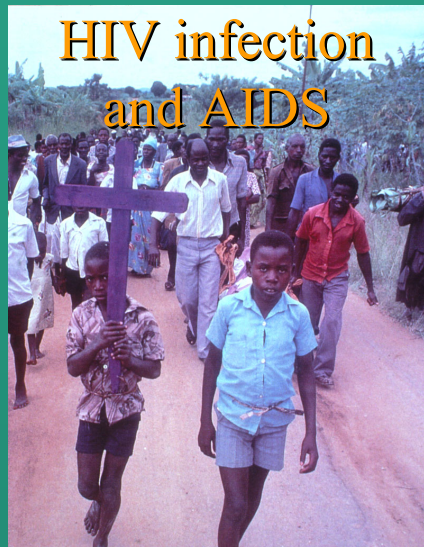


## Miracles and Misadventures...



## HIV and AIDS

### Summary

- Virology and immunology
- Patterns of disease
- Principles of treatment (i.e the 'miracle')
- Transmission
- Principles of prevention (i.e the 'misadventure')
  
- PNG and prisons...

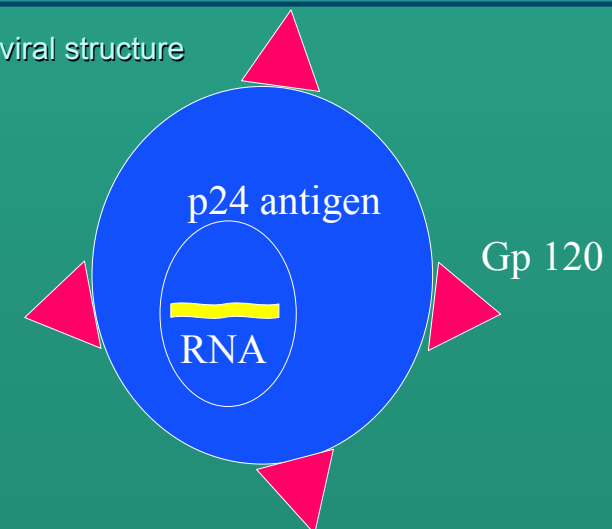
## HIV and AIDS

### Virology - what is a virus?

- A transferable piece of genetic material that cannot replicate itself
- It invades human cells and hijacks that cell's replication machinery

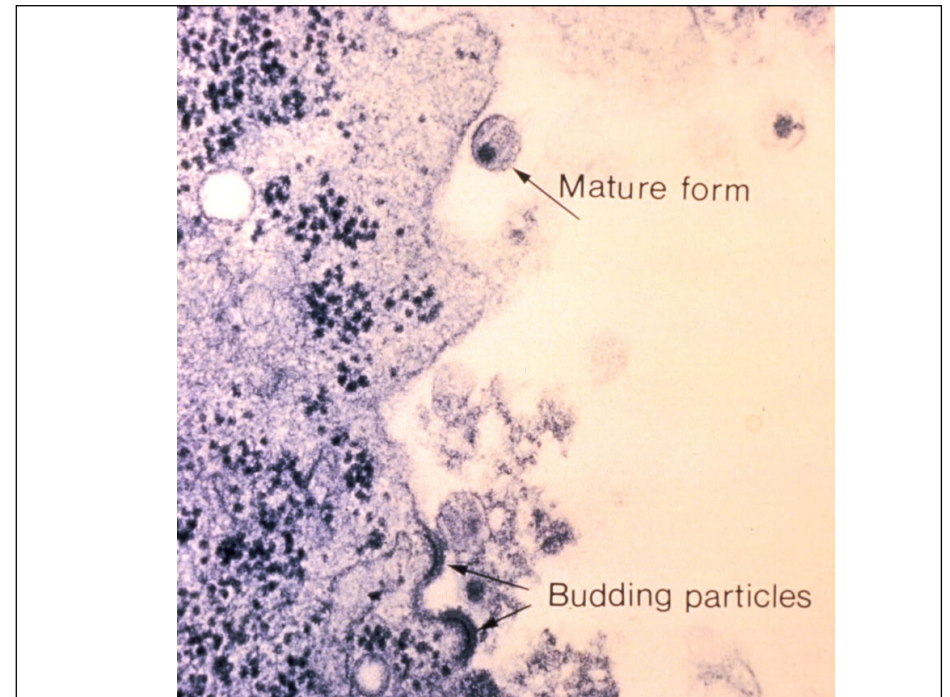
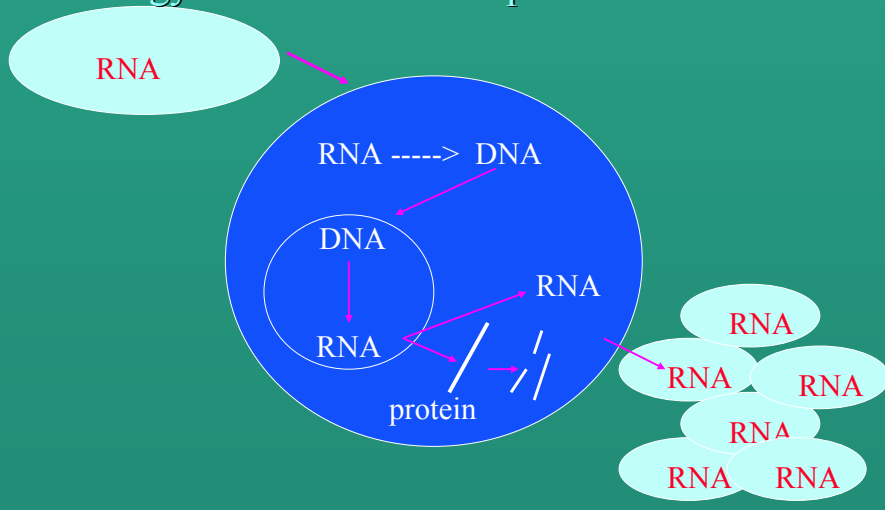
## HIV and AIDS

### HIV viral structure



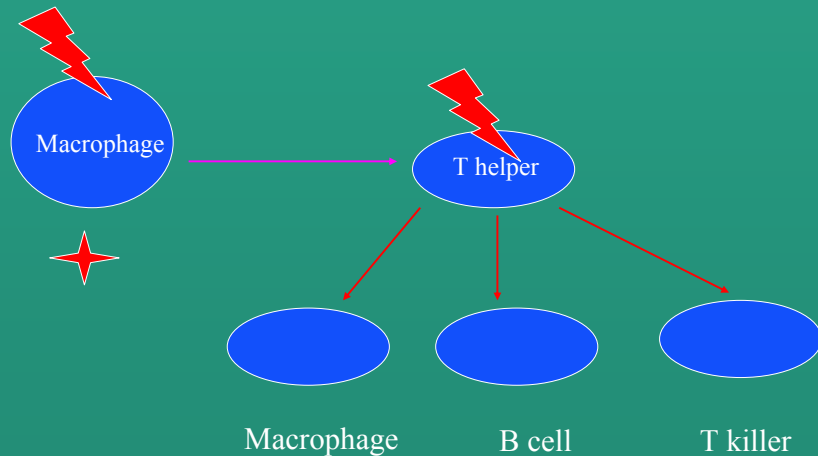
# HIV and AIDS

Virology - how does HIV replicate



# HIV and AIDS

Immunology - how does HIV damage immunity?



# HIV and AIDS

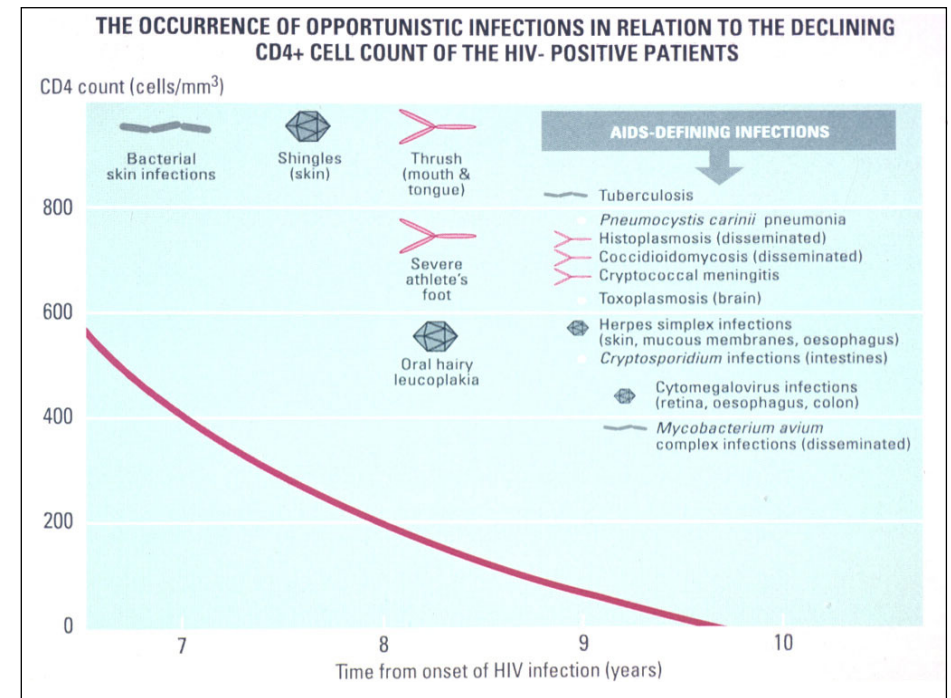
Virology/immunology - dynamics?

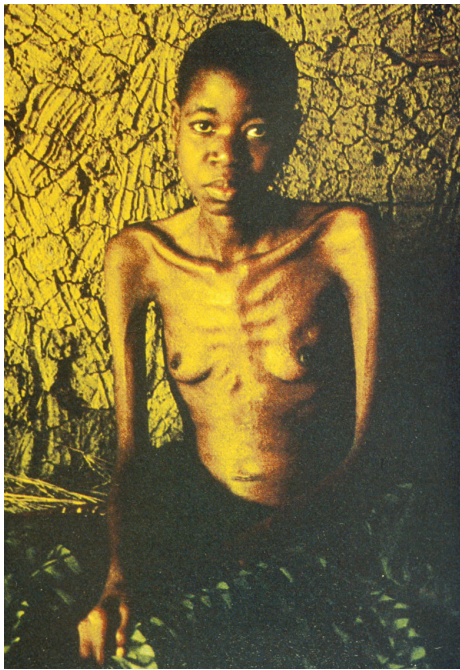
- Viral replication and CD4 destruction is continuous
- Each day...
  - $10^{10}$  HIV virions are produced
  - $10^{8-9}$  CD4 T cells are destroyed

# HIV and AIDS

Immunology - what happens in HIV infection?

- gradual destruction of immune system
- reflected by decreasing CD4 T cell counts
- when significant immune destruction has occurred opportunistic processes develop:
  - infections
  - tumours





## HIV and AIDS

### Patterns of disease

- Acute primary illness
  - 'glandular fever-like illness
- Asymptomatic period
  - longest part of illness
- Symptomatic period
  - AIDS

# HIV and AIDS

## Transmission

- Sexual:
  - anal
  - vaginal
  - oral
- Mother to child
- Blood to blood contact:
  - injecting drug use
  - blood transfusion
  - tattooing, piercing, etc

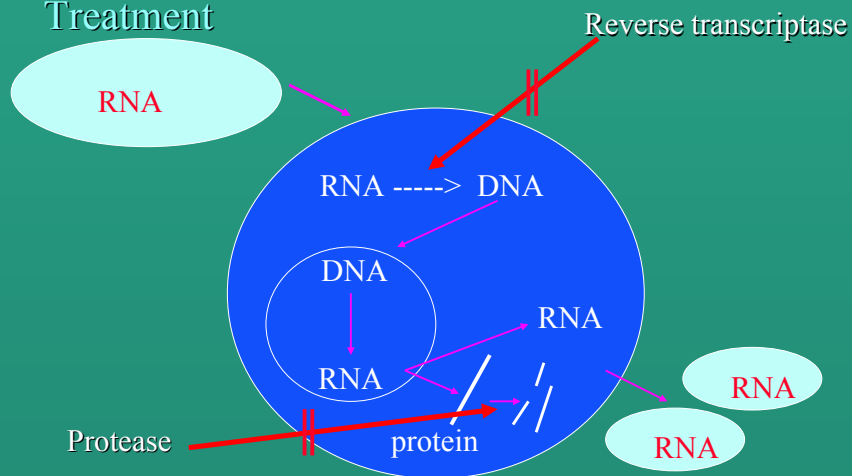
# HIV and AIDS

## Diagnosis?

- Detection of antibodies
- Clinical features

# HIV and AIDS

## Treatment



# HIV and AIDS

## Treatment principles

- HIV replication
  - antiretroviral agents, combination therapy
- Prevention and treatment of opportunistic infections

# HIV and AIDS

## Treatment

- Reverse transcriptase inhibitors
  - nucleoside analogues
    - » ZDV, DDI, DDC, 3TC, D4T, abacavir
  - non-nucleoside analogues
    - » nevirapine, delavirdine, efavirenz
- Protease inhibitors
  - saquinavir, ritonavir
  - indinavir, nelfinavir, amprenavir

# Global summary of the HIV/AIDS epidemic, as of end 2001

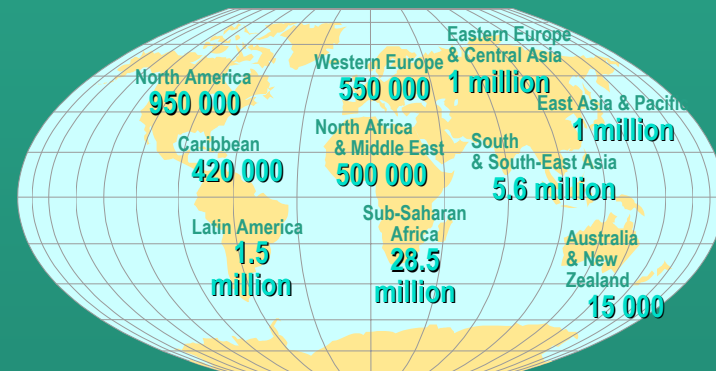
Number of people living with HIV/AIDS	Total
<b>40 million</b>	
Adults	37.1 million
<i>Women</i>	18.5 million
Children under 15 years	3.0 million
<hr/>	
People newly infected with HIV in 2001	Total
<b>5 million</b>	
Adults	4.2 million
<i>Women</i>	2.0 million
Children under 15 years	800 000
<hr/>	
AIDS deaths in 2001	Total
<b>3 million</b>	
Adults	2.4 million
<i>Women</i>	1.1 million
Children under 15 years	580 000



# Global estimates for adults and children, end 2001

- People living with HIV/AIDS..... 40 million
- New HIV infections in 2001..... 5 million
- Deaths due to HIV/AIDS in 2001..... 3 million

# Adults and children estimated to be living with HIV/AIDS, end 2001



Total: 40 million



## About 14, 000 new HIV infections a day in 2001

- More than 95% are in developing countries
- About 2,000 are in children under 15 years
- About 12 000 are in persons aged 15 to 49 years, of whom:
  - almost 50% are women
  - about 50% are 15–24 year olds



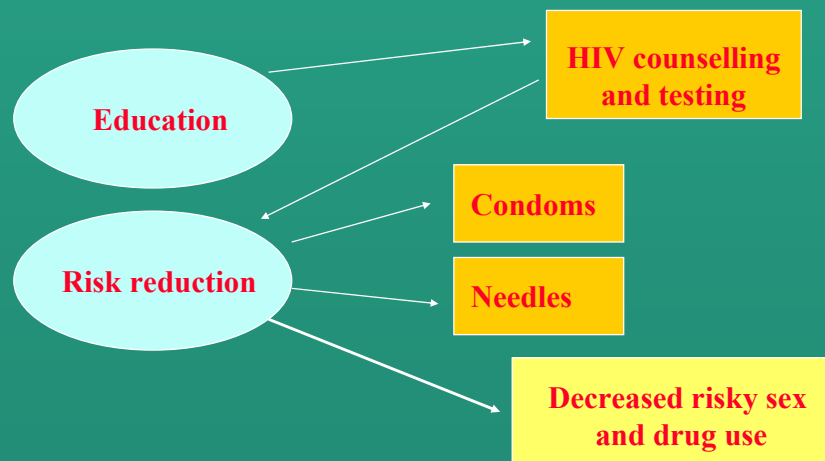
## HIV and AIDS

### Principles of prevention

- Primary prevention
- Secondary prevention
  - behaviour change
- Intervention vs education vs counselling

## HIV and AIDS

### Principles of prevention



## HIV and AIDS

### Prevention

- Biological
  - vaccination
  - blood product screening
  - anti-retroviral treatment including vertical transmission
  - treatment and prevention of STDs

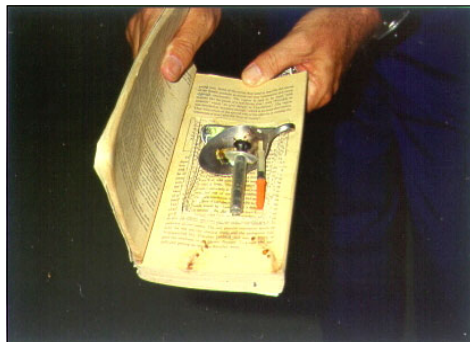
# Papua New Guinea

- Population... 4 million
- Aged 15-49...2.5 million
- % urban.....16%
- % secondary educ'n... 20%



# Prison population

- 94% males, mainly aged 20-40
- 70% drug related crimes
- 15% Aboriginal or Torres St Islanders
- Vicious cycle of disadvantage
- Poor education - illiterate
- Median sentence 6 months



## Injecting and prisons

- 75% continue injecting
- 80% share in prison
- 10% started injecting inside
- High number of partners:
  - 5 inside vs 1 outside

*Dolan, 1997 and Dolan, 1999*



## Blood-to-blood contact and prisons

- Injuries and self-harm:
  - 10% females
  - 5% males
- Sexual assault
  - 20% young male prisoners suffer sexual assault (Heilpern, 1994)
- Tattooing
  - 40% tattoo in prison
  - 68% share tattooing equipment

