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

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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. Pettitfor (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

Malawi
CT trial
(HIV prevalence)

Tanzania
Respect trial
(STI prevalence)

Lesotho
Lottery
(HIV incidence)

Control
Cash transfers

Control
Low CCT
High CCT

Control
Lottery eligible
Lottery, females
Only high value lottery

Statistically significant effect sizes

Comparative analysis across different countries and interventions:
- Malawi CT trial (HIV prevalence)
- Tanzania Respect trial (STI prevalence)
- Lesotho Lottery (HIV incidence)

Effect size comparison:
- Malawi: 0.36
- Tanzania Low CCT: 0.73
- Tanzania High CCT: 0.75
- Lesotho Lottery eligible: 0.67
- Lesotho Lottery females: 0.69

World Bank Group
Voluntary Community Drug Rehabilitation
With Secretariat, UNDOC

Compulsory Detention:
- 65% relapse
- 83% tested positive for substances other than methadone

Community OST:
- 6% relapse
- 14% tested positive for substances other than methadone

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

- Completed for country government
- In progress for country government
- Other analysis
For resource vector $R$ such that $\Sigma R = c(t)$ and bounded by constraints $r_{\text{min}}(t) \leq R_i \leq r_{\text{max}}(t)$ 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
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

USD millions

2013 actual spending

Optimal allocations

Actual reallocations

An additional 49,000 new infections averted: 33% reduction

An additional 14,000 deaths averted: 22% reduction

- FSW
- MSM prevention
- Gen. pop. prevention (HTC)
- ART & care
- Management
- High-risk men programs (FSW clients)
- Gen. pop. prevention (condoms, SBCC, STIs)
- PMTCT
- Other programs (infrastr., PLHIV, IGP, HIV/TB)
- Strategic information

2015–17 "business as usual" allocations maintained to 2030
2015–17 "actual" allocations maintained to 2030

Reduce management cost
Increase ART
Increase prevention for KPs
ART up from 12% to 18%
KPs up from 7% to 29%
Optimizing HIV Investments in BELARUS

With WHO, GFATM

**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 in 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

**Rumphi**
- School boys incentivised: 210
- Mother group: 858
- Total circumcisions: 858
- No vouchers: 7

In Rumphi, the intervention led to an additional **16.05 male circumcisions** per 1,000 adult males.

**Mchinji**
- School boys incentivised: 487
- Mother group: 865
- Total circumcisions: 1,323
- No vouchers: 15

In Mchinji, the intervention led to an additional **9.15 male circumcisions** per 1,000 adult males.

WORLD BANK GROUP
Routine data are underused for performance analysis and improvement.

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

These data were 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%

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
Using Routine Data to Improve Implementation SOUTH AFRICA
With Secretariat, WHO

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

WORLD BANK GROUP
Contribution of the Joint Program:

SUSTAINABILITY
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

Upper middle income
(GNI per capital $4,086 to $12,615)

Lower middle income
(GNI per capital $1,036 to $4,085)

Low income
(GNI per capital $1,035 or less)
What’s required to **close the gap with core health package which includes HIV?**

![Diagram showing GHE/GGE % for different countries such as Nasarawa, Nigeria, Côte d’Ivoire, and Tanzania, with Kenya depicted as a reference point. The diagram illustrates varying percentages for different countries, indicating the gap in funding for HIV integration.](image-url)
Integrating HIV into Domestic Financing in EECA
With Secretariat, UNDP, Other Co-sponsors

HIV spending as a percentage of total health expenditure (THE)
- Current HIV spending
- Optimized allocations
- Optimized plus technically efficient

Total health expenditure (THE) in millions US$, 2013

<table>
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<tr>
<th>Country</th>
<th>Armenia</th>
<th>Belarus</th>
<th>Georgia</th>
<th>Kazakhstan</th>
<th>Kyrgyzstan</th>
<th>Moldova</th>
<th>Ukraine</th>
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<tr>
<td>Current HIV spending</td>
<td>4</td>
<td>20</td>
<td>15</td>
<td>38</td>
<td>13</td>
<td>9</td>
<td>80</td>
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<tr>
<td>Optimized allocations to achieve 2020 targets</td>
<td>6</td>
<td>58</td>
<td>21</td>
<td>80</td>
<td>24</td>
<td>20</td>
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<tr>
<td>Optimized allocations plus technical efficiency</td>
<td>-</td>
<td>30</td>
<td>19</td>
<td>38</td>
<td>15</td>
<td>14</td>
<td>113</td>
</tr>
</tbody>
</table>

Source: WHO NHA 2014. Populated Optima model
Integrating HIV into UHC INDOMESIA
With Secretariat, UNDP, Other Co-sponsors

- HIV is negligible fraction of GOI expenses: 0.07%
- Projected HIV JKN (UHC) cost: 2.8%
- At 100% coverage cost is at 1.9%

Devil in details
- Painstaking planning and implementation details

Limited incentives to strengthen cascade
- Diagnosis
- Enrollment
- Adherence
- Maintenance
- Prevention
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