Prevalence of tobacco use among people living with HIV is more than double that of the general population.

Access to antiretroviral therapy has contributed to increase in life expectancy rates for people living with HIV; high rates of tobacco use are undermining those gains in life expectancy.

The excess mortality rate among smokers living with HIV is on average three times higher than that of the general population.

Premature death among smokers living with HIV is due to higher rates of both communicable and noncommunicable diseases – including tuberculosis, pneumonia, cancer, cardiovascular disease and chronic obstructive lung disease – as compared to their non-smoking counterparts.

HIV programmes have an important role to play in preventing and assessing tobacco use status, and initiating tobacco cessation interventions.

Evidence-based policies can support the integration and scaling up of tobacco cessation services through training and system changes that leverage the existing HIV care infrastructure.

What is HIV?

HIV (human immunodeficiency virus) is a virus that attacks the body’s immune system which, untreated, increases the risk of infections like tuberculosis (TB) and pneumonia and some cancers (1,2,3). Acquired immunodeficiency syndrome (AIDS) is the most advanced stage of the disease (2). HIV is transmitted from the body fluids of a person living with HIV, including blood, breast milk, semen and vaginal fluids. Antiretroviral therapy (ART) is effective in treating HIV through viral suppression. Taking ART as prescribed reduces both the risk of transmission and of disease progression (3). If the person living with HIV takes ART as prescribed, the viral load can decrease to a level that is undetectable, meaning zero risk of transmission to sexual partners and minimal risk of mother-to-child transmission (3).

This document summarizes the excess burden of disease associated with tobacco use among people living with HIV, reviews the current literature on effective tobacco cessation interventions, and describes approaches for integrating tobacco control in the context of HIV care. This brief specifically focuses on effective tobacco cessation interventions for people living with HIV.

Tobacco definitions

**Smoked tobacco products:** any product made or derived from tobacco that generates smoke. Examples include manufactured cigarettes, roll-your-own tobacco, cigars, shisha (also known as waterpipe), kreteks and bidis.

**Second-hand smoke (SHS):** the smoke emitted from the burning end of a cigarette or other tobacco products, usually in combination with the smoke exhaled by the smoker.

**Smokeless tobacco:** any product that consists of cut, ground, powdered or otherwise altered tobacco that is intended to be placed in the oral or nasal cavity. Examples include snuff, chewing tobacco, gutka, mishri and snus.

**Heated tobacco products (HTPs):** products that emit aerosols containing nicotine and toxic chemicals when tobacco is heated or when a device containing tobacco is activated. These aerosols are inhaled by sucking or smoking and involve a device. They contain the highly addictive substance nicotine, as well as non-tobacco additives, and are often flavoured.
The health impact of tobacco on people living with HIV

Worldwide, there are around 1.25 billion people who use tobacco with over 1 billion tobacco users residing in low- and middle-income countries (LMICs) (5). Smoking prevalence among people living with HIV is two to three times higher than that of the general population, across regions and country income level (6–13). Sub-Saharan Africa is the region most affected by HIV, accounting for around 70% of HIV infections (4). In South Africa alone, there were 160,000 new HIV infections in 2022, contributing to an overall prevalence of 17.8% (6). Simultaneously, the country is facing a double burden, since 20.3% of people aged 15 years and older are estimated to be current tobacco smokers (5). Notably, Lesotho has the second highest global HIV prevalence, estimated at 19.3% (7), and a 41.1% prevalence of tobacco use among men living with HIV (8). Recent research in LMICs revealed that among women living with HIV, 1.3% engage in tobacco smoking, 2.1% use smokeless tobacco, and 3.6% partake in some form of tobacco use (8). What is particularly alarming is that these rates are significantly higher compared to their HIV-negative counterparts. The risk of tobacco smoking, for instance, is 1.90 times greater among women living with HIV than among those without HIV (8). Similarly, among men living with HIV, the prevalence of tobacco-related use is notably high. With 24.4% engaging in tobacco smoking, 3.4% using smokeless tobacco, and an overall tobacco use prevalence of 27.1%, it is evident that tobacco-related challenges persist within this demographic (8). Comparatively, the prevalence rates for any tobacco use (RR 1.41) and tobacco smoking (RR 1.46) are significantly elevated in men living with HIV when compared to their HIV-negative counterparts (8). Additionally, studies among people living with HIV in the United States have reported rates of tobacco use as high as 46–76% (9,10,13). Widespread access to ART has transformed HIV into a manageable long-term condition. However, high rates of tobacco use threaten those gains in long-term survival, particularly in LMICs where the burden of HIV and tobacco are increasingly concentrated (13–17,18).

Pathophysiology of tobacco use and the development of HIV

There is evidence that tobacco smoking affects the likelihood of acquiring HIV when exposed to the virus, due to the negative impact of tobacco smoking on the innate and adaptive immune system, which may increase susceptibility to HIV and other infections (19,20). Compared to non-smokers, tobacco smokers have a poorer immune response when on ART, resulting in more rapid progress to advanced HIV disease and AIDS (21). Due to the above-mentioned effect on the immune system, smoking also increases the risk of sexually transmitted infections, which in turn increases the risk of HIV transmission (19). Additionally, drug use, which is strongly associated with the likelihood of acquiring HIV, is more common among people who smoke tobacco than people who do not (29).

Tobacco smoking and HIV-related complications and comorbidities

Tobacco use among people living with HIV substantially increases the risk of morbidity and mortality compared with people who do not use or have never used tobacco (15,17,18,23). A Danish study showed that current tobacco smokers had an excess mortality rate that was more than three times that of people living with HIV who never smoked (15). Similar impacts on life expectancy among people living with HIV have been reported from other European countries and North America (15). The consequences of the cumulative harmful effects of HIV and tobacco smoking on the immune system and the suppression of lung defences include an increased risk of acquiring bacterial pneumonia, acute bronchitis, TB, and higher rates of TB-related mortality (19,24–26). In addition, smoking increases the risk of non-AIDS-related noncommunicable (NCDs) diseases in this population, including cancer, cardiovascular disease, diabetes, and chronic obstructive lung disease, as compared with people living with HIV who do not smoke (16,18,23,26). An analysis of data from the ART Cohort Collaboration found that deaths from non-AIDS related malignancies (for example,
lung cancer) and cardiovascular disease account for most of the excess deaths among people living with HIV who smoke (15,28,30). The increased prevalence of NCDs among people living with HIV reflects a combination of factors, including aging, a greater prevalence of traditional NCD risk factors such as alcohol use, and the direct consequences of HIV infection and specific ARTs on cardiovascular risk factors (18,26). However, it is estimated that tobacco smoking among people living with HIV who are taking ART may account for 25% of total mortality (18).

Second-hand smoke and HIV
Second-hand smoke can have significant implications for people living with HIV, potentially exerting direct effects on blood vessels (32). These effects, in turn, increase the risk of cardiovascular disease (31). Exposure to second-hand smoke can further weaken their immune system, making them more susceptible to infections and illnesses. Second-hand smoke can irritate the respiratory system, leading to wheezing and shortness of breath. These symptoms can be more severe in people with HIV, particularly if they have pre-existing lung issues like TB or pneumonia (31,32).

Smokeless tobacco and HIV
Despite limited evidence on smokeless tobacco and HIV, a study in South Africa shows that smokeless tobacco, dry nasal snuff in particular, is extremely prevalent among women living with HIV, nearly six times higher than the general population. Furthermore, in this population snuff use is clearly associated with TB diagnosis and has potentially serious health implications (33). Similarly, in India, the prevalence of smokeless tobacco is very high, and people with HIV that are current smokeless tobacco users are at high risk of oral malignant disorders and potentially oral cancer, estimated at 27 times that of the general population (34).

Tobacco cessation and HIV
Within the literature encompassed by this summary, most studies relate to “smoking” and “smoking cessation”, which constitutes a subset within the broader category of tobacco use. It is crucial to recognize, however, that the term “tobacco use” extends beyond combustible cigarette use, to include various forms such as other smoked tobacco products, smokeless tobacco use, and heated tobacco products. Throughout this summary these terms are used in alignment with the terminology prevalent in the respective studies.

A large international trial found that tobacco cessation has the potential to reduce all-cause mortality for people living with HIV by 15.6%, major cardiovascular disease events by 17%, non-AIDS cancers (for example, lung) by 34%, and pneumonia by 18% (18). After quitting, people that are living with HIV report a decrease in HIV-related symptom burden, depression and anxiety, and report improvements in quality of life (35,36). Tobacco cessation is also associated with better control of HIV (37,38). People living with HIV are less likely to quit than the general population of tobacco users (39,41–43). Obstacles to achieving success in quitting interact with those associated with tobacco use, including higher levels of nicotine addiction, higher rates of depression and polysubstance use, social isolation, and the burden of enduring stigma and discrimination (26). Therefore, addressing mental health issues is an integral part of reducing tobacco use among people living with HIV (85,86). Beliefs held by people living with HIV may lead to continued tobacco use. Tobacco users living with HIV minimize health risks associated with tobacco use and report a sense of fatalism about HIV that may reduce their chances of success in quitting tobacco (39–41). There are also structural barriers that include a lack of access to tobacco cessation services in the context of HIV care.
Impact of selected tobacco control interventions on HIV

There is strong evidence that brief advice to quit delivered by a physician, health professional or non-health personnel, behavioural interventions (for example, telephone counselling and interventions delivered via short text messaging), and pharmacotherapy, are effective in increasing abstinence compared to placebo/no intervention among general populations of smokers [Box 1] (44–51). Nicotine replacement therapy, bupropion, varenicline and cytisine can all aid quitting tobacco with or without behavioural support. However, the likelihood of a successful quit attempt is increased if counselling is provided in combination with medication (45,47). Although most of this evidence is derived from studies conducted in high income countries, a systematic review and meta-analysis of studies conducted in LMICs similarly concluded that nicotine replacement therapy, behavioural counselling and brief advice are effective in aiding tobacco cessation in LMICs (52). The evidence suggests that tobacco cessation interventions are effective for people living with HIV. A 2016 Cochrane meta-analysis of 12 studies found that counseling combined with pharmacotherapy increased short-term smoking abstinence compared to control groups (55). Behavioral interventions, delivered through various modalities, showed the highest impact when conducted via telephone (56). Tailoring interventions to the unique challenges of people living with HIV yielded inconsistent results (55,56). A meta-analysis indicated that delivering eight counseling sessions was associated with higher smoking abstinence rates than offering fewer sessions (53). Recent trials demonstrated longer-term impact, including an interactive web-based intervention promoting six-month cessation and the safety and efficacy of varenicline combined with behavioural support. One trial reported a significant increase in 48-week continuous smoking abstinence, while another showed varenicline doubling quit rates at three months, though the effect declined over time (58). Overall, these findings underscore the effectiveness of tailored interventions, emphasizing the importance of counseling and pharmacotherapy in tobacco cessation for people living with HIV. A third randomized controlled trial compared the effectiveness of varenicline and cytisine with nicotine replacement therapy for reducing smoking among individuals with HIV who engage in risky drinking (60).

Box 1. Interventions to assist tobacco cessation

**Behavioural interventions**
- Brief advice from healthcare worker
- In-person multisession counselling
- Telephone counselling
- Mhealth (such as text messaging programmes, mobile phone apps)
- Websites
- Printed self-help material

**Pharmacotherapy**
- Varenicline
- Nicotine replacement therapy
- Cytisine
- Bupropion

The study found that all three medications, varenicline, cytisine and nicotine replacement therapy, achieved six-month cessation rates that were consistent with those of previous trials among people who smoke but are not infected with HIV, ranging from 17 to 19%. This study offered further evidence that these medications may be used safely and effectively for smoking cessation among individuals with HIV who have a history of substance use or active substance use disorders (60).

Health system interventions to facilitate tobacco cessation

Current guidelines recommend that healthcare workers ask all adults about tobacco use, advise them to quit, assess, assist and arrange (5As) and provide behavioural interventions and pharmacotherapy for cessation, or by referring patient to population-based interventions (such as national quit-lines, mHealth programmes and cessation clinics) [Box 2] (51,61,62).
Integrating and scaling tobacco use treatment in HIV care

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) establishes a minimum standard for action on tobacco control. Article 14 of the WHO FCTC states that Parties to the treaty “shall develop and take effective measures to promote cessation of tobacco use and adequate treatment for tobacco dependence” (63). The WHO FCTC also calls for integrating tobacco control into existing health system infrastructure including HIV services. Important barriers to implementing the WHO FCTC include low political priority, and a lack of funding and infrastructure to support NCD prevention and treatment in these settings (64). However, large investments in HIV service delivery create a platform for extending chronic care models for managing HIV to include tobacco use treatment. HIV treatment requires multiple interactions with the health system, providing healthcare workers with frequent opportunities to screen, diagnose and treat tobacco dependence. In addition, many of the health system interventions that were used to scale up ART resources in poor countries, such as standardized treatment protocols, registries to track adherence to guidelines, task-sharing, and counseling referrals, can facilitate effective management of tobacco dependence (16, 65, 66–68). Borrowing from both implementation and systems science, Box 3 outlines a process for optimizing the integration of tobacco use treatment in HIV care systems (69–72). The implementation of effective, evidence-based tobacco cessation interventions for people living with HIV in LMICs has potential to bring substantial benefits to health outcomes among people living with HIV, particularly in areas where the burden of both HIV and tobacco use is high (80).

**Box 2. 5As**

**Ask:** Ask every patient about their tobacco use status and note this in their medical records.

**Advise:** Advise patients to quit in a clear, strong, personalized manner: “ Quitting smoking strengthens your immune system and allows you to fully benefit from ART.”

**Assess:** Assess tobacco users’ readiness to quit

**Assist:** If ready to quit, support them to make a quit plan or provide information on specialist support

**Arrange:** Arrange for follow up via face-to-face contact or by phone or refer to specialist

**Box 3. Recommended System Interventions (49)**

- Implement a system to consistently identify tobacco users and document use in all HIV services
- Assign dedicated staff to coordinate tobacco use prevention and treatment
- Train all staff and healthcare workers and define and communicate duties
- Monitor performance and provide feedback
- Develop and promote a programme policy to support screening and treatment
- Include evidence-based tobacco dependence treatments (both counselling and pharmacotherapy) as paid or covered services to remove barriers to treatment

Existing resources, such as national quit-lines in 40 LMICs, mobile health programmes and extensive networks of community health workers supporting HIV programmes, provide the infrastructure for a three-step framework to facilitate treatment integration: 1) Ask all clients using HIV services about tobacco use; 2) Provide clear advice to quit as well as tailored brief counselling and 3) Connect patient to treatment (AAC) (62, 73–75). Population-based resources provide a sustainable and scalable option for connecting people living with HIV to treatment. National healthcare policies and infrastructure will inform the larger policy decisions about what types of integration models are selected (for example, integration into HIV care, integration into HIV and coordination with external resources) (76).
Potential next steps

Research
- More studies are needed to examine interventions concentrating on the socio-behavioural and environmental factors that may impede tobacco cessation among people living with HIV in LMICs.
- Research is needed to inform the design of interventions that address co-occurring addiction and comorbidities that are common among people living with HIV who smoke, to evaluate if the current evidence for treating cigarette use applies to other tobacco products such as waterpipe/hookah, smokeless tobacco, e-cigarettes and bidis, and to evaluate the effectiveness of digital interventions for people living with HIV.
- Research is needed to determine the best possible strategies and models for integrating tobacco cessation treatment into the context of HIV services.

Practice
- Involving communities of people living with HIV in the design and delivery of services.
- Immediate action to integrate screening for tobacco use, assessing willingness to quit, and offering brief advice, and supporting the initiation of pharmacotherapy as part of standard HIV care practice.
- Integrating quit-line referral systems in HIV health programmes will increase the reach of smoking cessation services.

Policy
- Global and national policies must define standards of care for treating tobacco use in the context of HIV care (65). This should include increasing access to nicotine replacement therapy, which is a WHO essential medication.
- Brief advice from a healthcare worker, quit-line, automated text messaging, printed self-help materials and nicotine replacement therapy and cytisine are globally affordable healthcare interventions to promote and assist tobacco cessation (50,77).
- International partners should include reporting requirements that clearly define performance measures for screening and treatment and include an evaluation of tobacco use treatment in HIV reported systems.

Contributors
Shelley D,2 Aarsand R,2 Vitoria M,3 Cantrell J,1 Namusisi K,1 Anam F R,4 Seale A,3 Dalal S,3 Stelzle D,3 Lebedeva E,5 Ciobanu A,5 Fu D,6 Fayokun R,6 Schotte K,6 Kaur J.7

1 New York University, School of Global Public Health, Department of Public Health Policy and Management
2 World Health Organization, Department of Digital Health and Innovation
3 World Health Organization, Global HIV, Hepatitis and Sexually Transmitted Infections Programmes
4 The Global Network of People Living with HIV (GNP+)
5 World Health Organization Regional Office for Europe
6 World Health Organization, Department of Health Promotion, No Tobacco Unit
7 World Health Organization Regional Office for South-East Asia
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