Assessing the Feasibility and Acceptability of an Interactive Voice Response (IVR) System to Deliver Refresher Training in Senegal

Kate E. Gilroy on behalf of the Senegal IVR mLearning team:

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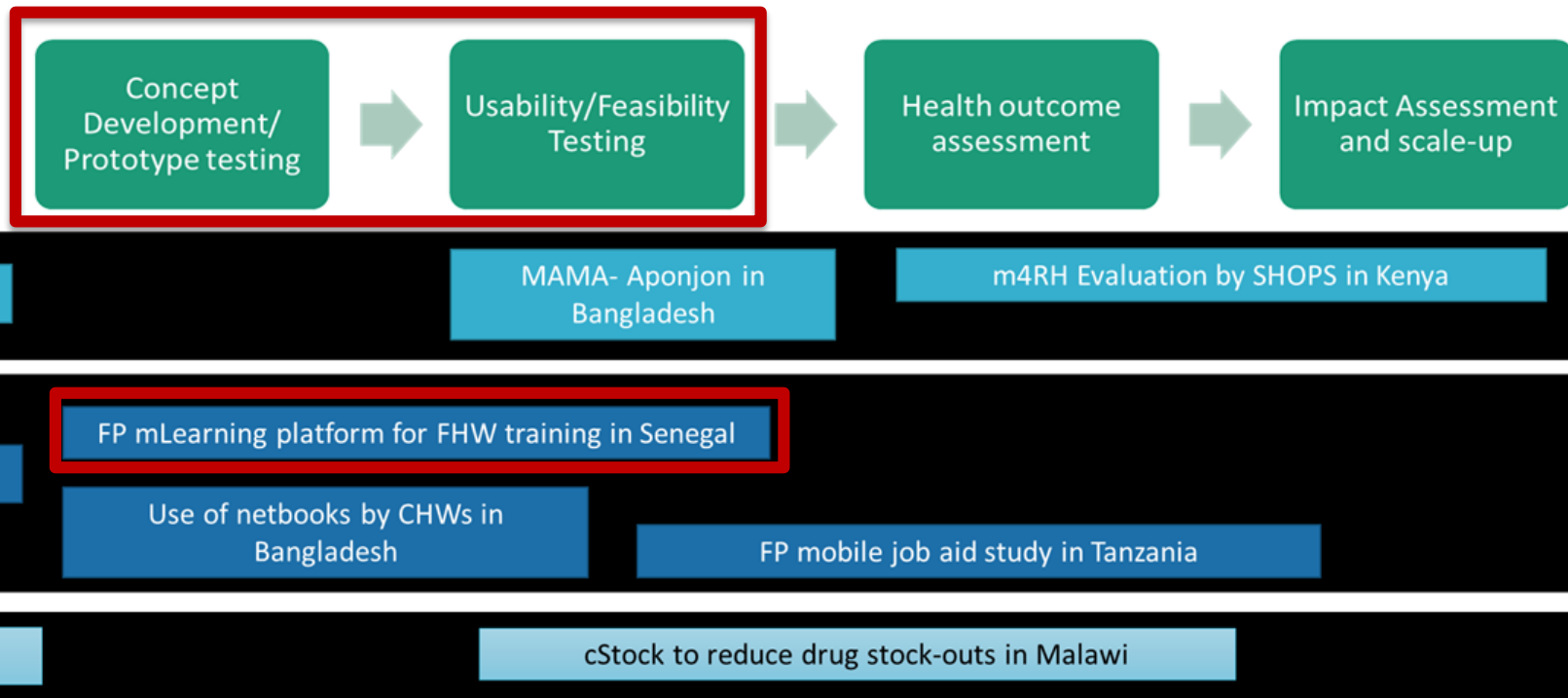
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Presentation Outline

1. Assessment objectives

2. Assessment design and methods

3. Discussion

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1. ASSESSMENT OBJECTIVES
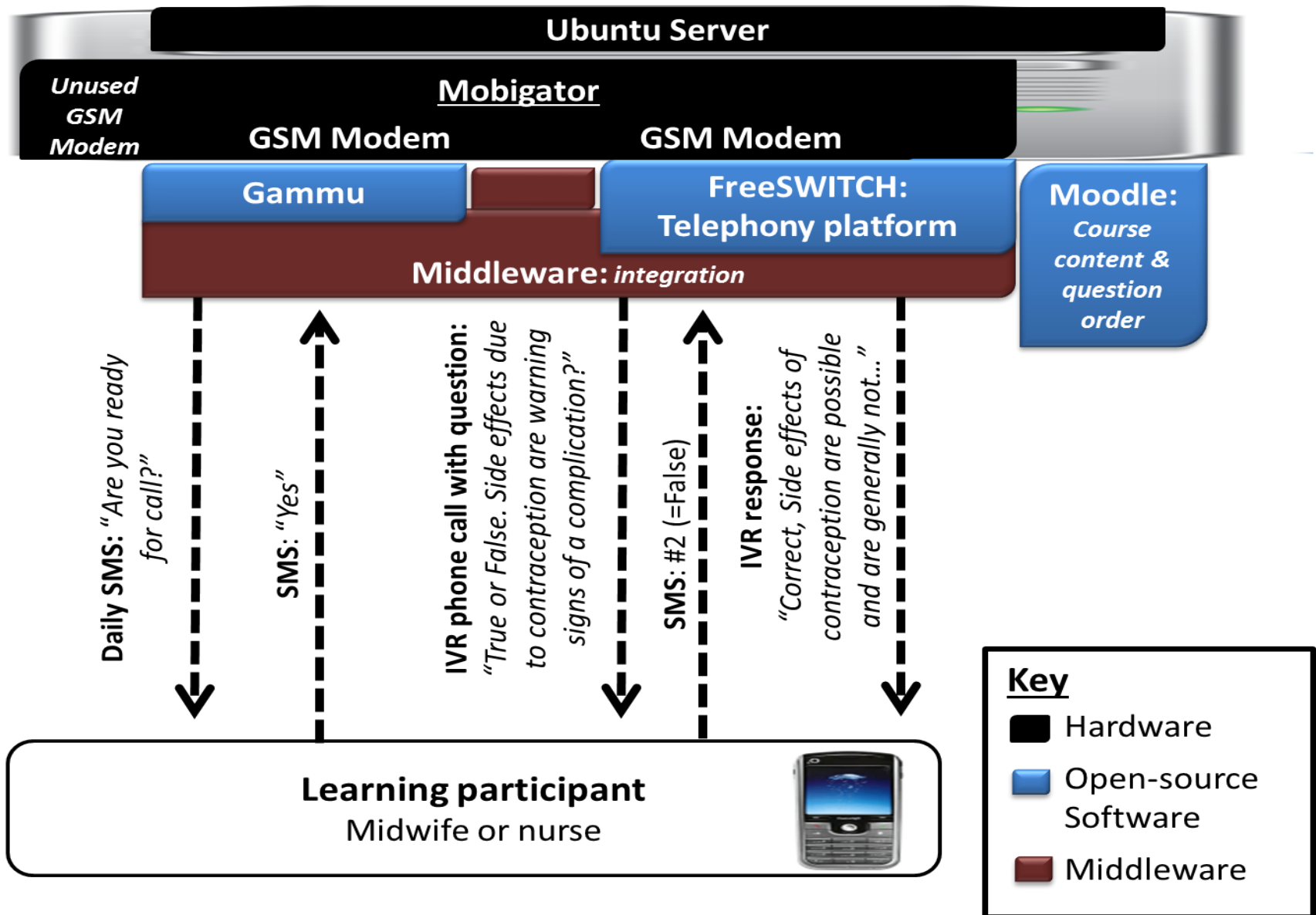
Assessment Objectives

Assessment Objectives

1. Develop and deploy an mLearning system using IVR and SMS text technologies to deliver a family planning refresher training

2. Assess the feasibility and acceptability of the IVR mLearning system for the provision of refresher training

3. Assess changes in health workers' knowledge of family planning associated with the deployment of the IVR mLearning system

2. ASSESSMENT DESIGN AND METHODS

Objective 1: Develop an IVR mLearning System Technology

Ubuntu Server

Mobigator

Unused GSM Modem

GSM Modem

GSM Modem

Gammu

FreeSWITCH: Telephony platform

Moodle: *Course content & question order*

Middleware: *integration*

Daily SMS: "Are you ready for call?"

SMS: "Yes"

IVR phone call with question: "True or False. Side effects due to contraception are warning signs of a complication?"

SMS: #2 (=False)

IVR response: "Correct, Side effects of contraception are possible and are generally not..."

Learning participant
Midwife or nurse

Key

■	Hardware
■	Open-source Software
■	Middleware

METHODS
Objective 1: Deploy an IVR mLearning system

Develop training content

Refresher training: Family planning side effects, rumors and misconceptions

Spaced-Ed Approach: 20 [true/false, multiple choice] questions asked repeatedly over 8 weeks; completion of course after 20 questions answered correctly twice

Select sample of training participants

Purposive sample; 1) geographic location; 2) participant in initial FP training; & 3) access to basic mobile phone for training course

20 Nurses & Midwives in 2 districts in Thies region

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Rationale

Limitations

Develop training content

Chosen in coordination with MOH

Side effects not everyday occurrence; difficult to measure provider practice

Select sample of training participants

Allowed for resolution of technical and logistics issues

Low precision, limited generalizability

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METHODS
Objective 2: Assess the feasibility and acceptability

Tracking of system administrative data

- Number & content of SMS text messages to and from system
- Number, duration & time of IVR calls
- Number & type of questions answered correctly/incorrectly each day

Documentation of cost of development & implementation

- Development/installation of IVR system (including equipment & TA)
- Development, adaptation & recording of training content
- Implementation (coordination, telephone contracts, orientation)

Structured survey of 20 participants at health posts 5 weeks after training

- Experiences with the IVR mLearning system technology
- Opinions about mLearning and the IVR system
- Assessment of training content
- Preferences and recommendations for future applications

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METHODS
Objective 2: Assess the feasibility and acceptability

|	Rationale	Limitations
Track system administrative data	Allows real-time assessment of functioning of system	Data only as good as system itself (i.e, system malfunctioning)
Document cost of development & implementation	Important information for replication/ scale-up	Not included in original protocol & done retrospectively; difficult to capture all costs
Survey participants at health posts 5 weeks after training	Feedback and experiences of training participants important for future improvement	Participants opinions and experiences subject to biases; Structured survey may miss information

Objective 2 Analyses: Counts, proportions, medians & means

Tracking of system administrative data

Median time of call = 17h16

★ *Participants' chosen time to recieve text*
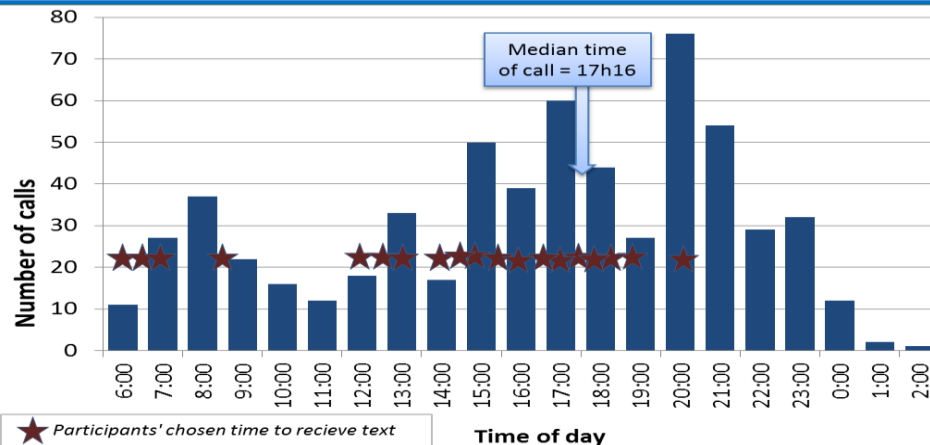
Survey of 20 participants

Participants liked **best** about using mobile phone in mLearning course

- Convenience (access and flexible pace) — 40%
- Explanations after questions — 25%
- Training content* — 15%
- Excitement (or calm) of training exchanges** — 20%
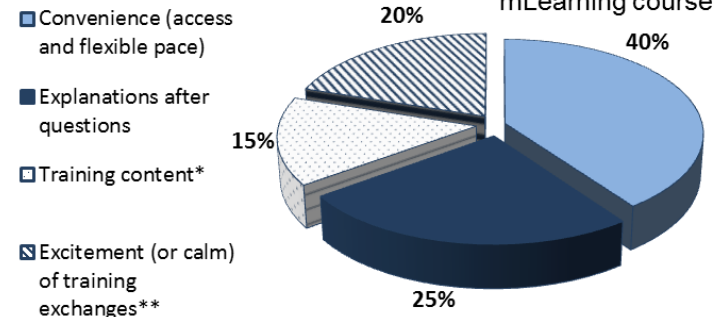
*overall content/satisfaction of curiosity (2) and HIV+ women & breastfeeding (1) **Calm olympian (1); spontenaity of exchanges (1); relaxing & amusing (1); exciting (1)*
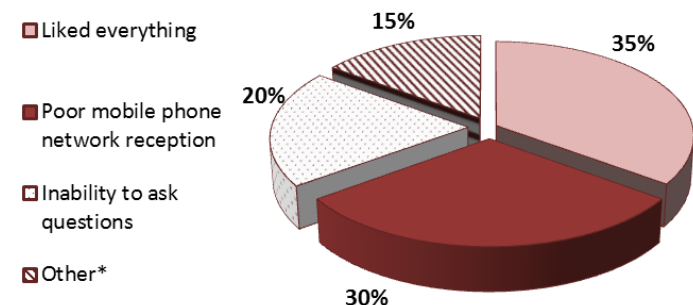
Preliminary Costs*

Development & installation of IVR system	$41,835
Development of training content	$12,247
Implementation	$4,037

Scale-up cost** approx. US$100 per HW

Participants liked **least** about using mobile phone in mLearning course

- Liked everything — 35%
- Poor mobile phone network reception — 30%
- Inability to ask questions — 20%
- Other* — 15%

Not enough time to respond to questions (1); Lack of documents to support explanations (1); Repetition of questions that were correctly answered once (1)

*Excluding indirect, capital or research costs
**Costs for training implementation only, excludes development of large-scale mLearning system or development of other training content

METHODS
Objective 3: Assess changes in health workers' knowledge

Pre-post test assessment

20 multiple choice & true/false questions on course content

Administered before training (at orientation) and 1-5 weeks post-training at participants' health posts

Post-test 9 months after training

20 multiple choice & true/false questions on course content

Administered during supervision visit 9 months after training

METHODS
Objective 3: Assess changes in health workers' knowledge

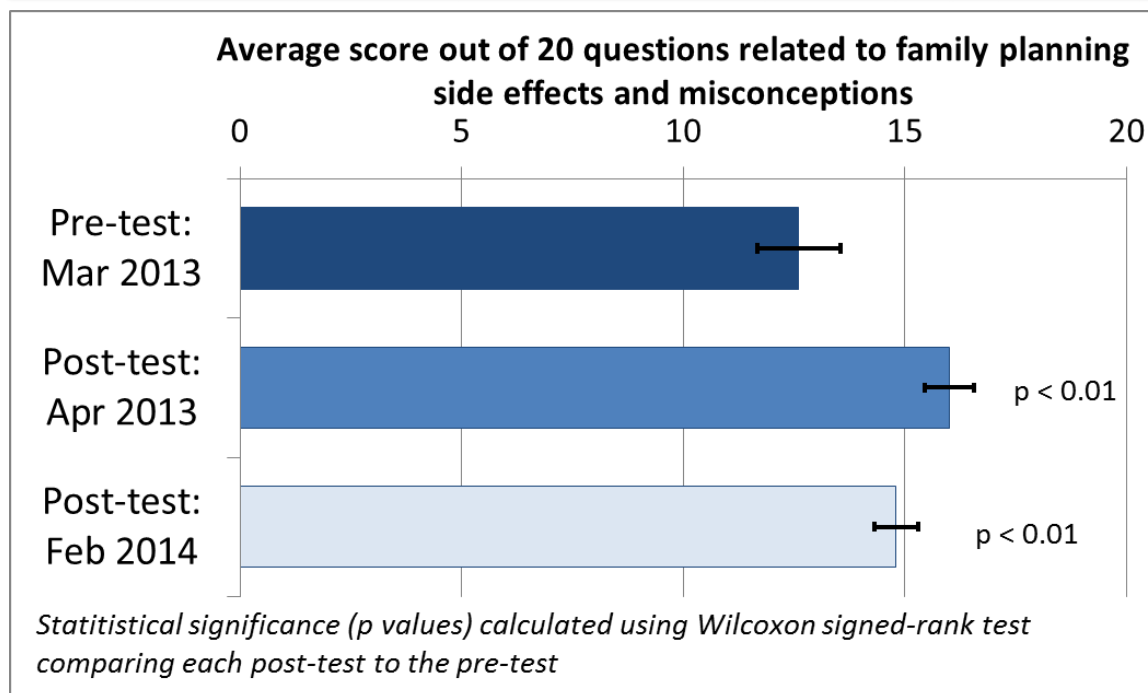|	Rationale	Limitations
Pre-post test assessment	Assess changes in knowledge of participants	Knowledge ≠ Practice Biases/issues in pre-post test*
Post-test 9 months after training	Assess if knowledge gains sustained	Not included in original protocol; 1 participant ill & not included

* Attribution of changes in knowledge to training content versus pre-test or student maturation

Objective 3 analyses: McNemar's exact chi-square statistic (paired binomial)
Wilcoxon signed rank test (overall scores)

Pre-post test assessment

Average score out of 20 questions related to family planning side effects and misconceptions

Pre-test: Mar 2013

Post-test: Apr 2013 — $p < 0.01$

Post-test: Feb 2014 — $p < 0.01$

Statitistical significance (p values) calculated using Wilcoxon signed-rank test comparing each post-test to the pre-test

3. DISCUSSION

Summary of Assessment Methods

What we did for our acceptability & feasibility assessment

- Purposively select a small sample of participants
- Use administrative, cost, survey & pre-post exam data
- Use a simple design & analyses

What we did *not* do

- Use a large, randomly selected sample
- Include a control group
- Assess provider practices, health outcomes or impact

Lessons Learned

Diversity of data sources provides more robust picture of feasibility and acceptability

- All findings strongly suggest that IVR mLearning system is innovative, feasible and acceptable

Small sample size & simple design

- Reduction of research implementation challenges
- Appropriate for early-stage testing of mHealth innovations

Feasibility and acceptability ≠ effectiveness

- Further assessment of IVR mLearning system needed if scaled-up…..including control group, larger sample, assessment of provider practices, cost-effectiveness analysis

The CapacityPlus Partnership

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