WHITE PAPER

Implementing SmartCerv in Zambia: Lessons from the roll out of a digital solution for linking women to cervical cancer care

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Introduction and background

Zambia's Commitment to Preventing Cervical Cancer

Since the launch of the Zambia Cervical Cancer Prevention Program in 2006, the country has successfully decentralized cervical cancer screening and treatment services to all levels of the healthcare system. It is working towards the World Health Organization's cervical cancer elimination targets to vaccinate 90 percent of girls by age 15, screen 70 percent of eligible women for cervical cancer twice by the age of 45, and treat 90 percent of cervical cancer cases.[1] The country has rapidly expanded cervical cancer early detection services, establishing at least one screening site in 115 of the 116 districts countrywide. However, the program has encountered challenges in maintaining a comprehensive central repository for program data. Without a robust data management system, it is challenging for programs to make evidence-based decisions and take informed action.

The SmartCerv Data Management System

SmartCerv is a data management system designed to meet the needs of patients and decision-makers. It collects patient-level information related to cervical cancer screening and care. It aggregates and visualizes this data to support information-based decision making across all levels of the health system. SmartCerv is an application developed by Blue Code Systems that can be installed on a computer, smartphone, or tablet. It allows for offline data collection, and its structure was designed to replicate and replace the paper-based cervical cancer patient enrollment process.
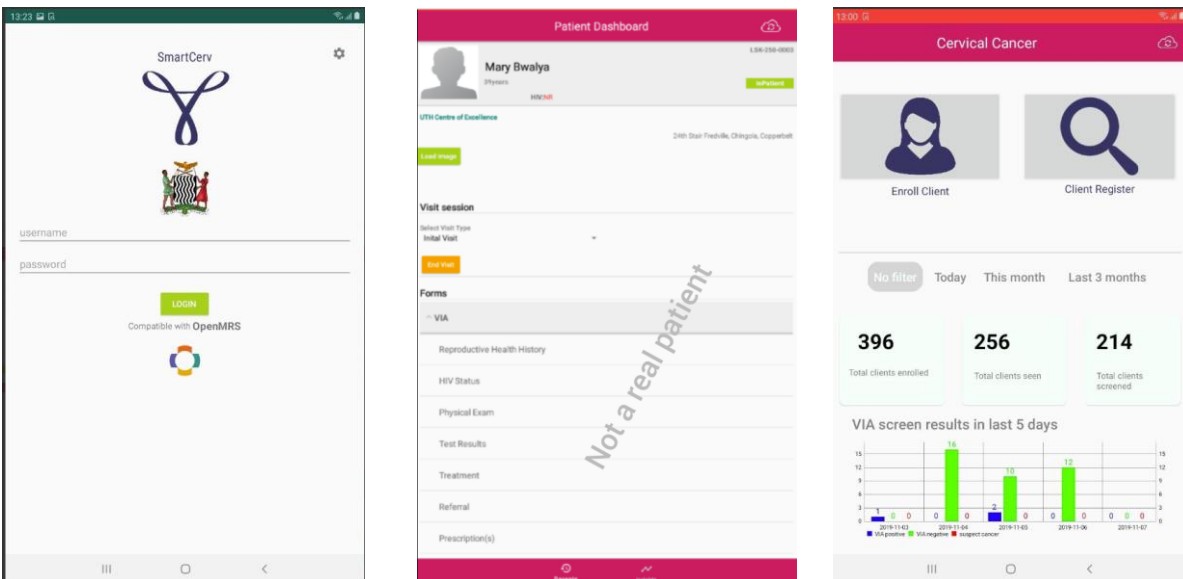
Screenshots courtesy of Blue Code Systems

Implementing SmartCerv in Zambia

The Ministry of Health, through Project Concern International, launched SmartCerv across a subset of cervical cancer care facilities in Zambia in August 2019. The launch was intended to introduce the new digital client record system, replace the existing paper-based system, and increase the Cervical Cancer

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[1] Global strategy to accelerate the elimination of cervical cancer as a public health problem. WHO, 2020.

Program's ability to make evidence-based decisions. The system was intended to improve patient and health provider experience, improve patient follow-up, make reports available faster, and harmonize the calculation of indicators across the country.

Assessing the implementation of SmartCerv

Objectives of the Assessment

In August 2020, approximately one year after the roll-out of the SmartCerv system, the Ministry of Health commissioned a formal assessment of SmartCerv and other data management systems in use at facilities offering cervical cancer screening and treatment services. The objective of this assessment was to identify gaps and challenges of SmartCerv implementation, as well as to understand factors that promoted successful implementation, and formulate a pathway to address the identified gaps. The action framework developed over the course of the assessment was designed to help strengthen program information and data management systems, propose next steps, and prioritize partner and Ministry support efforts.

Data Collection Approach

The Ministry of Health with support from the Clinton Health Access Initiative (CHAI), designed and implemented an assessment of cervical cancer data management systems using a mixed-methods approach combining quantitative surveys with key informant interviews. The quantitative component included a survey of facility equipment, infrastructure availability, and use of data management systems. The qualitative component comprised key informant interviews with healthcare providers, district health information officers, and provincial focal persons to better understand current cervical cancer data management practices, challenges, and the use of SmartCerv.

Results of the Assessment

The results, presented in March 2021, showed that slightly more than half (55 percent, 30/52) of the facilities in the assessment had access to SmartCerv. Of the 30 facilities with access to SmartCerv, 30 percent were not using the system at all, and 67 percent were using SmartCerv alongside another system. Only one facility (three percent) was using SmartCerv as a replacement for its other data management systems.

Despite these statistics, healthcare workers consistently reported that they liked using SmartCerv. At least 95 percent of those surveyed said they liked using the system; 90 percent said it was easy to use, and 86 percent said it made their job easier.

"[SmartCerv is] faster, as you are entering the data, it's very fast... it's very easy for anyone around connected to the system to evaluate and monitor what you are doing." – Nurse

"I think SmartCerv is much better than the database we used to use before." – Cervical cancer care provider

"...we are able to enter data [in SmartCerv] yes it's specific, it's manageable, it saves time" – Cervical cancer care provider

Despite the advantages of SmartCerv, users also reported important challenges in adopting the system as designed.

Lack of internet data bundles	Health workers in the facilities cited a lack of internet data bundles as the key barrier to using SmartCerv. Although the platform allows offline data entry, an internet connection is required to upload the data. Data can be collected for 200 patients before a tablet must connect to the internet to upload the entries.
Insufficient functional tablets and training	Health workers also reported that they did not have enough functional tablets to use SmartCerv, and that they had not received enough training
Inability to enter key patient information in SmartCerv	Another important barrier to using SmartCerv was the inability to link cervical images to client records in SmartCerv. This essential component of a patient record could only be stored on a different system, usually based on Excel.

These results suggest that the Ministry of Health and its partners should focus first on addressing these specific challenges and strengthening usage of SmartCerv at sites where it is implemented before expanding the system more widely.

Recommendations

The following four key next steps are recommended to address the barriers identified in the assessment.

- Address outstanding barriers at sites where SmartCerv has been rolled out to ensure complete adoption of the system.
- Create a clear, costed plan for purchasing internet bundles to ensure consistent collection and upload of data.
- Plan and carry out in-depth training sessions for health workers that are familiar and comfortable with the system.
- Develop a standard operating procedure for linking cervical images with patient records so that SmartCerv can fully replace existing patient records systems.

In addition to the addressing the immediate needs and actionable items as discussed in the previous section, the Ministry of Health may wish to consider the following for long-term planning:

- **Develop a clear strategy to position and operationalize SmartCerv as the *only* data management system for cervical cancer data in Zambia**. While most users recognized the clear advantages to SmartCerv over other data management systems, small but important shortcomings will likely continue to prevent it from overtaking other systems and eliminating parallel systems. As this assessment has indicated, healthcare workers will continue to rely on

outside or parallel data systems to fill gaps. There needs to be clear advantages to motivate providers to learn and fully adopt SmartCerv as the only data management system.

- **Carefully plan and implement expansion of SmartCerv to new sites**. This planning process should build on the lessons learned in the initial rollout. This could include assessing internet and electricity access, client volume, and number of staff members needing training before the system is introduced.
- **Consider options for linking or integrating SmartCerv within client-centric data systems (rather than disease-specific)**. SmartCerv is an excellent step towards modernizing critical public health information across Zambia and can provide excellent lessons for expanding digital record keeping and reporting to improve data quality and drive data-based decision-making.

Current State of SmartCerv

Two years after the presentation of results from the SmartCerv assessment, the system is still unevenly implemented. Health facilities continue to struggle with obtaining access to data bundles to upload their patient data to the SmartCerv server. Furthermore, the SmartCerv server has been down for several months as funding for the project has expired and a sustainable funding source has yet to be identified. Because of this, some facilities that were using SmartCerv at the time of the assessment have reverted to other systems, including paper-based systems.

These gaps in the scale up of the SmartCerv system have resulted in a shift in focus to discussions around using SmartCare, a system already in use for routine data management in Zambia's HIV program. The adoption of SmartCare for cervical cancer patient data would leverage HIV program funding. However, there are concerns about SmartCare possibly uploading data for HIV negative women screened for cervical cancer.

Conclusion

The SmartCerv rollout assessment, has empowered the Ministry of Health and partners to identify critical lessons for implementing digital health data management systems in Zambia. In addition, it offers a template for any country looking to advance electronic data collection in their health system. The challenges seen with SmartCerv, both within the assessment and in the two years since its launch, highlight the importance of reliable and sustainable funding for digital health data management systems. In addition, there is a need to align these innovative digital health management systems with existing national health information management systems so that data collected is accessible to a wider audience for use in policy decisions.