

Developing a data validation method with OpenStreetMap Senegal and the Ministry of Health in support of accurate health facility data

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This research examines the collaboration between a local OpenStreetMap chapter and health authorities to improve health facility data accuracy. By utilizing open data and statistical methods, communities can empower Ministries of Health, address Sustainable Development Goals (SDGs) indicators, and enhance emergency response.

The healthsites.io Digital Public Good [1] has been working with OpenStreetmap Senegal [2] since 2017. We have established a data collaborative focused on health facility data that lives in OpenStreetMap. The collaborative is a semi-formal network that identifies and shares geospatial data on health to OpenStreetMap. It works to identify gaps and barriers to sharing, defines methodologies and data models for sharing and supports stakeholders with sharing and the use of data especially for decision-making. Crucially, the collaborative saves validated data to OpenStreetMap which means that successive projects are able to benefit from the work even when programs end.

Accurate health data plays a vital role in effective healthcare planning, resource allocation, and emergency response. However, existing data sources often suffer from inaccuracies and limited sharing, hindering the potential for informed decision-making and comprehensive health interventions. In response, we have developed an Emergency Health data validation method [3]. The method involves local stakeholders and the healthsites.io open data platform as a means to enhance data quality and accessibility.

The Global Fund's COVID-19 response mechanism underscores the significance of accurate health facility data [4]. This mechanism relies on a robust Health Facility Registry to guide resource allocation, emergency response strategies, and pandemic management. The imperative to understand health capacity for effective emergency responses highlights the critical need for accessible, reliable health facility data.

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Acknowledging the need for accurate health data, the healthsites.io collaborative demonstrates how citizens are supporting the Ministry of Health to improve data accuracy and maintenance through a citizen-Ministry of Health (MoH) collaboration for data enhancement. The Emergency Health data validation method establishes cooperation between OpenStreetMap Senegal, the Direction of Planning Research and Statistics (DPRS/MoH) [5] and the Centre des Opérations d'Urgence Sanitaire (COUS/MoH) [6]. Recognizing citizens as valuable stakeholders, the method integrates input via OpenStreetMap's collaborative mapping. By involving Ministry of Health entities, the method endorses the legitimacy of citizen-contributed data and streamlines its integration into official health systems. This merger enhances data accuracy and amplifies its accessibility, rendering it a resourceful foundation for health interventions and emergency responses. Such collaboration not only empowers communities by valuing their input but also cultivates a sustained framework for reliable health data, capable of benefiting successive endeavors. Ultimately, this operationalized collaboration bridges the citizen-Ministry of Health gap, supporting accurate health data and informed decision-making.

Research questions include 'How can OpenStreetMap data and open statistical methods empower communities to collaborate with MoH and address SDG 3.8.1 indicators?' [7] and 'What is the business case for sharing baseline health facility data, and how does it impact health outcomes and emergency response?'

The method adopts a human-centered design approach to ensure that the collaboration between communities and health authorities is rooted in the needs and perspectives of all stakeholders. This encourages active participation, transparency, and inclusivity in the collaborative process.

A thorough data audit is undertaken to evaluate the accuracy and comprehensiveness of health facility data. This stage highlights prevailing gaps and obstacles that require resolution for productive collaboration. Employing an R building block of reusable code streamlines the process of enhancing health facility location data by juxtaposing information from diverse sources. By comparing datasets, this approach harmonizes naming conventions between Centre des Opérations d'Urgence Sanitaire (COUS), Department of Public Health and Statistics (DPRS), and OpenStreetMap, fostering data consistency and collaborative efficiency (see Figure 1).

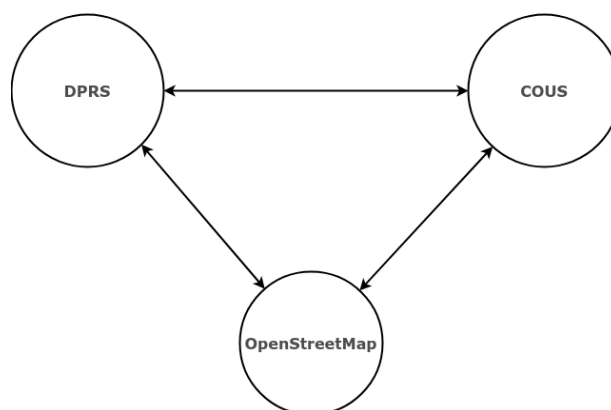


Figure 1. Harmonized health facility names between OpenStreetmap the Centre des Opérations d'Urgence Sanitaire (COUS) and the Department of Planning Research and Statistics (DPRS)

Field validation is carried out to verify the accuracy of health facility data on the ground. This involves on-site assessments, interviews, and data cross-referencing to ensure the reliability of the information.

The validated health facility data is shared to the OpenStreetMap platform, a widely used open mapping tool. This enables real-time access to accurate data by various stakeholders and supports evidence-based decision-making.

The approach underscores the significance of open development and open science principles in promoting effective collaborations. It emphasizes the use of open data and statistical methods to enable communities to actively work together with health authorities, leveraging local knowledge to improve health outcomes and address SDG 3.8.1 indicators. This collaborative approach not only strengthens health facility data but also involves local stakeholders in decision-making, fostering a sense of ownership and commitment. Sharing baseline health facility data forms a solid foundation for informed decision-making, resource allocation, and emergency responses, demonstrating the benefits of data sharing in enhancing health interventions. The OpenStreetMap-based approach supports transparency, trust, and ongoing engagement between communities and health authorities, illuminating the potential of collaborative mapping and open data initiatives in bridging the gap between communities and Ministries of Health. This symbiotic relationship can lead to improved health data accuracy, empowered communities, and enhanced health outcomes, contributing to the advancement of SDGs, resilient healthcare systems, and equitable health coverage through open development and open science principles.

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