



## HIV PREVENTION—A REAL OPPORTUNITY

We can **deepen the decline in new infections**

We can **intensify combination prevention**, which reaps and amplifies the benefits of treatment

**Combination prevention** is our best hope — **and only solution**—to this epidemic

We need prevention leaders, champions, scientists, managers and implementers—a **coherent prevention discipline**

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# Role of the Joint Program

## Collectively strengthen HIV prevention:

Evidence



Investment



Implementation



Sustainability





# EVIDENCE



# Education and HIV Prevention

With Secretariat, UNESCO, UNICEF, UN WOMEN



Early in the epidemic people with higher education had higher HIV prevalence  
Hargreaves et al, 2002

*However*, Fylkesnes (2001) and De Walque (2005) noted new infections were...

**...declining** among people with higher education and **increasing** among people with low education.

Hargreaves (2008) confirmed the inversion, with lower educated people now having higher prevalence

In South Africa, HIV prevalence was **16.9%** among girls who did not finish high school and **8.6%** among girls who did Pettifor (2008)



Similar associations have also been reported in Malawi and Uganda (Behrman, 2015)

In KwaZulu-Natal, South Africa, each additional year of schooling **reduced HIV risk by 7%**

Bärnighausen, 2007

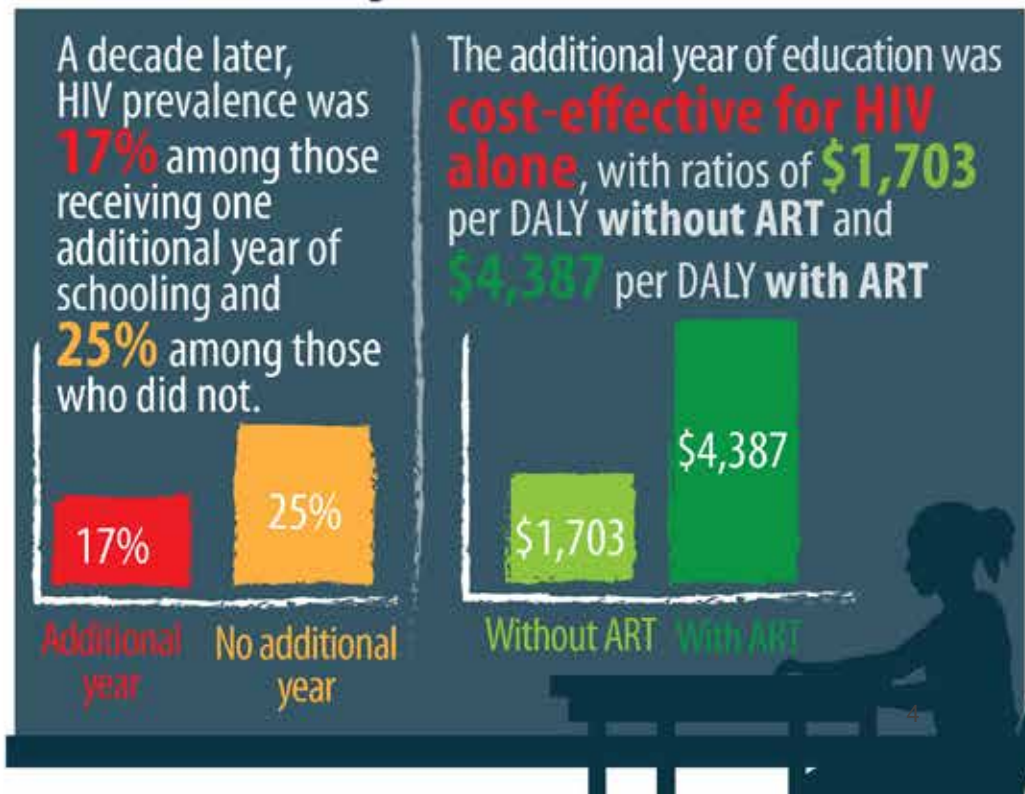


Beyond associations, De Neve (2015), used a regression discontinuity natural experiment to assess the causal effect of additional schooling.

A decade later, HIV prevalence was **17%** among those receiving one additional year of schooling and **25%** among those who did not.

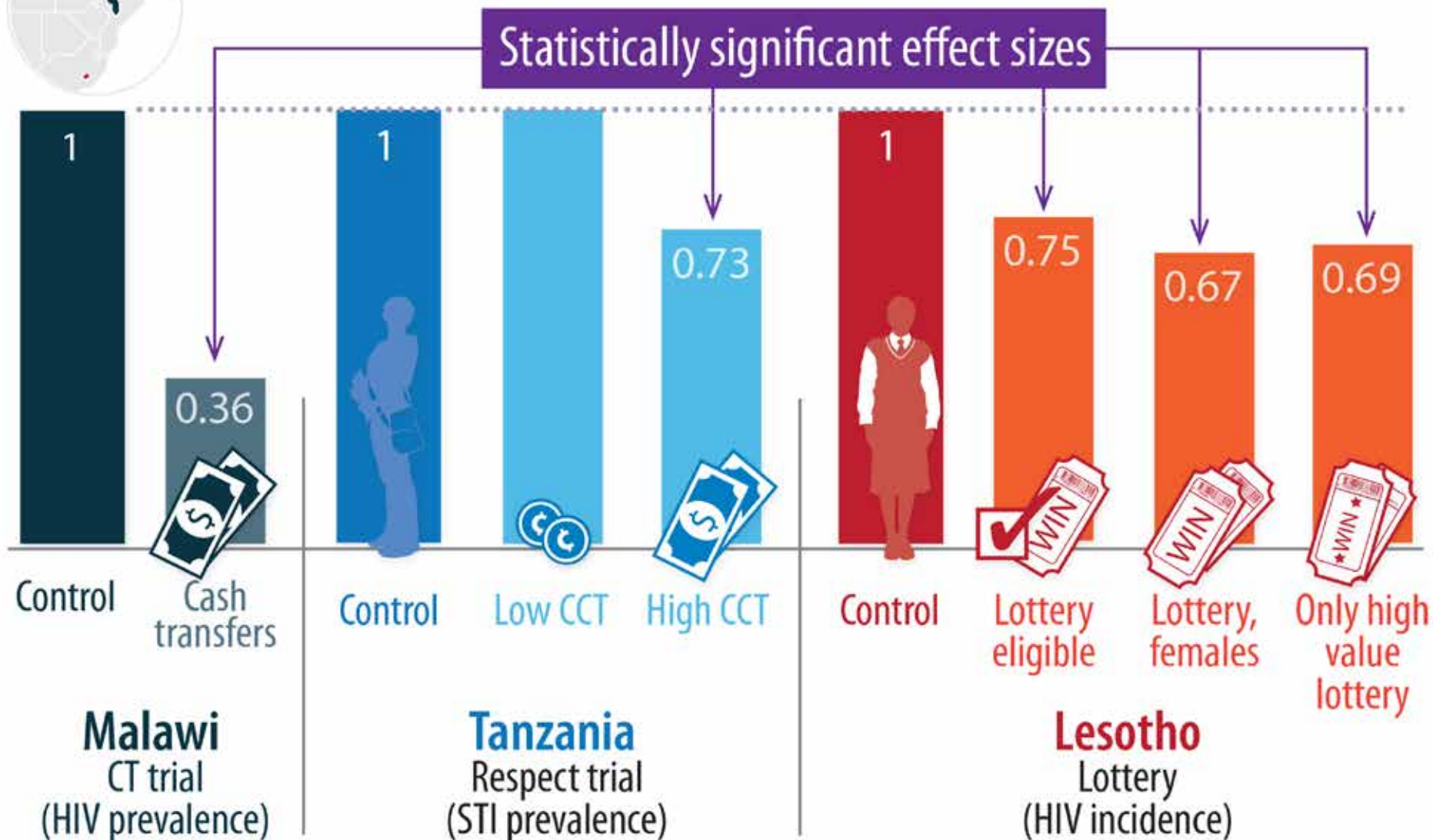


The additional year of education was **cost-effective for HIV alone**, with ratios of **\$1,703** per DALY **without ART** and **\$4,387** per DALY **with ART**

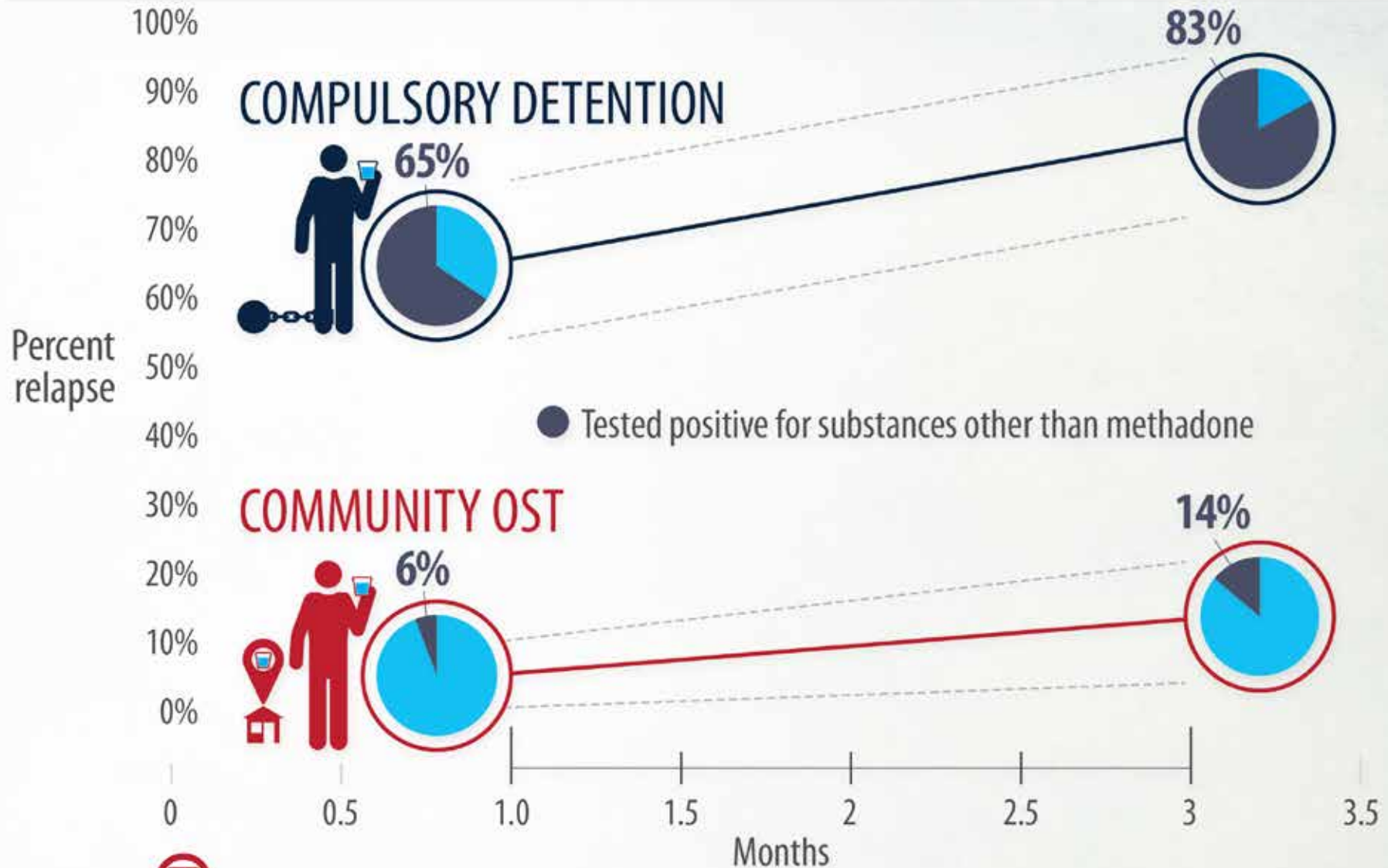


# Social Protection and HIV Prevention

With Secretariat, ILO, UNICEF, UNWOMEN, UNHCR, WFP



# Voluntary Community Drug Rehabilitation With Secretariat, UNDOC

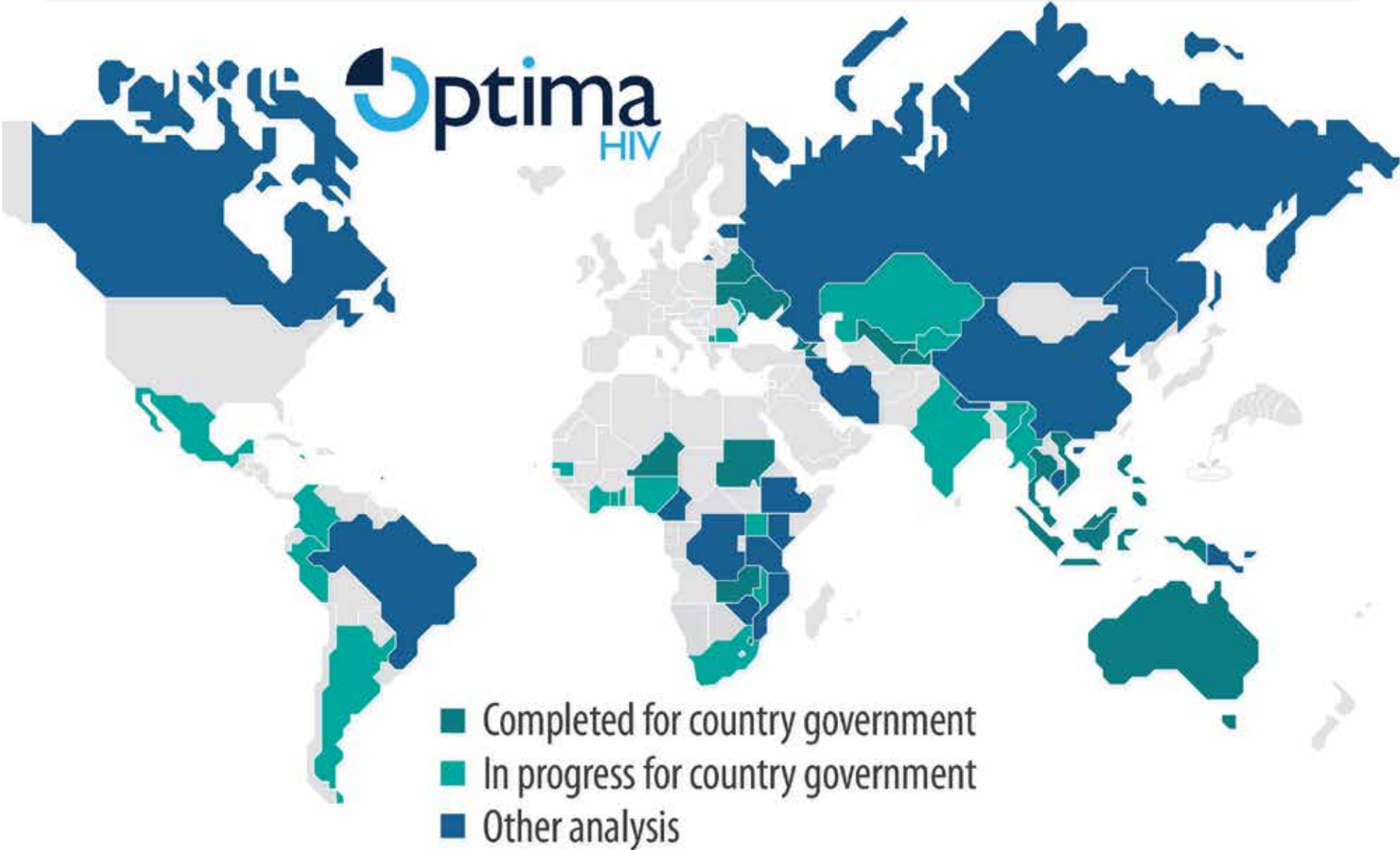


Community OST is **6-fold more effective** and **12-fold more cost-effective** as detention.



# INVESTMENTS

# Improving Investment



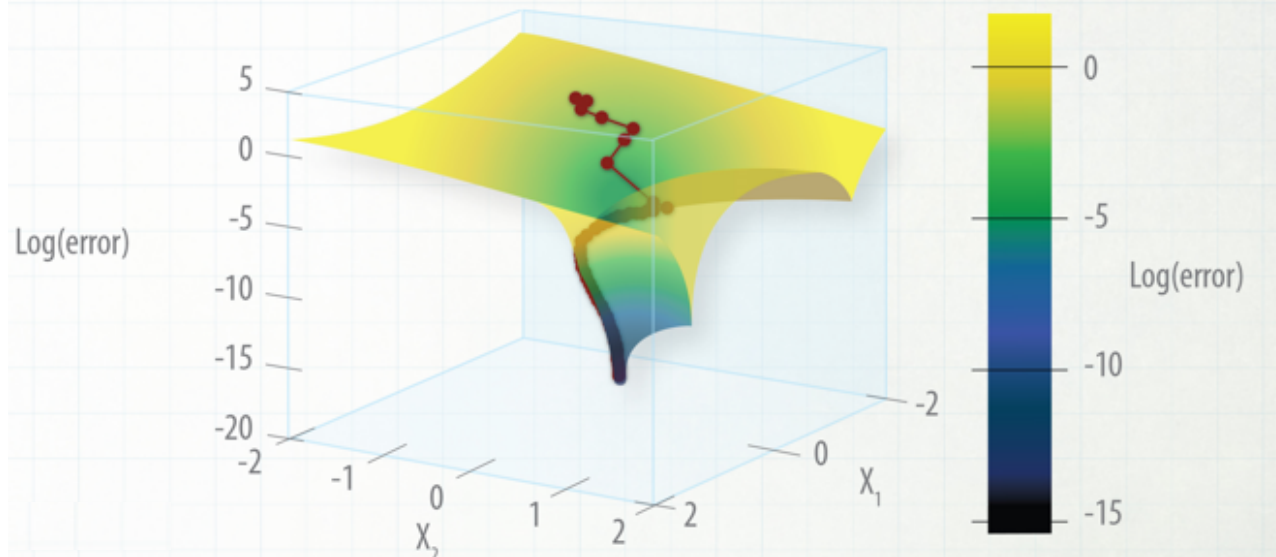




## OPTIMIZATION ALGORITHM



For resource vector  $R$  such that  $\sum R = c(t)$   
 and bounded by constraints  $r_{min}(t) \leq R_i \leq r_{max}(t)$   
 with outcome  $O = f(R)$ , find  $R$  that minimizes  $O$



### BURDEN OF DISEASE

- ▶ Epidemic model
- ▶ Data synthesis
- ▶ Calibration projection



### PROGRAMMATIC RESPONSES

- ▶ Identify interventions
- ▶ Delivery modes
- ▶ Costs and effects



### OBJECTIVES AND CONSTRAINTS

- ▶ Identify interventions
- ▶ Economic constraints
- ▶ Ethical and logistic constraints

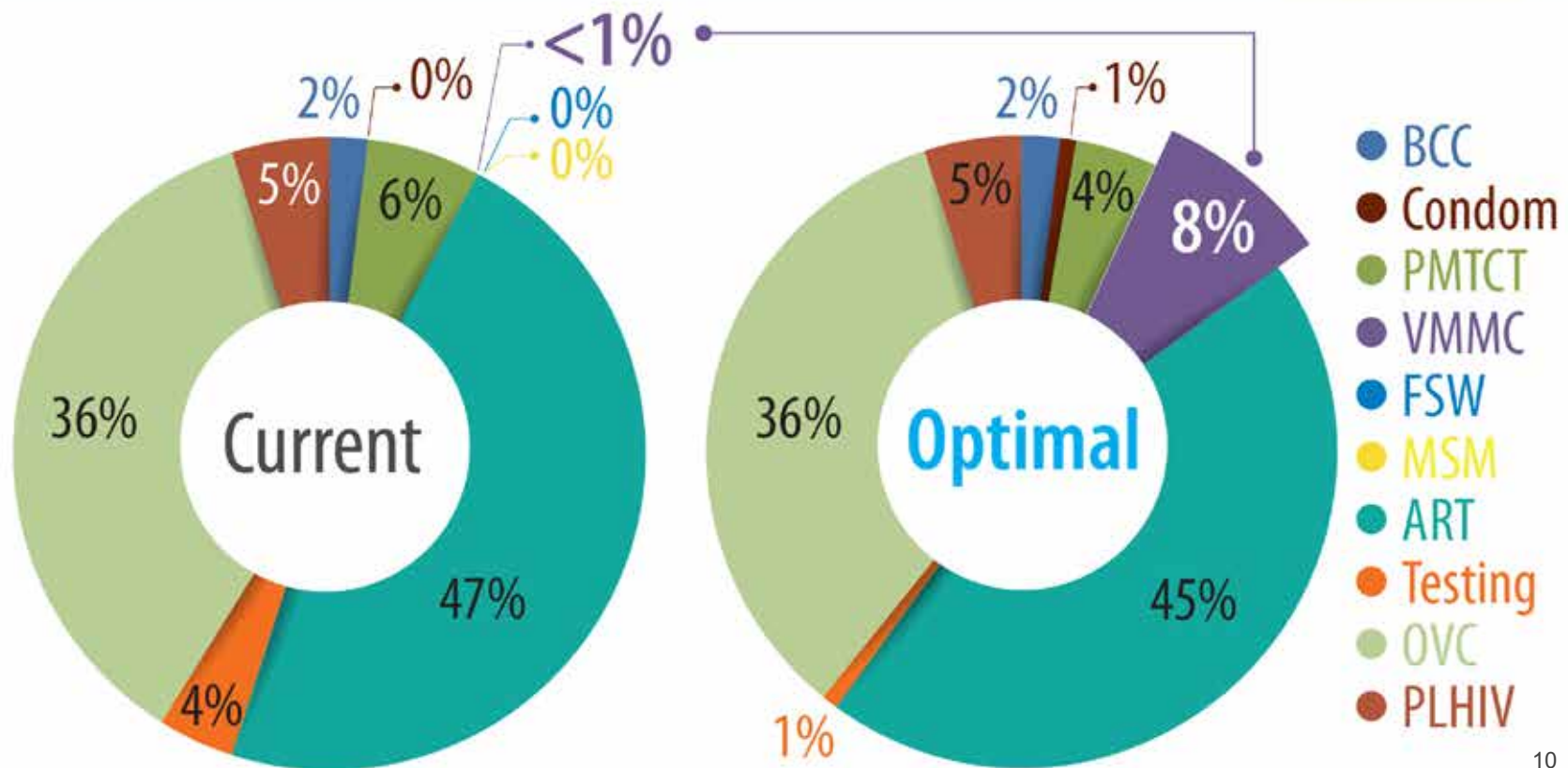


# Optimizing HIV Investments **SWAZILAND**

With Secretariat, UNDP, Multiple co-sponsors

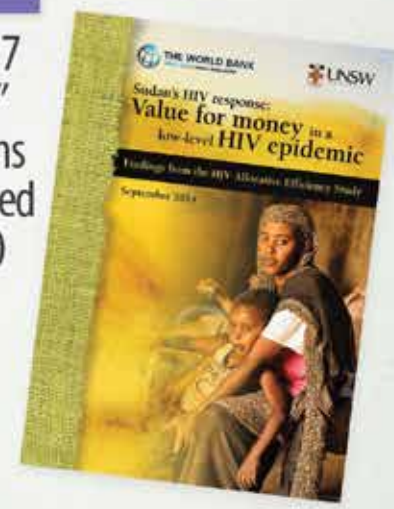
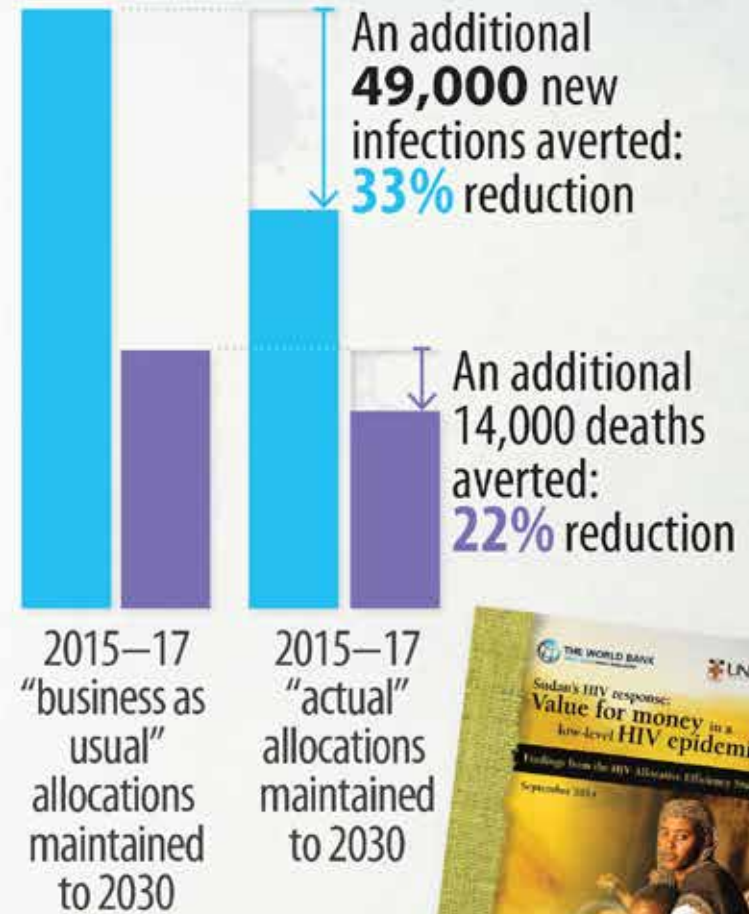
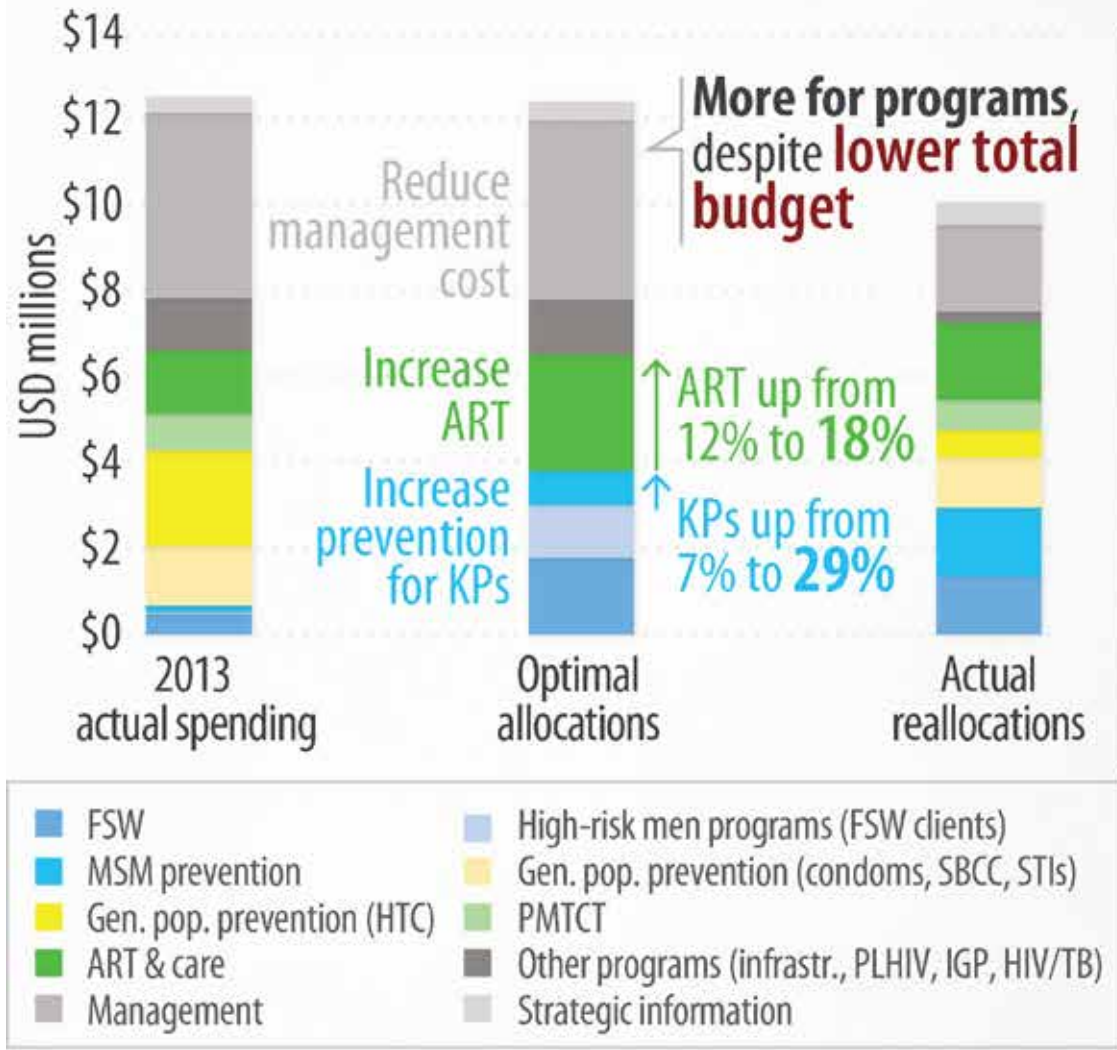


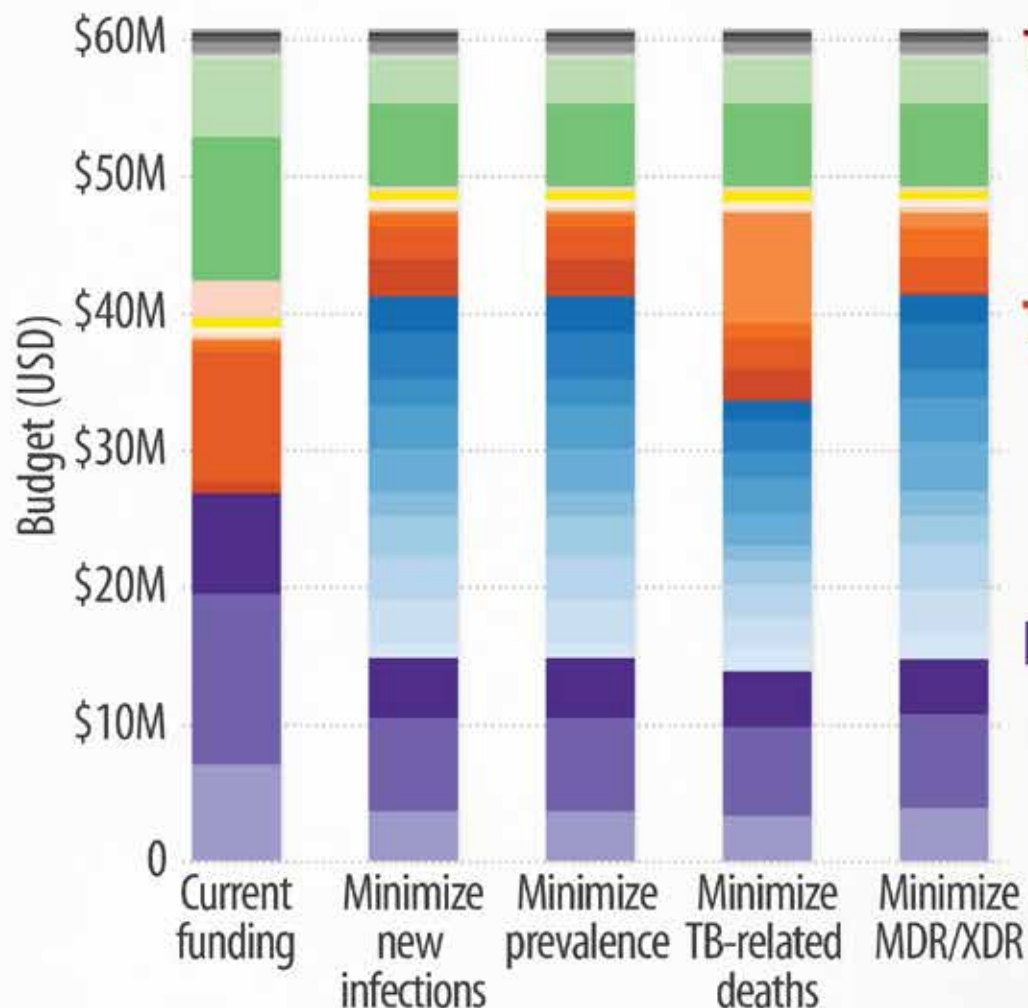
Swaziland **could reduce new infections by 30%** by 2018 by making a *single change* to allocations: Increase **VMMC** from **<1%** to **8%** of HIV spending plus sustain, expand ART, PMTCT, BCC, condoms within existing budgets



# Optimizing HIV Investments SUDAN

## With Secretariat, UNFPA





## REALLOCATIONS

### TESTING



Move from mass screening to active case finding in high risk groups and improve diagnosis with Xpert

### TREATMENT



Move from hospital care and involuntary isolation to ambulatory care, use new short course MDR/XDR regimens, increase IPT

### IMPACT



- ↓ Reduce TB prevalence in the general adult population by **84%**
- ↓ Reduce prevalence among PLHIV by up to **75%**
- ↓ Reduce TB deaths by **50%**
- ↓ Reduce TB incidence by **50%**



# IMPLEMENTATION

# Incentivizing Male Circumcision MALAWI

With Secretariat, WHO, UNFPA

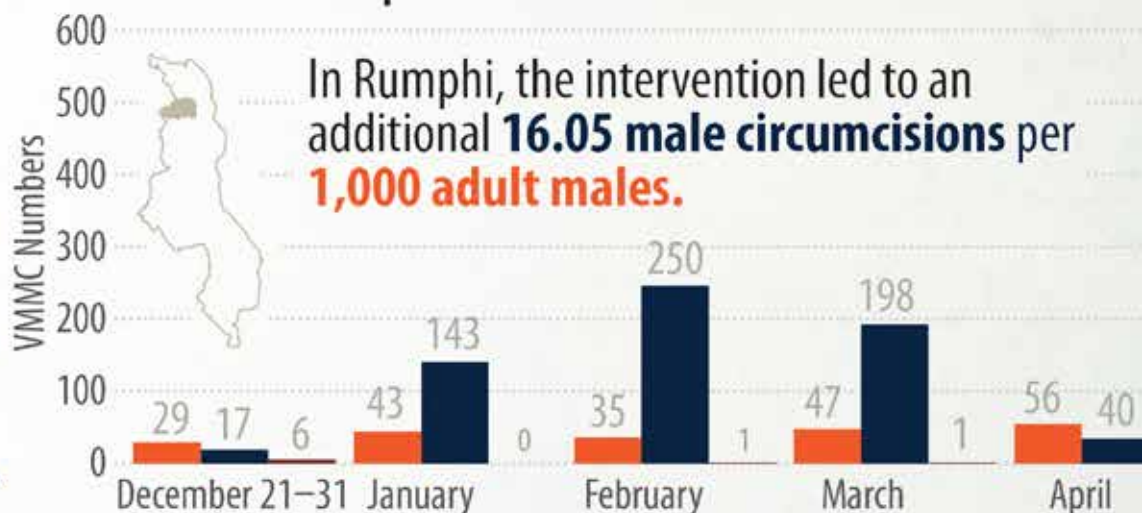


Vouchers Incentives **increased the odds of getting circumcised** in Mchinji or Rumphi by **7.32 times**

**TOTAL circumcisions with vouchers: 2,214 | Total circumcisions: 2,241**

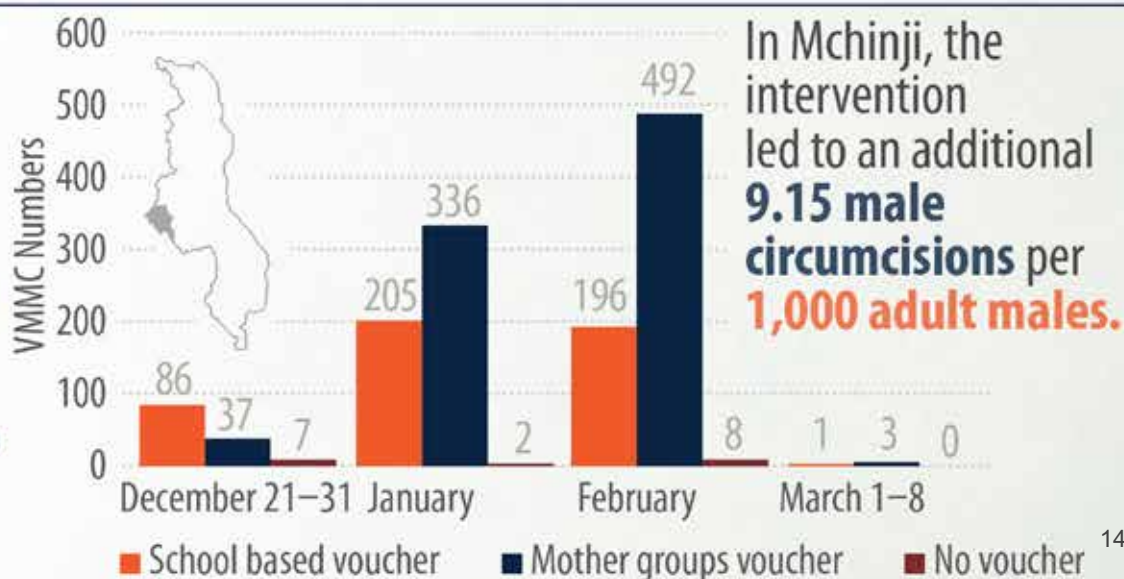
## Study Districts Rumphi

School boys incentivised	210
Mother group	858
<b>Total circumcisions</b>	<b>858</b>
No vouchers	7



## Study Districts Mchinji

School boys incentivised	487
Mother group	865
<b>Total circumcisions</b>	<b>1,323</b>
No vouchers	15



# Using Routine Data to Improve Implementation SOUTH AFRICA

## With Secretariat, WHO

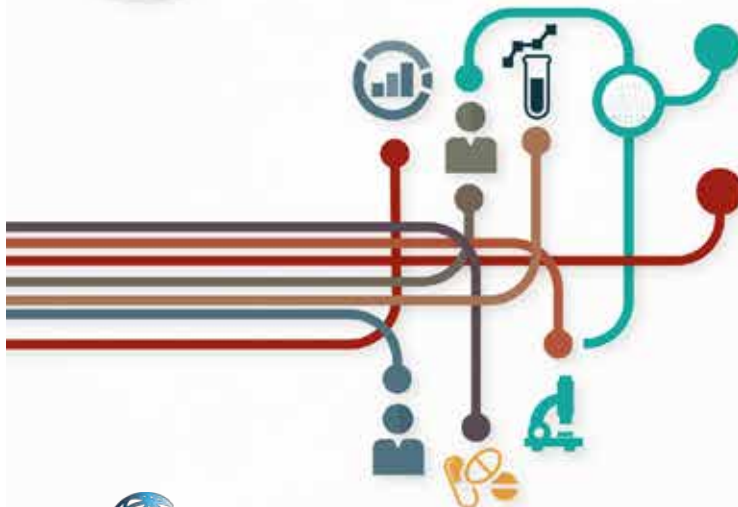


Routine data are **underused** for performance analysis and improvement

South Africa has **world's largest AIDS treatment program** and largest number of routine CD4 (immune strength) and viral load (amount of HIV) tests



These data was *never used* for **performance analysis** and **improvement**—at national, provincial, district or facility level



Using these data means linking different data bases and linking patient data

Complex matching procedure and fuzzy logic algorithms **linked data bases and matched 80%—44M lab tests to 12.7M new unique patient identifiers**

# Using Routine Data to Improve Implementation SOUTH AFRICA

With Secretariat, WHO



Using routine data for performance analysis and improvement

**75%** had at least one VL test in past year



**78%** were virally suppressed...

*an encouraging national performance!*

## Wide geographic variation for viral suppression...

...from **67%** in Northwest



...to **86%** in KZN



However,

**1 in 5** not suppressed



**1 in 3** under <25 yrs not suppressed



**1 in 4** men not suppressed



200 clinics below **50%**  
150 above **90%**



Men start treatment **far later** than women (CD4—177 vs 228) and have much slower immune reconstitution

## 5 key predictors of high performance at each

- 1 **Immediate counseling** for those diagnosed
- 2 **Decentralized medicine delivery**
- 3 **Adherence clubs** for adherence
- 4 **Enhanced counseling** for elevated VL
- 5 **Early tracing** for missed appointments

Initiated cluster randomized trial with matched pairs to evaluate their impact in low performing facilities





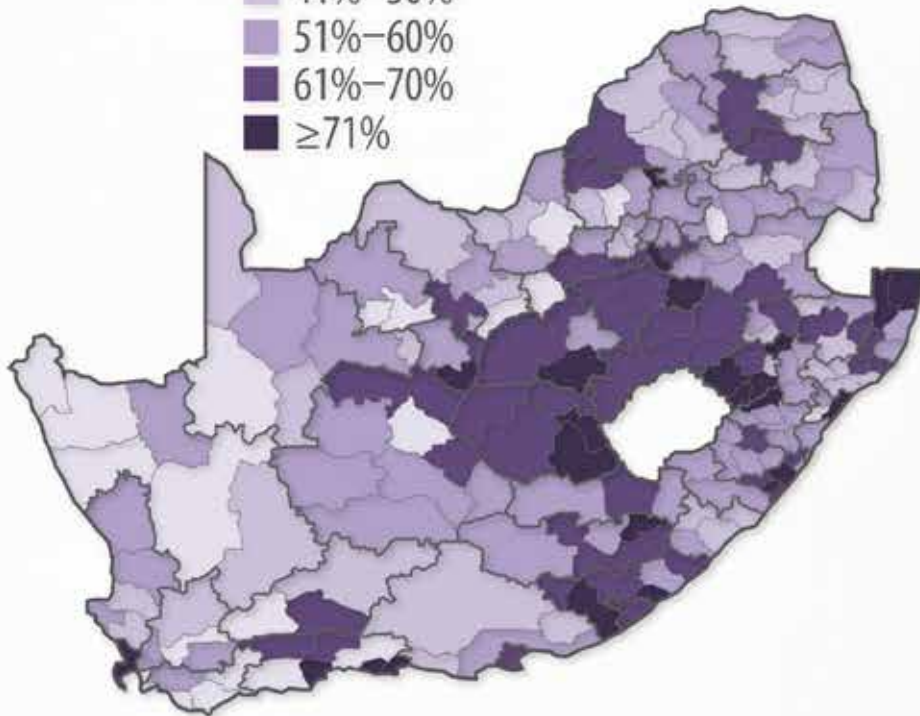


## Learning from **HIGH PERFORMANCE** (dark districts)

Proportion of **ART clients** with  
**known VL suppression** (<400 cp/ml)

Proportion viral load suppression

- <40%
- 41%–50%
- 51%–60%
- 61%–70%
- ≥71%

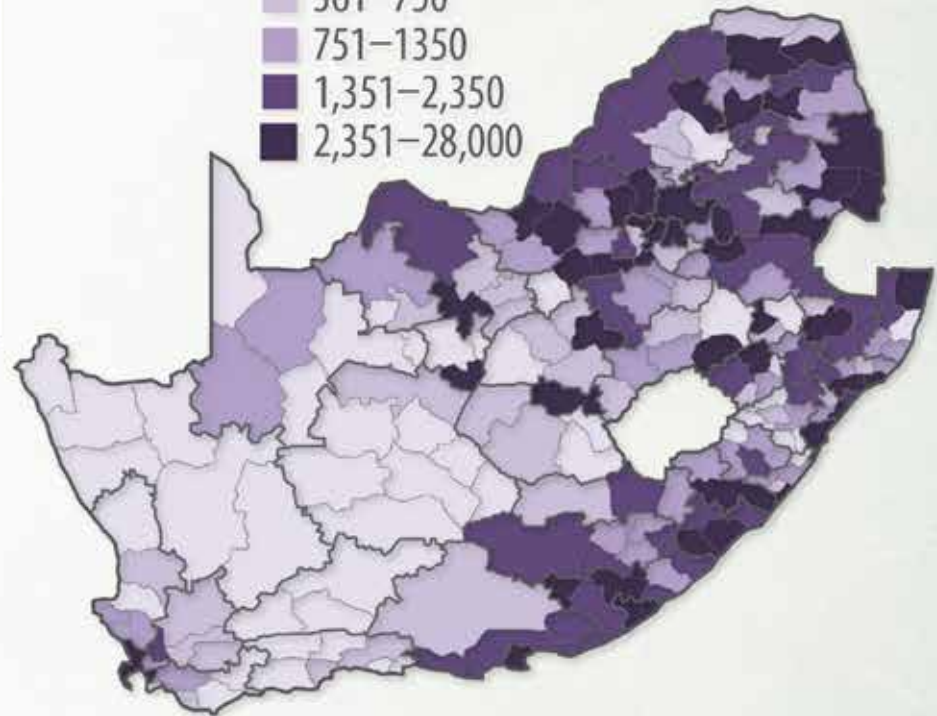


## Improving **LOW PERFORMANCE**

Number of **ART clients** with  
**high VL** (>1,000 cp/ml)

Number of clients

- 0–360
- 361–750
- 751–1350
- 1,351–2,350
- 2,351–28,000





In South Africa's **HIV PROGRAM**, we

- ▶ Conducted a systematic review to identify **30 proven cascade interventions**
- ▶ Determined **unit cost data for each intervention**
- ▶ Assessed **program scale-up potential**
- ▶ Fed these data into our **epi-econ-optimization model – Optima**



# Using Routine Data to Improve Implementation SOUTH AFRICA

With Secretariat, WHO



By **optimally allocating resources** (*expanded testing, rapid treatment initiation counseling, adherence support and decentralized drug dispensing*) and removing HIV treatment eligibility criteria...



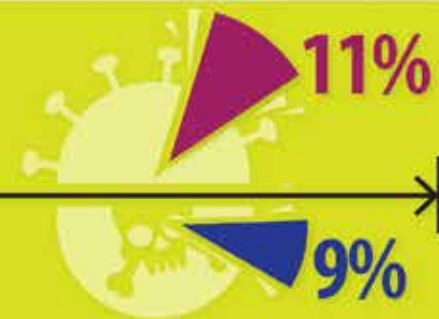
...PLHIV achieving viral suppression can be increased from 45% to **56%** by 2020

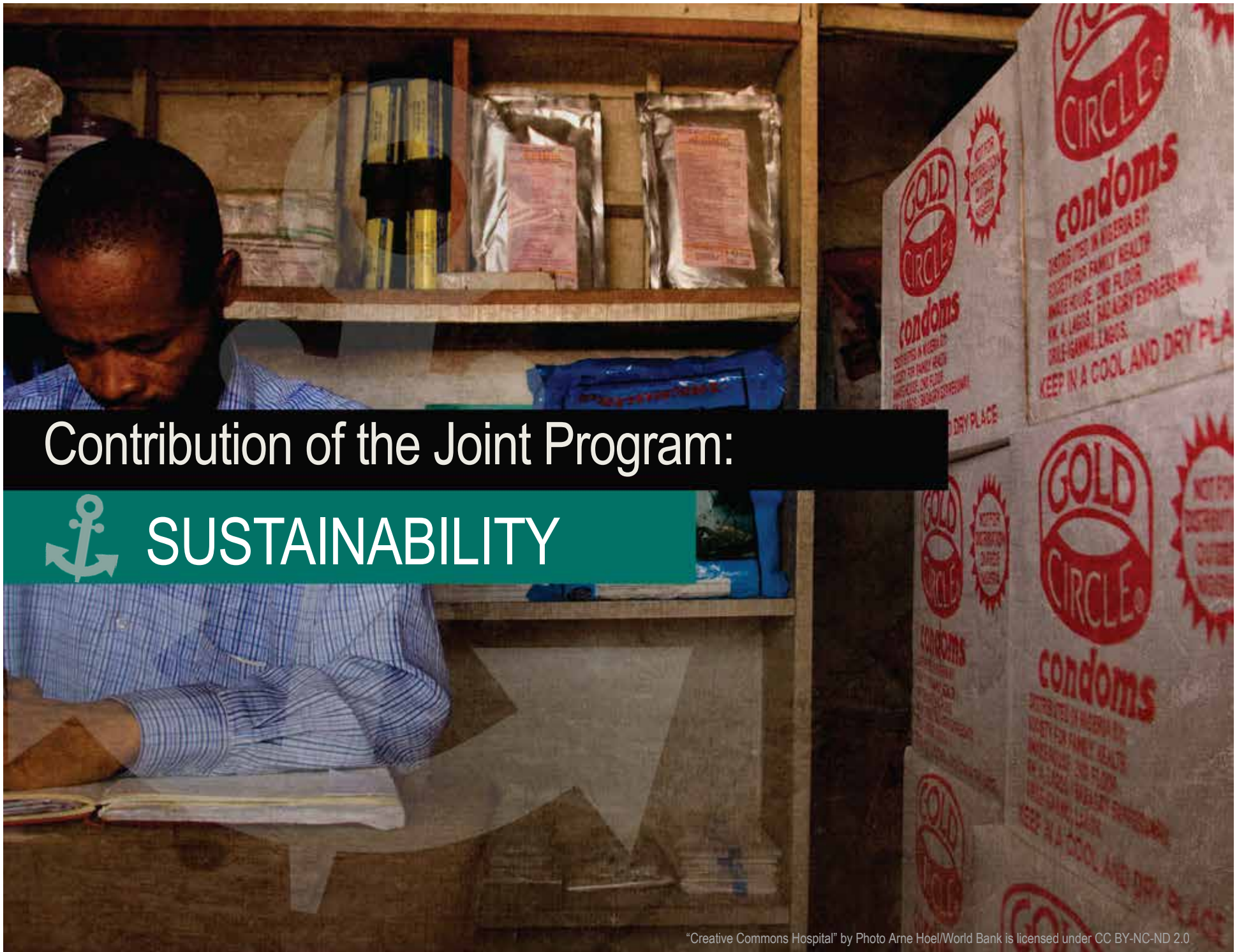
...without additional funds

From 2017 to 2020...

...An estimated **11% of HIV incidence** can be averted

...An estimated **9% of AIDS deaths** can be prevented





## Contribution of the Joint Program:



## SUSTAINABILITY

# Financing HIV Prevention

With Secretariat, UNDP, Other Co-sponsors

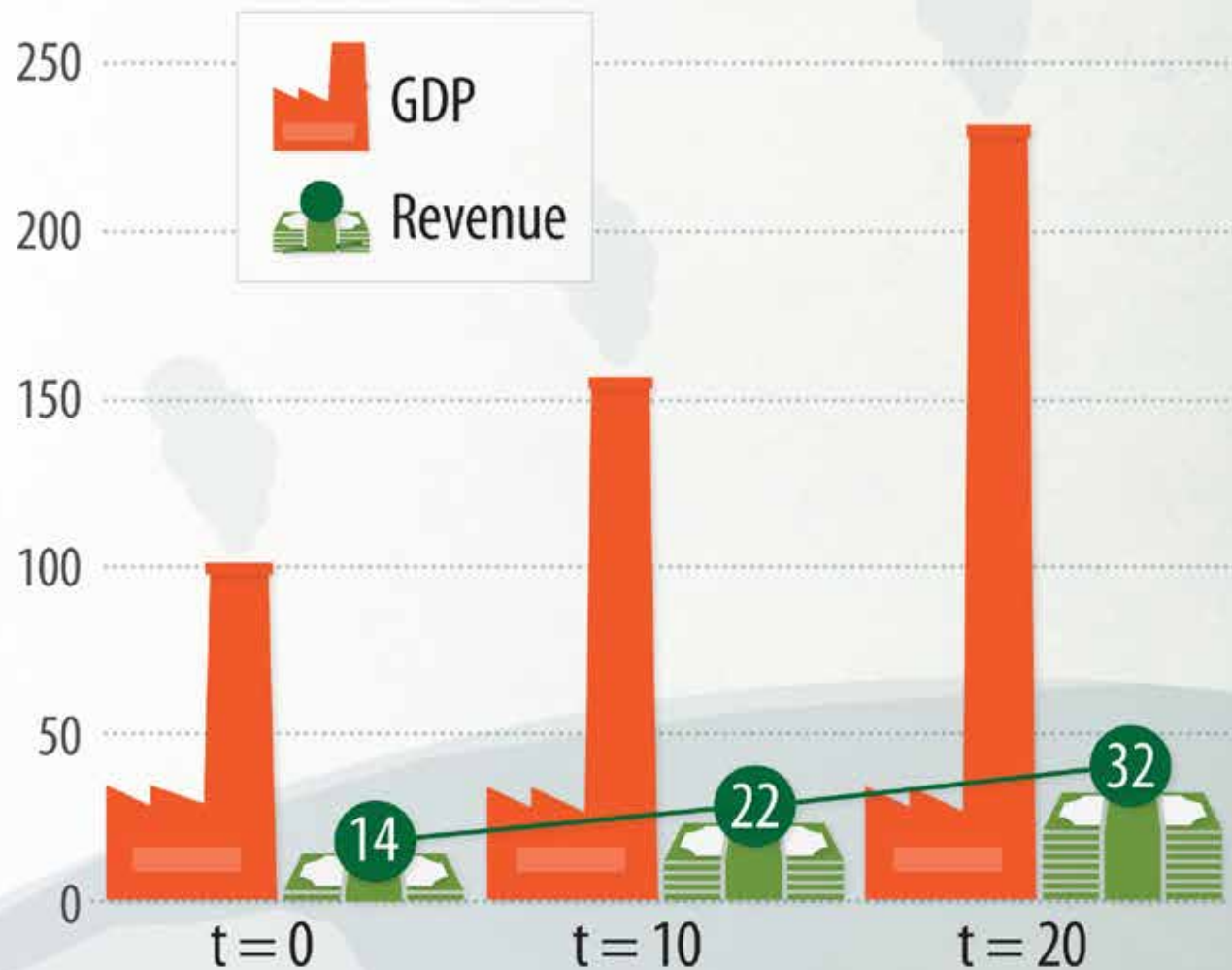


- ▶ *Can't rely indefinitely* on development assistance or special tax for every disease
- ▶ Highest impact prevention **often internationally financed**
- ▶ Need to situate HIV prevention financing in context of **economic growth, fiscal capacity and efficiency**, GHE as share of GGE, inclusion of HIV in GHE and UHC BP, public health financing, increased efficiency and effectiveness





- ▶ IMF forecast **4% long-term growth in low and middle income countries**
- ▶ This means economies—and revenue **doubles in 20 years**

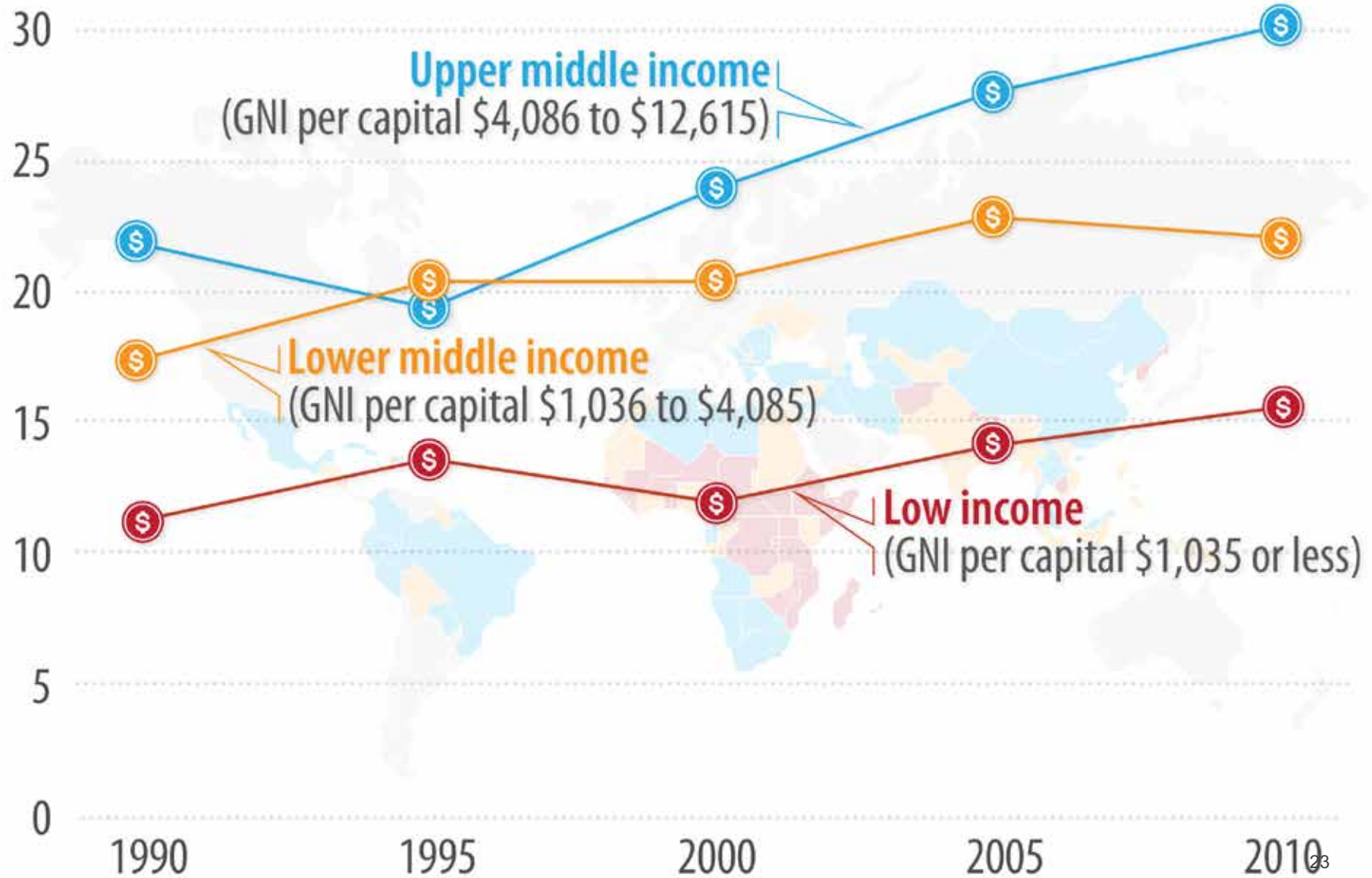


# Low Income Countries have Less Fiscal Capacity

With IMF

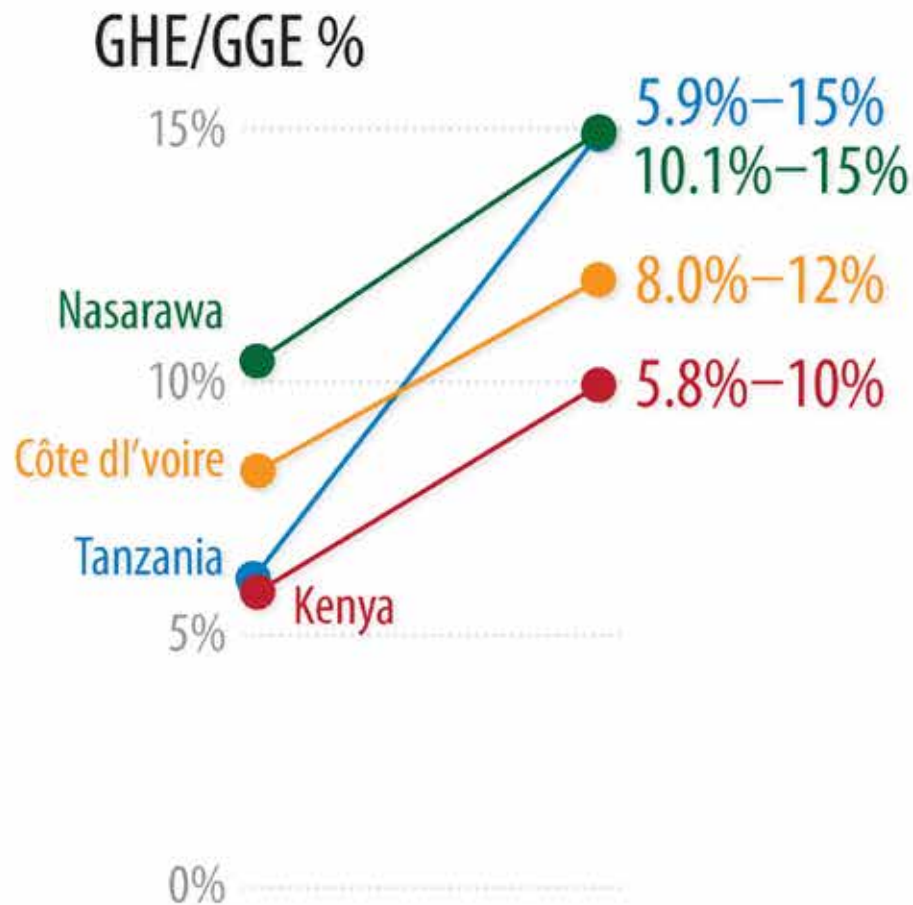


## Government Revenue as percentage of GDP





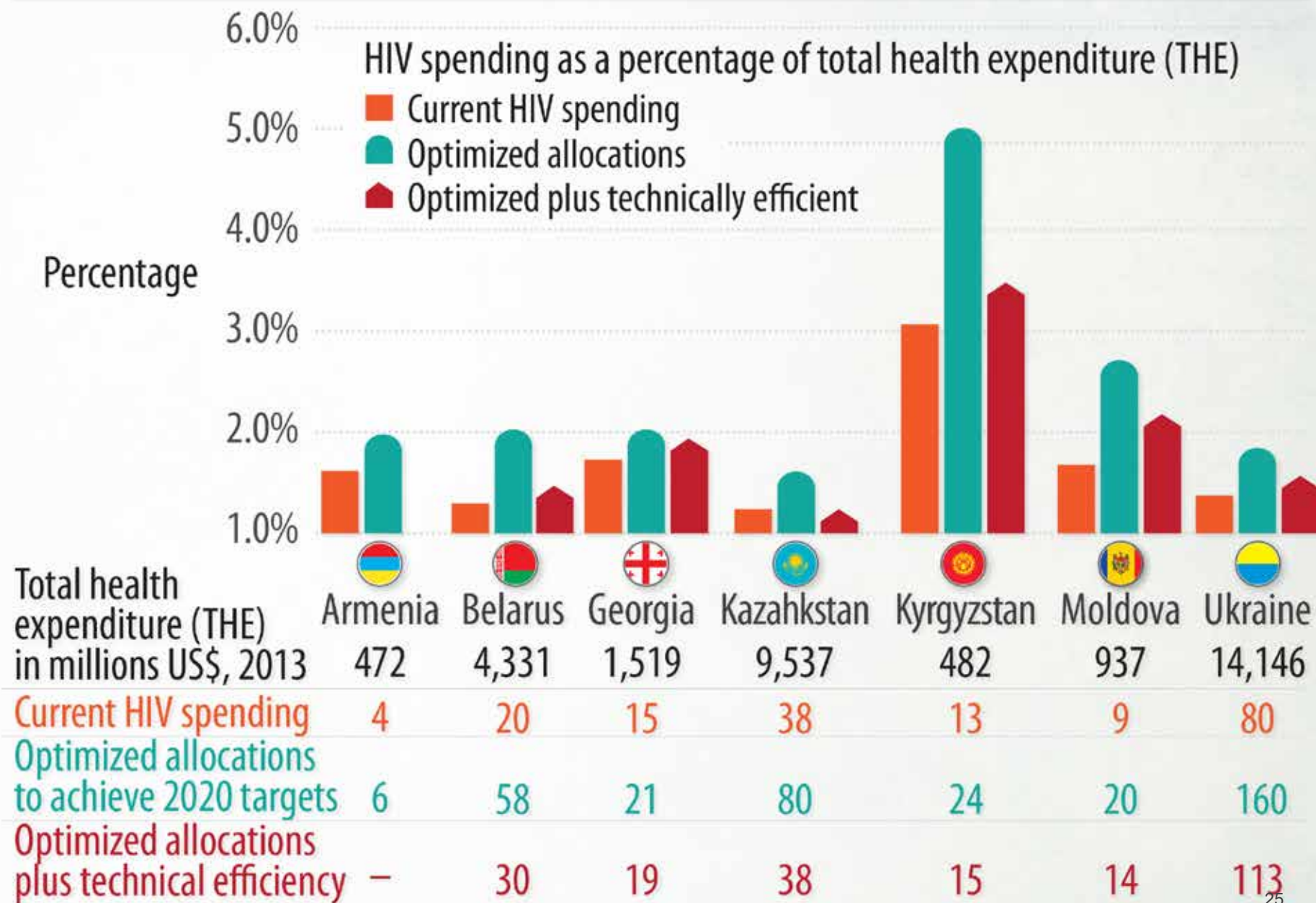
What's required to **close the gap with core health package** which **includes HIV**?





# Integrating HIV into Domestic Financing in EECA

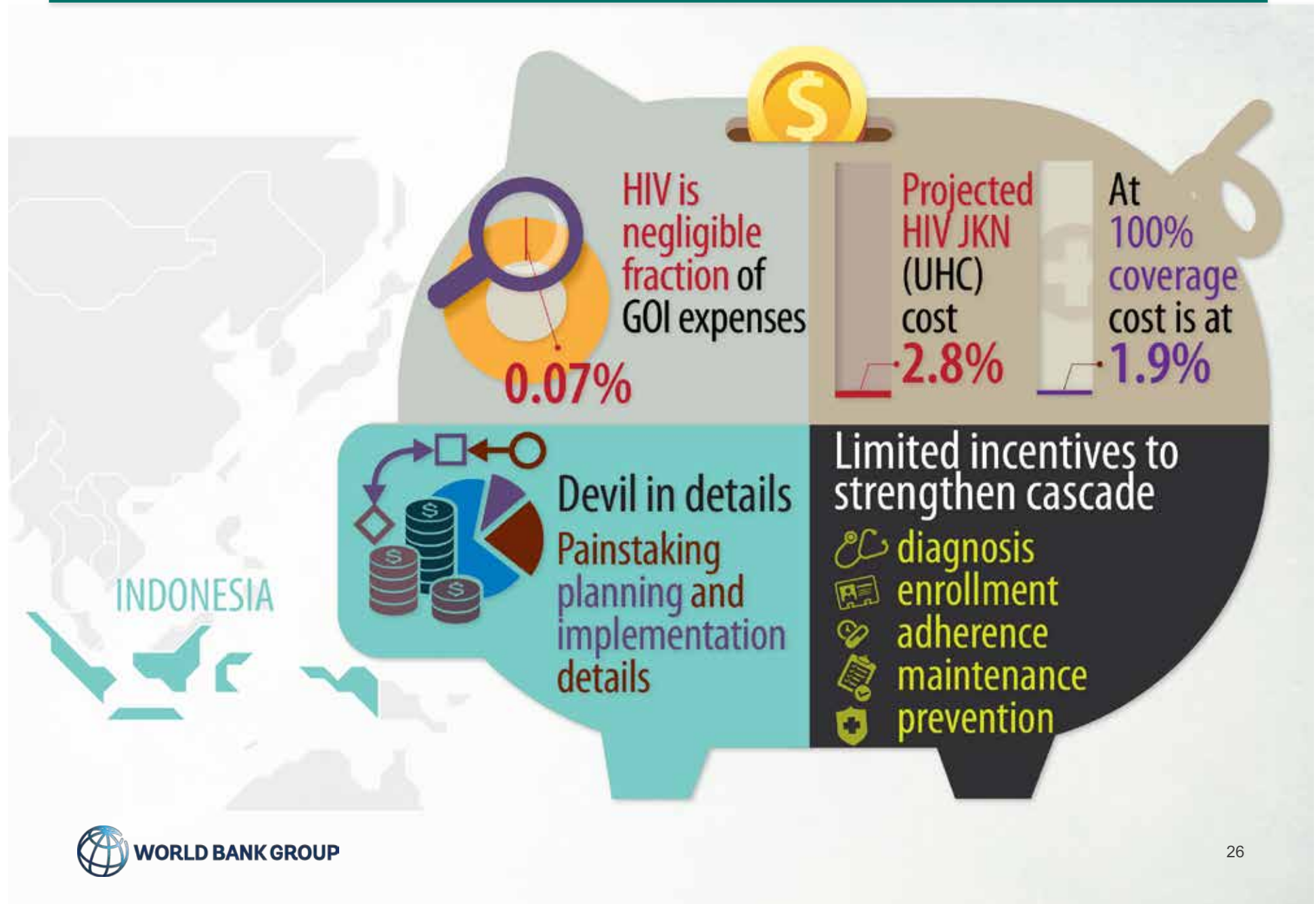
With With Secretariat, UNDP, Other Co-sponsors



\*National targets from national strategies were used and for the purpose of modelling translated into reductions of HIV incidence and deaths by 40 to 50 %  
Source: WHO NHA 2014, Populated Optima model

# Integrating HIV into UHC INDONESIA

With With Secretariat, UNDP, Other Co-sponsors



# HOW MUCH HIV DO WE WANT TO LIVE WITH?

## The Choice is OURS

- ▶ It's not all preventable—yet—but **with just laws and policies and comprehensive prevention, we can prevent a lot of it**
- ▶ Treatment has been an unmitigated blessing—**combination prevention amplifies its benefits**