GIS Support for the MSF Ebola response in Guinea in 2014

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Case study

MEDECINS SANS FRONTIERES
ÄRZTE OHNE GRENZEN

GIS support for the MSF Ebola response in Guinea in 2014

Case study

MSF Section	MSF-OCG		
Title	GIS Support for the MSF Ebola Response in Guinea 2014		
Owner & commissioner	Technical Support to the Operations Logistics Department Médecins Sans Frontières Operational Center Geneva		
Author	Timo Lüge, MSF-CH's GIS Unit (CartONG)		
Purpose	This case study aims to elaborate whether the GIS officer's mission to Guinea has succeeded in supporting the emergency response and furthering the strategic goals defined in the Strategic Paper "Development of the GIS in MSF-CH".		
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Reviewers	Sandra Sudhoff Audrey Lessard-Fontaine Sylvie de la Borderie GIS experts - MSF-CH's GIS Unit (CartONG) ; Mathieu Soupart, GIS focal point, Logistics director, MSF-CH	**Date**	07/07/2014

ABBREVIATIONS

FTP	File Transfer Protocol
HOT	Humanitarian OpenStreetMap Team
GIS	Geographic Information Systems
GPS	Global Positioning System
MSF	Médecins Sans Frontières
MSF-CH	Médecins Sans Frontières, Switzerland
NGO	Non-Governmental Organisation
OCG	Operational Centre Geneva
OSM	OpenStreetMap
V&TC	Volunteer and Tech Community
WHS	Water, Hygiene and Sanitation

EXECUTIVE SUMMARY

In March 2014, MSF-Switzerland deployed a dedicated Geographic Information Systems (GIS) officer to Guinea in response to the Ebola outbreak in the south of the country. In support of the epidemiological team, the GIS officer was charged with producing general overview maps, as well as topical maps that supported different aspects of the operation.

During the eight weeks of his mission, the GIS officer produced 109 maps for this previously very poorly mapped area. The maps included basic orientation maps that showed roads, landmarks and villages but also specialised maps that visualized population density or the spread of the disease.

Both field and headquarters staff interviewed for this case study emphasized that having a dedicated GIS officer in the field was a major asset that had a significant positive impact on the operation.

Universally, interviewees identified two outputs as the most useful:

- **Localization**: With the help of a newly created database and subsequently produced maps, the GIS officer was able to pinpoint the exact location of villages and identify villages that had the same name but were in different parts of the prefecture. Based on this information, MSF programme staff were able to respond to the outbreak faster, in a more targeted way and with fewer resources.
- **Visualization**: A weekly mapping of confirmed and suspected Ebola cases helped translate the progression of the epidemic from technical data into an easy-to-grasp map. As a result, staff at all levels had a better understanding of the emergency.

The interviews also highlighted the fact that most MSF staff know very little about GIS in general, let alone how a GIS officer could support them. The newly formed GIS unit at the Operational Centre Geneva (OCG) needs to do more to educate staff at headquarters and in the field about how GIS can support operations. For field deployments, this means that GIS officers need to be service-oriented self-starters because only very few staff will know how to make best use of his or her skills.

To map the areas of operation in a reasonable amount of time, the GIS unit - in support of the field officer - crowdsourced tasks that were neither confidential nor sensitive. As a result, a substantial number of overview

maps were created with the help of close to 250 online volunteers. These volunteers helped to map previously unmapped cities and roads within a few days, and at a granular level, mapping individual buildings. These overview maps then became the foundation of many maps that the GIS officer created for the response. While the cooperation with the online volunteers was overall very positive, it also showed that coordination as well as expectation management can be improved.

Given the universally positive feedback about the GIS officer's deployment, it is recommended that headquarters makes GIS officers available to field offices, where direct contact with field operations can bring clear benefits, and where close and timely monitoring of the spread of an epidemic is essential.


Google earth
Station Total
Google earth

INTRODUCTION

1.1 BACKGROUND

In March 2014, viral haemorrhagic broke out in southern Guinea, near the city of Guéckédou. The virus was quickly identified as Ebola haemorrhagic fever and Médecins Sans Frontières (MSF) deployed a team to assist the existing programme staff with the response. MSF Switzerland (MSF-CH) has been running a malaria programme in the area since 2010.

In support of the epidemiological team, MSF-CH deployed a dedicated Geographic Information Systems (GIS) officer. While MSF staff have been using maps and GIS technology for many years, the use of dedicated GIS staff in the field is still very uncommon.

The decision to send a dedicated GIS officer to Guinea was informed by a study[1] on the use of GIS within MSF, which had identified[2] epidemiology as "the domain where GIS can bring the most positive evolution". It was, furthermore, based on the newly developed GIS Strategy[3] for MSF-CH (see also 3 Strategic).

This case study aims to elaborate whether the GIS officer's mission to Guinea has succeeded in supporting the emergency response and furthering the strategic goals defined in the GIS Strategy. The findings of this case study are based on oral and written interviews with 11 MSF/CartONG team members who were either based in Guinea or at headquarters; it is also based on the end-of-mission report by the GIS officer himself.

Geographic Information Systems (GIS)

The term GIS in this case study encompasses any use of geographical information, or maps, ranging from the basic use of maps in the field to the use of Global Positioning Systems (GPS), remote sensing (satellite imagery), and all kinds of geo-referenced information (locations of patients, particular infrastructures, etc).

(see: "Typology of GIS Applications", GIS Study)

[1]"State of art and opportunities using Geographic Information Systems in MSF" (2013) – referred to as "GIS Study" in this document
[2]GIS-Study, p. 34
[3]"Development of the Geographic Information System in MSF-CH" (2014) - referred to as "GIS Strategy" in this document

1.2 MSF CH's GIS UNIT

Analysing GIS data and producing detailed, topical maps is a technical skill that is not readily available within MSF. To explore the use of GIS and to build capacity within the organisation, MSF-CH signed a framework agreement with the French NGO CartONG in late 2013.
In addition to building and maintaining technical infrastructure for MSF-CH, this agreement includes remote mapping support, as well as the provision of CartONG staff embedded in MSF field missions. The members of the MSF GIS unit wear two hats: on the one hand they are part of the internal MSF-CH structure and, on the other hand, they are employees of an external service provider.


GUECKEDOU – MACENTA
MAPKIT
MEDECINS SANS FRONTIERES
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2. OVERVIEW OF GIS PRODUCTS USED FOR THE EBOLA RESPONSE

The GIS officer was deployed early on in the response to the Ebola outbreak in Guinea. The first MSF team arrived in Guéckédou on 19 March 2014, and the GIS officer arrived three days later and stayed until 15 May 2014. His mission had originally been planned for four weeks, but was extended on the request by field coordination.

During the eight-week mission, the GIS officer produced 109 maps. About a quarter of these were created as a result of requests from different technical departments in the field; the rest were based on his own initiative and expertise.

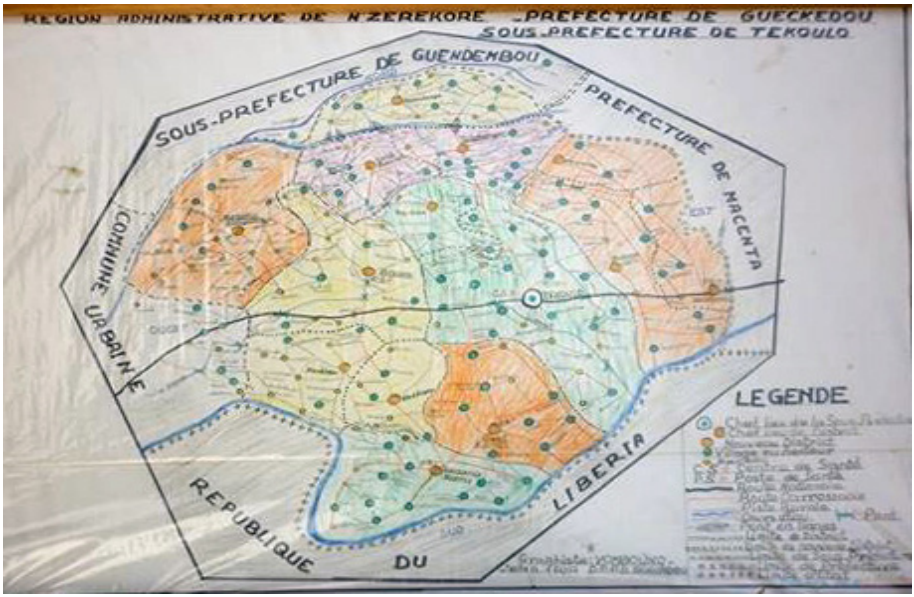
The GIS officer benefited from the fact that the Guéckédou office has a relatively fast internet connection[4]. While some of the maps could also have been produced without internet access, having a good connection significantly increased the range of products that the GIS officer could produce, thanks to access to online tools and data and remote support from the GIS Unit.

Whilst the GIS officer was officially attached to the epidemiological team, he also produced maps for the wider MSF team. In fact, the GIS officer estimated that he only spent about 10 per cent of his time on maps that were created specifically for the epidemiological team. About 60 per cent of his time was spent on producing maps that were of use to all units (base maps, village identification) and about 30 per cent was spent on maps for the logistics and Water, Hygiene and Sanitation (WHS) teams.

The classification of the GIS products described below follows the one used in the GIS study.

[4] Tests showed download speeds between 0.45 and 0.81 Mbps and upload speeds between 0.37 and 0.39 Mbps for one user on shared connection.

Table 1: Maps of Guéckédou prefecture before and at the end of the GIS officer's mission.



2.1 GLOBAL UNDERSTANDING OF THE SITUATION

Since epidemiological data was not available when the GIS officer arrived (see also 2.2 Epidemiology), he initially focused on producing base maps of the region and its most important towns.

At that point, only very basic maps existed of the prefecture of Guéckédou, which had been identified as the main field location for the Ebola response. Existing maps listed main town locations, one major road and also included low-quality paper-drawn city maps (see Table 1).

A first base map of the region had been produced remotely by the GIS unit, immediately before the deployment, based on information that was available in online databases. However, these proved to be only partially accurate.

One interviewee commented that it was surprising that better maps were not available, considering that MSF-CH has been working in the region for three years and has been preceded by MSF Belgium. Another said that a poor state of mapping was quite common in many operations despite the year-on-year presence of humanitarian organisations.

Base maps are maps showing a base layer of information. Additional layers of information can then be added. Common examples of base maps include topographical maps, relief maps and road maps.

Village localization
One the biggest challenges the team faced was that the names of many villages were unknown. There were also numerous villages with similar or identical names. For example, the village name ‘Bendou’ exists 14 times within the prefecture. This was hugely problematic as the team had to rely heavily on patient interviews to decide where to intervene. Errors in identifying locations can lead to delays and a waste of resources, and in an environment where MSF vehicles are not welcome everywhere, unnecessary trips to wrong locations can expose staff to additional risks.

The base maps produced by the GIS officer were a solution to these issues. With the help of the maps and a database of all identified village names, the GIS officer was quickly able to identify the exact location of villages and whether the name existed more than once.
Identifying village names was comparatively resource intensive since it had to be done on the ground. In many cases, local staff had to visit villages to confirm names and take GPS coordinates.

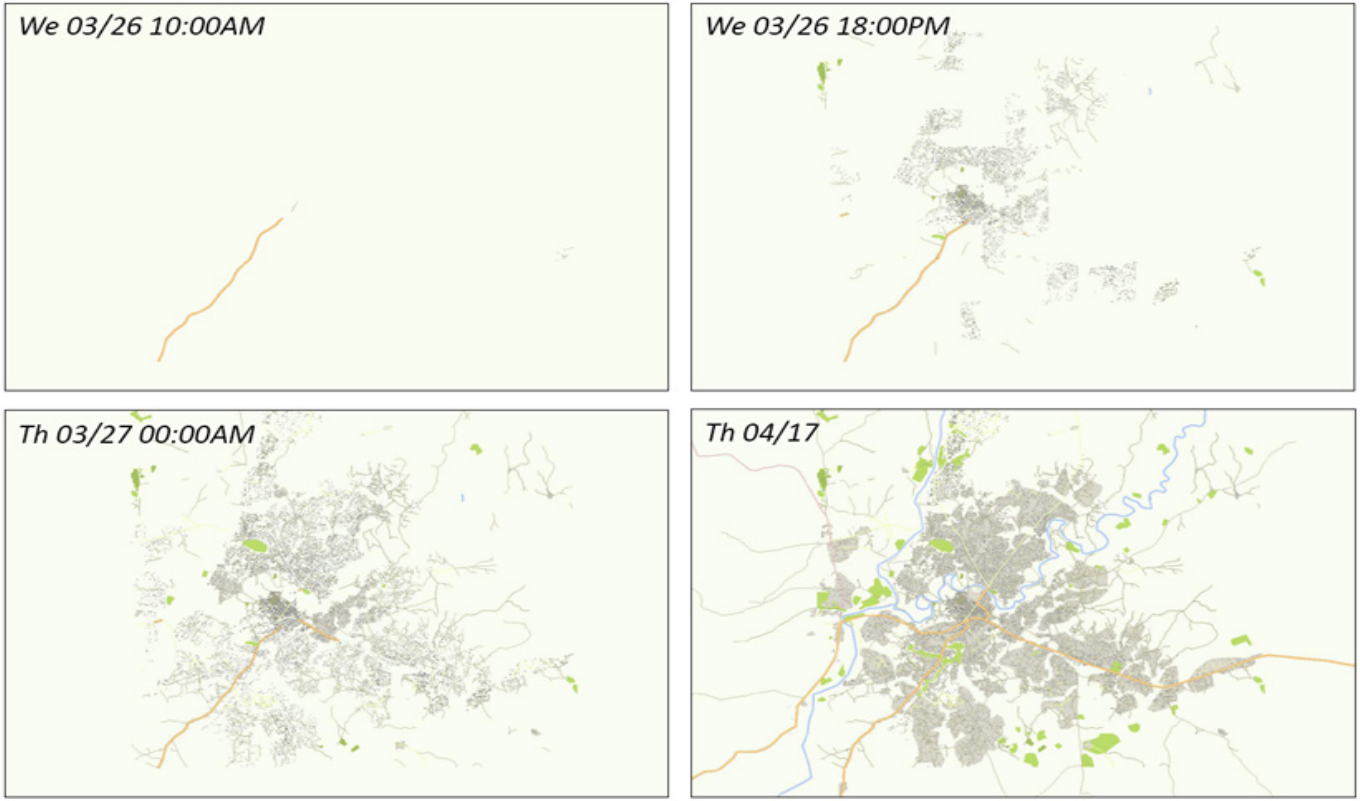


Table 2: Initial mapping of three cities as completed by the OSM volunteers within three days. Volunteers continued to work on maps of the region even after that period (see image bottom right).

Where possible, staff who were visiting an area for other reasons, were asked to verify names, but frequently local staff had to be sent out in cars or on motorbikes to specifically carry out this task. At the height of the localization activities, five local staff members spent at least some of their time on verifying villages names: three permanent staff as well as two temporary staff members whom the GIS officer had hired for this purpose.

All interviewees mentioned that knowing with confidence that they were sending their teams to the right locations significantly improved their ability to target their activities effectively.

One respondent also emphasized that in other emergencies technical staff had to try and identify the names and locations of villages, for example with the help of Google Earth. This frequently had to be done at night, after a long day of carrying out regular duties. Having a dedicated GIS officer in the field had a three-fold benefit: it increased the accuracy of the results, resulted in more user-friendly maps and saved time for programme staff.

Mapping Roads, Villages & Buildings
In order to quickly get more detailed maps of cities and major roads in the region, the GIS Unit decided to crowdsource this task. Through the volunteers of the Humanitarian OpenStreetMap Team (HOT), satellite images that had been acquired by MSF-CH were quickly turned into digital maps hosted on OpenStreetMap. Three priority cities (Guéckédou, Macenta, and Kissidougou) were mapped in less than three days. Within five days, 244 volunteers had mapped more than 90,000 buildings.

Many interviewees commented that they were 'amazed' by the speed at which the area was mapped with the help of the volunteers. On his own, the GIS officer would not have been able to produce these base maps during his mission.

OpenStreetMap (OSM) – www.openstreetmap.org

OpenStreetMap is often referred to as the "Wikipedia of Maps" as anybody can make changes to the maps online. OSM data is maintained by volunteers and released under an open source licence. In many developing countries, OSM maps are more detailed than Google maps because Google has no commercial incentive to improve its maps in these countries.

Humanitarian OpenStreetMap Team (HOT) – hot.openstreetmap.org

HOT is a group of OSM volunteers that acts as an interface between humanitarian organisations and the OSM volunteer network as a whole. Humanitarian organisations can send mapping requests to HOT, which then manages the volunteers responding to the request. This reduces the workload for the requesting organisation. HOT also functions as first-level support for all technical questions, while the requesting organisation has to be able to answer questions about the project itself.

The base maps that were created with the help of the OSF volunteers also served as the foundation of many other maps. In fact, many of the internal MSF maps that were created by the GIS officer could not have been produced without these base maps.

The OSM volunteers also identified some villages on the satellite images that had previously not been mentioned on maps at all. This process fed directly into the village localization workflow (see: 2.1 Village localization).

It's important to note that these base maps contained no sensitive or patient information, and were limited to roads, names of villages, landmarks etc. MSF teams could share them – digitally or on paper – with other humanitarian organisations and local authorities. This was greatly appreciated and helped build relationships with wider stakeholders.

Engaging the Volunteer and Tech Community (V&TC)

Most online volunteers contribute their time and expertise because they want to make a difference. The flipside of this is that they also expect feedback on how their work is being used and how their contributions helped – this is the "payment" they receive in exchange for their services.

Some respondents said they were surprised they had to provide this kind of feedback, and were also suprised that HOT had communicated publicly about their involvement, which resulted in significant media coverage. Some interviewees also felt that the media's focus on crowdsourced mapping almost distracted from the life-saving work being carried out by the medical staff.

In the future, MSF should discuss such issues with HOT in order to establish a set of procedures and manage expectations, for example, to define the type and frequency of feedback, the extent of public communication, as well as when the task has been completed (deactivation).

Mapkit
The GIS officer produced a "Mapkit" that included the most important base maps, as well as topical maps. This collection of 10–12 maps was given to all incoming staff as part of their briefing on arrival. These briefings were also an important opportunity for the GIS officer to explain his role, as most staff members were not familiar with it.

2.2 EPIDEMIOLOGY

Despite the fact that the GIS officer was "attached" to the epidemiology team, he spent comparatively little time working on products dedicated solely to epidemiology. The main reason for this was that most maps had cross-cutting uses. The maps showing the weekly evolution of cases, is the example that was most often cited by interviewees (see Figure 2).

As soon as epidemiological data became available, the GIS officer started to produce weekly updates of Ebola hotspots that showed both the number of new cases in the previous week, as well as the total number of cases since the beginning of the epidemic. This weekly, visual overview was appreciated by all the field and headquarters staff who were interviewed. As one respondent put it: "That map translated the scientific into the operational."

Since the end of the GIS officer's mission, these maps have continued to be produced remotely by the MSF-CH GIS unit.

One of the few GIS products that was produced solely for the epidemiology team, was a Google Earth layer showing palm tree density close to the suspected point of the outbreak's origin. This helped the epidemiologists test their hypothesis that bats living in certain types of palms might have been the source, rather than bats living in caves.

The palm tree density map was created by Copernicus[5], an emergency mapping service provided by the European Commission with particularly strong analytical capacity. As an associated user, MSF was able to send a request to Copernicus, which completed the analysis within 24 hours based on existing satellite image (so called rush-mode).

One of the constraints that the GIS officer had to deal with was that regular epidemiological data only became available from mid-April onwards. On the other hand, this enabled him to initially focus on base maps and similar products that were useful for all units.

[5]See : http://emergency.copernicus.eu/mapping/ems/what-copernicus

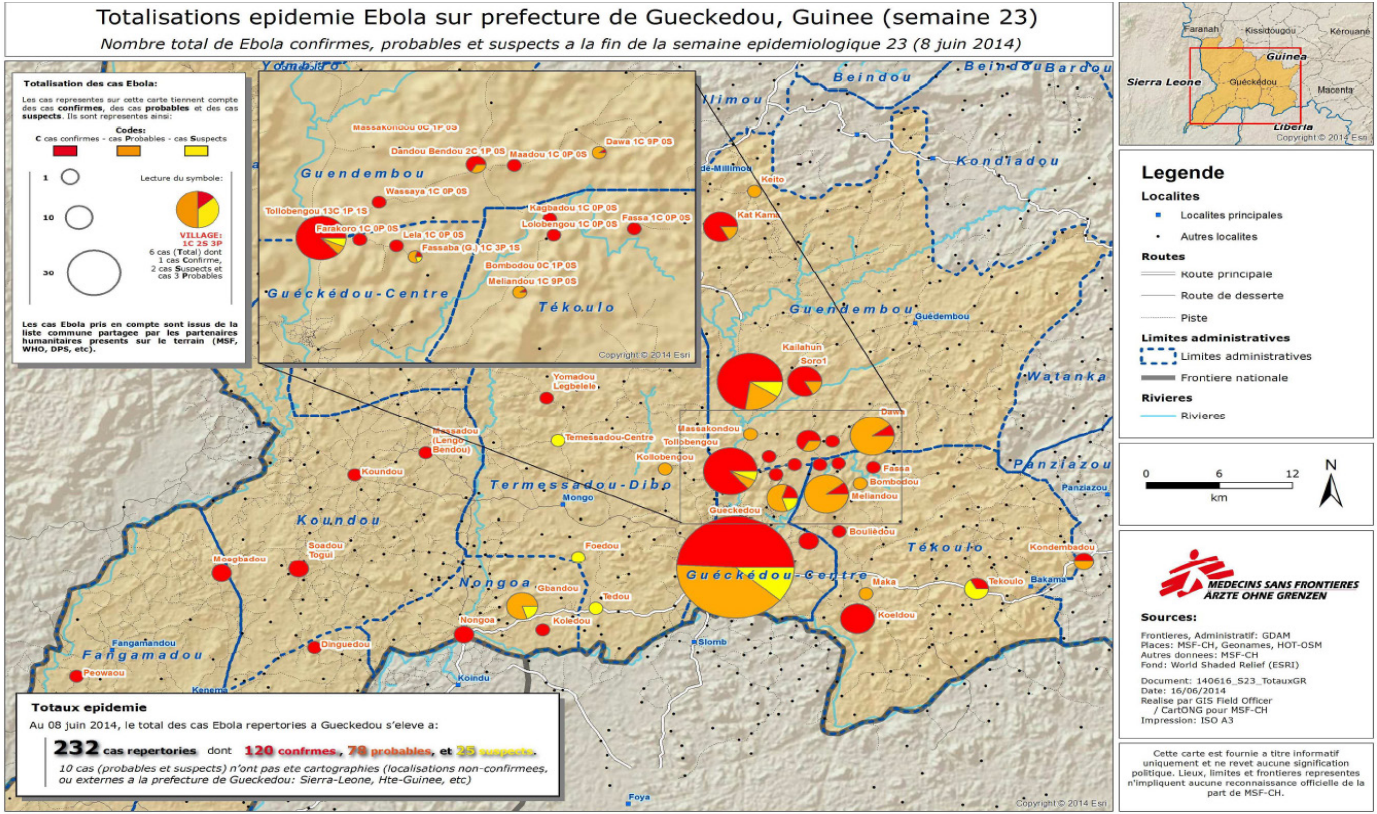


Figure 2: Regularly updates maps like these helped staff understand the situation better.

At the same time, there is also reason to believe that the rest of the epidemiology team would have been able to take better advantage of the GIS officer's skills if he had sat with the rest of the team. One reason for this physical separation was that the A3 colour printer was not in the building where the epidemiology team was based, but was located with coordination and logistics.

However, the GIS officer also felt strongly that, at least at the beginning, there was a lack of trust in his ability to operate confidentially because the GIS unit is managed through an external service provider. It was not clear to everyone whether the GIS officer was a member of MSF-CH or CartONG staff. However, when asked about these perceived issues when interviewed, members of the epidemiology team said that there were no trust issues.

Whichever is the case, in future it would be helpful to communicate the role and the position of the GIS unit more clearly as part of MSF-CH in order to avoid these real or perceived issues. Among other things, this means that GIS officers should use an MSF e-mail address.

2.3 REPORTING & COMMUNICATION

All interviewees commented positively on the transformative function of maps that manage to translate data that exists in spreadsheets into something visual that can be understood more easily. This applies to both the geographic and the temporal dimensions of maps when multiple maps can show changes over time.

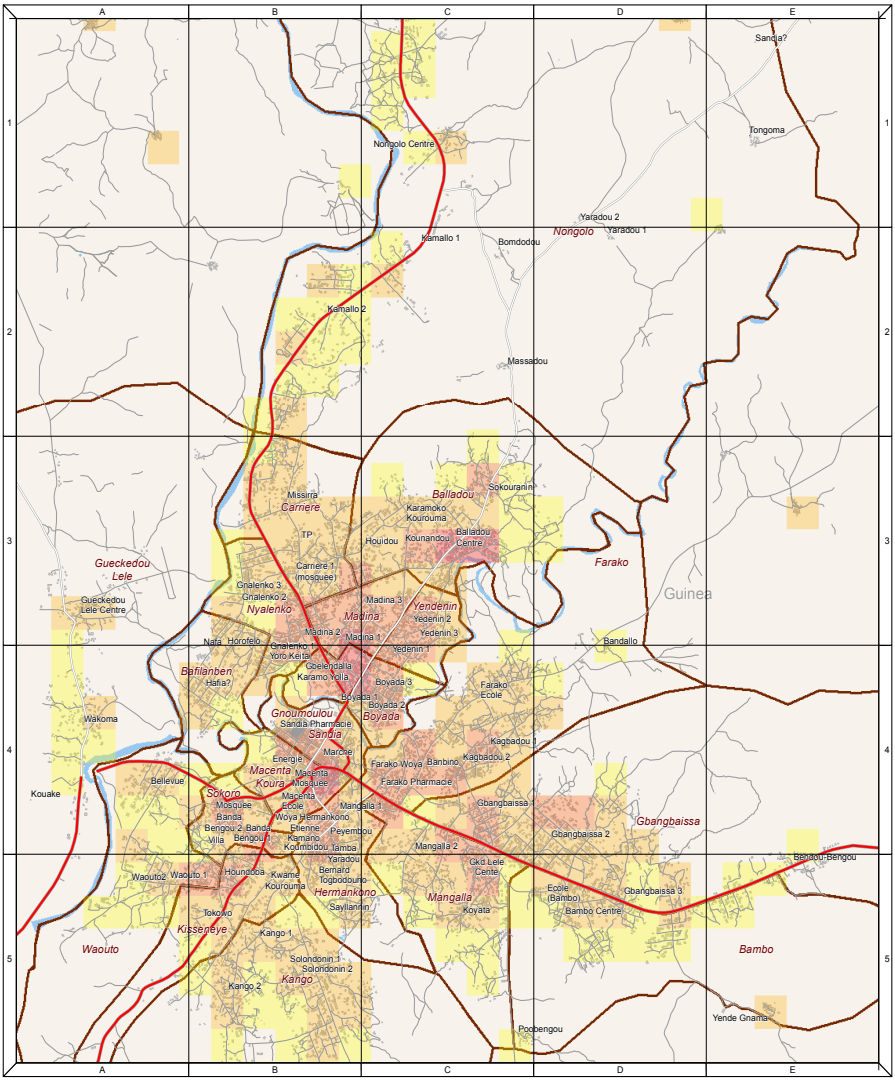
The most useful product in that respect was the weekly snapshot of new and total Ebola cases (see 2.2 Epidemiology). Both field-based and headquarters-based staff remarked that having these maps helped them understand the situation better and headquarters in particular appreciated that it provided them with a quick overview.

2.4 POPULATION COUNT & MOVEMENTS

Unlike in closed settings, the movements of individuals were too unpredictable to be mapped. This meant that geographic information could not be used to try to forecast the spread of the disease. This means that GIS was only an analytical, reactive tool rather than a predictive one, as might be the case in other emergencies such as Cholera.

While GIS could not help to predict where new cases might occur, it was useful in identifying areas that should be prioritized for health promotion activities based on population density.

Figure 3: Population density maps like these can help prioritize areas of intervention for health promotion or outreach activities



Légende

Densité (hab/carré)

- 0 - 80
- 80 - 200
- 200 - 500
- 500 - 800
- 800 - 1219

- Route principale
- Route secondaire
- Autre route
- Limite des quartiers
- Batiments
- Rivière

1 carré : 250 x 250m soit 62500 m² soit 0.0625 km²

N

Sources

Borders, Administrative levels : GADM, Diva-gis
Roads : OSM
Places : Geonames
Hydrography : NaturalEarth

Document Name : GIN_Gueckedou_Density
Date : 01/04/2014
Realised by CartONG for MSF-CH
Print dimensions : ISO A3 size

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This map is for information purposes only and has no political significance. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by MSF.

0 1 2 Km

This information also helped assess potential security risks, since teams working in crowded areas can be more vulnerable, particularly where the population is inhospitable.

The population density maps (see Figure 3) were produced based on the field team's knowledge of average family sizes and a count of buildings that had been mapped by the OSM volunteers.

As these maps could be easily produced remotely, they were created by the GIS unit.

Reactive versus predictive use of GIS

Since Ebola is spread from human-to-human and because people in the affected region are highly mobile, GIS could not help to predict where new cases might occur. However, population density maps were able to identify areas that should be prioritized for outreach and health promotion activities. In emergencies where the spread of the epidemic can be more easily modelled – such as Cholera - GIS could also be used to predict where new cases might appear.

2.5 ACTIVITY PLANNING

Interviewees from all technical departments said that the dedicated mapping support provided by the GIS officer helped them perform their tasks more quickly. Even seemingly small things could make a difference; a health promoter, for example, emphasized that having a map on one sheet of paper that showed the exact area where the team was working that day was much easier than having larger maps that were spread over multiple sheets. Being field-based, the GIS officer was able to fulfil simple requests like these on the fly.

Logistics
The logistics department benefited from the GIS officer's activities through a wide range of products. The improved road maps, for example, helped the logisticians know who was working where and allowed them to limit the number of movements and cars to the bare minimum. This was also significant from a security point of view.

In addition, the GIS officer produced the following maps for the logistics department:

- Distance maps
- Map with main intervention points for MSF
- Maps for helicopter landing areas
- Precipitation maps
- A grid system for improved radio communication

It's worth noting here that the logistics team leader was a trained geologist and was, therefore, probably more aware of the capabilities of GIS.

Coordination

The coordinator mainly benefitted from the maps that showed the locations of the different MSF activities. In the strategy meeting, he also took advantage of the village localization in order to plan activities together with the heads of the technical departments. Although the GIS officer is not part of the field coordination mechanism, he was normally present during these meetings in order to supply geographic information when needed.

As discussed, the GIS officer spent a large part of his time creating maps that were of common use to all units, and supported their planning and coordination at some level. Some respondents therefore felt that the GIS officer should not be attached to the epidemiology team, but to logistics or coordination. However, there was no consensus on this, and the coordinator felt strongly that a GIS officer should not be an additional direct report to him and should remain attached to a technical unit, similar to the structure at HQ where GIS is hosted by the technical support to operations unit.

Security

During a security incident, the GIS officer was able to show the location of moving MSF staff on a map. He also created a confidential post-incident map to help with the analysis of the incident. Following the incident, he created a set of dedicated security maps that showed no-go areas, MSF assets and evacuation routes.

Medical

The GIS officer also produced detailed interior maps of the two isolation wards. This was helpful for staff working in the wards as the personal protective equipment made communication difficult.

Building-level maps & stigma

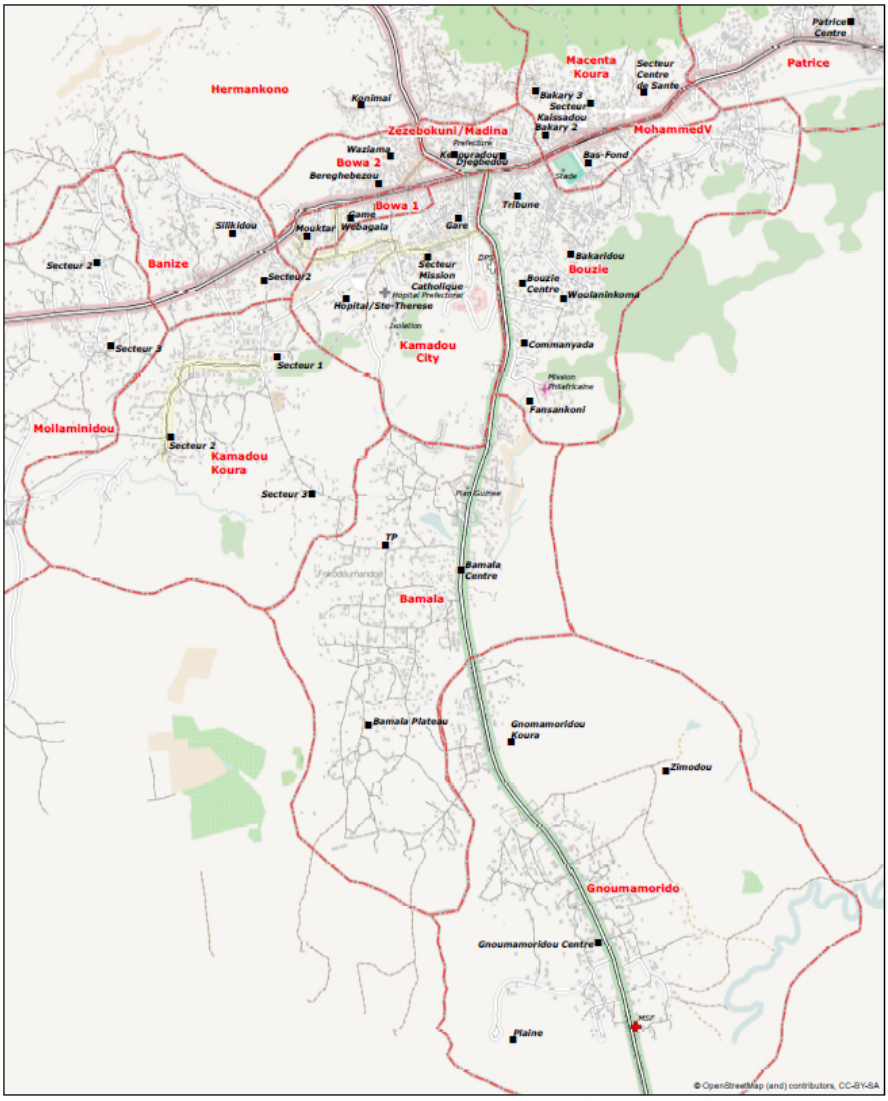
As mentioned previously, the base maps available through the OSM collaboration were available at building-level granularity, at least in the three main cities of the affected area. However, the units did not require this level of detail for their work and interviewees universally said that this was probably the least relevant aspect of the maps for them.

As a test case, the GIS officer produced a set of building-level maps to see whether they could help the water and sanitation teams identify more quickly those homes that needed to be disinfected. On these maps, the houses to be sprayed were clearly marked. However, after considering the amount of stigma that is attached to Ebola, it was deemed too risky to use these maps after this initial trial due to concerns that they might get lost during field trips and end up in unauthorized hands. Instead, the teams continued to rely on GPS points alone, since these are harder for outsiders to interpret.

Notwithstanding these concerns, many respondents mentioned that building-level maps could potentially be very useful both for analysis and activity planning in other scenarios.

Table 3: Page 28 to 31 - Urban street map with landmarks; Isolation ward ; Road Distance map; Helipad

Secteurs et lieux-dits - quartiers et peripherie de Macenta - Sud



N
metres
0 200 400

Document Name: SecteursMacentaCentre_A3L
Date: 03/04/2014
Produced by GIS Field Officer / CartONG for MSF-CH
Print dimensions: ISO A4 size

Sources:
Places : MSF-CH
Roads, Natural : OSM
Zoning: MSF-CH, DPS Macenta

Legende

Reperes
- DPS
- Hopital Prefectoral
- MSF
- Isolation
- Autres labels

Secteurs et lieux-dits
- Secteurs

Routes
- Main road
- Secondary road
- Other road / track
- Building

Les quartiers delimites sur cette carte correspondent aux quartiers operationnels MSF 2014. Ils different des zonages administratifs usuels.

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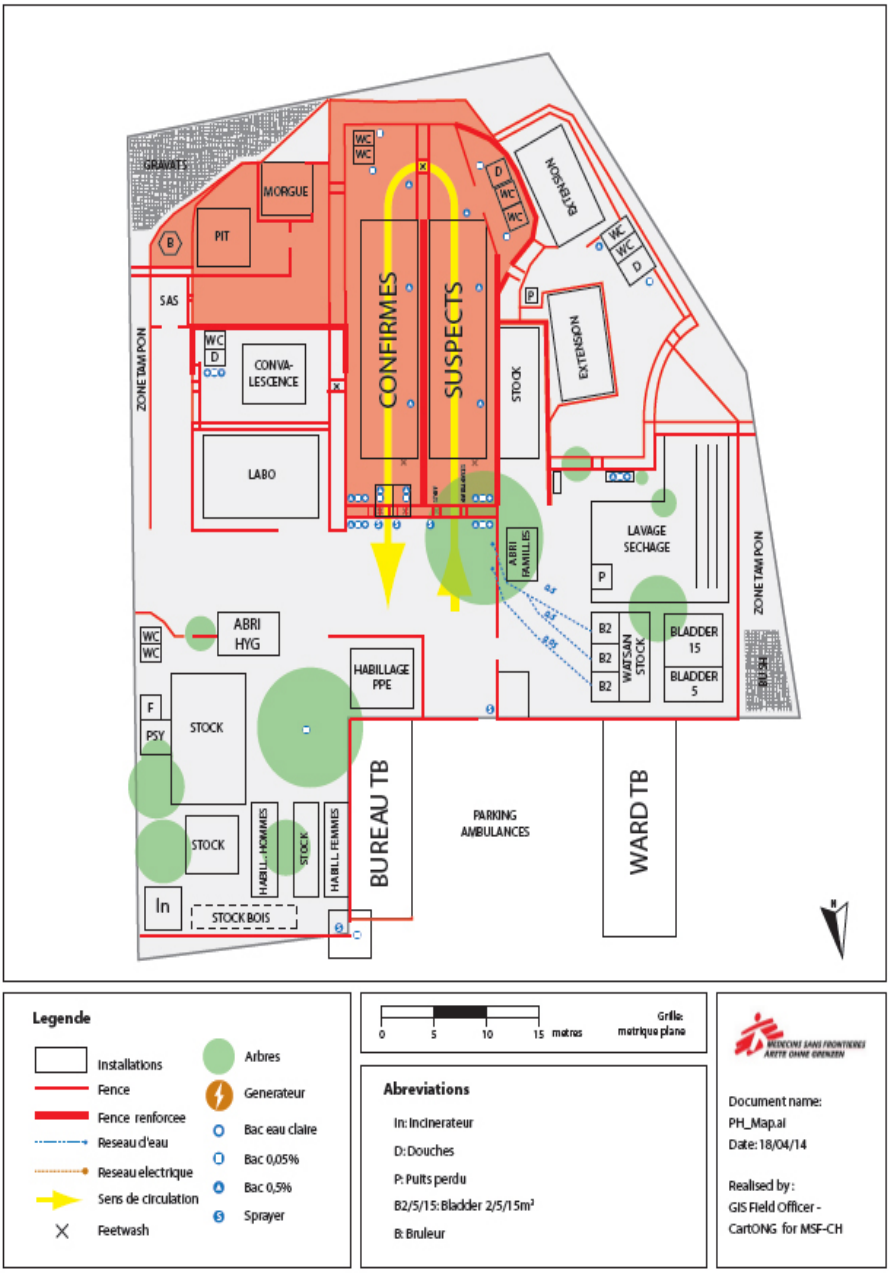
Site d'isolation MSF pour epidemie Ebola

Gueckedou, Guinee, Mars 2014



Legende

- Installations
- Fence
- Fence renforcee
- Reseau d'eau
- Reseau electrique
- Sens de circulation
- Feetwash
- Arbres
- Generateur
- Bac eau claire
- Bac 0,05%
- Bac 0,5%
- Sprayer

0 5 10 15 metres

Grille metrique plane

Abreviations

In: Incinerateur
D: Douches
P: Puits perdu
B2/5/15: Bladder 2/5/15m²
B: Bruleur

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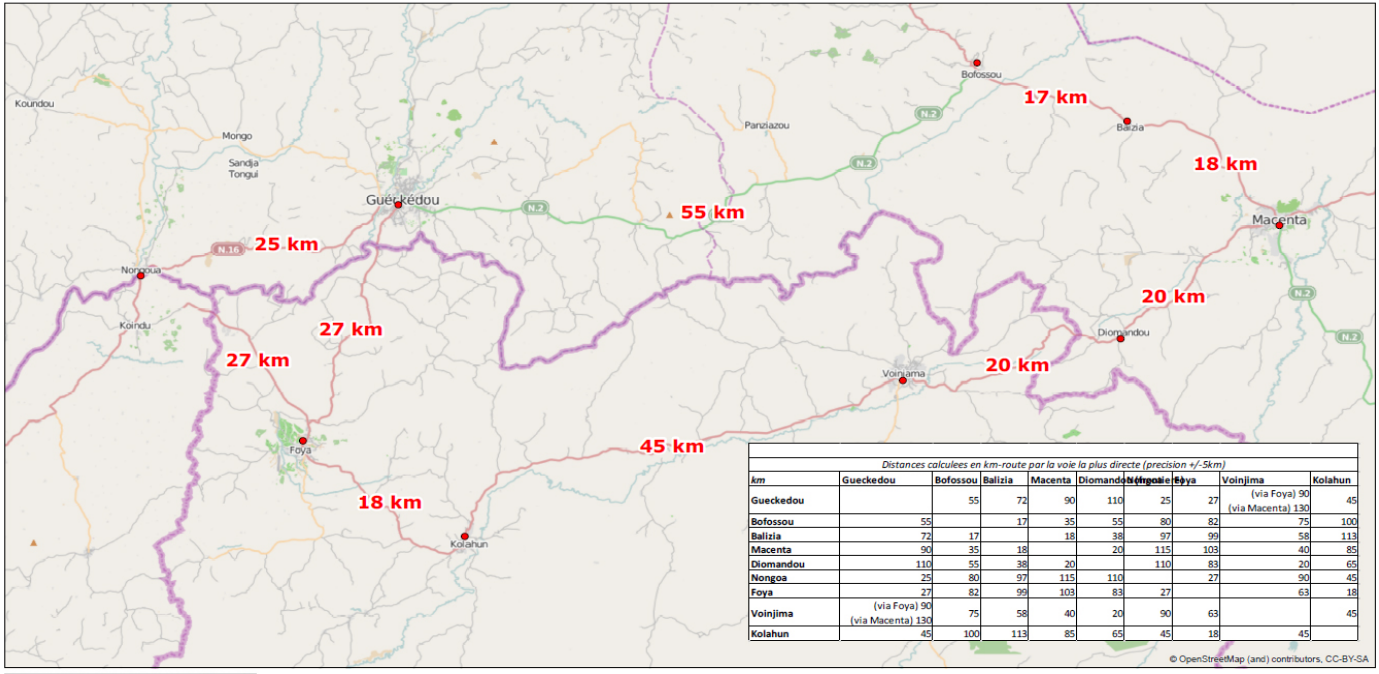
Document name:
PH_Map.ai
Date: 18/04/14

Realised by :
GIS Field Officer -
CartONG for MSF-CH

Voies d'acces a Foya (Liberia) depuis Gueckedou (Guinee)



Distances calculees en km-route par la voie la plus directe (precision +/-5km)

km	Gueckedou	Bofossou	Balizia	Macenta	Diomandou	Nongoa	Foya	Voinjima	Kolahun
Gueckedou		55	72	90	110	25	27	(via Foya) 90 (via Macenta) 130	45
Bofossou	55		17	35	55	80	82	75	100
Balizia	72	17		18	38	97	99	58	113
Macenta	90	35	18		20	115	103	40	85
Diomandou	110	55	38	20		110	83	20	65
Nongoa	25	80	97	115	110		27	90	45
Foya	27	82	99	103	83	27		63	18
Voinjima	(via Foya) 90 (via Macenta) 130	75	58	40	20	90	63		45
Kolahun	45	100	113	85	65	45	18	45	

Sources:

Frontieres, Administratif: GDAM
Routes, Bati, Naturel: HOT-OSM
Autres donnees: MSF-CH

Document: 140411_Acces_Foya
Date: 11/04/2014
Realise par GIS Field Officer / CartONG pour MSF-CH
Impression: ISO A3

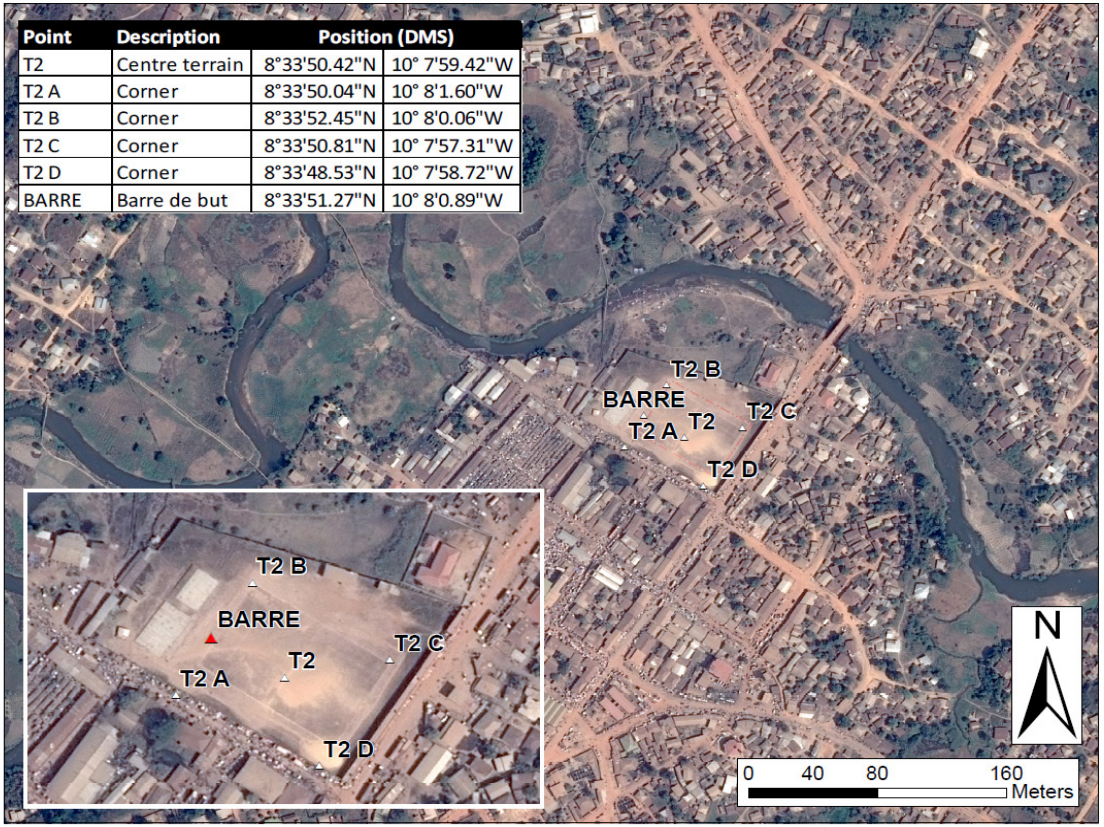
Legende

0 10 20 km

N

Terrain n.2 - Stade de Sandia (DMS: 8°33'50.42"N ; 10° 7'59.42"W)

Point	Description	Position (DMS)	
T2	Centre terrain	8°33'50.42"N	10° 7'59.42"W
T2 A	Corner	8°33'50.04"N	10° 8'1.60"W
T2 B	Corner	8°33'52.45"N	10° 8'0.06"W
T2 C	Corner	8°33'50.81"N	10° 7'57.31"W
T2 D	Corner	8°33'48.53"N	10° 7'58.72"W
BARRE	Barre de but	8°33'51.27"N	10° 8'0.89"W



Legende

Terrain d'aterrissage

△ Points de reperage

Sources:

Coordonnees: Geographique WGS84 (EPGS4326)
Date imagerie: 2014-02-05 11:25:27

Source imagerie: © ASTRIUM 2014
Autres donnees: MSF-CH

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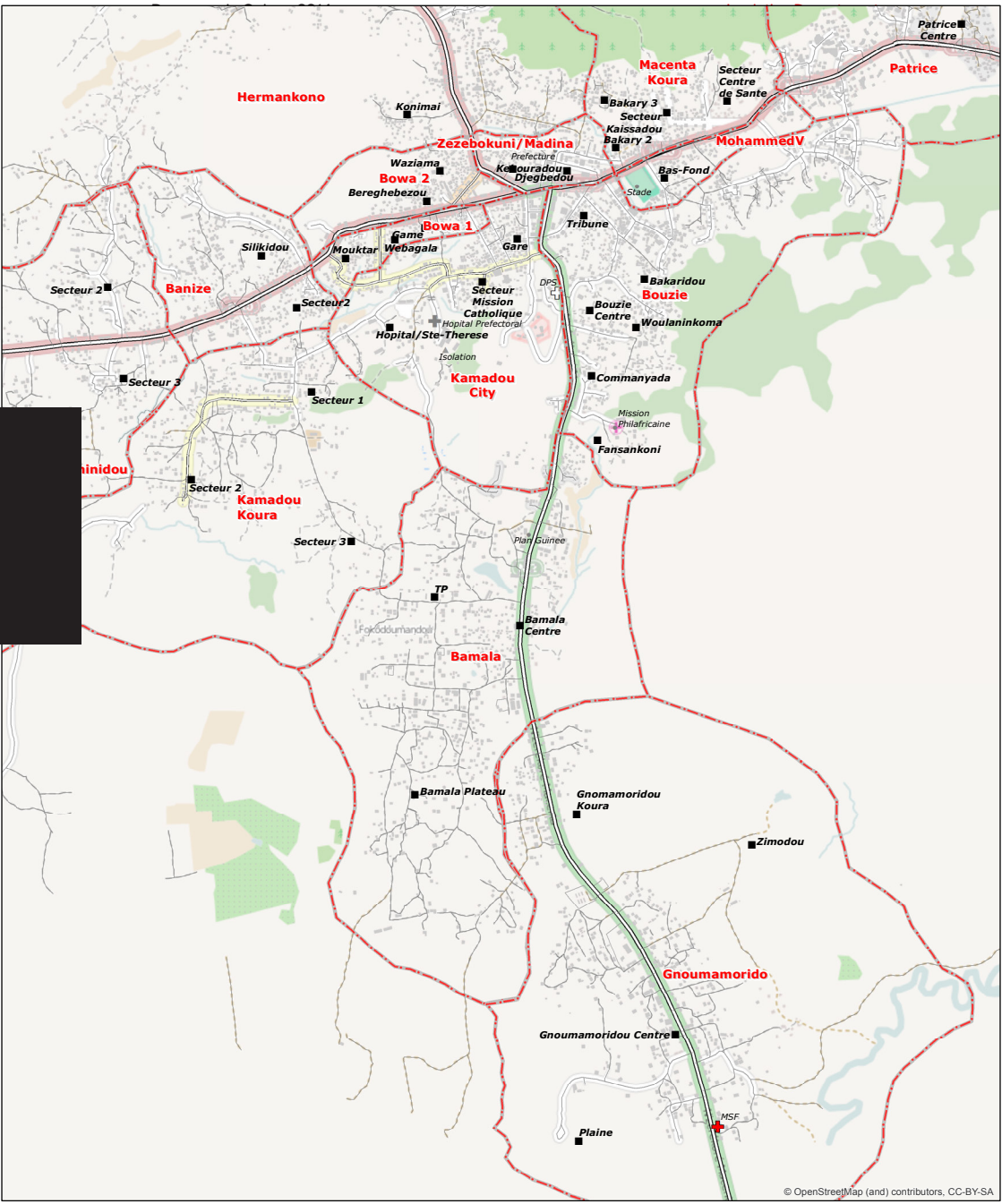
Realise par GIS Field Officer / CartONG pour MSF-CH
Impression: ISO A4

MEDECINS SANS FRONTIERES
ARZTE OHNE GRENZEN

Secteurs et lieux-dits - quartiers et peripherie de Macenta - Sud



MEDECINS SANS FRONTIERES
ARZTE OHNE GRENZEN

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Nom de document: SecteursMacentaCentre_A3L
Date: 03/04/2014
Produit par GIS Field Officer / CartONG pour MSF-CH
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Sources:
Toponymie: MSF-CH, OSM
Routes, Naturel, Bati: OSM
Zonages: MSF-CH, DPS Macenta

Legende

Reperes
- DPS
- Hopital Prefectoral
- MSF
- Isolation
- Autres labels

Secteurs et lieux-dits
- Secteurs

Routes
- Route principale
- Route secondaire
- 30 Autre route / Piste

Batiments
- Batiments

Les quartiers delimites sur cette carte correspondent aux quartiers operationnels MSF 2014. Ils different des zonages administratifs usuels.

Cette carte est a usage informatif uniquement. Les limites et noms employes n'impliquent pas une reconnaissance officielle de la part de MSF. Information spatiale presentee sous toute reserve de disponibilite et de fiabilite.

3. STRATEGIC OBJECTIVES

The decision to deploy a dedicated GIS officer was based on the newly developed GIS Strategy for MSF-CH, which defines four organisation-wide strategic objectives.

Promote the use of maps and other GIS products in the organisation.
Prior to this mission, most respondents did not know how a field-based GIS officer could effectively support them in the context of an evolving emergency response, in particular during the outbreak of an epidemic. While all interviewees were aware of the importance of maps in general, they did not realize how quickly a field based GIS officer could produce detailed, customized and topical maps that directly supported their work. It is recommended that MSF-CH does more to educate staff about the range of GIS products and the type of support that the GIS unit and field-based GIS officers can provide. However, it was also clear that most respondents felt that seeing GIS in action in the field was what convinced them and that a presentation at headquarters would have had far less impact.

All field based MSF-staff emphasized that in addition to his technical skills, it was also the GIS officer's personal communication skills and attitude that helped promote the use of GIS in the team.

Consolidate existing GIS capacity in MSF.
The GIS unit provided support to the field-based GIS officer for tasks that could be done remotely. This included support to produce maps for precipitation, ethnicity and population density. Since the GIS officer's mission has ended, the GIS unit has produced the weekly snapshot of new cases remotely.

Ensure good capacity to share information within MSF-CH and potentially across the organisation.
According to all interviewees, map sharing worked very well in the field office. MSF staff at headquarters also felt that they received the maps they needed for their work. At the same time, respondents mentioned that there was very little awareness of the maps in Conakry and that they only found out about these maps when visiting Guéckédou. One of the reasons for this might be that the current system for sharing maps is through an FTP server that is not user-friendly and via e-mail.

A new, web-based 'Map Centre' was launched in July 2014[6] . One interviewee suggested that this map centre should have multiple layers of access. That way maps that do not contain sensitive information could be shared more easily with other stakeholders, while sensitive data could remain internal and be protected by an additional password or some

Ensure participation and capacity-building within the organisation
In the beginning, the GIS officer had to proactively identify areas where he could add the most value. This was largely based on conversations he had with other MSF staff in the field, as well as on his own knowledge. This meant that those units that were sharing more details about their work were more likely to benefit from his support.

As staff became more familiar with GIS, they started to request specific products more often. By the end of the mission, the GIS officer had received 16 requests for specific maps, some of which consisted of multiple maps. Most requests came from the logistics department that includes the WHS sector.

The GIS officer trained four local staff on GPS and provided international staff with a basic introduction on request. To further build capacity that remains in-country, the epidemiology research assistant was trained in basic GIS tools. At the end of the mission, all GIS materials were handed over to staff from the MSF-CH malaria project that has been active in Guéckédou since 2010. The GIS unit continues to support the Guéckédou field team remotely.

[6]mapcentre.msf.org

4. CONCLUSION & DISCUSSION

- All interviewees emphasized that the GIS officer was able to add significant value to the operation.

- Beyond the general notion that maps are useful, there is very little awareness of what a GIS officer can do and how quickly new and topical maps can be produced. This lack of knowledge leads to the assumption that map production is complicated and most staff would never think of requesting custom maps. Seeing the GIS officer in the field changed this perception. Many interviewees commented that they were “amazed by the speed” with which the maps were produced.

- Considering that most MSF staff did not know how the GIS officer could support them, it was essential for him to be a self-starter. Until the point where GIS is widely known within the organisation, GIS field staff should be partly selected based on this attribute.

- The base maps and the localization of villages were universally seen as the most useful outputs.

- The fact that the GIS officer spent the majority of his time working with the coordination and logistics teams raises the question whether the GIS officer should be part of the epidemiology team or not. Respondents had different opinions on the matter. However, the coordinator felt strongly that the GIS officer should be with a technical department and should not be an additional direct report.

- Interviewees had different perceptions on whether the GIS officer was accepted as part of the team from the beginning of the response, or whether he was initially considered to be an external service provider. What is clear is that the GIS officer managed to overcome these reservations during his mission. Clearer communication explaining that GIS unit staff are part of MSF-CH would be helpful.

- One respondent identified knowledge management as one of the challenges to making GIS products sustainable. While useful tools exist on the intranet, most staff don’t know about them. However, this is an overall organisational challenge rather than one that is specifically related to the GIS unit.

5. RECOMMENDATIONS

General

- Headquarters should deploy dedicated GIS staff to the field more often in contexts where direct contact with field operations adds real value, and where close and timely monitoring of the spread of an epidemic is essential. Since GIS is still relatively little understood, it is unlikely that field staff will request a GIS officer. This process, therefore, needs be driven by headquarters.

- Despite the fact that MSF had been operational in the affected region for years, base maps of acceptable quality did not exist. Given the usefulness of these maps, MSF should identify current areas of operation where the organisation expects to continue to work and try to produce base maps for these areas. A substantial part of this work can be done remotely by the GIS unit, through the new online Map Centre.

- Physical proximity increases information exchange, formal and informal communication, and teamwork. Where possible, GIS officers should share the space with the unit that needs their services most. This can also mean that GIS officers rotate depending on where GIS can add the most value, depending on the phase of the operation. This is independent of the question of line management.

- In an area with poor maps, good maps are valuable to all stakeholders. Where possible, teams should take printed copies of base maps to meetings with local government officials and other NGOs. This can help build relations, at least in non-conflict areas. In conflict areas, the goodwill that can be generated by sharing maps has to be weighed against the risk that GIS technology could be mistaken as spying.

Human resources

- People skills and a self-starter mentality are at least as important for the acceptance of this new role as the technical skills. Until GIS is better understood, GIS officers need to be advocates as much as service providers. Recruitment should take this into account.

Organisational

- The GIS units should increase awareness of its services during training for field staff, either prior to deployment or when field staff come to headquarters for training and discussions.

- There are indications that the dual identity of the GSI unit – part of MSF-CH but also an external NGO – caused some confusion. The unit's role and internal branding need to be better communicated. Among other things, the GIS unit should use an MSF e-mail address, not those of CartONG. This would also help other MSF staff find the GIS unit in the internal e-mail address book. GIS unit staff should be given guidance on how to present the GIS unit internally and externally.

- MSF should continue to take advantage of crowdsourcing for the creation of base maps. To facilitate this process, the GIS unit, on behalf of MSF-CH, should engage in a dialogue with the Humanitarian OpenStreetMap team to better define the expectations from both sides. Issues to cover include the availability of GIS unit staff to answer questions and provide feedback, public communication and a how to formally end the cooperation once the request has been fulfilled (deactivation). Any discussions should involve at least the GIS unit and the public information team.

Infrastructure

- While internet access is not essential for all aspects of the work of the GIS officer, many maps can only be produced with sufficient bandwidth. Lack of a good connection also means that remote support becomes difficult or even impossible.

- The GIS officer should download all available map data for the area or operation before deploying as the internet connection might be too slow - or very expensive to use - for large file transfers.

- GIS officers should deploy with a dedicated A3 colour printer (as a minimum size) as well as ink cartridges. While A2 is better for some maps, A3 delivers the best compromise between performance and weight. Before deploying, the GIS unit should evaluate whether A2 and A1 maps can be produced elsewhere in the country.

Headquarters	
Base maps at different resolutions for Guinea, Guéckédou, Kindia and adjacent areas in Liberia and Sierra Leone	Guinea: Transport axis
Guinea: Land use map	Guinea Forestière: Presence of caves
Orientation maps	
Base maps for Guéckédou, as well as the border areas	Various road maps for area of operation
Administrative maps at prefecture level	
Terrain maps: Guéckédou and Macenta	
Urban street maps, including buildings, for different parts of the cities as well as for the cities as a whole	Population density based on building count and different household sizes
Maps showing the different axis of intervention, including roads	Distribution of ethnicities
Location of community health workers	Satellite views
Epidemiology	
New and total number of cases (weekly)	Location of deaths in February and March
New and updated hotspots	Map of palm tree density in Melliandou
Logistics and security	
Road distance maps	Security maps
Post-incident mapping of security incident	Helicopter landing areas
Plans	
Indoor plans of the isolation wards in Guéckédou and Macenta	
Other	
Maps with new villages to identify	Various base maps of Conakry

6. ANNEX

6.1 OVERVIEW OF GIS PRODUCTS

The GIS officer, supported by the GIS unit, produced 109 maps during the eight weeks he was deployed to Guinea. Most maps can be found in the new Map Centre: **mapcentre.msf.org**

(**See table page 40**)

6.2 LIST OF INTERVIEWEES

Name	Function
Audeoud, Jean-Guy	GIS Officer, MSF-CH's GIS Unit
Annaud, Louise	Communications Officer, MSF-CH
Decroo, Tom	Program Officer, Luxembourg Operational Research Unit
Dr Van Herp, Michel	Epidemiologist, MSF-B
Lachat, Sarah	Communications Manager, MSF-CH
Laborderie, Sylvie	GIS Officer, MSF-CH's GIS Unit
Lugli, Mariano	Deputy Director of Operations, MSF-CH
Piguet, Pascal	Logistics Team Leader, MSF-CH
Soupart, Mathieu	GIS focal point, Logistics Director, MSF-CH
Dr Sterk, Esther	Tropical Medicine Referent, HQ's Emergency Medical Coordinator during 1st phase of the outbreak, MSF-CH
Tiffany, Amanda	Epidemiologist, Epicentre for MSF-CH

6.3 TERMS OF REFERENCE

Time frame:
May 20 – June 30 2014 (15 days of work)

Case Study to document the GIS support provided to the MSF emergency response operation to the Ebola crisis of March 2014 in Guinea (CONSULTANT)

A. Context

In March 2014, cases of haemorrhagic fever were observed around the Gueckedou region in Guinea. Fearing the, later confirmed, possibility of an Ebola outbreak, MSF quickly deployed international staff to respond to the possible emergency. During the first days of the response, before confirmation that the disease was actually Ebola, it was decided that a GIS officer would be deployed to support the medical team and work closely together with the epidemiologist. This was the first time that MSF-CH deployed a GIS expert to the field.

The region most affected in Guinea had not been mapped previously. Also, MSF-CH only started developing its GIS capacity less than a year ago: the use of tailored maps is still new for the NGO. This means everything had to be done from scratch during this emergency, from mapping the region to putting into place procedures and learning to work with MSF's already existing procedures and building confidence over medical data being used by non-medical staff.

Because MSF wants and needs to learn from this first GIS Emergency Deployment, this first deployment is to be turned into a case study reviewing the GIS response, how it was perceived/received by MSF and in which context it should be repeated in the future.

B. Time Frame

The Consultant shall perform the services for a period of 15 days over the period commencing day 20th May 2014 to 30th June 2014.

C. Outputs and activities

In coordination with CartONG project manager for MSF and MSF focal point, the case study writer will achieve the following activities:

Activity 1: Interview a list of persons that were directly or indirectly involved in the GIS response in Guinea, mainly MSF workers, CartONG's GIS staff deployed to Guinea, CartONG technical staff from HQ and one member of OSM-Fr/HOT. The names and contact details of these persons will be provided by CartONG.

Activity 2: Write a case study on the GIS response. The case study will need to take into account the various aspects of this deployment, but from a decision maker point of view instead of a technical point of view. The purpose of the document is to help the decision maker understand the pros and cons of having a field-based GIS officer and when the organization should consider deploying one in an emergency setting based on the Guinea experience. Also, the usefulness of the products compiled and the capacity building conducted should be examined.

Report length should be around 1 page executive summary + report (5-15) + annexes (as needed). **Report must follow MSF structure** which will be provided to the consultant.
Formatting/Layout will be taken care of by MSF; the output format needs to differentiate different level of titles. All visual materials that need to be included should be provided to MSF in high resolution.

D. Qualifications and professional experience

REQUIRED

Academic: University degree, preferably in social sciences related with communication or advocacy.

Experience:
- At least ten year's relevant experience in different international organizations (e.g. UN agencies, INGOs, IOs, Donors, IFRC or ICRC).
- Excellent communication, coordination, and information management skills
- Extensive knowledge of current humanitarian issues with a particular focus on conflict-related emergencies.
- Expertise in planning, formulation, implementation, monitoring and reporting on humanitarian operations

Core Competencies:
- Communication and coordination
- Planning and organization
- Judgment and decision making
- Analytical thinking
- Innovation and creativity
- Political awareness

Languages: Good knowledge of English is essential. Some knowledge of French is a requirement.

DESIRABLE

- Experience working in public relations, reporting or journalism.
- Knowledge of layout, design and presentation software

In March 2014, MSF deployed a dedicated Geographic Information Systems (GIS) officer to Guinea in response to the Ebola outbreak. In support of the epidemiological team, the GIS officer was charged with producing general overview maps, as well as topical maps that supported different aspects of the operation.

This case study aims to elaborate whether the GIS officer's mission to Guinea has succeeded in supporting the emergency response and furthering the strategic goals defined in the Strategic Paper "Development of the GIS in MSF-CH".

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