Incorporating user needs into product development for improved infection detection to support malaria elimination programs

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Introduction

Project DIAMETER (Diagnoses for Malaria Elimination Toward Graduation) has developed a target product profile (TPP) for a diagnostic test intended for use in active infection detection. The objectives aimed at identifying and addressing asymptomatic, low parasite density populations that may serve as reservoirs to sustain malaria transmission. To achieve this, the TPP encompassed the needs of users of the DIAMETER team conducted field research in five low-resource countries.

Field work objectives

Engage users in all stages of the design decision-making process.

Define distinct user scenarios for malaria diagnostic tools in malaria elimination settings in health centers and communities.

Identify job- and outcome-oriented constraints related to each user scenario to inform priorities for new technology development.

Country selection

The DIAMETER team conducted field research in five countries (China, Ethiopia, Tanzania-Jimma, Thailand, and Zambia) across the spectrum of control to elimination.

Collecting user input

We reviewed malaria control and elimination policies and strategies, conducted interviews, and observed practices across the health system from volunteer health workers to national level decision-makers and researchers to better understand the constraints health workers face in accomplishing their jobs. By characterizing the context in which testing occurs, we can better identify relevant constraints health workers face in accomplishing their jobs.

Characterizing the context

The following tables provide an overview of how the TPP for an IDT addresses constraints related to each use scenario for active infection detection.

### Refining use scenarios

The information that emerged from our field work complemented desk research and discussions with stakeholders, and helped us characterize a taxonomy of user scenarios for malaria elimination settings.

### Characterizing the context

We characterized the constraints of diagnostic use including settings, human resources, supplies, infrastructure, processes, and outcomes. Below are examples of the constraints and settings for use scenario for active infection detection.

### Identifying constraints

by characterizing the context in which testing occurs, we can better identify relevant constraints health workers face in accomplishing their jobs. Understanding these constraints allows us to address user needs in the product development specification of an improved diagnostic test.

### Mapping constraints to the target product profile

Because we are targeting the development of an infection detection test (IDT) for use in remote areas where the test was composed and considered the constraints of users in active ID scenario in order to ensure their needs are considered in the TPP. The following examples demonstrate how these user needs guide product development.

Example 1: Users expressed that portability and size are important to ensure the test can be delivered to the patient quickly and that the test results are clear and easy to interpret. To meet these needs, the test should be portable and easy to transport.

Example 2: Users identified that microscopy and transportation are challenging in certain settings. To address these needs, the test should be sensitive to low parasite densities and easy to transport.

### Identifying unaddressed constraints

Constraints related to the health system and the context are more difficult to address within the TPP. In some cases, identified constraints require other actions to ensure the success of the program.

### Next steps

In the next phase of project DIAMETER, we will initiate product development partnerships with the goal of scaling up and implementing the product development process. We will also work in collaboration with stakeholders and program leaders to address operational challenges in order to ensure product uptake.

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