

# Programme Mwana



# Background

- Merrick Schaefer: Senior Innovation Specialist, previously software developer and program manager
- Previously founding member of UNICEF Innovation Team
- Support Country Offices Globally
- Built on experience from implementations we have done in over 10 countries.

# Overview

- Project Background
- Results160 SMS System
- RemindMi SMS System

# Programme Mwana

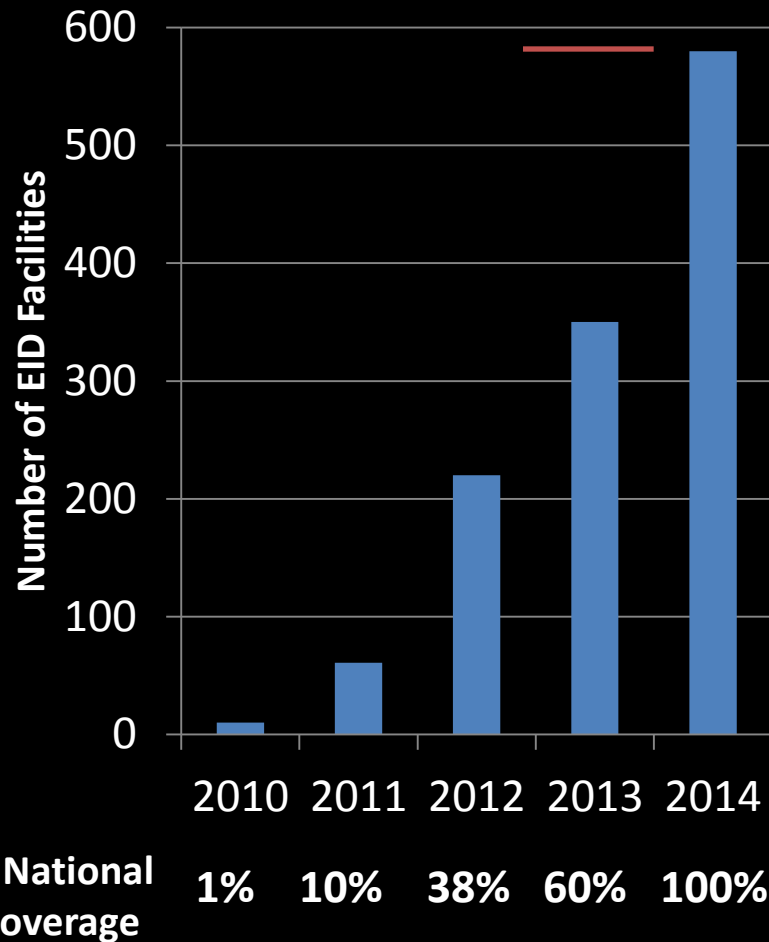
- mHealth project in Zambia (& Malawi)
- Implemented in Zambia by MOH, UNICEF, BU and CHAI (with help from ZPCT II)
- Addresses Early Infant Diagnosis (EID) of HIV and post-natal care

# Programme Mwana

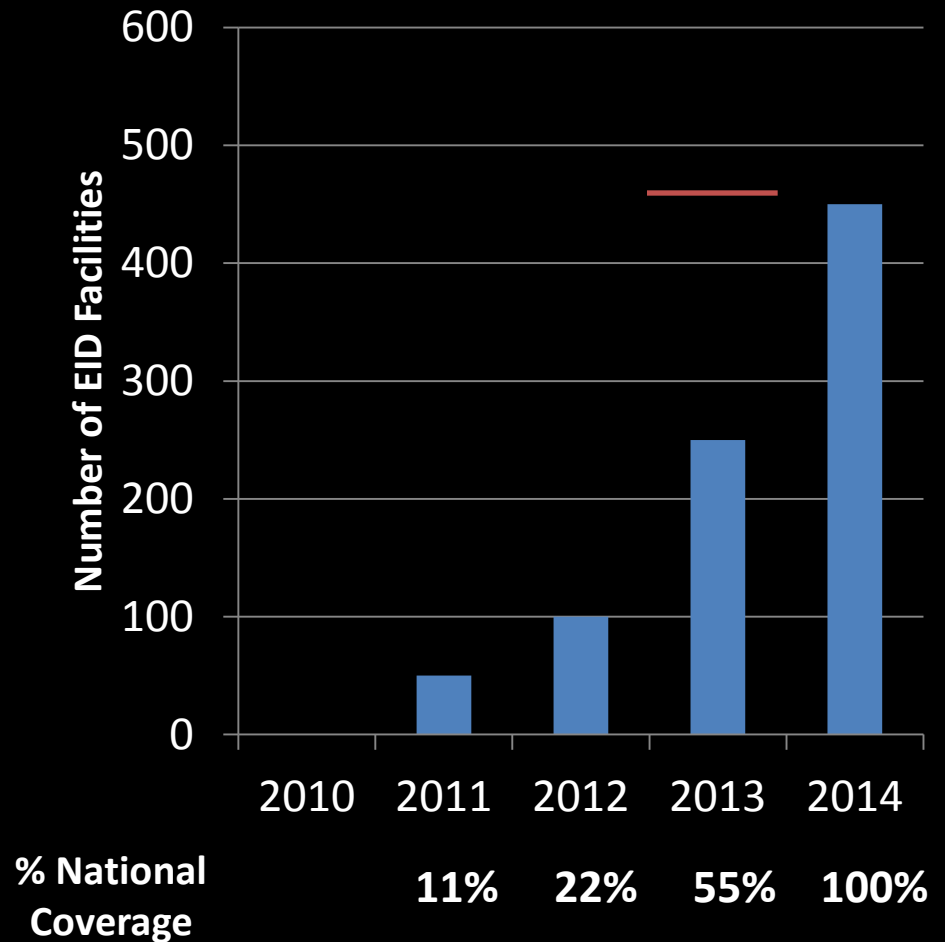
- Piloted in 31 clinics across 6 provinces for over a year, delivering thousands of results
- Built on RapidSMS, an open source framework
- Designed to be a government owned and operated enterprise mHealth system

# Scaling Nationally

## Zambia



## Malawi



# Scale in Zambia

Health Facilities: 581

Clinic Staff: 1,453

RemindMi Agents: 2,071

Results Delivered: 26,442

Births Registered: 57,686





# MDG and Global Plan Tracking Challenges

The Global Plan seeks to **eliminate vertical transmission** by 2015

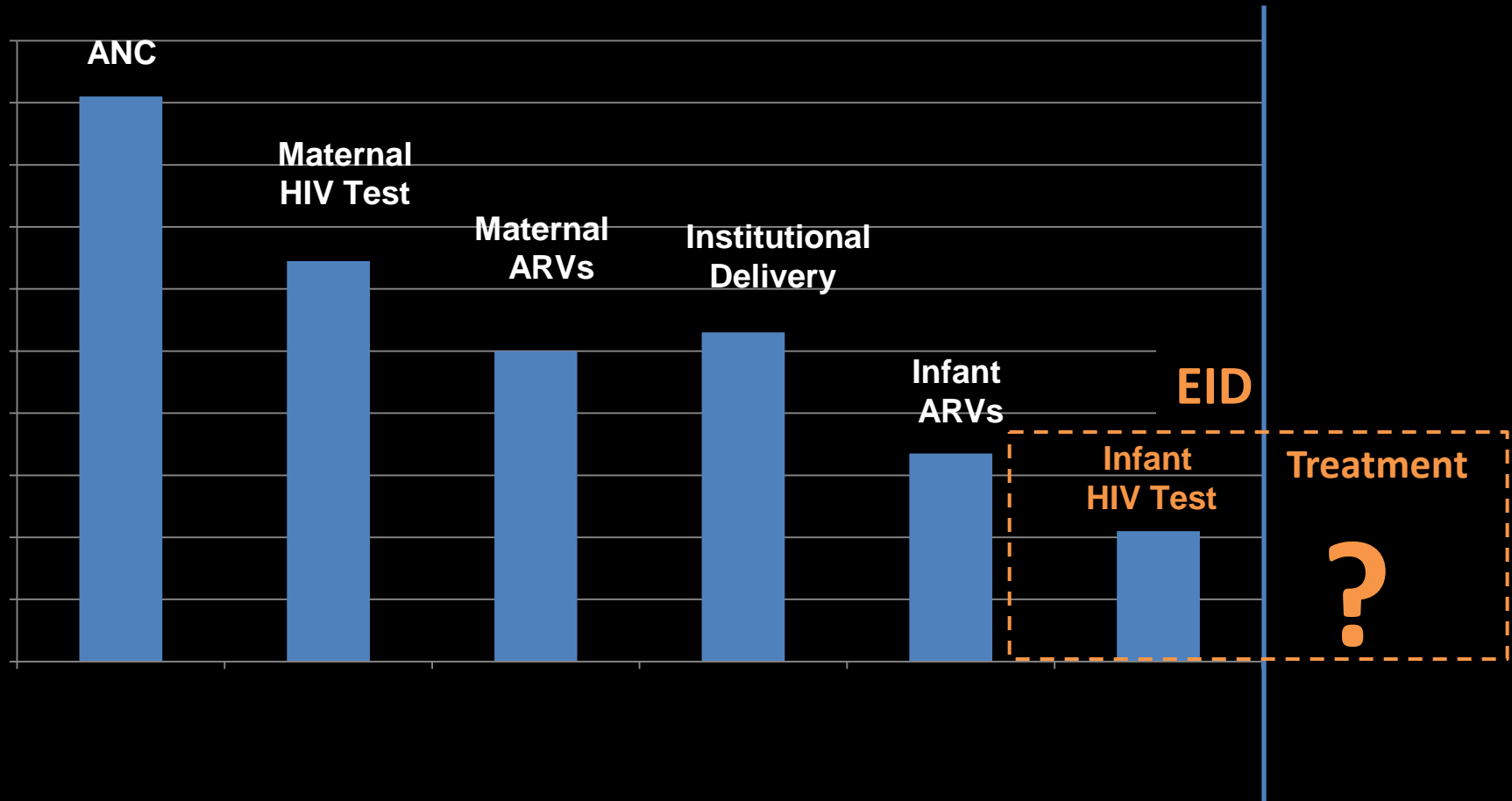
Reduce new HIV infections among children by 90% & AIDS-related maternal deaths by 50%

However, we have no way to accurately **identify the number of children currently infected**

Using current methods, **we will not know** if we have reached the MDGs until the date has passed

Current monitoring: expensive, labor intensive, retrospective, one-way information flow

# Cascading Challenges



Source: *Global HIV/AIDS Response: Epidemic update and health sector progress towards Universal Access, 2011*

# EID Challenges

## Challenges with EID

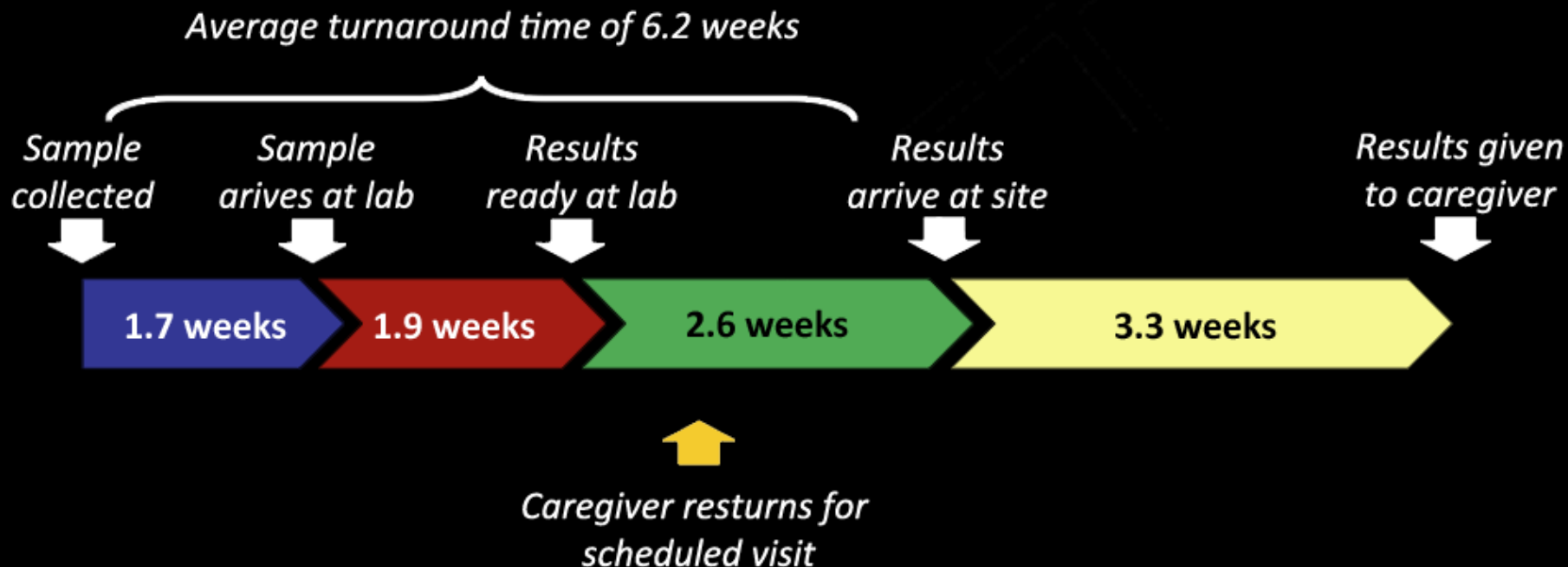
- Do not know true transmission rates in countries
- Lengthy transport of samples to the central labs
- Long distances that mothers have to travel for multiple visits
- Long turnaround times
- Do not know whether mothers receive results

## Other approaches have failed

- PCR turnaround time has been the focus, but turnaround time is not enough
- No cohort data, only cross-sectional so hard to know longer-term results
- Faster results do not necessarily mean that infants are being treated
- Lack of community interaction
- Point-of-care solutions are far away from being implemented

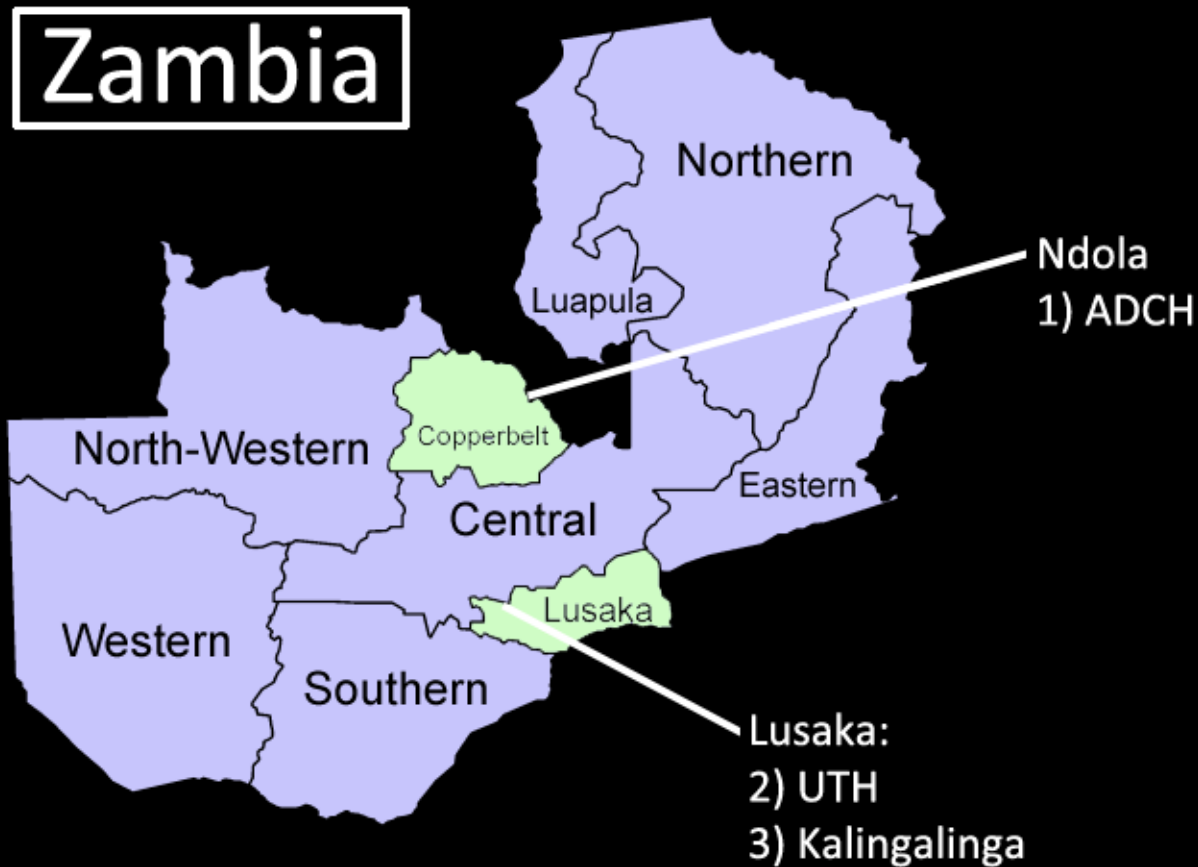
# Early Infant Diagnosis Results Cycle

*National average of 2008 including rural and urban*



85% of sites surveyed said that patients returned for their results before the results were ready\*

# Locations of PCR Labs



Provinces the Labs Serve:

- Arthur Davison
  - Northern
  - Northwestern
  - Copperbelt
  - Luapula
  - Central
- UTH
  - UTH facility
  - Southern
- Kalingalinga
  - Lusaka
  - Eastern
  - Western

QECH-7777

QECH-7778

SMS System

# Tools



- Health system focused, trained Clinic Staff



- Community focused, trained Community Health Workers (CHWs)

\*All SMS are free to end users\*



Results160

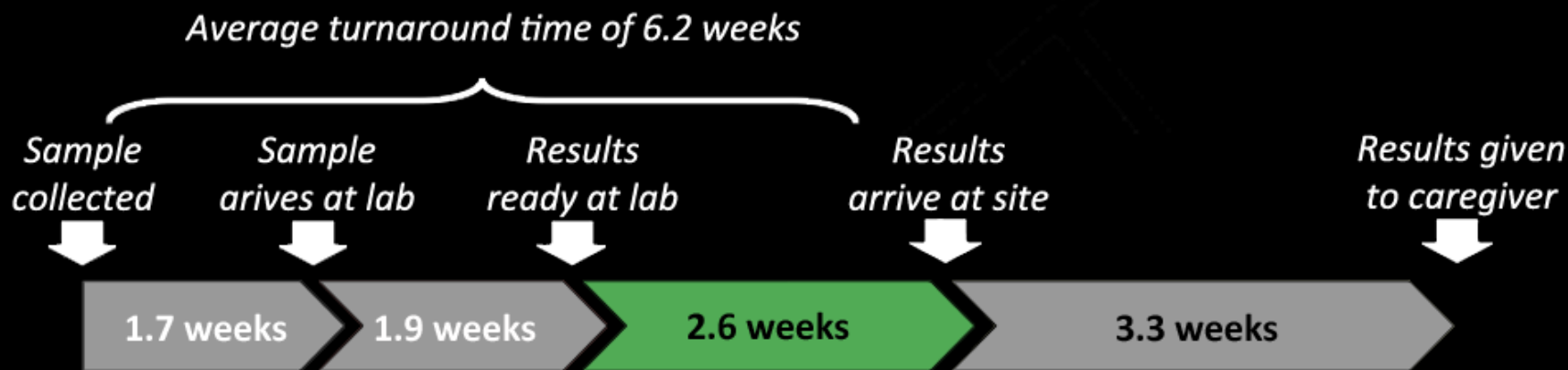


- Delivers infant HIV results from Lab to Facilities with SMS
- Tracks samples through the logistics system
- Provides government monitoring tools

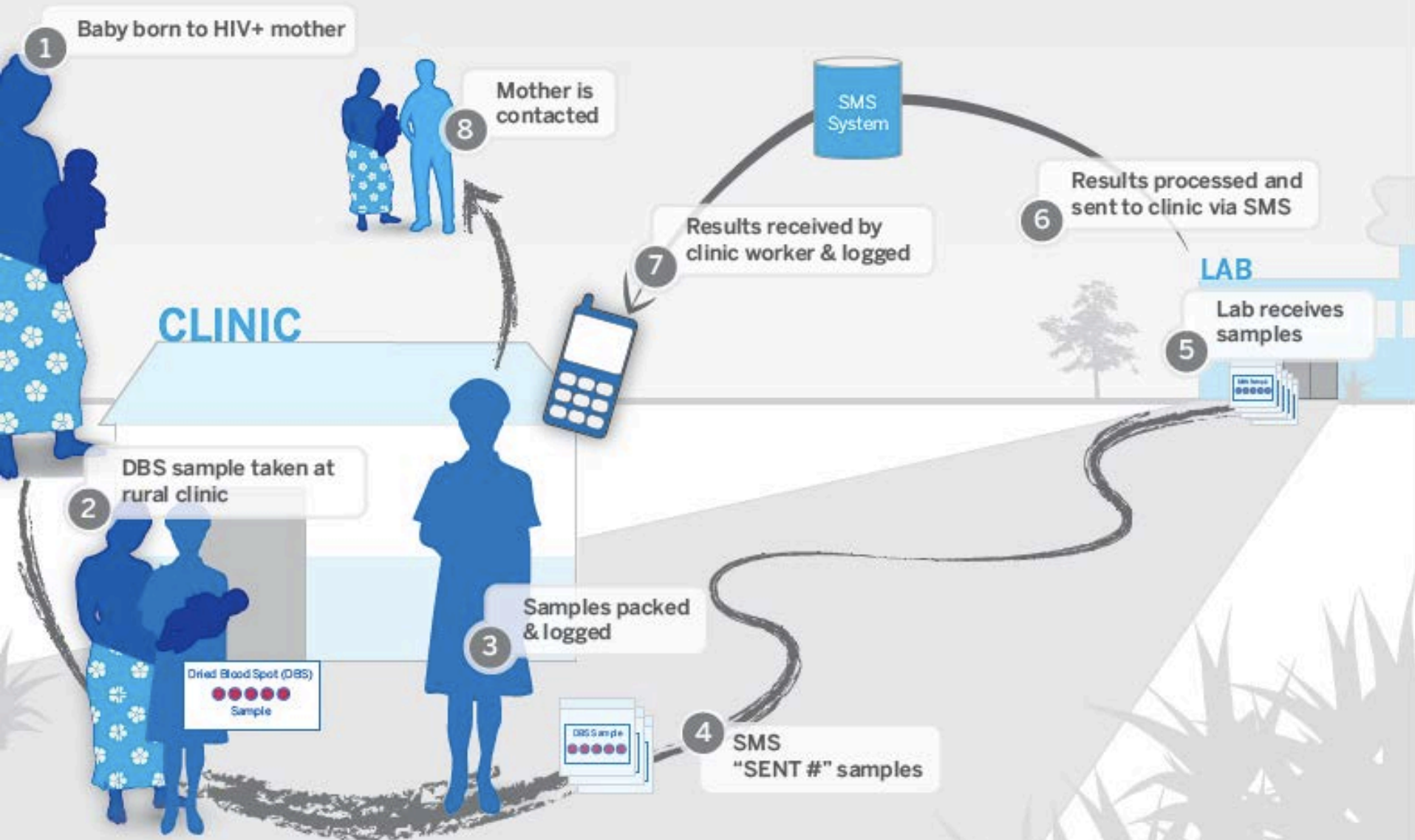
# Early Infant Diagnosis Results Cycle

*National average of 2008 including rural and urban*

Results160 focuses on the portion of the EID cycle from the lab to the facilities



# Results160 Process



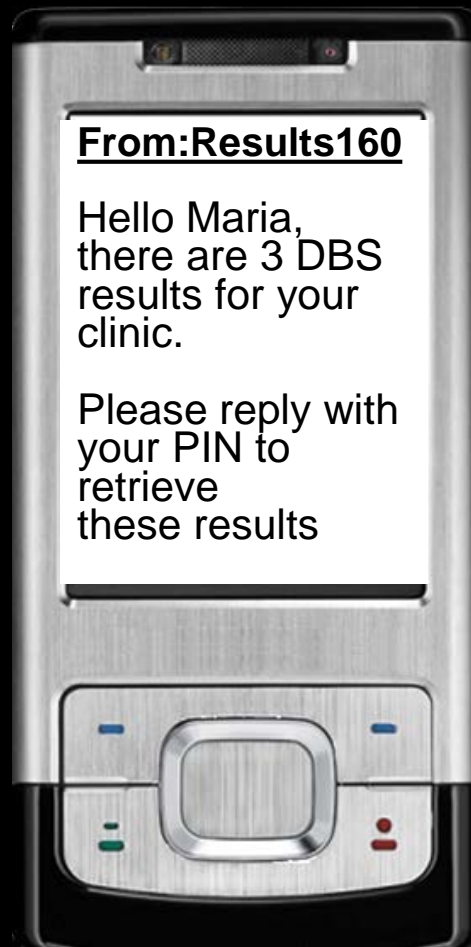
# Workflow

Phone: Results Retrieval

The 4 messages sent back and forth to  
securely retrieve results

# Workflow: Phone: Results Retrieval

1



When results are ready the central SMS System sends a message alerting the clinic workers results are ready.

# Workflow: Phone: Results Retrieval

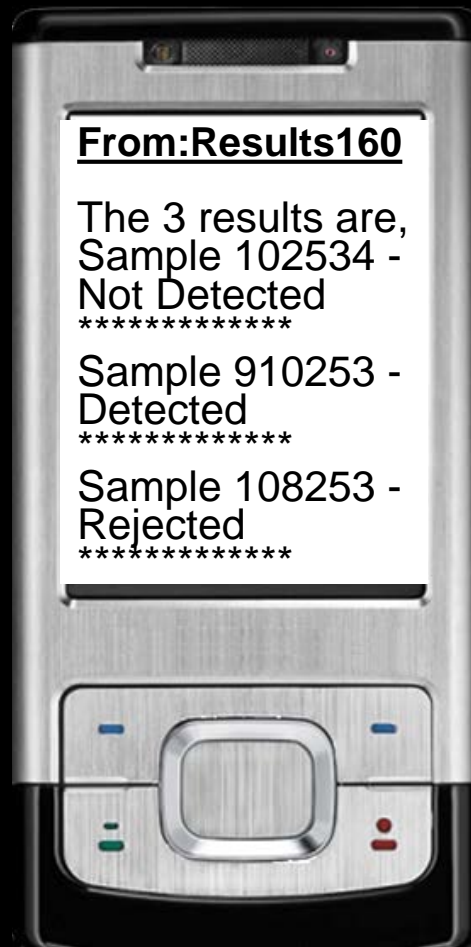
2



The first clinic worker ready to record the results send their 4 digit pin to the server.

# Workflow: Phone: Results Retrieval

3

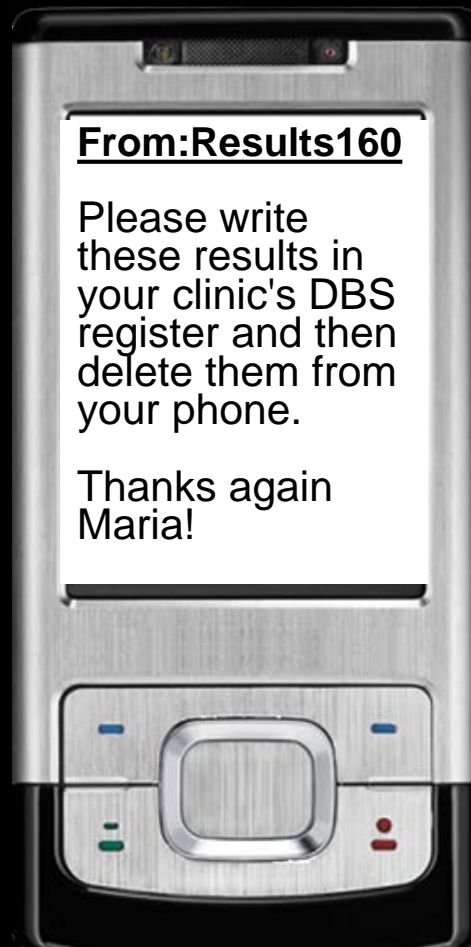


The results are sent to that phone formatted to be readable on different screen sizes.



# Workflow: Phone: Results Retrieval

4



A second message reminds the user to write the results down in the register and delete them off their phone.

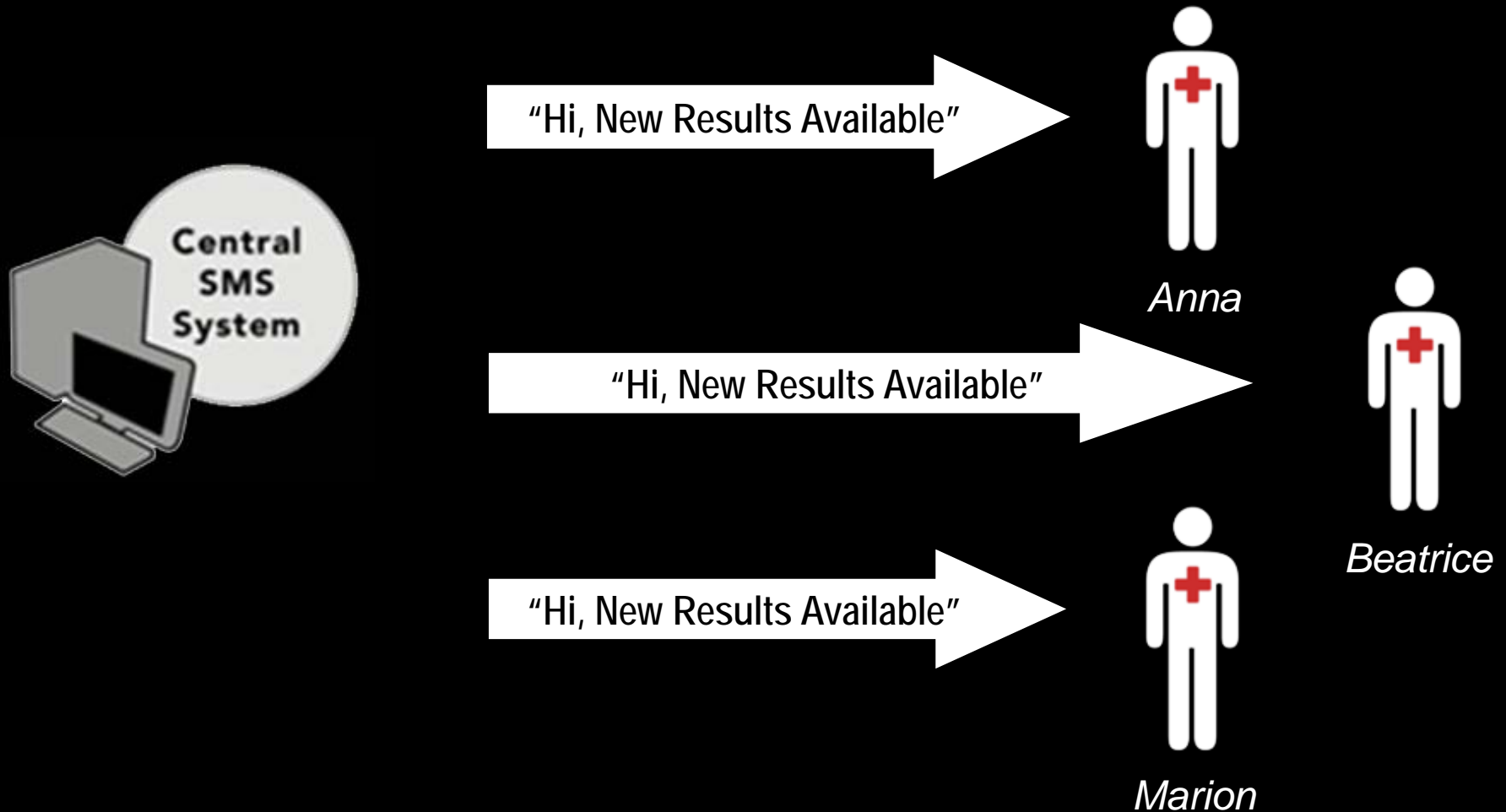
# Workflow

## Clinic: Results Retrieval

The 3 step process in the clinic used to create accountability in results retrieval

# Workflow: **Clinic**: Results Retrieval

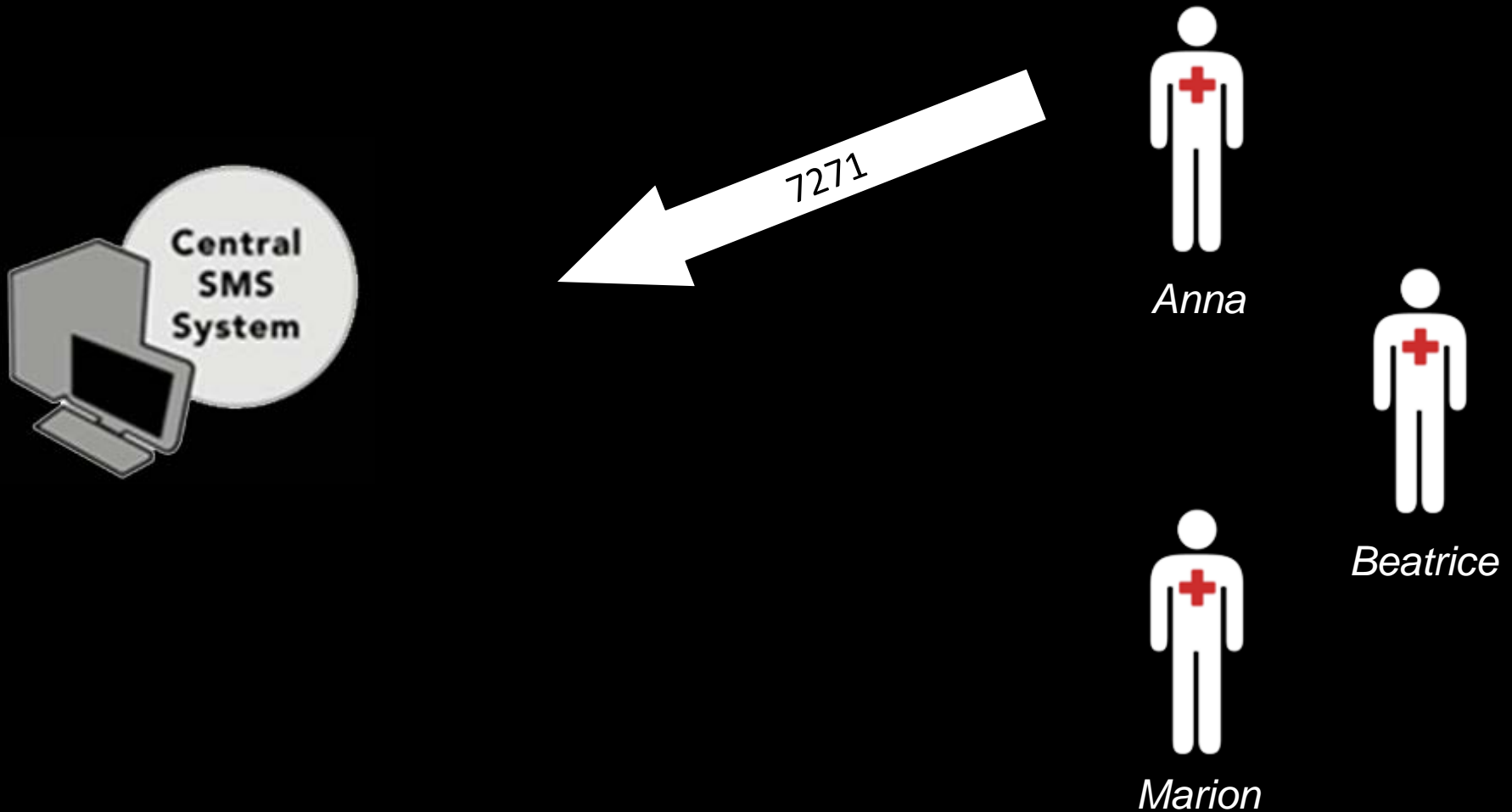
1



All registered clinic workers get notified that results are ready to be retrieved.

# Workflow: Clinic: Results Retrieval

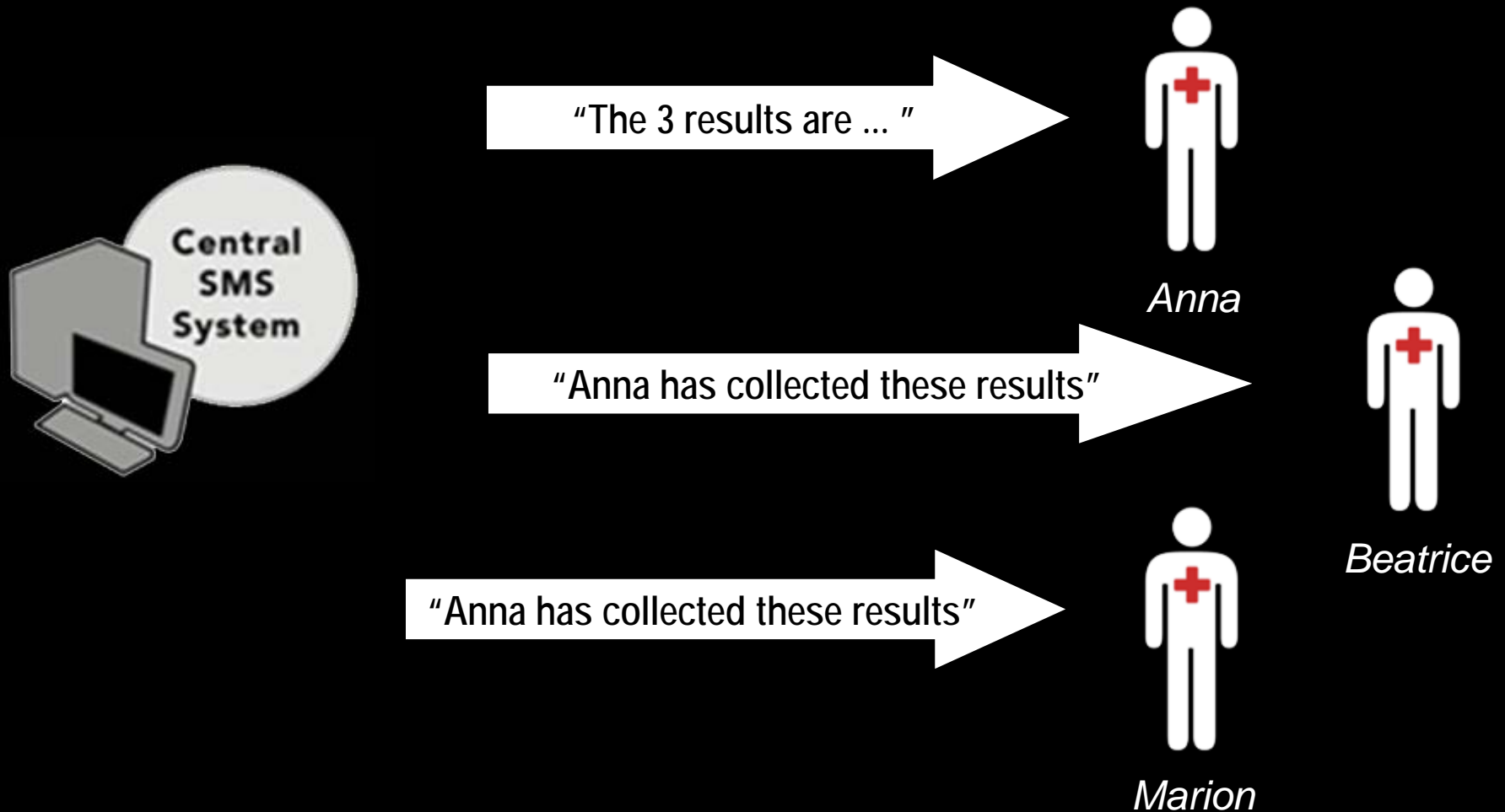
2



The first clinic worker ready to record the results send their 4 digit pin to the server.

# Workflow: Clinic: Results Retrieval

3



The results get sent to Anna but the other clinic workers get told that Anna has received the results.

# Pilot Results

# Monitoring & Evaluation

## Quantitative

- Registers in each clinic
- Pre and post SMS system data (10 facilities)
- Compare hard-copy v SMS
- Discrepancies between hard-copy & SMS results
- Analyzed the traffic of the system

## Qualitative

- Collected satisfaction survey of system users
- Collected surveys from all clinics
- Coded and analyzed all the data from the surveys

# Quantitative Analysis

## Pre-SMS System v Post-SMS System

Comparing the TAT of results getting from to caregivers before and after the SMS system for facilities with baseline data



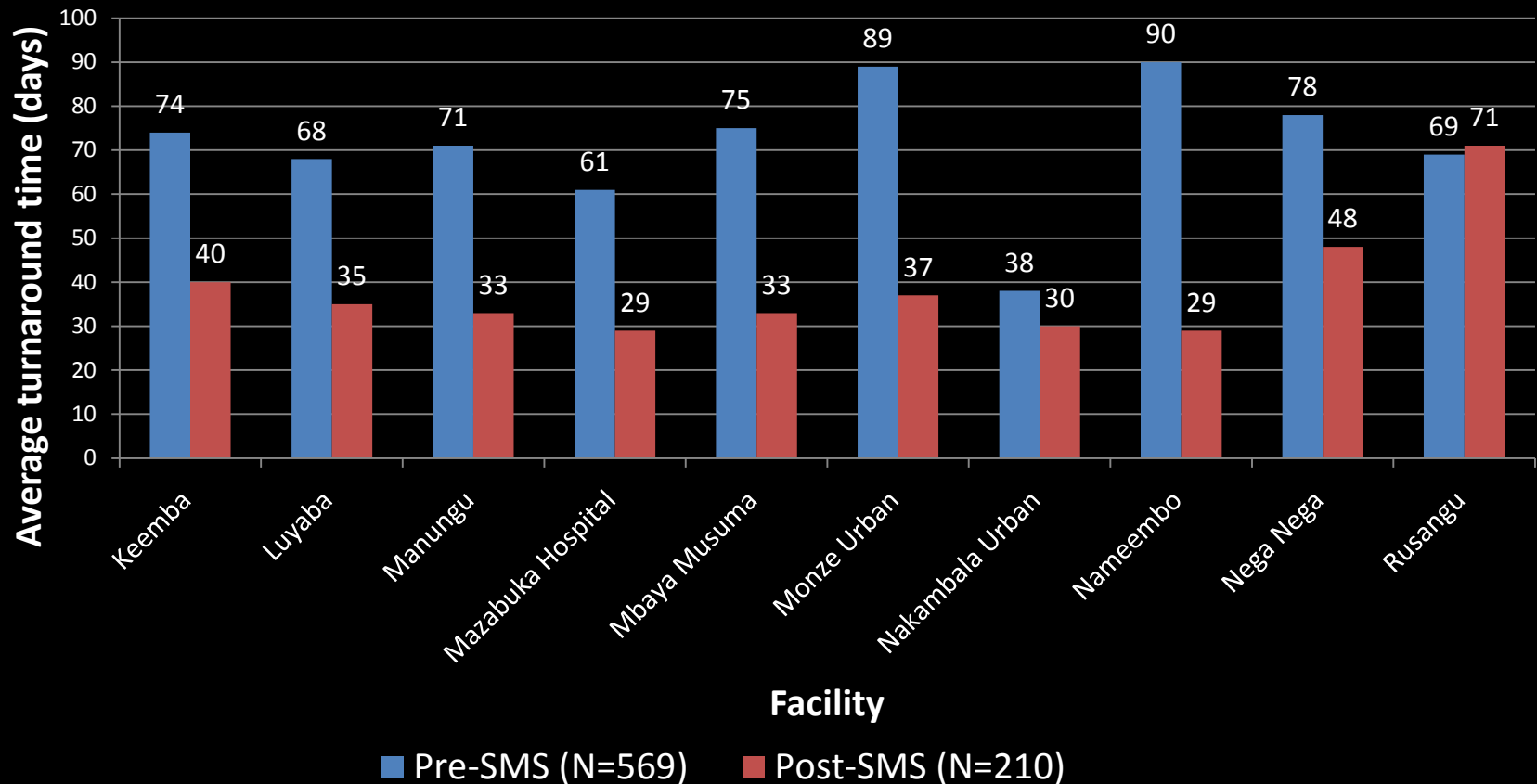
# Quantitative: Pre-SMS System v Post-SMS System

Southern Province



# Quantitative: Pre-SMS System v Post-SMS System

Turnaround Time to Caregiver, Pre- vs. Post-SMS System, Southern Province, by Facility (uncensored)



# Quantitative: Pre-SMS System v Post-SMS System

On average results were

**56% faster**

between sample collection and  
delivery to caregiver

# Quantitative Analysis

## Hardcopy v SMS Results

Comparing the volume of results delivered by the existing paper system vs the SMS system across all pilot sites

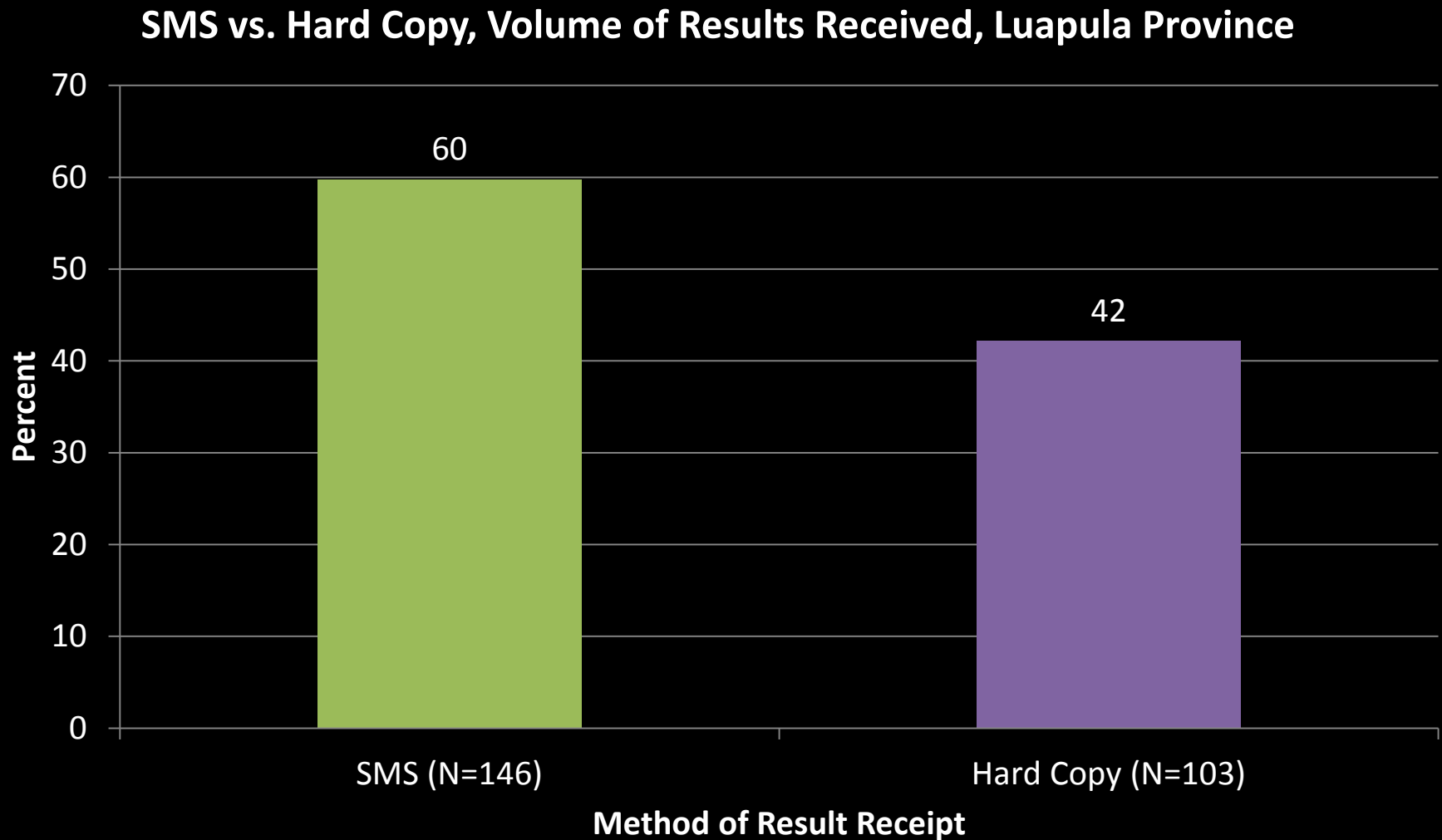
# Quantitative: Hardcopy v SMS Results

## Luapula Province



# Quantitative: Hardcopy v SMS Results

Luapula Province



# Quantitative: Hardcopy v SMS Results

On average

**30% more**

results arrived by SMS than by  
hardcopy

# Quantitative Analysis

## Discrepancies between Hardcopy & SMS Results

Comparing the any discrepancies between the existing paper system to the SMS system across all pilot sites



# Quantitative: Discrepancies: Hardcopy & SMS Results

Luapula & Southern Province



# Quantitative: Discrepancies: Hardcopy & SMS Results

Luapula & Southern Province

There were minimal discrepancies

0.48% error

2 out of the of the 414 samples

Hardcopy Result	Hard Copy Results vs. SMS Results			TOTAL
	SMS Result			
	Positive/Detected	Negative/Not Detected	Sample Rejected	
Positive/Detected	40	1	0	41
Negative/Not Detected	1	370	0	371
Sample Rejected	0	0	2	2
TOTAL	41	371	2	414



RemindMi

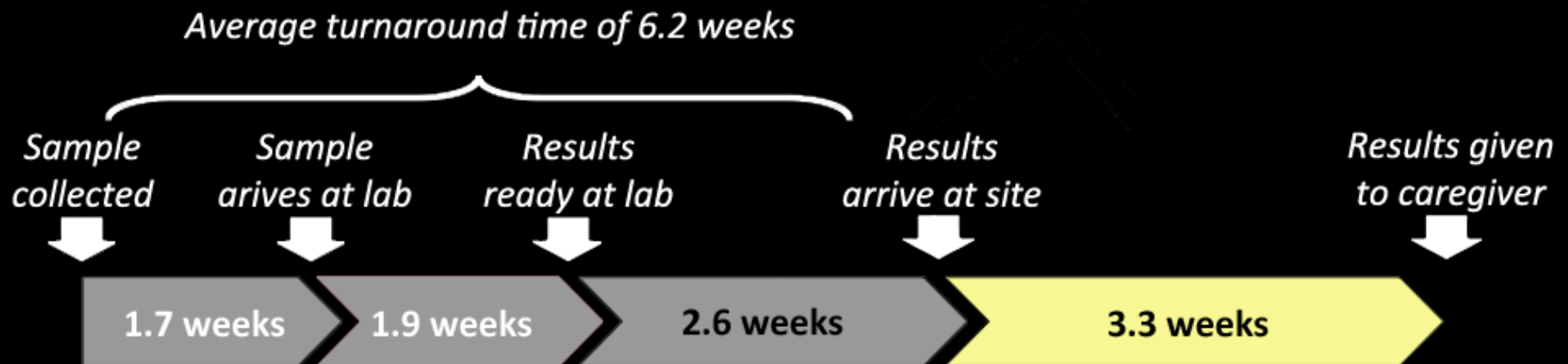


- Patient tracing by CHWs
- SMS Reminders for post-natal visits
- Specific traces for DBS results being returned

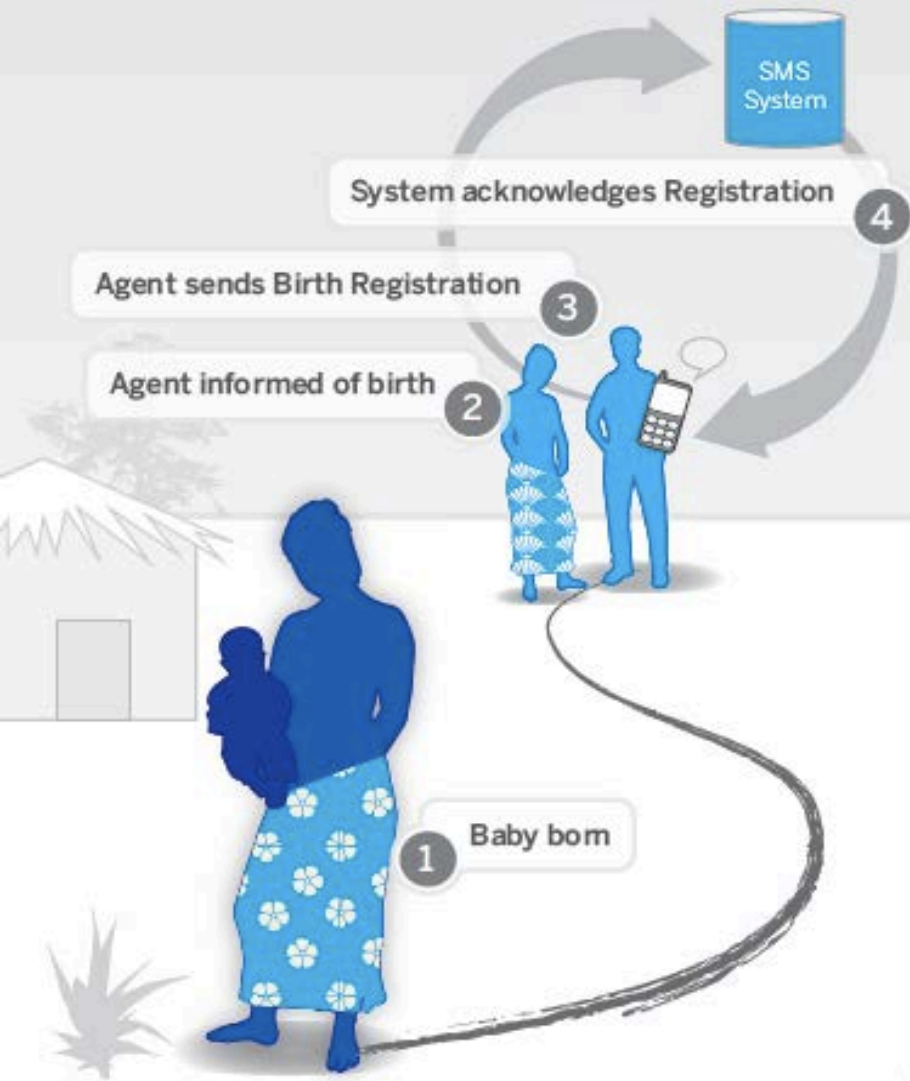
# Early Infant Diagnosis Results Cycle

*National average of 2008 including rural and urban*

RemindMi focuses on the portion of the EID cycle from the facilities to the caregiver



# RemindMi Process



# Workflow

Phone: Reminders

The 3 initial messages sent back and forth to register births and receive post natal reminders



# Workflow: Phone: Reminders

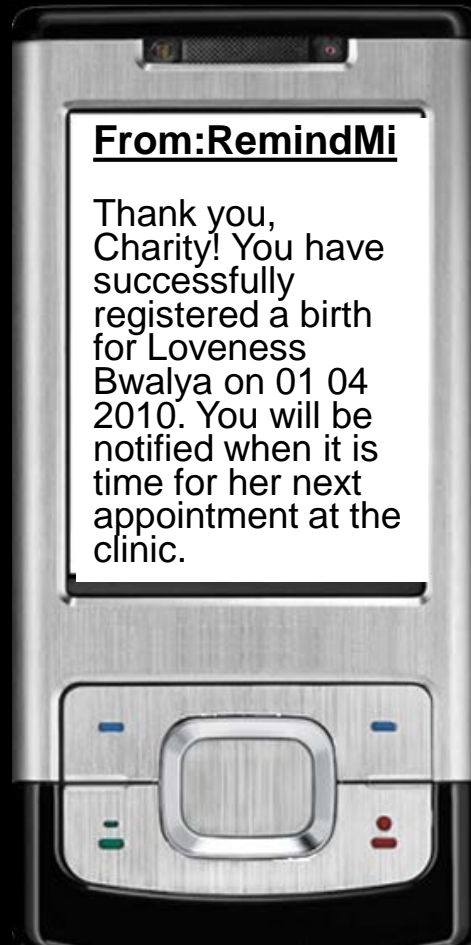
1



RemindMi Agents send a message to the system with the infant's date of birth and the mother's name.

# Workflow: Phone: Reminders

2

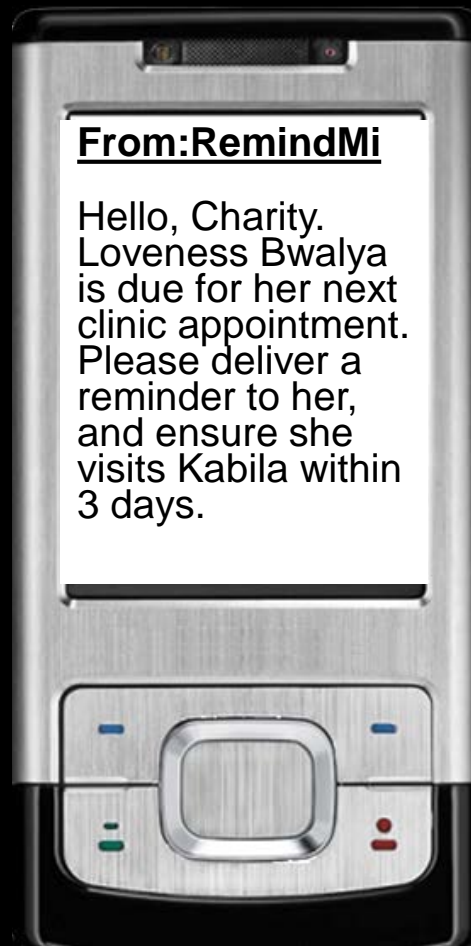


The system replies, thanking the RemindMi Agent for registering the birth.

6 days pass

# Workflow: Phone: Reminders

3



The system reminds the RemindMi Agent of a necessary post-natal visit at six days, six weeks, and six months.

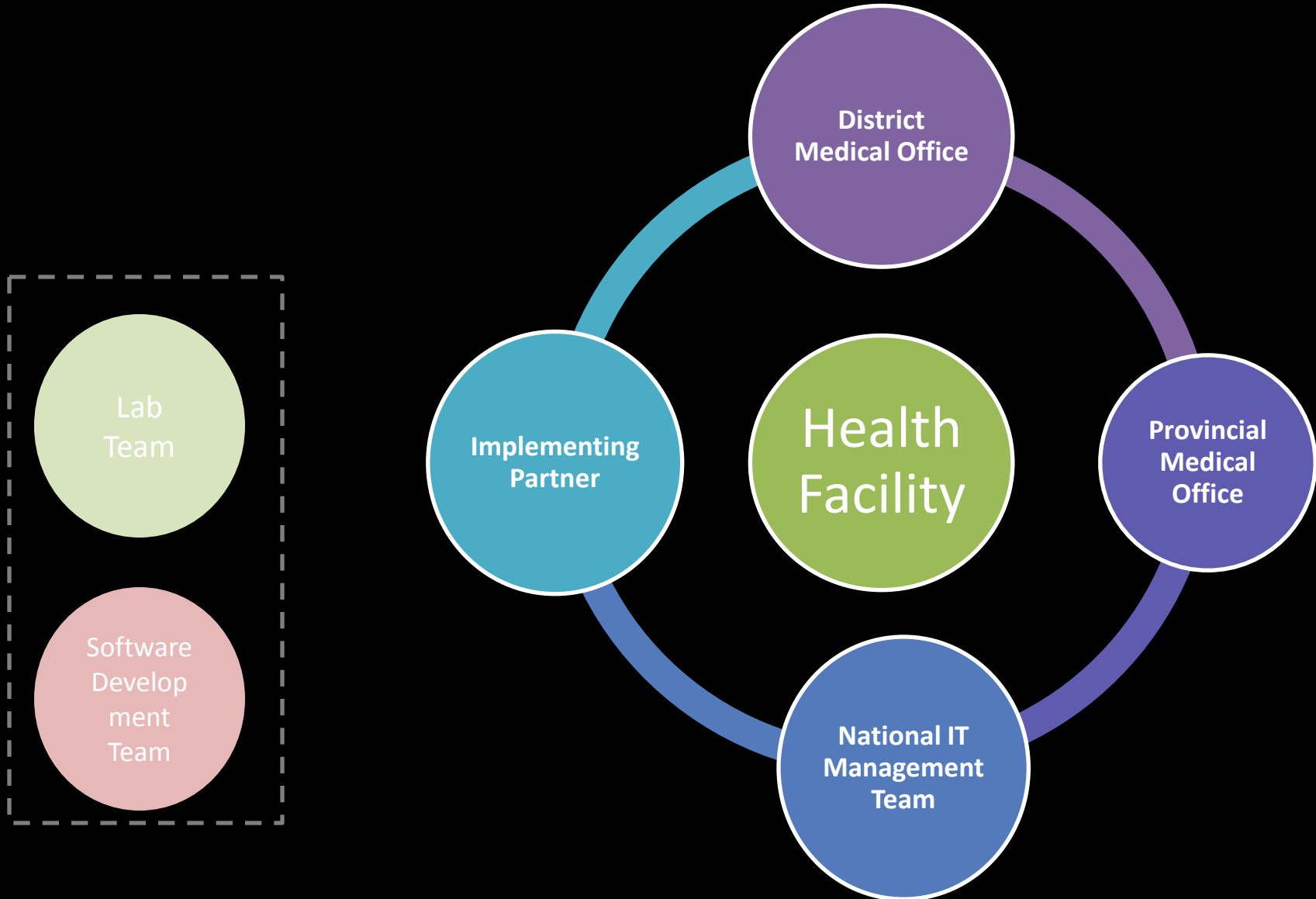
# Additional System Features

- To improve accountability:
  - TOLD – RemindMi Agent notifies the system that the caregiver was told of an appointment
  - CONFIRM – RemindMi Agent confirms that the caregiver went to the clinic
- To facilitate patient tracing:
  - TRACE – When DBS results return, RemindMi agents follow-up with caregivers in the community



# Management

# Redundant Management





# Aggregated Web Reports

Log out

RapidSMS

Republic of Zambia  
MINISTRY OF HEALTH

Dashboard

Map

Reports

Select Period  to

## Results160 Reports in period 2010-08-01 to 2010-10-11

Generated on **11 Oct 2010** at **02:34 PM**

### Results Received By Facilities


	<u>District</u>	<u>Facility</u>	<u>Positive</u>	<u>Negative</u>	<u>Rejected</u>	<u>Total Received</u>
1	Kawambwa	Kabila	0	5	0	5
2	Kawambwa	Mushota	1	1	0	2
3	Kawambwa	Salanga	3	7	3	13
4	Mansa	Buntungwa	2	28	2	32
5	Mansa	Central Clinic	2	39	0	41
6	Mansa	Fimpulu	1	2	0	3
7	Mansa	Mibenge	0	4	0	4
8	Mansa	Muwanguni	1	1	0	2
9	Mazabuka	Mazabuka District Hospital	1	21	0	22
10	Mazabuka	Mbaya	2	9	1	12
11	Mazabuka	Nakambala	1	22	1	24
12	Mazabuka	Nameembo	0	5	0	5
13	Mazabuka	Nega Nega	0	7	0	7
14	Monze	Keemba	1	20	0	21
15	Monze	Luyaba	2	5	0	7
16	Monze	Manungu	1	23	0	24
17	Monze	Monze Urban	4	55	0	59
18	Monze	Rusangu	2	9	0	11
19	Nchelenge	Kabuta	0	3	0	3
20	Nchelenge	Kambwali	2	12	0	14
21	Nchelenge	Kanyembo	2	0	0	2
	<b>All listed districts</b>	<b>All listed clinics</b>	<b>28</b>	<b>278</b>	<b>7</b>	<b>313</b>

# Real-time Alerts

Log out

RapidSMS

Republic of Zambia  
MINISTRY OF HEALTH



DashboardMapReportsAlerts

Results160 Alerts on 26th October 2010 at 11:46

### Clinic Issues:

Alerts for Clinics Not Retrieving Results in the last 5 days

Select date range (days)

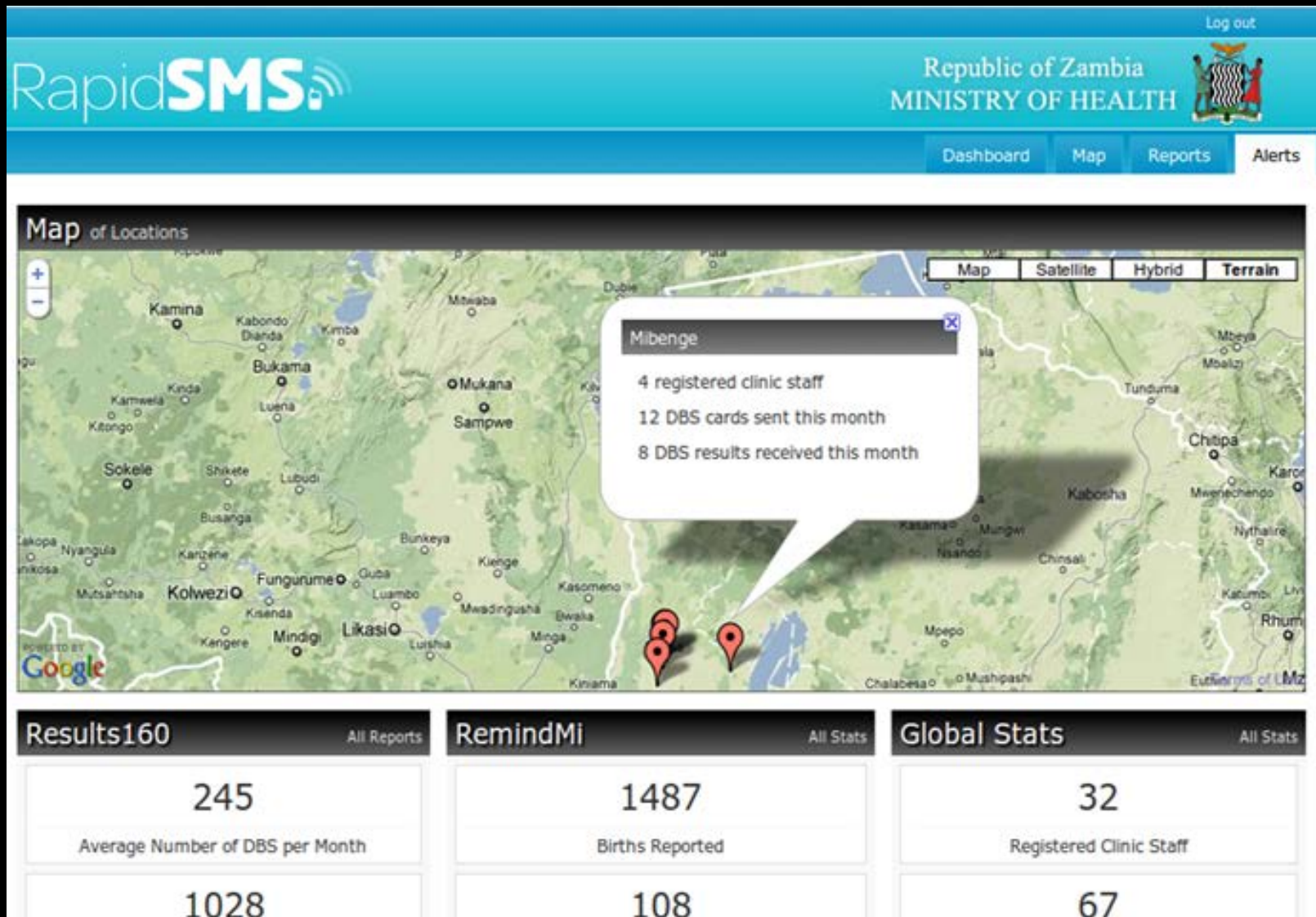
4 days	Rusangu	Rusangu clinic have not retrieved their results. Please call and enquire (Rusangu:+260974600169)
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Alerts for Clinics Not Sending DBS Samples or using Results160 in the last 14 days

Select date range (days)

16 days	Muwanguni	Clinic has no record of sending DBS samples. Please check that they have supplies by calling (Harrison:+260977546157, Francis Chilufya:+260979882318). <b>Clinic has not been using Results160 during this period</b>
16 days	Mibenge	Clinic has no record of sending DBS samples. Please check that they have supplies by calling (Cleo Mutale:+260979673648, Yumba:+260977102988). <b>Clinic has not been using Results160 during this period</b>
16 days	Kanyembo	Clinic has no record of sending DBS samples. Please check that they have supplies by calling (Paul Bwalya:+260979419311, Gina:+260975883777, Marvin Chama:+260974118639). <b>Clinic has not been using Results160 during this period</b>
16 days		Clinic has no record of sending DBS samples. Please check that they have supplies by calling (Joseph...

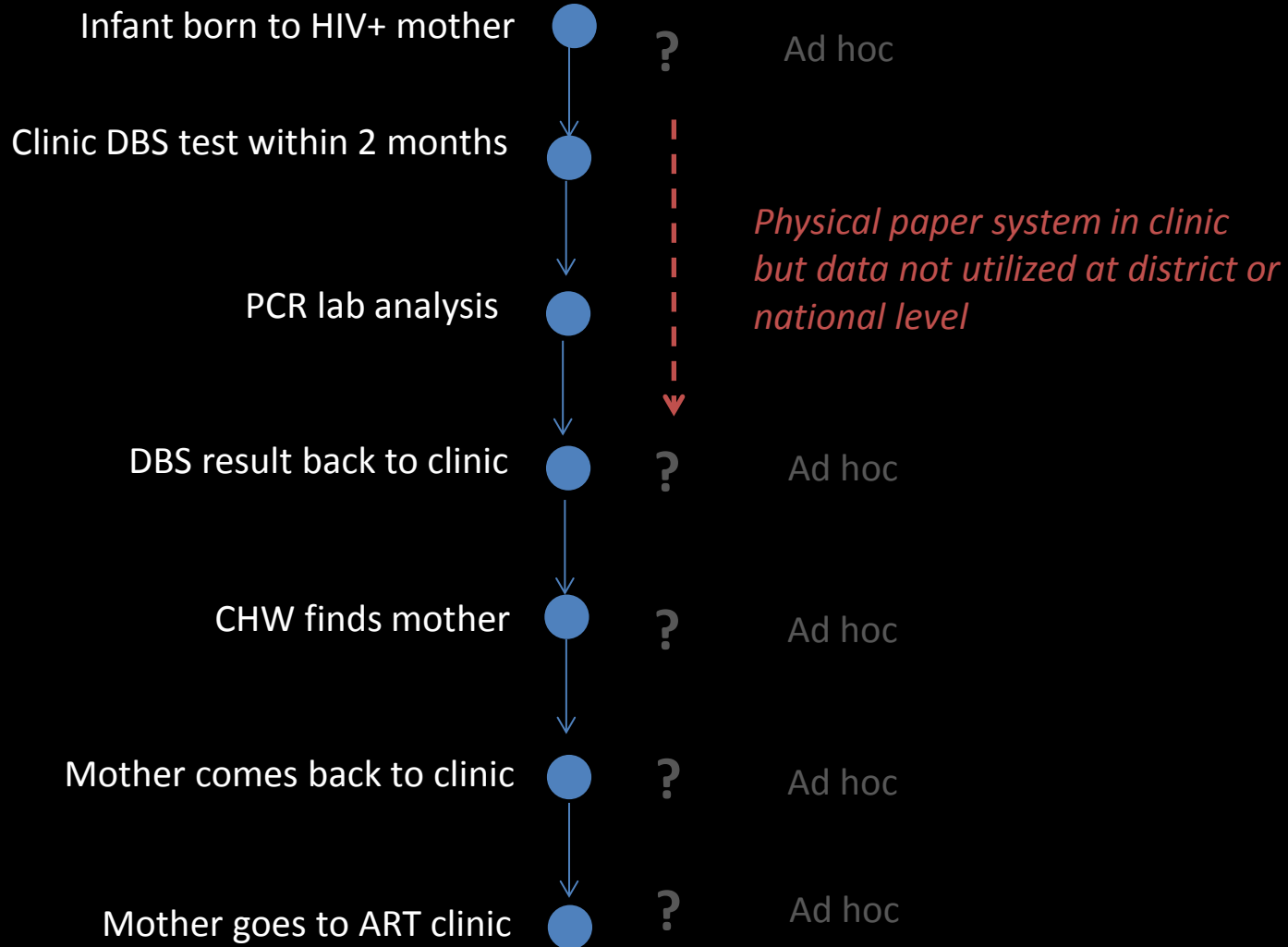
# Mapping



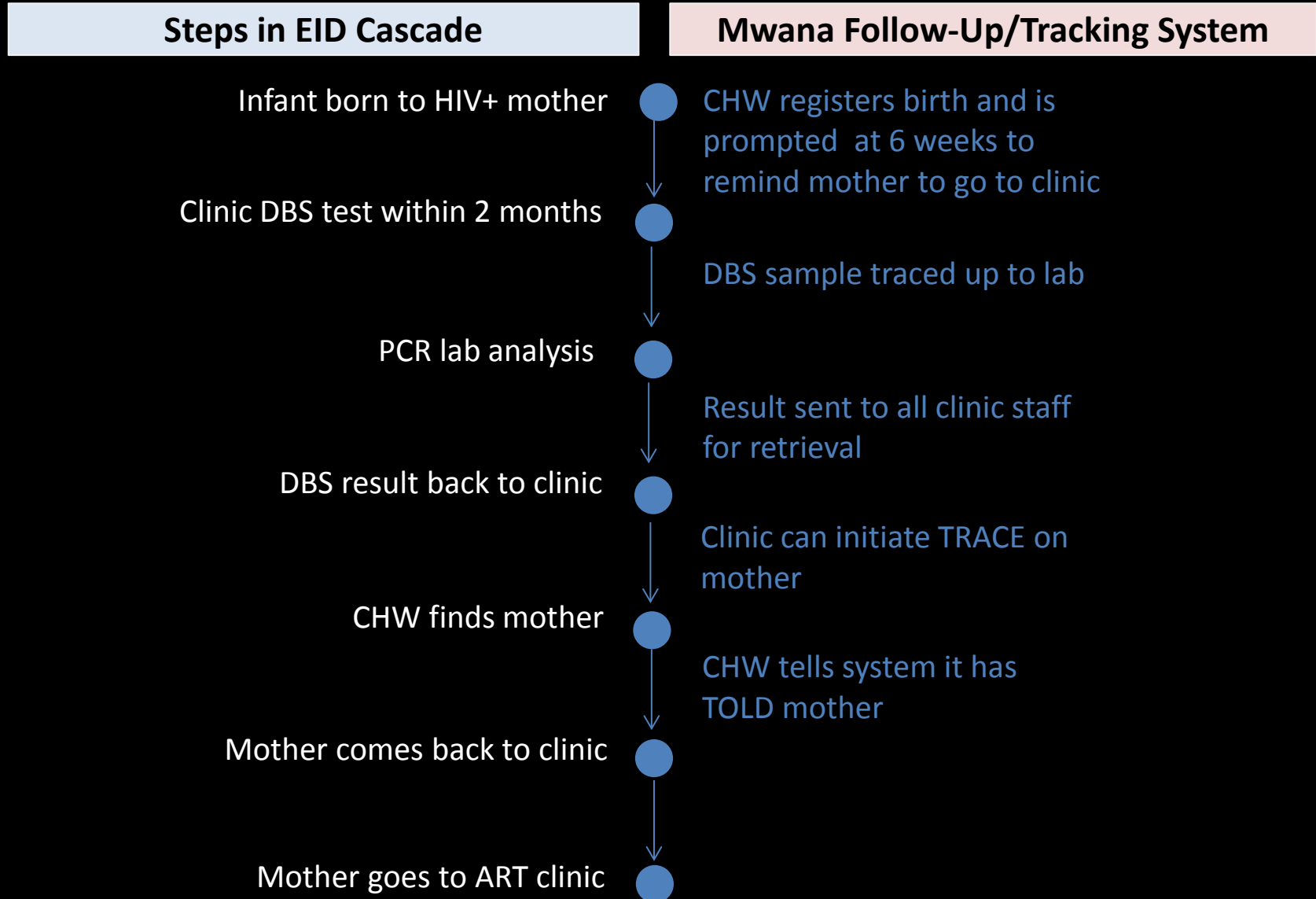
# EID Workflow: Pre-Mwana

## Steps in EID Cascade

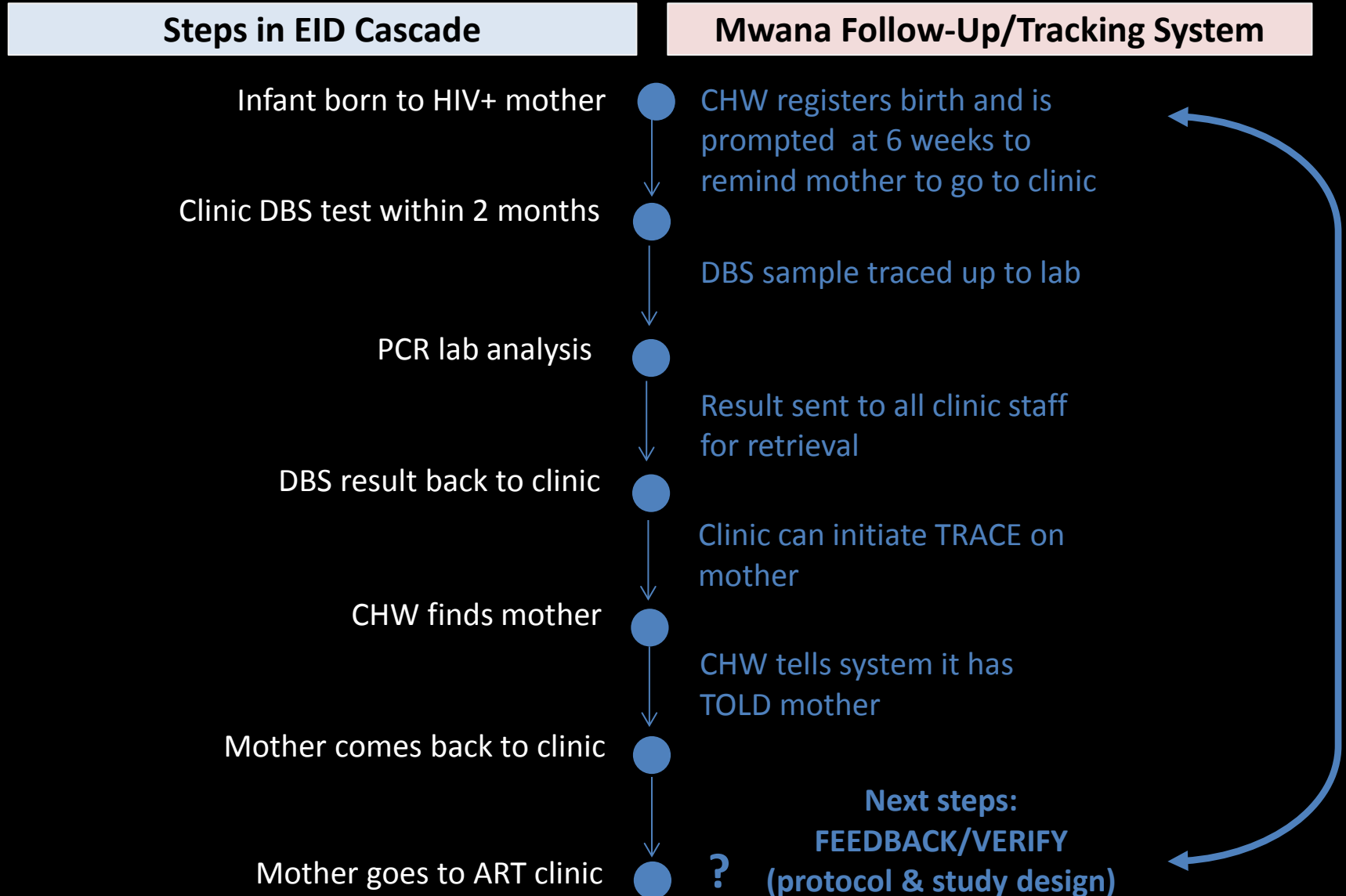
## Previous Follow-Up/Tracking System



# EID Workflow: Mwana



# EID Workflow: Next Steps Mwana



# Partners

## Government & UN



## Implementing Partners



## Mobile Network Operators



## Donors



# Design for Scale

- 1) **Design a "robust" system.**
- 2) **Start with "local ownership" of the solution.**
- 3) **Minimize "dependencies." Think about capacity.**
- 4) **Prioritize independent "adopt-ability." Solve user's pain-points.**
- 5) **"Evolve" your solution. Start small and grow.**



# Funding for Scale

- 1) **Involve the government and make sure what you are doing fits the larger needs and does not compete with others efforts.**
- 2) **Involve other partners early, coordinate with them for systemic solutions.**
- 3) **Do your M&E and publish it.**
- 4) **Calculate costs of the program at scale early on so there are no surprises. (contractual processes, TCO, capacity)**

# Thank You

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@unimps

<http://github.com/rapidsms/rapidsms/>