GIS @ JSI

Telling Better Stories with Data

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JSI uses geographic information systems (GIS) to save and improve lives. Geospatial analysis and visualizations are key to understanding relationships and developing health information. At JSI, we use geospatial tools and GIS to identify trends and patterns within and between data. We transform data from a multitude of sources into structured qualitative and quantitative data sets for geospatial analyses that can be used to generate information for decision-making. This information helps governments and other stakeholders understand their operating environment and make better decisions.

Why Use GIS?

Geography has a crucial role in every aspect of health systems, and geographic relationships greatly affect the need for, access to, and quality and availability of health services. We take a geographic approach to problem-solving and use GIS to store, analyze, manage, and visualize spatial and non-spatial data to answer questions, find solutions, and design more-effective public health interventions.

Understanding Disease Patterns and Identifying Health Trends

JSI uses geospatial approaches to determine how and where disease is distributed and its relationships to other factors to develop more effective methods of treatment.

In Nigeria under the USAID-funded MEASURE Evaluation project, JSI demonstrated the spatial relationships between domestic violence and HIV prevalence. As a result, it was determined that HIV-prevention programming should integrate activities to mitigate domestic violence (Figure 1).
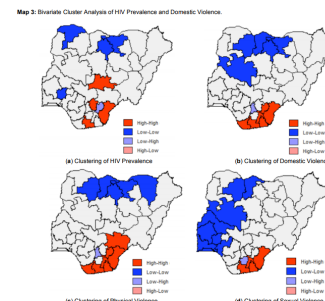

Figure 1: Representation of spatial relationships between domestic violence and HIV prevalence, USAID MEASURE Evaluation

Improving Service Delivery and Influencing Policy

Stakeholders need to know where partners are working, the activities that are being implemented, and the extent of the activities reach and their beneficiaries. JSI uses GIS visualization to answer these questions in a simple, visual manner.

Under the USAID-funded Strengthening the Care Continuum Project in Ghana, JSI was asked to improve decision-making processes for key population (KP) programming and ensure that government and civil society organizations (CSO) provide comprehensive coverage within districts. JSI developed an interactive map that identified locations and services information on KP hotspots; CSO HIV outreach sites; health facilities providing antiretroviral therapy and/or KP-friendly services; drop-in-centers; and CSO offices (Figure 2).

Improving Access to Health Care

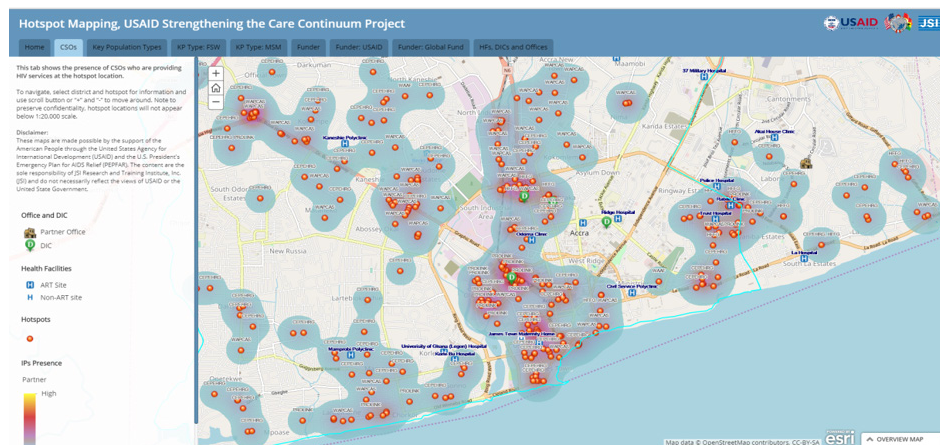If you don't have access, you don't have health care. At JSI, we understand

Figure 2: Mapping Key Population Hotspots for Improved HIV Services in Ghana, USAID Strengthening the Care Continuum Project

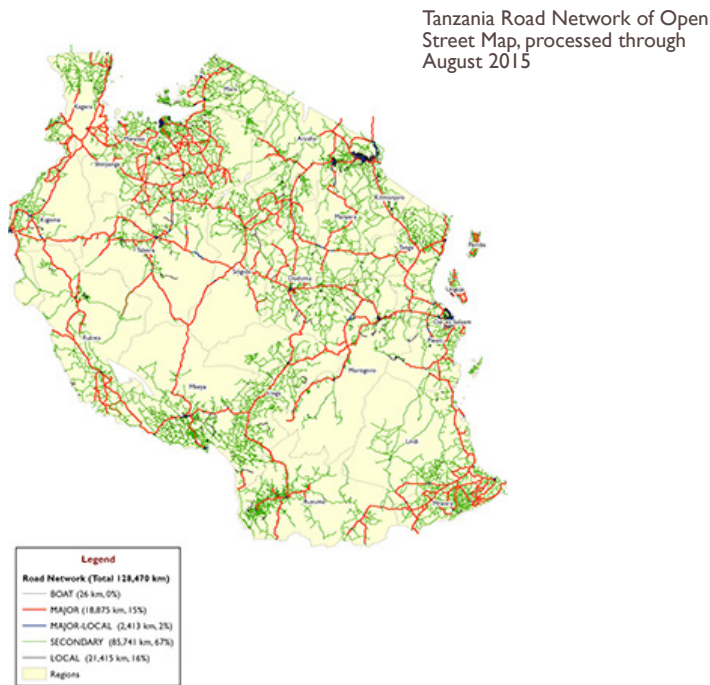Tanzania Road Network of Open Street Map, processed through August 2015

Figure 3: Tanzania Road Network, USAID DELIVER

that access to health care is a pillar of an effective health care system and we use GIS to model access among target populations to maximize coverage and efficacy.

In the Iringa Region of Tanzania, JSI under the USAID | DELIVER project piloted a low-cost participatory mapping approach using easily replicable methods to identify catchment areas and estimate coverage patterns for facility-based and outreach HIV services. Our approach used a combination of key informant interviews, printed maps, and open-source GIS software to produce computer-generated, district-level maps of catchment and coverage patterns (Figure 3).

Strengthening Coordination

GIS and related technologies are used to present geographic information in a range of visual and interactive ways. Service provider locations are mapped and overlaid with other information, such as target population density. Interactive web-mapping applications are developed and used to interact with the data, zoom to an area of interest, and find locations based on search criteria.

In Niger and Burkina Faso under the SPRING project, JSI collected spatial data and mapped the locations of social behavior change activities for its partner organizations. The output of the activity was an interactive dashboard that improved coordination between

Figure 4: SBCC GIS Dashboards for Sahel region, USAID SPRING Project

partners by providing information on the location and nature of nutrition and water, sanitation, and hygiene activities and areas of program overlap (Figure 4).

Strengthening Health Logistics

With logistics management information systems data displayed in innovative and visually appealing ways, we can attract a broader audience and overcome problems in new ways. GIS has allowed JSI to turn massive amounts of logistics data into information that can bolster both supply chain strategy and execution.

Using GIS and spatial analysis for USAID | DELIVER, JSI integrated multiple disparate and complex datasets into a series of analyses to determine the most efficient routing for commodity deliveries to government health facilities across Tanzania. With the data collected from delivery trucks' GPS devices, the JSI team mapped the secondary road network across the entire country. We also calculated travel speeds on paved versus dirt roads, including variations between wet and dry seasons and load capacities, leading to improved efficiencies and savings for government.

Building GIS Capacity

At JSI, we recognize sustainability is integral to the quality and value of our interventions. In addition to analyzing and visualizing geospatial data ourselves, we love teaching others to do it as well. JSI has implemented GIS capacity-building for Ministries of Health and other partners in Malawi, Nigeria, Rwanda, and Zambia to improve planning of maternal and child health services.