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**Dr. Jitender Saroha**

Associate Professor,

Dr. B.R.Ambedkar College,

University of Delhi, India

## HIV/AIDS: Trends and Patterns in the World

**Dr. Jitender Saroha**

### Abstract

HIV stands for the human immunodeficiency virus. This virus attacks human body's natural defense system against illness and its final stage is called AIDS (Acquired Immune Deficiency Syndrome). HIV/AIDS originated in Africa and spread to other parts of the world and became a global health challenge within a short span. HIV is transmitted by three main channels – sexual contact, significant exposure to infected body fluids or tissues, and from vertical transmission i.e. mother to child during pregnancy, delivery, or breastfeeding. Out of the 36.7 million persons living with HIV globally, about 53 per cent are concentrated in the Eastern and Southern Africa. The top ten countries constitute about 60 per cent of persons living with HIV/AIDS (PLHIV). The objectives of the present paper are following – (i) to describe the origin and history of HIV/AIDS; (ii) to describe the causes of HIV/AIDS transmission; (iii) to highlight the trends and patterns of HIV/AIDS; (iv) to discuss the impact of HIV/AIDS and finally (v) to point out the major preventive and curative measures of HIV/AIDS.

**Keywords:** HIV, AIDS, Transmission, ATR, Prevalence

### Introduction

HIV represents the human immunodeficiency virus. This virus attacks human body's natural defense system against infections and illness. This virus destroys a type of white blood cells in the immune system, which are known as T-helper cell or CD4 cells. The immunity of person breaks down due to gradual multiplication of HIV in CD4 cells and it becomes difficult for the person to fight against infections and diseases. There are three stages of HIV infection – (i) the acute stage, the first few weeks after infection, (ii) the clinical latency, or chronic stage and (iii) AIDS, the last stage. Thus, the most advanced stage of HIV is called AIDS (Acquired Immune Deficiency Syndrome). A CD4 count of below 200 is considered AIDS and for a normal adult CD4 count are 800 to 1000 per cubic millimeter. It represents syndrome or a set of symptoms when immune system is too weak to fight off infection and diseases. The gradual increase in immunodeficiency increases susceptibility to a wide variety of infections and diseases, final result is death.

### Origin and History

Generally, it is believed that HIV/AIDS started in the 1980s in the USA but in fact it was just the time when this new health condition was detected. Worldwide, a lot of research has been conducted to trace the origin of HIV since its identification in the 1980s. The scholars have established link of HIV with Simian Immunodeficiency Virus (SIV) that similarly attacks the immune systems of monkeys and apes. The similarities between HIV-1 and a strain of SIV found in chimpanzees, and HIV-2 and strain of SIV found in sooty mangabeys have been scientifically well established. The research scholars have established connection that chimps acquired SIV by hunting and eating monkeys and human beings by hunting and eating chimps and sooty mangabeys. The HIV-1 came from chimps and HIV-2 from sooty mangabey monkeys. There is great variety of HIV-1 strains at present and four main groups are M, N, O and P strains with slightly different genetic compositions. The HIV-1 group M strain is the most frequent and widespread. HIV-2 is rare and less infectious and found mainly localized in West African countries – Mali, Mauritania, Sierra Leone and Nigeria. It is widely believed that that first transmission of SIV from chimpanzees to HIV in humans

**Correspondence:**

**Dr. Jitender Saroha**

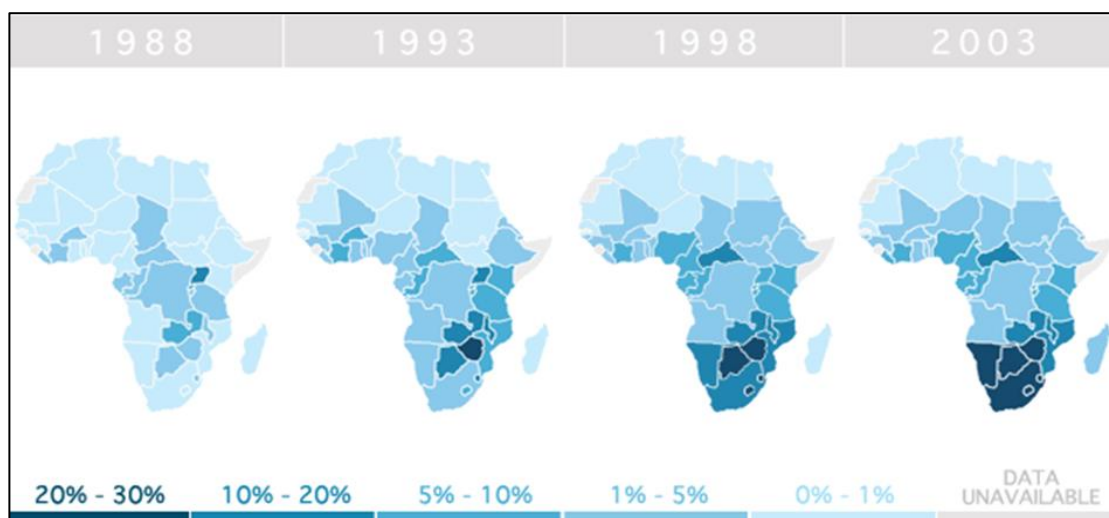
Associate Professor,

Dr. B.R.Ambedkar College,

University of Delhi, India

occurred around 1920 in Kinshasa region of the Democratic Republic of Congo, Africa. This region has greatest genetic diversity in HIV strains in the world and also record of many of the first cases of AIDS. The growing sex trade and

network of different modes of transportation resulted into spread of HIV along diverse transport routes from the Kinshasa region, except in north (Figure 1).



**Fig.1:** Spread of HIV/AIDS in Africa

Source: <http://www.publichealth.org/wp-content/uploads/2014/12/Image-III.-Africa-HIV-spread.png>

In the 1960s, Haitian migrant workers from Democratic Republic of Congo carried the HIV-1 to Haiti. Initially the Haitians were blamed for the HIV epidemic and they faced severe racism, stigma and discrimination. Prior to 1970, only sporadic cases of AIDS were recorded and data indicates that it gained epidemic status in mid-to late 1970s. By 1980 it may have already diffused to five continents (North America, South America, Europe, Africa and Australia with 100,000 to 300,000 people as probably infected).

In 1980s officially HIV/AIDS were recognized as new health conditions when cases of infections and their spread were detected in gay, haemophiliacs and heroin users. In 1982 the disease was finally named AIDS. In 1983 the HIV was isolated and identified by researchers at the Pasteur Institute in France and the virus was confirmed as the cause of AIDS by scientists working at the USA National Cancer Institute. In 1983, the Centers for Disease Control (CDC), USA identified the risk groups as partners of people with AIDS, people who inject drugs, haemophiliacs and people who have recently been to Haiti. The term "4-H Club" was widely used for people at risk of AIDS: homosexuals, haemophiliacs, heroin addicts and Haitians. The spread of HIV/AIDS contributed in stigmatization and panic among

masses.

To counter the threat of HIV/AIDS, in 1987 the World Health Organization (WHO) launched The Global Program on AIDS to raise awareness; generate evidence-based policies; provide technical and financial support to countries; conduct research; promote participation by NGOs; and promote the rights of people living with HIV. WHO, declared 1<sup>st</sup> December as the World AIDS Day (in 1988) and red ribbon became an international symbol of AIDS awareness in 1991. United Nations Programme on AIDS (UNAIDS) was started in 1996 to proponent and coordinate for worldwide action on HIV and AIDS. Efforts by UNAIDS and by different nations worldwide were reflected in achieving the Millennium Development Goal relating to halting and reversing the spread of HIV and AIDS six months before target in July, 2015 with 15 million people receiving treatment for HIV/AIDS.

#### Transmission of HIV/AIDS

HIV is transmitted by three main channels – sexual contact, significant exposure to infected body fluids or tissues, and from vertical transmission i.e. mother to child during pregnancy, delivery, or breastfeeding (Figure 2).



**Fig.2:** Transmission of HIV

Source: <http://www.thinkomania.com/wp-content/uploads/2015/12/Screen-Shot-2013-12-01-at-2.22.59-PM.png>

### Sexual Contact

Sexual contact with infected persons is the most frequent mode of transmission of HIV. The predominant mode of transmission of HIV at world continues to be heterosexual contacts, which is about three-fourth of the total spread. But in MDCs especially USA the most common mode is male-to-male sex. The unprotected heterosexual contacts due to lack of awareness and attitude are responsible for about four to ten times higher risks of HIV transmission per sexual act in LDCs as compared to MDC. Unprotected sex, presence of other sexually transmitted infections and diseases (STDs), commercial sex workers, high virus load and decreased CD4<sup>+</sup> cell, lack of circumcision and some sexual practices like sex during menses, bleeding during intercourse etc are the major risk factors which increase vulnerability to HIV infections. In heterosexual sex, women are more vulnerable to HIV infections because vagina have large mucous-membrane surface area is larger as compared to that of the urethra i.e. penile opening.

### Body fluids

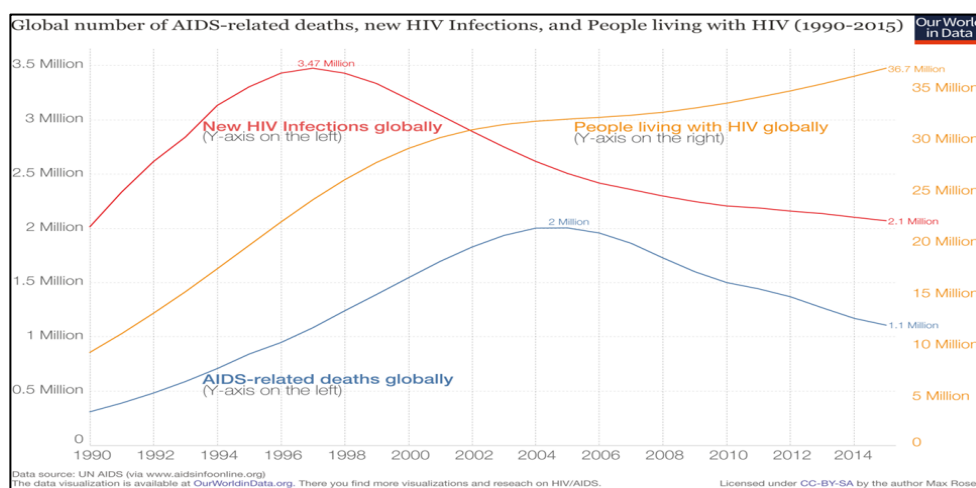
The second most common medium of HIV transmission is through blood and blood products. Needle-sharing during intravenous drug use, needle stick injuries, including among health workers, transfusion of contaminated blood or blood products, or medical injections with unsterilized equipment are the main blood-borne transmission mediums. Due to improved donor selection via HIV screening the risk of HIV transmission from blood transfusion is very low in MDCs but it is high in LDCs. For instance, in case of sub-Saharan Africa in 2007 between 12 and 17 per cent of infections were due to unsafe medical injections.

### Mother-to-child

The third most frequent mode of transmission is from mother to child. HIV is transmitted from mother to child during pregnancy period, during delivery time or later on through breast milk feeding. In new infections, mother to child transmission share is estimated between 15 and 25 per cent. Globally, more than 90 per cent of HIV infections in children are due to transmission from mothers and Africa, South Asia and South East Asia are the main regions for such transmissions.

### World Trends of HIV/AIDS

It is projected that current epidemic of HIV/AIDS surfaced in mid to late 1970s. By 1980 between 1 and 3 lakh people are estimated to be infected. By the end of 1985, every region in the world reported at least one case of AIDS, with 20,303 cases in total. In 1987 out of 71,751 AIDS cases reported to WHO about two-third were reported in USA. The number of persons living with HIV in 1990 was about 8 million. It increased drastically to about 3 times by 1998 to about 24 million and by 2002 to about 28 million (Figure 3). The growth rate of persons living with HIV started declining after 1997 due to decline in number of new infections. The new infections were at peak in 1997 with about 3.47 million cases. The number of new cases declined to 2.5 million by 2005 and further to 1.8 million by 2016. The decline in number of new cases due to preventive measures resulted into slow and gradual growth in the number of HIV infected persons from about 30 million in 2004 to about 36.7 million in 2016. As far as number of deaths due to AIDS is concerned the peak of 2 million was reported in 2004-05 and after that mainly due to curative measures the declining trend developed and in 2016 the reported deaths were about 1 million.



**Fig.3:** Number of Persons with HIV, New Infections and Deaths by AIDS  
Source: <https://ourworldindata.org/wp-content/uploads/2013/11/HIV-AIDS.png>

Out of the 36.7 million persons living with HIV globally, about 53 per cent are concentrated in the Eastern and Southern Africa (Table 1). About 17 per cent are concentrated in Western and Central Africa region. It means 70 per cent of total persons living with HIV are present in Africa continent. The main causes of high HIV/AIDS are the traditional liberal attitudes toward multiple sexual partners and pre-marital and outside marriage sexual activity and lack of awareness. About 14 per cent person with HIV are living in Asia and Pacific

region. Western and Central Europe along with North America have presence of 5.7 per cent of the world persons living with HIV. Latin America has presence of about 5 per cent persons of world with HIV. About 4.3 per cent of persons living with HIV are present in Eastern Europe and Central Asia. About two-third of the total newly infected adults and children are present in Africa continent. Africa constituted 73 per cent of the total deaths reported by AIDS in the world in 2016.

**Table: 1.** World Distribution of HIV/AIDS, 2016

| Region                                       | Adults and children living with HIV | Adults and children newly infected with HIV | Adults and child deaths due to AIDS |
|--|-------------------------------------|---|-------------------------------------|
| Eastern and Southern Africa                  | 19.4 million                        | 7,90,000                                    | 4,20,000                            |
| Western and Central Africa                   | 6.1 million                         | 3,70,000                                    | 3,10,000                            |
| Middle East and North Africa                 | 2,30,000                            | 18,000                                      | 11,000                              |
| Asia and Pacific                             | 5.1 million                         | 2,70,000                                    | 1,70,000                            |
| Latin America                                | 1.8 million                         | 97,000                                      | 36,000                              |
| Caribbean                                    | 3,10,000                            | 18,000                                      | 9,400                               |
| Eastern Europe and Central Asia              | 1.6 million                         | 1,90,000                                    | 40,000                              |
| Western and Central Europe and North America | 2.1 million                         | 73,000                                      | 18,000                              |
| Total  | 36.7 million                        | 1.8 million                                 | 1 million                           |

Source: UNAIDS Data 2017, P-14.

The top ten countries constitute about 60 per cent of persons living with HIV/AIDS (PLHIV). The leading country in the world is South Africa with a share of 19 per cent of the world's PLHIV (Table 2). The second position is occupied by Nigeria with a share of about 9.24 and is

followed by India with a share of 5.77 per cent of PLHIV of the world. Kenya, Mozambique, Uganda and Zimbabwe are other major countries with PLHIV with a share of about 4 per cent each.

**Table: 2.** Top Countries with PLHIV/AIDS

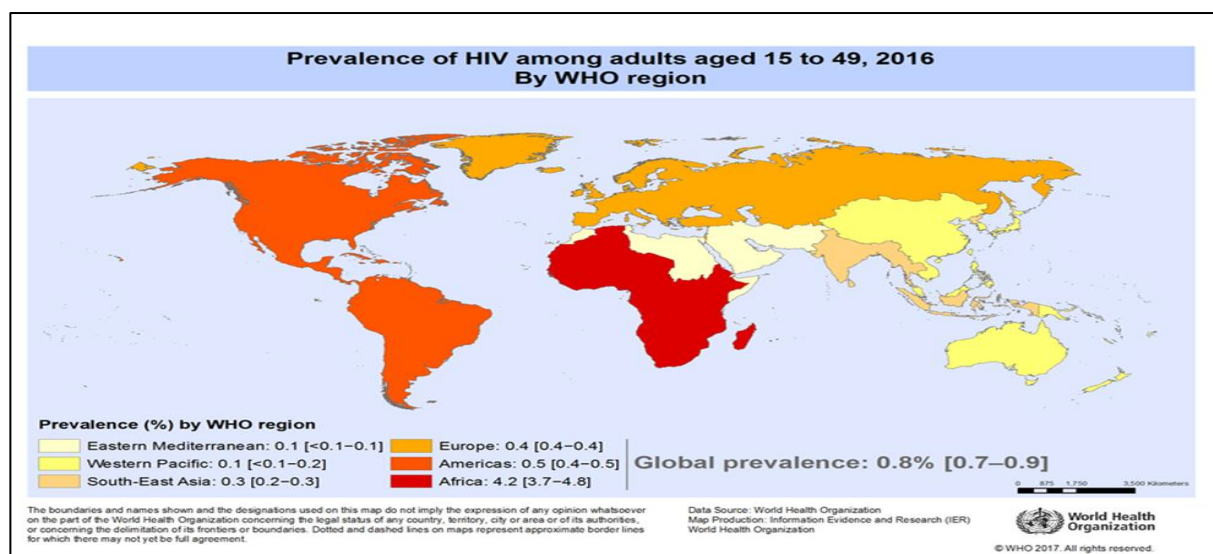
| Countries       | Persons   | Share (%) | Countries   | Persons    | Share (%) |
|-----------------|-----------|-----------|-------------|------------|-----------|
| 1. South Africa | 6,984,600 | 19.0      | 8. Tanzania | 1,385,800  | 3.77      |
| 2. Nigeria      | 3,391,600 | 9.24      | 9. Zambia   | 1,211,900  | 3.30      |
| 3. India        | 2,118,100 | 5.77      | 10. Malawi  | 976,300    | 2.66      |
| 4. Kenya        | 1,517,700 | 4.13      | 11. Brazil  | 826,700    | 2.25      |
| 5. Mozambique   | 1,505,900 | 4.10      | 12. China   | 780,000    | 2.12      |
| 6. Uganda       | 1,461,700 | 3.98      | 13 Ethiopia | 730,300    | 1.99      |
| 7. Zimbabwe     | 1,425,800 | 3.88      | World       | 36,710,700 | 100       |

Source: UNAIDS Data 2017.

### Prevalence of HIV/AIDS

The prevalence rate of HIV/AIDS is a major perspective to highlight this serious global health issue. At world level HIV/AIDS prevalence rate among adults (15 to 49 years) is about 0.8 per cent. The prevalence rate is highest in world in the sub-Saharan Africa and lowest in Eastern Mediterranean (Middle East and North Africa) and Western Pacific regions of WHO (figure). North America and South America continents have higher prevalence rates as

compared to the South East Asia. Within sub-Saharan Africa, the prevalence of HIV/AIDS is highest in southern African region. In Swaziland 27.2 per cent adults are HIV/AIDS infected, followed by Lesotho with 25 per cent and Botswana about 22 per cent prevalence rate. South Africa which leads in PLHIV has adult prevalence rate of 18.9 per cent. In India the adult prevalence rate is 0.3 per cent and it lower than world average of 0.8 per cent (Table 3).

**Fig.4:** Prevalence of HIV among Adults, 2016Source: [http://www.who.int/gho/hiv/hiv\\_013.jpg?ua=1](http://www.who.int/gho/hiv/hiv_013.jpg?ua=1)



**Table: 3.**Prevalence of HIV/AIDS

| Country      | Adult Prevalence Rate of HIV/AIDS (%) |
|--------------|---------------------------------------|
| Swaziland    | 27.2                                  |
| Lesotho      | 25.0                                  |
| Botswana     | 21.9                                  |
| South Africa | 18.9                                  |
| Namibia      | 13.8                                  |
| Zimbabwe     | 13.5                                  |
| Zambia       | 12.4                                  |
| Mozambique   | 12.3                                  |
| Malawi       | 9.2                                   |
| Uganda       | 6.5                                   |
| India        | 0.3                                   |
| World        | 0.8                                   |

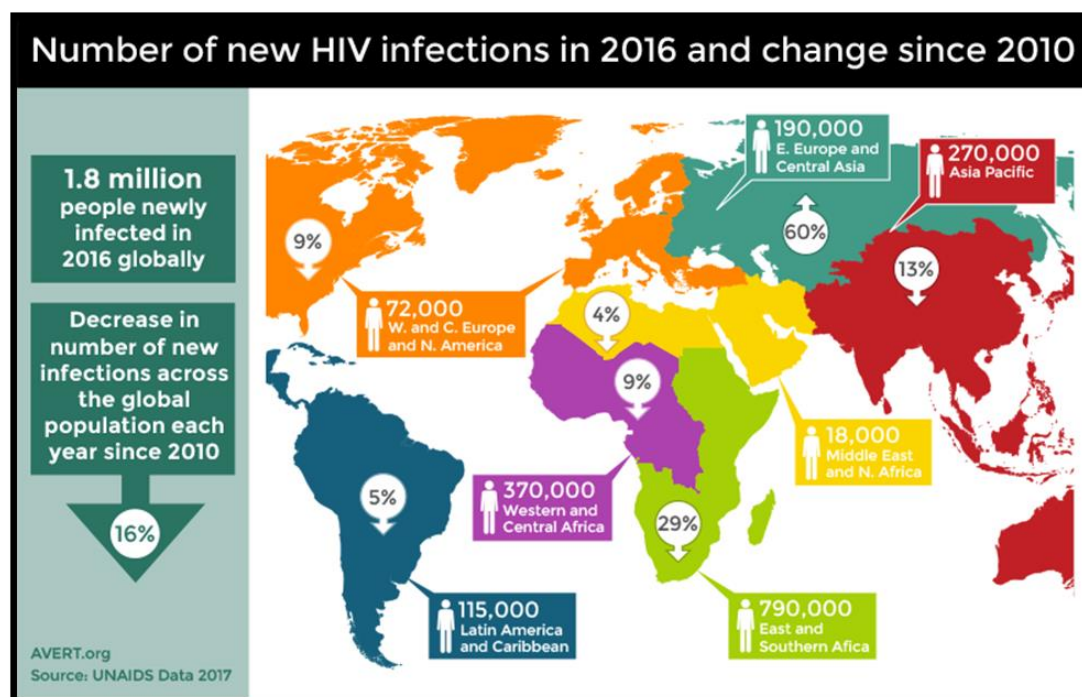
Source: WHO Data 2017.

### Prevention and Control of HIV/AIDS

In the late 1980s to counter the threat of HIV/AIDS the ABC approach was popularized as risk reduction and risk avoidance strategy. In this ABC approach, A represents abstain, B stands for be faithful and C for condom use. The risk could be avoided altogether by avoiding any sexual activities that could cause transmission of HIV (i.e. **Abstain**). The risk could also be reduced, through avoiding sexual intercourse other than with a mutually faithful uninfected partner (i.e. **Be faithful**) or through the correct and consistent use of condoms (i.e. **Condomise**). In this approach focus is on prevention and on sexual transmission. But to prevent other mediums of transmission and to provide treatment of existing infected persons new

steps were also introduced over the period of time. Testing and counseling for HIV and other STIs strategy is most effective in prevention and treatment. It includes establishing linkage with tuberculosis because TB is responsible for 1 of 3 HIV related deaths.

Voluntary medical male circumcision (VMMC), pre-exposure and post-exposure use of antiretroviral (ARV) drugs and antiretroviral therapy (ART), use of sterile injecting equipments by injecting drug users (IDU) and non-sharing with others, the vertical transmission that is mother-to-child transmission can be prevented by using ART. ART strategy has played the most significant role in prevention and treatment of HIV/AIDS worldwide. Although it does not cure HIV infection but suppresses viral replication within a person's body and allows an individual's immune system to strengthen and regain the capacity to fight off infections. In 2016, 19.5 million people living with HIV were receiving ART globally, which meant a global coverage of 53% of adults and children. However, more efforts are needed to scale up treatment, particularly for children and adolescents. Awareness about HIV/AIDS causes and preventive measures and role of NGOs have played a significant role in reversing the trends of new infections, along with efforts from local level to global level organizations (for instance, the Joint United Nations Programme on HIV/AIDS i.e. UNAIDS). The results of all these efforts are reflected in decrease in new infections since 2010 by 16 per cent each year with only exception of Eastern Europe and Central Asia (Figure 5).

**Fig. 5:** New HIV Infections in the World, 2010 to 2016

Source:

[https://www.avert.org/sites/default/files/styles/article\\_scale\\_style\\_780/public/New%20infections%20since%202010\\_updated%20August2017\\_for%20website.png?itok=tH1yBVdV&timestamp=1503493952](https://www.avert.org/sites/default/files/styles/article_scale_style_780/public/New%20infections%20since%202010_updated%20August2017_for%20website.png?itok=tH1yBVdV&timestamp=1503493952)

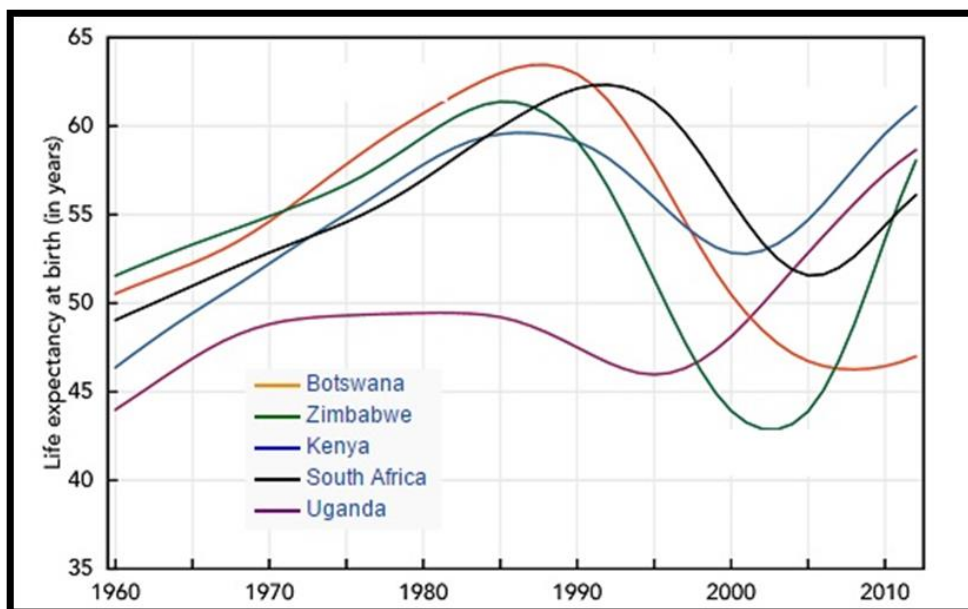
### Impact of HIV/AIDS

The most obvious outcome is illness and death. The impact of HIV/AIDS is found in all sectors of the system like health sector, households, educational institutions, workplaces and economies. HIV/AIDS has attracted

stigmatization that is overwhelming. It results into family disintegration and dissolution. The family burden normally shifts on women. AIDS strips families of their assets and income earners, further impoverishing the poor. The high prevalence of HIV/AIDS in adults reduces the life

expectancy significantly. For instance, in majority South African countries the life expectancy declined by about 15 years initially but now due to ART the life expectancy has improved significantly (Figure 6). The increased mortality and morbidity due to HIV/AIDS leads to shortage of labour force. Further, the long term illness reduces labour productivity. The decline in domestic production and productivity reduces exports and on the other side imports

of expensive healthcare goods increases. At macroeconomic level scholars have calculated cost of this pandemic as reduced average national economic growth rates by about 2 to 4 per cent across Africa. The National AIDS Control Programme (NACP) phase I and phase II in India required an investment of 84 and 191 million USD, respectively.



**Fig.6:** Life Expectancy and HIV/AIDS and ART.  
Source: <http://newsbatch.com/af-aidslife.jpg>

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#### Web Links

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