

Community Health Information for all Programmes - Online (CHIPO)

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Executive Summary

In developing countries, community health workers (CHW) are the main health service providers. Although the CHWs are the lowest cadre, they have many tasks compared to other cadres. An integrated system supporting all tasks of CHWs is likely to improve their work and health services. Currently, a stream of mHealth apps exist, funded by donors, developed by NGOs and used also by CHWs in most developing countries. However, each app concerns one health programme, promoting fragmentation, and consequently

- the CHW has to use many apps/phones, [1]
- each health program stores data in its own database, hence duplicate reporting and incoherent databases outside the national health information system emerge, and
- the CHW focuses attention on the area covered by the app and neglects other duties.

An integrated system can be built with the free and open source District Health Information Software (DHIS2) Android Tracker Capture and Dashboard. However, the software lacks three functionalities; the growth monitoring chart, training videos directly accessible from the app and reports (for each programme and consolidated). This proposal aims at developing these functionalities, setting up the system for CHWs and their supervisors, making it store data in the national DHIS2 database and having around 40 CHWs in three health facilities use it over 18 months. Funding for sustainable and countrywide scaling will be sought during the project period.

Partners

The University of Malawi (UNIMA), Department of Computer Science, will be main project partner. UNIMA has intimate knowledge and experience in health information system at all levels in the country. UNIMA collaborates with the Malawi Ministry of Health (MoH) and is assisting the Ministry on their servers and a number of their applications. They have also carried out research on community health information systems and on use of mobile devices for health information in rural areas. UNIMA has developers and technical support staff familiar with the DHIS2 software used in all health districts in Malawi.

The University of Oslo (UiO) is the other project partner. It has for more than a decade developed the DHIS2, which is configurable without coding and accessible with browsers and Android apps through the internet. DHIS2 is currently used in more than 60 countries. More than a dozen companies working on joint projects with UiO on DHIS2 have been established in developing countries. UiO has had four research projects on patient information systems in rural clinics in low and middle income countries. UiO also has a technical support group of 20 people; mostly software developers, testers and documenters, but also project coordinators.

UNIMA, UiO and MoH has for a decade collaborated on community based health information solutions. Through this collaboration, both academic and technical capacity has been built in all institutions. The output to date is 5 completed PhD dissertations and 3 near completion, 2 master programmes at UNIMA, over 30 completed Master's dissertations and over 50 peer reviewed papers in international journals and conferences.

UiO and UNIMA are currently partners in the following projects:

- mHealth4Afrika – Community-based ICT for Maternal Healthcare in Africa. 2015-2018. European Union, Horizon 2020, 688015.
- DHIS2 Technical Expertise. 2016-2018, UNICEF, LTAS-42105690.
- ETHIC – ExTending Health Informatics Capacity. 2017-2021. The Norwegian Centre for International Cooperation in Education, NORPART-2016/10134.

ETHIC will provide sufficient grants for international travel in CHIPO.

The MoH will provide requirements and medical protocols that feed into training curriculum for CHWs.

Research students from both partners will be recruited for doing their thesis work in CHIPO. The project will also contribute to developing capacity for open source software development and research at UNIMA in collaboration with the MoH.

Project description

DHIS2 Android Tracker Capture will be set up to communicate with the national health information server through the mobile phone network or Wi-Fi. When internet connection is broken, data can still be entered and will be automatically synchronized with the server when connection is re-established. Solar powered power banks will be supplied to ensure charging in places with no grid power. Tracker Capture can send reminders and other messages to clients' mobile phones, guide users through a decision tree and give alerts when the patient has danger signs. These functionalities will be exploited. The DHIS2 Android Dashboard will be set up for the CHWs and their supervisors to display time trends and compare neighbouring catchment areas with tables, charts and maps.

The missing functionalities of growth monitoring and training videos in the app will be developed by the partners in collaboration and included in Tracker Capture. Training videos will be sourced from free and open resources, and a few developed in local language. Other funding will be sought for producing a larger number of videos.

CHWs need to deal with several health programmes during their encounters with the community. For example, during a home visit, they may promote clean water and sanitation, advise pregnant women, administer malaria medication and care for AIDS patients; the same pattern is found during outreach work, where they are involved in immunization, sanitation, family planning and tuberculosis work.

The proposed integrated system aims at being useful for CHWs' health services and expand their participation in their community, motivate their work, strengthen their status in the communities and empower their professional role. For health services other than capturing data for the different programs, it allows for follow-up of patients, risk identification and prioritization of patients.

CHW empowerment on the other hand will be achieved through learning through built-in explanations of medical protocols, option descriptions, videos, and communication through the device with other CHWs and CHW supervisors. The reports developed will also empower the CHWs for their management and analysis of data.

Community engagement will be strengthened through messaging to clients and displaying reports to village health committees and chiefs.

The system will first be piloted by a few CHWs for a short period of time. Then it will be expanded to all CHWs attached to the three health facilities, totalling to around 40. This is a minimum number for determining improvements on healthy behaviour, correctness of medical procedures and reduction in morbidity, effects seen in studied mHealth apps.

To strengthen the institutional acceptance, CHW supervisors will also be furnished with tablets with the system.

mHealth applications have been failing due to poor training and support. Training has to convince the CHWs about the usefulness of new IT to increase the likelihood that they will learn, use it and contribute to its evolution. CHWs will receive printed, detailed step-by-step instructions for operating the ICT to be used after training, and they will practice following instructions during initial training. Instructions will be in the language most easily read by the CHWs. Looking up help in tooltips, protocols and videos embedded in the device and contacting the CHW coordinator for support are problem solving methods which will be taught in separate sessions during the training, since research shows that

explicit teaching of problem solving methods provides for better problem solving abilities.

One point of support is in general preferable. CHWs have supervisors supporting them on other issues, hence CHIPO will equip the supervisors with the knowledge and tools for handling the top 10 FAQs. To perform this role, the CHWs supervisors will be given a more comprehensive training.

The CHW supervisors will have a second line of support in the development team.

Ethical perspective

Patient data will be stored at the Malawi Ministry of Health and will not be accessible outside.

Disseminating the innovation

The participating health workers will spread the word to their communities and health facilities. The project will also regularly be discussed with MoH and other stakeholders in the country.

UiO organises 15-20 DHIS2 Academies every year in Africa, America, Asia and Europe. These Academies are attended by staff from the ministries of health in the region, and from NGOs and consultancies. The academy participants are normally in charge of developing their national patient and health information systems, and staff from more than 50 countries has so far attended.

Results from the CHIPO project will be embedded in the training material for the academies. For the academies which concern patient systems or community systems in particular, more details will be presented and the system will offered to other countries. Since the system can be changed without coding, the academy participants will be able to adapt it to local requirements.

Results from CHIPO will be presented in international conferences and outlets like WHO Bulletin.

[1] *chipo* (Shona) = *gift* (English)