

Learning Brief

Development and Roll-Out of a Mobile Application for Community and Health Facility Level Case-Based Registration and Tracing of Visceral Leishmaniasis (VL) Patients in Bangladesh

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EXECUTIVE SUMMARY

To fulfil the target of elimination of kala-azar patients in Bangladesh by 2025, it is crucial to systematically track patients from detection to treatment. In Bangladesh, the existing mechanism for capturing cases of Visceral Leishmaniasis (VL) and Post Kala-Azar Dermal Leishmaniasis (PKDL), is labor-intensive and inefficient. An advanced reporting tool will increase the efficiency of data collection, reduce the burden on surveillance workers, and aid decision-makers to make evidence-informed decisions on where to strengthen their health capacity by looking at the data at a glance.

In response to this need, the Ministry of Health requested support for the development of a system to capture the data for VL & PKDL and the Kala-azar mobile application was born. The resulting product is an intuitive mobile application in which users can insert case and manage data for assessment, referral, and monitoring. The tool promotes the continuous cycle of data; from data insertion of suspected patients, to referral for testing, to progress monitoring through effective follow-up and reporting. To inform the development of the application, focus group discussions (FGDs) were conducted with community health workers in the endemic areas.

Around 70 community health workers, doctors, nurses, data managers, health specialists supported the design and development process. The application was designed and developed using the latest technology for fluid operation and compatibility with both Android and iOS devices. A system thinking approach was utilized to understand the detailed process flow of the system before converting it into a technical application. The system thinking approach was integral to effectively analyze and understand key user requirements so that the system is based on actual user needs.

Recommendations for going forward:

- Given the importance of this kind of tool to effectively track patients and reach elimination targets by 2025, it is important to provide comprehensive training and to pilot the application among the health officers who are directly involved with identifying and monitoring the kala-azar patients.
- It is beneficial to lower the barriers to use as much as possible, by for example providing health officers with a smartphone and/or mobile data package).
- Further training and the development of a more extensive plan to disseminate the application among users will be required to ensure the sustainability of the application in the long run.
- Software development involves multiple phases of development and iteration to continuously incorporate user needs into the design and functioning of the tool. To fulfill these needs, further development will be required.



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1. INTRODUCTION /

Neglected tropical diseases are a major public health problem, which ultimately creates logistical and economic barriers, displacement, and health conflict among communities. Kala-azar is a major public health problem in Bangladesh, having been endemic for many decades.

To fulfil the target of elimination of kala-azar patients in Bangladesh by 2025, it is crucial to systematically track patients from detection to treatment. In Bangladesh, the existing mechanism for capturing cases of VL and PKDL, is labor-intensive and inefficient. An advanced reporting tool will increase the efficiency of data collection, reduce the burden on surveillance workers, and aid decision-makers to make evidence-informed decisions on where to strengthen their health capacity by looking at the data at a glance.

In response to this need, the Ministry of Health requested support for the development of a system to capture the data for VL & PKDL and the Kala-azar mobile application was born. The main goal of the mobile application is to reduce VL incidence through early case detection, prompt diagnosis, and treatment. The tool uses a 360-degree approach to eliminate this disease by maintaining proper surveillance, a complete treatment course, and rapid diagnosis under one effective network. Dnet provided the technical support to develop a mobile application for tracing and case-management of VL patients in Bangladesh using a human-centric design approach. The application also includes a referral mechanism and patient follow-up for effective treatment with secure data management and efficient reporting. The application is embedded within the existing National HMIS system (DHIS2) and has been implemented through trained government staff. The development and roll-out of the application have been supported through ASCEND.

1.1 Objectives

The primary objective of this project was to develop an intuitive and user-informed mobile application to be used for improved tracing and case-management of VL patients in the endemic areas of Bangladesh. To be effective, the tool had to effectively capture all components of the tracing and case-management cycle, from data insertion of suspected patients, to referrals for testing, to monitoring patient progress, and finally through to effective follow-up and reporting. The tool also had to have an informational component, to ensure proper information is shared about Kala-azar, among all health professionals involved in surveillance. Finally, it had to be embedded into the national HMIS system to allow the National Kala-azar Elimination Programme (NKEP) program to easily monitor the current progress of kala-azar centrally.

2. ACTIVITIES /

2.1 Designing the project implementation plan

After several meetings with the different levels of stakeholders for collecting the requirements, Dnet prepared a software requirement specification (SRS). Two field visits in the Trishal and Bhaluka Upazila in Mymensingh Division, key hotspots for kala-azar patients activities, were subsequently conducted to learn more about the process. Dnet visited a health complex where kala-azar patients are cared for to understand the processes of collecting the information of the patients, including form design and patient tracking and to get insights on how the supervisors work, how they detect a kala-azar patient and much more. Dnet was also able to collect feedback on what medical professionals would want to see on the platform and what would make their tracing, referral, and case management work easier and more efficient.

Having collected this information and understanding the requirements to finalize the SRS, a lay-out was designed for the alpha and subsequent beta version of the mobile application, and finalized in consultation with ASCEND.

Throughout this application development period, ASCEND supported Dnet by collecting requirements, conducting multiple stakeholder meetings to understand the real scenario of kala-azar cases, tracking field visits, piloting, and conducting training among the surveillance medical officers.

2.2 Piloting, back-end support, post Launch

After a review & refinement stage, the application completed its first stage of development and was ready to be piloted. Dnet conducted a pilot visit in an existing Kala-azar tracking camp, in Bhaluka, Mymensingh, where kala-azar patients go for regular check-ups. The pilot was conducted by the supervisor of the camp. The primary goal was to check the use and functionality of the mobile application and receive feedback. The test was successful and the system responded to a successful data entry and the admin was able to see the data from the backend. All the feedback that was collected was incorporated by Dnet.

2.3 Development of user guideline

To use the application properly, a user manual was developed and provided by Dnet for the application user. Using this guideline the surveillance medical officers, UHC medical officers, and designated treatment center's medical officers, persons in charge, program managers, and frontline health workers can easily learn the uses of the application and use this application in field visits and camps for tracking the kala-azar patients.

2.4 Training, Maintenance, troubleshooting, and reporting

To use and test the application in real-time at the field-level Dnet conducted a 2 day hands-on training session with a range of medical professionals, including a medical officer, lab technician, and treatment center medical officers, program managers, frontline health workers, and the ASCEND team. Dnet provided content management training, development & hosting training, and application submission training to all officials. They used the application in real-time and monitored the progress of kala-azar from the application. After completing this training session and gathering feedback from them, some requests for changes were raised. To incorporate these requests, further development support will be required.

3. SUCCESSES AND CHALLENGES /

In the end, the key success was that a user-friendly mobile application was successfully developed under this project. The mobile application for Android and IOS application is currently in the review phase in the app store. The application was designed and developed using the latest technology for fluid operation and compatibility with a range of devices. A key element of this success was that the application followed a system-thinking approach to ensure the detailed process flow of the system was directly informed by key user requirements and directly based on their needs. These needs and user requirements were collected in focus group discussions, training, and meetings with relevant stakeholders. Another key success was the pilot that was conducted to check the application readiness for full-scale implementation.

The challenges faced throughout the project were primarily logistical. Firstly, the project was delayed by the approval process required from the DGFP for collecting data on VL patients. After some back-and-forth, the necessary data was collected and inserted into the system. Furthermore, due to the outbreak of COVID, there was a delay to conduct training and piloting on time.

4. Lessons Learned and Recommendations /

As mentioned before, the system thinking approach was utilized to understand the detailed process flow of the system before converting it into a technical application. The system thinking approach was integral to effectively analyze and understand key user requirements so that the system is based on actual user needs. Furthermore, given the limited timeframe for the development, the utilization of Flutter was very effective and enabled for a smooth and easy cross-platform mobile app development process.

Given the importance of this kind of tool to effectively track patients and reach elimination targets by 2025, it is important to provide proper training and to pilot the application among the health officers who are directly involved with identifying and monitoring the kala-azar patients. It would also be beneficial to lower the barriers to use as much as possible, by for example providing them with a smartphone and/or mobile data package). Furthermore, proper software development involves multiple phases of development and iteration to continuously incorporate user needs into the design and functioning of the tool. To fulfill these needs, further development will be required.

5. Conclusion /

Improving timely case detection and case management is central to VL control. The Kala-azar mobile application was developed to properly trace and manage cases of VL patients in Bangladesh, with the aim to fulfil the target of elimination of kala-azar patients by 2025. The main goal of the mobile application is to reduce VL incidence through early case detection, prompt diagnosis, and effective treatment. The Kala-azar mobile application was successfully developed and training and piloting has been carried out, however further training and the development of a more extensive plan to disseminate the application among users is required to ensure the sustainability of the application in the long run.

Appendix A: MOBILE APPLICATION FOR VL DATA: USER MANUAL