LEVERAGING MOBILE TECHNOLOGY TO IMPROVE CERVICAL CANCER SCREENING EFFICIENCY: LESSONS FROM A GLOBAL HEALTH INITIATIVE IN GHANA

RUTGERS HEALTH
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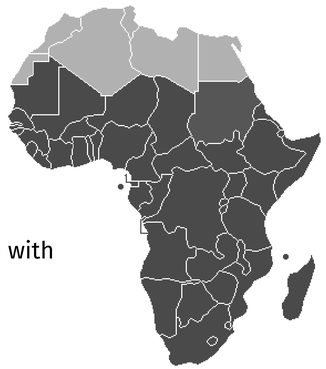
OBJECTIVE:

To evaluate the implementation of a mobile, technology-assisted VIA screening approach in a low-resource clinical setting and to assess its potential to enhance efficiency, affordability, and accessibility compared to conventional screening methods used in the United States.

Background

SUB-SAHARAN AFRICA

- Cervical cancer remains a major cause of morbidity and mortality
- This accounts for nearly 25% of global cervical cancer deaths despite representing less than 15% of the world's female population
- 19 of the 20 countries with the highest cervical cancer mortality rates are located in this region (largely due to limited access to screening, early detection, and treatment)
- WHO key target region for expanding HPV vaccination and visual inspection with acetic acid (VIA) screening programs
- Challenges with efficiency, equipment cost, and continuity of care



UNITED STATES

- Substantial reductions in cervical cancer incidence through routine cytology and HPV-based screening every 3–5 years
- Supported by robust laboratory infrastructure and follow-up systems.

Methods

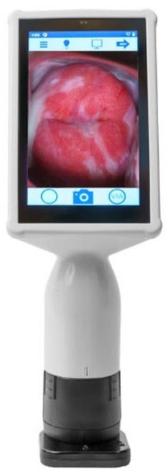
WHO: 3 GYN physicians (2 attendings and 1 resident) collaborated with local midwives

WHEN: during a weeklong medical mission in Cape Coast, Ghana

WHAT: performed 21 pap smears and VIA screenings within five hours and only 1 exam room

HOW:

- MobileODT EVA Pro, a portable, smartphone-based digital imaging device (approximate cost: $3,600–$5,000 USD) designed for VIA screening.
- Captured high-resolution cervical images (before and after acetic acid application, and with green filter) that were securely stored in each patient's digital medical record. This streamlined workflow eliminated the need for bulky, stationary equipment and enabled immediate patient education and documentation.
- By comparison, U.S. cervical evaluation often relies on colposcopy, which requires a large, microscope-based instrument costing $15,000–$25,000 USD and is less conducive to rapid or high-volume screening.



Results

- The mobile device markedly improved efficiency, portability, and image documentation, facilitating high patient throughput despite resource limitations.
- Clinic is midwife-run and lacked capacity to perform colposcopic biopsies, necessitating referral to gynecologists for definitive diagnosis and treatment.
- Expanding the use of mobile VIA devices to gynecologists capable of performing biopsies could significantly enhance diagnostic utility and continuity of care.

Discussion

	Ghana	United States
Screening standard	VIA	Cytology and HPV testing > colposcopy
Sensitivity	77-82%	47-59%
Specificity	87-92%	86-94%
Cost	$3,600–$5,000 (EVA Pro)	$15,000–$25,000 (colposcopy)

- VIA is Ghana's national screening standard; however widespread implementation remains challenging.
- Mobile VIA devices could help overcome some of these barriers by improving documentation, quality assurance, and clinician training.
- Comparatively, the U.S. model, based on cytology and HPV testing, offers high sensitivity but at significantly higher cost and logistical burden.
- Lessons from this Ghanaian initiative demonstrate that low-resource, high-efficiency screening models can inform new approaches to streamline cervical cancer prevention in diverse healthcare systems.

Conclusions

- Demonstrates the transformative potential of mobile VIA technology in expanding cervical cancer screening access.
- EVA Pro device:
  - combines portability, affordability, and real-time image capture,
  - offers a sustainable solution for low-resource settings,
  - example of workflow innovation; can inspire more efficient and patient-centered screening practices globally.