

Supplemental File 1

Description of each primary data source abstracted from this database

Settlements and PHCs. Settlement locations were downloaded from the vaccination tracking system (VTS) dashboard, a dashboard that was created during supplemental immunization activities (26). In this system, settlements are categorized into hamlet areas (i.e., clusters of hamlets, with each hamlet containing 0-16 residences); small settlement areas (i.e., rural villages with 16-100 residences); and urban areas or built-up areas (over 100 residences). These data are captured by GPEI partners using remote sensing techniques and high-resolution satellite imagery and are identified through ongoing data collection efforts conducted as a part of GPEI campaigns (14). Also abstracted were PHC and attributes (e.g., latitude and longitude).

Population estimates. Population estimates were also downloaded from the VTS. The general procedure for deriving population estimates is similar to how settlements and PHC were abstracted and has been described elsewhere (6,22). Briefly, supervised texture-based classifiers with very high-resolution satellite imagery were used to generate a binary map of human settlements. From this model, residential types were linked with the population density observations to produce population estimates in a gridded raster format at approximately 90-meter resolution.

Roads/railways/water bodies. These data (or Tiger files or streets/road data) were downloaded from OSM and were stored in a geodatabase. GPEI campaigns contribute to the road-based data through Humanitarian OSM Team (HOT) tasking manager.

Points of interest (POIs). These data were from the Office of the Surveyor-General of the Federation (OSGOF) (<http://osgof.blogspot.com/>) and provide geocoordinate data stored as shapefiles on POIs (e.g., schools, markets, churches, mosques, village head houses, and water points).

Administrative boundaries. OSGOF provided administrative boundary data at the state and LGA levels. These data are stored in the geodatabase as polygon shapefiles (boundary files). To note, there are no government predefined ward boundaries in Nigeria; as such, ward boundaries were delineated for operational use only. Consequently, their settlements may vary depending on who generated the ward boundaries. However, these boundaries have often been generated based on an aggregation of settlements believed to belong to the same ward by those who generate the wards. Points are polygonised with unique identifiers assigned to specific ward names using the Voronoi method, a partitioning of a plane into regions based on distance to points in a specific subset of the plane. To note, the ward-level boundaries are for GPEI *operational* purposes and do not reflect political boundaries.