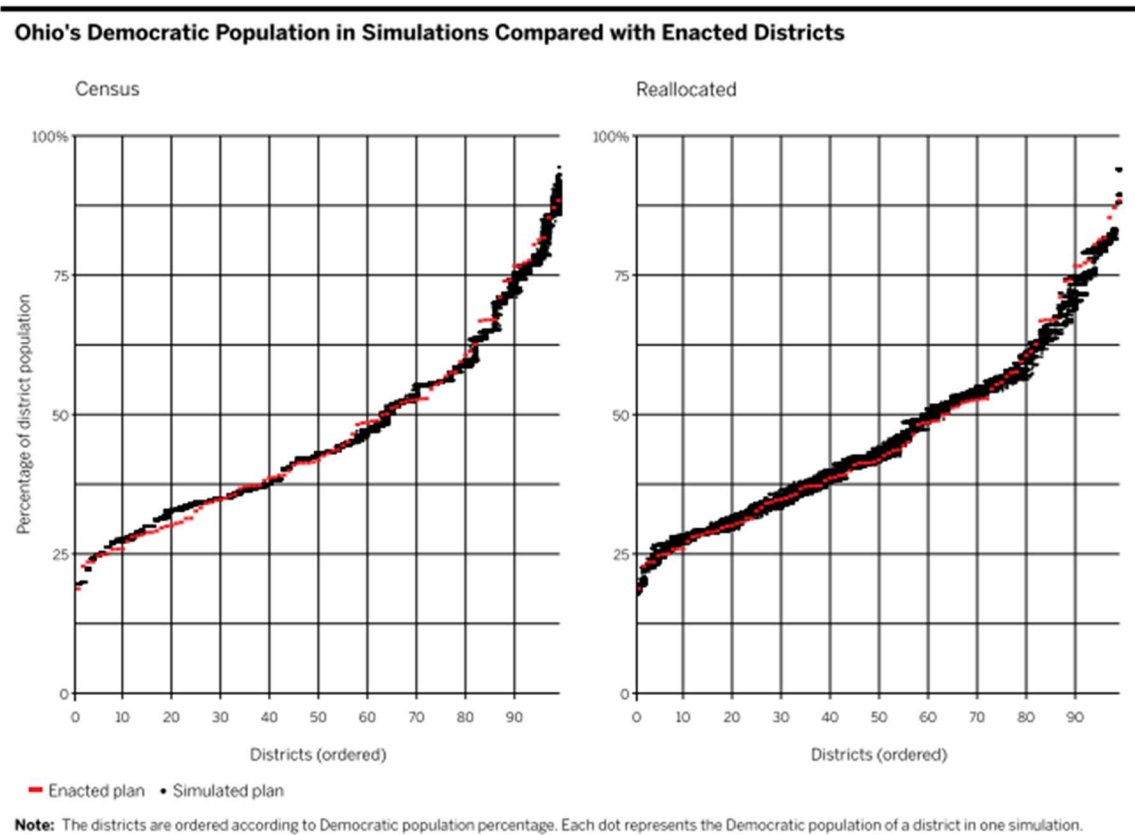
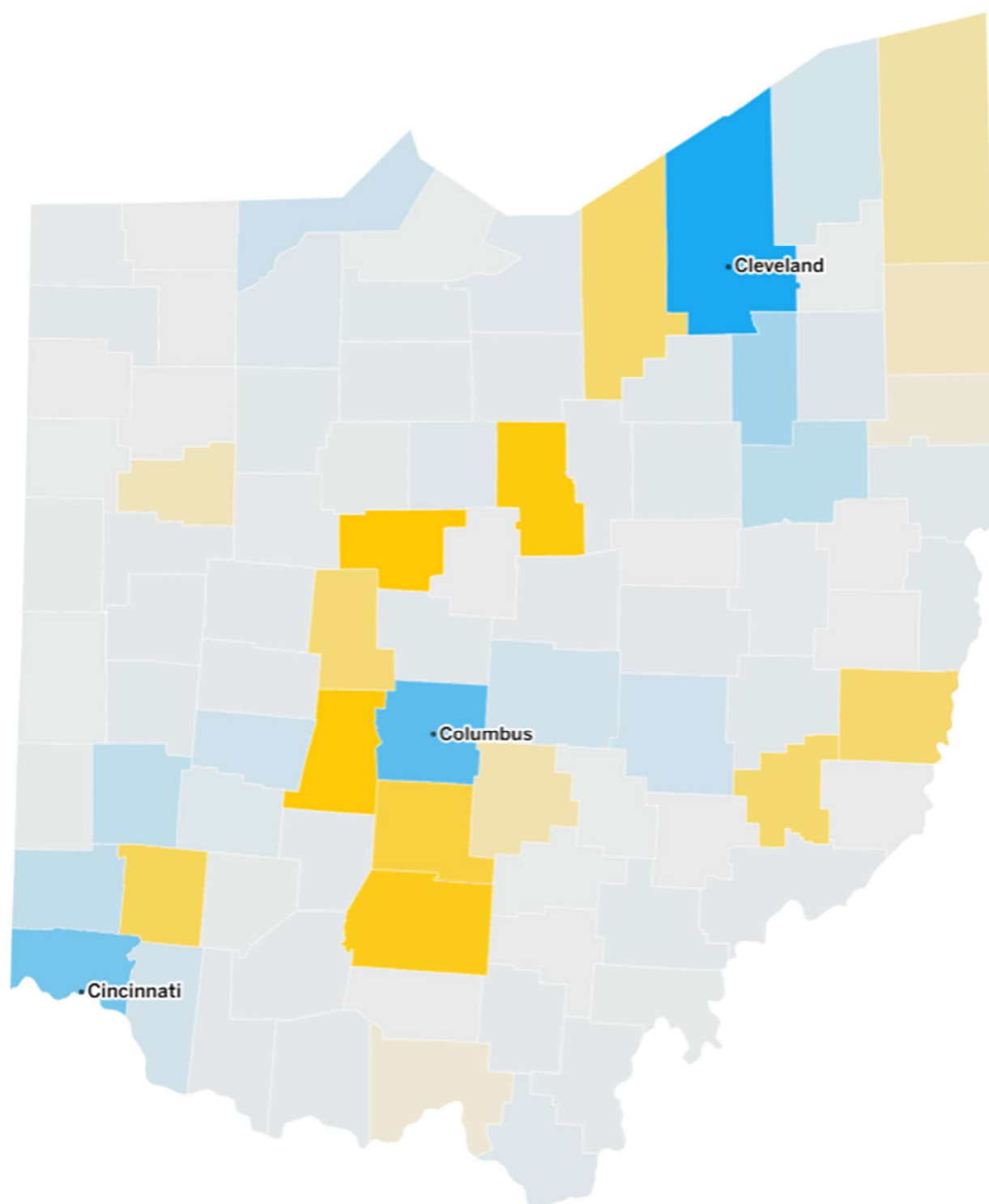


Figure A57

## Ohio County Population Changes Due to Reallocation of Incarcerated Populations

Population difference due to reallocation



## A.11 Texas

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

### Black Districts

Figure A58

Number of Texas Black-Majority Districts in Simulations

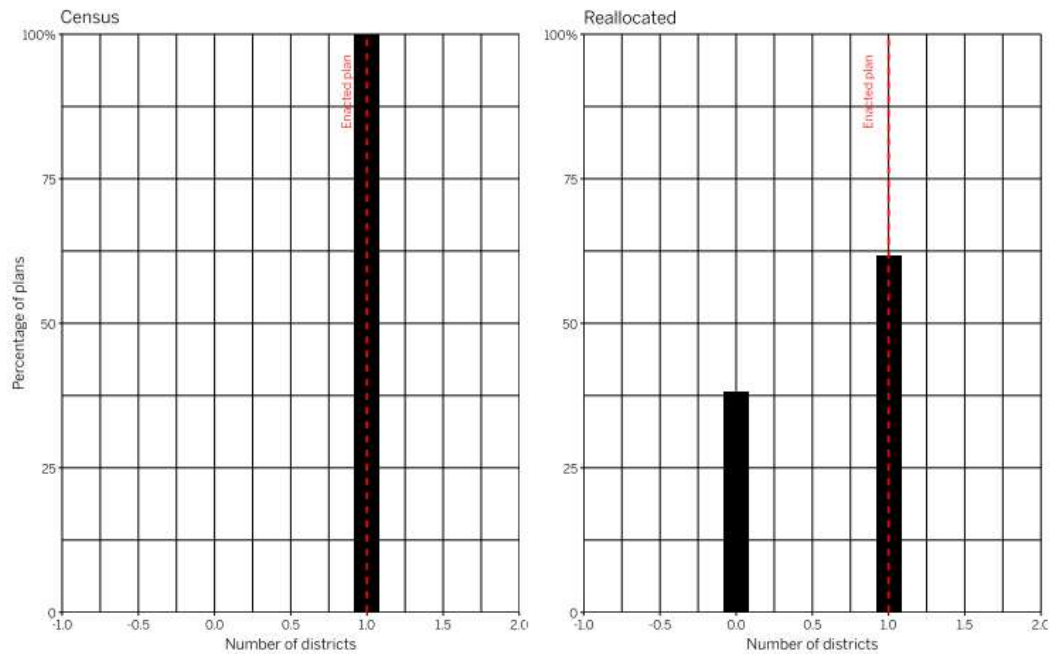


Figure A59

Texas's Black Population in Simulations Compared with Enacted Districts

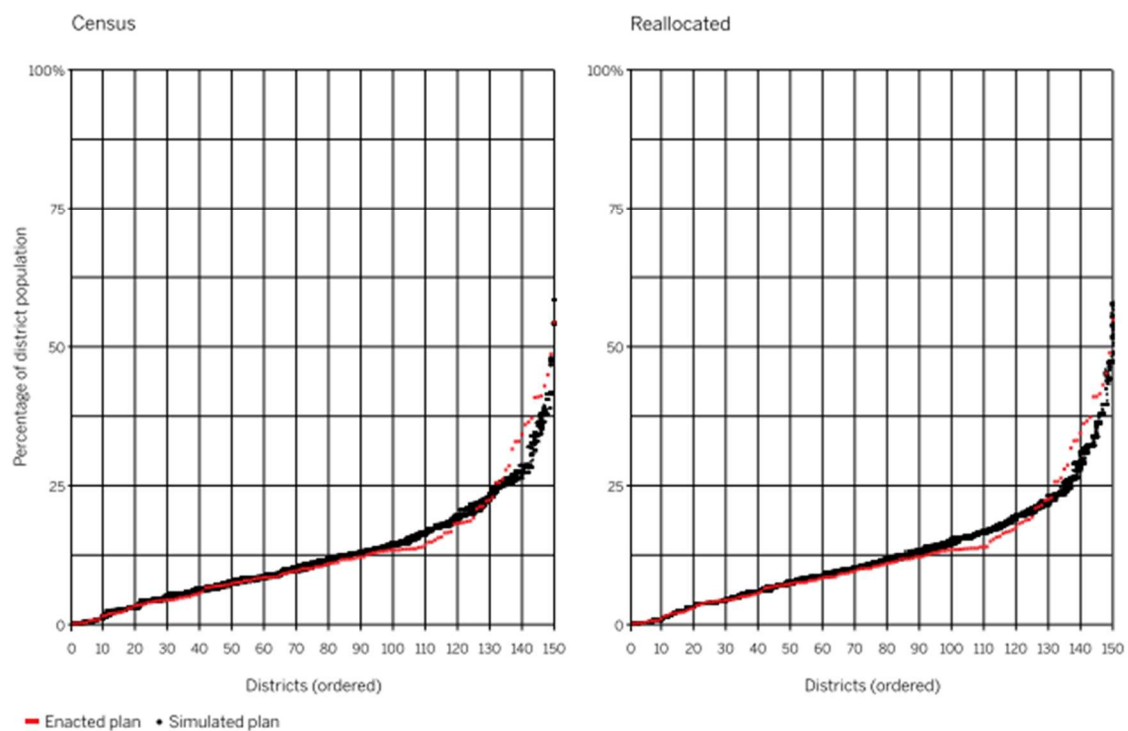


Figure A60

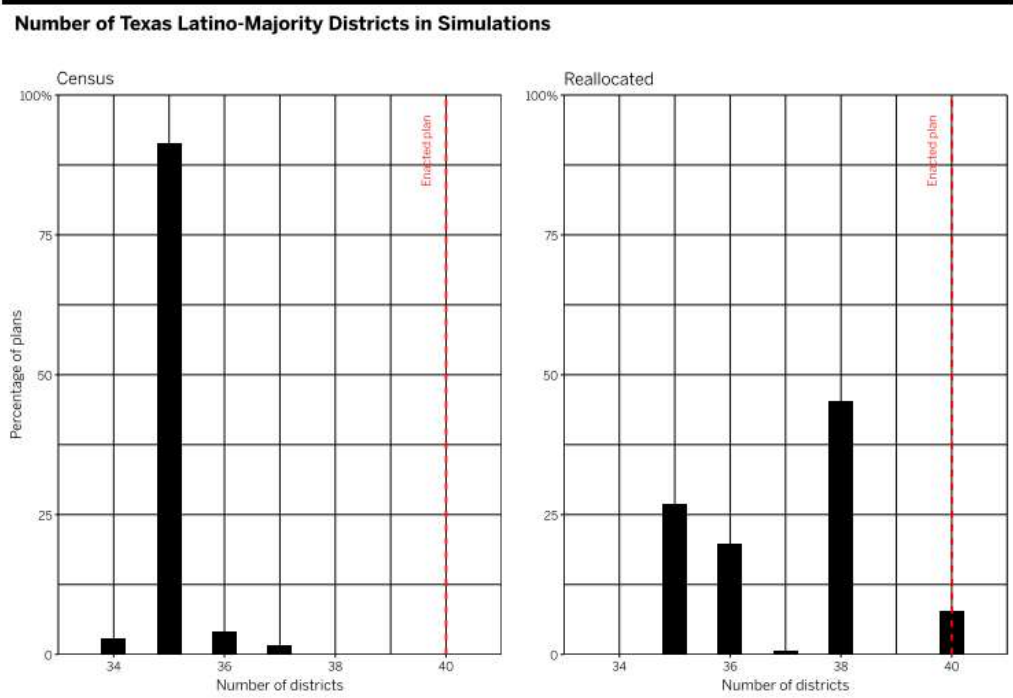


Figure A61

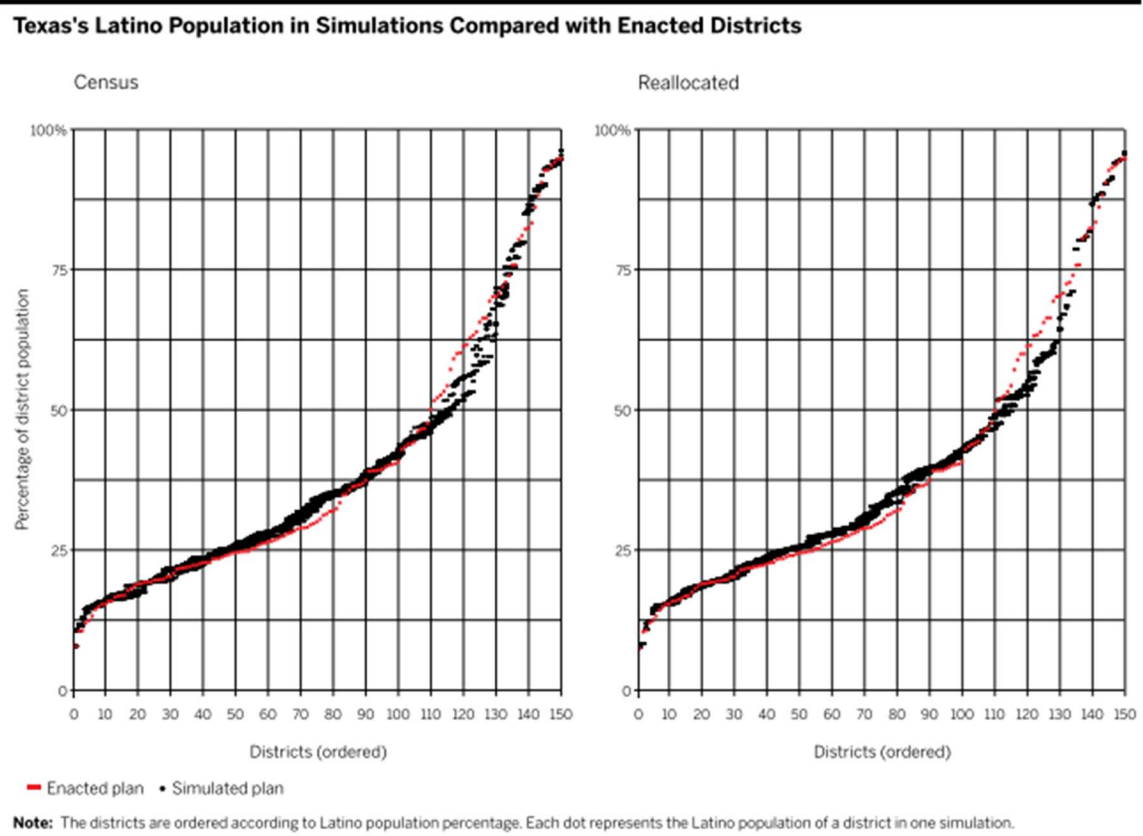


Figure A62

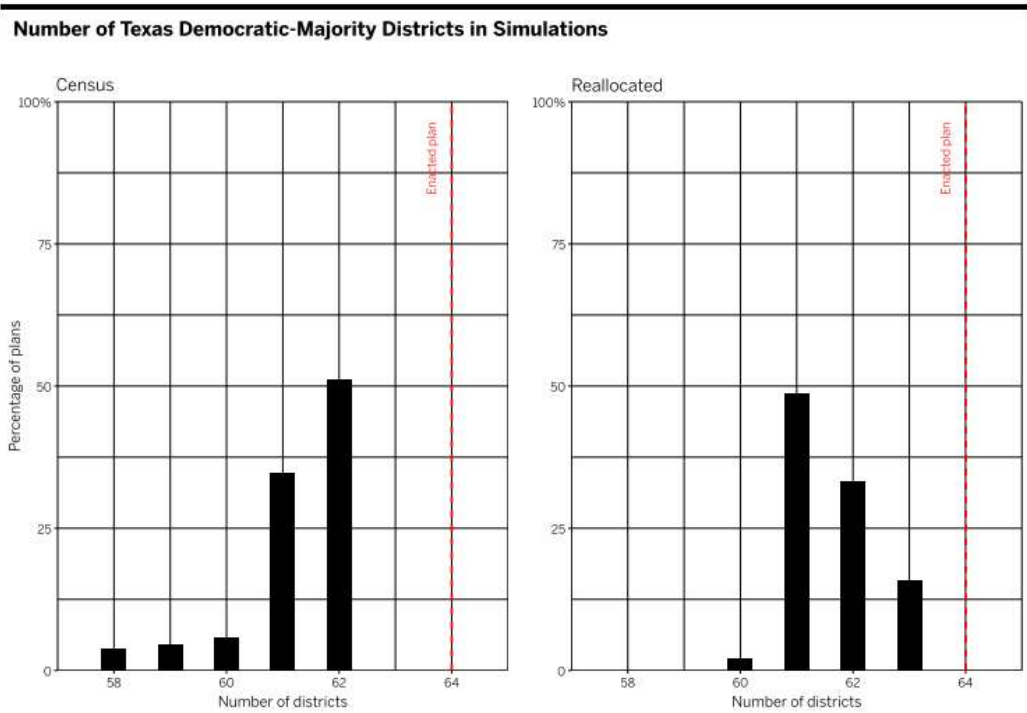


Figure A63

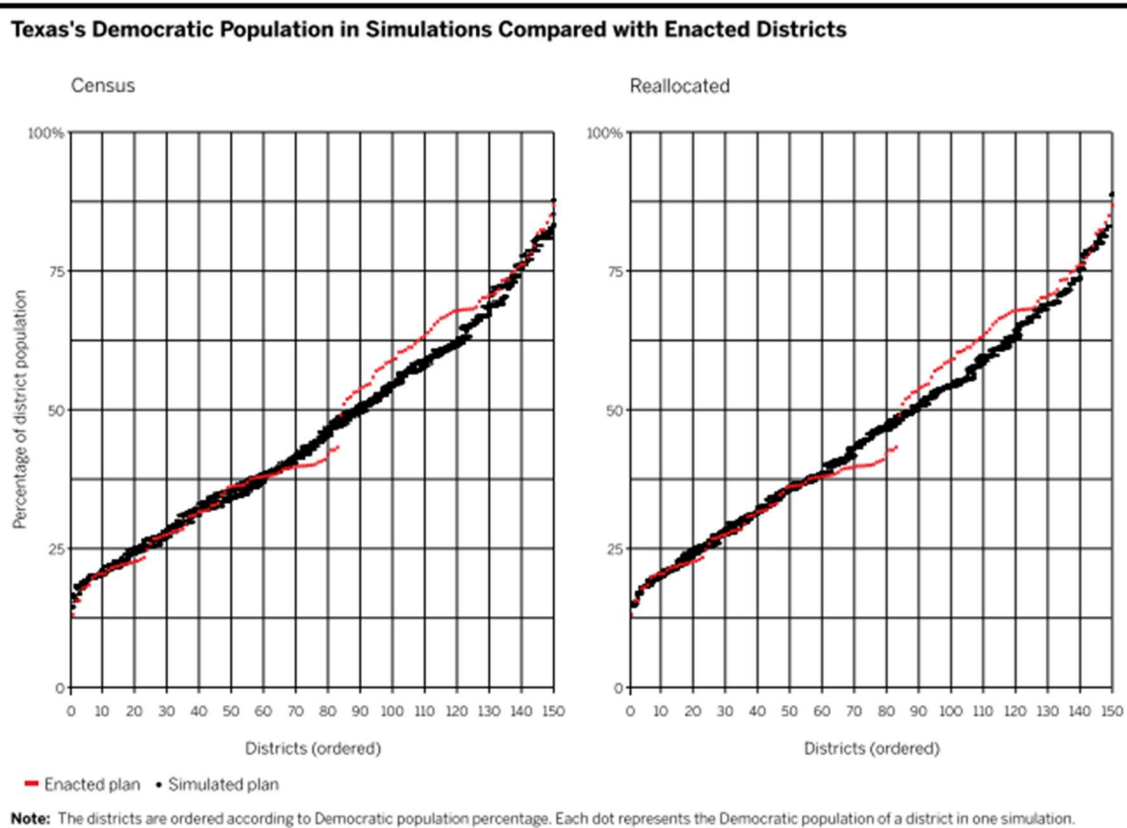
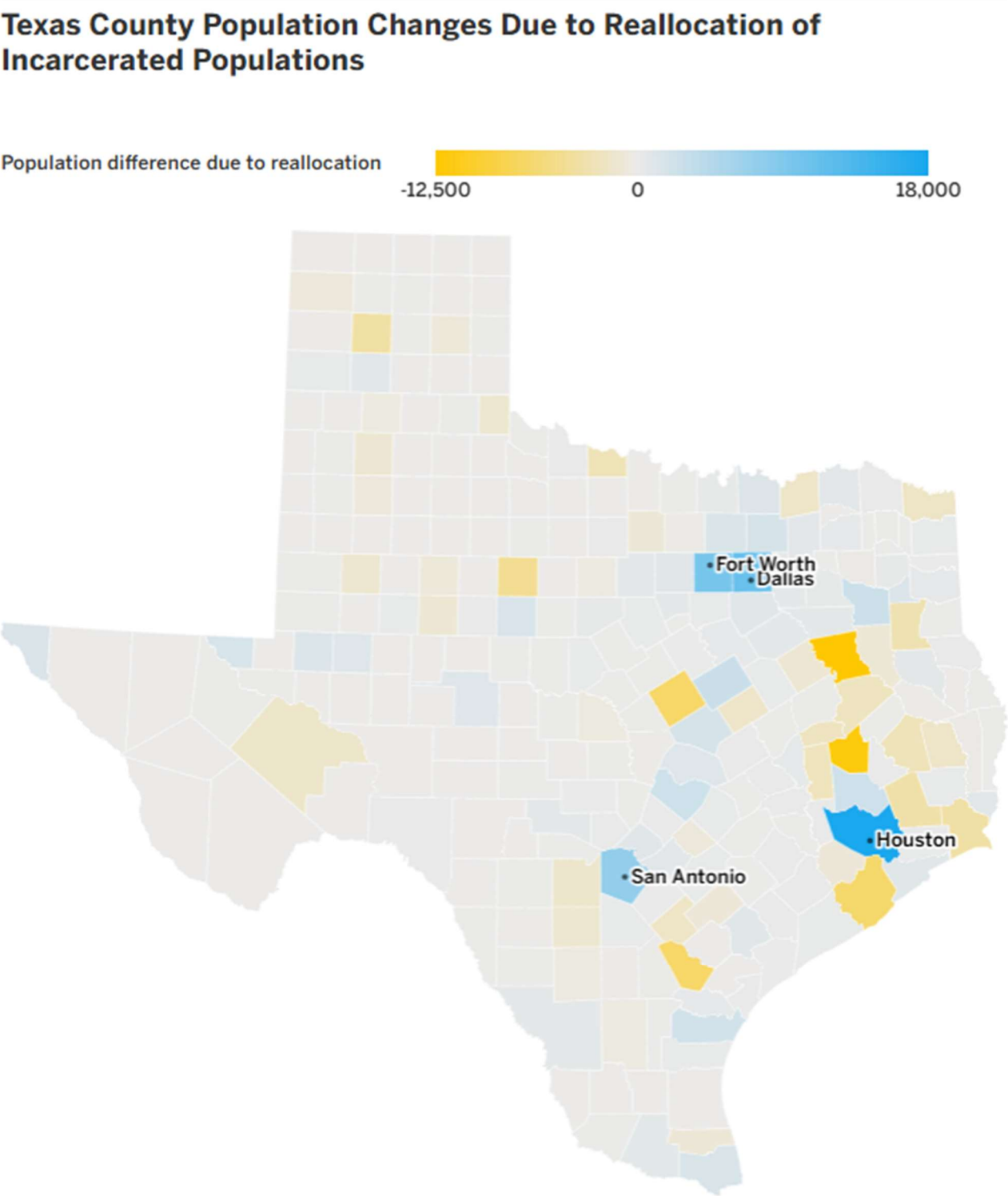


Figure A64





# A.12 West Virginia

Refer to Arkansas Black district graphs for explanations of how to read the graphs below.

## Black Districts

Figure A65

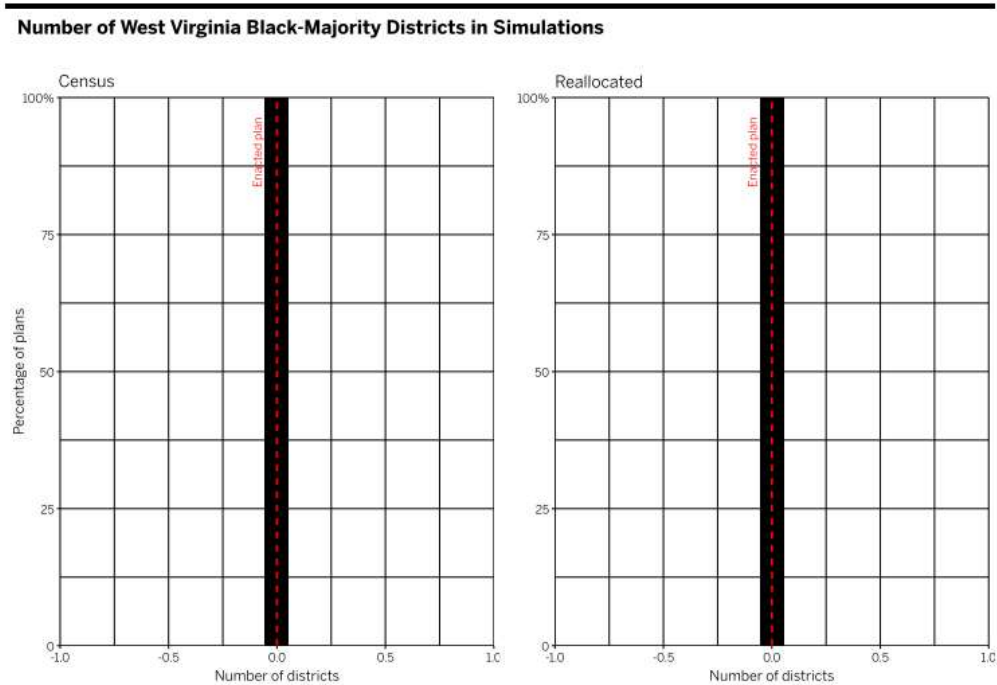


Figure A66

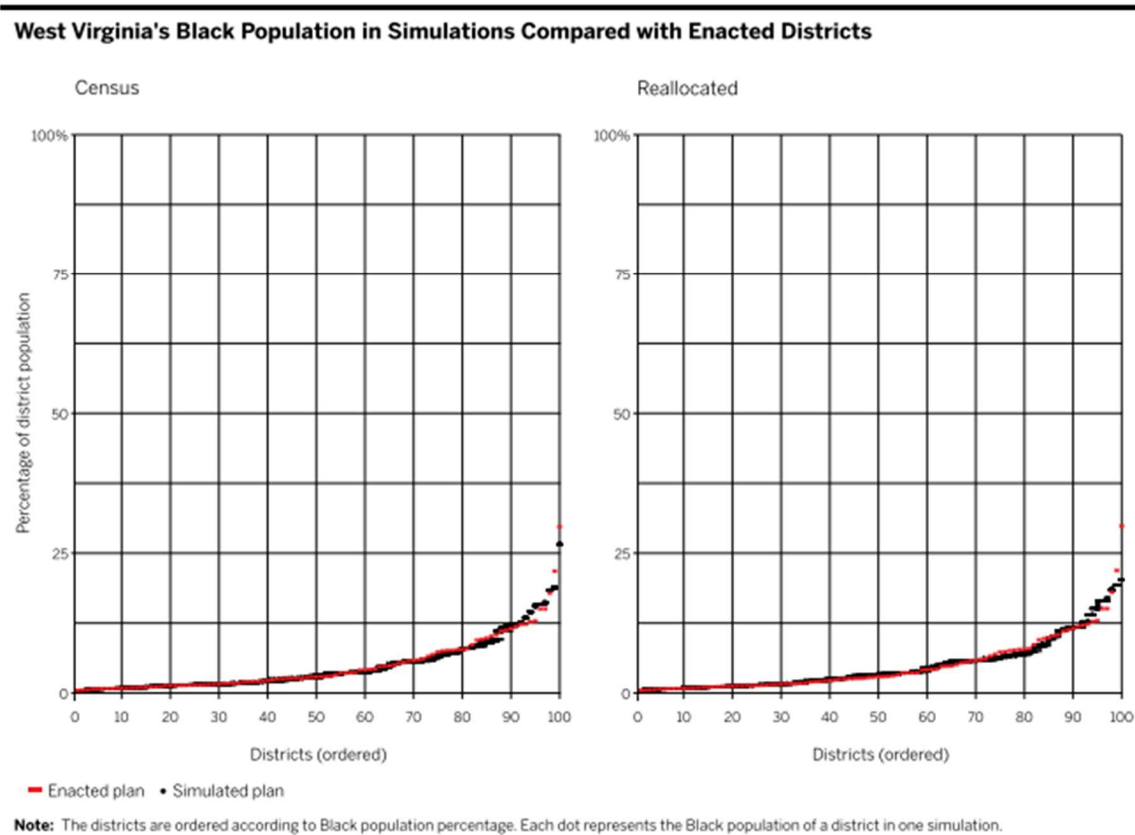


Figure A67

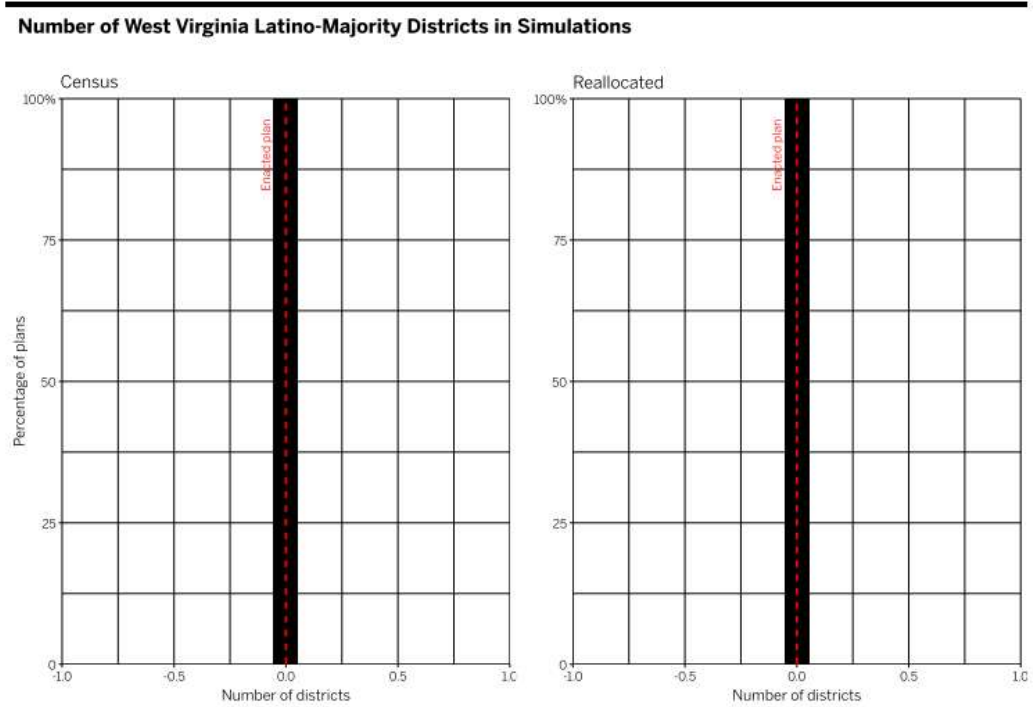


Figure A68

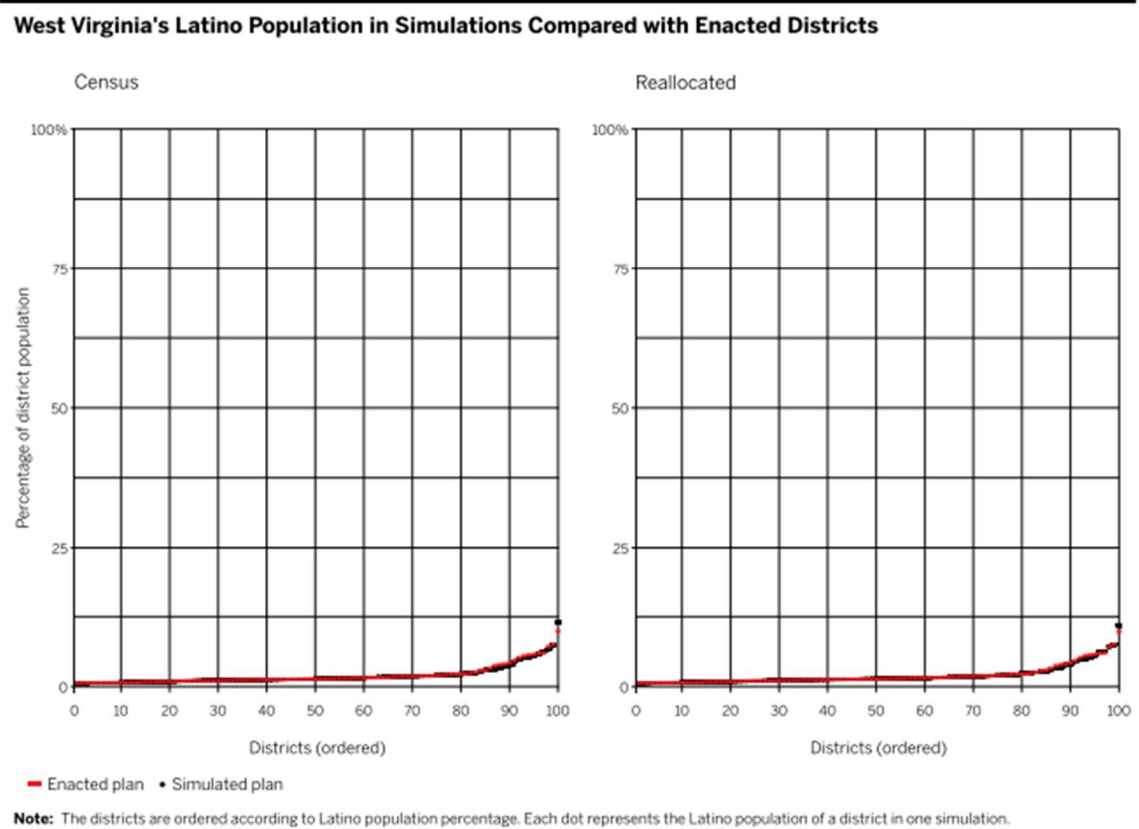


Figure A69

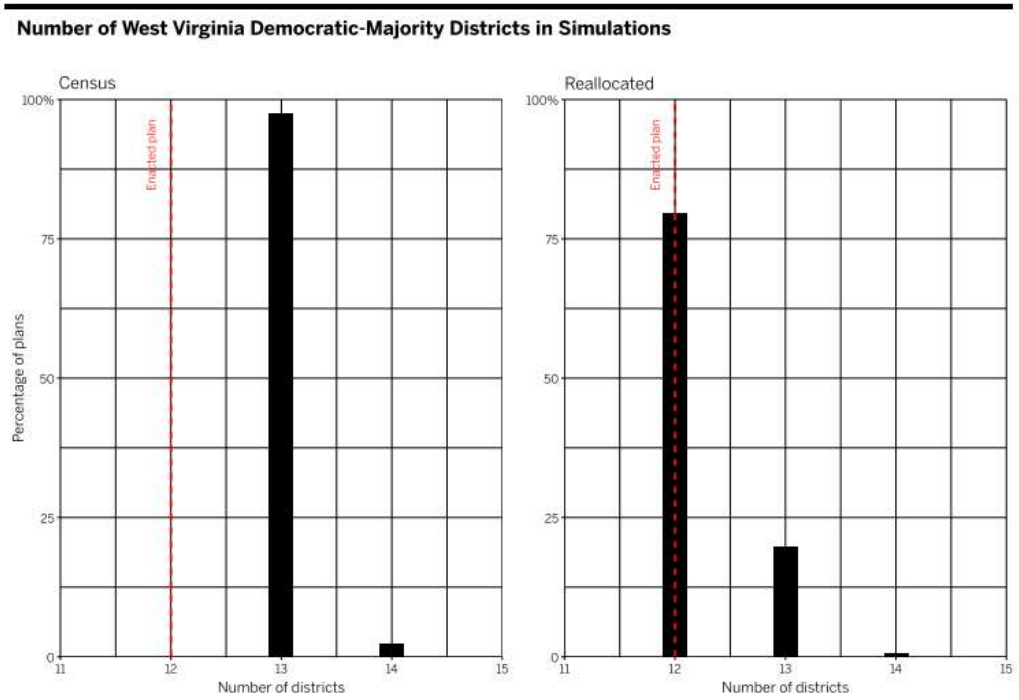


Figure A70

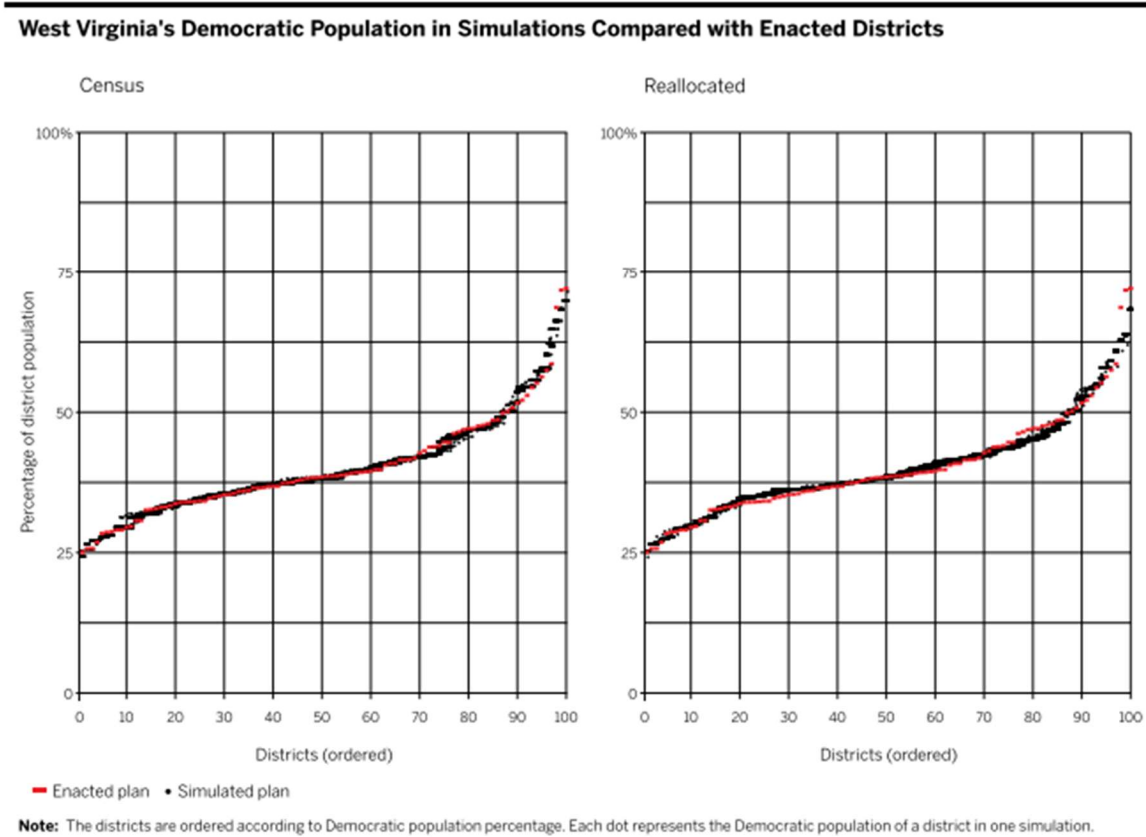
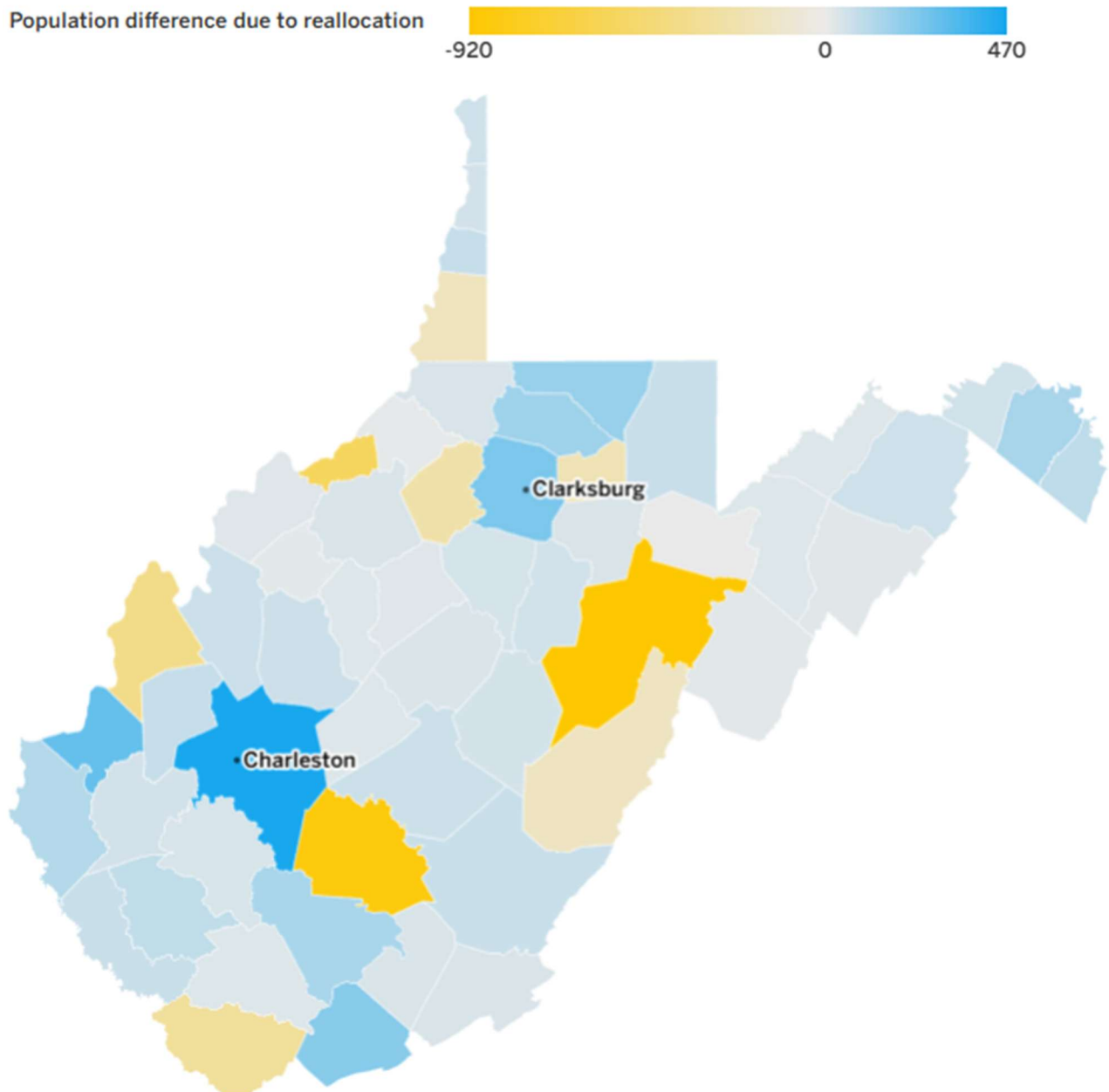


Figure A71

## West Virginia County Population Changes Due to Reallocation of Incarcerated Populations



### Endnotes

<sup>1</sup> The full report can be found at <https://www.brennancenter.org/our-work/research-reports/prison-gerrymandering-distorts-representation>.

<sup>2</sup> Jowei Chen and Jonathan Rodden, "Tobler's Law, Urbanizations, and Electoral Bias: Why Compact, Contiguous Districts Are Bad for the Democrats," November 2009, 1, [https://web.stanford.edu/~jrodden/chen\\_rodde\\_n\\_florida.pdf](https://web.stanford.edu/~jrodden/chen_rodde_n_florida.pdf).