

RTI U.S. Synthetic Household Population™ Database



The RTI U.S. Synthetic Household Population™ provides an accurate representation of the complete household and person population throughout the United States. The database includes locations and descriptive sociodemographic attributes that are derived from completely public data sources, statistically matches the real household population, and contains no personally identifiable information.

Overview

Imagine having a database of every household and person in the United States. Now imagine what you could do with such a database—plan for emergency response, assess environmental exposures, simulate infectious disease transmission, calculate the effects of public health interventions, or optimize the distribution of resources across space. The RTI U.S. Synthetic Population allows users to view population data by householder age, householder race, household size, and household income by matching high-resolution population distributions with the correct mix of households in each census block group. Users can explore the data and examine the rich complexity of the U.S. population by visiting the RTI U.S. Synthetic Household Population viewer at <http://synthpopviewer.rti.org>.

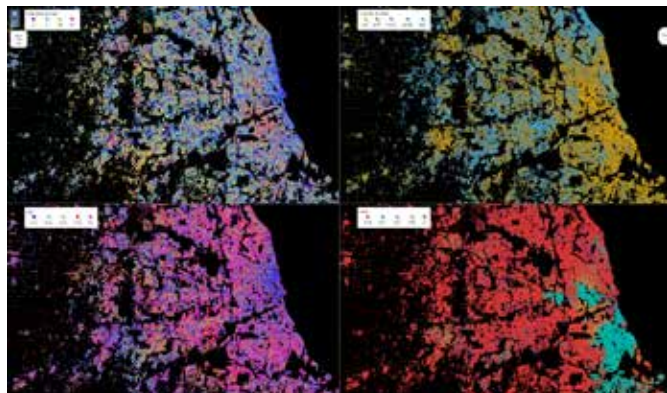
The Power of Points

Unlike typical sociodemographic data that are aggregated to administrative units (census tracts, ZIP codes, census block groups), the RTI U.S. Synthetic Household Population represents households and persons as dots on a map. This simple data structure enables powerful clustering, optimization, and spatial statistical analysis without sacrificing any accuracy. In some ways, the database is more accurate than census data because

the distribution of households in this database varies within census block group boundaries, whereas typical sociodemographic maps presume that households are evenly distributed within each boundary.

Features and Benefits

- 116,000,000 records to represent each household
- 300,000,000 records to represent each person living in households
- Attributes such as age, sex, race, income, and educational attainment for each person
- Attributes such as household size, household income, householder race, and householder age for each household
- Representations of persons who live in group quarters by age and gender for nursing homes, college dorms, prisons, and military barracks
- Estimated location of workplaces for each working adult
- Estimated location of schools for each student attending primary or secondary school
- Explicitly geospatial data structure
- No personally identifiable information
- Reduced effects of arbitrary boundaries on spatial analyses (the Modifiable Area Unit Problem)



Visualize the synthetic population data and the complex spatio-demographic distribution of the human population with the RTI U.S. Synthetic Population viewer.

Data Enrichment

Integrate, enrich, and extend other datasets by linking them to the RTI U.S. Synthetic Population. You can use your own data or public data, such as the many household surveys conducted by states and the federal government, to add new characteristics and behaviors to synthetic persons or households. Link data by location or by statistical matching methods.

Using these methods, RTI developed an example dataset called the Neighborhood Map of U.S. Obesity (<http://synthpopviewer.rti.org/obesity>). This detailed map of obesity has far more resolution than available data at the national level.

Applications

- Agent-based modeling to simulate changes in behavior over time
- Infectious disease modeling
- Identification of populations that are potentially exposed to environmental contaminants
- Optimized distribution of resources to best serve the population



Integrate other data sources to enrich the synthetic population and map the distribution of a variety of human characteristics and behaviors. In this image, National Health and Nutrition Examination Survey (NHANES) data were combined with the synthetic population to produce a detailed map of obesity in the United States.

- Expanded statistical survey data by assigning survey-based characteristics to the entire population
- Sociodemographic pattern recognition by identifying the spatial extent of communities of interest
- Improved planning and response to disasters with detailed spatio-demographic maps
- Compatibility with RTI's FPOP™ microsimulation model to age baseline populations into the future

More Information

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