# Insurance Innovation in mHealth: Results from a Pilot in Uganda

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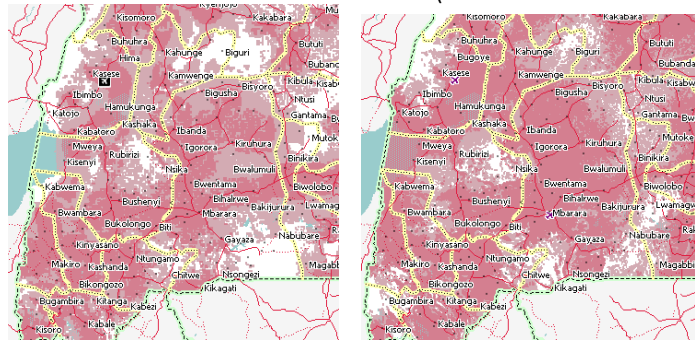
# Uganda

Population: 33,398,682 (cia.gov)

Landlines: 1/200 people (World Bank '08)

Mobiles: 27/100 people (World Bank '08)

## Mobile GSM Coverage
From 16% in 2000 to 100% in 2008
(World Bank ICT At a Glance)



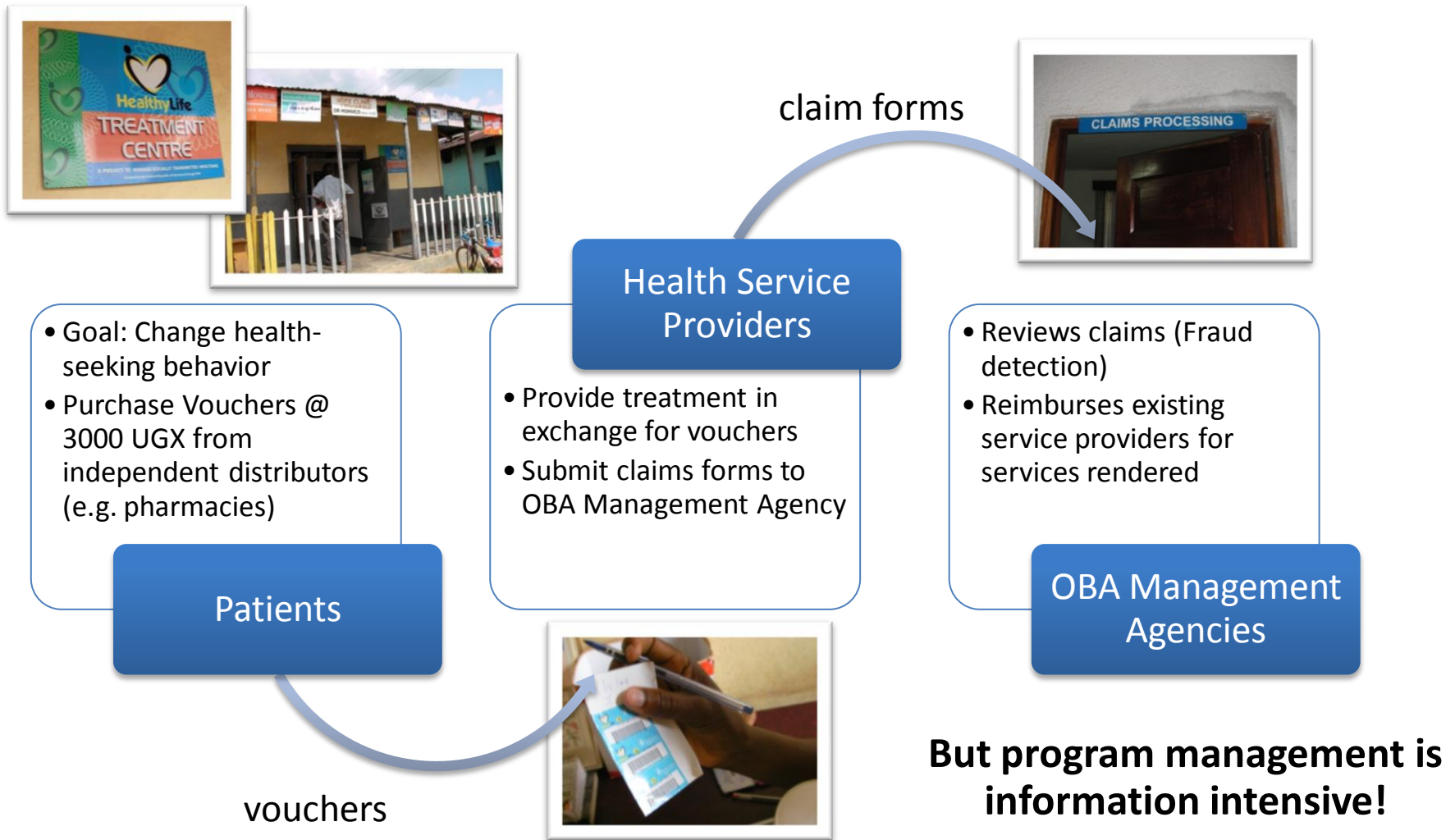Images from coverage maps available on gsmworld.com



Sexually Transmitted Diseases are an especially critical problem in Western Uganda
- HIV prevalence: 10% of adult population (15-49 years)
- Syphilis prevalence: about 5-7% of adult population
- 1 in 4 households had at least one phone.
- 39% reported STI symptoms
- only 1/3 sought care
- 54% of respondents who sought any STI treatment reported using private clinics.
From 2006 Venture Strategies and Mbarara University population survey. http://www.oba-uganda.net

# The Uganda Output-Based Aid Project



claim forms

**Health Service Providers**

- Goal: Change health-seeking behavior
- Purchase Vouchers @ 3000 UGX from independent distributors (e.g. pharmacies)

- Provide treatment in exchange for vouchers
- Submit claims forms to OBA Management Agency

- Reviews claims (Fraud detection)
- Reimburses existing service providers for services rendered

**Patients**

**OBA Management Agencies**

vouchers

**But program management is information intensive!**

# Information Constraints

| | FORM DETAILS | | | ACCEPTED CLAIMS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CLAIM DATE | SL. NO | FORM NO | EXPECTED AMT. | FULLY PAID AMT. | ADJUSTED AMT. | | | | | | AMOUNT | |
| Second Half of August 2008 | | | | | | | | | | | | |
| 29/Aug/2008 | 1 | 10786 | 6,920 | 6,920 | | | | | | | | |
| 29/Aug/2008 | 14 | 10800 | 9,400 | | 4,400 | 5,000 | 11 | | | | | |
| 29/Aug/2008 | 15 | 19101 | 19,200 | 19,200 | | | | | | | | |
| 29/Aug/2008 | 16 | 19102 | 8,000 | 8,000 | | | | | | | | |
| 29/Aug/2008 | 17 | 19103 | 13,700 | | | 11 | | | NO PREVIOUS FOLLOW UP | 8,700 | 5,000 | |
| 29/Aug/2008 | 18 | 19105 | 19,200 | 19,200 | | | | | | | | |

Providers often have questions about claim summary reports

4/12 didn't know how many claims have been rejected

4/12 have computer training

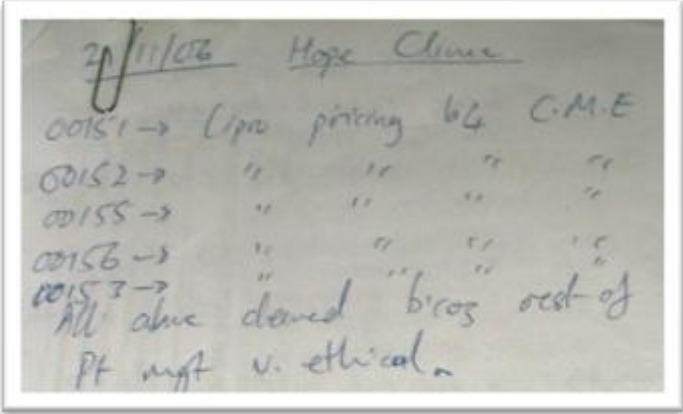3/12 had not gotten feedback

12/12 own a mobile phone

**Obscure and Infrequent Feedback**
*"I don't know. I don't know how we are performing. I don't know how we are faring… and of course it takes a lot of time.*
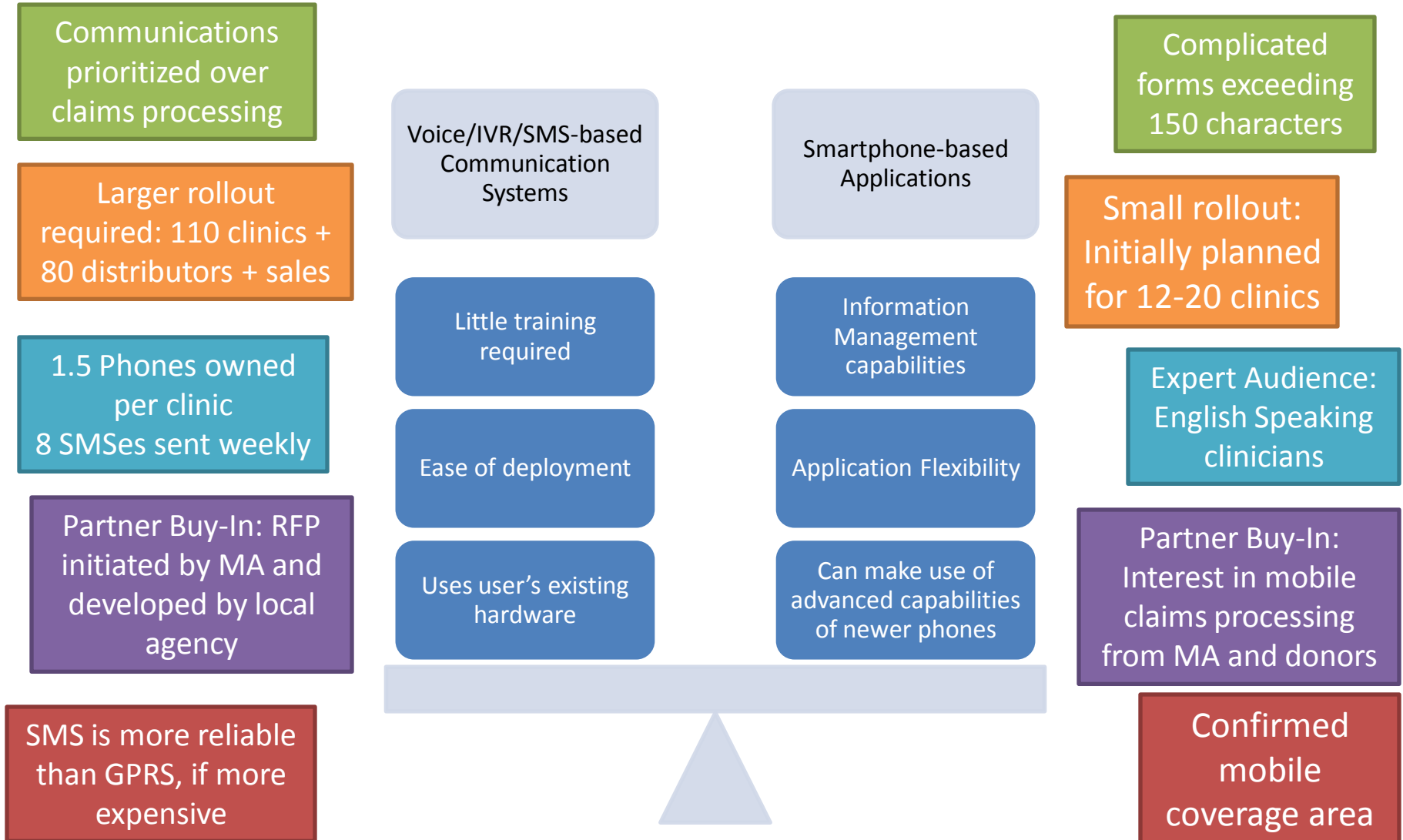
**Sequential Rejections**
*"Cipro pricing b4 C[ontinuing] M[edical] E[ducation]… All above denied b'cos rest of P[atien]t mgt n[ot]. ethical"*
Often an entire month's worth of claims might be rejected at once for the same error

4

# What kind of mHealth Application fits your context?

Communications prioritized over claims processing

Larger rollout required: 110 clinics + 80 distributors + sales

1.5 Phones owned per clinic
8 SMSes sent weekly

Partner Buy-In: RFP initiated by MA and developed by local agency

SMS is more reliable than GPRS, if more expensive

Voice/IVR/SMS-based Communication Systems

Little training required

Ease of deployment

Uses user's existing hardware

Smartphone-based Applications

Information Management capabilities

Application Flexibility

Can make use of advanced capabilities of newer phones

Complicated forms exceeding 150 characters

Small rollout: Initially planned for 12-20 clinics

Expert Audience: English Speaking clinicians

Partner Buy-In: Interest in mobile claims processing from MA and donors

Confirmed mobile coverage area

# Claim Mobile

## from paper form... to phone
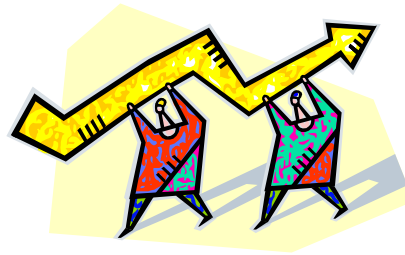


- Using mobile phones as a platform for facilitating information management
  - Dynamic, self-verifying forms reduce errors and provide ongoing training
  - GPRS-based form submission and approval
  - Phone-based clinic data management
  - Improved communications loop

**August 2008 Pre-Pilot**

- Rural Clinic
  - 12/86 claims via CM
  - Discrepancies noted on paper claims that would have been avoided via CM
  - Non-monetary errors go unreported
- Urban Clinic
  - 18/18 claims via CM
  - 5 following study
- Usability
  - Onscreen keyboard is preferred
  - "Qwerty" keyboard is acceptable

# Claims Submission Processing

**Health Service Providers**

14-90 days

prepare claims

batch claims

deliver claims

pay claims

approve claims

data entry

30-45 days

**Output Based Aid Management Agencies**
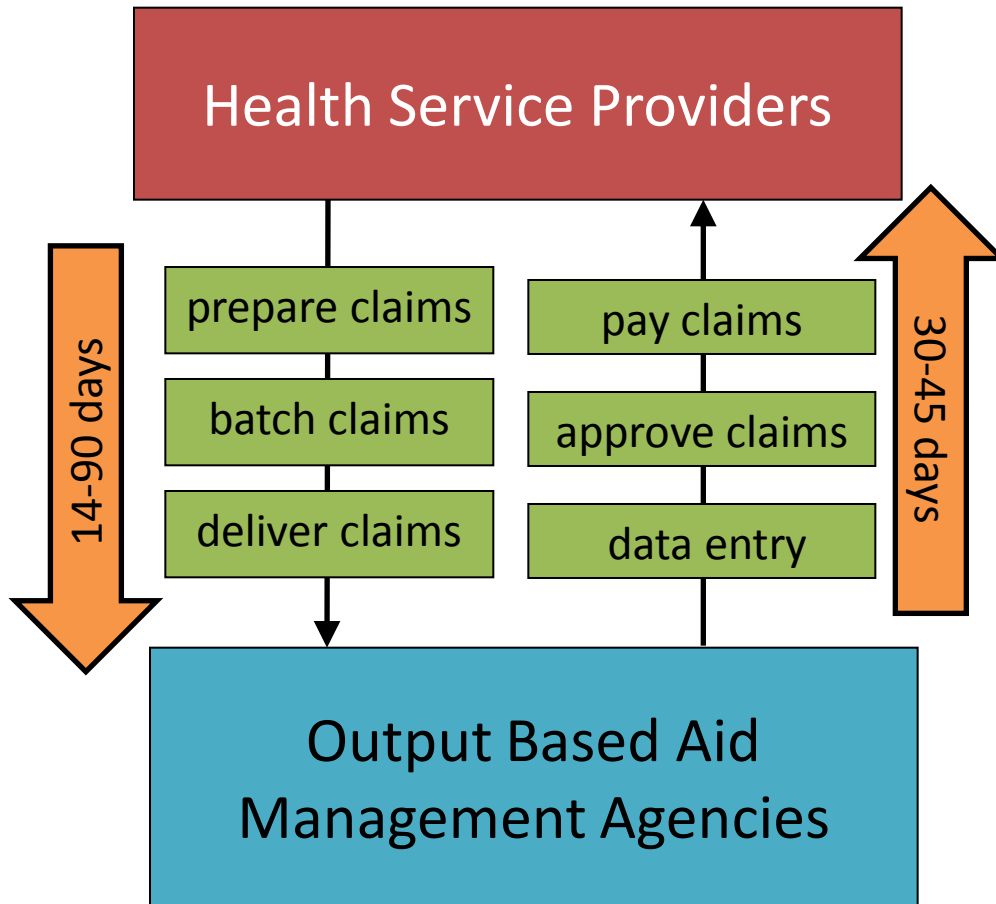
- Common errors
  - Written errors
  - Invalid client-partner use
  - Invalid treatment

Providers travel up to **3.5** hours to submit claim forms

- Submission delays
  - Batched claims
  - Transportation ($ + time)
- Processing delays
  - Data entry
  - Medical & technical review
  - Reconciling partial payments and rejections
  - Payment

# Claim Mobile Pilot

January 2009 – April 2010

Methods:
- Baseline Survey
- Participant Observation
- Controlled Study

Management Agency Findings:
- Delays Resolved via Program management
- Internal issues w/claim backlog
- New claims backend pending (delayed until Jan 2010)

Claims Forms:
- From one A4 per visit to 4 pages of A4, plus additional forms.

Conclusion:
- Compare Laptop vs Phone

| Topic | Question | Result |
|---|---|---|
| Mobile Phones | Average Airtime Spending | 20,000 UGX (10 USD) |
| | Internet Use | 12/59 (20.3%) |
| | SMS Sent/week | 8.84 (mean) |
| | Mobiles Owned | 1.49 (mean) |
| | Mobile SIMS Owned | 1.93 (mean) |
| Computers | Available in Facility | 17/59 (28.8%) |
| Internet Usage | Distance | 15.8.km (mean) |
| | Freq of Use: | |
| | - Every Day | 8/59 (13.6%) |
| | - Weekly | 13/59 (22.0%) |
| | - Monthly | 18/59 (30.5%) |
| | - None | 20/59 (33.9%) |

Health Clinic Findings:
- Interest in Phones is for secondary usage: patient data management, health education
- High interest in Computers
- Low existing training and experience with computers

# Bulk SMS: Enabling Broadcast Announcements



150 characters

Addressed from MSIU (on dominant carrier)

Template Support

Two-Way Communication

SMS Forwarding

Group Addressing

Automatic Archiving of Messages

# Message Types

**Program Officer**

**Medical Advisor**

**Finance Officer**

**Health Service Provider**

**Communications Announcements**
Hello service provider, please check your post office mail for your payme reports and UOBA.Confi MGT[-]

**Program Announcements**
Dear svce prvders, a team 'll b coming 2 midwstern UG btn 8th-14th to collect the Dec.claims 4 both ANC and Del.Pse summarize and organise apprtly.[-]

**Confirmation Receipt**
am stil wating ad up nw hv nt receivd any leter frm the yo ofice via ma box numbr ZZ ZZ Town. bt i wish u use ma email addres xxx@yahoo.com its post ofice pple a not eficiet. bt i wl agree wth yo new terms

**Medical Protocol Query**
*does oba for healthy baby cater for cough (rti\'s) in pregnancy? if yes, what drugs are recommended? Clinic.Y*

**Medical Query Reply**
no msiu does not take care of rtis.[-]

**Payment Query**
*Clinic W is asking about the oba payment b\'se it had delayed to be put on the hosp a/c*

**Payment Advices**
Dear FACLILITY,OBA on 22 jan crdted u with2304930 4 u'r facility's latest submn.snd us u'r queries and cnfrm rcpt to mgt on 078XXXXXXX[-]

**Payment Confirmation**
*i acknowledge receipt of paymt 4 nov. '09. thanx. Clinic Y*

# Bulk SMS Technical Difficulties

- Carrier Dependence
  - SMS service is on dominant carrier
  - HSPs on other carriers report that they failed to receive SMS messages
  - 10.7% of Warid confirmed non-delivery, other networks have no indicators
- Phone Number management
  - Wrong numbers
  - Changed numbers
  - Multiple numbers
  - Swapped/shifted numbers in spreadsheet
- Un-received Texts
  - HSPs in low coverage areas
  - HSPs without electricity (phones powered off)
- Duplicate and Delayed Texts
- System Limitations
  - Limited Capacity for SMSes on local database
  - Short Messages req'd hack for long message format
- However: Overall perceived as a benefit to the program



**HSP Mobile Provider Usage**
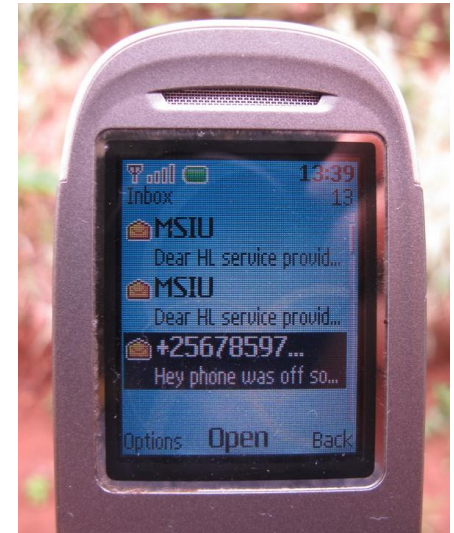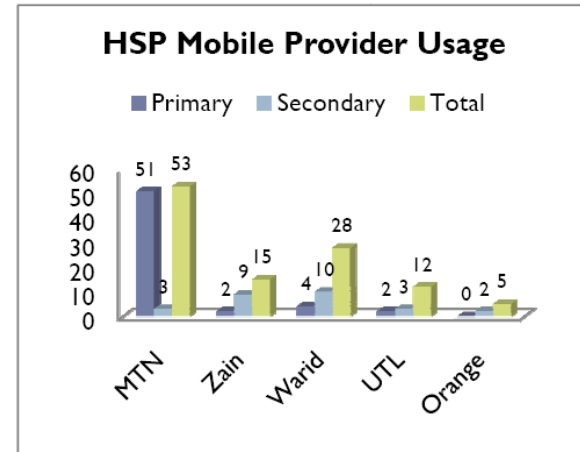
# mHealth **in a vacuum** is **vulnerable** and *will not scale*

100% Mobile Coverage

85% of Ugandans are off Grid

Find a good development partner

Many AID Projects have 3-5 year grant-dependent funding cycles

GPRS

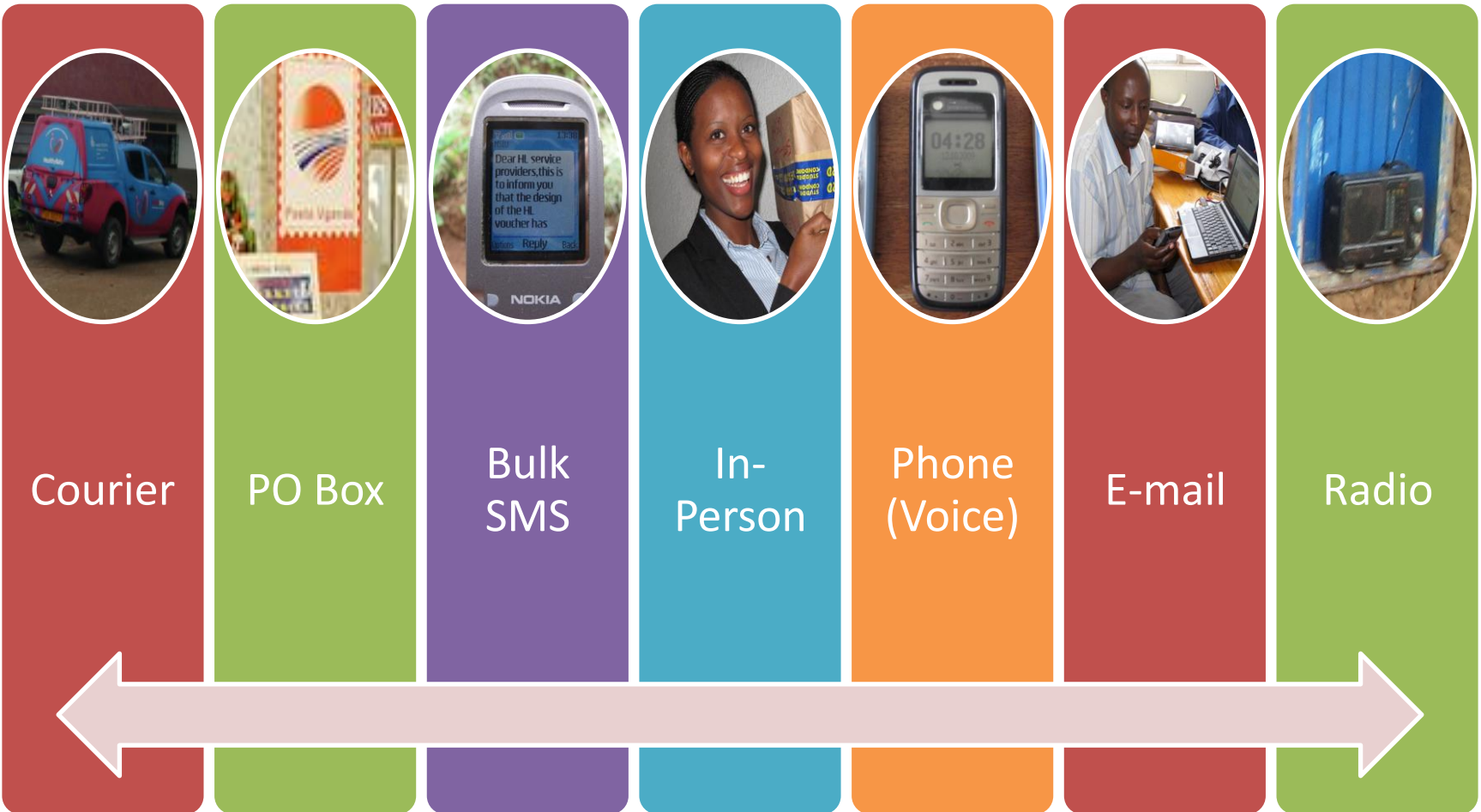Exchange agreements between providers are not settled

Mobile technology requires less training

Mobile deployments are only as good as their backend – and smartphones still need training.

Networks are unreiable and oversubscribed

# Multiple Modes of Communication → Reliability and Consumer Confidence



| Courier | PO Box | Bulk SMS | In-Person | Phone (Voice) | E-mail | Radio |

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