

# Open Geographic Data (OSM) for HIV/AIDS control in Côte d'Ivoire

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## Abstract

Efforts to address HIV/AIDS in Cote d'Ivoire have been limited by an inability to precisely identify who, what, and where these efforts must be targeted. How can we build on the data collected to support a strategy to combat HIV/AIDS? How can we address the lack of knowledge about the use of geospatial data?

With OpenStreetMap data collection tools (OSM tracker, OSMand, JOSM, id, Hot tasking manager) and OSM's mapping initiative, Development Gateway (DG), AidData and DCDJ collected over 28,000 points of interest across eight focus locations in Côte d'Ivoire (2 plateaux Sococé, Abobo behind the train tracks, Yopougon, Marcory Koumassi, Soubéré, San-Pedro, Daloa, Bouaké) between July 2018 and May 2019, including more than 710 health facilities, 730 schools and 9,300 disease transmission hotspots. With the active support and engagement of DIIS, USAID and local mapping groups, we have engaged over 110 local mappers to collect critical location data and raise public awareness of the HIV/AIDS epidemic

## Introduction

In health care, there is a great deal of data being collected. These data have a geographic component that can assist in health care access and utilization. Geographic information systems (GIS) can use geographic data to produce analyses to better locate services and ensure that they reach populations in need.

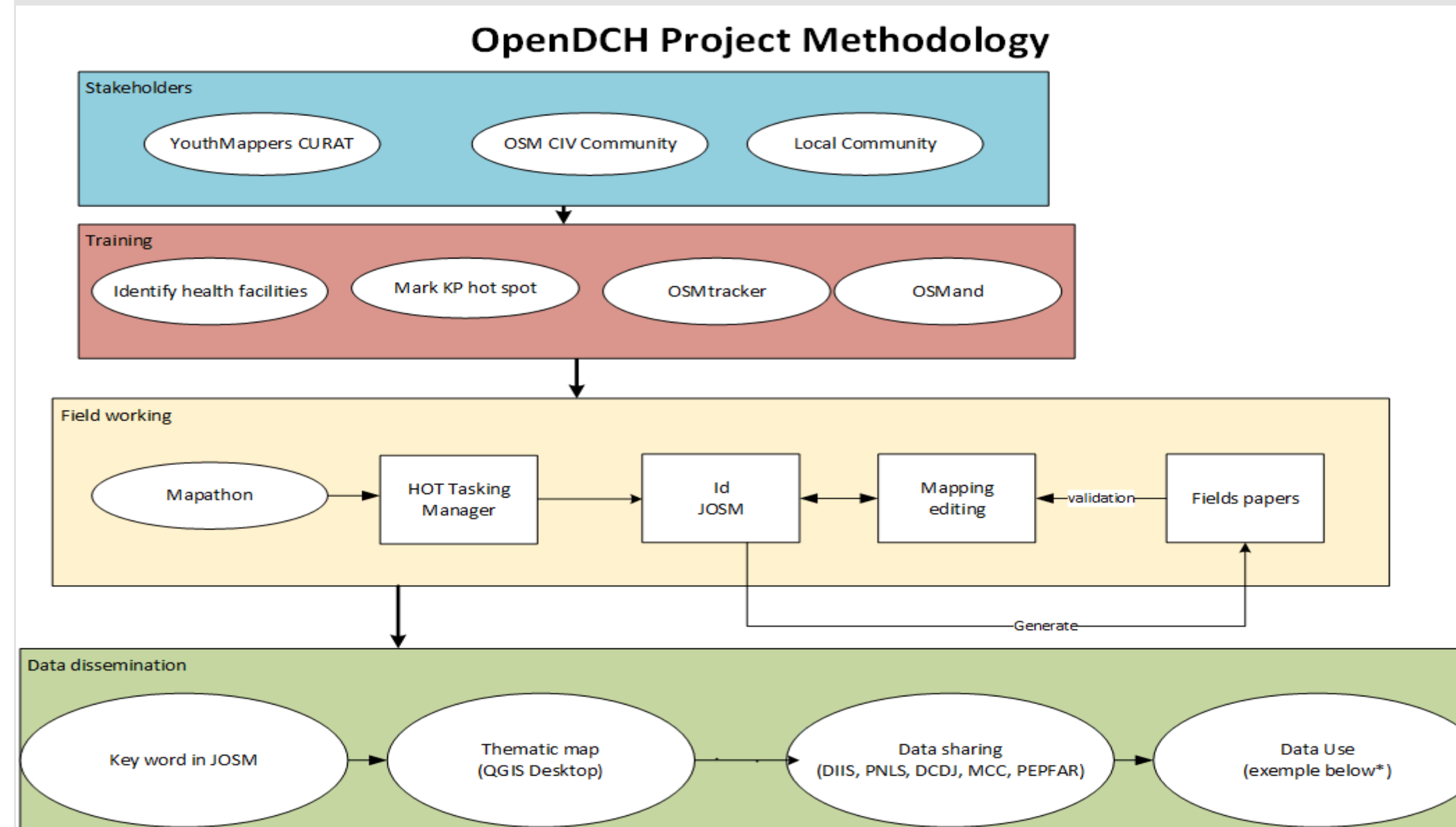
The Open Geospatial Data Center for Health (OpenDCH) project, supported by PEPFAR, aims to advance the analysis of the location of the most affected communities and to address gaps in HIV testing and treatment. It will be used to improve understanding of HIV program coverage at the community level, which will lead to improved adherence, retention and targeting of services. The OpenDCH system will use the OpenStreetMap (OSM) layers to take a more detailed approach to identify high-risk areas, verify that HIV/AIDS services are correctly placed and improve accessibility to health services.

Development Gateway (DG) and AidData have developed a strategy to map high-risk areas based on research by the Ministry of Health of Côte d'Ivoire and USAID-Côte d'Ivoire. The seven places of interest include the cities of Soubéré, San Pedro and Bouaké, and four sections of Abidjan: Koumassi, Cocody II Plateaux, Abobo and Yopougon. The objective is to collect GPS points of health facilities, centres of interest of socio-demographic data that can influence the prevalence of HIV/AIDS. What is the contribution of the Volunteered geographic information and OpenStreetMap tools to the achievement of these objectives?

## Methodology

Volunteered geographic information (VGI) is where citizens, often untrained, and regardless of their expertise and background create geographic information on dedicated web platforms (Goodchild 2007), e.g., OpenStreetMap (OSM).

With the ubiquity of advanced web technologies and location sensing hand held devices, citizens regardless of their knowledge or expertise, are able to produce spatial information. This phenomenon is known as volunteered geographic information (VGI).we had used this approach to support data collection in health care through this methodology below (Hansi Senaratne, 2017)



- OSM Côte d'Ivoire, Youth Mappers Curat, Community health worker was trained about purposes of the OpenDCH project, OSM tools on smartphones, Health facilities Ivorian tags, KPs hot spots.
- In field working The first step was to host a series of participatory mapathons, where volunteers could identify and confirm infrastructure – like buildings and roads – on map sections across the focus cities and neighborhoods.
- The next step was to prepare local data collectors to take to the streets themselves. We supported a group of experienced mappers to administer groups of 10-25 door-to-door data collectors. These individuals would identify the functions of the mapped points from the mapathons – are they health facilities, restaurants, workplaces, or otherwise? – using mobile technologies and paper maps.
- Finally, after on-the-ground data collection, we conducted data validation to ensure that our inputs were of consistent quality. In the end, this multi-step process helped us map three cities and four sections of Abidjan.



health centers (green points), education facilities (yellow points), and potential transmission hotspots (red points).

## Results

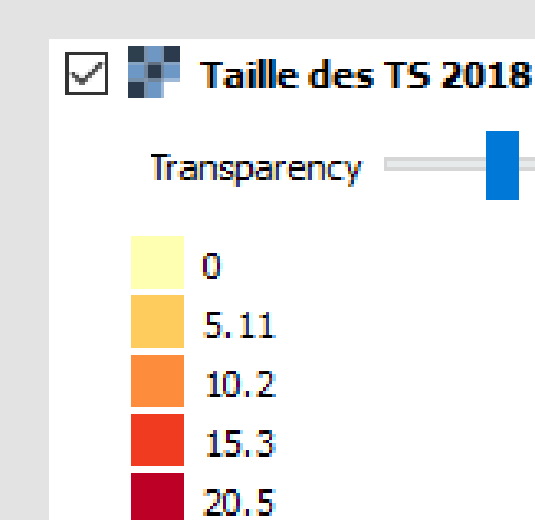
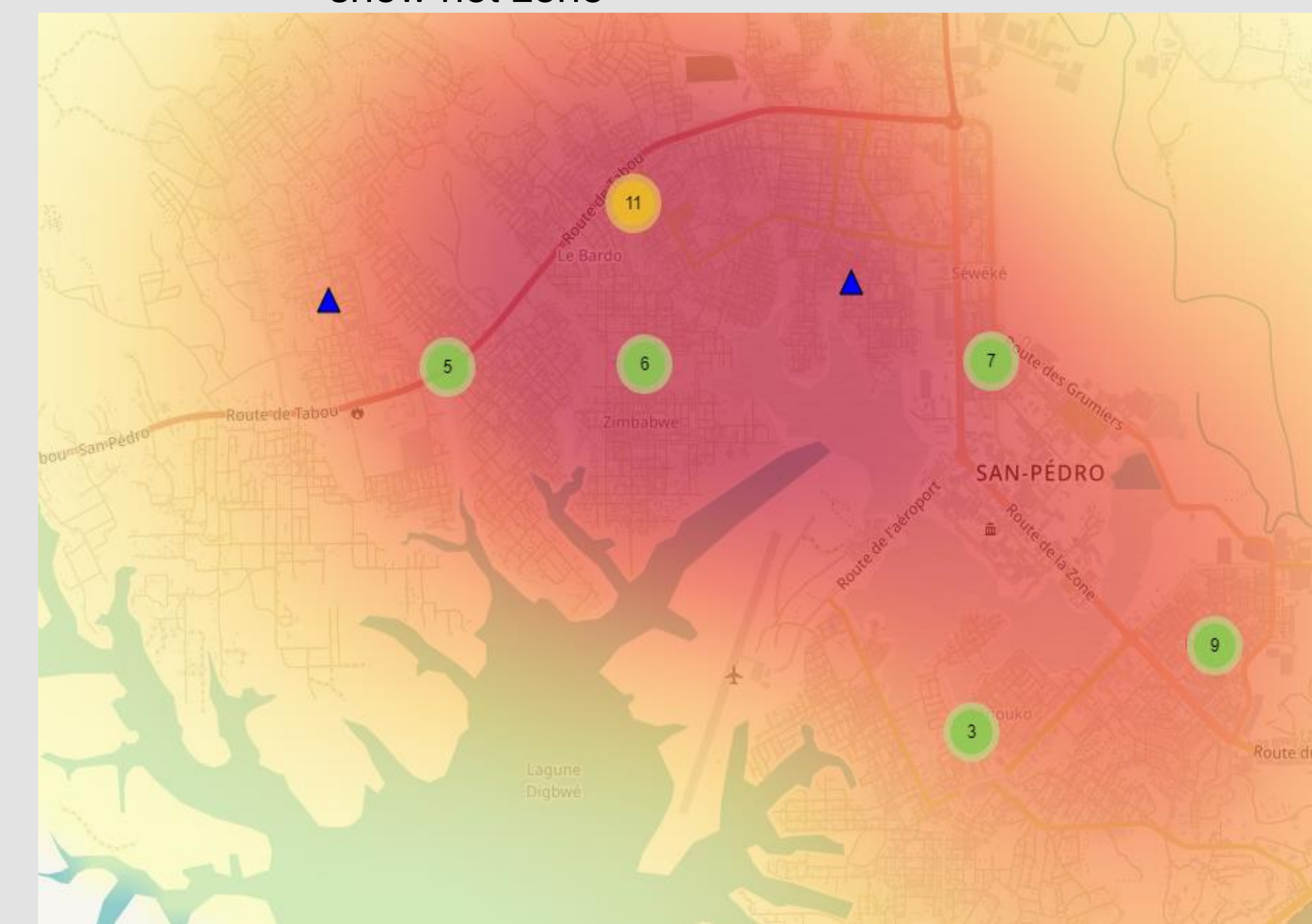
With the help of the OpenstreetMap data collection tools (OSM tracker, OSMand, JOSM, id, Hot tasking manager) and the OSM mapping initiative, we had collected more than 27,000 points of interest on eight target sites (2 Plateaux Sococé, Abobo derrière rail, Yopougon, Marcory Koumassi, Soubéré, San-Pedro, Daloa, Bouaké) in Côte d'Ivoire, including more than 670 health centres, 730 schools and 9,300 disease transmission hot spots. With the active support and involvement of local mapping groups (Youth mappers Curat, OpenStreetMap Côte d'Ivoire), we have engaged more than 110 local cartographers to collect crucial location data and raise awareness of the HIV/AIDS epidemic.



### Use case of OpenStreetMap data from OpenDCH-OSM data collection

The PNLS through the PHV service shared with us data from PHV sites such as bars, bushes, hotels, etc. The geographical coordinates of the socialization or prostitution sites of key populations were shared with the PNLS, which used them to develop appropriate strategies for achieving the 90-90-90 objectives.

Heat map for sex workers to show hot zone



The sharing of data from the OSM mapping collection at the PNLS has made it possible to enrich the health database, but also to bring a geographical dimension to the development of strategies to fight the epidemic for key populations

## Conclusion

The input of the VGI has been crucial in determining the social demographic information that can influence HIV prevalence. Indeed, the data collected have been used to develop appropriate strategies to determine where the HIV epidemic needs to be stepped up.

Despite low representation in the broader OSM community (only 3% of Ivorian women participate in OSMCI), 34.78% of data collection participants in San Pedro and 23.80% in Bouaké were women. These figures can be explained by the growing interest of women in the OSM - a growing network - as well as by a greater awareness of the professional, social and personal impacts of mapping. Participants are eager to learn and improve, and each event fosters a community of shared experiences and fruitful discussions that last well beyond the duration of the mapping itself.

The VGI also allowed community health workers to see that it was possible to have GPS points with a handy tool called a smartphone.

So what are the next steps in building on this work, both improving awareness of the epidemic and ensuring that HIV/AIDS health policy is data-driven, appropriately placed, and fit to citizen needs? Working hand-in-hand with USAID and the DIIS, AidData will develop a dashboard that helps users to harness OpenStreetMap data, along with other data sources, to better understand the HIV/AIDS epidemic and its impact. This tool will help policymakers to better target their response efforts, ensuring resources are focused on the right communities.

Although this study stops here, these initiatives should be sustained by supporting community health workers and key populations to take ownership of these good practices to eradicate the epidemic.

## Acknowledgements

\*The authors would like to thank OpenDCH project. It is funded by the U.S. Agency for International Development and the President's Emergency Plan for AIDS USAID/PEPFAR and is integrated into the Higher Education Solutions Network (HESN).

Thanks to the Office of Information Technology (DIIS), the national program for the fight against HIV/AIDS (PNLS), Youth mappers Curat, OSM CIV, Community health workers and Etien L. Koua, Ph.d. Strategic Information Branch Chief for USAID/PEPFAR in Abidjan.

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