

SUPPLEMENT TO:

Kramer MR, Black NC, Matthews SA, James SA. The legacy of slavery and contemporary declines in heart disease mortality in the U.S. South. *SSM – Population Health*. 2017. doi: <https://doi.org/10.1016/j.ssmph.2017.07.004>

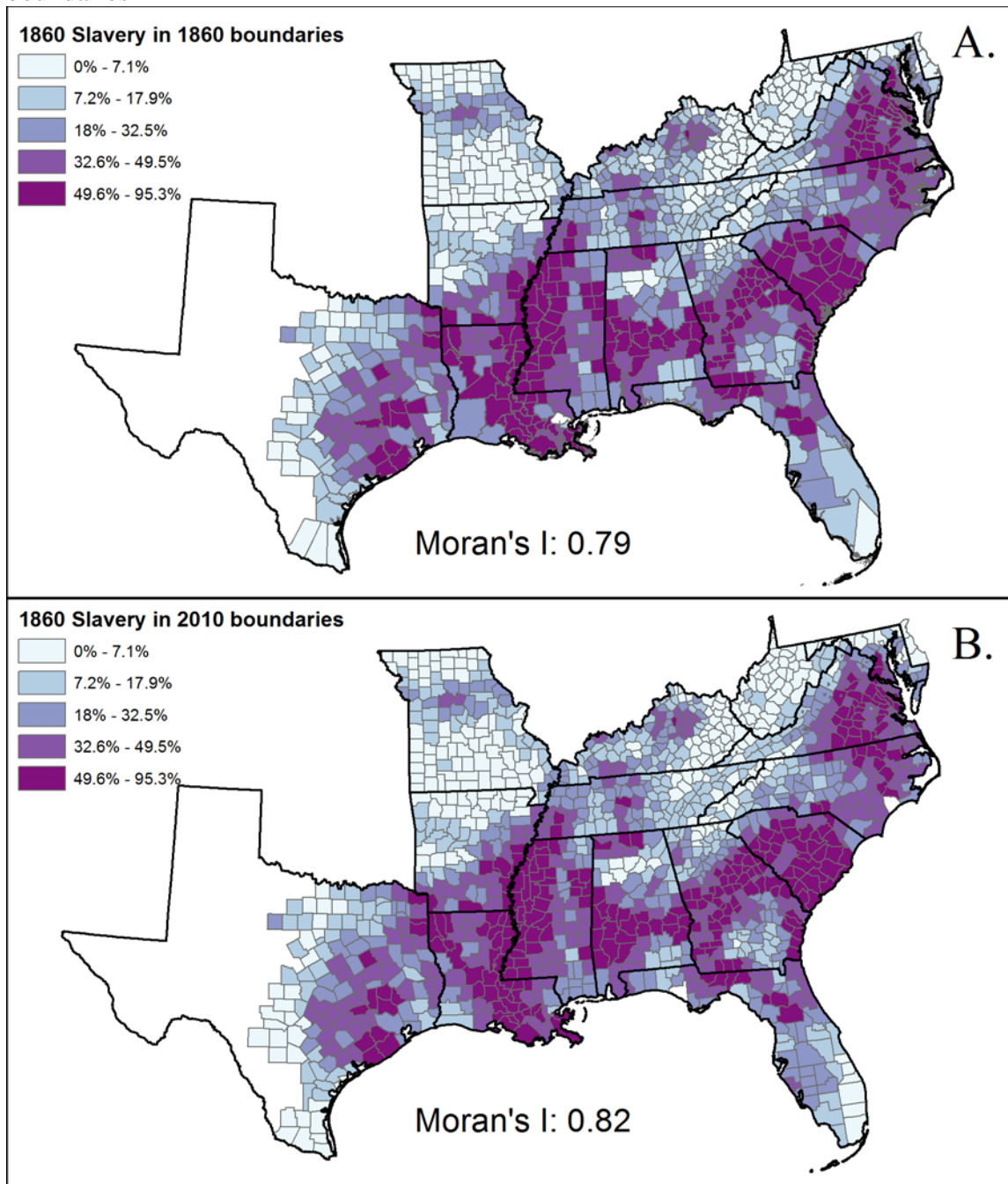
Spatial Interpolation

In order to normalize all variables from 1860, 1930, and 1970 to common geographic boundaries (2010 Census county and county-equivalent boundaries), we used the ArcMap 10.4

Geostatistical Analyst areal interpolation tool¹. Specifically, binomial and Poisson areal kriging models were fit to population count data at the county scale from historical Census sources² to produce a continuous predicted surface of the source variable. Then these values are reaggregated to the 2010 county boundaries, producing area- and population-weighted summaries of the distribution of each historical variable in contemporary boundaries.

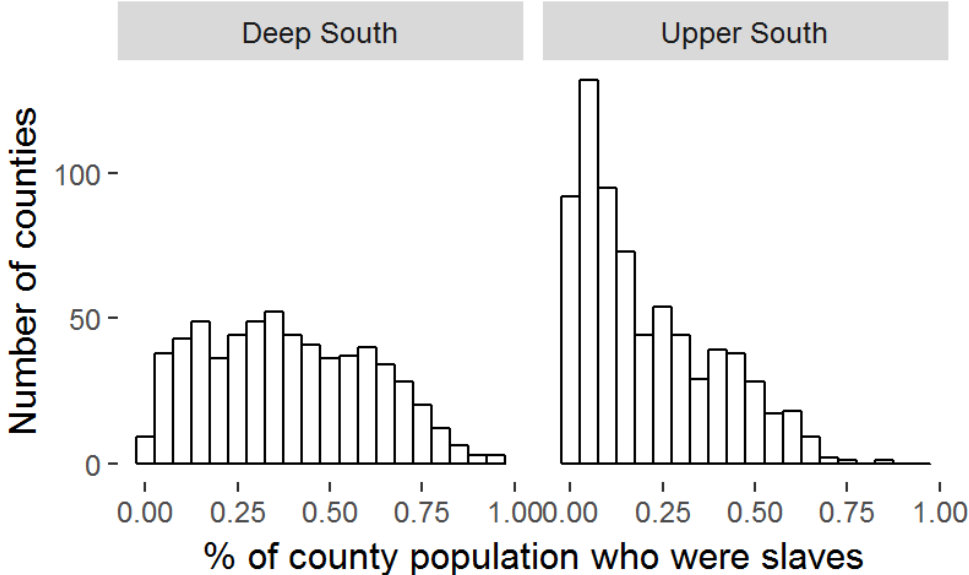
Semivariograms were examined to assess model fit. All interpolated surfaces were also examined to confirm essential face validity of final results compared to original data. Figure S1 provides a critical example: the interpolation of slave concentration percent from 1860 boundaries to the 2010 boundaries. The overall pattern is consistent in 1860 and 2010 boundaries, and the degree of spatial autocorrelation (Moran's I global test statistic) is similar suggesting that interpolation did not meaningfully alter the spatial structure or autocorrelation of the variable.

FIGURE S1. Comparing slave concentration before and after spatial interpolation to 2010 boundaries



Slave concentration using 1860 county boundaries (panel A, top) represents the original data retrieved from the National Historic Geographic Information System². Slave concentration using 2010 county (or county-equivalent) boundaries (panel B, bottom) represent the same data 'normalized' through binomial spatial kriging.

FIGURE S2. Distribution of county slave concentration in 1860 by region



Deep South states include: Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas. Upper South states include: Arkansas, Delaware, Kentucky, North Carolina, Maryland, Missouri, Tennessee, Virginia, and West Virginia.

Literature Cited

1. Krivoruchko K, Gribov A, Krause E. Multivariate areal interpolation for continuous and count data. *Procedia Environ Sci.* 2011;3:14-19. doi:10.1016/j.proenv.2011.02.004.
2. Minnesota Population Center. National Historic Geographic Information System, Version 2.0. 2011. <https://www.nhgis.org/>. Accessed November 1, 2015.