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| **Resource Metadata Fields** |
| File Type | GeoTIFF |
| Name | service\_area\_Ghana\_motorised |
| Note | This file is a zip archive containing travel time map in Geotiff format and a thumbnail image in PNG format. |
| **Dataset Metadata Fields** |
| Title of Dataset | Ghana Motorised Travel Time (in seconds) to nearest health centre |
| Description | A 100 m spatial resolution geotiff of motorised travel time in seconds to nearest health facility in Ghana. The data was generated using the Child Poverty and Access to Services (CPAS) software (10.5281/zenodo.4638563) and was created as part of the CPAS project within the Data for Children Collaborative. The travel time is calculated assuming driving speeds of local public transport options on all-weather roads/asphalt roads and walking speeds on all other roads, tracks, paths and land cover types. A full description is available here <https://doi.org/10.1038/s41597-022-01274-w> a video description of the data is also available at: <https://www.dataforchildrencollaborative.com/outputs/presentation-a-100m-resolution-travel-time-map> Projection system is: GCS\_WGS\_1984 EPSG 4326 for all  |
| Dataset contains sub-national data | No |
| Source | 1. Copernicus Global Land Service: Land Cover 100m Map of Africa 2016 <https://doi.org/10.5281/zenodo.3518026>
2. Hot Open Street Map Vector Polyline Shapefile of Ghana Roads <https://data.humdata.org/dataset/hotosm_gha_roads>
3. Shuttle Radar Topography Mission (SRTM) Digital Elevation Model (DEM) – 90m Mosaic available from Google Earth Engine <https://developers.google.com/earth-engine/datasets/catalog/CGIAR_SRTM90_V4>
4. geoBoundaries simplified Vector Polygon GeoJSON of Ghana Administration Level 0 (ADM0) boundary [https://data.humdata.org/dataset/geoboundaries-admin-boundaries-for-Ghana](https://data.humdata.org/dataset/geoboundaries-admin-boundaries-for-ghana)
5. A spatial database of health facilities managed by the public health sector in sub-Saharan Africa - Maina, Joseph; Ouma, Paul Onyango; Macharia, Peter Mwangi; Alegana, Victor Adagi; Mitto, Benard; Fall, Ibrahima-Socé; et al. (2019). A spatial database of health facilities managed by the public health sector in sub Saharan Africa. figshare. Collection: <https://doi.org/10.6084/m9.figshare.c.4399445.v1> <https://data.humdata.org/dataset/health-facilities-in-sub-saharan-africa>
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| Organisation | The University of Edinburgh |
| Maintainer | gwatmough |
| Date of Dataset | August 2024 |
| Location | Ghana |
| Field Names | N/A |
| File Types | Tiff |
| Number of Rows | Image dimensions (H\*W)? |
| License | CC BY-NC-SA 4.0 |
| Define License |  |
| Methodology |  |
| Define Methodology | The least cost path method was used here which is broken down into two steps: (1) the creation of a ‘cost’ allocation surface which can also be referred to as an effort or friction surface and represents the effort to travel across a particular pixel (2) uses the cost allocation (or effort surface) in a least cost path analysis to estimate travel time from every pixel to the nearest destination location (in this case health centres). This was done using Dijkstra’s algorithm to create Dijkstra trees which find the shortest path from one point to another. Full details of the method can be found in Watmough et al. (2022) and the code available in Zenodo (Hagdorn 2021) The cost allocation surface used three primary input datasets: (1) land cover (2) roads (3) topography. Roads were converted to a 100 m resolution grid with the fastest road being given preference when they overlap. Any pixels with no road get given the land cover. Each pixel is then given a value to represent the speed in which an individual can travel across that pixel considering the land cover or road type. Each of these is then weighted depending on the elevation from the DEM, with pixels that have a slope of more than 45 degrees being masked from the analysis (ie they are too steep for travel). The road types vary for each country depending on the Open Street Map and MapwithAI roads so the speeds are provided in the data download. Travel was assumed to be by motorised vehicle on: motorways, expressways, trunk roads, primary, secondary and tertiary roads. All other road types were assumed to have walking speeds. Watmough et al (2023) - <https://www.nature.com/articles/s41597-022-01274-w> Hagdorn (2021) - <https://zenodo.org/records/4638563#.YOycpRNKg6g> |
| Update Frequency | never |
| Caveats/Comments | The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Common Operational Datasets (COD) Administration Level 0 boundary polygons were used in instances where geoBoundaries simplified polygons were not available.  Where countries were not included in the health facility data published by Maina et al. (2019) we used data from the Global Healthsites Mapping Project published on Humanitarian Data Exchange (this included: Egypt, Libya, Tunisia, Algeria, Morocco).  For each country we removed health sites that were unlikely to offer child focused services and vaccinations. Facilities that were removed included: pharmacy, dentist, veterinary, café/pharmacy, social facility.  The accuracy of the road data sets has not been validated, Maina et al. (2019)- <https://www.nature.com/articles/s41597-019-0142-2> |
| Tags | geodatahealth facilitiestransportationAfricaAccess to health centresTravel time to health  |
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