Do Less Harm:

Evaluation of Programmatic Options in the Face of Reduced Foreign Aid

Emily Hyle, MD MSc
Division of Infectious Diseases
Massachusetts General Hospital
Harvard Medical School

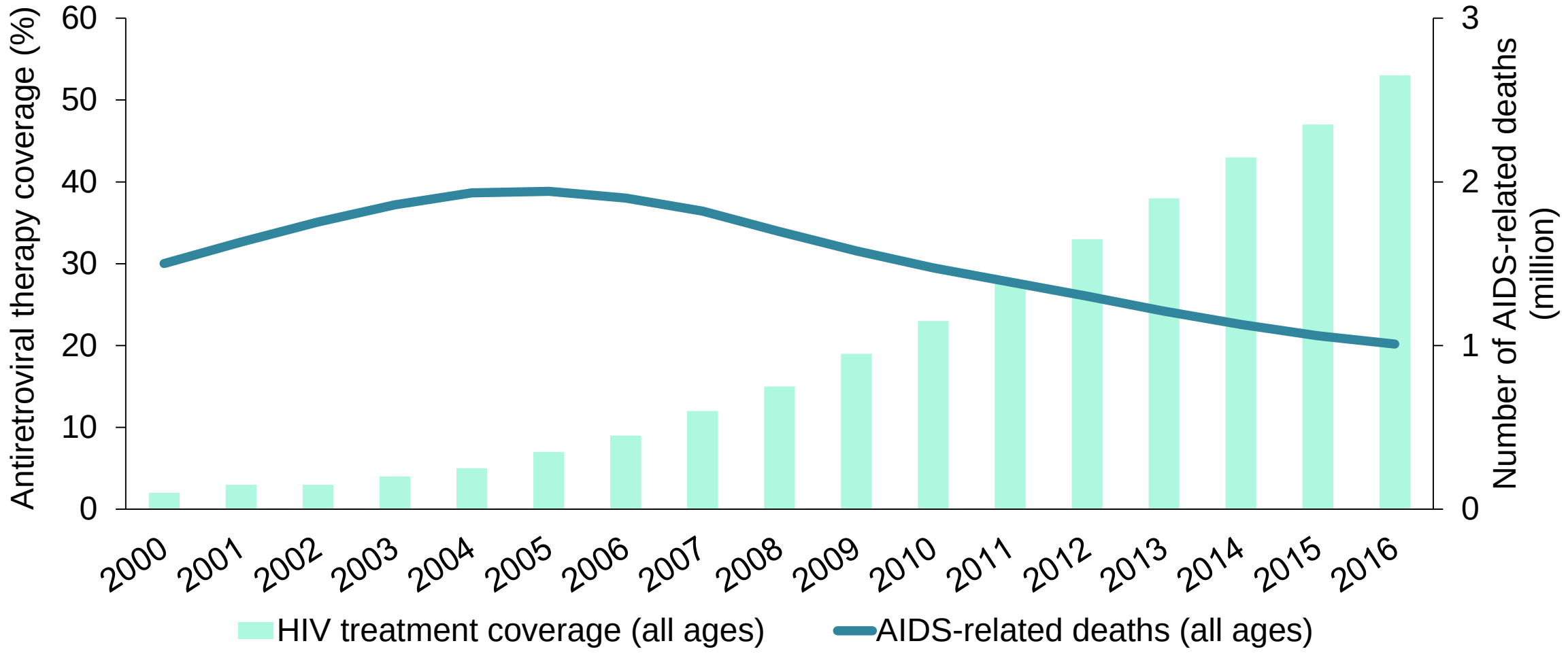
Supported by NIH (K01 HL123349)

Empowering Health for 15 years
ICAP
Columbia University Mailman School of Public Health

Disclosures

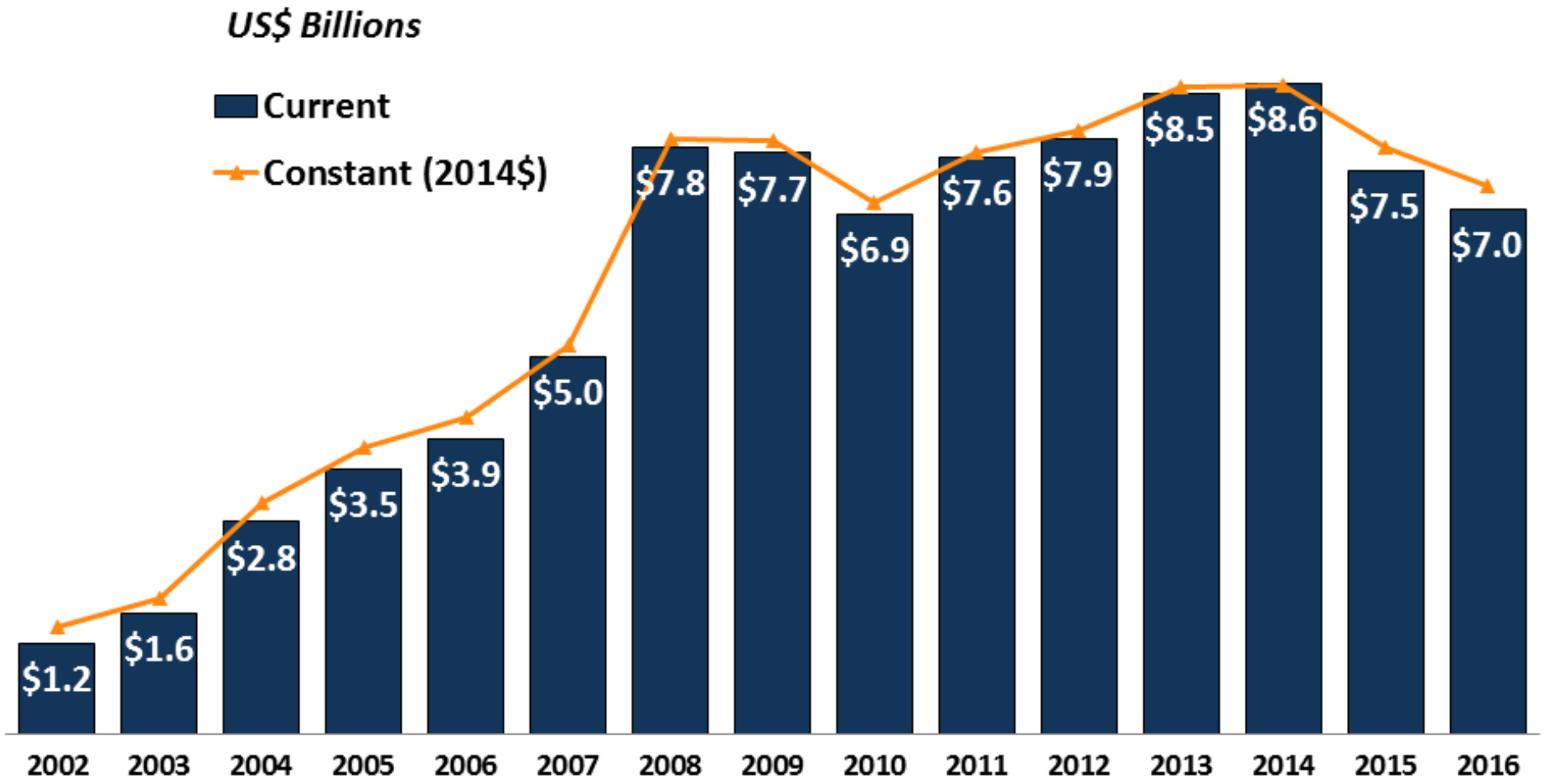
- I have no financial disclosures

Scale Up Success



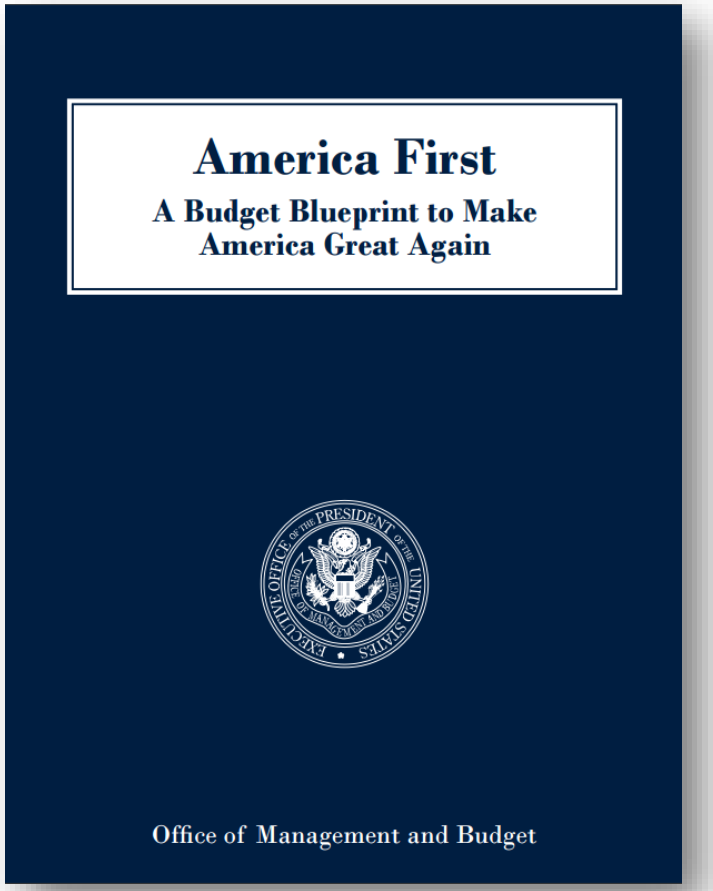
UNAIDS Global AIDS Update 2016

Flat Funding over the Past Decade



Donor Government Disbursements for HIV, Kaiser Family Foundation 2017

Scale Back?!



- "Provides sufficient resources to maintain current commitments and all current patient levels on HIV/AIDS treatment under the President's Emergency Plan for AIDS Relief (PEPFAR) and maintains funding for malaria programs."

- Proposed cuts:
  - PEPFAR 18%
  - Global Fund (GFATBM) 17%
  - $1 billion reduction to State, USAID, and CDC Global Health

White House, Office of Management and Budget 2017

Objective

- What is the best strategy to scale back and achieve budget cuts with the least impact on the epidemic and clinical outcomes?

- We used a simulation modeling approach to evaluate the epidemiologic, clinical, and budgetary consequences of different HIV program scale back strategies

Walensky *et al* Ann Int Med 2017

Methods – CEPAC-I Model

- We used the Cost-Effectiveness of Preventing AIDS Complications–International (CEPAC-I) microsimulation model
  - Populated with trial and cohort data
  - Case studies: South Africa and Côte d'Ivoire
- Model outcomes:
  - Epidemiologic: Transmissions
  - Clinical: Deaths
  - Budgetary: $$ saved

Walensky *et al* Ann Int Med 2017

Current Scale Up

Strategy	Description
Current Scale Up	Enhanced testing, linkage, treatment, and retention

Walensky *et al* Ann Int Med 2017

Six Scale Back Strategies

****Assumption:** commitments to patients already receiving HIV care would continue****

Strategy	Description
Current Scale Up	Enhanced testing, linkage, treatment, and retention
1. No New ART	Ongoing care only for established patients
2. Late Presentation	Reduced testing, so patients present at low CD4
3. Reduced ART Eligibility	ART initiated only when CD4 <350 cells/µL
4. Reduced Retention	84% now, decreasing to 70% at 5 years
5. No VL Monitoring	CD4 monitoring only
6. No 2nd-line ART	One ART regimen only

Walensky *et al* Ann Int Med 2017

South Africa: Projected Outcomes at 10 Years

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180

Walensky *et al* Ann Int Med 2017

South Africa: Projected Outcomes at 10 Years

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
1. No New ART	630,000	1,664,000	7,740 (24%)

Walensky *et al* Ann Int Med 2017

South Africa: Projected Outcomes at 10 Years

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
1. No New ART	630,000	1,664,000	7,740 (24%)
2. Late Presentation	470,000	945,000	4,290 (13%)
3. Reduced ART Eligibility	213,000	91,000	50 (0.2%)
4. Reduced Retention	188,000	308,000	1,040 (3%)
5. No VL Monitoring	206,000	46,000	-320 (+1%)
6. No 2nd-line ART	38,000	31,000	50 (0.2%)

Walensky *et al* Ann Int Med 2017

South Africa: Projected Outcomes at 10 Years

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
1. No New ART	630,000	1,664,000	7,740 (24%)
2. Late Presentation	470,000	945,000	4,290 (13%)
3. Reduced ART Eligibility	213,000	91,000	50 (0.2%)
4. Reduced Retention	188,000	308,000	1,040 (3%)
5. No VL Monitoring	206,000	46,000	-320 (+1%)
6. No 2nd-line ART	38,000	31,000	50 (0.2%)

Walensky *et al* Ann Int Med 2017

South Africa: Projected Outcomes at 10 Years

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
1. No New ART	630,000	1,664,000	7,740 (24%)
2. Late Presentation	470,000	945,000	4,290 (13%)
3. Reduced ART Eligibility	213,000	91,000	50 (0.2%)
4. Reduced Retention	188,000	308,000	1,040 (3%)
5. No VL Monitoring	206,000	46,000	-320 (+1%)
6. No 2nd-line ART	38,000	31,000	50 (0.2%)

Walensky *et al* Ann Int Med 2017

Scale Back Strategies in Combination

- Scale back strategies can have synergies or antagonisms when deployed in combination

- We also compared projected outcomes between
  - The sum of model outcomes for two scale back strategies alone
  - Model outcomes when two scale back strategies were used in combination

Reducing Both ART Eligibility and Retention

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
3. Reduced ART Eligibility	213,000	91,000	50 (0.2%)
4. Reduced Retention	188,000	308,000	1,040 (3%)
Sum of Individual Strategies	401,000	399,000	1,090 (3%)
In **Combination**	390,000	395,000	1,050 (3%)

** The impact of both strategies in combination is the same as individually **

Walensky *et al* Ann Int Med 2017

Late Presentation and Reduced ART Eligibility

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
2. Late Presentation	470,000	945,000	4,290 (13%)
3. Reduced ART Eligibility	213,000	91,000	50 (<0.1%)
Sum of Individual Strategies	683,000	1,036,000	4,340 (13%)
In **Combination**	493,000	959,000	4,310 (13%)

** Strategies in combination have reduced clinical downside than individually**

Walensky *et al* Ann Int Med 2017

No VL Monitoring and No 2nd-line ART

Strategy	Transmissions (n)	Deaths (n)	Budget ($ million)
Current Scale Up	3,240,000	4,258,000	32,180
	Additional Transmissions	Additional Deaths	Budget Savings ($ million (%))
5. No VL Monitoring	206,000	46,000	-320 (+1%)
6. No 2nd-line ART	38,000	31,000	50 (0.2%)
Sum of Individual Strategies	244,000	77,000	-270 (+1%)
In **Combination**	234,000	69,000	-80 (+0.2%)

** Strategies in combination have less budgetary impact than individually**

Walensky *et al* Ann Int Med 2017

Impact Will Differ Among Recipient Nations

A 10% cut in PEPFAR funding

	South Africa	**Côte d'Ivoire**
Percentage of overall HIV budget (%)	2%	9%
Reduction in absolute budget ($)	$40M	$20M
HIV prevalence (%)	19.2%	3.2%
Number of PWH affected (n)	6.7 million	440,000

Walensky *et al* Ann Int Med 2017

Projected $ Per Year of Life Lost

- For every year of life lost in South Africa and Côte d'Ivoire, HIV programs will save ~$600-$900

- Does imposing such tradeoffs on vulnerable populations accurately reflect how donor countries value life in recipient nations?

Conclusions

- Reduced funding for HIV prevention and treatment will have enormous consequences for the epidemic and for people with HIV, with only modest budgetary savings
- Simulation modeling can assist in highlighting the tradeoffs of difficult choices in policy-making and investments
- Further research is needed to optimize efficiencies in care and to minimize clinical harms if budget cuts are unavoidable

Thank You

United States

Ingrid Bassett, MD, MPH
Ethan Borre
Andrea Ciaranello, MD, MPH
Sydney Costantini
Caitlin Dugdale, MD
Kenneth Freedberg, MD, MSc
Gregg Gonsalves, PhD
Emily Hyle, MD, MSc
Emily Martey
Lucia Millham
Anne Neilan, MD, MPH
A. David Paltiel, PhD
Robert Parker, ScD
Krishna Reddy, MD
Justine Scott, MPH
Madeleine Stern
Rochelle Walensky, MD, MPH
Milton Weinstein, PhD

South Africa

Linda-Gail Bekker, MBChB, PhD
Robin Wood, BMBCh, DSc

Côte d'Ivoire

Xavier Anglaret, MD, PhD
Christine Danel, MD
Serge Eholié, MD, PhD
Eric Ouattara, MD, MPH
Eugène Messou, MD

Supported by:

National Institute of Allergy and Infectious Disease (R01 AI058736, R37 AI093269)

National Heart, Lung, and Blood Institute (EPH - K01 HL123349)

Steve and Deborah Gorlin Massachusetts General Hospital Research Scholars Award (RPW)