

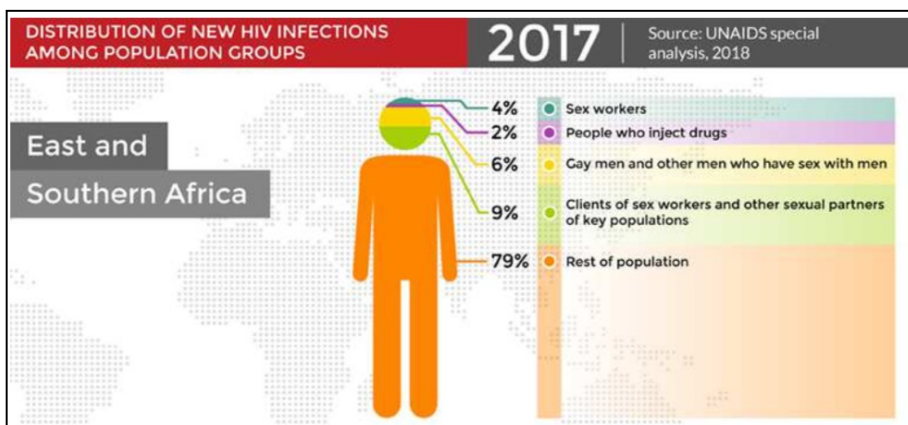
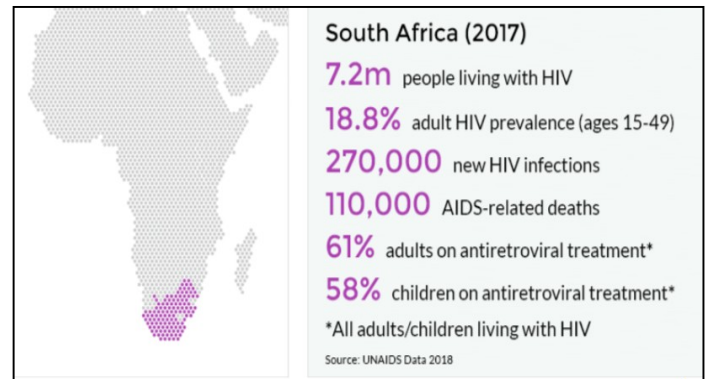
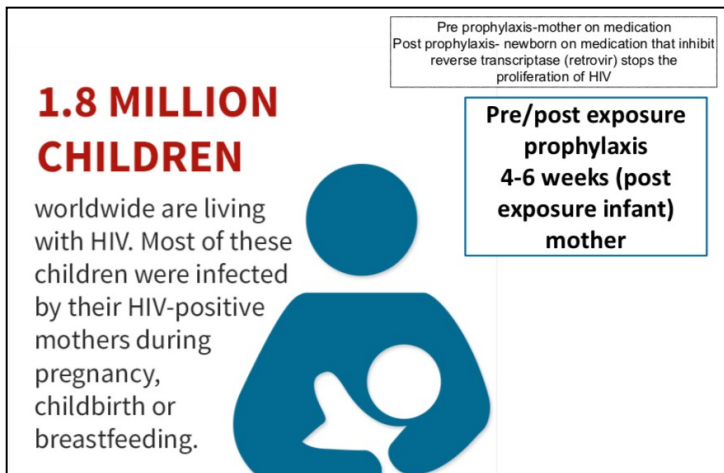
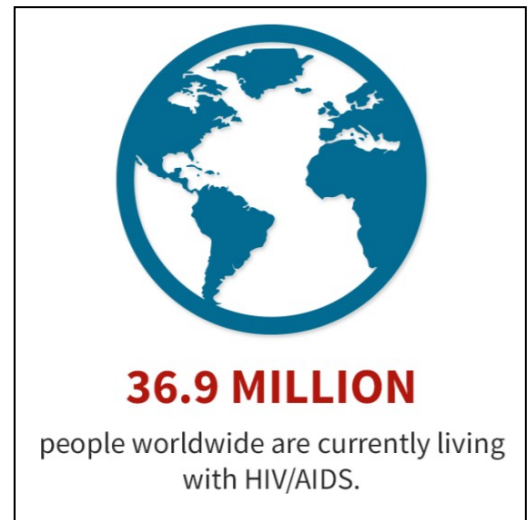
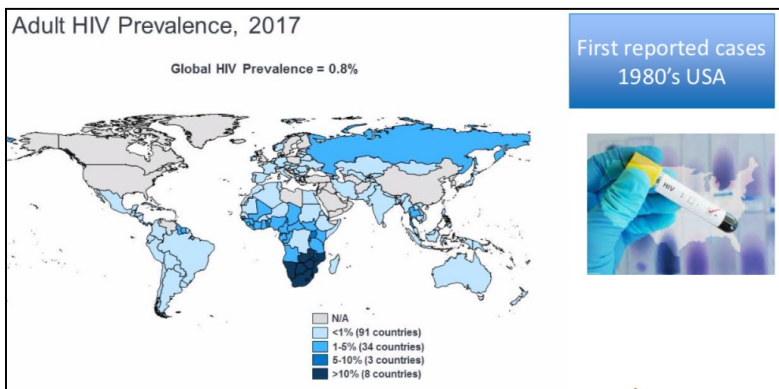
STUDY UNIT 5 : HIV NOTES

Chapter 49 : Psychoneuroimmunology

HUMAN IMMUNODEFICIENCY VIRUS (HIV)

- HIV retrovirus infects CD4 T lymphocytes
- HIV Particle
 - 2 RNA strands within a protein core surrounded by a lipid envelope from the host cell
- Viral RNA encodes for:
 - Structural proteins
 - Enzymes
 - Proteins that regulate transcription of a viral gene and viral life

DIAGRAMS BELOW: POSSIBLE MCQ QUESTIONS



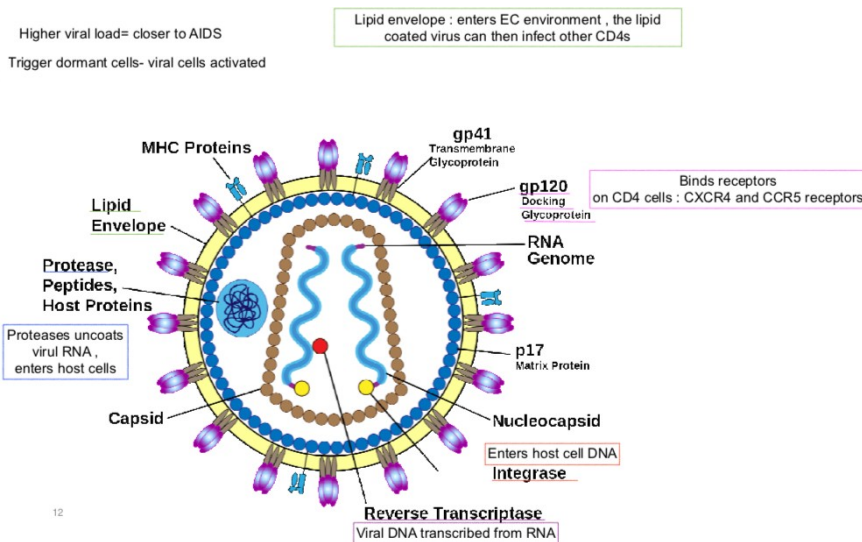
ANTIRETROVIRAL TREATMENT

- Formation of HIV is dependent on enzyme activity of:
 - Protease
 - Integrase
 - Reverse transcriptase
- Drugs target multiple stages of the viral replication cycle in order to decrease the rate of progression to AIDS
 - BUT HIV-1 will mutate over time to evade therapeutic regimens.

HIV VACCINE

- Vaccine and adjuvant (enhances the effect of the vaccine)
- Change in DNA sequence to create the drug and administer it. The sequencing is enough to trigger the immune response to create antibodies; the actual virus is not administered.

THE LIFE CYCLE OF HIV



- **Following sequential steps:**
 - Infection of host cell
 - Production of viral DNA and integration into host genome
 - Expression of viral genes
 - Production of viral particles
- **Infection of host cell:**
 - HIV-1 surface glycoprotein (gp120) attaches to CD4, which tethers virions to the cell surface and facilitates interaction with co-receptor molecules.
 - Chemokine receptors (CXCR4 and CCR5) bind to gp120 and initiates the fusion of the viral envelope with the cell membrane by exposing viral glycoprotein gp41- HIV-1 RNA is then released into the cell where viral reverse transcriptase (RT) converts viral RNA genome into double stranded proviral cDNA.
 - Pre-integration complex of viral proteins and nucleic acids migrate to the nucleus where the provirus is integrated into cellular DNA via viral Integrase.
 - The virus can only infect cells expressing CD4 and chemokine receptors
 - Macrophage and dendritic cells can also be infected by the virus