The practice of open defecation is a primary cause of existing water-borne diseases (i.e. diarrhea) that claims the lives of many children under five. The use of improved sanitation methods, such as facilities where the feces cannot re-enter the environment, can be used to reduce open defecation. Worldwide, 1 billion people do not have access to a toilet; in India alone 814 million people do not have access to improved sanitation, and 626 million people practice open defecation posing major obstacles to appropriate health and safety measures (Patil et al., 2014). In response to this challenge, the Government of India launched the Total Sanitation Campaign (TSC) in 1999 with the goal of achieving universal rural sanitation coverage by 2012. This program intended to be community-driven and demand-driven; however, due to poorly implemented interventions it ended up being government-led and supply-led leading to failed outcomes (Hueso & Bell, 2013). In order to understand the true impact of the campaign on toilet coverage, uptake and effect on health, studies and analysis need to be conducted.

**Background**

To evaluate the distribution of the Total Sanitation Campaign in Tamil Nadu, a cluster analysis was conducted using Global and Local Moran’s I of the change in latrines. Global Moran’s I demonstrates the presence of clustering, while local Moran’s I presents the locations where clustering is occurring. A different Local Moran’s I test was performed to evaluate whether more clustered change in latrine coverage occurred in rural or urban areas as a result of the government program. A regression analysis was then conducted to understand the factors contributing to the differences in latrine coverage, analyzing the impact of income, population density, and literacy rate on the change in latrine ownership between 2001 and 2011. In order to evaluate the effectiveness of the program at the local level, a secondary regression analysis was performed to examine the impact of latrine coverage on health outcomes, specifically diarrhea prevalence in children under five. The model attempts to control for extraneous factors including income, population density, and literacy rate.

**Methodology**

To determine the change in latrine ownership during this time period. Limitations of this analysis include lack of data at a limited sample size.

**Results and Limitations**

The resulting maps demonstrate the actual coverage of latrines in 2001 versus 2011, and the change in latrine ownership, distinguishing between total, rural, and urban change, with darker areas showing greater change. Clustering analysis exhibits clusters of high latrine change in southern Tamil Nadu (red), and Chennai is a low-density cluster. The model attempts to control for extraneous factors including income, population density, and literacy rate.

**Sources**

Cartography by Bhavana Shivabrahmanan
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Data Sources:
Census of India 2011; National Family Health Survey (NFHS) 2015-2016

References: