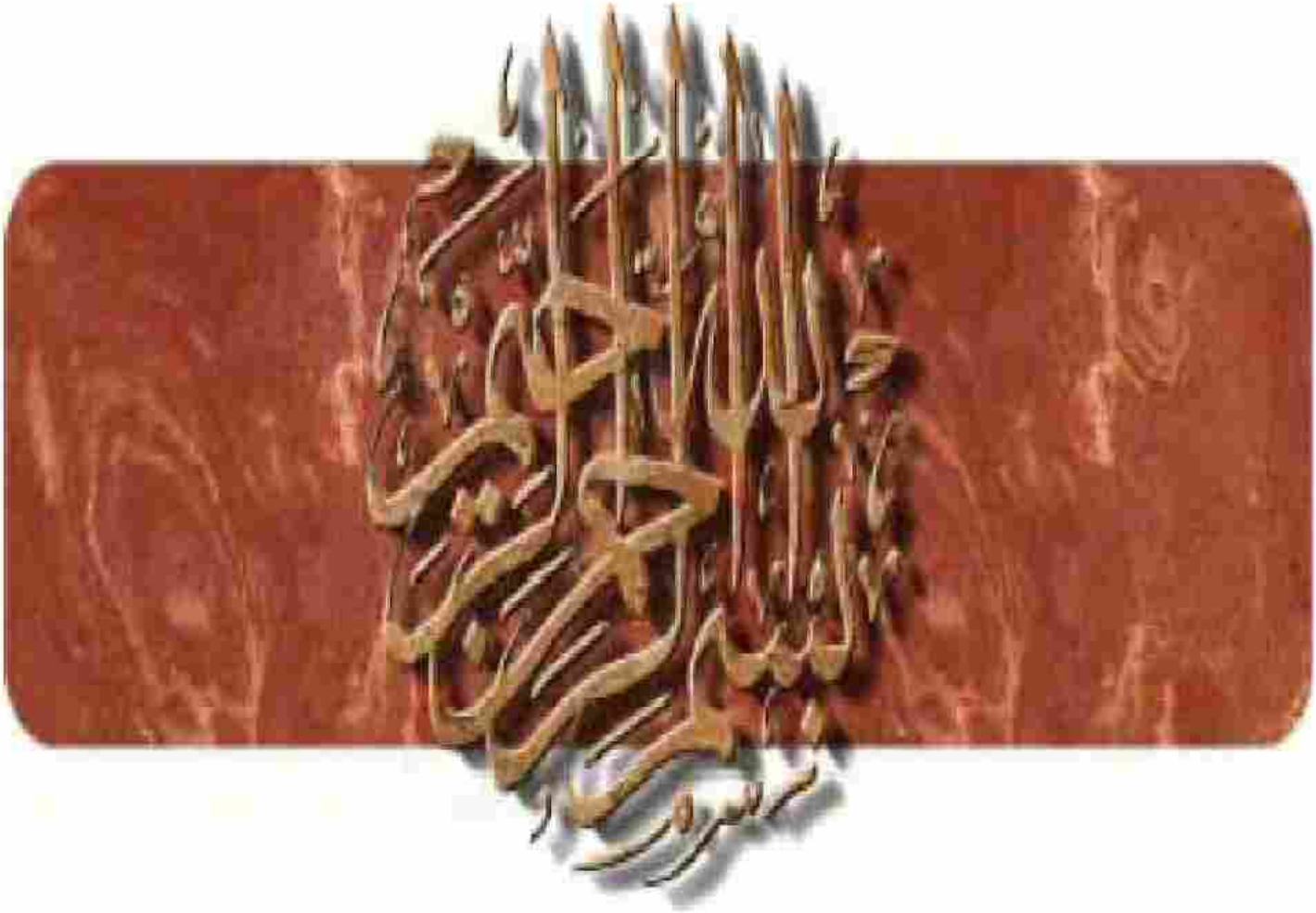


HIV/AIDS Epidemiology & Clinical Manifestations

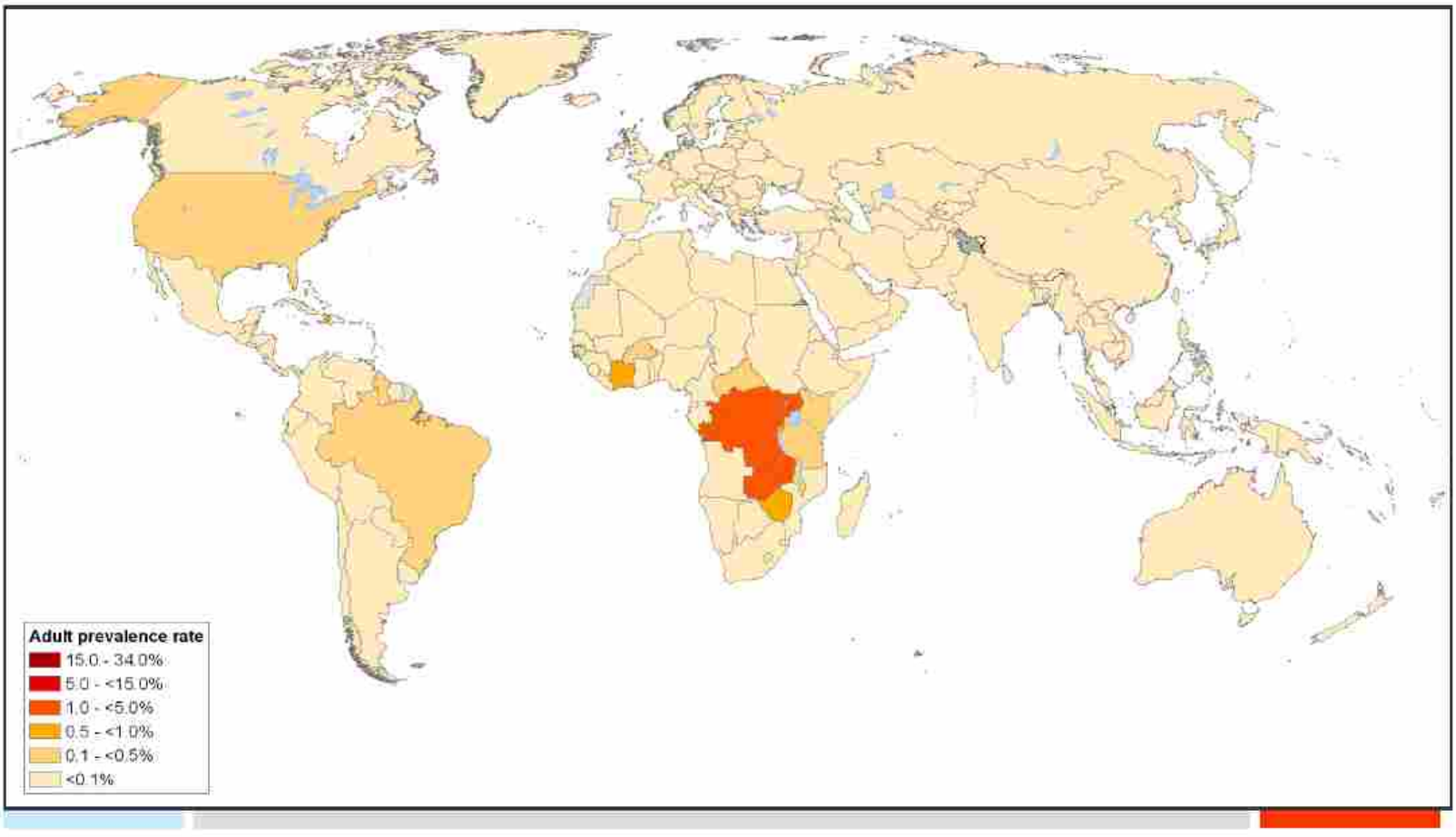
Hossain Jabbari
MD, MPH, ID & TM
ID Dept. , DDRC & IRCHA
TUMS

Epidemiology of

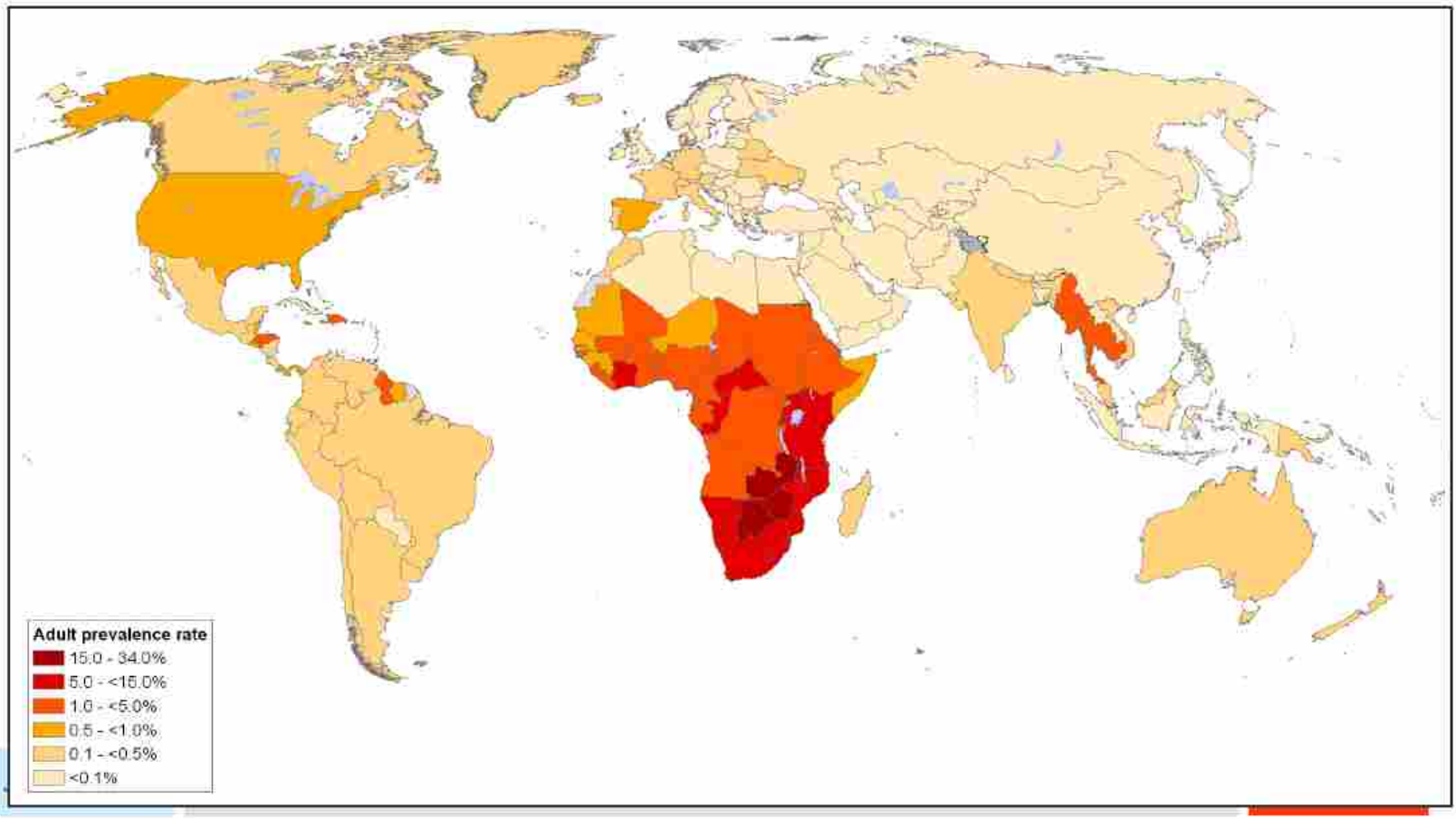
HIV / AIDS

HIV/AIDS Epidemiology in the World

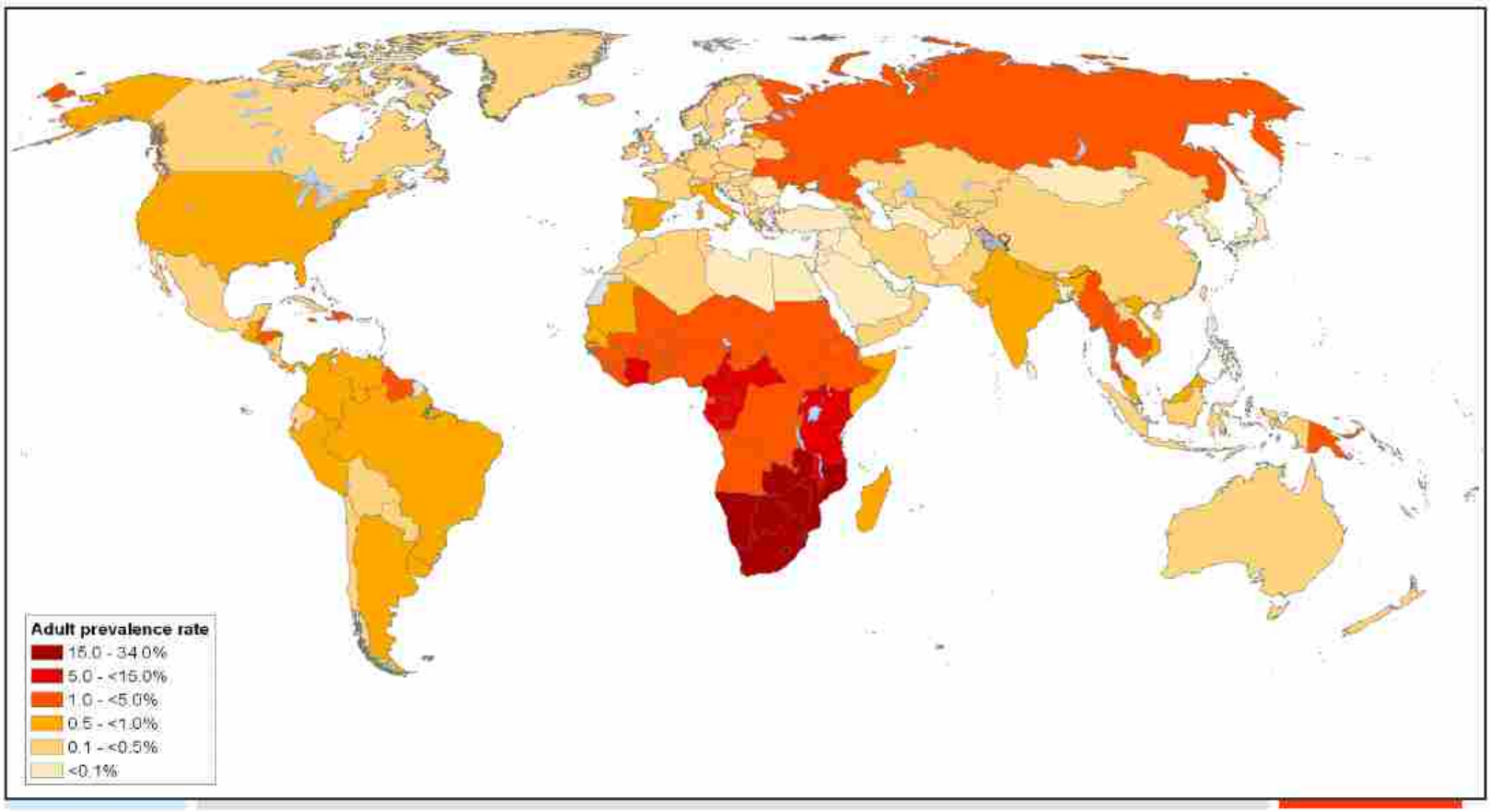
Global HIV prevalence in adults, 1985



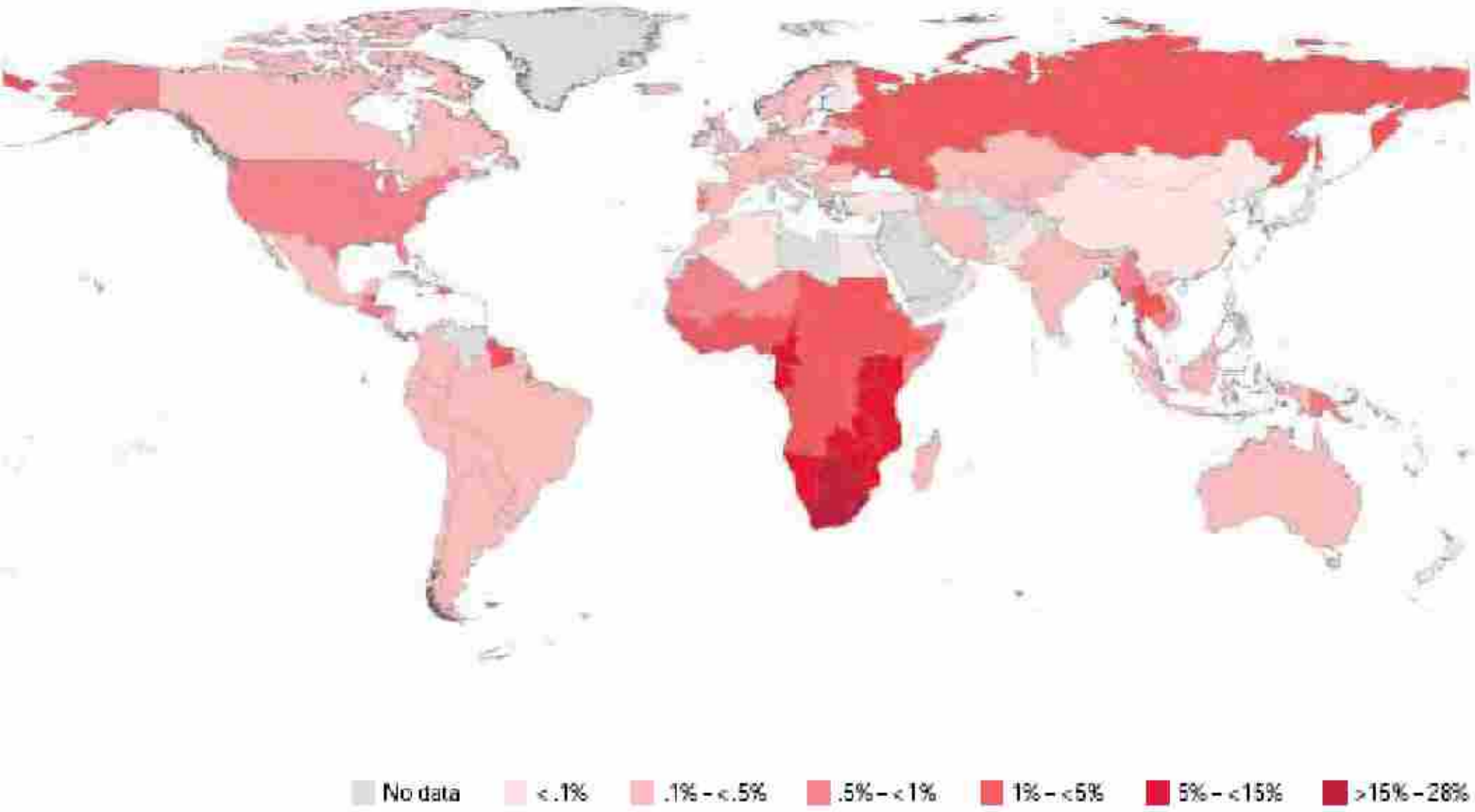
Global HIV prevalence in adults, 1995



Global HIV prevalence in adults, 2005



Global prevalence of HIV, 2009

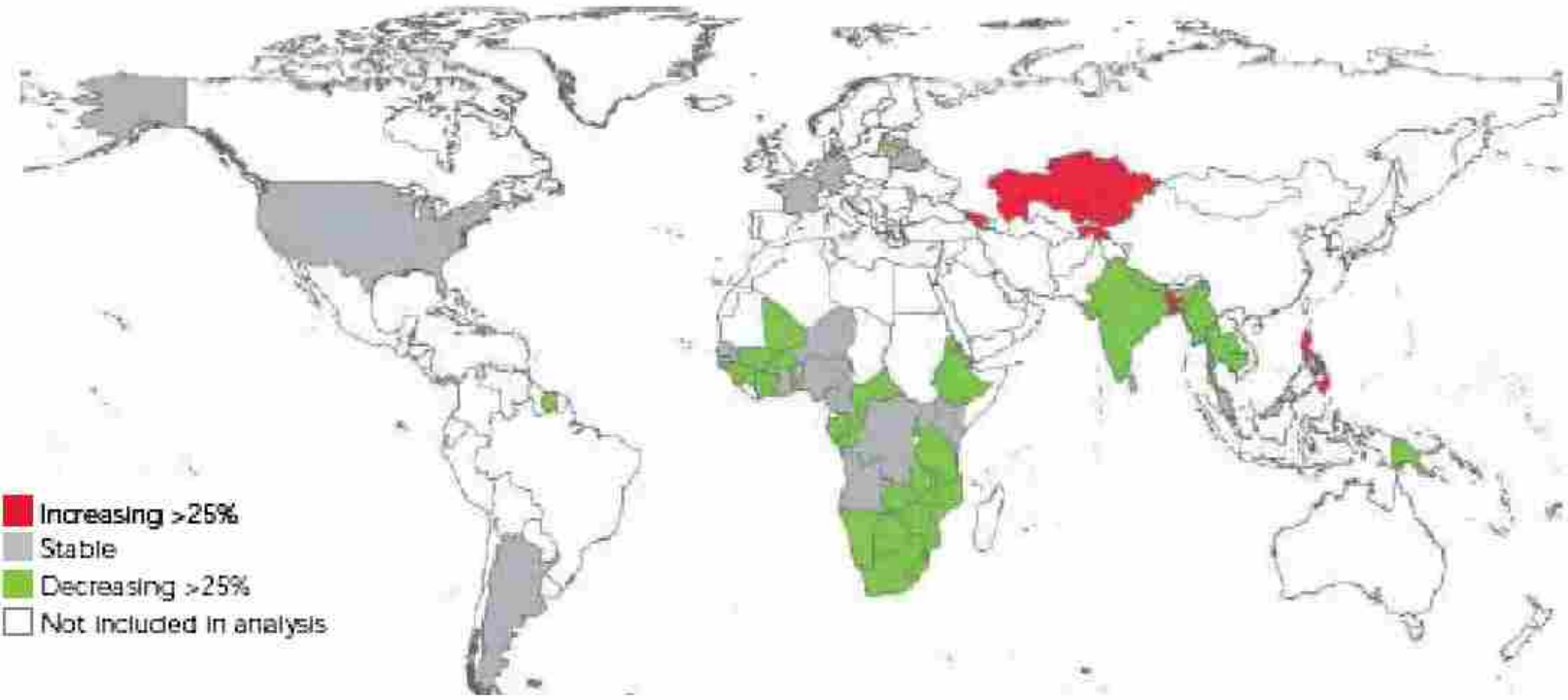


Adults and children estimated to be living with HIV, 2009

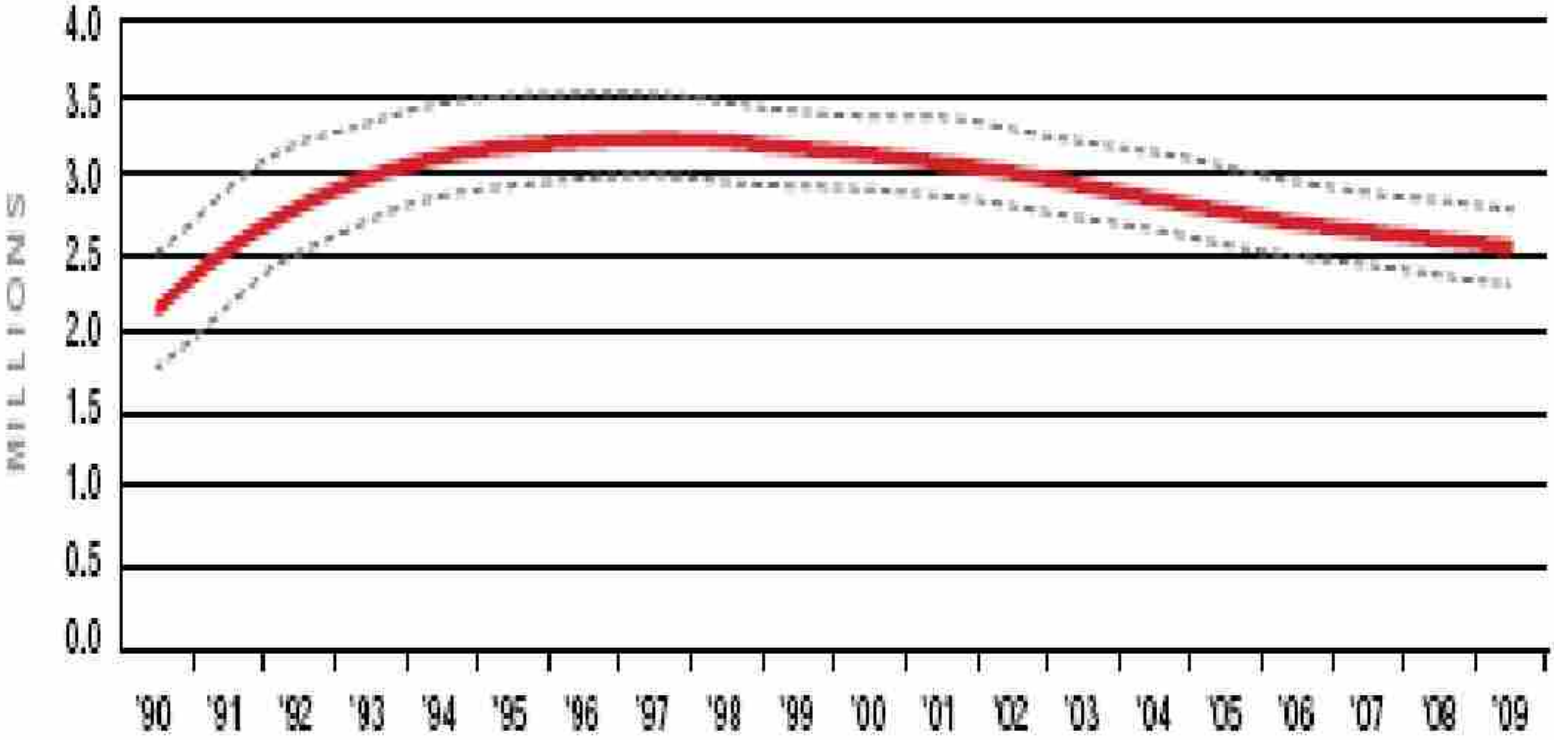
Total: 33.3 million [31.4 million – 35.3 million]

Changes in the incidence rate of HIV infection, 2001 to 2009, selected countries

Source: *UNAIDS*.



Number of people newly infected with HIV



World Health Organization

UNAIDS

Global summary of the AIDS epidemic, December 2007

Number of people living with HIV in 2007	Total	33 million [30 – 36 million]
	Adults	30.8 million [28.2 – 34.0 million]
	Women	15.5 million [14.2 – 16.9 million]
	Children under 15 years	2.0 million [1.9 – 2.3 million]
People newly infected with HIV in 2007	Total	2.7 million [2.2 – 3.2 million]
	Adults	2.3 million [1.9 – 2.8 million]
	Children under 15 years	370 000 [330 000 – 410 000]
AIDS deaths in 2007	Total	2.0 million [1.8 – 2.3 million]
	Adults	1.8 million [1.6 – 2.1 million]
	Children under 15 years	270 000 [250 000 – 290 000]

Global summary of the AIDS epidemic, 2009

	Adults and children living with HIV	Adults and children newly infected	% Adult prevalence (15–49 years)	AIDS-related deaths among adults and
2009	33.3 million [31.4–35.3 million]	2.6 million [2.3–2.8 million]	0.8 [0.7–0.8]	1.8 million [1.6–2.1 million]
2001	28.6 million [27.1–30.3 million]	3.1 million [2.9–3.4 million]	0.8 [0.7–0.8]	1.8 million [1.6–2.0 million]

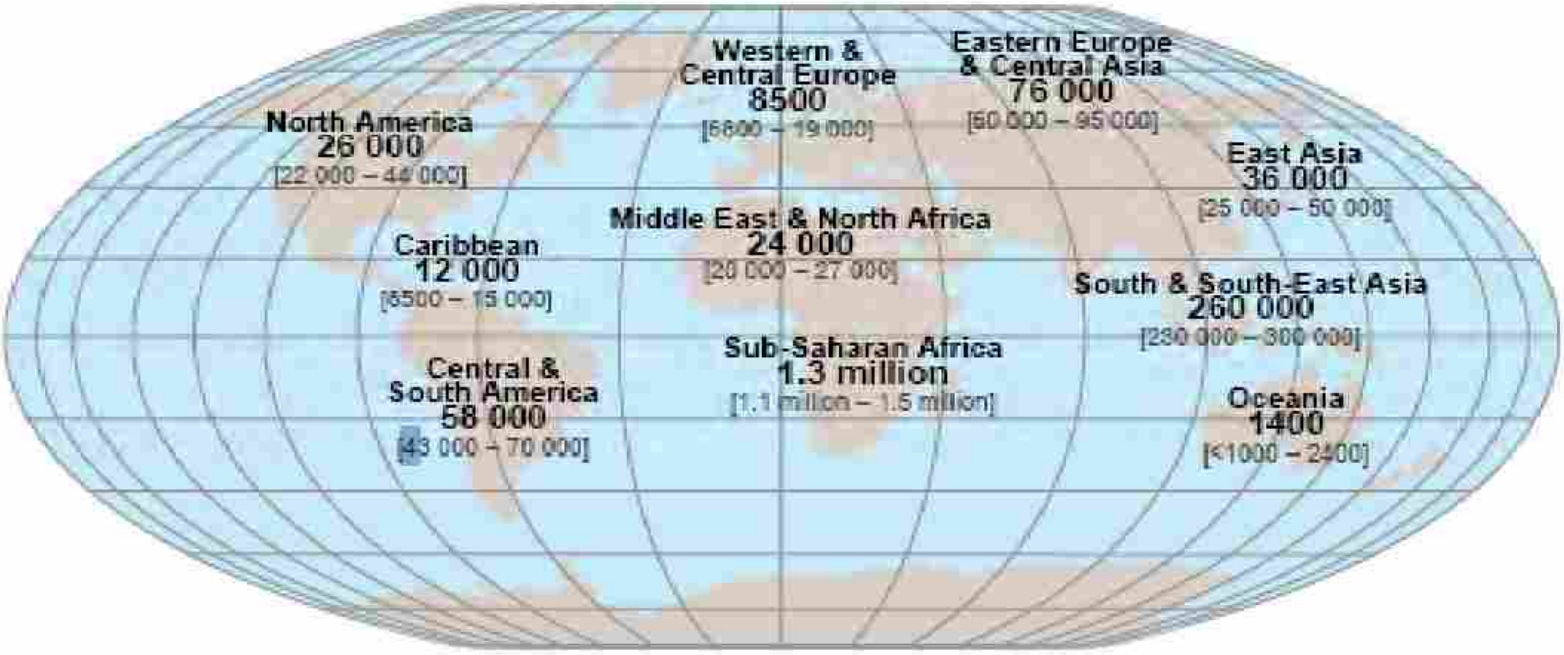
World Health Organization

UNAIDS

Global estimates for adults and children, 2009

- **People living with HIV** ---------- **33.3** million [31.4 – 35.3 million]
- **New HIV infections in 2009** ------ **2.6** million [2.3 –2.8 million]
- **Deaths due to AIDS in 2009** ----- **1.8** million [1.6 – 2.1 million]

Estimated adult and child deaths from AIDS, 2009



Total: 1.8 million [1.6 million – 2.1 million]

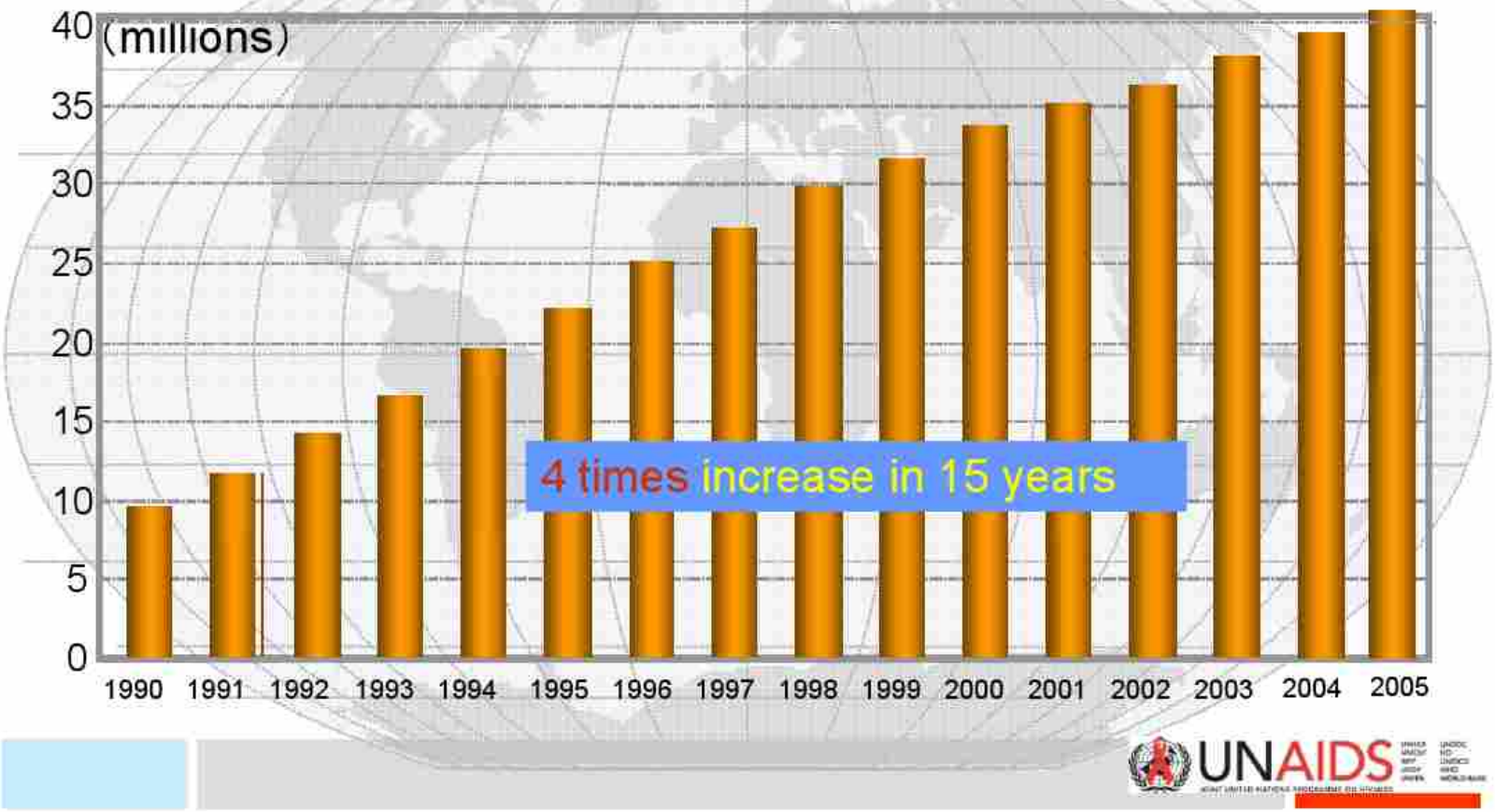
World Health Organization

UNAIDS

Over 7000 new HIV infections a day in 2009

- About 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)

Global HIV epidemic 1990-2005

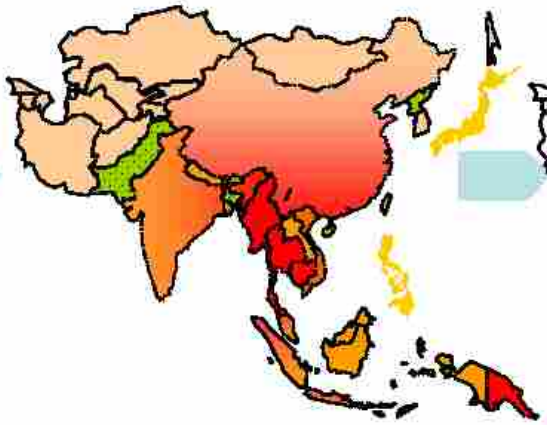


UNAIDS

HIV/AIDS Epidemiology in Asian countries

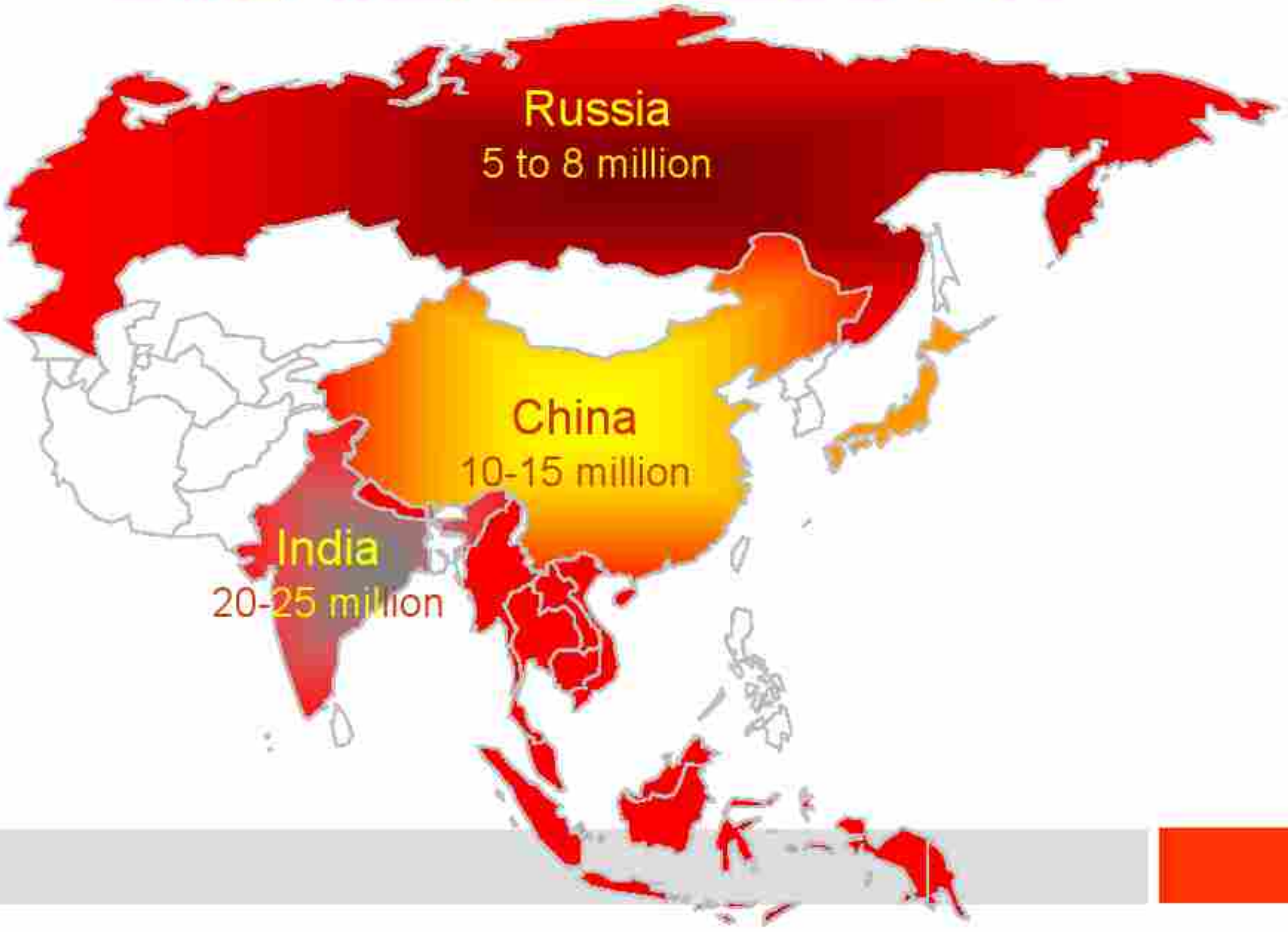
Asia

1990	2000	2010
It started in **Thailand**	Expanded to all over Southeast Asia	



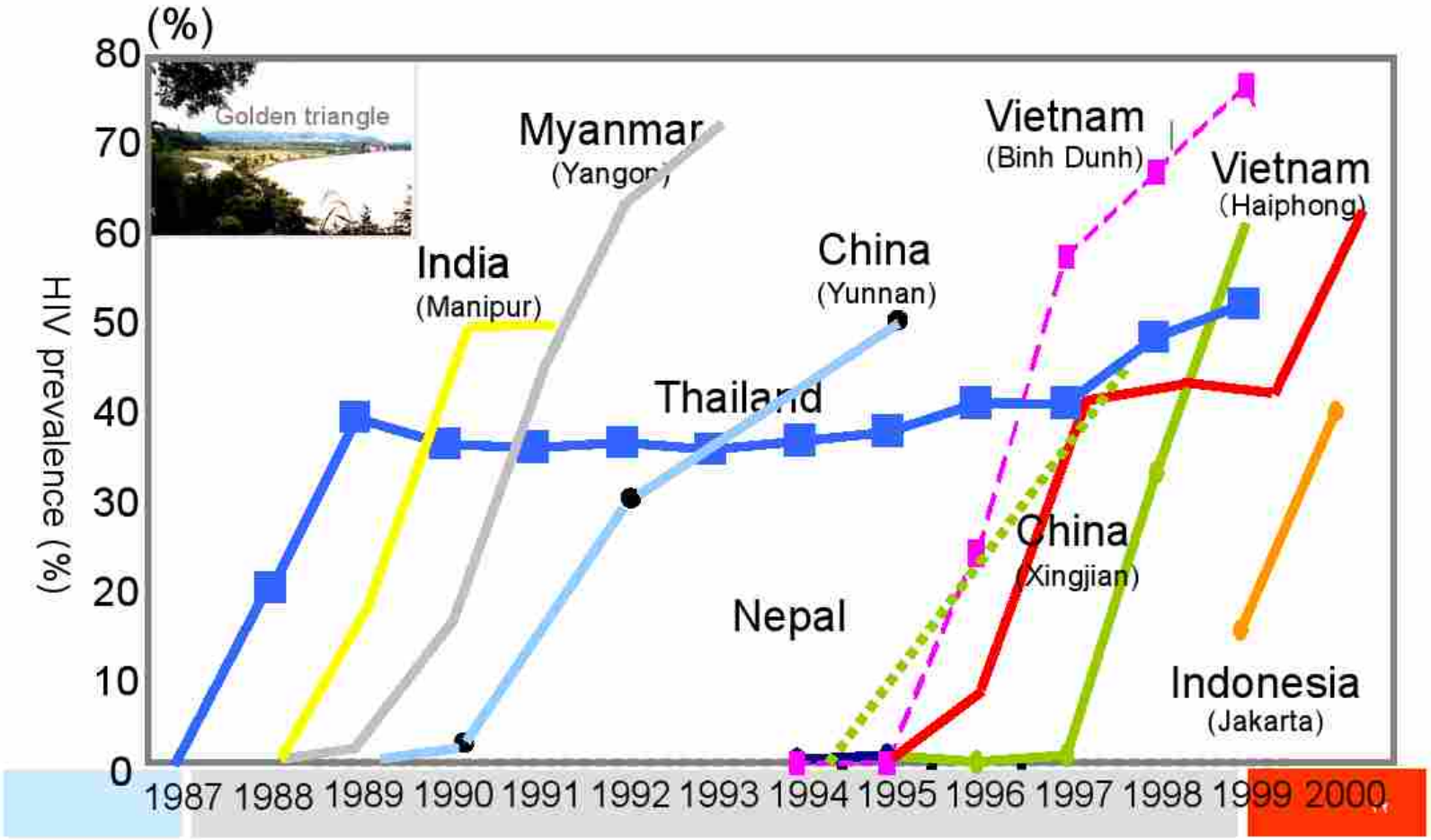
150 000 (Est. by UNAIDS)	6.4 mil. (Est. by UNAIDS) China 500 000 India 3.7 mil.	?

Estimated prevalence of PLWH/A in China, India and Russia in 2010



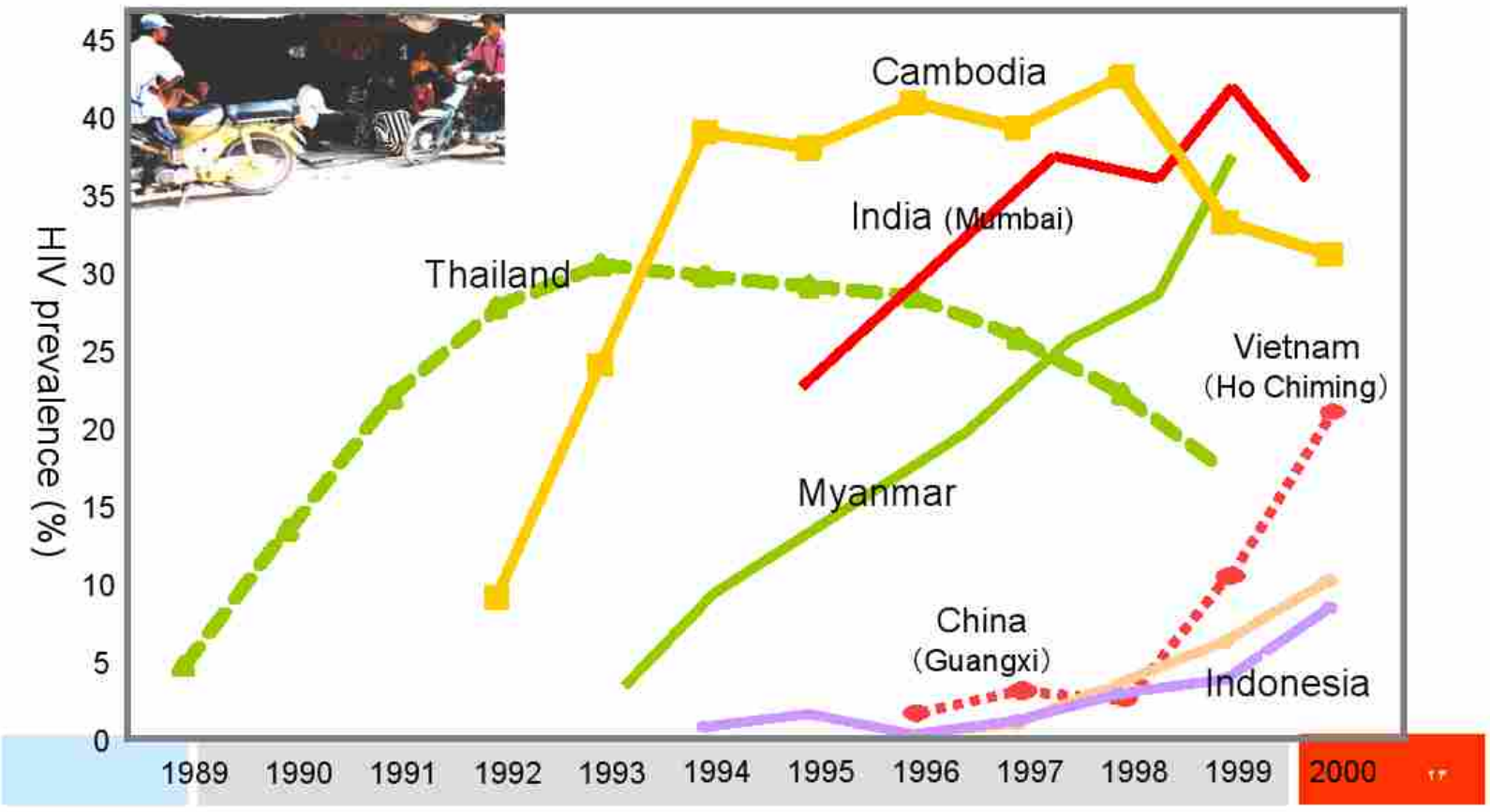
Asia

HIV epidemic among injecting drug users

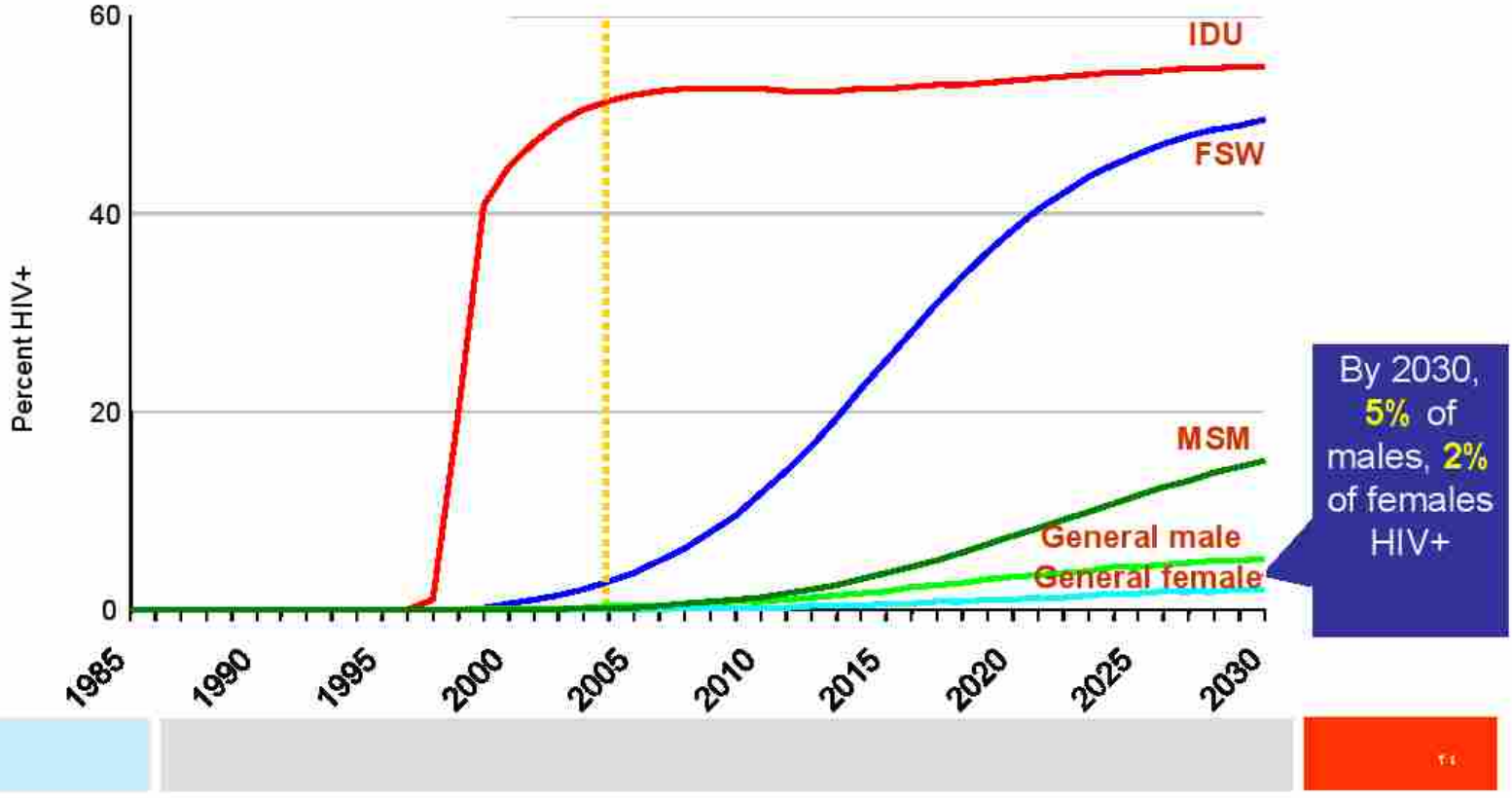


Asia

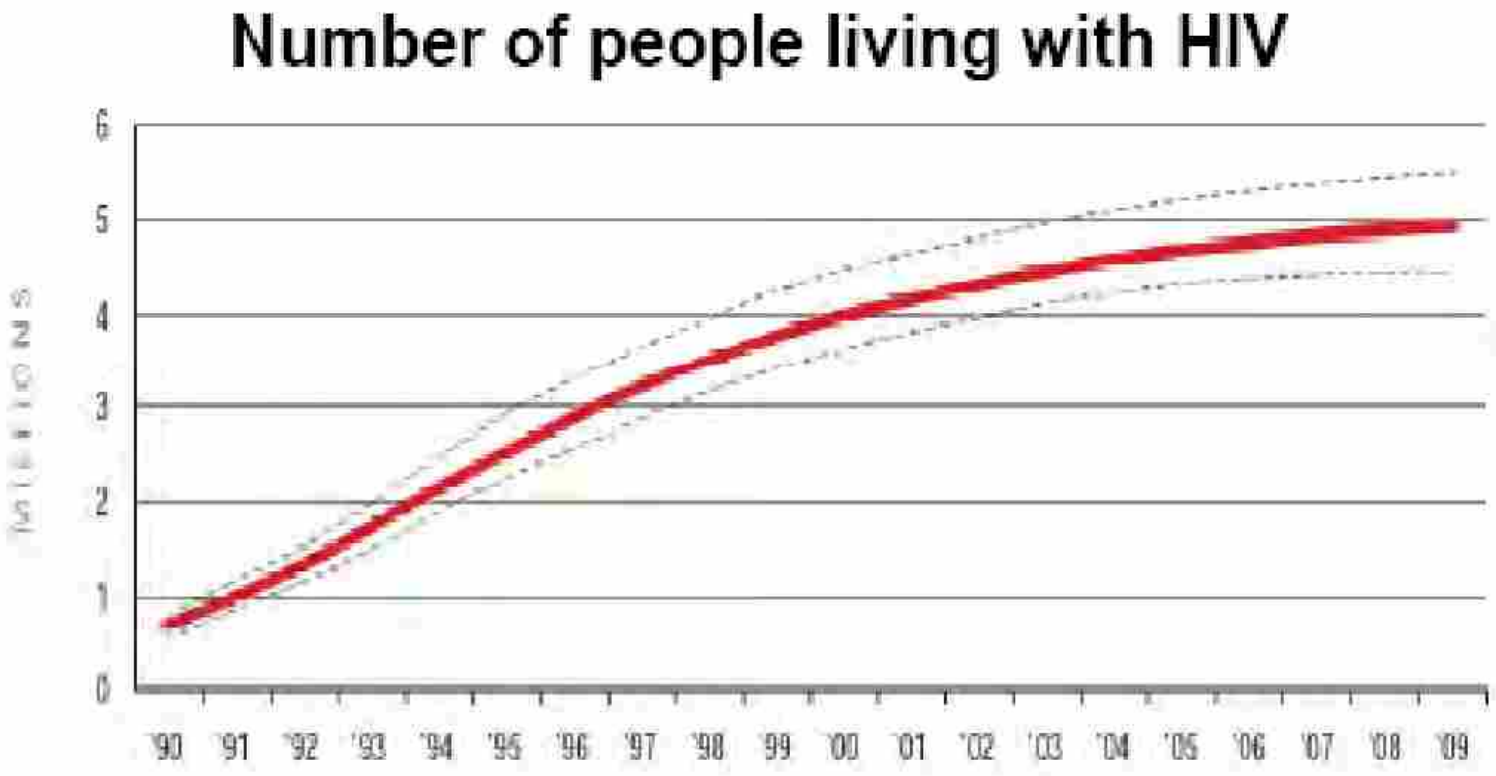
HIV epidemic among sex workers



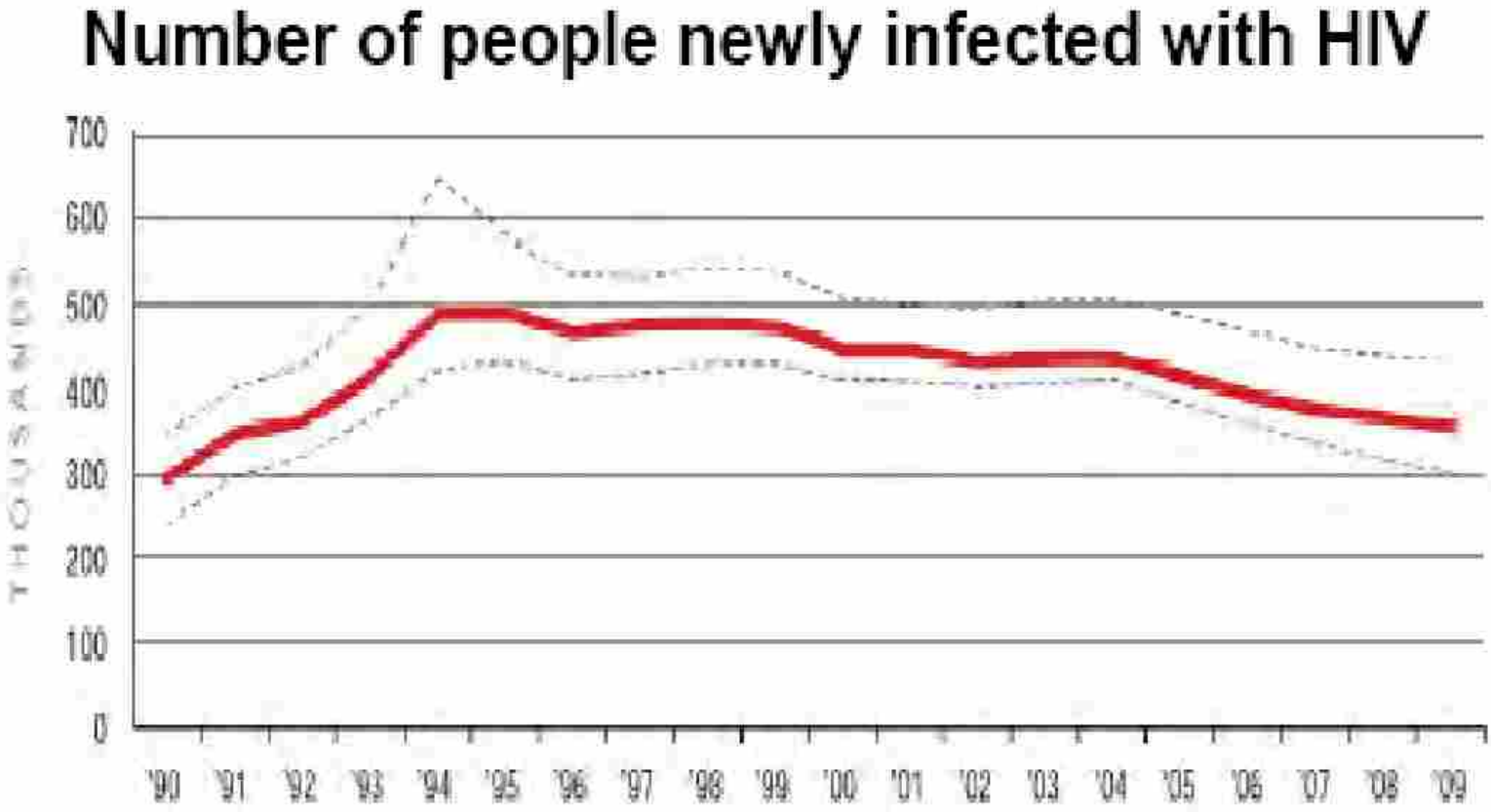
The baseline scenario through 2030



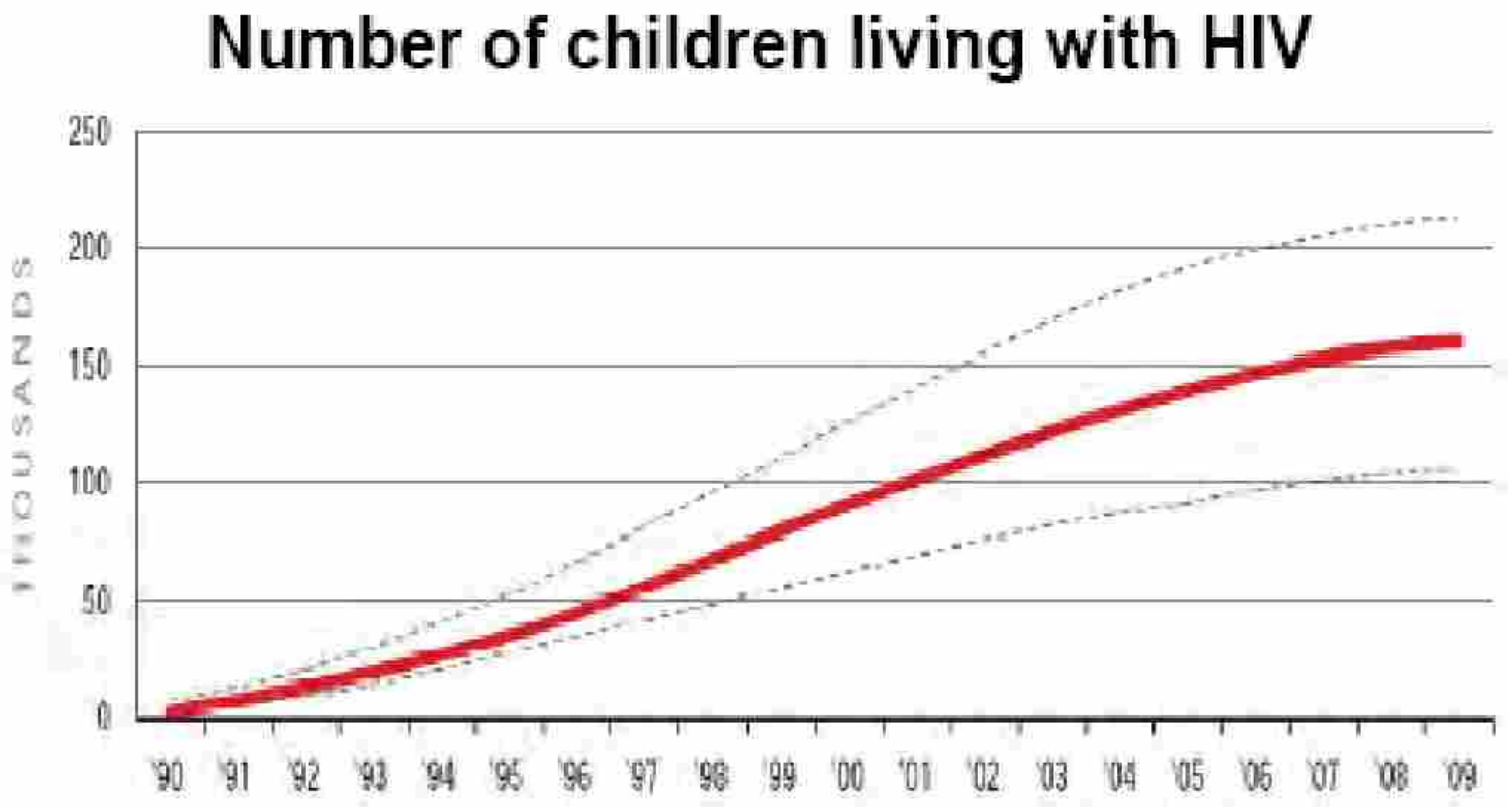
HIV trends in Asia



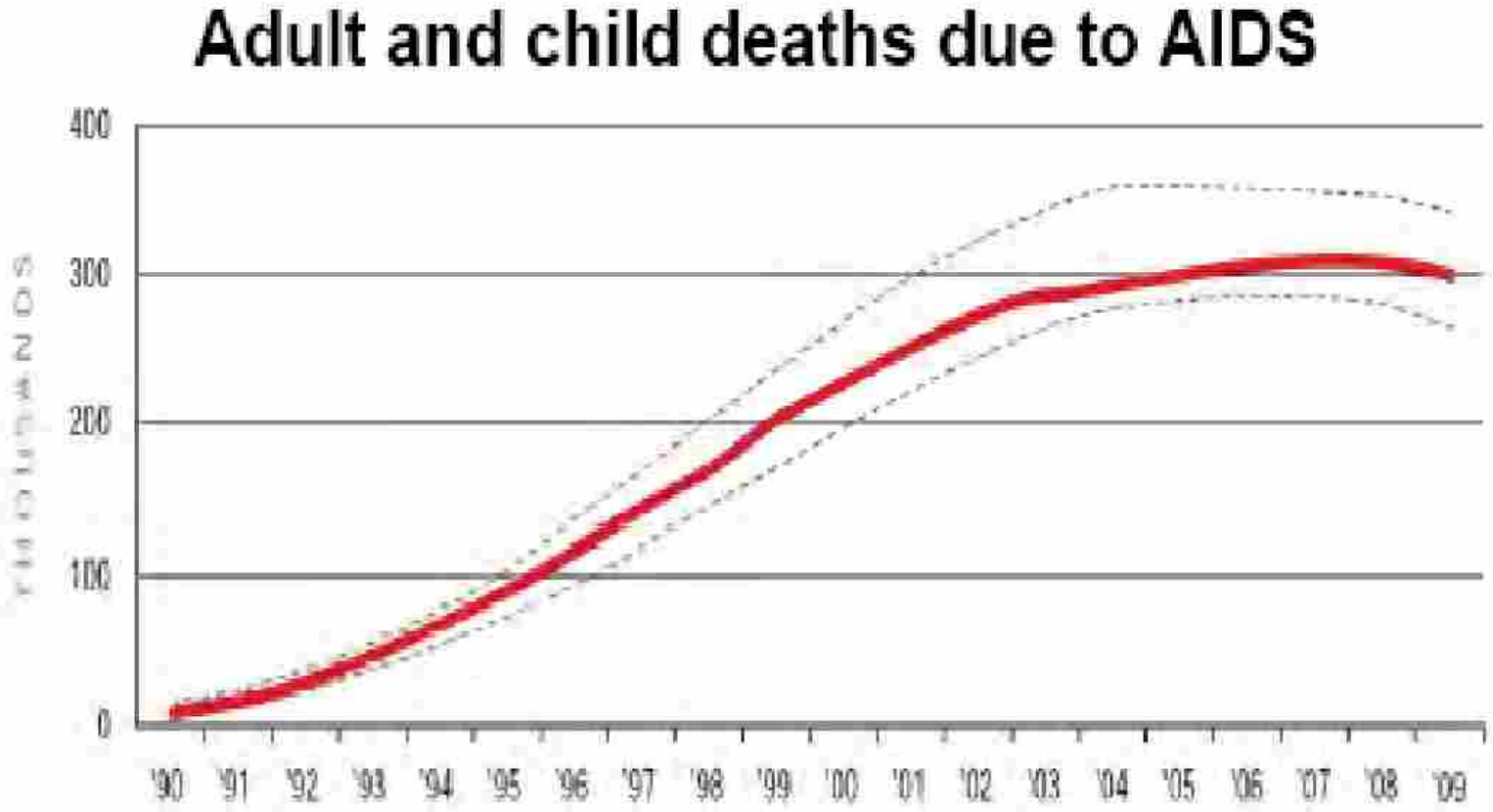
HIV trends in Asia



HIV trends in Asia



HIV trends in Asia



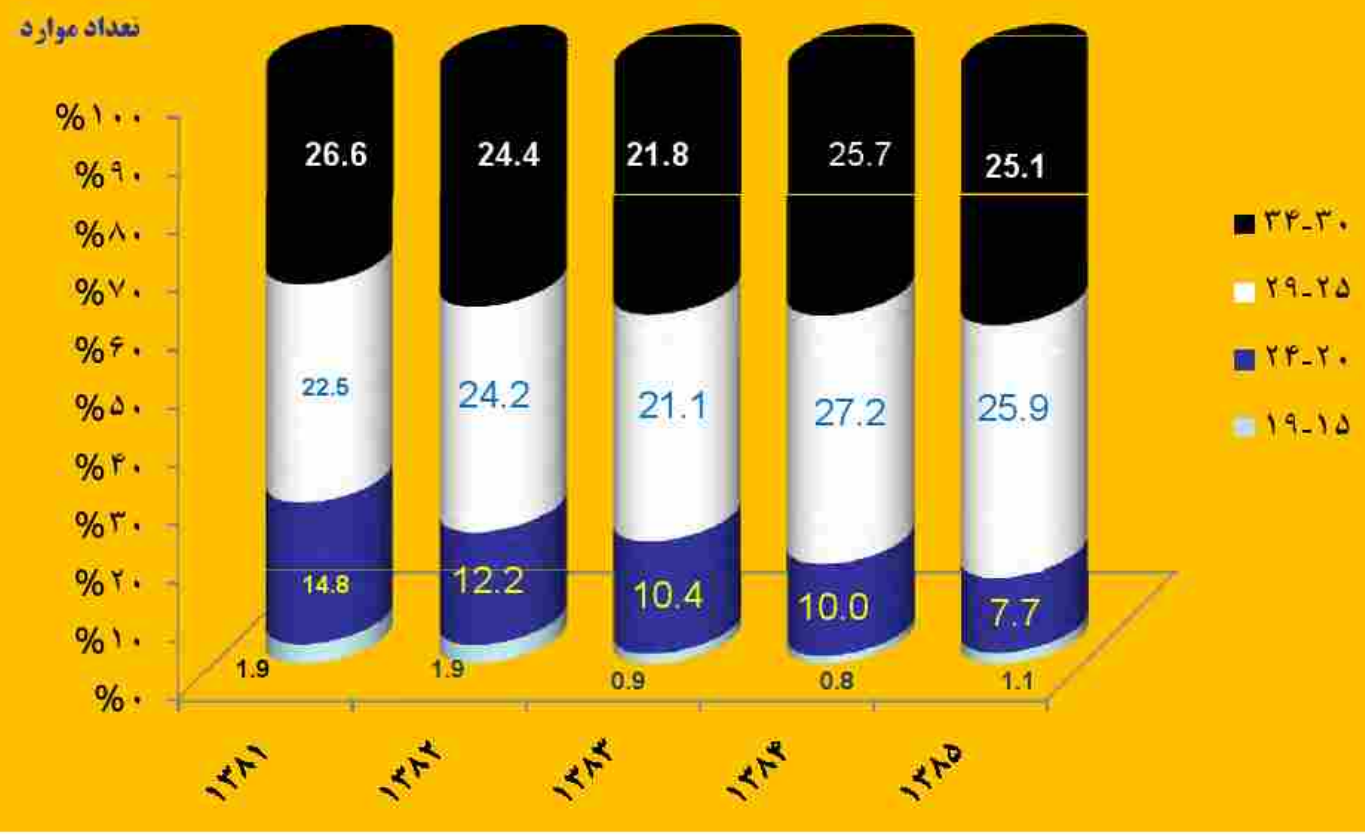
AIDS statistics for Asia, 2001 and 2009

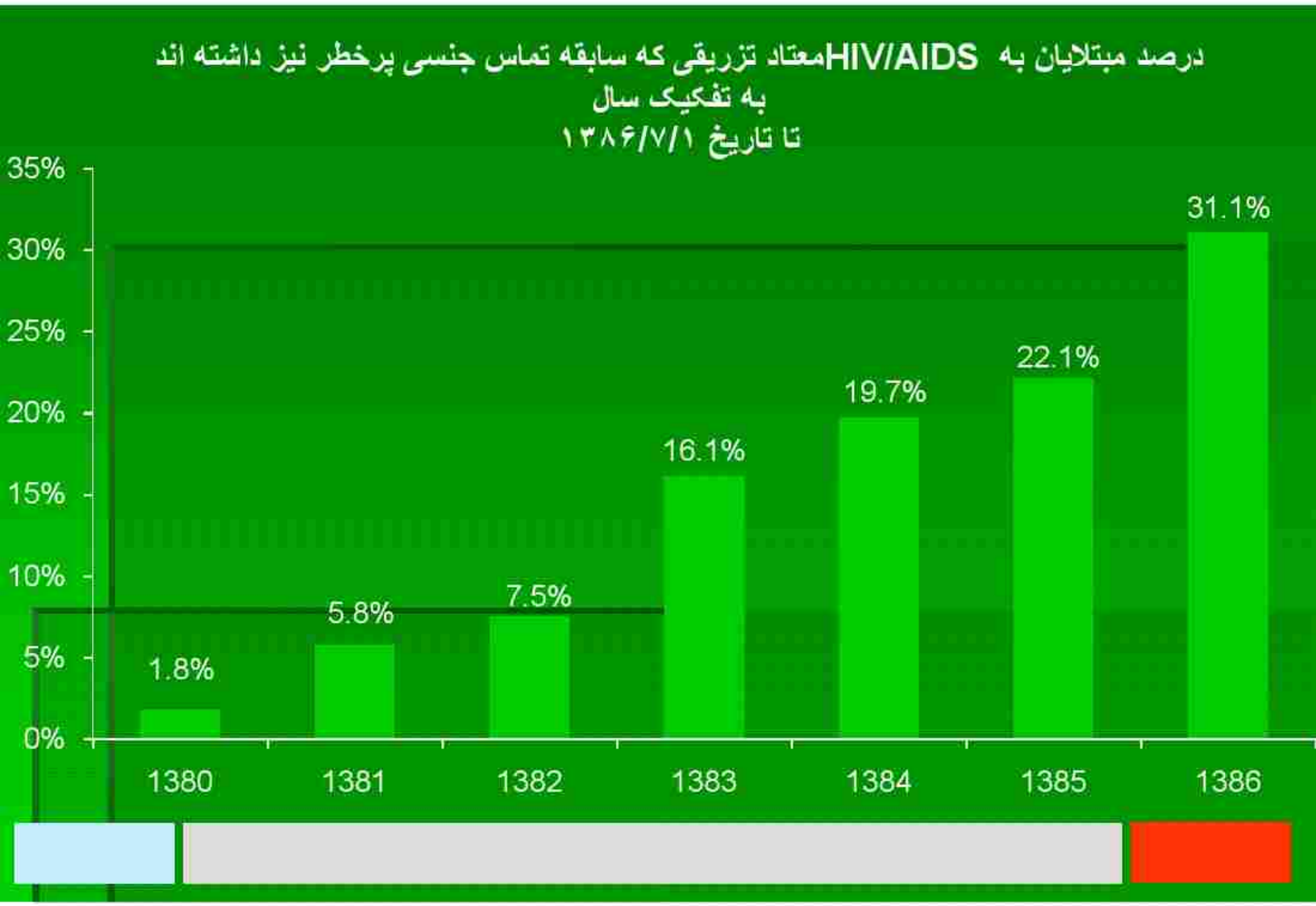
	People living with HIV	People newly infected with HIV	Children living with HIV	AIDS-related deaths
2009	4.9 million [4.5–5.5 million]	360 000 [300 000–430 000]	160 000 [110 000–210 000]	300 000 [260 000–340 000]
2001	4.2 million [3.8–4.6 million]	450 000 [410 000–500 000]	100 000 [69 000–140 000]	250 000 [220 000–300 000]

HIV/AIDS Epidemiology in Iran

- طبق آخرین آمار منتشره تا تاریخ ۱۳۸۹/۷/۱ مجموعاً ۲۱۸۹۰ نفر افراد مبتلا به اچ‌آی‌وی در کشور شناسایی شده‌اند که از این تعداد:
- مبتلایان به ایدز ۲۶۰۰ نفر و موارد فوت ۳۹۰۰ بوده اند.
- ۶۹/۹٪از موارد ابتلا به علت مصرف تزریقی مواد،
- ۹/۳٪به علت رابطه جنسی،
- ۰/۷٪از راه مادر به کودک
- ۱/۱٪ به علت دریافت فراورده‌های خونی بوده
- راه انتقال در ۱۹٪ از مبتلایان نامشخص بوده‌است.
- مرد : ۹۲/۲٪موارد شناخته شده
- زن : ۷/۸٪موارد شناخته شده
- تخمین موارد : ۸۰۰۰۰ تا ۷۰۰۰۰

موارد گزارش شده مبتلایان به HIVو ایدز برحسب گروه سنی (سن ابتلا) به تفکیک سال




درصد مبتلایان به HIV/AIDSمعتاد تزریقی که سابقه تماس جنسی پرخطر نیز داشته اند
به تفکیک سال
تا تاریخ ۱۳۸۶/۷/۱
35%
30%
25%
20%
15%
10%
5%
0%
1.8%
5.8%
7.5%
16.1%
19.7%
22.1%
31.1%
1380
1381
1382
1383
1384
1385
1386

نقش مصرف کنندگان مواد در اپیدمی

- .تعداد مصرف کنندگان تزریقی مواد در ایران ا*ندک نیست(* حدود **۲۰۰**تا **۴۰۰ هزارنفر**)
- .شیوع زیاد مصرف مواد *وتغییرات درنحوه مصرف مواد* ازاستنشاقی به تزریقی ،*مخزن بزرگی* فراهم میکند (تا افزایش سالانه ۸ ٪ در مصرف مواد وتا افزایش سالانه ۳۳٪ در مصرف تزریقی مواد)
- . *تزریق مشترک مواد* در مصرف کنندگان آن طی سالهای اخیر قابل توجه بوده است(درآخرین بررسی سوءمصرف مواد در سال ۱۳۸۳ حدود ۵۰ ٪ در یک تادو ماه آخر)
- ..*ورود به زندان* وسابقه زندانی شدن در این جمعیت شایع است (یک سوم آنها سابقه زندان دارند)
- این عوامل یعنی اشتراک در تزریق وبخصوص اشتراک در تزریق در زندان باعث شعله ور شدن اپیدمی در مصرف کنندگان مواد شد،بگونه ای که هم اکنون در بیشتر مناطق کشوربین
- ۵تا ۲۵٪ تخمین زده میشود.

ادامه:نقش مصرف کنندگان مواد در اپیدمی

- در حال حاضر *ارتباط جنسی با مصرف کنندگان مواد مهمترین عامل خطر* ابتلا به اچ آی وی در کسانی است که خود مصرف کننده تزریقی مواد نیستند
- بررسی ها حاکی ازانندکه ۳۰تا ۵۰٪**مصرف** کنندگان تزریقی مواد متاهل هستند
- *رابطه جنسی خارج از ازدواج در آنها بسیار شایع است* و در یک مطالعه ۳۰تا ۵۰ ٪در یکماه قبل از بررسی گزارش شده است
- در ارزیابی سریع وضعیت ۱۳۸۳ حدود ۴۳٪ آنان در یکماه قبل از بررسی با فردی غیر از همسر خود نزدیکی داشته اند،که در یک چهارم موارد با زنی غیرتن فروش و در یک چهارم موارد دیگر زنی تن فروش ودر ۱۳٪موارد با مردی دیگر بوده است
- *استفاده از کاندوم در آنها کم* و*تعدد شرکای جنسی بسیار شایع* بوده است

شیوع HIV در بررسی های معتادین

- ۱۸/۵درصد معتادین تزریقی در ۳ کلینیک اعتیاد
- ۲۲-۲۴ درصد در قزل حصار
- ۲۵ درصد در معتادین تزریقی و ۶ درصد معتادین غیر تزریقی خیابانی تهران

شاخص های رفتار در کشور

- در یک مطالعه در سطح شهر تهران استفاده از کاندوم در زنان تن فروش سال ۱۳۸۶: ۵۵.۰٪(۱۵۴ نفر از از ۲۸۰ نفر)

- مطالعه در ۱۰ استان بر روی مصرف کنندگان تزریقی مواد:
  - مصرف کاندوم در آخرین تماس جنسی : ۳۲.۸٪ (۵۱۹ نفر از ۱۵۸۲ نفر)
  - استفاده از روش تزریق سالم ۷۴.۵٪(۱۵۱۶ نفر از ۲۰۳۶ نفر)

شاخص های پیامد در کشور

- براساس دیده وری ها در کلینیک های مراقبت زنان باردار تا سال ۱۳۸۵ صفر در صد

- .مصرف کنندگان تزریقی در سال ۱۳۸۶: در سطح کشور ۱۸/۸٪(۳۱۸ نفر از ۱۶۹۳ نفر) ودر شهر تهران ۱۲/۳٪(۱۸ نفر از ۱۴۹ نفر)

- .زنان تن فروش اطلاعات قابل تعمیم موجود نیست

۱.مصرف کنندگان تزریقی مواد:

در دیده وری انجام شده شیوع اچ آی وی در مصرف کنندگان تزریقی مواد در کل کشور ۱۸.۴٪ ودر شهر تهران ۱۲.۳٪بوده است.

۲. زندانیان:

شیوع اچ آی وی در زندانیان در دیده وری های انجام شده در زندانهای ۷ استان در سالهای ۱۳۸۳ و۱۳۸۵ به ترتیب ۶.۸٪ و۵.۸٪ بوده است.

۳. زنان تن فروش:

داده های برخی مطالعات پراکنده حاکی از آنست که شیوع اچ آی وی در زنان تن فروشی که مصرف کننده تزریقی مواد نیستند، هنوز پایین است وبطور قطع به حد بحرانی ۵٪ نرسیده است .

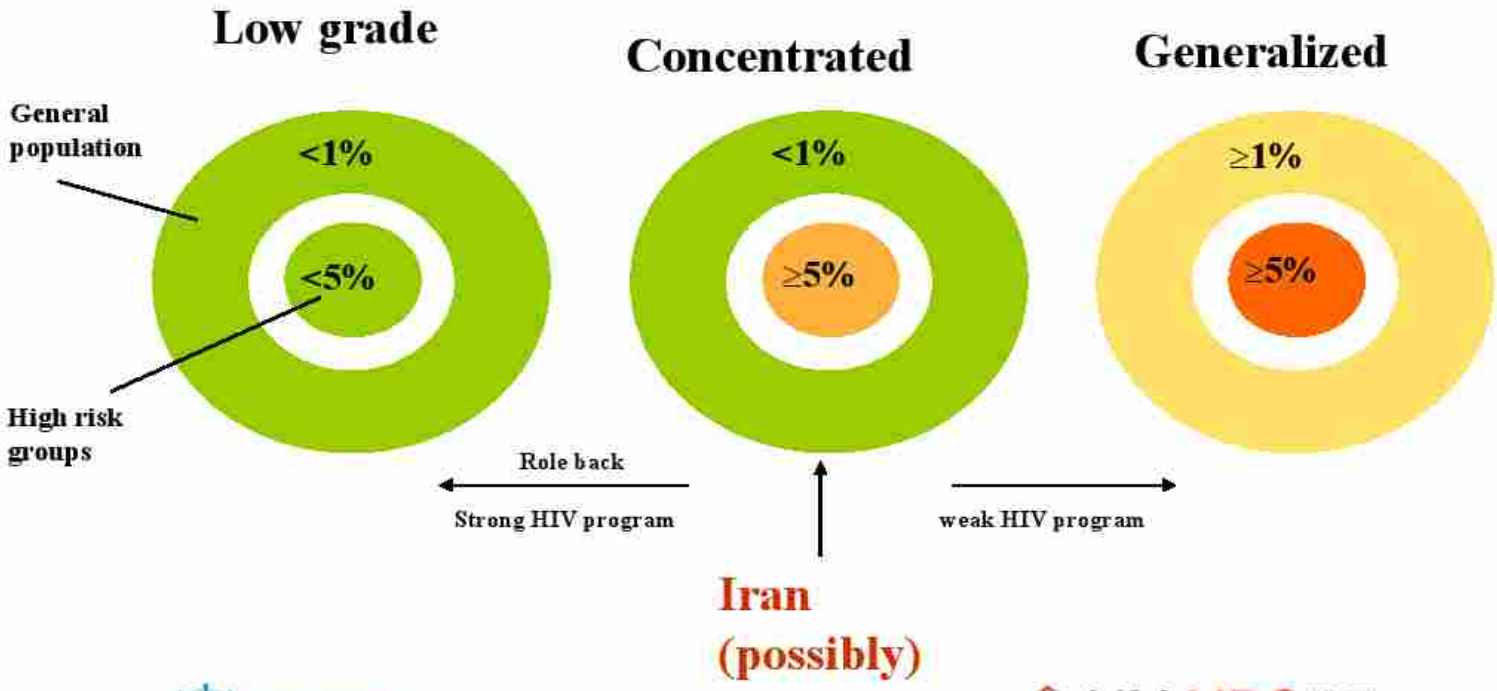
۴..MSM:

بسیار محدودند ونمی توانند به نتیجه گیری قابل تعمیم منجر شوند.

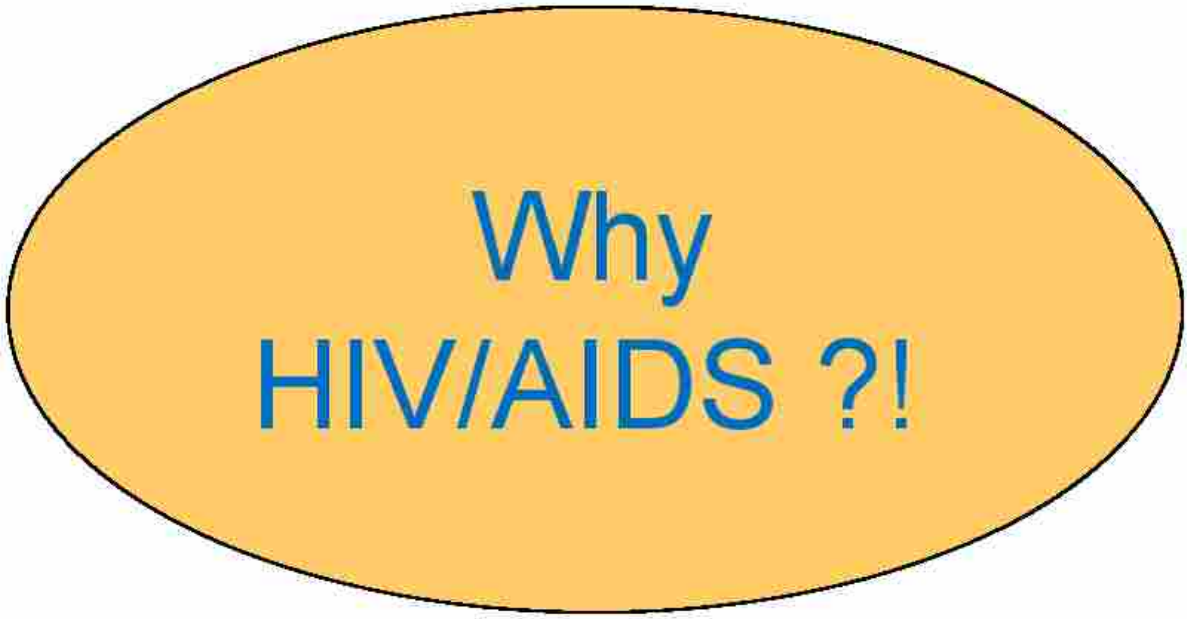
HIV/AIDS Statistics in Iran

- **5.2 times** cases since the beginning of HIV/AIDS
- **Three waves** of HIV/AIDS infection in Iran
- **Five new infections /day!**
- **5,000 $ / person** cost for HIV/AIDs treatment
- **One death /day!**

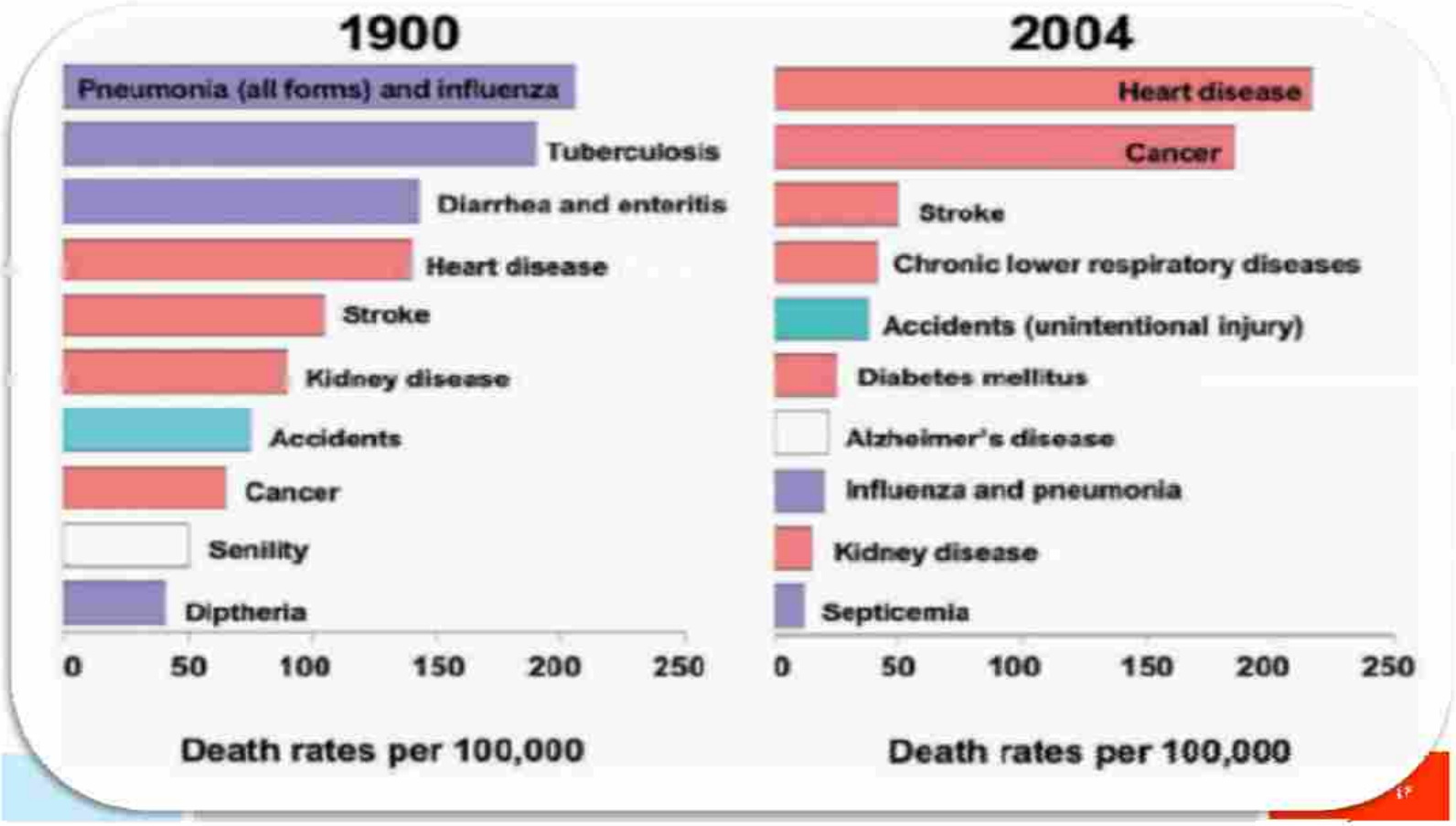
Stages of HIV epidemic



HIV/AIDS



Major causes of death in the United States in 1900 and in 2004



Major causes of death in the United States in 1900 and in 2004

In 1900, the leading causes of death were pneumonia and influenza, followed by tuberculosis and diarrhea and enteritis

In 2004, the leading causes of death were heart disease, cancer, stroke (or cerebrovascular disease), and chronic lower respiratory diseases

Infectious Diseases Trend

Since last quarter of 20th century: New & Resurgent infectious diseases

Unusually large number:
Rotavirus, Cryptosporidiosis, HIV/AIDS, Hanta virus, Lyme disease, Legionellosis, Hepatitis C

NEWLY IDENTIFIED INFECTIOUS DISEASES AND PATHOGENS

Year	Disease or Pathogen
1993	Hantavirus pulmonary syndrome (Sin Nombre virus)
1992	*Vibrio cholerae* O139
1991	Guanarito virus
1989	Hepatitis C
1988	Hepatitis E; human herpesvirus 6
1983	HIV
1982	*Escherichia coli* O157:H7; Lyme borreliosis; human T-lymphotropic virus type 2
1980	Human T-lymphotropic virus

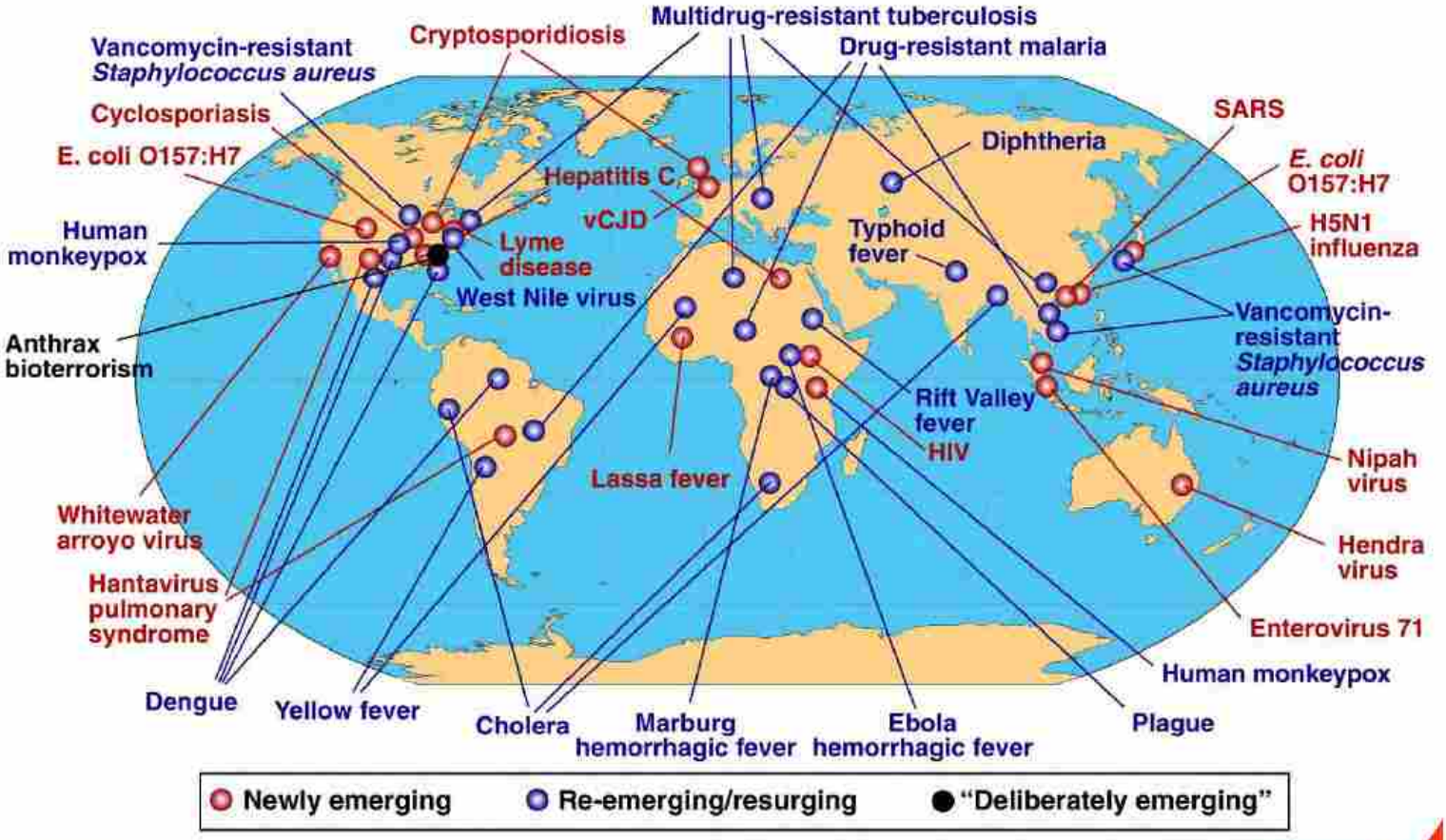
Source: Workshop presentation by David Heymann, World Health Organization, 1999

NEWLY IDENTIFIED INFECTIOUS DISEASES AND PATHOGENS

Year	Disease or Pathogen
2009	H1N1
2004	Avian influenza (human cases)
2003	SARS
1999	Nipah virus
1997	H5N1 (avian influenza A virus)
1996	New variant Creutzfelt-Jacob disease; Australian bat lyssavirus
1995	Human herpesvirus 8 (Kaposi's sarcoma virus)
1994	Savia virus; Hendra virus

Source: Workshop presentation by David Heymann, World Health Organization, 1999

GLOBAL EXAMPLES OF EMERGING AND RE-EMERGING INFECTIOUS DISEASES



Infectious Diseases: A World in Transition

HIV/AIDS
Avian Influenza
Ebola
Marburg
Cholera
Rift Valley Fever
Typhoid
Tuberculosis
Leptospirosis
Malaria
Chikungunya
Dengue
JE
Antimicrobial resistance

UP

DOWN

Guinea worm Smallpox

Yaws

Poliomyelitis

Measles

Leprosy

Neonatal tetanus

Infectious Diseases: A World in Transition

HIV/AIDS

UP

DOWN

Avian Influenza
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Dengue
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Antimicrobial resistance

Guinea worm Smallpox
Yaws
Poliomyelitis
Measles
Leprosy
Neonatal tetanus

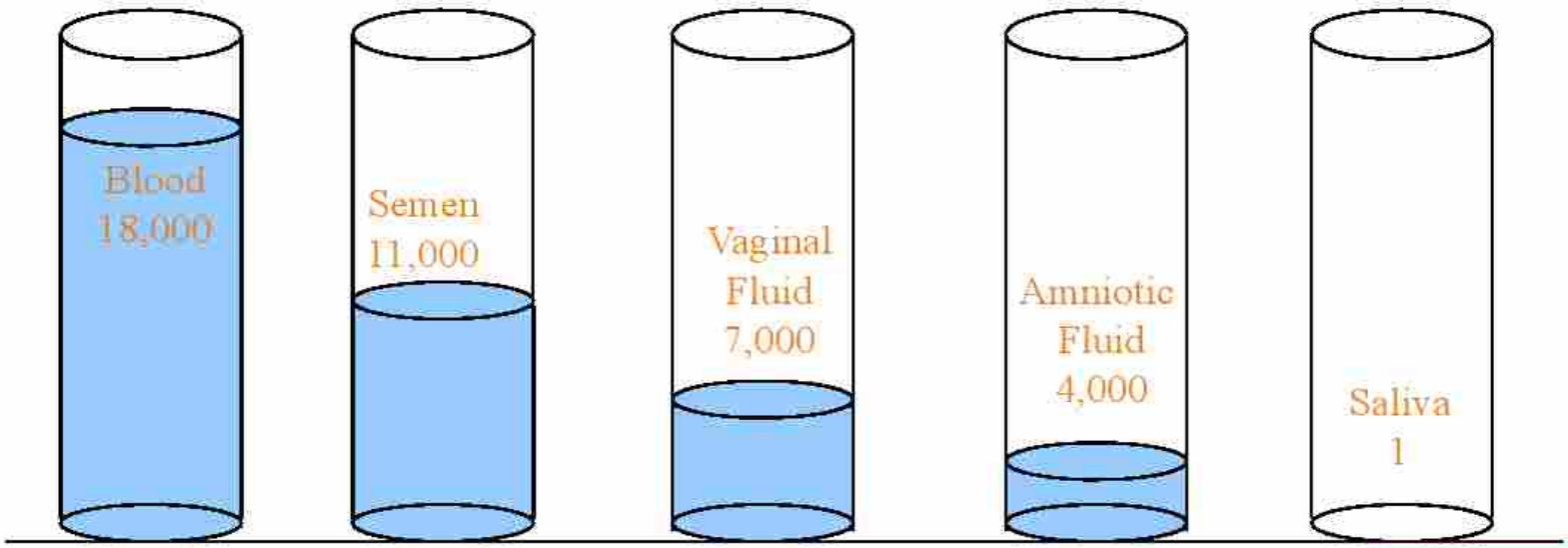
Routes of Transmission of

HIV/AIDS

Routes of Transmission of HIV

Sexual Contact:	*Male-to-male*
	Male-to-female or vice versa
	Female-to-female
Blood Exposure:	*Injecting drug use/needle sharing*
	Occupational exposure
	Transfusion of blood products
Perinatal:	*Transmission from mom to baby*
	Breastfeeding

HIV in Body Fluids



Average number of HIV particles in 1 ml of these body fluids

Routes of Transmission of HIV

1. SEXUAL CONTACT:

- Worldwide HIV infection is basically a sexually transmitted infection: predominant
- ↑ Risk : anal intercourse > vaginal I. > oral I.
- Coexistence of a STI (most notably genital ulcerative disease) → ↑ infectiousness ↑ susceptibility of the individual

Routes of Transmission of HIV

2. *VERTICAL (MOHTER - TO - CHILD) :*

- *The second major mode of spread of HIV*
- *During pregnancy ,*
- *delivery or*
- *breast-feeding*

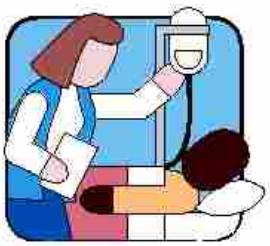
Routes of Transmission of HIV

3. *EXPOSURE TO BLOOD :*

- *Injection drug Users (IDUs)*
- *Transfusion with HIV-contaminated blood*
- *Nosocomial T.*

Routes of Transmission of HIV

- *Transfusion with HIV- contaminated blood or blood products, including :*
  - ** Whole blood*
  - ** Blood cellular components*
  - ** Plasma*
  - ** Clotting factors*



- *Use of HBIG ; ISG ; Rh(D) IG ; HB vaccine have not been associated with Transmission*

Routes of Transmission of HIV

Transmission of HIV in health care setting: through percutaneous , mucus membrane , cutaneous exposure to blood contaminated body fluids

- *Risk of T. by needle stick injury with HIV-infected blood ~ 0.3%*
- *Risk of T.: patient to HCW > HCW to Patient*

Routes of Transmission of HIV

- *Source of infection : Contact with blood, semen, other genital secretions, and breast-milk*
- *The infectivity of saliva from HIV infected persons through human bites or occupational contact is extremely low*

Routes of Transmission of HIV

- *No evidence of replication of HIV within insects*
- *In vitro mechanical T. of HIV , or through biting bloodsucking insects*
- *TRANSPLANTATION :*

  *Liver, Kidney, Heart, Pancreas, and Bone transplant , **not** with corneal or processed tissues transplantation*

PROBABILITY OF HIV INFECTION

- *Probability of HIV infection after receiving a single contaminated blood product ……100%*
- *Needle stick …… 0.3%*
- *Vertical T: - Perinatal T……13- 40%*
  - Breast feeding…… 14 -29%
- *Sexual exposure/episode:*
  - Anal I…… 0.1-3%
  - Vaginal I……0.1-0.2%

Lab. Diagnosis of

HIV/AIDS

Laboratory Diagnosis of HIV/AIDS

- **Laboratory- Based testing:**

  Laboratory-based tests must be performed off site and can take several days to produce results

- **Point- of- care testing:**

  With point-of-care tests, practitioners obtain a specimen from a patient, perform the test on site, and have results available in approximately 20 mins

Legal Considerations in HIV Testing

- **Steps for clinical practices setting up routine testing**
  1. Determine whether state requires written consent
  2. Become familiar with confidentiality regulations
  3. Become familiar with reporting requirements
     - Referral programs often report infections, but patients may not follow through and seek care
     - Clinicians must work with referral programs to determine who is responsible for reporting

Screening strongly recommended for all adolescents and adults at increased risk for HIV and all pregnant women

Increased risk defined as individuals with ≥ 1 risk individual factor or individuals receiving healthcare in a high-prevalence or high-risk clinical setting

Individual Risk Factors	High-Prevalence or High-Risk Settings
▪ Men who have had sex with men after 1975 ▪ Men and women having unprotected sex with multiple partners ▪ Past or present IDUs ▪ Men and women who exchange sex for money or drugs or have sex partners who do ▪ Individuals whose past or present sex partners were HIV infected, bisexual, or IDUs ▪ Persons being treated for STDs ▪ Persons with a history of blood transfusion between 1978 and 1985 ▪ Persons who request an HIV test despite reporting no individual risk factors may be considered at increased risk	▪ STD clinics ▪ Correctional facilities ▪ Homeless shelters ▪ Tuberculosis clinics ▪ Clinics serving men who have sex with men ▪ Adolescent health clinics with a high prevalence of STDs ▪ Any clinical setting with a known HIV prevalence ≥ 1% among the patient population being served

CDC Recommendations for Routine HIV Testing

- **Routine, voluntary HIV screening in healthcare settings recommended for all patients 13-64 yrs of age:**
  - Except in populations with documented prevalence of undiagnosed HIV infection **< 0.1%**
  - Without prevalence data, voluntary HIV screening appropriate until diagnostic yield **< 1/1000** patients screened is established
- **Separate written consent not recommended**
- **Pre- or post-test prevention counseling should not be required with testing or screening programs**

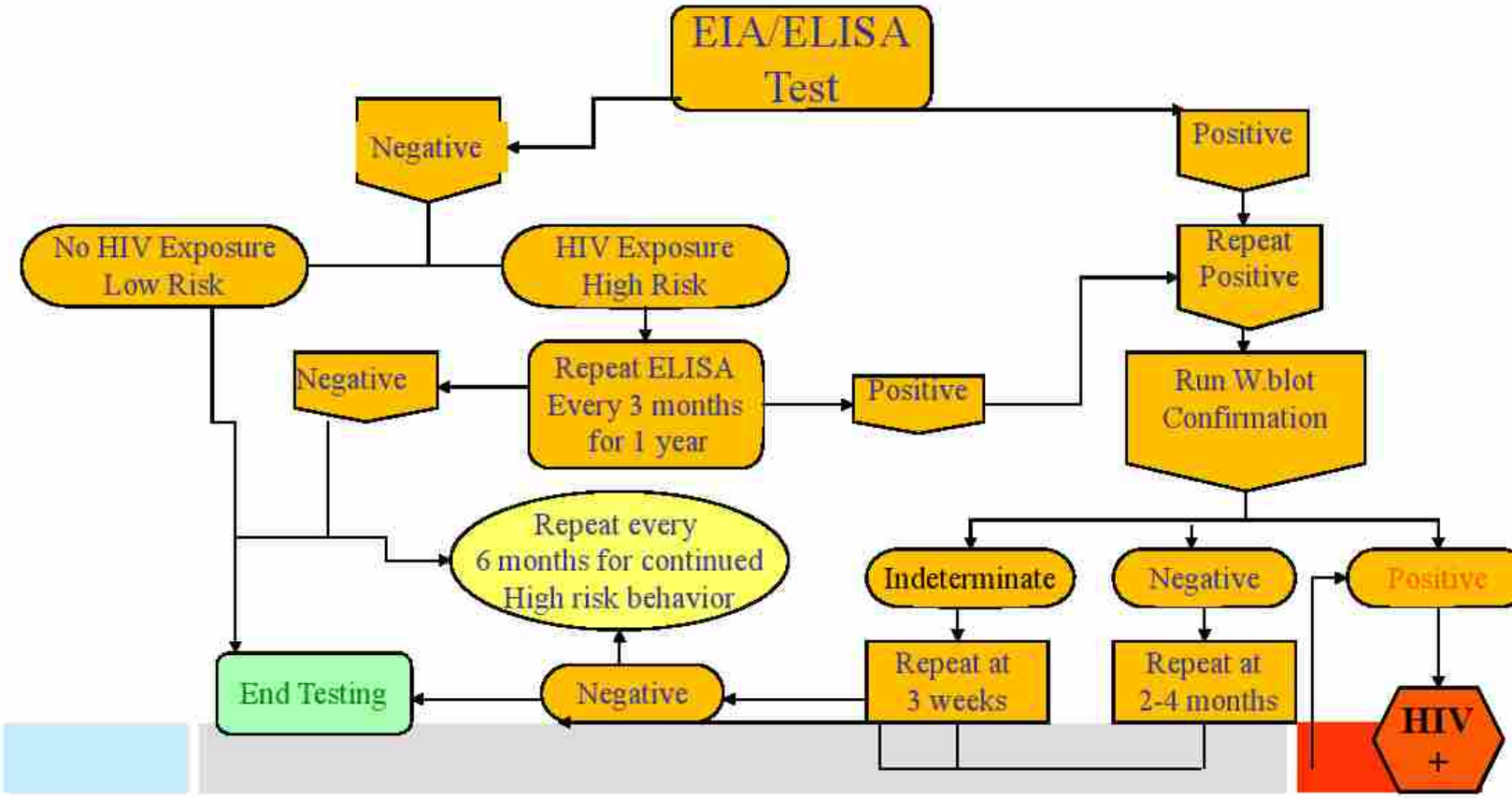
Importance of Early Testing and Diagnosis

- *Allows for early treatment to maintain and stabilize the immune system response*
- *Decreases risk of HIV transmission from mother to newborn baby*
- *Allows for risk reduction education to reduce or eliminate high-risk behavior*

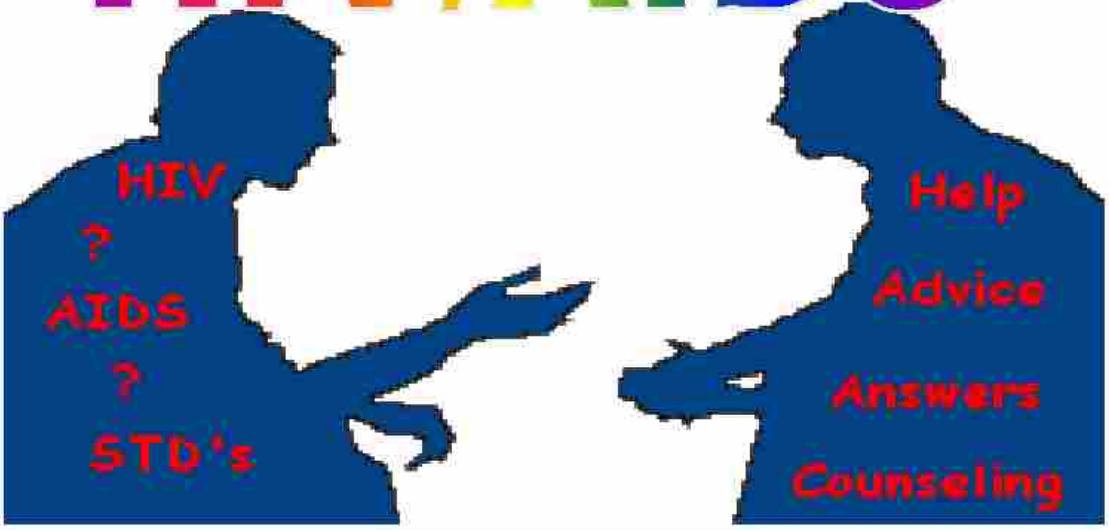
HIV Testing

- *Those recently exposed should be retested at least six months after their last exposure*
- *Screening test (EIA/ELISA) vs. confirmatory test (WB)*

HIV Testing


EIA/ELISA Test
Negative
Positive
No HIV Exposure Low Risk
HIV Exposure High Risk
Repeat Positive
Negative
Repeat ELISA Every 3 months for 1 year
Positive
Run W.blot Confirmation
Repeat every 6 months for continued High risk behavior
Indeterminate
Negative
Positive
End Testing
Negative
Repeat at 3 weeks
Repeat at 2-4 months
HIV +

Counseling in HIV/AIDS



Partner notification

Thanks
for your
kind attention!