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Concern's Knowledge Quarterly Review

KNOWLEDGE MATTERS

Innovations for Maternal, Newborn and Child Health

CONCERN worldwide

Any contributions, ideas or topics for future issues of knowledge matters. Contact the editorial team on email: knowledgematters@concern.net

The views expressed are the author's and do not necessarily coincide with those of Concern Worldwide or its partners.

Knowledge Matters basics

Knowledge Matters offers practice-relevant analysis relating to the development and humanitarian work of Concern Worldwide. It provides a forum for staff and partners to exchange ideas and experiences. The publication is committed to encouraging high quality analysis in the understanding of Concern's work. Concern staff and partners document their ideas and experiences through articles. Articles are very short – 500 – 1,500 words. Usually you only have space to make two or three interesting points. Here are some tips on writing a short feature article:

- Start by imagining your audience – a Concern colleague. Why are they interested – why do they want to read what you have to say? When you identify what your most important point is, say it straight away, in the title or first sentence.
- What can others learn from your story? Focus on this. Remember to back up your story with evidence. This can be got from evaluations.
- It's easier to get people reading if you start with the human perspective – mentioning real people and real-life events. (You don't have to give names).
- Use short sentences. Use Concern's style guide to help you.
- Keep paragraphs to a maximum of six lines long.
- Use clear language. Many of the readers of Knowledge Matters are non-native English speakers, so think carefully about using idioms or colloquial language that might not be easily understood by others.
- Always avoid assuming too high a level of knowledge of the topic you are writing about, on the part of the reader.
- Use active sentences ('we held a workshop' not 'a workshop was held by us')
- Use short and clear expressions.
- Keep your title short - no more than eight words.
- Where necessary use photos to accompany the narrative but ensure that you follow the Dochas Code of Conduct on Images and Messages.

Cover image: Concern Worldwide's Innovations for Maternal, Newborn and Child Health initiative has retrained over 200 former traditional birth attendants in Bo District to become Maternal and Newborn Health Promoters. The District Medical Officer for Bo has agreed to incorporate these women into the formal health system. Pictured is MNHP, Kai Jigba, with Maddie Sanoh and baby Mamie K. Photo by Kieran McConville, September 24, 2016, Bo, Sierra Leone.

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From the Issue editor

This is the second issue of Knowledge Matters dedicated to the results and learning from Concern's *Innovations for Maternal, Newborn and Child Health.* Spanning eight years and five countries, *Innovations* implemented nine pilot projects—four in Phase I (2008-2013) and five in Phase II (2013-2016). The first Knowledge Matters issue (March 2015) described *Innovations'* use of human-centred design, presented our monitoring and evaluation strategy and described six of the pilots. This edition summarizes several final evaluations and shares cost-effectiveness data. It updates the discussion about human-centred design and its important influence on project outcomes.

Unlike Phase I, with its relatively simple pilots, the Phase II interventions were more complex and so, too, were their evaluations. I urge anyone who is interested to read the evaluation PowerPoints, all of which are available on Concern's Knowledge Exchange. We made extensive use of both quantitative and qualitative approaches and in two projects we had full quasi-experimental designs where our intervention zones were compared against non-intervention control zones.

The *Innovations* grant from the Bill & Melinda Gates Foundation allowed Concern to develop a diverse body of work in maternal, newborn and child health. Along with the USAID Child Survival grants, *Innovations* enabled us to deepen our collective expertise in these most critical areas of primary health. It is fitting that 2017 will see Concern roll out a new five-year strategy to guide our efforts to improve maternal, newborn and child health and nutrition among the extreme poor.

Pam Bolton

Capsule descriptions of the nine Innovations pilots

Phase I Pilots	Overview
Chipatala Cha Pa Foni (Health Centre by Phone), Malawi	A hotline and voice and text messaging to connect pregnant women, caretakers and children to health workers, giving them immediate access to personalized health advice, tips and reminders via individual and community mobile phones.
Male Health Activists (MHA), Odisha, India	Building on existing networks of female community health workers by adding a cadre of Male Health Activists who engage male household decision-makers, promoting the importance of healthy practices and MNCH services among male household decision-makers.
Helping Health Workers Cope (HHWC), Sierra Leone	Psychosocial support through group and individual counselling services for health workers to cope with the stress and pressures of their work as well as training on stress management, self-care and client care.
Quality Circles (QC), Sierra Leone	Supporting health workers and traditional birth attendants to develop peer learning, peer support and joint problem solving skills to empower them to be more effective in their jobs and resolve gaps and failures in the health system.
Time lines	2008-2013

Phase II Pilots	Overview
Essential Newborn Care Corps (ENCC), Sierra Leone	Rebranding / training traditional birth attendants as Maternal Newborn Health Promoters who provide health advice and referrals to the health facility for women and their newborns during home visits; tests a social enterprise through which they earn income selling health-related products
Care Community Hub (CCH)– CHN on the Go, Ghana	Smartphone app (called CHN on the Go) to improve motivation and job satisfaction among frontline nurses. Offers point-of-care support, planning tools, professional development, wellness content and custom WhatsApp groups to connect rural community nurses, their peers and supervisors.
Community Benefits Health (CBH), Ghana	Creatively using collective, non-monetary incentives along with social and behaviour change to cultivate communities' commitment to supporting women and improving maternal and child health.
Maker Movement for MNCH (Maker), Kenya	Innovative partnership between Kenyatta National Hospital and University of Nairobi to create low-cost, high-quality locally-designed devices for Kenya's resource-constrained maternity wards.
Mobile Urgent Maternity Service (MUM), Kenya -- renamed PlanWise	Using open-source big data and computer modelling in a tool to help planners in low-resource settings know where best to place obstetric and neonatal care as well as other health services.
Time lines	2013-2016

Successful strategies for working with traditional birth attendants to improve maternal and newborn health in Sierra Leone

By Katie Waller

Background

Sierra Leone has among the highest maternal and infant mortality rates in the world. The culture of giving birth at home remains prevalent, with 44 percent of births at home, most assisted by a traditional birth attendant (TBA)[1].

In 2010 the Government of Sierra Leone implemented the Free Health Care Initiative, offering free health services for children under 5 and pregnant and lactating women, and simultaneously instituting a policy officially discouraging TBAs from performing home deliveries[2]. TBAs have supported women through pregnancy and delivery for generations and are a trusted health resource for women. Women continue to seek their advice and services, highlighting the need to engage the TBAs in combating maternal and infant mortality.

The Essential Newborn Care Corps Intervention

Recognizing TBAs as a crucial maternal and newborn health resource in their communities, the Essential Newborn Care Corps (ENCC), a 2 year pilot, explores how retraining and rebranding 200 TBAs to work as maternal newborn health promoters (MNHPs) in Bo district impacts coverage of essential care for mothers and newborns. MNHPs are trained to provide health-related advice to pregnant women and families during home visits and refer mothers to the government health facilities for deliveries, antenatal care (ANC), postnatal care (PNC) and emergencies or illness.

ENCC also contains a social enterprise component where half of the MNHPs receive business training and are given a US$30 loan in the form of a start-up basket of health and baby products to sell during home visits.

We used a mixed-methods approach to evaluate the effect of the ENCC intervention. A simplified theory of change (TOC) for ENCC (Figure 1) shows the pathways through which MNHPs were planned to affect the utilization of MNCH-related care.

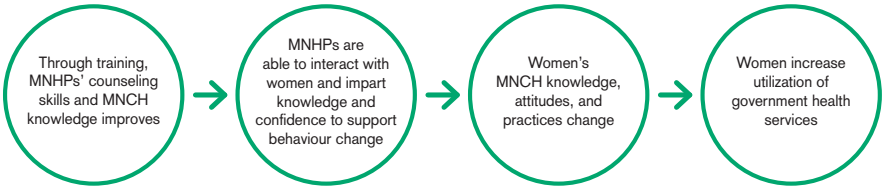

Figure 1: Project theory of change

ENCC tested two approaches:

- Health Promotion arm (HP): 100 MNHPs receive training on key health messages and provide counseling and referral through home visits
- Health Promotion + Social Enterprise arm (HP+): 100 MNHPs receive the same health training as those in HP, but additionally are trained in business skills and can earn money by selling health-related goods.

The goal of the evaluation was to assess the effectiveness of the HP and HP+ interventions on utilization of MNCH services and to examine whether the intervention followed the pathways of change. The evaluation also assessed the feasibility of the social enterprise model to incentivize MNHPs in their newfound roles.

Programme Successes and Challenges

Uptake of the MNHP Role

As a result of their rebranding and training, MNHPs reported being **satisfied in their new roles.** ENCC maintained a 100 percent retention rate of MNHPs throughout the life of the pilot. MNHPs from both arms expressed **highest satisfaction in their role when counseling mothers**. They **achieved high household coverage** in their new role with 86 percent of women in the HP arm and 93 percent of women in the HP+ arm reported being visited by an MNHP during pregnancy. Generally, MNHPs even accompanied women to the health facilities when they were close to delivering or showing danger signs, which was not a requirement of the role. This reported level of effort, commitment to and satisfaction with the new role indicates that ENCC successfully created a new role for TBAs.

Social Enterprise

All MNHPs participating in the social enterprise component were **able to repay their loans** and **MNHPs reported satisfaction with their profits** from the business. However, communities weren't always aware of the **social enterprise**. In the HP+ arm, though coverage of MNHP counseling services was over 90 percent, only 70 percent of mothers were aware that MNHPs sold essential products, and of those only 56 percent of women had purchased items from the MNHP[3].

MNHP Engagement with Women, the Community and Government

The MNHPs were well integrated into the formal health system and **accepted by their communities**. Their presence increased the communities' trust in health facilities—a key success and a crucial intermediate step to achieving health outcomes. There was also **strong support from senior-level District Health Management Team (DHMT) members** for project activities and active interest in maintaining the MNHP cadre after the pilot's conclusion.

Challenges were observed with knowledge retention of MNHPs. While all MNHPs received the same training, MNHPs from the HP+ arm showed poor knowledge on key danger signs (proxy measure used for MNHP knowledge) as compared to their HP counterparts. Additionally, a higher percentage of MNHPs in the HP arm as compared to the HP+ arm reported training as a great source of satisfaction (58.8 percent versus only 33.3 percent) suggesting that those in the HP+ arm had **competing priorities due to the social enterprise**[3].

The intervention also did not statistically improve **mothers' knowledge of danger signs** but it did have a significant effect on women's **knowledge of birth preparedness**. This finding suggests women internalized knowledge from the MNHP about going to the health facility for delivery, but there was no change in their understanding on why and when to seek care if an emergency arose. This highlights that women were following the advice of the MNHPs, changing practices, without having a full understanding of the underlying rationale for their actions.

Key Evidence from the Evaluation

The ENCC strategy for engaging former TBAs as health promoters showed mixed results in influencing facility utilization for ANC, delivery and PNC. Overall, the project had little effect on ANC utilization. However, it successfully generated increases in both intervention arms for PNC utilization and increased facility deliveries in the HP+ arm.

Antenatal Care: ENCC had little effect on ANC utilization

At baseline, we found that the practice of seeking ANC at health facilities was already well established. Overall, the project did not statistically increase ANC 4+ utilization when compared to the control. In the HP+ arm, increases were observed from baseline to endline of ANC 4+ visits (72.4 percent to 88.3 percent). However, no such change was evident in the HP arm where, in fact, there was a very slight reduction in the utilization of ANC 4+ (89.8 percent to 86.5 percent).

We also looked to see if women were accessing ANC earlier. In all three arms the percentage of women accessing ANC in the first trimester increased, but none of these increases was significant. It is evident that MNHPs were counseling and referring pregnant women for ANC. However, they were not able to reach them in the earliest stages of pregnancy and the already high ANC levels made it challenging to increase the rates further. Figures 2 and 3 below show results for **ANC 4+ visits** and **First trimester ANC.**

DID in utilization of four or more ANC visits (adjusted)

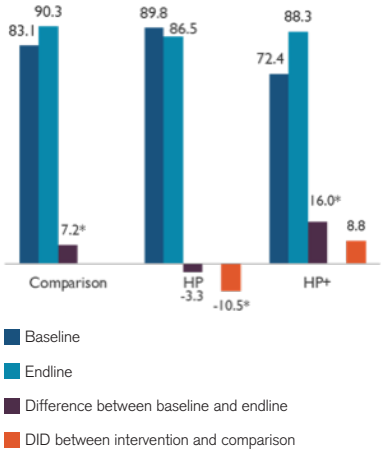

Figure 2: Difference-in-differences for ANC 4+

DID: Percentage of women who sought facility-based ANC during the first trimester

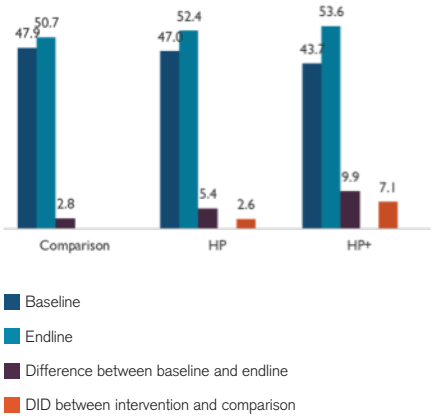

Figure 3: Difference-in-differences for Early ANC

Facility Delivery: HP+ intervention increased facility deliveries

Across all three arms, facility deliveries increased from baseline to endline ($p < .05$). As shown in Figure 4, the HP+ arm showed the greatest increase from baseline to endline (64.8 percent to 84.0 percent) this increase was statistically significant when compared to the control. Notably, facility-based deliveries were already quite high in the control arm at baseline (87.6 percent). There was still some room for improvement in the intervention areas, which was achieved. Additionally, respondents from the endline qualitative analyses agreed that more women were going to the facility than before the project was implemented.

> So now we are having more deliveries at the facility than before. So it is obvious the people respect them and obey them; that is why the turn-up is very high and it shows that the community people are really appreciative of the work of the health promoters.
>
> - MCH aide, HP Zone

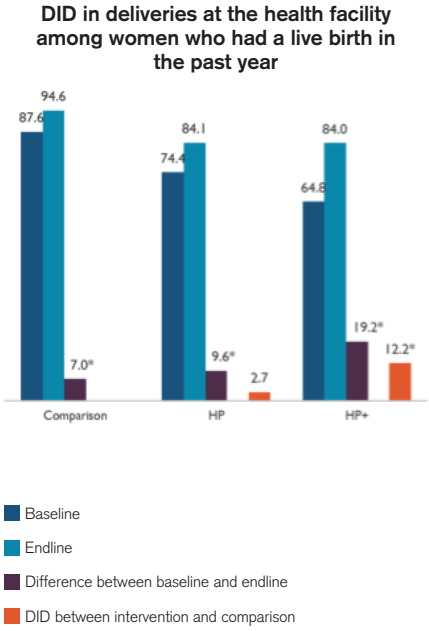

Figure 4: Difference-in-differences, Facility birth

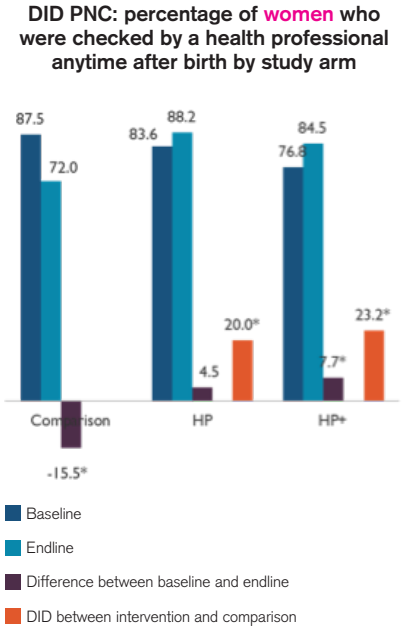

Figure 5: Difference-in-differences, Postnatal care

Postnatal Care: ENCC increased postnatal care use

In the intervention areas, the HP arm saw a slight increase (83.6 percent to 88.2 percent) and the HP+ arm had a larger, statistically significant increase (76.8 percent to 84.5 percent) in utilization in postnatal care (PNC) from baseline to endline, as shown in Figure 5. (As a proxy indicator for PNC, we used percentage of women who were checked by a health professional after birth). Due to the drop-off of PNC in the control arm, both intervention arms showed large effects on utilization of PNC when compared to the control. Thus the work of MNHPs had a positive effect.

Lessons

1. **To increase coverage of MNCH services, leverage TBAs' strength as respected members within the community and engage them as "agents of change."** Both facility births and postnatal care (PNC) increased, which likely is due to MNHPs' direct interaction with women and women's trust in MNHPs, as opposed to an increase in mothers' knowledge. Social enterprise, or linking community based agents to income generating activities, merits continued exploration as a complementary incentive for community health work. However, in ENCC, the MNHPs were highly motivated across both intervention arms by improved status in their communities. We did not see a clear link between the social enterprise and improved MNHP motivation.

2. **Community-based (demand side) programmess should consider adding interventions to improve the capacity of primary health facilities to provide quality care.** ENCC did not focus on strengthening health facility capacity or quality of care delivered to meet the increased demand. Poor quality of care may mean that increased utilization does not translate into improved health outcomes. A poor experience may also discourage women from returning.

Conclusion

To conclude, other countries struggling to shift TBAs away from conducting home deliveries should consider strategies to rebrand TBAs that capitalize on their respect within the community.

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1. Statistics Sierra Leone and ICF International. (2014). Sierra Leone demographic and health survey 2013: key findings. Rockville, Maryland, USA: Statistics Sierra Leone and ICF International. Retrieved from https://dhsprogram.com/pubs/pdf/SR215/SR215.pdf

2. Vallières, F., Cassidy, E. L., McAuliffe, E., Gilmore, B., Bangura, A. S., & Musa, J. (2016). Can Sierra Leone maintain the equitable delivery of their Free Health Care Initiative? The case for more contextualised interventions: results of a cross-sectional survey. BMC Health Services Research, 16(1), 258.

3. Ali, Disha, Magalona, Sophia, & Son, Yeri. (2016). Essential Newborn Care Corps Evaluation Findings. JSI Research & Training Institute,Inc.

Let's talk about it: Can social networks alter community social norms to improve maternal health?

By Leanne Dougherty and Pam Bolton

From 2014 through 2016, Community Benefits Health (CBH)—a Phase II *Innovations* pilot—aimed to shift social norms and cultural practices influencing maternal and newborn health behaviours in 33 villages across three districts of the Upper West region in Ghana. Upper West, dry and Sahelian, has the country's highest rates of poverty and cultural traditions that foster low levels of women's empowerment.

CBH introduced activities aimed at changing social norms in order to improve maternal health-seeking behaviours. A unique aspect of CBH as a social and behaviour change project was its **focus on the community as a whole** rather than individuals. This approach is grounded in an understanding that social relationships**—**or **social networks**—within the community have a strong influence on health behaviours (see Figure 1 below).

To leverage the power of these relationships, the project first used **social network analysis** to identify whom women were speaking to about pregnancy and breastfeeding behaviour. It then tailored health messages to social contacts identified during the social network analysis who could support and influence the uptake of improved maternal health and breastfeeding behaviours.

SOCIAL NETWORKS

Social network factors are associated with and perhaps influence a wide variety of health behaviours.

Social network theory and analysis are used to study health behaviours in developing countries most notably the use of modern methods of contraception

Few studies have investigated whether network characteristics might be associated with the use of pregnancy and breastfeeding related outcomes in developing country settings and what interventions might be used to alter these social networks.

Figure 1: Social networks

The CBH intervention design featured two components. The first was a **community-based incentive**—non-monetary in nature and selected to benefit the entire community, such as a borehole (handpump) for clean water or motorcycle ambulance for emergency transport. Each community debated and selected their incentive, which was promised to the community if they fulfilled three conditions over the two-year period, including having monthly meetings of their community governance group and having men participate in health education activities. The communities extensively discussed and agreed to the conditions as well as the incentive.

By incentivizing behaviour change in this way, CBH aimed to encourage the entire community to support women in adopting improved maternal and newborn health behaviours and swiftly change community-wide social norms by the end of the two-year project.

The second component was **a social and behaviour change communication strategy** with the following activities:

- Home visits by peer educators
- Community-based meetings facilitated by community health officers
- Participatory sessions with videos (often locally produced with local actors)
- Participatory dramas, animated by a skilled health promoter
- Posters
- Radio programs regularly aired on local stations.

These interventions targeted both women and the important influencers in their lives, such as husbands, mothers-in law, female friends and social groupings.

Results and evidence

CBH used a three-arm design to test whether the community incentive would yield additional benefits over and above the communication interventions. The three arms were **Control** (no intervention), **Health Communication** and **Health Communication-plus-Incentive**.

We used a mixed methods evaluation to explore the project's effects. We examined how social networks changed following exposure to the intervention—including whom women spoke with about issues such as pregnancy and breastfeeding. Our results revealed a shift: women became more likely to speak with their partners, family members and friends—either at home or in nearby villages—rather than just with health professionals.

Among women who said they spoke with at least one social contact about pregnancy or breastfeeding, we found significant improvements in healthy behaviours, indicating that efforts aimed at increasing communication across women and their social networks may lead to improved health outcomes. For example, increases were found in rates of women with 4-plus antenatal visits, facility delivery and immediate breastfeeding.

We also found qualitative evidence demonstrating how social norms related to communication about maternal health behaviours had shifted over the course of the intervention.

> **We used to be afraid of talking to someone's wife because you could be accused of negative things. Because of CBH we freely talk to people without fear. Old and young men and women are talking about MNCH in the community. We now know the need for discussion.**
> - Community Influencer

Several community members stated that the project interventions encouraged people to more actively provide advice to others in the community in a way that they would not have done previously. In the past, it might have been negatively perceived to intervene on pregnancy and breastfeeding issues, but now many community members see it as a communal responsibility to support the health of a mother and the growth of the child.

> **We give advice because we want the child to grow and benefit the whole community. It is a form of communal ownership. So if a child grows, I am sure he will benefit the community as a whole.**
> - Community Influencer

We determined that using social network analysis to strengthen our interventions for shifting social norms significantly improved the uptake of targeted maternal health and pregnancy behaviours.

Engaging men to improve women's health

CBH increased male engagement in support of women's well-being. After exposure to the project, husbands spoke of providing more support to keep their families healthy. This increased male involvement included: accompanying pregnant women for ANC visits, relieving them of heavy chores, ensuring proper nutrition and taking care of the children.

> **We the men are now responsive to the health needs of our wives and children than before. We buy our wives the needed food and we take them for ANC.**
> - Husband

As husbands were exposed to project messages encouraging their involvement during pregnancy and childbirth, discussions about MNCH issues increased between husbands and wives.

> Men scarcely discussed these issues with their wives and even among themselves. But today, discussions among men and women are prevalent as well as between fellow men.
> - Influencer

Exposure to videos and flipcharts showing how women and men can talk about pregnancy and childbirth helped to create an environment where husbands and wives have something in common to discuss.

> Now I can discuss [antenatal] weighing issues with my husband freely because he has been part of the meetings and knows the targets and benefits. Before the project, we only talked about health when the baby was sick.
> - Pregnant woman

These improved opportunities for dialogue strengthened women's role in household decision-making.

> Men don't dominate decision-making with regard to the health of the baby and the kind of jobs to do while pregnant. The videos and pictures have helped to increase communication between men and women.
> - Influencer

Health behaviour outcomes

Our quantitative evaluation examined changes in six behaviours in response to the CBH intervention:

- first-trimester antenatal care initiation
- making four or more antenatal care visits
- skilled birth attendance
- postpartum care for mother and newborn within 48 hours of delivery
- breastfeeding initiation within 30 minutes after delivery
- exclusive breastfeeding for six months.

The quantitative evaluation found **across-the-board increases** in five outcomes, spanning both the intervention and control areas. The sixth outcome, exclusive breastfeeding, showed mixed, minimal changes. Apart from immediate breastfeeding initiation, which showed significant increases in both intervention arms as compared to the control, there were no significant differences between intervention and control groups.

We believe this may have resulted from "spillover" of exposure to the project activities into control communities. To test our suspicion, we reanalysed the data to consider the dose of exposure to project activities.[1] We found that the subset of women with higher exposure to project activities

were significantly more likely to practice targeted maternal health behaviours. Using adjusted odds ratios, we found **significant increases in the odds of seeking first trimester antenatal care, completing 4+ antenatal care visits and using skilled birth attendance** among women who received a greater dose of communication activities.[2]

Key lesson: Mere "Spillover" or Another Effect of the Social Network Strategy?

It appears that social networks and the whole-of-community intervention approach had an unplanned yet beneficial effect. Because the project was required to follow Ghana Health Service decisions regarding selection of the project zones, the intervention and control communities were physically close to one other. Community members often attend funerals or shop at weekly markets in neighbouring communities. Interviews suggest that information about the project travelled quickly and a sort of competitive spirit developed among intervention communities. Intervention communities that had the health promotion without the incentive (i.e., Health Communication-only communities) came to know about the incentive and sought to outperform the other communities.

Information reports from the qualitative interviews suggests that some residents of the **control communities** also became curious and attended videos, dramas, and village meetings in the intervention communities.

These "spillover" effects of the interventions into control communities likely had the effect of diluting the measured effects of the programme. However, if control communities also benefited, that is good for people even if it is bad for the purity of the evaluation.

Conclusion

We believe our efforts aimed at increasing communication across women and their social networks helped improve the project's outcomes. The project changed social norms in part by increasing the number of people with whom women discussed pregnancy and childbirth, and by influencing the nature of these discussions toward women receiving more advice and support. We recommend considering a social network approach for other social and behaviour change interventions aimed at improving maternal, newborn and child health.

References

1. While controlling for study area and time.
2. Adjusted Odds Ratios (AORs) and P values as follows: early ANC AOR=1.34, p=0.02; ANC4 AOR=1.81, p<0.001; SBA AOR=1.32, p<0.01.

Designing a mobile phone app to support community health workers

By Pam Bolton

Introduction

Nursing is a stressful job, and being a nurse in rural Ghana – where traveling long distances to see patients, working in remote areas without peer support, and not having access to vital health information is common – is even more stressful. Nurses can feel isolated and overwhelmed by these problems.

Community Health Nurse on the Go (CHN on the Go) is a mobile phone application designed to improve motivation and job satisfaction for community nurses in Ghana. To develop the solution, the Concern *Innovations* team worked hand in hand with nurses and their supervisors as well as government officials in Ghana.

How did Concern use Human-Centred Design?

Working with a professional designer from the design firm ThinkPlace and technology partner Grameen Foundation, the Concern team conducted formative design research and interactive workshops in Ghana using a variety of design approaches. We used methods such as **storytelling**, **user personas**, and **journey maps** to gather insights into community nurses' values, desires, and daily experiences.

FIGURE 1: WHAT ARE USER PERSONAS?

User Personas *are archetypes—they are composites that capture the needs, goals, values, and behaviours of a large group of users—in our case, the nurses. They help us understand and talk about the nurses' experiences. We were able to identify two major themes for how the nurses experienced their work:*

- ***purpose-driven*** *(driven to provide care for the sick) or* ***paycheck-driven***

and

- ***resilient*** *(able to stay mostly positive) or* ***dispirited*** *(more beaten-down)*

Using these two dimensions (purpose/pay-check, resilient/dispirited), and building in age and gender, frustrations, hopes and dreams, we created three fictitious nurse personas that conveyed what we had learned about the nurses' daily experience.

The team then built the app based on these insights and continued to test and adapt to user feedback throughout the pilot.

> **Because we are driving towards this empathy and deep understanding, we have to get deep together quickly. This is not speed dating! It is like being locked in a tent with a group of people for two weeks and getting to know them WELL.**
> - Design participant

Project implementation

The team used the design insights they'd gleaned to create a set of six opportunity areas corresponding to the nurses' needs. These opportunity areas became the six modules that comprised the CHN on the GO mobile app, see table 1.

Table 1: How the app design linked to opportunity areas

Opportunity Area: What the nurses told us	Became	CHN on the Go Module
Learning and growing	→	eLearning Centre with accredited courses
Providing good care	→	Point of Care Centre with diagnosis and treatment support in the field
Knowing how I'm doing and feeling appreciated	→	Achievement Centre to track targets and course work
Connecting with others	→	WhatsApp groups to connect with peers and supervisors
Managing my work	→	Planning Centre to plan work and set targets
Staying well	→	Staying Well Centre to explore stress relief tips and wellness content

A community Health Nurse visits Georgine Butu and her newborn son in rural Ghana, 2016. Photo by Stephen Morrison.

Evaluation and evidence

As shown in Tables 2 and 3 below, we implemented a rigorous, mixed methods monitoring and evaluation strategy to collect data on the frequency of use, progress of implementation, effect on user knowledge and motivation, and the added value of the human-centred design process. While a full description of the evaluation results is beyond the scope of this article, our endline survey and key informant interviews found that the app enjoyed high levels of adoption, sustained use (49 percent of the nurses used it more than five times a week), and 94 percent user satisfaction. 88 percent of nurses said the app made their work life 'very much' easier and 57 percent said it improved their relationship with their supervisor 'very much.'[1]

Table 2: CHN on the Go Monitoring Activities

	First Round	Second Round
Feedback Sessions	30 nurses	186 nurses
	20 supervisors	
"Magpi" E-survey	178 nurses	182 nurses
	39 supervisors	34 supervisors
Pop-up Questions	115 nurses	135 nurses
	20 supervisors	17 supervisors
Usage Dashboard	Monthly: all users, with slight monthly variation in total number	
Field Monitoring	Monthly: field officers follow up with nurses & supervisors	

Table 3: CHN on the Go Evaluation Activities			
	Baseline	**Endline**	**Process Documentation**
In-depth Interviews	29 nurses 11 supervisors	40 nurses 8 supervisors 12 stakeholders 2 clients	29 in round 1 32 in round 2
Focus Group Discussions	4 groups (23 nurses)		
Nurse Observations			6 in round 2
Job Satisfaction & Motivation Questionnaire	186 nurses	185 nurses	
Knowledge Questionnaire	184 nurses	186 nurses	

How did design influence the success of CHN on the Go?

The evaluation clearly linked the success of the app to the learning and empathy that emerged from the initial design phase and the careful translation of this learning to the app. CHN on the Go made the nurses' daily tasks of advising, diagnosing, and treating easier; it helped them plan and set goals; it enabled them to build their knowledge continuously and to renew or upgrade their credentials; and it connected them more closely to their peers and supervisors.

Through the CHN on the Go experience, we were able to validate our hypothesis about how human-centred design improves project outcomes.

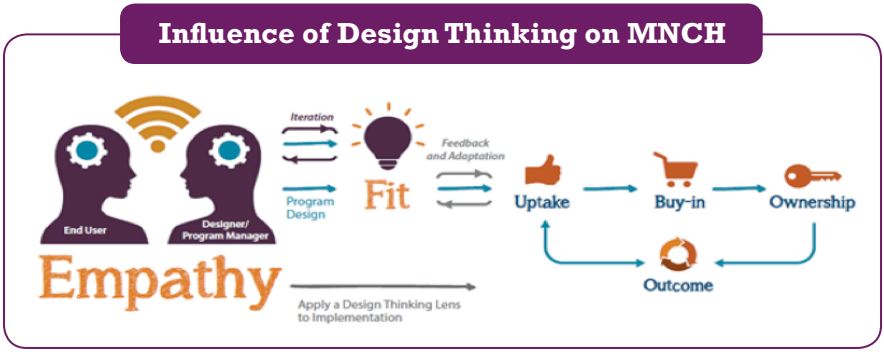

Figure 2: Influence of Design Thinking on MNCH

As Figure 2 shows, the essential step of developing empathy for programme participants (the users), creates products or programmes that fit their needs well. Feedback and adaptation improves the fit still further. This creates a virtuous cycle of product/programme uptake and buy-in, evolving to a strong sense of ownership and leading to better outcomes.

Lessons learned

Our design thinking experience in Ghana also influenced programme staff. Their empathy with the nurses morphed into a fierce determination to keep improving the app. Their continued commitment to collecting reflections and creating feedback loops to inform iteration of the app's content helped the app gain a progressively tighter fit with CHN needs and desires.

> "I think the purpose of design thinking was to make something in a way that the end users felt part of the process. It wasn't as if we wanted to design something and push it on them. We wanted them to tell us what they needed, what will suit them. We had to bring in…the supervisors and nurses to actually tell us what the application should look like. At the end of the day, they were the ones who were going to use it. So if you design something for them that doesn't suit their needs or what they have in mind, I think usage isn't going to be as high.
> - Concern Programme Manager

Conclusion

Through our experience with CHN on the Go, we are convinced that human-centred design is a powerful approach and provides a unique toolset to solve global health problems and develop programmes. It can enhance traditional programme planning and implementation to create greater impact. What's more, it dovetails smoothly with Concern's focus on community-based programming approaches such as Community Conversations

We encourage Concern field staff to consider design approaches and to contact our point person, Katie Waller, at katie.waller@concern.net for support.

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Health Centre by Phone in Malawi: Results, growth, sustainability and replication prospects

By Jessica Crawford and Pam Bolton

Introduction

In remote and rural communities, distance often prevents people from seeking health care when they need it. In a country like Malawi with one of the highest rates of maternal, child, and infant mortality in the world, knowing where *and* **when to seek care is critical to reducing maternal and child mortality rates.**[1] Chipatala cha pa Foni (CCPF), which means Health Centre by Phone in Chichewa, is a toll-free health hotline in Malawi that creates a link between the health system and remote communities. Originally created and launched in the first phase of Concern's Innovations for Maternal, Newborn & Child Health, CCPF has evolved to become a general health hotline, providing information, advice and referrals on a broad range of health topics including nutrition, HIV, cancer and common health concerns, in accordance with Ministry of Health guidelines. This article describes CCPF's results, its growth and rapid expansion under the leadership of Concern's partner VillageReach, and its prospects for sustainability and replication.

Programme description

From July 2011 to June 2013, Concern piloted CCPF in four rural communities in Balaka district in Southern Malawi. It targeted women of childbearing age, pregnant women, and guardians of children less than five years of age. The service had two components which continue to this day:

1. **Hotline**: A toll-free telephone hotline which is open from 7:00am to 7:00pm; anyone can call to receive information and advice on maternal and child health and reproductive health topics (now expanded to include all health topics). Trained hotline workers (generally nurses) respond to questions based on Ministry of Health protocols, and can also refer callers to a healthcare facility closest to their location. Concern's partner VillageReach worked with a local technology partner, Baobab Health Trust, to develop a software platform that handles incoming hotline calls, manages client data and also guides the hotline worker through the call in order to provide the best advice. When users call in their information is captured into the software and marked if they are referred to a local healthcare provider. Hotline workers will follow up with the caller to see whether they visited the healthcare provider.

2. **Message System**: CCPF offers a mobile messaging system that sends regularly scheduled text or voice messages, giving tips and reminders about maternal and infant health. Users who opt for voice messaging receive a phone call with a pre-recorded message. The messages are tailored—for example, keyed to a woman's month of pregnancy or her child's age. Users can also call into the CCPF interactive voice response (IVR) system at their convenience to retrieve their message. (These are known as "push" and "pull" systems.)

BOX 1: TARGETED MESSAGING

CCPF sends out three main sets of targeted messages:

- ***Pregnant women*** receive messages once or twice a week, on average, reminding them to visit a health professional, advising them on how to take care of their health, alerting them to common symptoms and danger signs in pregnancy, and prompting them to call the hotline to get more information.
- ***Caretakers of children*** under one-year-old receive messages regarding appropriate home- and facility-based services such as sleeping under a bed net, or reminding them to get their child vaccinated.
- ***Women of childbearing age*** receive health tips on topics of reproductive health, family planning, and reminders to visit a healthcare provider if they suspect they may be pregnant.

Key results

Innovations hired Invest in Knowledge, a Malawi-based non-profit research organization, to evaluate CCPF's pilot results. Invest in Knowledge conducted a mixed-methods evaluation using both quantitative (pre and post) and qualitative data gathering. The following findings were revealed by the evaluation:

1. **CCPF had statistically significant effects on maternal, newborn and child health knowledge and behaviour (see Table 1 below).**

   CCPF users showed statistically significant improvements for the following indicators:

   - Increased use of antenatal care (ANC) within the first trimester
   - Increased use of a bed net during pregnancy and for children under five
   - Early initiation of breastfeeding
   - Increased knowledge of healthy behaviours in pregnancy including drinking more water and minimizing strenuous lifting
   - Increased knowledge that some traditional medicines can be harmful in pregnancy
   - Increased knowledge of maternal health services including number of recommended antenatal visits and what to bring to the health centre for labour and delivery.

2. **CCPF encouraged appropriate use of the health system while reducing unnecessary visits.**

   Over three-fourths of calls to CCPF's hotline were resolved without a referral to a health facility. As a result, CCPF reduced undue burden on health facilities by encouraging minor ailments to be treated at home or by a community health worker.

3. **CCPF users were highly satisfied with the service.**

   Users appreciated the ability to access the service from home – saving time and personal costs associated with a trip to the health centre. CCPF was highly utilized in the community and satisfaction was high among these users. During the initial phase, approximately one in five women aged 15-49 used the service. 94 percent of users were satisfied with their hotline experience and 98 percent were satisfied with the tips and reminders service.[2]

The following table summarizes the service's effect on key indicators of interest:

Table 1: Chipatala Cha Pa Foni's Effect on Knowledge and Behavior

Topic:	Estimated Percentage Point Increase
Knowledge of health behavior during pregnancy such as drinking more water	40%
Use of bed nets for children under 5 years old	30
Use of bed nets during pregnancy	25
Breastfed baby within 1 hour of birth	15
Started antenatal care in first trimester	30
Knowledge of what to bring to the health facility for labor and delivery	49
Knowledge that some traditional medicines can be harmful during pregnancy	50
Knowledge that a pregnant woman should attend at least 4 ANC visits	35
Knowledge that a baby born at home should go directly to health center	80
Knowledge that pregnant women should lift less	15

The evaluation concluded that Chipatala Cha Pa Foni provided communities with greater control and opportunity to interact with the health system without having to travel long distances to the nearest health facility. It increased access to critical antenatal and postnatal care information, and effectively encouraged appropriate home and facility-based care.

Sustainability and expansion of CCPF in the post-Innovations period

One of *Innovations'* main objectives was that our most high-performing pilots would be sustained, scaled and replicated. The scale-up would nearly always involve Ministries of Health and could be supported by Concern itself or other organizations who shared our vision. Effective scale-up and replication was our definition of success.

Over the last six years, Chipatala Cha Pa Foni has had more than 30,000 callers and has expanded to serve all age groups and cover a growing range of health topics. By 2016, led by VillageReach, CCPF had achieved over 30 percent nationwide coverage in Malawi, serving 9 districts (Balaka, Machinga, Ncheu, Dedza, Salima, Nkhotakota, Mulanje, Mchinji, and Zomba). The Ministry of Health has been closely involved in each step of the expansion.

Today in 2017, CCPF has the potential to reach a population of over 4.5 million people in 9 districts. If the expansion continues to go according to plan, by the end of 2017 it will go nationwide, reaching all 28 districts in the country.

In 2016, CCPF merged with Airtel's Dial-A-Doctor hotline. Airtel is Africa's largest mobile carrier. The service is now called Airtel Chipatala Cha Pa Foni. Now, all calls to Dial-a-Doctor are routed directly to the CCPF hotline and calls are triaged to a doctor-on-call as appropriate.

The partnership with Airtel is essential to scaling CCPF rapidly at a nationwide level. Additionally, the partnership helps to reduce CCPF's operating costs as Airtel absorbs the voice airtime costs of the hotline and voice messages retrieved on the Interactive Voice Response system. Previously, CCPF paid Airtel for the airtime. The partnership increases satisfaction and loyalty among Airtel's mobile phone users, so it is a win for Airtel as well. **This partnership places CCPF on a path towards sustainability.**

Chipatala Cha Pa Foni's latest expansion: Adolescent sexual and reproductive health

In late 2016, VillageReach was awarded US$1.3 million from the DREAMS Innovation Challenge[3] to launch CCPF for Adolescents. This two-year programme expands Airtel CCPF to reach adolescent girls and young women by targeting Sexual and Reproductive Health (SRH) behaviours, care-seeking, and social norms. The new programme component aims to reduce HIV incidence and help girls stay in school.

VillageReach is rolling out a package of interventions designed to increase young people's access to information and services that help them make healthy decisions about their sexual and reproductive health. The new programme will offer a private, confidential option for youth seeking SRH information, while also helping facilitate their access to facility-based services when needed. CCPF hotline workers are being trained in adolescent development and health, youth-friendly customer care, and adolescent-focused health information, such as menstrual management, contraceptive options and partner communication.

CCPF for Adolescents will also strengthen the referral system to youth-friendly services at the facility level. To increase demand for the CCPF hotline, VillageReach and its partners will train peer mobilizers in schools and the community. This multi-tier approach leverages technology, peer outreach, and health facilities to cultivate a health system that supports healthy SRH behaviours amongst youth.

Looking ahead

The Malawian Ministry of Health (MOH) has been engaged and supportive of CCPF from its early days. VillageReach and the MOH recently signed a Memorandum of Understanding initiating the transition of CCPF ownership and operations from VillageReach to the MOH. A steering committee, led by the MOH and consisting of various stakeholders, is actively guiding all recommendations and decisions during the transition process including the incorporation of CCPF into the Health Sector Strategic Plan.

In view of the solid results of this *Innovations* pilot, its rapid growth and solid prospects for sustainability, Concern teams should consider replicating or adapting it in other countries with high needs for better reproductive, maternal, newborn, child and adolescent health.

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2. Susan Cotts Watkins, Amanda Robinson and Michael Dalious, Invest in Knowledge Initiative. Evaluation of the Information and Communications Technology for Maternal, Newborn and Child Health Project Known locally as "Chipatala Cha Pa Foni" (Health Center by Phone). A pilot project of the Concern Worldwide Innovations for Maternal, Newborn & Child Health Project, Balaka District, Malawi. December 2013.

3. The DREAMS Innovation Challenge is a partnership involving the U.S. President's Emergency Plan for AIDS Relief (PEPFAR); Janssen Pharmaceutical NV (part of Johnson & Johnson); and ViiV Healthcare. It aims to significantly reduce new HIV infections among adolescent girls and young women in the highest-burden areas of 10 sub-Saharan African countries.

How we can take forward Innovations in more fragile contexts?

By Connell Foley

Do these problems sound familiar to Concern programme staff?

- Inability to keep skilled front-line health workers in remote clinics
- Financial resources not flowing down through the system effectively leaving district level staff and offices with meagre resources
- Weak management skills at district level
- Lack of central commitment or resources to invest in district and front-lines cadres of staff
- Lack of transport and sustainable support for travel of district and front-line staff
- Weak community and district management of disaster risk
- Women-driven and user-suggested solutions being unheard or dismissed
- Competition for resources and power among district level government actors
- Lack of trust between different actors at district level (government, CSOs, politicians, business…)

I am sure that they are familiar to most of us! These are the kinds of issues we need to be tackling. When I look at the health service in countries like South Sudan or Chad, I see lack of delivery or incredibly weak delivery at community level, with health facilities under-staffed, under-resourced and often quite dysfunctional because of this. Ironically, Ministries of Health often have lots of resources but those resources rarely get through the system to the front-line services. In countries where there is conflict or a compelling security need, resources to social sectors tend to lose out to the needs of the military and policing institutions. But these are the realities of the contexts in which Concern works and what we need is to find solutions to the old engrained problems of weak state delivery capacity and to the volatility of conflict affected contexts.

> The signature Innovations processes of human-centred design, with cycles of testing, adapting and testing again, are highly relevant for tackling embedded problems in the contexts in which we work.

Innovations: We learned a huge amount in the course of the Innovations in Maternal, Newborn and Child Health initiative, funded by the Bill and Melinda Gates Foundation from 2008 to 2016. The early learning was hard won and painful by those managing and supporting the programme but it exists and is important. The signature *Innovations* processes of human-centred design, with cycles of testing, adapting and testing again, are highly relevant for tackling embedded problems in the contexts in which we work. Some of the specific initiatives undertaken by the latter phase of the programme included:

- **Care Community Hub or "CHN on the Go" (p.16)**: This was a mobile phone application for frontline health workers which was undertaken in Ghana, a country *outside* Concern's standard country target group. The intent of the CCH project was to provide the government with an innovative solution to address barriers in rural community health nurses' motivation and performance through the use of a mobile technology platform. The team used human centred design to develop a mobile phone "App" and revised it five times during the pilot. It helped field-based nurses to obtain diagnosis and treatment support remotely; to plan their work and set targets; to track progress against targets; to connect with peers and supervisors for support; to access tips on well-being and stress relief; and to take accredited e-learning courses.

- **Essential Newborn Care Corps (p.5):** In Sierra Leone, where home births and maternal deaths are still too common, this programme built on the strong and respected community of traditional birth attendants (TBAs). By retraining the TBAs and supporting them to take up a new and valued community role as Maternal, Newborn Health Promoters, *Innovations* helped create a sustainable cadre and improve health-seeking behaviours among women and infants. The initiative not only successfully worked with non-literate women but also challenged the government to reflect on how best to utilize low literate community resources. Concern built on local social capital to create stronger and more durable community systems.

From a Health Systems Strengthening perspective, one that is enshrined in Concern's health policy and strategy, these are potentially valuable contributions to improved health care in *any* country where we work.

> "It is appropriate for us to help fill gaps but it is not appropriate for us to ignore the deeper, structural issues

Sustainability: The meta-analysis of the evaluations of our programmes funded by Irish Aid from 2011 to 2016 suggested that a major weakness was the sustainability of our programmes and their benefits. The challenges or problems listed above outline the contextual challenges to sustainability and the weakness of local institutions to deliver effective interventions. This is why we need to innovate here; this is why we need to find local solutions to these kinds of problems.

Like most agencies, we have this tendency to do our own contextual analyses and then planning of interventions where we think we can add most value. However, these challenges seem to always get relegated to the "Risks and Assumptions" boxes and we try to work around them or despite them. These important challenges persistently dog our programmes but we seem to treat them as if we are powerless to do anything about them. A good example is the fact that we continue to pay the salaries of front-line health workers in several countries because they are not being paid by the Ministry of Health. We do some rather *adhoc* advocacy on the issue with other health-focused NGOs but continue to fill the gap, creating a bit of a Catch 22 dilemma! I wonder how different our health programme would look if this was the central defining problem statement… or even one of them.

But we all know that Concern's tradition is that of ensuring that we fill gaps in services; that our commitment to our target groups compels us to deliver for them. So we do; and we push the sustainability issue to one side. It is appropriate for us to help fill gaps but it is not appropriate for us to ignore the deeper, structural issues. It would be a major step for us to put some of these bang into the middle of our programmes, forcing us to address them more seriously.

I feel that the human centred design has huge potential here, if we can get very practical about it. So the learning from the Gates funded *Innovations* initiative needs to be applied to the contexts in which Concern seeks to excel. While some take the approach that contexts have to be "innovation ready", I do not subscribe to that view. I believe that one can be innovative in any context and that Concern has huge opportunity and potential to be innovative in the remote and difficult places in which we work.

Our programme managers have very strong experience of dealing with practical, day-to-day problems in areas of weak or no infrastructure and meagre resources. They also know the local context. Our SAL advisers have the assets of technical skills, analytical capacity and learning from a range of different contexts. To all of these strengths we now add the learning and experience of the ex-*Innovations* staff who bring skills in applying innovation-seeking processes to programmes. It should be an amazing marriage of skills! So let us apply all of these skills of different teams in our health programmes in fragile contexts and come up with a variety of small fixes and solutions to these old problems.

Let's remember our impulse to improve things. Let's put aside our biases and assumptions and be curious again; let's be committed to tackling these issues. Keep asking questions, thinking analytically and probably laterally. We should encourage all of our staff to practice these skills.

Cost effectiveness within health interventions: Evidence from Sierra Leone

By Kai Matturi

Project overview

Recognizing TBAs as a crucial yet overlooked maternal and newborn health resource in their communities, the *Innovations* team launched the Essential Newborn Care Corps (ENCC) project in Bo District, Sierra Leone (see article on page 6).

The project explored how training and rebranding of TBAs to work as Maternal Newborn Health Promoters (MNHPs) could fulfil important community health roles. Implemented between March 2014 and September 2016, the project had two key components: the promotion of health activities by the MNHPs and the use of social enterprise to incentivise the MNHPs in their new roles. All MNHPs made home visits to counsel mothers on birth preparedness, facility delivery and other topics and to refer women to the health centre for care. Half of the MNHPs participated in a social enterprise where they also received business training and $30 start-up loans. All MNHPs had monthly meetings where they discussed challenges and received refresher training.

The project sought to improve the following six health outcomes:

- The initiation of antenatal care (ANC) during the first trimester of pregnancy
- The completion of four or more ANC visits during pregnancy
- Health facility delivery
- Postnatal care (PNC) for mothers by a health professional
- PNC for newborns by a health professional
- The initiation of breastfeeding within one hour of delivery.

Evidence generation

In order to generate robust evidence the project used a three-arm study design with two intervention arms and one comparison group:

- **Health promotion (HP) arm:** Catchment areas of 9 Primary Health Units (PHUs) in five chiefdoms, with a population of about 57,040

- **Health promotion and social enterprise (HP+) arm:** Catchment areas of 9 PHUs in two chiefdoms with a population of nearly 46,355
- **Comparison arm:** Catchment areas of 9 PHUs in three chiefdoms, with a population of about 54,705.

Cost-effectiveness analysis: What is it and why is it important?

In addition to assessing whether ENCC effectively improved the target MNCH outcomes, it was equally important to demonstrate that the project could be cost-effective. That is, it represents good "value for money". Cost-effectiveness analysis (CEA) is a form of economic evaluation that compares the relative costs and outcomes of two or more alternatives. It converts an intervention's effects into a common health metric, such as discounted life years saved (DLYS), disability-adjusted-life-years (DALYs), or quality-adjusted life-years (QALYs). Interventions that can achieve improvements in health outcomes more cheaply than the alternatives are considered to be more "cost-effective". CEA was not included in the original evaluation design of ENCC. As interim findings became available, showing the potential of the project, interest in cost effectiveness began to arise.

The data on effectiveness came from a quasi-experimental evaluation design with baseline and endline household surveys. The final sample included 795 eligible women at baseline (in October-December 2013) and 1,110 at endline (in June-July 2016)[1]. Difference-in-differences regression models were used to estimate the prevalence of the six target outcomes in each treatment arm at baseline and endline, controlling for socio-demographic characteristics.

The cost analysis of ENCC followed standard costing methods,[2] with capital costs (e.g., equipment and vehicles) assigned resale prices. Each cost item was apportioned to the two intervention arms (HP and HP+) in proportion of the contribution of each arm to the cost, or based on estimated time committed to the different arms. Overall, the costs associated with the HP arm and HP+ arm were estimated at US$ 595,706 and US$ 757,488, respectively.

Life years saved by improved outcomes

In addition to the data on the original six outcomes, the baseline and endline surveys also collected data on three other outcomes which are part of the Lives Saved Tool (LiST) modelling:

1. Tetanus toxoid vaccination during pregnancy
2. Iron supplementation during pregnancy
3. Preventive treatment of malaria during pregnancy.

The prevalence estimates of these nine outcomes at baseline and endline by arm were inserted into the LiST software to estimate the lives saved from improvements in coverage.[3,4] The tool generates the number of maternal, neonatal and infant deaths averted as a result of improved outcomes, making use of Sierra Leone specific demographic data. These lives saved are further converted into life years saved, or discounted life years saved (DLYS).

Cost-effectiveness assessment

The measure of cost-effectiveness, known as the incremental cost-effectiveness ratio (ICER), is defined as the difference in costs between two arms, divided by the difference in their DLYS. It represents the average incremental cost associated with one additional life year saved.

Cost-effectiveness is context-dependent. To decide whether interventions meet criteria for cost-effectiveness, the World Health Organization uses a threshold that is tied to a country's Gross Domestic Product (GDP) per capita. Thus, for Sierra Leone WHO classifies interventions as follows[5]:

- **Highly cost-effective**: If ICER is less than the GDP per capita **($638.3 for Sierra Leone)**
- **Cost-effective:** if ICER is less than 3 times the GDP per capita **($1,915 for Sierra Leone)**

A project in a country with a higher per capita GDP than Sierra Leone would have a lesser challenge to meet the WHO definition for cost-effectiveness, while a project in a poorer country would need to meet a more stringent standard in order to conform to the definition.

Results

Effectiveness

The project evaluation revealed the following:

- A statistically significant effect of the project on the three post-delivery outcomes (**breastfeeding initiation, PNC for mothers, and PNC for newborns**) in both intervention arms
- A statistically significant effect on **four or more ANC visits** during pregnancy and **health facility delivery**, in the HP+ arm only
- No significant effect on **ANC initiation within the first trimester** (both intervention arms had small increases (5-8 percentage points) compared with the comparison group but these did not reach statistical significance
- An **added value from the business model** on four or more ANC visits and health facility deliveries.

More generally, the increases over the comparison group were more pronounced in the HP+ arm than in the HP arm on all outcomes, with the exception of PNC for mothers.

On the three secondary outcomes, the project's effect on **iron supplementation** was larger in the HP+ arm than in the HP arm. The estimates for **tetanus toxoid vaccination** and **preventive treatment of malaria** during pregnancy were of roughly the same magnitude across the two intervention arms.

This greater effectiveness of the "Health Promotion plus Social Enterprise" (HP+) intervention could also be explained by the lower baseline indicators in the HP+ arm, on seven of the nine outcomes. It is sometimes easier to achieve improvements when the starting level is low.

Using WHO standards we can say that Health Promotion plus Social Enterprise intervention was cost-effective

Cost-effectiveness

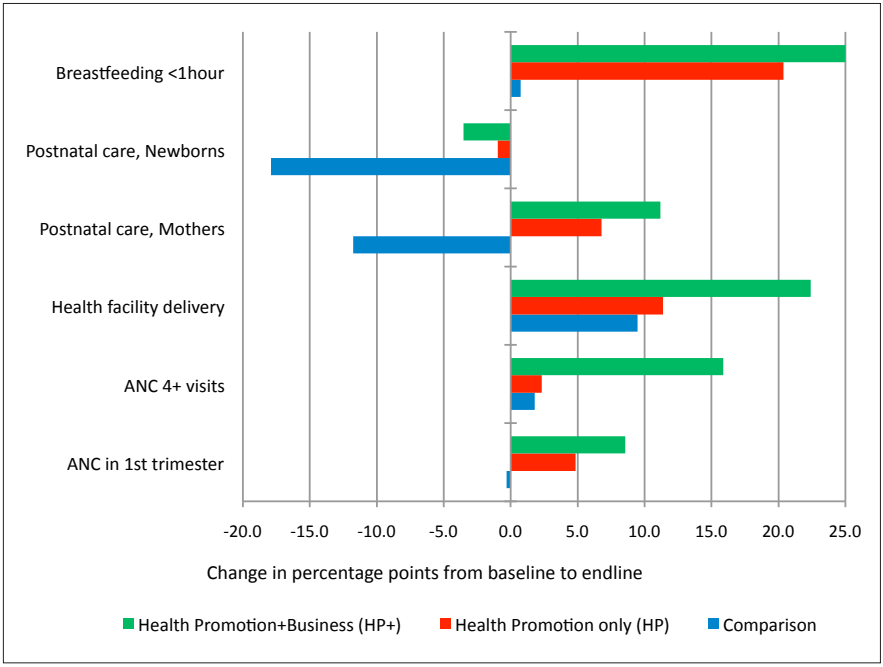
The HP+ intervention was about 55 percent more expensive per head than the "Health Promotion Only" (HP) strategy ($16.3 vs $10.4 per head). However, the HP intervention was associated with 141.0 life years saved relative to the comparison area, while the "Health Promotion Plus Social Enterprise" (HP+) strategy generated 468.2 life years saved. These life years saved from improved outcomes yielded an incremental cost-effectiveness of $4,225 per life year saved in the HP arm, and $1,618 per life year saved in the HP+ arm (see Table 1). **Therefore, in the Sierra Leone context, only HP+ is considered to be cost-effective according to the WHO standards.**

- The cost-effectiveness of the HP+ strategy was nearly 60 percent higher than that of the HP only intervention ($1,618 vs $4,225 per life year saved), due to greater effectiveness
- The greater effectiveness of HP+ is attributable to much larger increases (relative to the control) in several outcomes – including 4 or more antenatal care visits, iron supplementation, postnatal care and breastfeeding initiation rates (see Figure 1)
- As a result, the "Health Promotion plus Social Enterprise" intervention generated far more life years saved, relative to the control, than the HP only intervention (10.1 vs 2.5 life years saved per 1,000 population).

Table 1: Cost-Effectiveness analysis of Essential Newborn Care Corps

	Health Promotion only (HP) model		Health Promotion +Business (HP+) model	
	Control	Intervention	Control	Intervention
Population served	57,040	57,040	46,355	46,355
Life years saved	526.1	667.1	427.6	895.7
Incremental life years saved	NA	141.0	NA	468.2
Project costs (US $)	$0.00	$595,706	$0.00	$757,488
Cost-effectiveness (US$/ incremental life year saved)	NA	$4,225	NA	$1,618

Figure 1: Adjusted percentage change from baseline to endline, by arm



Limitations

The above results should be interpreted with several caveats. Firstly, had the cost-effectiveness analysis been included in the initial evaluation plan, data would have been collected on exclusive breastfeeding and family planning and used to strengthen the lives saved estimates, as they form part of LiST's inputs. The project would likely have been more cost-effective with these outcomes taken into account.

Secondly, the "Health Promotion plus Social Enterprise" arm had lower baseline indicators than the "Health Promotion only arm" on seven of the nine indicators, which may have contributed to the effectiveness gap between the two interventions because of the greater room for improvement when initial levels are low.

Thirdly, the cost analysis covers programmatic costs only and does not include any private household costs, such as the opportunity costs for MNHPs, community leaders, and PHU staff associated with the time they spent on project activities.

Conclusion

Using WHO standards we can say that The "Health Promotion plus Social Enterprise" intervention was cost-effective in the Sierra Leone context. Because this was a pilot project, it is possible that at larger scale Essential Newborn Care Corps would be even more effective and cost-effective than what was observed here. The latter is a key point which Concern should consider when assessing how best to design programmes to improve maternal and newborn health in other Concern countries with a strong TBA tradition.

Acknowledgments

This article draws on a longer piece, *'Essential Newborn Care Corps-Cost-Effectiveness Analysis of an Innovative Programme to Rebrand Traditional Birth Attendants in Sierra Leone'.* The document is available on Knowledge Exchange.

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Finding local solutions to local problems: The Maker experience in Kenya

By Katie Waller, Natasha Kanagat and Pam Bolton

Challenge meets opportunity

Equitable access to high-quality health care is essential to bringing down Kenya's unacceptably high maternal and newborn death rates. The Kenyan government has committed to reduce maternal and child mortality, but large gaps remain. Kenya experiences acute shortages of basic, lifesaving medical equipment needed to care for women and newborns. Expensive and procured internationally, the equipment also requires sophisticated maintenance and repair that is difficult or impossible for local technicians to do.

At the same time, Kenya has earned a reputation for being the hub of excellence and innovation in technology on the African continent, and has an existing network of skilled engineers ready and capable to innovate.

Project objectives

The Maker for Maternal, Newborn and Child Health (Maker) programme, part of Concern Worldwide's *Innovations for Maternal, Newborn & Child Health*, aimed to forge a strong partnership (called the Maker Hub) between Kenyatta National Hospital (KNH) and the University of Nairobi (UoN). Together they worked to create low-cost, locally-designed medical device prototypes and spare parts to serve women and newborns. The project had two core objectives:

1. Create a functioning partnership between **users** (clinicians and biomedical engineers from Kenyatta National Hospital) and **designers** (engineering faculty, staff and students from the University of Nairobi)
2. Develop locally-designed medical **device prototypes** that meet the needs of the users at Kenyatta National Hospital.

Evaluation methods

At baseline, the project conducted a needs assessment in 2014 to identify the major contributors to maternal and newborn mortality, equipment supply chain inefficiencies and their root causes. Data was collected through observations, document reviews and 30 key informant interviews using adapted questionnaires from USAID and WHO. Results were used to prioritize the medical equipment that needed to be built.

As the project did not aim to directly influence health outcomes, the evaluation focused on the processes, successes and challenges connected with establishing the Maker Hub. Nothing like this had ever been attempted before in Kenya.

Concern's evaluation partner, JSI Research and Training Institute (JSI) collected extensive qualitative data from project partners in May 2015 and March 2016 to understand the process of implementing the project. Data were collected through observations, review of notes from monthly partner meetings, design reports and 26 semi-structured interviews with partners and stakeholders.

> A big challenge for to the project was the lack of national policies related to procurement, safety, and standardization of locally designed medical devices

University of Nairobi students in the Maker space, Nairobi, Kenya, 2016. Photo by Stephen Morrison.

Results—Key achievements

The evaluation confirmed that Maker for MNCH achieved six principal outcomes:

1. Finalized a partnership with Kenya Bureau of Standards to enable the government to properly assess new devices—a strengthening of national capacity
2. Established a calibration centre at Kenyatta National Hospital to enable the hospital, for the first time, to calibrate and repair medical devices used on its wards
3. Trained biomedical engineers and a KNH programme manager to oversee and conduct the repairs and maintenance made possible by the new calibration centre, decreasing dependency on expensive outside services

4. Built, internally calibrated and secured clinical testing approval for one medical device – a suction machine for clearing newborn air passages, among other critical uses
5. Built and equipped the "Maker space" – a large idea incubation, design and fabrication lab in the university's Science and Technology Park – enabling students and entrepreneurs to create medical device prototypes
6. Established a partnership with UNICEF, Philips Healthcare and the Philips Foundation to continue to expand Maker during 2017-2019; this partnership will continue to fund the Maker programme, supporting inventors and innovators to design new and better devices for maternal, newborn and child health.

Enabling factors for success

The leadership and vision of the principal investigators at UoN, KNH and Concern Worldwide were instrumental in motivating teams to strengthen the partnership, produce results and get high level buy-in. Strong mechanisms for communication and collaboration included:

- Monthly Hub meetings during equipment design to keep partners informed
- Exchange visits that provided the opportunity for university designers to visit the maternity wards at KNH, and for KNH clinicians to meet with university engineers, review designs and give feedback
- Dedicated programme management by Concern that helped establish the hub, coordinate monthly partner meetings, and liaise with government entities.

Challenges

A big challenge for the project was the lack of national policies related to procurement, safety, and standardization of locally designed medical devices. Because the work was so innovative, it was necessary to help build the enabling environment while executing the project. The project also experienced major difficulties and delays procuring the equipment needed to fabricate the medical devices, including poor quality of local parts and difficulty in sourcing them. This was ironic in view of the fact that the project's purpose was to overcome challenges with medical devices. Another challenge was the turnover of UoN engineering students (who graduate and move on) and the constraints on their time due to their other university commitments.

Conclusions

Maker has successfully catalysed a unique partnership between engineers and clinicians and built several medical prototypes for women and newborns. This hub is creatively strengthening Kenya's health system and building local expertise, while fully aligning with the government's national development priorities of finding local solutions for local problems.

The approach of bringing together national institutions and building local self-reliance for health equipment has strong potential for many types of maternal, newborn and child health devices, including those used at the primary level in rural health facilities where Concern works.

New management and evaluation approaches to improve project learning: case examples from *Innovations*

By Katie Waller and Pam Bolton

The Context: A strong focus on evaluation and learning

From the beginning of Innovations for Maternal, Newborn & Child Health (*Innovations*), evaluation and learning were cornerstones of our approach. Charged with testing "innovative approaches" or "creative solutions" to improving maternal, newborn and child survival, the *Innovations* team knew it needed to be open to new and flexible approaches for programme development, design and evaluation.

In *Innovations'* early days, much of the initiative's focus was on idea generation. *Innovations* experimented with crowdsourcing ideas, embracing the principle that innovations can come from anywhere and that there are many people out there who rarely get to contribute their potentially ground-breaking ideas. Across Malawi, Sierra Leone, and Odisha state in India, Concern developed and ran a robust campaign to solicit new ideas to address barriers in maternal and child health. Through a multi-stage process involving mentorship and diverse judging teams, we winnowed these down to the four ideas that became our first four pilots.

After internal reflection and assessment, we ultimately concluded that our crowdsourcing approach had not unearthed the fully formed, ground-breaking ideas we had hoped for. Further, our approach of moving ideas —as they had been presented — directly into programme implementation, with classic baseline and endline evaluations, did not allow for enough exploration and refinement.

At the same time, the *Innovations* team grappled with the question, *what is different about evaluating innovations*?

Innovations' Second Phase: New approaches to designing, managing and evaluating

We determined that for our second phase of pilots, we would invest more time in **refining, grouping, building out, and contextualizing** the crowdsourced ideas before moving them into the implementation phase. We rethought our approach, reacting to a growing interest among designers, global health practitioners and funders to transfer design thinking methods and tools to help solve urgent problems and meet social needs. We put the principles of design thinking at the centre of each of our second batch of pilots. That meant we would be *human-centred*, intensively focused on user needs, committed to continually iterate and experiment, and willing to adjust our programmes at any time during their implementation.

Embracing new approaches to management and evaluation

Embracing design thinking led us to implement a form of **adaptive management** (Figure 1). Adaptive management is a type of programme management that focuses on learning and adapting as you go. It recognizes that programme contexts are complex and fluid, and that a programme may need adjustment along the way in order to get the best progress towards the desired outcomes.

Given this approach to managing the programme, the team also needed an approach to **monitoring and evaluation** that would be flexible—to accommodate the adaptive management—and yet still be rigorous.

Working with our evaluation partner JSI Research and Training Institute, Inc. (JSI), we adopted the technique of **developmental evaluation.**

Components of Adaptive Management

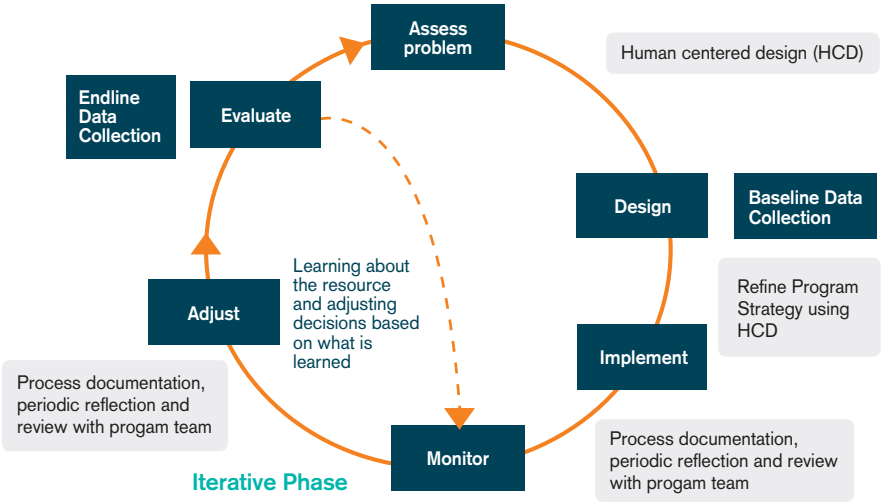

Figure 1: Components of Adaptive Management

> **Developmental evaluation** is an approach to understanding the activities of a programme operating in dynamic, novel environments with complex interactions. It focuses on innovation and strategic learning rather than standard outcomes and is as much a way of thinking about programmes-in-context as the feedback they produce.[1]

Developmental evaluation was well-suited to the adaptive management of the programmes because it allowed us to reach conclusions about the effectiveness of our interventions even though the interventions did not remain totally static over time. But how did it work?

In developmental evaluation, the research team takes a highly collaborative role within the programme's design and implementation. In the case of *Innovations,* a JSI colleague was assigned to each programme team. In that embedded role they helped us to develop the theory of change for the programme, frame the evaluation questions and decide how best to gather data. They not only made it possible to evaluate our evolving interventions, but actively guided our processes of programme adaptation and iteration by feeding data into continuous discussions and facilitating our decisions in real-time.

JSI also contributed heavily to the design of our evaluations, all of which involved a mixed methods approach that combined quantitative and qualitative methods. The evaluations comprised:

1. Routine monitoring
2. Baseline and endline studies to measure the effectiveness of the programme model. Some pilots also had matched comparison (control) zones against which the intervention zones were compared
3. Process documentation consisting of in-depth qualitative interviews with stakeholders conducted during implementation and assessing the pathways (proposed and actual) between programme intervention and program effects, as predicted by the pilot's theory of change
4. Additional primary data collection, including interviews with programme staff, to document and explore the application and influence of design thinking on the project.

Process Documentation: The role of qualitative data

Within each pilot, process documentation took the form of two rounds of qualitative data collection with key stakeholders, mainly through interviews. JSI coded this data and analysed it thematically. This real-time, quick form of data collection and interpretation allowed us to reflect on:

- Are the implementation strategies effective?
- Are the assumptions guiding our theory of change pathways valid? Are we seeing expected results emerge based on the pathways in the theory of change?
- What contextual factors, expected or unexpected, are influencing implementation?
- What are the barriers and enablers that are affecting implementation?

From a programme management perspective, the deep collaboration between programme and evaluation staff was very valuable. Furthermore, the collection of process documentation at key intervals was critical to informing our decisions. We were able to iterate and adapt the programmes (adaptive management) only because we had access to such good and timely information.

Maternal Newborn Health Promoters (MNHPs), nurses, community members and ENCC staff gather in Bo district to discuss results of process documentation. Photo credit: Ashley Ambrose

In the Essential Newborn Care Corps (ENCC) project, our process documentation data showed us that the former traditional birth attendants (TBAs) were embracing their new roles as health promoters, referring pregnant women to health facilities and balancing their health promotion responsibilities with their new business role.

Process documentation also helped us identify challenges in community support that we had not foreseen, including poor support from some men, cases of women refusing to visit PHUs without referral slips from health promoters, misconceptions arising around health promoters being paid for their work, or about how the communities were providing incentives to them, and the creation of by-laws in some communities that could be unnecessarily punitive for already-poor households.

Identifying these challenges earlier on in implementation allowed the team to take corrective action by creating and incorporating solutions. In ENCC, solution identification did not involve only programme staff. The data from process documentation was presented back to communities. Solutions were generated with and by the health promoters, nurses and community members (See picture). Examples of programme additions that had not been part of the initial programme design were:

- A more intentional strategy for engaging men and encouraging their support
- Revisions to the referral system by which health promoters directed women to a health facility
- Extensive engagement with chiefs and community leaders in collaboration with district health officials regarding the role of health promoters in their community.

Lessons

Strong collaboration between programme evaluators and programme managers can improve programme quality, particularly when trying new programme approaches. In the *Innovations* experience, embedding the evaluation team with the programme team was a good strategy because it shifted the focus from evaluators simply telling programme staff "whether the programme worked or not" to a more exploratory approach of learning "how the programme was working." This approach may be useful when working in complex environments that are constantly changing, as was the case with the Ebola outbreak which the ENCC project faced.

There are trade-offs between adaptive approaches to programming and evaluation methods. It is important for teams to be up-front with stakeholders, including government and donors, that the programme and evaluation methodology may evolve throughout the programme cycle as the programme adapts. Adaptive approaches may not be compatible with the need for traditional evaluation that requires a before-intervention-after scenario with a constant intervention and set outcomes. However, adaptive management approaches are increasingly being seen as pivotal to development and humanitarian projects.[2]

Conclusion

Concern has been using operations research and results-based management, to name just two of several approaches that embrace the idea of collecting feedback to improve programming. As Concern increasingly works in fragile environments and crises, our programmes will need to be more adaptive. It will be ever more important for programme teams to use management approaches that deliver quality programming and solid results in challenging environments—and evaluations that can adapt as well. Continuing to expand the use of frequent feedback loops and flexible methods for programme learning should be a key priority for Concern.

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1. What is developmental evaluation? https://censemaking.com/2011/11/19/what-is-developmental-evaluation/
2. See Duncan Green's Blog on 'Thinking and Working Politically'. https://oxfamblogs.org/fp2p/tag/adaptive-management/

Conclusion: Lessons for Concern's maternal, newborn and child health programmes

By Pam Bolton

> Innovation is the journey a new idea takes as it travels from conception to a realizable proposition.
> - From Ideas to Innovations: Incubation Process Overview. Innovations Progress Report, Appendix H

In awarding ***Innovations for Maternal, Newborn & Child Health*** to Concern Worldwide, the Bill & Melinda Gates foundation set out a challenge: In high mortality, low-resource settings, can we **crowd-source** ground-breaking Innovations to improve maternal, newborn and child health? Can we pull ideas from unconventional sources, marginalized voices—people who have never been consulted, but who live with these challenges day in and day out—and transform them into path-breaking solutions?

Concern's original proposal summarized our plan:

> "This project will take a very new approach in seeking to solve these implementation challenges. Its basic premise is that there are many good ideas among people who have had experience of maternal, newborn and child health but that many of these ideas have never been heard or listened to.... The project will attempt in a new way to reach these people, listen to their ideas and to invest in the best of these ideas…. translating [them] into genuine innovations.[1]

Embarking on *Innovations,* Concern set out five core principles. First, as noted above, we committed to source and refine ideas in novel ways. Second, we would take risks; in fact the untried crowd-sourcing methodology itself posed considerable risk. Third, we would evaluate rigorously and document our findings robustly. Fourth, both Concern and the foundation understood and accepted that not every innovation would succeed. In fact, the original proposal estimated that, of 27 innovations tested, only two would succeed.[2] Fifth, we would strive to ensure that the winners would be sustained and scaled.

Concern also committed from the outset to study the processes we would be experimenting with:

> While the core objective is to contribute to solving MNCH implementation challenges, the project will also **seek to learn about innovation processes** such as how to source ideas from marginalized groups and **how to develop, test and learn from innovations**.[3]

Concern achieved the grant's four objectives: we comprehensively identified key implementation challenges in MNCH, sourced hundreds of ideas, and implemented and rigorously tested nine ideas.

Did these Innovations translate into effective interventions that improve outcomes for women and children? While it is challenging to distill the rich and detailed evaluations, we can draw some thematic conclusions relevant to Concern's ongoing maternal, newborn and child health programming.

1. Provider morale, motivation and resilience can be strengthened, with positive outcomes

Helping Health Workers Cope, Essential Newborn Care Corps and Care Community Hub (CHN on the Go) were effective in supporting frontline health workers as they faced the daily challenges of delivering care to communities under difficult circumstances. With **Essential Newborn Care Corps**, the Maternal Newborn Health Promoters (MNHPs) were universally happy (99.5 percent) in their new roles and felt motivated and affirmed by the enhanced respect the community accorded them. Among community health nurses using **CHN on the Go**, 94 percent said the app met their needs, making their work life "easier" or "much easier." The app gave the nurses greater confidence in their skills, greater respect from clients and more recognition and encouragement from their supervisors.[4]

2. Improving community-provider relationships increases health-seeking behaviours

Chipatala Cha Pa Foni, Essential Newborn Care Corps and Community Benefits Health all showed significant positive effects on health-seeking behaviours in the intervention communities. These programmes enhanced the strength of interpersonal relationships between community members and frontline providers. Women who spoke with the **Chipatala Cha Pa Foni** hotline nurses were significantly more likely to have improved knowledge, uptake and use of key health behaviours such as antenatal care use in the first trimester and use of bed nets during pregnancy and for children under 5. Users of the service said they valued the interactions with hotline workers and felt they received better service at health centres they visited after having contacted the hotline.

With **Essential Newborn Care Corps**, women in the communities served by MNHPs were significantly more likely to deliver in a health facility and seek postnatal care.[5] Interestingly, the endline survey showed that mothers still had gaps in their MNCH knowledge, which suggests that they trusted the MNHPs and followed their advice even without having full understanding of the reasons for seeking care. The qualitative evaluation underscored the importance of the trusting relationships developed between MNHPs and the women they served and between the MNHPs and health facility staff.

Community Benefits Health, which layered non-monetary, community-wide incentives (such as a borehole) on top of social and behaviour change programming, had a strong positive effect on women's immediate breastfeeding after delivery and a significant effect on increasing health centre births. Our qualitative investigation revealed a substantial increase in male support for pregnancy-related issues, with increasing numbers of men accompanying their wives for antenatal visits and family planning services at the community health centre.[6]

3. Human-centred design can improve uptake and ownership of programme interventions

Authentic, empathic engagement is powerful: This is the lesson that our use of human-centred design taught us. Human-centred design facilitated well-fitting interventions and accelerated the uptake of new ideas. We saw this power most clearly with the **CHN on the Go** mobile phone application for frontline nurses. Having participated so thoroughly in its creation, the nurses quickly embraced the app. More surprising was how fiercely committed the app's designers and software coders became: having shared in the intensive design phase with the nurses, they were determined to keep improving the nurses' app with successive iterations beyond what had been originally planned. The power of human-centred design was also evidenced in **Essential Newborn Care Corps** by the enthusiastic acceptance of new Promoter roles by former TBAs and their communities.

Recommendations

Colleagues who are interested in the full details of our programmes and rigorous evaluations are encouraged to read the final evaluation reports prepared by *Innovations'* global research partner, JSI. They are presented in PowerPoint format and available on Knowledge Exchange.

Those interested in the human-centred design approaches used in the *Innovations* pilots can contact Katie Waller of the Concern Worldwide Centre for Innovation and Health at Katie.waller@concern.net.

References

1. *Innovative Implementation Solutions for Maternal, Newborn and Child Health.* Final proposal submitted by Concern Worldwide U.S. to the Bill & Melinda Gates Foundation, 13 August 2008.
2. Admittedly, the criteria for success were high: a 50 percent increase in district-level coverage, with the largest increases occurring among the poorest third of the districts' populations; this was later modified by the Gates Foundation to 25 percent and then removed).
3. *Innovations* proposal, p.8.
4. Detailed results from Care Community Hub (CHN On the Go) can be found in the evaluation brief and the complete evaluation slide deck linked on Knowledge Exchange.
5. The Essential Newborn Care Corps evaluation brief and complete evaluation slide deck can be found here**.** The cost-effectiveness analysis is on Knowledge Exchange.
6. The Community Benefits Health evaluation brief, complete evaluation slide deck cost-effectiveness analysis are all located on Knowledge Exchange.

Embracing a culture of exploration: Introducing the Concern Worldwide Centre for Innovation and Health

By Centre for Innovation staff

Like every institution today, Concern Worldwide confronts the need to find new and better ways to solve old and thorny problems. The management guru Peter Drucker coined a now-ubiquitous expression, catchy yet menacing, that warns: "Innovate or die." Though we were early to the application of design thinking in solving development and public health problems, we now see our peer organizations overtaking us in their quest for innovation and their willingness to embrace new approaches. It is time for Concern to explore more fully what we mean by "innovation" and how we can harness innovative thinking — throughout our organization.

The Centre for Innovation & Health

In 2017, Concern U.S. dedicated start-up funds to launch an internal innovation function, the ***Concern Worldwide Centre for Innovation & Health***. The Centre's mission is to support and galvanize Concern's long-standing tradition of practical innovation by leading alongside our field teams as they explore new or improved programmes, processes, and products. The initial focus area is health and nutrition.

The Centre takes an active approach, identifying challenges and seeking out ideas that can improve practice. As the illustration below shows, the Centre works in three primary ways:

- With country teams, identify challenges and explore new ideas and potential solutions
- Introduce Concern staff to new problem-solving approaches, such as human-centred design
- Collaborate strategically, tapping external expertise and advice to support innovation.

Through our experience with *Innovations*, we are convinced that human-centred design is a powerful approach and provides a unique toolset for global health problem-solving and programme development. What is more, it dovetails smoothly with Concern's signature focus on community-based programming approaches.

The Centre will build on this base to foster a culture of innovation throughout our global organization. It will support Concern staff at all levels to learn and build confidence in the use of design methodologies — unlocking imagination, creative thinking, and problem solving abilities that will enrich our work on the ground and the colleagues who lead it.

ACTIVELY IDEATE	INTEGRATE HUMAN-CENTRED DESIGN	COLLABORATE STRATEGICALLY
		
Source ideas and develop innovative programmes with country teams.	Foster a culture of innovation by introducing staff to and training them on new problem solving approaches.	Tap external expertise & advice through an External Advisory Group of innovation-minded individuals.

We are just getting started. This year, we are focused on exploring challenges in our maternal, newborn, and child health programmes, specifically in Malawi and Burundi. Our next step is to identify distinct challenges to explore within each of these countries. We will work hand in hand with country teams, Concern headquarters staff, and our newly formed External Advisory Group to ideate and develop solutions to roll out in the countries. And we will contribute to finding the funds to support these programmes.

The Centre for Innovation and Health aspires to be a resource for all of Concern. Those with questions or requests are invited to contact Katie Waller at katie.waller@concern.net.

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For whom is the publication

All staff involved in designing, implementing, managing, monitoring, evaluating and communicating Concern's work. This publication should also be shared with partners.

What this publication includes

- Promising practice
- Organisational learning
- Promotion of multi-sectoral and integrated approaches to programming
- Links to full reports

What it doesn't include

- Targeted recommendations
- Additional evidence not included in the papers cited
- Detailed descriptions of interventions or their implementation

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