HIV/AIDS In the Contemporary Era: Transmission, Prevention, Treatment, Social Inequality and Human Rights

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***Abstract*—Human Immunodeficiency Virus (HIV) and acquired immunodeficiency syndrome (AIDS) remain important global public-health, social and human-rights concerns despite major advances in diagnosis, antiretroviral therapy (ART), prevention and community-based care. HIV is no longer appropriately understood only as a fatal infectious disease. With timely diagnosis, sustained ART, viral-load monitoring and appropriate social support, people living with HIV can lead long and productive lives. Effective treatment can suppress viral replication to an undetectable level, and people who maintain sustained viral suppression do not sexually transmit HIV, a principle commonly expressed as "Undetectable = Untransmittable" (U=U). Nevertheless, the contemporary HIV response continues to face substantial challenges, including undiagnosed infection, unequal access to healthcare, stigma, discrimination, misinformation, gender inequality, socioeconomic disadvantage, mobility, treatment interruptions and gaps in prevention coverage.**

These challenges affect populations differently, including children, adolescents, women, men, transgender people, LGBTQIA+ communities, migrants, prisoners, sex workers and people who inject drugs. This chapter examines HIV/AIDS through an integrated public-health, social-history and human-rights perspective. It discusses transmission, prevention, testing, pre-exposure and post-exposure prophylaxis, antiretroviral treatment, viral suppression, prevention of vertical transmission, social inequality and stigma, with particular attention to India and Assam. Recent developments in long-acting HIV prevention, including twice-yearly injectable lenacapavir, demonstrate the continuing importance of biomedical innovation, while also raising questions concerning affordability, regulation, health-system capacity and equitable access.

The chapter argues that sustainable progress requires more than biomedical interventions. It requires accurate health education, social protection, community participation, gender-sensitive services, confidentiality and protection from discrimination.

***Index Terms*—HIV; AIDS; Antiretroviral Therapy; HIV Prevention; U=U; Public Health; Stigma; Human Rights; Assam**

I. INTRODUCTION

Human Immunodeficiency Virus (HIV) remains an important public-health issue in the contemporary world. Since the emergence of the epidemic, scientific understanding has changed considerably. Earlier perceptions often associated HIV infection with inevitable illness and premature death. The development and expansion of antiretroviral therapy (ART), improved diagnostic technologies, prevention programmes and community-based care have fundamentally changed the experience of living with HIV.

According to the latest UNAIDS global estimates, approximately 41.0 million people were living with HIV in 2025. An estimated 1.2 million people acquired HIV during that year and approximately 570,000 people died from AIDS-related illnesses. By the end of 2025, about 32.1 million people were receiving ART. Around 88% of people living with HIV knew their status, 78% were accessing treatment and approximately 74% had suppressed viral loads. These figures demonstrate both the scale of the continuing epidemic and the considerable progress achieved through treatment and prevention.

The contemporary HIV situation should therefore not be understood simply as either an expanding or declining epidemic. New infections and AIDS-related deaths have fallen substantially over the long term, but progress is uneven across countries and populations. UNAIDS reported that new HIV infections in 2025 were approximately 65% below the peak recorded in 1994, while AIDS-related deaths had declined by

approximately 73% from their 2004 peak. Nevertheless, important treatment and prevention gaps remain, and international financing pressures pose additional challenges.

HIV must also be understood as a social issue. Biological exposure alone does not explain why people experience HIV differently. Poverty, gender relations, education, employment, migration, stigma, discrimination and access to healthcare influence vulnerability, diagnosis, treatment continuity and quality of life. HIV research consequently benefits from an interdisciplinary approach involving public health, sociology, history, gender studies, human rights and community studies.

II. UNDERSTANDING HIV AND AIDS

HIV is a virus that attacks the body's immune system, particularly CD4 immune cells. Without effective treatment, progressive immune-system damage can lead to opportunistic infections, certain cancers and other serious illnesses. AIDS refers to the most advanced stage of HIV infection rather than a separate virus.

HIV infection and AIDS should therefore not be treated as interchangeable concepts. A person living with HIV may remain healthy for many years and may never develop AIDS when effective ART is started and maintained. WHO describes HIV as a manageable chronic health condition when people have access to effective prevention, diagnosis, treatment and care.

Modern HIV medicine emphasizes early diagnosis and treatment. ART suppresses viral replication, supports immune function, reduces HIV-related morbidity and mortality, and substantially reduces the likelihood of sexual transmission when viral suppression is maintained.

This medical transformation also has social significance. HIV should not automatically be associated with death, immorality, particular sexual identities or particular communities. Such assumptions can reproduce stigma and discourage individuals from seeking testing and treatment.

III. THE CONTEMPORARY GLOBAL HIV SITUATION

The global HIV response has achieved substantial progress, but the epidemic remains significant. UNAIDS estimates indicate that 41.0 million people were living with HIV in 2025, including approximately 39.7 million adults and 1.3 million children. Women and girls represented approximately 53% of all people living with HIV. About 5 million people living with HIV did not know their status.

Treatment access has expanded dramatically. Approximately 32.1 million people were accessing ART at the end of 2025, compared with 7.6 million in 2010. However, treatment coverage remained unequal: approximately 79% of adults were accessing treatment compared with 55% of children. These differences demonstrate the importance of strengthening paediatric diagnosis, treatment and follow-up.

New HIV infections among children have declined substantially over the longer term, but progress has slowed. In 2025, approximately 93,000 children acquired HIV globally. Prevention of vertical transmission therefore remains an essential component of the HIV response.

The continuing epidemic is also strongly shaped by inequality. UNAIDS reports substantially higher HIV acquisition risk among several key populations, including gay men and other men who have sex with men, sex workers, people who inject drugs and transgender women. These differences should not be interpreted as evidence that identity itself causes HIV. Rather, they reflect the interaction of exposure patterns, marginalization, discrimination, violence, criminalization and unequal access to prevention and healthcare.

IV. MODES OF HIV TRANSMISSION

HIV transmission occurs through specific biological routes. Important routes include:

Sexual exposure involving vaginal or anal sex where transmissible HIV is present.

Exposure to infected blood.

Sharing contaminated needles, syringes or other injecting equipment.

Transmission from a person with HIV to their infant during pregnancy, childbirth or breastfeeding.

Certain occupational or healthcare exposures involving infected blood.

HIV is not transmitted through ordinary social contact. Hugging, shaking hands, sharing food, sharing

ordinary household spaces, using common toilets, coughing or sneezing do not transmit HIV. WHO specifically confirms that ordinary day-to-day contact such as kissing, hugging and sharing food or water does not transmit HIV.

This distinction is essential because misinformation can create unnecessary fear and discrimination. Effective public-health education must clearly distinguish genuine transmission routes from myths.

HIV Prevention in the Contemporary Era

Contemporary HIV prevention involves a combination of biomedical, behavioural and structural strategies. No single intervention is equally appropriate for every person or community.

Condoms

Correct and consistent condom use remains an important method of reducing sexual transmission of HIV and other sexually transmitted infections. Condom availability must be accompanied by accurate information and the ability to access confidential sexual-health services.

V. HIV TESTING

HIV testing is central to prevention and treatment. People cannot access appropriate treatment without knowing their status. Testing can be offered through healthcare facilities, community-based services and appropriate self-testing programmes.

A negative test result must be interpreted according to the type of test, timing of exposure and relevant clinical guidance because testing during an early period following exposure may not immediately detect infection.

Pre-Exposure Prophylaxis

Pre-exposure prophylaxis (PrEP) is an HIV-prevention strategy for people who do not have HIV but may experience increased risk of exposure. WHO currently recognizes several PrEP options, including oral tenofovir-based PrEP, the dapivirine vaginal ring, injectable cabotegravir and long-acting injectable lenacapavir.

Post-Exposure Prophylaxis

Post-exposure prophylaxis (PEP) involves taking antiretroviral medicines after a possible exposure to HIV. Because effectiveness depends on timely initiation, anyone experiencing a possible exposure should seek medical advice promptly.

Harm Reduction

For people who inject drugs, access to sterile injecting equipment, HIV testing, ART and other harm-reduction services can substantially reduce transmission risk. Harm reduction should be integrated with broader healthcare and social-support services.

Safe Blood

Screening of donated blood and adherence to appropriate infection-control procedures are essential components of HIV prevention. Healthcare systems must maintain reliable standards for blood safety and clinical procedures.

Prevention of Vertical Transmission

Effective HIV testing and treatment during pregnancy can dramatically reduce transmission from mother to child. WHO recommends ART for pregnant women living with HIV as early as possible, both to protect maternal health and to reduce transmission to the infant.

Treatment, Viral Suppression and U=U

ART is one of the most important developments in the history of HIV medicine. Modern ART uses combinations of antiretroviral medicines to suppress HIV replication.

The principal objectives of ART are to:

- Reduce viral load;
- Protect and restore immune function;
- Reduce HIV-related illness;
- Reduce AIDS-related mortality;
- Improve quality of life;
- Support long-term health; and
- Prevent sexual transmission when sustained viral suppression is achieved.

The principle of Undetectable = Untransmittable (U=U) has major clinical and social significance. WHO states that people living with HIV who are taking ART and have an undetectable viral load do not transmit HIV sexually to their partners.

U=U challenges outdated assumptions that every person living with HIV represents a continuing sexual transmission threat. It demonstrates that treatment is

simultaneously a medical intervention and a major prevention strategy.

Treatment adherence remains essential. Interruptions can permit viral replication to increase and may negatively affect health. Consequently, treatment continuity depends not only on medicines but also on healthcare availability, transport, nutrition, counselling, laboratory services, family support and protection from stigma.

VI. HIV AND DIFFERENT SOCIAL GROUPS

HIV does not belong to any particular gender, sexuality, class, caste, ethnicity or community. Anyone can acquire HIV through a relevant exposure. However, social and structural conditions can produce unequal levels of vulnerability.

Children

Children may acquire HIV through vertical transmission or, in certain circumstances, through unsafe blood or medical exposure. Early diagnosis, paediatric ART and long-term follow-up are essential. Children living with HIV may also experience challenges involving disclosure, school discrimination, nutrition, family relationships and dependence on caregivers. The HIV response should therefore include child protection and educational support in addition to medical care.

Adolescents and Young People

Adolescence is an important period for comprehensive health education. Young people may experience misinformation, limited access to confidential services and fear of judgement.

Age-appropriate education should provide scientifically accurate information concerning HIV transmission, consent, condoms, testing, PrEP, PEP and treatment.

Women

Women can experience HIV vulnerability through biological, economic and social factors. Gender inequality, violence, unequal decision-making power and limited access to healthcare can affect prevention opportunities.

HIV services should therefore be connected, where appropriate, with reproductive healthcare, maternal healthcare and gender-based violence support.

Men

Men may face barriers to testing and treatment because of work schedules, mobility, social expectations surrounding masculinity or fear of stigma. HIV programmes should make services accessible without reinforcing gender stereotypes.

Transgender and LGBTQIA+ Communities

Transgender people and other LGBTQIA+ populations can experience elevated HIV vulnerability in some settings because of stigma, discrimination, violence, economic exclusion and unequal access to healthcare.

UNAIDS reports that transgender women have substantially higher HIV acquisition risk than the general adult population. Such statistics should not be interpreted as evidence that gender identity or sexual orientation itself causes HIV.

Rather, they illustrate the interaction between social exclusion, particular exposure patterns and barriers to healthcare.

Healthcare services should respect gender identity, confidentiality and dignity. Providers should avoid assumptions concerning sexual behaviour and should offer appropriate testing, prevention and treatment options.

Migrants and Mobile Populations

Migration itself does not cause HIV. However, mobility can interrupt treatment, separate individuals from healthcare systems and create economic or social vulnerabilities. Continuity-of-care systems are therefore important for mobile populations.

People Who Inject Drugs

Sharing contaminated injecting equipment can provide an efficient route for HIV transmission. Sterile equipment, harm reduction, testing, ART and appropriate substance-use services can reduce health risks.

Prisoners and People in Closed Settings

People in prisons and other closed settings may face challenges involving overcrowding, healthcare access, injecting drug use, sexual health, stigma and continuity of treatment following release. HIV services should be available without discrimination in custodial settings.

Sex Workers

Sex workers can face barriers created by stigma, violence, criminalization or economic insecurity. Accessible condoms, HIV testing, PrEP, treatment and confidential healthcare can strengthen prevention and health outcomes.

VII. HIV, STIGMA AND DISCRIMINATION

Stigma remains one of the most important social barriers to HIV prevention and treatment. HIV-related stigma can occur in families, schools, workplaces, healthcare institutions and communities.

Fear of discrimination may discourage testing, disclosure and treatment. Some individuals may avoid healthcare because they fear that their HIV status will become known.

There is an important distinction between legitimate infection-control practices and discrimination. Public-health measures should be based on evidence concerning actual routes of transmission rather than fear, stereotypes or moral judgement.

Confidentiality is therefore central to HIV care. People living with HIV have the same fundamental human dignity and rights as other citizens. HIV status should not be used to justify exclusion from education, employment, healthcare, housing or ordinary social participation.

VIII. HIV AND HUMAN RIGHTS

Human rights and public health are closely connected in the HIV response. Effective programmes require confidentiality, informed consent, dignity, equality and protection from discrimination.

India's Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (Prevention and Control) Act, 2017 provides a legal framework addressing discrimination, confidentiality and protection of people affected by HIV. The Act prohibits discrimination in areas including employment, healthcare and educational services and provides protections concerning HIV-related information.

The Act also recognizes the importance of age-appropriate, gender-sensitive, non-stigmatizing and non-discriminatory information and education programmes.

Rights-based HIV programmes are not merely ethical commitments. They can also strengthen public-health outcomes by creating conditions in which people feel safe enough to seek testing, disclose relevant information to healthcare providers and remain engaged in treatment.

HIV/AIDS in India

India has developed a substantial national HIV response involving the National AIDS Control Organisation (NACO), State AIDS Control Societies, ART centres, testing services, prevention programmes, blood-safety systems and community organizations.

The Indian epidemic demonstrates considerable geographical and population-level variation. National estimates should therefore not automatically be interpreted as representing every state or district.

The contemporary response includes HIV testing, ART, prevention of vertical transmission, targeted interventions, blood safety, harm reduction and community-based support. Digital health and beneficiary-monitoring systems have also become increasingly important for programme management and continuity of care.

The major challenge is to ensure that biomedical services are accompanied by accurate information, confidentiality, social protection and anti-discrimination mechanisms.

HIV/AIDS in Assam

Assam occupies an important geographical position in Northeast India. Its transport connections, population mobility and links with neighbouring northeastern states make HIV prevention and treatment an important component of public health.

Assam's HIV response has included testing, counselling, ART, prevention of parent-to-child transmission and community-based prevention services. Historical state-level estimates have indicated relatively low adult HIV prevalence compared with the national estimate. Such historical figures, however, should not be presented as current prevalence measurements without reference to the latest state estimates.

The Assam context also demonstrates why HIV prevention should not be based on assumptions concerning particular communities. Transmission

patterns must be understood through reliable epidemiological evidence rather than stereotypes.

Future research and policy in Assam should pay attention to rural populations, migrants, adolescents, women, transgender people, key populations, geographically difficult areas and people experiencing socioeconomic exclusion. District-level research can help identify differences that may be obscured by state-level averages.

IX. HIV AND SOCIAL INEQUALITY

HIV illustrates the relationship between health and social inequality. Two people exposed to the same virus may experience very different outcomes because their access to income, education, transport, nutrition, healthcare and social support differs.

Poverty can delay testing and treatment. Stigma can discourage disclosure. Migration can interrupt ART. Gender inequality can reduce a person's ability to negotiate prevention. Educational inequality can increase exposure to misinformation.

For this reason, HIV policy should not be reduced to medicine distribution. It must also address the social conditions that influence people's ability to access and maintain healthcare.

Social protection can be particularly important for people experiencing unemployment, homelessness, food insecurity or unstable living conditions. Community organizations can help bridge gaps between formal healthcare systems and marginalized populations.

Contemporary Developments in HIV Prevention and Treatment

HIV science continues to evolve. One major recent development is the expansion of long-acting prevention technologies.

In July 2025, WHO recommended twice-yearly injectable lenacapavir as an additional PrEP option. The recommendation was based on evidence demonstrating high effectiveness and recognized the potential value of a prevention method that does not require daily oral dosing.

WHO's current guidance also includes long-acting injectable cabotegravir and other prevention options. In 2026, WHO reported that lenacapavir was being introduced in several countries, while further rollout was planned elsewhere.

These developments are scientifically important, but technological innovation alone cannot eliminate HIV. Questions concerning affordability, regulatory approval, manufacturing, supply chains, trained healthcare personnel and equitable distribution remain central.

Long-acting technologies may particularly benefit individuals who experience difficulties with daily medication because of stigma, unstable living conditions, travel, work schedules or adherence barriers. However, programmes should preserve informed choice and provide multiple prevention options rather than assuming that one method will suit everyone.

X. MAJOR CHALLENGES

Several challenges continue to affect the HIV response.

Undiagnosed infection: Approximately 5 million people living with HIV were estimated not to know their status in 2025.

Treatment gaps: Approximately 9 million people living with HIV were not accessing ART in 2025. Children remain particularly underserved.

Stigma and discrimination: Fear of discrimination can discourage testing and treatment.

Misinformation: Myths about transmission can produce both unnecessary fear and unsafe behaviour.

Healthcare inequality: Rural and marginalized populations can experience greater barriers to services.

Treatment interruptions: Migration, transport difficulties, economic insecurity and health-system disruptions can interfere with ART.

Gender inequality: Unequal decision-making power can restrict prevention options.

Funding pressures: Sustainable HIV programmes require reliable long-term financing. UNAIDS reported that available resources for the AIDS response in low- and middle-income countries in 2025 remained below the amount estimated to be needed annually to stay on track toward global targets.

Adolescent barriers: young people may lack confidential and youth-friendly healthcare.

Unequal access to innovation: new prevention technologies can have limited population impact if they are unavailable or unaffordable to people who need them.

XI. RECOMMENDATIONS

Expand Accessible Testing

HIV testing should be available through healthcare facilities, community programmes and appropriate self-testing approaches, with confirmatory testing and linkage to care.

Strengthen Treatment Continuity

ART should remain accessible without unnecessary interruption. Decentralized services, community support and appropriate medicine-distribution mechanisms can reduce access barriers.

Promote U=U

Public-health campaigns should communicate the scientific evidence surrounding sustained viral suppression and sexual transmission.

Strengthen Combination Prevention

Condoms, PrEP, PEP, sterile injecting equipment, safe blood and prevention of vertical transmission should be incorporated into comprehensive prevention programmes.

Protect Confidentiality

Healthcare workers and institutions should maintain strong privacy and data-protection procedures concerning HIV status.

Address Stigma

Educational programmes should challenge misinformation and discriminatory practices while promoting accurate knowledge about HIV.

Strengthen Youth-Friendly Services

Schools, colleges and community institutions should support scientifically accurate, age-appropriate health education and pathways to confidential healthcare.

Integrate HIV Services

HIV services should be integrated where appropriate with tuberculosis care, sexual and reproductive health, maternal healthcare, mental-health support, substance-use services and broader social-welfare programmes.

Strengthen Assam-Specific Research

More district-level research is required concerning HIV-related stigma, treatment access, migration, gender, transgender communities, adolescents and rural healthcare access in Assam.

Encourage Community Participation

People living with HIV and affected communities should participate in programme planning, implementation and evaluation. Community participation can improve accountability and help ensure that services respond to lived realities.

XII. CONCLUSION

HIV/AIDS remains a significant global, national and regional health issue, but its meaning has changed profoundly through advances in science, treatment and prevention. HIV can now be managed as a chronic health condition when people have timely access to diagnosis, ART and continuing care. Viral suppression, U=U, PrEP, PEP, HIV testing, prevention of vertical transmission and long-acting prevention technologies have expanded the possibilities for both treatment and prevention.

Nevertheless, biomedical progress does not automatically eliminate social inequality. Undiagnosed infection, stigma, discrimination, poverty, gender inequality, migration, treatment interruptions and unequal healthcare access continue to influence HIV outcomes.

A comprehensive HIV response must therefore combine medical science with social justice and human rights. Children, adolescents, women, men, transgender people, LGBTQIA+ communities, migrants, prisoners, sex workers, people who inject drugs and the wider population should be able to obtain accurate information, confidential testing, prevention and treatment without discrimination.

For Assam, a balanced approach is particularly important. Historical estimates of relatively low prevalence should not create complacency, but neither should HIV prevention become a justification for stereotyping communities. Evidence-based and inclusive approaches are more appropriate than fear-based responses.

The future of the HIV response depends on sustaining scientific innovation while addressing the social conditions that shape access to health. Long-acting prevention technologies illustrate the possibilities of biomedical progress, while U=U demonstrates the transformative relationship between treatment and

prevention. Yet these advances can achieve their full public-health value only when they are available equitably.

HIV/AIDS should therefore be understood not only as a biomedical issue but also as a question of dignity, equality, social inclusion and human rights. Sustained investment in prevention, treatment, research, social protection, community participation and equitable access to innovation remains essential for reducing new infections, preventing AIDS-related illness and improving the lives of people living with HIV.

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