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THEMATIC SEGMENT:
Cervical cancer and HIV—addressing linkages and common inequalities to save women's lives

BACKGROUND NOTE

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All case studies have been compiled as a Conference Room Paper (UNAIDS/PCB (47)/CRP6), which is available on the PCB website.

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Key messages

- **New, ambitious targets to eliminate cervical cancer as a public health problem globally have been set: 90% of girls fully vaccinated with HPV vaccine by 15 years of age, 70% of women screened with a high-performance test by ages 35 and 45 years, and 90% of women identified with cervical disease receive treatment and care.** Achieving these targets could reduce more than 42% of new cervical cancer cases by 2045, with 300 000 deaths averted by 2030 and 14 million deaths averted by 2070.

- **HIV and cervical cancer are inextricably interlinked. Women living with HIV are at a sixfold higher risk of cervical cancer and are more likely to develop it at a younger age than women without HIV.** The fraction of cervical cancer attributable to HIV is ≥40% in the eight highest HIV prevalence countries in sub-Saharan Africa, compared to <5% in 127 countries with lower HIV prevalence. This contributes to the stark disparities in cervical cancer burden. Eighty-five per cent of women with cervical cancer and HIV live in sub-Saharan Africa, underscoring the major contribution of HIV to the cervical cancer burden in the region. Without ensuring access to the primary and secondary prevention and treatment of cervical cancer among women living with and at risk of HIV, their lives will not be saved and the global goals for cervical cancer elimination will not be met.

- **Worldwide, there are an estimated 570 000 new cases of cervical cancer annually with 311 000 cervical cancer-related deaths occur.** Nearly nine in ten women who die from cervical cancer live in low- and middle-income countries. In sub-Saharan Africa, Central America and south-central Asia, cervical cancer is the leading cause of cancer-related deaths among women. In southern Africa in 2018, 63.8% of women with cervical cancer were living with HIV, as were 27.4% of women in eastern Africa and there is an urgent need to scale-up vaccination, screening and treatment in countries with high HIV and cervical cancer burdens. Millions of lives have been saved by providing antiretroviral therapy to girls and women living with HIV, and these gains should not be undermined by failing to address cervical cancer.

- **Cervical cancer elimination is possible as we have all the necessary tools, and good progress towards that goal has been made in a number of settings**. The goal of cervical cancer elimination is within reach of countries as demonstrated through modelling the impact of scaling up of HPV vaccination and cervical cancer screening and treatment globally. To meet the global goal for cervical cancer elimination, however, dramatic scale-up of HPV vaccination for girls and young women at risk for HIV and cervical cancer screening and treatment programs that reach women and adolescent girls living with, and at risk of, HIV is urgently required. While the tools, platforms and programmes are well-established, it is necessary to strengthen these in order to increase the coverage and access to life-saving interventions substantially.

- **Primary prevention is key**. HPV vaccination coverage for girls is too low and urgently requires attention. HPV infections cause nearly all cervical cancer cases.

The HPV vaccine offers complete protection against 70%-90% of cervical cancer-causing HPV types. However, HPV vaccine coverage is low – especially in areas with high cervical cancer and HIV burdens. Overall, only 10% of girls in low and middle-income countries have access to HPV vaccination compared to 90% in high income countries.

- **We must act now to increase HPV vaccination coverage for girls**. Specifically, this requires introducing platforms that ensure high access for girls within and outside schools. Furthermore, we must think ahead to extend HPV vaccination to boys, adolescents, and young adults. While HPV immunisation coverage has been impacted by supply shortages, several vaccines are in the pipeline and should make vaccination of boys and multi-age cohort vaccination possible in the near future – in addition to the current emphasis on the vaccination of girls and – in some countries – adolescents.

- **Cervical cancer screening and early treatment work as secondary prevention and save the lives of women**. Screening methods require simplification to increase coverage and strengthen linkages to treatment for pre-cancerous lesions. HPV DNA screening, particularly paired with self-collection of specimens, has the potential to simplify cervical cancer screening by triaging women who need additional services into care. Of women who are screened with self-collection of vaginal specimens and HPV DNA testing, 85% will not require additional services, allowing health care personnel and resources to be focused on the remaining proportion who require additional services such as treatment of pre-cancerous lesions. As women living with HIV have a higher risk of cervical cancer, they require regular screening to ensure timely detection and successful treatment of precancerous lesions to prevent them from developing invasive cervical cancer. Low-cost and easy to use new and innovative technologies for screening and treatment of precancerous lesions must be made widely available, especially in resource constrained settings.

- **Integration of HIV and cervical cancer services is feasible and effective.** Cervical cancer screening and treatment of pre-cancerous lesions with a high-performance test such as HPV DNA screening should form part of routine care for HIV and sexual and reproductive health services. Women living with HIV are more likely to experience treatment failure and require regular screening, including rescreening, to ensure treatment success. Thermal ablation has been recommended by the WHO for the treatment of pre-cancerous lesions due to high efficacy and lower cost than cryotherapy.

- **Cervical cancer treatment is critical to improving quality of life and decreasing morbidity from cervical cancer.** Centres of Excellence that offer integrated care for women diagnosed with cervical cancer, including surgery, chemotherapy, radiotherapy, associated supportive services, and palliative care are needed – particularly in areas with a high cervical cancer burden. Such approaches prioritise early cervical cancer treatment including for women living with HIV; build in-country capacity for specialist services and harness innovations in care; offer women living with HIV and cervical cancer access to ongoing antiretroviral therapy while

undergoing treatment for cervical cancer, and include implementation science studies that focus on increasing coverage and access to high-quality services in a timely manner.

- **Cervical cancer and HIV both are diseases of inequality and health disparity across and within countries.** An interplay of social, economic and structural drivers, including poverty, gender inequality, gender-based violence, unequal power and relationship dynamics, social isolation and limited access to schooling and sexual education result in vulnerability to HIV and cervical cancer. Access to primary and secondary cervical cancer prevention, treatment and care services and support is limited for many girls and women living with, affected by and at risk of HIV. Steps to reduce overall disparities and improve the health of girls and women, including those vulnerable to and living with HIV, include:

    - Increasing access to education and economic opportunities for girls and women to reduce poverty, violence and injustice.
    - Fostering societal gender norms that support the ability of girls and women to make a choice about health care, including prevention of HIV and cervical cancer.
    - Increasing access to integrated sexual and reproductive health to enable access to high-quality sexual and reproductive health information, education, knowledge, and HIV and cervical cancer prevention and treatment services.
    - Ensure access to cervical cancer services for adolescent girls, young women, adult women, older women and key populations using the life-course approach. Adolescents need access to combined HPV-HIV prevention, specifically HPV vaccination, condoms, sexual and reproductive health services, and PrEP. Adult and older women with HIV require access to HIV treatment during their life-course and to cervical cancer screening. Higher mortality is seen with age for HIV and cervical cancer screening.

Introduction

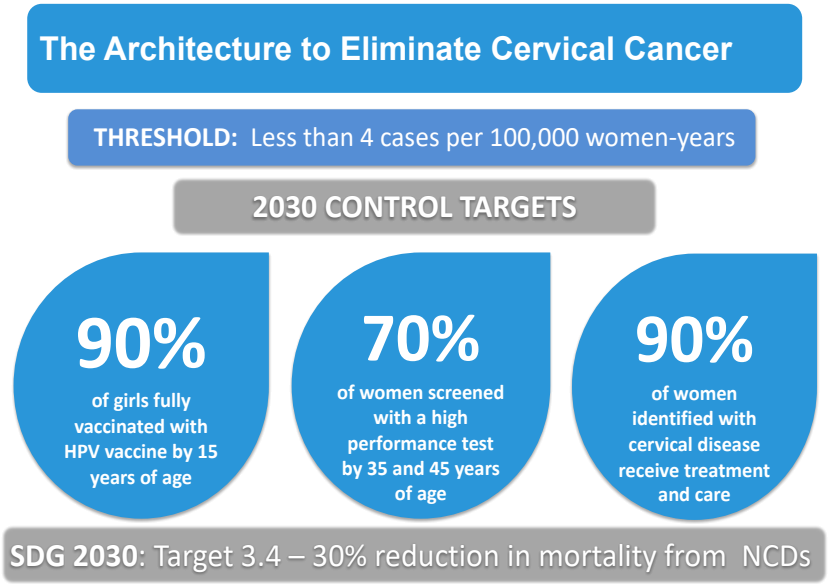
1. The UNAIDS Programme Coordinating Board (PCB) has chosen "Cervical cancer and HIV—Addressing linkages and common inequalities to save women's lives" as the thematic segment for the 47th PCB meeting. This segment recognizes the dual burden of HIV infection and cervical cancer on women and adolescent girls, and acknowledges that both diseases are linked to inequalities and health disparities.

2. This thematic segment focuses on reducing disparities and inequities within and across countries and communities, as well as on tackling stigma and discrimination to achieve good health and quality of life outcomes for women and girls living with, affected by, and at risk of HIV, human papillomavirus (HPV) and cervical cancer. Key considerations are:
   - the urgent need to address the links between HIV, HPV and cervical cancer;
   - using the opportunities for collaboration between HIV programmes, HPV and cervical cancer, sexual and reproductive health (including sexually transmitted infections), noncommunicable diseases, Universal Health Care and primary health-care programmes, and strengthening multisectoral, community-based and -led responses in addressing the common health, gender and socioeconomic inequities, and human rights concerns related to HIV, HPV and cervical cancer; and
   - using the potential for HIV and HPV and cervical cancer programmes to work together to address specific and diverse challenges and needs, and to achieve Universal Health Coverage.

3. This thematic discussion is timely, following the World Health Assembly's adoption in August 2020 of the Global Strategy towards eliminating cervical cancer as a global public health problem (Figure 1) and in the context of the development of the next UNAIDS Strategy.

4. The Global Strategy proposes that 90% of girls should be fully vaccinated with an HPV vaccine by the age of 15 years, that 70% of women should be screened with a high-performance test by 35 years of age and again by 45 years of age, and that 90% of women identified with cervical cancer disease should receive treatment (i.e. 90% of women with precancer are treated and 90% of women with invasive cancer are managed).[1] Achieving these targets could reduce median cervical cancer incidence rate by 42% by 2045, with 300 000 deaths averted by 2030 and 14 million deaths averted by 2070.[1]

Figure 1. Global strategy to eliminate cervical cancer



5. HPV infection is a necessary condition for cervical cancer and precancerous cervical lesions. Two types of HPV infection, HPV 16 and HPV 18, contribute to 70% of cervical cancer incidence globally.[2] While HPV is a sexually transmitted infection, penetrative sex is not required for transmission: skin-to-skin genital contact is also a well-recognized mode of transmission.[3]

6. Overall, the risk of HPV infection is twice as high among people living with HIV, irrespective of sexual orientation, in comparison to people who are HIV-negative. HPV infections are half as likely to be cleared among people living with HIV in comparison to people who are HIV-negative.[4] Women living with HIV have a six-fold higher risk of cervical cancer compared to women who are HIV-negative. The higher risk is manifested throughout the life cycle, starting with an increased risk of acquiring HPV infection, more rapid progression to cancer, developing cervical cancer at younger age,[5] lower chances of regression of precancer lesions, and higher rates of recurrence following treatment.[6] Women with HPV infection face a two-fold higher risk of HIV acquisition compared with women without HPV infection, due to the disruption of the mucosal surface of the cervix and increases in cellular targets for HIV.[4]

7. Cervical cancer is preventable and can be successfully treated, particularly if precancerous lesions are detected early, although treatments for invasive cancer are more complex and costlier. HPV vaccines are safe and effective for girls, boys, adolescents and adults regardless of HIV status.[1] [7]

8. There are three HPV vaccines on WHO's prequalified list.[2] WHO, PATH, and UN Population Fund (UNFPA) have made recommendations for the successful implementation and sustainability of a vaccine delivery strategy, including: planning requirements; overcoming vaccine hesitancy based on misinformation; and addressing

[1] These vaccines reduce the incidence of HPV by 80%, anogenital wart diagnoses by 70% and cervical intraepithelial neoplasia 2 and 3 (CIN2+) —the premalignant lesions that can progress to cervical cancer—by 50%.
[2] Cervarix (Bivalent) by GlaxoSmithKline, Gardasil 4 (Quadrivalent) by Merck Vaccines and Gardasil 9 (Nonavalent) by Merck Vaccines. All three vaccines prevent infection against HPV 16 and HPV 18, the two highest-risk HPV subtypes, which are known to contribute to at least 70% of cervical cancer cases.

the social, cultural, societal and other barriers that may affect vaccine acceptance and uptake.

9. While many high-income countries have integrated costly HPV-DNA testing into their cervical cancer screening programmes, lower cost and accurate HPV tests are available and are relevant for point-of-care services in low- and middle-income countries (LMICs).[8] Surgery, radiation therapy and chemotherapy are forms of cervical cancer treatment, and palliative care and symptom control are options for late-stage cancer or for less advanced disease where treatment is not affordable.[9]

10. Sexual debut marks the onset of risk for HPV infection, and WHO recommends a two-dose HPV vaccination for cervical cancer prevention among girls aged 9–14 years as the primary target group, preferably prior to any sexual activity. Vaccination of women and girls aged 15 years and older, and of boys and men may be considered if it is feasible, affordable and cost-effective and if it does not divert resources from the primary target population or screening programmes.[10] Vaccination of females is the most cost-effective approach.[11] Consistent condom use prevents sexually transmitted infections including HPV and HIV,[12] and adherence to pre-exposure prophylaxis (PrEP) regimes prevents HIV infection.[13]

11. Programme coverage for cervical cancer prevention, treatment and other support is inadequate in LMICs where HIV prevalence and HPV infection rates are highest.[14] Nearly nine out of ten cervical cancer deaths occur among women in LMICs.

12. To date, insufficient attention has been paid to the links between cervical cancer and HIV, and there is an urgent need to synergize efforts to prevent, diagnose and treat cervical cancer early. There is also a need to provide a continuum of treatment and care for women with advanced cervical cancer in the context of the gains made in preventing and treating HIV infection in adolescent girls and women. Consequently, it is strategically relevant to urgently promote awareness of HPV as a sexually transmitted infection and to promote HPV vaccination, cervical cancer screening and treatment and care services in conjunction with existing HIV prevention, testing and treatment programmes.

13. Although a number of cancers can be detected through screening, WHO recommends that all countries prioritize cervical cancer screening in particular.[11] The prioritization of cervical cancer prevention and treatment links to the work of the UN Interagency Task force on the Prevention and Control of Noncommunicable Diseases, the Global Action Plan for Healthy Lives and Well-being for All, The WHO Global Action Plan for the Prevention and Control of Noncommunicable Diseases, Universal Health Coverage and the "Every Woman Every Child" movements.

14. The COVID-19 pandemic poses additional challenges. The pandemic is affecting the HIV response globally.[15] Noncommunicable disease services, including cervical cancer services, and community outreach have been disrupted. HPV vaccination programmes in schools have been postponed or shifted to health facilities.[16] Despite these challenges, the COVID-19 pandemic also presents an opportunity to adapt health services, innovate to minimize disruptions, and scale up people-centred interventions for HIV and cervical cancer.

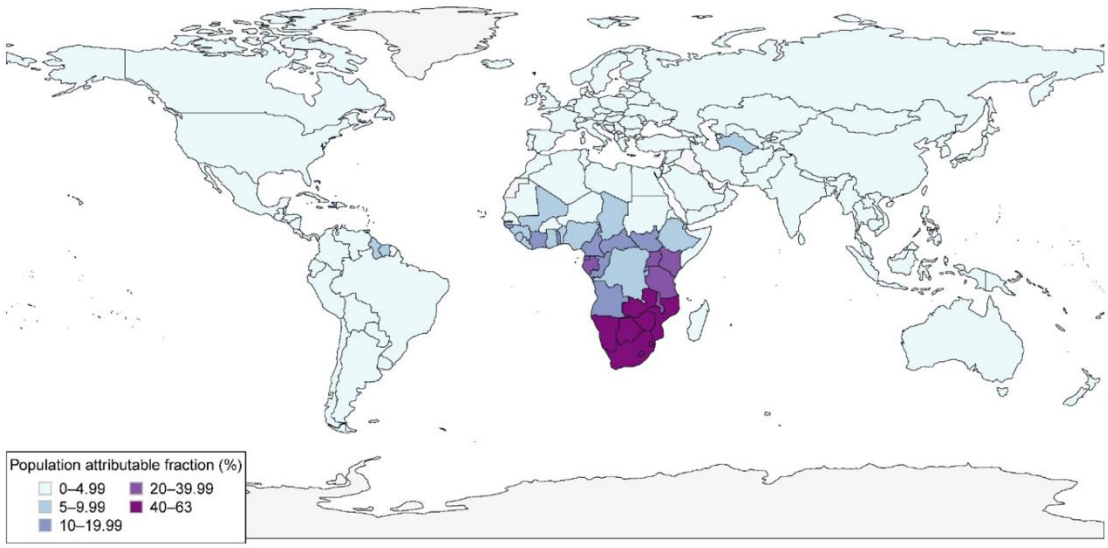
Cervical cancer and HIV

15. Life expectancy among people living with HIV has increased thanks to the global roll-out of antiretroviral therapy (ART) and the emphasis on sustained viral load suppression. ART prevents HIV-related morbidity and mortality and inhibits onward transmission of HIV. Undetected and untreated cervical cancer cases are threatening the gains in life

expectancy and quality of life among girls and women living with HIV. Poor access to HPV vaccination places girls who are vulnerable to HIV or living with HIV at elevated risk of HPV infection and cancer.

16. Noncommunicable diseases are on the rise among people living with HIV globally, with vulnerabilities and incidence highest in LMICs. Geographically, high-incidence areas for HIV and cervical cancer overlap (Figure 2). Three quarters of new HIV infections globally are in eastern and southern Africa, western and central Africa, and Asia and the Pacific. Adolescent girls and young women aged 15–24 years accounted for approximately 1 out of 4 new HIV infections in sub-Saharan Africa in 2019, even though they comprised only one-tenth of the population in that region.[19]

Figure 2. Population-attributable proportions of women with cervical cancer who are living with HIV, 2018[6]



17. Over 85% of all sexually active men and women will be infected with a type of HPV at some point during their lives.[17] HPV infections usually clear up without any intervention within a few months after acquisition, and about 90% clear within two years.[18] However, persistent exposure and incidence, particularly of HPV 16 and 18, increase the likelihood of cervical cancer developing in women.

18. Women living with HIV have higher rates of HPV infection and precancerous lesions, with a six times higher risk of invasive cervical cancer.[19 20] They have lesions which are more aggressive, persistent and which are likely to recur following treatment.[21] Among women living with HIV, having a low CD4 count increases the risk of acquiring HPV,[19] whereas ART may reduce the likelihood of acquiring HPV, increase HPV clearance and reduce precancer progression.[22]

19. Of the 570 000 new cases of cervical cancer in 2018, the majority were in sub-Saharan Africa. Approximately 85% of new cervical cancer cases among women living with HIV occur in the WHO Africa Region, 7% in South-East Asia and 4% in the Americas.[23 24 25]

20. Worldwide, an estimated 5% of all cervical cancer cases are attributable to HIV, with significant disparities across and within countries. In areas with the highest HIV prevalence, the proportion of cervical cancer attributable to HIV is as high as 75% in

Eswatini, 70% in Lesotho, 67% in Botswana, 63% in South Africa and 52% in Zimbabwe. In 127 other countries with much lower HIV prevalence, less than 5% of cervical cancer cases are attributable to HIV.[6]

21. Cervical cancer is the fourth most common cancer among women worldwide. Globally there were 311 000 cervical cancer-related deaths in 2018. Cervical cancer was the leading cause of cancer-related deaths among women in sub-Saharan Africa.[26]

22. The untimely loss of life caused by HIV and cervical cancer is a tragedy which also affects communities and societies at large. Cervical cancer elimination will lead to positive economic and societal outcomes. By 2030, approximately 250 000 women will remain productive members of the workforce, adding an estimated US$ 28 billion to the world economy—US$ 700 million as a direct result of increased workforce participation and about US$ 27 billion as an indirect "good health" benefit. [27]

23. Comprehensive cervical cancer control includes primary prevention (vaccination against HPV), secondary prevention (screening and treatment of precancerous lesions), tertiary prevention (diagnosis and treatment of invasive cervical cancer) and palliative care. WHO recommend screening sexually active women living with HIV for HPV or cervical abnormalities as soon as they are diagnosed with HIV and rescreened within three years if they are HPV-negative and free of cervical lesions.[28] While the HIV response has included a strong emphasis on reducing the costs of antiretrovirals and other drugs, there is still work to be done regarding patents and cost reductions for HPV vaccines,[29] as well as for technologies for cervical cancer screening, medicines and services for treatment and care.

Health disparities and other inequalities common to HIV and HPV/cervical cancer

24. The Global Strategy to accelerate elimination of cervical cancer as a public health problem recognizes that inequality underpins people's vulnerability to disease and contributes to limited access to the timely and high-quality services that can save women’s lives and safeguard their quality of life.[30] The same inequalities increase women and girl's vulnerability to HIV infection. There are distinct benefits to utilizing the HIV response infrastructure to reduce HPV infection as well as illness and death associated with cervical cancer, while also strengthening cervical cancer screening of women and girls with HIV.

25. Inequalities and inequities influence access along the pathway to HPV vaccination, cervical cancer screening and further care in LMICs. For example, 95% of the 100 million adolescent girls who received at least one dose of the HPV vaccine between 2006 and 2017 were living in high-income countries. Only 30% of low-income countries have pathology services, cancer surgery, chemotherapy and radiography generally available, compared with more than 90% of high-income countries. As of 2020, only one quarter of low-income countries have introduced HPV vaccination into their national immunization schedules.[31]

26. Cervical cancer disparities exemplify the experiences of the most vulnerable and marginalized women and girls, including those living with, affected by and vulnerable to HIV, mainly in LMICs. They face multiple, intersecting and shifting challenges to their sexual and reproductive health and rights, including gender, social, cultural and economic inequalities and challenges.

27. Gender, social, educational and economic inequalities and inequities underpin the higher vulnerability of women and girls to HIV infection, as well as to other sexually transmitted infections such as HPV. Gender-based and intimate partner violence increases the

prevalence of sexually transmitted infections. Girl children and adolescent girls have limited access to sexual reproductive health (SRH) and HIV services, and many women and girls do not have full control over their sexual and reproductive health decisions. Comprehensive sexuality education for adolescents is limited in many countries, and even though school attendance is associated with lower HIV risk, adolescent girls are less likely than their male peers to complete their schooling.[32]

28. Cervical cancer incidence and mortality differ substantially depending on income quintile, access to health-care services, race and ethnicity. Women and adolescent girls with less formal education or who live in rural areas and face adverse social and gender norms are more affected, including in high-income countries. In the United States, research found that women in the lowest socioeconomic group had a 76% higher cervical cancer mortality rate than women in the highest socioeconomic group.[33] Hispanic and African American women tend to have significantly lower five-year cervical cancer survival rates than women belonging to other racial groups, and their cervical cancer mortality rate is more than twice higher than that of white women.[34]

29. Stigma and discrimination (including in relation to HIV and noncommunicable diseases, such as cancers) contribute to poor health by hindering healthy health-seeking behaviours, particularly in LMICs. [35] Key populations are at higher risk of HIV infection and are more likely to experience overlapping stigmas. Sex workers have an overall high prevalence of HPV infection, especially subtypes 16 and 18, due to the nature of their work—and are consequently at increased risk of cervical cancer.[36] They are also made vulnerable by overlapping stigmas associated with cervical cancer, sex work and HIV.

30. While most high-income countries have reduced cervical cancer incidence and mortality, more than 85% of new cervical cancer cases and 80% of mortality occurs in LMICs. This disparity is largely due to much lower access to vaccination and limited availability and affordability of screening services, treatment services and follow-up. These factors, in turn, are related to a lower prioritization of HPV prevention and cervical cancer response in policies, along with resource limitations.[37]

31. The out-of-pocket costs for engaging in care can be significant. For cervical cancer screening among women living with HIV on ART, the cost for visual inspection with acetic acid (VIA) is US$ 3.24–3.67, for Papanicolaou smear (Pap smear) it is US$ 8.17–24.08, and for HPV testing it is US$ 17.92–54.34. Additional costs range from US$ 18 to US$ 26 per visit per person receiving integrated cervical cancer screening.[38]

Challenges and gaps in addressing HIV and cervical cancer

32. The WHO-initiated Global Strategy toward eliminating cervical cancer as a public health problem includes reducing the age-adjusted incidence rate to under 4 per 100 000 women in all countries, while also scaling up treatment and access to palliative care. Current incidence rates per country range from 70 per 100 000 women in the highest-risk countries to less than 10 per 100 000 women in the lowest-risk countries.[39]

33. Early detection is one of the most effective public health measures for cervical cancer prevention and is supported by awareness of symptoms or the need for screening, effective diagnosis, and referral for and access to treatment and care. Late-stage diagnosis is common in LMICs, including among women living with and at risk of HIV, and although many countries have screening programmes, they frequently are not well-planned or -implemented. Challenges include incorrect target populations, low participation rates and misallocation of resources.[11]

34. WHO recommends screening sexually active women living with HIV for HPV or cervical abnormalities as soon as they are diagnosed with HIV, and then rescreening them within three years if they are HPV-negative and free of cervical lesions.[28] Currently, suboptimal coverage of screening is impeding cervical cancer prevention efforts. The estimated coverage of cervical cancer screening programmes in 11 reporting countries with either opportunistic or organized population-based screening programmes for cervical cancer in 2019 varied from less than 10% in Ethiopia, Guinea and Madagascar to 50%–70% in Mozambique and South Africa.

35. Adding cervical screening to HIV services is cost-effective and scalable, yet such integration occurs in few LMICs. In 2019, only 9 of 47 reporting LMICs had done so and only 4 of those countries have high HIV burdens and are in sub-Saharan Africa. A further 12 countries had integrated services in some health facilities.[40] High levels of failure to retain women who need treatment have also been reported in some countries.

36. While vaccination for HPV is a proven prevention measure, of the 118 million women who have received the HPV vaccine so far, only 1% (1.4 million) live in LMICs.[8] Barriers to vaccine scale-up include cost, vaccine supply, and vaccine hesitancy. As efforts to increase access to HPV vaccination in LMICs accelerate, it is becoming clear that concerns regarding acceptability—especially among parents of girls who qualify for vaccination—need to be addressed.[41]

37. Global HPV vaccine availability is currently insufficient to meet demand, including in high HIV burden countries and settings. Barriers for vaccine delivery include a limited supply, vaccine price, and the high delivery cost (because the vaccine is not integrated into most existing childhood immunization programmes).[42] To address the shortage of vaccines, a consortium of stakeholders, including WHO and the UN Children's Fund (UNICEF), is supporting the manufacture of HPV vaccines.

38. Early diagnosis is a priority in cancer prevention, yet knowledge and awareness of cervical cancer prevention and screening have been found to be poor in sub-Saharan Africa and in LMICs globally. [43] [44] Screening coverage and access to treatment remain limited in LMICs due to constrained resources and capacities. In 2019, Iceland and Ireland reported over 70% screening coverage, while Australia and South Africa reported 50%–70% coverage, Côte d'Ivoire and Kenya reported 10%–50%, and Morocco, Myanmar, Peru, Timor-Leste and Ukraine reported less than 10%.[45]

39. Screening women living with HIV for cervical cancer works. In the United States, the risk of precancerous lesions among regularly-screened women living with HIV was similar to that among HIV-negative women, highlighting the importance of screening in this population.[46] In high-income countries and LMICs, a simplified, but comparatively effective screening regimen could successfully increase screening coverage among HIV-positive women. Such a regimen would involve fewer screenings, lengthened screening intervals, self-collected swabs and/or co-testing for high-risk HPV 16 or DNA methylation.[47] [48]

40. Country studies show that health system factors including lack of resources, limited health-care worker motivation, stigma and discrimination and poor patient-centred communication inhibit prevention uptake.[49] [50] [51]

41. While radiotherapy is among the approaches for treating cervical cancer, there is on average only 1 radiotherapy machine per 3.6 million people in Africa,[52] compared to the recommended ratio of 1 machine per 250 000 people.[53] Twenty-five countries in Africa and 2 countries in Asia have an extreme shortage of clinical oncologists.

42. Tools such as HPV molecular tests and alternative treatment devices are out of reach, and health-care workers in LMICs rely on substandard tools and strategies to manage precancer, prevent cervical cancer and reduce cervical cancer-related mortality. Without improving the affordability and availability of high-quality screen-and-treat tests and other medical devices, it will be difficult to scale up cervical cancer services and integrate them with HIV interventions.

43. The HIV and COVID-19 responses have shown that high-performance, low-cost, easy-to-use, self-managed, digital, mobile and Artificial Intelligence-based technologies can be used to broaden coverage, especially in resource-limited settings. There is an urgent need for a paradigm shift in screening, diagnosis and treatment for cervical cancer in many LMICs to increase equitable access to early detection and treatment of precancer and cancer, especially for women living with and vulnerable to HIV.

44. Affordable and easy-to-use technologies can help ensure equitable access to cervical cancer prevention and treatment in LMICs, including for women and adolescent girls living with and vulnerable to HIV. Examples include:
    - self-collection of vaginal samples for HPV testing without speculum examination at a clinic;
    - artificial intelligence-assisted diagnostic technologies for precancer screening and cytological evaluations;
    - affordable mobile or portable battery-run thermocoagulators for precancer treatment; and
    - use of mobile phones for health information tracking, referrals and follow-up visit reminders.[54]

45. Precancer treatment failure and recurrence is more common among women living with HIV than among HIV-negative women and also may be affected by treatment modality.[55] Shortages of oncologists, gynaecologist-oncologists, histopathologists, palliative care providers, radiotherapy and other equipment, and sustainable equipment maintenance services are barriers to cervical cancer diagnosis and treatment in LMICs.[56] [57]

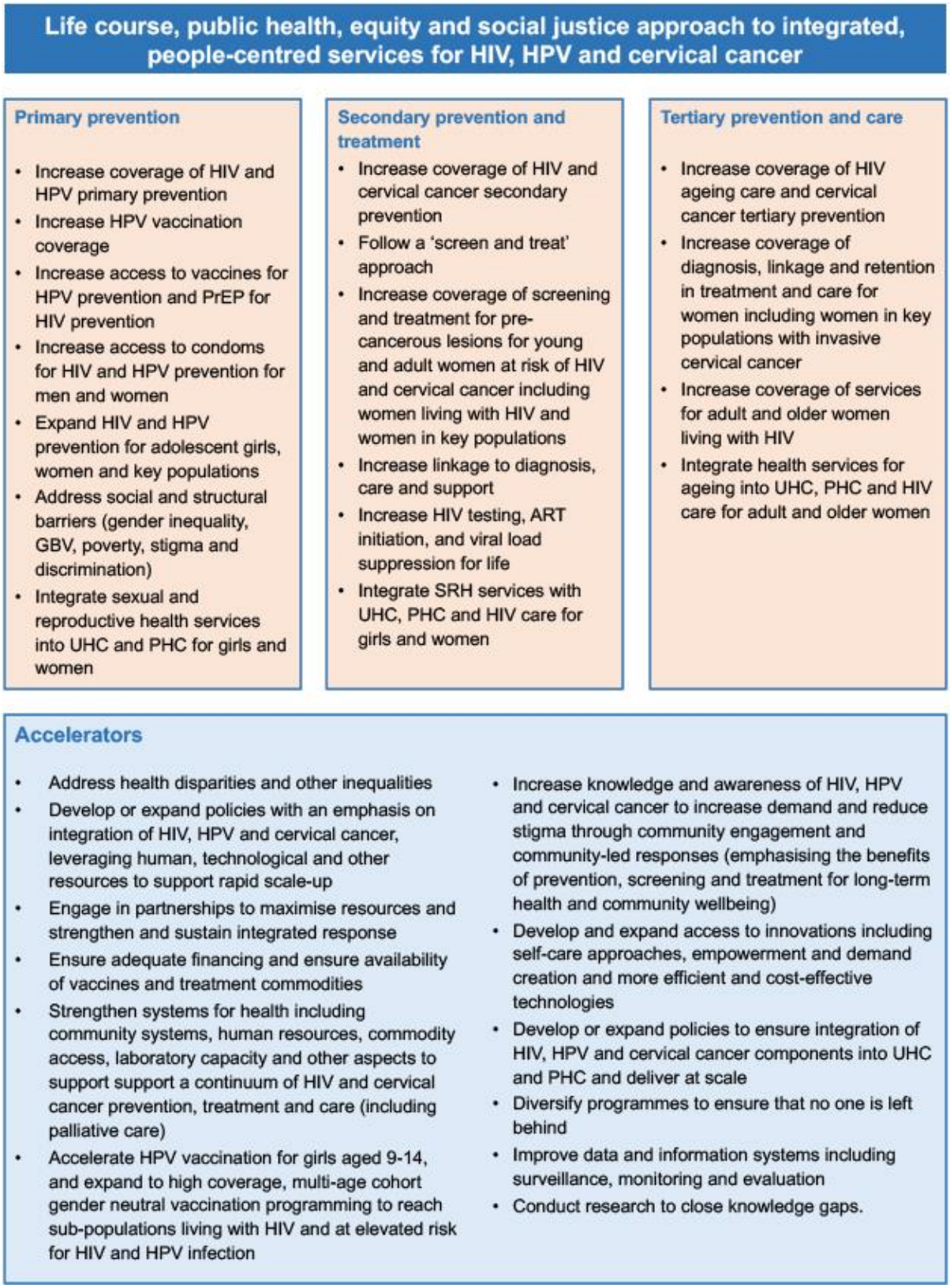
46. HPV infection and cervical cancer evoke stigmatizing reactions due to associations with sexual transmission, HIV-positivity, and sexual and reproductive aspects of women's health.[58] [59] Fear of casual transmission of cancer, self-blame, and fear of disability and death also contribute to stigma, including self-stigma.[60]

47. A review of the barriers to the use of cervical cancer screening in sub-Saharan Africa found similarities across countries and cultural contexts, including low awareness, fear of screening procedures and negative outcomes, privacy concerns, lack of spousal support, stigma, cost of accessing services and health service factors, such as the attitudes of health-care workers.[61] Lack of knowledge about cervical cancer and screening is common across LMICs,[62] and reviews of studies about knowledge of HPV and cervical cancer among women living with HIV highlight common misconceptions, lack of understanding of susceptibility and a dire need for social and behavioural communication.[63] [64]

Strategies and opportunities for integrated approaches

48. A life-course, public health, equity and social justice approach to integrated, people-centred health services for HIV, HPV and cervical cancer is needed to end AIDS and cervical cancer as public health threats, and to reach universal health coverage. This can be achieved by including the prevention of HIV and HPV, secondary prevention of cervical cancer and access to HIV treatment, and tertiary prevention and care, including care related to ageing, in the integrated approaches (Figure 3).

Figure 3. Proposed strategy towards the global goals of ending AIDS and cervical cancer as public health threats: key outputs



49. The Global Strategy to accelerate the elimination of cervical cancer as a public health problem includes three targets: 90% coverage of HPV vaccination, 70% coverage of

cervical cancer screening, and 90% success rate for treatment management. The Global Strategy highlights the importance of prioritizing and urgently implementing integrated preventive, screening and treatment services through a Primary Health Care package for both diseases to increase efficiencies and maximize impact.[31] The Global Strategy further emphasizes the need to address inequities in health outcomes among vulnerable or underserved populations, including women with HIV, by using tailored approaches.

50. Opportunities for integrating HIV, HPV and cervical cancer services occur across the prevention and care continuum. Screening and treatment of precancerous and cancerous lesions can be integrated into existing HIV, SRH, primary health-care and other service delivery platforms. Available infrastructure can be used more efficiently, as women engage in health care throughout their lives (e.g. antenatal care, well-child visits, family planning, primary health care and more). For women and adolescent girls living with and at risk of HIV, integration of cervical cancer screening with HIV testing, treatment and care is advised.

51. Integration of cervical cancer and HIV prevention and treatment should seek to increase access to services in ways that reduce health inequalities and disparities, and that are sustainable. This can be achieved by focusing on adolescent girls, young women, adult women, older women and key populations using the life-course approach. Adolescents need to be able to access to combined HIV and HPV prevention (e.g. condoms, PrEP and HPV vaccination). Similarly, older women require access to ART for HIV during their life-course, as well as to cervical cancer screening.

52. Chronic HIV and cervical cancer clinical management can be integrated into specialist sexual health services, with referrals from community-based cervical self-sampling, HIV self-testing, key population outreach, and referrals from primary health care, antenatal services, and SRH services. HPV vaccination programmes can be integrated with sexuality education, school-based health promotion and health services, and health facility-based service delivery systems for adolescents, including those at risk of HIV infection, living with HIV and/or receiving HIV treatment.

Financing

53. To close the funding gap, it is vital to conduct costing, cost-effectiveness and budget impact analyses to support programmes and implementation plans for long-term, integrated budgets and programmes. The investment case approach for cervical cancer elimination supports such work. WHO has a "Cervical Cancer Prevention and Control Costing Tool"[65] with an HPV vaccination module available online to support the generation of cost estimates for vaccination and cervical cancer screening. While not specifically designed for HIV, the spreadsheet application is flexible and can support the required budget estimations.

54. The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) has increased funding and technical support to expand access to cervical cancer screening and treatment services for women living with HIV. The focus on integrating those services with HIV treatment and care services at PEPFAR-supported HIV sites in sub-Saharan African countries through the "Go Further" partnership.[66] All PEPFAR-supported countries with HIV prevalence above 5% among women in the 15–49-year-old age group are expected to provide cervical cancer screening for women who are receiving ART. With increased funding of more than US$ 38 million available in the fiscal year 2020, screening has expanded significantly in 12 "Go Further" partnership countries in eastern and southern Africa.

55. The Global Fund to fight AIDS, Tuberculosis and Malaria (Global Fund) supports countries' cervical cancer prevention and treatment activities as part of their HIV programmes.[67] Since 2014, 20 sub-Saharan African countries have received Global Fund support for their HPV and cervical cancer prevention services and for integrating those services into their HIV programmes. In 2020, the Global Fund encouraged country funding requests that incorporate strategies for cervical cancer prevention including:
    - integration of family planning and SRH services, including cervical cancer screening, into HIV care for all women in high-prevalence areas to improve cost-effectiveness, uptake, access and quality of care;
    - screening for cervical cancer and HPV;
    - linking HIV prevention activities to HPV vaccine programmes, as relevant to the country context or adolescent girls and young women; and
    - opportunities for cofinancing HPV vaccination activities.

56. There is an opportunity to include HIV, HPV and cervical cancer components in the Global Fund's new 2023-–2028 Strategy.

57. Unitaid has launched two significant investments to address barriers to the introduction of innovative technologies and approaches for secondary prevention of cervical cancer. If taken to scale, these could enable countries to meet the elimination targets. The investments in 11 countries aim to reduce global mortality from cervical cancer through a multipronged approach by introducing innovations into national cancer elimination programmes and by advocating for their adoption and scale-up. Through Unitaid partnerships with the Clinton Health Access Initiative and Expertise France, in collaboration with Jhpiego and the Union for International Cancer Control, the focus is on:
    - new screening methods, such as introducing HPV molecular testing and artificial intelligence-based screening tools (e.g. automated visual evaluation or AVE) to detect precancerous lesions on the cervix;
    - new, affordable and effective methods for treatment of cervical precancerous lesions, such as portable and other thermal ablation devices;
    - new and improved service delivery models, such as self-sample collection for HPV testing, and mHealth-supported patient navigation through diagnostics and treatment; and
    - community engagement and demand generation.[68]

58. Total investment across Unitaid grants and WHO support amounts to US$ 60 million over the next three years in India, Kenya, Malawi, Nigeria, Rwanda, South Africa and Zambia (optimal screening tests and treatment) and in Burkina Faso, Côte d'Ivoire, Guatemala and the Philippines (cervical cancer elimination scale-up).

Case study: Malawi—reducing operational costs

As part of the integration agenda for Malawi, a joint cervical cancer and HIV programme response was developed with the formulation of the joint national coordination structure, comprising the Department of HIV and AIDS, Reproductive Health Directorate, and National Aids Commission. The national Government and USAID/ PEPFAR provided financial support. A national HIV/cervical cancer technical working group was set up to oversee the technical aspects of cervical cancer and HIV implementation. The main objective was to reduce operational costs for controlling both epidemics while also reducing cost as a barrier to accessing services. Collaboration between the HIV and reproductive health directorates offered opportunities for resource mobilization to advance the integration agenda. The involvement of adolescent girls and young women, as well as of sex workers and members of key populations, in developing and revising HIV and SRH policies ensured that nobody was left behind. The approach increased service uptake and treatment, and there is potential to scale up from 311 to 750 HIV treatment sites, if sufficient financial resources are available.

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Technologies and data systems

59. The Global AIDS Monitoring and National Composite Policy Index gathers country-level data on cervical cancer screening among women living with HIV and on the integration of HIV and cervical cancer policies and services. These data provide opportunities for data-driven programming that integrates cervical cancer services and HIV care.[69]

60. WHO recommends thermal ablation as superior to cryotherapy treatment method for women who have histologically confirmed CIN2+ or who have been screened positive in screen-and-treat strategies, especially in LMICs.[70] Traditional gas-based cryotherapy is difficult to implement because refrigerant gas, such as CO_2, is expensive and difficult to procure and transport. Thermal ablation devices are battery-operated, lightweight (2–5 kgs) and have shorter treatment time. The use of thermal ablation in low-resource settings has been shown to be effective and acceptable.[71]

Case study: Kenya—improving patient tracking through the health information system

In Kenya, cervical cancer comprises around 11% of cancer cases and is the second-leading cause of cancer deaths. Kenya is implementing strategies for the global goal of cervical cancer elimination. Drawing on the WHO guidelines, comprehensive national cancer screening guidelines have been formulated and disseminated to all 47 counties. The guidelines recommend programmatic screening for all women aged 30–39 years, using HPV DNA testing as the gold-standard method (or VIA where HPV testing is unavailable or as a follow-up test for a positive HPV test). The approach utilizes GeneXpert machines that are already available through the tuberculosis and HIV programmes. Data collection, monitoring and evaluation, utilize the available surveillance infrastructure, and the screening data is uploaded into the Kenya Health Information System. Community engagement has supported awareness building and county ownership supports sustainability. The main challenges have been commodity shortages and ensuring that women have convenient access to their results to ensure linkage to care and follow-up.

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Cervical cancer elimination

61. Cervical cancer elimination is feasible. Australia is on-track to eliminate cervical cancer by 2028, with ≤4 cases per 100 000 women. It was the first country to initiate publicly funded HPV vaccination (in 2007) with multi-age cohort, gender-neutral vaccination for 12–13-year-olds. Catch-up vaccination was offered for women up to the age of 26 years until 2009 and for boys up to the age 15 years until 2015. Approximately 75% of girls and boys have been vaccinated against HPV.[72] High coverage of vaccination resulted in new cases of cervical cancer being reduced by about one half. As a result, the interval between screening increased to 5 years, and Australia adopted HPV DNA screening as the primary method for national cervical cancer screening. Overall, 85% of women are screened for cervical cancer every 5 years. Since being introduced in 1991, national screening has reduced cervical cancer incidence by about one half in women older than 25 years.

62. In Rwanda, the drive towards the elimination of cervical cancer was initiated through a national prevention programme for cervical cancer in 2013, with HPV vaccination as the first step.[37] Pre-immunization activities, such as establishing a diverse technical group with subcommittees that managed detailed immunization logistics, were key to the success of the HPV vaccination campaign. Community health workers and nurses promote HPV vaccination and dispel myths associated with the HPV vaccine. Key stakeholders (including spiritual leaders, government officials, teachers and volunteers) support educational programmes, direct person-to-person interactions and billboard advertising. Along with community mobilization, Rwanda was able to surpass Australia in HPV vaccination coverage, by reaching >93% of girls aged 11–15 years. VIA screening is used to reach women who are older than the eligible age for vaccination.

63. In keeping with the 2016–2021 UNAIDS Strategy Fast-Track commitment to take AIDS out isolation, the "Go Further" public-private partnership between PEPFAR, the George W. Bush Institute, UNAIDS and Merck, cervical cancer screening and treatment of

precancerous lesions was scaled up in HIV treatment health facilities across 12 countries in sub-Saharan Africa. By March 2020, over 1 million cervical cancer screenings had been conducted, nearly 9 in 10 of which were first-time screenings. This led to 50 000 women being treated for precancerous lesions.[73] This approach illustrates the potential for low-cost, rapid scale-up. It is being expanded through the PEPFAR guidance for Country Operational Plans.[74]

64. In Zambia, funding from the national government and the United States was used to develop integrated HIV and cervical cancer programmes. Surgery and radiotherapy services were provided, and the approach now forms the basis for regional training. Virtual reality gynaecological training is used, and a "see-and-treat" approach is being followed. The approaches are being integrated into public health clinics, thereby extending the impact beyond a primary focus on women with HIV, which also reduces stigma. Settings with a high burden of HIV are being prioritized. Cervical cancer screening is fully integrated into ART clinics. Community sensitization has strengthened service uptake. Supportive engagement includes working with communities, networks of women living with HIV and a multistakeholder coalition which is managed in the auspices of the First Lady Foundation.

Case study: Nigeria—catalyzing the use of optimal screening tests and treatment devices

An estimated 50 million Nigerian women are at risk of cervical cancer. Yet screening programmes cover less than 9% of the population. More than half of all cervical cancer cases occur among women living with HIV. Unitaid and the Clinton Health Access Initiative, in collaboration with the Federal Ministry of Health, set out to accelerate access to screening and treatment in three states, working with 177 health-care facilities (including 136 ART sites reaching women living with HIV). Women use self-sampling kits, supported by the existing multiplex testing platform. AVE screening technology is used. It employs artificial intelligence to overcome the inadequacies of human-based visual inspection of the cervix. AVE analyses images to detect precancer, providing effective screening at very low cost through a software application on mobile phones.

Portable thermal ablation and Loop Electrosurgical Excision Procedure devices, which are useful in low-resource settings, are used for the treatment of precancerous lesions. The programme strengthens the capacity of health-care workers and engages civil society organizations to generate demand for cervical cancer services among women living with HIV. It includes building a robust patient-tracking system for cervical cancer, which allows for linking patient records across multiple contact points to support service provision and follow-up. The programme reinforces country ownership by working with the Federal Ministry of Health, while also brings together multisectoral partners to strengthen the programme. It is a good example of how different innovations can be applied jointly on a wide scale.

Integrated services

65. The country case studies describe how some countries/cities have successfully integrated HIV and HPV/cervical cancer services, and offer examples of approaches which can be expanded and used as best practices.

66. It is widely recognized that service integration and linkages can improve care and reduce missed opportunities for key interventions such as HIV testing, provision of ART, prevention of vertical transmission of HIV, and adherence support. This entails providing multiple services in a single visit.

Case studies: Uganda, Senegal, Guinea Bissau

In Uganda during 2016–2020, UNFPA supported the delivery of integrated sexual reproductive health and rights services to increase access to cervical cancer and HIV services for vulnerable women and girls (especially key populations, people living with HIV and adolescent and young people engaged in risky sexual behaviours). Activities focused on national advocacy for resource mobilization and embedding cervical cancer screening and referral into the various SRH, HIV and gender-based violence services in 17 UNFPA-supported districts.

A national implementation plan for cervical cancer prevention and control was developed, and HPV testing was prioritized for people living with HIV. A monitoring and evaluation plan was developed, along with health management information system tools. Resources were leveraged from additional funding sources, including from PEPFAR.

The acceptability of HPV testing of women living with HIV was explored by linking women to care and receiving VIA and treatment, if needed, on the same day they received their results. A benefit of this integration was that a high proportion of women were first-time screeners and there was good follow-up, with thermal ablation providing a practical approach for prompt on-site treatment of VIA-positive women in a low-resource context. Although health-care workers were provided with additional training, staff rotations posed a challenge for sustaining the presence of trained personnel.

In Senegal and Guinea Bissau, integrated HIV and cervical cancer screening and treatment services increased attendance and the use of services at care sites for people living with HIV, and at health and community structures for key populations.

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67. Since cervical cancer is the most common cancer among women living with HIV, health care facilities should offer more services, as well as coordinated and comprehensive care. A strong ability to manage patients with multiple health care needs would drastically improve health outcomes for women. The benefits of integration include cost efficiencies.

Country case studies: Iran (Islamic Republic of), Ukraine, Zimbabwe

In the Islamic Republic of Iran, women living with HIV and other vulnerable women are able to access HPV vaccine and cervical screening as part of the national HIV care and treatment protocol. Awareness-raising, advocacy, and capacity building for peers and service providers are central to the programme, which is implemented with financial support from the national Government. Access to vaccination has been enhanced through UN channels. A locally produced vaccine is being launched in late 2020; at-risk adolescents will be prioritized.

In Ukraine, two approaches were adopted. One involved creating a model for expanded services for women living with HIV through training of health-care personnel in HPV vaccination and expanding vaccination services. The other approach involved increasing early detection of cervical cancer to provide follow-up treatment for HIV-positive women in the Odessa region. The vaccination initiative included a communication campaign for parents and caregivers, reaching out to girls aged 9–14 years from 24 regions. Partnership with the Ministry of Health, Public Health Centre and health-care workers at the local level contributed to the success of the programme and ensured high coverage.

There are plans to expand nationally and advocate for the integration of cervical cancer prevention into the national HIV, tuberculosis and viral hepatitis programme. The Odessa initiative increased screening of women with HIV an ART, including many who had not been screened previously. A comparative analysis showed that early initiation of ART is likely to reduce the progression of precancerous cells and ultimately also the incidence of invasive cervical cancer. The findings highlight the benefits of proactive approaches and early interventions for girls and women living with HIV.

In Zimbabwe, the Ministry of Health and Child Care conducted a survey on, among other issues, the outcomes of integrating the cervical cancer response with HIV and SRH services. Analysis of the survey data showed the value of integration. Over a four-year period, service uptake had increased, as had cost efficiencies. The cost benefits of integration where especially evident in district hospitals.

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Community engagement

68. The expansion of HPV vaccination and cervical cancer screening, treatment, care and support programmes requires clear and sustained communication, advocacy, community engagement and mobilization and partnerships.[75] Culturally appropriate HIV and cervical cancer messages increase acceptability and uptake of prevention services.[76] HPV vaccine acceptability and uptake tends to be higher in communities that receive information about the vaccine through local health providers, community health workers, and community outreach programme.[77] [78]

69. The WHO Africa Regional Office emphasizes a series of processes, including community diagnosis of the problem of cervical cancer (including beliefs, family dynamics, trust in the health-care system, spirituality and the role of the community), clarification of health services and engagement with health-care providers and with community networks and leadership structures.[79] Even when there is strong political and programmatic support to scale-up of cervical cancer services, and when new and innovative technologies are utilized, awareness campaigns and demand creation can boost coverage further. Communities' roles in advocacy and demand creation are critically important.

70. In the United Republic of Tanzania in 2018, cervical cancer accounted for about 39% of all cancer cases in the country. Annually, nearly 10 000 women are diagnosed with cervical cancer and nearly 6 700 die from the disease.[25] A community approach to integrating HIV integration with cervical cancer has been implemented successfully by the Tanzania Mainland Ministry of Health, Community Development, Gender, Elderly and Children, the Tanzania Network of Women living with HIV, and Tanzania Health Promotion Support, a nongovernmental organization, with backing from the Pink Ribbon Red Ribbon initiative. The approach engages women living with HIV as community mobilizers to increase demand for and uptake of cervical cancer screening services, especially among their peers. Training is combined with consultation with local government structures, health authorities and project coordinators to advocate for increased screening days at health facilities, integration of cervical cancer screening within HIV services, and budget allocations for cervical cancer screening in district- and facility-level health plans. More than 13 000 women accessed cervical screening services over the period of one year. Support for expansion is being provided by the Global Fund, and for the first time, the Global Fund funding cycle 2021–2023 grant includes funding for cervical cancer interventions, including community-mobilization.

71. As with the HIV response, it is important to engage men as stakeholders in cervical cancer elimination. Male partners are likely to have some influence–-positive and negative—on the many factors that affect women's decisions in relation to cervical cancer.[80]

New cervical cancer and HIV integration targets for 2025 and integration of cervical cancer in the annotated outline of the Global AIDS Strategy 2021–2026

72. Specific targets for the integration of cervical cancer and HIV interventions have been included among global HIV targets for the first time. These 2025 targets call for:
    - 90% of women and adolescent girls living with HIV to have access to integrated or linked services for HIV treatment and cervical cancer; and
    - 90% of adolescent girls and young women (aged 15–24 years) and adult women (25 years and older) to have access to sexual and reproductive health services that integrate HIV prevention, testing and treatment services.

73. The inclusion of cervical cancer and HIV interventions and services in the outline of the Global AIDS Strategy 2021–2026 *(UNAIDS/PCB (47)/20.36)* provides an opportunity for strengthened integration of HIV with HPV and cervical cancer prevention, screening, treatment and care across countries' and partners' health, social and economic strategies, recovery plans and budgets, and community support.

The way forward

74. It is both feasible and effective to integrate and scale up the HIV, HPV and cervical cancer responses. Integrated, life-course-based and people-centred approaches will be critical to end both AIDS and cervical cancer as public health threats. That requires

coordinated action by diverse sectors, partners and communities to accelerate the prevention, treatment and care of both HIV and cervical cancer.

75. It will be essential to direct attention towards health disparities and gender, socioeconomic and other inequities and inequalities. Resource mobilization, cost-effectiveness, innovations, partnerships, community engagement, and sustained research, monitoring and evaluation are necessary foundations for a sustainable response.

76. COVID-19 remains a threat to the delivery of HIV, HPV and cervical cancer services and may also impede community-led responses. While the COVID-19 has disrupted some services, responses have included innovations to address gaps and improve efficiencies.

77. The following actions are crucial for saving women's lives:
    a. HIV and cervical cancer services should be integrated across the prevention and care continuum to maximize efficiency and impact;
    b. HPV vaccination needs to be urgently scaled up in countries with high HIV and cervical cancer burdens to prevent HPV infection among women and girls living with and at risk of HIV;
    c. Cervical cancer screening and early treatment should be made available, accessible and affordable as secondary prevention of cervical cancer among women living with HIV. Screening methods should be simplified to increase coverage;
    d. Integrated and timely cervical cancer treatment for women living with HIV is crucial to improve quality of life and reduce morbidity and mortality;
    e. Biomedical approaches should be combined with efforts to address the underlying social and structural drivers of vulnerability of HIV and cervical cancer, and to address stigma and discrimination;
    f. Communities and organizations of women living with HIV should be supported and empowered to promote awareness and increase demand for and uptake of cervical cancer prevention, screening and treatment services and to address fear, stigma and discrimination; and
    g. Data collection, surveillance systems and research on gaps in the HIV and cervical cancer responses should be strengthened to scale up data-driven integration of services.

References

1 WHO. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: WHO; 2020. (https://apps.who.int/iris/bitstream/handle/10665/336583/9789240014107-eng.pdf)

2 Ramakrishnan S, Partricia S, Mathan G. Overview of high-risk HPV's 16 and 18 infected cervical cancer: pathogenesis to prevention. Biomedicine & Pharmacotherapy. 2015 Mar 1;70:103-10.

3 WHO. Human papillomavirus (HPV) and cervical cancer 2019 (https://www.who.int/news-room/fact-sheets/detail/human-papillomavirus-(hpv)-and-cervical-cancer)

4 Looker KJ, Rönn MM, Brock PM, Brisson M, Drolet M, Mayaud P, et al. Evidence of synergistic relationships between HIV and Human Papillomavirus (HPV): systematic reviews and meta-analyses of longitudinal studies of HPV acquisition and clearance by HIV status, and of HIV acquisition by HPV status. Journal of the International AIDS Society. 2018;21(6):e25110-e.

5 Chambuso RS, Kaambo E, Stephan S. Observed age difference and clinical characteristics of invasive cervical cancer patients in tanzania; a comparison between HIV-positive and HIV-negative women. Journal of Neoplasm. 2017;2(3).

6 Stelzle D, Tanaka LF, Lee KK, Khalil AI, Baussano I, Shah ASV. Estimates of the global burden of cervical cancer associated with HIV. The Lancet Global Hedalth. 2020.

7 Drolet M, Bénard É, Pérez N, Brisson M, Ali H, Boily MC, Baldo V, Brassard P, Brotherton JM, Callander D, Checchi M. Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: updated systematic review and meta-analysis. The Lancet. 2019 10 August;394(10197):497-509.

8 Sigfrid L, Murphy G, Haldane V, Chuah FL, Ong SE, Cervero-Liceras F, Watt N, Alvaro A, Otero-Garcia L, Balabanova D, Hogarth S. Integrating cervical cancer with HIV healthcare services: A systematic review. PLoS One. 2017 21 July;12(7):e0181156.

9 Finocchario-Kessler S, Wexler C, Maloba M, Mabachi N, Ndikum-Moffor F, Bukusi E. Cervical cancer prevention and treatment research in Africa: a systematic review from a public health perspective. BMC women's health. 2016 Dec 1;16(1):29.

10 WHO. Human Papillomavirus. Update 5 September 2018. Geneva: WHO; 2018.

11 WHO. WHO report on cancer: setting priorities, investing wisely and providing care for all. Geneva: WHO; 2020. (https://www.who.int/publications/i/item/who-report-on-cancer-setting-priorities-investing-wisely-and-providing-care-for-all)

12 Lam JU, Rebolj M, Dugué PA, Bonde J, von Euler-Chelpin M, Lynge E. Condom use in prevention of Human Papillomavirus infections and cervical neoplasia: systematic review of longitudinal studies. Journal of medical screening. 2014 Mar;21(1):38-50.

13 Celum CL, Delany-Moretlwe S, Baeten JM, van der Straten A, Hosek S, Bukusi EA, McConnell M, Barnabas RV, Bekker LG. HIV pre-exposure prophylaxis for adolescent girls and young women in Africa: from efficacy trials to delivery. Journal of the International AIDS Society. 2019 Jul;22:e25298.

14 UNAIDS. (2016). HPV, HIV and cervical cancer. Leveraging synergies to save women's lives. Geneva: UNAIDS; 2016. (https://www.unaids.org/sites/default/files/media_asset/JC2851_HPV-HIV-cervicalcancer_en.pdf)

15 UNAIDS. COVID-19 and HIV: 1 Moment. 2 Epidemics. 3 Opportunities. Geneva; 2020 (https://www.unaids.org/sites/default/files/media_asset/20200909_Lessons-HIV-COVID19.pdf)

16 UNICEF. Human Papillomavirus Vaccine: Supply and Demand Update. 2020. Geneva: UNICEF; 2020. (https://www.unicef.org/supply/media/5406/file/Human-Papillomavirus-Vaccine-Market-Update-October2020.pdf)

17 Chesson HW, Dunne EF, Hariri S, Markowitz LE. The estimated lifetime probability of acquiring human papillomavirus in the United States. Sexually transmitted diseases. 2014;41(11):660-4.

18 Gargano J, Meites E, Watson M, Unger ER, Markowitz L. Human Papillomavirus. 2020. In: Manual for the Surveillance of Vaccine-Preventable Diseases (https://www.cdc.gov/vaccines/pubs/surv-manual/chpt05-hpv.html)

[19] Liu G, Sharma M, Tan N, Barnabas RV. HIV-positive women have a higher risk of human papillomavirus infection, pre-cancerous lesions, and cervical cancer. AIDS. 2018;32(6):795-808.

[20] Dryden-Peterson S, Bvochora-Nsingo M, Suneja G, et al. HIV infection and survival among women with cervical cancer. J Clin Oncol. 2016;34:3749-3757.

[21] Ellerbrock TV, Chiasson MA, Bush TJ, Sun XW, Sawo D, Brudney K, Wright TC. Incidence of cervical squamous intraepithelial lesions in HIV-infected women. *JAMA.* 2000;*283*:1031–1037.

[22] Menon S, Rossi R, Zdraveska N, Kariisa M, Acharya SD, Vanden Broeck D, Callens S. Associations between highly active antiretroviral therapy and the presence of HPV, premalignant and malignant cervical lesions in sub-Saharan Africa, a systematic review: current evidence and directions for future research. BMJ Open. 2017;7(8):e015123

[23] Narayan KV, Miotti PG, Anand NP, Kline LM, Harmston C, Gulakowski III R, Vermund SH. HIV and non-communicable disease co-morbidities in the era of antiretroviral therapy: a vital agenda for research in low- and middle-income country settings. JAIDS. 2020 1 September;67:S2-S7

[24] UNAIDS. Data 2020. Geneva: UNAIDS; 2020. (https://www.unaids.org/en/resources/documents/2020/unaids-data)

[25] https://aidsinfo.unaids.org

[26] Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, Bray F. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. The Lancet Global Health. 2020 Feb 1;8(2):e191-203.

[27] WHO. Draft: Global strategy towards eliminating cervical cancer as a public health problem. Geneva: WHO; 2019 (https://www.who.int/publications/m/item/draft-global-strategy-towards-eliminating-cervical-cancer-as-a-public-health-problem)

[28] Jeronimo J, Castle PE, Temin S, Shastri SS. Secondary Prevention of Cervical Cancer: American Society of Clinical Oncology Resource-Stratified Clinical Practice Guideline Summary. Journal of oncology practice. 2017;13(2):129-33.

[29] Médecins Sans Frontières. A fair shot for vaccine affordability. Understanding and addressing the effects of patents on access to newer vaccines. September 2017. Access Campaign. MSF; 2017. (https://msfaccess.org/sites/default/files/2018-06/VAC_report_A%20Fair%20Shot%20for%20Vaccine%20Affordability_ENG_2017.pdf)

[30] WHO. WHO leads the way towards the elimination of cervical cancer as a public health concern. September 2018. Geneva: WHO; 2018 (https://www.who.int/reproductivehealth/cervical-cancer-public-health-concern/en/)

[31] WHO. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: WHO; 2020. (https://apps.who.int/iris/bitstream/handle/10665/336583/9789240014107-eng.pdf)

[32] UNAIDS. We have got the power. Women, adolescent girls and the HIV response. Geneva: UNAIDS; 2020 (https://www.unaids.org/sites/default/files/media_asset/2020_women-adolescent-girls-and-hiv_en.pdf)

[33] Singh GK, Jemal A. Socioeconomic and Racial/Ethnic Disparities in Cancer Mortality, Incidence, and Survival in the United States, 1950-2014: Over Six Decades of Changing Patterns and Widening Inequalities. J Environ Public Health. 2017;2017:2819372

[34] Yoo W, Kim S, Huh WK, Dilley S, Coughlin SS, Partridge EE, et al. Recent trends in racial and regional disparities in cervical cancer incidence and mortality in United States. PLoS One. 2017;12(2):e0172548

[35] Kane JC, Elafros MA, Murray SM, Mitchell EMH, Augustinavicius JL, Causevic S, et al. A scoping review of health-related stigma outcomes for high-burden diseases in LMIC. BMC medicine. 2019;17(1):17.

[36] Soohoo M, Blas M, Byraiah G, Carcamo C, Brown B. Cervical HPV Infection in Female Sex Workers: A Global Perspective. Open AIDS J. 2013;7:58-66.

[37] Beddoe AM. Elimination of cervical cancer: challenges for developing countries. ecancermedicalscience. 2019;13.

[38] Nugent R, Barnabas RV, Golovaty I, et al. Costs and cost-effectiveness of HIV/noncommunicable disease integration in Africa: from theory to practice. AIDS (London, England). 2018 Jul;32 Suppl 1:S83-S92.

[39] WHO. WHO report on cancer: setting priorities, investing wisely and providing care for all. Geneva: WHO; 2020. (https://www.who.int/publications/i/item/who-report-on-cancer-setting-priorities-investing-wisely-and-providing-care-for-all)

[40] UNAIDS. Seizing the moment. Tackling entrenched inequalities to end epidemics. Global AIDS Update 2020. Geneva; 2020 (https://www.unaids.org/sites/default/files/media_asset/2020_global-aids-report_en.pdf)

[41] Audrey S, Batista Ferrer H, Ferrie J, Evans K, Bell M, Yates J, et al. Impact and acceptability of self-consent procedures for the school-based human papillomavirus vaccine: a mixed-methods study protocol. BMJ Open. 2018;8(3):e021321.

[42] (Cross reference) UNICEF. Human Papillomavirus Vaccine: Supply and Demand Update. 2020. Geneva: UNICEF; 2020. (https://www.unicef.org/supply/media/5406/file/Human-Papillomavirus-Vaccine-Market-Update-October2020.pdf)

[43] McFarland DM, Gueldner SM, Mogobe KD. An integrated review of barriers to cervical cancer screening in sub-Saharan Africa. Journal of Nursing Scholarship. 2016 Sep;48(5):490-8.

[44] Devarapalli P, Labani S, Nagarjuna N, Panchal P, Asthana S. Barriers affecting uptake of cervical cancer screening in low and middle-income countries: A systematic review. Indian Journal of Cancer. 2018 1 October;55(4):318.

[45] WHO. Women who were screened for cervical cancer: Response by country 2020 (https://apps.who.int/gho/data/view.main.GSWCAH24v)

[46] Massad LS, Hessol NA, Darragh TM, Minkoff H, Colie C, Wright RL, et al. Cervical cancer incidence after up to 20 years of observation among women with HIV. International journal of cancer. 2017;141(8):1561-5.

[47] Winer RL, Feng Q, Hughes JP, Yu M, Kiviat NB, O'Reilly S, et al. Concordance of self-collected and clinician-collected swab samples for detecting human papillomavirus DNA in women 18 to 32 years of age. Sexually transmitted diseases. 2007;34(6):371-7.

[48] Petignat P, Faltin DL, Bruchim I, Tramer MR, Franco EL, Coutlee F. Are self-collected samples comparable to physician-collected cervical specimens for human papillomavirus DNA testing? A systematic review and meta-analysis. Gynecologic oncology. 2007;105(2):530-5.

[49] Matenge TG, Mash B. Barriers to accessing cervical cancer screening among HIV positive women in Kgatleng district, Botswana: A qualitative study. PloS one. 2018 Oct 24;13(10):e0205425.

[50] Kasraeian M, Hessami K, Vafaei H, Asadi N, Foroughinia L, Roozmeh S, Bazrfashan K. Patients' self-reported factors influencing cervical cancer screening uptake among HIV-positive women in low-and middle-income countries: An integrative review. Gynecologic Oncology Reports. 2020 Jun 5:100596.

[51] Gravitt PE, Belinson JL, Salmeron J, Shah KV. Looking ahead: a case for human papillomavirus testing of self-sampled vaginal specimens as a cervical cancer screening strategy. International journal of cancer. 2011;129(3):517-27.

[52] Swanson M, Ueda S, Chen LM, Huchko MJ, Nakisige C, Namugga J. Evidence-based improvisation: Facing the challenges of cervical cancer care in Uganda. Gynecologic Oncology Reports. 2018;24:30-5.

[53] Abdel-Wahab M, Bourque JM, Pynda Y, Izewska J, Van der Merwe D, Zubizarreta E, et al. Status of radiotherapy resources in Africa: an International Atomic Energy Agency analysis. Lancet Oncol. 2013;14(4):e168-75. (https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(12)70532-6/fulltext)

[54] UNITAID. Cervical cancer. Screening and treatment of pre-cancerous lesions for secondary prevention of cervical cancer. Technology landscape. Geneva: UNITAID; May 2019.

[55] Debeaudrap P, Sobngwi J, Tebeu PM, Clifford GM. Residual or Recurrent Pre-cancerous Lesions After Treatment of Cervical Lesions in Human Immunodeficiency Virus–infected Women: A Systematic Review and Meta-analysis of Treatment Failure. Clinical Infectious Diseases. 2019 Oct 15;69(9):1555-65.

[56] Leng J, Ntekim AI, Ibraheem A, Anakwenze CP, Golden DW, Olopade OI. Infrastructural Challenges Lead to Delay of Curative Radiotherapy in Nigeria. JCO Glob Oncol. 2020;6:269-76.

[57] Grover S, Xu MJ, Yeager A, Rosman L, Groen RS, Chackungal S, et al. A systematic review of radiotherapy capacity in low- and middle-income countries. Front Oncol. 2014;4:380.

[58] Waller J, Marlow LA, Wardle J. The association between knowledge of HPV and feelings of stigma, shame and anxiety. Sexually transmitted infections. 2007 Apr 1;83(2):155-9.

[59] Rosser JI, Njoroge B, Huchko MJ. Cervical Cancer stigma in rural Kenya: what does HIV have to do with it?. Journal of Cancer Education. 2016 1 June;31(2):413-8.

[60] Nyblade L, Stockton M, Travasso S, Krishnan S. A qualitative exploration of cervical and breast cancer stigma in Karnataka, India. BMC women's health. 2017 Dec 1;17(1):58.

[61] Lim JN, Ojo AA. Barriers to utilisation of cervical cancer screening in Sub Sahara Africa: a systematic review. European journal of cancer care. 2017 Jan;26(1):e12444.

[62] Islam RM, Billah B, Hossain MN, Oldroyd J. Barriers to cervical cancer and breast cancer screening uptake in low-income and middle-income countries: a systematic review. Asian Pacific journal of cancer prevention: APJCP. 2017;18(7):1751.

[63] Wong JP, Vahabi M, Miholjcic J, Tan V, Owino M, Li AT, Poon MK. Knowledge of HPV/cervical cancer and acceptability of HPV self-sampling among women living with HIV: A scoping review. Current Oncology. 2018 Feb;25(1):e73.

[64] Guillaume D, Chandler R, Igbinoba S. Barriers to Cervical Cancer Screening Among Women Living With HIV in Low-and Middle-Income Countries: A Systematic Review. Journal of the Association of Nurses in AIDS Care. 2020 Sep 1;31(5):497-516.

[65] WHO Cervical Cancer Prevention and Control Costing (C4P) Tool (https://www.who.int/immunization/diseases/hpv/cervical_cancer_costing_tool/en/)

[66] PEPFAR. Go Further: Partnership to End AIDS and Cervical Cancer 2020 [Available from: https://gwbcenter.imgix.net/Publications/Resources/go-further-overview-2020.pdf.

[67] Global Fund. Policy on Co-infections and Co-morbidities. 1 April 2015. (https://www.theglobalfund.org/board-decisions/b33-dp08/)

[68] UNITAID. Intensifying and promoting cervical cancer prevention in low-resource countries. 15 November 2020. (https://unitaid.org/project/intensifying-and-promoting-cervical-cancer-prevention-in-low-resource-countries/#en)

[69] UNAIDS. Global AIDS Monitoring 2020. Geneva: UNAIDS; 2019. (https://www.unaids.org/sites/default/files/media_asset/global-aids-monitoring_en.pdf)

[70] Organisation WH. WHO guidelines for the use of thermal ablation for cervical pre-cancer lesions 2019. Available from: https://apps.who.int/iris/bitstream/handle/10665/329299/9789241550598-eng.pdf?sequence=1&isAllowed=y.

[71] Papoutsis D, Underwood M, Parry-Smith W, Panikkar J. Early and late pregnancy outcomes in women treated with cold-coagulation versus LLETZ cervical treatment for cervical intraepithelial neoplasia; a retrospective cohort study. Archives of gynaecology and obstetrics. 2018;297(4):1015-25.

[72] Hall MT, Simms KT, Lew JB, Smith MA, Brotherton JM, Saville M, et al. The projected timeframe until cervical cancer elimination in Australia: a modelling study. The Lancet Public health. 2019;4(1):e19-e27

[73] US Department of State. Go Further: Partnership to End AIDS and Cervical Cancer. 16 November 2020. (https://www.state.gov/partnership-to-end-aids-and-cervical-cancer/)

[74] PEPFAR. PEPFAR 2020 Country Operational Plan Guidance for all PEPFAR Countries. 2020.

[75] Wittet S, Aylward J, Cowal S, Drope J, Franca E, Goltz S, Kuo T, Larson H, Luciani S, Mugisha E, Schocken C. Advocacy, communication, and partnerships: Mobilising for effective, widespread cervical cancer prevention. International Journal of Gynecology & Obstetrics. 2017 Jul;138:57-62.

[76] Bungay V, Kolar K, Thindal S, Remple VP, Johnston CL, Ogilvie G. Community-based HIV and STI prevention in women working in indoor sex markets. Health promotion practice. 2013;14(2):247-55.

[77] Wamai RG, Ayissi CA, Oduwo GO, Perlman S, Welty E, Manga S, et al. Assessing the effectiveness of a community-based sensitisation strategy in creating awareness about HPV, cervical cancer and HPV vaccine among parents in North-West Cameroon. J Community Health. 2012;37(5):917-26.

[78] Kisaakye E, Namakula J, Kihembo C, Kisakye A, Nsubuga P, Babirye JN. Level and factors associated with uptake of human papillomavirus infection vaccine among female adolescents in Lira District, Uganda. The Pan African medical journal. 2018;31:184.

[79] WHO Africa Office. Information, education and communication for cervical cancer prevention and control in African countries. Brazzaville: WHO; 2015

[80] Adewumi K, Oketch SY, Choi Y, Huchko MJ. Female perspectives on male involvement in a human-papillomavirus-based cervical cancer-screening program in western Kenya. BMC women's health. 2019 Dec;19(1):1-9.