



**World Health
Organization**

New frontiers for GIS in Public Health

05 May, 2023

Ravi Shankar

WHO GIS Centre for Health

Meet the GISC team

The WHO GIS Centre for Health (GISC) team boasts a wide range of skills and backgrounds, spanning across nearly 20 countries and 10 time zones. By connecting maps, apps, data and people, GISC is dedicated to support countries and partners to make informed public health decisions faster and to extend the reach of geospatial information across the Organization.



Adam

Coder, geodatabase specialist



Ali

Monitoring and Evaluation



Ana

GIS specialist, project facilitator



Anare

GIS Specialist



Anna

Spatial biologist



Annette

GIS specialist



Asela

GIS specialist and data expert



Bodour

Project facilitator



Cam

GIS Specialist



Carlos

Geospatial Health Analyst



Catherine

Project facilitator



Chris

Emergency specialist,
project facilitator



Cici

Geospatial data scientist



Daniel

GIS server expert



Deen

Statistician



Denise

Monitoring and evaluation



Gopi

GIS Specialist



Ian

GIS specialist



Inge

Training and capacity
development specialist



Jaouad

GIS specialist, project facilitator



Jessie

Project facilitator



Jing

Product evangelist



Jo

GIS specialist



Jon

Partnerships



Julia

Geospatial data assistant



Kshitij

Web and IT specialist



Kt

Cartographer



Lucy

Geospatial data assistant



Marc

Project facilitator



Marissa

Administrative support



Michael

Business analyst



Mojdeh

Program support



Nadika

Geospatial Health Analyst



Nick

GIS data and research specialist



Nim

Project facilitator



Nomsa

Business analyst



Oluwaseun

GIS specialist



Paul

GIS Specialist



Prashant

GIS specialist, project facilitator



Ravi Shankar

GIS team lead



Samuel A.

GIS specialist, project facilitator



Samuel O.

GIS Specialist, Project facilitator



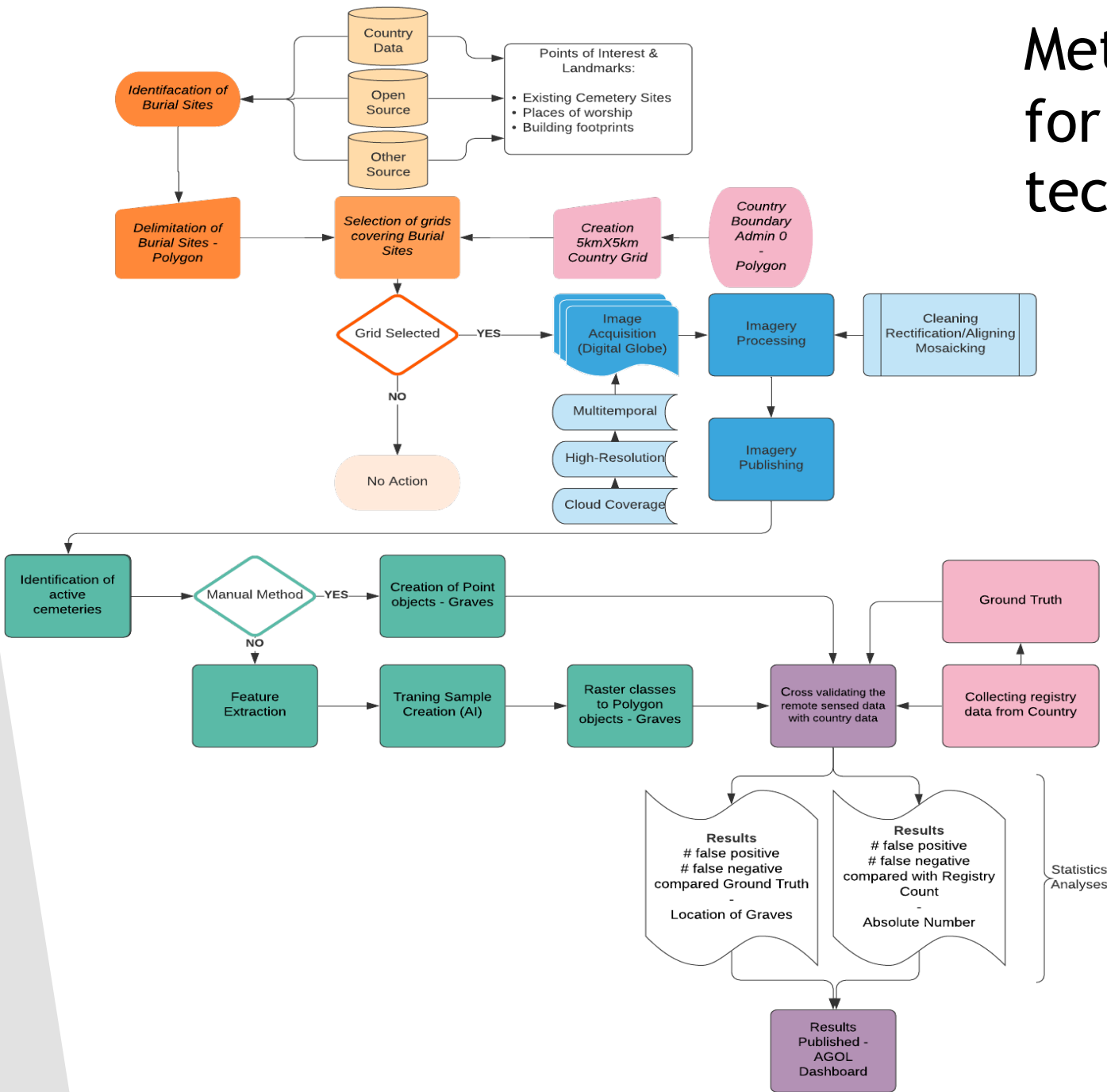
Tamer

GIS specialist, project facilitator

Counting deaths using High Resolution satellite Imagery



Methodology for longitudinal statistical analysis techniques to model burial rates





Between 2019 to 2020 (12 Months)

272

New Graves

Between - 2018 to 2019 (10 months)

122

New Graves

Between -2016 to 2018 (33 Months)

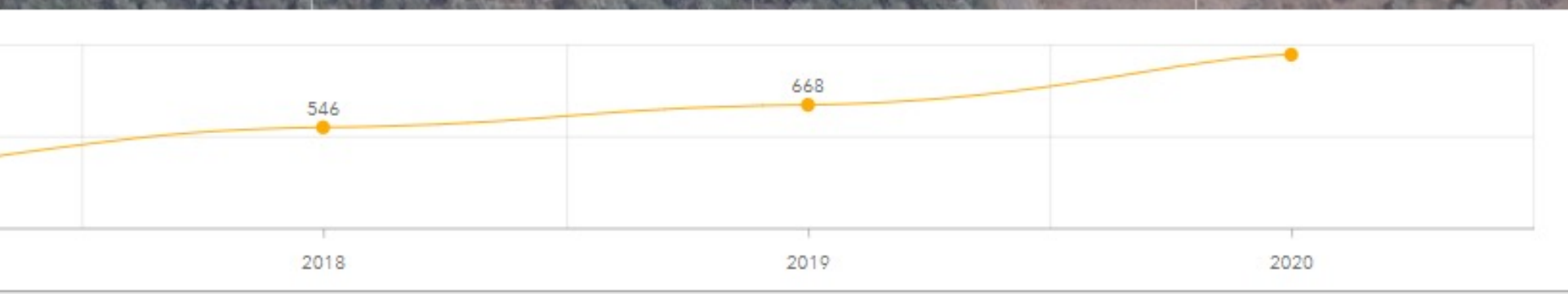
546

New Graves

Upto 2016

301

New Graves



Geo-enabled Microplanning Handbook

Geo-enabled microplanning is the application of geospatial data and technologies to improve last-mile decision-making, ensuring that health services reach every corner of a community. Geographic information systems (GIS) enable microplanners to reach more households more efficiently, sustainably and equitably. The Geo-enabled Microplanning Handbook is a step-by-step resource to designing, planning, implementing, and sustaining a geo-enabled microplan, crowd-sourced from expert authors in the field and facilitated by the WHO-UNICEF COVAX GIS Working Group.

WHO GIS Centre for Health

Division of Data, Analytics and Delivery for Impact

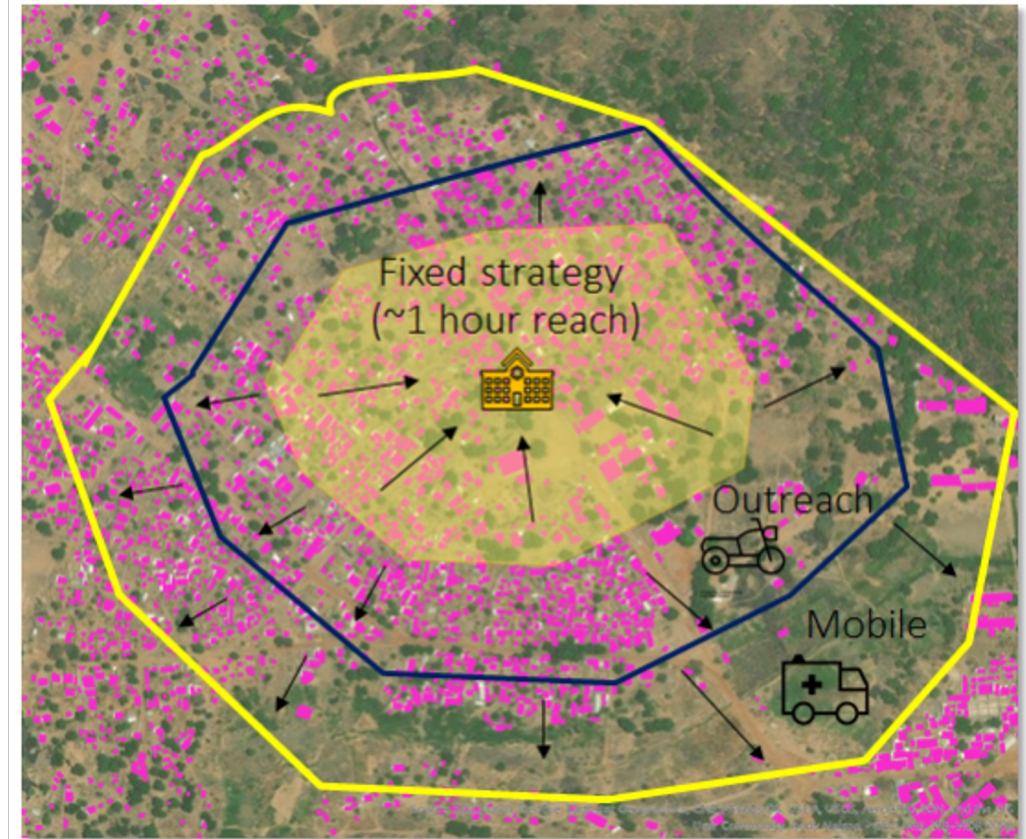
www.who.int/data/gis gissupport@who.int



What is microplanning?

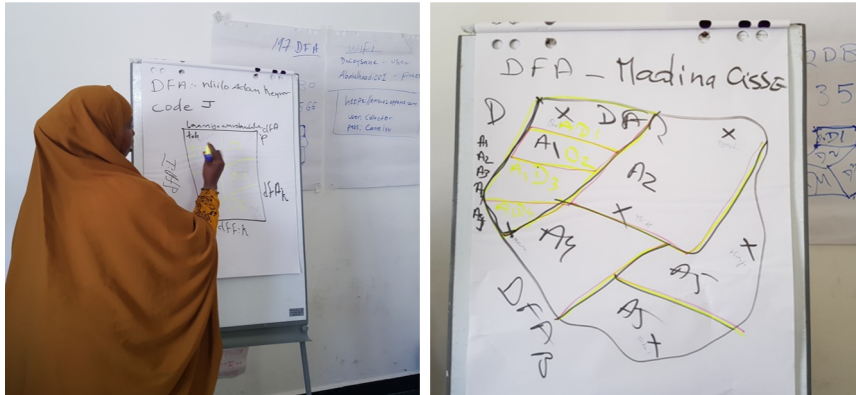
Microplanning is a set of last-mile decision-making steps and tools to ensure that health services reach every member of every community.

Microplanning is used to identify priority populations, address barriers to access and utilization, and to develop workplans with solutions.

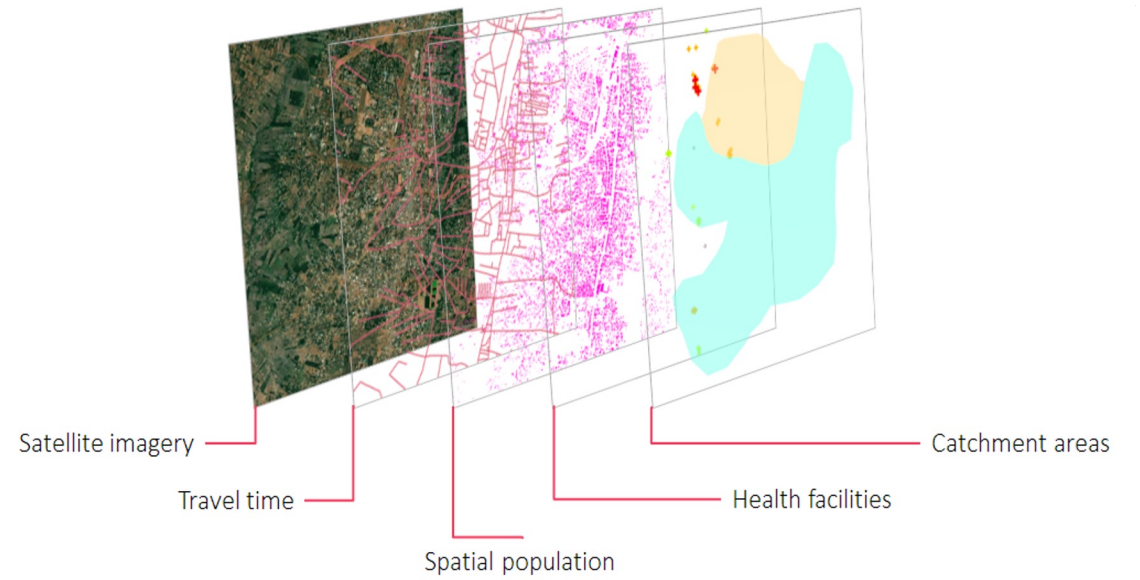
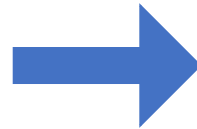


Geo-enabled Microplanning

“Geo-enablement” is the application of geospatial data and technologies to the microplanning process.



Microplanning using sketch maps and non digital tools



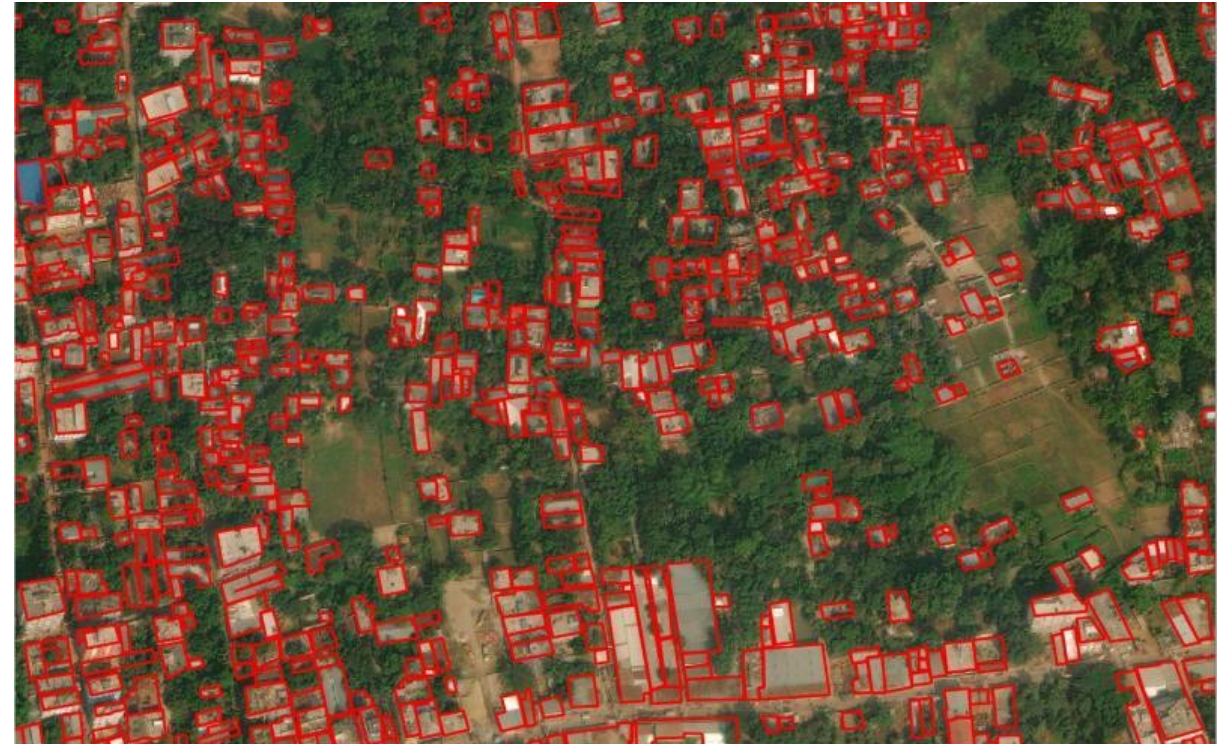
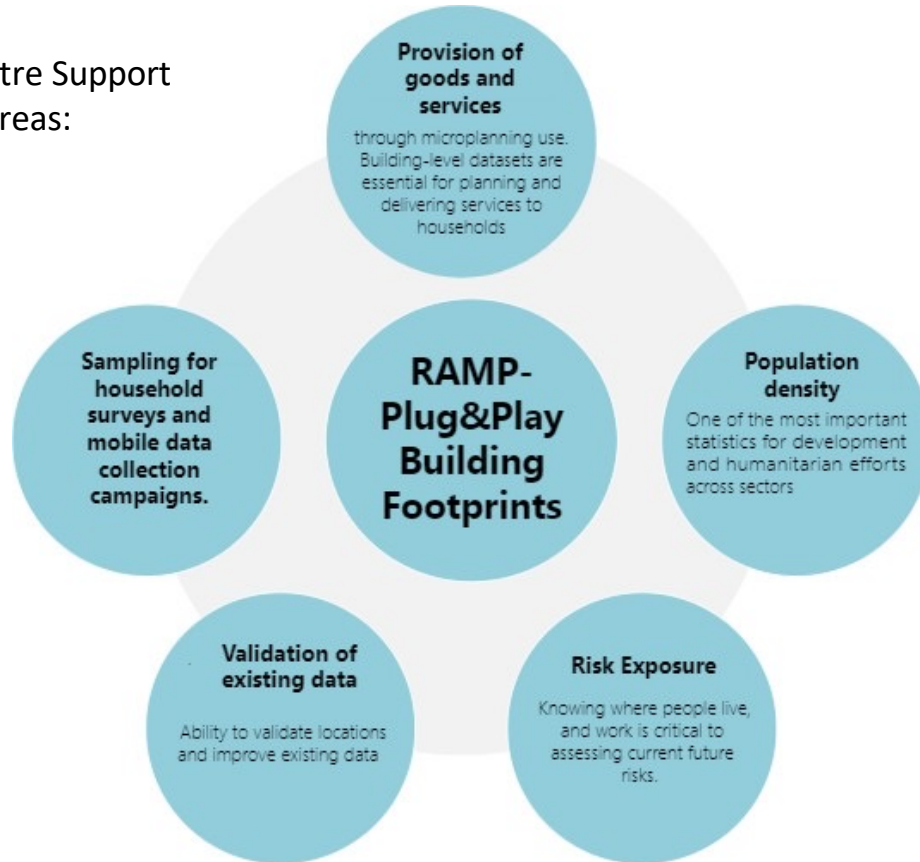
A data-driven and digitally enabled microplan using geospatial data and technologies



RAMP AI Plug&Play

Provides essential capacity to identify buildings, one pivotal layer to supporting humanitarian response.

GIS Centre Support
Focus Areas:



Geolocated Health Facilities Data (GHFD) initiative

Every country faces the challenging task of keeping its people healthy. From delivering primary care in rural communities and urban centers to addressing health crises like pandemics, each country needs accurate and reliable data to plan and deliver quality health services. Ministries of Health can benefit from leveraging geospatial data and technologies to better plan, monitor and implement timely health interventions; inform decision-making; and collaborate across sectors and regions to better serve communities. However, many countries currently miss out on these benefits because they lack a georeferenced health facility master list of quality. Geolocated Health Facilities Data (GHFD) initiative seeks to turn this global gap into a global good.

The initiative provides support for developing:

- A georeferenced Health Facility Master List (HFML) per country that is maintained, actively used, and publicly shared by the Ministry of Health
- Ministry of Health capacity to leverage geospatial information systems (GIS) for health
- A global database containing HFML-related information of importance to the international community

Thanks to this support, the GHFD initiative accelerates progress toward WHO's Triple Billion targets and the Sustainable Development Goals.

The GHFD initiative provides assistance to countries looking to establish, maintain, update and, share their HFML for their country that everyone can refer to as the single source of truth and use. Our mission is to strengthen the technical capacity of Ministries of Health across levels to ensure the availability, quality, accessibility and use of HFMLs and this to increase data interoperability and reduce duplication of work. The initiative will also provide the world with the first central and accessible public database of health facility-related information as global good for use by all.

This global database will contain the following for each of the UN Member States:

- Contact details of the HFML focal point
- Official definition of the health facility concept
- Classification table of health facility types
- Link to the HFML on MOH's web site
- Specific data elements extracted from the HFML (unique identifier, official name, type and location) to which WHO will add a global unique identifier.

The global database will be regularly synchronized with the HFML of each country as they get updated.

By 2027, we aim to have all 194 WHO Member States regularly updating their HFMLs and contributing information from them to the global database.



GHFD Initiative Strategic Framework

STRATEGIC OBJECTIVES

National Level

MOHs empowered to establish, maintain, openly share and use the HFML

Regional Level

Technical assistance available for countries to establish, maintain, share and use HFMLs

Global Level

Supporting environment in place to establish, sustain and share countries' HFMLs through the GHFD

STRATEGIC PATHWAYS

Seven strategic pathways act as enablers to support the implementation and sustainability of the project at the country level.

Governance & Policies

Partnerships & Collaboration

Advocacy & Communication

Interoperability & Data Management

Capacity

Financial Sustainability
Innovation & Technology

GUIDING PRINCIPLES

Quality

Openness

Empowerment

Cost Effectiveness & Sustainability



Geolocated Health Facilities Data Initiative



World Health Organization



SCAN ME TO LEARN MORE

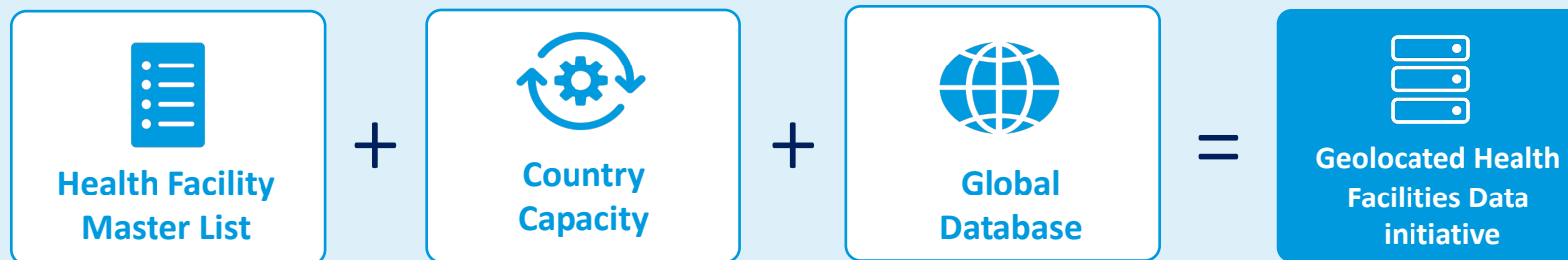
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The GHFD Initiative Activities

The GHFD initiative serves to:

- Help countries develop a single HFML that is digitized, geolocated, regularly updated, and made accessible by the Ministry of Health (MOH).
- Strengthen the technical capacity of MOHs across levels to ensure the availability, quality, accessibility, and use of HFMLs.
- Establish a global database that houses HFML data from country lists that are managed and maintained by the MOHs.



Support for HFMLs

The GHFD initiative works with MOHs:

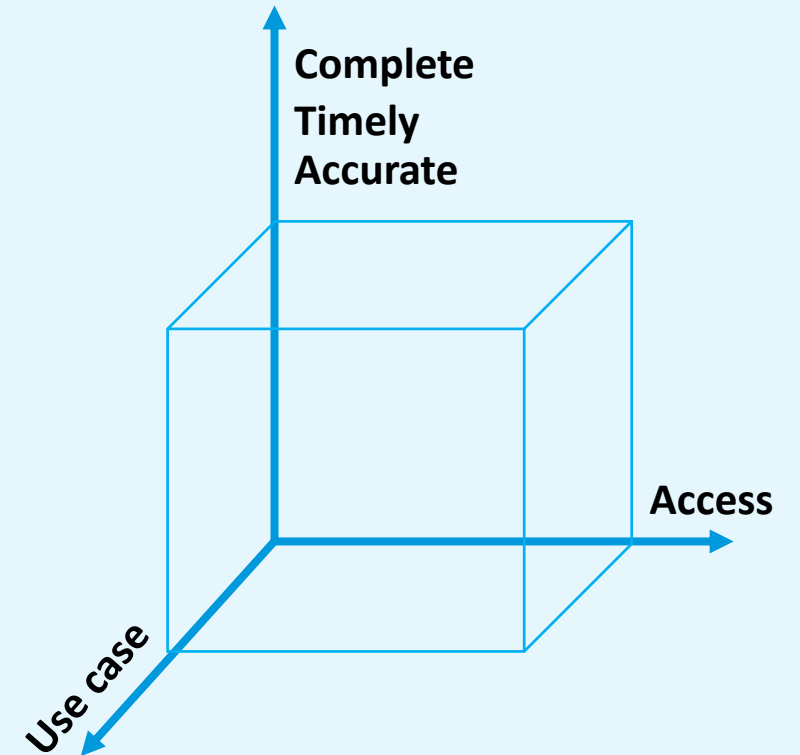
Manage elements:

- 1 Unique ID
- 2 Name
- 3 Type
- 4 Location

Share:

- 1 MOH Website
- 2 Global Database

NOTE: Each HFML will have health facility definition, classification table, and metadata.



AccessMod next-generation

WHO GIS Centre for Health is working to develop the AccessMod next-generation online platform of AccessMod version 5 to support accessibility as part of the Universal Health Coverage (UHC).

Just like we use google maps for navigation to a location, AccessMod is a WHO tool developed along with partners at University of Geneva. It is used to determine accessibility to healthcare facilities, and to assist countries to examine the geographic aspects of their health system. It specifically addresses the first three layers of a well-known framework developed by Tanahashi (1978) to evaluate health service coverage (the specific three layers being: the target population, availability coverage and accessibility coverage).

AccessMod tool developed

The current standalone AccessMod tool developed in partnership with Bluesquare will be now available to users in an online version with preloaded layers essential for accessibility analysis. This means that users from a web browser could use this tool to determine the time needed to reach the nearest health facility. Decision-makers could determine the percentage of population in a target area who have access to health facilities and where to add a new health facility to meet the population needs.



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Learn more about access to healthcare...

Layers Analysis

Target Population

- All
- Maternity
- Children

Travel Mode

- Walk
- Bike
- Ride
- Walk / Ride

Hospitals

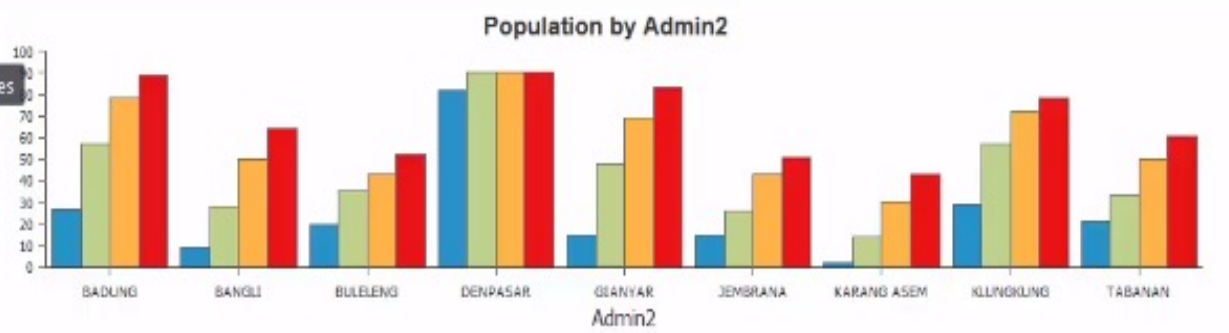
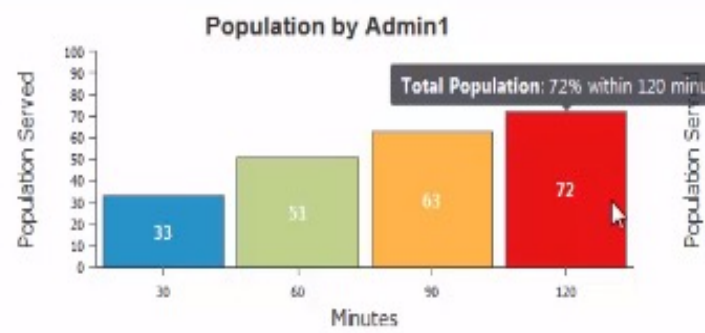
Use Hospitals (42 + 3) + Add

Excluded Hospitals

Health Centers

Use Health Centers N/A + Add

Excluded Health Centers








Population by Admin3

Name	30	60	90	120
ABANG			13	29
ARIANSEMAL	1	29	70	88
BANGLI	30	51	76	88
BANJAR	8	40	52	61
BANJARANGKAN	13	55	82	92
BEBANDEM	1	23	66	86
BLAHATUH	12	75	94	96
BULELENG	71	85	90	90
BUSUNGBIU			0	21
DAWAN	4	39	74	89
DENPASAR BARAT	85	90		
DENPASAR SELATAN	75	88	88	89
DENPASAR TIMUR	85	90	90	
DENPASAR UTARA	85	92	92	
GEROKGAK	0	0	0	14
GEANYAR	42	83	96	96
JEMBRANA	30	59	80	85
KARANGASEM	10	43	70	82
KEDIRI	27	47	79	94
KERAMBITAN	14	37	66	78
KINTAMANI	2	15	29	38
KLUNGKUNG	63	90	94	96

+ Add Calculate Access to Health Care

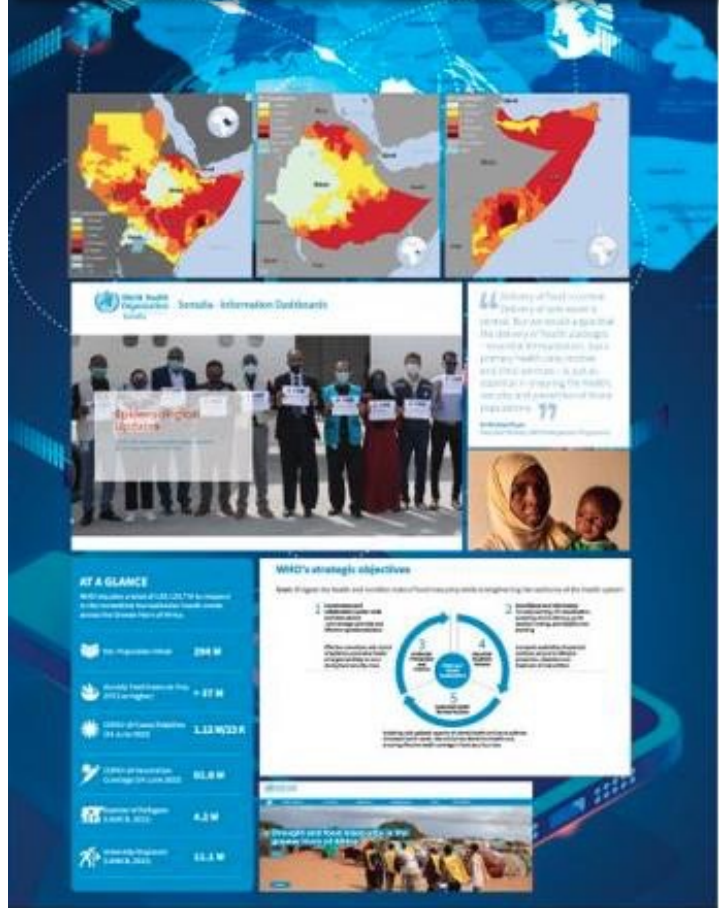
Greater Horn of Africa (GHoA)

The goals and responsibilities of the **Health Intelligence and Information Management (HIM)** team are to offer support to all seven affected country offices, incident managers and IMSTs, and to setup a coordination hub.

-  **Health information needs and Data Collection**
 - Deployments, Surveillance, Service Availability, Functionality, Barriers to Health Care, Health Risk Analysis
-  **Information products**
 - SitRep, Slide decks, dashboards (for Nairobi and national), PHSA, WHO presence/HR mapping, HeRAMS coordination
-  **Programmatic support**
 - Support Communication, advocacy, resource mobilization
-  **Monitoring and evaluation**
-  **In-Country GIS Training and Capacity building**

GIS support: 6 In-country deployments/1 remote

- Uganda, Somalia, Kenya, Sudan, South Sudan, Djibouti



8000+ hours of workload

Information Products

Greater Horn of Africa Food Insecurity and Health Dashboard



Greater Horn of Africa Food Insecurity and Health

Djibouti | Ethiopia | Kenya | Somalia | South Sudan | Sudan | Uganda



World Health Organization

WHO graded event



Horn of Africa Food Insecurity and Health Emergency Grade 3

Key figures



292.7M Estimated total population in GHoA (World Bank)



48.3M Acutely food insecure population (IPC3+)



11.64M Number of internally displaced (UNHCR)



4.48M Number of refugees (UNHCR)

Funding status



123.8M WHO Jul-Dec 2022 funding needs



Received (53.2M) 43%

Gap against funding received-pledged (70.6M) 57%

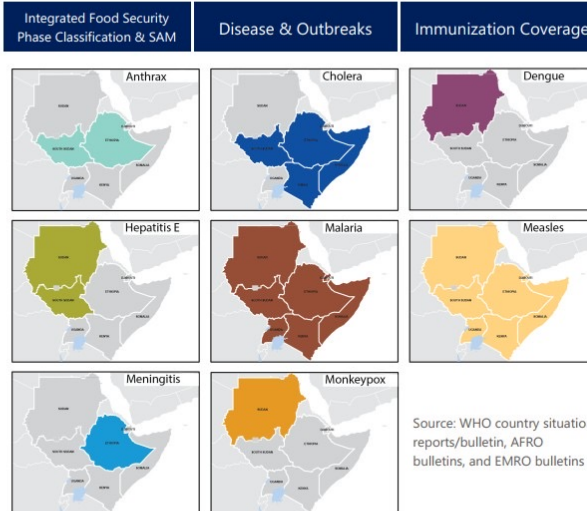


178M WHO Jan-Dec 2023 funding needs

The Greater Horn of Africa is facing a dire food insecurity crisis resulting from extreme weather events, along with conflict, the fallout from the COVID-19 pandemic, and high food and fuel prices. Most parts of the region are battling the worst drought in the last 40 years while other parts face substantial flooding and conflict. Over 48.3 million people are estimated to be food insecure, out of whom more than 129,000 people are facing catastrophic conditions (IPC5 in Somalia and South Sudan) with some essentially dying from hunger and its effects. This has forced people to flee their homes and the region now has 4.48 million refugees as well as 11.64 million internally displaced people. The climate-related health crisis worsens as the number of reported disease outbreaks and climate-related health emergencies in the region have reached their highest-ever level this century. The on-going outbreaks of measles and cholera are a major public health concern, not least because the combination of malnutrition and these diseases often proves fatal. Rapidly rising numbers of severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) admissions are being recorded in nutrition programmes - a dramatic increase as compared to previous years. Regardless of future rainfall performance, the recovery period from a climate emergency of this magnitude will take years, with extremely high humanitarian needs even set to increase in 2023.



Mother and children wait a vaccination against measles during a campaign at Kahda IDP camp in Mogadishu, Somalia (16 Nov 2022, WHO Somalia)



Navigate the different sections of the dashboard using the icon on the left side of the page.

Public Health Situational Analysis (PHSA), January 2023



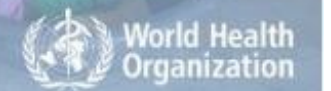
Public Health Situation Analysis

Greater Horn Of Africa

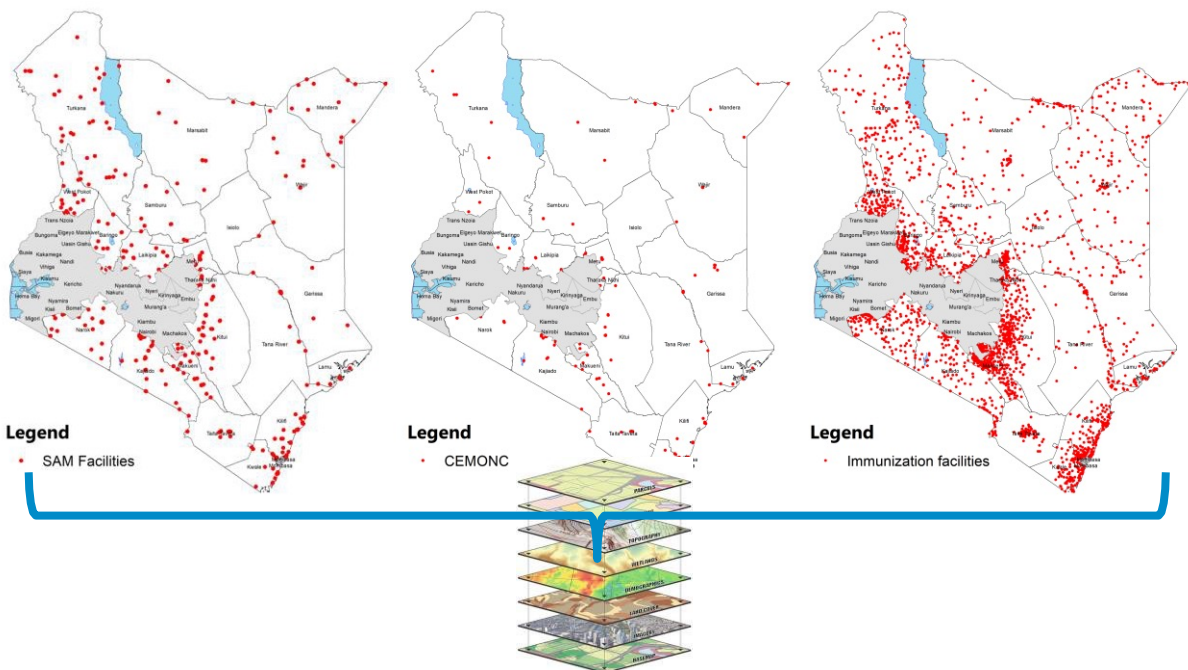
Health and Food Insecurity

Population: 494,616,000 of seven food insecurity affected (Djibouti, Ethiopia, Kenya, Somalia, South Sudan, Sudan, Uganda)
 Emergency: Grade 3
 Reporting period: June - December 2022
 Start date of crisis: Late 2020, Escalation: Quarter 1, 2022
 Typology of crisis: Drought, food security, conflict, health and displacement

This report was prepared by the Director of Africa (AFRO) and is subject to regular updates based on changes in the situation and availability of public data.



Health service availability, accessibility analysis-Secondary data



Methodology

- Using three tracer services, severe acute malnutrition, CEMONC and immunization
- Extracting facility-level service provision from health information systems for these tracer services
- This gives near real time (monthly) assessment of service provision
- Mapping population distribution incl. refugee and IDP camps
- Using geospatial modelling to assess marginalization from these services

Results/Kenya

1.million in IPC2+ live more than 2 hours from a SAM stabilization facility

- More than half of mothers needing CS in IPC2+ regions live more than 2 hours from a CEMONC facility
- Half of infants needing immunization in IPC 2+ regions live more than 1 hour from immunizing facility

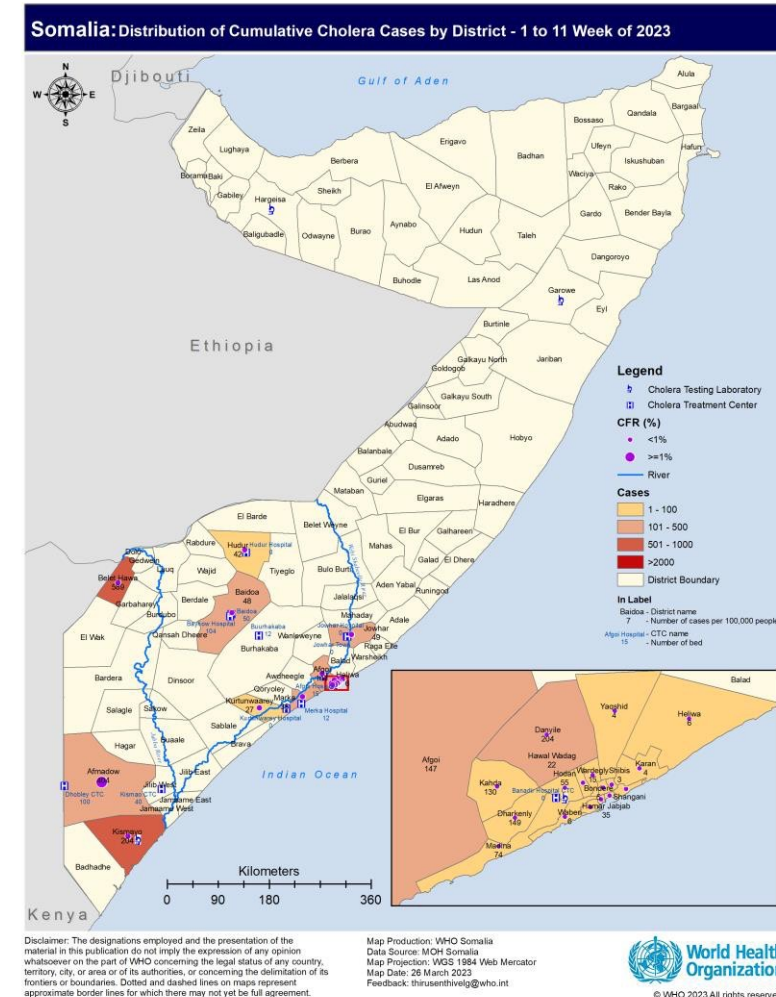
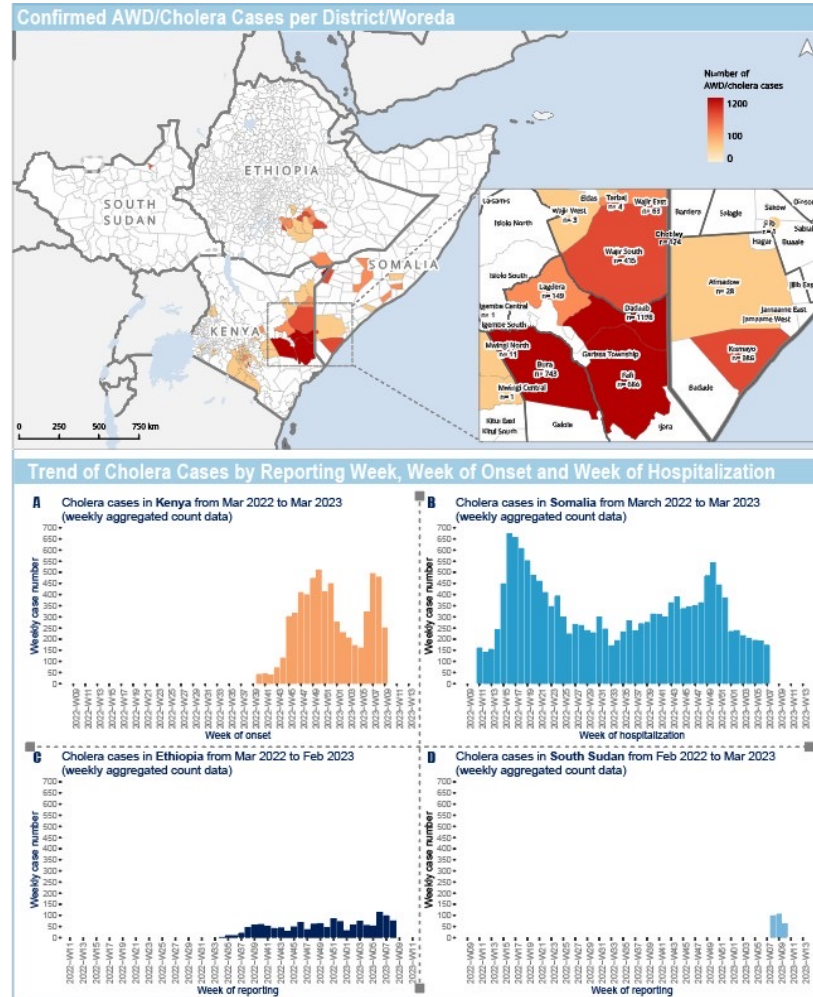
IPC Class	Immunization		CEMONC		Severe Acute malnutrition	
	Population without access	Mean Access outside 1 hour	Population without access	Mean Access within 2 hours	Population without access	Mean Access within 2 hours
IPC 2	85,805	32.1%	44,920	42.0%	1,535,051	26.3%
IPC 3	51,957	34.4%	41,007	67.8%	1,366,271	37.0%
IPC 4	147,662	66.1%	58,901	66.1%	3,199,016	49.5%
IPC 5	-	0.0%	-	0.0%	-	0.0%
Total	285,424	50.1%	144,828	59.1%	6,100,338	40.9%

Cholera Outbreak – Response in Greater Horn Of Africa

Provision of In-Country Support

GIS Centre Support Focus Areas:

- Supporting the Regional IMST cross border cholera coordination with products to inform the response
- Mapping of cholera cases in all 04 countries to identify hotspots
- Supporting Cholera outbreak response in Kenya, South Sudan, Ethiopia and Somalia through deployment of GIS Specialist



800+ hours of workload

Thank you

gissupport@who.int

www.who.int/data/GIS