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The Impact of HIV/AIDS on Medical Schemes in South Africa

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Agenda

- HIV modelling
- Medical scheme population
- Prescribed Minimum Benefits
- Models
- Family unit algorithm
- Sample population
- Results
- Discussion

The four stages of HIV

- The progression of the infection is measured in terms of the CD4 count, and the viral load (the amount of virus in the blood).
- The CD4 count generally determines the rate of deterioration of the patients resistance

	Clinical Indicator	Average Duration	Symptom
Stage1	CD4>500	4 to 6 years	Asymptomatic
Stage2	CD4 between 350 and 500	2 to 3 years	Some opportunistic infections
Stage3	CD4 between 200 and 350	2 to 3 years	Opportunistic infections
Stage4	CD4<200	6 months to 1 year	AIDS

Modelling HIV/AIDS

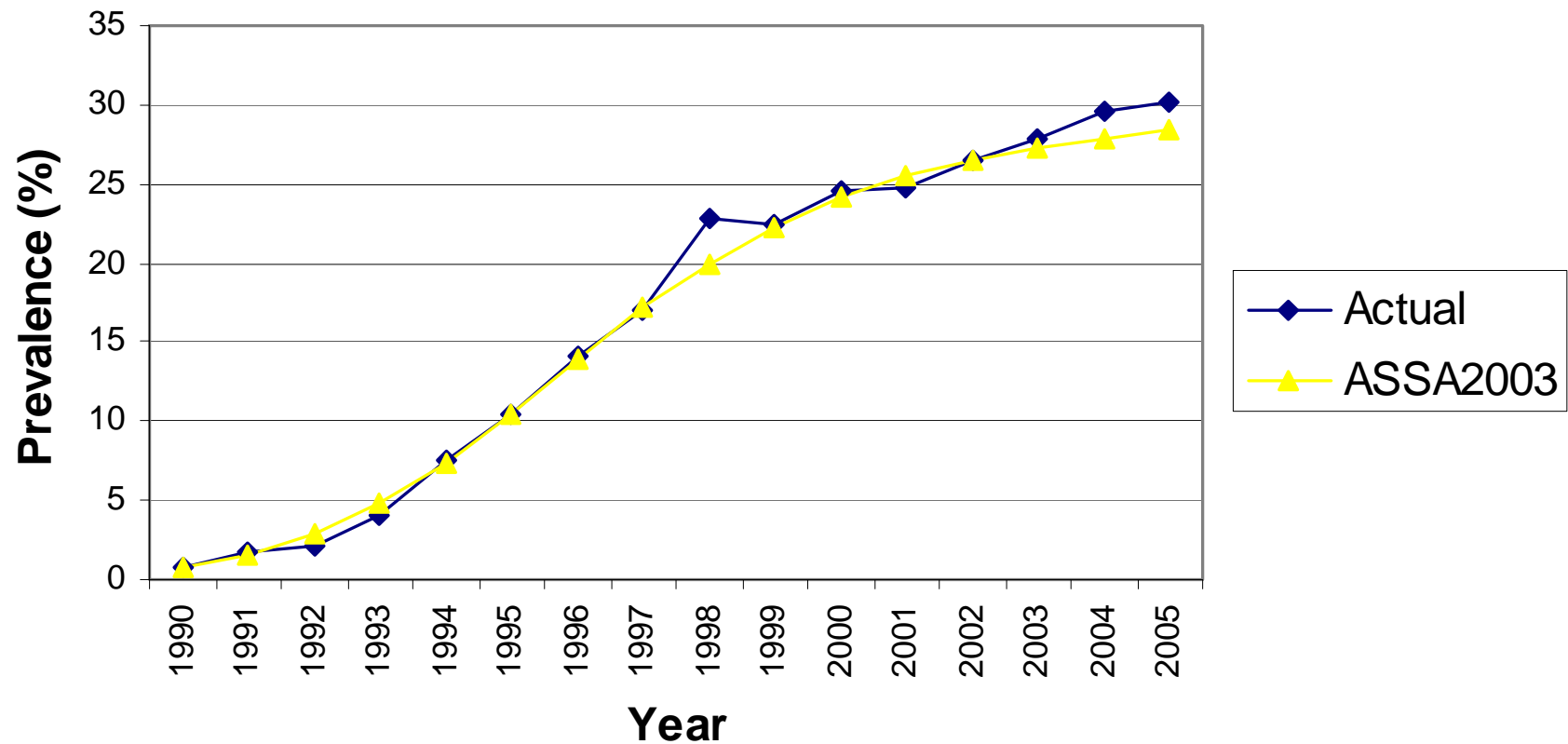
- UNAIDS
- ASSA2003 Suite:
 - Census 2001 for national and provincial populations and prior censuses for fertility rates.
 - Antenatal prevalence data for 2003
 - Mortality data for 2002/3
 - Data from the 2002 Nelson Mandela/Human Sciences Research Council household survey
 - The Reproductive Health Research Unit survey of sexual behaviour and prevalence of youth in South Africa.

ASSA 2003

- The ASSA2003 version includes five interventions:
 - improved treatment for sexually transmitted infections (STIs);
 - information and education campaigns (IEC);
 - voluntary counselling and testing (VCT);
 - mother-to-child transmission prevention (MTCTP);
 - anti-retroviral treatment (ART).

ANC Prevalence

HIV Prevalence trends among antenatal clinic attendees in South Africa, 1990-2005



Some Results

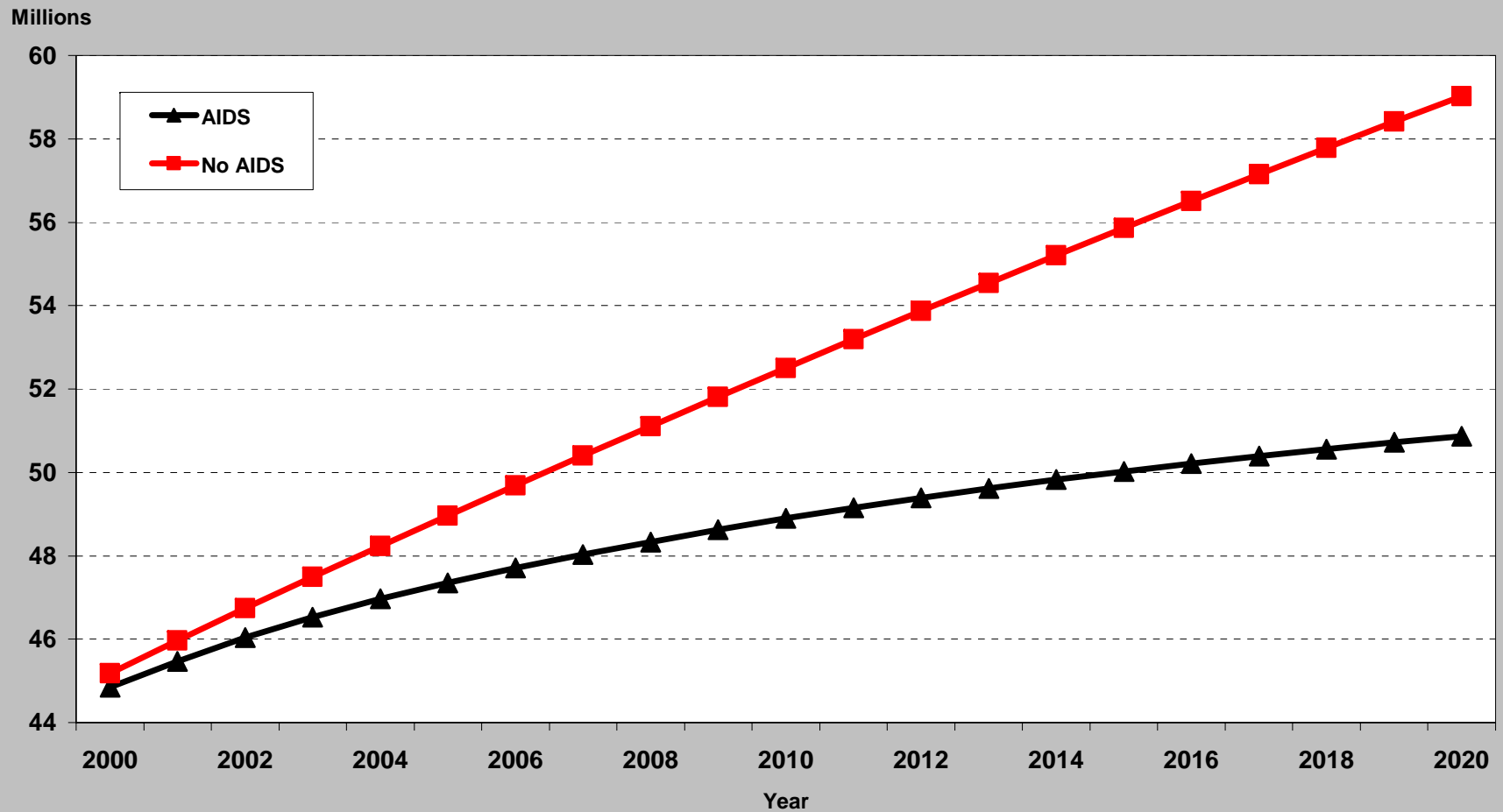
- ANC data
 - The prevalence measured in 2005 was 30.2% (95% confidence interval 29.1% to 31.2%)
 - Population extrapolation estimate of 5.54m
- HSRC household survey
 - 10.8% or 4.8m (4.2-5.3)
- UNAIDS
 - 5.5m
 - 18.8% of adults

UNAIDS analysis of sub-Saharan epidemic

	Proportion of Global Epidemic in sub-Saharan Africa
People living with HIV	64%
New infections	66%
AIDS deaths	71%
Women living with HIV	75%
Children living with HIV	90%
People in need of ART	72%

Population Forecasts (ASSA2003)

Total population



Update from the ASSA2003 Model for 2006

AIDS deaths per day	947
New HIV infections per day	1 443
People living with HIV	5 372 476
AIDS deaths	345 640
New HIV infections	526 771
Adults on ART	154 832
Children on ART	20 050

Source: AIDS Analysis Africa Online

Population prevalence by category

	2005	2010	2015	2020
Total Population	11.0%	11.8%	12.0%	11.9%
Adult Population	18.8%	19.7%	19.6%	19.3%
Labour force	21.5%	22.2%	21.4%	20.2%

Medical Scheme Population

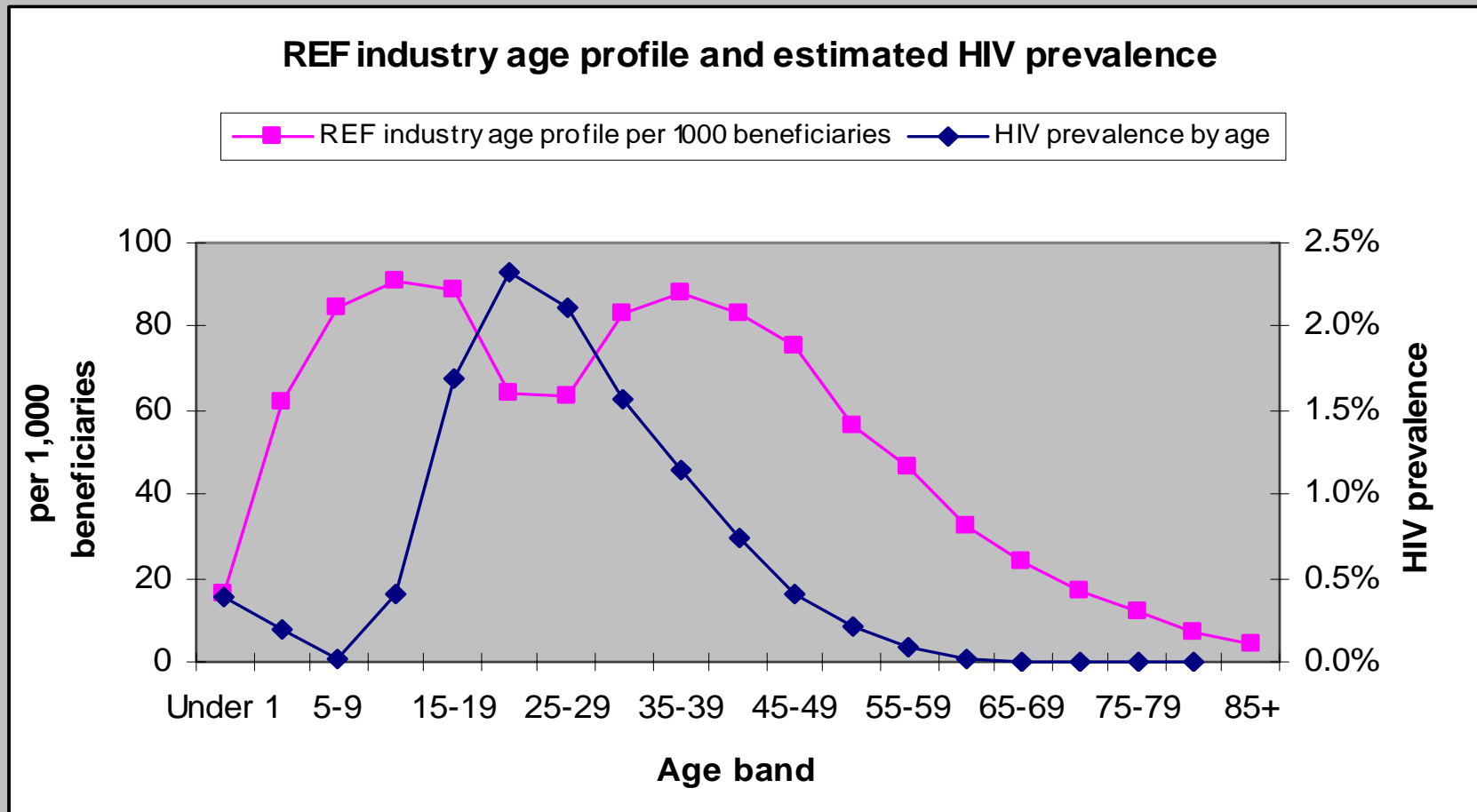
- Select population
- Approx 16% of South African population
- 'Twin peaks' age profile
- Socio-economic status
- Racial profile

Evolution of the Prescribed Minimum Benefits

- Legislated set of minimum benefits that each registered medical scheme is compelled to offer as part of each benefit option
- Stipulated in Annexure A of the Regulations to the Medical Schemes Act (Act 131 of 1998)
- **January 2000:** VCT, Co-trimoxazole, screening and preventative therapy for TB, STI diagnosis and treatment, palliative care, treatment of opportunistic infections, MTCTP, PEP following occupation exposure or sexual assault
- **January 2005:** *“medical management and medication, including the provision of anti-retroviral therapy... to the extent provided for in the national guidelines...”*
- Link between public sector and private sector provision

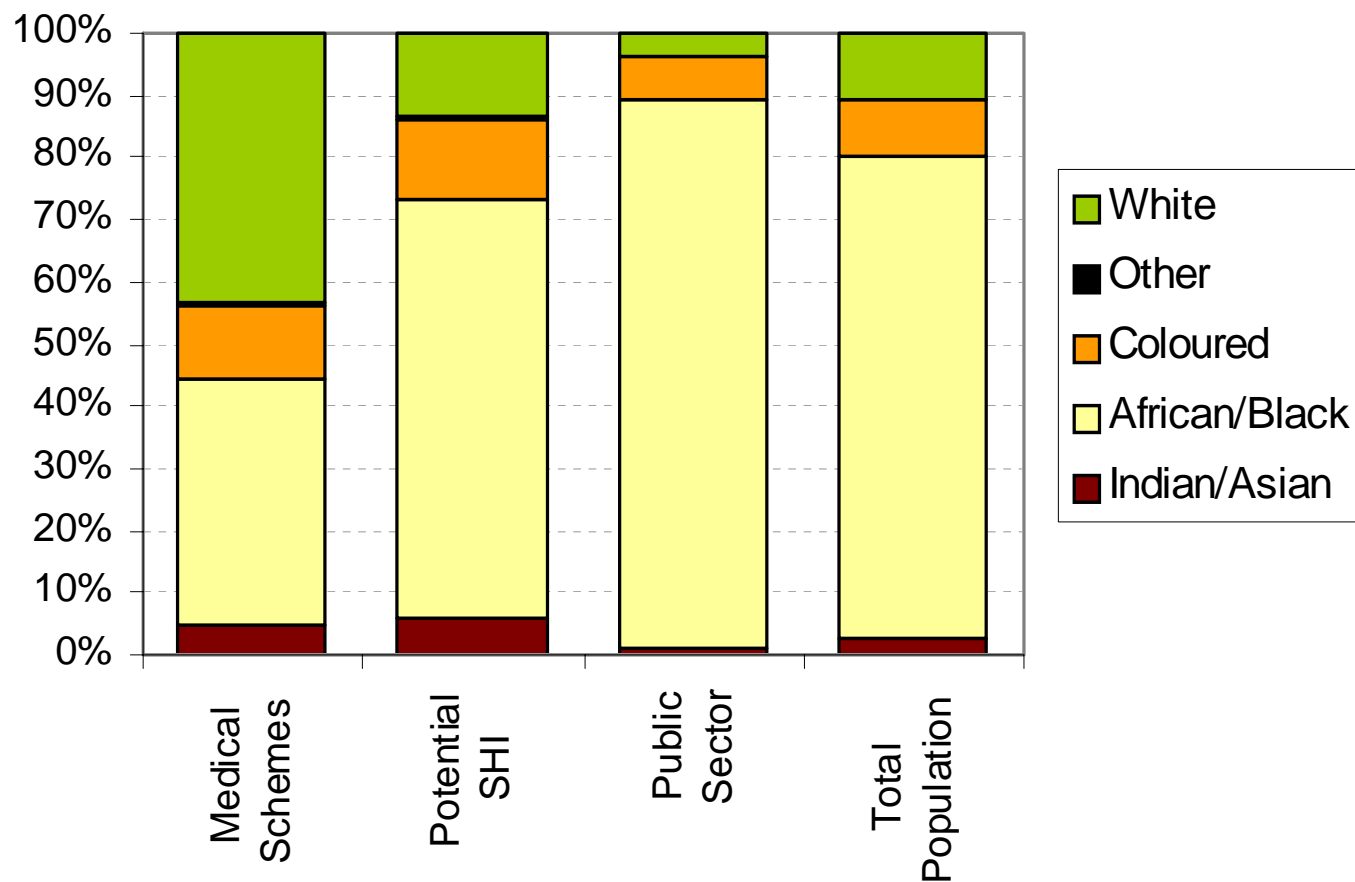
Age profile of the Medical Scheme Population

(Sources: ASSA 2003 Lite Model, REF grid)



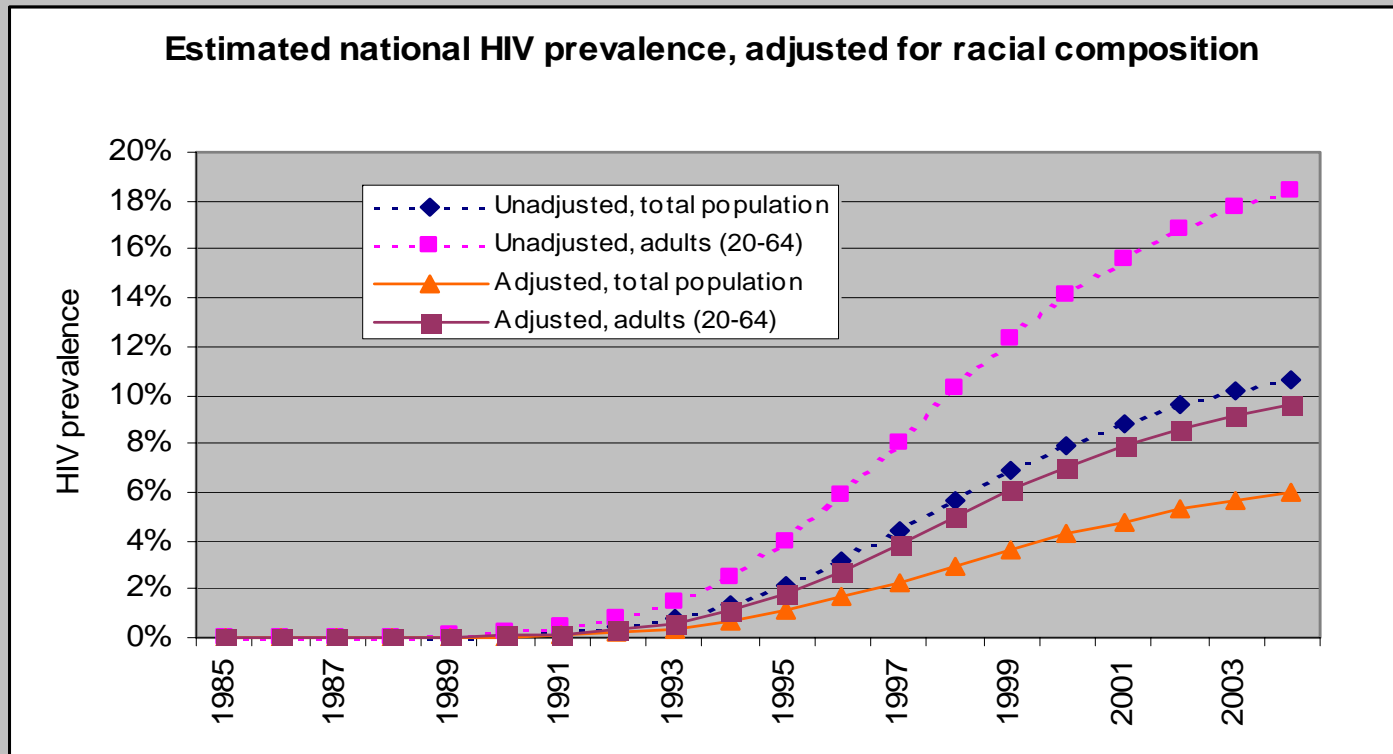
Racial split of the Medical Scheme Population

(Source: McLeod et al, 2004)



Racial adjustments

- Adjustment to national racial profile to reflect medical scheme profile → reduction in HIV prevalence rates



Modelling – ASSA2003 Select Model

- Model staging system: HIV stages 1-4, ART stages 1-4
(Source: Rosenberg *et al*, 2000)
- Construction of HIV prevalence scenarios: various multiplicative adjustments to HIV prevalence rates for new entrants and HIV incidence rates

Multiplicative adjustments	To HIV prevalence rates for new entrants					To HIV incidence rates				
	1	2	3	4	5	1	2	3	4	5
Skill level										
Scenario 1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Scenario 2	124%	90%	30%	18%	18%	124%	90%	30%	18%	18%
Scenario 3	100%	100%	100%	100%	100%	50%	50%	50%	50%	50%
Scenario 4	100%	80%	20%	10%	10%	100%	80%	20%	10%	10%

Family Unit Model and Assumptions

- Referred to studies on HIV sero-discordant couples
- Principal member (P) with spouse (S): Assume each HIV+ P has a corresponding HIV- S
- Transmission dynamics:
 - **Male → female:** 44% probability of male infecting female, females twice as likely to contract HIV from their HIV+ male partner (Sources: Quinn et al, 2000, Hugonnet et al, 2002, Carpenter, 1999)
 - **Female → male:** 22% probability of female infecting male (Source: Quinn et al, 2000)
 - Ignore infection of S other than from P
- Applied over 4 year periods starting from \square
- P without S: infection independent of family structure

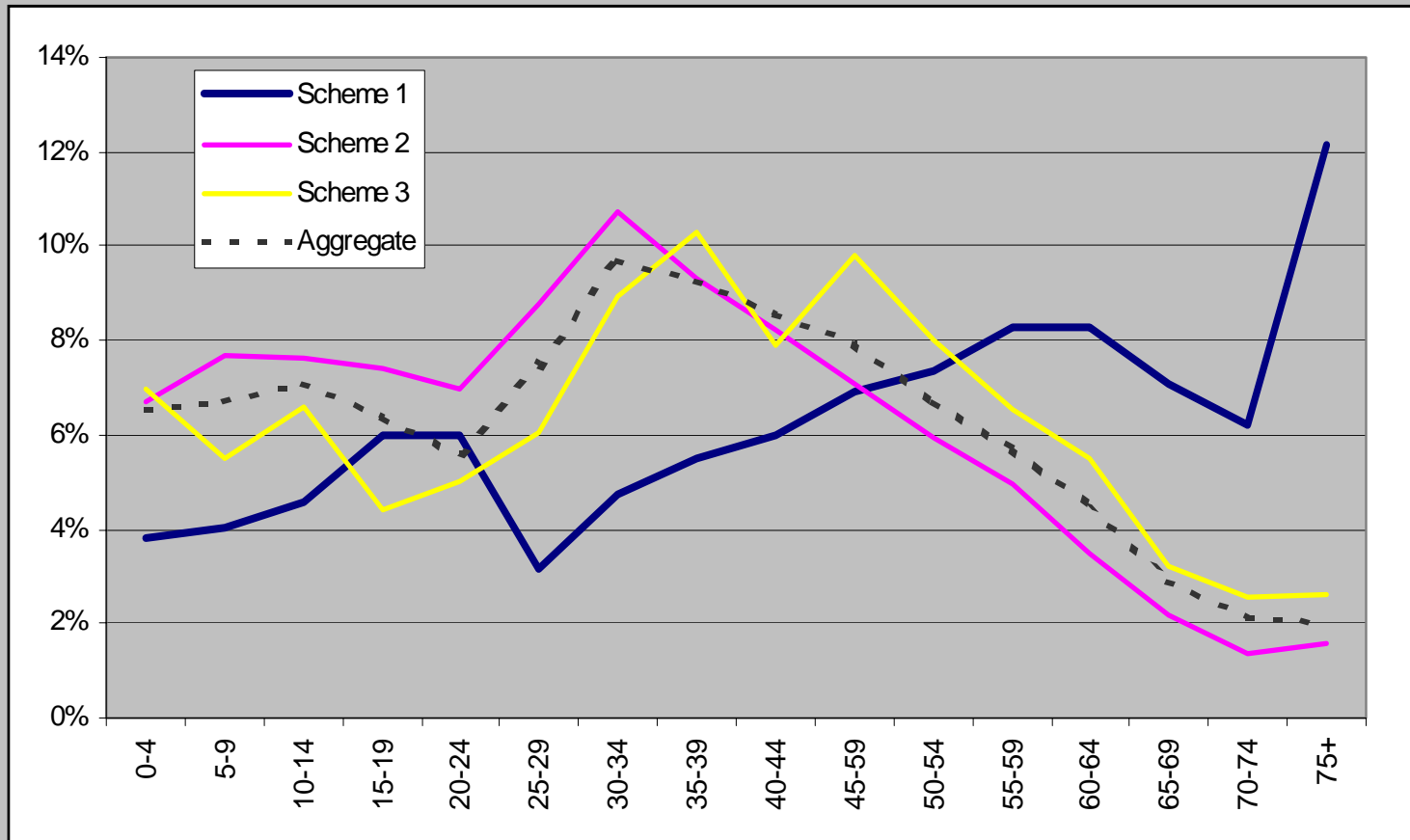
Family Unit Model and Assumptions

- New born child dependants (C) infection through MTCT:
 - **HIV+ P or S, 75% know HIV status:** 2% probability of MTCT (assuming ART administered during pregnancy, labour and delivery, and elective caesarian section if high viral load, ART administered to child.) (Source: CDC, 2006)
 - **HIV+ P or S, 25% not know HIV status:** 25% probability of MTCT (Source: CDC, 2006)
- Cover age of 14: infection independent of family
 - Modelled using National model
- Adult dependants (A): infection independent of family
 - Modelled separately using Select model
- Aggregate HIV prevalence rates for each beneficiary group

Sample Population

- Demographic data obtained from 3 open medical schemes in 2004
- 2.202 million lives, 31.3% of beneficiaries
- Data at beneficiary level: member number, date of birth, gender, benefit option, province
- Stable population assumed
- Calibration

Age Distribution of Sample Population

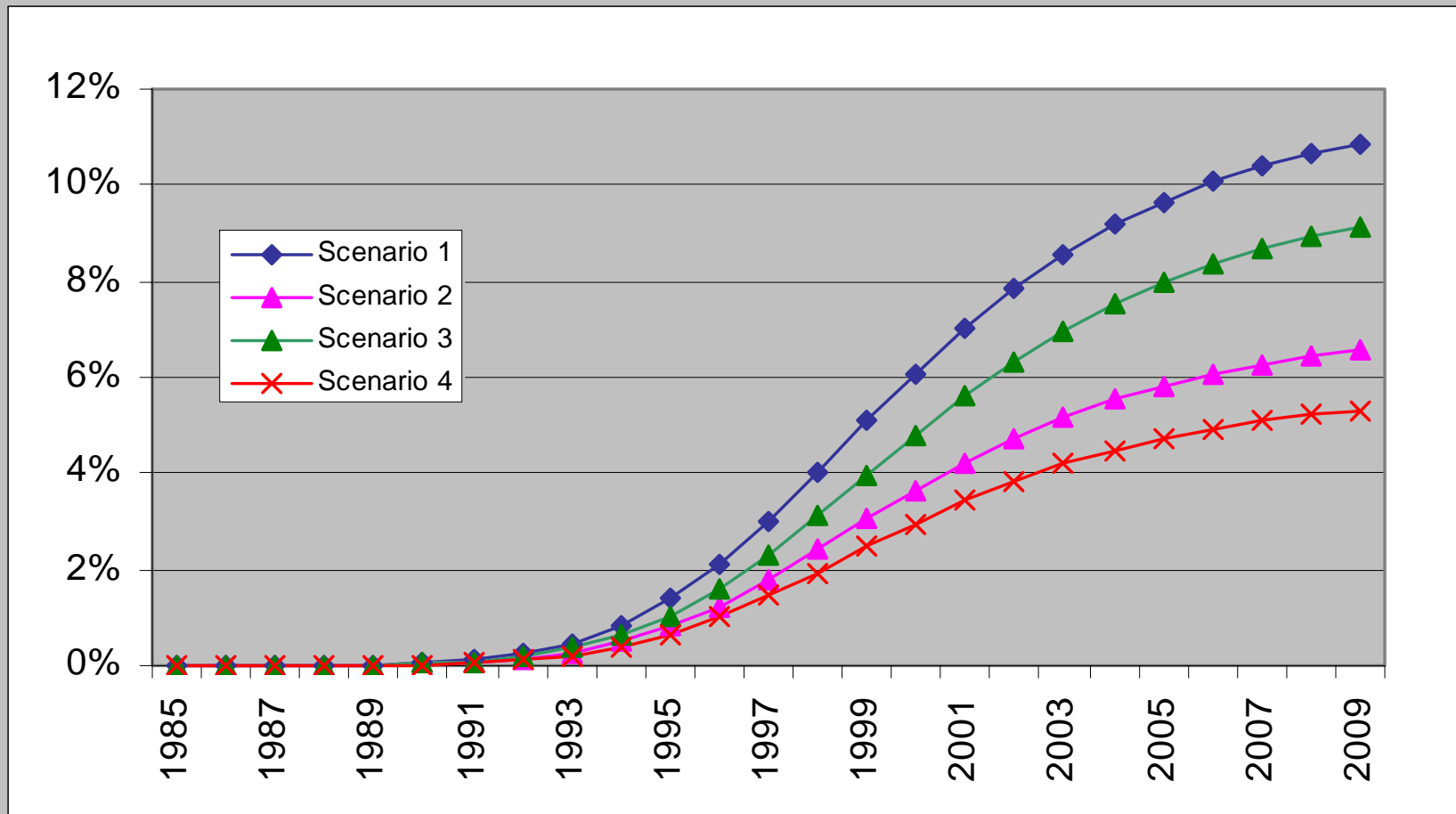


Socio-Economic Classification

Grade	Description	Patterson bands	Peromnes grades	TASK grades	Castellion grades
1	Employees living in single sex hostels and construction camps	–	–	–	–
2	Semi-skilled employees	A, B	12 to 19	1 to 8	1 to 7
3	Skilled employees	C	8 to 11	9 to 13	8, 9
4	Middle management	D	5 to 7	14 to 18	10 to 12
5	Senior management	E, F	1++ to 4	19 to 28	13, 14

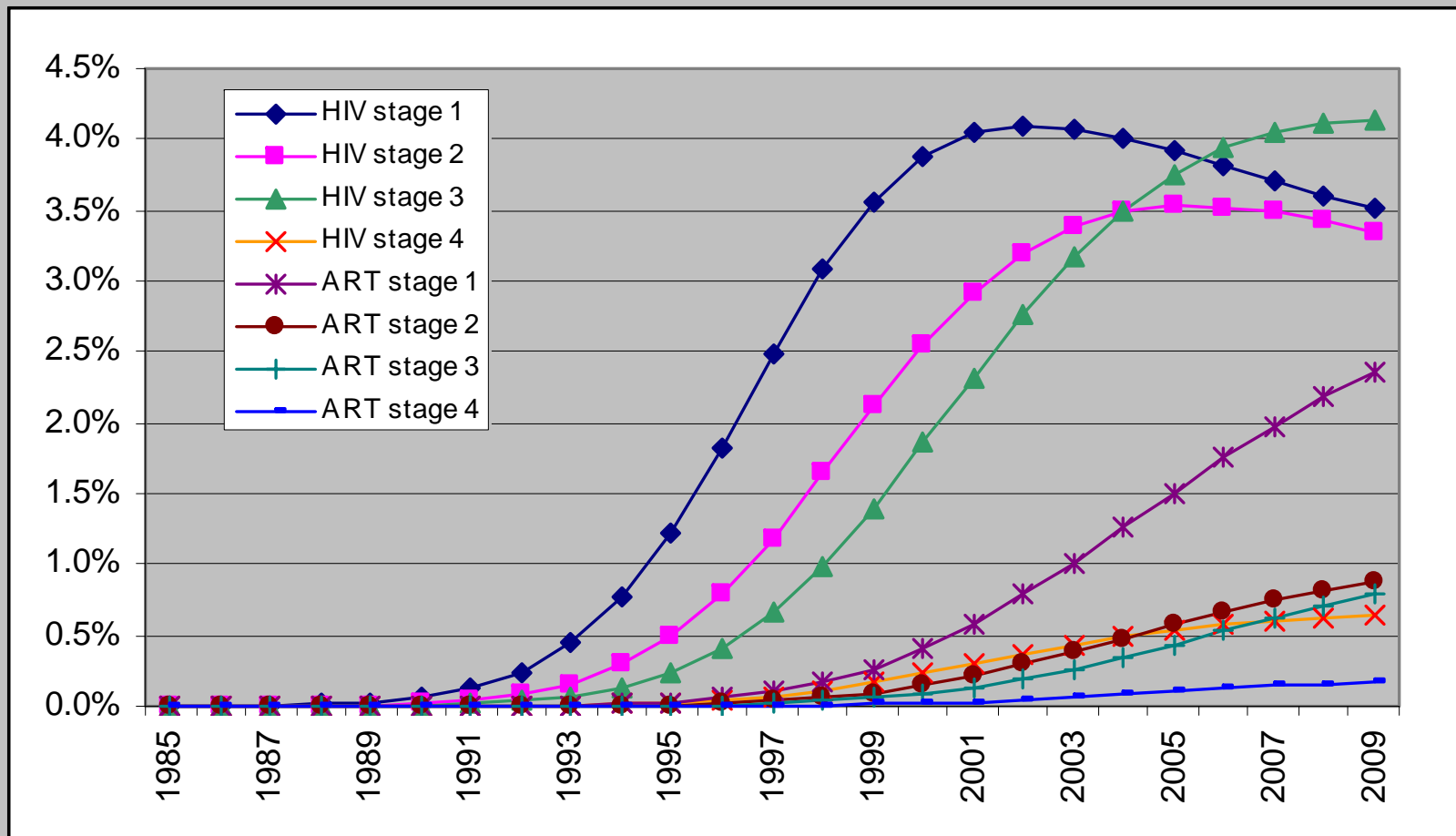
- Benefit options are proxies for job categories
- Benefit option movement ignored

Results – HIV prevalence by Scenario



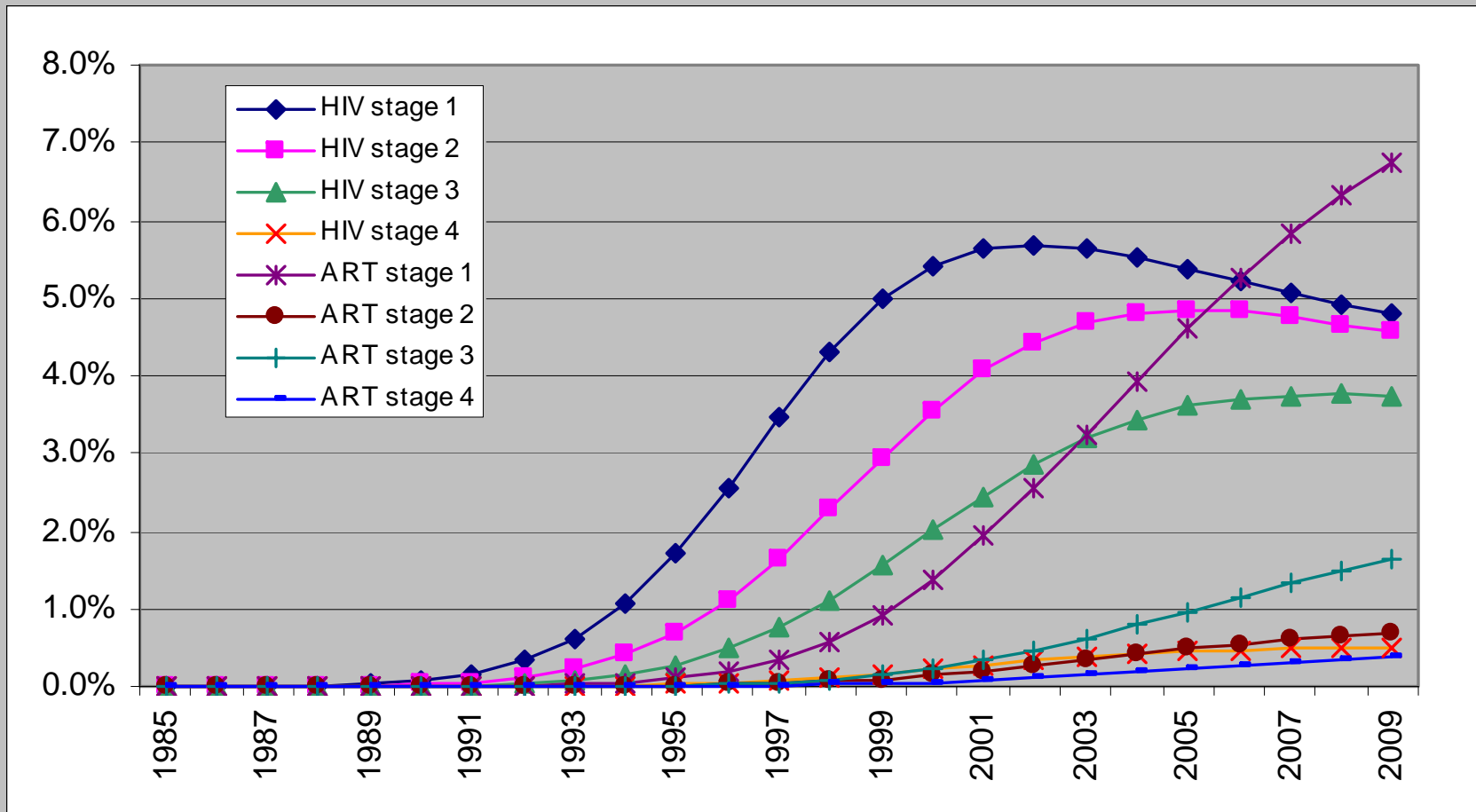
Results – HIV Prevalence

Scenario 4: 20%, 80% ART Uptake



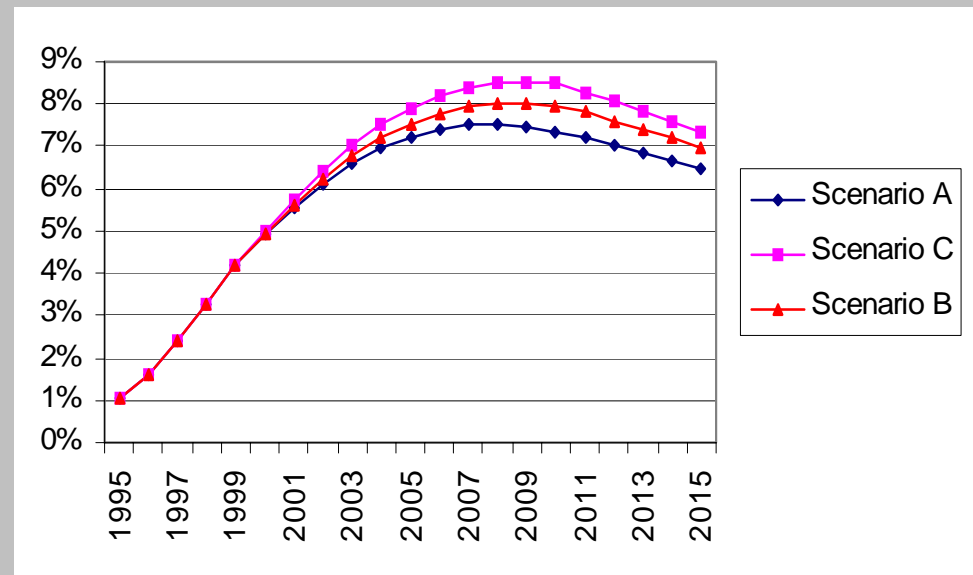
Results – HIV Prevalence

Scenario 4: 60%, 80% ART Uptake



Comparison of Modelling Results

- Johnson and Dorrington (2003, appendix), modelled 3 scenarios:
 - A: no change in profile by age, gender, skill level or race
 - B: change in skill profile
 - C: change in race profile
- Peak of 7,5% expected in 2008 (A)
- B, C not differ substantially from A



Financial Impact

- Cost structure based on prices in private health care sector in 2005
- Costed elements:
 - ART
 - Other meds (immune boosters pre-ART and with ART)
 - Pathology testing
 - MTCTP per birth
 - Outpatient costs (doctor consultations)
 - Hospitalisation (in-patient and out-patient)
- Costs applied to each HIV and ART stage
- MTCTP costs calculated on a per birth basis

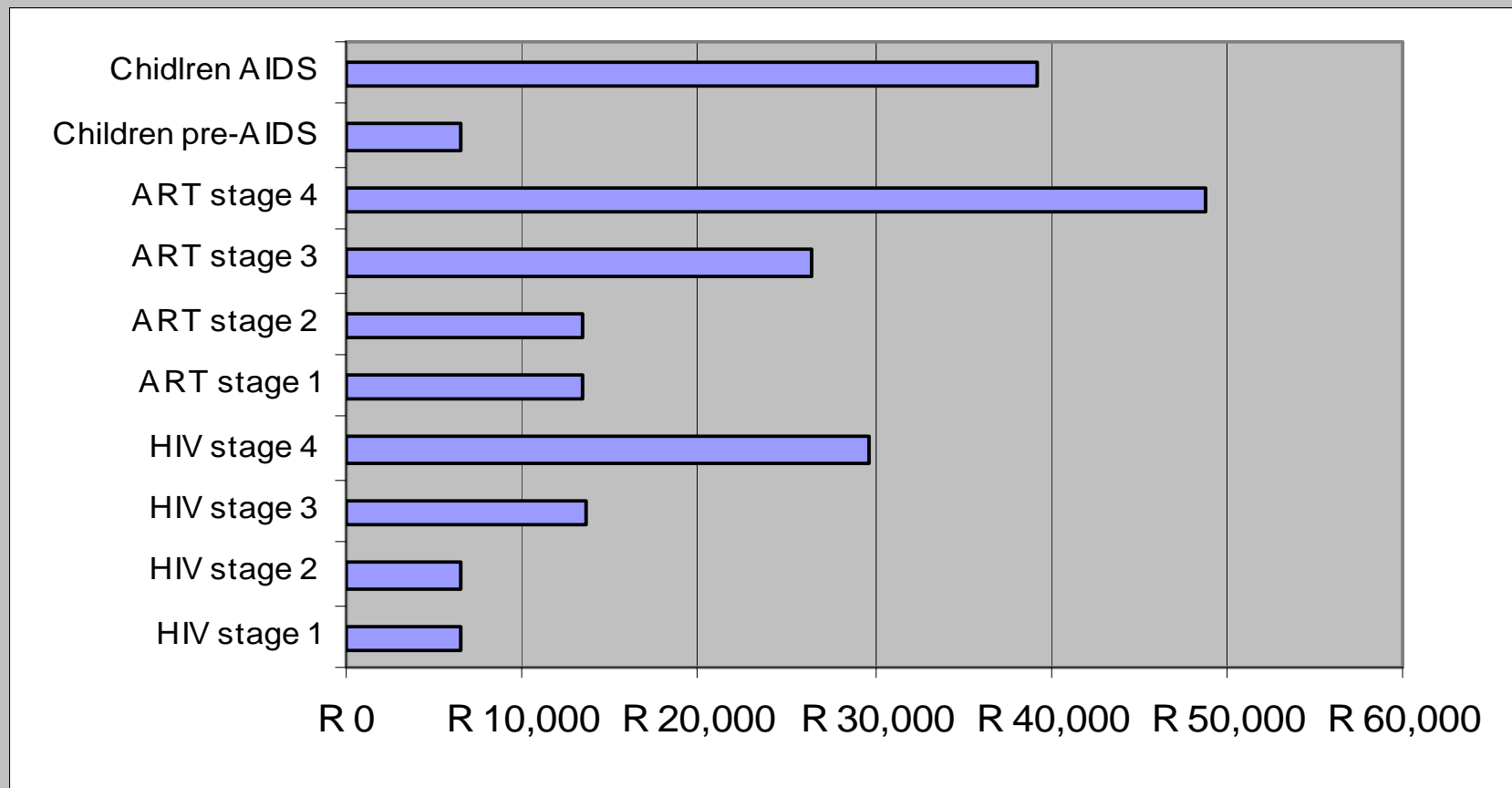
Financial Assumptions

- Use of brand drugs and generics
- Inflation assumptions
- Salvage regimen (ART stage 4)
- Managed cost scenario only

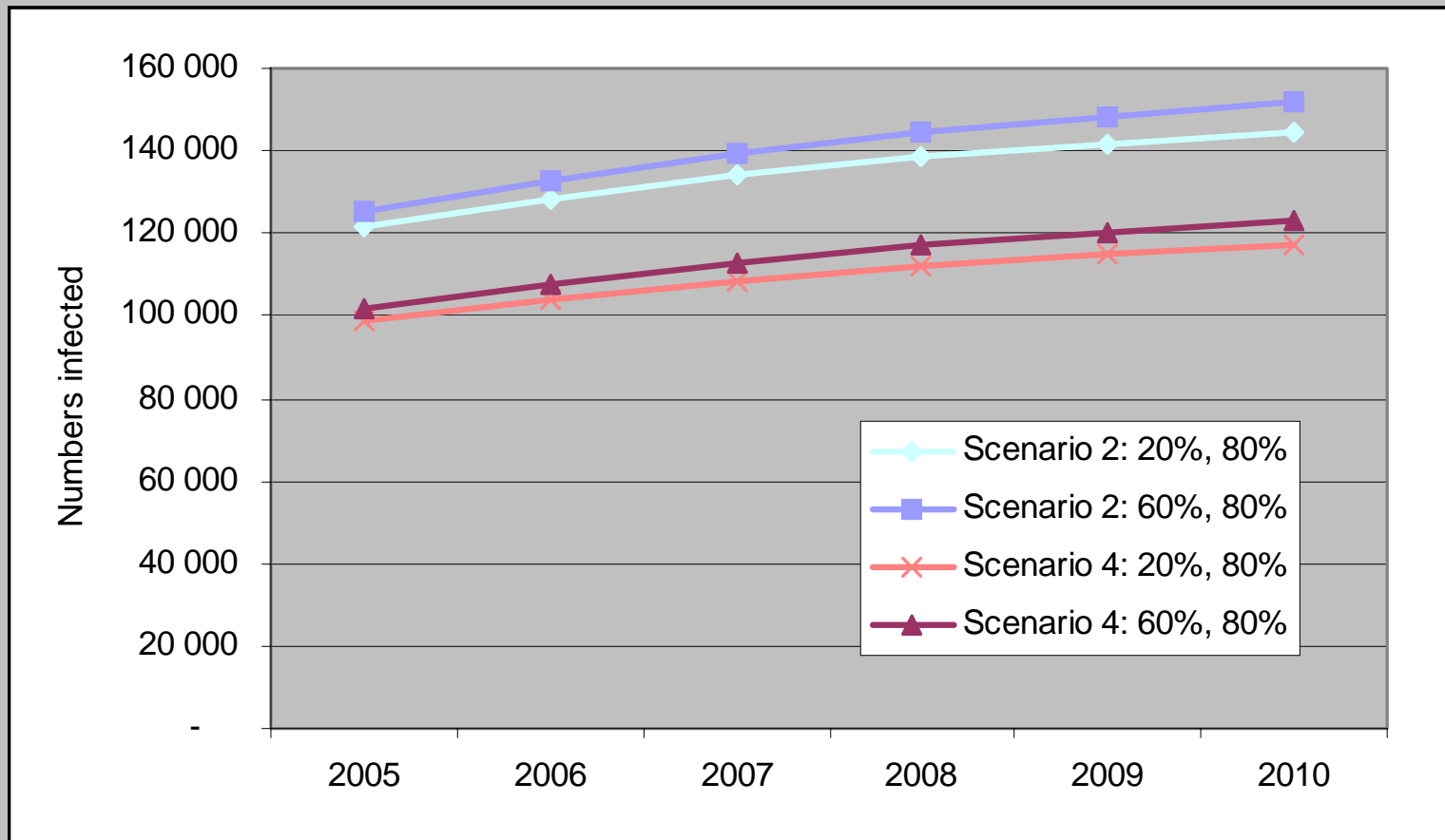
Treatment Protocols – Utilisation per infected person per annum

	ART	Immune modulators	Pathology testing	Doctor consultations	Hospitalisation
HIV stage 1	0	Monthly	Biannually	Biannually	Cost per HIV-positive or AIDS-sick beneficiary per annum Cost highest in: -ART stage 4 -Children AIDS -HIV stage 4 -ART stage 3
HIV stage 2	0	Monthly	Biannually	Biannually	
HIV stage 3	0	Monthly	Biannually	Biannually	
HIV stage 4	0	Monthly	Biannually	Biannually	
ART stage 1	Monthly	Monthly	Biannually	Biannually	
ART stage 2	Monthly	Monthly	Biannually	Biannually	
ART stage 3	Monthly	Monthly	<i>Quarterly</i>	<i>Quarterly</i>	
ART stage 4	Monthly	Monthly	<i>Quarterly</i>	<i>Quarterly</i>	
Children pre-AIDS	0	Monthly	Biannually	Biannually	
Children AIDS	Monthly	Monthly	<i>Quarterly</i>	<i>Quarterly</i>	

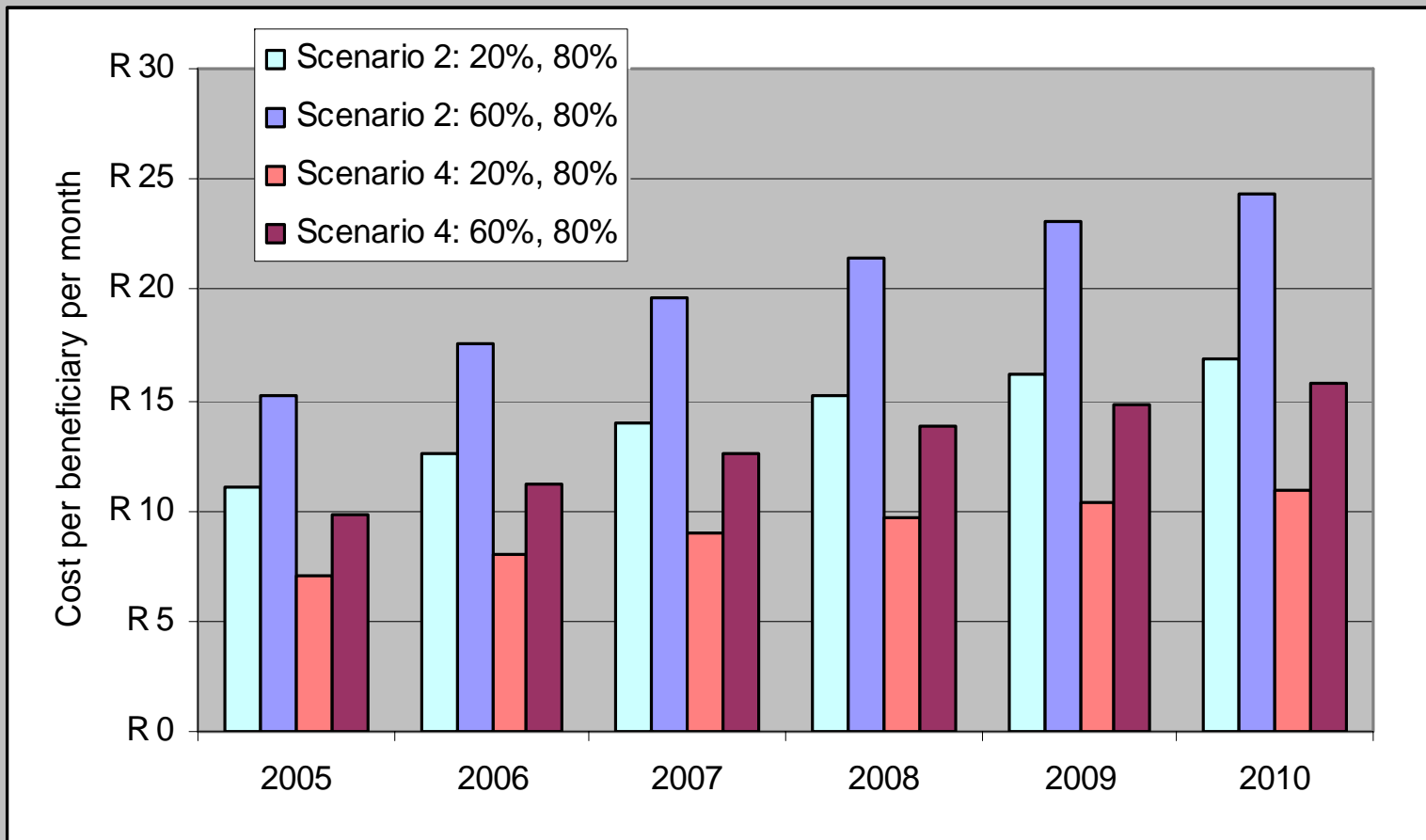
Estimated Cost per HIV and ART stage per annum



Numbers infected: Scenario 2 & Scenario 4

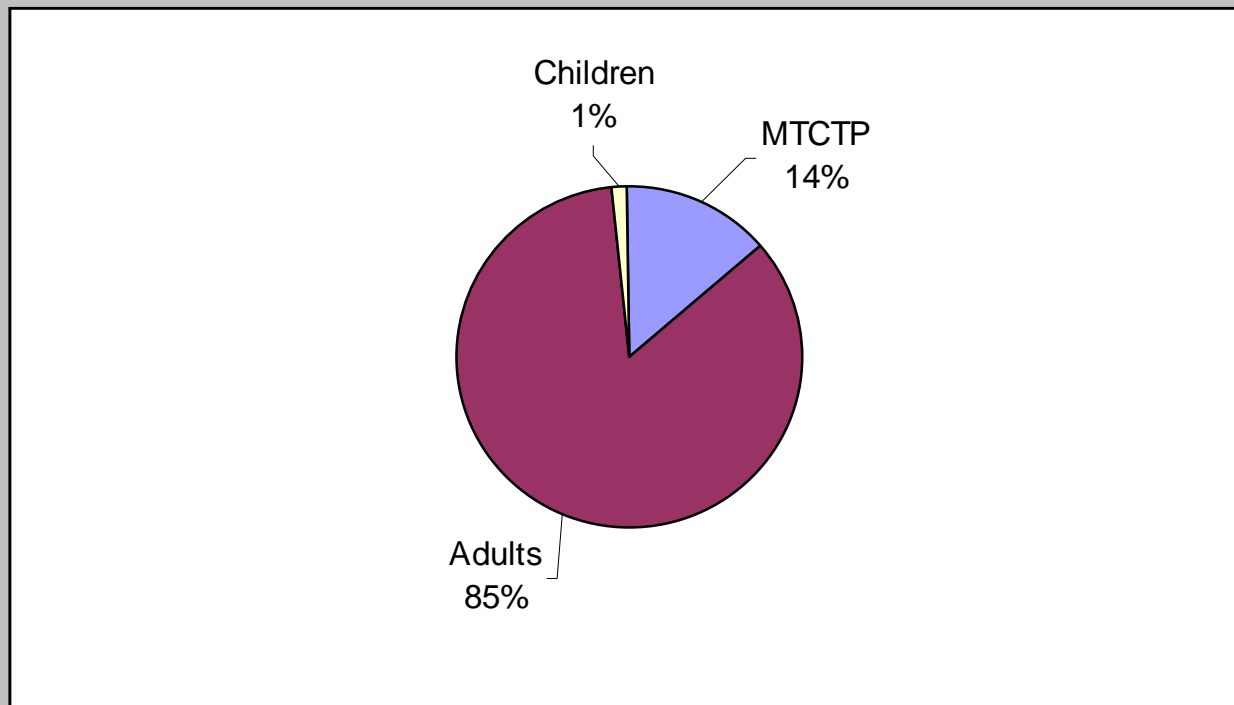


Results: Impact of ART initiation assumption: cost pbpm

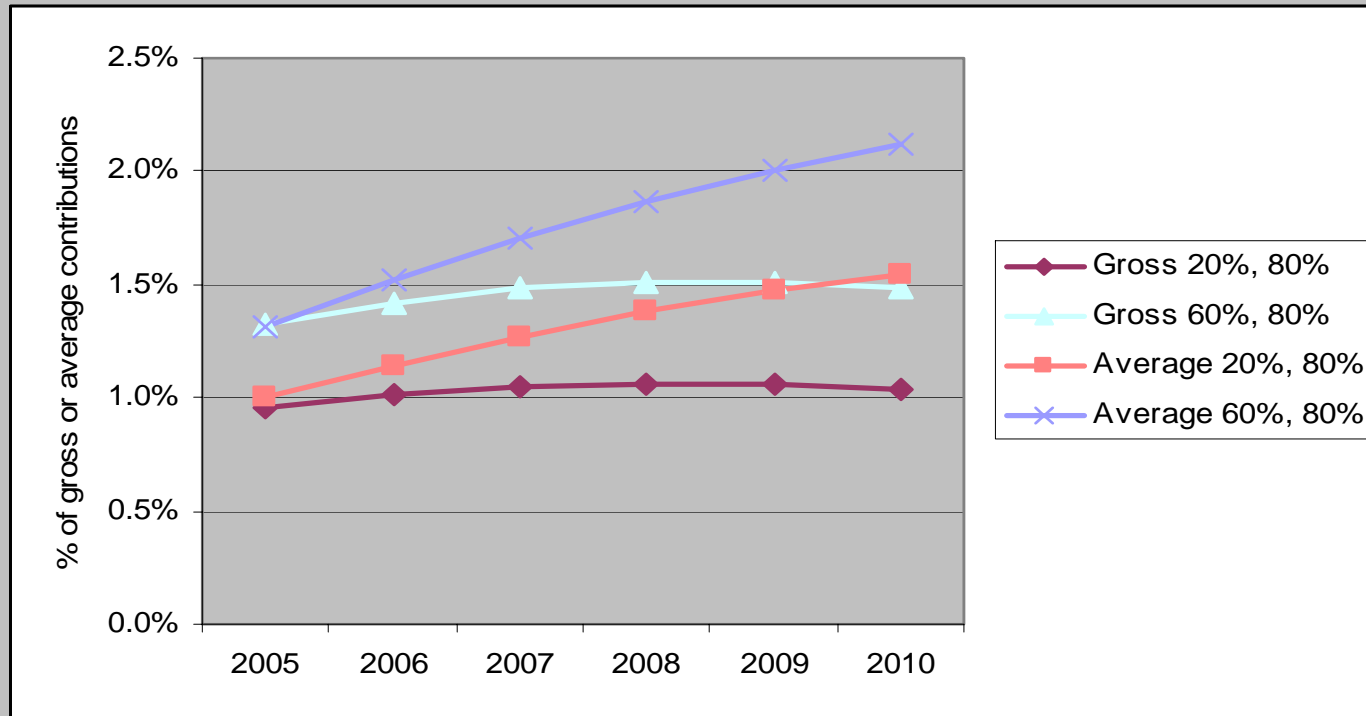


Cost components 2005: Scenario 4 - 60%, 80%

- Relative costs fairly similar across scenarios
- 20% assumption leads to higher proportion of costs for MTCT and children



Cost of HIV as % of gross and average contributions: Scenario 4



- Scenario 1: 4% - 9%
- Scenario 2: 1.5% - 3%
- Scenario 3: 3% - 6.5%

Discussion

- Further research
 - Change in medical scheme population
 - Take-up and compliance rates
 - Unmanaged costs
- REF implications
- Low Income Medical Scheme (LIMS)
- Need for risk-pooling of SMMEs