Technical Assistance Information Session

Front-line technologies and data analytics for pandemic preparedness and response

Overview

Digital technologies will play an increasingly important role in pandemic preparedness and response. As COVID-19 has demonstrated, collecting timely and accurate data and making it actionable is crucial to inform effective public health decisions and to save lives. There is immense value in building strong, integrated data and information systems in countries, whether for current epidemics like HIV, TB and malaria, pandemics like COVID-19, or emerging threats. Digital technologies and systems are a key part of strengthening pandemic preparedness strategies. The Global Fund and The Rockefeller Foundation are committed to supporting countries to develop and accelerate digital technologies and improve the use of data for better community health.

On 17 November 2021, the Global Fund and The Rockefeller Foundation organized a Technical Assistance Information Session on pandemic preparedness and response (PPR) front line technologies and data analytics, as part of the Data Science Catalytic Fund (DSCF). Four partners – Dimagi, Medic, Zenysis and Living Goods – presented their technologies being deployed in Burkina Faso, Mali, Pakistan, and Kenya.

This session showcased some best practices in innovation for digital health, illustrating how countries, companies and institutions can partner to leverage existing systems and bring innovations to effectively respond to COVID-19 and other current and future pandemics. It is an example of how, working together as a broader global community, we can catalyze learning around digital health at the community level and support them in strengthening their capacity to prepare for and respond to pandemics.

Recommendations

Some overarching lessons can be learned from the case studies on innovation during COVID-19 that were presented in the session.

- **Government leadership and vision** is key for success. This includes the establishment of national digitalization strategies, policies, and clear digital governance frameworks.

- It is more effective to **build upon existing digital infrastructure** and integrate systems rather than invest in stand-alone ones. Mapping available digital tools and solutions can identify bottlenecks and areas for collaboration, reducing fragmentation. Selecting digital tools that are adaptable is preferable.

- **Partnership is crucial.** Strong partnerships across government sectors, donors, implementers, and other relevant stakeholders are necessary to support countries in achieving their goals.

- **Sustainability is essential.** Solutions brought in by partnerships should be accompanied by a sustainable transition of ownership plan; hence the importance of capacity building/transfer of information as part of the country's digital transformation plan. Co-financing and co-design of digital health solutions and implementation plans alongside governments are also key levers to achieve sustainability.

Case studies

Case study 1: How an existing app by Dimagi was adapted for the COVID-19 response in Burkina Faso

Presentation by Jonathan Jackson, co-founder & CEO, Dimagi, and Dr. Boukary Ouedraogo, director of Health Information Systems, Ministry of Health, Burkina Faso

Context

Investments from the Global Fund, The Rockefeller Foundation, and partners since before the COVID-19 pandemic contributed significantly to the success of Dimagi and Burkina Faso's digital collaboration. Back in 2010, Burkina Faso's Ministry of Health partnered with Terre des hommes to implement the Integrated e-Diagnostic Approach (IeDA) app at the front lines to increase adherence to Integrated Management of Childhood Illness (IMCI) protocols.

Over the last 10 years, multiple digital partners have joined these digitalization efforts and by March 2020, health workers in 85% of the country's primary health care centers were using CommCare, a digital app designed to improve the ease and efficiency of work for front-line health workers, including at the community level. The fact that the digital infrastructure was already in place became a key point of leverage when COVID-19 hit. One of the reasons this project has been highly successful is that this application increases protocol adherence and quality of care at the primary health centers.

Leveraging a digital solution to respond to COVID-19

Because the digital infrastructure already existed at scale, and thanks to the flexible and modular nature of the CommCare tool, it was possible to rapidly build and deploy COVID-19 modules within three weeks. The screening and triage feature guided health workers through an algorithm to assess symptoms, map suspected cases, and trigger mobile message alerts to health authorities for testing and follow-up. In addition, the counseling and community sensitization module prompted health workers to share information, raise awareness, and coach caregivers on protective measures. Finally, the e-learning for health workers module equipped them with up-to-date information, guidance and answers to frequently asked questions.

> **250,000**
> *Average number of child consultations per month*
>
> **92%**
> *Usage rate in consultations of children under 5*
>
> **US$32 – US$66**
> *Cost-savings per health facility per month*

Lessons learned and best practices

By scaling the digital tool nationally and investing Global Fund resources, Burkina Faso's Ministry of Health has created an enabling environment for digital solutions. In addition, Terre des hommes and Dimagi have executed a roadmap for full transfer of ownership and system maintenance to the government.

Burkina Faso's experience has demonstrated that national leadership is key and collaboration with partners can drive effective scale-up of digital solutions. In addition, specific policies help to align donors and partners around national digital health strategies. Consistently using a proven and approved digital tool that serves front-line workers in conducting their work and that is easily adaptable during a crisis ensures long term sustainability. For instance, using a digital tool that is already scaled up like CommCare meant that COVID-19 modules could easily be integrated and deployed within weeks. Digital tools should be fully integrated into the country's health infrastructure and national health system, so that data can be readily available for decision-making. In this way, a separate pandemic preparedness and response tool is not needed, as it is already integrated.

Case study 2: Medic and the path to national scale-up of a digital solution in Mali

Presentation by Professor Bagayoko, MD, MSc, PhD and Fatou Fall, West Africa program head at Medic

Context

In Mali, initially there were many different digital health tools available in the country. Some of the challenges in this fragmented digital health environment included the absence of a national digitalization plan and roadmap, unclear roles and responsibilities between governance structures, the lack of an interoperability framework, and insufficient qualified human resources in digital health and health information systems.

The government of Mali decided to consolidate a digitalization policy and establish clear digital governance. To do so, the government launched a comprehensive mapping exercise to define the information needs at the central, regional and community level, with the patient at the center. They consulted with relevant stakeholders and conducted thematic workshops, establishing a cartography of all the available digital tools in the country that they benchmarked against each other. This in-depth analysis objectively determined that the best option was the Community Health Toolkit (CHT) – a platform developed by Medic, a private company that creates open-source digital tools to help community health workers to provide timely, equitable and accessible care. Successful field implementation experiences with the CHT supported this decision, and this has led to a national scale-up of the digital solution.

> **Results of the 2020 Community Health Toolkit initiative with community health workers in Bamako:**
>
> **500,000** households visited across Bamako
>
> **2.5 million** residents surveyed
>
> **925,594** care interactions by community health workers
>
> **Over 30,000** identified sick individuals
>
> **980** suspected cases of COVID-19
>
> **187** confirmed cases of COVID-19
>
> **Over 8,000** people with pneumonia symptoms
>
> **Over 800** people with TB symptoms

Leveraging a digital solution to respond to COVID-19

Since 2016, in collaboration with implementing health partner Muso, Medic has used the CHT platform to deploy the community health worker app (used for COVID-19 and TB screening and referral; diagnosis and treatment for malaria and pneumonia; vaccination status; and community health worker self-assessment) and their supervisor app (which offers 360-degree supervision). Medic's supervisor app has been scaled at the national level since 2019, and in 2020, the community health worker app initiative was rolled out to detect suspected cases of COVID-19 in Bamako and identify COVID-19 clusters. Based

off the success of this field experience, in 2021 the CHT was adopted as the unique national digital tool for all community health workers, also known as *les ASC Sentinelles*, who are tackling community-based COVID-19 transmission.

Lessons learned and best practices

By conducting a mapping exercise and in-depth analysis of the digital landscape, the government of Mali was able to identify challenges related to digital governance and information needs at the community level.

In response, Mali developed its Digital Health Strategic Plan, which was technically validated in May 2021. Community level digitalization was aligned with this strategic plan to ensure the integrated, coherent and harmonious development of digital health at the national level. It is now imperative that all actors combine their efforts around this roadmap. In addition, Mali has existing central digital structures, existing laws protecting personal data, significant 3G coverage across the country, an existing national data center, and a dynamic digital ecosystem – and all this contributed to the COVID-19 response.

Case study 3: Zenysis Technologies in Sindh province, Pakistan: from emergency response to routine use

Presentation by Bilal Shahid Rao, former deputy commissioner, government of Sindh, and Abdullah Khan, director of Zenysis Technologies

Context

The Sindh province in Pakistan counts a population of around 1.6 million people and around 90 health facilities. When COVID-19 hit in March 2020, the government of Sindh province declared a public health emergency and set about planning how to respond. However, this was complicated by the lack of available information – different datasets were scattered and were not cohesive, which made it difficult to get a clear picture of the situation. The government needed timely and accurate datasets to inform public health decisions, identify hotspots, and implement local lockdowns.

Leveraging a digital solution to respond to COVID-19

Zenysis, a digital interoperability platform, provided a good solution. Deployed in April 2020, the Sindh Sehat Analytics Platform (SSAP) brought together all data related to COVID-19 cases (at the individual and aggregate level), logistical data (including personal protective equipment (PPE) data, hospital bed availability, ventilator availability, and lab testing capacity), and auxiliary data (such as population size and geographic information). All this data was integrated through the Zenysis platform and then transmitted to the Sindh Virtual Control Room.

Data integrated through Zenysis supported the government to assess the spread of COVID-19 at the provincial and district levels, through high resolution COVID-19 data analysis, the production of daily reports, and pin-point case mapping. The data also informed optimal allocation of resources to high burden areas and enabled the tracking of active cases with special attention to high-risk and critical patients. For instance, when the datasets revealed 10 unused ventilators in one district, the government was able to relocate these to a high burden area. In addition, data enabled the government to implement targeted micro-lockdowns in areas with high concentration clusters of COVID-19. This allowed them to not only save lives, but also livelihoods.

Lessons learned and best practices

Ever since COVID-19, in the last year Zenysis has completely integrated all data systems, and this can now be used to improve health outcomes in other areas, such as routine immunization. For example, using advanced analysis and triangulating data on children who have not received any polio vaccination dose, the Zenysis platform can identify whether this is due to challenges in service delivery or rather challenges in demand generation, and a health intervention can be planned accordingly.

In the next 15 months, Zenysis is aiming to transfer ownership of the digital solution to the government and has laid out a sustainability roadmap for this to happen. The focus is on technical sustainability, and this includes considering how the digital solution can be scaled and maintained in a high-performance state over the long term. Zenysis will build innovative and user-friendly front-end tools that enable staff from the Sindh Expanded Programme on Immunization (EPI) to begin performing key technical functions to sustain SSAP with minimal support from Zenysis. They will also focus on capacity building, to ensure the effective transfer of knowledge.

Case study 4: Living Goods and sustainable, government-led community digital health systems in Kenya

Presentation by Dr. David Oluoch, director of Partnerships, Advocacy & Communications, Dr. Gregory Ganda, county executive committee member for Health, Kisumu County, and Mohini Bhavsar, global head of Digital Health Partnerships

Context

Living Goods supports community health workers to be digitally enabled, equipped, supervised, and compensated in order to drive impactful, cost-effective community health programs and help families receive the care they need. Living Goods offers governments policy and implementation support to help build resilient health systems. They started off their programs in Uganda and Kenya and have now expanded to Burkina Faso and Ethiopia. The Global Fund and The Rockefeller Foundation's Data Science Catalytic Fund (DSCF) supports the programs in Uganda and Burkina Faso.

Leveraging a digital solution to respond to COVID-19

In 2020, Living Goods rapidly adapted their existing SmartHealth app, which is built on the Community Health Toolkit (CHT) platform, to give community health workers the option to do remote consultations, as well as complete safety and precautions checklists before home visits. The app also included new workflows to assess COVID-19 symptoms and risk tracking, while ensuring that the community data flowed to the national level, thus aligning with national policy. Other innovations aiming to transform how care was delivered were included, such as client-initiated health assessment tools, remote learning options for community health workers, broadcast text messaging for disease awareness, and dashboards for surveillance. These innovations are still being evaluated at the learning sites to see which should be recommended and what other opportunities exist.

In addition, Living Goods is continuing to innovate around the role that community health workers can play regarding COVID-19 vaccinations, including supporting the mobilization and sensitization of communities. The new adaptations to the app enable community health workers to screen for eligible household members and refer them to vaccine sites. They can also collect information concerning vaccine hesitancy. Lessons from this work can help shape policy changes and better understand the role of community health workers and COVID-19 vaccination.

Lessons learned and best practices

Co-financing arrangements with governments is a key lever for sustainable digital health programs. In Kisumu County in Kenya, Living Goods worked with the government on a co-financing agreement supporting an electronic community health system (eCHIS) that aims to improve community health services, including a digitalization strategy for community health workers. Kisumu is a strategic county in western Kenya, with a large population, a high disease burden and strong political will.

> Co-financing arrangements with governments is a key lever for sustainable digital health programs.
>
> Cost-share proportions:
>
> - Kisumu County: 75%
> - Living Goods: 25%

Kisumu County is financing the majority of the program, including the training of community health workers and their supervisors, the provision of commodities, and compensation of community health volunteers. Living Goods covers the cost of devices like phones and tablets, technical training, and data bundles. Some of the benefits of this co-financing agreement includes government ownership of the program and an active understanding of realistic costs of the digital transformation of community health services. In addition, co-designing the program and implementation plan with the government was key to its success. The digitalization of community health has translated into big achievements, including significant improvements in maternal health outcomes, and higher delivery rates at the hospital.

Next technical assistance sessions

Technical assistance sessions in preparation in 2022 will address the following themes:

- Cloud-based hosting and data storage;
- Data analytics and interoperability solutions including, but not limited to, PPR;
- Lab information systems strengthening;
- Webinar and in-country stakeholder training sessions on the newly launched guidance for community health worker strategic information and service monitoring; and
- Developing community health worker master lists and registries.

To suggest other themes, please contact Shuai Jin (shuai.jin@theglobalfund.org), Beatriz Thome (beatriz.thome@theglobalfund.org), and Anthony Burn (anthony.burn@theglobalfund.org).

Further resources:

- The Global Fund
- The Rockefeller Foundation
- Dimagi
- Medic
- Zenysis
- Living Goods