

Dual Epidemics: Leveraging HIV Infrastructure to Support HPV Prevention, Testing, and Cervical Cancer Elimination Goals

Background

HIV and cervical cancer are critical public health concerns, each contributing to significant morbidity and mortality. In 2022, approximately 598,000 new HIV cases were recorded among women of reproductive age and HIV/AIDS was reported as a leading cause of death for this population worldwide.^{1,2} There were also an estimated 660,000 new cases of cervical cancer in 2022,³ 33,000 of which were among women* living with HIV (WLHIV).⁴ Cervical cancer is the leading malignancy among WLHIV and is predominantly caused by the most common sexually transmitted infection—human papillomavirus (HPV).^{**6} While cervical cancer is generally slow progressing, taking years to develop, HPV vaccination and early detection of HPV or abnormal cervical cells is vital for prevention. This is especially true for WLHIV, who are six times more likely to develop cervical cancer after HPV infection.⁷

Service integration, defined as the joining of two or more health services that were previously separated by location or provider,⁸ is especially important for populations like WLHIV, who have a complex set of sexual, reproductive, and other health needs.⁹ Services can be integrated through a variety of models including training clinic staff to play dual service delivery roles or establishing referral pathways between HIV, HPV, and cervical cancer providers within or across health facilities. The global HIV community has recognized the need for integration, with major international organizations calling for increased attention to these issues for WLHIV. This includes the

* While this paper references “women,” we recognize that any person with a cervix regardless of gender may develop cervical cancer, including trans men and non-binary people.

** The brief will focus on the causal link between HPV and cervical cancer. HPV is additionally a known contributor to anal, oropharyngeal, penile, vaginal, and vulvar cancers,⁵ but a full discussion of these cancers is outside the scope of this brief.

Key Messages

- The **global burdens** of HIV and cervical cancer are **high**, they **impact similar populations**, and they **overlap in key geographic areas**.
- The risk of HIV and HPV is bi-directional and mutually reinforcing, with women living with HIV (WLHIV) at **six times** greater risk for developing cervical cancer, and HPV infection **doubling** the risk of HIV acquisition.
- Current screening rates for cervical cancer are **well below recommended** levels for all women, including WLHIV, contributing to high cervical cancer mortality globally.
- **Service integration** for HIV, HPV, and cervical cancer prevention and treatment programs **responds to the best evidence** on overlapping risks, **reduces burdens** on service users, and **has overall economic benefits** for country health systems.
- **Existing HIV infrastructure** for testing and treatment can be **better leveraged to support** cervical cancer screening and treatment for WLHIV by training existing staff within HIV clinics, co-locating services, and increasing coordination across service delivery sites.
- Recent increases in **funding** from both national governments and international donors to jointly address HIV and cervical cancer have been vital, but more **attention and investments are needed**.
- **Co-investments** within this space can pay dividends towards both HIV and cervical cancer elimination.

UNAIDS Global AIDS Strategy, which has a sub-goal for 90% of WLHIV to have access to integrated services for HIV, HPV, and cervical cancer by 2025,¹⁰ and the World Health Organization (WHO) conditional recommendation to integrate STI and family planning services into HIV care in 2016.¹¹

HIV service delivery infrastructure is widely available in many high HIV burden countries due to disease-specific investments by governments and international donors. This existing infrastructure presents an important opportunity to better leverage HIV prevention and treatment programs to prevent cervical cancer and save lives. This brief will detail how HPV and cervical cancer intersect with HIV while highlighting opportunities to advance service integration to combat these issues globally.

Geographic Distribution of HIV and Cervical Cancer

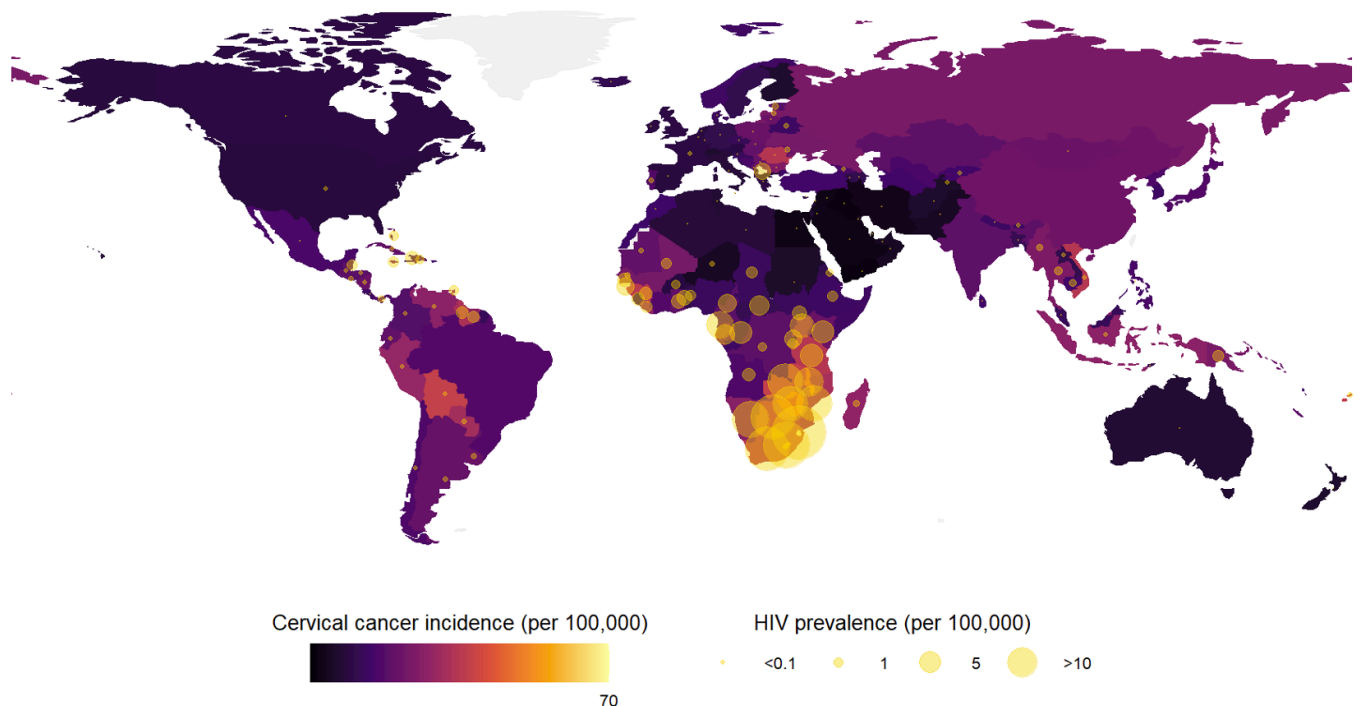
Globally, country prevalence of HIV and cervical cancer diagnoses are highly correlated, with the highest rates of both diseases found in sub-Saharan Africa [Figure 1]. Of the 20 countries with the highest cervical cancer rates in the world (>27 diagnoses per 100,000), 11 are in sub-Saharan Africa.

At the top of both lists for HIV prevalence and cervical cancer diagnoses is Eswatini (33.8% HIV prevalence; 69.4 cervical cancer cases per 100,000), Lesotho (24.9%; 54.3), Botswana (22.8%; 36.1), South Africa (21.9%; 34.1), Zambia (14.7%; 37.0), and Zimbabwe (14.3%; 44.0). This overlapping geographic distribution illustrates both high concentrated risk of disease and the important opportunity to address both pandemics through integrated infrastructure.

The highest rates of cervical cancer mortality are also found in sub-Saharan Africa, with women in Eswatini (44.8 per 100,000), Lesotho (37.5), Malawi (32.7), Zimbabwe (28.9), Guinea (23.8), and Mozambique (23.5) at greatest risk [Figure 2]. Low coverage of preventive screening can delay cervical cancer diagnoses and increase the risk of cervical cancer mortality. Globally, the countries with the highest burden of HIV also have the lowest access to cervical cancer screening.⁴ In low-income and low-and-middle income countries (LICs and LMICs), where HIV is most prevalent, only 30.2% of WLHIV have ever been screened for cervical cancer in their lifetime—compared to 92.4% in high-income countries.¹³

The WHO recommends cervical cancer screening every 5–10 years for all women starting at age 30, and every 3–5 years for

Figure 1: Overlapping HIV Prevalence and Cervical Cancer Incidence per 100,000 Adult Women



WLHIV beginning at age 25.³ Global screening rates are well below these recommended levels, with estimates suggesting that only 8% of women in LICs and 11% of women in LMICs have ever been screened for cervical cancer in their lifetime.¹⁴ The WHO recommends HPV testing as the primary form of cervical cancer screening followed by appropriate triage, follow-up testing, and treatment. However, HPV testing is not universally available. Therefore, cervical cancer screening is done through VIA (visual inspection with acetic acid) or cervical cytology (also known as a Pap smear or Pap test) in some settings [Figure 3]. HPV testing can be limited in affordability by lack of nationally funded cervical cancer screening programs—currently unavailable in 55 (39%) LICs and LMICs.¹⁵ Other financial and social barriers impacting the availability of preventive screening in LICs and LMICs include stigma, cost of services, provider capacity, lack of transportation, and lack of awareness.¹⁶ More nationally funded cervical cancer screening programs are needed to increase coverage and reach the people most in need of screening, including WLHIV.

Efforts to expand timely cervical cancer screening in LMICs are critical, but must be matched with investments to increase the availability of cervical cancer treatment services. Global cervical cancer treatment rates are not widely reported,

but high cervical cancer mortality signals gaps in treatment. Additionally, the availability of oncologists and chemotherapy in LICs and LMICs, such as those in sub-Saharan Africa, is scarce.¹⁷ Over half (55%) of LICs that offer cervical cancer screening lack radiotherapy and surgery services, which hinders their ability to reach the WHO goal of 90% of women living with cervical cancer receiving appropriate treatment.¹⁸ Early detection of abnormal or precancerous cervical cells is key, as treatment is far less invasive and more available before progression to later stages of cancer.

Bi-Directional Risks of HIV and HPV—Implications for Cervical Cancer

The risks for HIV and HPV are bi-directional and mutually reinforcing. Women with an HPV infection are twice as likely to acquire HIV,⁷ which may be due to an HPV-related inflammatory response that makes cells more receptive to HIV infection.¹⁹ Conversely, WLHIV are six times more likely to receive a cervical cancer diagnosis than other women.⁶ Biologically, scientists have proposed that HIV can disrupt mucosal membranes, making it easier for HPV to infect host cells.²⁰

Figure 2: Cervical Cancer Mortality per 100,000 Adult Women

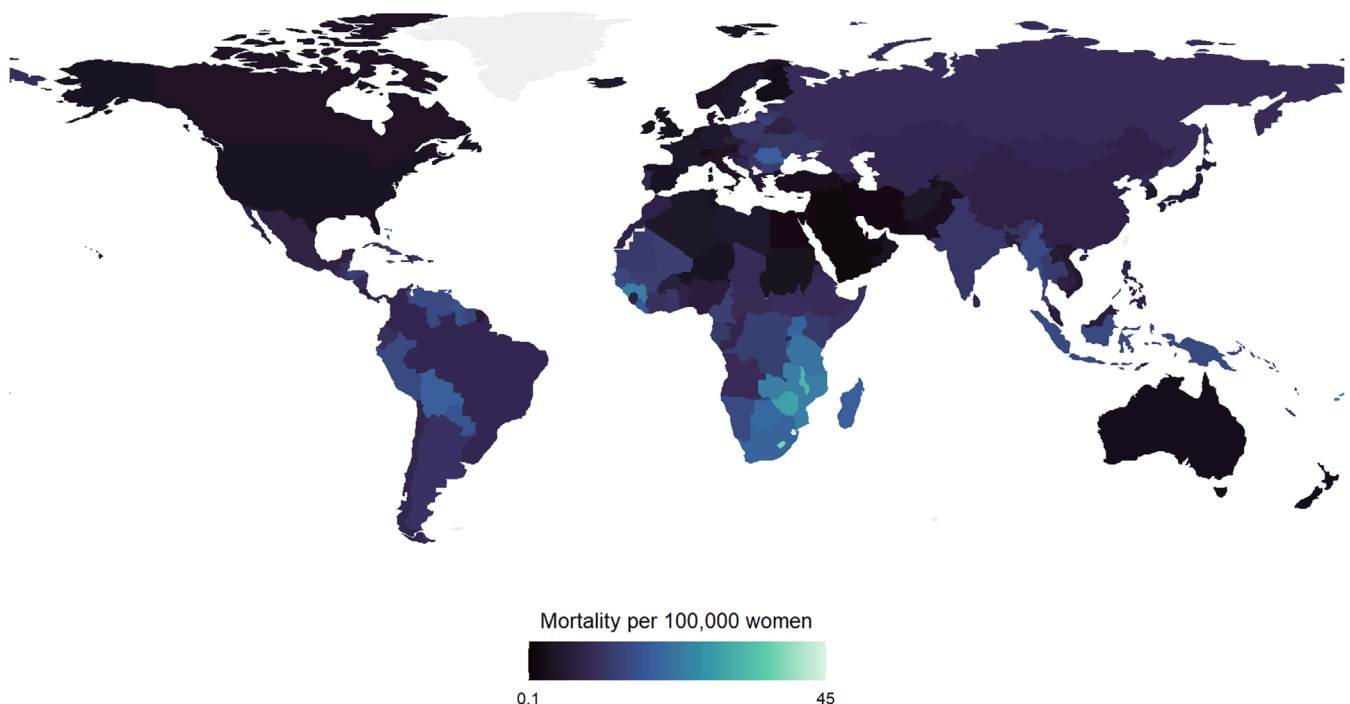


Figure 3: Comparison of Cervical Cancer Screening Tools

	VIA	Pap Smear	HPV Test
What?	Swab vinegar on cervix to identify precancerous or cancerous tissue	Swab cervix to check for abnormal cervix cells	Looks for high-risk HPV DNA in cervix cells
How?	Requires clinician	Requires clinician	Requires clinician or self-sampling option
Guidance	Recommended beginning at age 30 for general population and age 25 for WLHIV	Recommended beginning at age 21	Recommended beginning at age 30 for general population and age 25 for WLHIV
Frequency	Every 3 years	Every 3 years	Every 5-10 years for general population and 3-5 years for WLHIV
Validity	Relatively subjective	More specific = few false positives	More sensitive = detects cervical cancer risk earlier
Outcome	Color change to white is sign of damage	Normal, abnormal, or unclear results	Positive or negative results
Cost	\$	\$\$	\$\$\$
Additional Notes	Most common in low-resource settings; invasive	Sometimes in combination with HPV test	Gold standard

Over 90% of HPV infections are naturally resolved and become undetectable within two years among the general population. However, HIV impairs the body's ability to spontaneously clear HPV. WLHIV are thus susceptible to chronic, persistent high-risk HPV infection.²¹ Due to the faster progression of HPV to cervical cancer, WLHIV are an average of 10 years younger at the time of cervical cancer diagnosis compared to other women.²¹ These bi-directional risks highlight the immense need for earlier HPV screening and treatment among WLHIV to prevent progression to cervical cancer, as well as for increased HPV prevention efforts as a method to lower HIV risk.

Multiple Benefits of HIV Treatment for Health and Cervical Cancer Prevention

Antiretroviral therapy (ART) is an extremely effective treatment for HIV that saves lives, reduces viral loads, and decreases the risk of cervical cancer by promoting long-term immune health. HIV proliferates by attacking and destroying CD4 cells—a critical part of the immune system tasked with fighting off infections. However, consistent use of ART blocks the HIV replication cycle, protecting immune function.²² WLHIV on ART have higher CD4 counts, a stronger immune response to infections like HPV, and thus decreased invasive cervical cancer incidence.²³ Early

initiation of ART after HIV infection also slows the progression of HPV to cervical cancer, which develops at least twice as fast among untreated WLHIV due to accelerated abnormal cell division.⁷ Improving ART coverage is thus essential for preserving health and supporting cervical cancer control.

Multiple Benefits of HPV Vaccination for Cervical Cancer and HIV Prevention

HPV vaccination is a highly effective primary prevention tool for HPV-attributable cancers, being 90-97% effective in preventing cervical cancer and cell abnormality that can progress to cancer.^{24,25} HPV vaccines were initially licensed as a three-dose regimen; however, due to emerging evidence, the WHO now endorses a single-dose vaccination schedule for people under 20 years old.²⁶ This policy shift has important implications for improving vaccination coverage, which sat at only 17% of girls aged 9–14 in LMICs in 2022.²⁷ Despite this promising evidence, it is still recommended that adolescents living with HIV receive two to three doses where possible—highlighting the importance of increased efforts to reach this population with HPV vaccines. In addition to prevention of cervical cancer, improving HPV vaccination coverage may also advance HIV prevention goals given the increased risk of

HIV acquisition with HPV infection.^{28,29} Achieving high HPV vaccination coverage may therefore hold promise for the primary prevention of HIV.

Current Investments in HIV, HPV, and Cervical Cancer Service Integration

Service integration has been increasingly recognized as an opportunity to build more efficient patient-centered systems and improve health outcomes across disease areas.^{8,9} Major donors and organizations have responded to this evidence by investing in cervical cancer prevention and screening through their HIV programming. For example, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) launched "Go Further" in 2018, which seeks to scale up cervical cancer services within existing infrastructure for HIV.³⁰ This public-private partnership has screened over 7.5 million WLHIV for cervical cancer in sub-Saharan Africa thus far, 75% of whom were screened for the first time in their lives. Currently, PEPFAR is the largest donor for cervical cancer screen-and-treat programs globally, contributing \$36.7 million out of the \$67.1 million total invested across LICs and LMICs in 2022.³¹ Likewise, the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) has expanded investments for the dual prevention of HIV and cervical cancer in 20 countries, contributing \$1.7 million during the same period.³¹ Unitaid, with implementation support from Expertise France, Jhpiego, and the Union for International Cancer Control (UICC), introduced high-performance HPV testing in Côte d'Ivoire, Burkina Faso, Guatemala, and the Philippines with their project titled "SUCCESS." To date, SUCCESS has screened 55,970 WLHIV for cervical cancer, including 42,000 first-time screeners.^{32,33} From 2019 to 2021, the Clinton Health Access Initiative (CHAI) and Unitaid supported integration efforts in HIV facilities in five countries in sub-Saharan Africa; among 15,766 women screened, 32% were HPV positive and 87% of those needing it received treatment.³⁰ These efforts collectively demonstrate the importance of donor support and the feasibility of integrated HIV/HPV service delivery in high-burden contexts.

At the 2024 Global Cervical Cancer Elimination Forum, many organizing partners pledged to accelerate HPV vaccination uptake, including a \$100 million commitment from the Bill & Melinda Gates Foundation, a \$600 million commitment from GAVI, and a \$10 million commitment from UNICEF.³⁵ The majority of this funding is being directed towards the procurement of HPV vaccines to increase

supply, evaluating immune response durability from a single-dose schedule, and technical assistance for equitable campaigns and programs.

Despite these important investments, more attention towards HIV, HPV, and cervical cancer integration is needed. In LICs and LMICs, funding remains insufficient for HIV and cervical cancer individually, falling short of the additional projected \$8 billion and \$10.5 billion anticipated to meet the upcoming elimination goals set forth by UNAIDS and WHO, respectively.^{31,36} Resources directed towards the intersection of HIV, HPV, and cervical cancer are even scarcer.³¹ Notably, most cervical cancer funding comes from global organizations focused on HIV, family planning, non-communicable diseases, and sexual, reproductive, and maternal health rather than HPV-specific funding streams—which underscores the value of integration.³¹ Greater involvement and collaboration across these advocacy spheres can advance progress towards the elimination of HIV and HPV with a single comprehensive approach. Co-investments within this space can pay life-saving dividends towards both HIV and cervical cancer elimination.

Models for Service Integration in Syndemic Contexts

HIV, HPV, and cervical cancer integration holds benefits for both service users and the broader health system. For service users, integration reduces the number of return clinic visits, lessens travel, and saves time and money.^{37,38} This is an especially important benefit for service users in rural settings, who, on average, must invest more resources in travel for healthcare.³⁹ For the broader health system, investment in HIV and HPV service integration has been shown to have economic and social benefits, being cost-effective and contributing to earlier detection of both viruses.⁴⁰ Early detection is vital for early treatment and allows more women to have long, healthy, and productive lives.⁴¹

Overall, evidence suggests that integration increases service user satisfaction and well-being.^{8,42} However, there is not a "one-size-fits-all" approach to HIV, HPV, and cervical cancer service integration that will work for every population. Investing in a range of integration approaches will be necessary given the global diversity of healthcare delivery settings and the variety of needs and preferences of the people they serve.⁴³ The main HIV, HPV, and cervical cancer integration frameworks include: 1) A **single provider approach** whereby existing staff within HIV clinics are trained on cervical cancer; 2) The **co-location** of a group of providers who make internal referrals; and 3) A **network of providers** approach that facilitates external referrals between sites [Figure 4]. All of these approaches are viewed as feasible and acceptable.⁴²

Figure 4: Models of HIV, HPV, and Cervical Cancer Service Integration

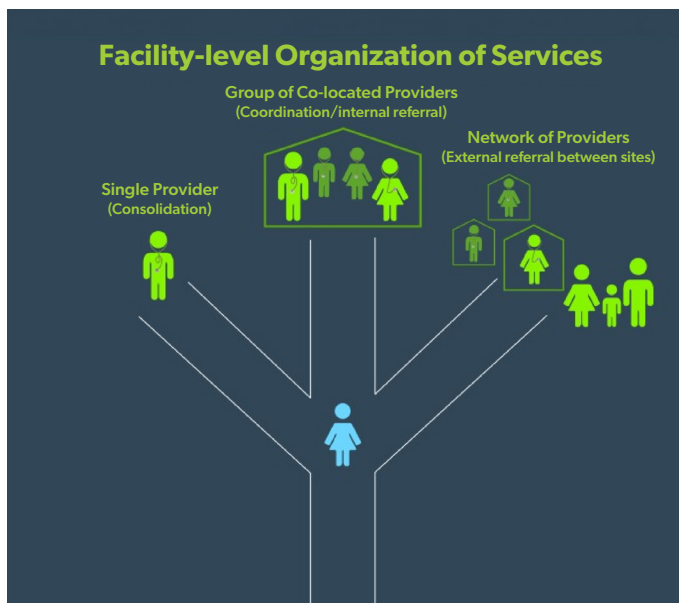


Figure from: Mackenzie D, Pfitzer A, Maly C, et al. Postpartum family planning integration with maternal, newborn and child health services: a cross sectional analysis of client flow patterns in India and Kenya. *BMJ Open* 2018;8:e018580. doi:10.1136/bmjopen-2017-018580

Single Provider: Integration by Training Existing Staff

Within-clinic integration is a small-scale approach that trains existing staff to offer a combined package of services delivered in the same setting, at the same visit, by the same clinician. For example, HIV clinics may provide HPV vaccination, testing, and different levels of cervical cancer screening and treatment. Under this model, WLHIV are screened for cervical cancer on-site during routine HIV check-ups, which maximizes each interaction with the health system and promotes regular follow-up. Adolescents may also receive HPV vaccination at HIV clinics, offering them ongoing protection.⁴⁴ Training existing HIV clinic staff to do cervical cancer screening promotes task-shifting, as less specialized health professionals like nurses can perform services traditionally only offered by physicians. Increasing the number of staff trained on cervical cancer screening and treatment can help alleviate physician shortages and make services more available. Under this model, external referrals for severe cervical cancer cases may still be necessary because HIV clinics may not have the equipment or expertise required for obtaining tissue biopsies.⁴⁵

Group of Co-Located Providers

Co-location of providers is a method of providing HIV care with cervical cancer prevention and treatment using different

specialists who are housed within the same facility or system. This model allows for internal referrals of service users between specialized providers within the same system, increasing the likelihood of same-day treatment and decreasing the likelihood of loss-to-follow-up. Co-location of specialists may involve communication across ART and reproductive health units that facilitates easy referral of service users or bringing 'mobile' gynecologists on a specific day of the week to HIV clinics to perform specialized services. Co-location differs from complete integration within HIV clinics because it typically requires internal referrals and depends upon service user and specialist availability, which may not always result in the immediate treatment of precancerous lesions. However, co-location has been associated with higher cervical cancer screening rates and better care linkages when compared to non-integrated services.^{46,47}


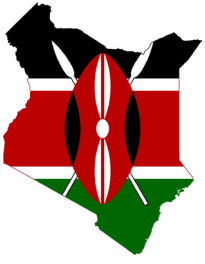

Network of Providers: External Referrals Between Sites

An external referral model works by facilitating service user movement across multiple HIV and cervical cancer clinical and community sites to meet their health needs. Under this model, the active monitoring of service users with a dedicated management system is key to success.³⁷ This can include extensive investment in education and outreach to avoid loss-to-follow-up between sites. Multi-disciplinary healthcare teams, including community health workers (CHWs), peer educators, and case managers can serve as important points of contact for community education and community-based service delivery. For example, CHWs have been shown to effectively distribute HPV testing kits at external ART pick-up points and facilitate post-test linkage to care.³⁷ Collaboration between CHWs and skilled clinic-based specialists can work as an important avenue to increase treatment coverage after community-based HPV testing among WLHIV.⁴⁸ While an external referral system presents higher risk of loss-to-follow-up between visits, if well coordinated it can be a highly successful way to increase service coverage and community service delivery.

Data Availability on HIV, HPV, Cervical Cancer Integration

Global data on HIV, HPV, and cervical cancer often exist in silos, with surveillance systems designed to detect and respond to specific infections or diseases. However, global health experts increasingly recognize the benefits of including cross-disease indicators and higher levels of disease disaggregation in order to better plan, implement, and evaluate health programs.⁵⁶ For example, the Framework for Monitoring the WHO Global Cervical Cancer Eliminations Strategy (2020) lays out a detailed set of 40 indicators relevant for tracking cervical cancer prevention and treatment, including a recommendation to track HIV incidence

Case Studies

<p>Malawi⁴⁹</p> 	<p>In Malawi, both HIV prevalence among women (9.5%) and cervical cancer rates (46 cases per 100,000) are high. In response, Malawi Ministry of Health pushed to integrate cervical cancer screening and treatment into routine ART services at HIV clinics in 2018. Integration activities included training HIV staff on same-day cervical cancer treatment and incorporating cervical cancer messaging into routine client counseling. ART clinics were stocked with HPV testing kits and thermal ablation devices. Each service user was offered information about HPV at their HIV appointments and received cervical cancer screening at that same visit if interested. This successful push towards integrated service delivery was a result of a multi-stakeholder collaboration among PEPFAR, which supported 129 facilities with supplies; the Global Fund, which assisted with the procurement of equipment; Unitaid, which led efforts for self-sampling and capacity building; and the Health Services Joint Fund, which pledged \$200,000 for provider education. In the following years, cervical cancer screening became available at 394 additional HIV service locations. This increase led to a rise in cervical cancer screening coverage among WLHIV from 30% to 64%, and a rise in treatment coverage for precancerous lesions from 36% to 49% from 2019 to 2023. In the Malawian context, multi-stakeholder collaboration proved crucial to catalyzing improved coverage of HPV services; however, further expansion to additional clinics and strengthening of government ownership will be critical for sustained success.</p>
<p>Kenya</p> 	<p>HIV and HPV service integration has been an important part of Kenya’s health strategy given high rates of both HIV (5.4%) and cervical cancer (21 cases per 100,000). Since 2007, Kenya has been building capacity to integrate HIV, HPV, and cervical cancer screening into its public health system by training a wide range of professionals, including nurses, gynecologists, laboratory staff, pathologists, primary care physicians, and lay people to support cervical cancer programs.^{39, 40} Increased integration allowed for precancerous cervical lesion treatment at HIV clinics, which minimized overhead fees and extra equipment and reduced treatment costs by 25% to 55% compared to non-integrated services.⁵² Kenya’s national level work to expand the capacity of its health workforce, coupled with investments to increase the availability of HPV tests, was key to increasing cervical cancer services.⁵³ To reach more WLHIV, Kenya also started home-based, self-sampling HPV testing, which ensures privacy and lowers turnaround times by sharing results via text.⁵³ Community-based approaches have significantly higher linkage to care compared to the national average.⁵³ For Kenya, improved HPV integration required a multi-pronged approach, strengthening human resources for healthcare, increasing availability of HPV tests, and expanding community-based service delivery.</p>
<p>Zambia</p> 	<p>Out of the countries in sub-Saharan Africa, Zambia ranks among the highest for prevalence of HIV (14.7%) and cervical cancer (37 per 100,000). To address this dual burden, the Zambian government—with technical expertise from the WHO, Clinton Health Access Initiative, Global Fund, and PEPFAR—began integrating HIV and cervical cancer services in 2018.⁵⁴ Women with abnormal cervical cells started receiving same-day thermal ablation and post-treatment counseling at HIV clinics, while complex cases were immediately referred for additional care. Mobile units were used to bring cervical cancer screening to geographically isolated peri-urban and rural ART clinics that did not have the proper staff or equipment. Zambia also launched a “train-the-trainer” model whereby nurses trained their peers on cervical cancer screening and treatment. Using telemedicine, these trained nurses may also send digital images of the cervix to remotely-based specialists in real time to review diagnosis and treatment recommendations.⁵⁵ From November 2020 to October 2021, 235,000 WLHIV were screened with VIA, a 30% increase over the previous year. Integrated HIV and cervical cancer screening were also found to be less costly than the standard of care, which included stand-alone testing and referrals. Zambia has set an early example with this program for other countries to follow by leveraging existing PEPFAR-funded HIV infrastructure for cervical cancer screening and treatment that meets the needs of WLHIV.</p>

as part of primary prevention.⁵⁷ The Framework also calls for disaggregation of multiple HPV and cervical cancer indicators by HIV status. Unfortunately, inclusion in the Framework does not guarantee the availability of data, as countries may not have the systems in place to track or report on these indicators or to disaggregate data by HIV status.

There is substantial variability in the availability and quality of country data related to HIV and cervical cancer. This includes data collected through Demographic and Health Surveys (DHS) in which countries select which modules of DHS questions to include. In 2017, only 22 out of 90 countries (24.4%) included cervical cancer screening questions in their data collection.⁵⁸ Major HIV funders may track specific indicators related to cervical cancer, but these are only available at donor-funded sites. For example, PEPFAR indicators track the number of WLHIV on ART screened for cervical cancer and the percentage who received cervical cancer treatment, if eligible.⁵⁹ UNAIDS collects survey data on cervical cancer screening for WLHIV, but data were only available for eight countries in 2022.⁶⁰ The Global Fund oversees investments in the integrated management of HIV and STI co-infections, but HPV is not disaggregated. Increased inclusion of HPV and cervical cancer indicators disaggregated by HIV status, in site surveillance, national population-based surveys, donor monitoring and evaluation indicators, and routine facility reporting systems would greatly improve the availability of data on the status of HIV, HPV, and cervical cancer service integration.

Opportunities for Investments to Advance Integration

An integrated funding approach to HIV and cervical cancer programming can dually address these overlapping health issues and better leverage limited health resources. Against the backdrop of heavy competition for health funding and immense unmet need for both diseases, these approaches will require partnerships across funders, agencies, movements, and sectors. Funders, policymakers, and researchers can pursue multiple avenues to support HIV, HPV, and cervical cancer integration including the following:

Investments in Primary Prevention:

- **Expanding delivery of HPV vaccination.** Closing the HPV vaccine gap would have expansive health benefits for the prevention of cervical cancer and potential implications for reducing HIV incidence. Reaching children and adolescents who are living with or likely to acquire HIV with HPV vaccines is a priority. HIV funders could enable better vaccine coverage among these populations by purchasing HPV

vaccines, training HIV staff and CHWs to deliver vaccines as part of HIV outreach programs, and using existing HIV delivery systems like community adherence groups or ART collection sites to offer HPV vaccination.

- **Expanding ART coverage among WLHIV.** Early initiation of ART reduces the risk of acquiring HPV and advancing to cervical cancer.²³ Ongoing work to expand ART coverage should be seen by funders as a core health intervention across these dual disease areas. Additionally, where more siloed cervical cancer screening programs may be operating—for example, as part of community or school-based outreach activities—HIV funders could partner with these programs to provide HIV testing. This would be an additional opportunity for early detection of HIV and initiation of ART among women at risk of cervical cancer.

Investments to Make Cervical Cancer Prevention Services Available in HIV Clinics and Outreach:

- **Training HIV staff on providing cervical cancer services.** Every type of HIV healthcare worker, from highly specialized providers to community peer-educators, has an opportunity to play a role in cervical cancer prevention. Depending on their level of expertise, different types of HIV staff may be trained to provide HPV vaccines, facilitate HPV testing, or treat precancerous or cancerous lesions. Community outreach workers delivering HIV prevention services could additionally deliver information on HPV, HPV testing kits, or cervical cancer screening. With the mounting evidence on the non-inferiority of self-testing for HPV and recent approvals of self-testing kits in the U.S.,⁶¹ HPV testing may be more feasible than ever to deliver in the field with oversight of CHWs. HIV funders can support these efforts by dually training HIV staff on HPV and cervical cancer, providing outreach workers and mobile HIV testing units with HPV testing kits, and securing partnerships with cervical cancer treatment centers to facilitate linkage to care for more complex cases. Funding targeted to community-led organizations to perform these training initiatives would be most effective to achieve sustainable results.
- **Establishing connections between HIV, HPV, and cervical cancer services.** Not all healthcare settings will be appropriate for co-delivery of HIV, HPV, and cervical cancer services given time and/or resource constraints. Strong referral networks between providers and facilities are consequently key to ensuring that service users get the care they need. The risk of loss-to-follow-up with external referrals can be mitigated by strong relationships and patient-tracking systems across service delivery sites. HIV funders can invest in building these partnerships between HIV programs and specialized cervical cancer treatment sites and in patient-tracking and follow-up systems that help

people navigate care across multiple locations. As part of a comprehensive model, HIV funders could include support for transportation or other costs for service users who must travel to obtain cervical cancer care at another site. Additionally, investments in lab infrastructure would pay dual dividends for the efficient processing of HIV, HPV, and cervical samples.

- **Purchasing HPV tests and cervical cancer screening tools for HIV clinics.** Protecting the lives and health of WLHIV is paramount to the mission of HIV funders—whether the threat to health comes from HIV or an associated disease. Increases in healthy life expectancy of WLHIV through ART should not be blunted by high mortality from other preventable diseases like cervical cancer. HIV funders can uphold their mission by purchasing HPV tests and cervical cancer screening tools to stock HIV clinics as part of their core procurement model.

Investing in Building Partnerships Across Sectors to Fund Integrated Programs:

- **Developing partnerships between governments and donors to purchase HPV vaccines and tests and deliver services.** Strong models for cervical cancer screening and treatment in low-resource settings can couple government commitments to cervical cancer elimination and investment in health infrastructure with new donor funds to alleviate supply constraints. HIV funders have developed long-time partnerships with country governments to build facility and lab infrastructure that can be additionally leveraged for cervical cancer service delivery.
- **Committing to building multi-sectoral partnerships.** Public health challenges are complex and cannot be fully addressed by a single sector. Partnerships that extend beyond the health sector to include stakeholders from departments of finance, housing, and others will be central to an effective HIV and cervical cancer response.

Investments to Advance Integration Research and Innovations in Technology:

- **Prioritizing research to find low-cost, easy-to-use technologies for cervical cancer screening and treatment.** Important gains have been made in cervical cancer screening and treatment technologies including new tests for HPV, approval for self-testing, and updated screening recommendations to reflect evolving evidence. These advancements have the potential to increase early detection of HPV and abnormal cervical cells before progression to cervical cancer. Easy-to-use and accessible technologies may be especially important for reaching WLHIV. HIV funders can support this research and development agenda to detect and treat cervical cancer,

with an eye towards ensuring technologies meet the needs of WLHIV.

- **Increasing research on HIV, STI, and cervical cancer overlap and integration.** While the link between HIV and HPV acquisition is clear, more research on the impact of integrated programming for both HIV and cervical cancer outcomes is needed. There may be HPV-related benefits from current HIV or other STI prevention and treatment programs that are not being detected in current data collection. For example, more longitudinal research about the benefits of ART for cervical cancer is needed outside of high-income settings.²³ HIV funders investing in research or evaluation can take an integrated lens to designing evaluation questions and indicators to capture the full benefits of programs or interventions.
- **Improving surveillance and data systems to evaluate the dual benefits of investment in HIV and cervical cancer.** Current gaps in national data on cervical cancer outcomes and the overlap with HIV limit programmatic responses. It is valuable to both know the rates of cancer screening and treatment for WLHIV as well as the prevalence of HIV among women screened or being treated for cervical cancer. Including cervical cancer indicators in HIV data systems and disaggregating cervical cancer indicators by HIV status could improve data availability for both pandemics.

Conclusion

Investments in service integration will better meet the health needs of the population and are economically beneficial for health systems, with the potential to pay dividends towards ending both HIV and cervical cancer as public health threats.

Siloed disease-specific funding has played a critical role in responding to emergency public health threats and achieving specific research goals. Indeed, in the early days of the HIV pandemic, HIV-specific funding was the only option to quickly build HIV infrastructure and save lives in the face of a true public health emergency. However, the public health response is changing, becoming more integrated with an increased focus on sustainability. Rigid funding portfolios can work against a sector-wide response to health. Reviewing how funding is designed to encourage greater integration and find efficiencies is key to building a more robust health system that can simultaneously respond to multiple public health threats. As government agencies, civil society, donors, and the international community move forward to reduce the toll of HIV and cervical cancer, integrated funding and service delivery will be the only way to galvanize the attention and resources necessary to reduce suffering and save lives from these dual epidemics.

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