Mobilizing administrative data for an actionable map of Niger population

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Context & Methods

Lack of reliable data on populations is sometimes held responsible for the failure of public health interventions. In Niger, a host of different data are collected by the state or other organizations. Census of populations are at best decennial, but national elections are held at least every five years, and provide an occasion to collect data on the population.
In order to make theses data sources useful for public health professional, we defined an approach to extract different data sources coming from the Niger administration, and to hybridize them with other available data sources like the collaborative mapping platform OpenStreetMap.

Name Resolution On average, 20% of localities can be directly linked between data sources, with some localities having different spellings in each data source. We explore algorithmic approaches to improve name resolution.

Geolocalization Correction Some sources have low quality GPS. We implement a progressive selection of GPS coordinates by ranking sources according to expected quality.

Population Modeling Finally, we model both population size and age structure using voters list data.

Modeling population from Voters List

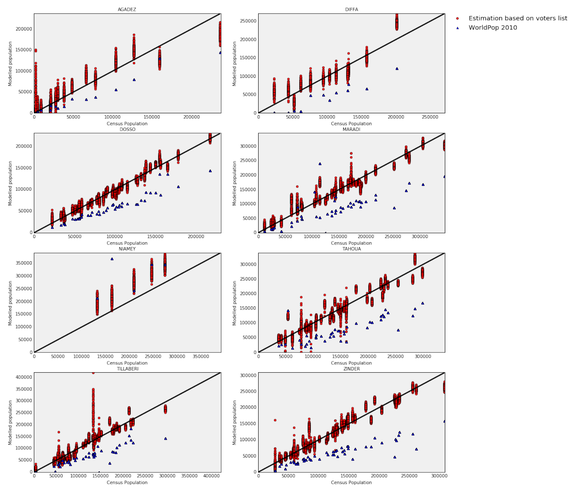
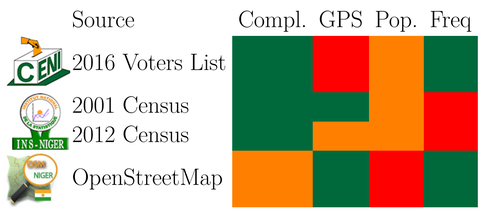


Figure: Population Prediction Results

Data Sources



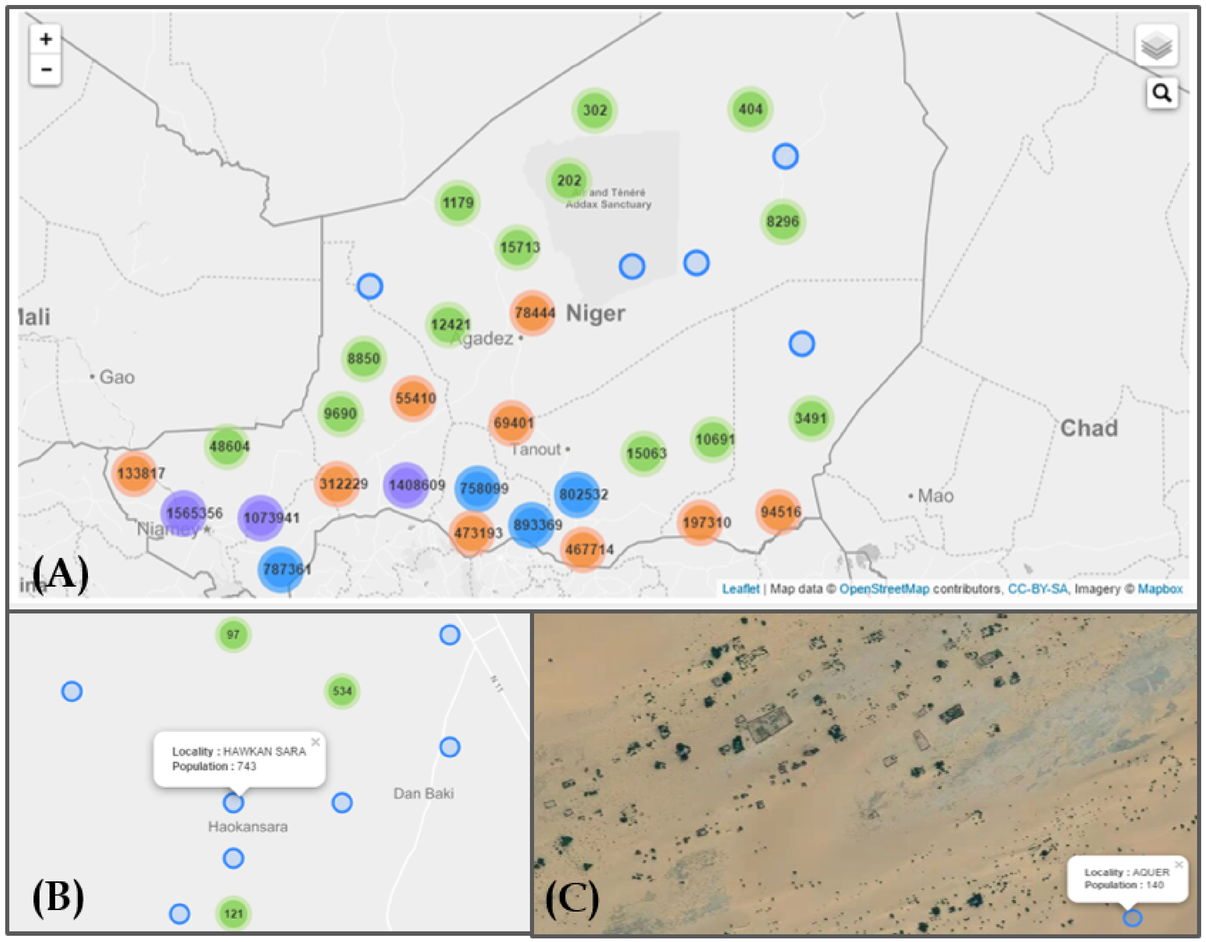


Figure: Preview of Niger Map
(A) General Map , (B) Ability to match different spellings , (C) Precise mapping of small settlements

Actionable Map Characteristics

In order to be useful for field workers and decision makers, we defined the following features for an actionable map.

1. Population mapping at locality level
2. Ability to query different spellings for localities names.
3. Ability to obtain aggregated population data for custom zones.
4. Ability to extract interesting information

Population Age Structure

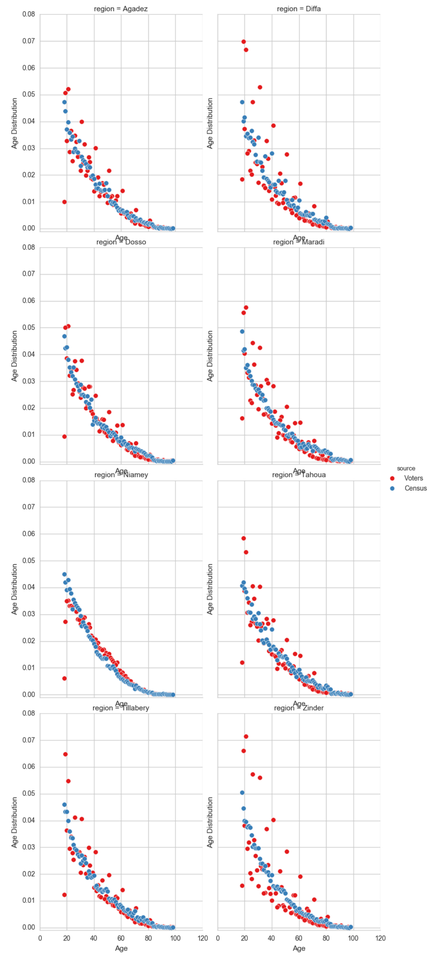


Figure: Age structure in census and voters list

Next steps

- Crowd Sourcing for name resolution validation
- Modeling and validation of population and age structure at a lower administrative level (Aire de Santé).
- Map validation with the Nigerien OSM community.