

## EPIDEMIOLOGICAL UPDATE ON AIDS-A SYSTEMATIC REVIEW

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### Abstract

Human immunodeficiency virus is categorized under the retrovirus family that infects humans and causes acquired immunodeficiency syndrome, a condition in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive. Human immunodeficiency virus infection is considered a global pandemic. AIDS continues to have devastating health effects globally, with over 39 million HIV/AIDS-related deaths to date and more than 36 million people living with HIV. This review explains the epidemiology of HIV burden across the globe and the scenario of people living with HIV throughout the world and its preventive measures.

**Key Words:** AIDS, epidemiology, HIV burden, Immune-system

## Introduction

The human immunodeficiency virus (HIV) is categorized under the retrovirus family. Retrovirus is a virus that uses RNA as its genetic material. When a retrovirus infects a cell it makes a DNA copy of its genome that is inserted into the DNA of the host cells. There are different forms of retroviruses. The retrovirus is not composed of DNA but of RNA, retrovirus has an enzyme, called reverse transcriptase that gives them the unique property of transcribing their RNA into DNA after entering a cell. Once they enter the host cell's cytoplasm, the virus uses its reverse transcriptase enzyme to produce DNA from its RNA genome, the reverse of the usual pattern, thus retro (backward). It is believed that HIV initially came from a virus specific to chimpanzees in West Africa during the 1930s, and was initially transmitted to humans through the transfer of blood on hunting. These Viruses may be transferred from the source to a host by direct or indirect contact transmission. HIV is known to be transmitted through sexual contact with an infected partner. The likelihood of HIV transmission is dependent on the probability of exposure and the probability of infection after exposure. After some years, the virus spread through Africa, and to other parts of the world<sup>1</sup>.

HIV causes acquired immunodeficiency syndrome (AIDS). Generally, our body has an immune system that counters viruses and bacteria. The defense system has white blood cells which protect the body from infections. White blood cells contain CD4+ cells called helper cells or T cells. HIV infects vital cells in the human immune system, such as helper T cells (specifically CD4+ T cells), macrophages, and dendritic cells. HIV infection leads to low levels of CD4+ T cells through many mechanisms, including pyroptosis of abortively infected T cells, apoptosis of uninfected bystander cells, the direct viral killing of infected cells, and killing of infected CD4+ T cells by CD8+ cytotoxic lymphocytes that recognize infected cells. When CD4+ T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes progressively more susceptible to opportunistic infections<sup>2</sup>. The various historical events about HIV/AIDS are explained as follows:

## Historical Event of HIV/AIDS

1981- Reporting of the unusually high rate of the rare forms of pneumonia and cancer in young gay men begins the diseases is initially called gay-related immune deficiency (GRID).

1982-The disease was renamed AIDS [ACQUIRED IMMUNE DEFICIENCY SYNDROME] in Canada.

1983-Identified first women infected with AIDS through heterosexual sex.

1985-The first international conference on AIDS was held in Georgia USA. The first Canadian conference on AIDS is held in Montreal.

1986-It was identified that HIV can be passed from mother to children through Brest feeding.

1987-The US-FDA approves the first antiretroviral drug.

1988-The first world AIDS day is held on December 1st, 1988.

1991- The red ribbon became the international symbol of AIDS awareness, intended to be a symbol of compassion for people living with HIV.

1996-Dr. MARK WAINBERG contributed to the development of 3TC a drug being used to treat HIV. This was a combination drug therapy that brought about an immediate decline of between 60%-80% in rates of AIDS-related death.

1999-The WHO announces that AIDS was the fourth biggest cause of death worldwide and the number one killer in Africa. An estimate of 33 million people was living with HIV and 14 million people were recognized to have died from AIDS

2003- U.S PRESIDENT EMERGENCY PLAN FOR AIDS RELIEF [PEPFAR] was organized by the government. To provide \$15 billion over five years to the countries that have high infection rates.

By the end of 2009, the world consists of approximately 33.3 million<sup>3</sup>. In 2018, a total of 4, 70,000 people died from AIDS-related illnesses in the African Region. Annual death cases in India accounted for about 100,000 people per year. Almost 1million people were dying from HIV/AIDS per year. These are considered as most dangerous infectious diseases in the world<sup>3</sup>.

Over the past two decades, major global efforts have been mounted to address the epidemic, and significant progress has been made. The number of people newly infected with HIV, especially children, and the number of AIDS-related deaths has declined over the years, and the number of people with HIV

receiving treatment increased to 25.4 million in 2019. The latest research on HIV avoidance highlights the increasing opportunities available and development made to eradicate HIV transmission<sup>4</sup>. Major risk factors for having HIV/AIDS are given below.

Behavior's and conditions that put individuals at greater risk

- Having unprotected anal or vaginal sex
- Having another sexually transmitted infection (STI) such as syphilis, herpes, chlamydia, gonorrhoea, and bacterial vaginosis
- Sharing contaminated needles, syringes, and other injecting equipment and drug solutions when injecting drugs;
- Receiving unsafe injections, blood transfusions and tissue transplantation, and medical procedures that involve unsterile cutting or piercing; and
- Experiencing accidental needle stick injuries, including among health workers.

#### **EPIDEMIOLOGY OF HIV**

The human immunodeficiency virus is considered a global pandemic. And the WHO currently uses the term global epidemic to describe HIV. It is estimated that the global incidence of HIV infection peaked in 1997 at 3.3 million per year. There were about 770,000 deaths from AIDS in 2018. The center for diseases controls mentions that HIV disease continues to be a serious health issue for several parts of the world<sup>5</sup>. This review mainly focuses on the epidemiological burden of AIDS across the globe.

#### **Global HIV Burden**

HIV continues to have devastating health effects globally, with over 39 million HIV/AIDS-related deaths to date and more than 36 million people living with HIV. The Joint United Nations Program on AIDS (UNAIDS). It Estimates that approximately 1.7 million people were newly infected with HIV and that 770,000 people died of AIDS in 2018, both statistics showing a decline over time. The vast majority of infections remain in sub-Saharan Africa, where 5.2% of the population is believed to be infected. Since the start of the global HIV epidemic, women in many regions have been disproportionately affected by HIV. Today, women constitute more than half of all people living with HIV<sub>1</sub> and AIDS-related illnesses remain the leading cause of death for women aged between 15 and 49. Young women aged 15-24, and adolescent girls aged

10-19 in particular, account for a disproportionate number of new HIV infections<sup>6</sup>.

Every week, around 5000 young women aged 15–24 years become infected with HIV. In sub-Saharan Africa, six in seven new HIV infections among adolescents aged 15–19 years are among girls. Young women aged 15–24 years are twice as likely to be living with HIV as men. Around 4200 adolescent girls and young women aged 15–24 years became infected with HIV every week in 2020. More than one-third of women around the world have experienced physical and/or sexual violence by an intimate partner or sexual violence by a non-partner at some time in their lives.

In some regions, women who have experienced physical or sexual intimate partner violence are 1.5 times more likely to acquire HIV than women who have not experienced such violence. In sub-Saharan Africa, women and girls accounted for 63% of all new HIV infections in 2020. In 2020, 84% of pregnant women with HIV received ART to prevent transmitting HIV to their babies during pregnancy and childbirth and to protect their health<sup>7</sup>.

AIDS-related deaths have been reduced by 61% since the peak in 2004. In 2020, around 690,000 people died from AIDS-related illnesses worldwide, compared to 1.2 million in 2010. The vast majority of people with HIV are in low- and middle-income countries. In 2020, there were 20.6 million people with HIV (55%) in eastern and southern Africa, 4.7 million (13%) in western and central Africa, 5.7 million (15%) in Asia and the Pacific, and 2.2 million (6%) in Western and Central Europe and North America<sup>8</sup>. The HIV epidemic across the continent was explained below paragraphs.

#### **Africa**

HIV/AIDS originated in Africa in the early 20th century and is a major public health concern and cause of death in many African countries. AIDS rates vary dramatically although the majority of cases are concentrated in Southern Africa. Although the continent is home to about 15.2 percent of the world's population, more than two-thirds of the total infected worldwide, some 35 million people were Africans, of whom 15 million have already died. Sub-Saharan Africa alone accounted for an estimated 69 percent of all people living with HIV and 70 percent of all AIDS deaths in 2011.

In the countries of sub-Saharan Africa most affected, AIDS has raised death rates and lowered life expectancy among adults between the ages of 20 and 49 by about twenty years. Furthermore, the life expectancy in many parts of Africa is declining, largely as a result of the HIV/AIDS epidemic with life expectancy in some countries reaching as low as thirty-four years<sup>9</sup>.

Countries in North Africa and the Horn of Africa have significantly lower prevalence rates, as their populations typically engage in fewer high-risk cultural patterns that promote the virus' spread in Sub-Saharan Africa. Southern Africa is the worst affected region on the continent. As of 2011, HIV has infected at least 10 percent of the population in Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Eswatini, Zambia, and Zimbabwe.

The number of HIV-positive people in Africa receiving ART in 2012 was over seven times the number receiving treatment in 2005, with nearly 1 million added in the previous year. The number of AIDS-related deaths in Sub-Saharan Africa in 2011 was 33 percent less than the number in 2005. The number of new HIV infections in Sub-Saharan Africa in 2011 was 25 percent less than the number in 2001.

Out of the 34 million HIV-positive people worldwide, 69% live in sub-Saharan Africa. There are roughly 23.8 million infected persons in all of Africa. 91% of the world's HIV-positive children live in Africa. More than one million adults and children die every year from HIV/AIDS in Africa alone<sup>10</sup>.

#### **North America**

As of 2016, it is estimated that there are 1.5 million adults and children living with HIV/AIDS in North America, excluding Central America and the Caribbean. 70,000 adults and children are newly infected every year, and the overall adult prevalence is 0.5%. 26,000 people in North America (excluding Central America and the Caribbean) die from AIDS every year.

The number of people living with HIV in the United States has reached its highest level ever with 1.2 million people living with the virus in 2005 and national adult HIV prevalence at 0.6%. Widespread access to antiretroviral therapy in the United States has kept the number of AIDS-related deaths relatively low. One in four women newly diagnosed with HIV in 2003 had been infected while injecting

drugs. AIDS is the leading cause of death among African American women aged 25-34 years<sup>11</sup>.

African Americans makeup just over 12% of the population in the USA and account for 50% of all new HIV diagnoses, African Americans are half as likely to be receiving antiretroviral therapy compared with other population groups. Canada's epidemic is much smaller and new annual HIV infections have remained at around 2,500 since 2002. Unprotected sex between men remains the main mode of transmission (43% of new diagnoses in the first six months of 2005), and more women are being infected. In 2004, women accounted for 27% of new diagnoses compared to just over 10% in 1995<sup>12</sup>.

#### **Asia**

The epidemic is largely characterized by concentrated and growing epidemics in key populations in a variety of countries, particularly clients of sex workers and other sexual partners of key populations, people who inject drugs (referred to as PWID), and men who have sex with men (sometimes referred to as MSM). The HIV epidemic in Asia and the Pacific varies throughout the region. For example, new HIV infections in South and South-East Asia are decreasing, whereas, in East Asia, they are rising. Across all countries, key affected populations are vulnerable and being left behind. 18 countries in the region still criminalize same-sex activities, while drug detention centers punish people who use drugs and deny them access to HIV treatment and harm reduction methods.

Asia remains a potential breeding ground for an epidemic. Gives the massive population density Compared with other regions, notably Africa and the Americas, national HIV prevalence levels in South Asia are very low (0.3% in the adult 15-49) group. However, due to the large populations of many South Asian nations, this low national HIV prevalence still means that many people have HIV. Although new infections declined by 9% between 2010 and 2018, progress has slowed in recent years and new infections are on the rise in some countries. In particular, Bangladesh, the Philippines, Pakistan, and Afghanistan are facing rapidly expanding HIV epidemics. The Philippines is experiencing the steepest rise, with new infections up by 200% between 2010 and 2018<sup>13</sup>.

Over the same period, new infections rose by 57% in Pakistan, 56% in Bangladesh, 49% in Afghanistan, and 26% in Papua New Guinea. The political climate in the Philippines under President Duterte, where extrajudicial killings against people who use drugs have been sanctioned and condom use discouraged, suggests this worrying trend is likely to continue. It is increasingly clear that the Asia and Pacific region is falling behind regions in Africa in its HIV response. In 2019, 75% of people living with HIV in this region were aware of their status. Among those aware, 80% were on the treatment of which 91% were virally suppressed. In terms of treatment coverage, this equates to 60% of all people living with HIV being on treatment and just 55% being virally suppressed. The Asia and Pacific region was home to an estimated 5.8 million people living with HIV in 2019. China, India, and Indonesia account for almost three-quarters of the total number of people living with HIV in the region.

Five countries account for the majority of the burden, namely India, Indonesia, Myanmar, Nepal, and Thailand. The countries reporting the highest rates are Indonesia (25.8%), Malaysia (21.6%), and Australia (18.3%). Rates among younger men (aged 15 to 24 years) are especially high and increasing. Male-male sex remains illegal in several countries in the region and prevention programs for MSM remain limited<sup>14</sup>.

#### **South America**

HIV/AIDS has been a public health concern for Latin America due to the remaining prevalence of the disease. In 2018 an estimated 2.2 million people had HIV in Latin America and the Caribbean, making the HIV prevalence rate approximately 0.4% in Latin America. Some demographic groups in Latin America have higher prevalence rates for HIV/AIDS including men who have sex with men having a prevalence rate of 10.6%, and transgender women having one of the highest rates within the population with a prevalence rate of 17.7%. Female sex workers and drug users also have a higher prevalence of the disease than the general population<sup>15</sup>.

One aspect that has contributed to the higher prevalence of HIV/AIDS in LGBT+ groups in Latin America is the concept of homophobia. Homophobia in Latin America has historically

affected HIV service provision through underreported data and less priority through a government program. Antiretroviral treatment coverage has been high, with AIDS-related deaths decreasing from 2007 to 2017 by 12%, although the rate of new infections has not seen a large decrease. The cost of antiretroviral medicines remains a barrier for some in Latin America, as well as country-wide shortages of medicines and condoms. In 2017 77% of Latin Americans with HIV were aware of their HIV status<sup>16</sup>.

#### **Europe**

In Western Europe, the routes of transmission of HIV are diverse, including paid sex, sex between men, intravenous drugs, mother-to-child transmission, and heterosexual sex. However, many new infections in this region occur through contact with HIV-infected individuals from other regions. In some areas of Europe, such as the Baltic countries, the most common route of HIV transmission is through injecting drug use and heterosexual sex, including paid sex.

The adult 15–49 prevalence in Europe in 2018 varied from a high of 1.20% in Russia to a low of 0.1% in eleven countries. Due to the availability of antiretroviral therapy, deaths from AIDS have stayed low since the introduction of protease inhibitors and combination therapy in the late 1990s<sup>17</sup>.

In 2018, 26164 people were diagnosed with HIV in the 31 countries of the EU/EEA, with a rate of 5.8 per 100000. Countries with the highest rates were Latvia (16.9; 326 cases), Malta (15.3; 73 cases), and Estonia (14.4; 190 cases), and the lowest was reported by Slovakia (1.9; 101 cases) and Slovenia (1.7; 35 cases). The rate of new HIV diagnoses was higher among men (7.9 per 100000 population) than women (2.4 per 100000 population). The overall male-to-female ratio was 3.1 this ratio was highest in Slovenia (34.0) and Hungary (24.4) and was above one in all of the EU/EEA countries.

The predominant mode of transmission in countries with the highest male-to-female ratio was sex between men. HIV transmission remains a major public health concern and affects millions of people in the WHO European Region, particularly in the eastern part of the Region. More than 140000 people were diagnosed with HIV in 2018 at a rate of 16.2 per 100000 populations. The vast majority, 79%

were diagnosed in the East of the Region and 16% in the EU/EEA. Newly diagnosed infections in Russia contributed 61% of all cases in the WHO European Region and 77% of cases in the East. As per data available, 1.3 percent of adults are HIV positive in the European Union<sup>18</sup>.

#### **Australia**

In 2019, it was estimated that there were 29,045 people with HIV in Australia. Of these 29,045 people, an estimated 90% were diagnosed by the end of 2019. The research also shows that 91% of people diagnosed were receiving HIV treatment, and of those on treatments, 97% had an undetectable viral load.

In 2019, 59% of HIV notifications were attributed to sexual contact between men. 23% of cases were attributed to heterosexual sex, 7% to a combination of sexual contact between men and injecting drug use, 3% to injecting drug use alone, and 8% to other/unspecified. Over the last five years, the rate of diagnosis has been between 1.3 and 1.9 times as high among Aboriginal and Torres Strait Islander people than Australian-born non-Indigenous people. Of the HIV notifications in 2019 with male-to-male sex as their risk exposure, 49% were overseas-born men<sup>19</sup>.

#### **EPIDEMIOLOGY OF HIV IN INDIA**

HIV is an epidemic in India, Where the AIDS prevalence rate in India is lower than that of many other countries. India's AIDS prevalence rate stood at approximately 0.30% which is the 80th highest in the world. The main factor which has contributed to India's large HIV infection is extensive labor migration and low literacy levels in certain rural areas resulting in a lack of awareness.

#### **HIV Burden in India**

India has the third-largest HIV epidemic in the world. In 2017 HIV prevalence among adults was an estimated 0.2% this is small when compared to other middle-income countries but due to India's huge population, it is equated to 2.1 million people. The primary drivers of the HIV epidemic in India are unprotected paid sex, unprotected sex between men, and injecting drug use. The heterosexual route of transmission accounts for 87% of the HIV cases detected.

No other continent has experienced the extensive spread of HIV that sub-Saharan Africa is suffering from. In part, this may be a result of the age of the epidemic, a factor known to account for some of the recorded differences in prevalence worldwide. Other areas of the world, however, are now reporting an increasing incidence of HIV<sup>20</sup>.

India is currently estimated to have 3.7 million HIV-positive persons from an estimated 2.7 million in 1998. The First HIV-positive person was identified in India in 1986, and there has since been a rapid spread of the epidemic in several parts of the country. It is estimated that most of these infections have been acquired through sexual transmission (80%), with smaller numbers from injecting drugs (5%) and from infected blood transfusions (5%), and a few through mother to child transmission. India, like many other countries, does not have a single HIV epidemic but has multiple epidemics in different geographical settings and among people with different types of risk.

Initial cases were reported among female sex workers in the cities of Mumbai and Chennai, and among injecting drug users in the northeast of the country, especially in the state of Manipur. Reacting to the global reports of HIV/AIDS, the Indian Council of Medical Research (ICMR) initiated surveillance for HIV infection in India in 1985-1986, and the first evidence of HIV infection in sex workers in Chennai, Madurai, and Vellore was obtained in 1986-1987. Gradually centers were established in the State Capitals of India. National AIDS Control Organization (NACO) set up under the Ministry of Health and Family Welfare mandated to implement initiatives like establishing HIV testing centers. Strengthening blood safety and controlling hospital infection took over surveillance activity in 1992<sup>21</sup>.

The epidemiologic data on HIV/AIDS in India has emerged primarily from the network of sentinel surveillance, ongoing testing in antenatal clinics and blood banks, research studies, reporting of AIDS cases, and information generated from mortality statistics. The geographic distribution of the HIV epidemic in India is varied and based on the prevalence of HIV infection in the low and high-risk groups. Few studies have been done on men having sex with men (MSM).

In a cross-sectional population-based random sample survey in 2001, randomly selected residents

of 30 slums in Chennai were interviewed for behavioral risk factors and 46 (5.9%) of them reported sex with other men. MSM was 8 times more likely to be seropositive for HIV and over twice more likely to have a history of STD than non-MSM. Risk behavior assessment of 10,785 men attending 3 STI clinics in Pune from 1993 to 2002 indicated that 708 (6.6%) were MSM. Hence specific interventions targeting MSM should also be included in the control of HIV and STD.

Nowadays, numbers of people with HIV are lesser than the high numbers came in 2001-'05 but not very low," said Sonal Mehta, chief executive of Alliance India, an NGO that works on HIV/AIDS. But according to the latest NACO report, Mizoram had the highest adult HIV prevalence in the country, followed by Manipur and Nagaland. Other states with high adult HIV prevalence are Telangana, Andhra Pradesh, Karnataka, Goa, Maharashtra, and Delhi<sup>22</sup>.

#### **HIV Prevalence in Tamil Nadu**

Every year more than four lakh people are tested and counseled for HIV in Tamil Nadu. Tamil Nadu has an AIDS testing center at all district headquarters with more than 55 Antiretroviral therapy (ART) centers and 750 Integrated (Voluntary) and Confidential Counseling and Testing Centre's (ICTC) under the National AIDS Control Program at district level government hospitals and medical colleges across the state. But as per the latest comprehensive survey by UNDP, HIV and AIDS are a serious challenge for the state with more than 1.5 lakh infected people.

Tamil Nadu State AIDS project was formed in 1993 and 1994. It has been registered as a society under the society act as Tamil Nadu state AIDS control society (TANSACS). The state health secretary is the president of the society and an IAS officer is the member secretary and project director of the society. TANSACS fully funded by the National AIDS Control Organization (NACO)

In India, Tamil Nadu with 1.55 lakh People Living with HIV has a prevalence of 0.27 then the national average of HIV infected population. Even after an increase in the level of awareness about AIDS in India, Tamil Nadu is still among the six high-prevalence states in India, according to the latest comprehensive survey undertaken by United Nation Development Program (UNDP). However, a large

number of youngsters who are educated also fail to receive timely treatment because of the social stigma that AIDS is transmitted through sex, which is a taboo subject in some cultures<sup>23</sup>.

#### **AIDS-Related Deaths**

The prognosis in patients with untreated HIV infection is poor, with an overall mortality rate of more than 90%. The average time from infection to death is 8-10 years, although individual variability ranges from less than 1 year to long-term no progression. Life expectancy in HIV/AIDS-infected patients is about 38 years less than that of the general population at the exact age of 20 (with treatment). The deaths caused by HIV/AIDS occurred about 36 years before what was expected in the general population at ages 20-64. Crucially, around 40% of the 37 million people living with HIV globally do not know that they are living with the virus<sup>24</sup>.

AIDS-related deaths have been reduced by 64% since the peak in 2004 and by 47% since 2010. In 2020, around 680 000 [480 000–1 million] people died from AIDS-related illnesses worldwide, compared to 1.9 million [1.3 million–2.7 million] people in 2004 and 1.3 million [910 000–1.9 million] people in 2010. AIDS-related mortality has declined by 53% among women and girls and by 41% among men and boys since 2010.

#### **PEOPLE LIVING WITH HIV AROUND THE WORLD**

37.7 million People were globally living with HIV in 2020. 1.5 million people became newly infected with HIV, 6, 80,000 people died from AIDS-related illnesses and 27.5 million people were accessing antiretroviral therapy in 2020. Of this population, 36.0 million were adults and 1.7 million were children (0–14 years). 53% of the population living with HIV were women and girls. 84% of them knew their HIV status while the remaining 14% were not known about it. Around 6.1 million people did not know that whether they were living with HIV or not<sup>25</sup>.

#### **People Living with HIV Accessing Antiretroviral Therapy**

At the end of December 2020, 27.5 million people were accessing antiretroviral therapy, up from 7.8 million in 2010. In 2020, 73% of all people living with HIV were accessing treatment. 74% of adults aged 15 years and older living with HIV had access to

treatment, as did 54% of children aged 0–14 years. 79% of female adults aged 15 years and older had access to treatment; however, just 68% of male adults aged 15 years and older had access. 85% of pregnant women living with HIV had access to antiretroviral medicines to prevent transmission of HIV to their children in 2020<sup>26</sup>.

### **People Living with HIV in India**

Nationally, there were 69.22 thousand (37.03 thousand – 121.50 thousand) estimated new HIV infections in 2019. This translates into 190 new infections every day and eight new infections every hour. State/Union Territories-wise, Maharashtra was estimated to have the highest number of new HIV infections in 2019 (8.54 thousand), followed by Bihar (8.04 thousand), Uttar Pradesh (6.72 thousand), West Bengal (3.97 thousand), Gujarat (3.37 thousand) and Delhi (2.99 thousand).

India's HIV Estimation 2019 report, HIV prevalence trend has been declining in India since the epidemic's peak in the year 2000 and has been stabilizing in recent years. The estimate for this indicator was 0.22% in 2019. The HIV epidemic has an overall decreasing trend in the country with estimated annual new HIV infection declining by 37% between 2010 and 2019. HIV Infection in India is mainly caused by engagement in high-risk behavior in unprotected HETRO& HOMO sexual behavior and PWID. The following table estimates the state-wise population living with AIDS in India<sup>27</sup>.

As per the latest HIV estimates report 2019 of the government, India is estimated to have around 23.49 lakh people living with HIV/AIDS.

### **New HIV Infections**

New HIV infections have been reduced by 52% since the peak in 1997. In 2020, around 1.5 million people were newly infected with HIV, compared to 3.0 million people in 1997. Women and girls accounted for 50% of all new infections in 2020. Since 2010, new HIV infections have declined by 31%, from 2.1 million to 1.5 million in 2020. Since 2010, new HIV infections among children have declined by 53%, from 320 000 in 2010 to 150 000 in 2020.

### **PREVENTION OF HIV**

The term non-governmental organizations apply to diverse organizations that work together outside of government to address a need to advance a cause or defend an interest. The World

Bank uses a somewhat narrow definition of NGOs as a private organization that pursues activities to relieve suffering promote the interests of the poor protect the environment or undertake community development.

Among the organization responding to the crisis non-governmental organization (NGOs) are emerging as a powerful force in the effort to contain the epidemic. From street kids in Zambia and prostitutes in Brazil to gay men in India, a diverse group at risk of HIV infection has been reached by NGOs in a wide variety of innovative program<sup>28</sup>. Various global organizations are explained in the given chapter.

### **Global Organization on HIV/AIDS**

There are many nongovernmental organizations (NGOs) engaged in the global response to HIV and AIDS. Below are some of the largest NGOs working to prevent new HIV infections and scale up access to treatment and related health services for people living with AIDS,

1. The Global Fund
2. International AIDS Society
3. Kaiser Family Foundation
4. UNAIDS
5. World Health Organization

### **The Global Fund**

The Global Fund is a partnership designed to accelerate the end of AIDS, tuberculosis, and malaria as epidemics. An international organization founded in 2002, the Global Fund mobilizes and invests more than US\$4 billion a year to support programs run by local experts in more than 100 countries<sup>29</sup>.

### **International AIDS Society (1988)**

The International AIDS Society (IAS) is the world's largest association of HIV professionals, with members from more than 180 countries working on all fronts of the global AIDS response. The mission of the IAS is to lead collective action on every front of the global HIV response through its membership base, scientific authority, and convening power.

The global fund is a financing institution, providing support to countries in the response to the three diseases, they do not implement the program on the ground. Global fund staff, all based in Geneva, Switzerland, come from all professional backgrounds and more than 100 different countries.



By challenging barriers and embracing innovative approaches, the global fund partnership strives for maximum impact.

Working together, they have saved millions of lives and provided prevention, treatment, and care services to hundreds of millions of people helping to revitalize entire communities, strengthen the local health system and improve economies. The Fund works in partnership with governments, civil society, technical agencies, the private sector, and people affected by the diseases to pool resources and invest strategically in programs and build resilient and sustainable systems for health<sup>30</sup>.

The International AIDS Conference is the premier global platform to advance the HIV response. As the world's largest conference on HIV and AIDS, it sits uniquely at the intersection of science, advocacy, and human rights, bringing together scientists, policymakers, healthcare professionals, people living with HIV, funders, media, and the community. Since its start in 1985, the conference continues to serve as an opportunity to strengthen policies and programs that ensure an evidence-based response to HIV and related epidemics.

To make scientific for more access to our members, their communities, and the HIV workforce, the IAS convenes smaller scientific symposia around the world targeted at healthcare workers, advocates, and policymakers. Through these smaller scientific meetings, the IAS Educational Fund provides access to the latest science and opportunities to question how that information impacts local epidemics. For more information, visit the IAS Educational Fund.

The vision of IAS vision is a worldwide force of professionals working together to prevent, control and treat HIV/AIDS. It focuses on three strategic areas of regional development: strengthening of relations and collaboration with regional AIDS networks and societies; regional AIDS conferences; and connecting and mobilizing individual IAS members in the region.

IAS advocates and drives urgent action to reduce the global impact of HIV. IAS is also the steward of the world's two most prestigious HIV conferences the International AIDS Conference and the IAS Conference on HIV Science<sup>31</sup>.

#### **Kaiser Family Foundation**

The Kaiser Family Foundation (KFF) is a nonprofit organization focusing on national health issues and the U.S. role in global health policy. KFF develops and runs its policy analysis, journalism, and communications programs, sometimes in partnership with major news organizations. KFF serves as a non-partisan source of facts, analysis, and journalism for policymakers, the media, the health policy community, and the public. Its information is always provided free of charge including policy research, data analysis, and health policy news coverage provided by its news service, Kaiser Health News (KHN).

The Foundation's GlobalHealth and HIV Policy Program focuses on providing the latest data and information on the U.S. role in global health and conducts research and analysis on current HIV-related policy issues, with a focus on the U.S. government's response to the epidemic domestically and around the world<sup>32</sup>.

#### **UNAIDS**

The Joint United Nations Programm on HIV/AIDS (UNAIDS) is an international organization that is working towards stopping new HIV infections, ensuring that everyone living with HIV has access to HIV treatment, promoting human rights, and producing data for decision-making. The organization leads and inspires the world to achieve its shared vision of zero new HIV infections, zero discrimination, and zero AIDS-related deaths.

The Joint United Nations Programm on AIDS (UNAIDS) is the main advocate for accelerated, comprehensive, and coordinated global action on the HIV/AIDS pandemic. The mission of UNAIDS is to lead, strengthen and support an expanded response to HIV and AIDS that includes preventing transmission of HIV, providing care and support to those already living with the virus, reducing the vulnerability of individuals and communities to HIV, and alleviating the impact of the epidemic. UNAIDS seeks to prevent the HIV/AIDS epidemic from becoming a severe pandemic<sup>33</sup>.

#### **The 90–90–90 Target**

In 2014, the Joint United Nations Programm on HIV/AIDS (UNAIDS) and partners launched the 90–90–90 target. The aim was to diagnose 90% of all HIV-positive persons, provide antiretroviral therapy (ART) for 90% of those diagnosed, and achieve viral suppression for 90% of those treated by 2020. This is

estimated to result in 73% of people with HIV achieving viral suppression, a crucial step in ending the AIDS epidemic by 2030.

#### **The First 90%**

In 2019, four out of five people living with HIV (81%) knew their status.

#### **The Second 90%**

among people who knew their status, four out of five (82%) were accessing treatment.

#### **The Third 90%**

among people accessing treatment, more than four out of five (88%) were virally suppressed.

Moving the global response towards this universal test and treat model will pose huge challenges to public health systems in resource-limited settings, including global and local supply chain systems.

These challenges are especially acute in Africa, which accounts for over 70% of the persons affected by HIV. While there has been progressing towards UNAIDS for prevention and treatment, year-on-year reductions appear to be stalling, while the consequences of the COVID-19 pandemic on the HIV response are not yet known.

Globally, there have been remarkable gains across the HIV testing and treatment cascade. At the end of 2019, 81% of people living with HIV knew their HIV status, and more than two thirds (67%) were on antiretroviral therapy, equal to an estimated 25.4 million of the 38.0 million people living with HIV a number that has more than tripled since 2010<sup>34</sup>.

#### **World Health Organization**

The World Health Organization (WHO) directs and coordinates international health activities within the United Nations system. Its goal is to build a better, healthier future for people all over the world. Working through offices in more than 150 countries, WHO work side by side with governments and other partners to ensure the highest attainable level of health for all people.

WHO HIV/AIDS Department provides evidence-based, technical support to the WHO Member States to help them scale up treatment, care, and prevention services as well as drugs and diagnostics supply to ensure a comprehensive and sustainable response to HIV/AIDS<sup>35</sup>.

#### **NGO Programs in India**

There is a need to create a safe and loving environment where HIV/AIDS patients can lead a

normal life without being outcasted. The national AIDS control program (NACP) has made efforts to increase awareness and reduce the risk of infection. With their efforts along with the help of NGOs, India has managed to reduce the spread of new infections by half since 2001<sup>36</sup>.

#### **GiveIndia**

GiveIndia is a nonprofit organization in India. It is an online donation platform and aims to channel and provide resources to credible nongovernmental organizations across India. As a web portal, it helps raise funds and contributions from individuals across India and the world and then disburses these donations to Indian NGOs.

GiveIndia does not undertake any charitable functions directly. Instead, it channels funds provided by donors to certified non-profit organizations across India. Non-profit organizations who wish to partner with GiveIndia need to satisfy a minimum set of conditions known as "credibility alliance norms." Among other criteria, organizations must have no political ties and at least fifty percent of their beneficiaries must be economically underprivileged. Donors visit the GiveIndia website and donate online to their preferred Indian NGOs and the donations are then disbursed to those NGOs. The following are some NGO partners of GiveIndia that have contributed to this change<sup>37</sup>.

#### **Partners of Give India**

1. Neptune Foundation.
2. Snehalaya.
3. Grace Peter Charitable Trust (GPCT).
4. Priyadarshini Seva Mandali.
5. Akhanda Seva for International Shanti (Operation Shanti).
6. Swadhar IDWC (Institute for development of women and children).
7. DESIRE society.
8. Mahesh Foundation.
9. Centre for People's Education (CPE)

#### **Organization for Friends Energies and Resources (OFFER) HIV Prevention by Indian Government**

Over the past decade, India has made significant progress in tackling its HIV epidemic, especially in comparison with other countries in the region. Overall, India's HIV epidemic is slowing down, with a 57% decline in new HIV infections between 2000 and 2011, and a 29% decline in acquired immune deficiency syndrome (AIDS)-

related deaths between 2007 and 2011. The trend in annual AIDS deaths has shown a steady decline since the rollout of the free antiretroviral therapy (ART) program in India in 2004.

It is estimated that around 1, 50,000 lives have been saved due to ART as of 2011. As of March 2014, 7, 68,000 people living with HIV (PLWHIV) were on first-line ART at 425 ART centers. Nearly 1, 00,000 children living with HIV/AIDS are registered for HIV treatment and care services at these ART centers and 42,015 of these are receiving free ART. Initiation of first-line ART is done based on a cluster of differentiation CD4 counts. About 254 CD4 counting machines are functional in the country, and over 1.5 million CD4 tests have been performed during 2013-2014.

According to HIV Sentinel Surveillance (HSS) 2012-13, an overall decline in HIV prevalence among antenatal care (ANC) attendees (considered proxy for prevalence in the general population) was noted at the national level. The declining trend for ANC attendees is consistent with India's story of large-scale implementation and high coverage during the National AIDS Control Programm-III (NACP-III).

The focus of information, education, and communication (IEC) activities has been on promoting safe behaviors, reducing HIV stigma and discrimination, demanding the generation of HIV/AIDS services, and promoting condom use. A folk media campaign was scaled up in 32 states, which reached out to 15 million people through folk performances during 2013-14. The Adolescence Education Program is being implemented in 23 states covering around 49,000 schools. Red Ribbon Clubs (RRCs) are functional in around 14,000 colleges; these include 1,700 new RRCs formed in 2013-14. Of the Millennium Development Goals (MDGs), the sixth target, or MDG-6 is to combat HIV/AIDS, malaria, and other diseases.

Target 6A is to have halted by 2015 and begun to reverse the spread of HIV/AIDS and Target 6B is to have achieved, by 2010, universal access to treatment for HIV/AIDS for all those who need it. India has made substantial progress in achieving targets related to HIV/AIDS. A major reason for the country's success has been the sustained commitment of the Indian government through National AIDS Control Organization (NACO) and its NACP.

The NACP-III has been particularly effective at targeting high-risk groups such as males having sex with males (MSM), sex workers, and people who inject drugs (PWID), in aiming to stem the wider epidemic. As rightly mentioned by Claeson and Alexander, there are no real "innovations" in India's approach to HIV prevention planning; rather, there is a strategy of sound policy-making, investment in good data to make informed decisions, analysis of the data to determine the epidemic drivers, and comprehensive plans and budgets for scaling up known interventions directed at those populations with behaviors that are responsible for the most exposure to HIV, without moral undertones.

The world has much to learn from India's approach. A major reason for this success is the sustained commitment of the Indian Government through its National AIDS Control Programm, which has been particularly effective at targeting high-risk groups<sup>38</sup>.

#### **NGOs in Tamil Nadu**

Non-governmental organizations (NGOs) are called by various names in Tamil Nadu, such as third sector organizations, non-profit organizations, voluntary organizations, charitable organizations, community-based organizations, etc.

In Tamil Nadu, the non-governmental organizations involved in the health care sector are spread in both rural and urban areas with a primary focus of providing curative, preventive, and rehabilitative care services through their established healthcare institutions and/or community level health camps in targeted areas. They are also involved in facilitating several public health programs by other institutions including governments. A very common feature among them is that the beneficiaries of their services are often not the payers. They generate resources from institutional and individual donors to facilitate achieving key goals and deliver services to the targeted beneficiaries. 4005 NGOs are working in Tamil Nadu for various social welfare activities. Nearly 150 organizations are working for AIDS-related people. Their role is to protect HIV patients, help them and educate them.

The state government of Tamil Nadu established a trust in the name of "Tamil Nadu Trust for Children Affected by AIDS" (TNTCAA), to address the needs of HIV-infected and affected children in the state and protects their rights. To objective of this trust was to provide continuous assistance to children

aged between 0 and 18 years- affected by HIV/AIDS<sup>39</sup>.

## CONCLUSION

It was concluded that AIDS is an infectious disease that affects people of all ages several non-governmental organizations and governments are taking serious action to suppress the virus. HIV has made a serious out brake in 1995-2005, during this time enormous cases were registered and changed into a serious problem in the world. After a decade, HIV prevalence in the world was declined. Overall reviews and researches explain that Prevention is better than cure which means, safer sex and proper sex play a major role in preventing AIDS.

The nation must prepare to deal with a serious illness whose causes are initially unknown but the transmission is identified. HIV transmission during Blood transfusion, Emergency blood transfer in a hospital also cause an impact on AIDS. But in the modern world, antiretroviral therapy (ART) plays a significant role in viral suppression throughout the world. To provide an AIDS-free world. Education and awareness is the only weapon in our hands.

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S.NO	STATES	2019
1.	Andhra Pradesh	3.14
2.	Arunachal Pradesh	0.01
3.	Assam	0.21
4.	Bihar	1.34
5.	Chhattisgarh	0.43
6.	Delhi	0.68
7.	Goa	0.05
8.	Gujarat	1.04
9.	Himachal Pradesh	0.07
10.	Haryana	0.45
11.	Jharkhand	0.23
12.	Jammu& Kashmir And Ladakh	0.06
13.	Karnataka	2.69
14.	Kerala	0.24
15.	Meghalaya	0.11
16.	Maharashtra	3.96
17.	Manipur	0.29
18.	Madhya Pradesh	0.59
19.	Mizoram	0.20
20.	Nagaland	0.23
21.	Odisha	0.49
22.	Punjab	0.66
23.	Rajasthan	0.63
24.	Sikkim	0.003
25.	Tamil Nadu	1.55
26.	Tripura	0.03
27.	Uttarakhand	0.11
28.	Uttar Pradesh	1.61
29.	West Bengal	0.74
30.	Andaman&Nicobar	0.005
31.	Chandigarh	0.02
32.	Pondicherry	0.05
33.	Telangana	1.58
34.	Daman & Diu	0.005

Table:1 Statements on States Living With HIV/AIDS in 2019 (In Lakh)