MACEPA PATH
Malaria Control and Elimination Partnership in Africa

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# Do dashboards matter for malaria elimination?

Documented experience from the development and testing of visualizations, dashboards, and alerts for malaria Elimination in Southern Province, Zambia

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## Background

The Zambian Ministry of Health is embarking on an ambitious effort to eliminate malaria. To inform action and monitor progress toward this goal, the PATH Malaria Control and Elimination Partnership in Africa (MACEPA) supported the Zambia National Malaria Elimination Centre to establish a scalable rapid reporting system at health facility and community levels in 2011.

This system is currently active in 36 districts involving approximately 600 health facilities (HFs) and over 2,000 community health workers (CHWs), primarily in Southern and Western provinces. Reporting is done by health workers via a java-based data entry system on low cost mobile phones into the open-source District Health Information System (DHIS2).

As more national malaria programs focus on malaria elimination, real time, accurate, and actionable data are critical for targeting interventions to specific geographies and populations and for optimizing the allocation of resources. District and facility managers will likely have greater responsibility for taking action as malaria incidence decreases and becomes more localized. Efforts to date have focused on collecting data and ensuring data quality so that national, provincial, and district teams can better track and understand local and regional malaria trends. However, questions remain on how to strengthen feedback loops down to the most granular levels and how to motivate end-users to access and view data to facilitate stronger analysis and action, especially at the district level.

## Methods

We initially wrote up several use cases, targeting different levels of users, that described the analytical objectives, content, and data needs. Based on the use cases, we worked with a team of developers and design specialists and took an iterative approach to develop and test different visualization, dashboard, and alert mechanisms tailored for national, provincial, district, and facility health managers, and community health worker cadres.

We organized an in-person user group assessment to solicit feedback on the prototype dashboards from representatives from 15 districts in Southern and Lusaka provinces.

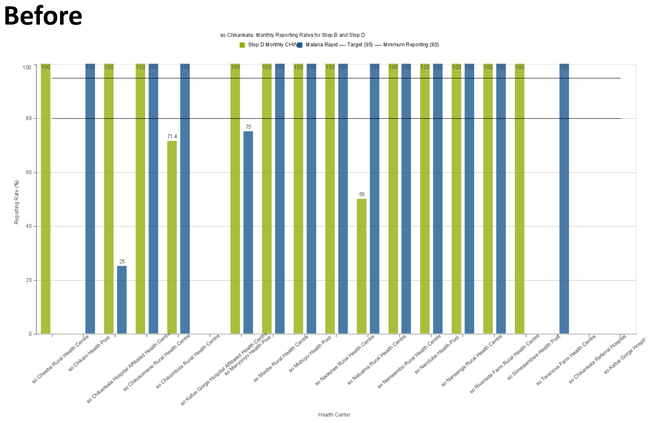
This was followed by several call-in and online sessions with a smaller group of district health managers to co-design and develop final dashboards to facilitate better planning and action, including visualizations assessing reporting, data quality, malaria case rates, case investigation, and commodity stocks.

We also developed and tested the usefulness of different alert systems using SMS, email, and web-based communication.

## Dashboard findings before and after

Dashboards currently available in DHIS2 are useful, but are limited to static visualizations, may present out of date information, and have several limitations on how data can be displayed and manipulated:

**Before**

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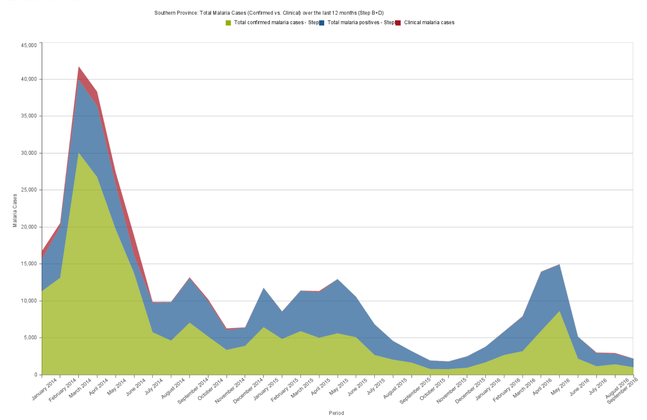


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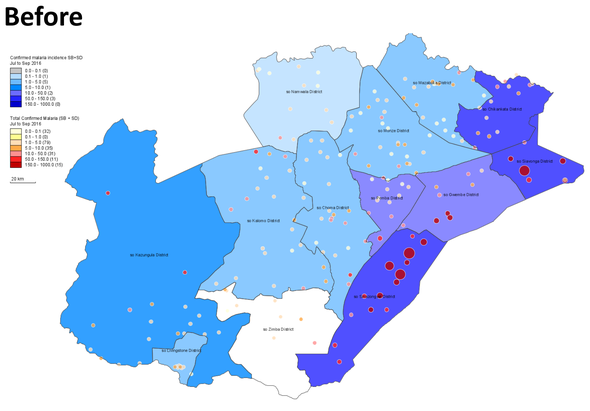


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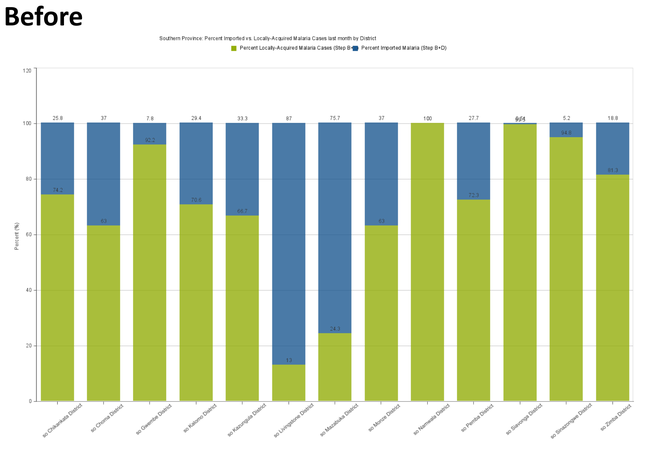
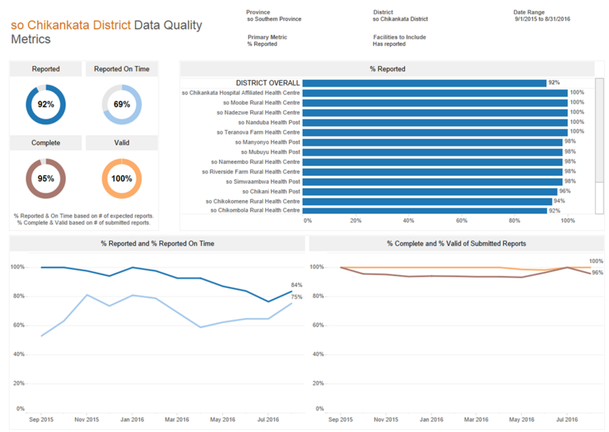



Dynamic interactive visualizations linked to data in DHIS2 and developed using Tableau software are updated automatically on an established schedule. Automated alerts and reports are e-mailed and texted to district and facility teams and community health workers:

**After**

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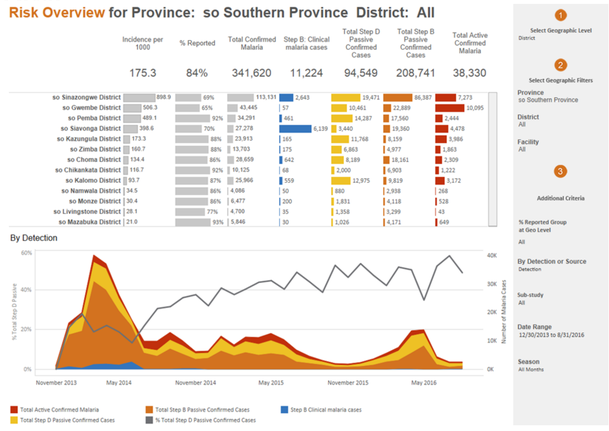


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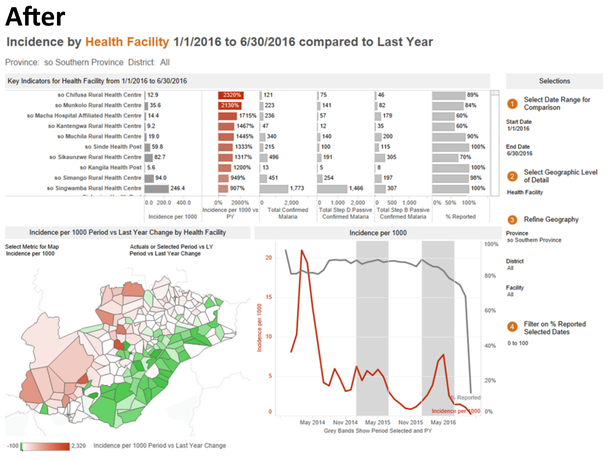


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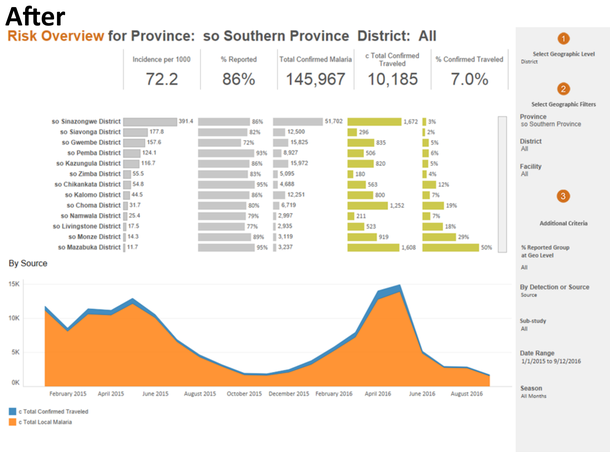


## Lessons learned

We found that initially developing several prototype visualizations and dashboards and sharing with the eventual end-users helped to stimulate discussion and feedback. Their feedback led to many meaningful changes in the analytical content and organization of data. During development, users tended to gravitate toward creating dashboards that decrease reporting efforts and strengthen data quality. This co-development approach produced well-documented promising practices on how to create and test dashboards that can help or hinder decision-making for district health managers. This process provided further insights into optimizing visualizations and identifying approaches to making the data more accessible to lower levels of the health system hierarchy.

While this collaborative method resulted in relevant and easy-to-use analytics, there is still a need to provide a minimum level of training to end-users. To this end, both written and video guides were created to walk through the use of the existing dashboards and to create new visualizations using Tableau.

Joint development of data visualization appears to improve data use for decision-making.

## Recommendations

To make dashboards matter, the focus should include strong skills-building of end-users. User motivation increases as they are empowered to drive the development and explore the data on their own.

Choosing nimble tools that allow users to create and manipulate dashboards in an iterative fashion is optimal. When users have more control of the data, can experiment with the tools, and can guide development, they not only develop better products, they simultaneously build their own competency and insight.

While developing dashboards for reporting is a good catalyst for end-user participation, facilitation of dashboard development should focus heavily on data use and practical decisions that managers will need to make. Once connections are made between dashboards and more routine decisions, there is more interest and participation in the development.

Lastly, quality of data matters greatly. Creating useful dashboards requires a great deal of data transformation which can create unforeseen calculation challenges. Frequent quality checks and quality control of these transformations are critical or users will lose faith that the dashboards accurately reflect the original data.