### HIV



### Estimated Annual New Cases and prevalence of STIs in the U.S. CDC)

#### STI Prevalence and Incidence in the US



\*Bars are for illustration only; not to scale, due to wide range in number of infections. Estimates for adults and adolescents ages 15+ unless otherwise stated. HIV and HBV data only represent sexually acquired infections.

### **Genesis of HIV**

### SIV -simian immunodeficiency virus

### HIV1 / HIV 2



## **History of HIV / AIDS**

- 1981 description of first cases of unusual infections and malignancies in Hx (MSM) and Bx
- 1982 term "AIDS"
- 1983 LAV: lymphadenopathy associated virus; Luc Montagnie
- 1984 HTLV III: human T lymphotropic virus; Robert Gallo
- 1985 ELISA test
- 1986 term "HIV"
- 1987 first drug AZT
- 1994 HAART





### Lymphocyte T CD4+







### A global view of HIV infection



Distribution of acquisition of new HIV infections by population, global, sub-Saharan Africa and rest of the world, 2021



Source: UNAIDS special analysis, 2022 (see Annex on Methods).

Note: Due to variations in the availability of data from one year to the next, we do not provide trends in this distribution. See Annex on Methods for a description of the calculation.



#### Adults and children estimated to be living with HIV | 2021



Total: 38.4 million [33.9 million-43.8 million]



### Estimated number of adults and children newly infected with HIV 2021



Total: 1.5 million [1.1 million-2.0 million]



#### Estimated adult and child deaths from AIDS | 2021



Total: 650 000 [510 000-860 000]



### Children (<15 years) estimated to be living with HIV | 2021



Total: 1.7 million [1.3 million-2.1 million]



#### Estimated number of children (<15 years) newly infected with HIV 2021



Total: 160 000 [110 000-230 000]



#### Estimated deaths in children (<15 years) from AIDS | 2021



Total: 98 000 [67 000-140 000]



# About **4000** new HIV infections (adults and children) a day | **2021**

- About 58% are in sub-Saharan Africa
- About 430 are among children under 15 years of age
- About 3600 are among adults aged 15 years and older, of whom:
  - almost 49% are among women
  - about 31% are among young people (15-24)
  - about 19% are among young women (15–24)

## **HIV transmission (WHO)**

- o Heterosexual
- o MSM
- o Vertical (mother-child)
  - in utero
  - during delivery
  - breast feeding
- o Drugs (iv)
- Blood transfussion and organ transplantation
- o Unknown

### Estimated Per-Act Risk for Acquisition of HIV by Exposure Route

Parenteral		
Blood Transfusion	9,250	
Needle-Sharing During Injection Drug Use	63	
Percutaneous (Needle-Stick)	23	
Sexual		
Receptive Anal Intercourse	138	
Insertive Anal Intercourse	11	
Receptive Penile-Vaginal Intercourse	8	
Insertive Penile-Vaginal Intercourse	4	
Receptive Oral Intercourse	Low	
Insertive Oral Intercourse	Low	

### Risk of HIV Infection following Occupational Exposure to HIV-Infected Blood

 Approximately 0.3% following percutaneous exposure

 Approximately 0.09% following mucous membrane exposure

### **Mother-to-Child Transmission**

### Risk of MTCT is 25-40%

 Can be reduced to below1% by implementation of MTCT prevention strategies (ART, avoidance of brestfeeding, cesarean section)



<sup>\*</sup>Gavis at all 2017

## **Diagnosis of AIDS**

CD4+ number Immunologic Criteria	<b>Clinical categories</b>		
1. > 500/µl (> 29%)	<b>A1</b>	<b>B1</b>	<b>C1</b>
2.200 - 499/µl (14- 28%)	<b>A2</b>	<b>B2</b>	<b>C2</b>
<b>3. &lt; 200/μl</b> (< 14%)	<b>A3</b>	B3	C3

## Category A

acute retroviral infection (present or in the past)
asymptomatic HIV infection
persistent generalised lymphadenopathy Acute retroviral infection (present or in the past) • 2-4 weeks after infection

**O**Transient enlargement of lymph nodes **O**Arthralgia, myositis **O** Headache ONon specific macular-papular skin eruptions • Erosions on the mucosa









Persistent generalised lymphadenopathy

lasting >3 months
>1cm in 2 or more regions,



- Unusual symptoms of common disorders (severe course, lack of response to the treatment)
- Suggestive of depressed cell-mediated immunity
- PID (pelvic inflammatory disease)
- Bacterial angiomatosis
- Candidiasis
- O Hairy leukoplakia
- CIN2/3 and carcimona in situ
- Zoster ( > 2 dermatomes, > 2 episodes)
- Idiopatic thrombocytopenic purpura
- O listeriosis
- Neuropathy
- o others



### Severe seborrheic dermatitis in HIV+ patient

## onychomycosis



## onychomycosis



## Candidiasis



### Candidiasis



\*S. Dhanireddy and R. Harrington, Atlas of Sexually Transmitted Diseases and AIDS
#### Candidiasis



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### Hairy leukoplakia



#### Hairy leukoplakia



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### **Eosinophylic foliculitis**



#### **Moluscum contagiosum**



#### Severe Foliculitis – S. aureus



#### **Recurrent HSV infection**



#### **Cervical intraepithelial neoplasia (CIN)**



#### **Bacterial angiomatosis**



# Other skin diseases exacerbated by HIV/AIDS

- ZosterTuberculosis
- Bacterial, fungal, parasitic infections
  Atopic dermatitis
- oAcne
- Vascular lesions (purpura)
  Lichen planus
- oother

#### Inverted acne in a HIV+ patient



#### Extensive disseminates cutaneous warts







## Psoriasis in HIV+ patient





Candidiasis of esophagus, larynx , lungs

#### **OInvasive cervical cancer**

- Histoplasmosis (lungs)
- O Coccidioidomycosis
- Isosporisis
- Cryptococosis
- CMV infections

#### OSevere HSV infections (>1 month)

#### OKaposi sarcoma

• Lymphomas (mainly of B cell type)

# Coccidioidomycosis





Severe bacterial infection (Bacterial embolisms in the course of sepsis)



# **Severe HSV infection**



# **Severe HSV infection**



#### HSV infection in a HIV positive patient

# Kaposi sarcoma (KS)

**O**Classical **O**Endemic **Olatrogenic** (immunosuppression) **OEpidemic (AIDS)** (HHV8 – human herpes virus 8)





#### **Classical Kaposi sarcoma**



## **Classical Kaposi sarcoma**



## AIDS – associated Kaposi sarcoma













\*C Despireddy and P Harrington Atlac of Sovually Tre





#### Necrotic lesions at the site of i.v. drug injection



#### Necrotic lesions at the site of i.v. drug injection

#### Severe drug-induced lesions in HIV positive patient


#### **Diagnostics – screening by ELISA**



I. Antigen is bound to microtiter well



2. Antibody from serum added; wash



 Antihuman immunoglobulin antibody conjugated with enzyme (E) added; wash



4. Add enzyme substrate (S); color formed (P)



 Color formed is proportional to amount of antibody in serum

#### Diagnosis of HIV infection confirmatory Western Blot test



## Children (mothers HIV+)

Antibodies from mother may persist until 18 months of age
p24 and RNA HIV (RT-PCR)

# HIV RNA testing (NAATs) as a diagnostic test

- Children (mothers HIV+)
- suspected acute retroviral disease/early HIV infection
- suspected AIDS and urgent need to start treatment, childbirth et cetera.

### When to start treatment

As soon as possible after detection of HIV infection

#### Inhibitors of reverse transcriptase

#### -nucleoside inhibitors (NRTI)

 Abakavir (ABC), azydothymidyne (AZT), didanozyne (ddl), stavudyna (d4T), lamiwudyna (3TC), emtrycytabine (FTC)

#### o-nucleotide inhibitors (NtRTI)

> tenofovir DF(TDF)

#### o-non-nucleoside inhibitors (NNRTI)

> nevirapine (NVP), efavirenz (EFV) ,Etravirine(ETR) Rilpivirine(RPV)

#### **Protease inhibitors(PI):**

atazanawir (ATV), lopinawir (LPV/r), darunawir (DRV), fosamprenawir (FVP), rytonawir (RTV\*), sakwinawir (SQV), typranawir(TPV)

#### Integrase inhibitors:

raltegrawir (RAL), elvitegrawir(EVG), dolutegrawir (DTG), Biktegrawir (BIC), Kabotegrawir(CAB)

#### **Entry/attachment inhibitors:**

- Fusion inhibitors
- enfuvirtyd (ENF)
- CCR5 antagonists
   maroviroc (MVC)
- Attachment inhibitors
- Fostemsavir
- Monoclonal antibodies
- Ibalizumab



 Simultaneous use of multiple ARV drugs (to pervent resistance)

 Usually 2NRTI + NNRTI or PI or an inegrase inhibitor



i.e. Elvitegravir+Tenofovir+Emtricitabine Rilpivirine +Tenofovir+Emtricitabine Atazanavir/Ritonavir +Tenofovir+Emtricitabine

once daily regimens

Post-exposure prophylaxis

OCleaning of the skin **OIntroduction of treatment** (<72 hrs) after exposure **OTreatment for 1 month** ○ 2 NRTI or 2NRTI+PI

#### **Pre-exposure prophylaxis**

- Tenofovir + emtricitabine for as long as risk of infection persists 1 x daily 1 tab
- Alternatively: emergency prophylaxis\* 2 tab 2-24 h before and intercourse 1 x 1 tab next 2 days or
- cabotegravir -i.m. every 2 months

# Thank you very much for your attention!