unicef | for every child

World Health Organization

LEVERAGING GIS-BASED MICROPLANNING IN GLOBAL FUND PROPOSALS FOR COVID-19 RESPONSE MECHANISM (C19RM) 2021

Technical Note

Compiled by the joint WHO-UNICEF GIS Working Group

Background

The Global Fund COVID-19 Response Mechanism (C19RM) was designed to support countries across three broad categories: (i) COVID-19 control and containment interventions, including testing, treatment, such as medical oxygen, provision of personal protective equipment (PPE), communications and other health and social measures; (ii) activities to mitigate the effects of the pandemic on HIV/AIDS, tuberculosis and malaria; and (iii) expanded reinforcement of key aspects of health and community systems, including disease surveillance and laboratory systems and community mobilization. The different funding streams of The C19RM are linked to the main pillars of WHOs COVID-19 Strategic Preparedness and Response Plan (SPRP) Operational Planning Guideline.

GIS-based microplanning is the use of Geographic Information Systems (GIS) and spatial data on location of health resources, target population and health areas for the planning and monitoring of health services at the district and health facility level. It has been demonstrated in various settings to benefit the efficiency and reach of immunization programs. However, the benefits of GIS data and spatial analysis for the health sector are by no means limited to immunization programs. For example, geographic accessibility to services is recognized as one of the primary determinants to care and a fundamental layer of health system performance towards achievement of Universal Health Coverage. Similarly, mapping of key populations and microplanning is amongst the key technical strategies for HIV epidemic control and service delivery continuation for The Global Fund (TGF) and PEPFAR.

This note is directed to the Country Coordinating Mechanisms (CCM) and Principal Recipients (PR) of TGF grant holders and applicants, with the objective of supporting the inclusion of core spatial data and GIS-based microplanning in funding requests of the C19RM mechanism. This document is meant as a complement to the C19RM Technical Information Note. It indicates recommended activities that are relevant to the deployment of GIS-based microplanning and how those can be linked to the C19RM pillars, as well as supporting PRs in the identification of the main cost drivers and activities to be costed.This Information note was compiled by the joint WHO-UNICEF GIS working group. A sub-group of the COVID-19 Vaccination Delivery Innovation team of COVAX, the vaccines pillar of the Access to COVID-19 Tools Accelerator (ACT-A), the GIS WG is coordinating technical support for the implementation of GIS-based

microplanning for the equitable distribution of the COVID-19 vaccine. In addition to the information and guidance provided in this note, countries can seek dedicated support from the GIS working group through the WHO and UNICEF contacts listed in the last page.

Key Considerations

The following key considerations justify and guide the inclusion of GIS-based microplanning into funding proposals for COVID-19 Response Mechanism (C19RM)

- GIS-based microplanning is crucial to effective and efficient rollouts of **national COVID-19 response plans**. For instance, improving identification of target populations and optimizing the targeting and deployment of COVID-19 control and containment interventions (testing, treatment and support e.g. oxygen, PPE, and vaccine delivery)

- Investments in GIS-based microplanning and its core spatial data (location of health resources, population distribution and boundaries of health/administrative areas) can positively impact **mitigation of the impacts of COVID-19 on HIV, TB and malaria**. For example supporting digitization of campaigns for malaria prevention (LLINs, IRS, SMC), targeting of active case finding for TB and improving access to diagnosis, treatment and prevention services for HIV, TB and malaria.

- Similarly, strengthened GIS capacity and data serves as cross-cutting improvement towards **resilient and sustainable health and community systems**, by supporting the mapping of health facilities (public and private) and community platforms, as well as the referral networks for improved availability and accessibility of services.

How to use this Information Note

The suggested workflow for the use of this Information Note to support C19RM proposal development is

1. Start from the gaps and needs identified by the national COVID-19 response committees.

2. Utilize the mapping in "Narrative and Justification" to understand the GIS-relevant activities that respond to those needs and gaps under each pillar and that are eligible for C19RM funding.

3. Use the allocation requests example tables to formulate allocation requests for section 2.3.6 and 2.37 of the application form for specific activities, and to identify main cost drivers.

4. Contact the GIS working group if additional technical support is required for formulating the allocation request tables and for support on country-specific costing.

Although the narrative presented is articulated mainly on the application of GIS for microplanning for COVID19, the earlier key considerations indicate that the narrative and activities proposed are cross-sectoral in nature. The reader is invited to use this resource with this flexibility in mind.

Narrative and Justification

Based on the key considerations, this document provides a narrative for the relevance of GIS-based microplanning to the specific pillars of the CR19M as mentioned in the grant application document. Except for Pillar 4 all pillars of the SPRP have been matched to GIS-based activities (within the context of C19RM, Pillar 8 “Operational support and logistics” is embedded within the other pillars).

Pillar 1: **Coordination, planning, financing, and monitoring**

Knowing where people are, where health facilities are and how those can be accessed are questions that geospatial technology and data can answer to support coordination, planning and monitoring of National COVID-19 Response Plans, including testing, treatment, oxygen/respiratory care, infection prevention and control, surveillance, and vaccine rollout, as well as mitigation of the impacts on HIV, TB and Malaria programmes, and strengthening health systems and community responses. Crucial to this is the establishment (or strengthening) of institutional capacity to oversee the collection, maintenance, and regular updating of the core spatial data of the health sector (georeferenced master lists of health facilities, CHWs and community-based services, population distribution and health area boundaries), as well as the establishment and implementation of standard mechanisms and processes for operational use of such spatial data for improved coordination, planning and monitoring throughout the health sector (Allocation request table c).

Pillar 2: **Risk Communication**

Geographic information systems have long proven their value in risk and vulnerability analysis and are also a powerful tool for risk communication. Targeted risk communication can benefit from geospatial information that identifies and maps marginalized and at-risk populations to deliver actionable, timely and credible health information to individuals and communities. Specifically, the improved localization of marginalized and at-risk populations through GIS-based microplanning provides the opportunity to ensure marginalized populations are accounted for in RCCE action plans for COVID-19 and to facilitate the process of planning of resources and logistics for community mobilization activities and community consultation (Allocation request table a).

Pillar 3: **Surveillance, including Epidemiological Investigation and Contact Tracing**

Using spatial tools and data enhances surveillance capacity. In order to derive public health intelligence about epidemiology, health system capacity and utilization, and to address disparities, it is important to collect, manage, analyze, interpret and report data at the national and sub-national levels stratified by sex, age, and other factors. Spatial data on population, vulnerability factors and health infrastructure will strengthen sub-national analysis of the spread and severity of COVID-19 versus health system preparedness and weaknesses. GIS will also facilitate localization of contact tracing activities for better geographic targeting of response.

Pillar 5: **Diagnostics and Testing**

Spatial data and GIS-based microplanning can support optimization of diagnostic and testing services by relating data on population and COVID-19 risk to candidate sites for testing, optimizing sample transport networks to laboratory locations, and assisting the deployment of mobile laboratories to optimize geographic coverage and efficient use of resources. GIS can also be used as a communication tool to inform the public about where testing services are available and to target communication around testing (Allocation request table a).

Pillar 6: Infection Prevention and Control, and protection of the health workforce

GIS-based microplanning can support optimization and targeting of the deployment of IPC strategies and resources at the subnational level and within districts. Detailed estimation of target population within health facilities' catchment areas can lead to improved supply management of stockpiles and distribution of sufficient IPC supplies including Personal Protective Equipment (PPE), as well as informing assessment of health facility IPC capacity in terms of sufficient staff-patient ratios within catchment areas. Vaccine rollout strategies in community settings can also benefit from the information on community-specific population densities in the microplans, informing better development of IPC strategies sensitive to community setting and coordination of IPC resources within districts. GIS-based microplanning also supports reduction of medical waste (PPE, single-use devices, vaccins, medical equipment and oxygen supply) by optimizing distribution of resources to effective demand (Allocation request table a).

Pillar 7: **Case management, Clinical Operations, and Therapeutics**

To support case management and clinical operations as well as therapeutics, geospatial data on the location of vulnerable populations and health facilities (public and private) can support this effort. GIS-based microplans can support identification of gaps in geographic coverage based on health facilities' capacities, workforce and equipment, and optimize planning of treatment sites. This can enable targeting of scarce resources to where they are needed most for

optimizing case management (e.g. therapeutics, oxygen) and clinical operations, referral pathways, and response to surges (Allocation request table a).

Pillar 8: **Operational support and logistics**, **and supply chains**

Logistical and operational capacities at the national level underpin all of the other pillars. Availability of core spatial data (location of health resources, population distribution and boundaries of health/administrative areas) and GIS-based microplans are crucial to supporting the optimization of logistics and operations of all aspects of National COVID-19 Response Plans. Within the framework of the C19RM, this pillar is embedded within the other pillars. Please refer to other pillars.

Pillar 9: **Strengthening essential health services and systems**

Geospatial data, tools, and technology support maintaining essential health services and systems. The establishment of spatial data on health resources (including public, private, community health workers), population distributions and boundaries of health/administrative areas embedded in the HIS enable GIS analysis to support the adaptation and optimization of essential health services beyond COVID19, including for HIV, TB and malaria (Allocation request table c) (Allocation request tables b).

Pillar 10: **Systems Support Contributing to Vaccine Delivery Services**

Spatial data, spatial analysis and GIS-based microplans are crucial for optimizing vaccine delivery. To vaccinate the population according to their priorities and needs, it is necessary to identify priority populations and plan how to reach them. The use of geospatial databases of population and health resources distribution, in the context of GIS microplans, will support optimization of vaccine delivery and outreach strategies cognizant of local geographic context, and the prioritization of available vaccine stocks based on localized quantification of population burden and outreach logistics (Allocation request table a). As noted above, this data and capacity can also serve to adapt and optimize the delivery of other essential services (Allocation request tables b)

Example Allocation Requests Tables

Examples are provided here for section 2.3.6 C19RM Base Allocation Request to be filled in the application form. If base allocations are exhausted with higher priority requests, interventions and activities can be placed in the above base allocation request section 2.3.7. Requests can be tailored to each countries' needs, gaps, desired interventions, and portfolio of existing overlapping initiatives.

a. COVID-19 control and containment interventions	
Intervention & Key activities	***GIS-based microplanning for optimizing the impact, efficiency, and equity of the national COVID-19 response, including testing, therapeutics, oxygen and respiratory care, and vaccinations*** ● *Develop or update georeferenced master lists of health facilities (public and private) and community health workers (CHWs) and other essential health infrastructure (supply warehouses, oxygen plants)* ● *Identify and map target population, including marginalized and at-risk* ● *Plan the optimal number and location of diagnostic, treatment,and vaccination sites for full coverage.* ● *Plan the equitable allocation of tests, PPE, therapeutics, oxygen, respirators, and vaccine doses among permanent and temporary health facilities.* ● *Plan the communication strategy to reach the catchment population served by each COVID-19 health facility.* ● *Optimize outreach activities to ensure all communities are reached*
Rationale	*COVID-19 PPE, tests, therapeutics, oxygen and respiratory care supplies. and vaccines are very limited, yet there is an urgent need to help the most vulnerable. GIS-based microplanning can help countries optimize the impact, efficiency, and equity of the national COVID-19 response.*
Expected Outcome	*Through acquiring the necessary data, skills, partners and infrastructure, [Country A] will develop GIS-based microplans for optimising the impact, efficiency, and equity of the national COVID-19 response and health systems strengthening*
Expected Investment[1]	*Cost will include* ● *Technical GIS support for project oversight, national coordination and oversight of field GIS activities* ● *Procurement of GIS datasets on population settlements, building footprints, populations (and/or technical support for updating these)* ● *Technical GIS support for updating of population estimates and population locations* ● *Technical GIS support for setup and configuration of a GIS-based microplanning software solution, GIS analysis and development of microplans for all health facilities* ● *Costs of field data collection activities for georeferencing master lists of health facilities (public and private), supply warehouses, oxygen plants, and community health workers* ● *Salary of Government staff involved in data field data collection, validation, management and production of GIS microplans, including supervision* ● *Cost of training and workshop activities for MoH staff on data collection, management, quality control and use of GIS tools for microplanning including per-diems and travel cost of government trainees* ● *Information technology equipment and software (laptops, GPS-devices, printers, GIS software license)*

[1] *For investments that will support GIS-based microplanning for more than one area (COVID-19 interventions, mitigation for HIV programs, mitigation for malaria programs, mitigation for TB programs), do not duplicate costs across tables. Simply reference the table where the costs are already included.*

Use section 2.3.6 b. to detail how GIS-based interventions will provide synergistic support to COVID-19 and HIV, TB, and malaria.

b. COVID-19-related risk mitigation measures for programs to fight HIV/AIDS, tuberculosis, and malaria	
Intervention & Key activities	**Mitigation for HIV programs** *GIS-based microplanning for optimising impact, efficiency, and equity of HIV prevention, testing, treatment and care* ● *Develop or update georeferenced master lists of health facilities (public and private) and community health workers (CHWs)* ● *Identify and map key and vulnerable populations* ● *Identify priority locations for targeting integrated services (including HIV/STI prevention, testing, treatment and care, family planning/sexual and reproductive health services) through facility, mobile, and community models*
Rationale	*It is essential to maintain HIV services in the context of COVID-19. GIS-based microplanning can help countries optimize the impact, efficiency, and equity of HIV prevention, testing, treatment and care services.*
Expected Outcome	*Through acquiring the necessary data, skills, partners and infrastructure, [Country A] will develop GIS-based microplans for optimising the impact, efficiency, and equity of HIV prevention, testing, treatment and care services.*
Expected Investment[2]	*Cost will include* ● *Technical GIS support for project oversight, national coordination and oversight of field GIS activities* ● *Procurement of GIS datasets on population settlements, building footprints, populations (and/or technical support for updating these)* ● *Technical GIS support for updating of population estimates and population locations* ● *Technical GIS support for setup and configuration of a GIS-based microplanning software solution, GIS analysis and development of microplans for all health facilities* ● *Costs of field data collection activities for georeferencing master lists of health facilities (public and private), supply warehouses, oxygen plants, and community health workers* ● *Salary of Government staff involved in data field data collection, validation, management and production of GIS microplans, including supervision* ● *Cost of training and workshop activities for MoH staff on data collection, management, quality control and use of GIS tools for microplanning including per-diems and travel cost of government trainees* ● *Information technology equipment and software (laptops, GPS-devices, printers, GIS software license)*

[2] *For investments that will support GIS-based microplanning for more than one area (COVID-19 interventions, mitigation for HIV programs, mitigation for malaria programs, mitigation for TB programs), do not duplicate costs across tables. Simply reference the table where the costs are already included.*

Intervention & Key activities	**Mitigation for TB programs** *GIS-based microplanning for optimising impact, efficiency, and equity of TB prevention, diagnosis, and treatment* ● *Develop or update georeferenced master lists of health facilities (public and private) and community health workers (CHWs)* ● *Identify and map key and vulnerable populations* ● *Identify priority locations for targeting integrated services (including TB prevention, diagnosis, and treatment) through facility, mobile, and community models*
Rationale	*It is essential to maintain TB services in the context of COVID-19. GIS-based microplanning can help countries optimize the impact, efficiency, and equity of TB prevention, diagnosis, and treatment services.*
Expected Outcome	*Through acquiring the necessary data, skills, partners and infrastructure, [Country A] will develop GIS-based microplans for optimising the impact, efficiency, and equity of TB prevention, diagnosis, and treatment services.*
Expected Investment[3]	*Cost will include* ● *Technical GIS support for project oversight, national coordination and oversight of field GIS activities* ● *Procurement of GIS datasets on population settlements, building footprints, populations (and/or technical support for updating these)* ● *Technical GIS support for updating of population estimates and population locations* ● *Technical GIS support for setup and configuration of a GIS-based microplanning software solution, GIS analysis and development of microplans for all health facilities* ● *Costs of field data collection activities for georeferencing master lists of health facilities (public and private), supply warehouses, oxygen plants, and community health workers* ● *Salary of Government staff involved in data field data collection, validation, management and production of GIS microplans, including supervision* ● *Cost of training and workshop activities for MoH staff on data collection, management, quality control and use of GIS tools for microplanning including per-diems and travel cost of government trainees* ● *Information technology equipment and software (laptops, GPS-devices, printers, GIS software license)*

[3] *For investments that will support GIS-based microplanning for more than one area (COVID-19 interventions, mitigation for HIV programs, mitigation for malaria programs, mitigation for TB programs), do not duplicate costs across tables. Simply reference the table where the costs are already included.*

Intervention & Key activities	**Mitigation for malaria programs** *GIS-based microplanning and digitizing campaigns for optimising impact, efficiency, and equity of malaria campaigns (LLINs, SMC, IRS) and malaria case management* ● *Identify settlements, buildings and target populations, plan the optimal number and distribution of campaign enumeration teams, provide digital maps to guide enumeration teams and ensure no target populations or structures are missed* ● *Use mobile devices (tablets, smart phone) during campaign enumeration and implementation for real-time data collection and monitoring, decision support, communication, supervision, transfer of funds to field teams* ● *Identify priority locations for targeting integrated services (including malaria case management) through facility, mobile, and community models*
Rationale	*Malaria campaigns (LLINs, SMC, IRS) are key tools in the fight against malaria but they are logistically challenging to plan and implement. GIS-based microplanning and "digitizing" campaigns through the use of digital technology can support planning and implementation to ensure no populations or structures are missed, field teams are supported, and performance monitored in real-time. GIS-based microplanning and digitalization of malaria campaigns can help countries optimize impact, efficiency, and equity of investments in campaigns.*
Expected Outcome	*Through acquiring the necessary data, skills, partners and infrastructure, [Country A] will develop GIS-based microplans for optimising the impact, efficiency, and equity of malaria campaigns (LLINs, SMC, IRS) and health systems strengthening.*
Expected Investment[4]	*Cost will include* ● *Technical GIS support for project oversight, national coordination and oversight of field GIS activities* ● *Procurement of GIS datasets on population settlements, building footprints, populations (and/or technical support for updating these)* ● *Technical GIS support for updating of population estimates and population locations* ● *Technical GIS support for setup and configuration of a GIS-based microplanning software solution, GIS analysis and development of microplans for all health facilities* ● *Costs of field data collection activities for georeferencing master lists of health facilities (public and private), supply warehouses, oxygen plants, and community health workers* ● *Salary of Government staff involved in data field data collection, validation, management and production of GIS microplans, including supervision* ● *Cost of training and workshop activities for MoH staff on data collection, management, quality control and use of GIS tools for microplanning including per-diems and travel cost of government trainees* ● *Information technology equipment and software (laptops, GPS-devices, printers, GIS software license)*

[4] *For investments that will support GIS-based microplanning for more than one area (COVID-19 interventions, mitigation for HIV programs, mitigation for malaria programs, mitigation for TB programs), do not duplicate costs across tables. Simply reference the table where the costs are already included.*

In Section 2.3.6 c., detail GIS interventions for COVID-19 which benefit health systems strengthening and enable community-led response.

c. Expanded reinforcement of key aspects of health systems and community-led response systems	
Intervention & Key activities	*Establish coss-cutting institutional capacity to operationalize the management and use of geospatial data for coordination, planning, and monitoring of the health sector (activity can be spearheaded in the context of the COVID19 response, but be inclusive of program stakeholders including Malaria, TB and HIV)* ● *Establish a geospatial governance mechanism* ● *Establish GIS team with minimum technical capacity in the MoH, with refresher training programs* ● *Complete, up-to-date core spatial data layers, including georeferenced master lists of health facilities (public and private) and community health workers, population distribution and health boundaries, and storage in an adequate management software* ● *Define data specifications and SOPs for geospatial data collection, management and use to be adopted across the health sector* ● *Procure geospatial technologies (GPS devices, satellite images, GIS software) and Information technology equipment* ● *Formalize all the above processes through health sector strategic documents and policies*
Rationale	*Geographic information on where people are, where health facilities are and how these can be accessed are cross-sectoral assets beneficial to multiple health programs, as well as foundational to strengthening health systems and community responses. The establishment (or strengthening) of institutional capacity is critical to ensure the sustainable management and use of geospatial assets and their use for improved coordination, planning and monitoring of COVID-19 Response Plans, mitigation of the impacts on HIV, TB and Malaria.*
Expected Outcome	*The Ministry of Health has the coordinated governance, resources and mechanisms to deploy GIS in support of coordination, planning and monitoring of COVID-19 Response Plans,and mitigation of the impacts on HIV, TB and Malaria. The resources and capacity established will support the application of GIS across the pillars of the modular framework as indicated in specific sections*
Expected Investment	● *Technical assistance for situational assessment and work-plan development, development of data specifications, SOPs* ● *Salaries of core GIS team in MoH* ● *Technical support for setup and configuration of a GIS-based microplanning software solution* ● *GIS trainings (data collection, management and analysis) including annual refreshers* ● *Information technology equipment and software (laptops, GPS-devices, printers, GIS software license)* ● *Workshops (advocacy, stakeholder consultation)*

The COVAX UNICEF / WHO GIS Working Group remains available to support countries, CCMs, and country and regional offices in developing their GIS funding requests and action plans for GIS-enabled COVID-19 response.

Contact Information

Rocco Panciera
UNICEF Health Section, New York
rpanciera@unicef.org

WHO GIS Centre for Health
gissupport@who.int