

March 2014 MEASURE GIS Working Group Meeting: *The Evolution of GIS for Planning, Monitoring and Evaluation in Global Health over the Past Five Years*

[The Demographic and Health Surveys \(DHS\) Program](#) and [MEASURE Evaluation](#) hosted the annual MEASURE GIS Working group meeting on 4-March-2014 at the ICF International I (eye) Street Conference Center. Individuals from funding agencies, NGOs, implementing partners, and universities attended. They gathered to review the current context around the use of GIS in the health sector and to discuss approaches to address key challenge facing the field.

Morning presentations focused on (A) increasing availability of health and administrative data at high levels of detail and (B) increases in capacity and guidance available for M&E officers seeking to integrate GIS into their work. These were illustrated with presentations from the USAID GeoCenter, The World Bank, MEASURE Evaluation, AidData, the World Wide Human Geography Data (WWHGD) Working Group, and the Humanitarian Information Unit at the U.S. Department of State.

The afternoon included six lightning talk presentations on the “Applications of GIS for Planning, Monitoring and Evaluation” which illustrated how the field is moving beyond creating choropleth maps to making use of broader range of geospatial tools. Two of the presentations used roads and network analyses for examining public health commodity routing and at obstetric service availability. The remaining four presentations looked at linking cluster level survey data with data from across the development sectors, examining climate vulnerability, biodiversity and nutrition, local conflict and intimate partner violence, and access to family planning.

With the discussions on the current status of geospatial data, capacity, and analytic techniques as context, the group engaged in a guided discussion on ways to mitigate challenges facing the field around the areas of **awareness, data, human resources, and ethical issues**.

AWARENESS

While the value of GIS for visualizing data through mapping is gaining broad support, both funders and decision makers may still lack understanding of the utility of advanced geospatial tools and techniques which can bring geographic perspectives to planning, monitoring and evaluation. Consequently, GIS professionals may face resistance in convincing these key stakeholders of the important role such techniques can play in health development work.

Documented case examples are needed to show the added value provided by geospatial analytic methods. Individuals seeking to use GIS for more than making ‘pretty’ maps could compare this added value against costs. We note that open source software options decrease some of those costs.

DATA

Significant improvements in country-level spatial data infrastructure have been made over the past five years, resulting in open data for administrative boundaries, roads and population at the subnational level. Despite this increase, participants stated that finding geospatial data can be a challenge for some activities, where up-to-date high-detail data is needed, but unavailable. While interpolated or modeled data may help meet this gap, more guidance on using such ‘surfaces’ is needed, given the data’s inherent uncertainty. When the data is must be collected by an activity, program managers may need support to better understanding the costs collecting, managing and analyzing spatial data. Of these three tasks, data management is often overlooked. It includes: updating the data over time; documenting meta-data; and identifying ownership, usage and sharing rights. As more programs collect spatial data, proper data management will facilitate sharing of data across organizations. In

addition to limiting duplication of data collection, this will allow better integration of data which will increase its value and use.

HUMAN RESOURCES

Despite increases in capacity for GIS use, there are continued human resource constraints in the field. GIS is often added onto the schedule of an already busy individual without reserving part of their time for the additional work. Working group participants identified the need for:

- Curricula specifically aimed towards decision makers, which would describe the role GIS can play in an organization, and the resources needed for GIS use to be sustained.
- User-friendly tools to generate maps routinely as data is updated. These may include web-based tools or improvements in data visualization 'decision support systems' linked to health management information systems.
- GIS specialists to maintain spatial data infrastructure. Such specialists would also be charged with conducting and interpreting more complex spatial analyses. A tiered tool-kit would be helpful to identify what geospatial methods can be reasonably expected for persons with varied geospatial educations and backgrounds.

ETHICAL ISSUES

As data becomes available at finer and finer resolutions, there is a growing risk of disclosing patient-level health data which can be linked to an individual. GIS users need to be aware of this risk and take active steps to avoid presenting data which would allow such a breach of privacy. To help address this and other ethical issues, a documented 'code of conduct' for GIS practitioners in health would be helpful. For new GIS users, these ethical issues should be addressed during trainings conducted in country.

CONCLUSION

The past five years have seen tremendous growth in the use of GIS for planning, monitoring and evaluation in global health, fueled by increases in data availability, accessible mapping software, and human resources. This success had bred its own challenges.

- With increased data availability at high levels of detail, we need more discussion around data management, sharing and data ownership, and individual privacy.
- Open source mapping software is becoming increasingly powerful and more user friendly, lowering one barrier to entry. As spatial tools proliferate and become more specialized, more guidance is needed on matching the tool with the task.
- Much of the growth in human resources has been focused on data visualization, and less on analytics. As web-based and automated mapping tools become the norm, allowing easy access for anyone to visualize their data, we need to continue to evaluate the role a GIS specialist with a grounding in health geography and spatial statistics plays in an organization's use of spatial data.

As the field continues to evolve, these and other challenges will shape the continued role of GIS in global health.

For more information about the MEASURE GIS Working Group meeting, including full presentations, visit www.cpc.unc.edu/measure/our-work/gis/ or contact:

John Spencer

Sr. Geospatial Analyst

MEASURE Evaluation

University of North Carolina at Chapel Hill

919-966-1721

john_spencer@unc.edu



Annex

Data:

The WWHGD Working Group has documented multiple data repositories useful across development sectors in the data-discovery section of their website. You will need to create a free account to access the data.

<http://wwhgd.org/content/data-discovery>

We mention the WWHGD Working Group repository, as it was highlighted during the morning session. They reference numerous data sources and other repositories covering fundamental spatial dataset for development, including administrative boundaries, population, roads, hydrology, and elevation. Several of the guidance documents listed below contain reference sections on additional data sources.

Capacity Building Materials

There is a growing list of software options for those wishing to map data. In response to the need for guidance on which tool to use for what task, the MEASURE GIS Working Group evaluated the features and ease of use of five commonly used mapping applications: ArcGIS, Quantum GIS (QGIS), Epi Info, Google mapping tools, and DevInfo.

- <https://www.cpc.unc.edu/measure/publications/ms-13-80>

The DHS Program and MEASURE Evaluation have created a set of training materials for using the open source QGIS software. These materials are modular, easily adapted, and use DHS health indicators for examples.

- <http://spatialdata.dhsprogram.com/resources.html>

MEASURE Evaluation also created a self-directed course on using Geographic Approaches to manage, analyze, and leverage spatial data effectively when planning, monitoring, and evaluating health sector programs.

- <https://training.measureevaluation.org/certificate-courses/geo-global-health-en>

The DHS Program has published a guide on GPS data collection during health surveys and a technical document on using DHS GPS data, which is randomly displaced to protect the confidentiality of survey respondents .

- <http://dhsprogram.com/publications/publication-dhsm9-dhs-questionnaires-and-manuals.cfm>
- <http://dhsprogram.com/publications/publication-SAR8-Spatial-Analysis-Reports.cfm>

MEASURE Evaluation has also created guidance for using geography to link: facility and survey data; HIV data; and family planning & reproductive health.

- <https://www.cpc.unc.edu/measure/publications/ja-13-167>
- <https://www.cpc.unc.edu/measure/publications/sr-14-86>
- <https://www.cpc.unc.edu/measure/publications/sr-12-74>

For those considering How and Why to include “Where” in your activities, these documents provide a detailed summary:

- <https://www.cpc.unc.edu/measure/publications/ms-11-41a>
- <https://www.cpc.unc.edu/measure/publications/ms-11-41-b>

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