Rapid Response Brief

March 2019

What can research evidence tell us about:

Feasibility and Effects of task sharing and m-health by VHTS in the prevention and control of hypertension and Diabetes Mellitus

Key messages

- It is feasible for Lay health workers/ village health teams (VHTs) to identify, screen, refer and follow up patients with hypertension and or diabetes mellitus in different settings.
- Sharing of these tasks with VHTs might improve reduction of hypertension by only -2mmHg of both the systolic and diastolic blood pressure and -0.6% HbA1c. These improvements are of limited clinical importance.

Although studies do not report possible adverse effects, these concerns should be addressed: complexity, intensity, scope and duration of training, supervision; ensuring availability of internet, functional BP machines and glucometers; sustainability after the end of project; linkage to healthcare system; current prescription policies; Increased workload; and poor drug supply and access; Resistance by other health professionals. This is important for the continuation of care.

Where did this Rapid Response come from?

This document was created in response to a specific question from a policy maker in Uganda in 2019.
It was prepared by the Center for Rapid Evidence Synthesis (ACRES), at the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative.

✚ Included:

- **Key findings** from research
- **Considerations about the relevance** of this research for health system decisions in Uganda

✖ Not included:

- Recommendations
- Detailed descriptions

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Summary

Background:

Village Health Teams (VHTs) or Lay health workers have been shown to a play an important role of increasing access to healthcare within communities and homes for infectious diseases such as malaria, pneumonia, HIV and Tuberculosis and in maternal and child health care. Innovations such as task sharing and mhealth/ telemedicine have been considered to increase the role of VHTs in the prevention and control of NCDs in the communities. Currently, an innovation seeking to use VHTs to screen, diagnose, prescribe and follow up patients with non-communicable diseases by linking them to doctors using mhealth has been proposed in Mukono district. However, the district health team is concerned about the feasibility, effectiveness and possible adverse effects of such an innovation in the community.

Rapid Response Question:
What is the feasibility and effects of task sharing to VHTs in the screening, diagnosis, treatment and follow up of patients with hypertension and or diabetes mellitus using m-health?

Findings:
There is scanty evidence on the effects of redistribution of tasks such as identifying, screening, referral and follow up of patients with non-communicable diseases to VHTS.
There are a number of studies showing that it is feasible and cost effective for VHTs to identify, screen and educate and follow up patients with hypertension and or diabetes mellitus. VHTs have been shown to be able to identify, diagnose and follow up patients with hypertension using BP machines and or diabetes mellitus using glucometers.
A study in India demonstrated the feasibility of mHealth using Lay Health workers to identify, screen, diagnose, link patients with hypertension and diabetes mellitus to doctors for consultations and prescriptions. The VHTs screened patients and sent obtained medical information to the doctors who would, through interaction with the VHTs and/or patient diagnose and prescribe medicine for the patients. The prescription would then be printed out by the VHT using a portable printer for the patients to get medicine.
There is however limited evidence on the feasibility and effects of VHTs' ability to separately screen, diagnose, initiate treatment and refer patients with hypertension and diabetes mellitus. There is often improvement in the absolute reduction of mean systolic and diastolic blood pressure by only -2mmHg and HbA1c by -0.6%. These changes are of limited clinical importance.
These studies do not report on the possible adverse effects of task sharing and m-health using VHTs to identify, screen, diagnose, treat and follow up patients with hypertension and or diabetes mellitus. However, qualitative studies have shown that effectiveness of using VHTs is limited if these considerations are not made during planning:

- Community acceptance of VHTs to diagnose and initiate treatment
- Complexity, intensity, scope and duration of training, supervision
- Availability of resources such internet, functional BP machines, glucometers

- Presence of professional health workers for invasive techniques such as drawing venous blood
- The number of VHTs included in the programme- these studies included very few VHTs and this might be problem if one were to ensure standards for more VHTs
- Sustainability after the end of the project
- Linkage to healthcare system such as integrating patient records to the HMIS. This is important for continuation of care.
- Resistance by other health professionals
- Current prescription policies limits on who prescribes. These studies include portable printers and VHTs print these for the patients
- Increased workload for the VHTs
- Complexity of training material
- Lack of availability of doctors for referral
- Poor drug supply and access to the patients.

Conclusion:

Task sharing and use of m-health to identify, screen, refer and follow up by VHTs among patients with hypertension and or diabetes mellitus has been shown to be feasible, however there is limited clinical effect on the control of high blood pressure and hyperglycemia.

Background

A high number of patients with hypertension and or diabetes mellitus within the community are not aware or do not adhere to treatment when started on medication. These patients are more likely to present with severe co-mobilities and complications such as stroke, acute myocardial infarction and or death, thereby increasing the costs of health care to themselves, their families, communities and the health system (Perry et al., 2014). Among the several factors cited for this is inaccessibility to the health system (both the professional health workers and the facilities). In order to address this, Community Health Workers, through the mHealth strategy or telemedicine has been suggested (Perry et al., 2014, Dandge et al., 2019).

How this Rapid Response was prepared

After clarifying the question being asked, we searched for systematic reviews, local or national evidence from Uganda, and other relevant research. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here: www.evipnet.org/sure/rr/methods

Community Health workers (CHWs), also referred to as Village Health Teams (VHTs) or Lay Health Workers (LHWs) are defined as a diverse category of health workers who commonly work in communities outside of fixed health facilities. They usually have some formal type of training, though limited, but considered sufficient to perform the expected tasks (Perry et al., 2014). Using the mHealth model, the CHWs are trained and equipped with adequate knowledge pertaining to the screening, aiding in diagnosis and treatment initiation and follow up of patients who have been initiated on treatment. The CHWs stay in constant communication with professional health workers through mobile communication devices when executing the different tasks in the community (Dandge et al., 2019).

Traditionally, CHWs have been used in patient education pertaining to nutrition and control of infectious diseases (which included the testing and treatment initiation in malaria and pneumonia) with significant success. In countries like South Africa, Mexico, Bangladesh and Guatemala, this scope has been extended to include cardiovascular diseases (with due emphasis to hypertension) and diabetes mellitus. A similar strategy is proposed for implementation in Mukono District, thus we set out to provide available evidence on the implementation feasibility of mHealth and its impact on the control of diabetes mellitus and hypertension.

Summary of findings

The strategy of mHealth in the control of hypertension and diabetes mellitus has been used in other countries. Its implementation differs from country to country, however entails basically similar facets. These facets are; the initial training of the CHWs, followed by their field activities (screening community members for diseases and risk factors, aiding in the diagnosis and initiation of treatment, and follow up of the individuals initiated on treatment) (Praveen et al., 2014, Jeet et al., Dandge et al., 2019). There are barriers to the successful implementation of the strategy at different levels of the cascade and these have to be put into consideration when planning for its implementation (Praveen et al., 2014).

Training of CHWs

In order for VHTs to execute their new proposed scope of work in NCDs, there is a need for training (Kim et al., 2016). This training stems from screening for NCDs, to patient education and use of mHealth tools such as smart

phones, skype, portable printers etc. Different settings have had varying durations of training as shown in the table below;

Study	Country	Duration of training
(Dandge et al., 2019)	India	Intensive in-office training for one week followed by 12 weeks in the field
(Gaziano et al., 2015)	Bangladesh, South Africa, Mexico, Guatemala	1 to 2 weeks of training
(Charanthimath et al., 2018)	India	4 weeks training

The education level of the VHTs varied from setting to setting, and this in addition to the intended scope of practice could have influenced the duration of training. However, it is crucial to assess the VHTs content knowledge upon completion of training. Furthermore, there is need for refresher training to keep the VHTs abreast with current knowledge pertaining their practice.

Screening

CHWs' scope in some countries has previously included the screening of community members for infectious diseases. However, recently this scope is being expanded to include the screening for NCDs. A study in Bangladesh, Mexico, Guatemala and South Africa where CHWs where screening community members for risk to cardio vascular diseases showed a 96.8% level of agreement in risk scores between the CHWs and the professional health workers (Gaziano et al., 2015).

Diagnosis and Treatment initiation

There is limited information pertaining to the community members that are diagnosed with hypertension and or diabetes mellitus by CHWs or with the help of information collected by CHWs. A study in India reported 9.2% (95% C.I 7.8% to 10.5%) and 3.2% (95% C.I 2.4% to 4.0%) of the screened individuals in the community were newly diagnosed with hypertension and diabetes respectively (Dandge et al., 2019). Studies in infectious diseases have shown a significant impact in the diagnosis and treatment initiation and or referral of community members by the CHWs (Christopher et al., Perry et al., 2014).

Follow up

During follow up, the VHTs provide patient education and advise on physical exercises and diet. However, their impact on the disease status of those initiated on treatment has shown varying results.

Outcomes	Control group (no VHTs used)	Intervention group (VHTs used)	Number of participants (studies)	Quality of evidence
Diastolic Blood Pressure; mean follow up of 14 months	Mean BP of 84mm Hg	2.88 (5.65 to 0.1) lower than control group	6621 (11)	Moderate
Systolic Blood Pressure; mean follow up of 14 months	Mean BP of 134.5mm Hg	4.8 (8.12 to 1.49) lower than control group	6782 (12)	Moderate
HbA1c	Mean HbA1c of 8.8%	0.83 (1.25 to 0.41) lower than control group	1342 (4)	Low

(Jeet et al.)

In addition, a systematic review by (Kim et al., 2016) showed that 16 (62%) of the included studies showed a significant effect of CHWs interventions on CVD risk reduction, and 5 (56%) of the studies showed greater

improvement in lipid profile (total cholesterol, high-density lipoprotein, or triglycerides). Most of the papers included in this systematic review were of high quality, with few of medium quality and none of low quality.
A study that categorised patients into newly diagnosed and known patients showed improvement among the newly diagnosed patients and no improvement among the already known patients.

Category of individuals with hypertension	**Blood pressure**	**Baseline**	**End-line**
With past medical history of hypertension	Mean SBP in mmHg (SD)	139.7 (24.6)	133.2 (22.4)
With past medical history of hypertension	Mean DBP in mmHg (SD)	88.4 (16.8)	82.5 (13.5)
Newly detected with hypertension	Mean SBP in mmHg (SD)	154.8 (20.6)	136.7 (18.9)
Newly detected with hypertension	Mean DBP in mmHg (SD)	103.1 (14.2)	87.8 (12.4)

(Dandge et al., 2019)

Category of individuals with diabetes	**Variable**	**Baseline**	**End-line**
With past medical history of diabetes	Mean fasting blood sugar mg/dl (SD)	163.8 (65.4)	170.0 (70.5)
With past medical history of diabetes	Mean HbA1c % (SD)	8.3 (2.2)	8.0 (1.9)
Newly detected with diabetes	Mean fasting blood sugar mg/dl (SD)	192.8 (65.0)	166.3 (64.2)
Newly detected with diabetes	Mean HbA1c % (SD)	9.2 (2.5)	8.3 (2.1)

(Dandge et al., 2019)

Potential barriers to the implementation of the proposed scope of VHTs

The potential barriers to the implantation of the proposed scope of practice of VHTs can be categorised into system level barriers, CHWs barriers, community barriers and tools and technology barriers.

Level of barrier	**Barrier**
System	• Access to doctors when needed by the CHWs while in the field • Access to medication by the community • Assistance from professional medical personnel in invasive diagnostic medical procedures while in the field
CHWs	• Training to acquire new knowledge and skills • Remuneration for work done • Availability of other lucrative opportunities outside of health
Community members	• Acceptance of village-based screening • Trust and confidence in the work executed by the CHWs • Access to households
Tools and technology	• Access to fast and reliable internet • Availability of phones • Availability of portable printers • Functional diagnostic tools

(Praveen et al., 2014, van Heerden et al., 2017)

Conclusion:

Task sharing and use of m-health to identify, screen, refer and follow up by VHTs among patients with hypertension and or diabetes mellitus has been shown to be feasible, however there is limited clinical effect on the control of high blood pressure and hyperglycemia. Furthermore, there are several barriers and facilitators that have to be explored in the successful implementation of the strategy.

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What is SURE Rapid Response?

SURE Rapid Responses address the needs of policymakers and managers for research evidence that has been appraised and contextualised in a matter of hours or days, if it is going to be of value to them. The Responses address questions about arrangements for organising, financing and governing health systems, and strategies for implementing changes.

What is SURE?

SURE – Supporting the Use of Research Evidence (SURE) for policy in African health systems - is a collaborative project that builds on and supports the Evidence-Informed Policy Network **(EVIPNet) in** Africa and the Regional East African Community Health **(REACH)** Policy Initiative (see back page). SURE is funded by the European Commission's 7th Framework Programme.
www.evipnet.org/sure

SURE collaborators:

Reagional East African Community Health Policy Initiative
www.eac.int/health

EVIPnet
www.evipnet.org

Glossary

of terms used in this report:
www.evipnet.org/sure/rr/glossary

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Conflicts of interest
None known.

Acknowledgements
The following people provided comments on a draft of this Response: [Name, Affiliation; Name, Affiliation].

This Rapid Response should be cited as
Edward Kayongo, Ismael Kawooya, Rhona Mijumbi-Deve Feasiblity and effects of Task sharing and m-health by VHTs in the prevention and control of hypertension and diabetes mellitus. A Rapid Response Brief. March 2019

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