Regional Geography of Vaccination Uptake and the Impacts of Policy Change in Pennsylvania

Childhood vaccination in the United States continues to be a pressing issue, as vaccine hesitancy and low levels of vaccine uptake have led to a number of outbreaks. Prior to the 2017 school year, Pennsylvania's vaccination policy was updated with the intention of reducing the state's provisional entrance rate and in turn improving vaccination rates among kindergarteners. The new policy reduced the grace period, the timeframe in which provisional entrants must become up-to-date or submit a schedule for becoming up-to-date, from 8 months to 5 days. This project explores the policy's impact on the global and local clustering of county-level provisional entry rates as well as the relationship between community-level factors and provisional entry rate. Vaccination data for the 2015-16 to 2018-19 school years were obtained from the Pennsylvania Department of Health, and demographic data were gathered from 2014-2018 American Community Survey. Clustering of county-level kindergarten provisional entry rates was not detected prior to the new policy; however, clustering was detected after, suggesting that the policy had a variable impact across counties. Linear regression models indicated that percent White population was consistently a negative predictor of provisional entry rate before and after the policy change. The models also suggested that communities with more adults with less than a high school diploma had a smaller decrease in provisional entry rate. The predictor variables (percent White population, percent adults with less than a high school diploma, and insurance coverage) better captured provisional entry rate following the implementation of the new policy. Pennsylvania's vaccination policy update resulted in a more predictable distribution of provisional entry rates. Future vaccination campaigns to discourage provisional entrance may focus on regions with more adults without a high school diploma.