

HIV progression and mortality in a community-based Zambian cohort: gender-specific differences

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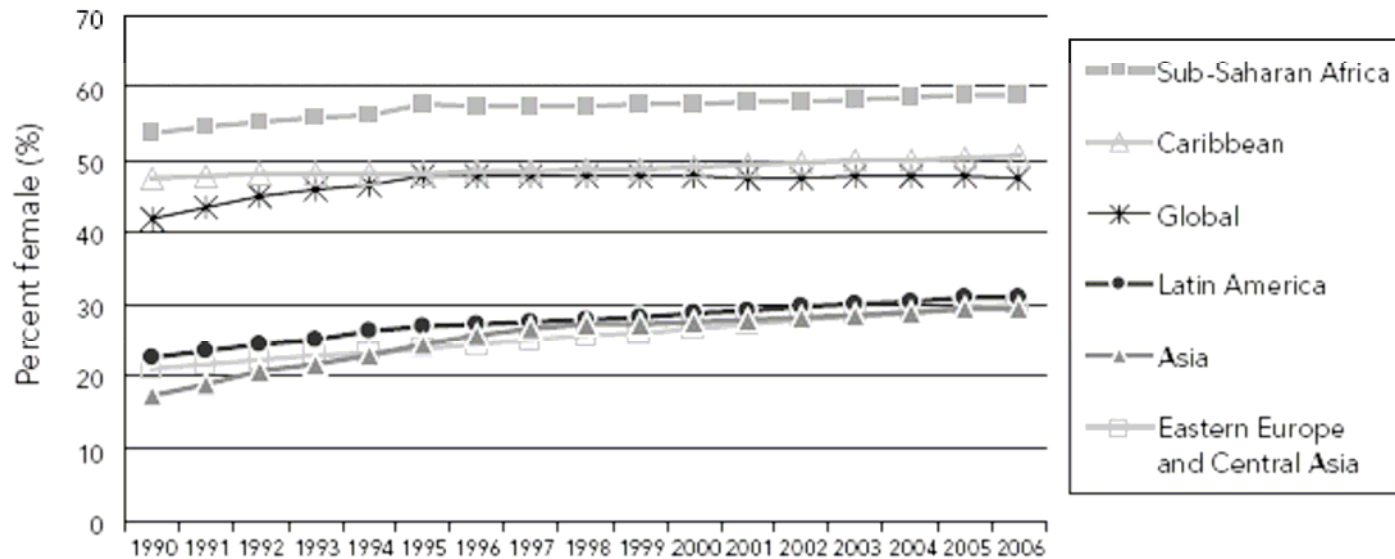
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Feminization of AIDS

Percent of adults (15+) living with HIV who are female, 1990–2006



Feminization of AIDS in Africa

- 59% of people living with HIV in Africa are female
- For every 10 adult men with HIV there are about 14 infected women.
- For Africans aged 15-24 with HIV, women account for 76% of all infections
- In South Africa, Zimbabwe, and Zambia infection rates in women aged 15-24 are between 3 and 6 times higher than in their male peers
- In South Africa, mortality in women aged 24-34 increased 5-fold between 1997 and 2004

Zambia



**1,1 mio adults and children
with HIV (17% of adults)**

100.000 deaths annually

710.000 orphans

**12,7% of women aged 15-24
(3,8% of men aged 15-24)**

**HIV prevalence in women
attending antenatal clinics:
19-20% overall**

**50.000 on ART (26% coverage)
in >110 sites**

(Zambian Ministry of Health)

Recruitment of patients

Number tested for HIV: 3278

Number HIV-seropositive: 2063

Number recruited: 1053

No follow-up: 80

HIV progression study: 973

Person-years of follow-up: 3138

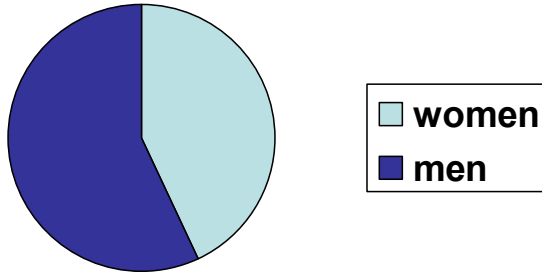
Laboratory characteristics at recruitment

CD4 cells	median 239/μl
Neopterin	median 15,3 mmol/l
Anaemia	mean 112g/l (f) 133g/l (m) no anaemia 37%
Lymphocyte	median 2240/μl

Demographic characteristics

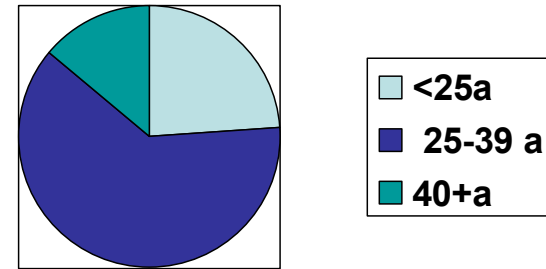
Sex

43% female



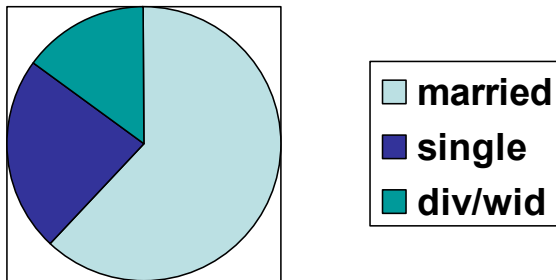
Age

mean 30a



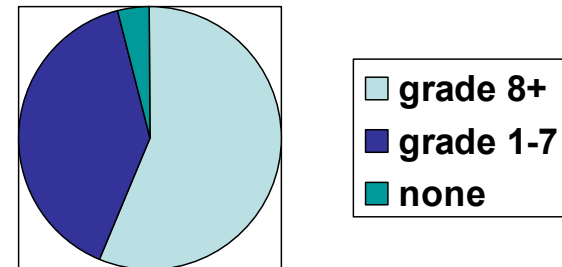
Marital status

62% married



Education

56% higher education



Gender differences at recruitment

Women were more likely to be:

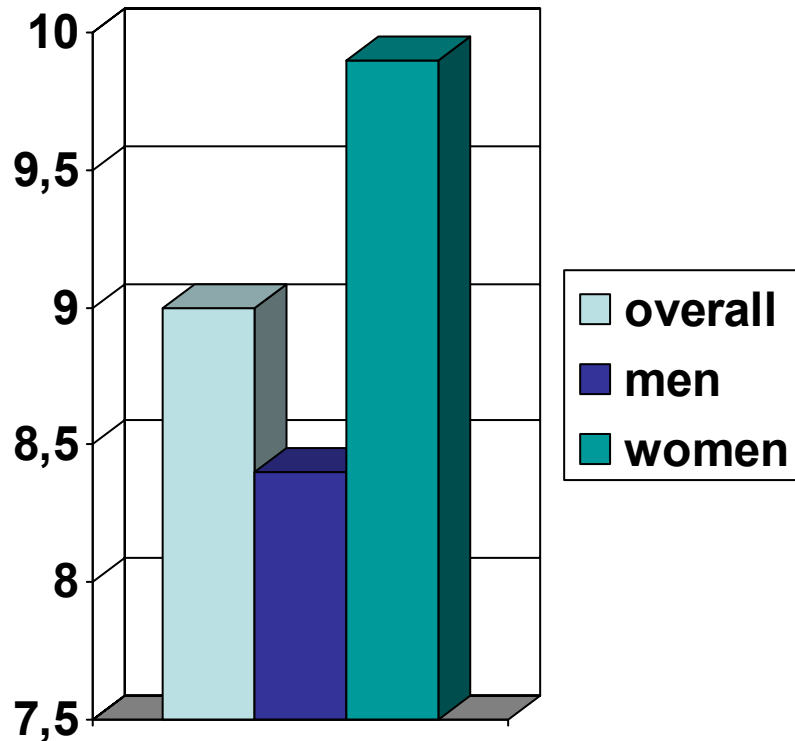
- Younger (28 vs 32 years)
- Widowed, divorced, or separated (25% vs. 8%)
- No education at all (8% vs 1%)
- Only primary education (50% vs. 33%)
- resident in George township
- (lost before recruitment)

Laboratory markers:

- Haemoglobin lower in women (112 vs 133g/dl)
- All other markers no difference

Mortality rate by gender

(per 100 pyrs)



Overall **9,0**

men **8,4**

women **9,9**

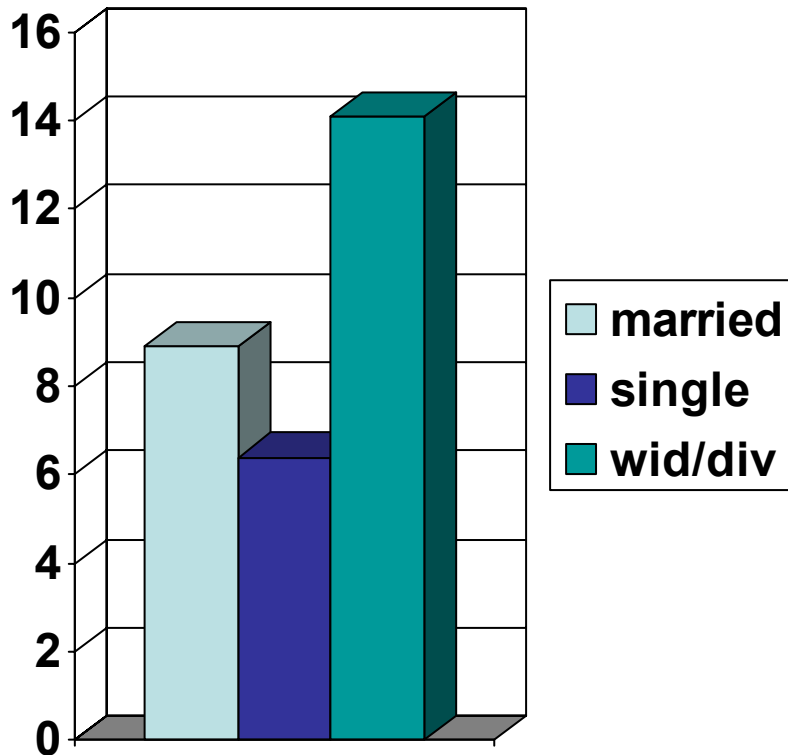
Adjusted risk ratio:

1,29

p=0,041

Mortality rate by marital status

(per 100 pyrs)



Overall	9,0
married	8,9
single	6,4
wid/div	14,1

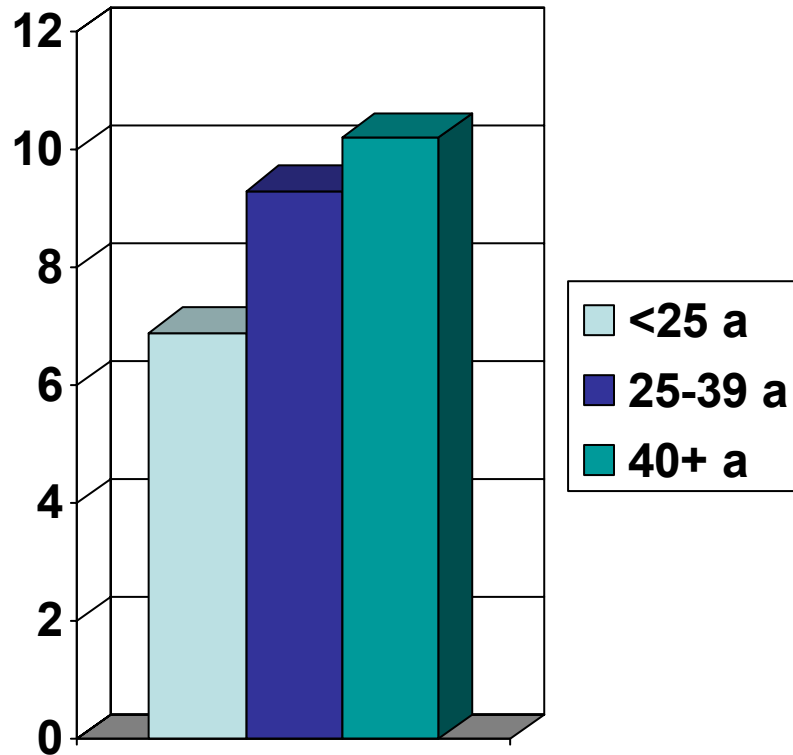
Adjusted risk ratio:

married	1
single	0,87
wid/div	1,48

p<0,05

Mortality rate by age

(per 100 pyrs)



Overall 9,0

Under 25 6,9

Age 25-39 9,3

Over 40 10,2

Adjusted risk ratio:

Under 25 1

Age 25-39 1,45

Over 40 1,60

P<0,001

Mortality rates by baseline progression markers

		Death rate	adj. RR	% dead (5a)
CD4 count	≥200	2,4	1	13
(/μl)	<200	11,6	4,43	47
			p<0,001	
CD4 %	≥18	5,8	1	26
	<18	12,8	2,26	49
			p<0,001	
TLC	≥1500	7,2	1	31
(/μl)	<1500	12,1	1,63	45
			p<0,01	

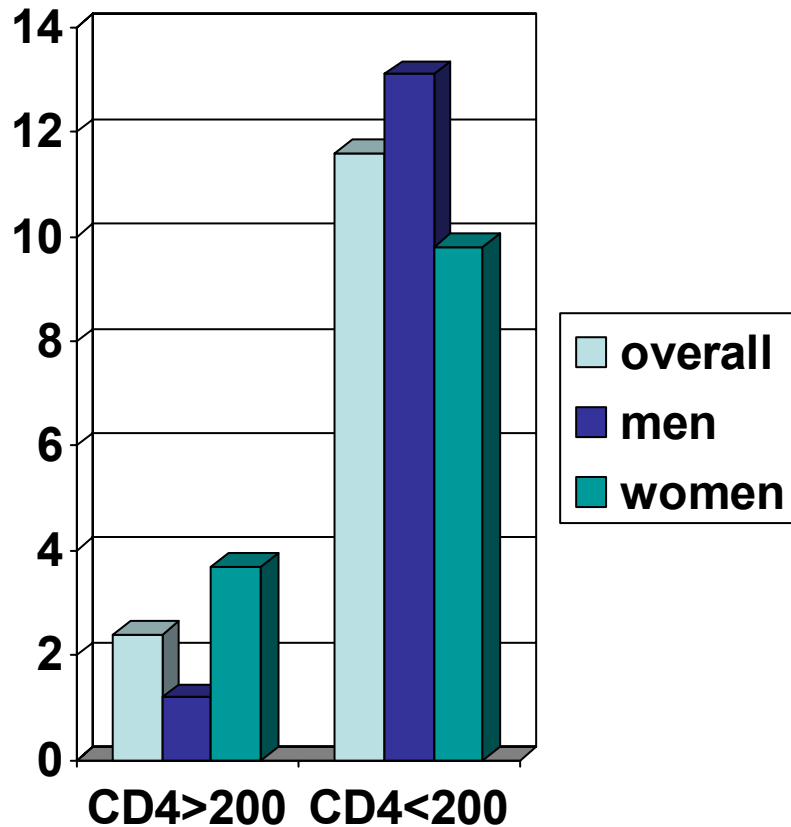
Mortality rates by baseline progression markers

		Death rate	adj. RR	% dead (5a)
anaemia	none	1,3	1	20
	Mild *	10,2	2,31	41
	severe	34,8	6,55	61
			p<0,001	
neopterin	<15	3,1	1	13
(nmol/l)	≥15	15,4	4,92	56
			p<0,001	

*mild anaemia: Hb 8-12g/dl in females
8-14g/dl in males

Mortality rates for gender

(stratified by baseline CD4 count)



CD4 \geq 200

Men 1,2

Women 3,7

adjusted RR 4,23

p<0,01

CD4<200/ μ l

Men 13,1

Women 9,8

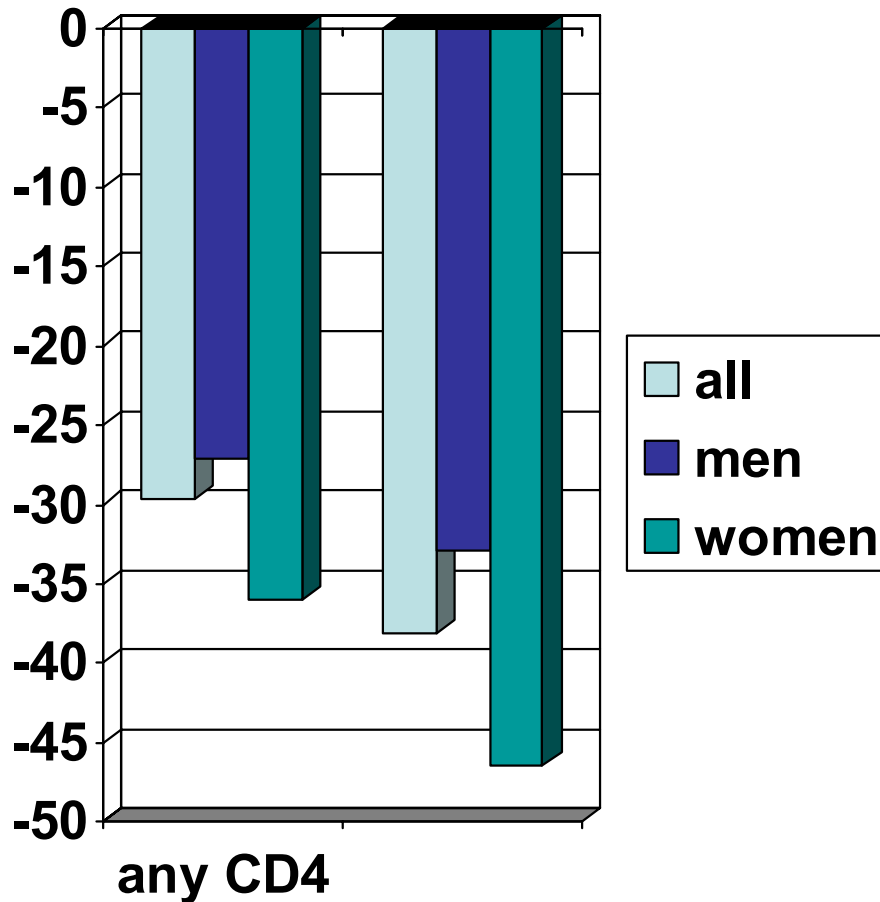
adjusted RR 0,78

n.s.

Annual change in progression markers

	all	survivors	deaths	P-value
CD4 (/μl)	-29,6	-28,0	-43,8	P<0,05
Hb (g/L)	-1,9	-1,1	-5,6	P<0,001
Neopterin (nmol/L)	1,2	0,9	4,26	P<0,001

Annual CD4 decline by gender



Whole cohort

- All -29,6
 - Men -27,1
 - Women -36,0
- p<0,05

Baseline CD4 ≥ 200

- All -38,1
 - Men -32,9
 - Women -46,4
- p<0,05

Summary

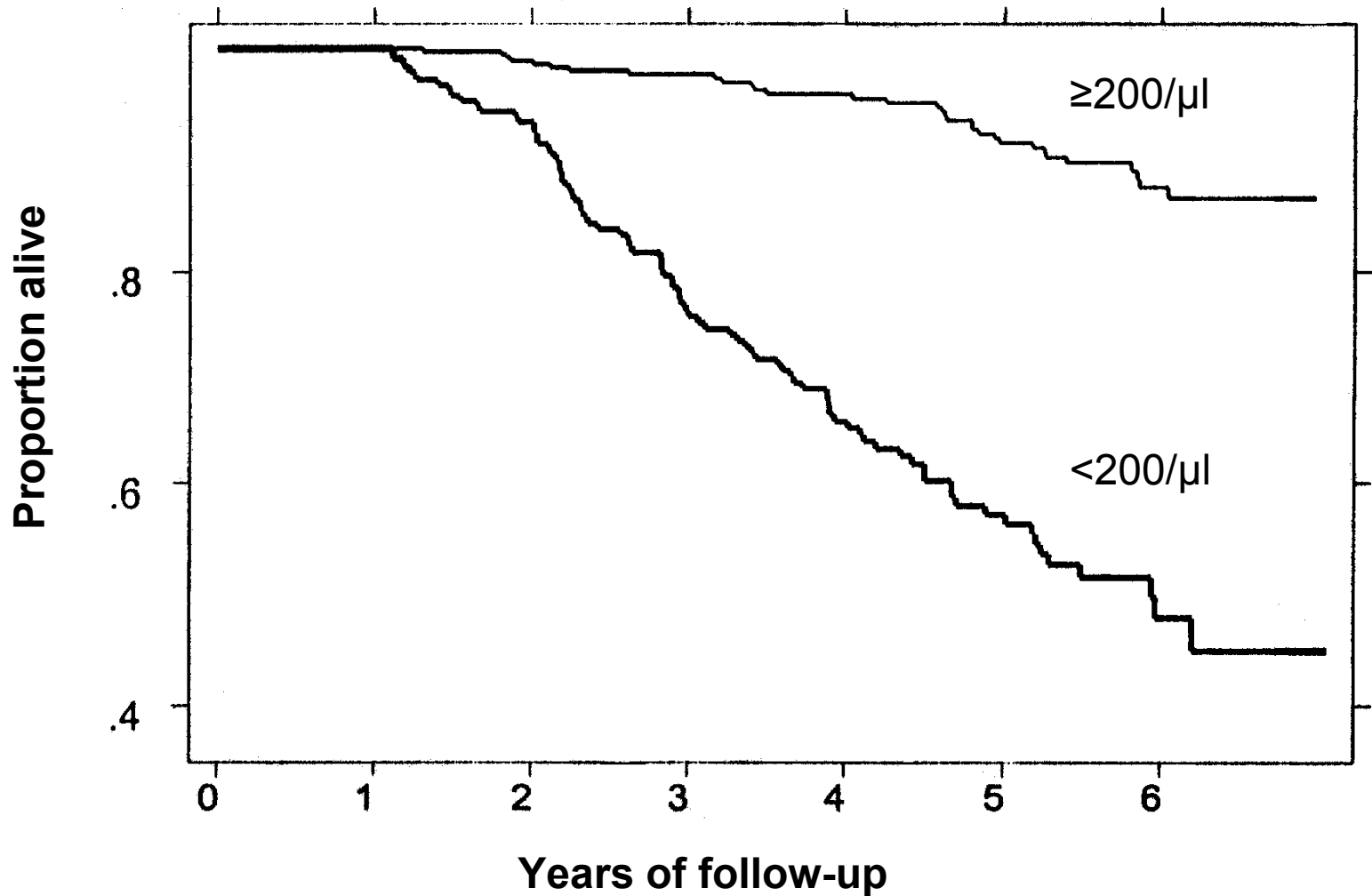
- 3138 person-years of follow-up
overall death rate of 9.0 per 100 pyrs
- higher death rates in females, in older patients,
in divorced/widowed/separated persons
- Annual CD4 decline is faster in women
- Women with CD4 >200/ μ l have a >4-fold higher risk of
death compared with men
- Increased mortality in women is mainly due to socio-
economic factors
- Health systems and interventions need to address the
special needs of African women, and also pay attention
to those women who do not qualify for ART

A wide-angle photograph of Victoria Falls in Zambia. The image shows a massive volume of white water cascading over a rocky ledge into a pool below. The sky is bright with scattered clouds. In the foreground, there are dark green tree branches and leaves framing the scene. The text "Thank you !" is overlaid in the upper right quadrant.

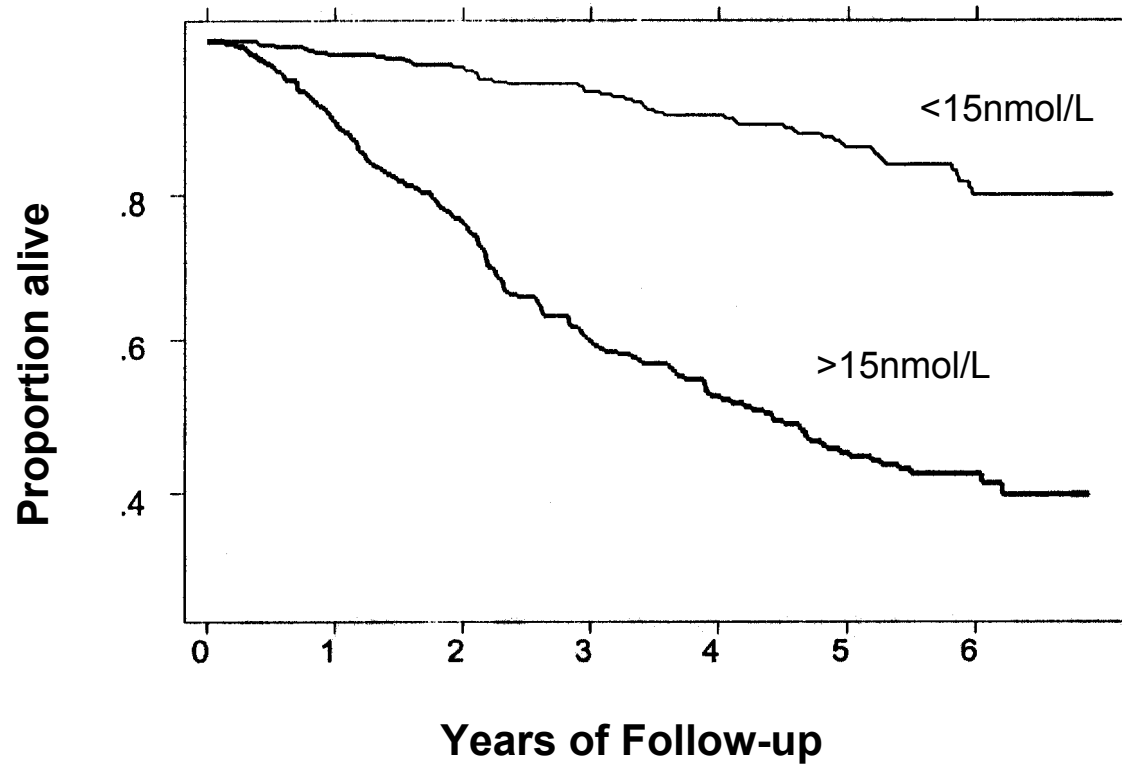
Thank you !

Victoria Falls, Zambia

Kaplan Meier survival curves by baseline CD4 count



Kaplan Meier survival curves by baseline neopterin



Practices of men that put women at risk

- **Sugar daddies**
- **High payments to encourage sex workers to engage in unprotected sex**
- **Rape of young girls by school teachers**
- **Molestation of young girls by family members**
- **Molestation of street children**

Cultural practices

- **Cultural expectation of subservience in sexual matters**
- **Lack of proactive opportunities to discuss sexual matters and risks with husbands**
- **Culture of wife inheritance after widowhood**
- **Lack of property rights for widows and single mothers even when they have to take care of small children**

Lack of female education

- **45% of women \geq 15 years are illiterate**
- **94% of boys are enrolled into primary school vs. 81% of girls**
- **Primary school education should be free**
- **Woman should have increased access to university education, esp. from poor families**

Empowerment of African women

- **Although women are major sources of economic wealth in many rural parts of Africa, these women have limited control over their created income due to cultural taboos and traditional practices**
- **Micro-credit facilities for enterprising rural women → disposable income**
- **Women with disposable income are likely to make better personal choices for themselves and their children**

Political space for women

- **Women should be in decision making organs in local and state governments**
- **Leadership role in key government institutions such as ministry of finance, national planning, justice**
- **Decision making positions in civil society, local chambers of commerce, local youth organizations that directly interface with grassroots**
- **Female representation in national cabinets in Africa should go beyond the obligatory „Ministry of women or Gender affairs“**

Legal climate and framework that protect women from discrimination

- **More than 50% of African countries do not have legal statutes that outlaw discrimination against people with HIV/AIDS (UNAIDS estimate)**
- **Fear of an HIV test among women, including pregnant mothers, since negative societal consequences and uncertain future may lie ahead**
- **Legal reforms on rape, sexual molestation, property rights, and ownership of business are crucial in the fight against feminization of HIV/AIDS**
- **Zero legal tolerance against sexual violence should be enforced**

Female friendly health systems

- **Privacy and confidentiality are rare in African health services**
- **Social stigma is common when women become linked to STDs**
- **Fear of violence may prevent women from utilising HIV preventive services or even showing up for AIDS clinical care**
- **Gender issues should be positioned as a major priority of international development assistance**
- **Poverty is major reason why women knowingly engage in high risk behaviour**

