Exploring Changing Infant Mortality Rates in Northeast Brazil from 2000 to 2014

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The infant mortality rate (IMR) for a region or country is defined as the number of children who die before their first birthday for every 1,000 live births. Brazil's IMR has been higher than many other countries, despite its recent reduction from 49.5 in 2000 to 10.85 in 2014. Thus, there have been ongoing studies focused on the relationship between social and environmental variables associated with IMR in Brazil. Past studies found that multiple variables, such as education, sanitation and socioeconomic factors, relate with IMR. Most studies found that improvements in multiple variables are needed to sustain reductions in IMR. Furthermore, IMR reductions are dynamic over time and space. Our study continues to explore IMR, focusing on Northeast (NE) Brazil in the years 2000-2014. We explore gross domestic product (GDP), human resources in health, health education and nutritional education programs, water provisions, sewage system provisions, and illiteracy rates. These variables were identified in the literature and chosen based on data availability. Water provisions, sewage system provisions, and illiteracy data are used to compare changes from 2000 to 2014 at the state level. The remaining variables were available for 2014 at a higher spatial resolution (microregion). IMR values for 2000 and 2014, distributed by NASA's Socioeconomic Data and Applications Center (SEDAC), for the NE region were compared. IMR values for the NE region overall decreased from 72.8 in 2000 to 10.5 in 2014. Spatial analysis and mapping, using geographic information systems (GIS), enabled visualization of changes in the chosen variables between 2000 and 2014 at the state level. Generally, illiteracy rates decreased while water provisions, sewage system provisions, and GDP increased. The gender makeup of the illiterate population changed from being mostly female to being mostly male. Exploring these data gave us a better understanding of the region overall to inform future research.