Estimating the Number of Measles-Susceptible Children in the State of Georgia

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1. Significance/Justification

There is an urgent need to understand childhood vaccine uptake and its behavioral and social drivers to ensure effective strategies for improving vaccine coverage. Measles susceptibility is a significant public health concern due to the contagious nature of the virus and its potential to cause severe health complications, especially among unvaccinated children. Data from the Georgia Registry of Immunization Transactions and Services (GRITS) reveals a considerable number of adolescents who have received zero doses of the measles-containing vaccine, thus creating a reservoir of susceptible individuals.

2. Aims of the Study

- **Spatial Distributions**: The primary objective is to explore the spatial distribution of unvaccinated children using the GRITS dataset, identify factors contributing to these clusters, and assess how this information can guide efforts to improve vaccination rates.
- **Vaccination Records**: Analyze the vaccination records and immunization coverage for children born in Georgia after January 1, 2014, to identify the proportion of the susceptible population within the state.
- **Geographic Disparities**: Evaluate geographic and demographic disparities in measles vaccination rates across regions within Georgia.

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3. Analysis Plan

Data Requests:

- Obtain vaccine administration data, provider data, and vaccine order data from the GRITS dataset for children born on or after January 1, 2014.

Methodology:

- **Geocoding**: Geocode local addresses to ensure geographic coordinates are included.
- **Data Integration**: Join vaccination data with relevant demographic and geographic data, including census data.
- **Visualization**: Create heatmaps and cluster analyses to identify hotspots of unvaccinated children.
- **Access to Services**: Include data on healthcare facilities and vaccination clinics to assess service access.
- **Socioeconomic Factors**: Analyze correlations between vaccination rates and socioeconomic variables.
- **Buffer Analysis**: Evaluate proximity to healthcare facilities for unvaccinated children.

Data Analysis:

- Load and geocode the GRITS dataset, integrating external datasets (e.g., census data) to include socioeconomic factors, population density, and age distribution.
- Filter data for children born after January 1, 2014, who received zero doses of the measles-containing vaccine.
- Use the Optimized Hot Spot Analysis tool to identify clusters of unvaccinated children.

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4. Expected Outcomes

The findings will inform public health stakeholders and provide data-driven insights to develop interactive dashboards for exploring trends and generating reports. This will facilitate the planning of targeted vaccination campaigns in identified high-risk areas to reduce measles susceptibility.