ENGAGING THE PRIVATE SECTOR IN DISEASE SURVEILLANCE USING SOCIAL MEDIA CHATBOTS IN MYANMAR

SUMMARY

Despite the importance of the private healthcare sector in Myanmar, private clinics and pharmacies are not involved in disease surveillance, and there are no standard tools for disease notification to health authorities. In the context of a fragile health system that is affected by ongoing conflict and social and economic disruptions since early 2021, there is a need to include the extensive private sector into efforts to improve surveillance of outbreak-prone diseases and emerging infectious pathogens through a nationwide integrated disease surveillance system.

As part of an investment by the Indo-Pacific Center for Health Security, PSI/Myanmar developed and implemented social media chatbots used for disease notification by private healthcare providers, in line with the project’s goal to improve health security through more effective and efficient surveillance and emergency response capabilities. The newly designed digital tools were proven to be user-friendly and scalable with potential future integration into the national surveillance system. The chatbots are available on Facebook Messenger and Viber, and are linked to DHIS2 for data visualization and analysis.

This brief describes the learning process and outcomes achieved, in support of private sector inclusion in real-time diseases surveillance through innovative digital solutions.

INTRODUCTION

Myanmar is currently highly vulnerable to public health threats, particularly in conflict-affected border areas. The national burden of major communicable diseases such as TB and malaria is high, with recent outbreaks of dengue, malaria, chikungunya, and measles posing significant challenges to a health system still crippled by the ongoing COVID-19 pandemic. Public health surveillance and response systems serving mobile and other vulnerable populations in particular are not fully functional, resulting in increased risks of disease outbreak and other public health emergencies.

To support disease surveillance and effective management and response to outbreaks, Public Health Emergency Operations Centers (PHEOCs) require well-established integrated surveillance and monitoring systems. They need comprehensive and timely data on key diseases and symptoms, captured from both public and private sector healthcare providers. Yet, there are multiple challenges in extending disease surveillance to private clinics and pharmacies, as they lack the resources, infrastructure, standard tools, and incentives to report case data for notifiable diseases.
PROGRAM APPROACH

With funding from the Indo-Pacific Center for Health Security, Population Services International (PSI) is working to improve national governments’ long-term capacity to monitor, prepare for, and respond to disease outbreaks by strengthening PHEOCs in Myanmar, Cambodia, and Laos. To achieve the goal of improved health security, during 2020 and early 2021, PSI/Myanmar supported the Ministry of Health with interventions around 1) enhanced disease surveillance information systems, 2) PHEOC workforce development and capacity building, 3) establishment of the PHEOC legal authority, and 4) implementation of an Incident Management System and associated plans and procedures. Due to the change in country’s leadership following the coup d’état in February 2021, the project team repurposed part of its strategy to focus on private sector disease surveillance and response for COVID-19 and other infectious diseases.

During the initial phase of the project, PSI conducted a basic desk review of existing notifiable disease surveillance systems and of the national HMIS to identify existing data flows and reporting mechanisms as well as current gaps and bottlenecks. Although the surveillance of HIV, TB, and malaria is supported by strong electronic systems, the surveillance system as a whole is fragmented by these vertical surveillance systems that use different reporting formats as well as by the continued use of paper-based reporting for other diseases. Private sector data are not routinely captured, yet private clinics and pharmacies are the dominant health service delivery channel in the country. While many private health providers have been engaged in routine monthly reporting systems to the government through INGOs and local NGOs, they are not involved in real-time disease surveillance and response. The lack of systematic initiatives or infrastructure to steward the private sector in disease surveillance further contributes to fragmented public health functions for prevention and control of disease outbreaks.

Overcoming the impediments of traditional paper-based and custom-built mobile reporting tools, PSI initiated a private sector real-time disease notification mechanism using social media chatbots. These tools were found to be ideal due to their ease of use (everybody has a social media account!) and require only minimal training, maintenance, and troubleshooting (no need to upgrade apps, manage user accounts, or ensure compatibility with mobile devices).

We initially developed a Notifiable Diseases Information System (“NODIS”) chatbot built on Facebook Messenger which connects to a DHIS2 database, then rolled out to PSI’s Sun Community Health’s (SCH) network of private general practitioners in December 2020. The suite of digital reporting tools was further expanded to include additional service delivery networks including clinics and pharmacies, as well as a new reporting channel, Viber.
KEY INSIGHTS

Flexible project design enables response to acute health needs in changing contexts

Private sector disease surveillance was not one of the initial project focus areas in supporting PHEOC. However, the military take-over of Myanmar’s government in February 2021 and the ensuing nationwide state of emergency limited our direct engagement with the Ministry of Health, leading to our project activities supporting the public sector being put on hold. During the ongoing political, social, and economic crisis layered on top of a severe pandemic with multiple successive waves of COVID-19 transmission, the public health system all but collapsed. Essential health services were disrupted, while the operational capacity for disease surveillance and public health emergency response further deteriorated.

Seeing the need for greater involvement of the private sector to fill some of these gaps, the project team urgently reprogrammed its activities, shifting the focus towards private sector disease surveillance and COVID-19 emergency response. Within a couple of months, PSI was actively expanding its disease surveillance activities in its extensive network of private health care providers, building on its long-term experience in malaria, HIV, TB, and reproductive health service delivery through these channels.

The quick and successful change in program strategies was made possible by these strong foundations in service delivery, combined with an agile project implementation approach, strong technical capacity on digital health solutions, and a flexible funding agency.

Innovative digital solutions are easy to develop and scalable for functionality

As chatbots are principally server-side applications with a user-friendly interface, it is easier to develop in comparison with other mobile applications. Building on the success of the pilot phase and initial deployment of the "NODIS" chatbot reporting tool for malaria, we rapidly expanded to other social media platforms and private sector channels. The chatbot was updated with additional options for disease notification for tuberculosis ("probable TB") and fever with rash (covering measles, dengue, chikungunya, etc.). Besides Facebook Messenger, we expanded our chatbot platform to Viber to provide end-users the option to use the tool most in line with their preferences as well as to overcome limitations posed by temporary Facebook bans in the country.

Chatbot deployment across both platforms was found to be simple and cost-effective, meaning that it was easy to adopt its use to introduce a Community Malaria chatbot specific to the community channel of the SCH network. This Viber application enables instant reporting of malaria cases by Community Mobilizers, who receive case reports from private outlets and Integrated Community Malaria Volunteers in view of adhering to the standard 24-hour case notification. Once again, we capitalized on existing on-the-ground networks to successfully extend our disease surveillance activities to the community level.

Chatbots and digital tools facilitate extensive private sector network engagement

By November 2021, both chatbots had been launched in a network of more than 500 general practitioners and 1000 community health workers. Between June 2021 and November 2022, more than 6,400 confirmed and suspected cases of malaria, TB, and fever with rash were reported through the chatbots. Instant alerts to local health authorities are sent via automated SMS and are synced with PSI’s open-source DHIS2 platform, which opens the door for potential future integration of data into national surveillance systems. The surveillance dashboards enhance live data monitoring and analysis, enabling rapid detection of potential outbreaks.
As an example of the crucial role of private sector surveillance, during the deployment phase, our network detected two malaria outbreaks at an early stage using these innovative digital tools, and assisted public health authorities to take immediate response. In June 2021, a total of 131 positive malaria cases were notified through the chatbot in Kachin state alone, enabling early detection and case investigation. And again in May 2022, when disease notification chatbots identified 876 cases in the same region, local health authorities were instantly alerted, enabling them to promptly perform case investigation.

Linking disease notification tools with DHIS2 Tracker Application enables comprehensive case management

Following the success of our private sector and community channel chatbots, we further expanded our suite of digital tools to engage pharmacies, which are often the first point of contact for healthcare in the country. Building on our recent experience in working with pharmacies for TB screening and referral, a comprehensive “TB Pharma” chatbot was developed. This tool not only collects TB surveillance data, but also is linked to a DHIS2 tracker program that is accessible to Community Mobilizers through the DHIS2 Android Capture mobile application.

Through this linkage, Community Mobilizers can view individual-level data and follow up with presumptive TB patients to establish confirmatory diagnosis. Used in conjunction, the chatbot and tracker tools allow the Community Mobilizers to take quick action to help TB patients secure the care they need. Data on patient screening, referral, and diagnosis are stored on live monitoring dashboards that are accessible to all program teams and actively used to improve patient referral and follow-up throughout their healthcare journey. As these important mandatory reporting data are captured in DHIS2, the system is ready to be integrated into a national surveillance system at any time.

Since the roll-out in July 2022, more than 400 pharmacies have been trained and have referred over 1,299 cases, of which 421 were registered as TB patients.

TREND IN MALARIA CASES REPORTED THROUGH THE COMMUNITY MALARIA CHATBOT
FEBRUARY–NOVEMBER 2022

<table>
<thead>
<tr>
<th>Total Malaria Cases</th>
<th>Py</th>
<th>Pf</th>
<th>Mixed</th>
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<tbody>
<tr>
<td>4,972</td>
<td>4,814</td>
<td>145</td>
<td>9</td>
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</table>

TREND IN PRESumptive TB CASES REFERRED AND FOLLOW-UP BY COMMUNITY MOBILIZERS
JULY–NOVEMBER 2022

<table>
<thead>
<tr>
<th>Referred Patients</th>
<th>Consulted Patients</th>
<th>Registered Patients</th>
<th>Bact Confirmed Register</th>
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<tr>
<td>1,299</td>
<td>1,285</td>
<td>421</td>
<td>194</td>
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THERE IS NO “ONE SIZE FITS ALL” DIGITAL SOLUTION FOR DISEASE NOTIFICATION: HEALTH WORKERS NEED OPTIONS TO EASILY REPORT SURVEILLANCE DATA
WAY FORWARD

The establishment of integrated national notifiable disease surveillance cannot be accomplished overnight. Our flexible, need-driven approach to health security project implementation has demonstrated that it is possible to rapidly design and deploy innovative digital solutions at scale – and that it is possible to actively engage the private healthcare sector in disease surveillance and response, particularly in complex emergency settings. More generally, healthcare providers and community health workers should be more systematically incorporated into efforts to improve real-time disease notification in order to ensure that there are no large blind spots in the surveillance system.

Unlike most other digital reporting tools, disease notification chatbots connected to systems such as DHIS2 offer easier development, deployment, and agility on multiple social media platforms in accordance with users’ preferences. They allow expansion into different disease areas and can easily integrate with health information systems. However, not one single notification tool will ever be universally appropriate for all private channels: they need to be tailored to meet the user’s needs and preferences.

The functionality of these disease surveillance chatbots can be expanded to include automated alerts and notifications and can be integrated into other workflows through the DHIS2 tracker applications, for example to support patient referral and follow-up. Overall, their accessibility, scalability, and cost-effectiveness embrace a sustainable and interoperable digital health reporting tool, strengthening disease surveillance for improved health security. We have also found that these simple tools can also increase engagement of the private sector, and that it can be easily replicated, particularly in low resource environments.

PSI expects to develop a generic all-in-one disease surveillance system which not only includes notification chatbots but also other solutions that can complement the surveillance and response activities. This system is intended for implementing partners or private organizations to apply in their context.

We also plan to expand the Community Malaria chatbot beyond its current functionality of case-based reporting to include an additional DHIS2 Tracker mobile app for malaria case investigation, thus contributing to a more robust malaria response mechanism that will further our efforts toward malaria control in Myanmar.

ABOUT PSI

PSI makes it easier for people in the developing world to lead healthier lives and plan families they desire by marketing affordable products and services.

While preparing for the readiness of private sector in disease surveillance, PSI highlights the need for private sector surveillance activities to be easily integrated into existing national systems.

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AUTHORS

Dr. Ei Wathan Zaw, Dr. Zayar Kyaw, Dr. Phyo Aung Win, Bram Piot.

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