



Mobile Devices to Facilitate Cervical Cancer Screening in Zambia

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The Problem

Around the world, a woman dies of cervical cancer every 2 minutes. Over 80% of the deaths occur in the developing world, with sub-Saharan Africa being the worst-affected. In Zambia, cervical cancer strikes 63 women in 100,000, affecting women at a time of life when they are critical to social and economic stability.

But cervical cancer takes a long time to fully develop, and thus, is highly preventable through yearly pap smears. Such screening, which is routine in countries like the US, is not possible in most countries because of the resources it requires. Visual inspection of the cervix after painting with vinegar or VIA to detect pre-cancerous lesions has emerged as a cheaper alternative in developing countries.

Current Landscape

Since 2006, close to 20,000 Zambian women have undergone cervical cancer screening through VIA performed by nurses. However, the program cannot be scaled because of constraints on health care workforce. In up to 10% of cases, it is difficult to say whether the findings on VIA are precancerous or not. Currently, the nurses would diagnose these indeterminate cases as precancerous, treat them with cryotherapy, and arrange follow-up visits for these women. A significant number of false-positives is thus inevitable in this set-up, leading to unnecessary follow-up visits, further constraining an already severely-constrained labor resources. Input from a specialist would be very helpful in these situations.

ICT Solution



Assessing Sustainability

The use of expensive technology should be justified by value, not by its ingenious design and demonstration of its feasibility. It has to facilitate the most cost-effective way of achieving the desired outcomes and the delivery of the best return-on-investment. We propose tracking of outcome metrics before and after implementation of our application, i.e. incidence and death from cervical cancer. Outcomes data are then evaluated against total implementation costs to calculate the cost per year of life saved. Rigorous and robust analyses of ICT4D projects can provide guidance for the global community by identifying health investments that are of the highest priority and have the greatest promise.

Future Directions

Once a large database of cervical images has accumulated that are linked to both diagnoses that have been QA'd and clinical outcomes, it is likely possible to come up with artificial intelligence tools that can classify images of indeterminate cervical lesions, further reducing the need for specialist support. Although this software application was initially developed to facilitate cervical cancer screening, this software application can be used for longitudinal care of patients who live in remote areas, especially if visual inspection is crucial in their clinical monitoring, such as in dermatology and wound care.

Technologies

Mobile

- Camera phone: 5 Megapixel Nokia N82
- J2ME MIDlet

Server:

- Linux,
- Apache,
- MySQL,
- PHP

