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HIV/AIDS Overview –Recent advancement made by WHO

Amit Sharma*, Shiv Kumar Kushawaha, Durgadas Anghore, Vinat Pandit, Dev Raj Sharma

Department of Pharmacology, Laureate Institute of Pharmacy, Kathog, Kangra, H.P., India

Review Article

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Corresponding Author:
Mr. Amit Sharma
Laureate Institute of Pharmacy,
Kathog, Kangra, H.P., India
Email: amit.clinical@yahoo.com
Contact : +919736022382

Review contents

HIV (human immunodeficiency virus) infection has now spread to every country in the world. Approximately 40 million people are currently living with HIV infection, and an estimated 25 million have died from this disease[1]. The scourge of HIV has been particularly devastating in sub-Saharan Africa, but infection rates in other countries remain high. In the United States, approximately 1 million people are currently infected. Here are a few key points about the disease: Globally, 85% of HIV transmission is heterosexual[2].

In the United States, approximately one-third of new diagnoses appear to be related to heterosexual transmission[3]. Male-to-male sexual contact still accounts for approximately half of new diagnoses in the U.S. Intravenous drug use contributes to the remaining cases. Because the diagnosis may occur years after infection, it is likely that a higher proportion of recent infections are due to heterosexual transmission[3-4].

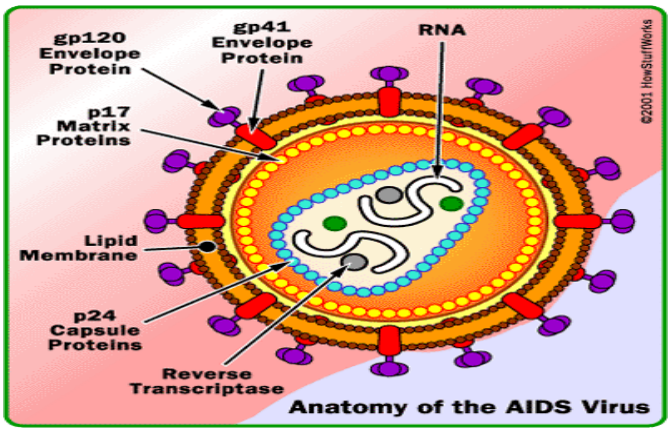
Infections in women are increasing. Worldwide, 42% of people with HIV are women. In the United States, approximately 25% of new diagnoses are in women, and the proportion is rising.

There is good news on one front. New HIV infections in U.S. children have fallen dramatically. This is largely a result of testing and treating infected mothers, as well as establishing uniform testing guidelines for blood products[5].

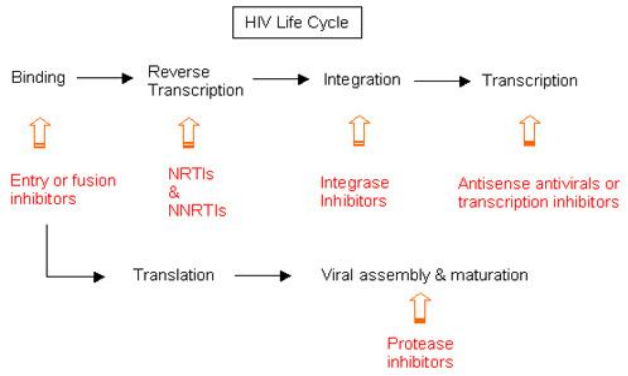
In order to understand HIV and AIDS, it is important to understand the meanings behind these terms:

HIV stands for the human immunodeficiency virus. It is one of a group of viruses known as retroviruses. After getting into the body, the virus kills or damages cells of the body's immune system. The body tries to keep up by making new cells or trying to contain the virus, but eventually the HIV wins out and progressively destroys the body's ability to fight infections and certain cancers [6-8].

The AIDS (Acquired Immune Deficiency Syndrome) VirusIllustrations, scanning electron micrographs (SEM), and transmission electron micrographs (TEM) of the Human Immunodeficiency Virus (HIV)



Emerging Therapy for Treatment of HIV Infection



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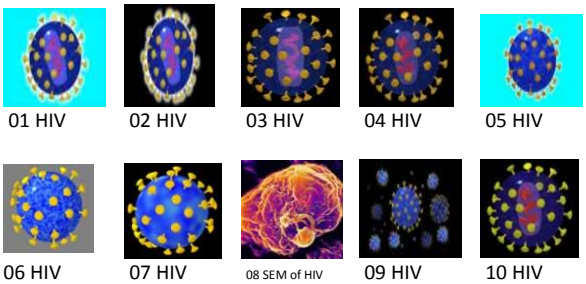

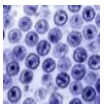
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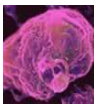
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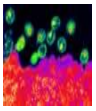
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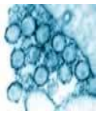
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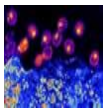
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HIV/AIDS Transmission

HIV is transmitted when the virus enters the body, usually by injecting infected cells or semen. There are several possible ways in which the virus can enter. Most commonly, HIV infection is spread by having sex with an infected partner. The virus can enter the body through the lining of the vagina, vulva, penis, rectum, or mouth during sex. HIV frequently spreads among injection-drug users who share needles or syringes that are contaminated with blood from an infected person. Women can transmit HIV to their babies during pregnancy or birth, when infected maternal cells enter the baby's circulation. HIV can be spread in health-care settings through accidental needle sticks or contact with contaminated fluids[9].

Very rarely, HIV spreads through transfusion of contaminated blood or blood components. Blood products are now tested to minimize this risk. If tissues or organs from an infected person are transplanted, the recipient may acquire HIV. Donors are now tested for HIV to minimize this risk. The virus does not spread through casual contact such as preparing food, sharing towels and bedding, or via swimming pools, telephones, or toilet seats. The virus is also unlikely to be spread by contact with saliva, unless it is contaminated with blood[11].

Infection with the human immunodeficiency virus (HIV) is spreading rapidly among injection drug users (IDUs), particularly in countries of the Golden Triangle where Myanmar (Burma), Thailand, and Laos converge and the pure heroin China White is refined. Thailand, Myanmar, Hong Kong, Malaysia, Singapore, the southern provinces of China, and the northeastern states of Mizoram, Manipur and Nagaland in India are affected. Infection has reached 50% and more in some groups of IDUs in these countries[12]. In Thailand, 63% of the 23,845 known cases of HIV infection are among an estimated 400,000 IDUs. It is estimated that Myanmar has 160,000 IDUs, of whom half are infected with HIV, and among 85,000 IDUs tested, 85% were infected. The Myanmar sector of the Golden Triangle produces double the amount of the mid-1980s, more than 2000 tons of raw opium a year impaction northeastern India and China's southwest Yunnan province. The HIV infection rate among IDUs tested in Manipur was 50% in 1991, and 40% of an estimated 10,000 IDUs in neighboring Nagaland carry the virus. In China 398 of the 493 registered HIV cases are among IDUs in Yunnan. In Malaysia, there are nearly 4000 cases of HIV infection, approximately 80% of which are IDUs. The epidemic of heroin injection swept over Asia in the last decade, since Afghanistan, Pakistan, and Iran were major heroin producers. An estimated is 10 of Karachi's 8 million population uses drugs. Criminal syndicates in Pakistan, Afghanistan, and India control production, manufacture and wholesale distribution of heroin using sophisticated systems. Addiction is punishable in only a few countries, as most countries distinguish between the selling of drugs and consumption. WHO placed the interdiction of IDUs and HIV in Asia on its agenda at a meeting in Thailand, in October 1991, to prevent a shift toward drug injecting in countries where drugs are still largely inhaled. Since the infection rates have become so high among certain IDU groups, it is probable that the infection will continue to increase in frequency as well as spread to the wives and unborn children of IDUs. Earlier study reported that about 1% of general population or urban Manipur was injecting drug users (IDUs)[12].

A study was conducted to observe the IDU prevalence in rural Manipur and the role of national highway (NH) in determining the IDU prevalence if any. It was also aimed to study based on distance and communication facilities from the national highway, which cuts across the villages to the neighboring state, Nagaland. Villages close to NH had the highest IDU prevalence of 1.3% and remote villages had the least prevalence of 0.2% whereas villages in between the above mentioned two groups had a prevalence of 0.9%. It was surprisingly observed that HIV was uniformly distributed among the IDUs of all villages and ranged from 50-51%. This indicates that IDU prevalence at distance is predominantly determined by the presence of drug trafficking route/s like national highway whereas HIV prevalence is mainly determined by the needle sharing behaviour of IDUs. This article details the correlation between the use of injection drugs and the existence of a national highway system[13-66]. It concludes that in areas where there is no national highway system there is a consistently lower prevalence of injection drug use, and in areas that contain a national highway system the prevalence of injection drug use is consistently high. The rate of HIV infection is consistent among IDUs, whether they are near a national highway system or not[13].

HIV/AIDS Symptoms and Signs

Many people with HIV do not know they are infected. Many people do not develop symptoms after they first get infected with HIV. Others have a flu-like illness within several days to weeks after exposure to the virus. They complain of tiredness, and enlarged lymph nodes in the neck. These symptoms usually disappear on their own within a few weeks. After that, the person feels normal and has no symptoms. This asymptomatic phase often lasts for years. The progression of disease varies widely among individuals. This state may last from a few months to more than 10 years[14].

During this period, the virus continues to multiply actively and infects and kills the cells of the immune

system. The virus destroys the cells that are the primary infection fighters, a type of white blood cell called CD4 cells. Even though the person has no symptoms, he or she is contagious and can pass HIV to others through the routes listed above[15].[17].

Orphanhood Impacts on Children

The following areas were discussed:

- Loss of family and identity.
- Psychosocial distress.
- Increased malnutrition.
- Loss of health care, including immunisation.
- Increased demands for labour.
- Fewer opportunities for schooling and education.
- Loss of inheritance.
- Forced migration.
- Homelessness, vagrancy, starvation, crime.
- Exposure to HIV infection.
- Exploitation and exposure to violence; and
- Gender differentials in impact.

Based on recent estimation efforts, the number of orphans created by current epidemics is reasonably known. What is not known are the age patterns, gender differences, or the situation of these orphans in the households and communities in which they live. The numbers of orphans in several countries with severe HIV/AIDS epidemics is already straining the ability of extended families and communities to absorb and provide for these children's needs. It is unclear how much coping can be expected of families and communities. How much of the inevitable gap in support will be taken up by the state? And what can civil society, with the support of government and the international community, do to help? These are questions that must be faced in the next decade, and there are no easy answers[19].

When to Seek Medical Care

If you have engaged in unprotected sex outside of a mutually monogamous relationship or shared needles while using drugs, you should have Early detection and treatment of the infection can slow the growth of HIV. If you are pregnant and infected with HIV, you may be able to reduce the risk to your unborn child by getting treatment early. You can also avoid infecting others if you know that you have the disease. Testing is available anonymously and confidentially. You can even test yourself at home[20].

People known to have HIV infection or AIDS should go to the hospital any time they develop high fever, shortness of breath, coughing up blood, severe severe chest or abdominal, generalized weakness, severe headache, confusion, or a change in mental status. These may be the indication of a life-threatening condition for which an urgent evaluation in the hospital's emergency department is recommended. All infected people should be under the regular care of a physician skilled in the treatment of HIV and AIDS [21-22].

HIV/AIDS Diagnosis

HIV infection is commonly diagnosed by blood tests. There are three main types of tests that are commonly used: (1) antibody tests, (2) RNA tests, and (3) a combination test that detects both antibodies and a piece of the virus called the p24 protein. In addition, a blood test known as a Western blot is used to confirm the diagnosis [23.]

No test is perfect. Tests may be falsely positive or falsely negative. For example, it can take some time for the immune system to produce enough antibodies for the antibody test to turn positive. This time period is commonly referred to as the "window period" and may last six weeks to three months following infection. Therefore, if the initial antibody test is negative, a repeat test should be performed three months later. Early testing is crucial; because early treatment for HIV helps people avoid or minimize complications. Furthermore, high-risk behaviours can be avoided, thus preventing the spread of the virus to others [24].

Testing for HIV is usually a two-step process. First, an inexpensive screening test is done. If that test is positive, a second test (Western blot) is done to confirm the result. Antibody tests are the most common initial screening test used. There are different types of antibody screening tests available: Most commonly, blood is drawn for an enzyme immunoassay (EIA). The test is usually run in a local laboratory, so results can take one to three days to come back.

Other tests can detect antibodies in body fluids other than blood such as saliva, urine, and vaginal secretions. Some of these are designed to be rapid tests that produce results in approximately 20 minutes. These tests have accuracy rates similar to traditional blood tests[25].

HIV home-testing kits are available at many local drug stores. Blood is obtained by a finger prick and blotted on a filter strip. Other test kits use saliva or urine. The filter strip is mailed in a protective envelope to a laboratory to be tested. Results are returned by mail in one to two weeks.

All positive antibody screening tests must be confirmed with a follow-up blood test called the Western blot to make a positive diagnosis. If the antibody test and the Western blot are both positive, the likelihood of a person being HIV infected is >99%. Sometimes, the Western blot is "indeterminate," meaning that it is neither positive nor negative. In these cases, the tests are usually repeated at a later date. In addition, an RNA test for the virus might be done.

Other tests, such as those that look for virus RNA and the combination test are not commonly used for screening.

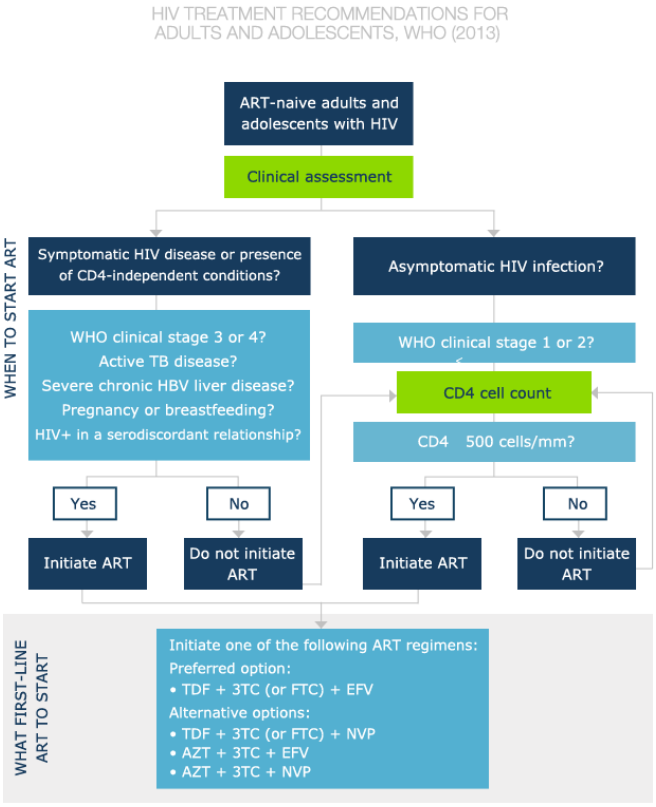
HIV/AIDS Treatment

Medications

Over the past years, several drugs have become available to fight both the HIV infection and its associated infections and cancers. These drugs are called highly active antiretroviral therapy (HAART) and have substantially reduced HIV-related complications and deaths. However, there is no cure for HIV/AIDS. Therapy is initiated and individualized under the supervision of a physician who is an expert in the care of HIV-infected patients. A combination of at least three drugs is recommended to suppress the virus from replicating and boost the immune system. The following are the different classes of medications used in treatment. Reverse transcriptase inhibitors: These drugs inhibit the ability of the virus to make copies of it [26-27-28].

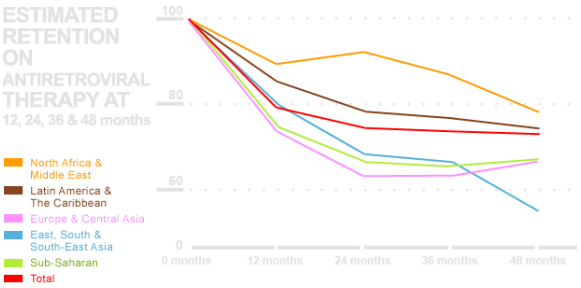
The following are examples: Nucleoside or nucleotide reverse transcriptase inhibitors (NRTIs). These include medications such as Zidovudine (AZT/Retrovir), Didanosine (ddI/Videx), Zalcitabine (ddC/Hivid),Stavudine (d4T/Zerit), Lamivudine(3TC/Epivir), abacavir (ABC/Ziagen),Emtricitabine (FTC/Emtriva), and Tenofovir (Viread). Non-nucleoside reverse transcriptase inhibitors (NNRTIS) are commonly used in combination with NRTIs to help keep the virus from multiplying. Examples of NNRTIs (Sustiva), (Viramune),And Rescriptor (Intelence), a newer member of this class of drugs, was approved by the U.S. FDA in 2013 [77-78]. Using PIs with NRTIs reduces the chances that the virus will become resistant to medications. Fusion and entry inhibitors are newer agents that keep HIV from entering human cells. (Fuzeon/T20) was the first drug in this group. Another drug (Selzentry) binds to a protein on the surface of the human cell and can be given by mouth. Both drugs are used in combination with other anti-HIV drugs. Integrase inhibitors stop HIV genes from becoming incorporated into the human cell's DNA. This is a newer class of drugs recently approved to help treat those who have developed resistance to the other medications (Isentress) was the first drug in this class approved by the FDA in 2007 [77-78].

Antiretroviral viral drugs stop viral replication and delay the development of AIDS. However, they also have side effects that can be severe. They include decreased levels of red or white blood cells, inflammation of the pancreas, liver toxicity, gastrointestinal problems, elevated cholesterol level, abnormal body-fat distribution, and painful nerve damage [29.] Pregnant women who are HIV-positive should seek care immediately because HAART therapy reduces the risk of transmitting the virus to the fetus. There are certain drugs, however, that are harmful to the baby. Therefore, seeing a physician to discuss anti-HIV medications is crucial.



Patients who do not start treatment or who do not continue with treatment are often classified as “lost to follow-up”. This could be for a range of possible reasons including simply stopping or interrupting treatment, death, or finding alternative sources of ARVs. The nature of loss to follow-up is that very often a patient’s eventual whereabouts or outcome is unknown, even if efforts are made to trace such patients[32].

People with HIV infection should be under the care of a physician who is experienced in treating the infection. All people with HIV should be counselled about avoiding the spread of the disease. Infected individuals are also educated about the disease process, and attempts are made to improve the quality of their life[31].



Retention on antiretroviral therapy, low and middle-income countries by region,

A review of treatment programmes in sub-Saharan Africa estimated that 70 percent of people were still receiving treatment two years after initiating

antiretroviral therapy. [28] Another study examining data on 5,491 patients beginning antiretroviral therapy in 15 treatment programmes in Africa, South America and Asia, found 21 percent of patients became lost within six months, including 4 percent who were not seen since receiving their first prescription of ARVs. [29]

Some studies suggest that patient retention actually suffers as a result of the drive to boost patient initiation. [30] Research across three continents found the proportion of patients who were lost to follow-up was greater in 2003-2004 than in 2000 or earlier. [31] This, it was suggested, was due to difficulties following-up the growing patient numbers[32].

HIV Prevention

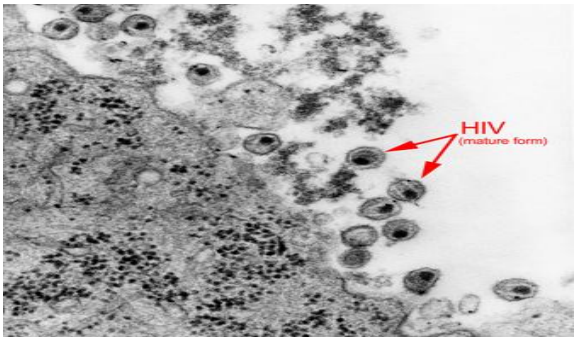
Despite significant efforts, there is no effective vaccine against HIV. The only way to prevent infection by the virus is to avoid behaviours that put you at risk, such as sharing needles or having unprotected sex. In this context, unprotected sex means sex without a barrier such as. Because condoms break, even they are not perfect protection. Many people infected with HIV don't have any symptoms. There is no way to know with certainty whether a sexual partner is infected. Here are some prevention strategies.

Abstain from sex. This obviously has limited appeal, but it absolutely protects against HIV transmission by this route. Have sex with a single partner who is uninfected. Mutual monogamy between uninfected partners eliminates the risk of sexual transmission of HIV. Use a condom in other situations. Condoms offer some protection if used properly and consistently. Occasionally, they may break or leak. Only condoms made of latex should be used. Only water-based lubricants should be used with latex condoms. Do not share needles or inject illicit drugs. If you work in a health-care field, follow recommended guidelines for protecting yourself against needle sticks and exposure to contaminated fluids. If you have engaged in risky behaviours, get tested to see if you have HIV. The risk of HIV transmission from a pregnant woman to her baby is significantly reduced if the mother takes medications labor, and delivery and her baby takes medications for the first six weeks of life. Even shorter courses of treatment are effective, though not as optimal. The key is to get tested for HIV as early as possible in pregnancy. In consultation with their physician, many women opt to avoid to minimize the risk of transmission after the baby is born[35].

HIV/AIDS Prognosis

There is no cure for HIV infection. Before we had any treatment for the virus, people with AIDS lived only for a couple of years. Fortunately, medications have substantially improved the outlook and survival rates. Prevention efforts have sharply reduced HIV infection in young children and have the potential to sharply limit new infections in other populations[36]. Medications have extended the average life expectancy, and many people with HIV can expect to live for decades with proper treatment. An increasing number have a normal life expectancy if they adhere carefully to medication regimens. Medications help the immune system recover and fight infections and prevent cancers from occurring. Eventually, the virus may become resistant to the available drugs, and the manifestations of AIDS may develop. Drugs used to treat HIV and AIDS do not eliminate the infection. It is important for the person to remember that he or she is still contagious even when receiving effective treatment[37].

Intensive research efforts are being focused on developing new and better treatments. Although currently there is no promising vaccine, work continues on this front.



This Transmission electron micrographic image shows mature forms of the human immunodeficiency virus (hiv) in a tissue sample. (Source credit: cdc).

In 2013 global treatment recommendations changed, stating that where feasible, people with HIV should begin treatment even earlier - at 500 cells/mm3; increasing the number of people eligible for treatment by 9.2 million. The 2013 WHO recommendations acknowledge that not all countries will be able to provide treatment at 500 cells/mm3, stating that providing treatment to people with a CD4 count of 350 cells/mm3 or less, or with advanced HIV infection, should take priority[41]

Status in India

India: the epidemic continues with a population of close to one billion - roughly half of them in the most sexually active age group of 15 to 49 - an estimated adult prevalence rate of about 0.6 to 1 present translates to between three and five million infected persons, a figure higher than any other single country. However, the distribution of HIV/AIDS in India is not uniform[43]. The epidemic is focussed very sharply in a few states with most of India having extremely low rates of infection. It is noteworthy that 21 of the 31 states only report four percent of the total AIDS cases. The major impact of the epidemic is being felt in Maharashtra in the West, Tamil Nadu in the South with adjacent Pondichery, and Manipur in the northeast. [46]. While the epidemic is predominantly heterosexual in nature over most of India, the north-eastern states have a severe epidemic among IDUs. In Manipur, IDU infection rates are now 70 percent or more.

In those parts of India where the epidemic is most firmly entrenched, the infection has spread out of those groups traditionally considered most at risk. From being highly concentrated in sex workers and patients attending sexually transmitted infection (STI) clinics, the HIV has spread to the general population. In Maharashtra, antenatal clinics in Mumbai now report 4.5 percent prevalence, and one clinic in Pune reports over 5 percent. In Chinnai between 1.2 and 2.3 percent of antenatal cases are reported to be HIV positive. Even in Manipur, where the infection is largely focussed on IDU, ANC have a prevalence rate of 1.2 present. The sentinel surveillance reports for early 1998 have brought to attention the fact that not only is the epidemic spreading to previously less affected groups within the severely affected states, but states that had relatively low infection rates are now beginning to have a serious problem. A case in point is the state of Andhra Pradesh, which has reported a 24 percent prevalence rate in STI patients and about one percent in antenatal clinics. The data from India highlight the fallacy of considering average national figures for measuring the epidemic. India clearly has areas very severely affected by the epidemic, and yet the major portion of the country has a very minor HIV/AIDS problem at this time. Unless this differential is taken into account for planning interventions, efforts are likely to be inadequate in some areas, and inappropriate in others[48].

Data on both the distribution and the molecular epidemiology, also point out that HIV does not respect national or state boundaries. Plans for coping with the epidemic have to be regional rather than confined to political boundaries. Clearly the epidemic in Manipur is closely linked to that in the adjacent parts of Myanmar, Bangladesh and Thailand. The nature of the virus and the route of transmission are the same. To be effective, the interventions must also be in concert.

(Monitoring the AIDS Pandemic (MAP) Network report 2012)[80]

25% of India's HIV positive cases come from the northeast states of Manipur, Mizoram, and Nagaland, which have only 3% of the country's total population. The reason is access to Burmese heroin just over the border, which is poorly monitored. The Meiteis, Kukis, and Nagas ethnic groups are known for their young people's involvement with drug use in urban as well as rural areas. True rehabilitation programs are in small numbers. There are a few noncoercive 12-step Narcotics Anonymous type centers and counseling programs in Manipur; the Kripa Foundation is one such small program. Examples of other treatment include a Christian group program which chains addicts by the ankles or incarcerates addicts on petty theft charges in order to make available to them detoxification and vocational training. Jails such as the one of Imphal run experiments in herbal medicine and "sweat therapy" for addicts. Clearly, there is a need for a greater investment in addict rehabilitation[51].

A survey was conducted between April and October 2013 at the time of an ethnic clash in imphal, the capital of Manipur. Sixty-nine women drug users were interviewed through street-based outreach workers; 38 women (55%) were injecting drug users. Data were generated with the help of a semi-structured questionnaire on sociodemography, drug use practice and health issues after obtaining informed consent from the participants. Subsequently, consent was also obtained from 60 respondents for collecting blood for unlinked anonymous tests for HIV and hepatitis B surface antigen. Clinical examination for reproductive tract infections, offered to all the study participants, generated data on sexually transmitted diseases. The prevalence of HIV infection in injecting drug users was 57% (20/35) compared to 20% (5/25) among non-injecting drug users (p = 0.001), although the prevalence of hepatitis B surface antigen was similar in the two groups, 48% v. 56%, respectively. Eighty per cent of the respondents, many of whom migrated following the ethnic clash, reported having sex with non-regular partners, two-thirds reported sex in exchange for money or drugs. Eighty-one per cent (29/36) of women who agreed to have a clinical examination had abnormal vaginal discharge, of which 10 had endocervical discharge. The presence of infection was confirmed in only 24% of those with vaginal discharge 4 had bacterial vaginosis and 3 trichomoniasis. [52]

Interactions between TB and HIV

From 30 to 70 percent of young adults in developing countries are infected with *Mycobacterium tuberculosis,* most of whom will not develop disease. HIV infection is the single strongest risk factor for progression from primary as well as latent infection to active disease, so that in areas of the developing world that have a high prevalence of HIV infection, rates of TB are rising. Of the 15.3 million people estimated to be infected with HIV and *M. tuberculosis* at the end of 1997, 11.7 million (76 percent) live in sub-Saharan Africa. An estimated 7.4 million TB cases have occurred in 1996. Three countries, India, China, and Indonesia, account for half of the annual world total of TB. WHO has refined and promoted a strategy for TB control, the DOTS (Directly Observed Therapy – Short Course) strategy, which is more likely than other approaches to result in high rates of cure and avoidance of drug resistance[54].

Although patients with HIV-associated TB mostly have typical clinical patterns, their frequency of atypical manifestations is increased, making diagnosis more difficult. Recurrence rates may be higher than in HIV-negative persons through relapse or reinfection. Drug resistant TB has been associated with HIV, particularly in the U.S.A., where HIV-associated TB may occur in the context of other factors that decrease access to health care such as intravenous drug use and migration. Drug reactions, particularly skin eruptions, are more common in

People Living with HIV/AIDS (PLWHA), notably to Thiacetazone, which may lead to life threatening reactions. *M. tuberculosis* also enhances the replication of HIV, leading to higher viral levels and possibly to more rapid progression of HIV disease in PLWH who develop TB compared to those who do not. The following are the main impacts of HIV on TB control programmes: Increased Burden: From 5 to 10 percent of dually infected adults will develop TB each year. If HIV sero prevalence raises as high as 10 percent of the adult population, 100 to 200 new cases of HIV related TB can be expected per 100,000 total populations. In most countries, this will represent at least a twofold increase in numbers of cases, with urban areas being most heavily impacted. Diagnosis*:* In addition to the effect that the increased burden has on diagnosis, it is also more difficult to diagnose individual cases. Furthermore, HIV causes several other pulmonary problems that may be misdiagnosed as TB[55].

Treatment**:** The advent of highly active anti-retroviral therapy (HAART) may cause problems of drug interactions in the few who are able to afford this treatment; the protease inhibitors are contraindicated while taking rifampicin[56]. TB programmers are increasingly faced by patients with other medical problems associated with HIV in addition to TB. Mortality and morbidity: Even in programmers that use the DOTS strategy, mortality in HIV-positive patients is high, mostly from other manifestations of HIV disease. This leads both to loss of the community's confidence in the programmer as well as to deterioration in staff morale. Adherence to therapy and follow-up may be threatened by other medical and social problems affecting HIV-infected patients. (***The Status and Trends of the HIV/AIDS Epidemics in the World)***[57]

How have lives been saved?

In just the past two years, HIV treatment access grew by 63% around the world. The massive scale up over the last 24 months enabled tens of thousands of people living with HIV to receive lifesaving antiretroviral therapy the first time. The increase came at a time when international funding for AIDS remained flat. Countries are better implementing programmers. They have used a combination of innovation, efficiency and increased domestic investments to sustain the rapid growth in access to treatment. The gap between people who can access treatment and people in need is still very large, nearly 46%, and as the demand for treatment as prevention continues to rise and increasingly outstrips availability, this treatment gap is set to grow[58].

Rapid declines in new HIV infections among children

New HIV infections in children dropped by 43% from 2003 to 2011. In fact, new HIV infections in children declined by 24% in the last two years alone, this is equal to the decrease between 2003 and 2011 [60]. Two-thirds of the decrease in new HIV infections—in adults and children—in the 24-month period between 2009 and 2011 were among newborn children[59]. This reduction has been accelerated by the rapid progress made in the last two years in giving more women living with HIV access to prevention and treatment services. When women living with HIV receive antiretroviral prophylaxis during pregnancy, delivery and breastfeeding, the risk of HIV transmission is reduced to less than 5%.This accelerated progress in cutting new HIV infections as happened as countries move forward in implementing the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive[79]. (***UNAIDS World AIDS Day Report 2012)***

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AUTHORS' CONTRIBUTIONS

Authors contributed equally to all aspects of the study.

PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.