Online, Self-Administered Screening Tool for Improving TB Detection among University Students in Ethiopia

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Challenge TB Ethiopia

Presented by Sherri Haas, Management Sciences for Health
Overview

- High magnitude of TB case notification among university students, ranging from 522 to 1814 cases per 100,000 population.

- With high turnover of student populations, face-to-face mass screening may not be feasible.

- An online, self-administered screening tool was proposed as a method for initial TB screening for university students.

- The objective was to assess the feasibility and yield of self-administered tools for identifying missing cases of TB among the student population.
Implementation timeline

**PHASE 1**
*Developing the intervention*

- Designing of screening checklist
  (April–May 2017)
- Assessing availability and suitability of technology infrastructure
  (May–June 2017)
- Field testing
  (June 2017)

**PHASE 2**
*Implementation (April–June 2018)*

- Learning and adapting from field test
- Preparing for full rollout

[Logos of USAID and msh]
Developed the tool in partnership with the NTP through a consultative process that involved students and university administration. Implemented from April 2017 - June 2018

Piloted: 49 students administered the tool

TB negative students are discharged from care as per national guidelines.

TB positive students are added to follow-up case group with automated SMS follow-up.

Information stored in central data storage.

Students complete online survey questions and submit to data storage system.

Symptoms are analyzed for TB response.

TB not suspected

TB suspected

Data is transferred to CommCare.

Student is prompted to visit clinic.

Clinicians are prompted to contact student.

Automated SMS messages sent.

TB Screening
Sputum samples are collected from those with productive cough and transported to the nearby diagnostic center for GeneXpert testing.
TB self-screening checklist

Please read this information before proceeding with the self-screening.

Some facts:
- Tuberculosis (TB) is an infectious disease caused by bacteria
- The bacteria are easily transmitted from person to person
- Droplets released into the air during coughing, sneezing, laughing, talking, singing, etc... and carry infectious bacteria.
- A person with untreated, active form of TB is usual source of infection.
- The chances of acquiring infections is high in congregate settings
- TB is treatable and curable.

Why self-screening:
- Most of the tertiary level students are believed to be free from TB
- However, a few infected individuals can transmit the disease to many others
- Face-to-face screening of all students is not feasible because of resource constraints
- Since the symptoms of TB are easily identifiable, we think students can easily identify them.

Confidentiality
- All the information you provide in this checklist will be treated confidentially
- If you have TB symptoms, a health worker will contact you for further medical examination and treatment free of charge

Willingness
- Completing this form is voluntary and you can withdraw your responses at any time before submission.

Risk Factor

Have anyone in close contact had tuberculosis (TB) in the past 2 years? *
- Yes
- No
- Not Sure

If the response for the above question is positive, what category below?
- Family
- Dormitory student
- Other:

Have you ever been treated for TB? *
- Yes
- No

Do you have diabetes mellitus? *
- Yes
- No

Personal Information

Full Name *
Your answer

Age *
Your answer

Sex *
- Male
- Female

Mobile Number *
Your answer

University Name *
Choose

Field of Study
Choose

Year *
- 1
- 2

BACK NEXT
Results

- Of 2100 university students, 67.5% completed online screening
  - 58% were Men
  - 87% were ≤ 19 yrs

- 120 students were found presumptive TB cases
  - 17.5% were excluded upon clinic assessment
Results

Total 2,100

Not screened 683 (32.5%)
- No presumptive TB 1,297 (91.5%)
  - Presumptive TB not confirmed 21 (17.5%)

Screened online 1,417 (67.5%)
- Presumptive TB 120 (8.5%)
  - Presumptive TB confirmed 99 (82.5%)

TB diagnosis confirmed in one patient who was already on treatment
Lessons learned and Next Steps

- Demonstrated feasibility of online TB self-screening
  - Optimizing existing facilities for TB screening
    - Availability of free WiFi in the University
    - Presence of a ready sample transport system
  - Enhancing collaboration
    - Willingness of students and clinic staff to collaborate
    - Joint planning with stakeholder engagement
  - Providing performance-based incentives:
    - Mini-media sets provided upon completion of the screening
  - An Operational Research protocol is in progress for further assessment
Thank you

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Who owns my data?
Empowering clients through NFC technology to own their health information

December 2018

Rebecca Litner
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D-tree Approach

Digital and health

- Situated at the intersection of health and technology
- Public health professionals who know and use technology

Impact partner

- Partnerships at the core of our model
- Co-design with stakeholders for greater impact
- Focus on capacity building

Systems, not just apps

- Start by understanding health system & context
- Appreciate complexity and need for comprehensive solutions
- Our aim is to solve health system challenges, not build flashy technology
Health System Challenges

- Data Sharing
- Care Coordination
- Client Engagement
Program Challenges

Maternal Health in Liberia

Tuberculosis in Thailand
What is NFC?
A low cost digital storage device which comes in various forms: card, keychain, bracelet, sticker and more.

How does it work?
Front line health worker stores key client information in the NFC storage device using a mobile phone. The client keeps the NFC device and brings with him/her to any program encounter.
<table>
<thead>
<tr>
<th>Feature</th>
<th>NFC</th>
<th>QR Code/Barcode</th>
<th>Biometrics</th>
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<tbody>
<tr>
<td>Low cost</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Data stays with client</td>
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<td></td>
<td></td>
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<tr>
<td>Functions with limited/no connectivity on single device</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Supports data sharing across locations with no connectivity</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Can read/write data</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Cannot be lost</td>
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</table>
Use Cases

D-TREE PROJECT EXAMPLES

- Maternal services and payments from the government to private health facilities in Liberia.
- Tuberculosis case management and treatment adherence among migrants in Thailand.

Multiple workers on a client case

Client referrals

Client movement

Low connectivity
Pregnant Women in Liberia

Diagram showing interactions between Payer/Government, Provider E-Payment, Data Analytics, Feedback, NFC E-Birth Record, Healthcare Worker Mobile Decision Support.
Tuberculosis Cases in Thailand
NFC Program Design Discussions

- NFC type preferences
- Program use cases
- NFC workflow touch points
- NFC data requirements
NFC Program Development and Testing

- Phone compatibility
- Storage and sensitivity
- Data and workflow testing
- Connectivity testing
NFC Program Usability Feedback

- NFC scanning skills
- Usability enhancements
- Training focus areas
NFC Program Takeaways

1. Use a systems and client centered approach

2. NFC technology as a solution to client data ownership and engagement

3. Address common and complex use cases across multiple locations with limited connectivity

4. Undergo thorough design, testing and usability activities for NFC program
Thank you

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DIRECT TO USER DIGITAL HEALTH SOLUTIONS IN LOW & MIDDLE INCOME COUNTRIES

CASE STUDY
DOT™ FERTILITY APP

Presented by Leslie Heyer
Founder, Cycle Technologies
THE FUTURE OF DIGITAL TECHNOLOGY IS PROMISING

Mobile technology is transforming healthcare.

70% of the world’s population will use a smartphone by 2020.

Smartphone use will grow most in Africa, the Middle East, and South Asia.

Source: Ericsson Mobile Technology Report
BUT, THERE ARE CHALLENGES...

- CONTEXT
- TECHNOLOGY
- USABILITY
- EVIDENCE
- SCALE
- SUSTAINABILITY
The Dot Fertility App

Dot is multi-talented

- Prevent pregnancy
- Plan a pregnancy
- Just track my periods

HOW WOULD YOU LIKE TO USE DOT?
214 million women worldwide have an unmet need for contraception.

80 million unplanned pregnancies occur worldwide each year.

95% of unplanned pregnancies occur to women not using contraception consistently.
The most common methods available and in use include:

- Female sterilization 18%
- IUD 12%
- Pill 8%
- Male condom 8%
- Rhythm or withdrawal 8%
- Injectable 5%

Source: Trends in Contraceptive Use Worldwide 2015
“Contraceptive prevalence among married or in-union women age 15-49 by method.”
CONTEXT
REASONS FOR NON-USE

#1 Concerns about side effects

- Access
- Cost
- Partner Unwillingness
- Cultural Bias
- Provider Bias
WHAT IS THE SOLUTION?

effective | non-hormonal | low cost | accessible | works in a variety of contexts
DOT™
A FERTILITY APP

A fertility app that dynamically calculates a woman’s conception risks for each day of her cycle using just her period start dates. It can be used to prevent pregnancy, plan pregnancy, or to track cycles.
HOW IT WORKS

To use Dot,

• A user enters her period start dates.

• Dot’s proprietary algorithm uses a statistical analysis & machine learning to identify a user’s fertility risk each day of her cycle.

• Dot flags pregnancy risk as High or Low based on the user’s unique cycles, amount of information entered, and her reproductive goals.

• Dot refines its calculations and narrows the High risk days as user enters in more period start dates.
● Worked with leading experts
● Developed an algorithm that uses a Bayesian statistical approach
● Trained it on data from the WHO & U.S. datasets
● Computational analysis identified
  - key cycle parameters
  - variables for implementation
  - high theoretical efficacy.
## TECHNOLOGY

<table>
<thead>
<tr>
<th></th>
<th>Current Access</th>
<th>Forecasted Access</th>
<th>Technology Capabilities</th>
<th>Technology Limitations</th>
<th>Ease of Distribution</th>
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Direct to User Digital Health Solutions in Low & Middle Income Countries
DESIGN & USABILITY

[Diagram of a user interface for an app named 'Belinda Jacobsen', showing features for tracking fertility and pregnancy likelihood. The interface includes icons for 'low' chance of pregnancy today, with notes for 'today' and 'cyclos tracked'.]
DESIGN & USABILITY

EARLY FOCUS GROUPS → 1-ON-1 PROTOTYPE TESTING → 1-ON-1 CORE FUNCTIONALITY TESTING → 1-ON-1 FULL APP TESTING → PERSONAL USE OF THE APP + FOCUS GROUP FEEDBACK
See which days you are likely to get pregnant.
EVIDENCE

• Foundational research on this type of intervention showed that it could address unmet contraceptive need and bring new users to family planning.

• Computational analysis which showed theoretical efficacy.

• Usability research which showed users understood it and could use it correctly.
CONTRACEPTIVE EFFICACY STUDY

- Conducted by researchers at Georgetown University’s Institute for Reproductive Health.

- Study completed October 2018 and final results will be published and publicly available shortly.

- Interim results have been published and indicate a very high perfect use and typical use efficacy.
SCALE-UP

• Over 100,000 users.
• 30% of users are in low & middle income countries.
• Most of this comes from cost efficient digital marketing, app store discovery, and word of mouth.
• Scale-up activities beginning in specific countries in early 2019.
SUSTAINABILITY

- Low cost distribution and marketing.
- High value to end users, but limited ability to pay.
- Innovative business models – ad model, upgrade model, subscription model, co-marketing opportunities, etc.
DOT REVIEW

• No side effects
• Free or low cost to end user
• Effective
• Accessible entirely through a mobile device
• Low cost & easy to distribute
• Sustainable through innovative business models
TAKEAWAYS

• Think big. What is the issue you are trying to address?

• Drill down to understand the key drivers of the problem.

• Stay laser focused on the end user’s needs.

• Keep the user at the center of your technology.

• Be flexible.
PROJECT CHECKLIST

- What is the goal?
- What is the life of your user like? What are they currently doing?
- What technologies do these users already have access to?
- What technologies will they have access to in the next few years?
- What do you need the technology to do in order for your solution to be proven? Is this different than what you need for it to scale?
- How easy is it your solution to use? Does it “delight” the user?
- What evidence do you need to determine if your project is successful or to build confidence among potential users or stakeholders?
- How will you scale? Does the chosen technology lend itself to scaling?
- What is the plan for sustainability?
Thank You!

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