

Missing Maps and GIS support to MSF measles vaccination coverage survey in Am Timan health district, Chad

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What is Missing Maps?

Missing Maps is an open, collaborative project that maps on OpenStreetMap parts of the world that are vulnerable to natural disasters, conflicts, and disease epidemics. Missing Maps was founded in November 2014 by the American Red Cross, British Red Cross, Humanitarian OpenStreetMap Team, and Médecins Sans Frontières. Over 86,000 volunteers have contributed to the project.

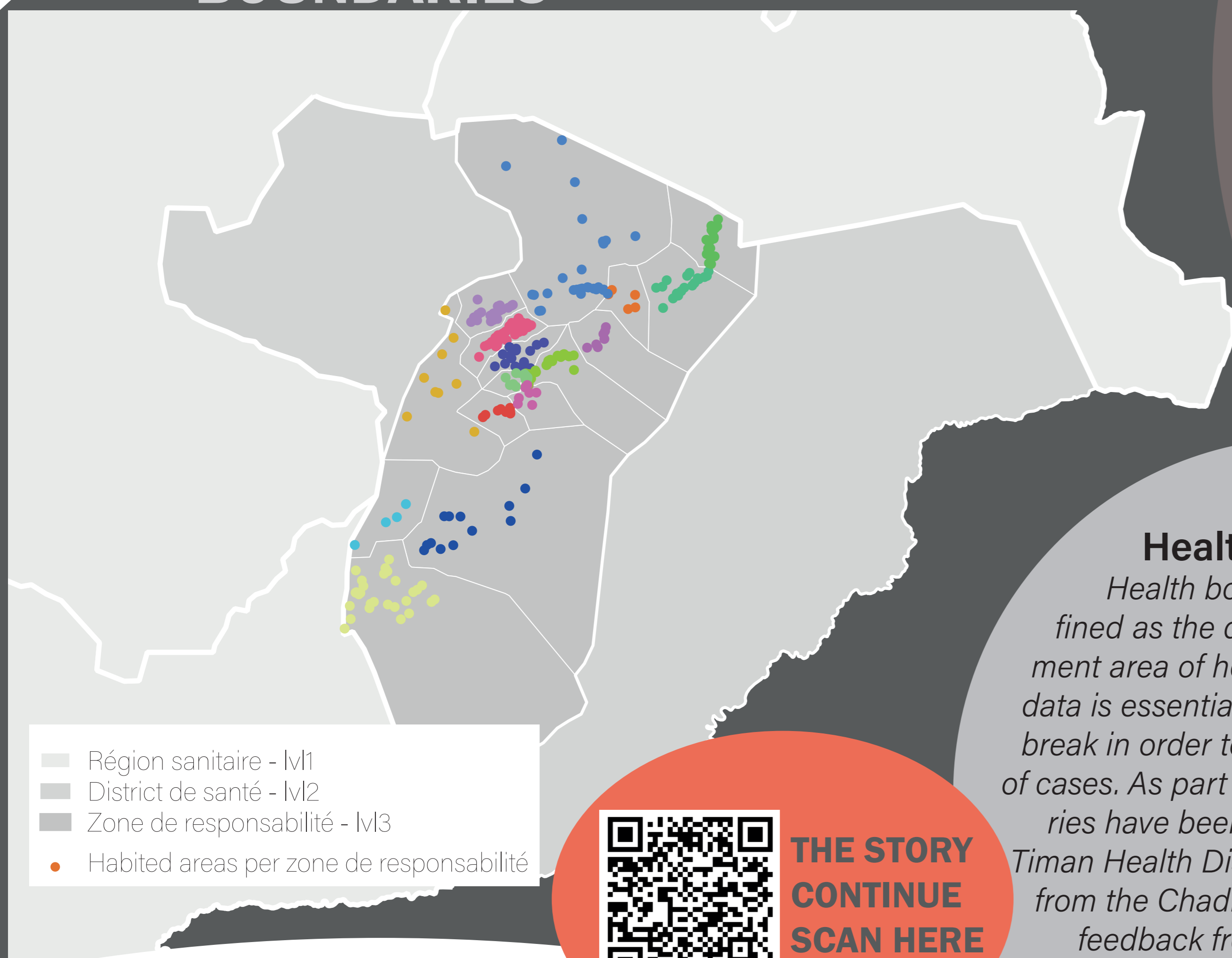
Methodology and results

OpenStreetMap data was of main importance for the measles vaccination coverage survey, after the initial vaccination campaign was conducted. The next workflow was used:

1. A first area of interest was determined by using the existing health district boundary in the database of the MSF GIS unit, and by using GPS points of villages and health facilities collected on the ground.
2. With help of MapSwipe, more than 700 volunteers detected all inhabited areas within this area of interest.
3. By combining the output of MapSwipe and high-resolution population density data created by Facebook – tasks on the HOT tasking manager (<https://tasks.hotosm.org>) were set up to map all residential areas on OpenStreetMap.
4. After this, the OpenStreetMap data was downloaded through the QuickOSM plugin into QGIS, where it was combined again with the GPS points from the field. Thanks to this data and feedback from the MSF teams and Chadian Ministry of Health, accurate health boundaries were created.
5. Within the Am Timan City, survey points were randomly selected within the mapped residential areas with help of Qgis. A sampled population proportionate to size by village method as been used in the countryside
6. The sampled points were saved as a GPX files and added into the smartphone app OsmAnd.
7. With help of OsmAnd the teams were now able to travel to every sampled point, and to survey the closest household to this point.

With help of this workflow MSF teams were able to conduct the survey and estimated a measles vaccination coverage of 91.1% for the Am Timan health district, and 81.9% for Am Timan town. Within MSF, the standard target for measles vaccination is 95% of eligible children, though the World Health Organization (WHO) deems 90-95% coverage acceptable. Am Timan district is near or in this target range, Am Timan town is slightly below. MSF keeps closely monitoring the situation.

AM TIMAN HEALTH DISTRICT BOUNDARIES



THE STORY CONTINUE SCAN HERE

Health boundaries
Health boundaries can be defined as the delimitation of the catchment area of health facilities. This kind of data is essential for the analysis of an outbreak in order to report spatial distribution of cases. As part of this work, health boundaries have been mapped out for the Am Timan Health District. Thanks to information from the Chadian Ministry of Health and feedback from the MSF field team each village was designated to the right health area.

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Background

The persisting very low measles vaccination coverage in Chad exposes children, especially among under 5 years, to several related medical complication and deaths. Since May 2018, an increase in measles cases with weekly more than 50 cases countrywide was reported throughout Chad. In January 2019 an alert of an increase in measles cases was reported, most of them were registered in Salamat province and particularly in the Am Timan health district. Routine vaccination needs to be reinforced to reach full immunization of all children and avoid epidemics in future. Based on the latest data shared by health authorities, only one in four children under 5 is fully immunized in Chad and an estimated 37% have been vaccinated against measles. To achieve herd immunity, 95% coverage is needed. To try to help control the spread of the disease, the MSF Chad Emergency Response Unit (CERU) spent four weeks vaccinating 107.000 children between 6 months and 9 years against measles. Thousands of mothers and fathers brought their children, sometime for several kilometres away, to the vaccination sites or Am Timan hospital where the emergency team is also supporting with case management.

MSF in Chad

MSF has been working in Chad for 37 years. Its Chad Emergency Response Unit (CERU) provides rapid medical responses to epidemic emergencies, providing free quality treatment and carrying out emergency vaccination campaigns. MSF also runs medical activities in Moissala, in Chad's Mandoul region.

What is MapSwipe?

MapSwipe is a mobile app that allows volunteers to classify (in)habited areas from satellite imagery without special mapping skills – only a smartphone is needed. The data that is created supports the detailed mapping in OpenStreetMap. Since 2016, MapSwipe has been used by almost 30,000 volunteers covering an area of approximately 650,000 square kilometres.

"We are currently vaccinating 100,000+ children in Am Timan and environs. We will use the maps of the Am Timan health district to sample village clusters for measuring our vaccination coverage afterwards. If it turns out we missed children we can do catch-up vaccination rounds. So, this map is extremely important to us."

MSF Head of Mission in Chad
Martin Braaksma

AM TIMAN AND ENVIRONS OpenStreetMap



"Navigating to geosampled points on the map was easy in the city, but outside the city was more difficult. There were a few hand-drawn maps, but they were not used by the drivers, they prefer to navigate by names of villages and points of interest."

MSF Epidemiologist
Kate Doyle

