

ANNUAL REPORT

January - December 2023

A Word of Introduction

In 2023, we continued to grow our reach to 800,000+ women and 15,000+ frontline nurses, and expanded our pilots in Eswatini and Ghana (p4). Our programs have demonstrated measurable improvements in health seeking behavior, quality of frontline care (p12), and increasing government investment in maternal health (p19).

Meanwhile, we adapted our programs to reach vulnerable populations and deepen our impact, like testing new avenues to bring hard-to-reach mums onto PROMPTS (p7), and finding ways to better measure felt respect and dignity among women in the health system (p19). We continuously adapted our dashboards, working with county

leadership to understand what data they needed to see, and how to increase its usefulness (p18)

Last year, our growing Kenyan-led tech team put Jacaranda on the frontline of generative AI (p9), and shared learnings with the global health community. We started using conversational data to screen and support high-risk pregnancies (p8), and developed new content for small and sick newborns.

We're grateful to our supportive coalition of funding and government partners for giving us room to test new innovations, put mothers first, and push new boundaries for technology in underserved areas.



We are working to scale a package of low-cost, evidence-based solutions to empower mothers to receive better quality care

Jacaranda developed its package of solutions to address a twin challenge: delays in care seeking and gaps in care quality.

We base our model around a simple Theory of Change: that mothers seek care at the right time and receive the best quality care when they reach hospital – which in turn drives better outcomes and more sustainable, efficient maternal health systems. The work you’ll read about in this report plugs into each stage of this journey.



New & expecting mothers

are empowered to seek and demand timely, quality care.

(Section 1, Pages 5 - 10)



Providers & facilities

are equipped to deliver high quality, respectful care.

(Section 2, Pages 11 - 15)



Health system managers

are supported to deliver and finance quality services

(Section 3, Pages 16 - 17)

We reach 60% of facility-based deliveries across Kenya

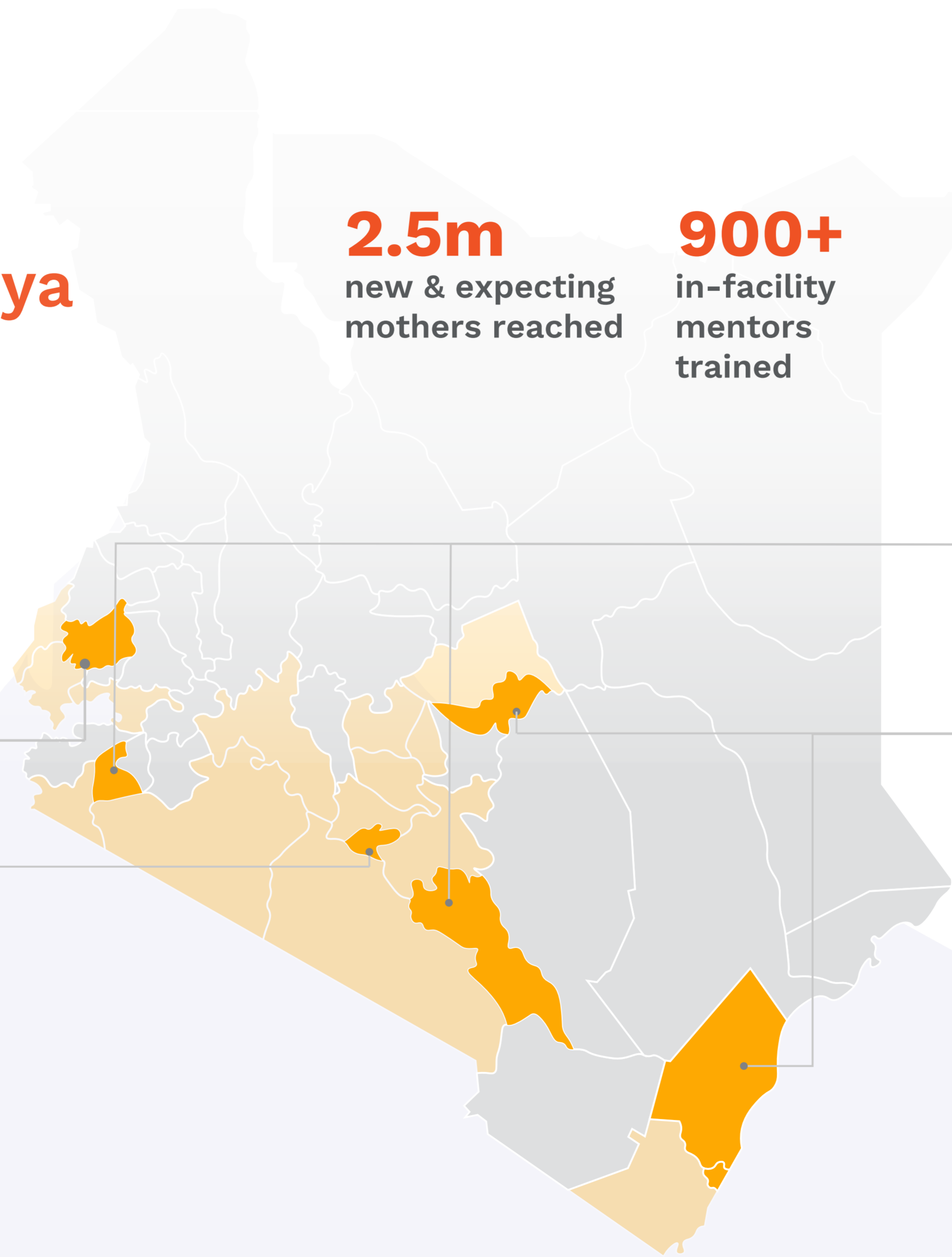
We aim for broad national scale in Kenya, but also recognize that every pregnancy journey is different, depending on where the mother is and the robustness of the systems that support her. Our research and data is helping us understand and adapt solutions based on specific contextual challenges and health system gaps impacting maternal and newborn health outcomes in different parts of Kenya.

2.5m
new & expecting mothers reached

900+
in-facility mentors trained

1,300+
partner health facilities

22
partner Kenyan counties



DESIGNING QUALITY ECOSYSTEMS for improved maternal and newborn health outcomes (p21)

INCREASING COUNTY BUY-IN and ownership of solutions (p14)

EXTENDING DIGITAL SUPPORT to moms through community health workers (p7)

STRENGTHENING SERVICES AND SYSTEMS supporting mothers and babies (p20)

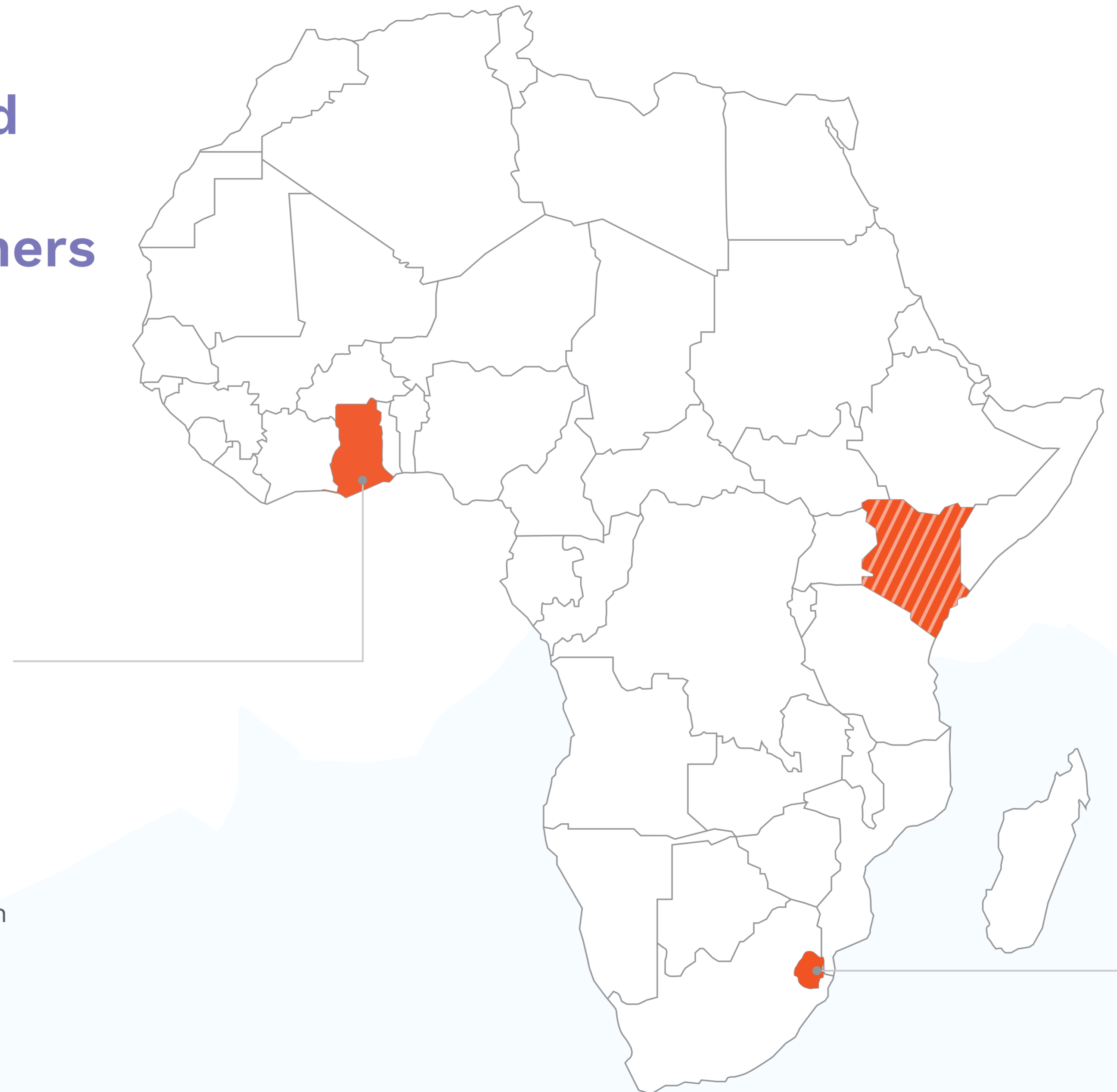
ADDRESSING CONTEXTUAL BARRIERS to care seeking and quality in urban informal settings (22)

We are testing and adapting scalable solutions for mothers and babies in new countries

GHANA | Testing and adapting PROMPTS to support the Ghana Health Service improve care seeking and quality for mothers and babies.

→ **Page 17**

- Ongoing operational study
- **2** districts in the Great Accra Region



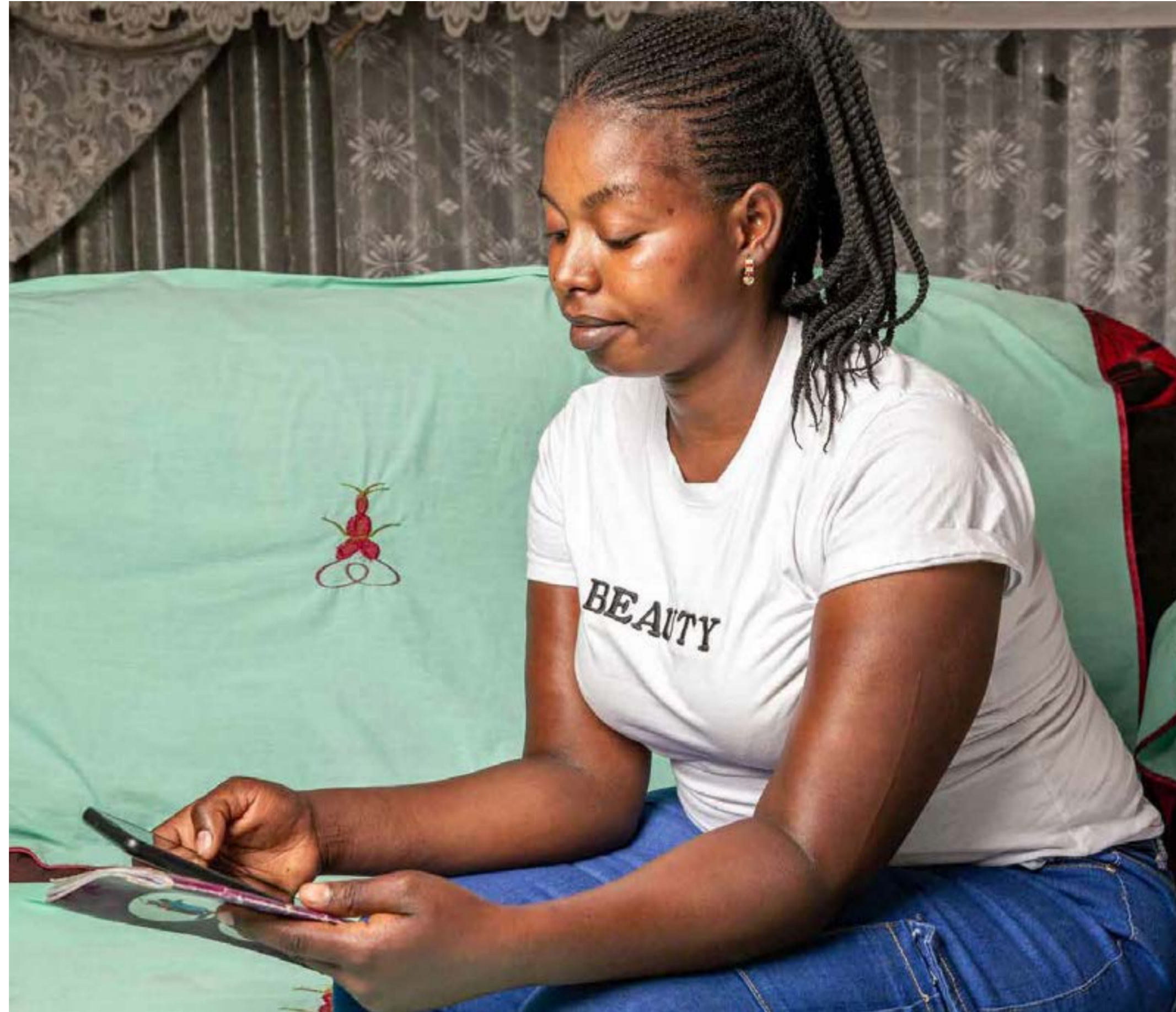
ESWATINI | Completing a year long PROMPTS pilot focussed on infant immunization tracking to chart a pathway towards national scale.

→ **Page 18**

- **4** regions (whole country)
- **54** partner health facilities

Mothers are empowered to seek and demand timely, quality care

Jacaranda's AI enabled digital health service, PROMPTS, equips new and expecting mothers to make the right decisions throughout pregnancy and postpartum.



First time mother Lilian Nyamusi types out a message to PROMPTS in her home in Kitengela, Kajiado County. *Photo by Peter Thira.*

2.5 million mothers reached (cumulative) with lifesaving information

In 2023, we expanded PROMPTS' reach by working closely with local implementing partners and the county and facility personnel who deliver the platform to mothers.

On the back-end, we adapted the platform's infrastructure to rapidly and cost-effectively deliver it through new partners and in new countries, starting with Eswatini and Ghana.

Meanwhile, we tested how to increase the speed and sensitivity of the PROMPTS helpdesk, including smarter risk screening, and harnessing AI's growing potential for increasingly personalized support.

Digital support across the care pathway



PROMPTS sends women gestation stage-specific information via SMS throughout pregnancy and up to one year postpartum.
Photo by Allan Gichigi.

Reaching Diverse Mothers via Platform Adaptations

- Exploring enrollment via community based channels in Kenya → **Page 7**
- Adapting PROMPTS for the Ghanaian context → **Page 24**
- Completing a PROMPTS pilot in Eswatini → **Page 25**

Empowering Mothers across the Continuum of Care

- Testing SMS-based family planning counseling → [Read More](#)
- Designing specialized content for small and sick newborns

Connecting them to Care at the Right Time and Place

- Proactive risk screening for highrisk pregnancies → **Page 8**
- 24/7 helpdesk support → [Read More](#)
- Innovating AI to increase message speed and personalization → **Page 9**

Extending digital support to moms through Community Health Workers (CHWs)

“Working with PROMPTS not only helps our clients, but also means we can reach more women with reliable information through their pregnancies when we don’t have the time or resources to reach all of them!”

Margaret Katunge,
CHW, Kilome, Makueni County

Community Health Workers have helped Jacaranda extend life-saving PROMPTS support to mothers who might not typically seek care in formal health systems. *Photo by Jjumba Martin*



1,910+

CHWs currently enrolling women to PROMPTS across 8 Kenyan counties

Helen was in early pregnancy when she received a visit from Margaret, a CHW and familiar face in Kiombe. Margaret helped her sign-up to pregnancy-related information through her phone.

The messages gave Margaret confidence too - knowing that clients like Helen had access to lifesaving information between visits.

In 2023, Jacaranda piloted CHW-led enrollments of mothers to PROMPTS to reach a new demographic of women.

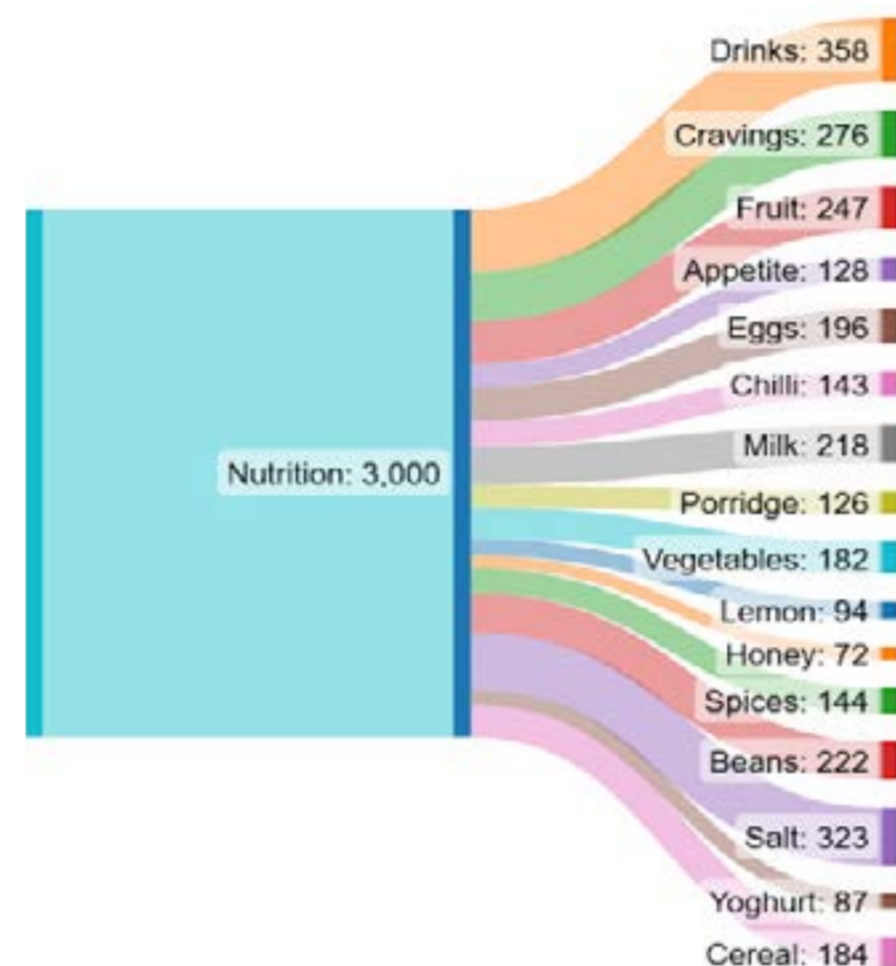
Mothers enrolled by CHWs ask more questions, and enroll earlier during their pregnancy compared to those who sign up at a facility, helping identify potential complications earlier.

→ [Margaret’s Story](#)

Carving new in-roads for AI innovation across Africa

How we are using AI to improve the speed, efficiency and contextual relevance of our interactions with mothers on PROMPTS, and expand AI-driven support for underserved populations.

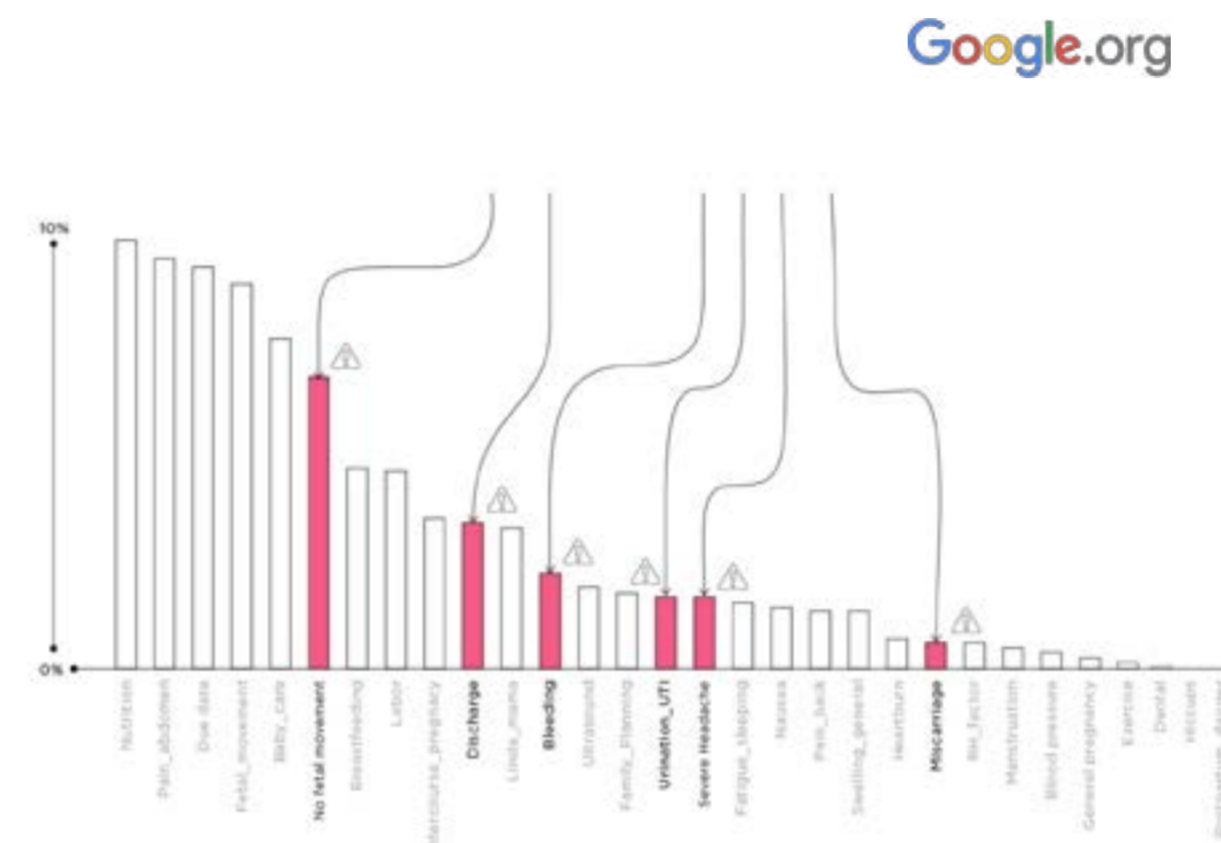
[→ Our Principles for Responsible, Human-Centered AI](#)



Deepening support around nuanced health issues

We manually labeled tens of thousands of messages across 150+ new categories, and developed AI algorithms to proactively identify high risk pregnancies, driving more accurate response and referral.

[→ Learn more](#)



Expanding AI-driven information and referral support

In July, we received \$1.4m from Google.org to help us translate life saving PROMPTS AI support into multiple low resourced languages, and improve the speed, accuracy, and efficiency by which PROMPTS supports high risk mothers.

[→ Learn more](#)

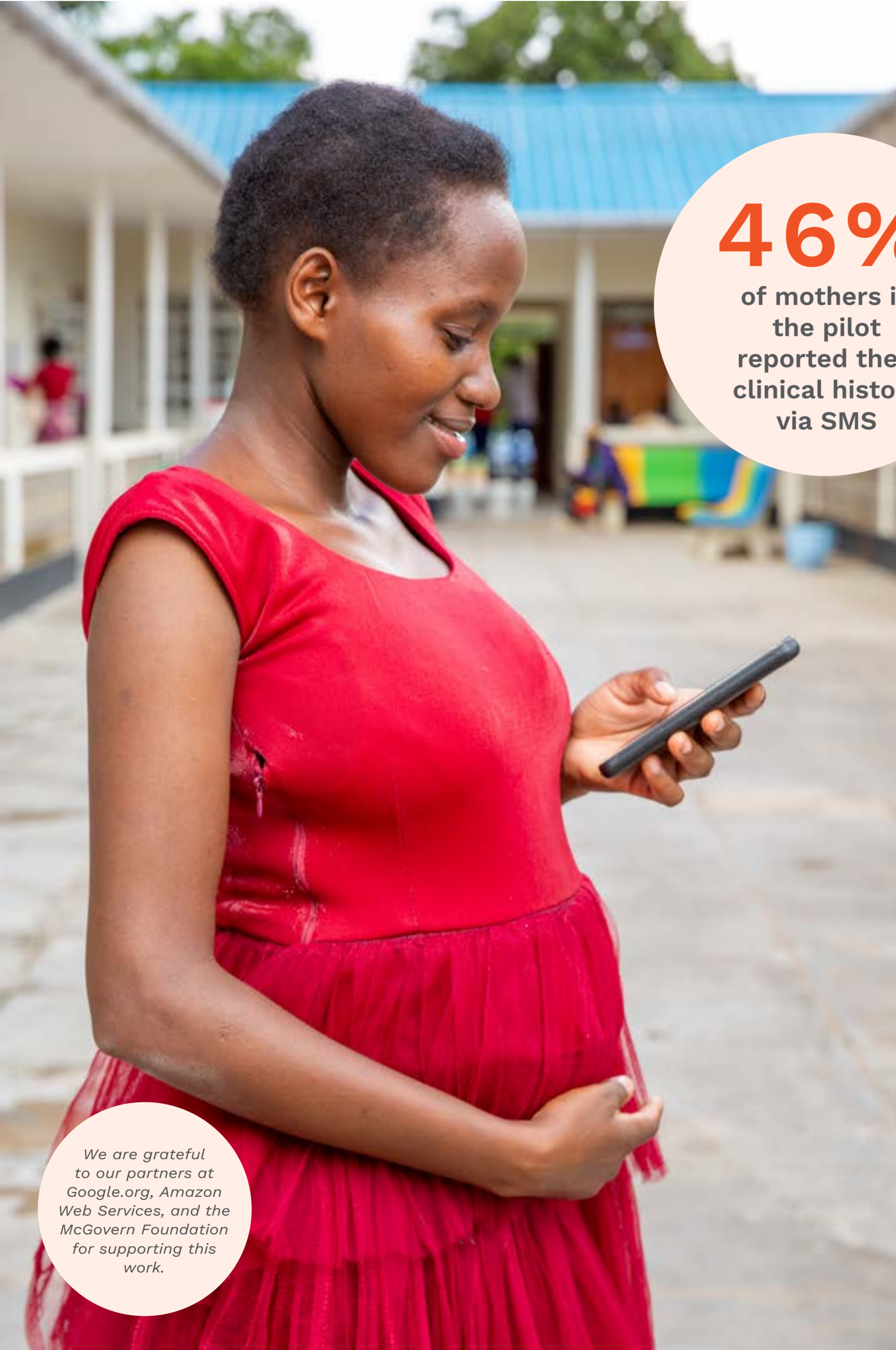


Adapting generative AI for the African context

In October, we launched UlizaLlama, a world first Swahili Large Language Model. The model transforms the sensitivity of Swahili interactions on PROMPTS, and is open source, for others to cost-effectively improve AI-driven support for Swahili speakers.

[→ Learn more](#)

[→ Download the Toolkit](#)



46%

of mothers in the pilot reported their clinical history via SMS

We are grateful to our partners at Google.org, Amazon Web Services, and the McGovern Foundation for supporting this work.

We are identifying high risk mothers through proactive clinical and contextual risk screening

Our clinicians know that the biggest predictor of risk is a prior history of complications. But how do you assess through a text messaging service? **But what if we could identify at-risk individuals before the final urgent message?**

Last year, we analyzed users' conversational history to develop a predictive risk model. This model assesses the pattern of 'non-urgent' statements a mother has made, and determines the likelihood of a future escalation.

We paired this with newly-tested screening surveys at enrollment to understand more about a woman's clinical history.

This will allow our helpdesk agents to further triage incoming messages, and flag users who may need additional support in a way that wouldn't have been previously obvious.

The potential is exciting. **In the short-term, it means we can proactively engage higher risk mothers with personalized messaging and referral support.**

Longer-term, extrapolating this data across 2.4m mothers could offer a country-wide window into patterns of risk, and improve early identification and support for higher risk cases at a systems level.

→ SMS-based Clinical Risk Screening: A Case Study

New PROMPTS algorithms will help us achieve more personalized referral pathways for the mothers that rely on the platform to direct their pregnancies. *Photo by Peter Thira.*



Caption: Mercy Mwende uses PROMPTS outside her home in Machakos with her third and youngest son, Sky Jayden. *Photo by Allan Gichigi.*

Providers and facilities are equipped to deliver quality, respectful care

We equip frontline nurses and clinicians with emergency care skills and knowledge through our peer-to-peer **MENTORS** program.



Frontline nurse and MENTORS program mentor Juliana Mwendo watches a simulation-based drill at the Makeni County Referral Hospital. *Photo by Allan Gichigi.*

900+

mentors
empowered to
train nurses in
their facilities

15,000+

frontline nurses
receiving lifesaving
skills from their
mentors

In 2023, 72% of births in Kenya took place in a health facility. Yet while equitable access to facility-based care is rising, its quality is often inconsistent.

In 2023, we expanded our MENTORS training package to include new modules (e.g newborn care), while exploring new avenues to improve frontline prenatal care, like AI-assisted ultrasound.

We also took a step back to look at the determinants of effective learning: How do nurses want to learn? What workplace enablers and barriers are there? How do we track individual performance?

These questions, and more, continue to be explored through research and testing, with last year's activities outlined below.

Lifesaving learning to tackle different emergencies



Props like NeoNatalie help frontline nurses practice essential emergency care skills, like newborn resuscitation, during facility-based ‘drills’ conducted as part of Jacaranda’s MENTORS program. Photo by Allan Gichigi.

Extending Vital Skills to Nurses

- Extending lifesaving EmONC learning into digital formats → [Read More](#)
- Availing accessible ultrasound for frontline nurses → [Read More](#)

Personalizing the Learning Journey

- Piloting mentor ‘cohorts’ for individualized skills-building → [Read More](#)
- Characterizing individual provider performance through data → [Page 13](#)

Expanding our Curricula

- Extending learning to include obstructed labor, fetal distress, maternal resuscitation, partograph and antepartum hemorrhage
- Developing high risk newborn care content for frontline nurses → [Page 14](#)

Characterizing individual provider performance through data

When a woman arrives at hospital, every nurse on the ward needs the full suite of obstetric skills to ensure she receives quality care, whatever the issue.

Which is where data comes in. As with many national data systems, KHIS2 tracks care quality at a facility level.

But last year, we saw potential in our MENTORS program to track performance at a provider level.

In April, program mentees were asked to self-log their training progress, building accountability towards curriculum completion,

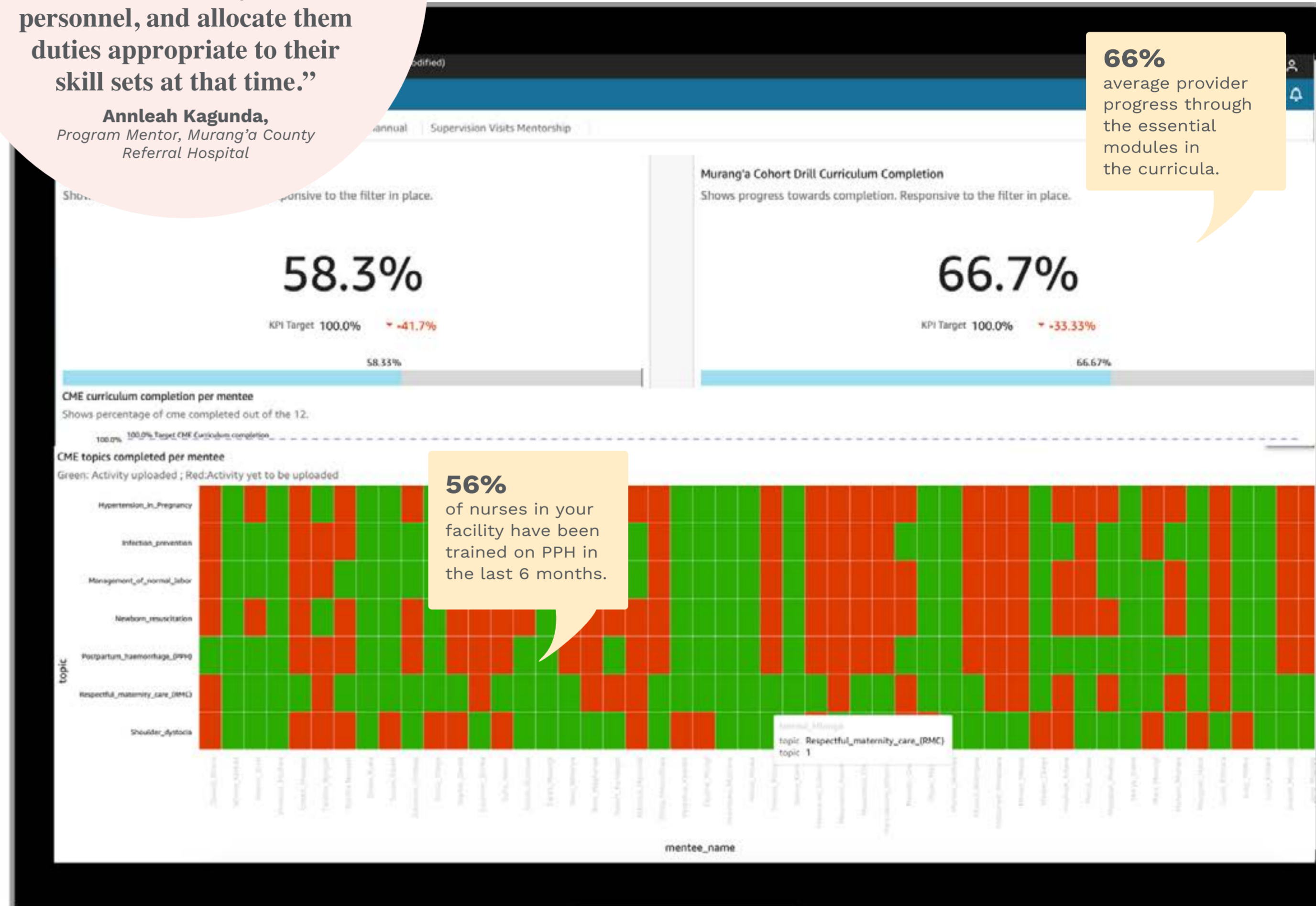
while offering a granular window in specific skills gaps - eg. in neonatal resuscitation or breech delivery - in different facilities.

The potential of provider-level data is exciting. For Jacaranda, it will strengthen the link between EmONC knowledge scores and facility outcomes.

For our facility partners, the data will identify which nurses can competently handle what emergencies, helping improve targeted training, referral protocols, and ultimately, outcomes.

“This data gives us a deeper understanding of exactly what our nurses have been trained on, and address knowledge gaps. We can quantify the number of fully trained personnel, and allocate them duties appropriate to their skill sets at that time.”

Annleah Kagunda,
Program Mentor, Murang'a County Referral Hospital



Protecting Early Lives: Enhanced Support for Small and At-Risk Newborns

“There is a big gap in skills and knowledge surrounding taking care of newborns on the ward. And you can’t afford to miss a step when managing a baby”.

Kakamega Nurse,
Study Participant

Nurse in-charge and in-facility mentor Juster Kanana introduces herself to one day old Adelaide. *Photo by Allan Gichigi.*



KAKAMEGA COUNTY - In August, Jacaranda initiated a pilot study to understand the experiences of caregivers and nurses supporting at-risk newborns, and how our programs could support.

Research revealed a significant gap in nurses training voiced an urgent need for routine training to identify newborn risk, adequately manage complications, and apply the correct referral procedures when needed.

In late 2023, Jacaranda developed new learning content within its MENTORS curricula to help nurses manage and refer vulnerable newborns, including those with neurologic impairment, oxygen deprivation and risk of HIV.

The module will be rolled out in 2024, along with new high-risk newborn content on PROMPTS, ensuring the continuum of vital care extends into the home setting.



Nurse in-charge Angeline Muniyao debriefs her team on their performance during a simulation-based drill on identifying and mitigating postpartum hemorrhage. *Photo by Allan Gichigi.*

Bridging the gap between care provision and care experience

PULSE empowers hospitals and health management teams with the right data to improve the services and systems that support moms and babies.



Manager of Nambale Hospital, Busia County, checks Jacaranda's real-time dashboards to identify and address skills gaps and improvements among the nurses in his facility. *Photo by Peter Thira.*

In 2023, we re-named our dashboards PULSE. PULSE speaks to the real-time nature of the data we collect and share with our government partners, giving them finger-on-the-pulse insights to continuously improve the quality of services that support moms and babies.

Last year (with a little trial and error), we improved the granularity, scope, and volume of data we collect from mothers, providers and facilities.

We built sophisticated dashboards to make sense of this data, and found meaningful ways to make our government partners co-designers and stewards of these tools to inform how they spend resources with greatest impact.

Using data for decision making



Clinical students from Kenya Medical Training College for Nurses examine real-time data from mothers, nurses and facilities in Jacaranda's newest series of dashboards. Photo by Peter Thira.

Using data to improve maternal health services

- Putting mums in the driving seat of defining technical quality → [Read More](#)
- Identifying skills gaps and improvements among frontline nurses → [Page 13](#)

Using data to improve maternal health systems

- Identifying 'red flags' in maternal health systems → [Page 18](#)
- Building a comprehensive picture of facility quality

Strengthening government accountability

- Making governments operational and financial stewards of change → [Page 19](#)
- Co-creating dashboards with government → [Read More](#)

Helping facilities and governments identify and address the ‘red flags’ in their health systems

MAKUENI COUNTY – Nurse Jedida has granular visibility over service delivery at her workplace, Kibwezi Hospital.

She routinely logs in to dashboards that help her identify gaps in prenatal check-ups, respectful care, and infant immunization, among other metrics.

The data comes directly from her clients, the women seeking care on the ward. Previously, Kibwezi relied on exit interviews, which were costly, un-anonymized, and tricky to scale.

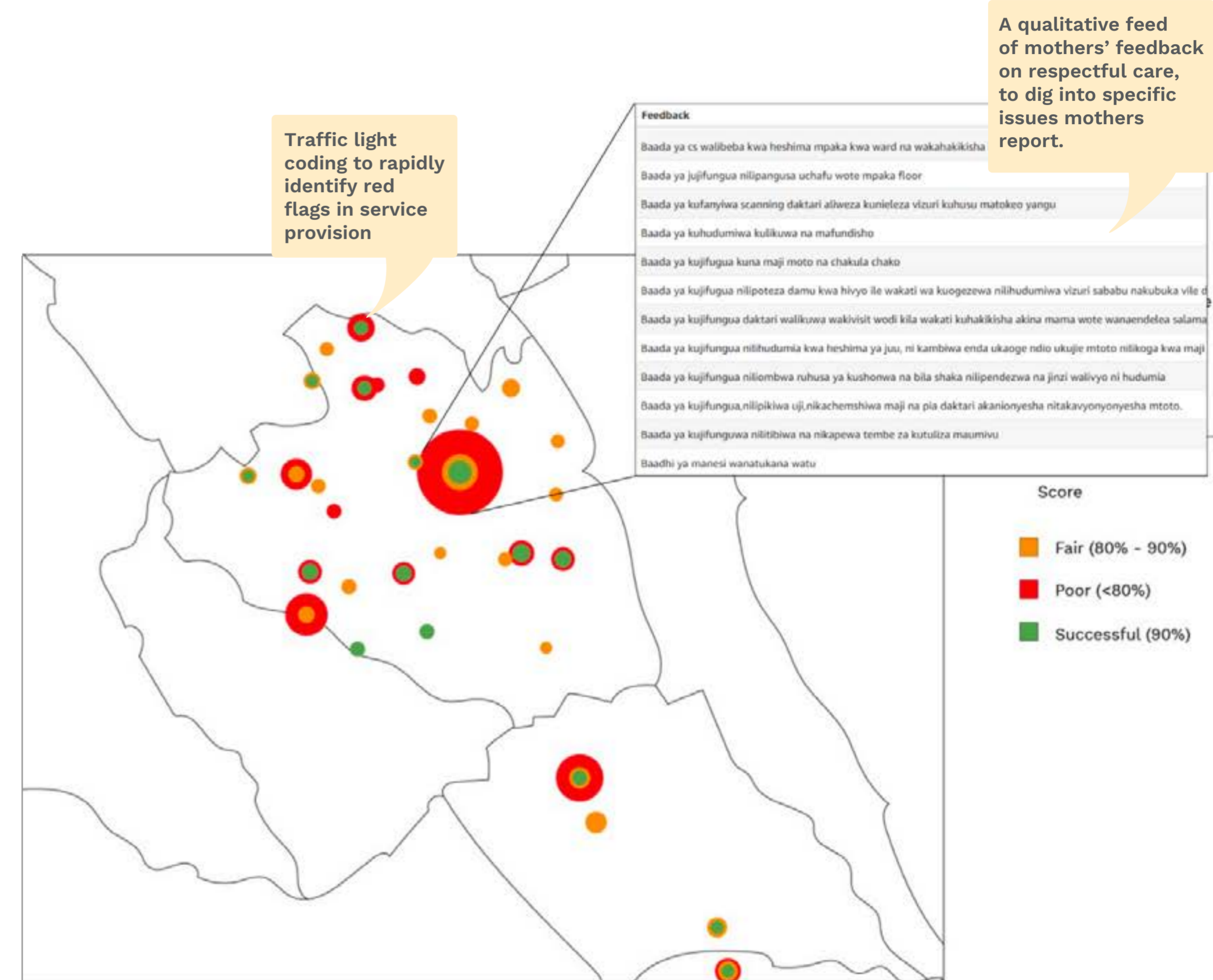
Jedida understands how to use the dashboards. After all, she codesigned them, advising on what metrics to measure and their aesthetic during a series of March focus groups with Jacaranda.

Jedida noticed increasing reports of long waiting times, and identified staff shortages as a leading driver.

Her manager Syliva had access to the same dashboards and, together, they mobilized a plan, hiring nurses to cover the shortages. Jedida has already seen a reduction in reports of long waiting times.

[→ Read more in Devex](#)

A qualitative feed of mothers' feedback on respectful care, to dig into specific issues mothers report.



Example visualizations showing broad and granular views of mothers' feedback on respectful care, ranging from positive reports ('Asked for consent before closing perineal tear') to negative feedback ('I was asked to clean the floor after delivery').

[→ Our approach to dashboard co-design](#)

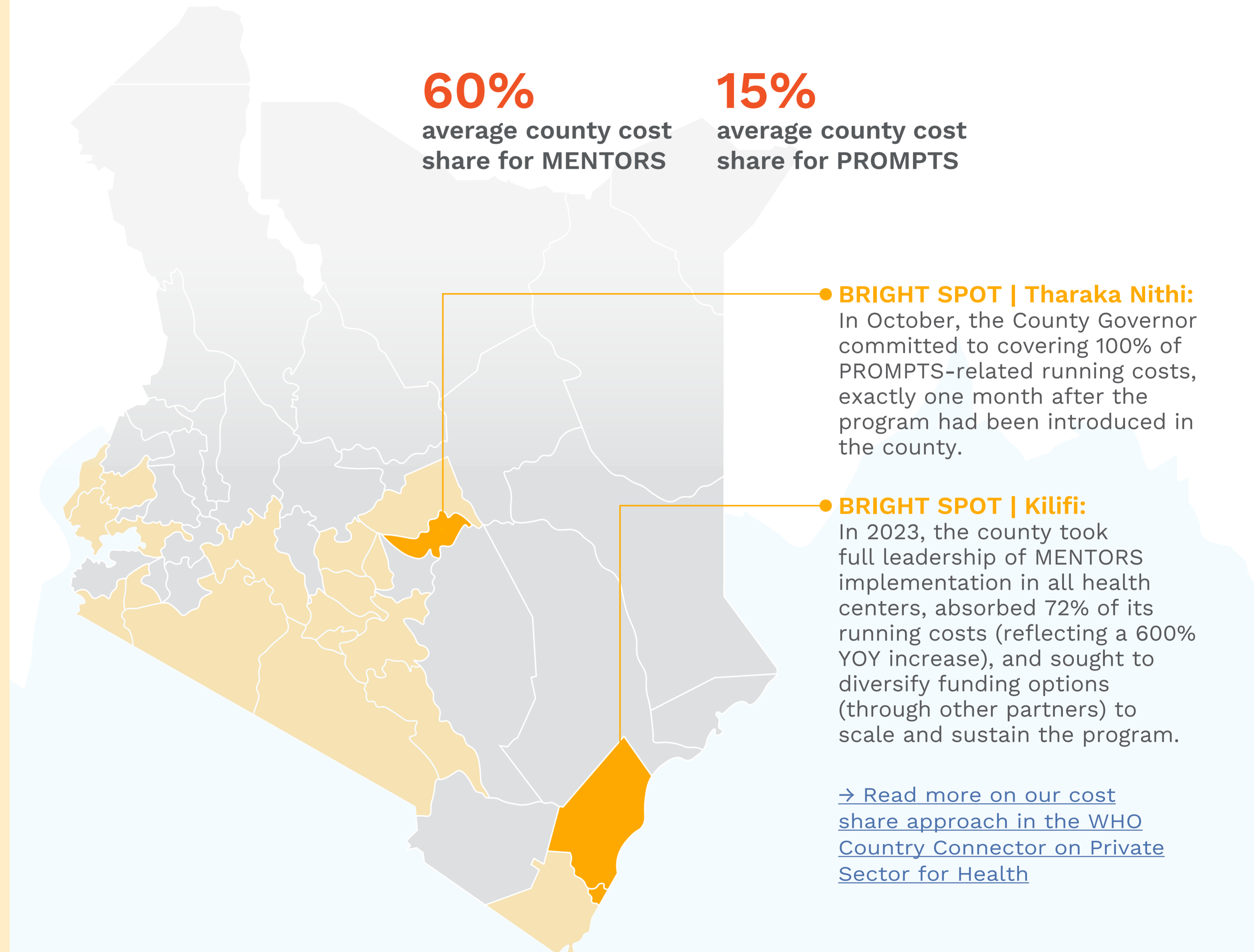
Making governments operational and financial stewards of change

For interventions to have a deep and lasting impact in public health systems, they have to be embedded in government health agendas and budgets.

Last year, we saw a significant shift in government investment in our solutions. Our focus on data quality and dashboard development (p18) presented a compelling investment case to our county partners; namely, identifying gaps in their health systems that could be addressed with our programs, and justifying their impact once implemented.

Our Tech teams sought and achieved increasing cost efficiencies in our programs, enabling faster, more feasible integration into constrained government budgets.

Our Partnerships team embedded themselves within county budgeting cycles and planning to see this through.



Strengthening the services and systems that support mothers and babies

“My intention and that of our partners is to redesign how we offer health services to ensure that expectant mothers and other members of our community access facilities with competent medical personnel and appropriate equipment as quickly as possible.”

H.E. Hon. FCPA Fernandes Barasa,
OGW Governor of Kakamega County, Chairperson
Finance, Planning and Economic Affairs
Committee (CoG)

Kakamega County's Governor meets a two day old baby in the newly-renovated maternity ward of Lumakanda County Hospital, Kakamega. Photo by Eugene Namusende.



We are confident in our solutions' ability to achieve impact. But we also recognize that ensuring the best outcomes for moms relies on plugging additional gaps across their journey, like emergency transport, infrastructure, and the availability of critical commodities.

We are testing a broader health systems approach to improving outcomes in several Kenyan counties.

IN KAKAMEGA - Jacaranda is working with the county government to ensure every mother delivers in a well-equipped hospital.

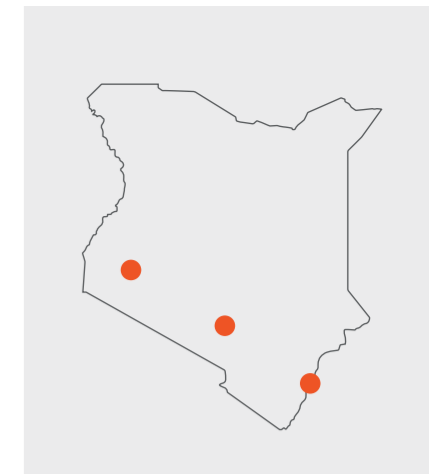
To date we have helped to strengthen primary care and upgraded the capacity of hospitals with skills, staff and infrastructure - including the establishment of a newborn unit at Malava Sub-County Hospital.

We have also improved the emergency management system through policy and practice, leading to 5800 emergency MNH transfers in 2023. With Thinkwell, we also supported the launch of the Kakamega Health Fund, which stabilized and sequestered financing dedicated to improving quality of care for mothers and babies. → *Cont. next page*



Nurses at Makueni County Referral Hospital simulate a scenario involving active management of the third stage of labor under the guidance of in-facility mentor Mercy Ndanu. *Photo by Peter Thira.*

1,970+
frontline nurses
trained in lifesaving
skills since project
inception.



→ **IN MAKUENI, KISII, AND MOMBASA** – Jacaranda is working with healthcare financing partner Thinkwell to test how evidence-based solutions, real-time data, and smart financing strategies can improve outcomes for moms and babies.

Funded by MSD, the project has supported the deployment of PROMPTS and mentorship in the three counties, but has also focused on leveraging data from these programs - alongside commodities and financial data - to help county managers understand where to add

resources to improve quality of care.

For example, when our dashboards identified unequal distribution of nurses among hospitals in Kisii, the county used the data to redistribute staff to counter gaps in service delivery and provider burn-out.

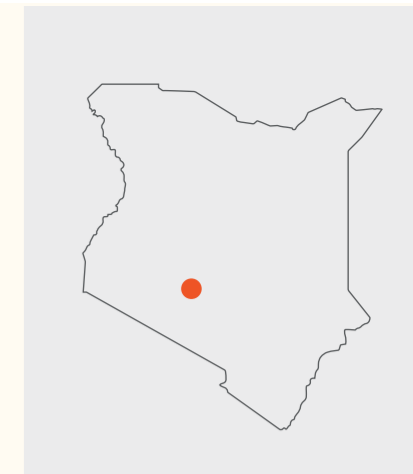
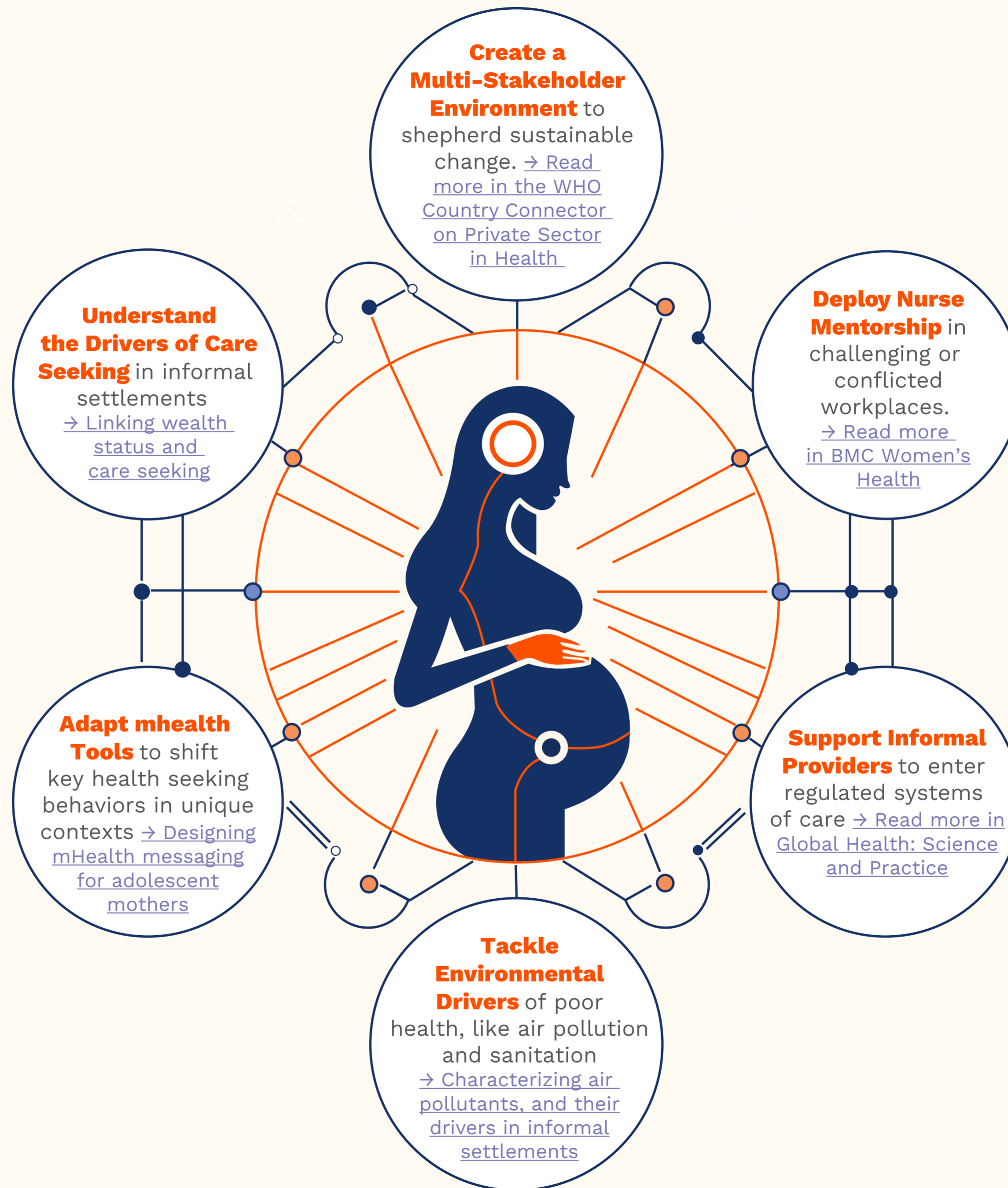
Meanwhile, Thinkwell has worked hand-in-hand with the county government to understand what strategies could unlock funds to sustain the critical services supporting mothers and babies.

Kuboresha Afya Mitaani: Addressing contextual barriers to care seeking and quality in urban informal settings

In July, we completed a three year USAID-funded implementation research project in two Nairobi informal settlements, Kawangware and Mathare, where the maternal mortality rate is almost twice the national average.

The project was built around a ‘Quality Ecosystem’, integrating typically siloed actors in the quality of care space to collaboratively identify, and plug gaps in these fragmented health systems.

The ecosystem generated a cross-section of learnings and solutions in this context, as unpacked on the right:



This project is made possible by the generous support of the American people through the United States Agency for International Development (USAID) under the cooperative agreement no. 7200AA19CA00026. The contents of this implementation research project are the sole responsibility of the “Kuboresha Afya Mitaani: Urban MNCH Project” and Jacaranda Health and do not necessarily reflect the views of USAID or the United States Government.





A new mother carries her newborn back home in Kawangware, a large informal settlement in Nairobi. The Kuboresha Afya Mitaani project leveraged implementation research to understand the unique contextual factors affecting outcomes for mothers and babies in informal urban settings, and generate evidence to catalyze political interest in the adoption and implementation of priority life-saving health and development interventions. *Photo by Jjumba Martin.*

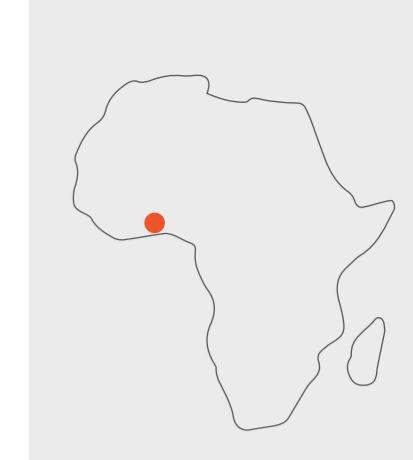
Expanding digital health support for mothers with the Ghana Health Service

Throughout 2023, we forged new partnerships to test and scale PROMPTS in Ghana. At the government level, our team established technical working groups to make key decision-makers thought partners in project implementation.

On the ground, we partnered with the Dodowa Health Research Centre to dig into the needs of mothers and nurses in these contexts, like knowledge gaps around delivery, and the need for personalized educational channels to reinforce facility-based care.

Our team has adapted PROMPTS for Twi, including the capacity for AI-based triaging, and we now have a full time helpdesk team to answer questions from mothers in Ghana.

Now, in the early stages of implementation, we have strong foundations for PROMPTS' early success: customized technology to ensure its relevance, a growing Ghanaian team, and strong nurse buy-in to distribute it to moms in Accra.



“PROMPTS will help us [midwives] more easily prevent defaulting. Often, mothers forget to come to ANC or postnatal, and so the PROMPTS reminders will be useful to make them, or their husbands, more aware of when to turn up”.
Study participant, Midwife, Manheim Polyclinic.

Frontline health workers and facility leadership at the Shai-Osudoku District Hospital in Dodowa are trained to use, and enroll mothers to PROMPTS. Shai-Osudoku District Hospital was chosen as the target facility for a 'soft launch' of the platform, which aims to engage 20 nurses to enroll 60 women onto the platform to test the technical capability of the platform before a wider launch. *Photo by Dodowa Health Research Center.*



Scaling PROMPTS nationally in Eswatini

In April, we completed a year-long pilot in partnership with Eswatini's Ministry of Health (MoH) and the Clinton Health Access Initiative to test PROMPTS as a cost-effective tool for infant immunization tracking.

The results were encouraging, showing high uptake and use of the tool among women, as well as positive changes in health seeking behaviors, including an increase in uptake of the BCG vaccine, and greater awareness around the vaccine schedule.

The pilot presents some exciting levers for future scale. Near term, it offers the evidence base and incentive for the MoH to scale PROMPTS nationally, and expand its scope to cover all childhood vaccines, pre and postnatal care support, and prevention of mother-to-child HIV transmission.

Longer term, it offers a playbook for future country expansion. Namely, how to diversify from a single use case (ie. vaccination), provide meaningful technical assistance to other implementing partners, and catalyze rapid scale-up with the national government.

→ [Findings from our pilot in Eswatini](#)

A health provider helps a new mother to enroll to PROMPTS at the Mathangeni Clinic in Eswatini's Manzini Region.
Photo by Khayaletu Motsa.



97%
of mothers found the messages helped them track when their baby needed which vaccine.

Building and investing in the team to succeed

We are committed to developing strong proximal leadership to deliver sustainable impact for moms and babies at scale.

Our 2023 hires build on a diverse set of organizational skills to build, deploy and scale our solutions in public health systems - both in Kenya and beyond.

[→ Our Team](#)
[→ Open Roles](#)



Job Makoyo
Deputy Country Director



Rachael Alldian
Director of Global Programs and Product



Priscah Cheruiyot
Head of Research



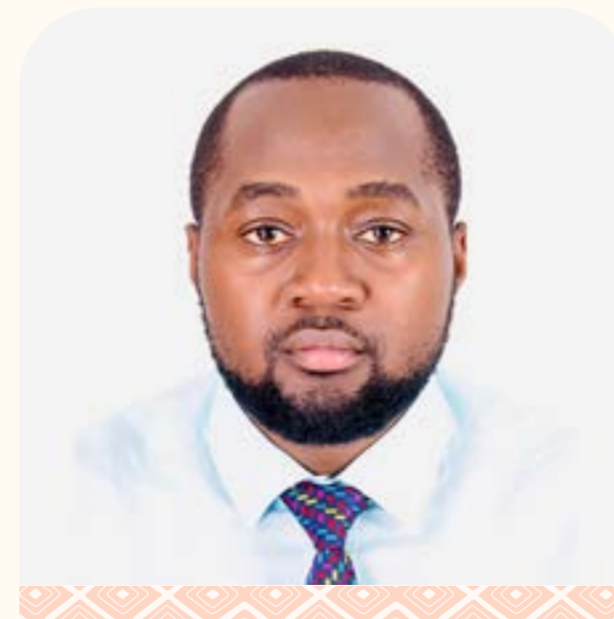
Sieglinder Mghenyi
Head of Health Systems Strengthening



Aba Asilon
Ghana Lead



Cephas Avoka
Ghana Program Manager



Stanlaus Mwangela
Machine Learning Manager



Mesaye Bersoma
Senior US Finance Officer



John Otieno
Research Projects Manager

Milestone Moments

Sharing insights, learnings, and data on the global stage.



IMNHC 2023 | In May, a cohort from Jacaranda convened in Cape Town to share impact and insights from our work with global audiences at the International Maternal and Newborn Health Conference.

[→ Our takeaways](#)



UNGA78 | In October, Co-Executive Director Nick Pearson talked private public sector partnerships, data tools for decision-making, and the power of digital tools in public health systems at UNGA78.

[→ Our takeaways](#)



Deep Learning Indaba | Jacaranda's Head of Tech Jay Patel shared learnings from our machine learning journey with audiences in Ghana at Indaba, Africa's premier conference for AI professionals.

[→ Our takeaways](#)



Global Digital Health Forum | In November, Co-Executive Director Sathy Rajasekharan shared opportunities and risks for using generative and non-generative AI in maternal healthcare at GHDF 2023.

[→ Our takeaways](#)

The Last Word

We are beginning 2024 with a strong foundation for scale and impact.

One predicated on the belief that new technology can thrive in low-resourced settings, data can evoke meaningful change in health systems, and that effective public private sector partnerships can transform outcomes for moms and babies.

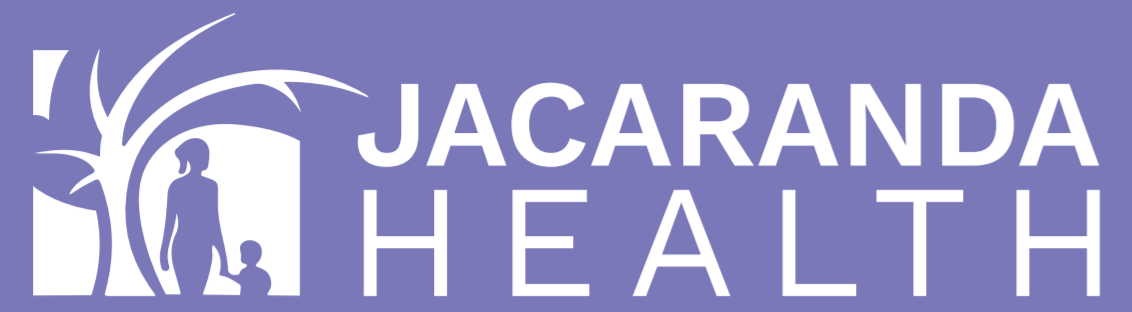
We are extremely grateful to our coalition of funding partners, who provide the continued support to scale and strengthen the work within and outside this report, and also serve as true advisors and stewards of our vision.

We look forward to another collaborative year of shared progress and innovation in 2024.

Disclaimer: This report discusses pregnancy and motherhood. While we use the term “mother” throughout the piece to mirror the language of the community we are collaborating with; we also acknowledge that not all pregnant people identify as “mothers.” We would like to recognize that pregnancy and motherhood can be experienced by people of all genders.

A Note of Condolence: We would like to acknowledge the outstanding design work of Francis Karuri, who tragically passed away during the development of this report. We were blessed to work with Francis across many design projects at Jacaranda, and his passion for the work was unrivaled. We are grateful to his friend and colleague George Magenyi for finishing what Francis couldn't, and share our deepest condolences with Francis' family during this difficult time.





**Improving quality
of care and outcomes
for every mother and
every newborn**

jacarandahealth.org

[in](#) [X](#) [f](#)

First time mother
Judy Thomas cradles
her newborn at home
in Katoloni, Mbilimi.
*Photo by Allan
Gichigi.*

