Community Engagement: Use of Mobile Technologies in Health Promotion and Disease Management

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Global Health and Disasters Course
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Objectives

• To discuss motivations for using cell phones in health promotion and care delivery
• To consider the evidence base and promising practices for mHealth interventions
• To identify emerging programs that integrate mobile phones and other digital devices in health promotion and disease prevention in the global south
Why Mobile and Social Media and other Digital Strategies?
Why Mobile and Social Media

• Reach—can potentially reach many more people with technology than through face to face programs
  • Are they the “right” people?
  • Can we keep them?
• Potential for impact
  • While likely smaller effects, they reach more people
  • Population effects and therefore impact has potential to be greater

• Timing—once we reach people, we can do so at times of the day and days of the week that either are more convenient, and/or more relevant or ideal for sending a message
Why Mobile and Social Media

• Standardization—the message or program is delivered in the same way each time

• Easy to adapt or change—can use effective content but alter the spokesperson or setting

• Scalability—if we know a technology based program works, it is potentially easy to replicate and disseminate widely in different settings
Mobile phone subscriptions per capita 2011
The use of Mobile Devices

- Mobile phone technology is the predominant mode of communication world wide
- Developing country populations are major consumers of cell phone minutes Globally
- The average number of cell phones used per 100 people in Asia, Africa and Latin America and the Caribbean (LAC) increased between 100% and 400% in the first five years of the 21st Century

Rashid, A.T., & Elder, L. 2009. MOBILE PHONES AND DEVELOPMENT: AN ANALYSIS OF IDRC-SUPPORTED PROJECTS. The Electronic Journal on Information Systems in Developing Countries. 36(2)1-16
The use of Mobile Devices

• Populations increasingly use cell phones to access the Internet
  • Additional services that are not widely used today but anticipated include MMS (sending photos via phone) and using phones to send and receive data
What works for mHealth interventions?

• Do you smoke after Txt?
  • Randomized controlled trial of smoking cessation program delivered via cell phone to persons ready to quit
  • Messages delivered 5X daily in days prior to quit date; could be up to hourly in the first two weeks of quitting, then tapering off
  • Higher quit rates in intervention (28%) vs. controls at six weeks (13%)

What works for mHealth interventions?

- HIV Adherence project
  - 538 HIV Patients in Kenya
  - 62% adherent in intervention vs. 50% in controls at 5 months
  - 58% in intervention group had Reduced viral load vs. 48% controls

Lester et al., The HAART cell phone adherence trial (WelTel Kenya1): a randomized controlled trial protocol. Trials. 2009 Sep 22;10:87.
What works for mHealth interventions?

- CyberSenga is a research project that aims to develop and test an Internet program for adolescents in Uganda
  - “Senga” is the Luganda term for Auntie, who is the father’s sister and is expected to offer guidance to family as they mature
CyberSenga

A six session computer program for Ugandan youth:
Comprehensive sex education
Skills building for HIV prevention
Focus on decision making, communication and avoidance of coercion

Among sexually active youth, those exposed to CyberSenga showed significant declines in sexual activity at a six month follow-up compared to those not exposed.
What works for mHealth interventions?

CyberSenga Outcomes

- Abstinent
- unprotected

- Intervention+Booster
- Intervention
- Control
What works for mHealth interventions?

<table>
<thead>
<tr>
<th>Author/Year</th>
<th>Modality/Intervention</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>Broomhealth et al., 2012</td>
<td>SMS reminders for TB adherence in Kenya</td>
<td>Improved daily adherence for TB meds</td>
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<tr>
<td>Ramanchandran et al., 2013</td>
<td>SMS for diabetes self management in India</td>
<td>Fewer cases of Type II diabetes at 3 years</td>
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<tr>
<td>Lund et al., 2012</td>
<td>SMS to improve access to skilled birth attendant in Tanzania</td>
<td>Greater use of TBA and improved antenatal care</td>
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<tr>
<td>Wakadha et al., 2013</td>
<td>SMS conditional cash transfers for vaccine compliance</td>
<td>Higher vaccination rates</td>
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T-HIT System: Surveillance & Communication

Health Workers enter patient data at antenatal clinic

Alert and reminder messages appear when entered data reveal a risk factor

Send information from tablet to server at CUHAS

System on the server at CUHAS sends messages & summary reports back to health worker

Reports to Management/Administrative Team

Send basic message to mothers

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**DASHBOARD**

- **Getting Started**
  - Record a Visit

**Summary of All Activity at this Facility**

- 964 Visits
- 791 Tested
- 44 Positive

**Recent Activity at this Facility**

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<th># Positive</th>
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Creation guided by Health Risk Communication Theory
Reminder Messages

- As HW enters data, reminder/alert messages appear if a risk factor is indicated.
- Intended to prompt the HW to interact with patient real-time.
Initial Pilot Results

Map of Misungwi District showing health facilities, study sites, percent HIV positive tests, and percent unable to test for HIV. The maps display different features such as District, Hospital, Health Centre, Dispensary, Buffer20km, Control, Intervention, District Hospital, Paved Truck Road, and Roads.
What did we learn?

• T-HIT integrates the antenatal, hospital and post natal visit information in a single place
  • Currently there are separate paper logs for these data
• This promotes continuity of care
• T-HIT can be expanded to facilitate improvements in MCH and to address other health care priorities more broadly
What is emerging in mobile and digital health?

• Crowdsourcing information
• Machine learning
• Phone based surveillance and disease detection
• Rural care delivery
Guerreros Contra El Zika: Program Elements

- Increased Zika Impact
- Hot spots

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Guerreros contra el Zika

• Machine learning

