



Revolutionizing Cervical Cancer Screening

AI-Powered Tool Promises Low-Cost, Quick, and Accurate Diagnosis

Artificial Intelligence Based on Automated Visual Evaluation for Cervical Cancer Prevention

A new study funded by the Gillings Gift aims to validate a low-cost AI-powered tool for cervical cancer screening in Malawi. The Automated Visual Evaluation (AVE) tool uses artificial intelligence to analyze cervical images and provide immediate diagnosis, which can be crucial for early treatment. By enhancing accuracy, reducing costs, and providing quick results, this innovative tool has the potential to transform cervical cancer screening in low- and middle-income countries, significantly improving women's health outcomes and reducing cancer-related mortality.

Aim One: Retrain the Current AVE Classifier

The first aim of the study is to ensure the quality of collected cervical images and retrain the AVE classifier. This involves verifying the image quality, matching images with corresponding HPV, VIA, and histopathology data, and retraining the AVE algorithm using these images. The retrained classifier will then be tested to evaluate its sensitivity and specificity for detecting high-grade cervical precancer and cancer, ensuring its reliability and accuracy for future use in clinical settings.

Aim Two: Evaluate the Performance of AVE

The second aim of the study is to evaluate the effectiveness of the AVE tool compared to Visual Inspection with Acetic Acid (VIA) for detecting high-grade cervical precancer and cancer in HPV-positive women. This involves comparing the accuracy of AVE and VIA in identifying cases of high-grade cervical lesions, with the hypothesis that AVE will perform better than VIA. The results will help determine if AVE can be a superior triage test, leading to improved diagnosis and treatment strategies in low-resource settings.

Outcomes, Milestones, and Deliverables

Key milestones include ensuring high-quality image collection, retraining the AVE algorithm, and evaluating its performance. The expected deliverables are improved screening accuracy, reduced healthcare costs, and enhanced accessibility and equity in cervical cancer prevention, aligning with the United Nations' Sustainable Development Goal of 'Good Health and Well-Being.'

Leadership



PI: Jennifer Smith, PhD, is a professor in the Department of Epidemiology at the UNC Gillings School of Global Public Health. Dr. Smith is also affiliated with the UNC Lineberger Comprehensive Cancer Center, UNC Center for Aids Research and the UNC Center for Women's Health Research. Her research focuses on human papillomavirus (HPV) and cervical cancer prevention through screening and vaccines.

Co-Is: Lameck Chinula, MD; Jennifer Tang, MD; Michael Hudgens, PhD



Goal

Validate the performance of the Automated Visual Evaluation (AVE), a low-cost tool that uses AI to quickly and accurately detect early signs of cervical cancers.

Partners

UNC Department of Obstetrics & Gynecology, Global Women's Health, UNC Department of Biostatistics, UNC Department of Pathology/Laboratory Medicine, UNC Project Malawi, DL Analytics

Impact!

AVE's machine learning technology could revolutionize cervical cancer screening by minimizing operator bias and providing a low-cost, point-of-care triage solution. This innovative, lab-free diagnostic tool offers accurate, immediate predictions of cervical pathology, addressing the urgent need for effective screening and treatment in low- and middle-income countries.

Capture & Analysis



Immediate Results

