HIV/AIDS

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- At the end of session, the learner shall be able to

- Epidemiological factors associated with HIV/AIDS
- Routes of transmission
- Clinical features of HIV/AIDS
- Prevention & Control Strategies

Specific Learning Objectives

- A retrovirus
- Targets the immune system and weakens people's surveillance and defence systems against infections and some types of cancer.
- As the virus destroys and impairs the function of immune cells, infected individuals gradually become immunodeficient.
- Immune function is typically measured by CD4 cell count.

Human Immunodeficiency Virus (HIV)

Acquired Immunodeficiency Syndrome (AIDS)

- AIDS is defined by the development of certain cancers, infections, or other severe clinical manifestations.
- *A severe life threatening clinical condition*
- The most advanced stage of HIV infection which can take from 2 to 15 years to develop depending on the individual.
- Most often results in progressive damages to the immune and other organ systems, including the CNS

Magnitude of the problem

issue, having claimed more than 39 million lives so far.

- 35.0 [33.2–37.2] million ***people living with HIV***.
- 2.1 [1.9–2.4] million people becoming ***newly infected with HIV in 2013 globally.***

- Sub-Saharan Africa is the ***most affected region***, with 24.7 [23.5–26.1] million people living with HIV in 2013.
- Also sub-Saharan Africa accounts for ***almost 70%*** of the global total of new HIV infections.

Low-level epidemic

subpopulation.

Concentrated epidemic

- HIV has spread rapidly in one or more populations but is ***not well established in the general population.***
- HIV prevalence is ***over 5% in subpopulations*** while remaining under 1% in the general population

Generalised epidemic

- An epidemic that is ***self-sustaining through heterosexual transmission.***
- HIV prevalence usually ***exceeds 1% among pregnant women*** attending antenatal clinics

- Not a single epidemic but ***made up of a number of***

  to general population.
- From urban to rural areas.

Group	Prevalence States	HRG	Ante natal women
I	High	> 5%	1% or more
II	Moderate	>5%	< 1%
III	Low	< 5%	< 1%

India

Prioritisation of Districts for Programme Implementation

Category A:

- ***More than 1% ANC prevalence in district*** in any of the sites in the last 3 years.

Category B:

- ***Less than 1% ANC prevalence in all the sites*** during last 3 years with more than 5% prevalence in any HRG site (STD/FSW/MSM/IDU).

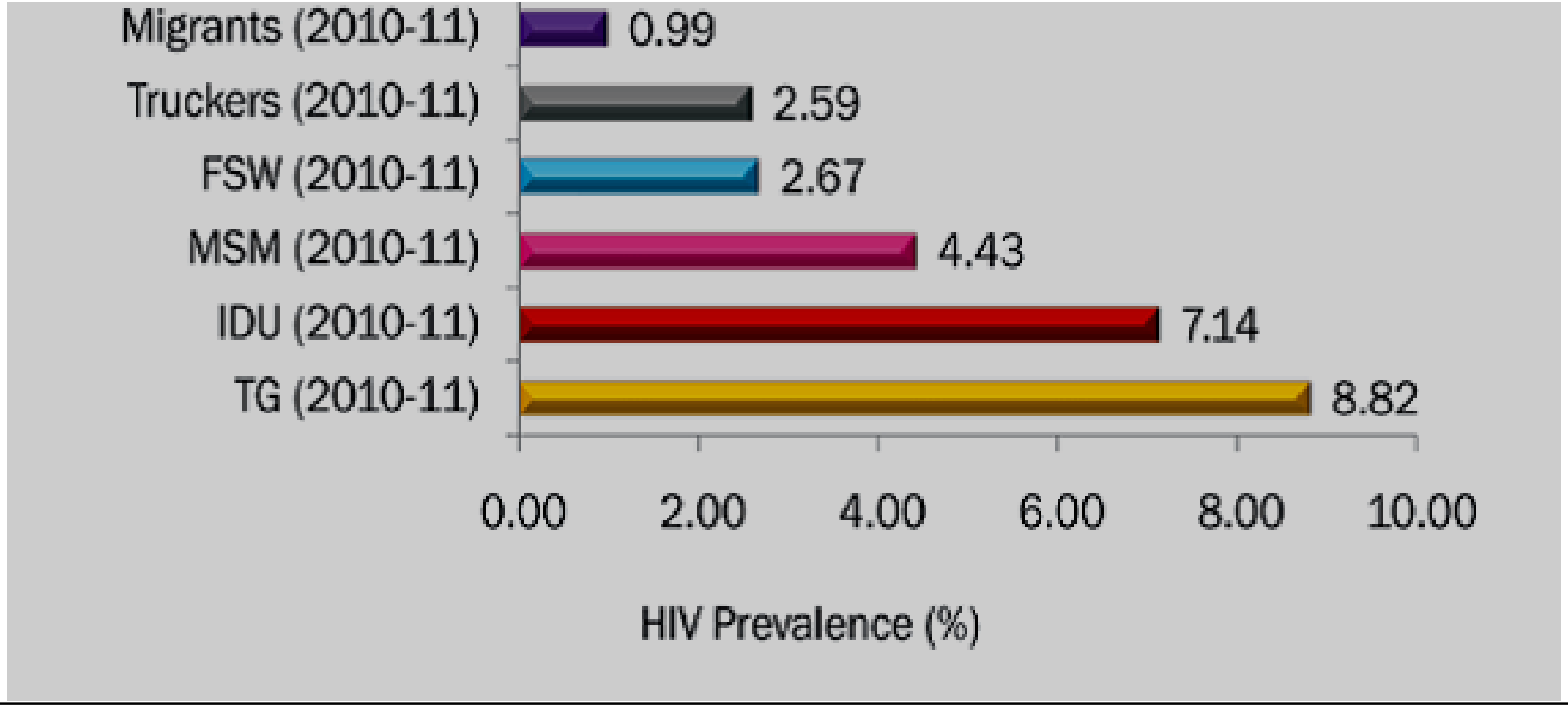
Category C:

- Less than 1% ANC prevalence in all sites during last 3 years with less than 5% in all HRG sites, ***with known hot spots*** (Migrants, truckers, large aggregation of factory workers, tourist etc).

Category D:

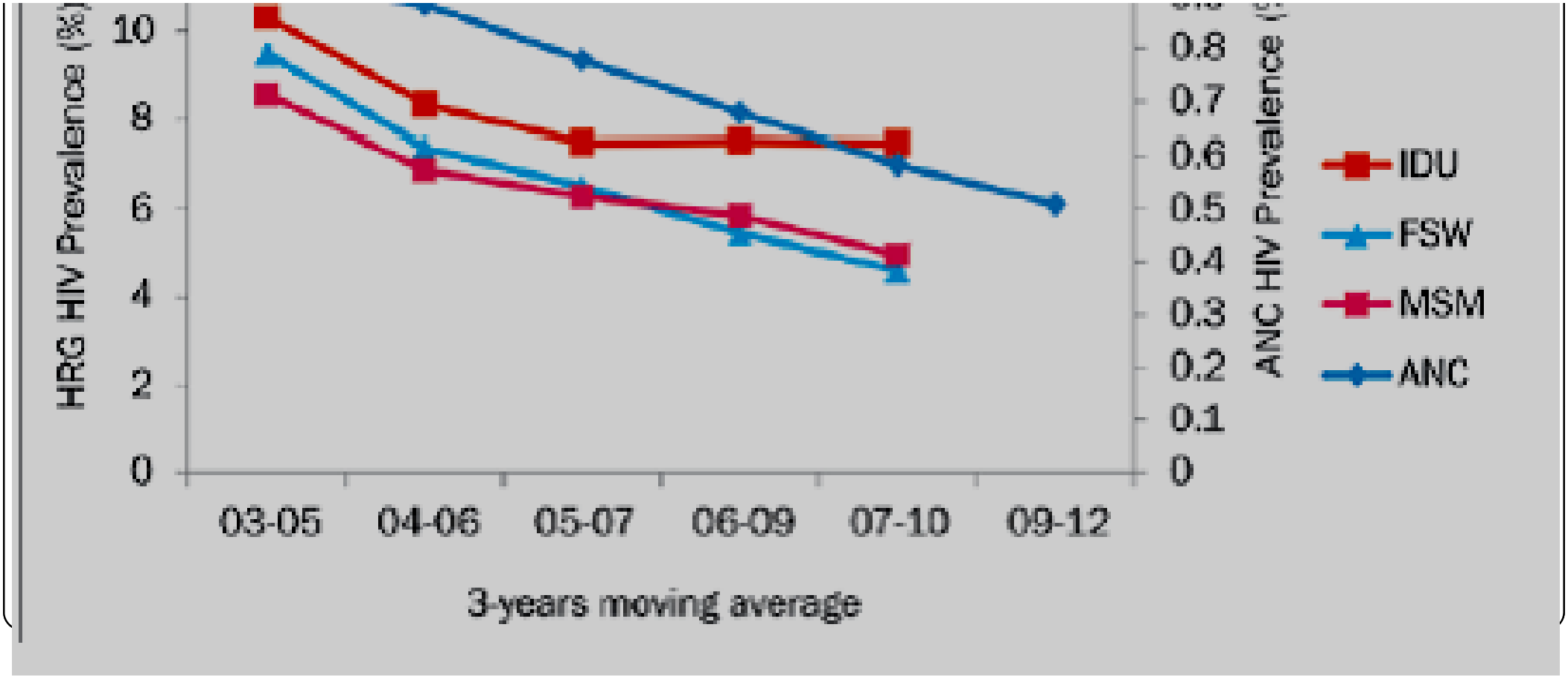
- Less than 1% ANC prevalence in all sites during last 3 years with less than 5% in all HRG sites with ***no known hot spots*** OR no or poor HIV data.

National HIV Prevalence for ANC attendees (2012-13) and low risk groups (2010-11)



HIV prevalence trends

(three year moving averages based on consistent sites), 2003-2012



Epidemic Scenario (2011)

	India	Chandigarh	Punjab	Haryana
Adult HIV Prevalence (%)*	0.27 (0.32, 0.22)	0.28 (0.33, 0.22)	0.18 (0.22, 0.15)	0.11 (0.13, 0.09)
No. of PLHA	20, 88, 638	1,814	31, 963	17,877
No. of CLHA	1,45,446	60	1,254	940
No. of new infections	1,16,459	252	3,325	1.580
No. of AIDS deaths	1,47,729	102	1,104	1,025

***More than national figure: Manipur, Mizoram, Nagaland, Goa, Maharashtra, Karnataka, An**

State Fact Sheet, Mar 2014

- HIV belongs to a class of viruses called retroviruses.
- HIV is a ***fragile virus***.
- It is easily killed by heat, inactivated by ether, acetone, 20% ethanol and beta-propiolactone.
- It cannot live for very long outside the body. As a result, the virus is ***not transmitted through day-to-day activities such as shaking hands, hugging, sharing utensils*** etc.
- It is relatively resistant to ionizing radiation and UV light.

Agent factors

- Once a person is infected, the virus remains in the body life long.
- Since symptoms takes years to manifest, the carrier can infect other people for years.

Source of Infection :

- The virus has been found in ***greatest concentration from blood, semen and CSF.***
- Lower concentrations in tears, saliva, breast milk, urine, and cervical and vaginal secretions.

Age :

- Most cases occur in sexually active persons aged 20-49 yrs.
- This group represents the productive members of the society, and those responsible for child bearing and child rearing.

Sex :

AIDS is still most common among ***homosexual and bisexual men.***

- However, in more developed countries the disease is becoming ***more frequent among heterosexuals, especially young people.***

Host factors

- Intravenous drug users and people with many sexual partners are particularly at risk from HIV.
- Higher rate of HIV infection is found in ***CSWs and their clients, transfusion recipients of blood and blood products, haemophiliacs***.
- Certain persons are at ***high risk due to the compulsions of their occupation,*** as truck drivers, military personnel, and migratory labour.

Social factors

- Increasing availability of Commercial Sex Workers (CSWs),
- Rapid industrialization,
- **Migration** of young persons to urban areas in search of jobs and away from the traditional social control of their families, compulsively staying away from family due to occupational requirements,
- ***Poverty*** with consequent resorting to sex for money, trafficking of women and girl children,
- *Availability of pornographic literature and visuals ?????*
- **Lack of knowledge about the causation and**

Incubation period :

- It is widely variable.
- Although the time from infection to the development of detectable antibodies is generally 1-3 months, the time from HIV infection to diagnosis of AIDS has an observed range of less than 1 year to 10 years or more.
- However, it is estimated that 75% of those infected with HIV will develop AIDS by the end of ten years.

Period of Communicability :

- Presumed to begin early after onset of HIV infection and extend throughout life.
- Infectiousness increases with increasing immune deficiency; clinical symptoms and other STDs.
- However patients on ***ART are less likely to transmit*** HIV infection to other

Routes of transmission	Percentage
Heterosexual	88.2
Parent to child	5.0
Injecting drug use	1.7
Homosexual	1.5
Blood & blood products	1.0
Unknown	2.7

Transmission

Sexual contact

- Sexual intercourse is the leading way of transmission of HIV.
- This form of transmission occurs mainly among high-risk groups.
- During intercourse, the virus can enter the body through the mucosal linings of the vagina, vulva, penis, or rectum or, rarely, via the mouth and possibly the upper gastrointestinal tract after oral sex.
- The risk of sexual transmission is in direct relationship with the ***amount of trauma and laceration of the recipient's genital mucosa***.
- So, receptive anal intercourse provides the greatest risk.
- The rate of transmission from a man to a woman is greater than the opposite.

- Users of illicit parenteral drugs continue to account for a

common practices, as well as engagement in highrisk sexual practices like exchanging sex for drugs and money.

Sharing of HIV contaminated needles and syringes

- The risk of contracting HIV infection from transfusion of a

hence the risk of getting infected through a contaminated needle, syringe or any other body piercing equipment *is very much lower than with transfusion.*

Transfusion of infected blood or its components

- during pregnancy (7%)

Parentes to child

- having unprotected anal or vaginal sex;

vaginosis;
- sharing contaminated needles, syringes and other injecting equipment and drug solutions when injecting drugs;
- receiving unsafe injections, blood transfusions, medical procedures that involve unsterile cutting or piercing; and
- experiencing accidental needle stick injuries, including among health workers.

Risk factors

Signs and symptoms of HIV

- The symptoms of HIV vary depending on the stage of infection.
  - The first few weeks after initial infection, individuals may experience no symptoms or an influenza-like illness including fever, headache, rash or sore throat.
  - As the infection progressively weakens the person's immune system, the individual can develop other signs and symptoms such as swollen lymph nodes, weight loss, fever, diarrhoea and cough.
  - Without treatment, they could also develop severe illnesses such as tuberculosis, cryptococcal meningitis, and cancers such as lymphomas and Kaposi's sarcoma, among others.

WHO clinical staging of

- The recognition of HIV-related clinical events helps to determine the stage of a patient's disease and decisions on when to initiate OI prophylaxis and ART
- WHO **stage 1, 2 and 3** conditions, with the exception of moderate anaemia, can be readily **recognized clinically**.
- For WHO stage 4 conditions, where clinical diagnosis is not possible, definite diagnostic criteria are recommended

WHO clinical staging of HIV/AIDS (2010)

- Asymptomatic
- Persistent generalized lymphadenopathy

Clinical Stage 2

- Unexplained moderate weight loss (<10% of presumed or measured body weight)
- Recurrent respiratory tract infections (sinusitis, tonsillitis, otitis media, pharyngitis)
- Herpes zoster
- Angular Cheilitis

- Seborrheic dermatitis
- Fungal nail infections

Clinical Stage 3

- Unexplained severe weight loss (>10% of presumed or measured body weight)
- Unexplained chronic diarrhoea for longer than one month
- Unexplained persistent fever (above 37.5^{o}C intermittent or constant for longer than one month)
- Persistent oral candidiasis
- Oral hairy leucoplakia
- Pulmonary tuberculosis
- Severe bacterial infections (e.g. pneumonia, empyema, pyomyositis, bone or joint infection, meningitis, bacteraemia)
- Acute necrotizing ulcerative stomatitis, gingivitis or periodontitis
- Unexplained anaemia (<8 g/dl), neutropenia (<0.5 x 109/litre) and or chronic thrombocytopenia (<50 x 109/litre^{3})

Clinical stage 4

- Recurrent severe bacterial pneumonia
- Extra pulmonary tuberculosis
- Kaposi sarcoma
- CNS toxoplasmosis
- HIV encephalopathy
- Lymphoma
  - (cerebral or B cell non Hodgkin)
- Invasive cervical carcinoma
- Atypical disseminated leishmaniasis
- Extra pulmonary cryptococcosis
- CMV infection
  - (extra pulmonary histoplasmosis, coccidiomycosis)
- Oesophageal candidiasis
  - (or candidiasis of trachea, bronchi or lungs)
- Chronic herpes simplex infection
  - (orolabial, genital or anorectal of more than one month's duration or visceral at any site)
- Recurrent septicaemia (including non-typhoidal salmonella)
- Symptomatic HIV-associated nephropathy or cardiomyopathy

Comprehensive Laboratory Evaluation in HIV/AIDS

- The purpose of the baseline laboratory evaluation is to

  i. determine the stage of the disease,
  ii. rule out concomitant infections and
  iii. determine baseline safety parameters

Essential tests

- Haemogram/CBC,
- Urine for routine and microscopic examination,
- Fasting blood sugar,
- Blood urea,
- ALT (SGPT),
- VDRL,
- Serum creatinine
- CD4 count
- Symptoms and signs directed investigations for ruling out OIs.

Additional tests

- For all patients to be started on ART (as per the physician's decision depending on clinical presentation)
- USG abdomen,
- Sputum for AFB,
- CSF analysis etc.
- Efforts to be made to fast track
- PAP smear & Fundus examination also to be done but ART initiation not to be delayed for these tests.

Tests for Special Situation

- HBsAg:
  - For all patients if facility is available but mandatorily for those with history of IDU, multiple blood & blood products transfusion, ALT > 2 times of ULN, on strong clinical suspicion.
  - But ART not to be withheld if HBsAg testing is not available.

- Anti - HCV antibody:
  - Only for those with history of IDU, multiple blood & blood products transfusion, ALT >2 times of ULN, on strong clinical suspicion.

- For patients with Hepatitis B or C co-infection: further tests may be required to assess for chronic active hepatitis

- For patients to be switched to a PI based regimen: Blood Sugar, LFT and Lipid profile to be done at baseline.

Tests for monitoring purpose

- **Essential:** CD4, Hb, TLC, DLC, ALT (SGPT).
- **TDF based regimen:** Creatinine/ creatinine clearance, every 6 months or earlier if required.
- **AZT based regimen:** Hb at 15 days, then every month for initial 3 months, 6 months and then every 6 months/ as & when indicated.
- **NVP based regimen:** ALT (SGPT) at 15 days, 1 month and then every 6 months.
- **EFV based regimen:** lipid profile should also be done yearly.
- **ATV based regimen:** LFT to be done at 15 days, 1 month, 3 month, 6 months and then every 6 months. Blood sugar and Lipid profile every 6 months for patients on PI based regimen.
- All the above tests can be done earlier based on clinicians assessment/ discretion
- Other investigations during follow up as per requirement

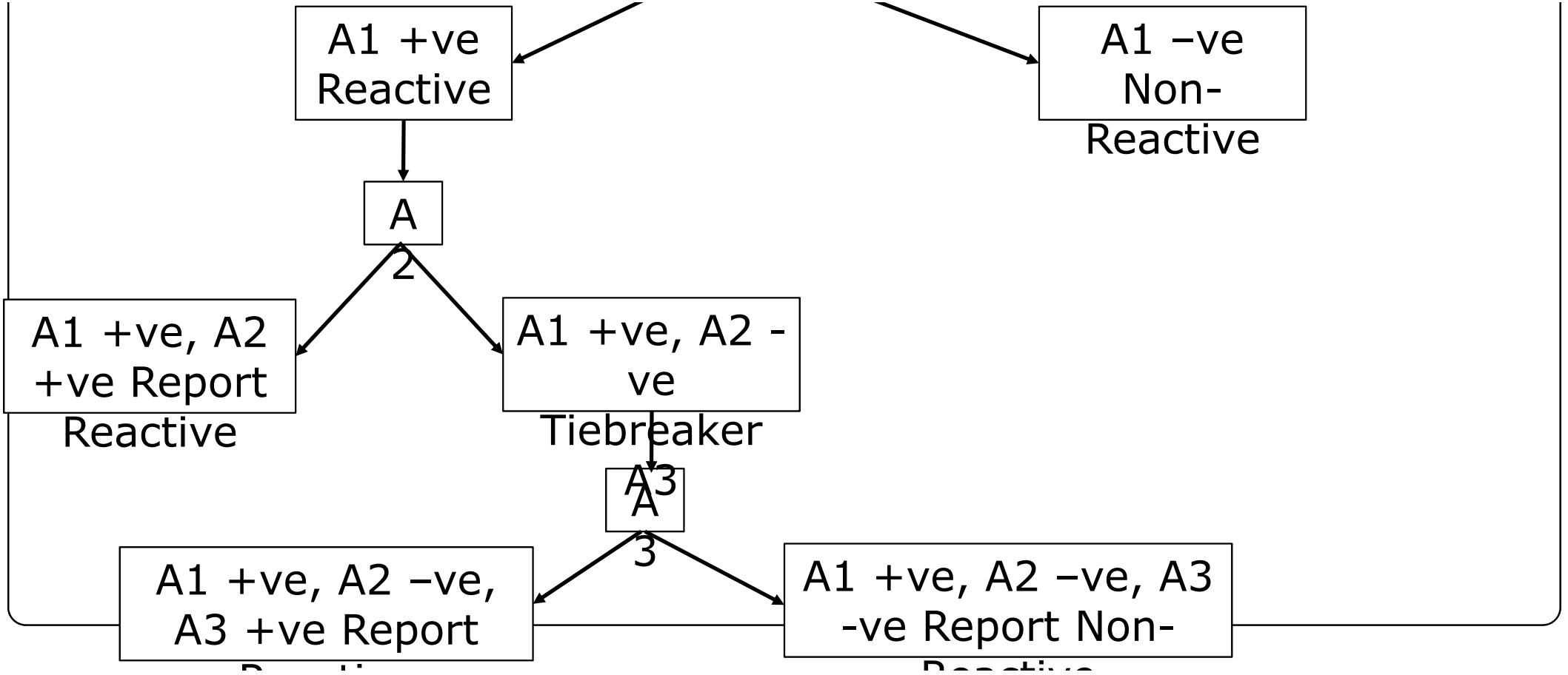
- Fixed ICTC
- Mobile ICTC

ICTC

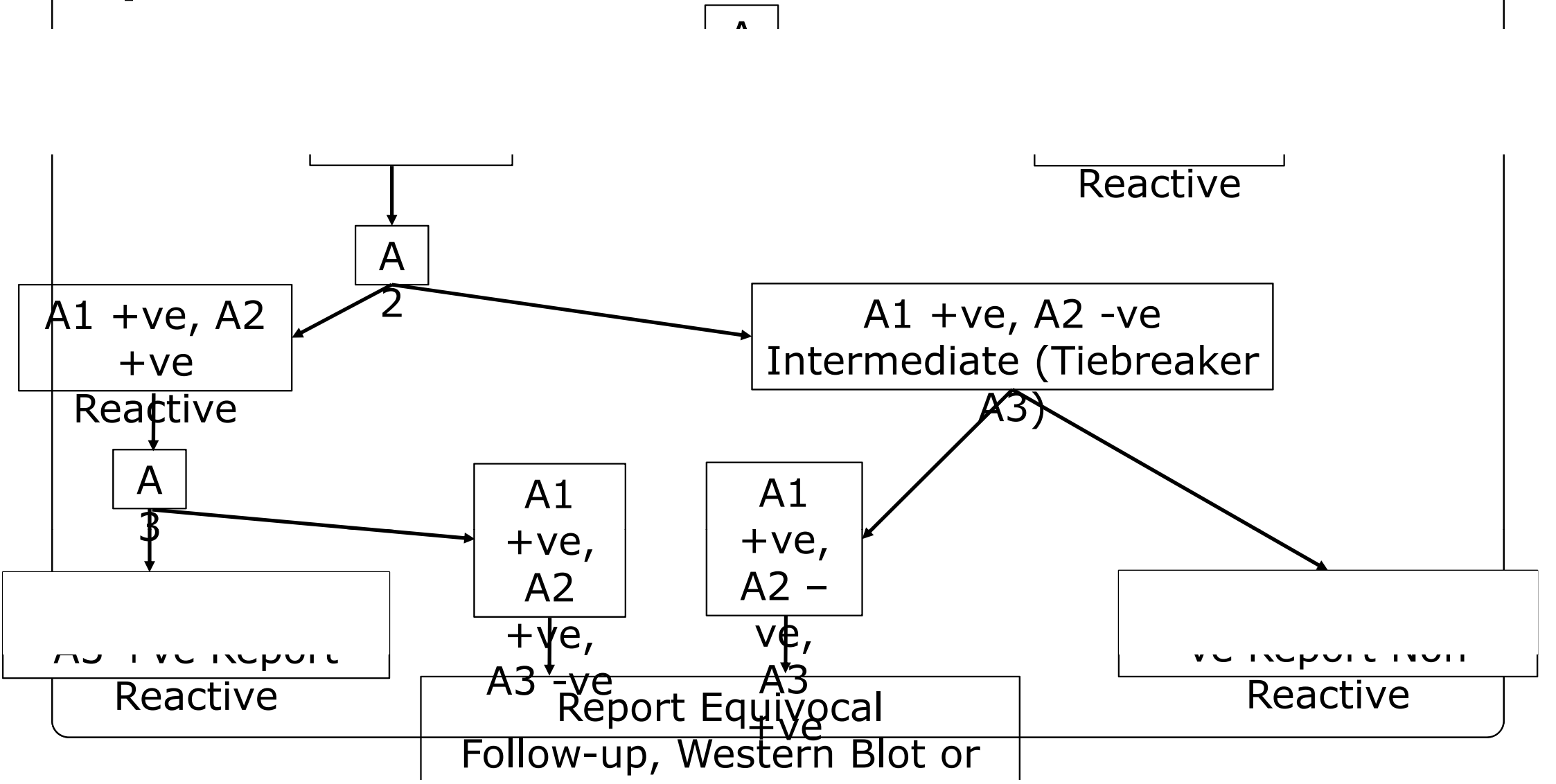
- The blood sample collected at one time is tested with the second and third kits.
- **For symptomatic persons:** the sample should be reactive with two different kits.
- **For asymptomatic persons:** the sample should be reactive with three different kits

National Guidelines on Testing Adults

HIV testing strategy for Symptomatic persons



HIV testing strategy for Asymptomatic persons



- The period where an HIV positive person does not

and be linked to care and support services.
- Follow-up visit for pre-ART care and CD4 screening
- Educate patient to return to ART centre if unwell or new symptoms arise

Pre-ART Care

Initiation of ART

WHO Clinical Stage	Recommendations
HIV infected Adults & Adolescents (Including pregnant women)	
Clinical Stage I and II	Start ART if CD4 < 350 cells/mm^3
Clinical Stage III and IV	Start ART irrespective of CD4 count
For HIV and TB co-infected patients	
Patients with HIV and TB co-infection (Pulmonary/ Extra-Pulmonary)	Start ART irrespective of CD4 t and type of tuberculosis
Start ATT first, initiate ART as early as possible between 2 weeks to 2 months when TB treatment is tolerated	
For HIV and Hepatitis B and C co-infected patients	

CD4 Count	Follow up
CD4 of any value and on ART	Every 6 months
Between 350 and 500 and not on ART	Repeat at 3 months
>500 and not on ART	Repeat at 6 months

CD4 monitoring and follow up schedule

ways during different stages of viral replication. These include:

i. Block binding of HIV to target cell (*fusion inhibitors*)
ii. Block viral RNA cleavage and one that inhibits reverse transcriptase (*reverse transcriptase inhibitors*)
iii. Block the enzyme, integrase, which helps in the incorporation of the proviral DNA into the host cell chromosome (*integrase inhibitors*)
iv. Block the RNA to prevent viral protein production
v. Block the enzyme protease (*protease inhibitors*)
vi. Inhibit the budding of virus from host cells

Classes of drugs under ART

Nucleoside reverse transcriptase inhibitors (NRTI)	Non-nucleoside reverse transcriptase inhibitors (NNRTI)	Protease inhibitors (PI)
• Zidovudine (AZT/ZDV)* • Stavudine (d4T)* • Lamivudine • Zalcitabine (ddC)*	• Nevirapine* (NVP) • Efavirenz*(EFV) • Delavirdine (DLV) • Fusion inhibitors • Integrase Inhibitors Raltegravir	• Saquinavir* (SQV) • Ritonavir* (RTV) • Nelfinavir* (NFV) • Amprenavir (APV) r (LPV)* • Foseamprenavir (FPV)

Antiretroviral Therapy Regimens

- Fixed-dose combinations (FDCs) are preferred
  - easy to use,
  - have distribution advantages (procurement and stock management),
  - improve adherence to treatment and thus reduce the chances of development of drug resistance.

- The current national experience shows that bid (twice a day) regimens of FDCs are well tolerated and complied with.

combinations for first-line regimens

i. Zidovudine (300 mg) + Lamivudine (150 mg)
ii. Tenofovir (300mg) + Lamivudine (150 mg)
iii. Zidovudine (300 mg) + Lamivudine (150 mg) + Nevirapine (200 mg)
iv. Efavirenz (600 mg)
v. Nevirapine (200 mg)

1. Choose 3TC (Lamivudine) in all regimens
2. Choose one NRTI to combine with 3TC (AZT **or** TDF)
3. Choose one NNRTI (NVP **or** EFV)

- Regimen I, I(a), II, II(a), III, III(a), IV, IV(a), V, V(a) are available.

ART in Pregnant Women & PPTCT

- **TDF+3TC+EFV** (FDC, single pill, once daily)
  - Prophylaxis starting from 14 weeks of gestation (or as early as possible thereafter) but not before 14 weeks
  - Continue same ARV Prophylaxis until 1 week after breastfeeding has stopped tail of TDF+3TC

Infant:

- Daily Sy. **NVP** from birth until 6 weeks, then stop
- Initiate Cotrimoxazole Prophylactic Treatment (CPT) at 6 weeks

- Depending upon the stage of the disease, HIV/AIDS produces
  - Reduction in food intake
  - Difficulties related to digestion
  - Difficulties related to absorption
  - Altered metabolism of nutrients (e.g. metabolism of carbohydrates/lipids may be different in HIV)
  - Altered body functions: inability to produce saliva, other juices
  - Improper utilization of fats

Nutrition

Nutritional care

- (5—6 meals/day)
- Eat fibre-rich food and sprouted food
- Eat nutritious snacks
- Drink plenty of liquids
- Add flavour to drink and food
- Take walks before meals
  - the fresh air helps to stimulate appetite
- Take light exercise and do light activity

foods

- like rice porridge, oat meal, mashed vegetables, milk

- Eat food at room temperature
- Eat soft and moist food
- Eat a variety of green leafy vegetables
- Take jaggery
- Avoid acidic and spicy foods
- Avoid caffeine and alcohol

Palliative Care

- Palliative care is an "approach that **improves the** the **prevention and relief of suffering** by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual."

- The active total care of patients whose **disease is not responsive to curative treatment**.

- Pain management.
- Psychosocial support
- Spiritual support
- End-of-life care
- Bereavement counselling

Components of Palliative Care

Prevention

1. Condom use

- Correct and consistent use of male and female condoms during vaginal or anal penetration

2. Testing and counselling for HIV and STIs

- strongly advised for all people exposed to any of the risk factors

3. Voluntary medical male circumcision

- reduces the risk of heterosexually acquired HIV infection in men by approximately 60%.
- This is a key intervention in generalized epidemic settings with high HIV prevalence and low male circumcision rates.

4. Antiretroviral (ART) use for prevention

4.1 ART as prevention

- A 2011 trial has confirmed if an HIV-positive person adheres to an effective ART regimen, the risk of transmitting the virus to their uninfected sexual partner can be reduced by 96%.

- For couples in which one partner is HIV-positive and the other HIV-negative, WHO recommends offering ART for the HIV-positive partner regardless of her/his CD4 count.

4.2 Pre-exposure prophylaxis (PrEP) for HIV-

- Oral PrEP of HIV is the daily use of ARV drugs by HIV-uninfected people to block the acquisition of HIV.

- Studies have demonstrated the effectiveness of PrEP in reducing HIV transmission among
  - serodiscordant heterosexual couples (where one partner is infected and the other is not),
  - men who have sex with men,
  - transgender women,
  - high-risk heterosexual couples, and
  - people who inject drugs.

drugs within 72 hours of exposure to HIV in order to prevent infection.

- PEP includes:
  - Counselling,
  - First aid care,
  - HIV testing, and
  - Administering of a 28-day course of ARV drugs with follow-up care

- by using sterile injecting equipment, including needles and syringes, for each injection.

- Opioid substitution therapy (OST);
- HIV testing and counselling;
- HIV treatment and care;
- Access to condoms; and
- Management of STIs, tuberculosis and viral hepatitis