CHAPTER - 2

REVIEW OF LITERATURE

2.1. AIDS

At the Centre for Disease Control (CDC), Atlanta, Georgia, USA, a suddenly high number of cases of rare form of pneumonia was greatly weakened immune system. El Mekkwy et al., (1985) reported that the Epstein Barr virus is more common in AIDS patient which also occurs in the non-immuno suppressed. It is believed to be oncogenic. The term AIDS refers to the end stage of HIV disease, characterized by unusual tumors and immunodeficiency. Everyone who becomes infected with HIV develops HIV disease, marked by slow destruction of their immune system, eventually ending in AIDS. Gallo (1986) found that the retro virus was isolated from a West African patient with persistent generalized lymphadenopathy, which is manifestation of AIDS, and called it lymphadenopathy associated virus (LAV). Retro virus from AIDS patient was isolated and called as human T cells lymphotropic virus III or HTLV III. Serological test Enzyme Linked Immuno Sorbant Assay (ELISA) became available for detection of anti HIV antibodies.

Various African cultural practices contribute to the transmission of HIV such as female circumcision, group circumcision and contact with non-human primates, ritual scarification and the epidemic of AIDS (Hardy, 1987). Scarification and the epidemic of AIDS (Hardy, 1987). Histoplasma capsulatum has a 20% incidence of CNS involvement in patients with AIDS. Aspergillus is uncommon but is recognized as an opportunist in advanced HIV especially with neutropenia, high dose steroids, chemotherapy, malignancy and additional immune suppression. (Luft et al., 1993).
Fine and Mayer, (1993) suggested that the primary CNS lymphoma occurs most often in HIV and AIDS population, which is up to 6% of the AIDS population. In the immunocompetent population the male to female ratio is 3:2, but in the AIDS population the ratio is 13:1. The prevention of AIDS rests at present on general measures such as health education, identification of sources and elimination of high risk activities. No specific vaccine is available till now (Border and Merigan, 1993). Francois Simon (1995) reported that the globally, the majority of HIV infections fall under the viral group HIV 1. A second group HIV 2 which was originally thought to be confined to parts of Africa has been increasingly detected in other parts of the world including India. Several sub types of HIV 1 have already been detected.

Primary CNS lymphoma is the most common CNS neuroplasm in patients with AIDS. Systemic lymphoma will frequently involve the nervous system during its course about 20% -50% and usually accompanies or follows another diagnosis. Glioma has increased frequency in HIV patient (Lesprit et al., 1997). Shearer (1997) observed that the pediatric AIDS acquired from mothers in high risk groups is present with clinical symptoms by 2 years of age and death follows in another 2 years. The disease was first named as "hay -related immune disorder” but the name was soon changed to AIDS. In 1982, Acquired immunodeficiency is the major complication of HIV infection. The first formal definition of AIDS as a syndrome was before HIV -1 had been characterized. The definition was modified in 1987 to include evidence of HIV infection and again in 1993, when CD4 cell count criteria were added. AIDS defining tumors include primary lymphoma of the, burkitt’s or immuno blastic lymphoma and invasive cervical carcinoma in women, in addition to Kaposis Sarcoma (Sande, 1997).
Jawetz et al., (1998) reported that the AIDS related deaths averaged about 50 thousand in both 1994 and 1995, and then decreased to 13 % 1996. The increased AIDS prevalence is believed to be due to stability of the AIDS incidence coupled with declines in AIDS deaths. The annual incidence of AIDS for persons who had received blood transfusions before screening of donated blood declined in the 1990s. Rhesus monkey are not infected naturally in the wild in Asia but are susceptible to induction of simian AIDS by various SIV isolates, simian lenti viruses share molecular and biologic characteristics with HIV and cause an AIDS like disease in selected non human primates. Although India has a high number of HIV infected persons, the relatively low rate of HIV transmission leaves enough room to plan and find effective strategies aimed at preventing a wild fire spread of the AIDS epidemic in the country (Siddarth, 1998). Jaya Shreedhar (1998) identified the new strain of HIV named Ybf30, which may not be detectable by the tests that are currently in uses.

The joint world health organization - United Nations program on HIV/AIDS has estimated that there are about 4 million HIV infected persons in India and the rate of HIV transmission in the adult population in the country is below 1%. Even this low percentage makes India the country with the highest number of HIV infected people in world (UNAIDS-WHO, 1998). Researchers who make estimations and projections for HIV/AIDS in India follow their own logic based on individual experiences and interpretations. Projections also vary depending who makes them. Biostaticians and epidemiologist employ different norms while making estimations. Bureaucrats and politicians have their ways of understanding and presenting epidemiological data before parliament, the public and the media (Siddarth, 1998).
According to NACO (1998) overwhelmed by the enormity of the challenge, the National AIDS Control Organization (NACO) has worked hard to gauge the number of HIV infected people in the country. Its attempts consist primarily of sero – sentinel surveillance through unlinked, anonymous HIV screenings in different sub population groups such as pregnant women, patients attending sexually transmitted disease (STD) clinics, truck driver and commercial sex workers. NACO believes that HIV prevalence among pregnant women can be taken as being the most indicative of HIV prevalence in the general population. A common assumption is that pregnant women do not indulge in high risk sexual behavior and are probably infected by their spouses.

Statistics on few other disease have generated as much confusion and controversy as those related to AIDS. In fact, as yet there is no reliable method to determine the number of people infected with HIV, which causes AIDS. While there have been a few authentic epidemiological studies to extrapolate data on the extent of the AIDS epidemic in Asia, statistical methodologies about magnitude of the epidemic continue to proliferate and these are endorsed at different schools of thought (Balaji, 1998). Skiest et al examined in 1998, 30 pallas patients with HIV and Brain lesions. Herrlinger, (1999) observed that the lesions are multifocal in 40% of immunocompetent patients. Almost 100% of AIDS populations have multiple lesions.

The only Indian study to assess community prevalence of STD including HIV infection was completed in 1997 – 98 in Tamilnadu. Funded by the United States Agency for International Development (USAID), this large scale effort was undertaken through the AIDS Prevention and Control Project (APAC) administered by the Voluntary Health
Services, Chennai, in collaboration with post graduate institute of biomedical sciences (Chennai), the Christian Medical College Hospital (Vellore), the Meenakshi Mission Hospital and Research Centre or MMHRC (Madurai) and the MGM or Mahatma Gandhi Medical College (Mumbai). (Krishnamurthy, 1999). Eugene et al., (2001) found that the antiviral medications have provided little benefit to world’s AIDS sufferers because they can’t afford them. In Uganda, an estimated 250,000 children have lost both parents to AIDS; by the year 2010 and estimated 41 million African children will have lost one or both parent to disease.

A one third decline in new HIV infections in the worst hit regions of India is in Tamilnadu, Maharastra, Karnataka and Andrapradesh (Woodman, 2003). The disease now known as Acquired Immuno Deficiency Syndrome or AIDS was reported 20 years ago in the morbidity and mortality weekly report under the quiet title “Pneumocystis Pneumonia-Los Angeles”. The initial report described 5 young homosexuals men in whom a rare disease, Pneumocystic caries Pneumonia and other unusual infections had developed. Kent and Sepkowitz, (2004) noticed that the disease was gatherly encountered in injection- drug users, Haitians, transfusion recipients including those with haemophilia, infants, female sexual contacts infected men, prisoners and Africans.

In 20 years, the AIDS epidemic has grown from a series of small out breaks in several risk groups scattered throughout the United States and Western Europe in to a global public health calamity. Tremendous stride have been made in understanding the disease, from the molecular level to the broadest perspective public health. In addition, important advances are achieved in anti retroviral therapy and blood supply safety (Kent and Sepkowitz, 2004). At the beginning of 1986, despite over 20, 000 reported cases
worldwide; India had no reported case of HIV or AIDS. India’s first case of HIV was diagnosed in sex workers in Chennai, TamilNadu. It was noted that contact with foreign visitors had played a role in initial infection among sex workers (NACO, 2004).

Anathanarayan and Paniker (2005) suggested that the virus may have originated in Africa, perhaps from a simian immunodeficiency virus and spread to the USA, probably through Haiti. In the permissive American society of the 1970s, the virus spread widely among male and homosexuals and drug addicts, finally this came as outbreaks in 1981. The virus may have spread to Europe from America as well as directly from the former African colonies of the European nation. Conclusive evidence was obtained from molecular studies, including genetic typing of mitochondrial DNA from human and chimpanzee viruses. The progenitor of HIV1 entered the human population from chimpanzees of the sub species Pan troglodytes living in equatorial West Africa (Cameroon, habon, Equatorial Guinea). HIV is believed to have been present in monkeys for over 100000 years. The CPZ SIV has taken root in humans by becoming HIV through mutation or recombination.

The irreversible breakdown of immune defence mechanisms, make the patient prey to progressive opportunistic infection malignancies. In the USA and other western countries, the characteristic pathogen initially was *P. carinii* but now *M. tuberculosis* or atypical Mycobacterium such as *M. avium*, which is more often responsible for dry cough, dyspne and fever associated with AIDS. A characteristic intestinal pathogen in AIDS is *Cryptosporidium, Salmonella, Mycobacterium isospora*, CMV or Adeno virus (Ananthanarayan and Paniker, 2005). Krishnamurthy (2005) noticed that in Africa and Asia 20 % of the adults were afflicted with AIDS. Further more 24 and 33% of the
children born to women having AIDS had the disease. Thus AIDS was concluded as an infectious disease.

Nirmal Kumar Ganguly (2006) observed that the interventions strategies based on increasing awareness and imparting adequate information especially among high risk groups have helped to put a brake on the epidemic. This was one of the best news reported so far on AIDS in India. World wide, 33 million people are infected with an AIDS causing virus; it is estimated that a new infection occurs about every 6 seconds and a person dies of AIDS every 5 minutes (UNAIDS, 2006). In India, the male use of female sex workers is the main reason for the spread, which had put the wives in a vulnerable position. Intervention and awareness programmes aimed at sex workers and their effect has contributed to a drastic decline (WHO, 2007). DeLuca et al., (2007) suggested that the HIV/AIDS groups have resistant to make revisions of estimates. If the total number of cases in world is half of what is according to the survey, it is indigestible. So every year the numbers are lowered a little bit and retro actively changes the estimates.

2.2. SURVEY

Smith et al., (1994) reported that the HIV seroprevalance among various high risk groups is increasing in Tamilnadu. Another important finding is that, positive smears were obtained in similar proportion of HIV positive and negative culture conformed cases of tuberculosis. There is no difference in the frequency of positive smears between HIV infected and non infected individuals. HIV does not kill by it self but by depleting the immune system makes the person vulnerable to other infections. Treatment of TB among the HIV infected persons is a new challenge to the national effort in controlling this infection. Some of the drugs which are recommended for TB treatment pose
complications in case of HIV infected persons and had to be withdrawn in areas of high HIV prevalence (Deo, 1995).

The number of AIDS cases reported in India represents only a small fraction of the actual AIDS cases. The reported cases do not tell anything about the magnitude of the problem. This may be due to under reporting by states and lack of diagnostic skills, for which efforts are being made to improve this component (Tripathy et al., 1996). Nicoll (1997) found that the United States HIV incidence rate is 3.5 times higher than that of the closest advanced industrialized nation. The high incidence of male circumcision in the US did nothing to prevent the spread of the infection. The US is the industrialized country most burdened with HIV.

The advancing epidemic infection with HIV has increased the burden of tuberculosis, especially in populations where HIV has become common and where the prevalence of tuberculosis is high. Infection with HIV is the most potent known risk factor for progression of active tuberculosis (Telzak, 1997). Ramachandran et al., (1998) suggested that the seroprevalence of HIV among TB patients showed wide variations between the different centers where the survey was undertaken. The prevalence in DTC, Vellore and GATT hospital, Chennai was 4.3 and 4.0 % respectively compared to 0.6% in DTC, Kanchipuram. This could be due to the fact that most patients suspected to be HIV positive from Kanchipuram seek medical attention at Tambaram Sanatorium, Chennai, which is geographically close.
Rajasekaran *et al.*, (1999) found that the *Mycobacterium tuberculosis* is the predominant pathogen among the HIV positive TB patients as none of the culture isolates was identified as Non *Tuberculosis Mycobacterium*(NTM). The pattern of drug resistance among the HIV positive patients in the present was found to be similar to that found among the HIV negative population in certain parts of Tamilnadu. HIV positive patients with tuberculosis can be treated with standard anti tuberculosis regimens recommended and employed in the Revised National Tuberculosis Control Programme (RNTCP).


Nittala Subramanya Sastry (2000) observed that the over 3.5 million persons were estimated to be infected with HIV virus in India. The total number of sentinel sites is 180. HIV infection has reached almost all parts of the country and that heterosexual transmission was major mode of HIV transmission in India. There is consistent rise in AIDS being reported every year. The reported cases of HIV infection and fall blown AIDS are only in thousands. However it is realized, that there is a wide gap between the reported and estimated figures. The number of HIV infections as on mid 1998 was 3.5 million. The over all prevalence in India is relatively low when compared to the other countries in Asia-Pacific region. However this is nearly 10 times higher than China. More and more a women attending antenatal clinics are testing HIV positive there by increasing the risk of prenatal transmission (WHO, 2000).
The epidemiological data collected till the end of March 1999 examine the different mode of infection of both HIV and AIDS. It was observed that extramarital sex was the primary mode of infection, 80% of AIDS patients identified owned their extramarital sex to be the cause. The infection by HIV virus can be avoided by taking preventive measures and avoiding risky behaviours (UNAIDS 2000). Swaminathan et al., (2000) reported that the generalized epidemic: HIV prevalence among antenatal women is more than 1%. In Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu and Manipur. HIV prevalence among antenatal women as less than 1% but HIV prevalent in Gujarat, West Bengal, Nagaland and Goa. Low level epidemic: HIV prevalence among high risk group is less than 5%.

By March 1999, a total number of 3.46 million persons were screened out of which 85312 persons were found to be HIV positive with a sero positivity rate of 24.66/1000. Over the last decade, the HIV has continued to spread among the different risk groups at different rates and trends have been quite similar to the trends seen in other parts of the world. The geographic spread has been quite uneven and variable (WHO, 2000). The predominant mode of transmission of infection in the AIDS patients is through heterosexual contact (76.2%) followed by blood transfusion and blood product infusion (7.4%) and injectable drug use (6.3%) (WHO, 2000).

Nittala Subramanya Sastry (2000) suggested that the objective of the surveillance is best achieved by annual cross sectional survey of the same risk groups in the same place over few years by unlinked anonymous testing following test procedure by two ERS. The number of samples to be screened must represent the risk group under study
and the samples should be collected within the shortest possible period with adequate sample size. Clinic based approach for such collection has many advantages including the procedure for collection of samples which should be repeated every year. As such the surveillance activity for HIV infection must be done on the above lines selection bias and participation bias of the population under study. The national AIDS control project has aimed at encouraging management reforms, such as better managed state level AIDS control societies and improved drugs and equipment procurement practices. These reforms are viewed at bringing about a sense of “ownership” of the programme among the states, municipal corporations, NGOs and other implementing agencies and also to support structural and evidence based annual reviews and operational research (NACO, 2001).

The surveillance process uses only population in the age group of 15-49 as this age group is mainly exposed to the high-risk behavior; however the estimation on the number of newborn HIV children is made using the estimation on infected mothers (WHO-UNAIDS 2002). HIV/AIDS is a national calamity and can only be fought in unison by forging coordination and convergence in respect of HIV/AIDS prevention and control strategies between the society, voluntary organization and different arms of the Government. The National AIDS Control Organization implements the National AIDS Control Programme in the country.

The over all vision of the NACO is;

- To lead and catalyze and expand response to HIV /AIDS epidemic in order to contain the spread of infection.
- Reduce people’s vulnerability to HIV
- Promote community and family based care to HIV/AIDS cases within an enabling environment with out any stigmatization and discrimination.

- To alleviate the epidemic’s devastating social and economic impart. (NACO, 2003).

Arni and Srinivasa rao (2003) reported that the initially the spread of HIV did not attract much attention in India. Only in early 1990s was there a noticeable media exposure. Now there are 320 surveillance centers at the national level, and more than 42,000 AIDS cases were reported by the end of 2002. The current HIV estimate in India stands at about 4 million inter-state variations in sexual behavior and condom usage have been reported. Age at first sex for urban females was low (16 years) for Bihar, Andrapradesh, Rajasthan and Maharastra and high at 25 years for Assam. For rural males it was low at 18 for Madhyapradesh and high at 25 years for Kerala.

HIV sentinel surveillance is recognized as a robust mechanism globally to track the spread and prevalence of HIV. It is used to estimate the number of HIV infection across the country. Sites frequented by high-risk population, for example, in clinics for sexually transmitted infections and intravenous drug users attending drug de-addiction centers and antenatal clinics have been located primarily as the HIV sentinel sites in India since 1998 (NACO, 2003). The adult prevalence of HIV in the year 2000 was 3.86 million which further increased to 5.10 million in the year 2003. A community based STD study completed during 2002-2003 has made clear that the rural urban differential in STD prevalence and the HIV prevalence among the STD clinic attendees required modification, though this validation of assumption has strengthened our estimation of HIV infections across India (ICMR and National institute of health and family welfare,
2003). Not a single one among 3 moderate HIV prevalence states, Gujarat, Goa and Pondicherry has moved in to high prevalence of HIV. Not a single low prevalence state has moved in to moderate prevalence or high prevalence HIV infection. There is a clear demonstration of early signs of sero-stabilization of HIV infection in the high prevalence states. These all explains that there is no galloping HIV epidemic across India (NACO, 2003).

India remains a low prevalence country with an adult HIV prevalence of 0.9% the total population. In rural India, the number of HIV infection is 30.6 Lakhs accounting 19.22% of males and the 11.38% of females, where as in urban India it is 20.46 lakhs accounting 12.97% males and 7.49% females which makes a total of 51 lakhs HIV infection across India (NACO, 2003). In 2003, rural India accounted for 59% of the infection as against 41% in urban India. In terms of figures the number of HIV infection in rural areas translates in to 29.8 lakhs of which women accounted for 10.95 lakhs. With women accounting for 36% of the infections there is a narrowing of the gap between men and women. The ratio of HIV infection between men and women is 3:1 (NACO, 2003).

Ramachandran et al., (2003) found that the over all HIV seroprevalence among TB patients was 4.7%. The highest HIV seropositivity rate was found among patients aged 30-39 year (10.6%). HIV infection is on the rise among TB patients in Tamilnadu. Acid fast smear microscopy is adequate for the diagnosis of pulmonary tuberculosis and drug resistance among HIV positive patients is not a major problem at this point of time, hence anti tuberculosis regimens recommended by the Revised National Tuberculosis Control Program (RNTCP) can be used to treat HIV positive patients with tuberculosis.
The objectives of the AIDS case surveillance are,

- To improve the detection and correct diagnosis of AIDS cases by physicians throughout the country
- To develop a mechanism to ensure that all AIDS cases, which are diagnosed, are reported to NACO as part of the surveillance programme.

AIDS case surveillance data can also supplement the HIV surveillance data in monitoring the epidemic and could contribute to the planning of hospital and home/community based cares AIDS patients (NACO, 2004). Surveillance of STD constitutes an important component of prevention and control of HIV/AIDS. It is now established that presence of sexually transmitted disease (STDs) increases the risk of HIV transmission by 3-10 times. Thus prevention and control of STDs is an integral component of National AIDS Control Program. Surveillance of STDs is of paramount importance for effective control of this group of disease (NACO, 2004).

David Gisselquist (2004) reported that the lack of alteration paid to non sterile health and cosmetic services in India contrast sharply with what's happening in developed countries shortly after HIV was recognized as a blood born virus. In the early 1980s health care managers responding to public pressure-cleaned up the health care system to protect and patients and staff.

Most of the available evidences from India points to an important contribution from non sterile invasive health care and cosmetic procedures. A WHO sponsored model estimate that medical injections account for 24% of HIV infections in south Asia (Hauri et al., 2004). Prasad Raa (2004) estimated 5.1 million Indians are currently living with HIV concentrated in 7 states specifically Andra Pradesh, Karnataka, Maharastra and Tamilnadu. A significant proportion of new infections is occurring in women who are...
married and who have been infected by husbands, frequented sex workers (who either currently or in the past), commercial sex serves as a major driver of the epidemic in most parts of India. It is estimated that 50% of all new HIV infections are among young people (about 7000 young people become every day) and that 30% of those living with HIV are in the 15-24 age group. The vast majority of young people who are HIV positive do not know that they are infected and hardly a few know the HIV slants of their partner (Asha Krishnakumar, 2004).

HIV/AIDS epidemic is a major health concern worldwide with an estimated 39.4 (range 35.92-44.3) million people including women 17.6 range (16.3-19.5) millions and children under 15 years 2.2 (range 2.0-2.6) millions affected HIV virus more then 3.1 (range 2.8 – 3.5) million death due to AIDS as of December 2004. (UNAIDS/WHO, 2004). Mariette Correa and David Gisselquist (2005) reported that the difficulty in drawing attention to the potential of HIV transmission through unsafe exposure to blood is in many ways, understandable. The sexual route is a convenient one; it places full responsibility on the HIV positive person, or some one close to him/her. To a large extent, it becomes a moral issue. When the blood society addressed, it relates to HIV drug users, an already marginalized group.

By the end of July 2005, the total number of AIDS cases reported to NACO was 111,608. Of this number, 32,567 were women and 37% were under the age of 30. These figures are not completely accurate reflections of the actual situation though, as large numbers of AIDS cases go unreported. (NACO, 2005). Becker et al., (2005) found that the HIV prevalence is currently higher in rural than urban India. For example, a 2003 survey found 2.9% of the general population infected in Bajahot in Karnataka. During the
annual sentinel surveillance was conducted in 703 sites across the country, covering antenatal clinic attendees (391), STD clinic attendees (175), female sex workers (83), Injecting drug users (30), men having sex with men (18), TB patients (4) and migrants (1). On an average, 0.88% of antenatal mothers, 5.66% of STD patients, 8.44% of female sex workers and 10.16% of injecting drug users were infected with HIV. There were, however considerable differences in the prevalence rates from state to state (WHO, 2005). Washington and Moses (2005) noticed that the recent expansion of HIV testing to most pregnant women and their spouses through the prevention of parent to child transmission (PPTCT) program has found an unexpectedly large percentage of HIV positive women with HIV negative husbands. For example, more than 50,00,000 women are tested for HIV in several southern states during 2001-2005, 23% of all men tested with HIV positive wives were HIV negative.

Health care providers and general public has been informed on the survival of the HIV virus outside the human body and its transmission efficiency through to infected blood. Reuse of non sterilized unreliably sterile syringe and/or needles continued on a massive scale, infections through transfusions continue, professional blood donors still go about their business (Blanchard, 2005). Government health officials were aware of common infection control lapses in public and private setting but had no power to take action against private providers. NACOs emphasis on infection control in hospital settings has focused on the safety of health care providers. Less attention has been paid to reducing the risk of patient -to- patient transmission with in hospital there is no standardized format to collect misinformation from AIDS patients on sources of infection and no standardized system for reporting that information. Doctors and
counselors who are responsible for assessing and reporting states of infection have not been trained to do so. Moreover there is widespread misinformation about the relative risk of HIV transmission through blood and sexual exposure (NACO, 2005).

In the absence of any nationally representative community based data, the information is used to estimate the number of HIV infections in the country using some assumptions to overcome the limitations arising out of absence of surveillance among male general population and adequate rural representatives. For the analysis of the primary data from these sentinel sites, every year the steps have been adopted to ensure professional peer review and independent assessment. A core group of experts including eminent epidemiologist and biostatisticians (national and international). WHO and UNAIDS are members. ICMR and NACO convey expert’s group meetings every year to review the procedures and data used for estimation. Two institutions, National Institute of Health and Family Welfare (NIHFW) and the Institute for Research in Medical Statistic (IRMS0) have been identified to independently analyze the sentinel surveillance data since 2002. All these data set along with the findings of community based study on STD prevalence, were used to validate the assumptions used in estimation since 1998 (UNAIDS, 2005).

Aggarwal et al., (2005) determine the prevalence of respiratory, gastro intestinal and other pathogen in 100% HIV seropositive patients. A total of 132 pathogens were detected in 81 patients as more than one pathogen was observed in 40 patients. Candida was the commonest isolate (24.24%) followed by Mycobacterium tuberculosis (15.13%) and Cryptosporidium parvum (13.63%). Over 22% of HIV positive person in India are house wives with one sexual partner. The increasing HIV prevalence among the women
is also leading to a rise in the mother to child transmission of HIV and pediatric HIV cases. 50% of all new HIV infections are among young people (about 7000 young people become infected everyday) and that 30% of those living with HIV are in the 15-24 age group. Majority of HIV positive do not know that they are infected, a few know about the HIV infection of their partners (UNDP, 2006).

Arora et al., (2006) reported that the national study of injection practices by the all India institute of Medical sciences found that 65% of injections in the country were unsafe and that 23.5% of injections were administered using reused non sterile or unreliable needle and or syringes, there by posing the risk of transmitting blood-borne viruses. Mathew (2006) suspected that the nosocomial and the unexplained HIV infections should be recognized and recorded in a registry and revived to consider possible routes of transmission. The government should investigate suspected nosocomial infections. When multiple nosocomial infections are documented or suspected at a specific institution, investigation trust is carried out to pin point possible sources of infection at the institution. Testing of Hepatitis C (HCV) infection should be extended to identify infection control lapses in health care and cosmetic services. Where blood transfusions are the possible cause of HIV infection, the donor should be traced and retested.

New government data – gathered with help of UNAIDS – showed there were 2.47 million people with HIV/AIDS in India in 2006, less than half the previous year’s estimation announced by Minister Anbumani Ramdoss. The HIV prevalence rate was 0.36% down from 0.9% in 2005. UN agencies had earlier painted a grim picture. In 1997 UNDPs common country assessment there were up to 5 million infected people in mid
1996. 2002 UNAIDS report showed over 3 lakh AIDS death in India in 1999, when actually 11000 deaths were recorded. In 2002 the US intelligence community assessment predicted 20 – 25 million HIV positive people in India by 2010. (Sanchita Sharma, 2007).

Sharahbosely (2007) suggested that the official estimate for 2006 was that 39.5 million people were infected. That must now come down to around 36 million. National AIDS organization asked people to volunteer for blood test to detect malaria, vitamin C deficiency and HIV. In the early days of AIDS surveillance, only those who went to a health clinic feeling unwell were tested. Then checks were made on women in antenatal clinics where blood test could be done. This gave an idea about the number of urban women with HIV and little about rural people.

2.3. HIV

The World Health Organization grouped HIV infections and conditions together, by introducing a staging system for patients infected with HIV-1. Most of the conditions are opportunistic infections. HIV disease in asymptomatic and not categorized as AIDS in the first stage. The second stage is characterized by minor mucocutaneous manifestations and recurrent upper respiratory tract infections. Stage three includes unexplained chronic diarrhea for a longer period and severe bacterial infections and pulmonary tuberculosis. The fourth stage, that is the final stage includes toxoplasmosis of brain, candidiasis of esophagus, trachea, bronchi or lungs and kaposi’s sarcoma, these disease are indicators of AIDS (WHO, 1990).

Cruz et al., (1992) found that the antiretroviral medications deplete many of the micronutrients necessary to keep the body healthy. Providing proper nutrition and complementary therapies can address the immune system and many of the side effects of
HIV treatments. Incorporations of vitamins, minerals, herbs and botanicals into daily life provide the necessary requirements of an immune system. Nutritional needs of those infected with HIV are 10% higher than someone not infected with HIV. HIV sentinel surveillance among tuberculosis patients is being carried out in many countries in order to ascertain the level of HIV prevalence and trends over time in them, since these data reflect the association between TB and HIV. HIV prevalence of 20.1% has been reported (Paranjape et al., 1997).

Hitchcock and Stephens (1999) observed that the invasive intracellular pathogenesis of *C. trachomatis* can cause substantial damage to the genital epithelial layer which may facilitate HIV infection. HIV-1 is spreading at an alarming rate in Asian countries including India. It is of great significance to understand what host factors are responsible for this spread. It is well established now that HIV-1, HIV-2 and SIV need an additional factor (called co - receptors) besides CD4, to gain entry in to a susceptible cell. The co repressors are actually 7 team members G coupled proteins. To gain entry in to the susceptible cell, HIV virus needs some co receptors, besides CD4 such as CCR5, CXCR-4. The virus establishes the infection using almost exclusively CCR5 co receptors, and then shows the ability to use other co receptors such as CXCR-4, which are known as chemokine (Shanmugasundaram et al., 2000).

Hai Zhang *et al.*, (2000) found that the highly active antiretroviral therapy can effectively decrease levels of human immuno deficiency virus type1 (HIV-1) virions in peripheral plasma and seminal fluid of infected men. Whether the genital tract of HIV I infected men who are receiving highly active antiretroviral therapy and who have no detectable virus in the peripheral plasma harbors replication – competent virus is not
known. Immunological changes due to HIV infection may favour *C.trachomatis* infection. (Debattista *et al.*, 2002)

Thomas Simms (2002) studied that the immunosuppressant due to HIV may lead to aggressive Chlamydia disease conditions like PID in those who are infected with *C.trachomatis*. Human immuno deficiency virus is the etiological agent of Acquired Immuno Deficiency Syndrome. HIV is a type of retrovirus, which infects human when it comes in contact with tissue such as those that line the vagina, anal area, mouth or in contact with eyes or a break in the skin. HIV is a RNA containing viruses. HIV is included in the sub group *lentiviridae*. The virus infects susceptible host cell by binding to the CD4 receptors present in the surface of lymphocytes, which are the critical factors for body’s immune system. (Mala Rao, 2004)

Royce *et al.*, (2004) noticed that the first children with HIV I infection were described in 1983. Almost all HIV infection among young children is due to vertical transmission. Testing of blood donors for HIV 1 RNA by means of nucleic acid amplification was introduced in the United States as an investigational screening test in mid 1999 to identify donation made during the window period before sero conversion. Screening of potential blood donors has historically relied on the use of immuno assay to detect viral antibodies or antigens, (Susan *et al.*, 2005). Ananthnarayan and Jayaram Paniker (2005) reported that the HIV is a spherical enveloped virus, about 90-120nm in size. The nucleocapsid has an outer icosahedral shell and an inner cone shaped core, enclosing the genome. The genome of HIV contains the three structural genes (*gag*, *pol* and *env*), and the product of these gene acts as antigen. Sera of infected patient contain antibodies to them. Detection of this antigens and antibodies is useful in the diagnosis
and prognosis of HIV infection. The \textit{gag} gene determines the core and shell of the virus. The \textit{env} determines the synthesis of envelope glycol protein and the \textit{pol} gene codes for the polymerase reverse transcriptase. Based on molecular and antigenic differences, two types of HIV have been recognized. HIV 1 and HIV 2.

Adhikari \textit{et al.}, (2005) found that the determination outcome in HIV exposed neonates required intensive care (n=30) was different from that of HIV unexposed neonates required intensive care (n=40) in the first week of post natal life. The outcome is not worst in HIV exposed babies and most of these ultimately turned to be HIV uninfected. HIV infections were significantly high among the patients with anemia. HIV infected patients have elevated erythrocyte sedimentation rate. Among human immunodeficiency virus infected persons, there is a high risk of progression to active tuberculosis once infection with \textit{Mycobacterium tuberculosis} occurs. The highest rate of infection was among the age group of 26-35 years. Sd bioline standard diagnostic inc (Korea) is a screening kit used in HIV 1 and HIV 2 screening. This is an immuno chromatographic (rapid) method for quantitative detection of antibodies of all iso types (IgG, IgM, IgA) specific to HIV 1 and HIV 2 in serum plasma or whole blood (Ojo \textit{et al.}, 2006).

2.4. TRANSMISSION

Sexually Transmitted Infections (STI) increase risk of HIV transmission and infection because they cause disruption of the normal epithelial barrier by genital ulceration and/or microulceration; and by accumulation of pools of HIV susceptible or HIV infected cells (lymphocytes and macrophages) in semen and vaginal secretions. Transmission of HIV depends on the infections of the index case and the susceptibility of
the uninfected partner. Infectivity seems to vary during the course of illness and is not constant between individuals (Laga et al., 1991). Catherine peck ham and Diana Gibb (1995) observed that the transmission of HIV infection from mother to child is influenced by multiple factors. An important determinant may be viral load. The presence of p24 antigen has consistently been associated with increased transmission. Other factors associated with increased transmission are also assumed to reflect viral load. These include low maternal CD4 cell counts, advanced clinical HIV disease and increased levels of neopterin or Beta_2 micro globulin.

Human immuno deficiency virus is a blood borne viruses, thus cause occupational hazards to health care workers exposed to the blood of infected patients. The risk of acquiring HIV infection after percutaneous exposure to blood from an HIV infected patients is 0.3%. Case report on a needle stick injury was confirmed to be positive after 8 months of the incident with symptoms (Renee Ridzon et al., 1996)

Mastro and Devincenzi (1996) found that the oral sex is not without its risk as HIV is transmissible through both insertive and receptive oral sex. The risk of HIV transmission from exposure to saliva is considerably smaller than the risk from exposure to semen; contrary to popular belief; one would have to swallow gallons of saliva from a carrier to run a significant risk of becoming infected. Routes of transmission of HIV are by unprotected, penetrative sexual intercourse, from mother to child, by blood or blood products. Heterosexual transmission to partners occurs from infected male and female, drug misusers, from bisexual men and from haemophilias and others infected through contaminated blood and blood products. Virus can be isolated from blood, semen and cervical and vaginal secretions and these three sources are important in transmission,
although breast milk and donated organs have caused infection. Virus may also be present in cerebrospinal fluid, saliva, tears and urine, but usually to a lower titer than in blood. (David Greenwood et al., 1997)

Heather (1997) observed that the perinatal transmission of HIV may occur in utero, during labour, delivery or in post partum period via breast feeding. There are wide variation in virus transmission rates and the reported risk of transmission from mother to child ranges from 9.1 to 55% in women not receiving anti retroviral therapy. The majority of HIV infections are acquired through unprotected sexual relations between partners, one of whom has HIV. Sexual transmission occurs with the contact between sexual secretions of one partner with the rectal, genital or oral mucous membranes of another. Unprotected receptive sexual acts are riskier than unprotected insertive sexual acts, with the risk for transmitting HIV from an infected partner to an uninfected partner through unprotected insertive and intercourse greater than the risk for transmission through vaginal intercourse or oral sex (Rothenberg et al., 1998).

Wig et al., (1998) reported that the perinatal transmission of HIV is truly a multifactorial situation and the risk factors associated with the transmission include high maternal viral load, viral proto type, obstetric factors, maternal immune response, prematurity and breast feeding of babies. HIV effects T4 lymphocytes through infected semen, the contaminated blood and blood products and rarely through saliva, urine and the fecal material (Sathish Gupte and Jaypee, 1998). Thomas et al., (1999) found that the predominant mode of transmission of human immuno deficiency virus type 1(HIV-1) is through heterosexual contact and the rate of transmission by this means is increasing throughout Asia and in many industrialized countries. A wide variety of behavioral and
biological risk factors are associated with the risk of transmission, including the frequency and types of sexual contact, the use or non-use of condoms.

Female genital mutilation plays a significant role in the transmission of HIV. The control of STD is important in reducing HIV transmission (Brady, 1999). Morgan et al., (2002) studied that the three main transmission routes of HIV are sexual contact, exposure to infected body fluids, or tissues and from mother to fetus or child during perinatal period. It is possible to find HIV in the saliva, tears and urine of infected individuals. There are no recorded cases of infection by these secretions and the risk of infection is negligible. Intravenous drug use accounts for about one third of all AIDS cases and one - half, apart from high risk sexual behavior, sharing of needles and other equipment (Pal et al., 2003). Singh et al., (2003) reported that the intravenous drug use is the major mode of transmission of HIV, apart from high risk sexual behavior, sharing of needle and other equipments. Prevalence of HIV infection amongst intravenous drug users was 30%.

Drug addicts represent a high risk group for acquiring parenterally transmitted viral infections like Human Immuno Deficiency Virus (HIV), Hepatitis C Virus (HCV), and Hepatitis B Virus (HBV). It is very likely that an Injecting Drug User (IDU) infected with HIV will also be infected with HBV and or /HCV because of common high risk behavior (Baveja et al., 2003). Marjette correa and David Gisselquist (2004) found that the HIV transmitted through unsafe sex and contaminated blood. The virus transmits many hundreds times faster through the blood then through heterosexual coiters. The available evidence from India points to an important contribution from non-sterile invasive health
care and cosmetic procedures. A WHO sponsored model estimates that medical injections account for 24% of HIV infections in south Asia.

Coovadia (2004) studied that the transmission of the virus from mother to child can occur in utero during the last weeks of pregnancy and at child birth. In the absence of treatment, the transmission rate between the mother to child during pregnancy, labour and delivery is 25%. A number of factors influence the risk of infection, particularly the viral load of the mother at birth. The greater the load, the higher the risk. Breast feeding increases the risk of transmission by 10-15%. The transmission of AIDS through infected body fluids is particularly relevant to intravenous drug users, hemophilia’s and recipients of blood transfusions and blood products. Sharing and reusing syringes contaminated with HIV infected blood represents a major risk for infection with not only AIDS, but also Hepatitis B and Hepatitis C. This can affect people who give and receive tattoos and piercing (Fan, 2005).

Sharma and Marfatia (2005) noticed that the spousal transmission was more incase acquiring HIV via sexual route than those acquiring blood transmission. STD’s were significantly high in the seroconcordent group as compared to the serodiscordant group. The factors play an important role in influencing HIV transmission among married couples. The consistent use of condoms coupled with easily diagnosis and treatment of STD’s can significantly reduce the risk of HIV infection. HIV infection is predominantly a sexually transmitted disease (STD) World wide. Oral sex is a much less efficient mode of transmission of HIV than is receptive and inter course .The association of alcohol consumption and illicit drug use with unsafe sexual behavior, both homosexual and hetero sexual, leads to an increased risk of sexual transmission of HIV. Breast feeding is
an important modality of transmission of HIV infection. HIV can also be isolated typically in low titres from saliva and body fluids. The occupational risk of HIV transmission to health care workers and laboratory personnel and potentially others who work with HIV containing materials, particularly when sharp objects are used (Anthony et al., 2005).

Ananthanarayan and Paniker (2005) reported that about a third to half the number of babies born to infected mothers are infected with HIV. Virus transmission may occur to the fetus in pregnancy as early as the first trimester, but infection is more common perinatally. Many of the infected children may not survive for a year. Children may also acquire the infection from blood transfusion or blood predicts. The campaign against HIV/AIDS in the state is involving a strict gynaecological vigil to check the mother to child transmission of the virus. Globally, the risk of mother to child transmission is 30%, failing any intervention officials of the TANSACS said that under a strengthened antenatal monitoring counselors across 760 centers were persuading every expecting mother to undergo HIV testing. Under the prevention parent to child transmission (PPCT) campaign last year nearly 7 lakhs mothers were sensitized to the primary prevention of HIV through counseling. According to the data available with the society, there 3000 children in the state who have registered them selves for the antiretroviral treatment (Dinesh Varma, 2007).

Supriya sahu (2007) reported that the every mothers are provided with a minimum package of services from antenatal counseling through CD4 testing and ART intervention. They also provide seminars to gynecologists to provide an idea about the importance of CD4 testing of HIV mother to device the ideal treatment plan.
2.5. HIV in Tamilnadu

The latest survey conducted by HIV sentinel surveillance covered 79 sentinel sites and antenatal clinics and STD clinic offenees, intravenous drug users, sex workers, commercial sex workers and men having sex with men to known about the epidemiological information on the distribution and spread of HIV. Cross sectional studies are also carried out. (HIV sentinels surveillance, Tamilnadu, 2000). Eight surveys were conducted by HIV risk behavior surveillance in Tamilnadu, to know trends in sexual behavior among the high risk group. Since the year 2000, these surveys are conducted yearly among the urban and rural population. Pondicherry was included in 2001. The results of 2003 survey indicated a rising level of knowledge among all groups on HIV/AIDS and STD. (HIV risk behavior surveillance survey in Tamilnadu, 2000).

Dandona and Dandona (2005) reported that the resource and training centers at Chennai, Madurai and Kanyakumari were established to train the trainers in traditional media. Demonstration centers like (ARMI- Villupuram, CSR- Nagarcoil and DPG Trichy) were set up for targeted interventions. Prevention Along The Highway (PATH), Women In Prostitution (WIP), Slum Intervention Programme (SIP) Tourists and Women in Prostitution (TWIP), Clinical Intervention Programme (CLIP), Men who have Sex with Men (MSM) migrants integrated STD/MCH, care and support and Industrial Intervention Programme (IIP) are the thematic area that the APAC has identified to full fill in mandate (NACO,2005).

Bozzette (2006) reported that the Tamilnadu had 52,036 AIDS cases (reported to NACO by July 2005). HIV infection among pregnant women were rising tripling to 1.25% between 1995-1997. The contact with foreign visitors had played a role in initial
infections among sex workers. Tamilnadu, Andrapradesh, Karnataka and Maharastra together accounted for 3.7 million infections close to \( \frac{3}{4} \) of India’s present estimate of about 5.2 million infections. Tamilnadu has the highest number of AIDS cases about (37000) in the country. The first case of HIV infection was reported in Tamilnadu. APAC project was formulated under a tripartite agreement among the Voluntary Health Service (VHS) in Chennai with the objective of preventing the spread of HIV/AIDS particularly the case of sexual transmission (Chandrasekaran and Dallabetta, 2006).

In 1995, 9 years after the first case of HIV was reported in Tamilnadu, the APAC project was formulated under a tripartite agreement among the Voluntary Health Services VHS) in Chennai. It was in collaboration with the United States Agency for International Development (USAID) and the government of India with the primary objective of Preventing and controlling the spread of HIV/AIDS (UDNP, 2006). Detailed study was under taken to ascertain the appropriateness of the clinical management provided to health care seekers and to determine the proportion of patients reporting STDs and receiving appropriate advice in Tamilnadu towns (UNDP, 2006). Nara (2006) observed that the condom use was promoted in Tamilnadu by introducing innovative schemes for retailers and consumers. With in a year of implementing this strategy, over two lakhs single piece condoms were sold by 2337 outlets.

2.6. HIV in India

Merson (1990) reported that the India lacks the scientific laboratories, research facilities, equipment and medical personal to deal with AIDS epidemic. In addition, factors such as cultural taboos against discussion of sexual practices, poor condition
between local health authorities and there communities, wide spread poverty and malnutrition and a lack of capacity to test and store blood severely hinder the ability of the government to control AIDS. At the beginning of the 1990s, as infection rates continued to rise, responses were strengthened. In 1992, the government set up NACO (The National AIDS Control Organization) to oversee the formulation of policies, prevention work and control programs relating to HIV and AIDS (Bhupesh, 1992).

India’s first case of HIV was diagnosed at sex workers in Chennai, Tamil Nadu. There are many HIV screening centers were set up across country, there were calls for visitors to be screened for HIV. HIV screening was carried out in blood banks (Telzak et al., 1997). Jaya Sreedhar (1997) reported that the actual number of people living with HIV (PLHIV) in India might be a third lower than the present estimate of 5.2 million. A generous downward revision of HIV prevalence would still leave the country with a massive smoldering epidemic of about 3.5 million people, and hot spots of infection with the imagining danger of explosive spread. India’s HIV prevalence rate is presently calculated from data collected each year by the various state AIDS control societies through HIV Sentinel Surveillance (HSS). For a few months each year, blood samples are collected from incoming patients at ‘sentinel’ sites in the public health sector.

In Mumbai, which has a larger brothel-based sex industry than any other area of India, HIV prevalence among sex workers has not fallen below 44% since 2000. Another area where sex workers are heavily affected by the epidemic is the city of Mysore, in Karnataka, southern India. Around 26% of sex workers in Mysore are living with HIV-a situation that is not surprising given that only 14% of sex workers in the city use condoms consistently with clients, and that 91% never use condoms during sex with their
regular partners. In comparison, 80-90% of sex workers in Tamil Nadu state report condom use, which correlates with a relatively low HIV prevalence of 9% (NACO, 1998). A major challenge for India now is that of rapidly expanding the coverage of HIV/AIDS programmes to all vulnerable groups. Public education campaigns can make a difference. An estimated 1% Indian’s one billion population has HIV (NACO, 1998).

Jana (1999) found that the sex workers have been trained to act as peer-educators, and sent to brothels to teach others about HIV and AIDS, and the importance of using condoms with clients. Between 1992 and 1995 condom use among sex workers rose from 27% to 82%. The project continues to have an impact, with HIV prevalence among sex workers in the area falling from 11% in 2001 to less than 4% by 2004. The Sonagachi project has become internationally famous for its achievements and the UN has used the project as a ‘best practice’ model for other sex worker projects around the world. Most of the infections have been detected in people who had migrated to work in place outside the state. Mumbai is the largest brothel-based sex industry in India. Other areas where sex workers are heavily affected by the epidemic is the city of Mysore, Karnataka, South India. Around 26% of sex workers are living with HIV. 24-34% of truck drivers in various surveys have reported engaging in sex with commercial sex workers and India has one of the largest road networks in the world, involving millions of drivers and helper (Jana et al., 1999).

Atal Bihari Vajpayee (2001) reported that the government adopted the national AIDS prevention and control policy. During that year, Prime Minister Atal Bihari Vajpayee addressed parliament and referred to HIV/AIDS as one of the most serious health challenges facing the country. The Prime Minister also met the chief ministers of
the six high prevalence states to plan the implementation of strategies for HIV/AIDS prevention. Uttar Pradesh has more than half million HIV positive case, but only 20,000 of them have been reported, due to the stigma attached to the disease. Around 60% of HIV cases reported come from the socially and economically backward eastern part of the state. “There is a shift from the urban to rural and from high risk to low risk categories” (UNAIDS 2001).

Joshi et al., (2002) noticed that the screening for HBs Ag, anti-HIV and syphilis amongst blood donors in a teaching hospital reported that 0.6% (128/21180) and anti-HIV antibodies seropositivity among voluntary blood donors during a period of four years from May 1997 to July 2001. Case of people being tested without their consent or knowledge is common in Indian hospitals. In one 2002 study, it was suggested that over 95% of patients listed for surgical procedure are tested against their will (Malavade, 2002). 2002 reported by the CIA’S National intelligence council predicted 20-25 million AIDS cases in India by 2010—which is more than any other country in the world. Being mobile in and of itself is not a risk for HIV infection. It is the situations encountered and the behavior possibly engaged in during mobility or migration that increases vulnerability and risk regarding HIV/AIDS. Migration doesn’t change an individual’s sexual behavior, but leads them to take their established sexual behavior to areas where there is a higher prevalence of HIV. Long working hours, isolation from their family and movement between areas may increase the likelihood that an individual will become involved in casual sexual relationships, which in turn may increase the risk of HIV transmission (Srivastava and Sasikumar, 2003). HIV-emerged later in India than it did in many other countries, but this has not limited its impact. Infection rates soared throughout the 1990s.
and have increased further in recent years. Epidemic is affecting all sectors of Indian society. In a country where poverty, illiteracy and poor health are rife, the spread of HIV presents a daunting challenge (Woodman, 2003). IV epidemic has entered the third phase in India, where the most transmission occurs through perinatal route. HIV had now spread extensively throughout the country. A 2004 NACO report revealed that the total number of people living with HIV had risen from 0.2 million in 1990 to 3.86 million in 2000. By 2003, 5.1 million infections had been reported (NACO, 2004).

Sunil Raman (2005) reported that the high number of pregnant women infected with HIV had also been identified in districts of Lakshiserai and Saharsa of Bihar. HIV/AIDS infection in Uttar Pradesh and Bihar go unreported because of the social stigma attached to the disease. The districts of Etawah, Bandra and Lalitpur in Uttar Pradesh had been found to have more than 1% of pregnant mothers infected with the virus. The challenges India faces to overcome this epidemic are enormous. Yet India possesses in ample quantities all the resources needed to achieve universal access to HIV prevention and treatment (Peter Piot, 2005). Kumaraswamy et al., (2005) found that the clinical course of the disease with HIV and pattern of opportunistic infections vary from country to country and also from patient to patient. In tropical countries like India, a handful of pathogens cause most of the opportunistic infections.

The overwhelming majority of infection in India occurs through heterosexual sex. In large number of cases, women in monogamous relationship are becoming infected because of the multiple sexual partnership of their husband. Sex workers are very widespread in India, which is a major cause of HIV spreading. There is a substantial geographical heterogeneity of HIV prevalence existing within the 115 districts of the 4
states analyzed. Prevalence of STDs in the previous year and average age at marriage are significantly associated with district wise HIV infection (Mukerjee, 2006). There is going to be a reversal of Epidemic by 2008 and 2009 (Ibid, 2006). Nationally, HIV prevalence among injecting drug uses appears to have declined slightly in recent years, from 13% in 2003 to 10% in 2005. However, transmission through injecting drug use is still a major driving factor in the spread of HIV in India. This is particularly the case in the north-eastern state of India, such as Manipur, where the HIV prevalence among injecting drug uses has been consistently high in recent years. Injecting drug use is also a major problem in urban areas outside the north, such as Mumbai, kolkata and Chennai. The alarming levels of infection occurring through needle sharing have implications that extend beyond networks of drug users (NACO, 2006).

Bozzette (2006) reported that the migrants return home and have unprotected sex with their wives. This causes serious problems in developed states should take steps to educate migrant workers. Andhra Pradesh, Tamil Nadu and Karnataka in South, Maharastra in the west and Manipur and Nagaland in Northeast are considered high HIV prevalence states in India. The problem lies within the community. Chandrasekaran and Dallabetta (2006) noticed that the 24-34% of truck drivers in various surveys have reported engaging in sex with commercial sex workers. Both truck drivers and sex workers move from area to area, often unaware that they are infected with HIV. Then they transfer HIV from urban to rural settings. The geographic distribution of the HIV epidemic in India is varied and is based on the prevalence of HIV in low and high risk groups (NACO, 2006). Studies have shown that sexual activity between men is relatively common in both urban and rural areas of India, although it is illegal. Many men who
have sex with men (MSM) do not consider themselves homosexual, and a large number have female partners. Unprotected sex between men can also present a risk to any women that they may subsequently have sex with (UNAIDS, 2006). United Nations estimated that India’s adult HIV prevalence will peak at 1.9% in 2019. It does not correlate with the estimate given by UN. UN also states that the number of AIDS which was estimated at 2.7 million for the period 1980-2000 will rise to 12.3 million during 2000-15 and 49.5 million during 2015-50. Economic growth in India will slow by almost a percentage point per year as a result of AIDS by 2019 (UNDP, 2006).

Some states have tried to implement policies that would force people to be tested for HIV against their will. In Goa, the state government recently planned to make HIV tests compulsory before marriage, and in Punjab it has been proposed that all people willing to obtain or retain a driver’s license should be tested for HIV. (Human Rights watch, 2006). Gelmon and Singh (2006) found that among HIV prostitutes, rate of sexually transmitted infection is 56%. Women with infection are more susceptible to contracting the virus. In India, the infection are spreading from urban to rural areas, and infecting more and more women. In 1987, a National AIDS control programme was launched to co-ordinate national responses. Its activities covered surveillance, blood screening, and health education. By the end of 1987, out of 52,907 who had been tested, around 135 people were found to be HIV positive and 14 had AIDS (NACO, 2006).

Kumar and Jha (2006) suggested that the National HIV prevalence has risen dramatically since the start of the epidemic, but a study released at the beginning of 2006 suggested that HIV infection rate has fallen in Southern India, the region that has been hit hardest by AIDS. The HIV prevalence data for each state is established through antenatal
clinics, where pregnant women are tested. The data are directly relevant to sexually active women. Andhrapradhesh-HIV prevalence at this state is higher than in any other state. The vast majority of infection results from sexual contact. HIV prevalence at STD clinics was 22.8% in 2005. Goa- the HIV prevalence at antenatal clinics is found to be above 1%. Karnataka – The average HIV prevalence at antenatal clinic has exceeded 1%. Maharastra – The big state having total population of 97 million, is now having high risk of HIV transmission, mainly among injecting drug users and men who have sex with men. Manipur, Nizoram & Nagaland are under the risk of HIV transmission, which is mainly found among injecting drug users (NACO, 2006).

In India each state has its own AIDS prevention and control society which carries out local initiatives with guidance from NACO. Under the second stage of the government’s National AIDS control programme, which finished in March 2006; Message were also conveyed to young people through schools. Teachers and peer educators were trained to teach about the subject. (World Bank South Asia Region (SAR), 2006). Aarti Dhar (2007) reported that the HIV affected children were made to sit separately in schools got less attention than their classmates and their parent’s illness was used to humiliate them. Some schools refused admission to such children. Study was conducted by United Nations children’s fund (UNICEF) in association with NACO and ministry of women and child development in Andra Pradesh, Karnataka, Maharastra, Manipur, Nagaland and Tamilnadu where HIV prevalence is more than 1%. Even for a routine (non HIV), medical treatment if affected children went to health care center, they were made to sit separately, Nurses refuse to dress wounds are give injection, be placed in corridor rather then a ward. In Maharastra subsidized food grains did not reach them at
all. Exclusion some times is also self imposed by affected children or their care give as to avoid mistreatment and further stigmatization. These all problems arise due to the misbelieve that children get infected from their HIV positive parents through casual contact.

2.7. Plant Extract

Egyptian folk medicines had inhibitory effect on human immuno deficiency virus reverse transcriptase. Extracts of 41 medicinal plants used in Egyptian folk medicine were screened for their inhibitory affects on HIV I reverse transcriptase. It can be used in the chemo therapy of HIV infection. The extracts of fruits of Phyllanthus emblica, Quercus pedunculata, Rumex cyprius, Terminalia chebula, and Terminalia horrida showed significant inhibitory activity (El Mekkawy et al., 1985). Berkin et al., (1989) observed that the herbal immune system tea restores immune system function of the body efficiently, and large number of viral secondary infection seems to be taken care of at the same time. 2 bags per day is the dosage. The herbal extract is non toxic. Chinese nutraceutical was extracted from Arctium lappa(radix), Prunella vulgaris, Glycyrrhiza glabra(radix) and Nelumbo nucifera. Arctium lappa is an edible variety of burdock and is used as a traditional medicinal plant in China, India and Japan. It is able to support the body’s blood production. Coix tacryma-jobi is used for production of non dairy milk. Hypericum chinensis the poly cyclic diones hypericine and pseudohypericine were used as antidepressant. Hypericine is able to block replication of HIV virus. Nelumbo nucifera has antiviral proteins. Polysaccharides of Prunella vulgaris which is a road side plant show anti HIV research results. Ziziphus jojoba contains the active ingredient betulinic acids which cure cell death of melanoma cells.
The HIV infected cells are exposed to a plant protein or glycol protein, such as trichosanthin or momoracharin, to inhibit the expression of HIV antigen, at a concentration sufficient to produce a substantial reduction in the level of HIV antigen and effect a selective reduction in the number of HIV infected cells, with respect to an infected cell of the same type. The method is used to treat HIV infection in human (Jeffrey et al., 1989). Lee-Huang et al., (1990) found that the MAP 30 (Momordica anti HIV protein) is a basic protein of about 30 kda, which is isolated from Momordica charantia. This protein can act as a new inhibitor of human immuno deficiency virus. It exhibits dose dependent of cell free HIV I infection and replication as measured by (i) quantitative focal syncytium formation on CEM –SS monolayer (ii) viral core protein p 24 expression and (iii) viral associated reverse transcriptase (RT) activity in HIV I infected H9 cells. MAP30 may be a useful therapeutic agent in the treatment of HIV I infection.

In treating HIV infections, the protein is administrated alone or in conjunction with conventional AIDS therapies. This MAP30 protein has anti HIV activity in vitro in p24 expression or reverse transcriptase assays (Sylvia lee-Hung., 1991). Crockett co et al., (1992) suggested that the Casia alata can be used as a therapeutic agent for the treatment of opportunistic infections in AIDS patients. C.alata extracts contain agents which have therapeutic potential. Bitter melon use in HIV infection informs of extracts and powdered formulations of the fruit are most frequently used. Teas made from leaves are also recommended. The below uses are based on superstitions, scientific theories or limited research. The least doses are based on scientific research, publications, traditional use or expert opinion (Tennekoon et al., 1994). Hu Co et al., (1994) reported that the
extracts of *Chrysanthemum morifolium* such as acetin-7-o-beta-D-galactopyranoside had anti HIV activity. 7 additional flavanoids isolated from this plant, 13 known related flavanoids, 14 synthetic flavanoids were evaluated as inhibitors of HIV replication in H 9 cells.

Atazanavir and nelfinavir have anti retroviral activity; it is potent, safe, well tolerated and effective one daily protease inhibitors with low pill burden. Lipid changes with atazanavir were significantly less then with nelfinaver (Pope *et al.*, 1994). Bourinbaiar and lee-Huang (1995) found that the MAP30 is a multifunctional antiviral plant protein capable of topological inactivation of viral DNA and specific cleavage of 28s ribosomal RNA, may regulate HIV replication in concern with steroid and non steroidal inhibitors of prostaglandin synthesis. Use of MAP30 in combination with low pharmacological doses of dexamethazone and indomethacin may improve the efficiency of anti HIV therapy. MAP30 and GAP 31 (Gelonium anti HIV protein of 81 kda) are anti HIV plant proteins were identified, purified and cloned from the medicinal plants *Momordica charantia* and *Gelonium multiform.* These agents are capable of inhibiting HIV type I infection in T Lymphocytes and monocytes as well as replication of virus in already infected cells. They are unable to enter in to unhealthy cells. MAP30 and GAP31 also possess an N glycosidase activity on 28s ribosomal RNA and a topological activity on plasmid and viral DNA including HIV 1 long terminal repeats. Both these anti viral agent’s exhibit- dose dependent inhibition of HIV 1 integrase. The inhibition of HIV 1 integrates by MAP30 and GAP31 suggests that impediment of viral DNA integration may play a key role in the anti HIV activity of these plant proteins (Lee Huang *et al.*, 1995).
Bolognesi (1996) studied that to inhibit HIV virus in test tube studies. HIV infected cells treated with alpha and beta mom or charin showed a complete loss of viral antigen. Leaf extract increased resistant to viral infections and had an immuno stimulant effect in humans. The anti HIV activity of the plant substances discussed according to their mechanism of action, targeting the critical steps of the HIV replicate cycle, i.e. adsorption, virus- cell fusion, virus uncaring , reverse transcription, integration, proviral DNA transcription ,translation, assembly and budding. Some of the anti HIV active compounds show also immune stimulating properties, which can provide an additional benefit in the treatment of AIDS (Cos et al., 2001).

Che-yi chao and ching jang Huang (2003) suggested that the bitter gourd (Momordica charantia) extract activates peroxisome proliferators-activated receptors and up regulates the expression of the acyl co A oxidase gene in H411EC3- hepatoma cells. peroxisome proliferators-activated receptors peroxisome proliferators-activated receptors and up regulates the expression of the acyl co A oxidase a (pPARα) is a ligand – dependent transcription factor that regulate the expression of genes involved in lipid metabolism and transport. Ethyl acetate extracts (EA) extracts of Bitter gourd (Momordica charantia) activates pPARα. EA extracts prepared from the whole fruit showed significantly higher activity than that from seeds or flesh alone. EA extract was able to act a natural pPARα signaling path way in cell line.

Bitter melon is a fruit that is widely used as food as well as medicine in Asia. It believed to increase the number of beta cells of the pancreas. Two proteins, alpha and beta- momorcharin in the seeds of bitter melon happen to modulate the activity of lymphocytes and could a suppress macrophage activity but were non cytotoxic. Bitter
melon capsules are not intended to diagnose, treat, cure or prevent any disease (Virdi et al., 2003). Grover and Yadav (2004) reported that the Momordica charantia is used for several ailments such as anti diabetic, abortifacient, antihelminthic, contraceptive, dysmenorrheal, eezema, emmengogue, antimalarial, galatagogus, gout, jaundice, abdominal pain, kidney, laxative, leprosy, leucorrhea, piles, pneumonia, purgative, rheumatisim, fever and scabies. It has been also used for the treatment of peptic ulcer and most importantly in various cancers such as lymphoid leukemia, lymphoma, melanoma, breast cancer, skin tumour, prostatic cancer, squamous carcinoma of tongue, larynx, human bladder carcinomas and hodkgkin’s disease.

The herbal approach to viral infection is to stimulate the immune system and thus produce more immune cells and specific use of anti viral herbs to disrupt the replication cycle. Immune enhancing polysaccharides have been identified in herbs such as Siberian ginseng, astragalus, liquorice, bladderwrack and saw palmetto. Some compounds work by interfering with the enzymes needed to make copies of virus components (Hsieh, 2005). Fang, (2005) found that the polysaccharides isolated from the aqueous extract of Prunella vulgaris exhibit anti HIV activity. P vulgaris extracts could up regulate immune response of monocytes/macrophages. P vulgaris has been traditionally used for anti inflammation to relieve red ness, swelling of sore throat and this contrary to the immune stimulatory activities. Certain organic extracts isolated from P. vulgaris like hydroxyursolic acid had stimulatory effect on macrophages. It can enhance innate immunity by stimulating production of nitric oxide (NO) from monocytes, macrophages. P. vulgaris contains tri terpenes exhibiting anti allergic and anti inflammatory effect. It protects erythrocyte against haemolysis. Ethanol extracts exhibit radical scavenger’s effects on DPPH.
Ethanolic and water extract from 5 species of Thai medicinal plants known as Hur-Khao-yen, exhibit inhibitory effect against HIV I protease (HIV-PR) and HIV integrase. Extracts of smilex corbularia exhibited anti HIV I activity. The Et OH extracts of Dioscorea membranacea showed appreciable activity against HIV I, these Thai medicinal plants can effectively usable for AIDS treatment (Tew trackul et al., 2006). Tolo et al., (2006) found that the Herpes simplex is a major opportunistic infection in immuno suppressed persons, such as AIDS patients. Extracts of Kenyan medicinal plants carissa edulis can act as an anti viral agent against HSV. Aqueous extracts preparation from the roots of Carissa edulis (Forssk). Vahl (apocynaceae), a medicinal plant locally growing in Kenya exhibited anti-HSV activity. It increases the mean survival time of infected mice by between 28 and 35% relative to the infected untreated mice. Bitter melon has traditionally been used as a remedy for lowering blood glucose in patients with diabetes mellitus. Bitter melon is also consumed as food stuff and is found an ingredient and South Asian Countries. The below uses of bitter melon are based on tradition or scientific theories. Bitter melon is administrated as a fruit juice in doses of 50 milliliters or 100 milliliters in diabetes patients. Juice formulations have more potent effects on blood sugar. There is not enough scientific data to recommend Bitter melon fore using children. There are some side effects also. Head ache have been reported after the ingestion of Bitter melon. Seeds contain a toxic chemical Known as lectin which inhibits protein synthesis of intestinal walls. The ingestion of Bitter melon should be avoided in patients with glucose 6 phosphate dehydrogenase deficiency. The anti viral protein of Bitter melon may enhance the therapies of weak HIV antagonist. Blood glucose level may require monitoring and doses may need adjustment. Bitter melon leaf extracts have
also been observed to reverse chemotherapy drug resistance. It can lower triglyceride levels and therefore have additive effects with other drugs (Day and Cartwright, 2007).

2.8. CD4

Fischl et al., (1987) reported that the Zidovudine treatment increases the CD4 cell count. The combination of ZDV and ddI improves viral load markers, CD4 cell counts and disease progression significantly better than ZDV monotherapy. 0.75 mg of Zalcitabine recommended dose every hours is in the middle of a dose-response curve both for toxicity and viral and CD4 cell activity. HIV is a retrovirus that primarily infects viral components of the human immune system such as CD4+T cells, macrophages and dendrites cells. It directly and indirectly destroys CD4+T cells. CD4 +T cells are required for the proper functioning of the immune system. When HIV kills CD4 + T cells, its number in the blood reduces; cellular immunity is lost, leading to the condition known as AIDS. HIV infection is identified on the basis of the amount of CD4+T cells in the blood and the presence of certain infections (Skowron and Bozzette, 1989). Cameron et al., (1992) found that the after the HIV infection, a primary mechanism for CD4+T lymphocyte depletion occurs in vivo. Syncytium formation occurs in tissues, with the exception of hispathologic changes observed in the brain tissue of infected individuals. In in vitro, syncytia have been observed in cell clusters of infected dendritic cells and CD4+T lymphocytes. Other mechanisms have been suggested to play a role in CD4 + T-lymphocyte depletion, including direct cytopathicity mediated by immune mechanisms and virally mediated apoptosis.
CD4+ T cells are the main target for HIV infection. Some other cells express the CD4 protein, albeit at a lower level and are infectable. About 30% of the lymphoid CD4+ cells are infected, but as these contain viral DNA but not viral RNA, the infection at this time is largely latent. At the last stages of the infection, the loss of CD4+ cells was observed. The onset of AIDS is defined by CD4+ T cells dropping below a concentration of 200 cells per mm of blood. The HIV can multiply in dividing CD4+ T cells (Dimmock and Primrose, 1994). Ho et al., (1995) reported that the frequency of circulating CD4+ T cells containing HIV-1 DNA is estimated to range from 1 in 1,000 to 1 in 100,000 cells in asymptomatic individuals, while in AIDS patients the frequency can easily rise to 1 in 100 cells. The follicular dendritic cells are not directly infected with HIV-1; they may facilitate infection of associated CD4+ T cells. To maintain the cell number of circulating CD4+ T cells, the immune system must respond by replenishing the CD4+ cell population, leading is a constant rapid turn over of cells and virus.

Deo (1995) noticed that the CD4 molecule is the major receptor for HIV; infection can be blocked by monoclonal antibodies to CD4 and by recombinant soluble CD4. All strains of HIV infect primary CD4+ T lymphocytes. The consequences of CD4+ T cell dysfunction caused by HIV infection are devastating because the CD4+ T lymphocyte play a critical role in the human immune response. Preliminary evidence in some cases suggested that CD4+ T lymphocytes from multiply exposed uninfected individuals are significantly more resistant to infection with HIV-1 in vitro than cells from normal blood donors (Paxton et al., 1996).

CD4 cell counts can differ between different ethnic groups. People of Chinese and north Indian origin have naturally lower CD4 cell counts than people from western
countries. Factors other than HIV can affect the CD4 count including infection, time of day, smoking, stress and which lab tests the blood sample. Changes in CD4 cell count (which looks only at the blood) may reflect the movement of cells into and out of the blood, rather than changes in the total number of CD4 cells in the body (UNAIDS, 2000). Waterson (2000) reported that the CD4 count helps to predict the risk of complications and debilitating infections. The CD4 count is used in combination with the viral load test, which measures the level of HIV in the blood, to determine the staging and outlook of the disease. If a person is taking treatment for HIV, CD4 count should be performed every 3-6 months. A person's first CD4 count is known as the “baseline” CD4 count. After the baseline, a CD4 cell count is usually done every six months if the patient is in the earlier stages of HIV diseases. If the person has more advanced disease, the CD4 cell count may be done more frequently. The CD4 cell count may be used to help decide when to start antiretroviral treatment (Garcia et al., 2003).

Plana et al., (2003) suggested that the people who had a small increase in CD4 counts did not live longer than those whose CD4 counts stayed the same. A big boost in CD4 cells almost always lowers the risk of getting seriously ill. The lower the CD4 count, the greater the chance of getting PCP or other serious infections. The CD4 cell is the primary target of HIV. It performs critical functions such as signaling other parts of the immune system to respond to an infection. Treatment decisions are often based on viral load and CD4 count. Normal counts range from 500-1500 cells per cubic millimeter of blood (De lazzari et al., 2004). Ananthanarayan and Paniker (2005) found that the HIV infection is transmitted when the virus enters the blood or tissues of a person and comes into contact with a suitable host cell, principally the CD4 lymphocytes. The receptor for
the views is the CD4 antigen and therefore the virus may infect any cell bearing the CD4 antigen on the surface. Some other immune cells also possess the CD4 antigen on the surface and so are susceptible to infection. The comparative prognostic importance of latest plasma HIV RNA levels (Viral loads) and CD4+cell counts among patients prescribed highly active antiretroviral therapy (HAART) has not been well characterized. When CD4 + cell count and viral load are jointly considered, the association of viral load with AIDS or death is substantially diminished. CD4 levels are more strongly related to AIDS or death than viral load levels in patients on HAART (Mac Arthur et al., 2005).

Amit Katiyar (2007) reported that the persons infected with the human immunodeficiency virus (HIV), who also have alcohol problems, were negatively affected by co-infection with the hepatitis C virus (HCV). CD4 cells counts and HIV RNA levels were assessed at baseline and then again every 6 months for upto 42 months. Analysis of this data found a significant association between co-infection with HIV and lower CD4 cell counts among patients taking antiretroviral therapy.

CD4 T lymphocytes were decreased in both asymptomatic HIV patients; the decrease was greater in symptomatic, which cost T-lymphocytes was increased in both except advanced symptomatic CD4:CD8 ratio was reversed in both groups. Opportunistic infections correlated with different CD4, T-lymphocytes categories. The number and percentage of CD8+ T-lymphocytes begins to increase soon after seroconversion and it operate by killing the CD4 T-lymphocytes, and partially controls the infection, but simultaneously contribute to the destruction of the immune system (Singh et al., 2007).
2.9. Symptoms

AIDS occurs in homosexuals (75%) but bisexual males, heterosexual, intravenous drug users and hemophiliacs treated with blood products or factor VIII are also at risk to get infected. AIDS is characterized by pronounced suppression of immune system, the development of unusual neoplasm especially Kaposi’s sarcoma or wide variety of severe opportunistic infections. Other symptoms include fatigue, malaise, unexplained weight loss, fever, and shortness of breath, chronic diarrhea and white patches on tongue (hairy leukoplakia or oral candidiasis and lymphadenopathy) (Sathish Gupta, 1998).

Eugene et al., (2001) found that the immunodeficient individuals are susceptible to the same infectious diseases as other people. Pneumocystosis was the most common cause of death among AIDS sufferers, before the effective preventive regimens were developed. Symptoms develop slowly with gradually increasing shortness of breath and rapid breathing, non-productive cough, slight or absent fever, dusky color of skin and mucous membranes. Toxoplasmosis is a protozoan disease, which can be a serious problem for people with HIV diseases. The symptoms consist of sore throat, fever, enlarged lymph nodes and spleen and sometimes a rash. Cytomegalovirus disease follows a pattern similar to that of toxoplasmosis. Exposure to Mycobacterium tuberculosis usually causes an asymptomatic infection to the AIDS patients. Ananthan et al., (2001) noticed that the HIV/AIDS patients, diarrhea is a major complication and occurs in nearly 90% of the cases in developing countries. The most common pathogens associated with diarrhea and dysentery in the AIDS cases are parasites like Cryptosporidium giardia and bacteria such as Salmonella, Shigella, Campylobacter and Vibrio. The association of
enterotoxigenic *Aeromonas* in gastrointestinal illnesses of HIV/AIDS patients may also suffered from acute diarrhea. Some other symptoms are vomiting, number of loose-motions per day, consistency of stool, blood and mucous in the stool, and abdominal pain and other opportunistic infection.

HIV pandemic has a major impact on tuberculosis. It directly attacks the critical immune mechanisms involved in protection against tuberculosis. In early stages of HIV infection when the CMI is only partially compromised, tuberculosis presents typically as upper lobe infiltrates and cavitations where as in later stages tuberculosis with diffuse interstitial and miliary infiltrates, little or no cavitations is seen (Mario *et al.*, 2002). Pattnaik *et al.*, (2005) observed that the HIV serospecificity was seen mostly in persons presenting with the symptoms like urethral or cervical discharge. Three middle aged HIV infected males with *Histoplasma capsulatum* opportunistic infections and haematologic abnormalities were reported. All the three cases had mild anaemia, thrombocytopenia in the peripheral blood, erythroid and megakaryolytic dysplasias and *Histoplasma capsulatum* in bone marrow. There was no significant lymphadenopathy and hepatosplenomegaly (Sharma *et al.*, 2005). Thakar *et al.*, (2007) reported that the Meningitis caused by *Rhodotorulla rubra* is asystemic infection in immuno compromised patients, especially in HIV infected patients. The symptoms characterized by mild hepatomegaly and no splenomegaly. The liver will get enlarged.

Central nervous system *Cryptococcus* is an important cause of mortality among human immunodeficiency virus reactive patient. *Cryptococcus meningitis* caused by the environmental encapsulated fungus *Cryptococcus neoformans*, is the most common lethal fungal infection in patient with HIV (Lakshmi *et al.*, 2007).
2.10. Diagnosis

Gallahar (1991) reported that the HIV internal antigen p24 is the main diagnostic criterion; this test decides if a person is HIV positive. The test is not carried out until 2 months after the suspected infection, to allow antibody to form and to avoid a falsely negative diagnosis. With babies born to HIV positive mothers, a period of 3-6 months has to elapse to allow the decay of maternal HIV antibody in the infant’s circulation. Various approaches have been tried in the hope of halting or at least slowing the progression of HIV infection to AIDS. The most widely used drug is a nucleoside analogue, azidothymidine or zidovudine. In some cases requiring frequent blood transfusions and cessation of therapy. Soluble CD4 has not proved effective. Combined treatment using a nucleoside and a protease inhibitor is also used (David Greenwood et al., 1997).

Diagnosis work up includes history, clinical examination, and sputum for acid base bacilli, chest X-ray, Ultrasonography abdomen, Fine Needle Aspiration Cytology (FNAC) Trans Bronchial Needle Aspiration (TBNA) and computed tomography of chest. The most frequent extrapulmonary site was lymph nodes, spleen, pleura, military and hepatic (Barthwall et al., 2005). Anthony et al., (2005) suggested that the diagnosis of HIV infection depends upon the demonstration of antibodies to HIV and / or the direct detection of HIV or one of its components. The standard screening test for HIV infection is the ELISA, also referred to as an enzyme immunoassay (EIA). The most commonly used confirmatory test is the western blot. This assay takes advantage of the fact that multiple HIV antigens of different, well characterized molecular weights elicit the
production of specific antibodies. Determinations of CD4+ T cell counts and measurements of the levels of HIV RNA in serum or plasma provide a powerful set of tools for determining prognosis and monitoring response to therapy. Other laboratory tests are quantitative culture of replication-competent HIV from plasma, peripheral blood mononuclear cells or resting CD4 + T cells. Sputum smears for TB cases which were negative by ZN method were positive by flurochrome stain. It was also observed that sputum positivity was less in HIV positive patients than in patients negative for HIV and flurochrome stain was more sensitive in detecting sputum postivity in HIV cases than ZN stain (Prasanthi and Kumari, 2005).

Williams et al., (2006) noticed that the zoster form Herpes simplex infection is a very rare clinical entity. It was found in seropositive married women. CD4 count in this case will be 313 cells/cubic millimeter. AIDS cholangiopathy is a biliary syndrome in patients with AIDS. This entity is diagnosed on the basis of clinical features raised alkaline phosphatase, evidence of Cryptosporidium in stool, and on ultra sound and ERCP/MRCP Examination. The best management of cryptosporidiosis in AIDS is HAART (Sharma et al., 2006). There is currently no vaccine or cure for HIV or AIDS. The only known methods of prevention are based on avoiding exposure to the virus or failing that, an antiretroviral treatment directly after a highly significant exposure, called post-exposure prophylaxis (PEP). PEP has a very demanding four-week schedule of dosage. It also has very unpleasant side effects including diarrhea, malaise, nausea and fatigue (Health and Human Service, 2006).

Current drug therapy tries to protect the immune system by limiting HIV replication. These days, with the help of such anti-viral drugs, HIV infected people are
able to lead a normal life. But the drugs are not able to flush out the virus completely from the body and the infected people must take the medication every day for the rest of their lives. The research opens up a whole new approach towards creating more effective anti-HIV drugs. Working with cultured cells, the scientists have demonstrated that an enzyme can be created to recognize and excise only the viral genome from the infected cells. “The results” notes a commentary in the journal science, “raise the possibility that customized enzymes might some day help to eradicate HIV-1 from the body (Ravi Sharma, 2007)

Rupak Doshi (2007) reported that the abbot has received FDA approval to market the Abbott Real Time HIV-1 viral load test for use on the company’s m2000 automated instrument system. The Abbot Real-Time HIV-1 assay for use on the new m2000 system is designed to detect and precisely measure levels of HIV circulating in a patient’s blood including the three major groups of HIV-1 as well as non B subtypes. The test is intended for use as a marker of disease prognosis and an aid in assessing viral response to anti-retroviral treatment. Detection of antibodies to HIV in the patient’s sera was done by using commercial ELISA kits. The initial screening was done using HIV chex ELISA, Xyton Diagnosis, India and the positive results were counter checked by another ELISA kit, Genelavia Mixt (Thakar et al., 2007).

2.11. ARV

Fischl et al., (1987) found that the zidovudine was the first drug that was proved to provide benefit for the treatment of HIV infection. The original placebo controlled trial in patients with low CD4 cell counts and either AIDS or AIDS related complex was
conducted when prophylaxis for pneumocystic was not yet used. ZDV increased CD4 cell counts; reduced serum p24 antigenemia slowed disease progression and reduced mortality. With increasing drug exposure, the selective pressure on replicating virus population increases to promote the rapid emergence of drug resistant mutants. An example was given by using higher doses of Azidovudine treatment which tend to select for drug resistant virus more readily than lower doses (Larder et al., 1989). A distinctive sugar moiety probably accounts for the high level resistance rapidly attainable against lamivudine (3TC) in the reverse transcriptase of HIV, in contrast to ddc (Tisdale et al., 1993). Piatak et al., (1993) reported that the more straight forward decision to switch can be based on patient adherence to a treatment regiment. The effective treatment of a chronic infection with levels of replication requires continuous suppressive treatment. Drug withdrawal results in loss of activity on CD4 and viral measurement with in days of infection.

Prolonged antiviral activity with Nevirapine or Delavirdine has been documented in some patients with relatively less resistant virus and with higher plasma concentration of drug significant CD4 and viral activity was shown in phase II trial examining the combination of Zidovudine Didanosine and Nevirapine (Havlir et al., 1995). Mellors et al., (1995) observed that the most antiretroviral drugs select for the emergence of drug resistant viral variance. The mutations that confer resistance have been characterized by sequencing resistant virus that emerges with treatment of cell cultures of patients and then by reconstructing the mutant in a defined genetic background by site directed mutagenesis. With the availability of potent protease inhibitors the treatment using these
drugs must be made while awaiting the results of phase III clinical trials. The activities of nucleosides and protease inhibitors appear to be additive (Gulick et al., 1996).

Eugene Nester (2001) suggested that the advances in antiviral treatment mainly result from the development of new medications with different modes of anti viral action and use of this medication in ‘cocktails’, combination of reverse transcriptase and protease inhibitors refer to as HAART “highly active antiretroviral therapy”. The compounds 2-mercapto-3-(Substituted methyl amino) quinazolin-4 (3H) - one are synthesized by condensing the active hydrogen atom of 3-amino group of 3-amino-2-mercapto quinazoline -4 (3H) - one with formaldehyde the desired amines. These compounds exhibited significant antibacterial and antifungal activities against 6 pathogenic bacteria, 3 pathogenic fungi and anti HIV activity against replication of HIV-I (III B) and HIV-II (ROD) in MT-4 cells, (Alagarasamy et al., 2004). The coverage of treatment remains unacceptably low. The government has started to expand access to ARVs in a number of areas, and the national number of ARV centers increased from 25 to around 70 in 2005 alone (Ibid, 2006).

2.12. Physical Exercise

Schlenzig et al., (1993) studied that the physical exercise should be recommended as an additional therapy to patients in all stages of HIV infection. Progressions of HIV infection were low in patients undergoing to supervised physical exercise sessions per week. Significant increase in physical performance such as maximum volumes of oxygen consumption is seen on patients who are practicing physical exercises. 74 patient records between January and June 1992, reviewed by Researchers, that Eighty percent of the referrals for physical therapy were for pain management, and of these 43 percent were for
musculo skeletal problems, 27 percent were for peripheral neuropathy problems and 15 percent were for general rehabilitation. Results indicate that physical therapy can play a vital role in reducing the need for hospitalization, for pain management of peripheral neuropathies, and for musculo skeletal complaints of people with HIV disease (Galantino and McReynolds, 1995).

Galantino et al. (1998) reported that the disability assessment and rehabilitation have implications for specific stages of HIV disease. The AIDS epidemic has challenged communities to develop and to mobilize care networks for persons infected with HIV. Individuals with HIV and AIDS are living longer and with greater levels of health, the chronicity of the disease warrants community support and long-term care. Rehabilitation professionals can anticipate more referrals for the assessment and management of physical disability in persons with HIV infection. Optimal care requires maximizing autonomous functioning and reducing periods of disability and dependence. Flexibility training is probably the most neglected component of everyone's workout. Stretching can play a vital role in maintaining muscle mass and tone. Hold each stretch for 10-30 seconds, taking full deep breaths during the stretch. Basic forms of T'ai Chi and yoga can also provide an interesting format for flexibility exercises as well as strengthening the muscles. HIV and some of the HIV medications can affect the patient's neuromuscular activities. This will affect the body balance. Balance training is a simple technique of putting the body in situations that challenge the sense of balance. The idea is that to retraining the muscles and nerves to balance again. T'ai Chi and yoga both work to improve balance and body awareness (Jaeger and Rieder, 1998).
Macera et al., (1999) found that the cardiovascular training or aerobic training involves activities of moderate intensity that use the major muscle groups for an extended period of time (12 minutes or more). These activities can include walking, running, swimming laps, bicycling and aerobic dance to name a few. Cardiovascular training improves overall health by helping to control blood pressure, blood sugar, blood lipids and stress, but over-training can have negative effects on the person with HIV. Recommendations for cardiovascular exercise program vary depending on the patients overall health and CD4 count. Regular exercise can help to slow down progression of HIV and increase blood count of a specific cell. The exercises make the body healthy or men improve the health by keeping immune system strong. A strong immune system helps to fight infections. It can give more energy and repair the damaged tissues. It can also prevent or improve the digestive problems. Vitamins and mineral supplements taken along with a healthy diet can help people with HIV (Mustafa et al., 1999). Ronenn Roubenoff (2000) noticed that the HIV infection is characterized by two opposing macronutrient problems: wasting and lipodystrophy. Wasting is defined as the unintentional loss of 10% or more of body weight. Lipodystrophy is the loss of subcutaneous fat in the legs, arms and face, with increased deposition of fat in the abdomen, breasts and upper back. In both cases, there is evidence that a judicious diet and exercise can help to reverse or ameliorate these abnormalities. The resistance exercise can be used to treat wasting and that combined aerobic and resistance exercise can reduce abdominal fat gain in lipodystrophy.

Fitness includes several different components, like resistance training, cardiovascular training, flexibility training, balance training and mind-body training, all
of which are important to a person with HIV. Exercise can also help an HIV patient to minimize some of the long term side-effects of many medications including changes in body composition and elevated blood pressure, cholesterol, triglycerides and blood sugars. Through the warm up of body, the CD4 cell count is increased (Glenn and Preston, 2001). Basic exercise is important for everyone in addition to toning muscles and improving strength; exercise can greatly improve the immune system and helps to manage stress, which is especially beneficial for those living with HIV. The stress of more intense workouts or competitive sports might have an adverse effect on people infected with HIV (Tursi and Jermyn, 2002).

Bennell et al., (2002) observed that the mind-body fitness is one of the newest trends in the fitness industry. Mind-body fitness is the integration of the patient’s mental, spiritual, emotional and physical awareness into one component. These mind-body activities can help to create a connection between what is going on with the patient’s body, emotions and feelings and help with stress management. Working out is an important component of every person with HIV’s treatment regimen. It is often overlooked or underemphasized. The proper combination of resistance, cardiovascular, flexibility, balance and mind-body training can help to keep the person with HIV healthy for many years to come. It is important to find the right balance and to find things that patient enjoy and will participate (Green and Bennell, 2003). David Kietrys (2004) reported that the management of chronic pain is a common need of many individuals with HIV. Fit-for-life, an early intervention program of Kennedy health systems promotes health maintenance and palliative care (pain management). This provides an opportunity to respond immediately to the patients needs and to ensure they will get ongoing physical
therapy if it is needed. Individuals with HIV are frequently retentant to access the health care systems. The program under scores that adherence to a total program of care, including diet, exercise and medication, is critical to patients with HIV.

Resistance training is probably the most important part of fitness for the person living with HIV, because it helps to add muscle mass or enhance the muscle mass. Muscle mass is important because of the role muscle and the proteins in muscle play in the body’s immune system. Muscle wasting is a big problem with HIV and as the muscles waste they lose their function. Resistance training can include weight training (with free weights or machines), rubber tubing, body weight (including yoga and T’ai Chi) or a variety of home-made objects (eHow, 2004). Ellen Steinberg (2004) noticed that the Some HIV medications increase the amount of fat in patient’s blood, but exercise can help to protect against the associated risk of hearty diseases. The two major types of exercise that can be beneficial for people living with HIV are resistance and aerobic training. Resistance exercise (weight training) adds density and bulk to the muscles in the body. Aerobic (Cardio vascular) training involves exercises that increase heart rate. Aerobic activity is not only great for the immune system, but also to decreases the risk of developing heart diseases. The exercise training in combination with metformin significantly improves cardiovascular and biochemical parameters more than metformin alone in HIV infected patients with fat redistribution and hyperinsulinemia. Combined treatment was safe, well tolerated and may be a useful strategy to decrease cardiovascular risk in the population (Driscoll et al., 2004). Hammel and Rieder (2005) found that the benefits of physical exercises are maintenance or builds muscle mass, reduces cholesterol and
triglyceride levels, increases energy, regulates bowel function, strengthens bones improves blood circulation, increases lung capacity lowers stress and improves appetite. The resistance or strength training involves exertion of force by moving objects of weight. Aerobic exercise strengthens the lungs and heart. This movement increases the rate and depth of breathing, which in turn increases the pumping of blood and oxygen from the heart to muscles.

2.13. Positive Network

Block level networks have been formed in cumbum in Theni District, and they work closely and extensively with NGOs, VCCTCs, PPTCTs and Government Hospital in their near by blocks (TDNP+, 2003). TDNP+ has had a strong network with NGOs and government organizations; the TDNP+ has been able to deliver impeccable service delivery to the PLHAs and their family. The advocacy programmes have created very good impacts in terms of awareness level, care and support for the PLWHA and their family (TDNP+, 2004). The district level network programmes conduct advocacy with Government Health sector, support group meeting, counseling services, HIV/AIDS awareness programmes. Advocacy activity done with 5 revenue people. Self help group meeting have been proceeded by the network for the welfare of affected women on HIV/AIDS in the name of Nambikkai and Nambikkai Oli (DDS+, 2004).

Salient feature of the network: Advocacy activity done with 5 revenue people. This advocacy is provided to 5 doctors, 3 HI and 2 Staff nurse about treatment. Property rights advocacy done by MDPS+ for 3PLHA and their family (MDPS+, 2004). Theni District Network was founded since July 2002 is a supportive organization for PLWHAs; it is ment for HIV positive people. The Network is situated at Theni District and affiliated
to The Indian Network for people living with HIV/AIDS. Objective of this Network is to create less stigma discrimination in the society, to promote behavioral changes through advocacy programme to the society, to take action against the spreading of HIV/AIDS in the society. If functions as an information referral center on HIV positive living. This network give counsel and strengthen the people who are HIV positive at Theni Dist. (TDNP+, 2004).

Two wheeler mechanical training were given to 24 HIV infected patients throng CNP+. Also home care providers training and training in income generation programme were given to 19 and 32 HIV infected patients respectively by the same organization (SNP+, 2004). Government Health and Development schemes. The main activities brought by peer groups, with the help of like minded peoples like NGOs and in Government officials. They give psychological support and Medical support and referral services to the PLHAs and their family (NCP+, 2004). The national conference on AIDS held at Hyderabad in the year 2003 was attended by 3 HIV infected people, through TDNP+. In the same year the international conference at Katmandu was attended by 2 HIV infected patients (TDNP+, 2004). In the year 2005, through HUNs 659 HIV infected patients were counseled. Among them 331 were male and 328 were female. The counseling was also extended to their family members, for the moral support of HIV patients (HUNs, 2005).

Main activities of District level Network program promoted positive speakers. They conduct capacity building activities; they gave HIV/AIDS awareness programme. This network is a Referral service for STI/VCTC and HAART. They also have linkage with through TDNP+, during the year 2004-2005 26 awareness programme were
conducted, in that 450 members have participated. Positive speaker’s bureau organized 19 programmes, also 23 supporting meetings and 33 advocacy meetings were organized. All these activities are done for the upliftment of HIV infected patients (TNDP+, annual report 2004-2005). In the year 2005, Trichy district, totally 428 people were registered their name in to TDN+. Among them 222 are male and 206 members are female (TDN+, 2005).

Income generation programmes has been conducted with the help of network of Theni project. This programme sanctioned Rs.45, 000/- for all beneficiary in first list and also having 10 members in second list for Rs.50, 000/-. Advocacy programmes of the network conveyed messages about the creation of an awareness and the role play of an action for prevention of mother to child transmission of HIV/AIDS (TNDP+, annual report 2004-2005). HIV infected patients in India are set to get insurance cover provided by Chennai-based star Health and Allied Insurance Company Ltd. The country’s first stand alone health insurance company, star health has already moved the Insurance Regulatory and Development Authority (IRDA) seeking permission to launch a product to provide group insurance cover for the HIV-hit. The premium would be Rs.3000 per person per year. The compensation becomes payable if an HIV patient is confirmed to be carrying AIDS. The total cover per person would be Rs. 50,000/-. Star Health would work in close co-operation with non-government organizations. The social stigma attached to HIV patients and the difficulty in drawing the individuals out to take up a policy on their own had forced Star Health to adopt the institutional route to offer this cover (Sanjay, 2007)
2.14. CONTROL MEASURES

Greenblatt et al., (1988) reported that the general measures for preventing *T. gondii* infection include washing hands after handling raw meet, during contact with soil or changing cat litter. Meat especially lamb, pork and venison should be cooked until the pink colour is lost from its interior. Children sand boxes should be kept tightly covered when not in use. These measures are especially important for pregnant women and persons with immunodeficiency. Some groups of gay men lower the incidence of new HIV infection from 10% to 20% annually to 1% to 2% by using condoms and avoiding practices that favors HIV transmission (Stamm et al., 1988). Lemp et al., (1990) found that the avoiding sexual intercourse with persons at risk of HIV infection like sexually promisous men and women, especially prostitutes, drug abuses and homosexual and bisexual men. People with history of hepatitis B, syphilis, Gonorrhea, or other sexually transmitted disease should be avoided.

HIV transmission from infected mother to new born can be safely prevented in 2/3 of cases by administering zidovudine (AZT) to mother during pregnancy. Cesarean section significantly reduces the risk of HIV transmission to the new born baby, by avoiding HIV containing fluids in the birth canal (Richman et al., 1990). Terai et al., (1991) reported that the using latex condoms from beginning to end of sexual intercourse. Polyurethane condoms are reasonable alternative for those allergic to latex. Condoms made from other materials are not reliable for disease prevention nor are those marketed in many African and other countries outside the United States. Condoms for women are available.
Devices that have punctured the skin, hypodermic and acupuncture needles should be steam sterilized by autoclaving before reuse or should be safely discarded. Dental instruments should be heat sterilized between patients. Disposable needles and equipments should be used. HIV infected mother should avoid breast feeding to reduce transmission of the virus to their children if safe alternative feeding options are available, (Elias and Heise, 1994). Seropositive women or women with seropositive sexual partners are them selves at increased risk of acquiring AIDS (MMWR morb mortal WKLY Rep, 1994). Dunn et al., (1995) observed that the education about how HIV is transmitted is a very effective tool in helping to bring the world wide epidemic of HIV disease under control. Education of schools children has shown effective decrease risky sexual behavior among teen ages.

*C. trachomatis* infection is an important risk factor facilitating sexual transmission of HIV infection. Documentation of *C. trachomatis* infection in high risk population can assist in designing HIV risk reduction strategies as well (Brunham et al., 1996). Fields (1996) found that the supplementation with spermicidal such as nonoxynol-9 for both homosexual men and heterosexual is an important measure. Occupational risk can be controlled by the implementation of straight forward measures to prevent accidental injury and contamination with blood. This includes the use of gloves, mask and eye protection if bleeding and spattering occurs. Telzak (1997) suggested that the recent development in the prevention of AIDS is that transmission from mother to new born can be interrupted in about 2/3 of the cases by chemotherapy. Identification and treatment of STDs decreases the risk of contracting HIV disease and by the consistent use of latex condoms. As HIV may be transmitted in blood all donor blood
is tested for antibody. Properly conducted antibody test appear to detect almost all HIV I and HIV II carriers. Transmission by blood transfusion has virtually disappeared due to this (Jawetz Melnick and Aldenbergs, 1998). Postponing pregnancy in HIV infected women not sure of HIV status, blood tests to rule out HIV disease before considering pregnancy (Antoni et al., 1995). Ananthanarayan and Panicker (2005) noticed that the best method of checking sexual transmission of infection is health education regarding the danger of promiscuity and other high risk activity. Changes in life style and sexual attitudes have already taken place in USA and the incidence in homosexuals has come down. Persons are counseled regarding “safer sex” methods. The risk of HIV transmission increases with multiple partners the use of unsterile syringe is a needles by qualified and unqualified health workers makes iatrogenic infection likely.

Epidemiological knowledge of sexually transmitted diseases in India is mostly derived from clinic based studies. Common symptoms of STDs were poorly known by males. Amongst preventive methods monogamous relationship and condom use were mostly known. A comprehensive awareness campaigning program in the community is recommended to raise substantial level of knowledge about STDs (Ray et al., 2006). Anbumani Ramdos (2007) launched the III phase of the national AIDS control program (NACP-3) which aims at halting reversing the tide of the epidemic in the country 2011. The focus will be a reducing new HIV infection in all categories and preventing spread of HIV from the high risk s groups to the general population. NACP3 will focus on developing safe behaviors and attitudes in terms of human relationships, particularly among the youth and high risk groups and ensure easy access to health care. The government would establish centers of excellence in the four metes for collecting
and processing one lakh units of blood annually. He stressed the need to promote the use of condoms to prevent unwanted pregnancies and check spread sexually transmitted disease.

2.15. TANSACS

Sivaram (2002) found that the grant in aid received from the National AIDS Control Organization, Ministry of health and family welfare was Rs 1295.50 in lakhs (2002-2003), Rs 1225-00 in lakhs (2003-2004), Rs 1800.00 in lakhs (2004-005). The high burden of sexually transmitted diseases (STD) in the society makes it highly vulnerable to HIV/AIDS. Reduction of burden of STDs is therefore an important strategy in the fight against HIV/AIDS. The society extends support, through provision of Infrastructure Facilities, equipments and drugs, to 57 STD clinics in Tamilnadu. The knowledge and skills of the medical officers are improved through CME programs. Measures have also been taken to bring about appropriate attitudinal changes among the medical and paramedical staff in the STD clinics to make them patients friendly. (TANSACS, 2003). The family health awareness campaign (FHAC) is an important strategies to Identified and treat sexually transmitted diseases among general public. Top priority has been given to promote condom usage among people, both high risk and low risk to prevent transmission of HIV through sexual route of transmission. Adequate measures have been provided by the TANSACS for the supply of safe and tested blood. (TANSACS, 2003). Kaisernetwork (2004) suggested that the different strategies adapted by TANSACS to promote condom use are promotion of subsidized or low prized condoms through social marketing, distribution of free condom to the people,
popularizing the concept of safe sex through awareness and behavior change communication and by the sale of condoms through the fair prize shops. The Government continues to accord top priority for HIV/AIDS prevention Programs.

The TANSACS initiated several measures during the year to strengthen HIV prevention care and support programs. HIV sentinel surveillance survey helps monitor trends in HIV infection among selected group in the population know as sentinel groups at regular intervals at regular sentinel sites. The HIV prevalence among the STD attendees also showed a declined from 14.80% in 2002 – 9.20 % during 2003. The prevalence among IVDUs went up from 33.80%- 83.80% and the prevalence among MSM went up from 2.4 % to 4.4% (TANSACS, 2004).Awareness creation is prerequisite for effective HIV prevalence programs. The society has succeeded in creating sufficient awareness about HIV/AIDS among various high risk groups as well as the general population Information, Education and Communication(IEC)interventions have also been launched to reduce the stigma and discrimination associated with HIV/AIDS and also to safe guard and protect the human rights of people living with HIV/AIDS (PLWHA). (Inp+, 2004).Tamilnadu is a pioneering state in introducing HIV/AIDS information in regular School curriculum. In the government of India funded school AIDS education programs is also Under implementation in the state. During 2003-2004, for the first time all the 8417 high schools and higher secondary schools including matriculation schools both in the public and private sector have been brought under this program. UNICEF and the USAID assisted APAC project have extended their support for the program in the state.(APAC,2004).The voluntary confidential counseling and testing centers (VCCTC) function as a bridge between prevention and care and
support intervention. An effective network of VCCTCS can succeed in drawing and
counseling the high risk groups bringing phase in Tamilnadu in government hospital for
thoracic medicine, Tambaram (GHTM). 100 about desired changes in their behavior,
identification of sero positive persons extending psychological support to sero positive
persons and referring seropositive persons for appropriate medical treatment where ever
necessary. (TANSACS, 2004).

The government accords high priority for making quality medical care and
treatment available to the people living with HIV/AIDS in the state. The society extends
financial support for the purchase of drugs for opportunistic infections and for poor
exposure prophylaxis (PEP) Drugs. The society also assists the association of people
living with HIV/AIDS towards running day care centers and community care centers.
(TANSACS, 2004). The Government of India has taken a policy decision to make
antiretroviral drugs available in the public health system in the country. The ART
program was launched as the first eligible AIDS patients have been extended free anti
retroviral therapy. (TANSACS, 2004). The Government is committed to the concept of
greater involvement of people living with HIV/AIDS programs. The positive networks
are actively involved in the decision making process of TANSACS at various levels.
More importantly, the government has ordered including a women member of positive
networks in all the hospitals advisory committee, in the state. (Inp+, 2004). As part of the
Tamilnadu government initiative towards this area of concern, the Tamilnadu State AIDS
Control Society was formed in 1994. The Government agencies today spearheading the
efforts taken to compact HIV/AIDS and has emerged as the convergence of all
HIV/AIDS services in the state. (TANSACS, 2005). TANSACS has focused largely on
establishing the continuum of care in the state as a sustained and strengthened system, so as to provide quality services to the infected and affected people. Tamilnadu is considered as one among the high prevalence states. The HIV infection was first detected in 1986. (Vijayakumar, 2005). Tamilnadu State AIDS Control Society has some major activities to prevent and reduce the HIV infections. They include targeted intervention programs through NGOs, integrated counseling and testing centers (ICTCS) for primary prevention and counseling for affected persons and for the prevention of parent to child transmission and Anti Retroviral Therapy (ART) (UNICEF, 2005).

HIV prevention programs especially targeted at high risk group are called the targeted interventions. Effective targeted interventions are necessary not only to protect high risk groups from contractive HIV but also to prevent spread of HIV among the general population. The targeted interventions are implemented through nongovernmental organizations (NGO), who plays a crucial role in combating the HIV/AIDS epidemic (TANSACS, 2005). TANSACS is conducting training programs for the medical and paramedical staff to sensitize them to address the needs of PLHAS. TANSACS provides funds for maintaining community care and institutional care centers, drop-in centers and positive network. There at present 26 community and institutional care centers, 8 drop-in centers and 4 positive networks. The government of India through NACO is providing anti retroviral therapy to the HIV/AIDS patients from 1st of April 2004 onwards at present there more than 3704 patients receiving ART. ART is being provided at 12 government college hospitals and one district head quarters hospital in the state of Tamilnadu (TANSACS, 2005). Tamilnadu is model state in AIDS control. First case of HIV in the country was detected in Tamilnadu at Chennai in
1986. Tamilnadu was the first state to provide care and support services to a large number of HIV/AIDS patients (Peter Piot, 2005).

The PLHA networks are the mirrors for TANSACS. They are involved in planning, policy making, training, and implementation monitoring. PLHA serves as a member on the state task committee, executive committee, the ICTC team and on hospital development Committees. Training on HIV/AIDS has been imported to medical professionals, paramedical, (government and private sector), NGOs, CBOs, PLHAs, SHGs. Training programmes are being conducted continuum of care. STI counseling and testing, behavior change communication HIV –TB co infection (TANSACS, 2006).

Gopalakrishnan (2006) reported that the drugs are supplied for effective treatment of the patients attending STD clinics. Counseling is provided to attendees in out reach camps and also at STD clinics. Partners of the patients are notified for improving effectiveness of treatment and follow up services and to reduce the risk of transmission. STI care referral system aims at developing linkages between government STI clinics and NGO/CBOS, private practitioner’s private paramedics, SHGs, RBCs etc. To expand services to taluk levels and also to improve treatment seeking behavior. The primary objective of the Family Health Awareness Campaign (FHAC) 2005 is to provide facilities for screening and treating Reproductive Tract Infections (RTIs) and Sexually Transmitted Diseases (STDs). A sum of Rs.243 corers has been allotted to Tamil Nadu for conducting FHAC campaign for the year 2005. The FHAC campaign in Tamil Nadu, which commenced in November 2005, is going forward in all the 29 districts in the state (Kalyanasundaram, 2006)
The HIV sentinel surveillance survey helps to monitor trends in HIV infection among selected groups in the population known as sentinel groups at regular intervals at regular sentinel sites, which brings out the impact of the various interventions carried out to stall the progress of the infection. For the past three years, the state has shown a continuous downward trend in the prevalence. The analysis has shown that the epidemic is not homogenous throughout the state. The primary objective of the work in terms of blood safety is to promote 0% transmission of positivity due to blood transfusion. TANSACS has worked to increase voluntary blood donation and strengthen existing personnel and infrastructure. Blood Banks have been strengthened with qualified Medical Officers, Counselors and Lab Technicians (TANSACS, 2006).

The activities of TANSACS are three fold: one focused on prevention, the second on care and support and the other on intersectoral collaboration or prevention, TANSACS has worked using IEC (Information Education and Communication) as its strategy. Awareness creation is the prerequisite for effective HIV prevention programmes, School AIDS Education Programmes, Multi sectoral campaign. In the process of creating awareness throughout TamilNadu, TANSACS has geared up multimedia activities that can further strengthen the movement at the grass root level by adopting an integrated approach accommodating all the stakeholders. The campaign will continue as a multi-sectoral endeavor with sustained and continued efforts to eliminate HIV/AIDS from the state (NACO, 2006).

Apart from TANSACS, the state of Tamil Nadu has various other agencies working in the field of HIV/AIDS. TANSACS, being the apex body for these efforts in the state, felt the need to consolidate all the efforts of these partners so as to synchronize
their activities to avoid duplication of services and resources. In this regard, TANSACS has established the partners in Action Consortium to handle the epidemic through a unified focus. Working groups on various subjects have been formed and each group meets once a month to plan and review activities. This consortium is an effort to streamline all concrete activities so as to ensure collective action. TANSACS efforts at ensuring an effective partnership with the private sector have gained momentum in the recent part. The private sector has been identified as a crucial intervention point to reach out to the general population who do not utilize government health services (TANSACS, 2006). Pillay (2007) observed that the operational Research studies in HIV-TB are supported to assess the efficacy of treatment. HIV-TB care and support is offered through all the 275 ICTC centers with training. All the TB sanatoriums in TamilNadu are strengthened to take care of HIV-TB patients. Drugs for opportunistic infections are made available for HIV-TB patients. The state HIV/TB unit has been set up with a state HIV-TB consultant, Data Manager and secretarial support.