

Using mHealth For HIV/TB Treatment Support In Lesotho: Enhancing Patient–Provider Communication in the START Study

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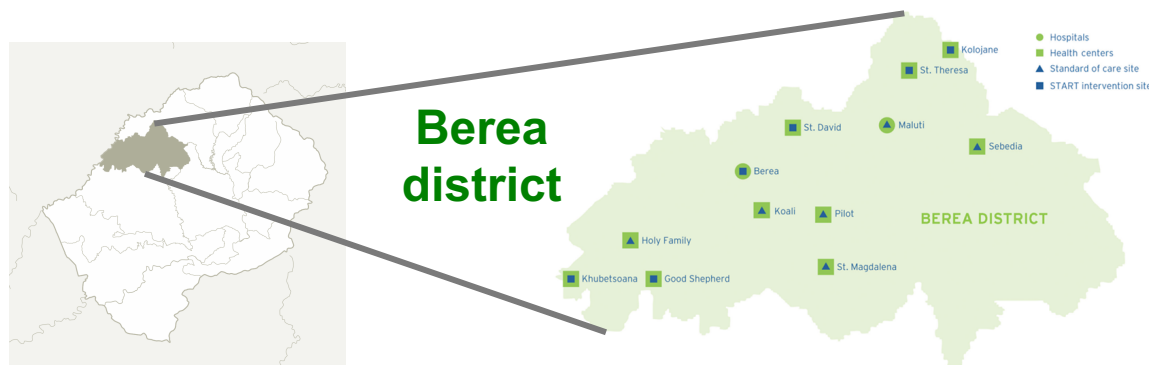
Context – Lesotho

- Landlocked by South Africa
- Population ~2 million people (73% rural)
- Poverty ~60%
- TB incidence 852 / 100,000
- HIV prevalence 23%
- TB-HIV coinfection 72%
- TB treatment success 70%
- ART coverage in TB patients 53%



Context – START Study

- Two-arm cluster randomized trial to enhance ART uptake and adherence in TB/HIV patients
- 12 health facilities randomized to deliver a combination intervention package (CIP) or standard of care (SOC)
- Quantitative data on CIP uptake, effectiveness and cost drawn from all TB/HIV patients over ~2 years (2013-15)
- Qualitative data on CIP acceptability drawn from a sub-sample of CIP patients and HCW over 1 year (2014-15)



Context – CIP components

	SOC	CIP
Nurses trained on national TB guidelines	✓	✓
All TB patients offered HIV testing by lay counselors	✓	✓
ART available to TB/HIV patients in integrated clinics	✓	✓
TB patients identify treatment supporter for TB treatment	✓	✓
Nurses provided with training and mentorship in TB/HIV co-treatment using a clinical algorithm		✓
Patients and treatment supporters provided with reimbursement for transportation costs associated with monthly clinic visits		✓
Patients and treatment supporters provided with health education by VHWs using TB/HIV treatment literacy and disclosure flipcharts		✓
Patients provided with real-time adherence support by trained VHWs and through automated SMS text messaging system		✓
Patients provided with cellphone airtime vouchers		✓

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SUPPLEMENT ARTICLE

OPEN

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A mixed-methods evaluation of the use and acceptability of the mHealth components of the START Study CIP

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Study participants, staff and village health workers at study sites

Berea District Health Management Team

Lesotho Ministry of Health

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mHealth components



PATIENTS
SMS reminders*
Airtime \$3.7/m



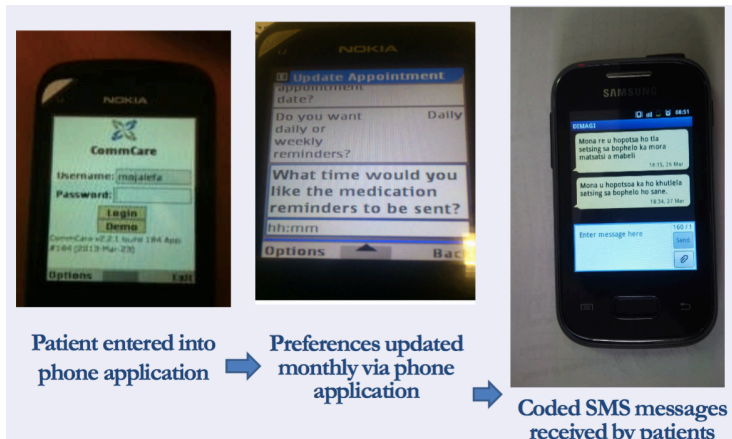
VILLAGE HEALTH WORKERS (VHW)
Airtime \$3.7/m
Mobile phones (lead VHW)



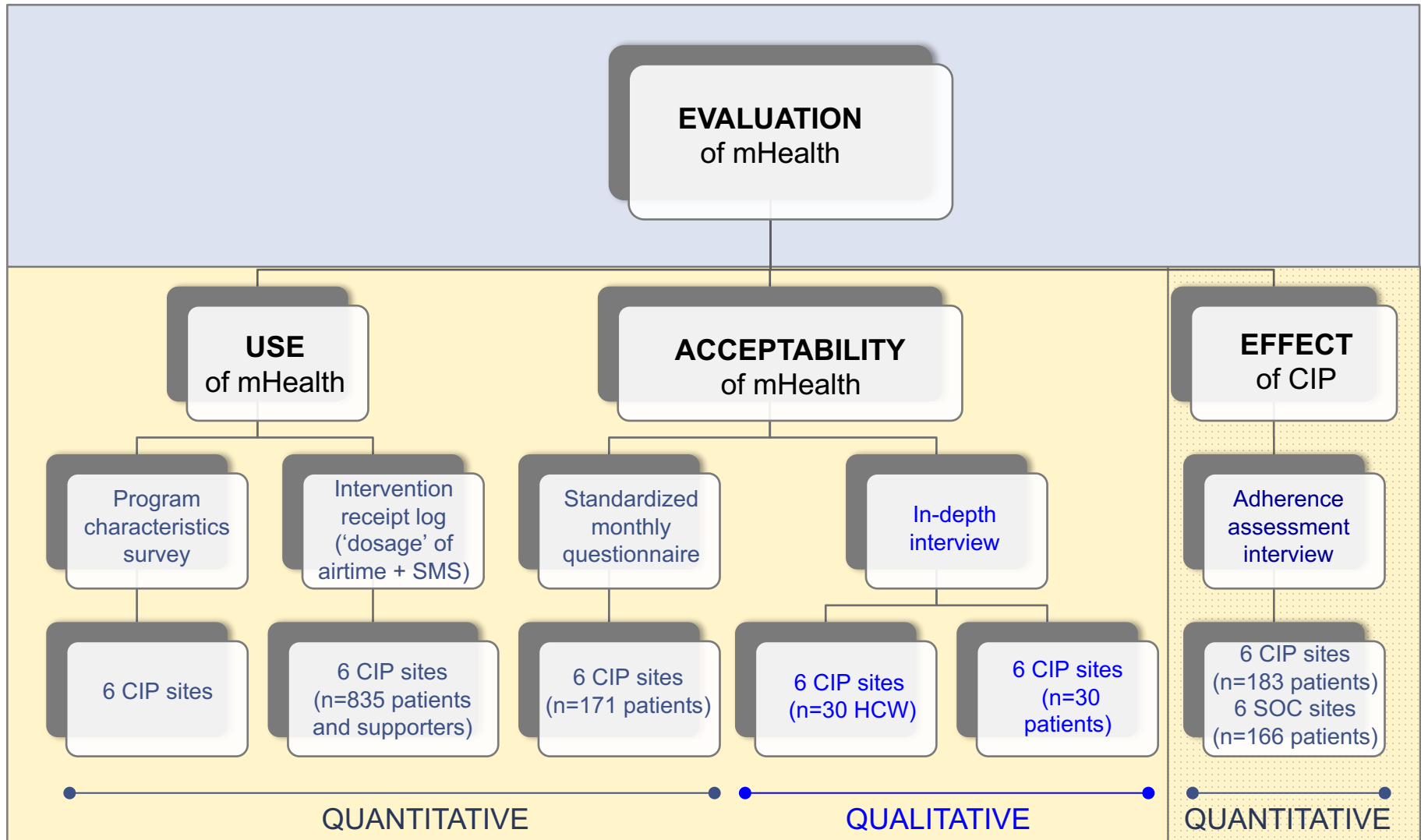
NURSES
Airtime \$3.7/m

* Daily/weekly adherence reminders + appointment reminders (coded, e.g., did you eat your meal today?) sent to patients and/or treatment supporters

SMS architecture



Evaluation methods



Participants

Patient characteristics	CIP Measurement Cohort Participants	Qualitative Patient Participants
N	191	30
Mean age, yrs (SD)	37.6 (10.4)	38.1 (9.7)
Female gender, n (%)	79 (41.4)	13 (43.3)
Education, n (%)		
Did not attend school	12 (6.3)	2 (6.7)
Primary	123 (64.4)	20 (66.7)
Secondary	35 (18.3)	5 (16.7)
High school or technical/vocational	21 (11.0)	3 (10.0)
Marital status, n (%)		
Married/living together	103 (53.9)	17 (56.7)
Divorced/separated/widowed	50 (26.2)	9 (30.0)
Never married	38 (19.9)	4 (13.3)
Literacy, n (%)		
Able to read whole sentence	143 (74.9)	25 (83.3)
Own mobile phone, n (%)	171 (89.5)	25 (83.3)
Have electricity in the house, n (%)	69 (36.1)	9 (30.0)

← no major differences →

HCW characteristics	Nurse participants	VHW participants
N	10	20
Median years 'experience	12	18
Facility-based	12	7
Community-based	-	13

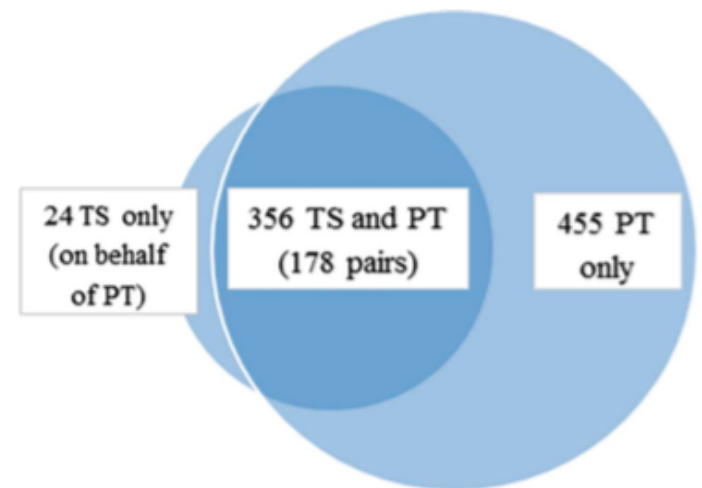
Quantitative data collected from patients at 6 CIP sites

Qualitative data collected from a purposive sub-sample of CIP patients and HCW

mHealth use

n = 657 patients + 178 treatment supporters

- **39,258 text messages were delivered to 835 individuals over 29 months**
- **92.1% (657 / 731) uptake**
 - 455 patients + 24 treatment supporters (+ 178 rec'd both)
 - F~M
- **15.2% switched from daily to weekly SMS reminders**

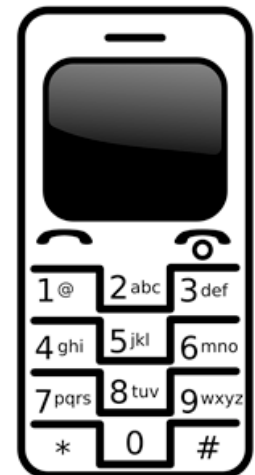


mHealth acceptability

n = 171 patients

Q. What makes it easier or helps you to take your TB medicines or ART?

A. SMS messages (41.9%)



mHealth acceptability

n = 30 patients + 30 HCW

- **Patients and HCW (nurses + VHW) appreciated the study SMS reminders, airtime and/or phones**
- **HCWs noted improvements in quality and timeliness of patient-provider and nurse-VHW communication**
- **mHealth tools were understood to address structural and operational barriers to adherence and patient monitoring**
- **mHealth acceptability may have been mediated by stigma (HIV non-disclosure), technical know-how (phone use/access), and local infrastructure (network, electricity)**

mHealth acceptability

Sample patient quotes – pros

I think the one that remind me to take my medication being the first class [i.e., excellent], I don't make any mistake with the medication I fear and I can't miss them at all. (M, 29y)

They don't cause any problems because each and every one has his [own] phone and is private. (F, 26y)

mHealth acceptability

Sample patient quotes – cons

This little lady [i.e., my daughter] is the one who supports me. She is the one who would be telling me that, “Hey, it’s time”... She has a phone. **I don’t have a phone myself... I have not received them [i.e., SMS] personally.** (F, 56y)

This phone has issue because at home **we don’t have electricity it keeps giving us trouble as to where we charge and what to do like that.** (F, 52y)

mHealth acceptability

Sample HCW quotes – pros

The use of SMS is very important... **suppose it rains heavily and I am unable to attend him, I text him** and say, 'It is your time now. Have you remembered your food?' He already knows. I will have taught him that when I say that, I mean it's time to take his pills. **So it is very helpful this SMS thing, it helps us meet our patients.**

It is very important... the way it [i.e., SMS] is written. If it says, have you taken medication... [if] you find that someone's phone is in the wrong hands, then they get to know the patient's issues too soon.

mHealth acceptability

Sample HCW quotes – cons

When I was initially taught **it was a bit of a struggle to understand** as quick. But I ultimately got it... .. For others you find that **the patient has given you a certain number, in a blink of an eye he has changed it** without telling you that he doesn't use that number anymore.

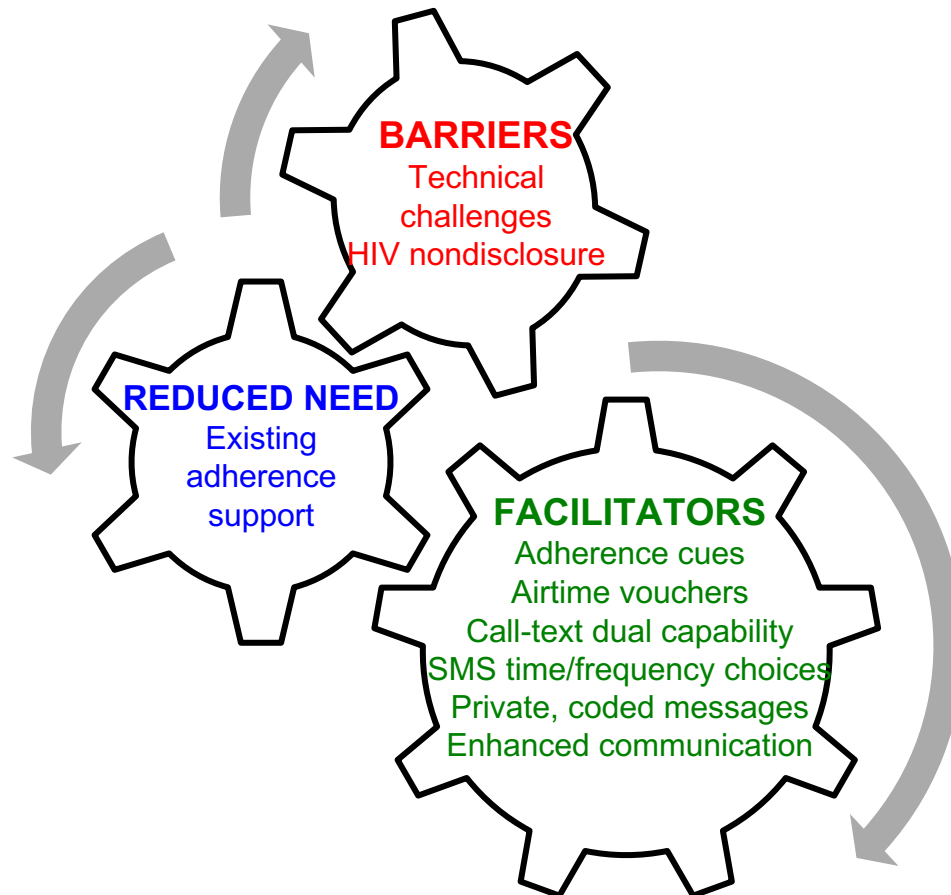
Overall effect of the CIP

Specific effect of mHealth was not measured

Self reported adherence	CIP (n = 183), N (%)	SOC (n = 166), N (%)
Measurement cohort		
Average monthly adherence to ART—100%	158 (86.3)	134 (80.7)
Average monthly adherence to TB medications—100%	163 (89.1)	132 (79.5)
Patient participants in the qualitative evaluation*		
Average monthly adherence to ART—100%	27 (90.0)	UK
Average monthly adherence to TB medications—100%	28 (93.3)	UK

*n = 30.
UK, unknown.

Determinants of mHealth uptake and acceptability



Attributes of the evaluation

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CIP limited to patients with a mobile phone	Mixed-methods
Exact dosage of mHealth unclear	Implementation science trial
Specific effect of mHealth unclear	Heterogeneous sites
Adherence was self-reported	Good representation of men
No comparison between daily vs. weekly SMS	Strong local engagement and support
Treatment supporters not interviewed	

Contributions

- **Few other studies break down mHealth use *and* acceptability**
 - We identify the role of stigma and target groups for intervention
- **Few other studies break down effect of daily vs. weekly SMS**
 - We did not compare effect, but patients preferred daily SMS
- **Few other studies break down adherence to TB and HIV medicines**

Implications for mhealth interventions

1. **Keep it flexible (SMS/phone; airtime where feasible; tailor to local infrastructure)**
2. **Keep it simple (adapt to local norms; frequent training and troubleshooting)**
3. **Identify target groups in need**
4. **Stigma may affect uptake**



Questions?

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THANK YOU