

# 90-90-90 Targets Workshop

---

July 22–23, 2017 • Paris

Sponsored by



In partnership with



## Modelling the Impact and Economics of 90-90-90

Brian Williams

South African Centre for Epidemiological Modelling and  
Analysis, University of Stellenbosch, South Africa



# UNAIDS Report

- Reached 70-77-82
- On track to reach 90-90-90
- End AIDS by 2030
- Does not mean the end of HIV
- End-game is always the hardest part

To get effective global, national and local action we need...

## Data

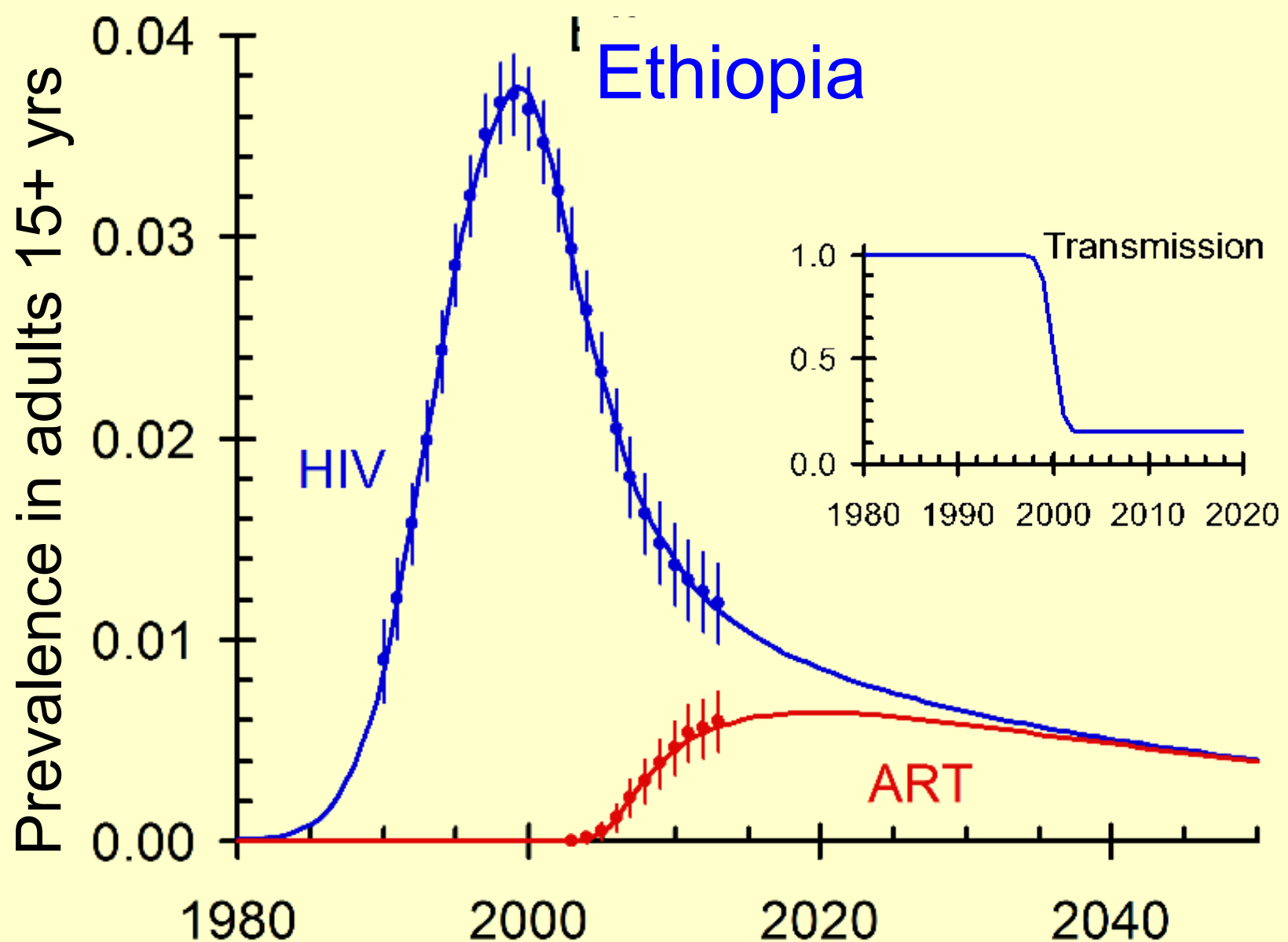
Natural history; social context; financial

## Interpretation and analysis

Biology, sociology and statistics

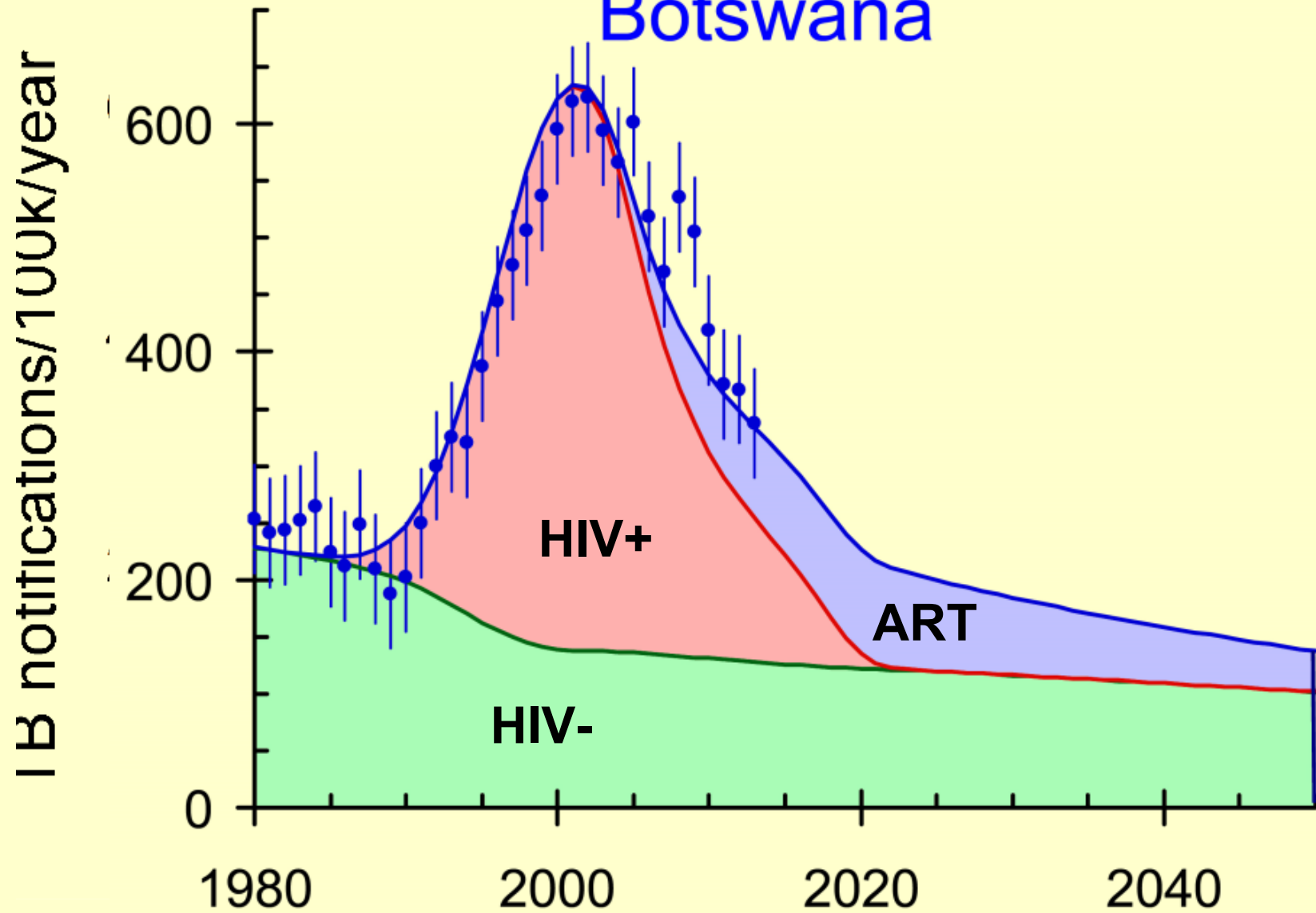
## Estimates and projections

Dynamical models, epidemiology, economics



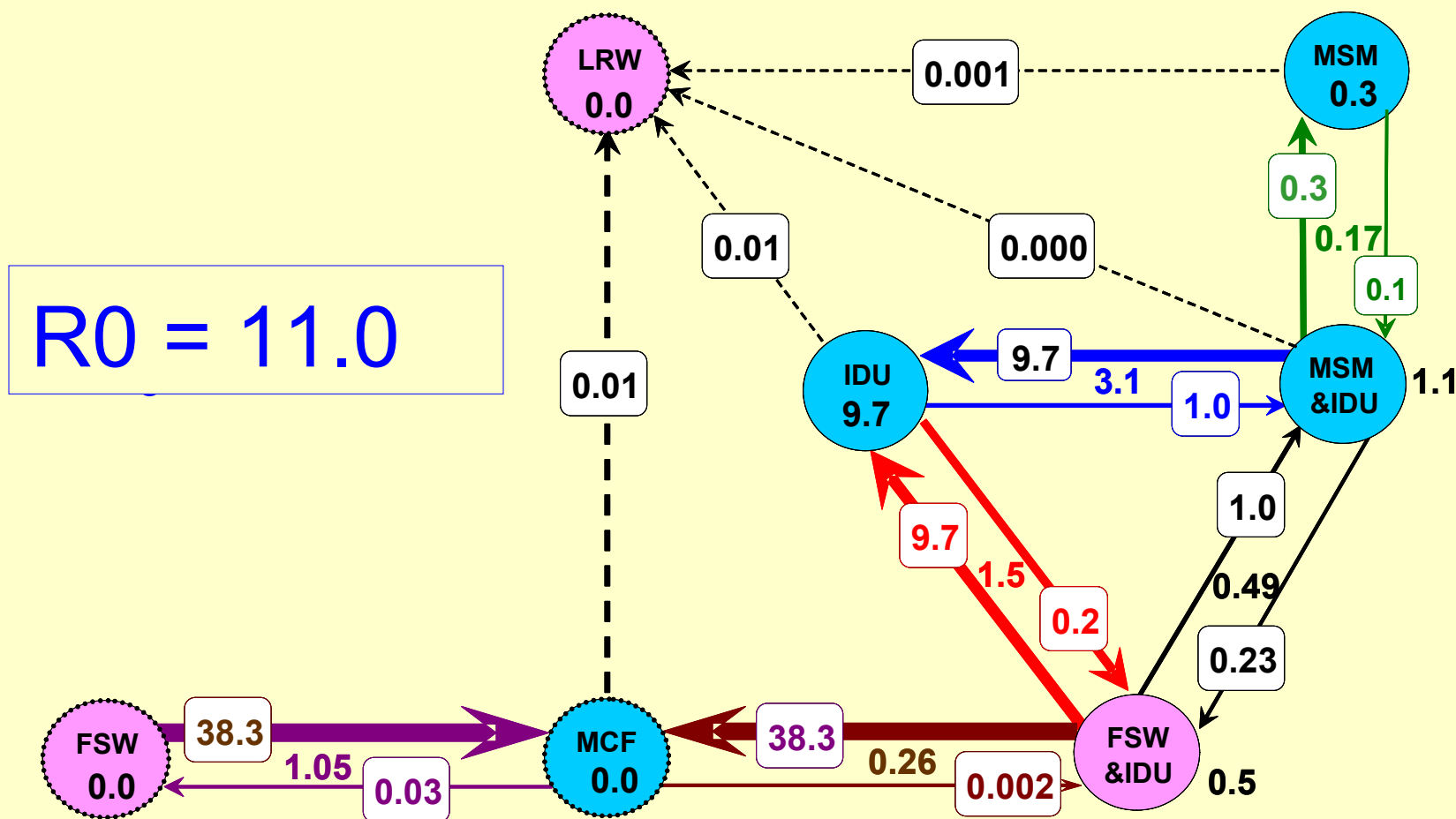
Dramatic decline in transmission before ART roll-out

# Botswana



HIV-drives TB

# Transmission Network: Can Tho, Vietnam



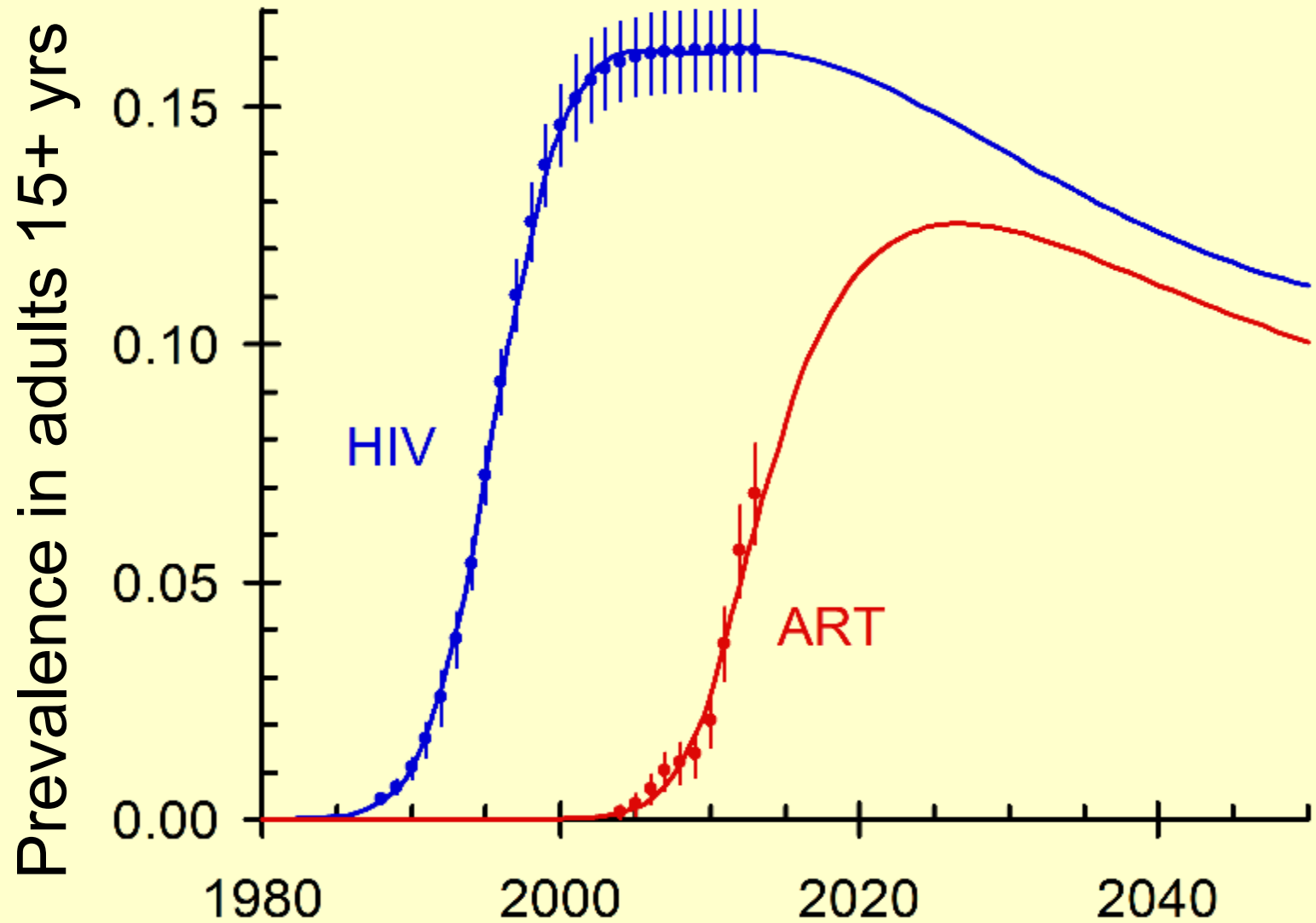
LRW: low risk women  
IDU: intravenous drug users  
MCF: male clients of female sex workers

MSM: men who have sex with men  
FSW: female sex workers

# South Africa

- Good trend data
- Good costing data
- Biggest epidemic in the world

# South Africa



Current strategy



# South Africa Cost Data:2016 (US\$)

---

Testing 32 per test

---

ARV 120 *p.a.*

---

Health care off ART	1	25 <i>p.a.</i>
	2	51 <i>p.a.</i>
	3	63 <i>p.a.</i>
	4	108 <i>p.a.</i>

---

Health care on ART	1	48 <i>p.a.</i>
	2	54 <i>p.a.</i>
	3	106 <i>p.a.</i>
	4	132 <i>p.a.</i>

---

VMMC 101 *p. circ.*

---

PreP 84 *p.p.a.*

---

Condoms 5 *p.p.a.*

---

Deaths 1136 *p. death*

---

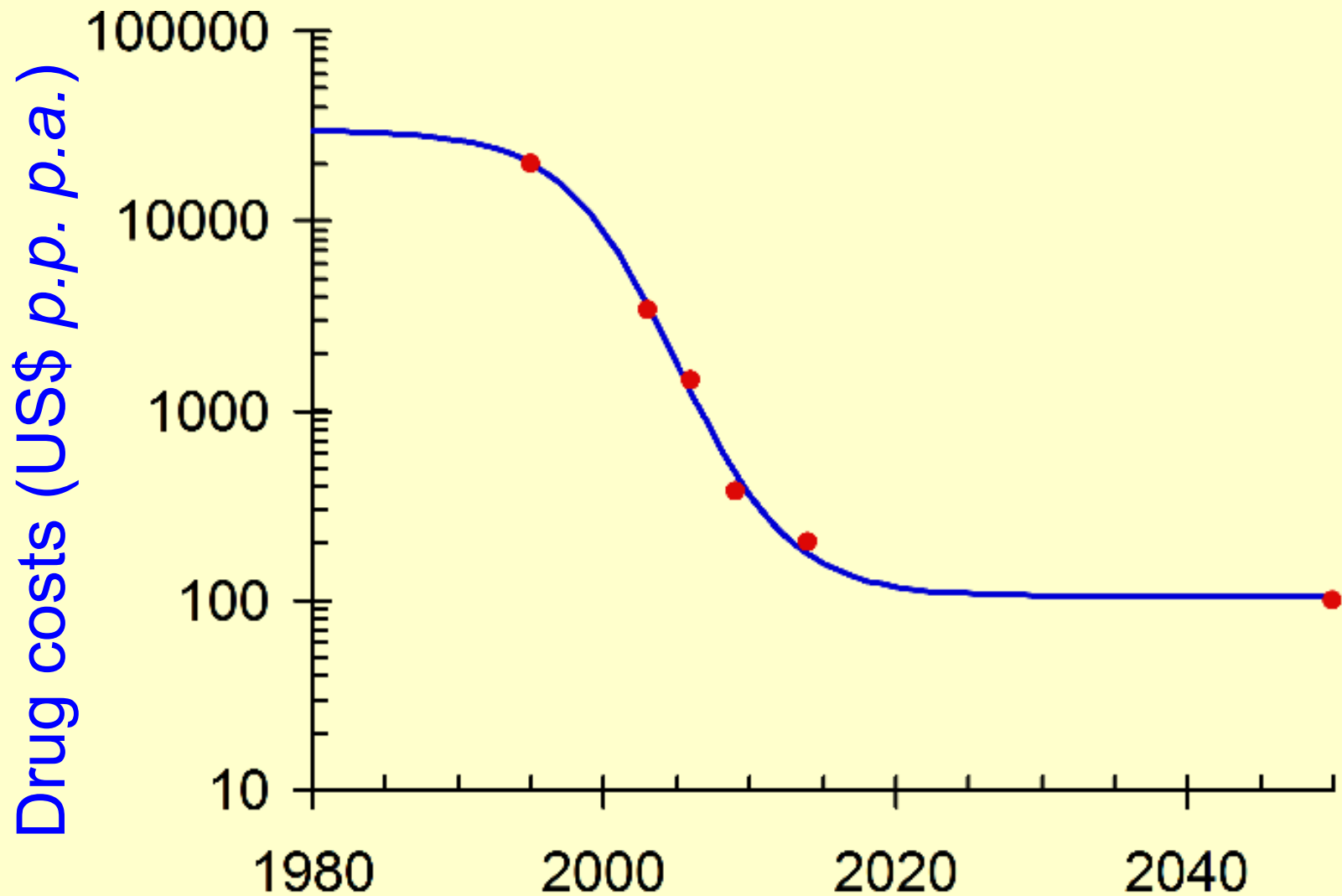
TB treat. 780 *p. case*

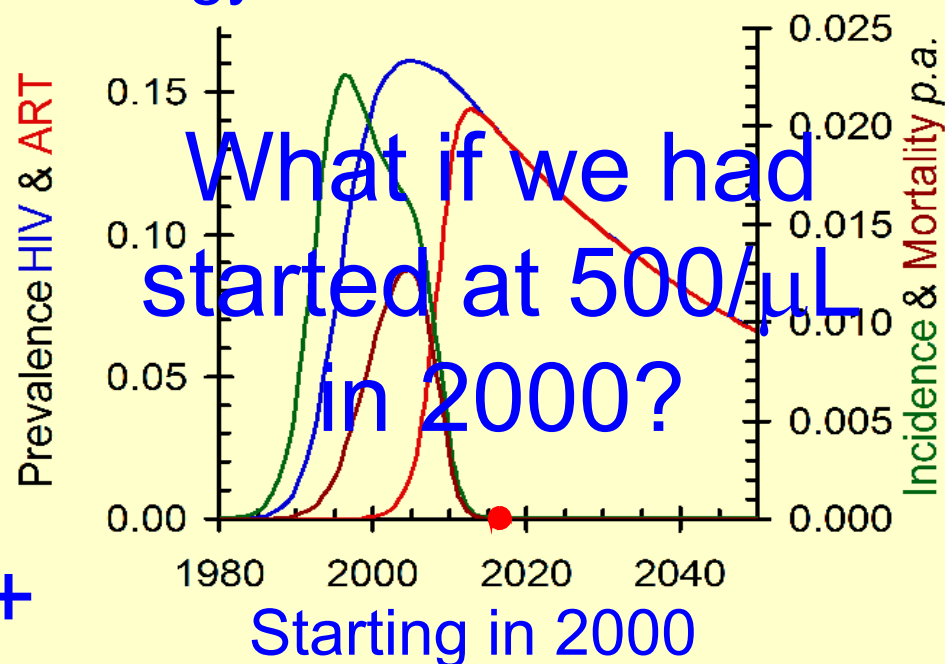
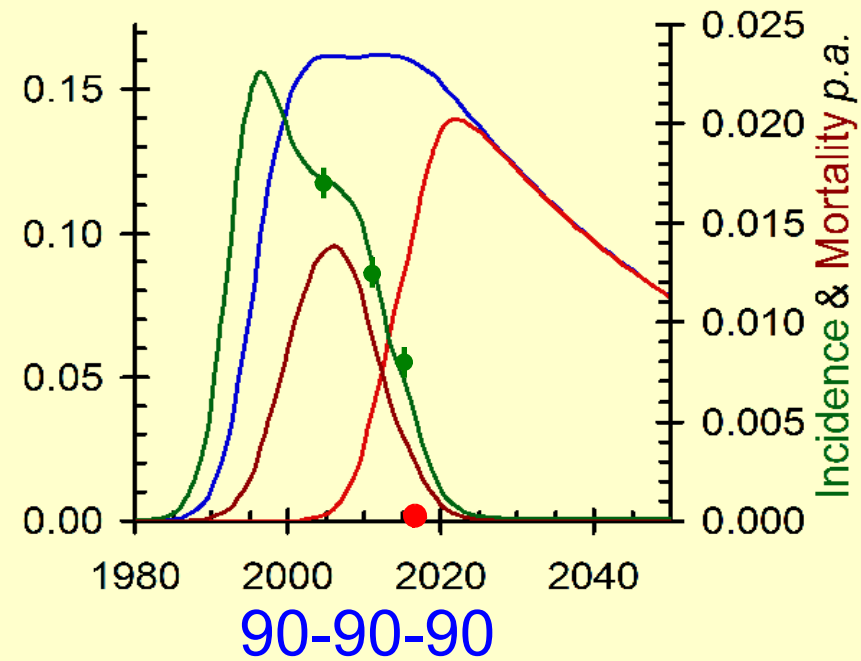
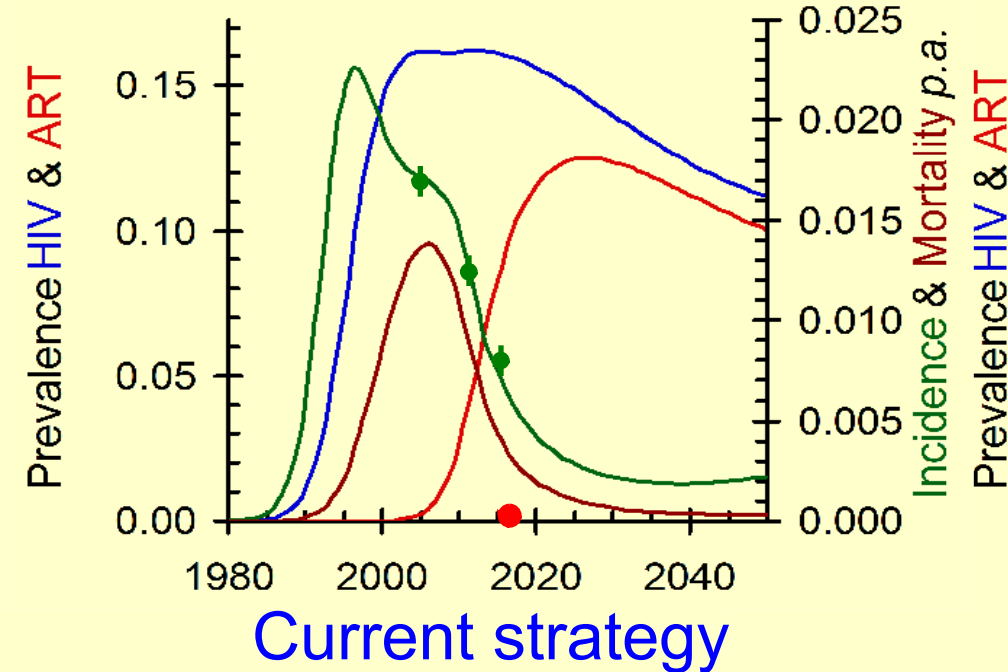
---

Disc. rate 0.03 *p.a.*

---

# South Africa





HIV in  
South  
Africa

Adults 15+

● Today

◆ UNAIDS 2017

<http://tinyurl.com/BGW0019>

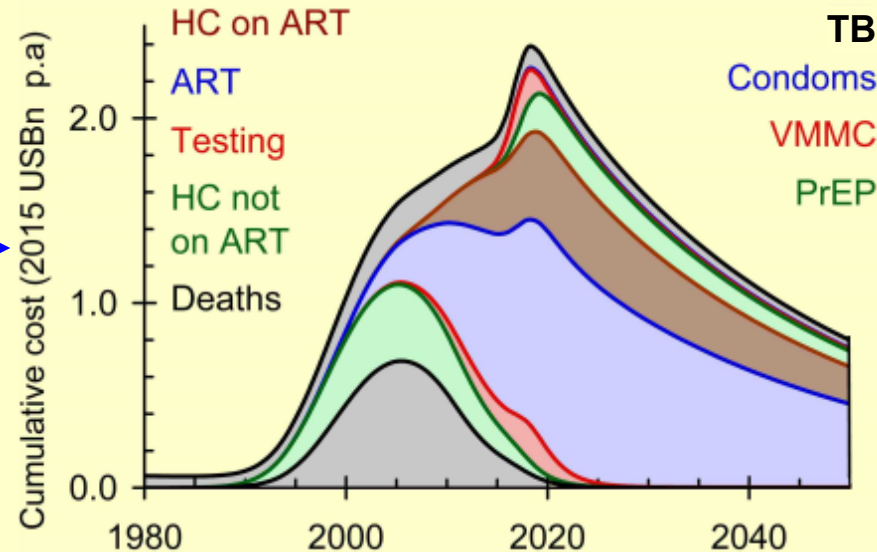
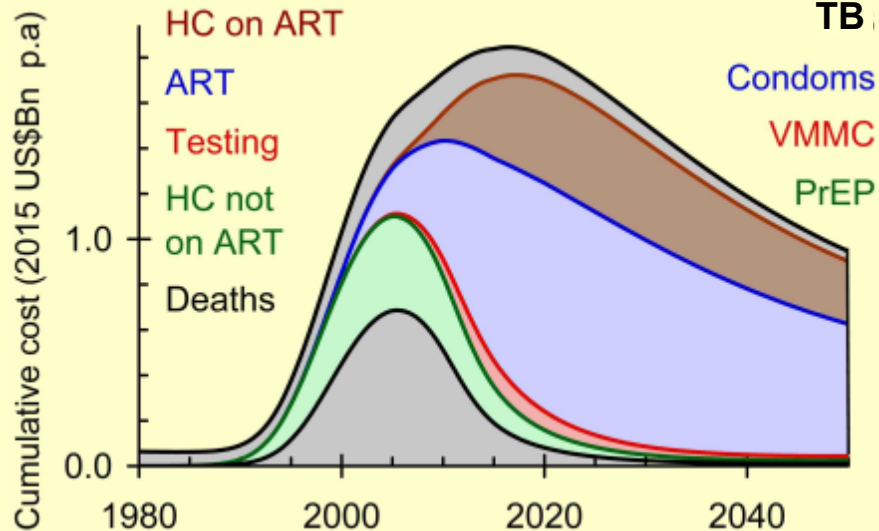
<http://tinyurl.com/BGW0020>

<http://tinyurl.com/BGW0021>

**Current strategy**

**Save US\$2.5Bn 1.0M deaths**

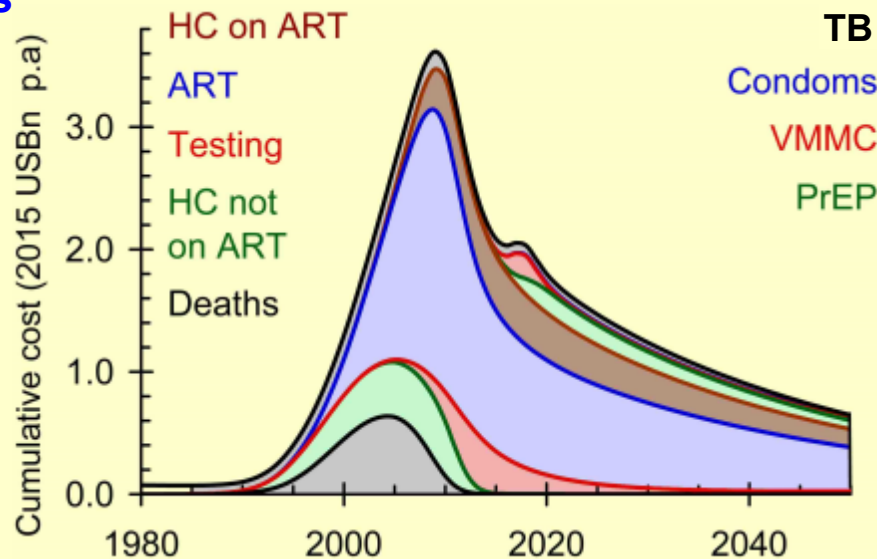
**90-90-90**



**US\$ 73 Bn  
7.8 M deaths**

**\$4k/death averted ↓**

**US\$ 70 Bn  
6.8 M deaths**



**US\$ 80 Bn**

**4.2 M deaths**

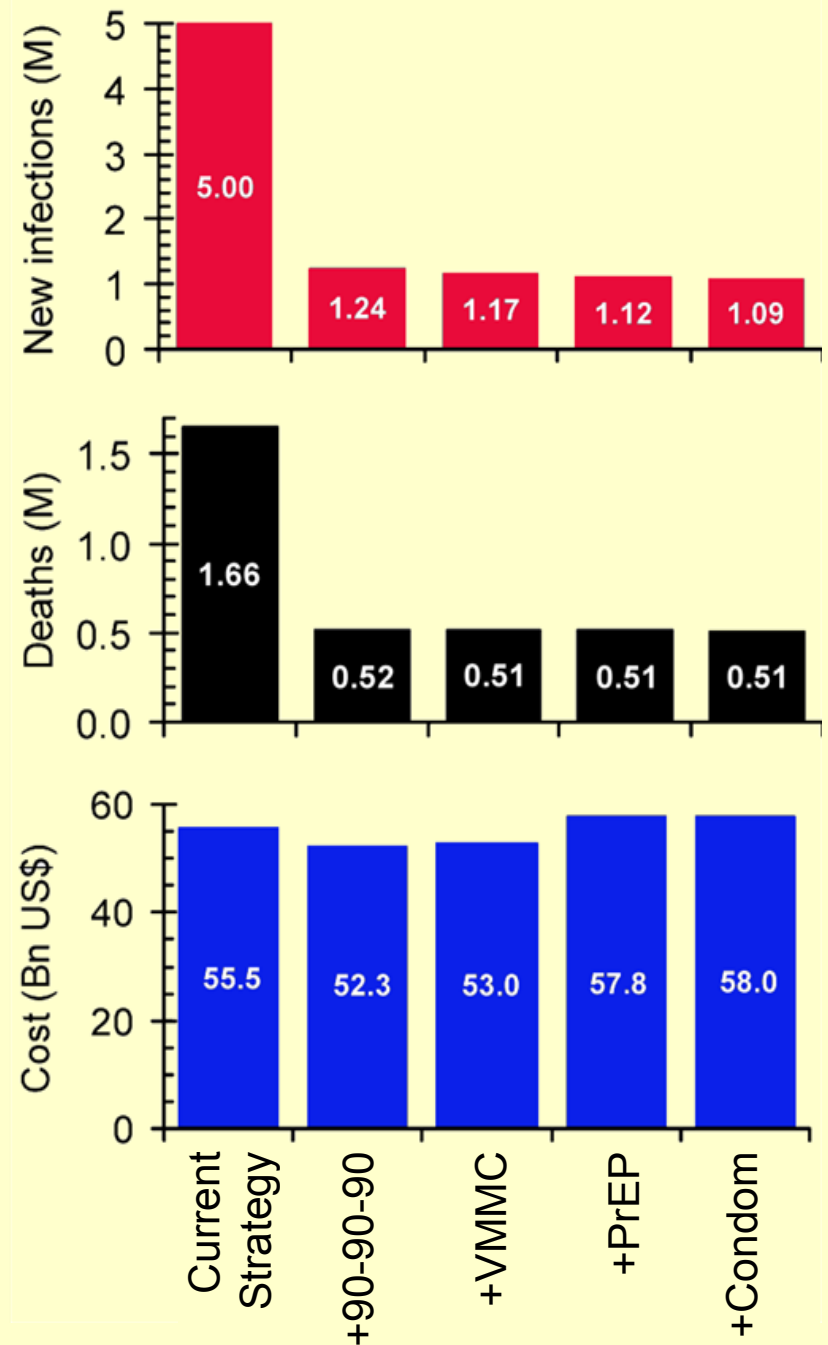
**HIV in  
South  
Africa**

**Adults 15+**

**What  
will it all  
cost?**

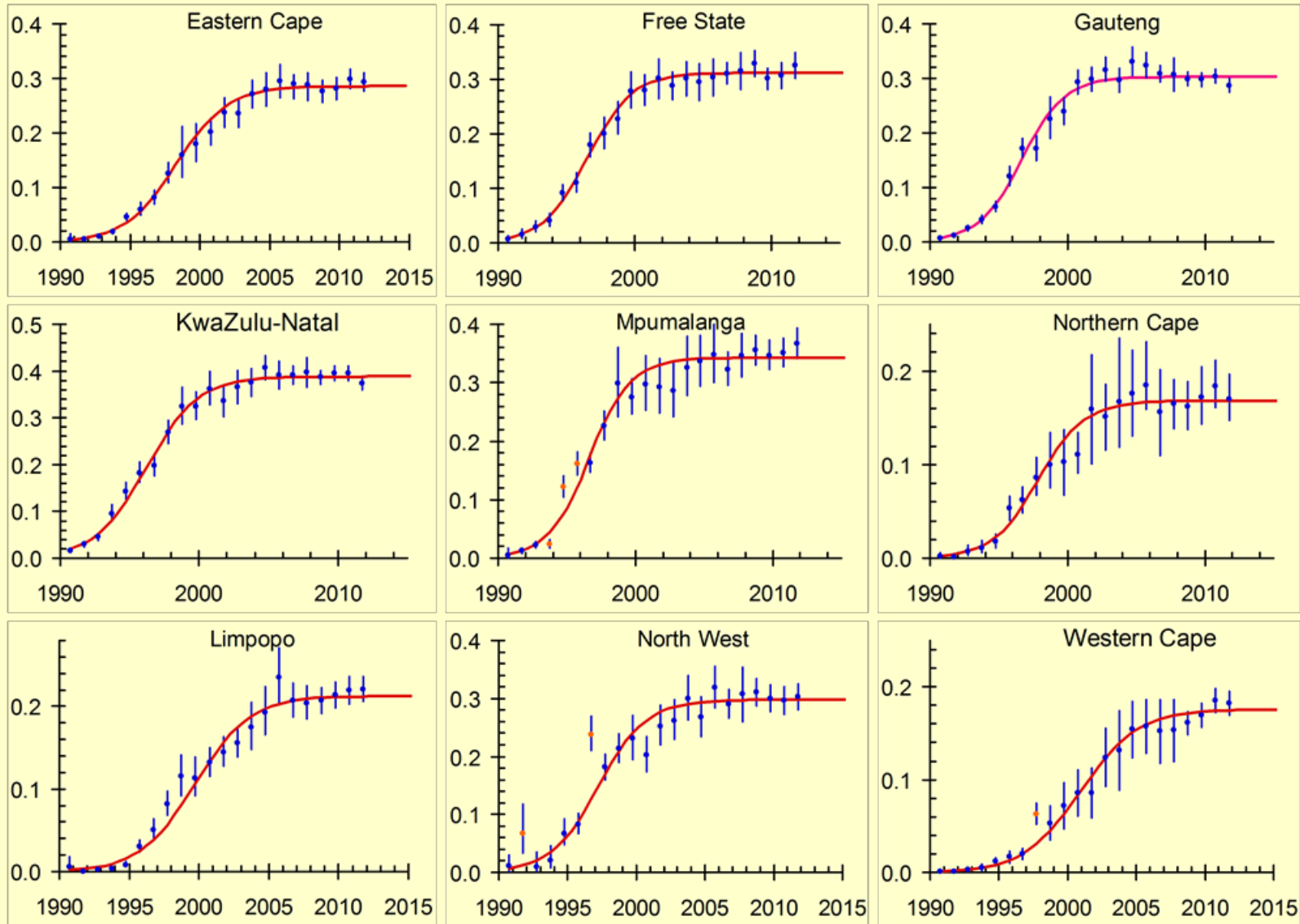
# South Africa

## Cost and impact: 2015 to 2050



What we really need is  
much better data

# South African ANC surveys



# ANC surveillance (2017)

1. Ask about status
2. HIV
3. ARV
4. Viral load
5. Recent infection
6. Drug resistance
7. Other STIs
8. TB

Cost ~ 0.1% of current annual expenditure



# Malawi Quarterly Reports 2004 to date

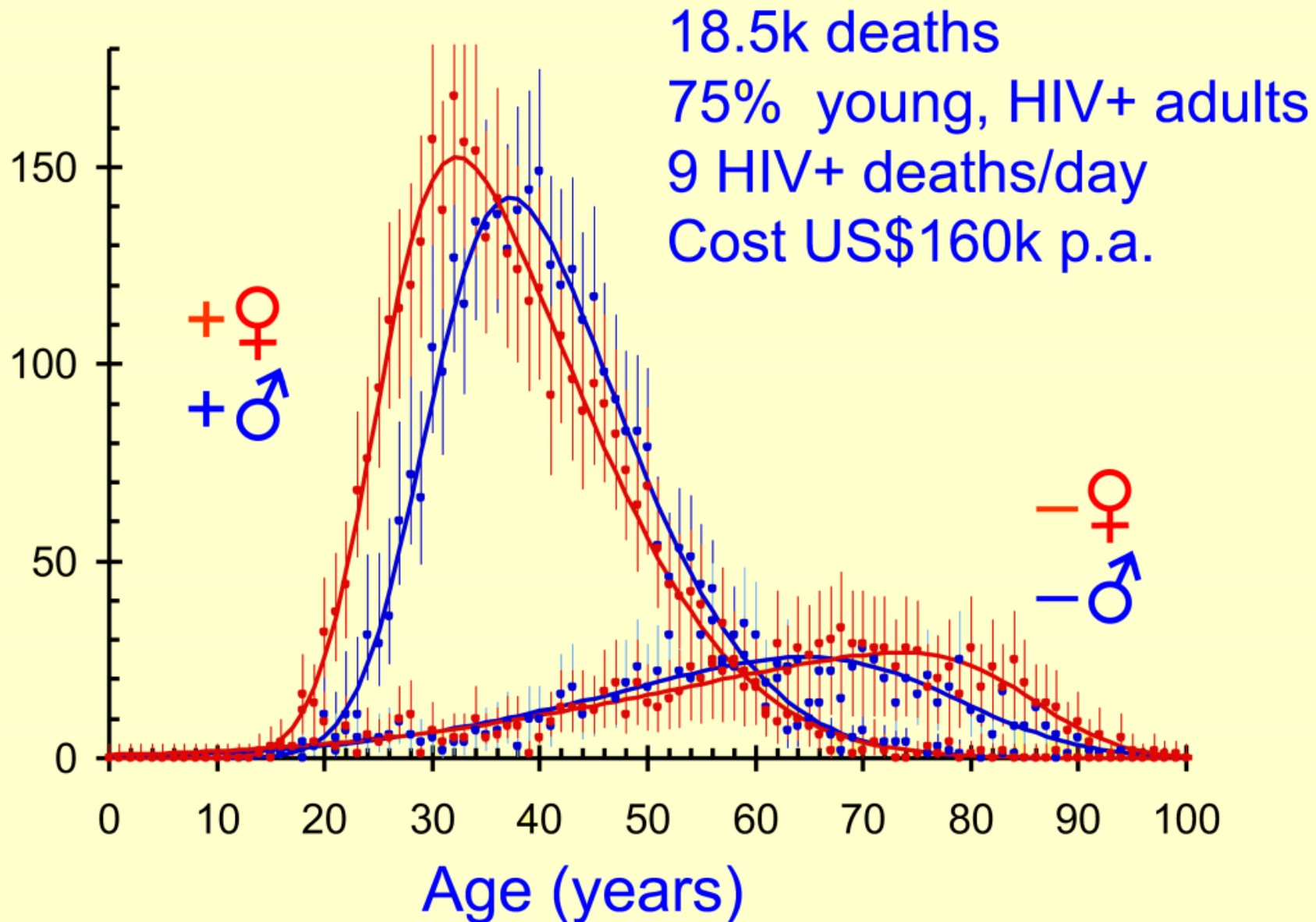
## April to June 2015

Tested	141,212
Already infected	10,766
Starting ART	25,957
Number on ART and alive	
Adults	519,063
Children	49,407
ART coverage (%)	57
Survival on ART at 12 months	
Adults (%)	79
Children (%)	78
HIV+ pregnant women on ART	10,460
HIV exposed infants on ARV prophylaxis	7,771

# Cost of Malawi's patient monitoring

~ 1% of current expenditure

Number of deaths

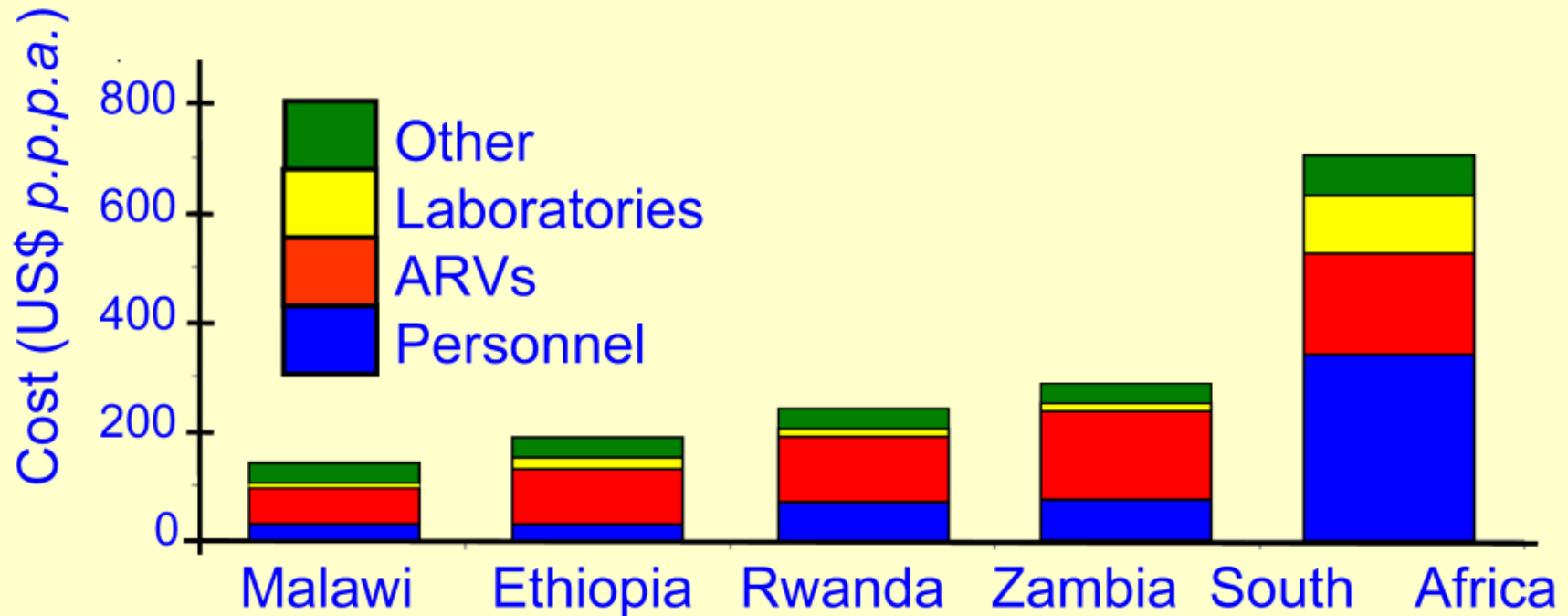


## HIV+ Deaths in Baragwanath 2006–2009

The fault, dear colleagues, lies  
not in our models but in our  
data.

With apologies ...

# Facility-based treatment cost (CHAI)

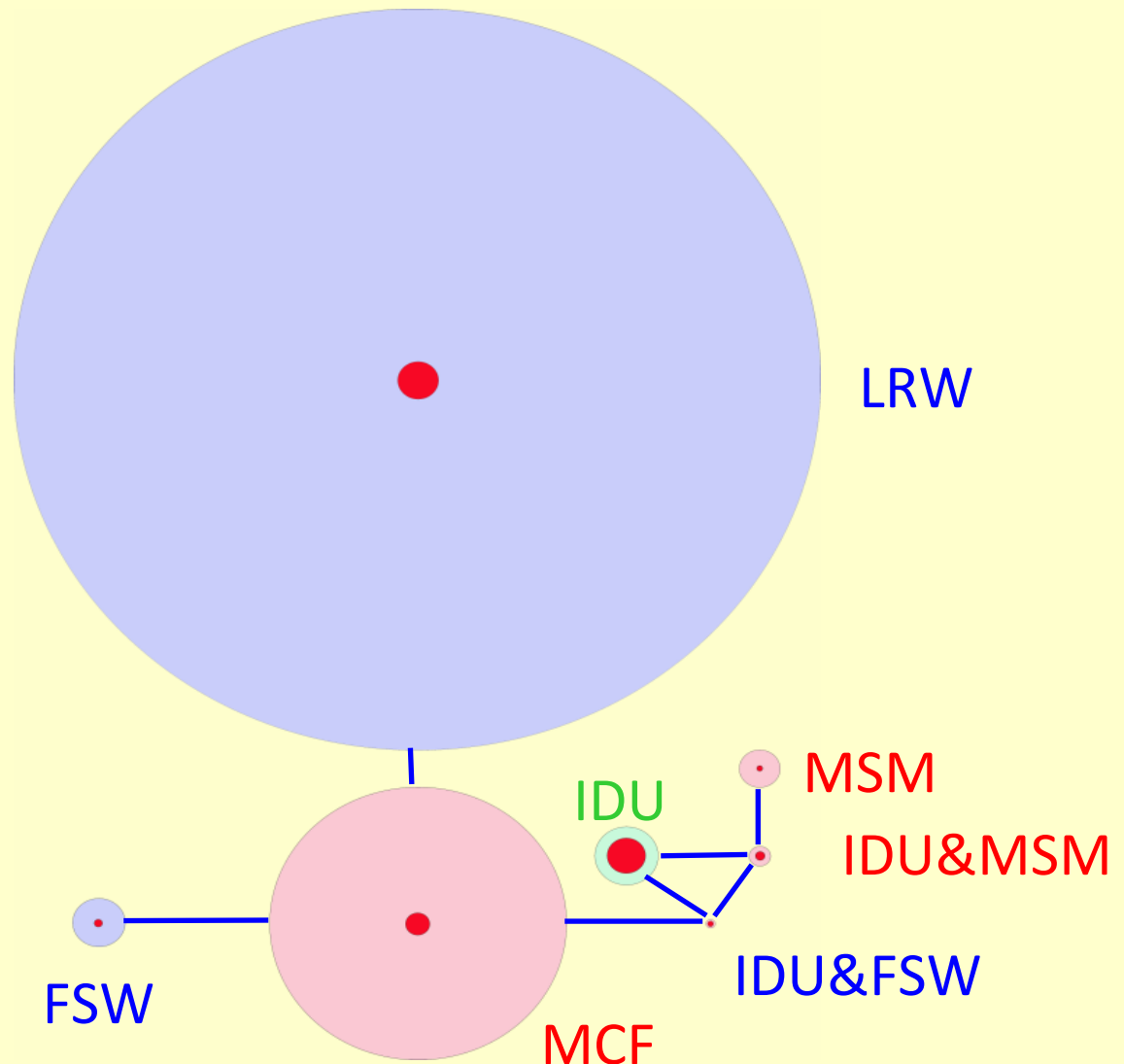


Country	ARV	Pers.	Labs	Other	Total
Malawi	66	29	5	36	136
Ethiopia	103	28	16	39	186
Rwanda	114	67	15	37	232
Zambia	155	73	13	37	278
RSA	181	334	102	65	682

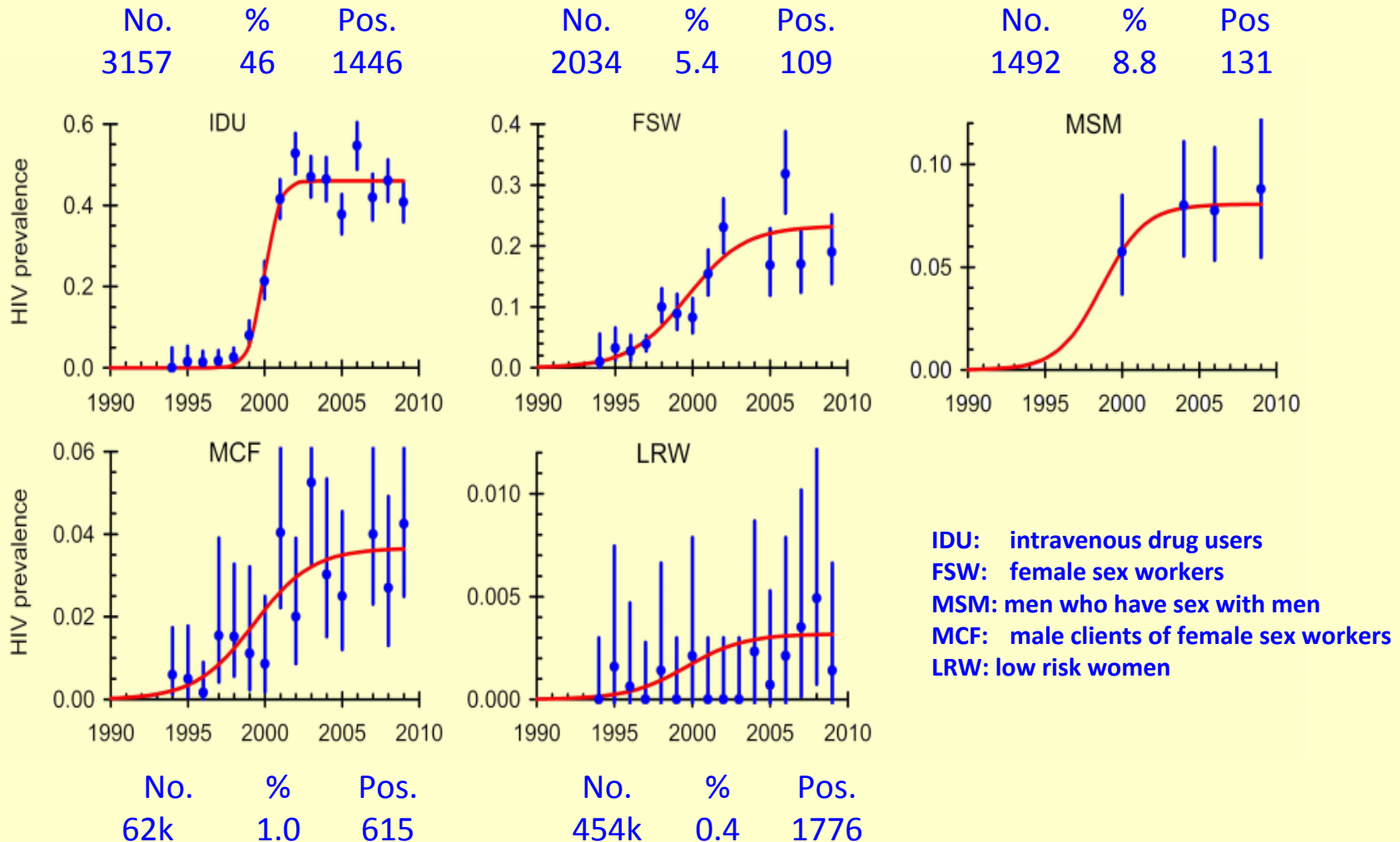
# Can Tho: Vietnam

Big circle  
Group size

Small circle  
No. infected



# Concentrated HIV epidemics: Can Tho, Vietnam



Prevalence varies greatly    Group size varies greatly  
Some groups overlap

# Show us the money (US\$)

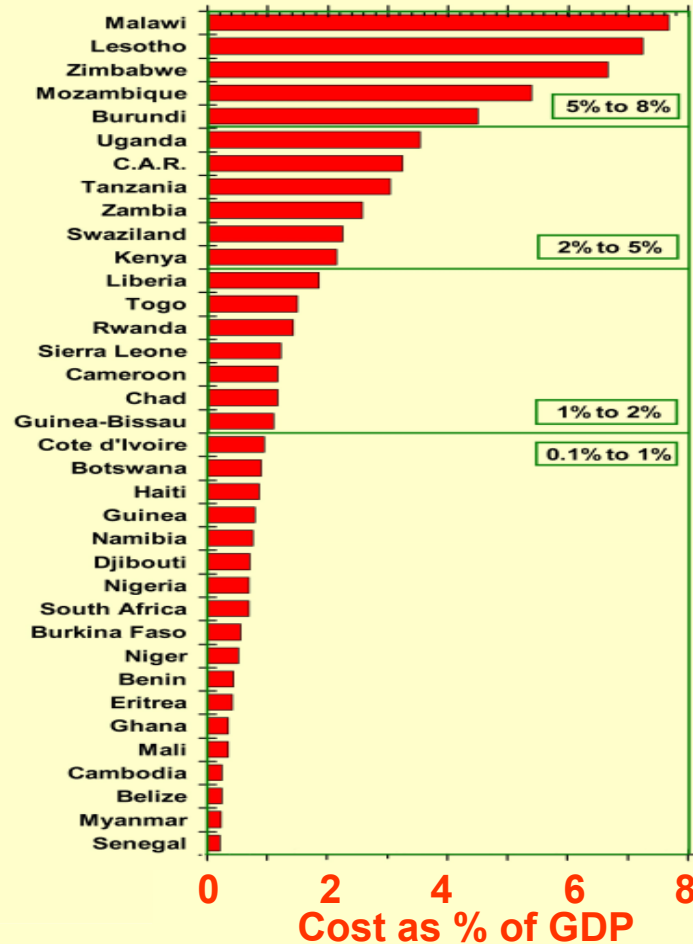
People infected with HIV	36M
People on ART	15M
Current investment p.a.	\$22B

Current investment/PLWH p.a.	\$600
Cost of ARV p.a.	\$100
Admin, Care, PrEP, VMMC etc.	\$500

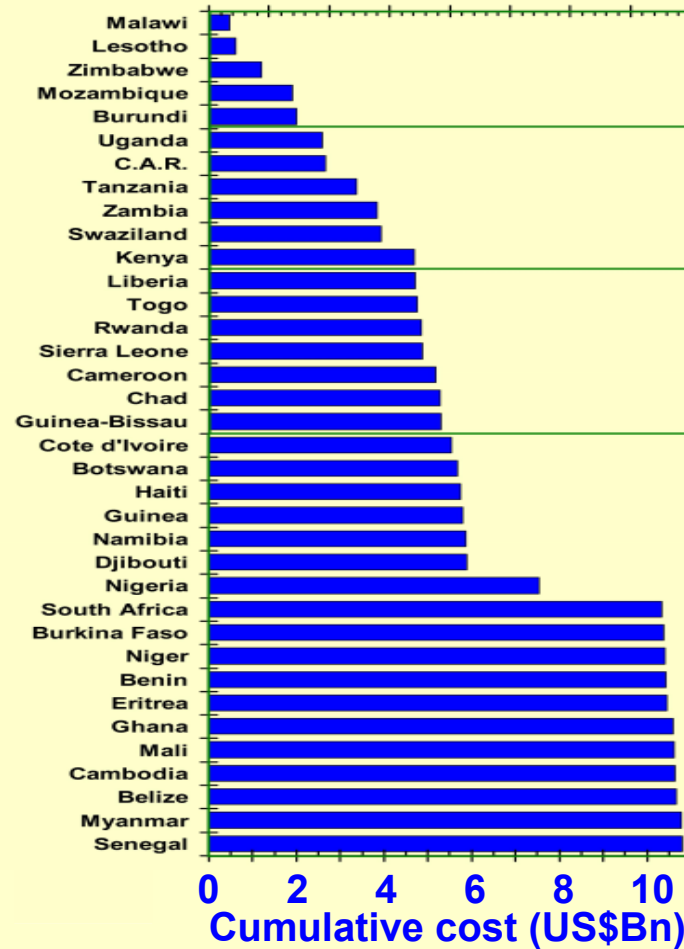


# Affordability at US\$500/person p.a.

Cost as a percentage of GDP



Cumulative cost



With international support, universal access to ART is affordable in Africa

# Zibambele: Fixing roads, improving health, alleviating poverty

David Ginsburg and Peter Derman

Launched in 2000 by the KZN Department of Transport to maintain designated strips of gravel road.

Women headed households, no male support or other income

2010: 40k households were receiving R460 (US\$30) per month

US\$1.2 million paid monthly to the poorest families in the province: 93% to the women; 7% to manage the project

Improvements in household nutrition, people able to pay school fees. Collective savings in excess of US\$1 million

Invested in small-scale enterprises creating jobs and injecting cash into impoverished rural communities.