

Methodology to Adapt WHO Global Polio Geodatabase of Administrative Boundaries to the WorldPop Global 2 Mastergrid (2016-2023). Version 1.0.

23 April 2025

Release Content

- 8 subnational boundary shapefiles: *nibbledGAVIadm2_mosaic_[year]_[version].shp*
- 8 subnational boundary shapefiles for India, South Sudan, Syria, and Chad including disputed territory: *nibbledGAVIadm2_mosaic_wdispute_[year]_[version].shp*
- 8 subnational boundary shapefiles for Ethiopia adm2 units: *ETH_adm2_[year].shp*
- 1 raster mastergrid of WorldPop adm0 boundaries:
WP_mastergrid_L0_2015_2030_1km.tif
- 1 vector mastergrid of WorldPop adm0 boundaries: *G2_adm0_boundaries_v2.shp*

File Descriptions:

These boundaries were adapted from the WHO Global Polio geodatabase of administrative boundariesⁱ of 94 countries dating to the years 2016 and 2023. Each shapefile includes the boundaries for one year between 2016 and 2023. Boundary attributes from the original WHO file were edited to remove erroneous data including missing or duplicated attributes, faulty or misplaced geometries, and overlapping boundary units. For 94 low- and middle-income countries, each year of administrative boundary data was designed to align, to the extent possible, with that year's subnational immunization data reported by countries through the WHO/UNICEF electronic Joint Reporting Form on Immunization. To reflect administrative units that have split up or combined over time, each shapefile year may include boundaries from different release date versions of the WHO Global Polio geodatabase, manually combined boundaries, boundaries imported from open-source shapefiles (i.e. Angola, Cote d'Ivoire, India, Uganda, Congo, and Ghana from Open Street Mapsⁱⁱ; Burundi and Ethiopia from Geoboundariesⁱⁱⁱ; Congo^{iv}, Mauritania^v, Myanmar^{vi}, Indonesia^{vii}, Yemen^{viii}, and Syria^{ix} from OCHA), or bespoke boundaries generated from a combination of these sources. In cases where a country did not report subnational immunization data for a given year, the boundaries from the most recent preceding year of reported data were used. If there were no preceding boundaries (as was the case with missing boundaries in 2016), then the boundaries of the closest subsequent year were used. The original WHO shapefiles were rasterized and harmonised to the 1km WorldPop Global2 mastergrid^x. This included expanding and contracting the original WHO boundaries to the extent of WorldPop population, particularly along coastlines, and clipping country boundaries to those of the WorldPop Global2 Mastergrid. Boundary polygons were then produced from the raster and saved as a shapefile. Four countries (India, South Sudan, Syria, and Chad), have significant disputed areas that have been assigned to another country in the subnational mosaic. However, should subsequent analysis need to analyse these areas as part of these four countries, and additional shapefile for each year has been included

where the disputed areas have been added to the country boundaries and the subnational units have been nibbled as described above.

Field descriptions:

iso3: Iso3 code for each country

year: the year for which the boundaries should be used

admin1_pol: name of the administrative level 1 boundary to which the shape relates

admin2_pol: name of the administrative level 2 boundary to which the shape relates

admin1_cod: WHO assigned code for the level 1 boundary to which the shape relates

admin2_cod: WHO assigned code for the level 2 boundary to which the shape relates

level: level to which the boundary geometry relates

version: WHO assigned versioning of original WHO from which this boundary was generated

has_admin_: indicates whether the country reported immunization data through the WHO/UNICEF electronic Joint Reporting Form for the given year and administrative unit or not. “1” indicates that corresponding immunization data was reported. “0” indicates that immunization was not reported.

admin3_pol: name of the administrative level 3 boundary to which the shape relates (Ethiopia only)

admin3_cod: Code for the level 3 boundary to which the shape relates from UN OCHA’s Common Operational Datasets – Administrative boundaries (Ethiopia only)

admin0: name of the administrative level 0 boundary to which the shape relates

admin0_cod: WHO assigned code for the level 0 boundary to which the shape relates

adm2_WPid: unique key assigned by the WorldPop team to each boundary. These keys are unique across all years, so boundaries from multiple years can be combined and the keys remain unique.

If you require information about the data or any of its source material, please contact the authors: N.Tejedor-Garavito at soton.ac.uk

Suggested citation:

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- ⁱ Sonoiki, O. WHO Polio administrative boundaries Geodatabase, March 2023 release.
- ⁱⁱ OpenStreetMap contributors. 2025. Open Street Map. Retrieved from <https://openstreetmap.org>. (Retrieval dates vary by country: Angola—8 Jan 2024, 2 July 2024; Cote d'Ivoire—18 Jan 2024; India—21 Jan 2024, 22 Jan 2024, 3 Feb 2025, 4 April 2025; Uganda—10 Jan 2024. Boundaries were extracted from OSM using the Overpass Turbo API: <https://overpass-turbo.eu/>)
- ⁱⁱⁱ Runfola, D. et al. (2020) geoBoundaries: A global database of political administrative boundaries. PLoS ONE 15(4): e0231866. <https://doi.org/10.1371/journal.pone.0231866>. Available at: Burundi--<https://data.humdata.org/dataset/geoboundaries-admin-boundaries-for-burundi> (30 May 2024); Ethiopia--<https://data.humdata.org/dataset/cod-ab-eth> (16 Nov 2023)
- ^{iv} OCHA West and Central Africa (2025). Congo - Subnational Administrative Boundaries. Available at: <https://data.humdata.org/dataset/cod-ab-cog>.
- ^v OCHA Field Information Services Section (2024). Mauritania - Subnational Administrative Boundaries. Available at: <https://data.humdata.org/dataset/cod-ab-mrt>
- ^{vi} OCHA Field Information Services Section (2025). Myanmar - Subnational Administrative Boundaries. Available at: <https://data.humdata.org/dataset/cod-ab-mm>
- ^{vii} OCHA Regional Office for Asia and the Pacific (2023). Indonesia - Subnational Administrative Boundaries. Available at: <https://data.humdata.org/dataset/cod-ab-idn>
- ^{viii} OCHA Yemen (2024). Yemen - Subnational Administrative Boundaries. Available at: <https://data.humdata.org/dataset/cod-ab-yem>
- ^{ix} OCHA Syria (2024). Syrian Arab Republic - Subnational Administrative Boundaries. Available at: <https://data.humdata.org/dataset/cod-ab-syr>
- ^x Bondarenko M., Priyatikanto R., Tejedor-Garavito N., Zhang W., McKeen T., Cunningham A., Nosatiuk B., Tatem A., Sorichetta A. Global mosaiced national boundaries at a resolution of 30 arc-second (approximately 1km at the equator) R2024B version v1. 2025. Global Demographic Data Project - Funded by The Bill and Melinda Gates Foundation (INV-045237). WorldPop - School of Geography and Environmental Science, University of Southampton. DOI:10.5258/SOTON/WP00813