

Epidemiology of HIV in older populations (including response to ART)

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What is "Older"

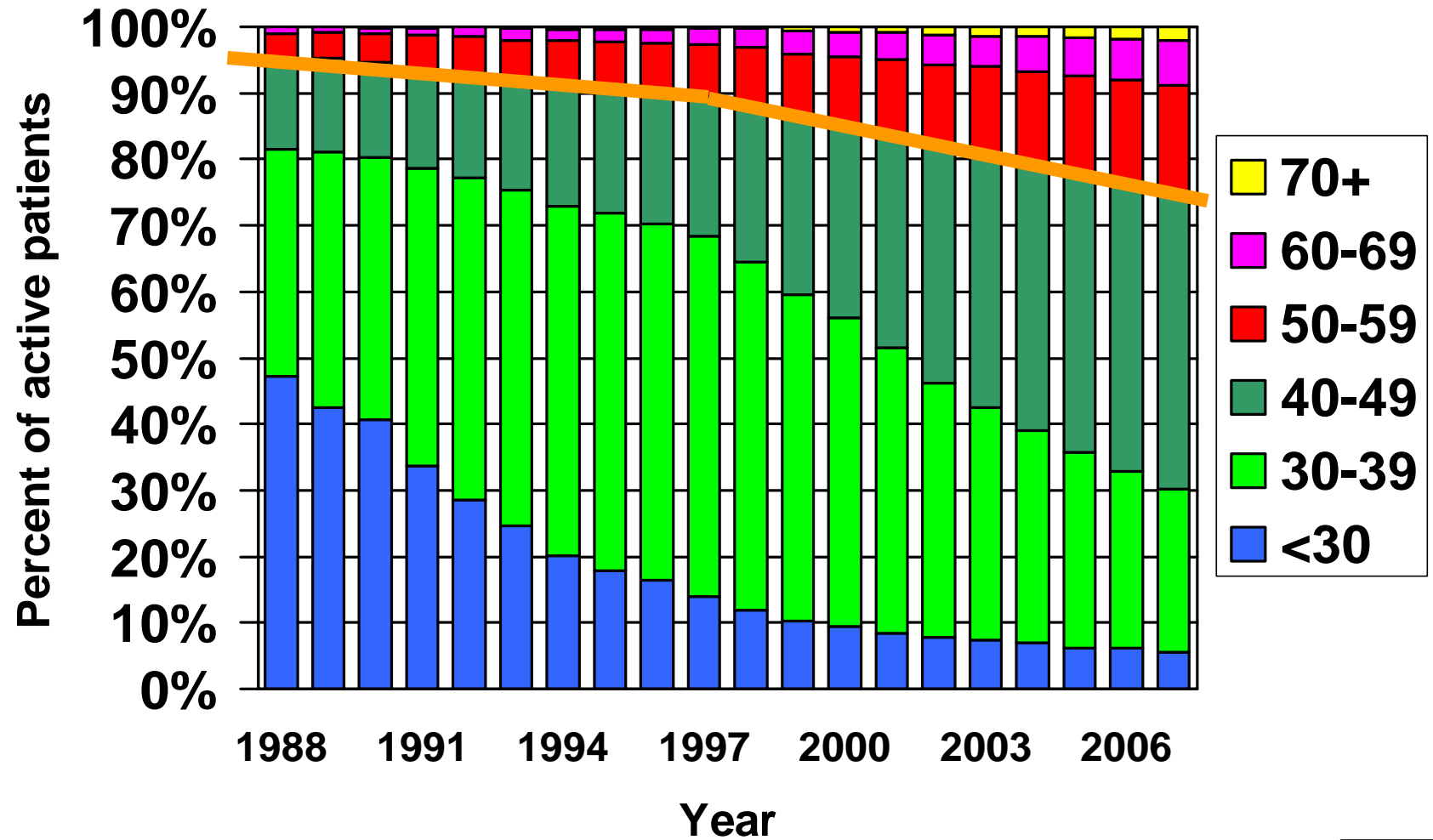
- Most studies and surveillance reports in high-income countries use 50 years as cut-off for older populations (and 65 for elderly)
- HIV statistics (WHO, UNAIDS) for low-income countries stop at age 49
- Physical and mental state as well as co-morbidities at age 50 may vary substantially from individual to individual

Outline

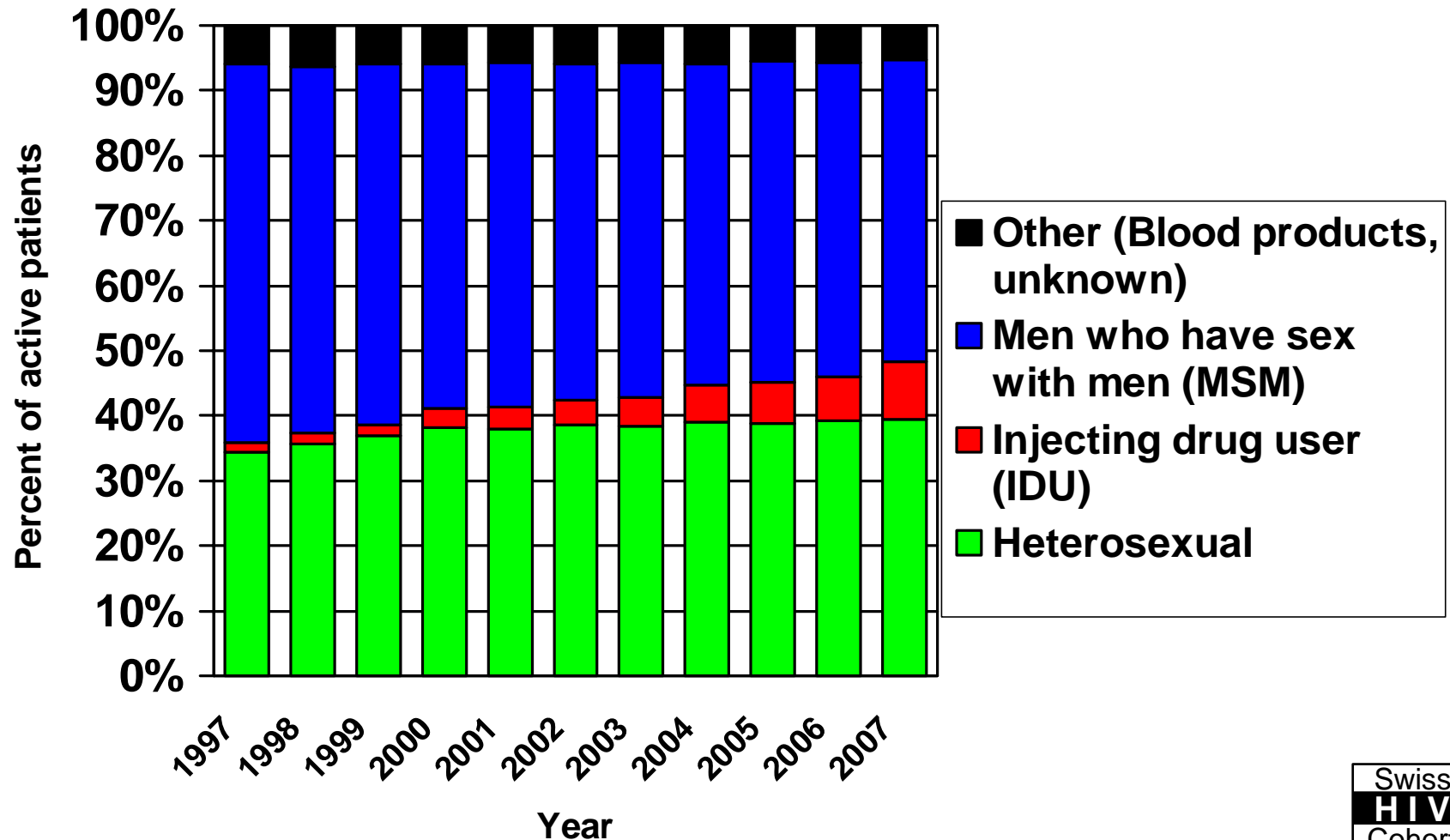
- Shift in demographical characteristics of HIV+ population
- Surveillance data of new HIV/AIDS cases
- Presentation for HIV care
- Natural history of HIV infection
- Virological, immunological and clinical response to antiretroviral treatment

→ Changing demographics of
HIV-infected populations

Age distribution of HIV infected individuals in Switzerland from 1988-2007

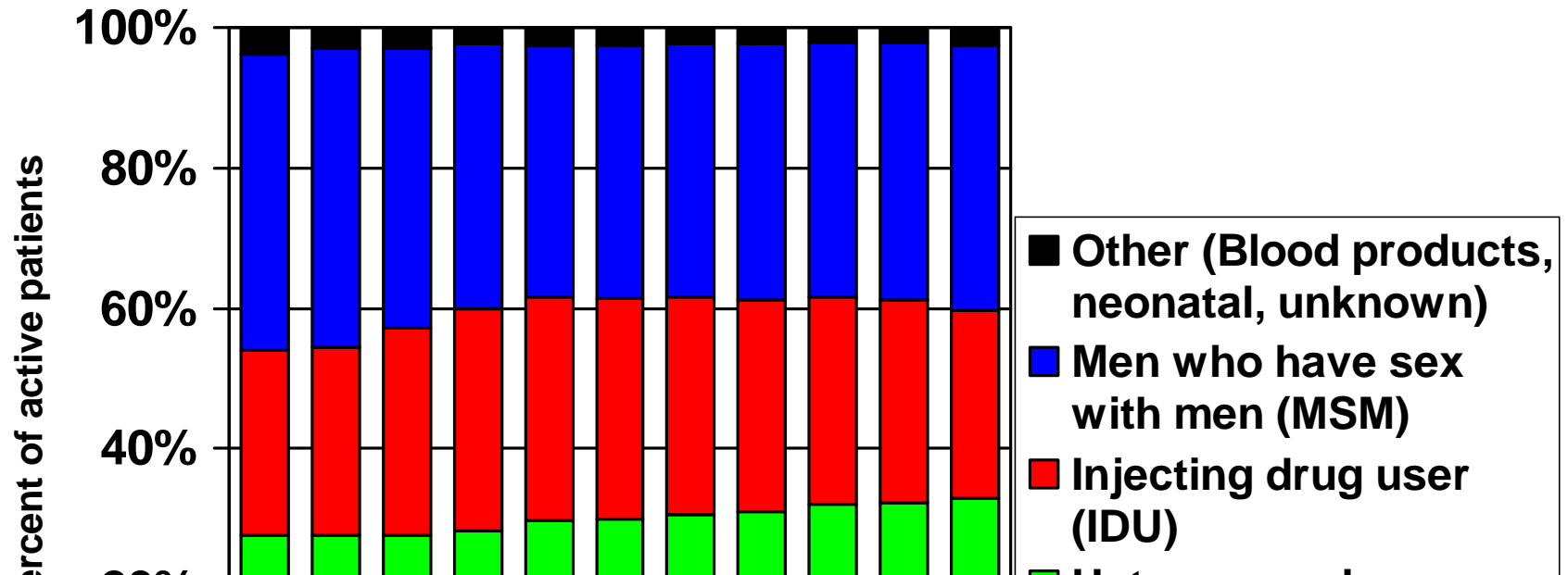


Transmission categories among HIV infected individuals aged 50+ in Switzerland from 1997-2007



Source : SHCS 12/2007

Transmission categories among HIV infected individuals aged 40-49 in Switzerland from 1997-2007



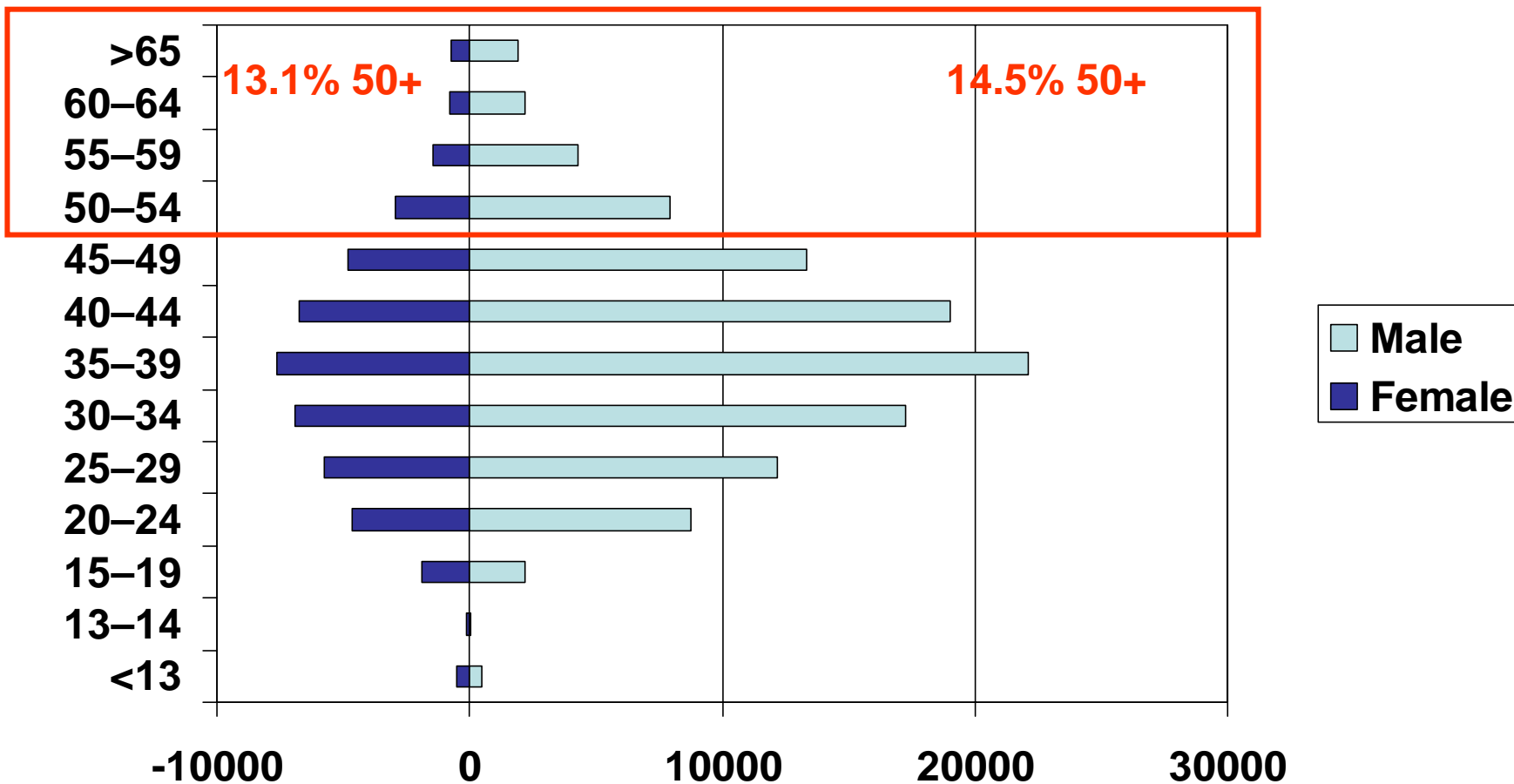
Expect substantial increase of older former/current IDU

- Started ART with mono-/dual therapy prior 1997
- Substance dependencies
- Smoking
- HCV related co-morbidities

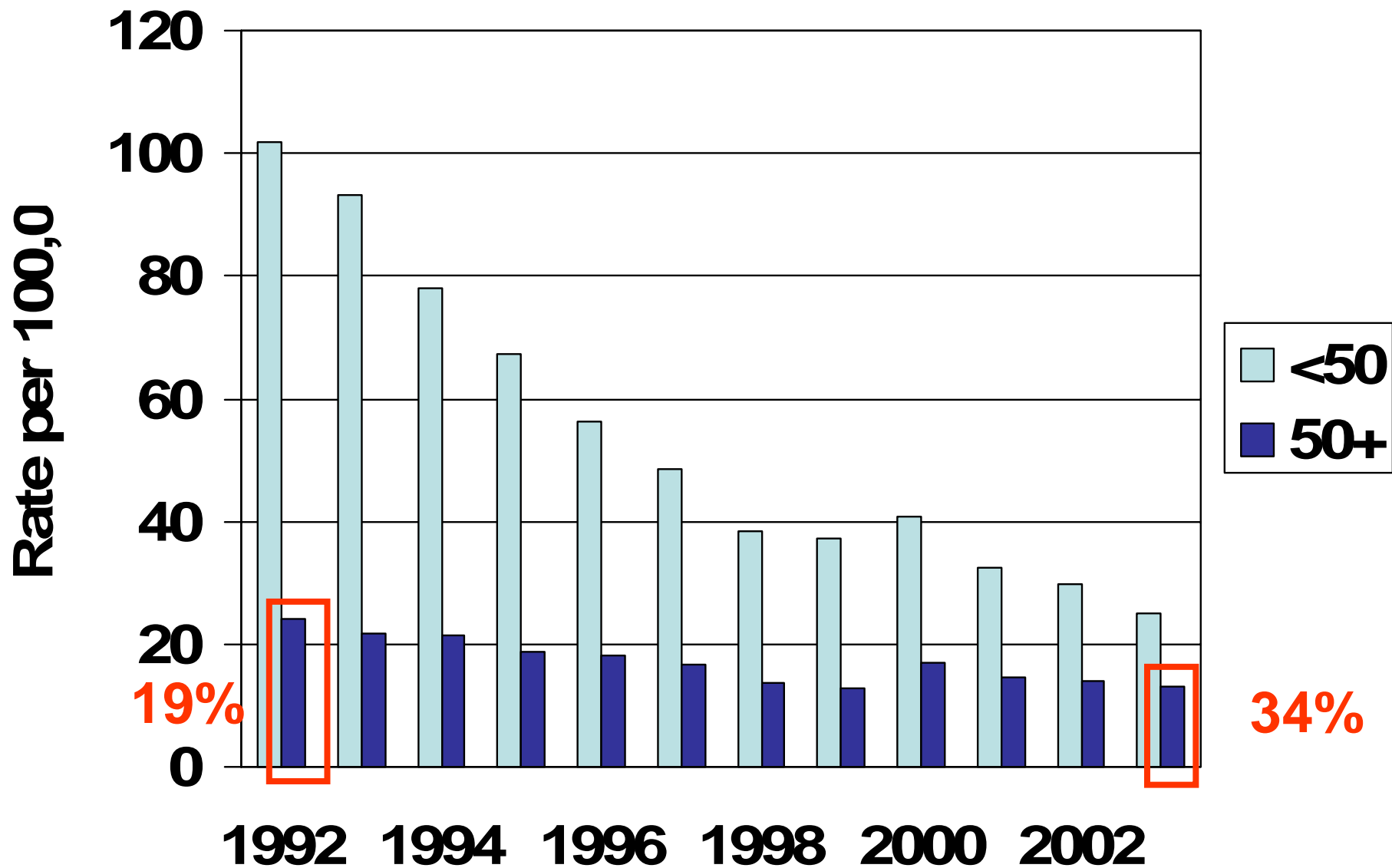
- Population of HIV infected individuals is aging since cART became available

→ Surveillance data:

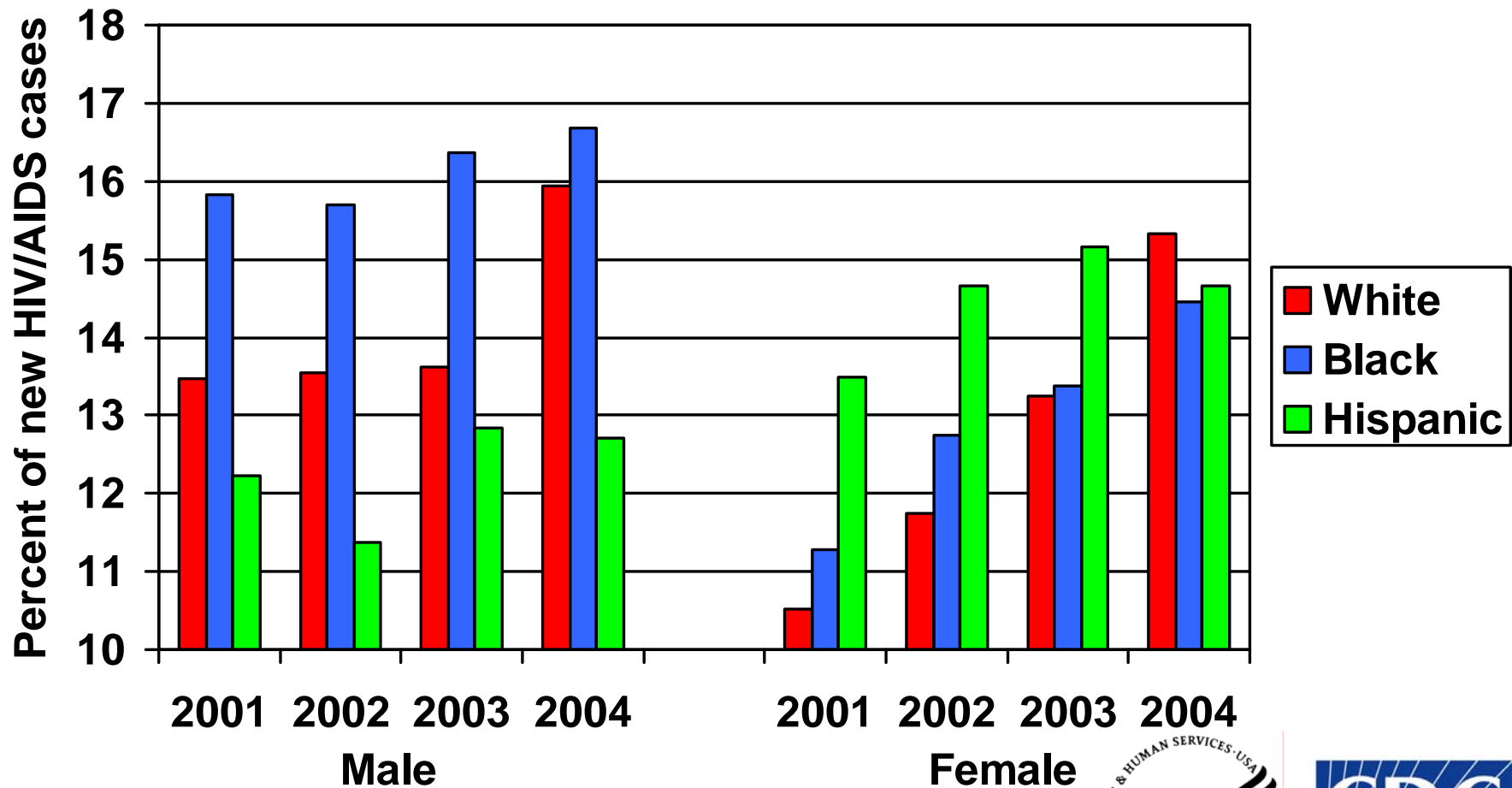
Age/gender distribution of new HIV/AIDS cases 2001-2004 in the US



New HIV infections, New Jersey 1992-2003



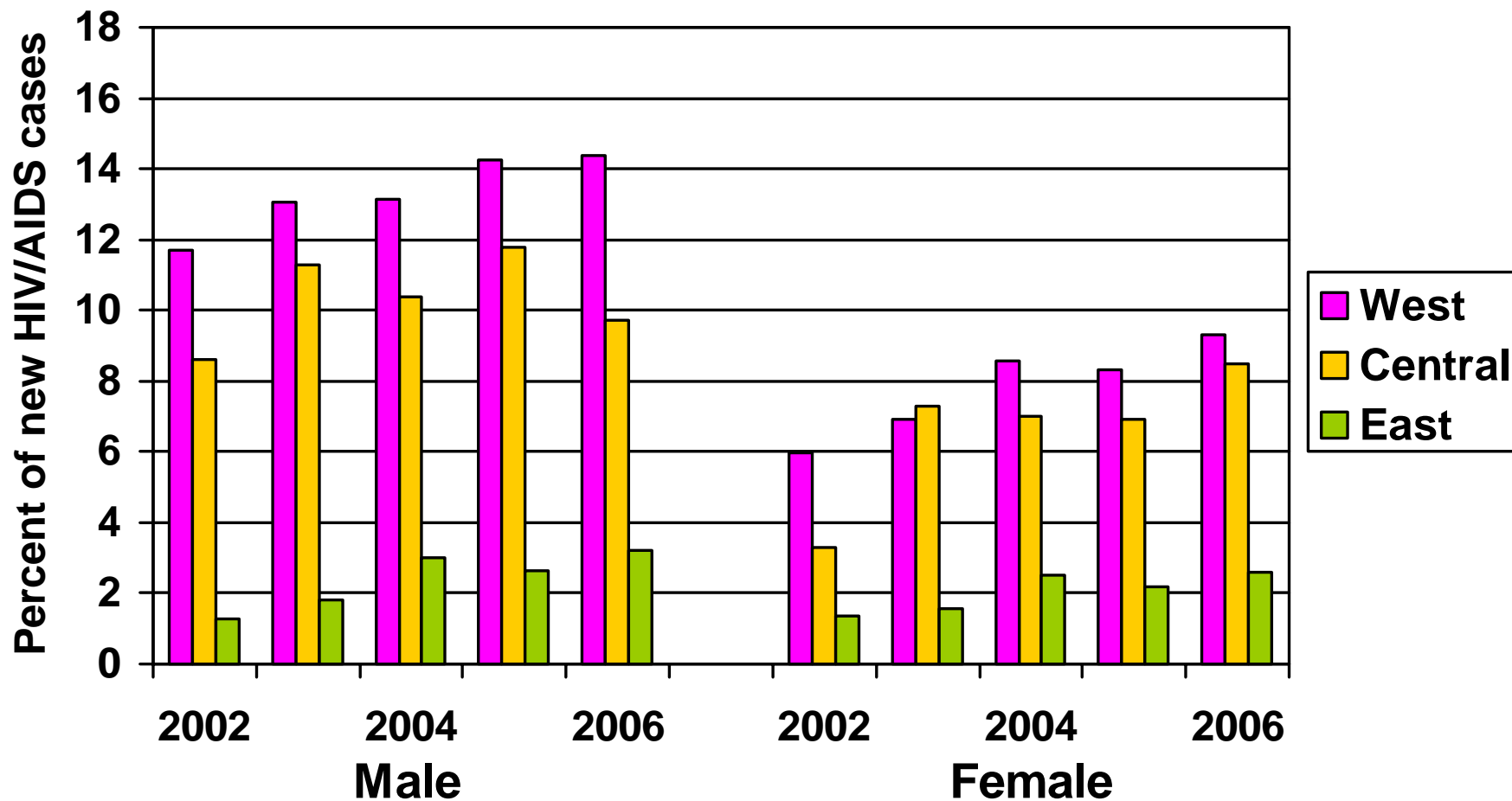
Percentage of 50+ years old among new HIV/AIDS cases 2001-2004 in the US



CDC HIV/AIDS Surveillance Supplemental Report
2006 Volume 12, Number 1



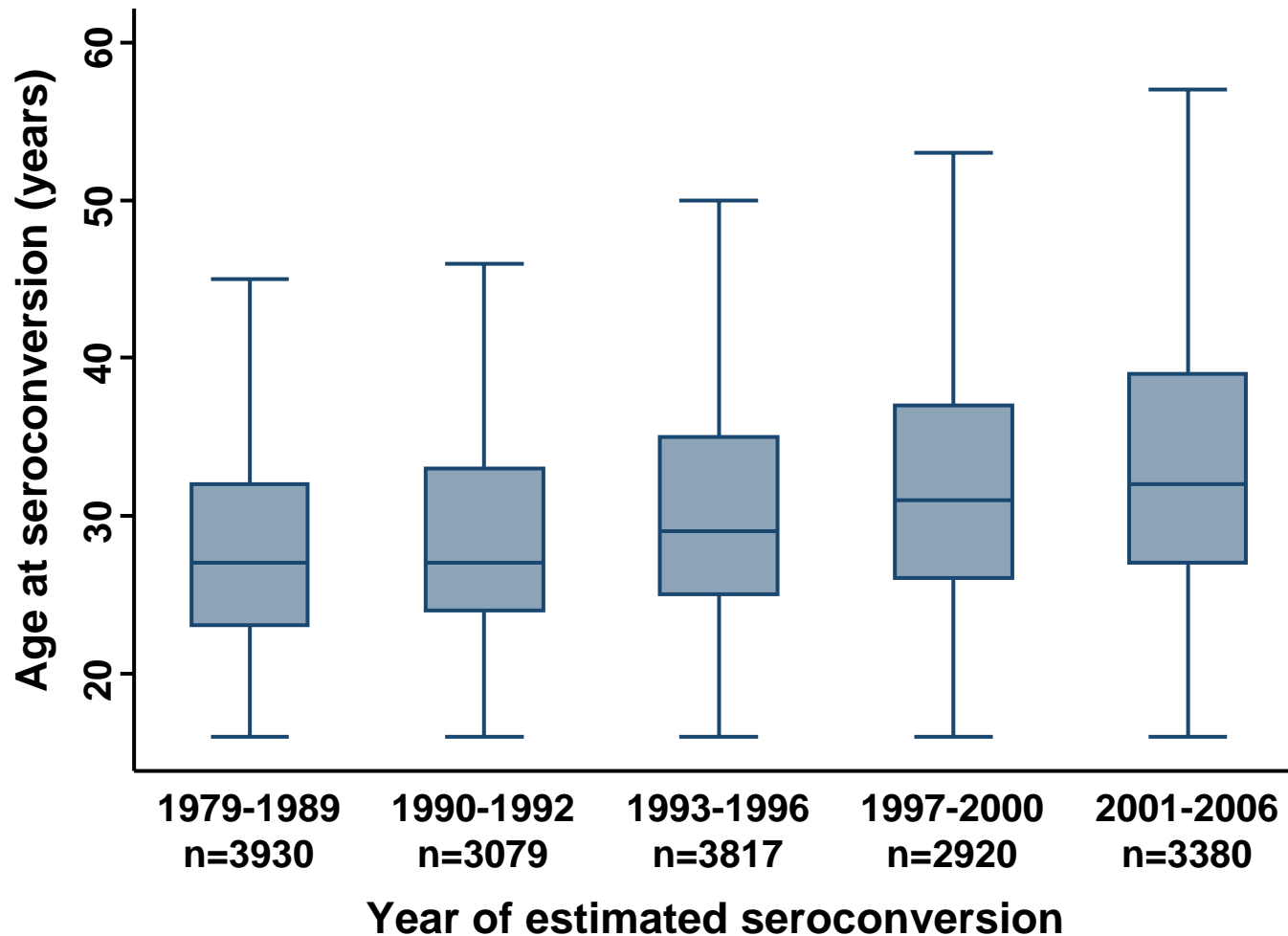
Percentage of 50+ years old among new HIV/AIDS cases 2002-2006 in Europe



- Population of HIV infected individuals is aging since cART became available
- Increase of new HIV/AIDS infections among older women in US and western Europe

➔ Characteristics at presentation

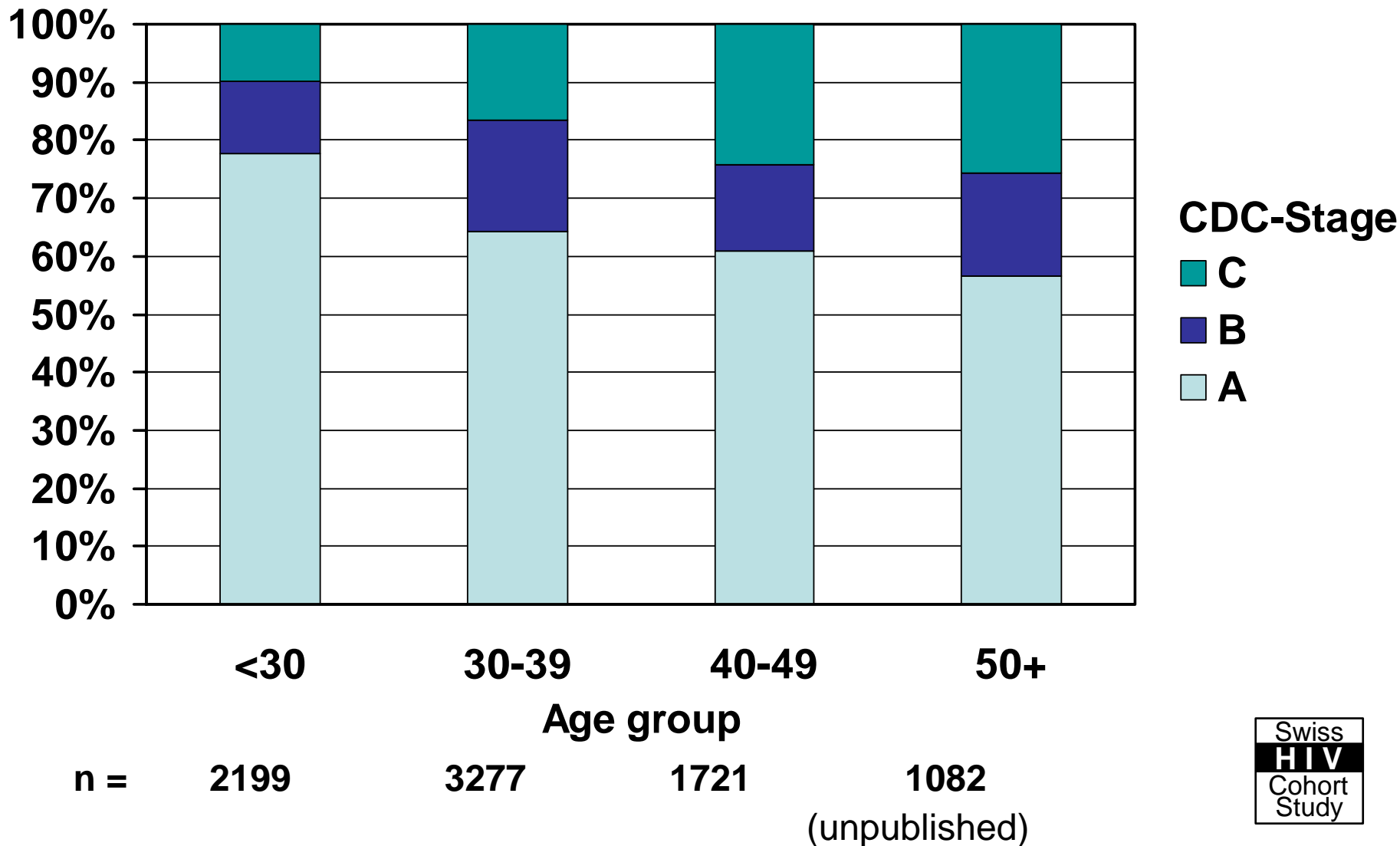
Time-trend of age at seroconversion



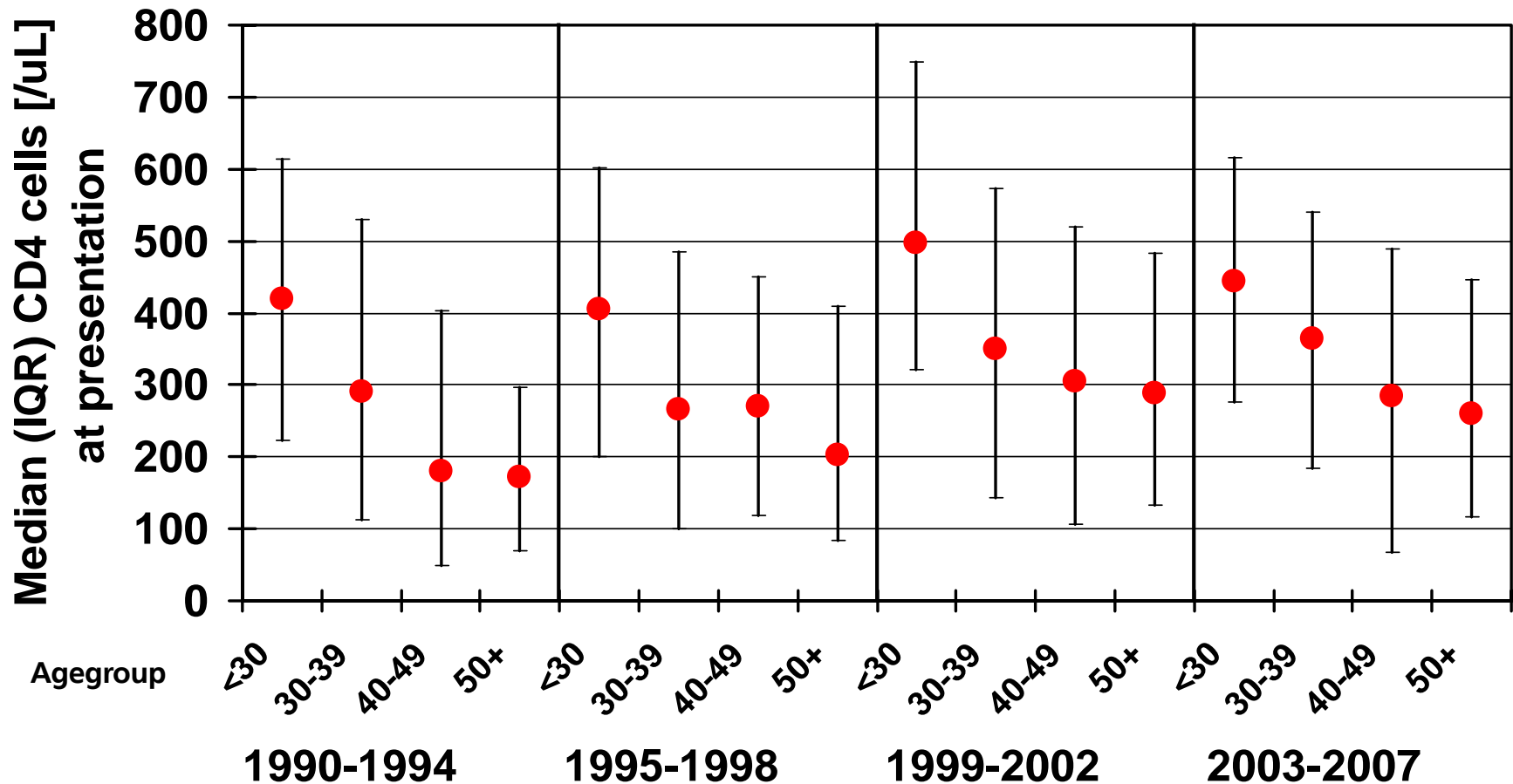
(CASCADE unpublished)



Clinical stage at presentation of non-IDU's since 1990



CD4 cell count at presentation of caucasian heterosexually infected persons (n=2877)



(unpublished)

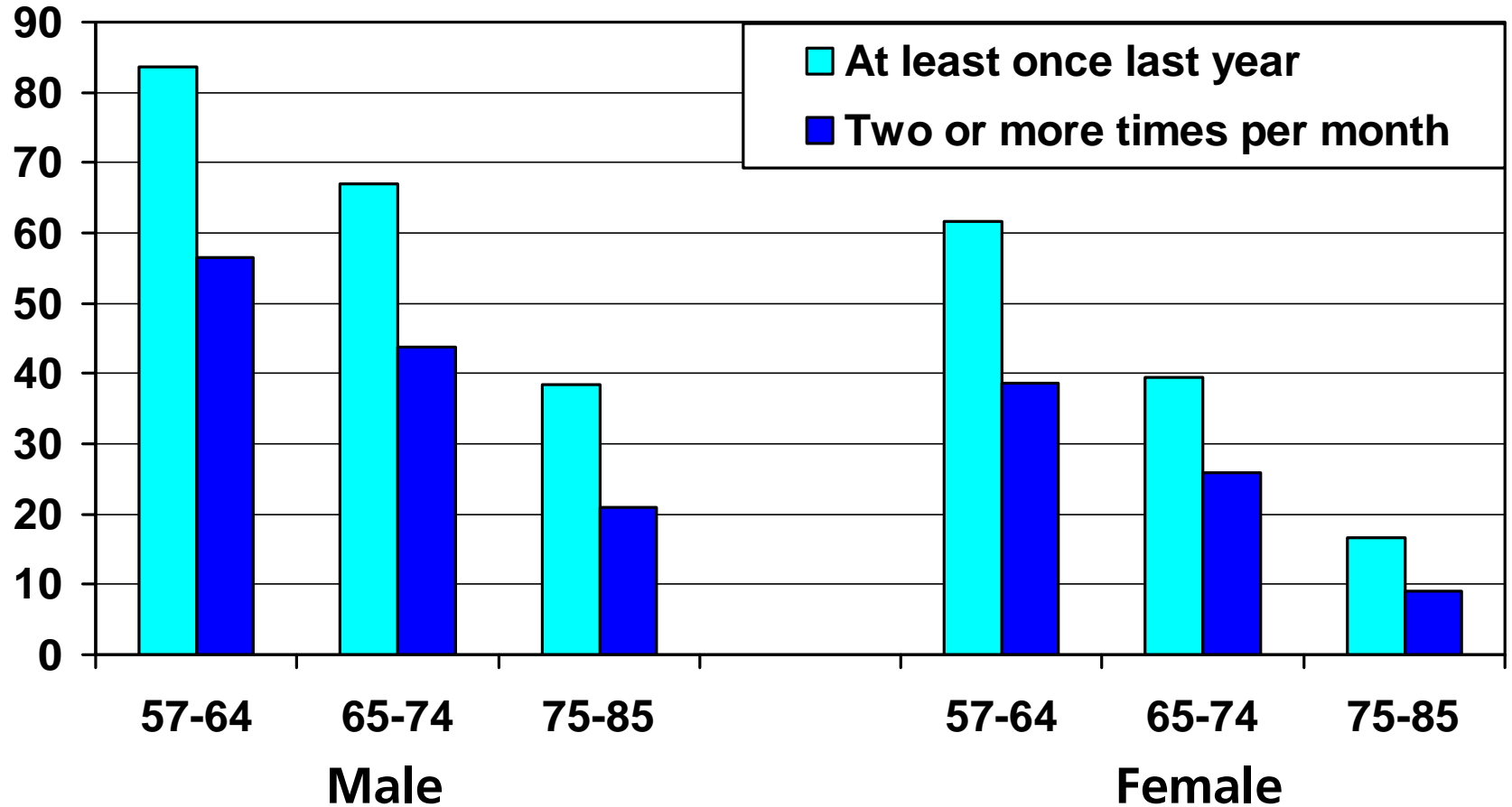
- Population of HIV infected individuals is aging since cART became available
- Increase of new HIV/AIDS infections among older women in US and western Europe
- Delayed presentation for care among older populations

→ Why?

Why do older individuals present later?

- Older individuals are
 - Often not tested for HIV
 - Not perceived "at risk" by themselves and their doctors
 - Early symptoms of HIV infection mistaken as age-related
 - At risk for HIV infection
 - No education in risk assessment and safer sex
 - No need for condoms as contraceptives in older women
 - Men with erectile dysfunction do not like condoms
 - Belief that HIV affects only younger people
 - Single again (divorced, widowed, children grown up)
 - Have a lot of free time and re-discover sexuality (Viagra)

Sexual activity among 3005 older adults in the US in 2004



(Tessler Lindau, NEJM 2007)

More targeted prevention campaigns are needed!

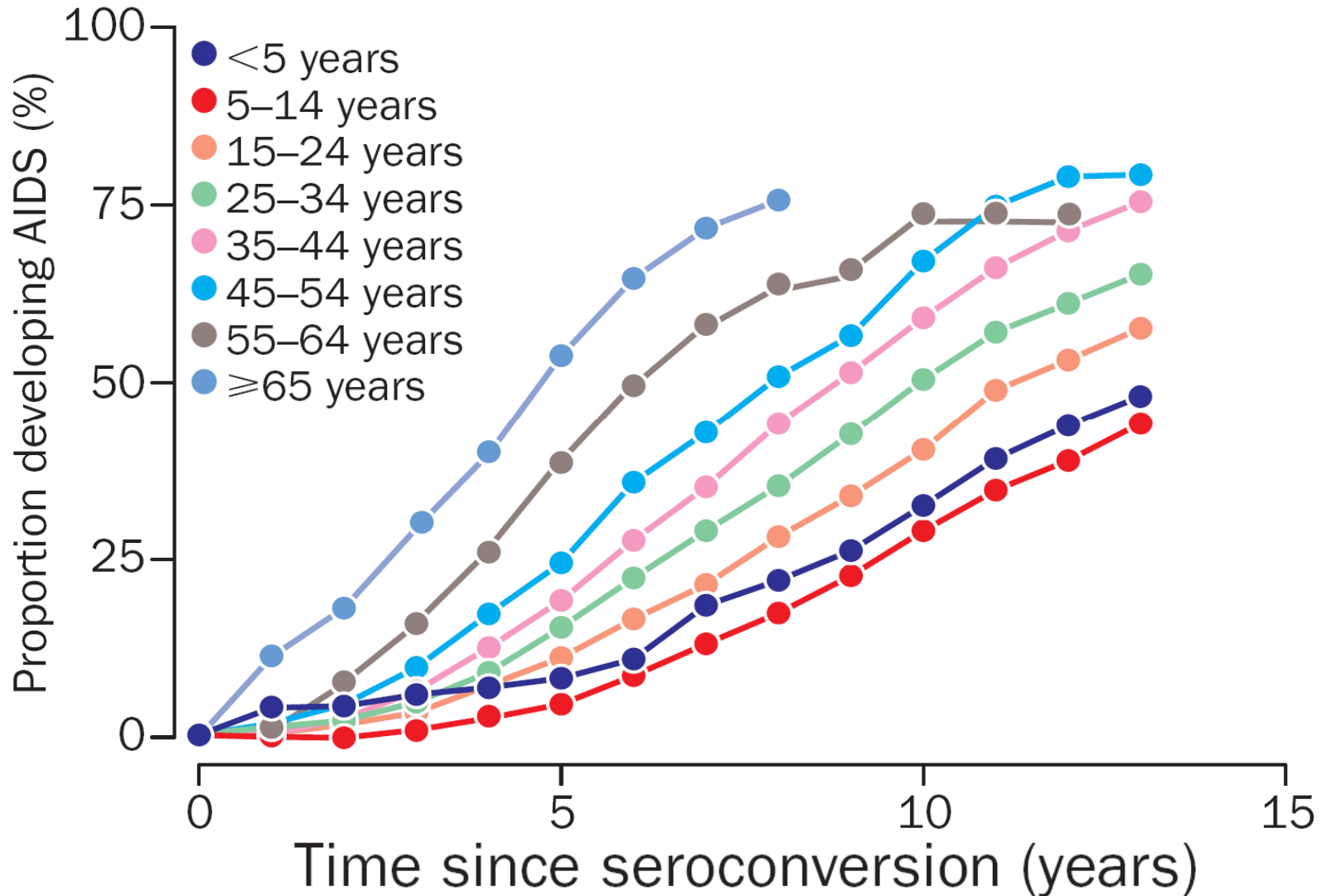


"You're giving out condoms," 82-year-old Rose Crescenzo said with a wistful smile, "but who's going to give us a guy?"

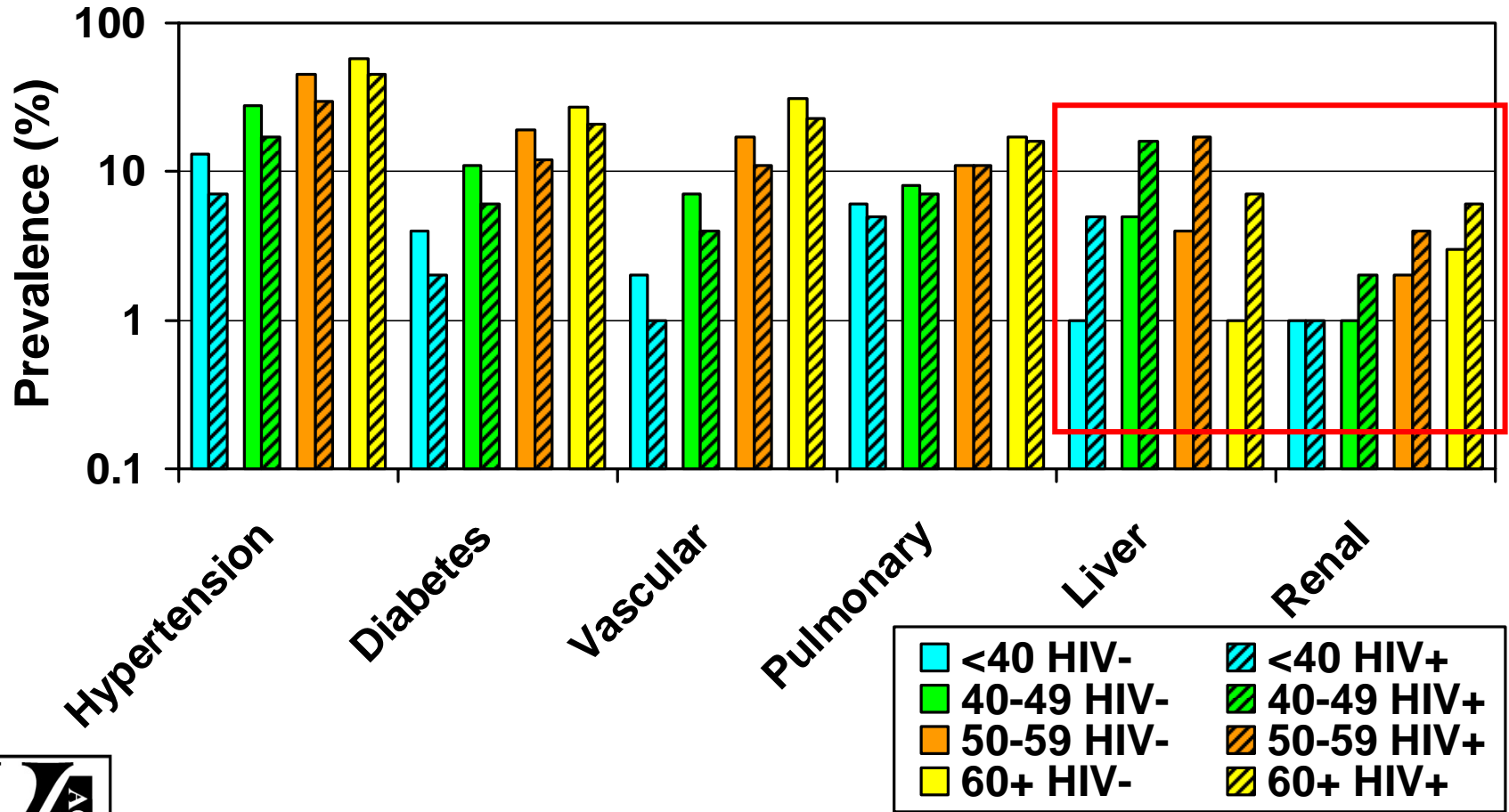
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- Delayed presentation for care among older populations
- **More targeted prevention campaigns needed!**

➔ Natural history of HIV and older age

Progression to CDC stage C by age at seroconversion before introduction of cART

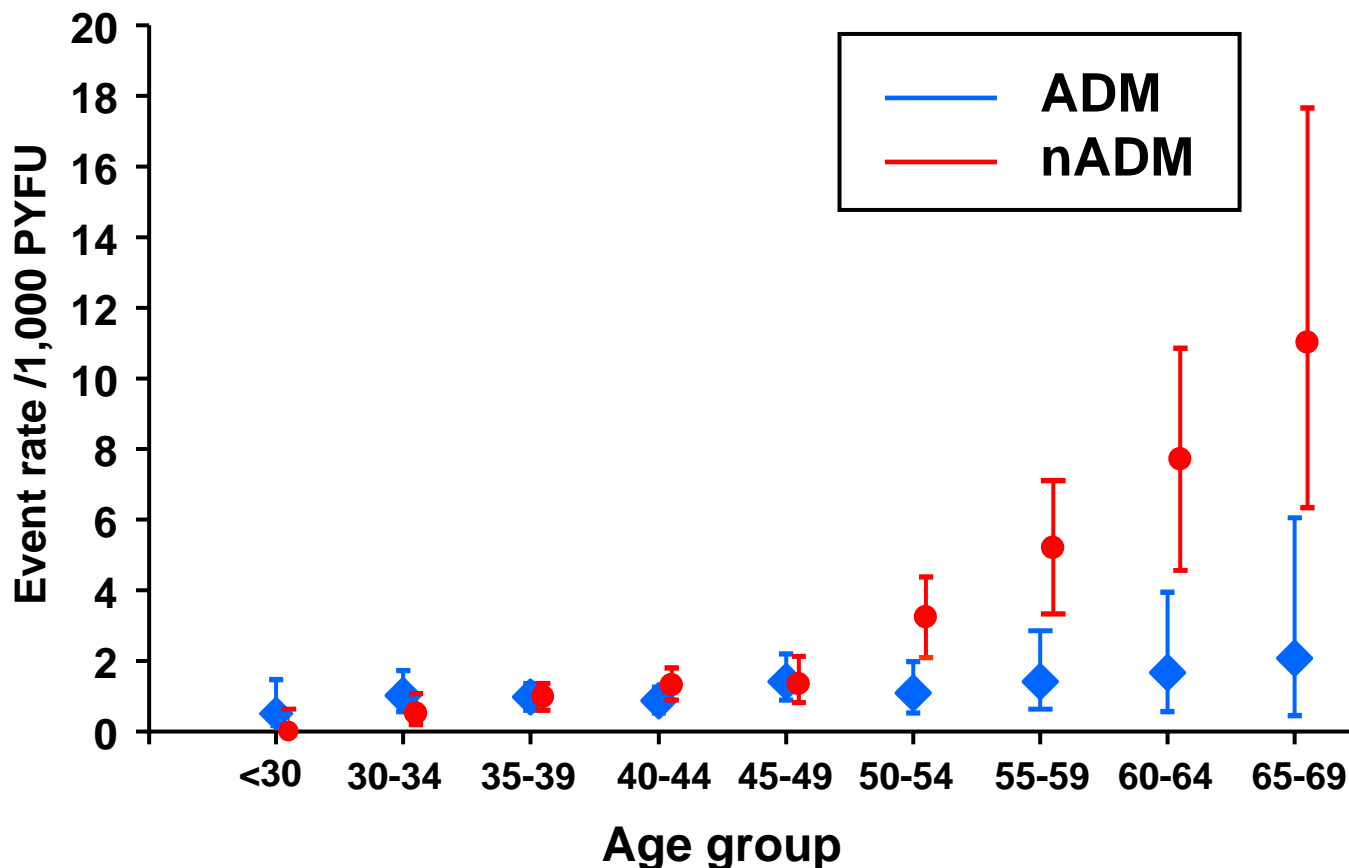


Medical comorbidities among 66,840 HIV- and 33,420 HIV+ veterans



(Goulet, CID 2007)

Incidence of fatal AIDS-defining malignancies (ADM, n=112) and non-AIDS-defining malignancies (nADM, n=193) among 23'437 patients



Frailty

- MACS (1905 HIV- / 245 HIV+)
- Strong association of frailty with HIV
 - OR of frailty for HIV+ vs. HIV-
 - 0-4 years of HIV: 3.4 (1.3-9.1)
 - 4-8 years of HIV: 13 (6.6-25)
 - 8-12 years of HIV: 15 (7.6-28)
- 65 year old HIV- has similar frailty as a 55 year old HIV+ infected for 0-4 years

- Population of HIV infected individuals is aging since cART became available
- Increase of new HIV/AIDS infections among older women in US and western Europe
- Delayed presentation for care among older populations
- More targeted prevention campaigns needed!
- **Faster HIV disease progression and more non AIDS-defining conditions with older age**

➔ Response to antiretroviral treatment

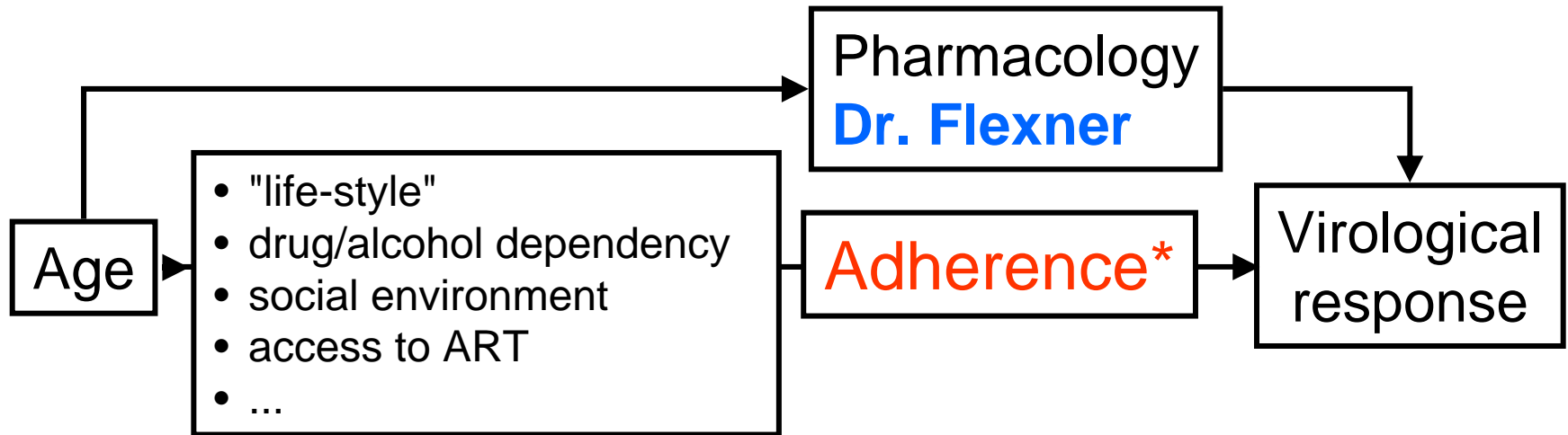
Association of virologic response with older age

patients 50+ years

- No
 - Patterson et al., HIV Medicine 2007 63
- Yes
 - Goodkin et al. AIDS 2004 72
 - Grabar et al., AIDS 2004 401
 - Silverberg et al., Arch Int Med 2007 997
 - Bosch et al., JAIDS 2007*
 - Sabin et al., CROI 2007 5962

* number of patients 50+ year old not explicitly stated

Virologic response and older age



Goodkin et al., AIDS 2004 (n=135, 90% on ART):

→ Effect of age on viral load through evolution or immunological control?

Müller et al., AIDS 2006 (n=817, ART naive):

→ No effect of age on viral setpoint

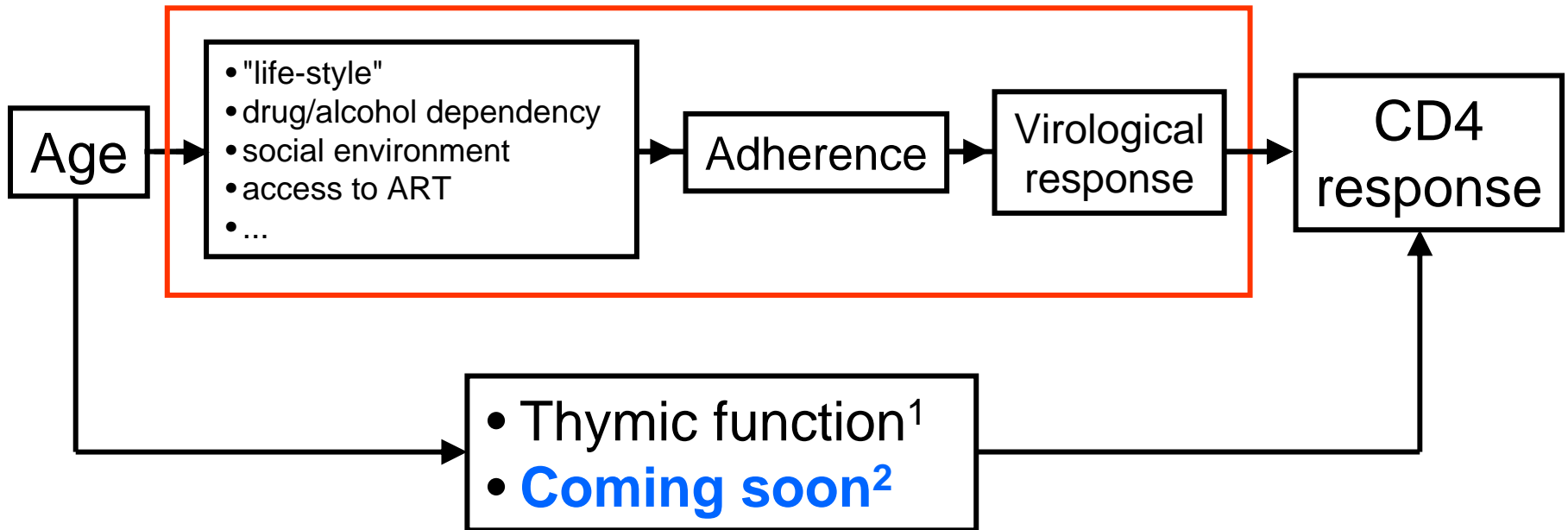
* Hinkin et al. AIDS 2004: Effect of age and cognitive impairment on adherence

CD4 recovery and older age

- **No association with age** patients 50+ years
 - Patterson et al., HIV Medicine 2007 (Johns Hopkins) 63
 - Cuzin et al., CID 2007 (Toulouse, F) 99
 - Tumbarello et al., BMC Infect Dis 2004 (Rome, I) 120
- **Delayed CD4 recovery**
 - Silverberg et al., Arch Intern Med 2007 (KPNC) 997
 - Wolbers et al. Antiviral Therapy 2007 (SHCS)*
- **Reduced CD4 recovery**
 - Viard et al., JID 2001 (EuroSIDA)*
 - Grabar et al., AIDS 2004 (FHDH) 401
 - Moore et al., CID 2006*
 - Sabin et al. CROI 2007 (COHERE) 5962

* number of patients 50+ year old not explicitly stated

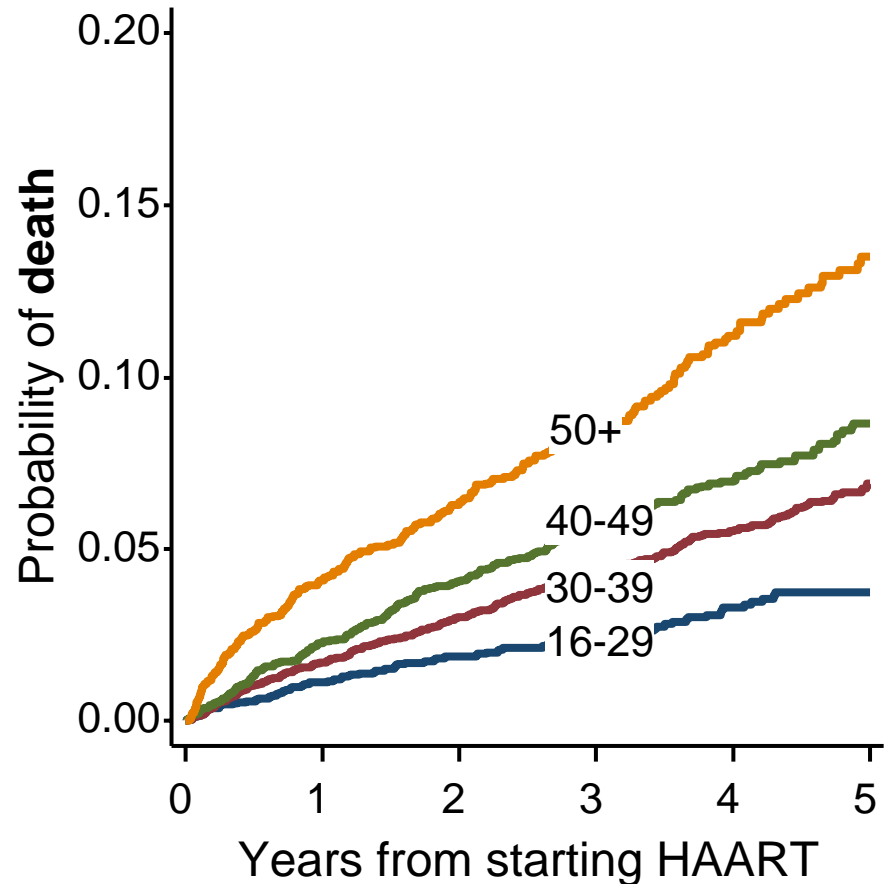
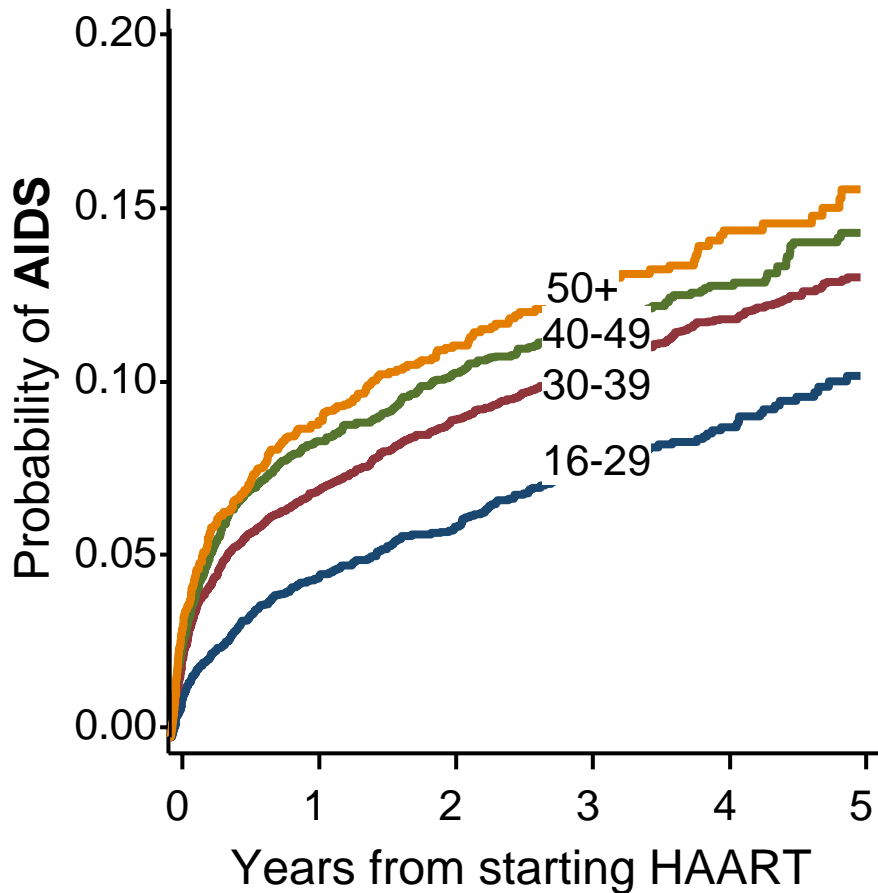
CD4 recovery and older age



¹ Douek et al., Nature 1998: Thymic function decreases with age

² Dr. Rita Effros' presentation

Clinical progression among 20'379 treatment naïve patients starting HAART



ART-CC, AIDS 2007, supplementary material
<http://www.art-cohort-collaboration.org/>



- Population of HIV infected individuals is aging since cART became available
- Increase of new HIV/AIDS infections among older women in US and western Europe
- Delayed presentation for care among older populations
- More targeted prevention campaigns needed!
- Faster HIV disease progression and more non AIDS-defining conditions with older age
- Better adherence of older persons translates into better virological outcome and partially better CD4 response but clinical outcome is blunted by age-related co-morbidity/mortality

Thanks to

- Patients and colleagues from
- ART-CC
- CASCADE
- COHERE
- D:A:D
- SHCS

Contributing Cohorts

1917 Clinic Cohort, University of Alabama, Birmingham US
AHOD, Australian HIV Observational Database, Australia
AIDS Therapy Evaluation project Netherlands
AMACS, Greece
ANRS CO1/CO10 EPF, France
ANRS CO2 SEROCO, France
ANRS CO3 AQUITAINE, France
ANRS CO4 FHDH, France
ANRS CO6 PRIMO, France
ANRS CO8 COPILOTE, France
Amsterdam Cohort Studies in Homosexual Men and IDUs, Netherlands
Aquitaine Cohort, France
Aquitaine Cohort, France
Aquitaine, France
BASS, Spain
Badalona IDU Hospital Cohort, Spain
Barcelona IDU Cohort, Spain
British Columbia Centre for Excellence in HIV (BCCfE-HIV), Canada
Brussels St Pierre Cohort, Belgium
CHIC, United Kingdom
CHIPS, United Kingdom
CPCRA, USA
Co-RIS, Spain
Collaborations in HIV Outcomes Research, USA
Danish HIV Cohort, Denmark
ECS-Mothers & ECS-Infants, United Kingdom
Edinburgh Hospital Cohort, Scotland
EuroSIDA
Frankfurt HIV Cohort, Germany
French Hospital Database on HIV, France
GEMES-Haemo, Spain
Greek Haemophilia Cohort, Greece
HIV-MIP-Mothers & HIV-MIP-Infants, Spain
HivBivus, Sweden
ICC, Italy
IMIT, Italy
ITLR-Mothers & ITLR-Infants, Italy
Italian Cohort of Antiretroviral-Naive Patients, Italy
Italian Seroconversion Study, Italy
KOMPNET, Germany
Köln / Bonn Cohort, Germany
Lyon Primary Infection Cohort, France
Madrid Cohort HIV Children, Spain
Modena Cohort Study, Italy
Madrid Cohort, Spain
MoCHIV-Mothers & MoCHIV-Infants, Switzerland
NSHPC-Mothers & NHPS-Infants, UK
Nice Cohort, France
Oslo and Ulleval Hospital Cohorts, Norway
PISCIS, Spain
Royal Free Haemophilia Cohort, UK
Royal Free Hospital Cohort, London UK
SAN RAFFAELE, Italy
SEROCO Cohort, France
ST PIERRE, Brussels, Belgium
South Alberta Clinic, Canada
Southern Alberta Clinic Cohort, Canada
Swiss HIV Cohort Study, Switzerland
Sydney AIDS Prospective Study, Australia
Sydney Primary HIV Infection cohort, Australia
The Italian Master Cohort, Italy
The Multicenter Study Group on EuroSIDA
UK Register of HIV Seroconverters, UK
University of Washington HIV Cohort, Seattle, US
VACH, Spain
Valencia IDU Cohort, Spain
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