

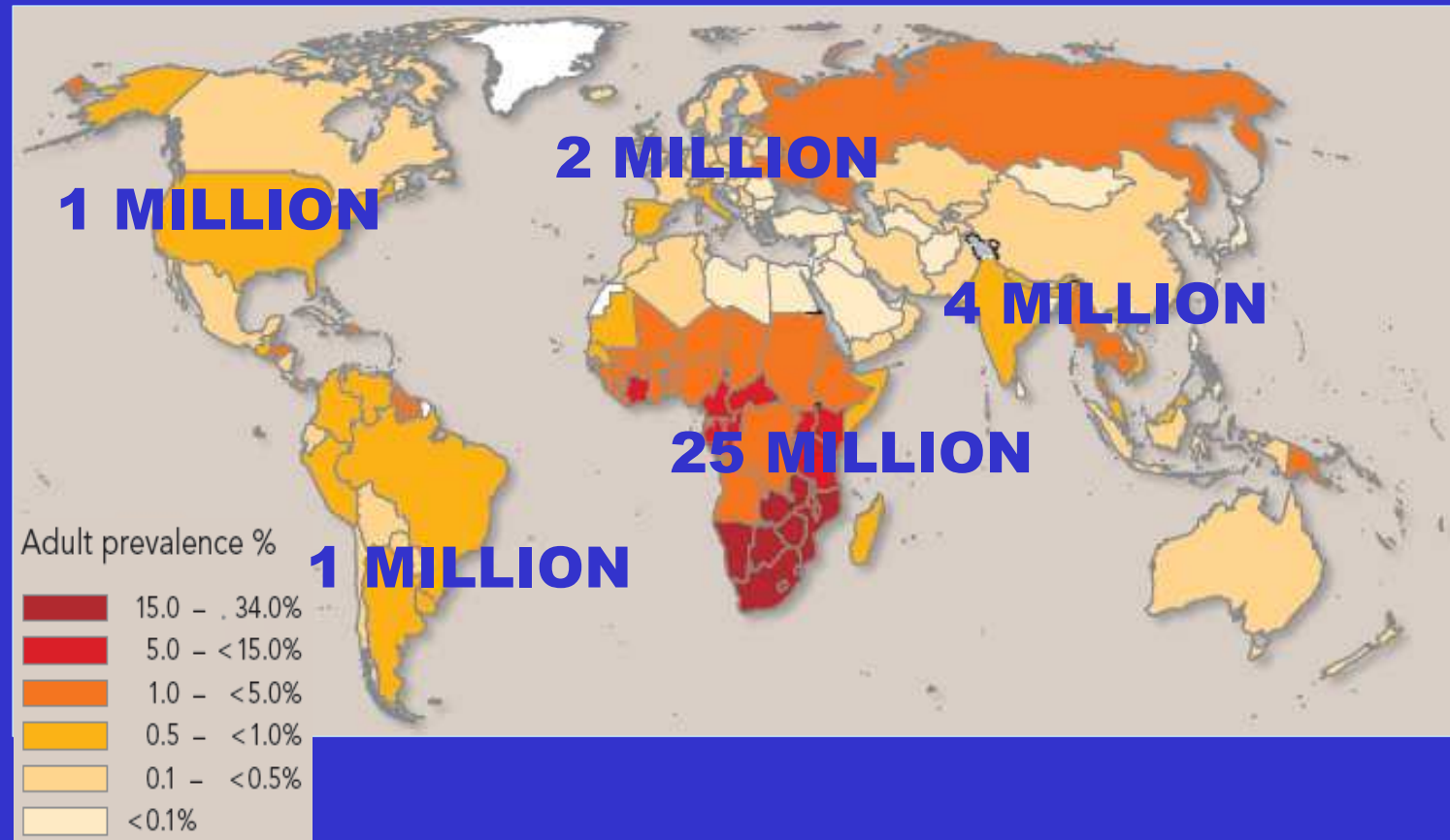
# Epidemiology of AIDS-related Cancers

**Sam M. Mbulaiteye, M.D.**

Infections and immunoepidemiology Branch  
Division of Cancer Epidemiology and Genetics

8<sup>th</sup> INCTR Meeting on Cancer in Countries with Limited Resources  
Antalya, Turkey, March 24<sup>th</sup>, 2009

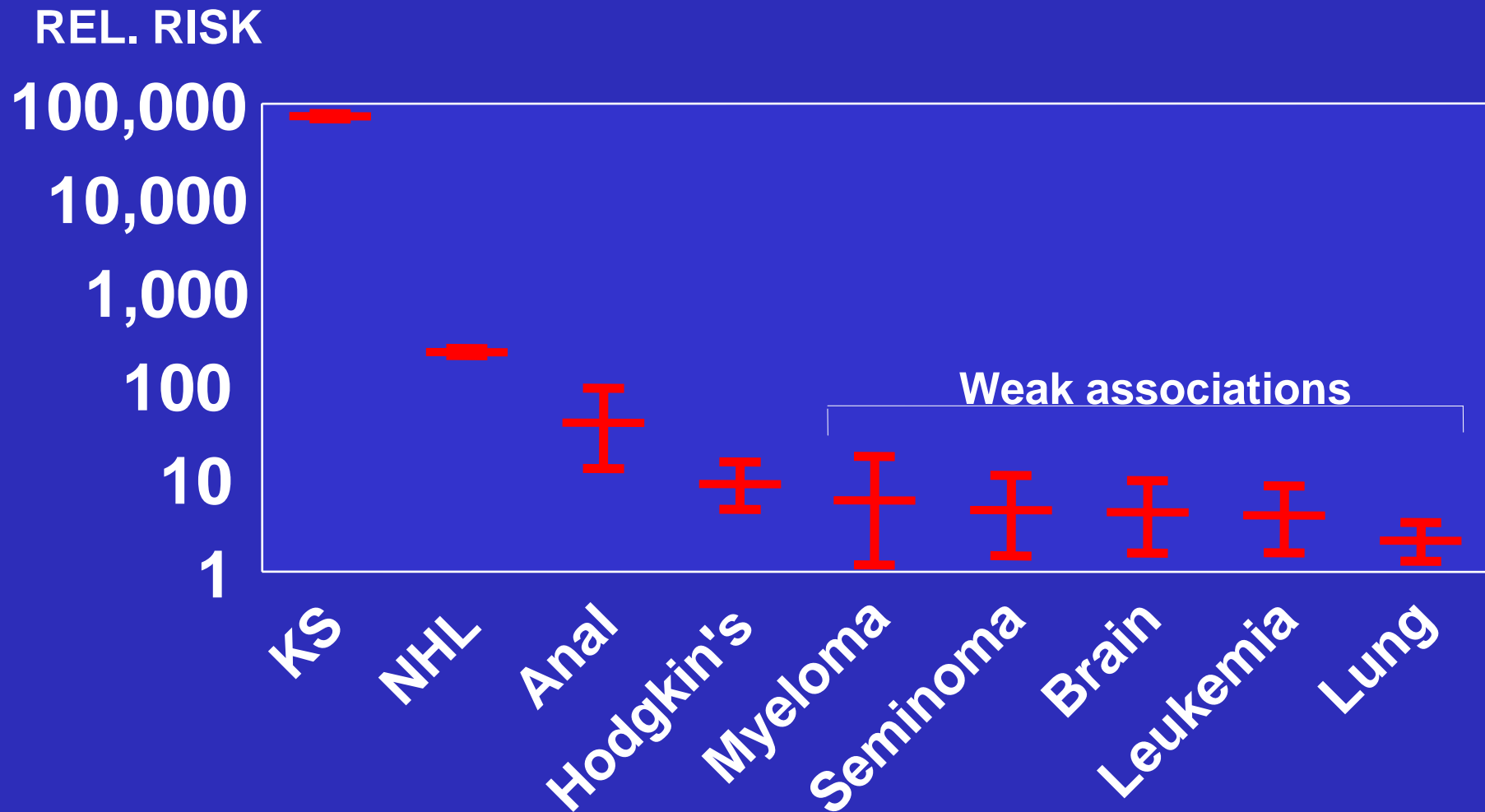
# A global view of HIV infection



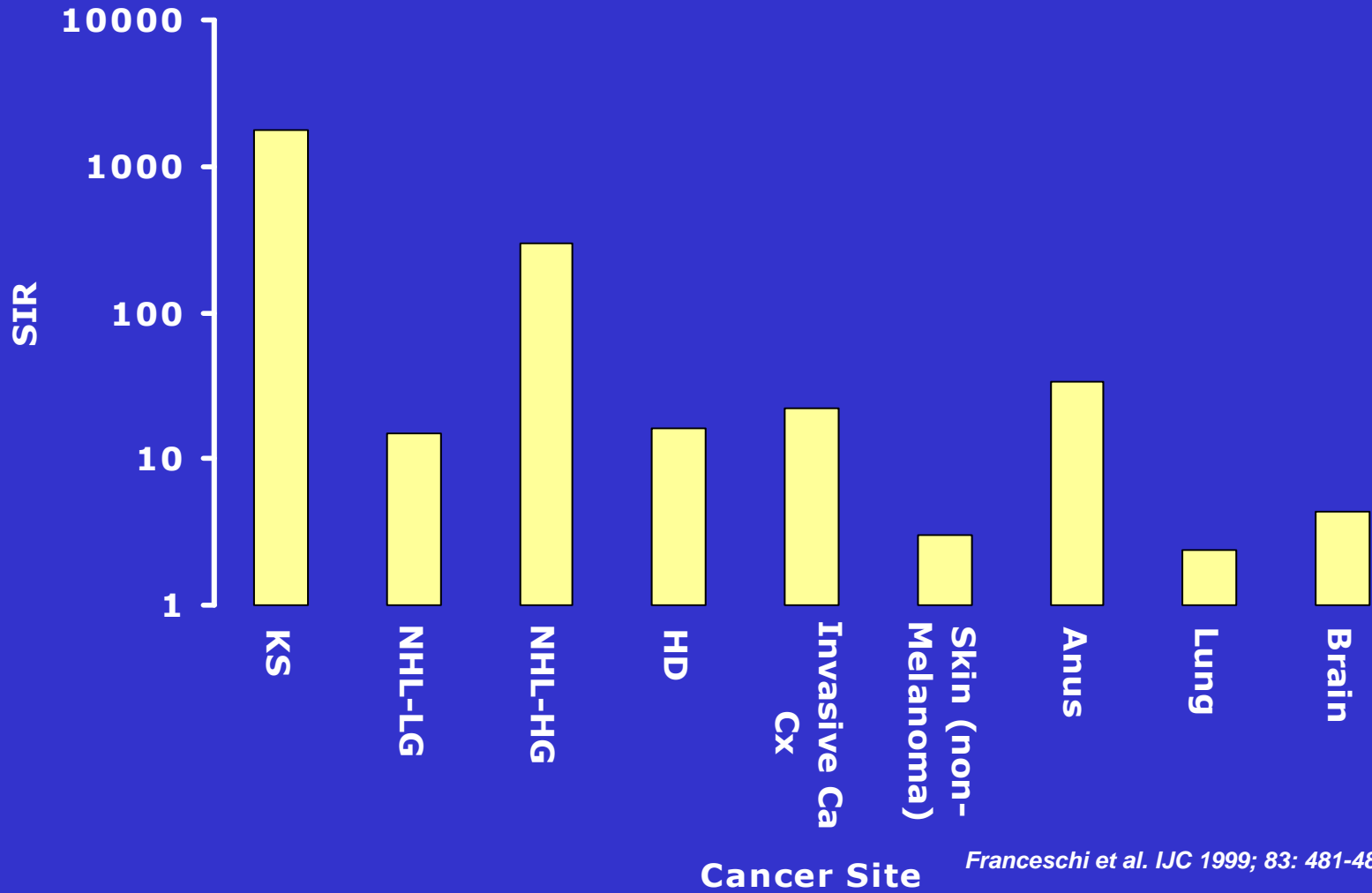
# Cancer and AIDS

- **Cancer pathogenesis**
  - immunity
  - infectious agents e.g., EBV and NHL
  - new infection-cancer associations, e.g., KS & KSHV
- **Public health**
  - burden
  - trends
    - forecasting, planning, and evaluation of programs
      - HAART
      - diagnosis or screening

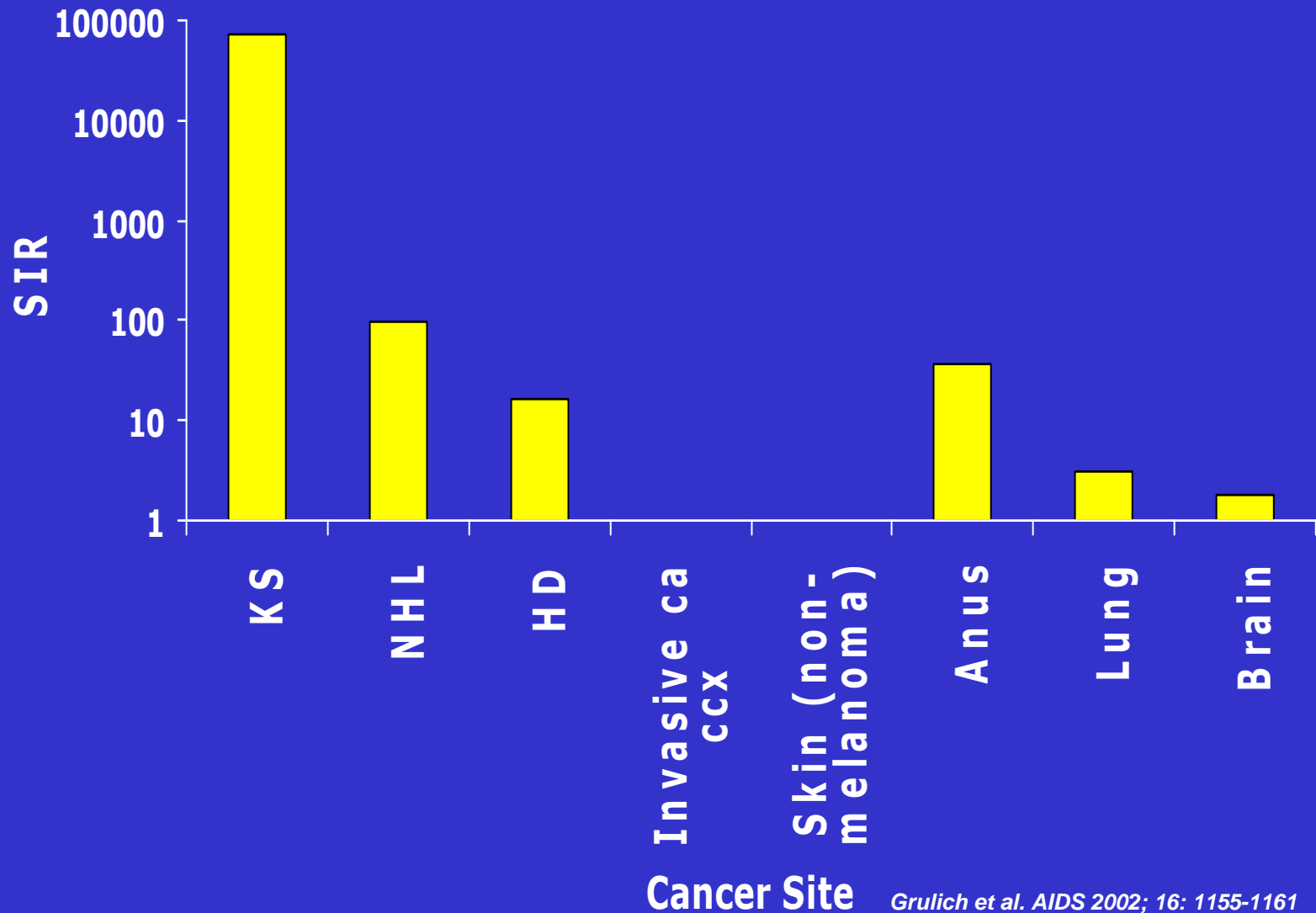
# AIDS- and non-AIDS-defining cancers



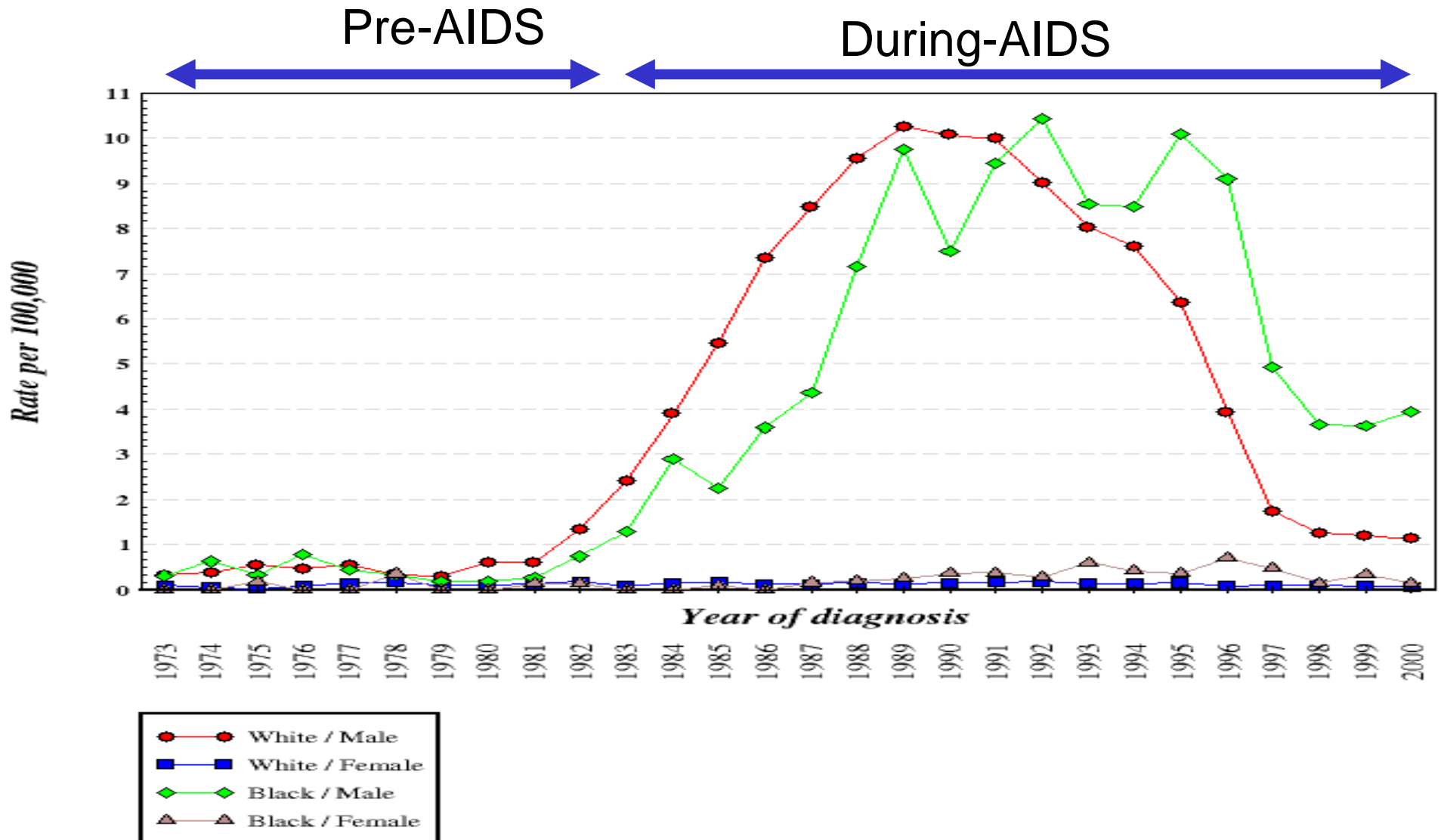
# HIV/AIDS-Cancer Match Study Italy



# HIV/AIDS-Cancer Match Study Australia



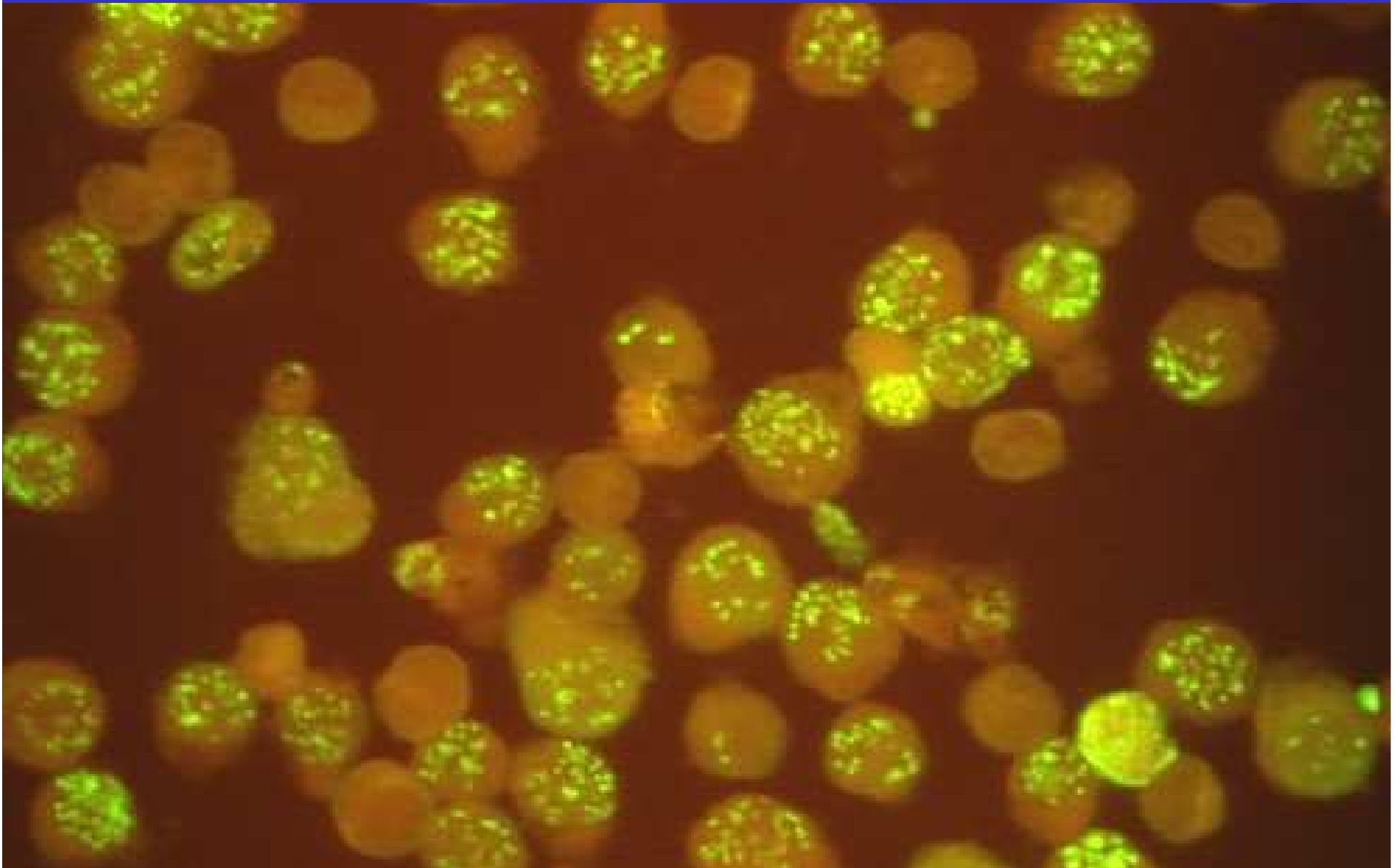
# KS incidence (U.S. SEER)



# Three-year incidence of AIDS KS by CD4 baseline CD4 count

CD4 Counts	Incident KS		P trend
	Number	Rate/100 PY	
0-299	4	7.0	
300-399	2	3.2	
400-549	2	3.6	
550+	0	0.0	<0.05

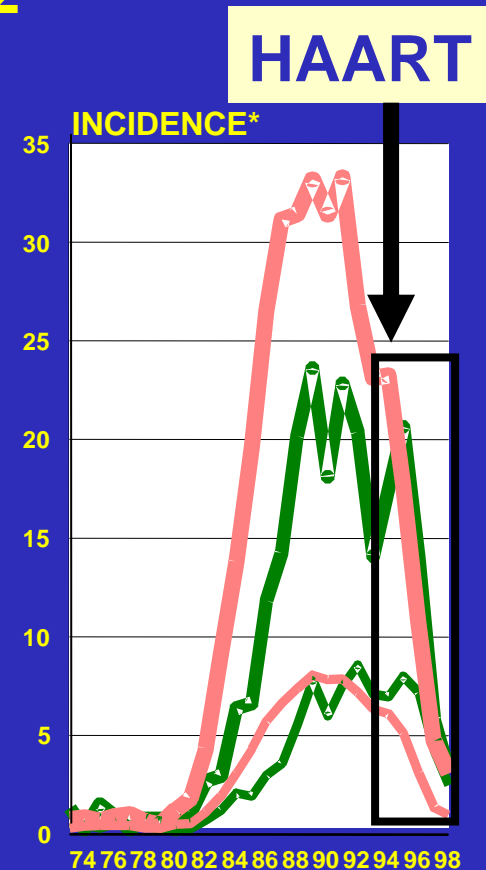
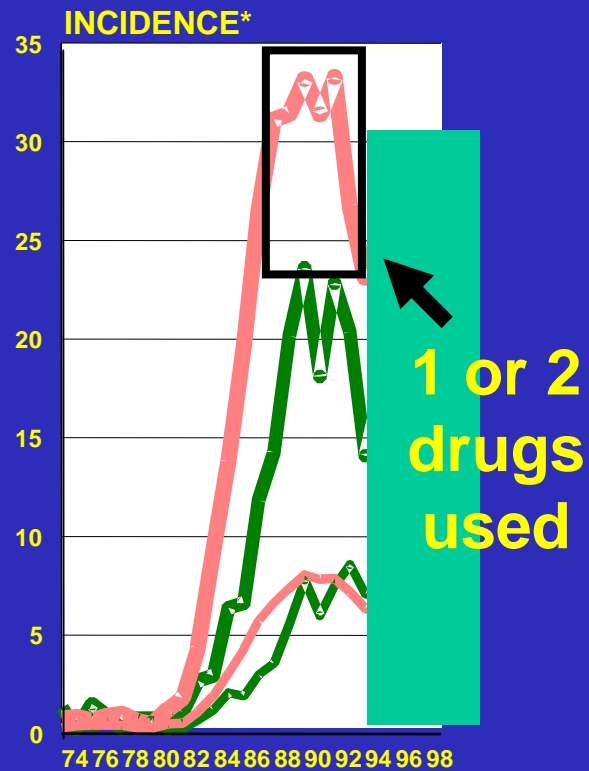
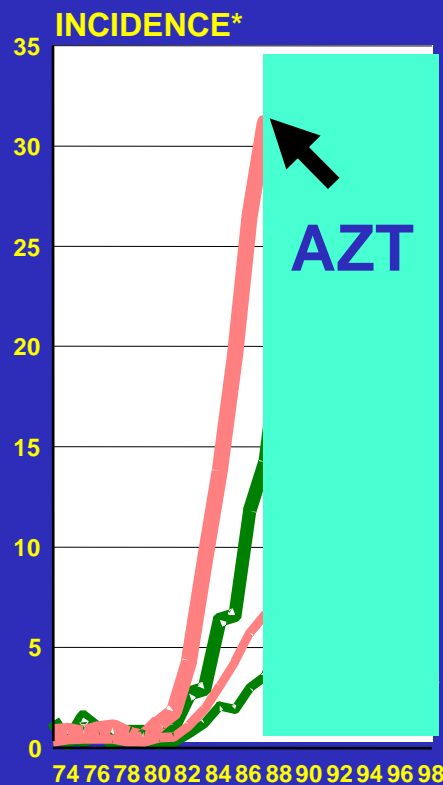
# KSHV/HHV-8 Latent IFA



# Kaposi's sarcoma incidence

## General population: 1973-1999

Eltom et al, JNCI, 2002



ALL SEER REG.  
SAN FRANCISCO AREA

WHITE



BLACK

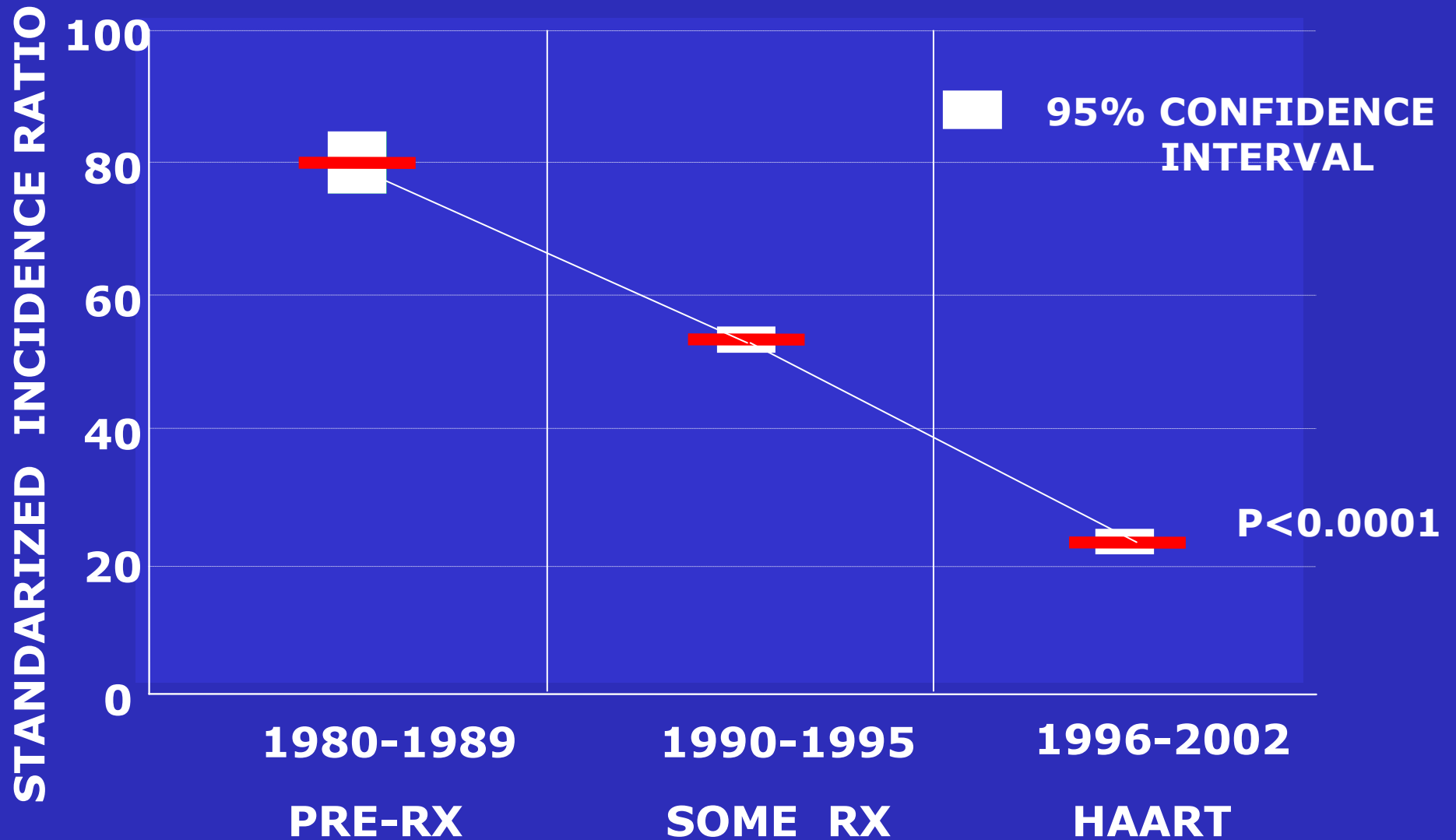


\*PER 100,000, AGE-STANDARDIZED TO THE 1970 U.S. POPULATION

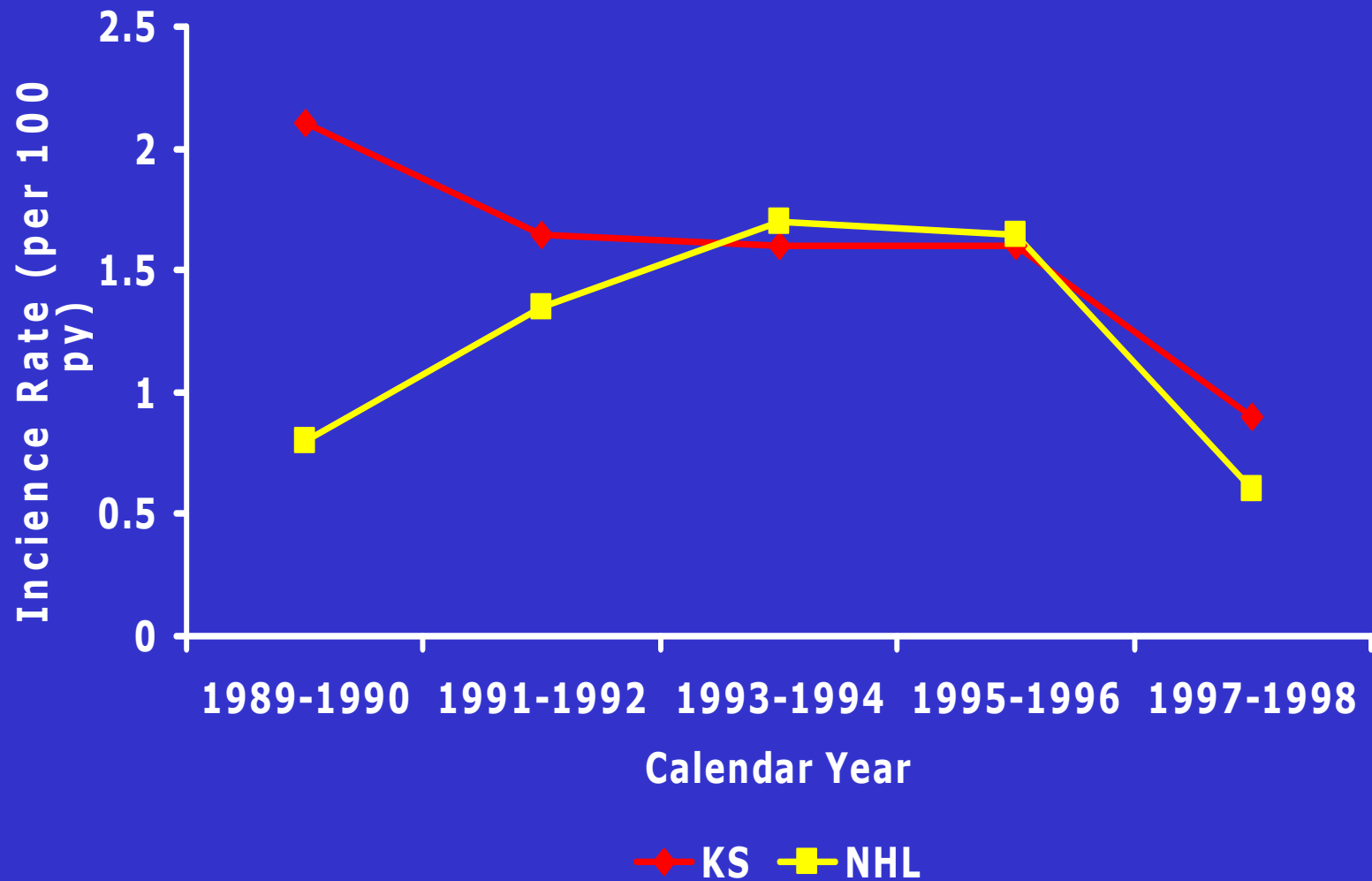
# NHL IN PWA

## RISK COMPARED TO THE GENERAL POPULATION

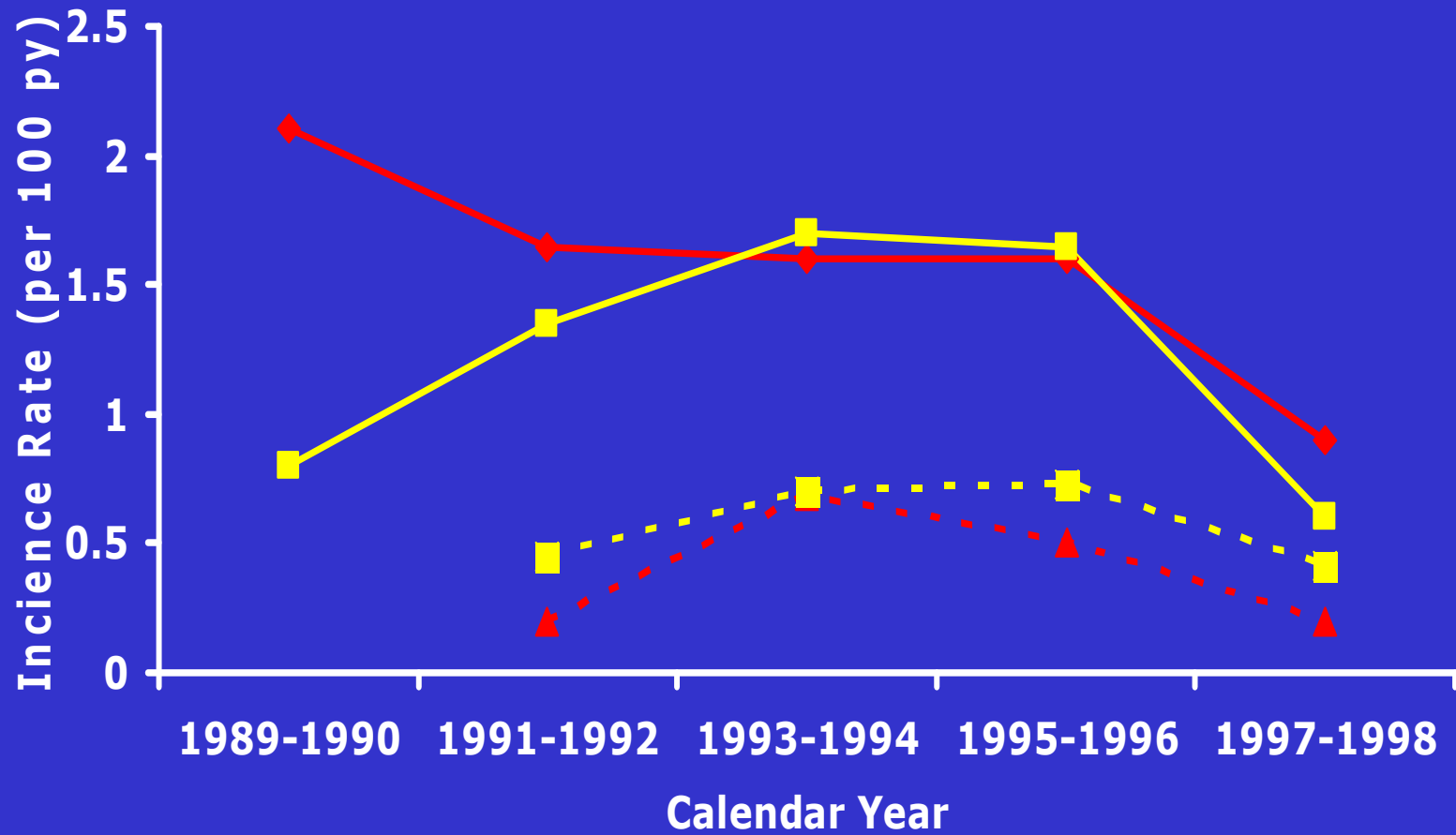
### HIV/AIDS MATCH REGISTRY (USA)



# HIV/AIDS-Cancer Match Study Italy

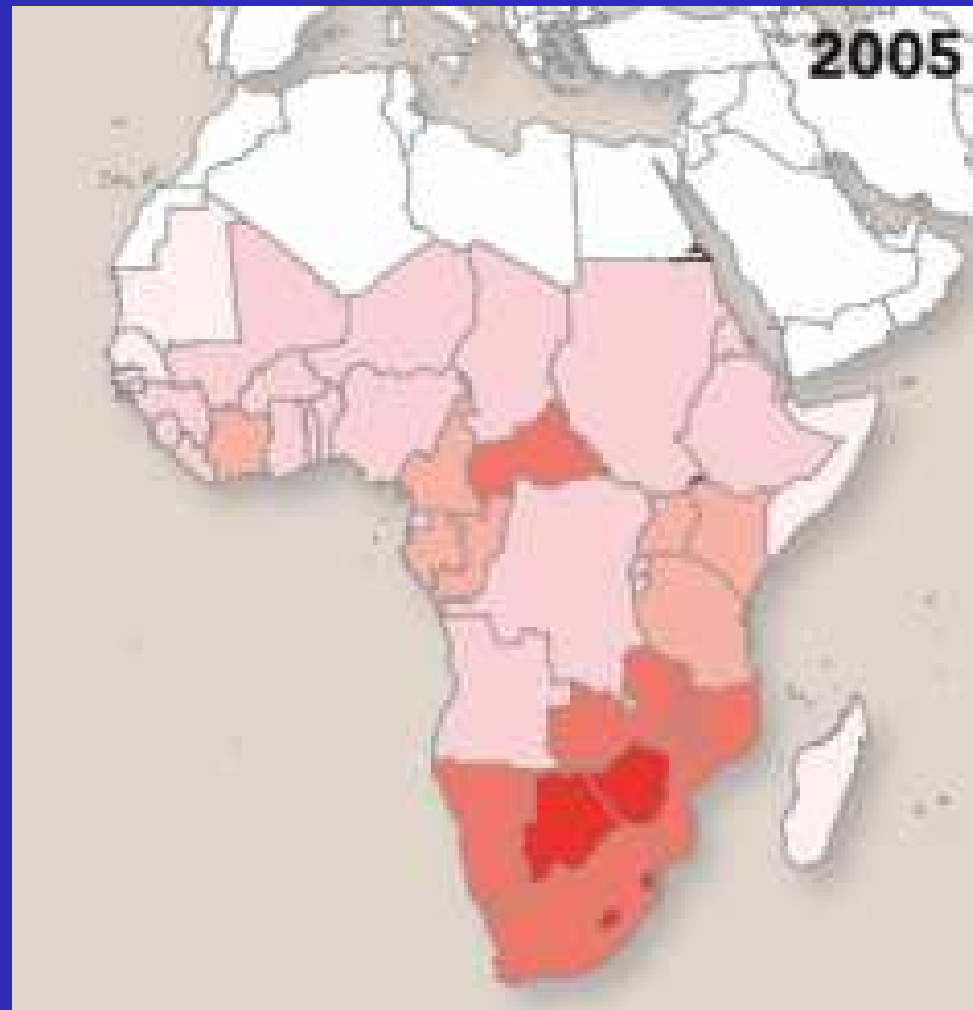


# KS and NHL Incidence Italy and Australia

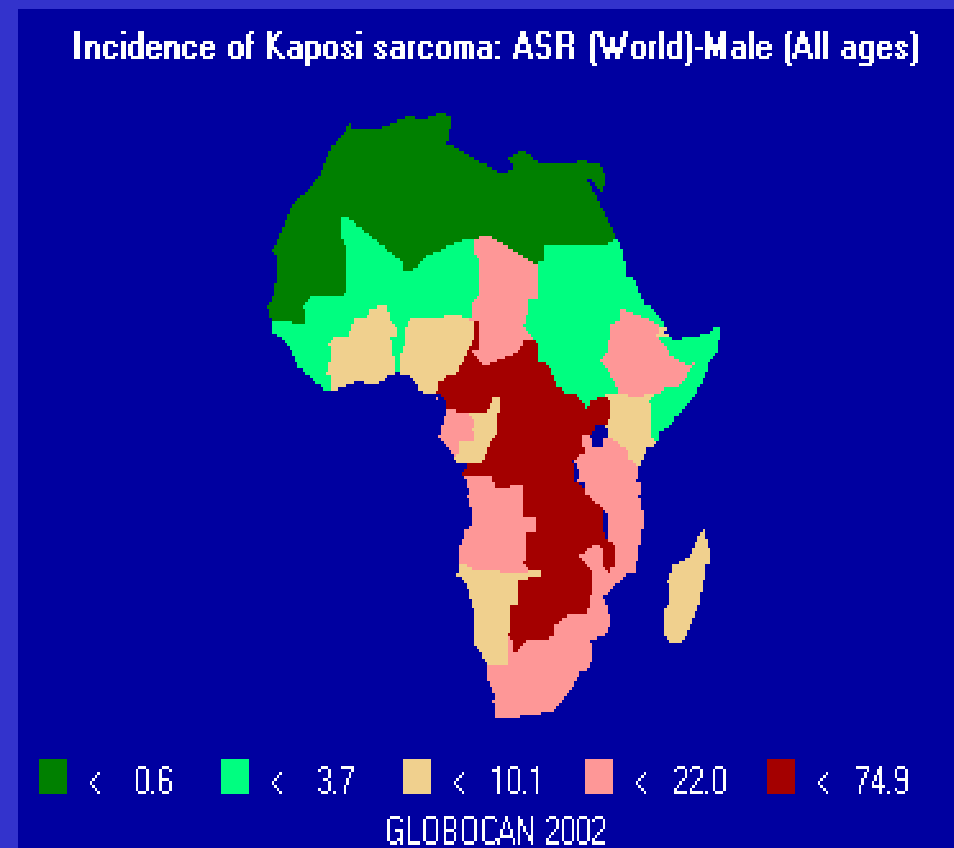
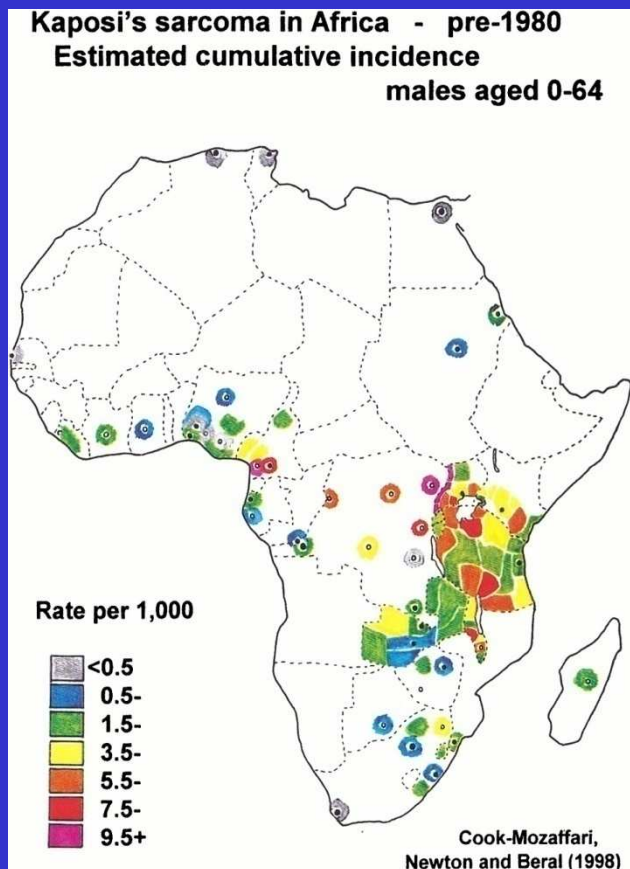


—◆— KS I(IT) —■— NHL (IT) -▲- KS (AU) -■- NHL (AU)

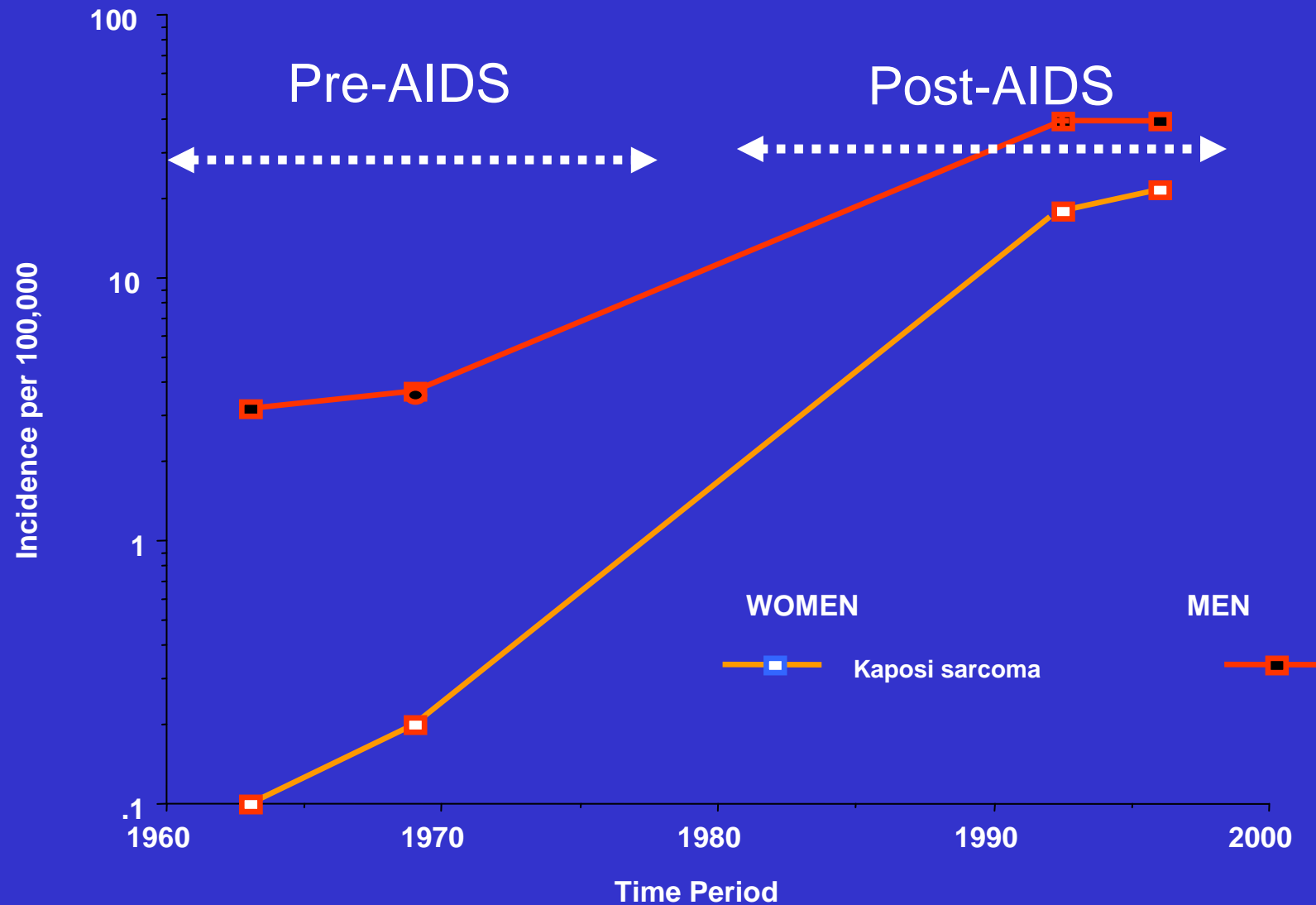
# HIV/AIDS and Cancer in Africa



# KS in Africa before and after AIDS



# KS incidence (Kyadondo, Uganda)

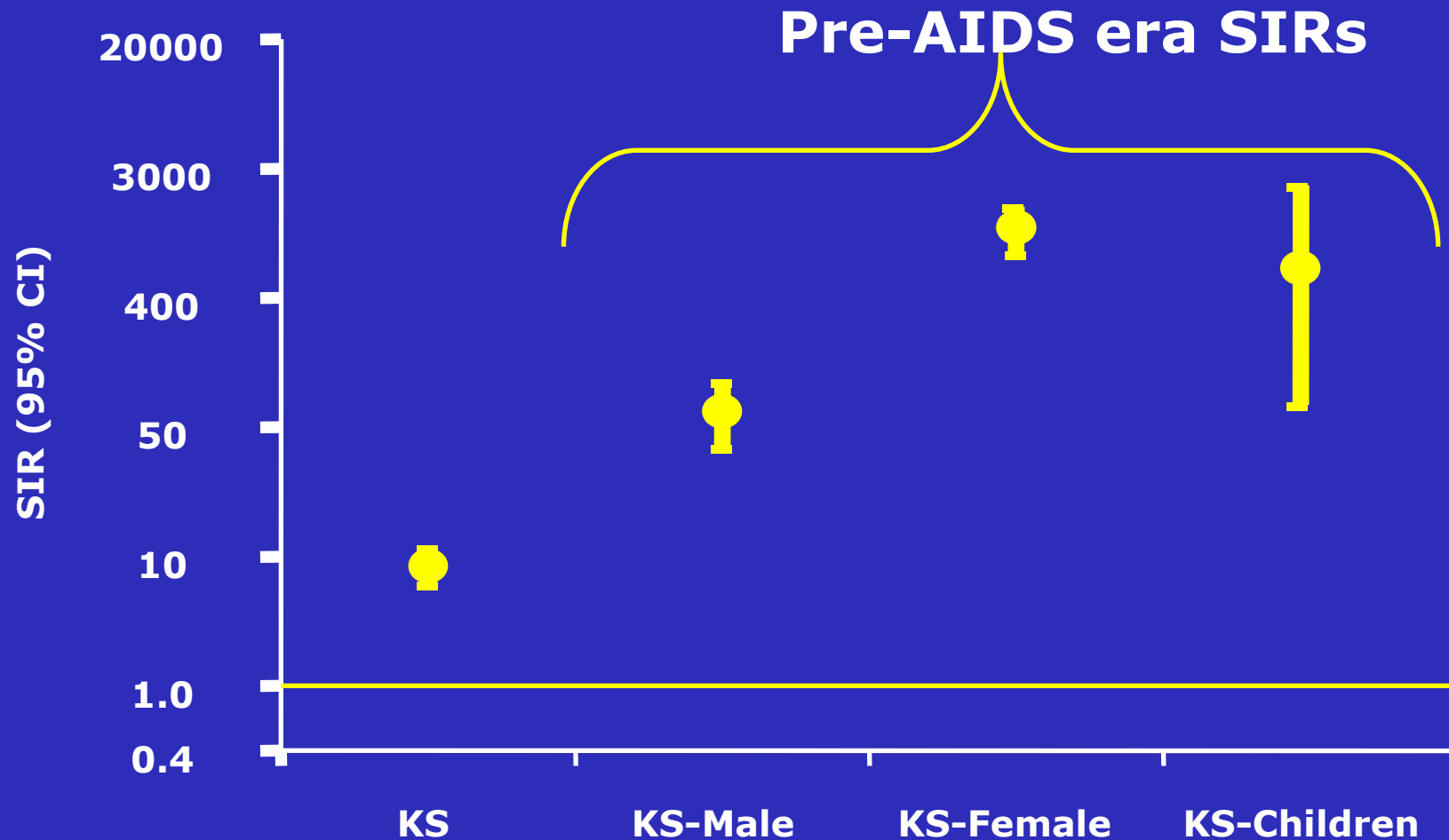


# KS risk

## (Selected African Countries)

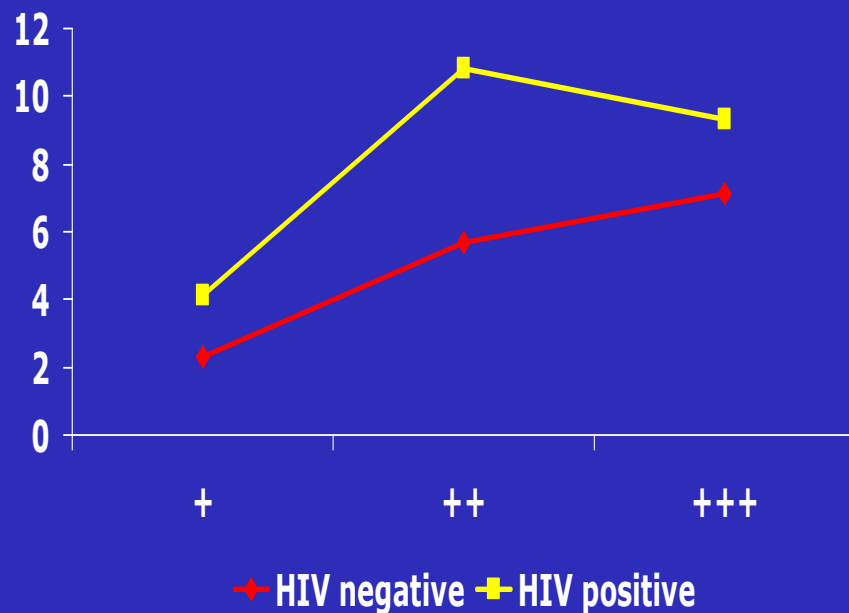
Subjects	Country	Odds ratio (95% CI)	References
Children	Uganda	95 (28.5-315)	Newton, 2001
Adults	South Africa	22 (12.5-39)	Sitas, 2000
	Rwanda	35 (8.2-207)	Newton, 1995

# SIRs for KS

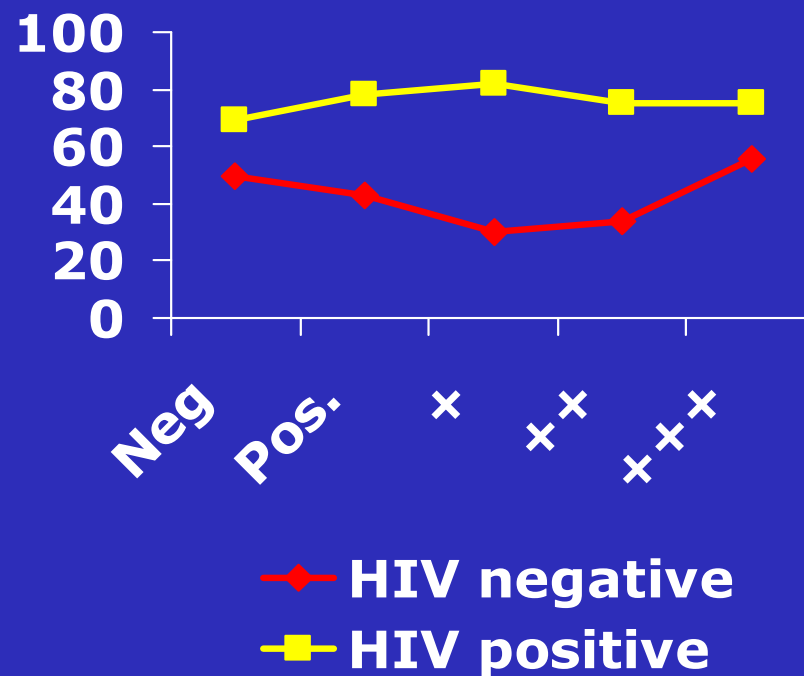


# KS characteristics by HIV status

Odds of KS by HHV8 status



Percent widespread KS

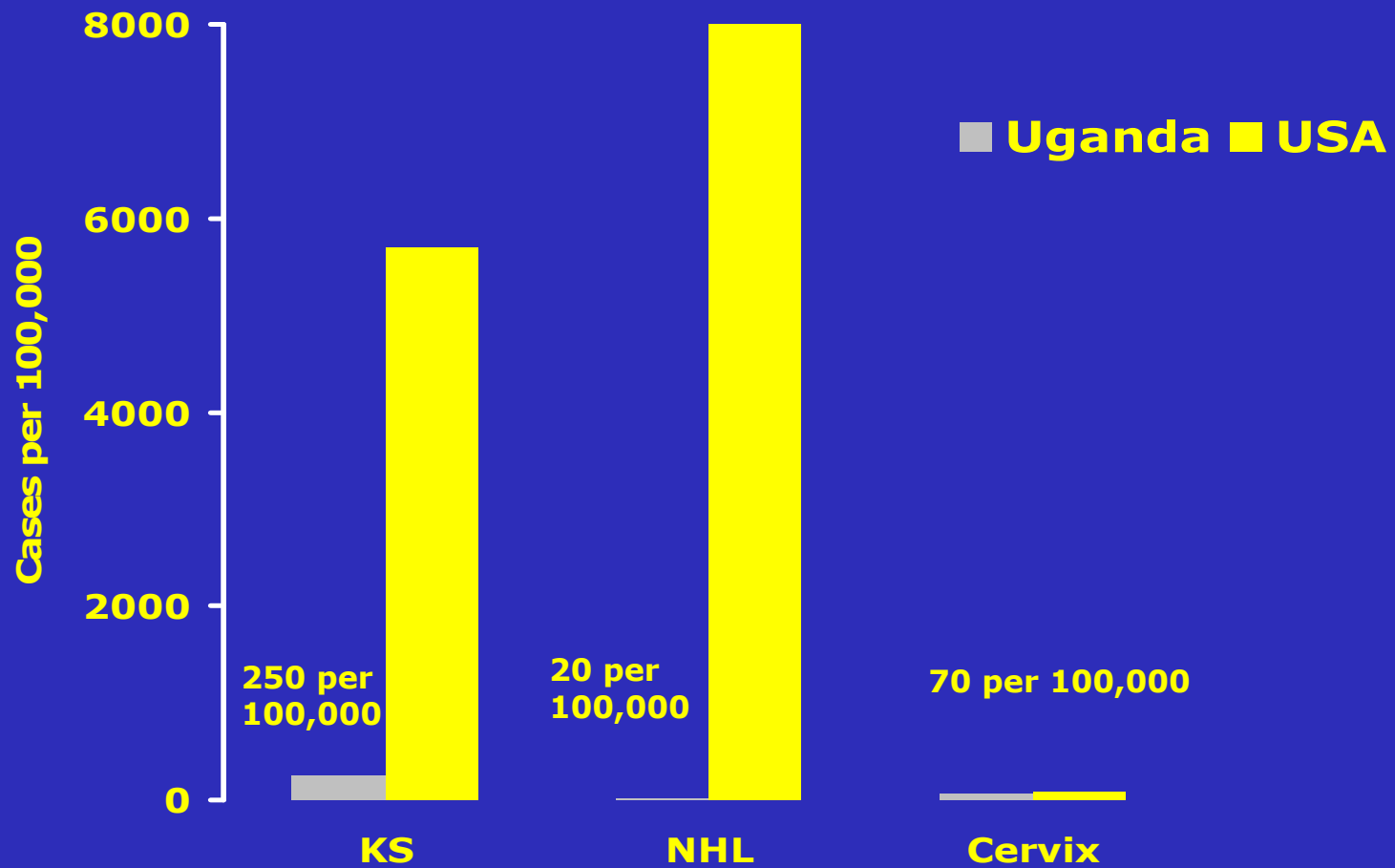


# NHL risk

## (Selected African Countries)

Tumor	Country	Odds ratio (95% CI)	References
<b>NHL</b>			
Children	Uganda	7.5 (2.8-20)	Newton, 2001
Adults	Uganda	6.2 (1.9-20)	Newton, 2001
	Uganda	2.2 (0.9-5.1)	Parkin, 2000
	South Africa	5.0 (2.7-9.5)	Sitas, 2000
	Rwanda	13 (2.2-54.4)	Newton, 1995

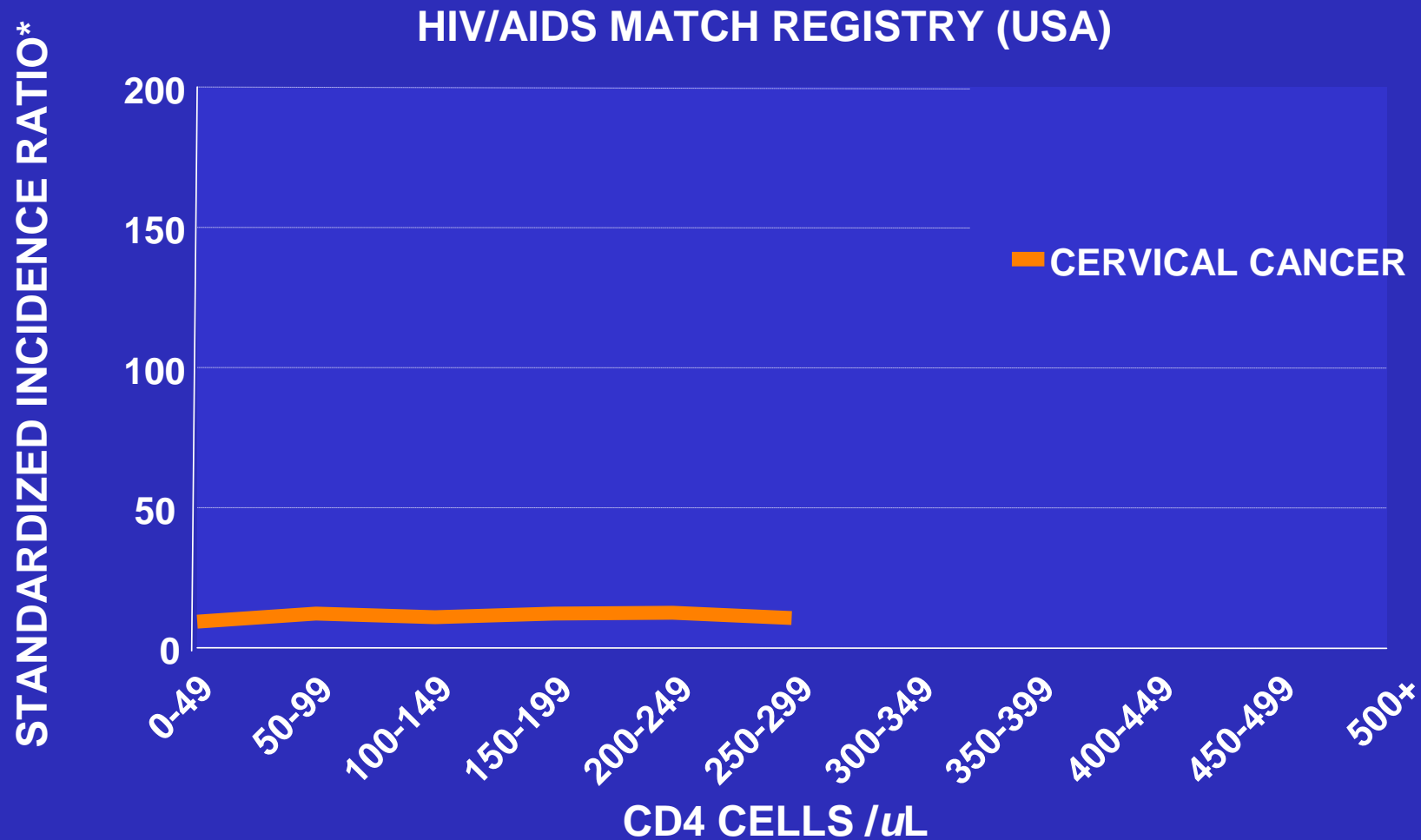
# Incidence of AIDS-defining cancers Uganda vs. U.S.



# Cervical cancer risk (Selected African Countries)

Country	Odds ratio (95% CI)	References
Uganda	1.6 (0.7-3.6)	Newton, 2001
South Africa	1.6 (1.1-2.3)	Sitas, 2000

# Cervical cancer risk by CD4 Count

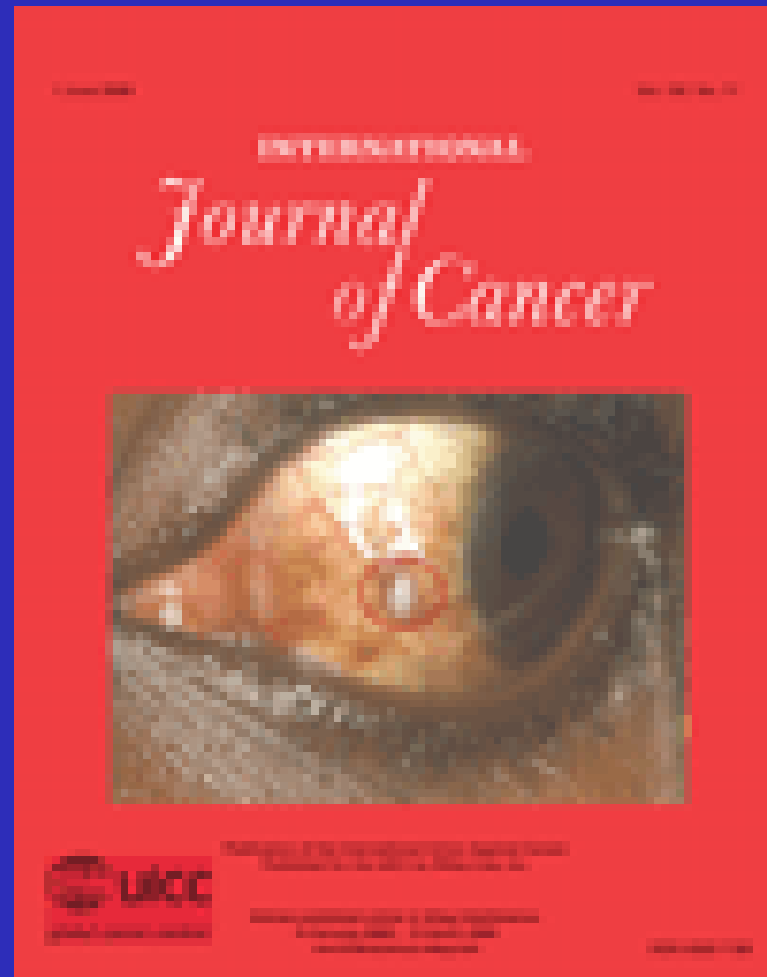


\* SIR VERSUS CONTEMPORANEOUS INCIDENCE RATES IN SAME REGISTRY

# Squamous cell carcinoma of the conjunctiva

Country	Odds ratio (95% CI)	Reference
Uganda	10 (5.2-19)	Newton, 2002

# Ocular cancers in the people with AIDS



# Conclusions

- **AIDS-defining cancers elevated**
  - KS
  - NHL
  - Cervical cancer
- **Some non-AIDS defining cancers elevated, notably**
  - Conjunctival cancer
  - Hodgkin lymphoma

# **Is cancer risk lower in resource constrained settings**

- **Insufficient studies?**
- **Really true?**
  - Ks: lower KS risk in HIV setting**
  - NHL: non-diagnosis**
- **Other cancers?**
  - Hodgkin lymphoma? Plasmacytoma?**
  - Cervical cancer?**
  - Oral cancers?**

**“There is an urgent need to improve gathering of epidemiological data and to direct research efforts to explain a very strikingly low incidence of cancers in African subjects as compared to that in the west.”**

**A R. CHITALE**

**CANCER AND AIDS**

**IND J PATH MICROBIOL, 2005**

## Limitations of data on cancer in resource limited countries

- Limited comprehensive registration
- Non-computerized, incomplete data
- Incomplete ascertainment
- Compartmentalization of research
- Limited descriptive research

# Acknowledgement

Eric A. Engels  
Robert J. Biggar  
Meklit Workneh  
Charles S. Rabkin  
James J. Goedert  
Viral Epidemiology Branch, NCI

Alex Coutinho  
Robert Ochai  
Isaac Sebuliba  
The AIDS Support Organization

Philip Virgo  
Computer Sciences Corp.

Elly Katabira  
Makerere University Medical School

Sarah Parsons  
Stella Munuo  
Information Management Systems

Henry Wabinga  
D Maxwell Parkin  
Kampala Cancer Registry