



Using interactive SMS to reach  
women and improve quality of care  
in Kenya

*Rachel M. Jones, MPH*

# Agenda

- Background on Jacaranda Health
- Principals of our design
- Our Results
- Rapid Evaluation and Integration
  - V1 – SMS only
  - V2 – SMS & helpdesk
  - V3 – SMS & Quality of Facilities
  - V3.1 – Helpdesks at facilities
- Next Steps





## Challenge: Poor Quality of Maternal Care

More mothers than ever are delivering in hospitals, but better access to care often does not mean better health outcomes. Why? *Poor quality of facility-based care.*





# Jacaranda health is transforming the quality maternal healthcare with high-quality in the private and public sector



## Social enterprise:

- Highest quality maternity hospital in East Africa
- Replicable low-cost model
- Can return capital to investors



**Nonprofit:** adapts and replicates innovations in public hospitals to improve quality of care

- Proven impact
- Low-cost and sustainable in public health system

# Our approach in public facilities is to rapidly test, validate and scale maternal health innovations

## FOCUS AREAS

- 1 Increase client demand for better care at facilities
- 2 Equip providers with life-saving obstetric skills
- 3 Resolve system-level bottlenecks to service delivery



mHealth tools



Nurse Mentorship



Quality Improvement



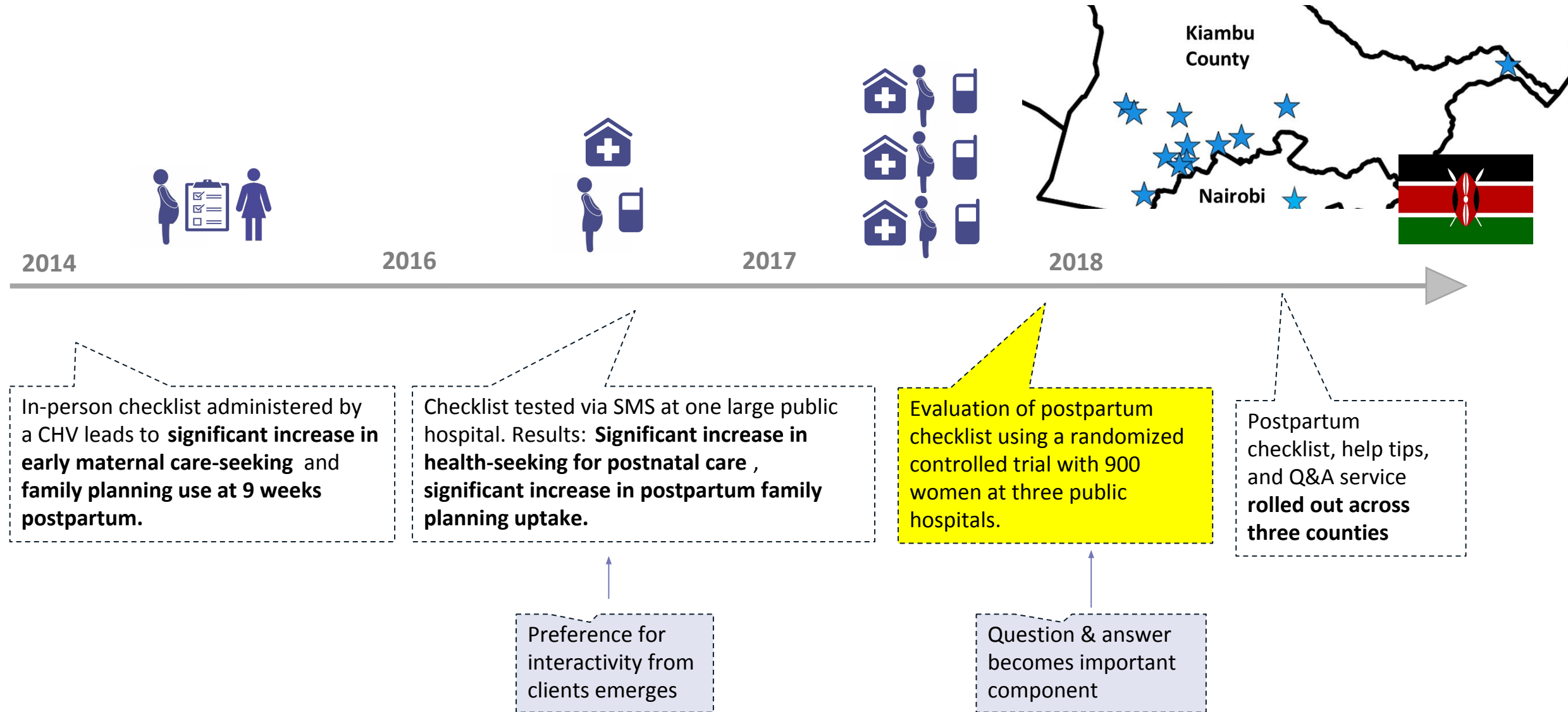
# Our Design Principals

- Reach the lowest income woman (whether rural, urban, or peri-urban)
- Keep platform simple
- Evaluate rigorously and rapidly
- Continuously engage users for feedback on products



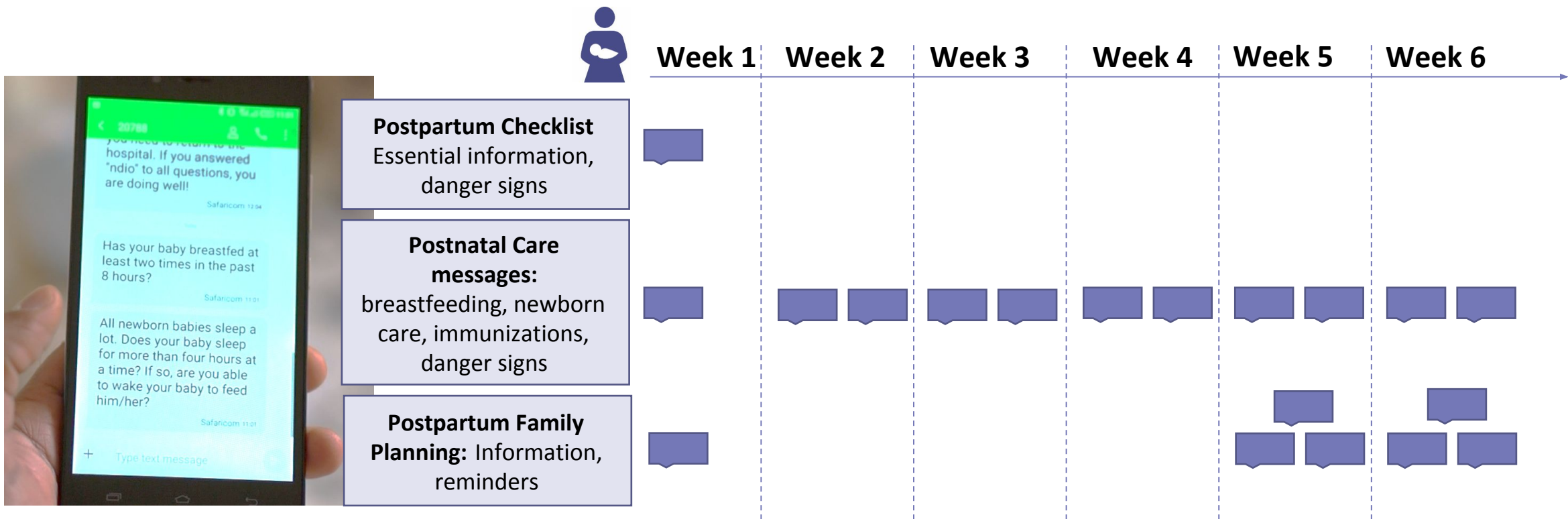


# SMS tools for increasing patient-provider contact during the pregnancy continuum



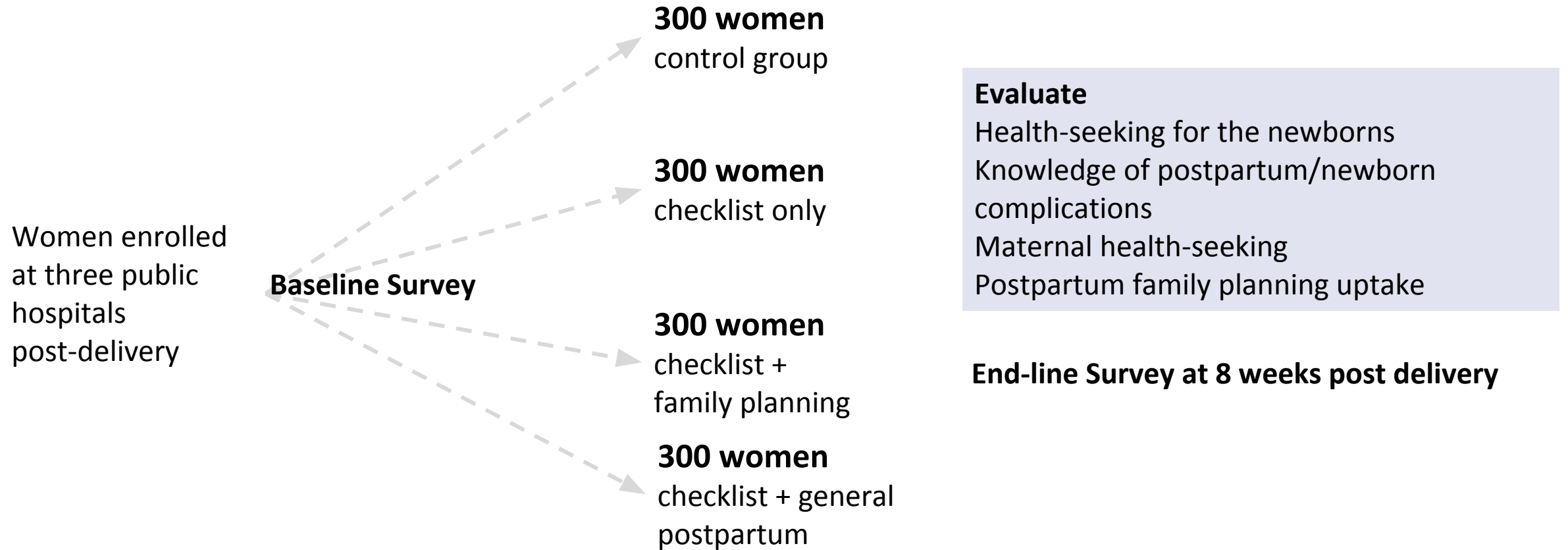
# Intervention: A discrete series of postpartum SMS messages

- Designed in collaboration with mothers & providers  
e.g. through focus group discussions on content, frequency, language





# A Randomized Controlled Trial (RCT) design



# Results: Our SMS package improves maternal health seeking

We have tested the messages through pilot studies, and most recently through a **randomized controlled trial (RCT)** with 900 women



"I learned about danger signs like headaches and dizziness which I thought were normal for a pregnant mother"

When pregnant women or new mothers receive our SMS messages, they are...

## more likely to know danger signs and seek care

The likelihood of a participant naming 1+ danger **sign increased by 29%** ( $p=0.04$ ). Women were **22% more likely to seek advice for their negative health symptoms** ( $p=0.07$ ; 90% CI)

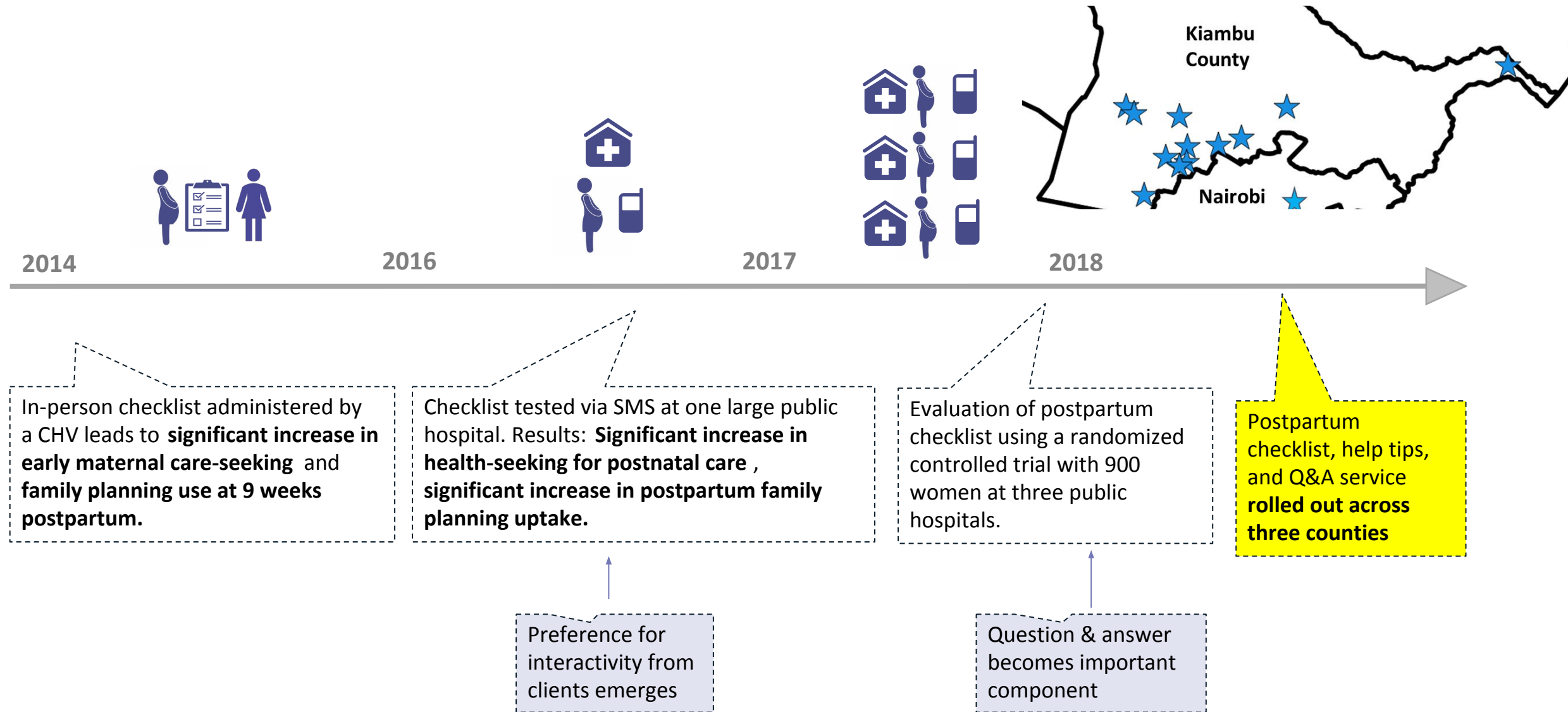
## more likely to take up family planning

The odds of women in the FP messaging arm taking up PPFP by 8 weeks postpartum was **1.6 times** the odds of women in the other groups ( $p=0.02$ )

LARC uptake – The odds of women in the FP messaging arm taking up a LARC method (implant or copper IUD) by 8 weeks postpartum were **1.9 times** the odds of women in the other groups ( $p=0.04$ )



# SMS tools for increasing patient-provider contact during the pregnancy continuum

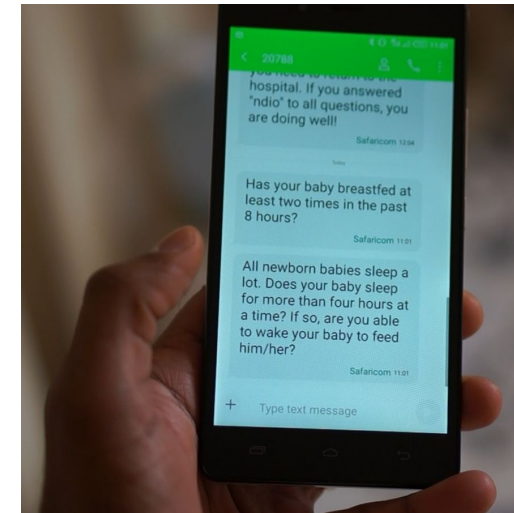


# Version 1.0: Rolling the SMS package out across public facilities

## 1 Pregnant women/new moms see posters



## 2 Receive SMS messages



### ANTENATAL CARE

- Tips
- Danger signs
- Pregnancy nutrition



### POSTPARTUM

- Checklists of information
- maternal and newborn danger signs
- Family planning tips

19 msgs

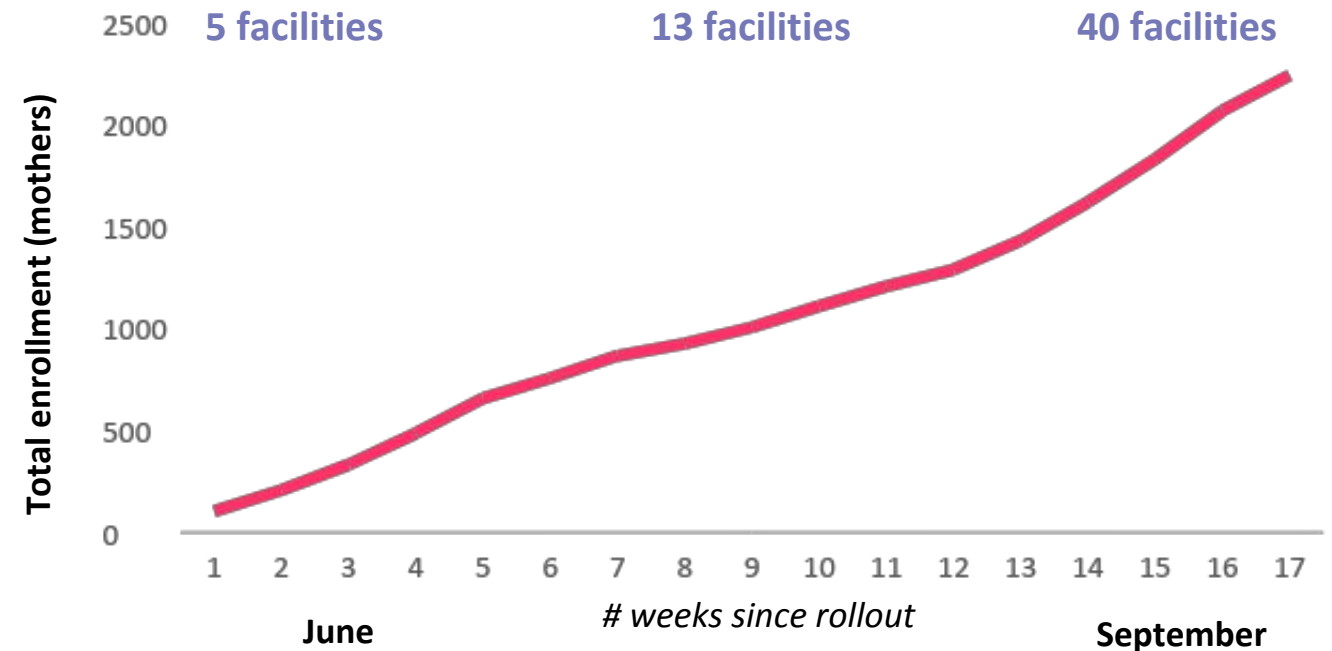
26 msgs



# Current status: Rapid enrollment across public facilities

- We have now rolled out the SMS service in three Kenyan counties: Kiambu County, Nairobi County, Bungoma County
- Jacaranda works directly with the sub-county health management teams to recruit facilities
- Adding ~1,300 new mothers/month

3

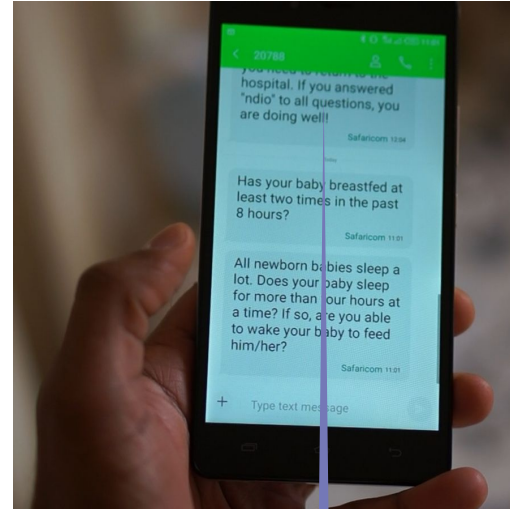


# Version 1.2: Due to Demand - Questions & Answers from Helpdesk

1 Women see posters



2 Receive SMS messages



3

Can ask questions via a helpdesk service



## ANTENATAL CARE

- Tips
- Danger signs
- Pregnancy nutrition

19 msgs



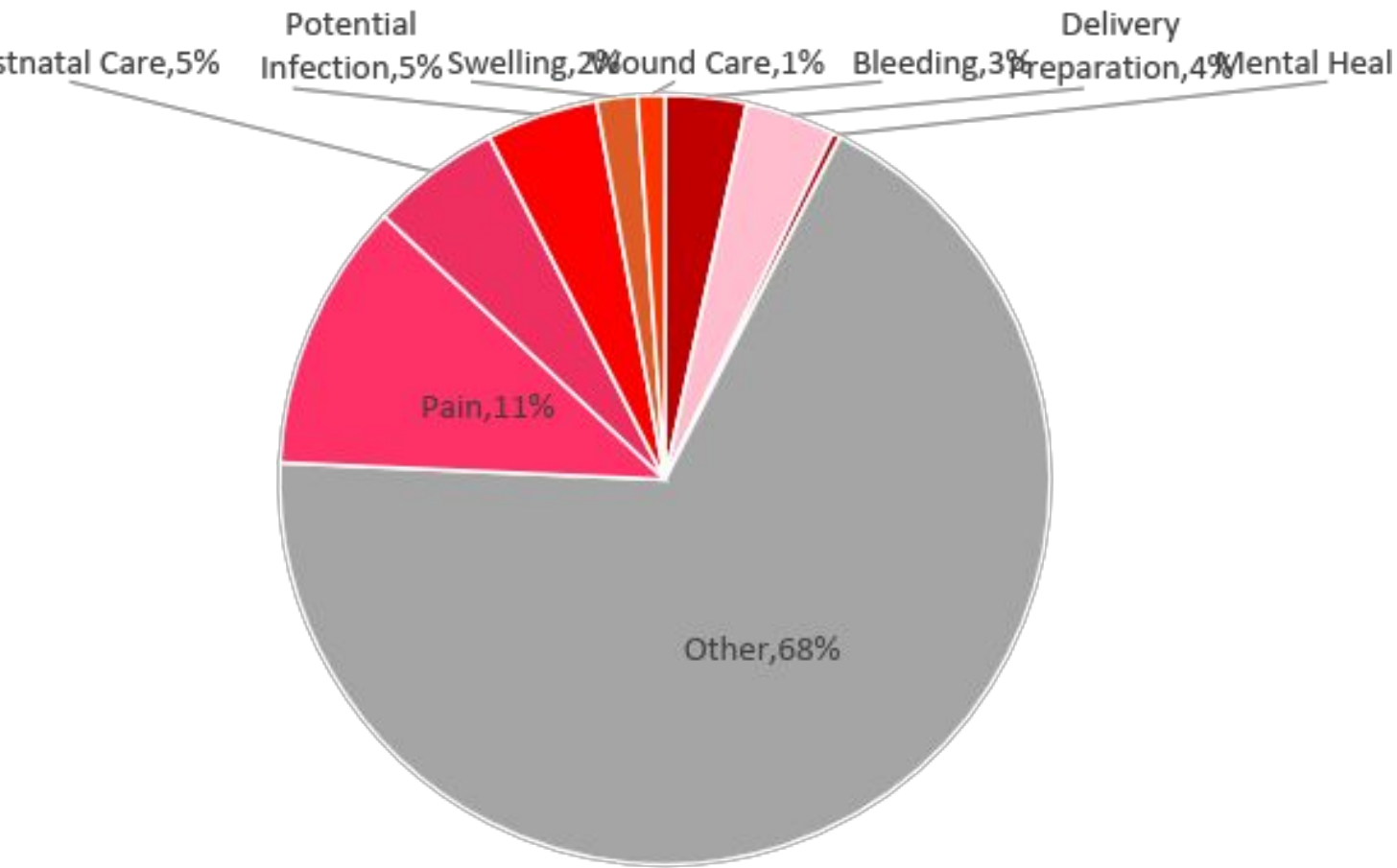
## POSTPARTUM

- Checklists of information
- maternal and newborn danger signs
- Family planning tips

26 msgs



# Providing patient-centered answers to clients questions



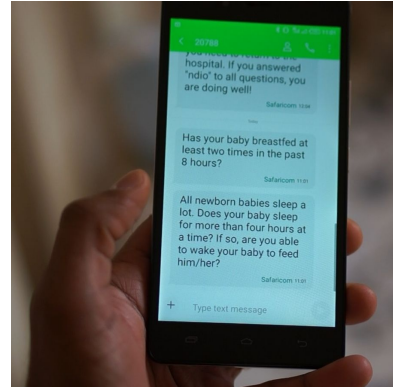
- Thousands of questions have been asked on our platform
- 60%+ of the mothers enrolled ask at least 1 question
- The majority of questions asked are general pregnancy, but **20-30% could be medically serious** and require additional attention

# Version 1.3: Adding Client Feedback on Facility Quality

1 Women see posters



2 Receive SMS messages



3 Can ask questions via a helpdesk service



4



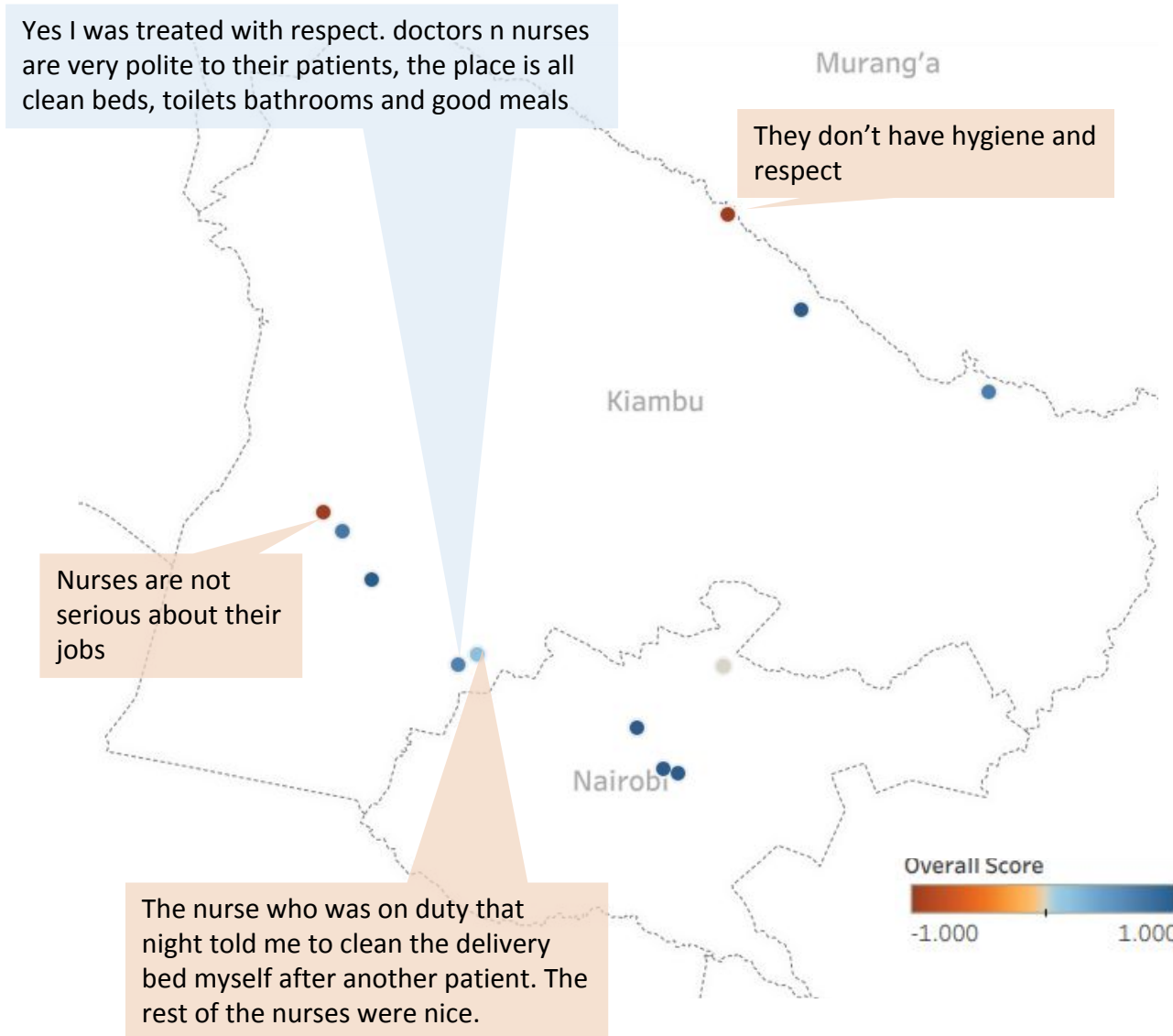
Clients provide info on facility quality

2018 DASHBOARD: KAHAWA

		Goal	Red Flag	Measure	Data Source	OCT	NOV	DEC	JAN	FEB	MAR	APRI	MAY	JUN	JUL	AUG	SEP	OCT
	(severe)Newborn Jaundice			No. of newborns	SF	0	0	2	0	0	0	0	0	0	0	0	0	0
	Newborn Resuscitation			No. of newborns	SF	3	3	3	0	0	1	1	1	0	2	6	1	2
	initiate breastfeeding within 1hr	100%	<95%		SF	98%	96%	85%	100%	100%	100%	100%	***	100%	100%	100%	100%	100%
Inpatient Referral	Maternal			No. of cases per month	SF	1	1	0	0	1	2	0	0	0	0	0	0	0
	Newborn			No. of cases per month	SF	3	4	4	3	0	2	1	3	0	1	1	1	2
<b>Overall Indicators</b>																		
Complaints	Number of complaints	<10/ month	>15/month	No. of cases per month	SF		2	2	3	5	3	2	5	3	1	0	2	0
	satisfaction with the quality of care		≥ 95%		PATIENT		92%	89%	92%	84%	88%	91%	74%	92%	90%	93%	90%	99%
	Rating of Hospital	>=8	<6		PATIENT	9	8.9	9	9.3	9.1	9.4	9.7	8.4	9.3	9.8	10	8.5	10



# Can clients tell us more about their experiences at facilities?



## Rapid SMS Quality Survey

- Evaluated client experience with quality of care at facilities
- Questions sent via SMS, responses within 24 hours
- ~27% response rate

**We are able to learn about quality challenges, including poor patient centered care, from our SMS user base**



## **Next Steps**

**Helpdesks based at facilities**

**Monthly quality dashboards based on client responses**

**Appointment reminders and defaulter tracing**

**Additional content on breastfeeding & weaning**



INVESTIGATING ATTITUDES AND PREFERENCES OF CHATBOT GUIDES IN  
FACEBOOK'S SOCIAL MEDIA PLATFORM AMONGST PREGNANT WOMEN IN  
KENYA– A FEASIBILITY STUDY

Mary Brannock

Duke GLOBAL HEALTH INSTITUTE



# BACKGROUND

1

What is a  
Chatbot?

2

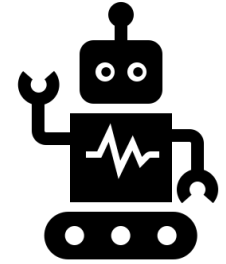
90.4%  
Mobile Phone  
Coverage

3

86%  
Internet  
penetration

4

Facebook &  
Messenger  
2 / 10





## STORAGE SPACE

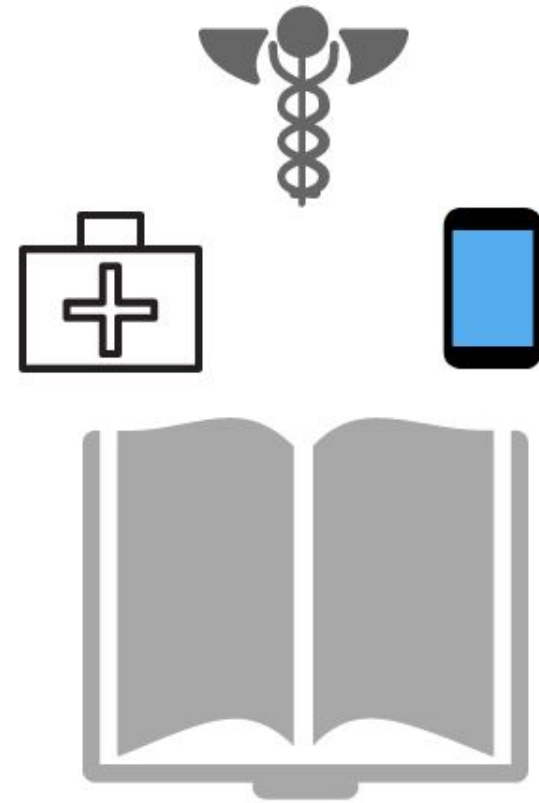
- Tecno N2
- 87.6% - Kenya's global market share
- 8 GB internal memory
- \$50 USD



## BACKGROUND CONTINUED

Health Literacy

Healthcare Workforce in Kenya



## PROBLEM STATEMENT

Kenyan Maternal Mortality Rate : 510 per 100,000 live births

Only 20% of women receive ANC before their fourth month of pregnancy

Only 18% of women are using a modern PFP method 6 months after birth

39% do NOT practice exclusive breastfeeding

Maternal health literacy is low in Kenya and impacts all of these variables

(KDHS 2014)



# IDEA



Could free, personalized pregnancy health information be delivered through a Facebook application?



Accepted?

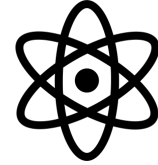
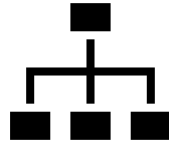


Feasible?



Health literacy?

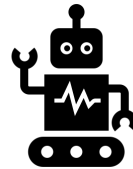
## ACCEPTABILITY & DESIGN FGDS



Modes of  
information  
delivery



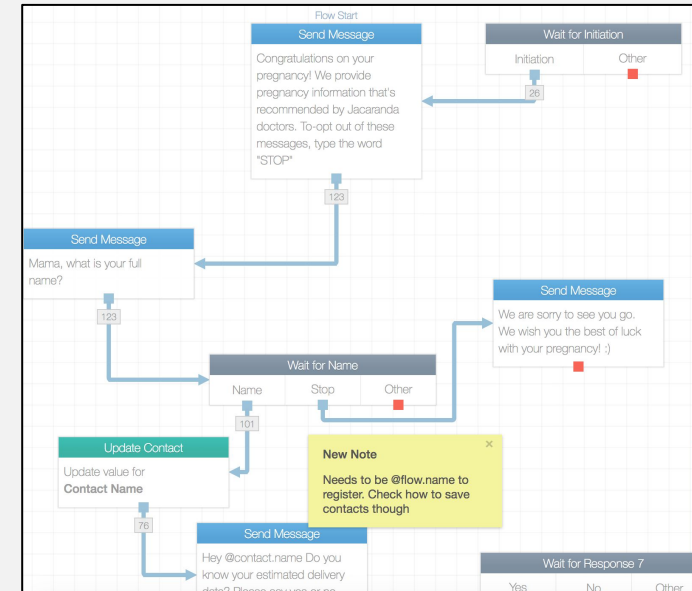
Voice



Icon

# TECHNOLOGY AND DEVELOPMENT

- Open-source platform – Textit.in
- Integrations with Zapier & Facebook
- Facebook Accounts – Business & Developers
- Facebook Approval 3<sup>rd</sup> Party Integrations



textit.in

messages contacts flows campaigns triggers

Trimester1 ANC

Events for the Trimester 1 group

Add Event

Edd

250 DAYS BEFORE	Hi @contact.name it is important to go to clinic before your 13th week. This is a reminder to attend clinic if you haven't already.
217 DAYS BEFORE	Hi @contact.name it is important to go to clinic in your first trimester. There are important labs & pregnancy advice your provider wants to discuss with you. This is a reminder to attend clinic if you haven't already.
245 DAYS AFTER	Hi @contact.name Did you know the first trimester is when your baby develops all of its' essential organs? This is a reminder to attend clinic if you haven't already to make sure your baby is healthy.



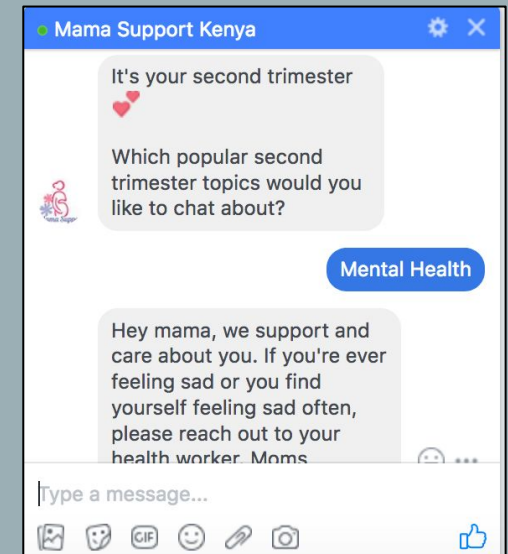
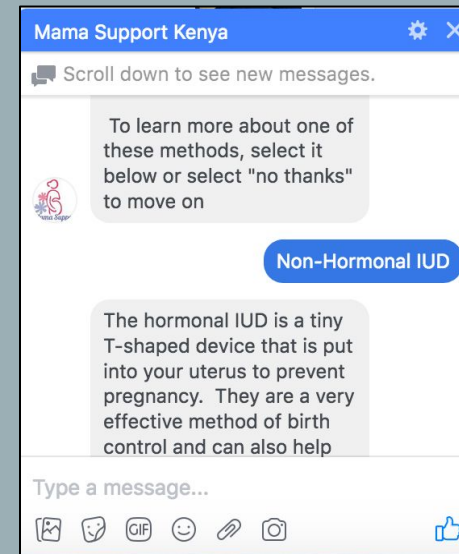
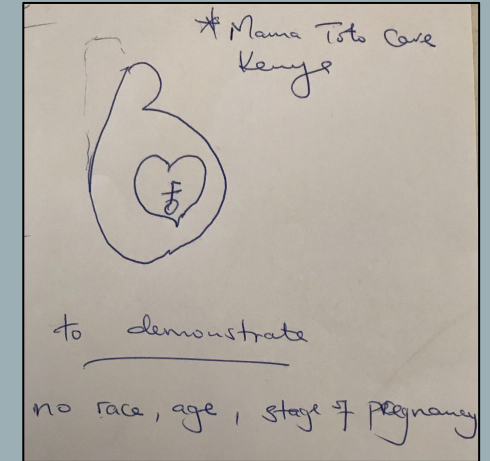
# IMPLEMENTATION & PILOT

## Pilot Intervention

4 weeks of interaction

Moderated

Group Chats



# PRELIMINARY RESULTS

## Benefits

Trusted Source

New Learnings

Psychological Aid

Perceived Anonymity



## Challenges

NLP

More Information

Desire pregnancy  
continuum



## CHALLENGES AND LESSONS LEARNED

1

Prevalence of  
Messenger Lite and  
how it interacts with  
buttons

2

Facebook third-party  
integrations after Data  
Analytica

3

Unanticipated questions  
that data did not  
indicate prior



## REFERENCES

- *Kenya Demographic and Health Survey 2014*. (2014)
- WHO: Mandate on Health Literacy
- <http://www.who.int/healthpromotion/conferences/9gchp/health-literacy/en/>
- Jumia 2017
- <https://www.jumia.co.ke/mobile-report/>

THANK YOU!

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**Making better health as easy as  
starting a conversation**



# ● ● ● The Problem

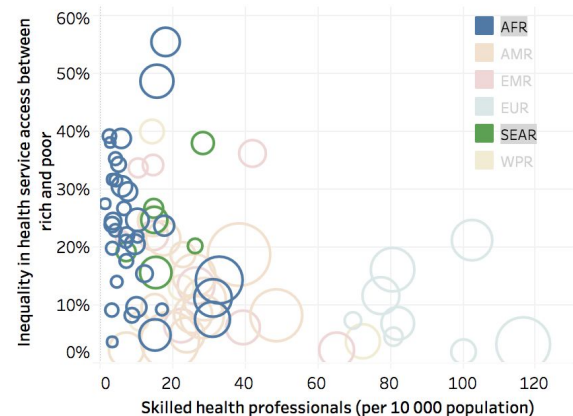
Individuals and families lack **timely, accurate, personalized** information to make effective decisions and take action for their health.



“ I didn't know anything about contraceptives – anything. I just wanted to know ”

– Loise from Nairobi

More health workers does not necessarily mean more equitable access to health services



Note: Data 2015 or latest available year. Bubble size proportional to GDP per capita. Inequality in access to health services measured as difference in RMNCH service coverage between richest and poorest quintiles. Source: WHO Global Health Observatory

# ● ● ● The Solution



**Engage** with  
marketing  
campaigns

Learn by  
**chatting**

**Act** to access  
health services and  
products

“ We used to see  
maybe one, two,  
three clients a week,  
and now we see  
maybe 15 ”

**Health  
Consumers**

**Health  
Systems**

“ That showed me that  
this is a service that  
is mindful, that cares  
about people’s health ”



**Create** and  
**launch** digital  
services

**Refine &  
improve** services

**Monitor**  
engagement



# Our Evolution



# ● ● ● Nivi 1.0: Your FP Agent

## Our solution



Nivi is simple to use, private, and free



### STEP 1

Get a free screening  
by phone



### STEP 2

Get a recommendation  
for the method  
that suits you best



### STEP 3

We arrange a  
free ride to the clinic  
at your convenience



### STEP 4

Get your family planning  
method at the clinic



### STEP 5

Rate your  
experience  
by phone

# ● ● ● Nivi 2.0: Just askNivi

V2.0

@AskNivi

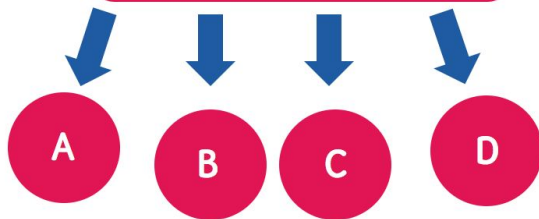
The next step in our vision to be the most trusted source of information about women's health

Between the two, which one prevents the menstruation? I do fear that IUD.

Neither the minipill, or the pill prevents menstruation. If you want lighter or shorter periods, the pill might help. Could you explore a little bit more about why you fear the IUD?

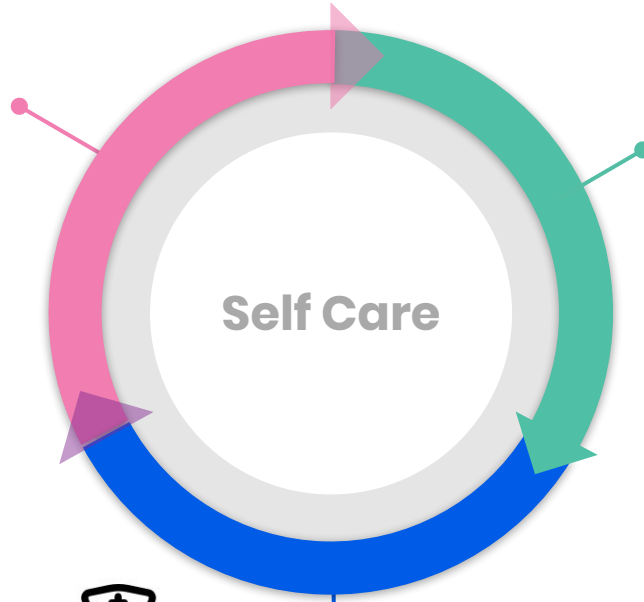
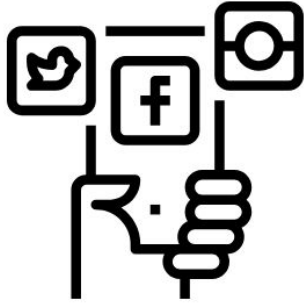
The facts that it's get inside. And then other people say that it can cause cervical cancer.

It does not. An analysis of 12,000+ women published this month showed that the incidence of cervical cancer was actually LOWER among IUD users.



# ● ● ● Nivi 3.0: A Health Journey

ENGAGE



CHAT



ACT





# The Cold Hard Facts



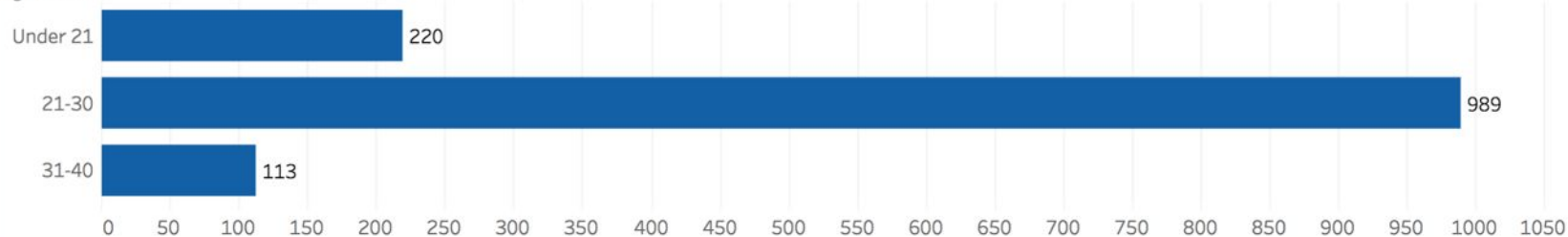
# ● ● ● Our Overall Progress

<b>Total askNivi users</b>	<b>45,000+</b>
<b>FP referrals given</b>	<b>5,000+</b>
<b>FP referrals redeemed</b>	<b>1,500+</b>

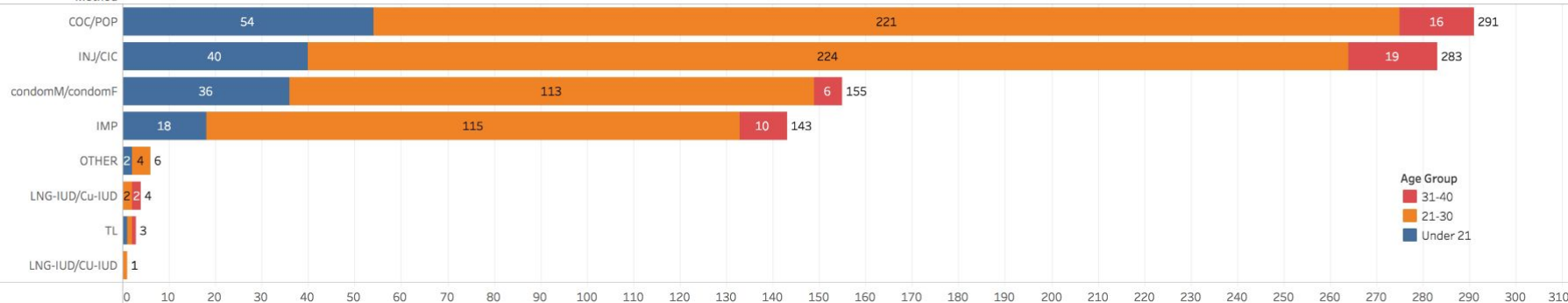


# FP Referral Insights

Age Gr. 

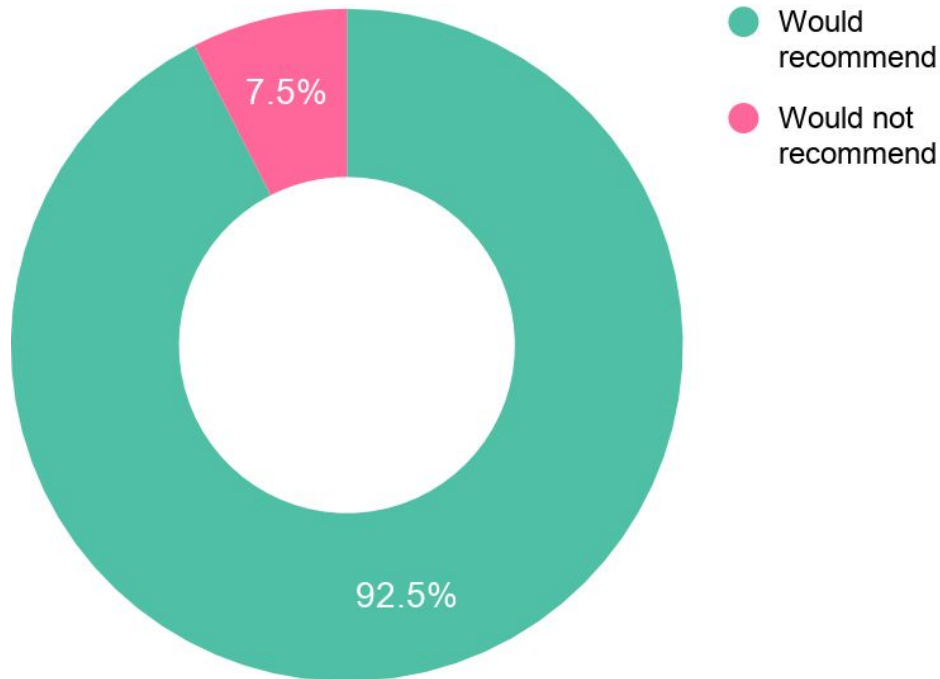


Method



# ● ● ● User Happiness

Would you recommend Nivi to a friend?



2018 Nov 23, 4:01 PM

Wow.... Thank you... You are inspiring... Nice to meet you

2018 Nov 29, 7:07 PM

Thank you for helping me out Nivi you are my hero

2018 Nov 29, 3:17 PM

Thank you alot for letting me learn what i didn't know

2018 Nov 27, 2:18 PM

Ok thanks ,i will start ANC Tomorrow

2018 Nov 25, 10:50 PM

THANKS FOR YOUR SERVICE

2018 Nov 24, 3:28 PM

Thank you so much for being there for us



# How we make it all work

# ● ● ● Rural Engagement

## Actions

- **Distributor Model (Internal) :**
  - Western + Nyanza
  - Community Manager managing teams of 10-15 distributing cards within their networks
- **FMCG Distribution Model (External):**
  - Nairobi - Campus + University
  - Smart partners to activate different locations

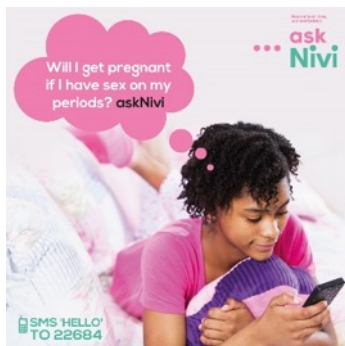




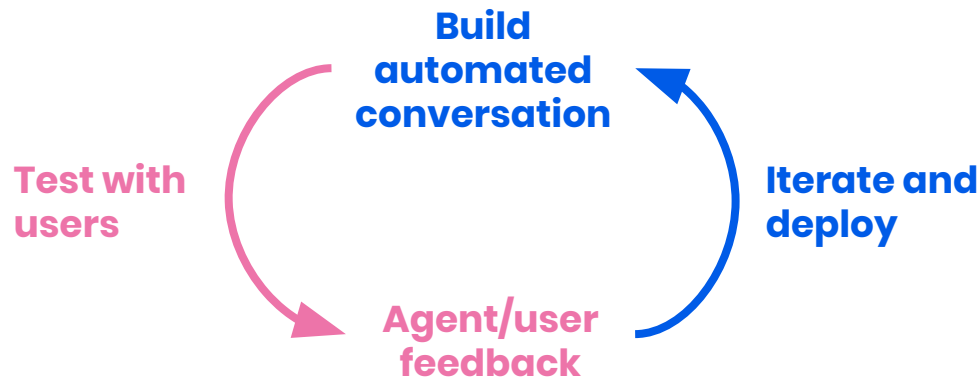
# ● ● ● Digital Engagement

## Actions

- **Brand Awareness** - Content creation (via FB)
- **Conversion** - Paid advertising
  - GDN
  - FB

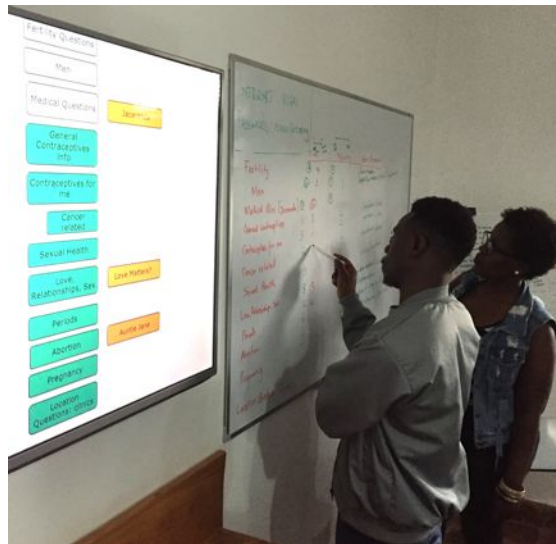


# Creating Conversations



GENERIC SMS APP Create An SMS Application Home Create SMS Application

<b>Name</b>	<b>Description</b>
<input type="text" value="app_future"/>	<div>This is the SMS version of the family planning screening that will then generate a referral for the user after completion.</div>
<b>Type</b>	
<div>Screening</div>	
<b>Stages</b>	
<b>Stage Name</b>	<b>Input Type</b>
<input type="text" value="Name of the stage"/>	<div>--No input--</div>
<b>Options</b>	<b>Next Stage(s)</b>
<input type="text" value="Text input mapping, comma separated"/>	<input type="text" value="Next stage(s); comma separated"/>



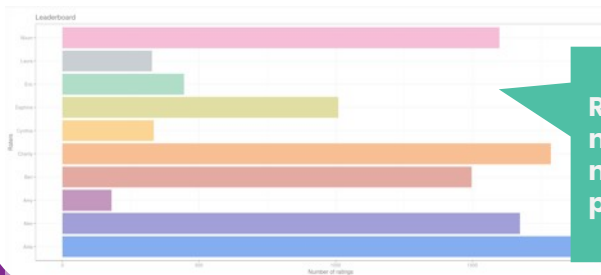
# ● ● ● Training the AI

## 1. Initial training

contraception, side effects  
contraception  
contraception, method recommendation  
sexual health, having sex  
sexual health, STI  
sexual health  
pregnancy  
women's health, menstruation  
symptoms  
sexual health, relationships  
contraception, effectiveness  
women's health, cervical cancer  
pregnancy, days, when safe  
men's health, prostate  
symptoms, discharge  
abortion

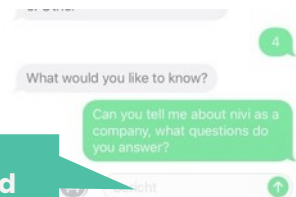
AI trained by  
feeding tagged  
questions

## 3. Re-classification



Reclassify  
messages via an  
mTurk style  
process

## 2. User Validation



User Validated intent based  
on precision accuracy



# Our Roadmap

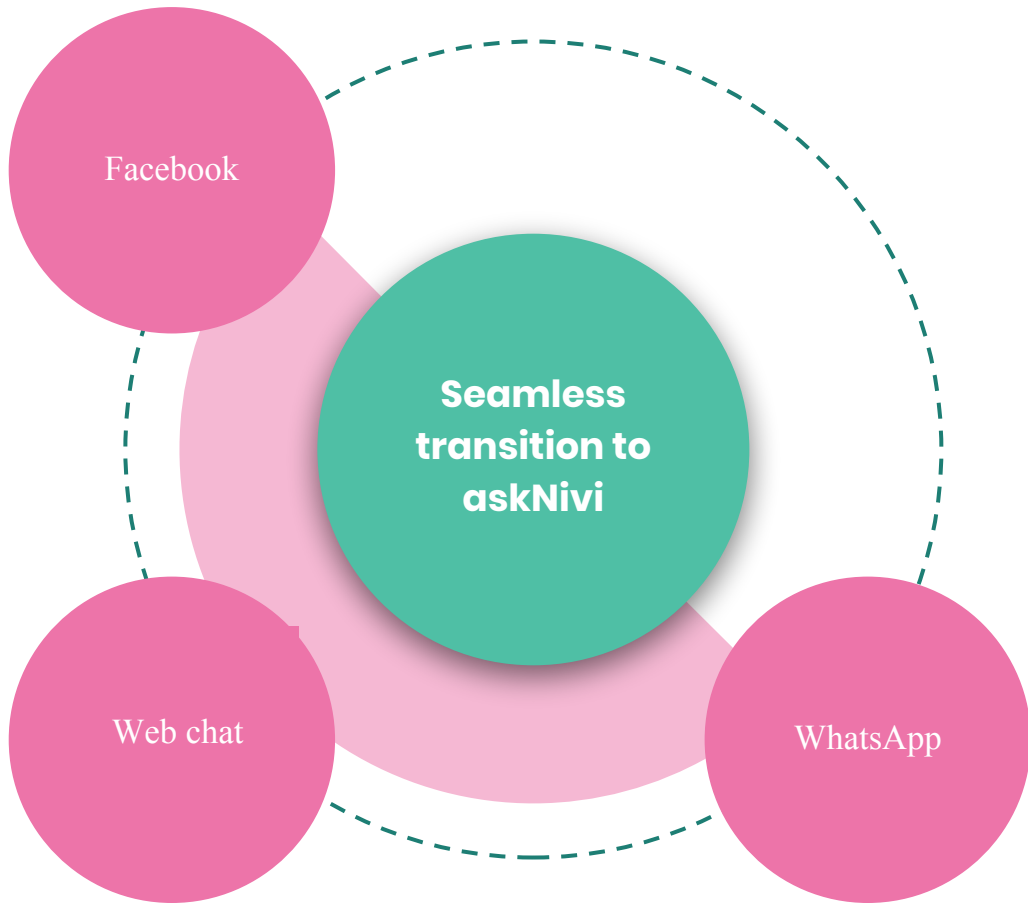
# ● ● ● 2019 and beyond

- 1 Enhance platform to engage users throughout their health journey starting with FP and HPV
- 2 Create a frictionless experience to help users easily access health products & services
- 3 Improve distribution model to enable engagement via partner channels, and encourage organic growth



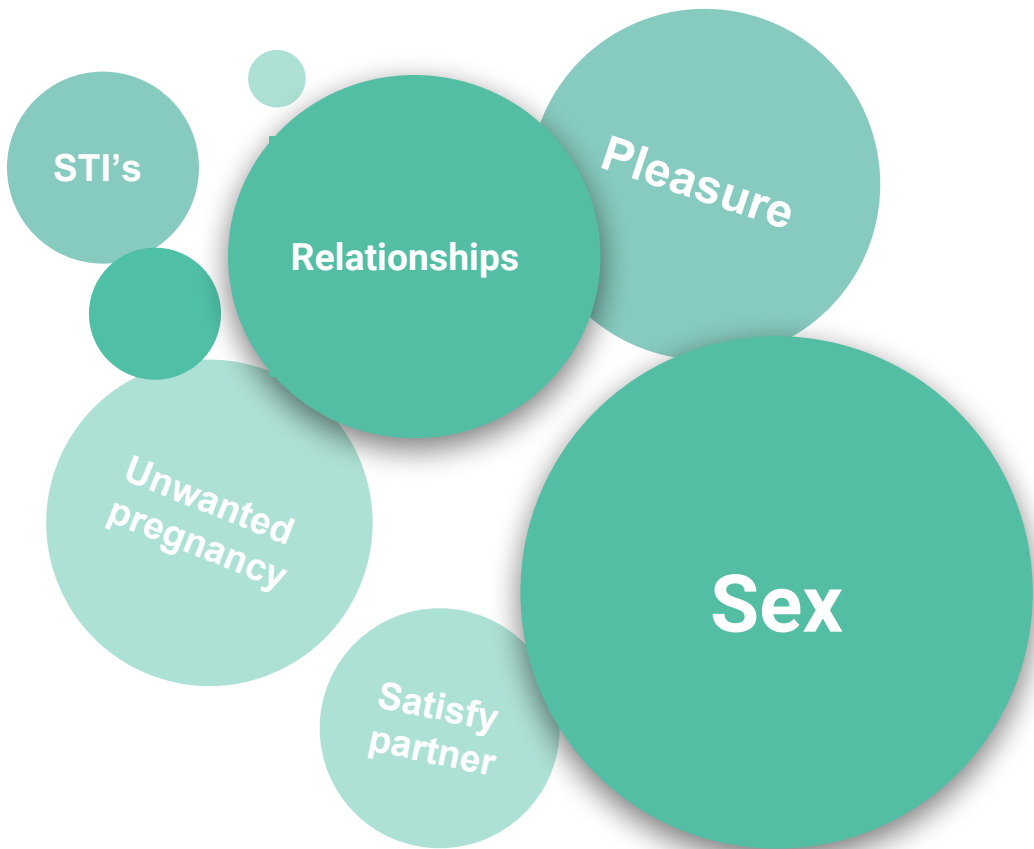


# Engage



# ● ● ● Chat

- Drive the FP journey
- Systems in place so we can know what to automate next
- Guide the user on their journey of self discovery



# ● ● ● Act

1

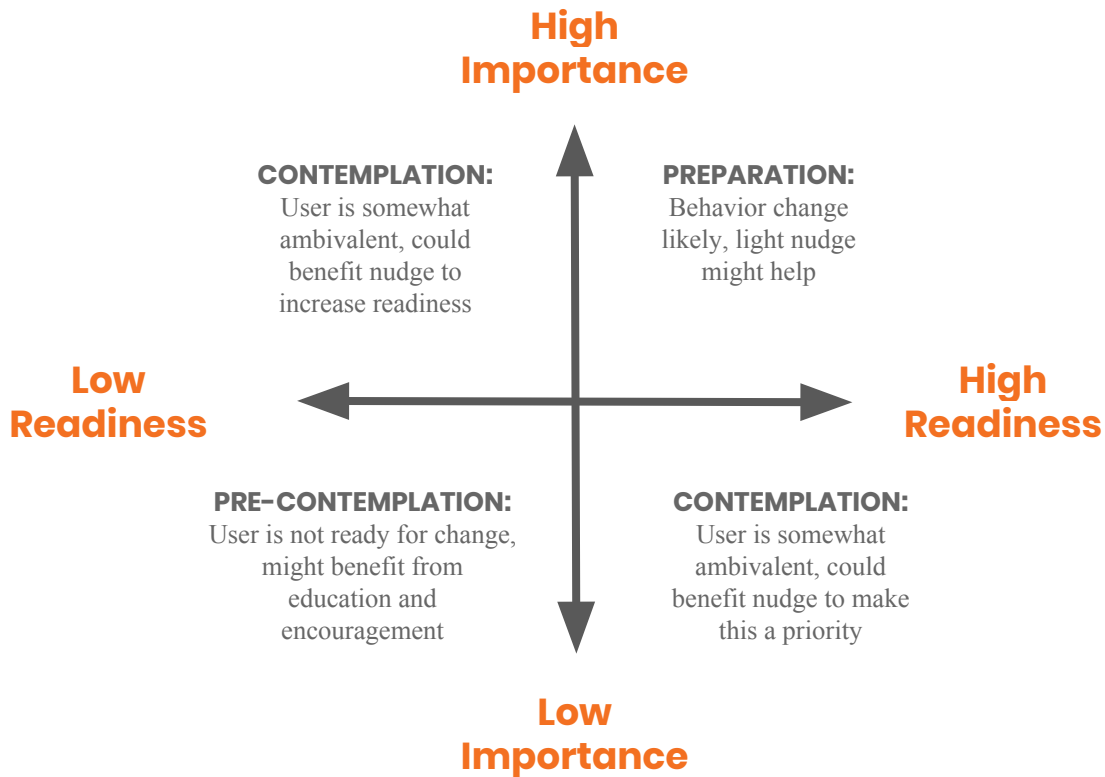
Have a conversation to classify a user's stage of readiness

2

Use this classification to guide efforts to nudge her toward action

3

Refine approach over time by evaluation conversion rates and time to conversion





# Thank you!

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**<https://nivi.io>**