Translating mHealth Evidence to Scale

WelTel SMS: Enhancing patient care for HIV in Kenya to global TB and chronic diseases

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Disclosures:

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Co-founder WelTel Incorporated
Funding from multiple government, philanthropic, and
Industry sources.
Scaling up an opportunity!

**Problem:** People living with HIV

**Response:** People on ART

**People with mobile phones**

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[Graphs and images showing trends and data related to HIV/AIDS and mobile phone subscriptions.]
Purpose of the innovation: addressing a problem

HIV TREATMENT CASCADE

MOBILE PHONES VS. HEALTH USAGE

FIGURE 3. Estimated spectrum of engagement in the HIV Care Cascade in the USA. From [43].

Purpose of scaling up: Higher impact
Stages of Clinical Studies during scale up process

Phase I (informative)
Phase II (piloting)
Phase III (efficacy)
Phase IV (effectiveness)
WelTel Kenya SMS concept: “Mambo?”

Developing solutions

There is more to combating HIV in the developing world than providing affordable drugs. T. V. Padma looks at the innovative new strategies being employed.

Mambo?

“Sawa/Shida”
WelTel Kenya1: RCT for HIV Treatment Adherence

Exclusion (44)
Inadequate phone access
Refused/Unable

Screening (581+)
Randomized (538)

Inclusion
Adults (≥ 18 years) starting ART
Adequate phone access (owned/shared)
Informed consent

Pumwani (251)
Coptic (209)
Kajiado (78)

SMS (120)
control (131)
SMS (117)
control (92)
SMS (36)
control (42)

Follow-up
Follow-up
Follow-up
Follow-up
Follow-up
Follow-up

6 month
12 month

Powered to show 10% improvement in adherence
SMS n=273
Control n=265

Baseline survey
Randomization

Powered to show 10% improvement in adherence
SMS n=273
Control n=265
Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): a randomised trial


Summary

Background Mobile (cell) phone communication has been suggested as a method to improve delivery of health services. However, data on the effects of mobile health technology on patient outcomes in resource-limited settings are limited. We aimed to assess whether mobile phone communication between health-care workers and patients starting antiretroviral therapy in Kenya improved drug adherence and suppression of plasma HIV-1 RNA load.

Methods WelTel Kenya1 was a multicentre randomised clinical trial of HIV-infected adults initiating antiretroviral therapy (ART) in three clinics in Kenya. Patients were randomised (1:1) by simple randomisation with a random number generating program to a mobile phone short message service (SMS) intervention or standard care. Patients in the intervention group received weekly SMS messages from a clinic nurse and were required to respond within 48 h. Randomisation, laboratory assays, and analyses were done by investigators masked to treatment allocation; however, study participants and clinic staff were not masked to treatment. Primary outcomes were self-reported ART adherence (>95% of prescribed doses in the past 30 days at both 6 and 12 month follow-up visits) and plasma HIV-1 viral RNA load suppression (<400 copies per ml) at 12 months. The primary analysis was by intention to treat. This trial is registered with ClinicalTrials.gov, NCT01930622.

Findings Between May 2007 and October 2008, we randomly assigned 538 participants to the SMS intervention (n=273) or to standard care (n=265). Adherence to ART was reported in 166 of 273 patients receiving the SMS intervention compared with 132 of 265 in the control group (relative risk [RR] for non-adherence 0.41, 95% CI 0.30-0.54; p<0.001). Suppressed viral load was reported in 156 of 273 patients in the SMS group and 128 of 265 in the control group (RR for virologic failure 0.44, 95% CI 0.31-0.60; p<0.04). The number needed to treat (NNT) to achieve greater than 95% adherence was nine (95% CI 5-20) and the NNT to achieve viral load suppression was 11 (5-227).3

Interpretation Patients who received SMS support had significantly improved ART adherence and rates of viral suppression compared with the control individuals. Mobile phones might be effective tools to improve patient outcome in resource-limited settings.

Funding US President's Emergency Plan for AIDS Relief.
Health worker efficiency (WelTel Kenya1).

![Graph showing the proportion of weekly SMS responses over months since recruitment. The graph has three categories: No response, Sawa (fine), and Shida (problem). The proportion of weekly SMS responses over months shows a slight decline over time.]

n=11,983 SMS logs

- [Link](http://www.scientificamerican.com/podcast/episode.cfm?id=text-message-outreach-improves-hiv-10-11-10)
Evidence sells?

Ten Biggest Positive Africa Stories of 2011

- Lancet podcast

- Scientific American podcast (1min)

- CBC News The National (3min)
  - [http://www.youtube.com/watch?v=UOiVKxM4wIE](http://www.youtube.com/watch?v=UOiVKxM4wIE)

- The Economist:
  - [http://www.economist.com/node/17465455](http://www.economist.com/node/17465455)

**Wireless health care M-powered**
The convergence of mobile telephony and health care is under way
Improving adherence is cost-effective

Bella Hwang – mHealth Summit 2011
WelTel: PEPFAR
(2.485M people NNT = 11)
= +230,000 suppressed

http://finance.fortune.cnn.com/2011/12/12/mobile-health-hallelujah-or-bah-
9.2.2 Interventions to optimize adherence to ART (part 2)

- Operations and service delivery
- Topic: Interventions to optimize adherence to ART
- Recommendations:
  Mobile phone text messages could be considered as a reminder tool for promoting adherence to ART as part of a package of adherence interventions (strong recommendation, moderate-quality evidence).
Ask, Don’t Tell — Mobile Phones to Improve HIV Care

TO THE EDITOR: Almost all health care is voluntary: patients choose when to engage in care, when to take their medicine (if they choose to take it), and whether to return for follow-up visits. In human immunodeficiency virus (HIV) infection and other chronic diseases, the benefits of medication adherence for the patient and public health are tremendous. Mobile health — the use of mobile devices such as cell phones to improve health outcomes and health care services
Transition to Scale 1

New conditions

E.g. HIV PrEP, MNCH, TB, Asthma (NCDs)

New settings

E.g. Kenya, Canada, USA, SA, China
urban/rural, facility/community
Evidence progression (WelTel)

Research Studies and Projects

- WelTel Big River (SK)
- WelTel eAsthma (BC)
- WelTel Kenya2
- EmPhAsIS (BC)
- mHealth International Roundtable
- Global Health Research Collaboration
- The Cedar Project (BC)
- WelTel Oak Tree (BC)
- WelTel Retain (Kenya)
- WelTel GCC1 (Kenya)
- SMS Uganda
- EPIC (San Francisco)
- WelTel LTBI (BC)
- WelTel BC1 Oak Tree Pilot
- HIV mHealth Workshop
- WelTel LTBI Pilot
- WelTel Kenya1
Use of the WelTel mobile health intervention at a tuberculosis clinic in British Columbia: a pilot study

Mia L. van der Kop, MSc1,2, Jasmina Memetovic, MSc3, Kirsten Smillie, MA3, Jesse Coleman, MA5, Jan Hajek, MD3, Natasha Van Borek, MA3, Darlene Taylor, MSc4,5, Kadria Alasaly, MD3, James Johr

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The effect of weekly text-message communication on treatment completion among patients with latent tuberculosis infection: study protocol for a randomised controlled trial (WelTel LTBI)

Mia L van der Kop,1,2 Jasmina Memetovic,3 Anik Patel,4 Fawzia Marra,5 Mohsen Sadatsafavi,5 Jan Hajek,5 Kirsten Smillie,3 Lehana Thabane,6 Darlene Taylor,3,7 James Johnston,3 Richard T Lester5

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Pilot + RCT + PHSI (BCCDC/BCLA/CIHR funded)
WelTel LTBI

Patient receives “Are you OK?” text message

- “Yes”
- “No” No response (after 48 hrs)

Patient receives “Haven’t heard from you. How’s it going?” text message

Clinician calls patient and triages:
- provides counselling or advice
- provides support
- refers to clinic or hospital

Patient doing OK
WelTel LTBI qualitative research

Ease of use:
The first time I went to the clinic, they explained to me that it will be easy. But I said that I will find it difficult. They said, just try it once and you’ll find it easy. So after doing it after a week, I found it easy” (Female, 37 years, Punjabi).

Mechanism of action:
“I think it was nice just to have, kind of, a weekly message just to know that there would be someone looking out for you if you needed any help with your treatment. ..it doesn't really help with you remembering to take your medication every day... it's more just for the support...

Quality of care:
..it was nice to know that - like, if -- if you don't answer or you answer that you are not okay, then someone would be calling you...I just enjoyed having someone checking in with me every week” (Female, 25 years, French).
Transition to Scale 2

Population size

E.g. Research settings → public and private clinics

Market size

E.g. Governments, insurers, donors, private HC facilities, users
Transition to Scale Grants

Phase I ($100,000)

Phase II ($1,000,000) plus ‘Smart Partner’ matched funding (+$1,000,000 = $2M)

www.grandchallenges.ca
Our Grand Challenge
WelTel Kenya2: Improving Global Health
One Text at a Time (HIV, TB, MNCH)

Your health, in your hands

Kenya’s Northern and Arid Lands
An mHealth Patient Engagement Service for Healthcare Providers.

Evidence-based

As a result of our research and publications, a number of mHealth innovations have emerged.

Informing Guidelines

WelTel is at the forefront of mHealth reform, redefining the way healthcare professionals operate.

Engaging People

Our progress has been prominently featured by many major news outlets, on television, radio, and in print.

THE LANCET
WelTel Patient Care v2.1

Screenshot
Value proposition for frontline users:

1. Patients – want your expertise to help them be healthy

2. Healthcare providers – want a better or more efficient way to do their work looking after patients

Monitoring is not a patient-centred value.
+ readjust and re-aim as necessary to overcome scaling barriers

Evidence every step of the way... (e.g. CFIR*)
My Take Home Points

Remember your target users (e.g. the non-adherent)
Know what they value! Are you reaching them?

Keep it simple (to use)

Know the stakeholder value chain (no kinks, government standards)
Continuous cycle of research/evidence (M&E)
Keep improving/innovating

Perfect, then diversify?

STOP using “reminders” to describe mHealth and SMS!
Thank you!

The future is now.

Frank Plummer
Joshua Kimani
Blake Ball
KACP staff
Pumwani patients
Michael Chung
Coptic Hospital
Kenya MoH
Kajiado HS
NASCOP
Mia van der Kopp
Kirsten Smillie
Daljeet Mahal
Melanie Murray
Oak Tree staff
BCCDC staff
WelTel Kenya1 study team
Coinvestigators
Many more!

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Partnerships and Support!

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