



# Reveal Forum Quarterly Meeting

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November 2020



# Agenda

Topic	Description	Presenter	Time
Welcome	Welcome; Purpose of Forum; and Agenda.	Kyle Hutchinson, Akros	5 mins
Reveal Update	Geographic scope; Use cases; New functionality; Roadmap	Anna Winters, Akros	10 mins
What We Are Learning	Summary of M&E implementation and results incl. successes, challenges and solutions.	Alistair Lindawson Stanford, Previously UCSF MEI	15 minutes
Zambia Vector Link Implementation 2019 vs. 2020	2019 vs. 2020 - How have improvements been received in the field?	Patrick Mwansa, Abt Associates / Zambia VL	10 Minutes
Open Source Platforms and Pathways to Sustainability	Long term sustainability models for Global Good platforms.	Heath Arnesen, DIAL	15 minutes
Closing	<i>Questions, feedback, AOB.</i>	Anna Winters, Akros	5 Minutes



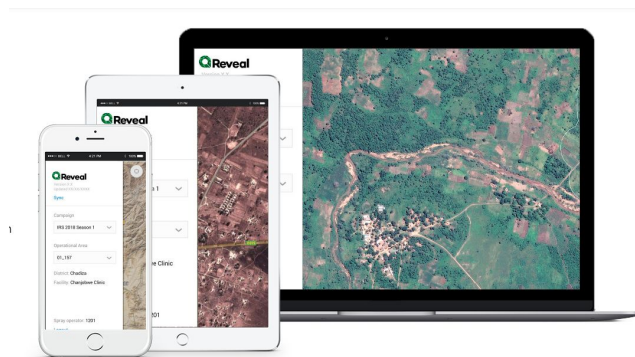


# Reveal Update

Geographic scope, use cases, new functionality, roadmap, & Reveal Lite

# About Reveal

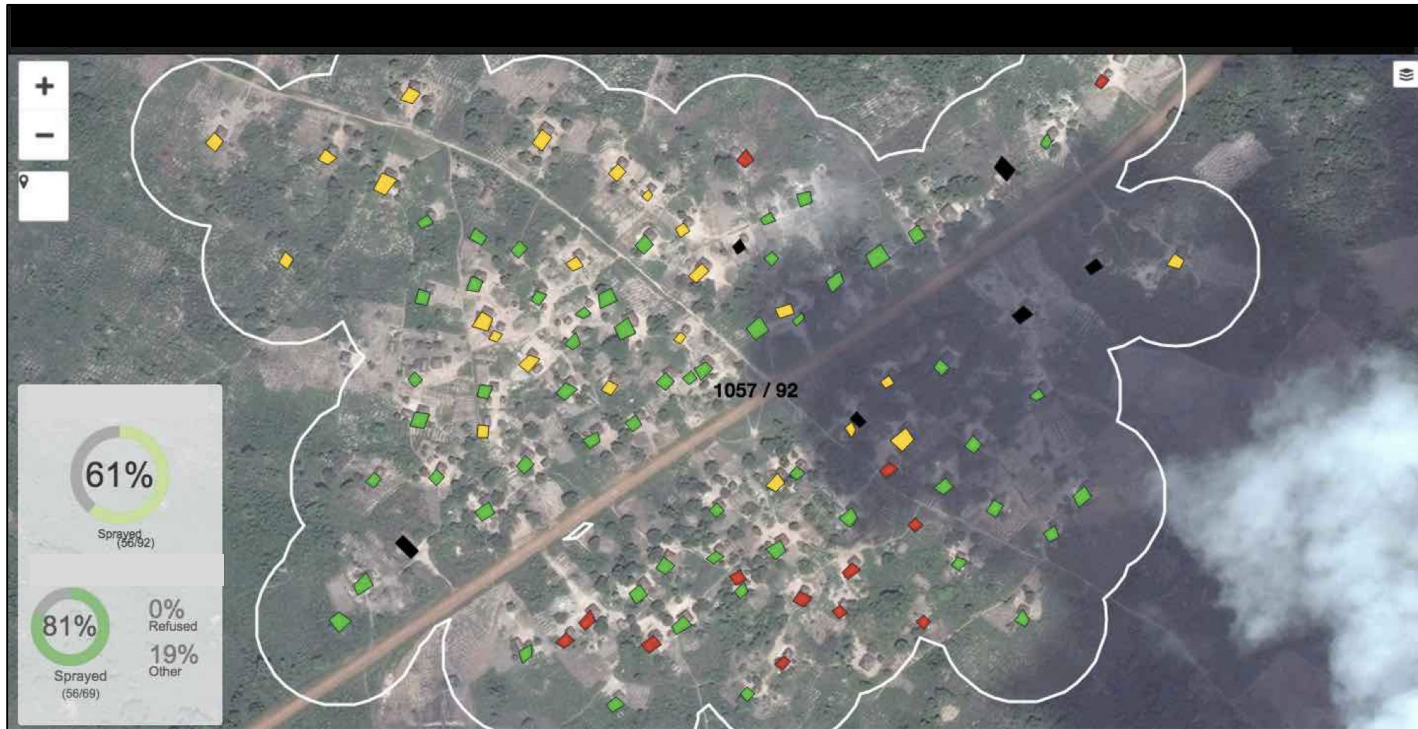
- Reveal is an open-source platform that uses spatial intelligence to drive delivery of life-saving interventions
  - *Health staff use maps in the field to deliver and account for drugs, bednets, and other services and commodities down to the household or operational area level*
- Reveal supports decision makers and intervention managers to plan, guide, and track delivery of in-field activities with precision
  - *Managers use dashboards and maps to monitor in-field progress & make adjustments as needed*



AKROS



# Ensure no one is missed



- Household not yet visited
- Received all interventions
- Refused any intervention

# Adherence and cost-effective impact

- Increased health campaign coverages by 20-30%.<sup>1</sup>
- Reduction in malaria incidence by 15% (comparing IRS alone to IRS + Reveal).<sup>2</sup>
- Reduced cost per malaria case averted by 63%.<sup>3</sup>



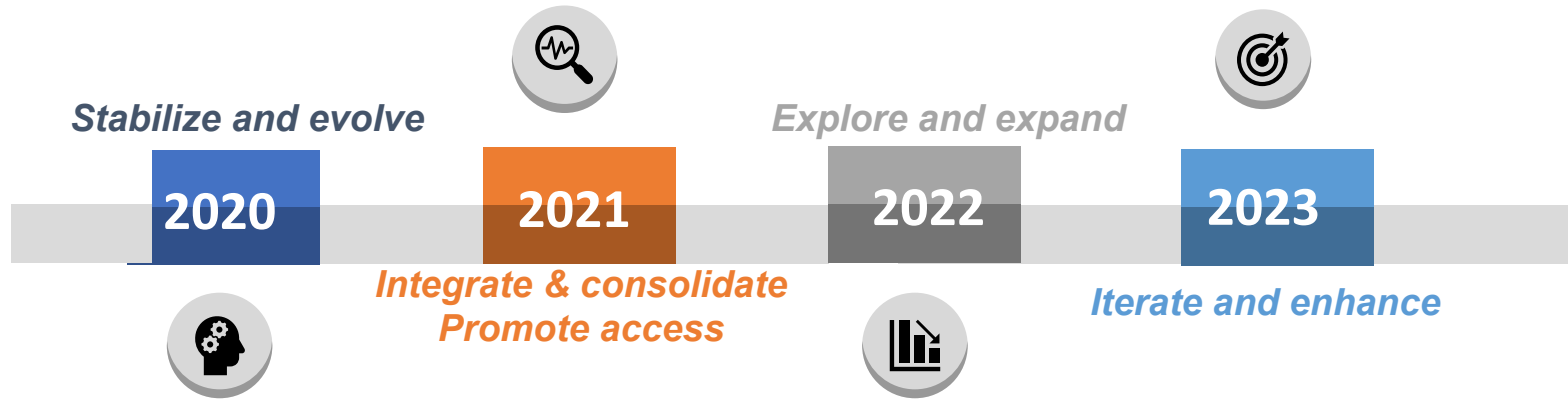
1. Larsen et al (2020). Leveraging risk maps of malaria vector abundance to guide control efforts reduces malaria incidence in Eastern Province, Zambia. Nature Scientific Reports. 10: <https://www.nature.com/articles/s41598-020-66968-w>
2. Center for Applied Malaria Research at Tulane University. Retrospective Evaluation of the Effectiveness of Indoor Residual Spray with Pirimiphos-Methyl (Actellic) on Malaria Transmission in Zambia. January 2017.
3. Tropical Health (Josh Yukich). Cost and cost-effectiveness of 3GIRS in sub-Saharan Africa: results of data collection and analysis in the nGenIRS project. January 2019.



# Geographic Scope & Use Cases

Country	<u>Indoor Residual Spray Malaria</u>	<u>Focus Investigation Malaria</u>	<u>Seasonal Malaria Chemopro Malaria</u>	<u>Mass Drug Admin Malaria &amp; NTDs</u>	Immunization	<i>Local Partners</i>	<i>Partners</i>
Angola	X					MOH	Mentor Initiative
Eswatini				X		MOH	CHAI
Kenya				X		MOH	END Fund
Namibia	X					MHSS	CHAI
Nigeria			X			FMOH	MC
Senegal	X					PNLP	PATH
Thailand		X				BVBD	CHAI
Rwanda				X		MOH - RBC	END Fund
Zambia	X			X	X	MOH NMCP; NTD & EPI Unit	PATH; Abt Associates; CHAI; MRT/JHU





- Dynamic tasking
- Form configurability
- Location management
- QR codes
- Performance dashboard improvements
- Reveal 'lite touch'



# Roadmap Aim: Shelf Readiness

Aim: Build Shelf Readiness, lower barrier to entry

- Global Good Maturity Model ([GGMM](#)) & OpenHIE standards- Reveal aligned with medium/high scores but gaps remaining.
- 5 thematic gaps emerged, currently being addressed through both engagement with DIAL (in-kind grant) and *just-announced* Digital Square E0 award.
  - Engage public in roadmapping plus technical review committee
  - Build out technical documentation and access
  - Achieve OpenHIE architecture for packaging & deployment to increase access & configurability
  - Expand load testing
  - Expand interoperability

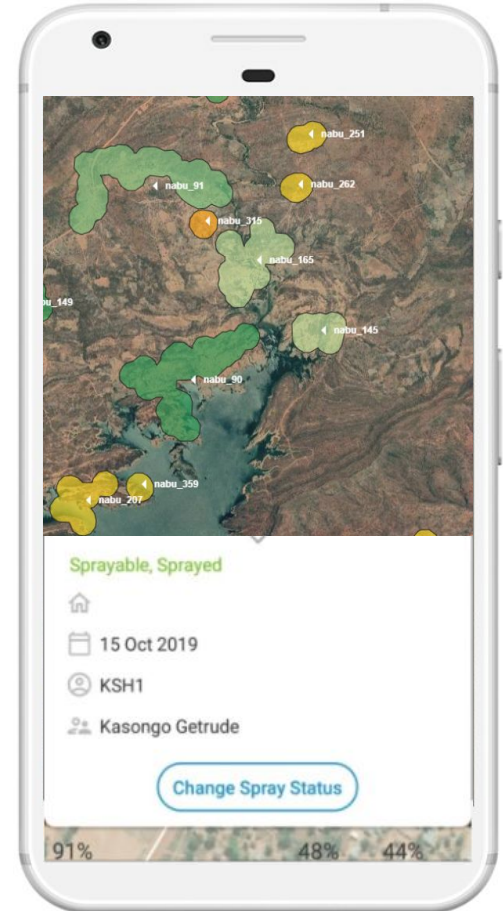
# New for 2020: Reveal Lite

Aggregate settlement-level data collection, not household.  
Reduce devices in field; reduce cost.

- Supervisors record daily summary data of services delivered in each targeted operational area.

Dashboards:

- operational areas reached out of targeted;
- structure coverage out of targeted; and
- total, using operational area attributes (using GRID3, manual enumeration, and/or Maxar footprints with residential algorithm)



\*Currently being used in 14 districts in Zambia in collaboration with GRZ and PATH;  
Expanding in Kenya and Rwanda with EF to support MDA for NTDs

# New for 2020:



## Rationale

Low to medium cost option for low to medium accurate settlement-level coverage; enabling campaigns to understand whether

## Pros

- Can use already available, open source data, like the GRID3 data
- Fewer resources required
- Still uses mobile navigation tools for area and data collection tools
- Provides accurate health facility data

July 30, 2020

## Zambian government works with GRID3 and partners to control malaria

GRID3 Zambia partnered with Akros, National Malaria Elimination Programme (NMEP), PATH and President's Malaria Initiative (PMI) to create maps as a low-cost solution that can contribute significantly to controlling malaria in the country. The maps display GRID3 population estimates, settlement extents with estimated residential structure counts, schools, health facilities and village names. These datasets were developed with multiple Zambian government agencies.

mobile maps, navigation tools, structure coverage; enabling services to targeted settlements.

health facility level or area denominator compared to structure-based



# What Are We Learning?

Summary of M&E implementation and results: successes, challenges and solutions.

# Evaluating the Programmatic Impact of the Reveal Application on IRS Implementation in Southern Africa



# Overview

## Aims

1. To evaluate the impact of the Reveal app on the planning, execution, and decision making process for national IRS campaigns.
2. To assess the perception and usability of the Reveal app among its primary users.

## Objectives

1. Assess the accuracy, timeliness, and completeness of data collected through the Reveal app as compared to the best alternative data collection method available in-country
2. Determine how the Reveal app was being used/not used and what decisions were made based on its use to guide IRS field campaigns; and
3. Identify the benefits and challenges experienced by users when interacting with the Reveal app.

# Methods

## Sampling – Participants

Management Level	Total No. of Participants*
National Malaria Program	5
District Health Management Teams/IRS Managers	7
Spray Supervisors	22
Spray Team Leaders/Team Leader Assistants	12
Total Participants	46

\*Total number represents combined participants from both countries.

## Data Collection Methods

- Key Informant Interviews
- System Usability Scale Surveys
- User Analytics

# Disruptions Due To COVID-19

- Planned start of data collection in March 2020 coincided with the onset of the COVID-19 pandemic in February 2020
- Delayed timeline of data collection resulted in recall issues among some participants
- Shortened timeline of data collection made it necessary to reduce sample size
- KIs were done over the phone, rather than in-person, leading to some technological and comprehension challenges
- Evaluators were unable to obtain paper forms necessary for conducting a comparison review between electronic and paper records, which resulted in some indicators being removed from the evaluation



# Results

# Reveal's Impact on Data Quality Dimensions

## Data Timeliness

- The largest difference in time savings when comparing Reveal versus paper was reflected when aggregating the data from one operational level and/or temporal level to the next.
- This automatic aggregation gave decision makers within different management levels quick access to field data throughout the campaign.
- While data entry and data aggregation was seen as quick, some respondents felt that using Reveal added workload and slowed down operations.

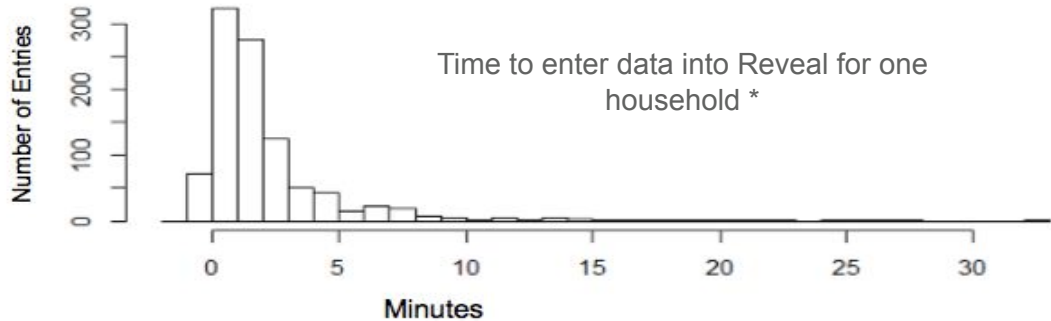
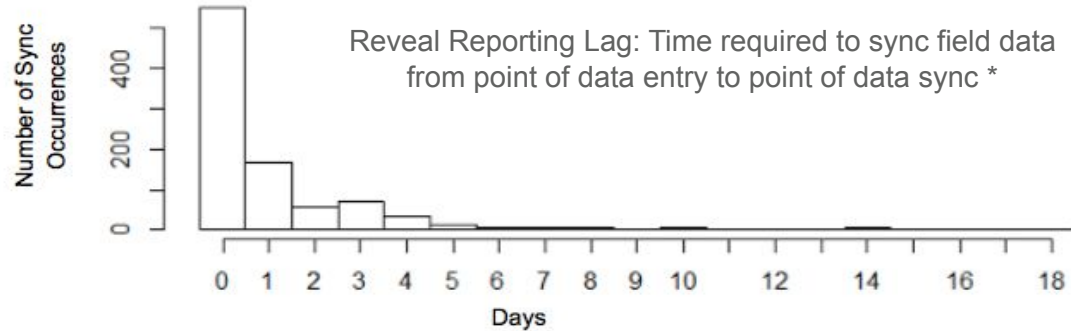
*"Compared to the previous years when we didn't use Reveal, this time around the data collection was faster and it was easier. It saved us a lot of physical effort because in previous years we used to enter data by writing. But this time it was much easier and faster."*

– Field Supervisor

*"It [Reveal] slowed down the team. It's like a duplication because you have SOPs collecting data on paper and TLAs collecting the same data using tablets [for Reveal]. It was going to be faster if it was only the TLA collecting the data."*

-District Manager

# Reveal's Impact on Data Quality Dimensions



\*Represents data from only one country.

# Reveal's Impact on Data Quality Dimensions

## Data Accuracy and Completeness

- Reveal improved data accuracy by correcting the mathematical errors typically found during the auditing process of the paper forms.
- Many users felt Reveal helped catch errors and identify gaps in data that would have been missed using a paper-based system

*“It [Reveal] decreased the chances of recording incorrect data on unsprayed structures. You wouldn't be able to put a value that exceeded what was initially counted. If there are five sprayable structures but you only sprayed two, validation wouldn't let you enter more than three unsprayed.”*  
- District Manager

*“Sometimes when you are just using paper, you might not be able to reach all the structures in the areas. For example, if you are remaining within one hour before you knock off, SOPs might indicate false data that all structures have been sprayed. They might say they have reached the target but other structures are left out if you do not have a map or application.”*  
- Team Leader Assistant

# Utilization of Reveal

## Decision Making

Feedback from the KIIs was overwhelmingly positive regarding the ways in which Reveal added value to the IRS campaigns. In particular three ways were mentioned:

- Decision making around mop ups
- Tracking progress of the campaign
- Managing field operations

# Utilization of Reveal

## Decision Making around Mop Ups

- The level of detail of Reveal helped to pinpoint locations where mop ups were needed in a much more efficient fashion
- The color coding on the Reveal app helped identify and locate the specific structures that had been missed, making mop ups easier for those who were directing the spray teams
- The “reason for refusal” helped the team plan what steps were needed to gain access; e.g. was a structure locked or had the residents refused to let the spraying take place.

*“With Reveal we were able to plan for mop up activities, even before we finished the campaign, which was not going to be possible if we were relying on the paper records. The tool saved time because spraying and mop up was done almost at the same time.”*

-Supervisor

*“The good thing of Reveal is it will tell us more. And it’s easy to work with. It can tell, this house if the dot is red, means you were not in that house, so you can do a mop up. It can also tell you, this house, or this village, there are some houses where we did not finish them, you need to go and do a mop up.”*

- Spray Team Leader

# Utilization of Reveal

## Tracking Progress of the Campaign

- Reveal was used by nearly all respondents to track daily progress that information was used to plan the work moving forward
- The ability to visualize their team's performance and the performance of other teams was seen as a way to motivate people to work harder
- The maps were overwhelmingly found to be the most useful visualization for tracking progress

*"I found it [data via the Reveal dashboard] useful because the dashboard was giving us the daily progress. We will be guided in what we have done on that day, in that way we were able to plan for the next day."*

- District Manager

*"Performance of the team was monitored on the dashboard. Viewing it was a source of motivation, it gave a true picture on how work was being done and it kept everyone going. It helped with decision making. It would also give information on how much time is being spent in the field and this would help the district know whether they were on schedule or not."*

- Supervisor

# Utilization of Reveal

## Managing field operations

- Nearly every respondent said that Reveal helped them to supervise their team more effectively.
- Reveal made operations more efficient because it showed a clear distinction between village boundaries indicating to each spray team which households were in their spray jurisdiction.
- Reveal proved helpful to teams in planning their work, day to day, both in terms of how much territory they needed to cover and what sort of resources were needed

*“Using Reveal you will know the spray areas and it would even show you how many houses were there. It showed places that had few houses and others that had more structures so it helped us in deploying teams. Reveal would show the actual road of where we were going and the state of the road whether it had water or not. This prevented us from moving blindly and helped us to use the right mode of transport.”*

- Supervisor

*“It [Reveal] helped both efficiently and effectively, able to see work done at the end of the day, decisions were made on those who needed more supervision than others and helped have recommendations for the next campaign.”*

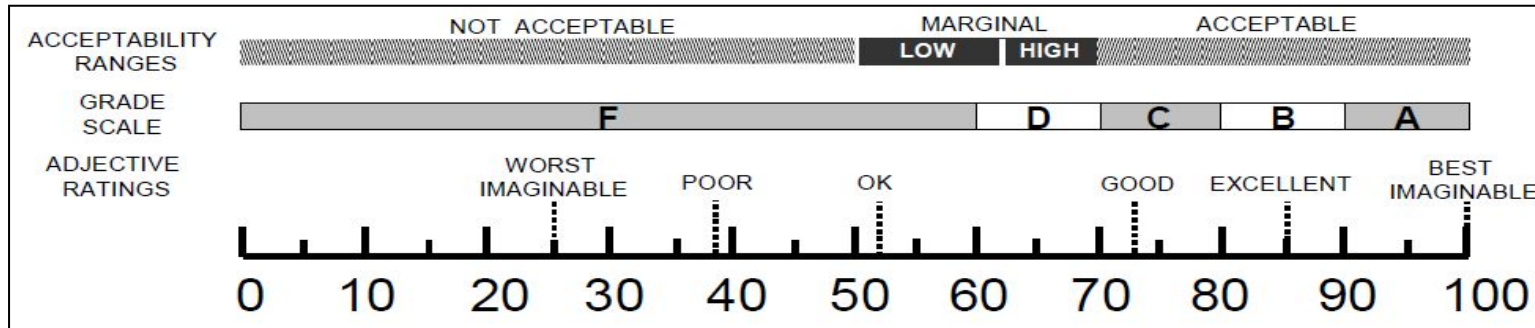
- District Manager



# Reveal System Usability Scale (SUS)

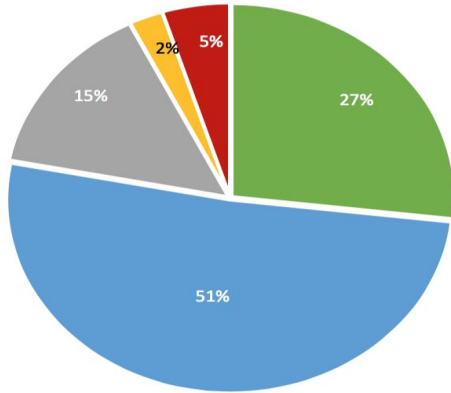
Country	SUS Final Score*	Rating
Country 1	75	Good acceptability (68-80.3)
Country 2	69.1	Good acceptability (68-80.3)

\* SUS scores are not percentages.

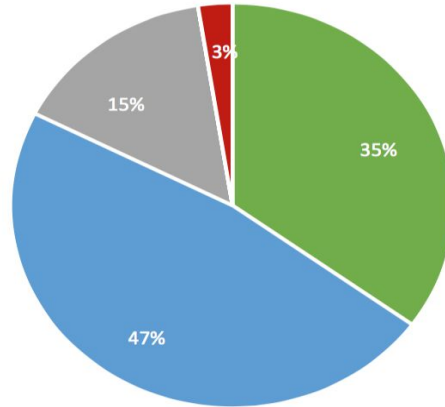


# REVEAL SUS (Selected Questions)

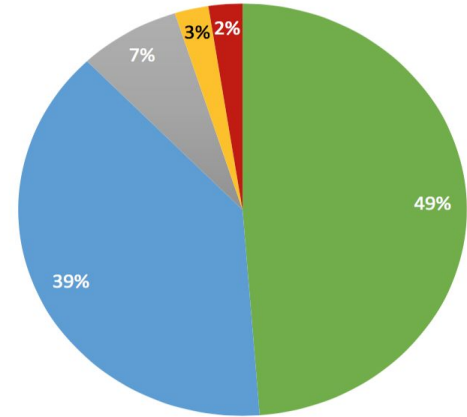
I thought the Reveal App was easy to use.



I felt very confident using the Reveal App.



I think that I would like to use the Reveal App frequently.



■ Strongly Agree ■ Agree ■ Neutral ■ Disagree ■ Strongly Disagree

# Challenges with Using Reveal App

1. **Technical issues** related to the functionality and design of the Reveal app
2. **Logistical issues** related to the necessary equipment and infrastructure required for the Reveal app to function properly
3. **Capacity and motivational issues** related to ensuring users are adequately prepared and supported to use the Reveal app successfully

# Challenges with Using Reveal App

## Technical

- Inaccurate locator
- Poor enumeration of structures and outdated satellite maps
- Spray areas incorrectly mapped or misplaced
- Unreliable when reflecting reality on the ground
- Reveal app malfunctioning
- Limited functionality
- Dashboard not updating properly or unavailable
- Poor GPS accuracy and difficulty pinning structures
- Difficulties in syncing, saving, and retrieving data

*“Sometimes we went to areas where the number of structures on tablets differed with what we found on the ground. The numbers on our tablets were too few or too many than on the ground. SOPs had carried insufficient chemicals because of the Reveal information and as a result, chemicals ran out in the field leaving certain structures unsprayed.”*

– Team Leader Assistant

# Challenges with Using Reveal App

## Logistical

- Over reliant on strong network connection
- Poor network connectivity resulting in difficulty loading imagery
- Frequent updates to app delayed field operations
- Short battery life
- Inability to charge tablets while in the field (lack of power sources)
- Poor quality of tablets
- Insufficient supply of tablets, routers and charging devices

*“Charging was also a challenge because someone would be traveling just to charge the tablets. If there's no availability of power, then you give someone a phone that's useless. You have to wait for two to three days for data to be sent.”*

– National Representative

# Challenges with Using Reveal App

## Capacity & Motivational

- Poor communication regarding the need for frequent updates
- Insufficient trust in the tool
- Variance in general technological literacy and math skills among users
- Confusing language and instructions built into the tool
- Overburdened supervisors, both in regards to having to complete both paper and Reveal and in having to keep up with spray operators

*“When we were using Reveal we lagged behind because we could not upload the data and the maps weren’t showing. The colleagues started giving up.”*

– Spray Team Leader

# Recommendations

1. Increase collaboration between the national malaria programs, local implementing partners, and app developers to ensure a consistent feedback loop during the app development, rollout, and modification processes for future scale up and use cases of Reveal.
2. Implement additional field testing of the Reveal app and relevant equipment prior to launching the IRS campaign to better understand and prepare for the tool's limitations in remote areas.
3. Procure additional support equipment (e.g., mobile battery packs for tablets, wifi routers, etc.) to ensure the app can operate without disruption. Likewise, procure additional primary equipment (e.g. tablets and mobile phones) to allow more users onto the Reveal platform.
4. Provide more in-depth, practical training for app users prior to field implementation
5. Improve the accuracy of village and building enumeration
6. Practice ongoing, mixed methods monitoring and evaluation of Reveal to ensure user feedback is incorporated into future iterations of the tool

# Solutions

## 1. Technical

- Updated the enumeration & boundary layer using field-verified numbers, additional datasets for triangulation, and more granular mapping
- Optimized the 'My Locator' function, syncing process & speed, and additional platform stabilization
- Added Dynamic Tasking, Team Assignment, and Filled Forms View for QA alignment

## 2. Logistical, Capacity & motivational

- Conducted live-fire testing and load testing to better test and prepare for offline use
- Updated training materials more inclusive terminology, and added video tutorials
- Improved in-field syncing & QA protocols and conducted a mock-exercise with full teams during training to emphasize roles and responsibility



# Questions?

# Snapshot: IRS Implementation, Zambia

2019 vs. 2020 - How have improvements been received in the field?

# IRS Data Collection using the Reveal Tool



Patrick Mwansa

M&E Manager - PMI VectorLink Zambia

Date: 05/11/2020



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FROM THE AMERICAN PEOPLE



U.S. President's Malaria Initiative



1. Background
2. Stability of the Reveal Tool
3. Reveal Tool Feature Improvements
4. Dashboard Utilization for Decision Making
5. Challenges



# Background

- PMI-funded IRS projects have been working with Akros to collect IRS data, using satellite based data collection technology, since 2014.
- During the 2020 IRS campaign season, VectorLink is using the Reveal tool to:
  - Map spray areas and enumeration of eligible structures in 9 of its 15 target districts.
  - Collect spray data in two IRS target districts (Chadiza and Nchelenge)



# Stability of the Reveal Tool

- The Reveal tool has been very stable during the first five weeks of IRS data collection in the two Reveal districts:
  - System malfunctions have drastically reduced compared to its implementation in 2019
  - Faster in loading maps and enumeration data onto mobile devices
  - Faster in navigating the maps
  - Faster in navigating through the IRS electronic data collections forms
  - Low levels of power utilization of the application on mobile devices (Tablets)
  - High retention of data collected in the field through the course of the day



# Feature Improvements since 2019

- Allows for users (TLAs) and supervisors to be easily trained on various features of the system
- Supports IRS data quality assurance protocol—namely, review and comparison of data from paper forms with data collected on tablets before data reconciliation and upload to the cloud
- Weekly upload of IRS plans onto the tablets
- Ability to maintain the assigned color codes for each enumerated and visited structure, throughout campaign period



# Dashboard Utilization for Decision making

- The Reveal dashboard is useful for monitoring IRS performance and aids in decision making
  - IRS performance is monitored at various geographical levels; district, catchment, location (zone) and spray area respectively.
- Data analyzed and presented in ideal format (spray coverage, spray progress, found coverage and spray areas effectively sprayed)





# Challenges

- Some geographical boundaries especially those along district borders do not match reality on the ground
- Instances of mismatched spray area assignments for some TLAs
  - Updating of map/enumeration data, by TLAs, while in the field is often a challenge whenever there is poor internet connectivity
  - This has led to structures being sprayed without being tagged
- Access to the dashboard is a challenge in low internet connectivity areas
- The Reveal dashboard is not very user friendly to navigate



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U.S. President's Malaria Initiative

U.S. PRESIDENT'S MALARIA INITIATIVE

**vectorlink**

INTELLIGENT > INNOVATIVE > INTEGRATED



Thank You!



# Pathways to Sustainability

Long term sustainability models for Global Good platforms

# Open source software is widely used by government and NGO programs addressing SDG challenges around the globe



Small business loans & financial management



Charities connecting with beneficiaries

***“Digital public goods are essential in unlocking the full potential of digital technologies and data to attain the Sustainable Development Goals, in particular for low- and middle-income countries”***

*-UN Secretary-General’s Roadmap for Digital Cooperation*

## Digital Public Goods:



# Who are the Digital Public Goods actors that need to connect?

Independent foundation co-invested in by stakeholders to bridge disparate global, sector and project efforts?

How do we coordinate across the existing open source support efforts?

**Open Source Center + Digital Square + Digital Public Goods Alliance**

## Maintainers

Primarily responsible for  
Open Source Project

Organizational owners  
Individual owner  
Community Governed

## Contributors

Contribute time and  
resources to project

Individual Volunteers  
Organizational Volunteers  
Paid Employees

## Sustainers

Provide financial support  
to open source project

Donors  
Corporations  
Governments  
NGOs

## Consumers

Use the open source  
project, commercialize

Implementers  
NGOS  
Governments  
Corporations

**End Users**

\*Ecosystem Categories from: <https://sustainoss.org/summit/2017/>

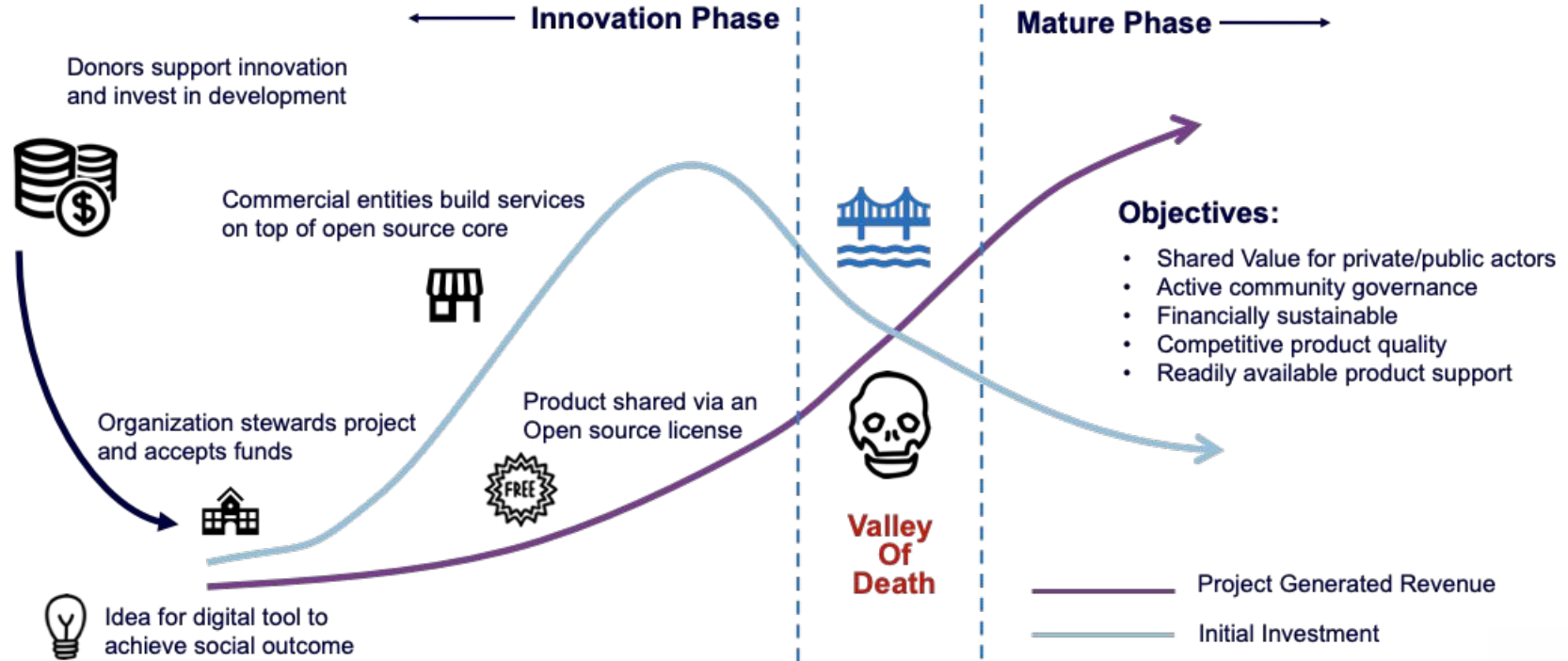


Reveal

dial Digital  
Impact  
Alliance

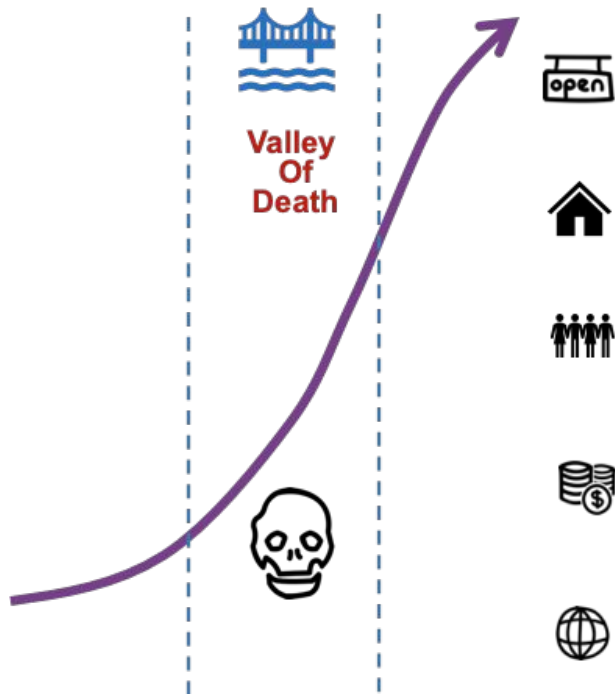
# Journey of a Digital Public Good

Despite widespread use, most digital public goods fail to reach maturity phase and achieve their stated objectives



# What services do Digital Public Goods need to thrive?

We believe an independent foundation is needed to turn the **Valley of Death** into a **Window of Viability**



**Fiscal Home:** A host entity to hold intellectual property, execute legal contracts, and receive funding. This legal entity must be able to meet the audit requirements of multilateral donors, a bar that can be far higher than what many small nonprofits typically encounter.



**A Primary Maintainer:** A primary maintainer takes responsibility for facilitating community management, product roadmaps, community governance, etc., all on behalf of the project's many stakeholders.



**Dedicated Product Team:** Consistent "staffing" (whether directly paid by the project or volunteer) ensures a continuity of quality and efficiency while reducing costs by as much as 40%. With some variance, a core product team typically comprises a product owner, community manager, technical architect, and one or more software engineers.



**Access to Core Funding:** Stable and secure funding for a baseline budget to maintain core product development is foundational for maintaining quality with assurance of ongoing support. Core funds are likely to include a mix of grants and generated revenue, ideally through public-private partnerships.



**Connection to a Community of Practice:** Collaborating with others solving similar challenges leads to better products through knowledge sharing as well as reduced duplication of effort and greater interoperability between products.

# Open Source Center Services Menu

Our three service categories provide direct support - bridging the gap to product maturity



## 1 Professional Services (Advisory/Consulting)



Standard Maturity Model Assessment

Sustainability Workshop and Recommendations

Consulting: Sustainability, Community, Governance, Technical

## 2 Grants and Technical Assistance

Micro Grants

Technical Assistance

## 2 Access to support programs

Google Summer of Code and Outreachy Interns

Discounts, cloud credits, forums, events



Reveal





# Closing

To note; Questions and Feedback

# To Note

- Forum Feedback - [Here](#)
- Technical Review Committee being formed, more soon.
- 2021: Follow [www.revealprecision.com](http://www.revealprecision.com) for community engagement on roadmap direction, documentation expansion (wiki) and help-desk support, upcoming forum meetings and opportunities.
- ASTMH Symposium #140 - 11/19/2020: “Spatial Intelligence to Optimise Public Health Interventions”.





## ASTMH Symposium #140 - 11/19/2020: “Spatial Intelligence to Optimise Public Health Interventions”

Dr. Kafula Silumbe, Senior Program Manager, PATH - Zambia  
“Spatial Intelligence for Malaria Elimination in Southern Province, Zambia”



Olatunde Adesoro, Programme Director, SMC, Nigeria  
“Piloting Reveal for use in Seasonal Malaria Chemoprevention in Nigeria”



Olena Borkovska, Geospatial Division, Center for International Earth Science Information Network (CIESEN), Earth Institute at Columbia  
“High Resolution Population and Settlement Data for Impactful Malaria Intervention in Sub-Saharan Africa”



Center for International Earth Science Information Network  
EARTH INSTITUTE | COLUMBIA UNIVERSITY



Dr. Hugh Sturrock, Chief Science Officer, Locational  
“Improving Access to Data Science and AI: A Global Health Priority”



# Thank you!



A large rectangular area containing a grid of logos for various partner organizations. The logos include: OPENSERP, Clinton Health Access Initiative, iSARM, DSME (with a mosquito icon), vectorlink (with "J.S. PRESIDENT'S MALARIA INITIATIVE" text), Johns Hopkins University, dial Digital Impact Alliance, Bill &amp; Melinda Gates Foundation, Vital Wave, World Health Organization, PATH, Abt Associates, TELESMA (with "THE TECHNOLOGY TALISMAN" text), planet., USAID (with "FROM THE AMERICAN PEOPLE" text), U.S. President's Malaria Initiative, Ministry of Public Health (with a circular emblem), UCSF (University of California San Francisco), The Mentor Initiative, digital square, MAXAR, The End Fund, HOT (with a red arrow icon), TERRAFRAME, and GRID3 (with "GEO-REFERENCED INFRASTRUCTURE AND DEMOGRAPHIC DATA FOR DEVELOPMENT" text). The Center for International Earth Science Information Network logo is also present at the bottom right of the collage.

For more information: [info@revealprecision.com](mailto:info@revealprecision.com)  
[www.revealprecision.com](http://www.revealprecision.com)  
Anna Winters, PhD - [awinters@akros.com](mailto:awinters@akros.com)



Center for International Earth  
Science Information Network  
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