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Facility-based indicators to monitor cervical cancer control services for women living with HIV

In collaboration with the International epidemiology Databases to Evaluate AIDS (IeDEA) consortium, the Cervical Cancer Prevention and Care Cascade (CCPC Cascade) has been developed as a monitoring framework for routine patient-level data collection at HIV clinics offering cervical cancer prevention and care services in sub-Saharan Africa. The framework includes 17 facility-based indicators for performance measurement. Indicators can be adapted for use in different contexts.

Photo: A nurse conducting a visual inspection with acetic acid exam at a government health facility in Lusaka, Zambia. © Centre for Infectious Disease Research in Zambia

KEY MESSAGES

- The CCPC Cascade is a framework to measure the performance of steps along the cervical cancer prevention and care continuum for women living with HIV in sub-Saharan Africa.
- Five core and 12 optional CCPC Cascade indicators are recommended for routine patient-level data collection at ART clinics offering cervical cancer prevention and care services.
- A minimum set of data elements are required to inform the CCPC Cascade indicators.
- CCPC Cascade indicators should be selected based on local, programme, or facility priorities and data availability.

MAIN MESSAGE

Five core indicators and 12 optional indicators are recommended to inform the CCPC Cascade. Indicators were defined through a Delphi consensus process with 72 stakeholders working in 15 sub-Saharan African countries that are part of the IeDEA consortium.

How can we monitor and scale-up cervical cancer prevention and care services for women living with HIV in sub-Saharan Africa?
Cervical cancer is the leading cause of cancer mortality in women in sub-Saharan Africa. Women living with HIV are six times more likely to develop cervical cancer compared to women living without HIV. Of all women with cervical cancer and HIV globally, 85% live in sub-Saharan Africa, where 21% of all cervical cancer cases are attributable to HIV infection [1]. In 2020, the World Health Organization (WHO) launched the global strategy to eliminate cervical cancer as a public health problem. The aim of this strategy is to reduce the cervical cancer incidence rate to below four per 100,000 women per country within a century. The WHO proposed **90-70-90 targets by 2030** to accelerate these efforts: 90% coverage of HPV vaccination in girls, 70% coverage of cervical cancer screening, and 90% treatment and management of both precancerous lesions and invasive cancers [2, 3].

To reach the **90-70-90 targets,** the WHO recommended the introduction of HPV DNA testing as a primary screening test for women living with HIV, followed by a triage test (Figure 1). These services must be monitored and evaluated to allow policy makers to make evidence-based decisions and ensure the services are effective. To support monitoring efforts and improve the availability of high-quality data, the WHO published 'Improving data for decision-making: a toolkit for cervical cancer prevention and control programmes' [4] in 2018. This toolkit was developed by focusing on the secondary prevention portion of the continuum (screening and treatment of precancerous lesions). Although the toolkit suggested indicators and provided information to generate meaningful, actionable data for decision-making, it lacked specific indicators for high-risk populations like women living with HIV.

Advancing Cervical Cancer Screening in HIV-positive women (ACCHIVe) - The CCPC Cascade
To support existing cervical cancer control and monitoring efforts, the CCPC Cascade was tailored to girls and women living with HIV in sub-Saharan Africa. The **CCPC Cascade** is an innovative framework to monitor, and scale-up cervical screening services offered at antiretroviral treatment (ART) clinics. The CCPC Cascade is aligned to the current recommended cervical screening and treatment algorithms for women living with HIV [5] and follows the steps of the cervical cancer prevention and care continuum. For each step of the cascade, patient-level and facility-based indicators and data elements are recommended to inform these indicators, aiming to measure the performance of each specific step. The data collected and analyzed using the CCPC Cascade can be used to guide the decision-making process at the facility level.

First, a literature review was employed to extract relevant indicators, grouping them into domains along the cervical cancer control continuum at the facility level (Figure 2). From February 2021 to March 2022, **a three-round online Delphi consensus process** was conducted to reach agreement on indicators within IeDEA African region. **The Delphi consensus process** is an iterative, anonymous method to gather opinions and reach a consensus among a group of experts or stakeholders on a particular topic. This process followed recommendations from guidelines.

Stakeholders included experts in cervical cancer prevention and HIV/AIDS, healthcare professionals and clinicians, representatives of international health care organizations and government at the national, regional and district levels, public health experts, facility managers, and patient and community representatives. The Delphi process included **72 stakeholders from 15 countries in sub-Saharan Africa.** Through an anonymous, iterative process, they adapted the indicators to their local context (round 1), then rated based on five criteria – relevance, feasibility, comparability, reliability, and understandability – (rounds 2 and 3) and ranked them by importance (round 3). **Consensus** was reached if the indicator had a high level of agreement (more than 70% of respondents rated the indicator as high or very high on the Likert scale) in at least three of the five criteria listed above.

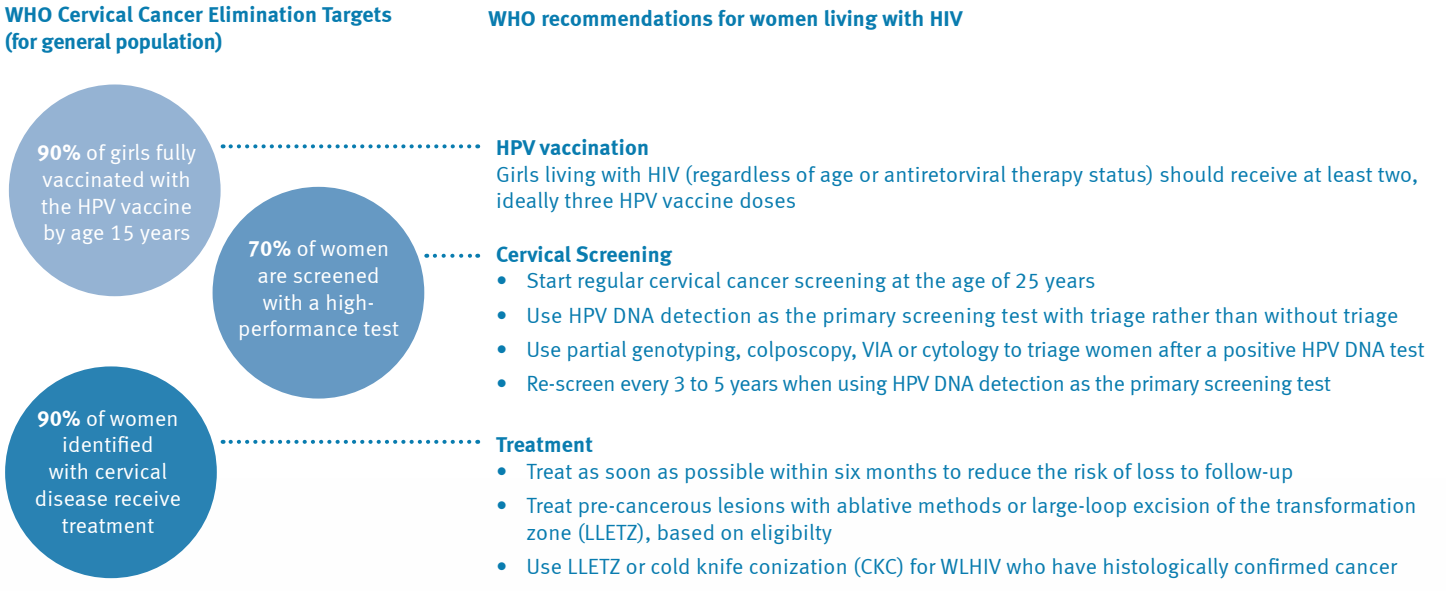

Figure 1 WHO cervical cancer elimination targets and recommendations for girls and women living with HIV.

Consensus was reached for **17 indicators** in the following domains: primary prevention (HPV prevention, n=2), secondary prevention (screening, triage, and treatment of precancerous lesions, n=11), tertiary prevention (cervical cancer diagnosis and care, n=2), and long-term programme impact and linkage to HIV services (n=2) (Figure 2). Five indicators had a high level of agreement in all five criteria **(core indicators):** 'Treatment rate of precancerous lesions', 'cervical screening rate', 'number of women screened for cervical pre-cancer', 'screening test positivity rate', and 'screening test positivity rate for first-time screened women'. The other 12 indicators **(optional indicators)** had a high level of agreement in three or four criteria.

Conclusions, implications, and recommendations

Stakeholders from 15 countries reached consensus on **five core and 12 optional indicators** to evaluate performance along **the CCPC Cascade**, a framework for routine patient-level data collection at ART clinics that offer cervical cancer prevention and care services in sub-Saharan Africa. Minimum data elements (Table 1) to be collected and reported to inform

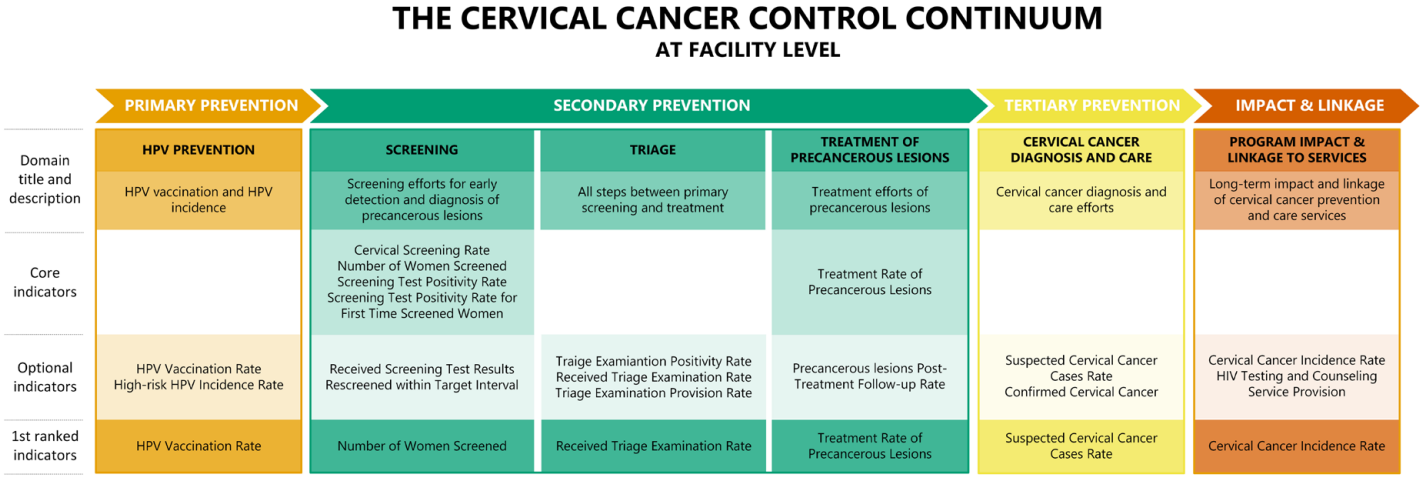

Figure 2 The Cervical Cancer Control Continuum at facility level: the overview of domains, core, optional and 1st ranked indicators per each domain that reached consensus in Round 3. Source: Davidović M et al, on behalf of the IeDEA (In press). Facility-based indicators to manage and scale up cervical cancer prevention and care services for women living with HIV in sub-Saharan Africa: three-round online Delphi consensus method. JAIDS.

The minimum data set required:	Enrollment into HIV care[1]	Screening visit	Screening / triage Results[2]	Treatment for pre-cancer	Age	Screening visit type[3]	Screening / triage methods[4]	Treatment methods[5]	Received HIV testing and counseling service	HPV vaccination	Biopsy results
Core indicators											
Number of women screened for cervical pre-cancer		X			D	D	D				
Cervical Screening Rate	X	X			D	D	D				
Screening test positivity rate for the primary screening test		X	X		D	D	D				
Screening test positivity rate for the primary screening test for first time screened women		X	X		D	X	D				
Treatment rate of precancerous lesions			X	X	D	D	D	X			
Optional indicators											
Suspected Cervical Cancer Cases Rate		X	X		D	D	D				
Triage Examination Positivity Rate		X	X		D	D	D				
Cervical Cancer Incidence Rate	X				D						X
High Risk HPV Incidence Rate		X	X		D						
Confirmed Cervical Cancers		X	X		D	D	D				
HPV Vaccination Rate	X				D					X	
Precancerous Lesions Post-Treatment Follow-Up Rate				X	D	X		D			
Received Screening Test Results		X	X		D	D	D				
Rescreened within Recommended Screening Interval		X			D	X	D				
HIV Testing and Counseling Service Provision Rate		X			D				X		
Received Triage Examination Rate		X	X		D	D	D				
Triage Examination Provision Rate		X	X		D	D	D				

Abbreviations: X – Data element required; D – Data element needed for additional disaggregation.

Table 1 Indicators are ordered by the rating results from the third round.
[1] Key population: women living with HIV/AIDS 25-49 years old enrolled in care with at least one ART clinic visit during the period of interest.
[2] Screening / Triage results: according to WHO guidelines.
[3] Screening visit: First-time Screening; Post-treatment Follow-up Screening; Rescreening.
[4] Screening / triage results: HPV test; VIA/VILI; Pap smear / cytology; and colposcopy.
[5] Treatment methods for precancerous lesions: cryotherapy and LEEP.

the CCPC Cascade indicators are proposed. These indicators should support programme and data managers, stakeholders, and health professionals to better understand the performance of each step along the cervical cancer prevention and care continuum for girls and women living with HIV, leading them towards evidence-based decision-making.

These indicators were tailored to ART clinics that offer on- and/or off-site cervical cancer prevention and care services. In collaboration with the IeDEA consortium, the data needed to inform the CCPC Cascade indicators will be implemented within the IeDEA Data Exchange Standard. This will help to manage cervical cancer control services in ART clinics in sub-Saharan Africa. The CCPC Cascade indicators can be implemented gradually and adapted to context in other countries. This will facilitate standardized data collection and reporting, and inform decision-making processes to improve or scale-up cervical cancer screening and care services. Ultimately, the aim is to strengthen capacities for analyzing, interpreting, and sharing cervical cancer data, and to support existing efforts [6] to reach the goals of the WHO Cervical Cancer Elimination Strategy [2].

ABOUT THE ACCHIVE PROJECT

The Advancing Cervical Cancer Screening in HIV-positive women (ACCHIVe) project involves a team of cancer researchers and health professionals from Zambia (Cervical Cancer Prevention Programme, University Teaching Hospital, and Centre for Infectious Disease Research) and Switzerland (Swiss Tropical and Public Health Institute, University of Basel). The ACCHIVe project is being undertaken in collaboration with the IeDEA International epidemiology Databases to Evaluate AIDS consortium, a network that curates and analyzes data from routine HIV treatment and care sites in 22 countries across four African regions (Central, East, Southern, and West Africa).

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FURTHER INFORMATION ABOUT THE PROJECT AND RELATED PUBLICATIONS

Advancing Cervical Cancer Screening in HIV-positive women (ACCHIVe) – The Cervical Cancer Prevention and Care Cascade: here

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ABBREVIATIONS:

AIDS – Acquired Immune Deficiency Syndrome
ART – antiretroviral treatment
DNA – Deoxyribonucleic acid
HIV – Human Immunodeficiency Virus
HPV – Human Papillomavirus
VIA – Visual Inspection with Acetic Acid
WHO – World Health Organization

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DISCLAIMER

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