Nepal Health Sector Support Programme III (NHSSP – III)

Facilitate, Design and Test an Innovation to Improve Access to RMNCAH, FP and Nutrition

May 2017

Disclaimer

This material has been funded by UK aid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies.

Table of Contents

1. Background and Rationale

The Sustainable Development Goals (SDG) and targets are firmly focused on the concept of "Leaving No-One Behind" (LNOB) and the Nepal health sector has a good track record in addressing exclusion related goals. For example, since the 1990s, national health strategies have focused on trying to address the social determinants of health and improving equal access to services. The current national Nepal Health Sector Strategy (NHSS) (2015-2020) has equitable access as one of the four principles with accompanied disaggregated targets.

Despite the policy commitment to addressing inequality, much more still needs to be done, with the most recent data illustrating that differentials in knowledge, access and use still exist. For example, urban women are more likely to have four or more ANC visits than those living in rural areas (76% and 62% respectively), poor women and those with no education are even less likely to have four or more ANC visits (49% and 57% respectively). Nationally 42% of women took the full course of iron tablets during their last pregnancy which falls to 28% for women living in State 2 (the Terai districts of the former Eastern and Central Development regions)[i].

The new Nepal Health Sector Support Programme (NHSSP) embeds the LNOB agenda across the entire programme and has an operational framework which prioritises this agenda and focuses on identity, geography and health: (i) Identity: who is left behind due to multiple factors, such as gender, caste/ethnicity, poverty, age and occupation; (ii) Geography: where the left behind live, such as remote mountain areas, Terai, Far West, urban areas and disaster affected districts; and (iii) Neglected health conditions: which place a high burden on society and the individual, such as mental illness, gender based violence (GBV) and disability.

Based on this operational framework and the NHSS strategy, the NHSSP has committed to designing and implementing a number of innovations in service delivery designed to improve access to reproductive, maternal, child, adolescent health, family planning and nutrition. The potential innovations include:

(i) Using Mobile Health (m-health) to increase Female Community Health Volunteers (FCHV) knowledge and communication;
(ii) Helping mothers to identify low birth weight newborns and improve their knowledge and health seeking behaviour;
(iii) Working with newly married adolescent girls to increase their knowledge and practice on health and healthy behaviour;
(iv) Training mid-level health cadres to provide basic physiotherapy services with good outcomes;
(v) Providing a performance based incentive to skilled birth attendants in remote rural areas to encourage retention and higher productivity.

For this payment deliverable, the process for the development of the design of one of the innovations is described. The innovation, item (i) above, is to improve the accuracy of FCHV's knowledge, and therefore, the quality of the interaction they have with mothers from vulnerable and excluded groups which should lead to an increase in accurate health knowledge, demand for services and more appropriate and timely referral to health facilities.

2 Using mobile health to increase the accuracy of the information that Female Community Health Volunteer's provide and the quality of the interaction with mothers' from excluded and vulnerable groups.

2.1 What do we know about FCHVs' knowledge and communication?

Established in 1988, the FCHVs are the key link between the community and the health facility and/or community health units. There are now approximately 52,000 FCHVs across the country and are on average 41 years old, more than 80% are literate and 83% have mobile phones[ii]. They focus on promoting maternal and child health services and collect local data that feeds into the national health management information system. They are expected to visit the community and organise mothers' group meetings all of which amounts to approximately 7 hours of work per week. FCHVs are still an important source of modern contraceptives for the community distributing nearly 18% of pills provided through Government outlets and 13.4% of condoms[iii].

FCHVs report a high level of satisfaction with their role, despite the lack of remuneration. In some more remote parts of the country they are the only point of contact to discuss maternal and child health issues, birth preparedness, nutrition and sanitation. However, they are not always well equipped with only 59% of FCHVs observed as having the basic flip chart critical to perform their health promotion role[iv]. Good attempts are made by the Government to ensure that FCHVs knowledge is updated but their knowledge is rarely tested; the 2014 National FCHV survey indicated that the majority of FCHVs were able to recall (unprompted) danger signs in newborns but only one in five (19 percent) mentioned small size at birth as a danger sign[v]. It is not clear how good FCHV's are at providing explanations for health related information, for example, why it is important to eat green leafy vegetables. Furthermore, it is not clear to what extent FCHVs are working closely with those women who most need their services — the excluded and vulnerable.

2.2 What is the international evidence for community volunteers using mobile health technologies?

There is a growing body of research indicating the potential for using m-health interventions to improve maternal, newborn and child health in low income countries. M-health has been used for improving clinical diagnosis; for providing health information such as nutrition advice; for reminders for clinic attendance; as a communication platform to get better support from clinical providers; as a data collection platform to enable better registration or reporting of health indicators; and as part of peer support mechanisms.

Systematic reviews and reviews of the grey literature[vi] indicate that there is modest evidence in developed countries that m-health can improve clinical diagnosis and adherence to treatment protocols. SMS reminders have demonstrated modest benefits on clinic attendance[vii]. Information delivered via SMS messaging to mothers and care takers can improve infant feeding instead of routine pre-natal care[viii].

There are two systematic reviews which examine the feasibility of frontline or Community Health Workers (CHW) in developing countries using mobile phones[ix x]. These studies are largely qualitative but none-the-less provide useful insights. For example, frontline health workers were able to use mobile phones with adequate training, health workers themselves considered m-health tools as a useful means to improve the way services were delivered and they felt empowered by having access to such tools. A number of studies suggest that health workers can effectively use mobile phones for data collection with improve data completeness and reduced error rates compared to paper based systems. M-health tools can also assist in improving communication between different levels of the health care system and in emergency referrals[xi].

In general, most mobile health research projects operate for a short period of time, ranging from 6-12 months and very few operate at scale. There is a need for more accurate documentation of the implementation, challenges and effectiveness and for this to be in the public-domain. Projects are typically: "under–theorised, poorly specified and vaguely described"[xii]. Key gaps in knowledge include: cost effectiveness; scaling distance learning or self-learning tools as face to face training is challenging and expensive; scaling job aids to support health workers in their health education work; scaling software that enables frontline health workers to access electronic medical records and supply chain management[xiii].

2.3 What is the Nepal experience for community volunteers using mobile health technologies?

No published evidence could be found which measured the effectiveness of community volunteers using mobile health technologies in Nepal. There are a number of organisations, however, who are experimenting with mobile technology, which can very broadly be classified into two types: (i) mobile technologies to be accessed and used by target populations and (ii) mobile technologies that are used by health workers. An illustrative list of some of the main activities is provided in Annex 1. There are a number of organisations who are working with Medic Mobile[xiv] and its free open source software to mainly assist health workers in tracking pregnancies and newborns. There does not appear to be any examples in Nepal of FCHVs using mobile phones as job aids. There is very little information on the cost-effectiveness of m-health interventions and this will be important to measure.

2.4 What are the key lessons from the international and national literature to take forward in this intervention?

Both international and national literature indicates that CHW, with appropriate training, are able to use mobile phones to collect data and they feel empowered by using them. There is no information available on FCHV's health knowledge, whether it is up-to-date and what areas they find hard to understand or explain. It will be important for the intervention to firstly understand and then focus on the areas of the FCHV training which FCHVs themselves find hard to understand or explain, and are important locally. For example, iron and folate compliance during pregnancy is still very low and levels of anaemia are high. How do FCHVs present this information to women? How do they explain why it is important? Equally important is that most m-health interventions, as noted above, are not well theorised or described so the intervention will need to be clear on what it wants to achieve, the assumptions underpinning the delivery and is able to adequately measure this.

2.5 What is BBC Media Action's experience in mobile health?

BBC Media Action has extensive experience in delivering m-health tools that support health communications, more recently from working in India, Bangladesh and Sierra Leone. In India, in collaboration with the Indian Government and the Bill and Melinda Gates Foundation, BBC Media Action has developed a range of mobile health services including:

- Mobile Academy. This is a series of training courses for CHW that are accessed by a mobile phone. The content has been designed to be engaging and to meet CHW knowledge and skills gaps. The services were designed for CHW in Bihar, India, where 88% of CHW are living in rural areas, 70% are illiterate and only 9% had ever used a mobile phone. The training course and the mobile phone number is free. At the end of each training module the m-health tool tests CHW knowledge before they are able to move onto the next module and testing also takes place before they are able to graduate. On completion of the entire course CHW get official certification from the Ministry of Health. To date,

255,366 CHW across seven states have already started the Mobile Academy, and more than 144,880 CHW have already graduated.

- Mobile Kunji. This is a job aid for CHW which aims to improve the communication accuracy and quality between the CHW and the families she works with. The job aid comprises a deck of hand held cards that contain messages on maternal and child health related practices and behaviour and at the end of each card is a toll-free number that the CHW could call to listen to a pre-recorded message from a doctor reinforcing what the CHW has said and providing more information. Data from BBC Media Action, indicated that the job aid led to increased levels of engagement between the CHWs and those counselled, increased levels of trust in the CHWs and the belief they were credible source of information. Alongside increased uptake in simple actions such as birth planning and exclusive breastfeeding.[xv]
- Kilkari. This is a free series of audio-messages about pregnancy, childbirth and child care. During the second trimester of pregnancy, mothers and their husbands are encouraged to subscribe to Kilkari to receive weekly phone calls of pre-recorded audio messages until the child is one year old. Kilkari is now reaching 1.59 million subscribers every week across nine states, and has reached 3.5 million subscribers in the last 12 months. The Kilkari service ensures beneficiaries are exposed to health messages at the appropriate time within their pregnancy or the critical post-natal period. The Kilkari phone service is supplemented with Kilkari behavioural change strategies at the village level. Kilkari is also designed to increase dialogue within the family on maternal and child health issues. The extent to which individuals discuss behaviour with others is often closely correlated to the adoption of that behaviour.[xvi] [xvii]

3. Objective

FCHVs continue to play an important role in communities as health promoters and facilitators. In support of this role the objective of the intervention is to improve the accuracy of the information that FCHVs provide and the quality of the interaction they have with mothers from excluded and vulnerable groups, which in turn, should lead to an increase in the accuracy of mothers' health knowledge, the demand for health services and the more appropriate and timely referral to health facilities

4. Outline of Activities

4.1 Initial research and scoping phase

An intensive period of in-depth research will take place over approximately 3-months and will include, but not be limited to research to:

- Understand gaps in FCHVs knowledge, service quality and reach, particularly understanding issues around underserved vulnerable groups;
- Understand how FCHVs work on a daily basis, their incentives, how they use the materials available to them to give information to communities;
- Understand FCHVs media and mobile access, ownership and usage patterns;
- Understand the factors that influence community and household level decision making, how and why communities use FCHVs in their health-related decision making;
- Assess the Ministry of Health (MoH) and its partners, capacity enhancement needs for Behaviour Change Communication (BCC) and m-health solutions;

- Understand how a m-health tool could best integrate with the existing MoH infrastructure and other FCHV interventions;
- With mobile network operators, understand the telecoms infrastructure of Nepal including service provision, mobile access and usage;
- Map the mobile network system architecture, costs, connectivity, software and user solutions, including new mobile call storage facilities at National Health Education Information and Communication Centre (NHEICC);
- Review m-health interventions worldwide to build a bank of evidence and examples to inform the design.

4.2 m-health Tool Prototype user testing

Once the findings of the initial research and scoping phase have been discussed and disseminated to the MoH and other key stakeholders, the process for designing the actual m-health tool will commence. Successful mobile service design requires multiple iterations of user-testing and accordingly, a small number of prototype m-health tools and BCC content will be pre-tested with approximately 150 FCHVs in communities and adjusted and re-tested with FCHVs, to ensure that the tool is effective, culturally suitable, sustainable and viable within the context. The BCC content will be based on agreed technical health priority messages for FCHVs. The prototype testing and iterations will, for example, focus on answering questions such as: 'how can we design a technology solution which works with inconsistent network coverage?' 'do the FCHVs understand the health messages and can explain them as intended' 'are the technical health messages more likely to influence behaviour change?' 'can we design to tool to further motivate FCHVs in their work and increase their social standing in communities?'

The multiple iterations of user testing is critical as the content is key in health communications. Communications are only successful in changing behaviour when the communication content, is not only technical accurately in terms of health information, but resonates with the audience, and if this is the case, mothers and the communities in which they live will be much more convinced by the message and will support FCHV to become more effective communicators. For example, during the Ebola outbreak, BBC Media Action developed a radio program with a character called "Mr. Plan-Plan" which was produced in three local languages, and quickly became a byword for preparedness within communities. In Bihar, fictional characters called Dr Anita and her assistant Nishant Kumar were created whose voices were used as pre-recorded messages to reinforce and validate the health information that CHW deliver.

4.3 Final prototype testing and evaluation

Once the prototypes have been tested and a final m-health tool has been designed it will be then be evaluated with a number of FCHVs covering 3 districts. Districts will be selected based on: (i) poorer socio-economic and health status; (ii) councils with large number of marginalised and vulnerable groups; (iii) fewer donor interventions *and* (iv) representing the geography of Nepal. A short-list of 7 districts that has been discussed with MoH colleagues can be found in Annex 3.

Baseline and end-line qualitative and quantitative data will be collected to be able to assess whether the m-health tool is operationally and cost effective. A draft study protocol to evaluate the intervention can be found in Annex 2. This draft is only indicative at this stage and is likely to change following the formative research and the user-testing of the m-health prototypes. The study protocol will be the basis for which NHRC approval will be sought.

4.4 Preparation for scale-up

If the evaluation of the m-health tool indicates that the tool is both operationally effective and cost effective and the MoH is keen to expand the intervention then a plan for scaling up will be developed. This will include working with MoH stakeholders to bring together all the findings from the intervention into a plan for a roll out which is cost-effective, realistic, sustainable and institutionalised with MoH management and delivery systems.

At the end of the project the proposed outputs include:

- A fully user-tested m-health tool and BCC content for FCHVs;
- Dissemination products, such as summaries of the m-health tool and the results of the intervention and possibly research papers published both locally and internationally;
- A costed plan designed in collaboration with the MoH for the government's initial roll out of the m-health tool;
- Proposed indicators which can be easily collected by the MoH and by which the m-health tool can be monitored over the roll-out years.

5. Indicative Timeframe

The timeframe of the intervention is indicative and is as follows:

- Initial research and scoping phase (3 months)
- Prototype user testing (6 months)
- Final prototype testing and evaluation (9-12 months)
- Data analysis and report writing (2 months)
- Preparation for scale-up (1 month)

The outcome of the evaluation of the m-health tool will be ready to be presented as a report in November 2019, as per the payment deliverable: "an innovation for RMNCAH and nutrition implemented, evaluated and evidence presented by MoH at the Joint Annual Review (November 2019)."

6. Risks and assumptions

The design is based on a number of assumptions which include:

- The intervention will focus on testing whether a mobile health job aid will improve the accuracy of FCHVs health knowledge and their skills in sharing this knowledge with mothers from vulnerable and excluded groups and their communities. If the mobile health job aid does not demonstrate sufficient change in the accuracy of knowledge and/or it proves to be successful but too expensive, then the mobile health tool will not be taken to scale.
- Given the short time frame during which the mobile health tool will be tested it is not expected that the testing phase will capture change in mothers' health seeking behaviour or behaviour change but it will measure changes in knowledge. However, indicators to measure behaviour change will be collected at the baseline and if the intervention is scaled up then these indicators can be measured in the same cohort over time and integrated into the scale-up plan.

- FCHVs already have access to mobile phones and are willing and able to use them for their work. To date we understand that the capacity of FCHVs to use mobiles is highly variable. We will need to understand these differences and design a solution appropriately.
- The mobile network in Nepal reaches sufficient FCHVs to make a national roll-out, or significant roll out of a m-health tool viable. Coverage in remote areas is known to be variable. It is possible that in some districts a mobile technology solution is not yet the most viable tool.
- The Government of Nepal has the budget to scale up the m-health tool if it proves successful. Estimation of costs and the measurement of real costs will be considered and discussed with Government at all stages of the design and testing.
- The Government of Nepal will have the technical skills to manage the scale-up and sustained implementation of a m-health tool (or contracts a skilled third party to manage the roll-out and implementation). BBC Media Action proposes to make an assessment of the capacity enhancement needs and to work flexibly through training, meetings and workshops to up-skill the MoH and relevant government stakeholders to be able to manage the scale-up.

The project design may be affected by the following key risks, with possible mitigation actions in italics and brackets:

- The project implementation is not interrupted by significant political or environmental instability (*the political and environmental situation will be regularly monitored and activities adjusted accordingly*).
- The FCHV program remains popular and new activities for FCHVs are uncontentious (*the MoH is a collaborative partner throughout the design and implementation of this intervention*)

7. Sustainability

The intervention will only be sustainable if the evaluation demonstrates that it works and the cost for scaling-up is not prohibitive and that the MoH has the capacity to manage and/or deliver the m-health tool.

8. Synergies with other DFID suppliers

The Monitoring, Evaluation and Operational Research (MEOR) supplier will be asked to peer review the research protocol for this intervention and provide feedback. The Social Accountability in the Health Sector (SAHS) supplier will be fully informed of the activities and will be considered as a stakeholder in terms of the supplier's potential interest in improving health volunteers accountability to their clients.

9. Audience and Dissemination Plan

The primary audience of the m health tool are FCHV who are managed by Family Health Division (FHD) of the Department of Health Services and NHEICC who are responsible for information and communications at the Department of Health Services. Both FHD and NHEICC will be actively involved in designing the m health tool and with support from both BBC Media Action and NHSSP dissemination key findings at the end of the evaluation phase. Dissemination products will include easy to read evaluation summaries, full reports and if possible academic papers. Evaluation results will be shared with FCHVs, local and national

Government partners, donor partners, non governmental organisations, academic and media/communications organisations.

Annex 1: Selected Experience of Community Volunteers using Mobile Health Technologies in Nepal

(i) mobile technologies to be accessed and used by target populations

- *Ministry of Health/National Health Education and Information Communication Centre in collaboration with GIZ, UNFPA and USAID* in 2014 launched mobile application for adolescent sexual and reproductive health. The application has an online encyclopaedia where adolescents can find information; stories of role models, tailored for age and gender, where the recipient can choose the path of the story and see different outcomes; quizzes, to drive engagement and interaction and a telephone hotline, where adolescents can talk directly to health care workers. It used SMS to send and receive information and given the increasing use the cost became prohibitive. The same partners are developing and launching a new application with no SMS and off-line. Including a menstruation tracker, information on available services and ability to speak with an expert.

- *Marie Stopes International Nepal* is using mobile health technology to provide women with information on medical abortion. SMS are sent to women who register providing information on the dosage and timing of medical abortion, expected side effects, possible complications and referral points.

- *USAID's* Suaahara I project set up a radio program called Bhanchhin Aama and each weekly episode is linked to a toll free number that mothers could call to listen to pre-recorded messages providing further information (in 3 different languages) or to leave a question by voice or SMS. Top 5 questions would then be read out the following week and linked to others women's experience of addressing this issue. They receive on average 3,500 SMS messages per week. This activity will continue in Suaahara II.

(ii) Mobile technologies used by health workers

- *WHO* and Medic Mobile and WHO have been working together to transfer the paper-based nation-wide surveillance of vaccine preventable diseases to a mobile application. The surveillance system covers all 75 districts with 735 reporting units and 15 surveillance medical officers providing weekly reports on the number of immunisation preventable diseases and outbreaks of measles or acute flaccid paralysis. Moving from a paper based system to one using mobile technology will mean that real-time information can be collected and outbreaks notified immediately. The first training took place in June 2016 in Rasuwa district and is expected to be scaled up nationwide.

- *POSSIBLE* and Medic Mobile in Achham district developed a mobile application for POSSIBLE's community health worker leaders. These are women employed by POSSIBLE in the community who supervise and support the FCHVs. The community health worker leaders were given mobile phones to collect data on treatments for illness and mortality that was sent to the hospital server to be aggregated and used to help make population level health decisions at the hospital and to inform community interventions[xviii].

- *IPAS* in 2016 used Medic Mobile to train abortion providers to report on reproductive health services using mobile SMS reporting tools. IPAS will then be able to monitor the service provided by IPAS-trained providers more quickly, provide direct and more appropriate support and to address any gaps in provision.

- *Karuna Foundation* worked with and Medic Mobile in 2016 to train FCHVs and ANMs working in health posts of 27 VDCs in Ilam to use mobile phones to track pregnant women to ensure timely ANC visits, safe deliveries and ultimately to reduce the number of birth defects and disabilities among children. The medic mobile system will also identify any women who have missed a visit and remind the FCHV/ANM to follow-up.

- *One Heart World-Wide* worked with Medic Mobile in 2016 to train 950 FCHVs in Baglung to use an SMS-based system to provide counselling and follow up to women during pregnancy on ANC visits and safe delivery. As in Ilam the system will also identify any woman who has missed an ANC visit. One Heart World-Wide will expand this work to Dhading and Ilam.

- *Tilganga Institute of Ophthalmology*, Fred Hollows Foundation and Medic Mobile worked with FCHVs across 24 VDCs in Rolpa to conduct simple eye tests and refer possible clients to community eye centres using SMS messages. Each potential patient has a unique ID and a referral slip which they present at the community centre. Health workers at the community eyes centres can also track patients and follow-up.

- *Medic Mobile* implemented an m-health pilot in Kailali, Nepal in 2014 using SMS messages to assist FCHVs and ANMs at health posts/primary health care centres to track the screening and treatment of women with cervical cancer and follow-up[xix].

- *H4L* is using a mobile tracking system to remind pregnant women to visit a health facility for ANC check-ups, delivery and FP counselling. This is not carried out by Government health workers but by community mobilisers who are employed by H4L with the cost shared by the project and the health facility management committees. From mid-2015 to November 2016, 75% of all pregnant women in 39 targeted H4L sites have been registered, 78% of all registered pregnant women, including Dalits, delivered at health facilities, 65% of all pregnant women, and 60% of pregnant Dalit women, attended all four recommended check-ups before their delivery.

- *GIZ* is piloting a digital medical records systems in hospital, DHIS-2 at all health facilities and using FCHVs to collect health identification to be able to track patients using mobile technology in Nuwakot district.

Annex 2: Draft Study Protocol for the m-health Tool

Study goal

The overall goal of the research is to evaluate whether a m-health tool designed for FCHVs can increase their knowledge on key health behaviours and their ability to communicate effectively, in particular with vulnerable and excluded women and communities.

Objectives

1. To assess whether the:
    - m-health tool will increase the accuracy of FCHV's critical health knowledge
    - m-health tool will increase the length, frequency and quality of engagement with mothers' and communities, in particular with vulnerable and excluded women.
    - FCHV engagement using the m-health tool increases critical health knowledge among mothers and communities
2. To document the implementation challenges and effectiveness of the FCHVs m-health tool and content
3. To assess the cost effectiveness of the m-health tool

Methodology

A m-health tool and content will be designed and pre tested with users over a preliminary period. The m-health tool will then be evaluated using an experimental design. FCHVs will be recruited for participation in the study from areas that have large numbers of communities that are considered excluded and marginalised, with poor health indicators. FCHVs will be randomly assigned to a intervention or a control group. The treatment group will be trained to use the m-health tool and the control group will be provided with and re-trained on existing Government health education materials.

The overall sample size and the number of FCHVs assigned to each group will be based on: (i) an estimation of the percentage improvement in indicators that will demonstrate an increase in FCHV knowledge (such as recognition of key newborn illness danger signs); (ii) 95% confidence intervals and (iii) a power of approximately 80%.

During the initial training of the m-health tool, a structured questionnaire will be administered to collect baseline data from FCHVs on knowledge, communication efficacy, mobile literacy and usage. The questionnaire will be administered simultaneously in the control group. The questionnaire will be repeated at the end of the intervention in both the control and intervention groups. Data on mobile phone use will be collected throughout the period of the research.

Individual and focus group interviews will be conducted with a sample of FCHVs to understand whether using the m-health tool has changed the way they work. Individual and focus group interviews will also be held with mothers and communities to document any changes in FCHV engagement following the introduction of the m-health tool. A structured questionnaire will also be administered to a small sub-sample of mothers in the catchment area to measure baseline behaviours. If the m-health tool demonstrates its efficacy then this cohort of mothers will be re-visited at the end of the intervention and then at subsequent periods to be able to measure any changes in community behaviour.

Data Management and Statistical Analysis

Quantitative data will be analysed using the appropriate statistical software and regression analysis to estimate odds ratios. Qualitative data will be translated, coded, cleaned and indexed and a thematic analysis conducted (possibly using a qualitative analysis software package). Mobile data will also be analysed to how the number of times the content has been accessed, which content etc. and results validated with FCHVs.

Quality Assurance and Ethics

A technical advisory board will be set up to ensure rigour and credibility**.** BBC Media Action's research team will follow a process called Assuring Integrity in Measurements (AIM). This process ensures that quality is tracked and that there are checks and sign-offs throughout the research project. For example, when designing and developing the study, selecting the research agency for data collection, briefing data collection team, monitoring of data collection, data and analysis checks. Ethical approval will be sought from the Nepal Medical Research Council before the study is conducted.

Expected Outcomes of the Study

Globally there are few m-health tools that focus on job aids for CHW. This study will therefore provide a useful contribution to the international knowledge base. M-health projects tend to only document the effectiveness (operational effectiveness and cost effectiveness) of the tools and not the implementation challenges, this research will document both.

Dissemination of Results and Publication Policy

Research results will be discussed in detail with Government counterparts and will inform whether a scale-up plan is pursued. Results will be presented and shared with a wide range of key stakeholders and in local policy forums. National and international publications will be considered where relevant.

Annex 3: List of Short-listed Districts

		Health Management Information Data (HMIS) Reporting Year 2015-16			
District	Major Four Ethnic/Caste Group (% of district population) 2011 Census	Contraceptive Prevalence Rate (%)	Antenatal Care (%)	Institutional Deliveries (%)	Major donor working directly with FCHVs
Sindhupalchowk	Tamang 34.2% Chhetri (18.2%) Newar (11.1%) Hill Brahmin (10.3%)	41.55	25.3	23.9	Suaahara
Jarjakot	Chhetri (38.0%) Kami (22.2%) Thakuri (16.7%) Magar (9.0%)	31.84	25.6	29.3	Suaahara
Ramechhap	Chhetri (26.9%) Tamang (19.2%) Newar (14.5%) Magar (11.1%)	29.9	34.3	29.9	None
Sindhuli	Tamang (26.9%) Magar (14.9%) Chhetri (13.7%) Hill Brahmin (7.8%)	33.29	26.1	25.2	None
Udayapur	Chhetri (21.5%) Rai (17.3%) Magar (13.9%) Tharu (7.6%)	25.5	42.3	43.7	None
Kapilvastu	Muslim (18.2%) Tharu (12.3%) Yadav (10.1%) Hill Brahmin (8.5%)	30.78	51.2	18	Suaahara
Bara	Muslim (13.1%) Yadav (10.5%) Tharu (10.5%) Kanu (4.8%)	38.14	40.33	39.75	UNICEF

References

[i] Ministry of Health, Nepal; New ERA; and ICF (2017) Nepal Demographic and Health Survey 2016: Key Indicators Report

[ii] Ministry of Health, Nepal (2014) Female Community Health Volunteer National Survey Report

[iii] Ministry of Health, Nepal; New ERA; and ICF (2017) Nepal Demographic and Health Survey 2016: Key Indicators Report

[iv] Ministry of Health, Nepal (2014) Female Community Health Volunteer National Survey Report

[v] Ministry of Health, Nepal (2014) Female Community Health Volunteer National Survey Report

[vi] John Hopkins University (2017) Mobile Technology in support of Front Line Health Workers. Global M-Health Initiative. Gates Foundation.

[vii] Free et al. (2013) The effectiveness of mobile health technologies to improve health service delivery processes: systematic review and meta-analysis. PLOS Medicine Vol 10 Issue 1

[viii] Lee et al. (2016) Effectiveness of m-health interventions for maternal, newborn and child health in low and middle income countries: systematic review and meta-analysis. Journal of Global Health vol. 6 no.1

[ix] Braun et al. (2013) Community health workers and mobile technology: a systematic review of the literature. PLOS One Vol 8 Iss. 6

[x] Agarwal et al. (2015) Evidence on feasibility and effective use of m-health strategies by frontline health workers in developing countries: systematic review. Tropical Medicine and International Health vol. 20 No. 8

[xi] Agarwal et al. (2015) Evidence on feasibility and effective use of m-health strategies by frontline health workers in developing countries: systematic review. Tropical Medicine and International Health vol. 20 No. 8

[xii] Lee et al. (2016) Effectiveness of m-health interventions for maternal, newborn and child health in low and middle income countries: systematic review and meta-analysis. Journal of Global Health vol. 6 no.1

[xiii] John Hopkins University (2017) Mobile Technology in support of Front Line Health Workers. Global M-Health Initiative. Gates Foundation.

[xiv] Medic Mobile (2017) Information can be accessed from http://medicmobile.org

[xv] BBC Media Action (2015) How does the Mobile Kunji audio visual job aid support engagement between front line health workers and their beneficiaries in Bihar, India?

[xvi] Rogers, E M (1995) Diffusion: Interpersonal Influence in Diffusion of Innovations (4th ed.) London: The Free Press.

[xvii] Wejnert, B (2002) Integrating Models of Diffusion of Innovations: A Conceptual Framework. Annual Review of Sociology, Vol. 28: 297-326

[xviii] Meyers et al (2017) Management challenges in health: failures of a mobile community health worker surveillance program in rural Nepal. British Medical Journal Innovations vol. 3

[xix] Bhatt et al. (2017) Barriers to scale of digital health systems for cancer care and control in last mile settings. Journal of Global Oncology