The Global HIV Epidemic

Jerome Larkin, MD
Outline

• Global Epidemiology
• Natural History of HIV
• Antiretroviral Therapy
• Malaria
• Tuberculosis
• Prevention of Mother to Child Transmission
• Post-Exposure Prophylaxis
# Global summary of the AIDS epidemic, 2009

## Number of people living with HIV in 2009

<table>
<thead>
<tr>
<th>Category</th>
<th>Total (million)</th>
<th>Adults (million)</th>
<th>Women (aged 15 and above) (million)</th>
<th>Children under 15 years (million)</th>
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<tr>
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</tr>
<tr>
<td>Total</td>
<td>33.3</td>
<td>30.8</td>
<td>15.9</td>
<td>2.5</td>
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<tr>
<td>Adults</td>
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<td></td>
<td>30.8</td>
<td>29.2</td>
<td>14.2</td>
<td>2.0</td>
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<tr>
<td>Women (aged 15 and above)</td>
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<td>15.9</td>
<td>17.2</td>
<td>14.2</td>
<td>2.9</td>
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<tr>
<td>Children under 15 years</td>
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<tr>
<td></td>
<td>2.5</td>
<td>2.9</td>
<td>1.2</td>
<td>1.2</td>
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</tbody>
</table>

## People newly infected with HIV in 2009

<table>
<thead>
<tr>
<th>Category</th>
<th>Total (million)</th>
<th>Adults (million)</th>
<th>Children under 15 years (000)</th>
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<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>Total</td>
<td>2.6</td>
<td>2.2</td>
<td>370,000</td>
</tr>
<tr>
<td>Adults</td>
<td></td>
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<tr>
<td></td>
<td>2.2</td>
<td>2.0</td>
<td>240,000</td>
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<tr>
<td>Children under 15 years</td>
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<tr>
<td></td>
<td>0.4</td>
<td>0.5</td>
<td>610</td>
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</tbody>
</table>

## AIDS-related deaths in 2009

<table>
<thead>
<tr>
<th>Category</th>
<th>Total (million)</th>
<th>Adults (million)</th>
<th>Children under 15 years (000)</th>
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<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.8</td>
<td>1.6</td>
<td>260,000</td>
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<tr>
<td>Adults</td>
<td></td>
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<tr>
<td></td>
<td>1.6</td>
<td>1.4</td>
<td>150,000</td>
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<tr>
<td>Children under 15 years</td>
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<tr>
<td></td>
<td>0.2</td>
<td>0.2</td>
<td>110,000</td>
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</tbody>
</table>
## Regional HIV and AIDS statistics and features, 2009

<table>
<thead>
<tr>
<th>Area</th>
<th>Adults &amp; children living with HIV</th>
<th>Adults &amp; children newly infected with HIV</th>
<th>Adult prevalence (15–49) [%]</th>
<th>Adult &amp; child deaths due to AIDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>22.5 million [20.8 – 24.1 million]</td>
<td>1.8 million [1.6 – 2.2 million]</td>
<td>5.0 [4.9 – 5.4]</td>
<td>1.3 million [1.1 – 1.7 million]</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>460 000 [250 000 – 380 000]</td>
<td>75 000 [24 000 – 46 000]</td>
<td>0.2 [&lt;0.2 – 0.3]</td>
<td>24 000 [15 000 – 25 000]</td>
</tr>
<tr>
<td>South and South-East Asia</td>
<td>4.1 million [3.4 – 4.3 million]</td>
<td>270 000 [240 000 – 320 000]</td>
<td>0.3 [0.2 – 0.3]</td>
<td>260 000 [220 000 – 310 000]</td>
</tr>
<tr>
<td>East Asia</td>
<td>770 000 [700 000 – 1.0 million]</td>
<td>82 000 [58 000 – 88 000]</td>
<td>&lt;0.1 [&lt;0.1]</td>
<td>36 000 [46 000 – 71 000]</td>
</tr>
<tr>
<td>Latin America</td>
<td>1.4 million [1.8 – 2.2 million]</td>
<td>92 000 [150 000 – 200 000]</td>
<td>0.5 [0.5 – 0.6]</td>
<td>58 000 [66 000 – 89 000]</td>
</tr>
<tr>
<td>Caribbean</td>
<td>240 000 [220 000 – 260 000]</td>
<td>17 000 [16 000 – 24 000]</td>
<td>1.0 [0.9 – 1.1]</td>
<td>12 000 [9300 – 14 000]</td>
</tr>
<tr>
<td>Eastern Europe &amp; Central Asia</td>
<td>1.4 million [1.4 – 1.7 million]</td>
<td>130 000 [100 000 – 130 000]</td>
<td>0.8 [0.6 – 0.8]</td>
<td>76 000 [72 000 – 110 000]</td>
</tr>
<tr>
<td>Western &amp; Central Europe</td>
<td>820 000 [710 000 – 970 000]</td>
<td>31 000 [23 000 – 35 000]</td>
<td>0.2 [0.2 – 0.3]</td>
<td>8500 [10 000 – 15 000]</td>
</tr>
<tr>
<td>North America</td>
<td>1.5 million [1.2 – 1.6 million]</td>
<td>70 000 [36 000 – 61 000]</td>
<td>0.5 [0.5 – 0.7]</td>
<td>25 000 [9100 – 55 000]</td>
</tr>
<tr>
<td>Oceania</td>
<td>57 000 [51 000 – 68 000]</td>
<td>4500 [2900 – 5100]</td>
<td>0.3 [&lt;0.3 – 0.4]</td>
<td>1400 [1100 – 3100]</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>33.3 million [31.1 – 35.8 million]</td>
<td>2.6 million [2.4 – 3.0 million]</td>
<td>0.8 [&lt;0.8 – 0.8]</td>
<td>1.8 million [1.7 – 2.4 million]</td>
</tr>
</tbody>
</table>

The ranges around the estimates in this table define the boundaries within which the actual numbers lie, based on the best available information.
Global estimates for adults and children, 2009

- People living with HIV 33.3 million [31.1 – 35.8 million]
- New HIV infections in 2009 2.6 million [2.4 – 3.0 million]
- Deaths due to AIDS in 2009 1.8 million [1.7 – 2.4 million]
Adults and children estimated to be living with HIV, 2009

Total: 33.3 million (31.1 – 35.8 million)
Estimated number of adults and children newly infected with HIV, 2009

Western & Central Europe
31 000
[23 000 – 35 000]

Eastern Europe & Central Asia
130 000
[100 000 – 130 000]

Middle East & North Africa
75 000
[24 000 – 46 000]

South & South-East Asia
270 000
[240 000 – 320 000]

Sub-Saharan Africa
1.8 million
[1.6 – 2.2 million]

Caribbean
17 000
[16 000 – 24 000]

East Asia
82 000
[58 000 – 88 000]

Latin America
92 000
[150 000 – 200 000]

Oceania
4500
[2900 – 5100]

North America
70 000
[36 000 – 61 000]

South & South-East Asia
270 000
[240 000 – 320 000]

Total: 2.6 million (2.4 – 3.0 million)
Estimated adult and child deaths due to AIDS, 2009

- Western & Central Europe: 8,500 [10,000 – 15,000]
- Middle East & North Africa: 24,000 [15,000 – 25,000]
- Sub-Saharan Africa: 1.3 million [1.1 – 1.7 million]
- Eastern Europe & Central Asia: 76,000 [72,000 – 110,000]
- South & South-East Asia: 260,000 [220,000 – 310,000]
- East Asia: 36,000 [46,000 – 71,000]
- Oceania: 1,400 [1,100 – 3,100]
- Caribbean: 12,000 [9,300 – 14,000]
- Latin America: 58,000 [66,000 – 89,000]
- North America: 26,000 [20,000 – 31,000]

Total: 1.8 million (1.7 – 2.4 million)
Children (<15 years) estimated to be living with HIV, 2009

Total: 2.5 million (1.2 – 2.9 million)
Estimated number of children (<15 years) newly infected with HIV, 2009

<table>
<thead>
<tr>
<th>Region</th>
<th>Estimated Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Caribbean</td>
<td>1900</td>
</tr>
<tr>
<td>Latin America</td>
<td>4300</td>
</tr>
<tr>
<td>Western &amp; Central Europe</td>
<td>&lt;100 (&lt;100 – &lt;200)</td>
</tr>
<tr>
<td>Eastern Europe &amp; Central Asia</td>
<td>3400 (1700 – 6000)</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>6400 (2300 – 7500)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>330 000 (210 000 – 570 000)</td>
</tr>
<tr>
<td>East Asia</td>
<td>1900 (2100 – 4500)</td>
</tr>
<tr>
<td>South &amp; South-East Asia</td>
<td>20 000 (11 000 – 25 000)</td>
</tr>
<tr>
<td>Oceania</td>
<td>&lt;1000 (&lt;500 – &lt;1000)</td>
</tr>
<tr>
<td>Total</td>
<td>370 000 (240 000 – 610 000)</td>
</tr>
</tbody>
</table>
Estimated deaths of children (<15 years) due to AIDS, 2009

Total: 260 000 (150 000 – 410 000)
Over 7000 new HIV infections a day in 2009

• More than 97% are in low- and middle-income countries

• About 1000 are in children under 15 years of age

• About 6000 are in adults aged 15 years and older, of whom:
  — almost 51% are among women
  — about 41% are among young people (15–24)
2009 global HIV and AIDS estimates
Children (<15 years)

- **Children living with HIV** 2.5 million [1.2 – 2.9 million]
- **New HIV infections in 2008** 370 000 [240 000 – 610 000]
- **Deaths due to AIDS in 2008** 260 000 [150 000 – 410 000]

December 2009
Three Epidemics:

- **Sub-Saharan Africa**
  - Largely sexually transmitted
  - High prevalence
  - Variable political/economic stability; often catastrophic
  - Resource poor
  - Clusters in urban/professional population

- **N. America, W. Europe:**
  - Clusters among MSM/IVDU
  - Low prevalence
  - Stable infrastructure/politics/economics
  - Heavily resourced

- **S. America, Asia**
  - More commonly sexually transmitted
  - Relatively low prevalence
  - Intermediate political/economic stability/resources
In Africa:

- At least 77% is heterosexual transmission
- 5% mother to child
- Blood transfusion 0.5%
- Unknown 17%
Infections in Children

• 370,000 children newly infected with HIV in the world (2009)

• Mortality before the age of 2 if untreated is 50%

• Most (90%) in SubSaharan Africa
Infections in Children

• Most are infected via maternal to child transmission

• Most potentially preventable

• Compounded by geography, decreased access to health care services, most women delivering at home, lack of HIV awareness, lack of testing, poverty
In the US . . .

- Infections in IVDU is decreasing
- Perinatal infections now very rare
- An estimated 280,000 people are positive and do not know it; do not perceive risk
- Infections in women, MSM, Hispanics and African Americans increasing
- Most infections in women through heterosexual contact
Natural History of HIV
Types of HIV

• There are 2 types of HIV: **HIV-1 and HIV-2**
  • Most of the HIV in the world is HIV-1
  • There are at least 10 subtypes of HIV-1.
  • HIV-2 is found mostly in West Africa (and Mozambique) although only 1% of cases
HIV 1 Subtypes

- Multiple subtypes: M, N, O, P
- Different strains predominate in specific geographic areas
- M is further subdivided in clades: A-K
- N and O are very rare
- B predominates in North America and is the best studied; accounts for ~12% worldwide
- C is the most common with ~50% world wide (E. Africa, S. Africa, S. Asia, China)
HIV-2

- HIV-2 is a weaker virus
- It progresses more slowly to AIDS but eventually leads to the same opportunistic infections.
- Transmission from a mother to a child is relatively rare (0-4% in breastfeeding mothers)
- Important to diagnose because treatment is different from HIV-1
- Less well studied
HIV is transmitted via

- **Blood**
  - Usually via transfusions or contaminated needles and syringes
- **Semen**
  - Usually from sex without a condom
- **Vaginal secretions**
  - Usually from sex without a condom
- **Mother-to-child**
  - During pregnancy, birth, or breast-feeding
Acute HIV Infection

An infected person will often become ill a few weeks after infection with HIV:

Fever, Rash, Sore throat, Muscle Aches, Headache, Vomitting, Diarrhea, Stiff Neck

This usually goes away as the immune system starts to control the infection.
Acute HIV Infection

- **Acute infection** occurs within 2-6 weeks after HIV enters the body.

- Virus is then produced rapidly and spreads throughout the body.

- Patient develops antibodies to control the virus (but these are not detectable for 2-12 weeks on HIV rapid tests)
CD4 Count

• Normal 800-1200; range 500-1400

• CD4/CD8 ratio normally >2

• Should not be used to diagnose HIV infection
CD4 Count

- With viral load best predictor of disease progression
- Treatment with antiretrovirals always indicated if CD4<200
- Usually indicated if CD4<500
- WHO currently recommends treatment at <350
- Viral load level indications less clear; most would treat for a viral load >100,000 regardless of CD4 Count
### CD 4 Count and Percent

- **CD4 % has the best intermeasure consistency:**

<table>
<thead>
<tr>
<th>Immune function/suppression</th>
<th>CD4%</th>
<th>CD4 Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&gt;30</td>
<td>&gt;350</td>
</tr>
<tr>
<td>Moderate</td>
<td>15-29</td>
<td>201-350</td>
</tr>
<tr>
<td>Severe</td>
<td>&lt;15</td>
<td>&lt;200</td>
</tr>
</tbody>
</table>

6-7% of CD4 cells are turned over daily; the entire population in around 15 days
HIV Replication

- **Billions** of new virus made EVERY DAY
- Takes 24 hours to replicate
- Entire viral burden turns over in ~72h
- **Error-prone**: $10^4 - 10^5$ error rate
- Replication errors = **mutations** (slight changes in structure of virus)
- Selection pressure may select drug-resistant strains
- Original, non-mutated virus = “**wild-type**”
HIV to AIDS

- Median time from HIV infection to symptomatic disease (clinical latency):
  - Adults: 10 years
  - Children: months to 1-2 years
- 5-10% of adults have stable CD4 counts and no symptoms after 10 years (Elite Controllers)
- 10% of adults progress to AIDS in 2-3 years
AIDS Defining Illnesses

- Candidiasis: esophageal, pulmonary
- Toxoplasmosis
- PCP
- Cryptococcal Meningitis
- Recurrent Pneumonia
AIDS Defining Illnesses

• Lymphoma
  – GI
  – CNS
  – PEL
• Kaposi’s Sarcoma
• Invasive Cervical Cancer
AIDS Defining Illnesses

- Wasting
- PML
- CMV (not of LN, spleen, liver)
- Dementia
- Active TB
- Disseminated MAC
- HSV > 1 month
- Cryptosporidium > 1 month
AIDS Defining Illnesses

• Coccidiomycosis
• Histoplasmosis
• Isosporosis
• Nocardiosis
• Salmonella
• Strongyloidosis
OI’s Common in Africa but not in US

• Malaria

• Tuberculosis

• Salmonellosis
Antiretroviral Therapy
Antiretroviral Therapy

- Also known as HAART or ART
- First agent available in 1987: Zidovudine/AZT
- Had marginal improvement in survival, symptoms but patients always relapsed
• 1995: ACTG 076 demonstrates decreased mother to child transmission: ~25 to 10%

• Combination therapy became available with development of protease inhibitors circa 1996

• 1996-1999 mortality, AIDS, OI’s and hospitalization all decreased 60-80%
Indications for ART

- CD4 <500
- Rapid Decline in CD4
- Viral load >100,000 (? 50-100,000)
- Rapid rise in viral load
- AIDS defining illness
- Patient Preference
- Chronic Hep B
- HIV related nephropathy
- Pregnancy
## Current ARV Medications

<table>
<thead>
<tr>
<th>NRTI</th>
<th>PI</th>
<th>Integrase Inhibitor (II)</th>
<th>Fusion Inhibitor</th>
<th>CCR5 Antagonist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacavir (ABC)</td>
<td>Atazanavir (ATV)</td>
<td>Raltegravir (RAL)</td>
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<tr>
<td>Didanosine (ddI)</td>
<td>Darunavir (DRV)</td>
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<tr>
<td>Emtricitabine (FTC)</td>
<td>Fosamprenavir (FPV)</td>
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<tr>
<td>Lamivudine (3TC)</td>
<td>Indinavir (IDV)</td>
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<td>Stavudine (d4T)</td>
<td>Lopinavir (LPV)</td>
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<tr>
<td>Tenofovir (TDF)</td>
<td>Nelfinavir (NFV)</td>
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<tr>
<td>Zidovudine (AZT, ZDV)</td>
<td>Saquinavir (SQV)</td>
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<td></td>
<td>Tipranavir (TPV)</td>
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<tr>
<td>NNRTI</td>
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<tr>
<td>Delavirdine (DLV)</td>
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<tr>
<td>Efavirenz (EFV)</td>
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<tr>
<td>Etravirine (ETR)</td>
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<tr>
<td>Nevirapine (NVP)</td>
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</tbody>
</table>
Current ARV Medications Available in Africa

NRTI
- Abacavir (ABC)
- Didanosine (ddI)
- Lamivudine (3TC)
- Stavudine (d4T)
- Tenofovir (TDF)
- Zidovudine (AZT, ZDV)

NNRTI
- Efavirenz (EFV)
- Nevirapine (NVP)

PI
- Atazanavir (ATZ)
- Indinavir (IDV)
- Lopinavir (LPV)
- Nelfinavir (NFV)
- Ritonavir (RTV)
- Saquinavir (SQV)

December 2009 www.aidsetc.org
ART in Africa

• Currently generally recommended for CD4 counts <350 or <200 or WHO Stage 3 or 4 disease*
• Problems with access to care, drugs, monitoring
• Very few medical providers, limited expertise
• Lab infrastructure limited, variable; prone to issues of reagent supply, technical support, refrigeration

*varies by country guideline
However...

• Studies demonstrate that rates of adherence, viral suppression, immune reconstitution and clinical improvement are similar to resource-rich areas of the world.

• Largely funded by donor agencies: PEPFAR, The Global Fund to Fight AIDS, Tuberculosis and Malaria, Gates Foundation
Adult WHO Stage 3

- Weight loss, >10% of body weight
- Unexplained chronic diarrhea > 1 month
- Unexplained prolonged fever (intermittent or constant) >1 month
- Oral Candidiasis (thrush)
- Vulvo-vaginal Candidiasis, chronic (>1/12) or poorly responsive to therapy
- Oral hairy leukoplakia
- Pulmonary TB, within the past year
- Severe bacterial infections (i.e. pneumonia)
Adult WHO Stage 4

- HIV wasting syndrome
- Pneumocystitis pneumonia (PCP)
- Toxoplasmosis of the brain
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis with diarrhea >1 month
- Extrapulmonary TB
- Cytomegalovirus retinitis (CMV)
- Herpes simplex virus infection, mucocutaneous >1 month or visceral (any duration)
- Candidiasis of esophagus, trachea, bronchi
- Lymphoma
- Kaposi’s sarcoma
- HIV encephalopathy
- Progressive multifocal leucoencephalopathy (PML)
- Any disseminated endemic mycosis
- Atypical mycobacteriosi, disseminated or pulmonary
- Non-typhoid Salmonella septicaemia
- And/or performance scale 4: bedridden >50% of the day during the last month
Estimated percentage of people covered among those in need of antiretroviral treatment, situation as of November 2003.
HIV and Malaria
Symptoms of Malaria

Central
- Headache

Systemic
- Fever

Muscular
- Fatigue
- Pain

Back
- Pain

Skin
- Chills
- Sweating

Respiratory
- Dry cough

Spleen
- Enlargement

Stomach
- Nausea
- Vomiting
Malaria Basics

• 5 species infect humans; Plasmodium falciparum is the most pathologic and most common in Africa
• 243 million cases/year worldwide in 2008
• 863,000 deaths; most in children in Africa due to falciparum
• Pregnant women are susceptible to severe disease
• Older children, adults and multigravids (>2) acquire immunity
Malaria and HIV

- Increasing prevalence with severity of immunosuppression
- Increased prevalence of severe malaria: cerebral, hypoglycemia, coma, anemia, placental
- Episodes of malaria lead to increase in HIV viral load
- Parasite load is higher in HIV infection
- Increase risk of treatment failure in adults; children appear to respond similarly to HIV-uninfected
- Pregnancy: increased maternal death, premature deliver, LBW, ? infant mortality
- Monthly treatment/impregnated bed nets reduce morbidity in pregnancy
TMP/Sulfa Prophylaxis

- Prescribed for PCP prophylaxis
- Decreases incidence of malaria and parasitemia including at higher CD4 counts
- Reduces diarrheal illness (Salmonella)
- Reduces bacterial pneumonia
- Should be prescribed for all HIV positive individuals regardless of CD4 count
HIV and Tuberculosis
HIV and Tuberculosis

• Rates of coinfection 30-60% in sub-Saharan Africa depending on population studied
• Activation of latent disease 5-10%/year
• Presents atypically at CD4 <350
• More likely to be disseminated at CD4 <50
• May present as an manifestation of immune reconstitution inflammatory syndrom (IRIS)
• Active disease associated with increased viremia and progression of HIV
ART and Anti-TB Treatment

• 11-45% of patients receiving ART within six weeks of starting treatment for TB develop IRIS

• High rate of progression/mortality of both associated with delay of treatment for either at low CD4 counts

• Multiple drug interactions: Rif vs Nevirapine, Protease Inhibitors
ART and Anti-TB Treatment

- Always start treatment for TB first
- Start ART based on CD4 Count:
  - <100: within 2 weeks
  - 100-200: delay 2-8 weeks
  - >200-350: delay 8 weeks
Prevention of Mother to Child Transmission
Mother-to-Child Transmission of HIV-1

Pregnancy 5–10%

Delivery 15%

Breastfeeding 5–15%

Up to 40% transmission
Factors Increasing Transmission:

- New maternal infection in third trimester
- Low maternal CD4 count
- High maternal viral load
- Mother with AIDS defining illness
- Chorioamnionitis
- Exposure of infant to maternal blood ie abruption
- PROM
- Prolonged labor
- Preterm delivery
- Maternal/fetal HLA discordance
Estimated Numbers of Perinatally Acquired AIDS Cases by Year of Diagnosis, 1985–2007—United States and Dependent Areas

Note: Data have been adjusted for reporting delays and missing risk-factor information.
Prevention of Mother to Child Transmission

- Currently HIV infection is an absolute indication for three drug antiretroviral therapy in pregnancy.

- Typical regimen: **Combivir/Kaletra***
  - Combivir: fixed dose combination of zidovudine and lamivudine
  - Kaletra: fixed dose combination of lopinivir and ritonovir

- Maternal zidovudine in 2\textsuperscript{nd}/3\textsuperscript{rd} trimester with nevirapine at delivery and post-natal nevirapine +/- zidovudine still used in resource poor areas of the world.
Estimated number of children (<15 years) newly infected with HIV, 2009

Total: 370 000 (240 000 – 610 000)
### Table 10: Recommended Regimens for PMTCT Intervention.

<table>
<thead>
<tr>
<th>Target</th>
<th>Nevirapine (NVP)</th>
<th>Zidovudine (ZDV)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mother</strong></td>
<td>200 mg stat at the beginning of labor or latest 30 minutes before delivery</td>
<td>• 300 mg twice daily for at least 4 weeks before delivery <strong>then</strong></td>
</tr>
<tr>
<td></td>
<td>• 300 mg every 3 hrs during labor <strong>then</strong></td>
<td>• 300 mg every 3 hrs during labor <strong>then</strong></td>
</tr>
<tr>
<td></td>
<td>• 300 mg twice daily for 1 week after delivery</td>
<td>• 300 mg twice daily for 1 week after delivery</td>
</tr>
<tr>
<td><strong>Infant</strong></td>
<td>Syrup 2 mg/kg stat</td>
<td>Syrup 5 mg/kg twice daily for one week</td>
</tr>
<tr>
<td>(Within 72 hours of birth)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Should all HIV infected women be treated with ART?

• Fertility rates in Africa are very high
• Breastfeeding is necessary to decrease infant mortality
• Intermittent therapy can lead to viral resistance
• Each discontinuation and resumption of therapy is an opportunity for error
Post-Exposure Prophylaxis
Non-infectious Body Fluid

- Tears
- Urine
- Feces
- Saliva, Sputum, Vomit
- Nasal secretions
- Sweat
Potentially Risky Exposure

- Percutaneous (through the skin) injury with potentially infectious body fluids

- Contact of mucous membranes (eye, nose, mouth, vagina, rectum) or non-intact skin with infectious body fluids
Risk for Occupational Transmission of HIV
(23 studies before HAART)

• Percutaneous exposure to HIV-infected blood: 0.33% (20/6135)

• Mucous membrane exposure: 0.09% (1/1143)

• Intact skin exposure: 0% (0/2712)
Probable Factors affecting Risk of HIV

- Medical device visibly contaminated with blood
- Needle went into vein or artery of infected patient
- Involving deep injury
- Traumatic sexual assault
- Source person has a terminal illness (HIV-related Sx, AIDS) (increased viral load)
Principles of PEP

- Transmission of HIV can be reduced by 79% by taking ARVs for 1 month

- Start PEP ASAP (pref. within 2 hours)

- Efficacy is decreased if delayed

- Can start up to 72hrs post-exposure
Post-Exposure Prophylaxis

- Initial response is to clean the area of exposure
- Determined by risk assessment of source and type of exposure
- Generally use two or three drugs:
  - tenofovir/emtricitabine
  - tenofovir/emtricitabine/lopinavir/r
  - should not receive nevirapine
- Initiate treatment as soon as possible within 72 hours
- Drugs taken for 4 weeks
Fin

Questions?