

**GETTING TO  
ZERO**



## **An AIDS-free generation:** promises and challenges

Thomas Friedrich | Path/PBS 210 | 11 Nov 2013

# **Unit 3 explores interventions to stop HIV.**

How do we get to an AIDS-Free  
generation?

## **Which methods do you think show the most promise?**



win mcnamee/getty

“ Our efforts have helped set the stage for a historic opportunity...to change the course of this pandemic and usher in an **AIDS-free generation.** ”

Secretary of State Hillary Clinton, 8 November 2011

# **What does it mean to say there will be an “AIDS-free generation?”**

Prevent HIV infection from getting to the AIDS stage.

## **Is this possible?**

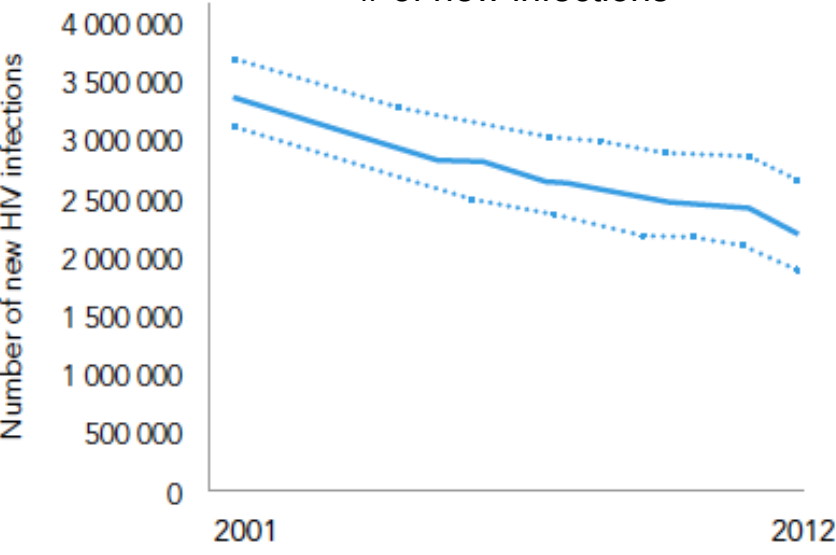
Is it realistic?

**Today we will focus on HIV/AIDS in low- and middle-income countries.**

**For an overview of the state of the epidemic in the US, see this week's supplemental materials.**

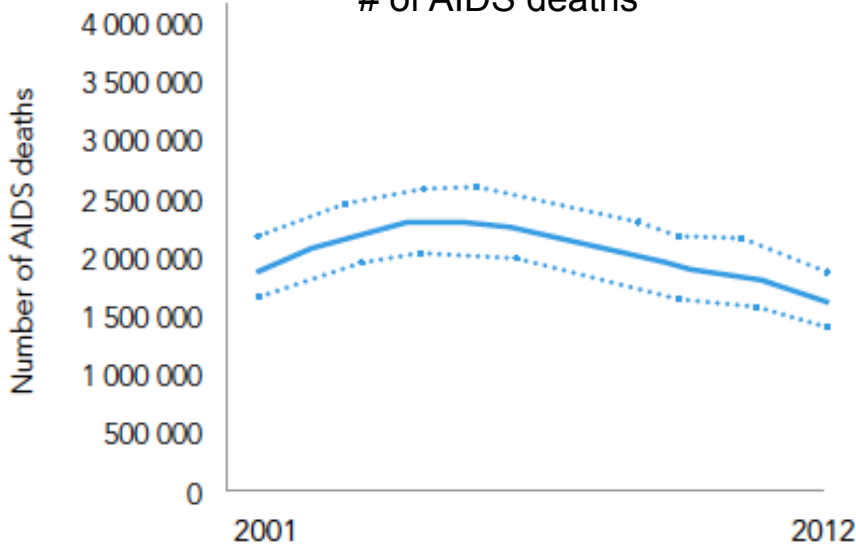
NEW HIV INFECTIONS, GLOBAL, 2001-2012

# of new infections



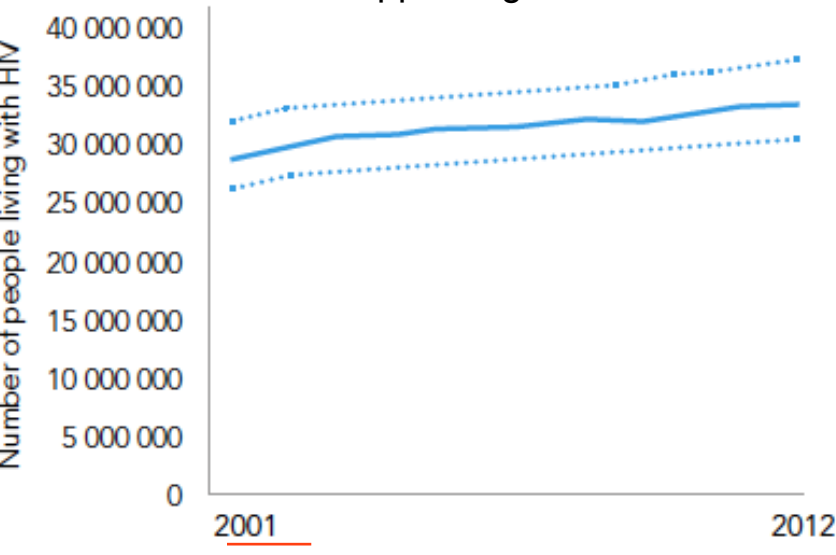
AIDS DEATHS, GLOBAL, 2001-2012

# of AIDS deaths

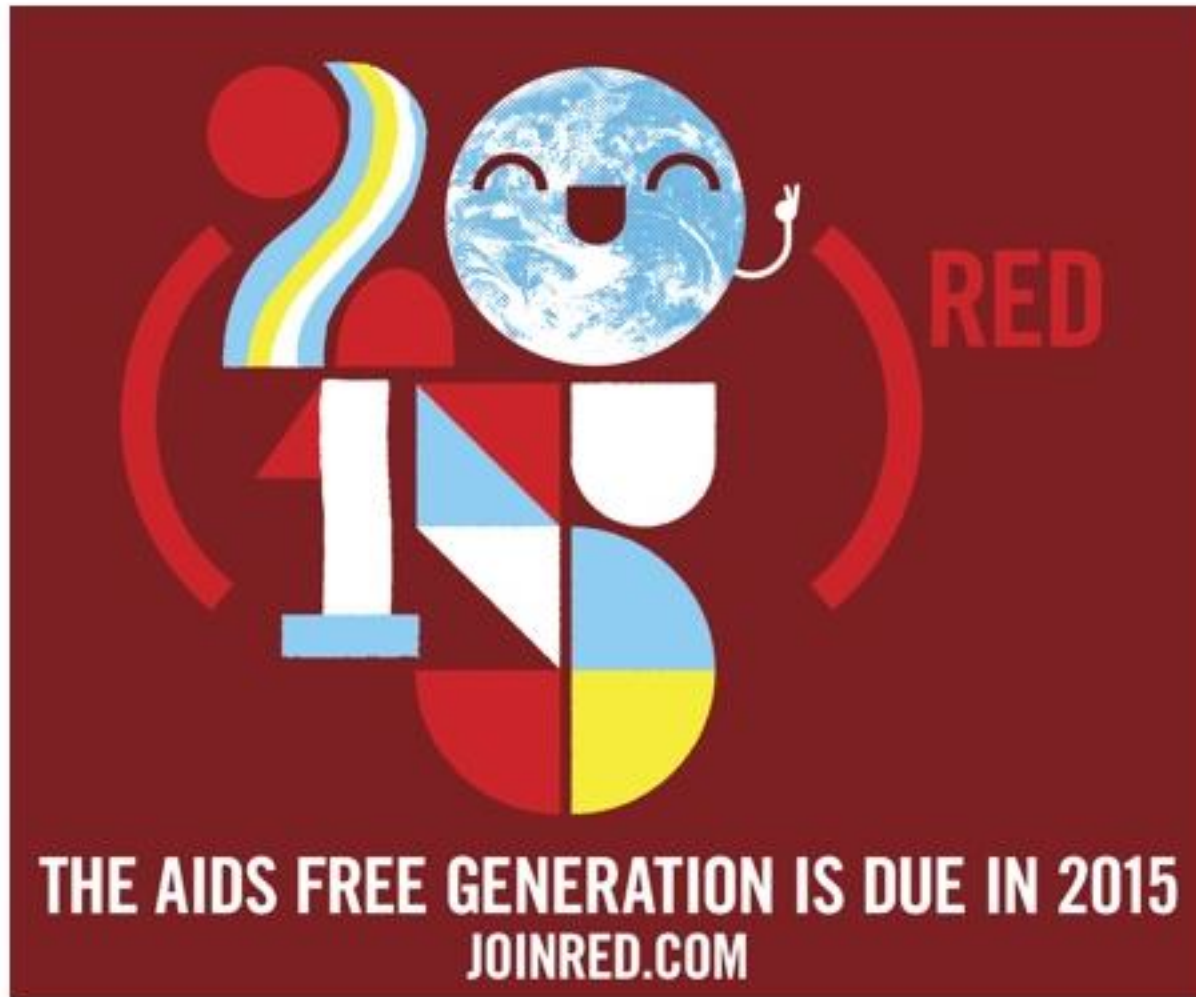


PEOPLE LIVING WITH HIV, GLOBAL, 2001-2012

# of ppl living with HIV



- High estimate
- Estimate
- Low estimate



Goal to have AIDS-Free generation by 2015

Achieving an AIDS-free generation  
requires **combination prevention**.

What does this mean?



**Education**

**Condoms**

**STI treatment**

**Testing/  
counseling**

**Treatment as  
Prevention**

**Drug/alcohol  
treatment**

**Circumcision**

**Microbicides**

**PrEP**

**Harm reduction**

# **Combination HIV Prevention**

there is not one way to prevent HIV:  
bring a package of prevention methods

10 goals to AFG

# UNAIDS 2015 targets

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REDUCE SEXUAL  
TRANSMISSION



PREVENT HIV  
AMONG  
DRUG USERS



ELIMINATE NEW  
HIV INFECTIONS  
AMONG CHILDREN



15 MILLION  
ACCESSING  
TREATMENT



AVOID  
TB DEATHS



CLOSE THE  
RESOURCE GAP



ELIMINATE  
GENDER  
INEQUALITIES



ELIMINATE  
STIGMA AND  
DISCRIMINATION



ELIMINATE  
TRAVEL  
RESTRICTIONS



STRENGTHEN  
HIV  
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# UNAIDS 2015 targets

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4 most important goals to achieve 2015 goal

# UNAIDS 2015 targets

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# UNAIDS 2015 targets

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## Reduce sexual transmission of HIV by 50%

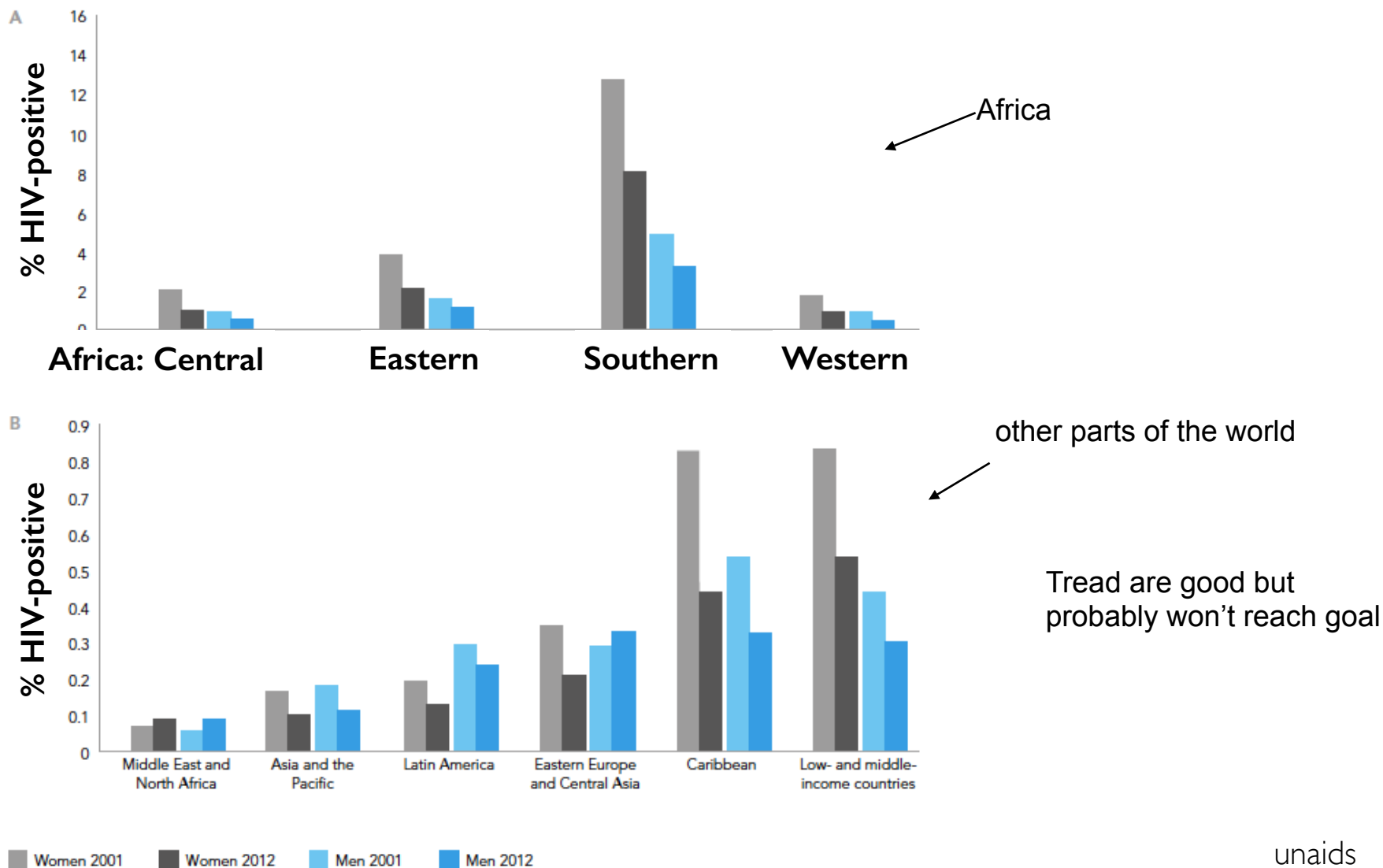
- ▶ Promote condom use
- ▶ Scale up voluntary medical male circumcision
- ▶ Scale up prevention efforts in at-risk populations  
Have people know their status
- ▶ Increase access to treatment

# Reduce sexual transmission by 50%

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- ▶ Favorable changes in behavior throughout the world since 2000—but some recent reversals
- ▶ Generally increasing rates of condom use  
There has been some back sliding of youth not practicing safe sex
- ▶ Increasing access to male circumcision  
Will far short of this goal
- ▶ Decreased HIV incidence in many parts of the world, but prevalence remains high among MSM, young people and commercial sex workers  
..at risk populations

# HIV prevalence among young women and men (aged 15-24), 2001 and 2012



# UNAIDS 2015 targets

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# UNAIDS 2015 targets

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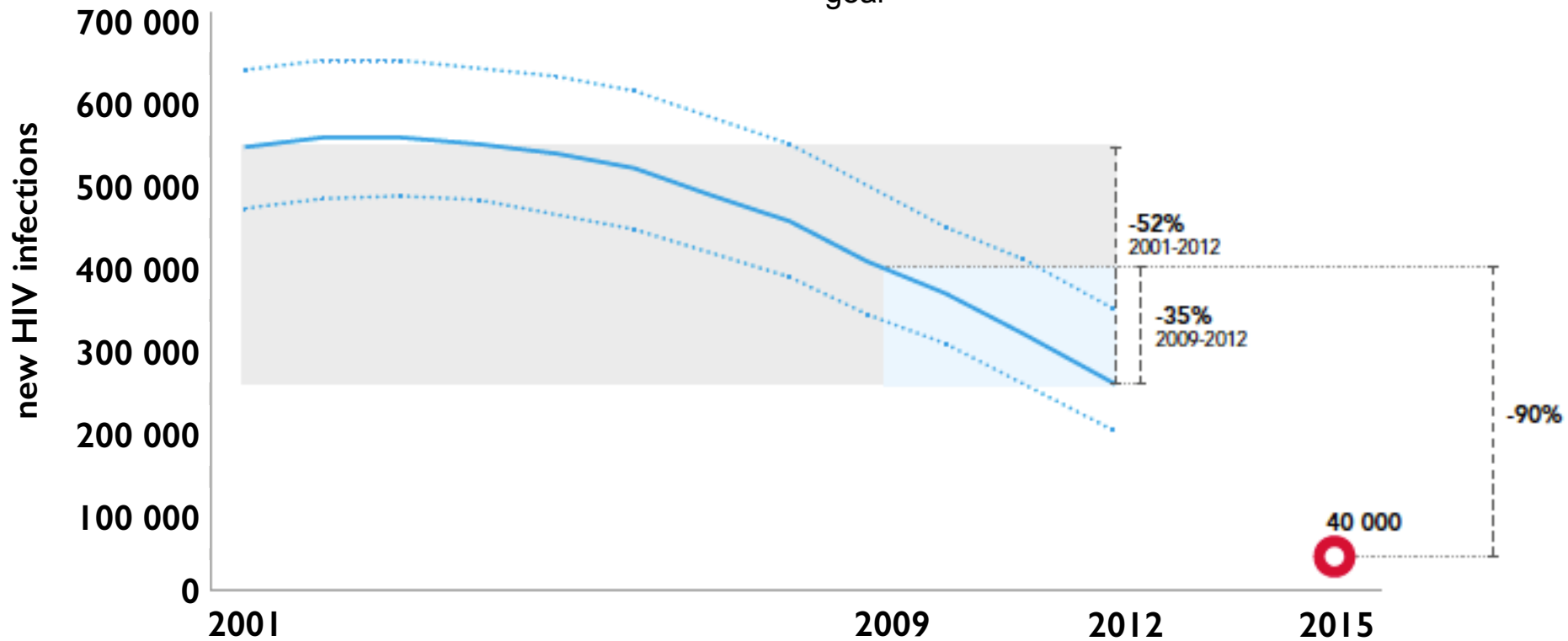


## Eliminate MTCT and keep mothers alive

- ▶ Prevent new infections among women of childbearing age during delivery
- ▶ Provide high-quality pre- and perinatal care, including HIV testing, counseling and treatment
- ▶ Help HIV+ women avoid unintended pregnancy
- ▶ 22 countries account for 90% of HIV+ pregnant women

# Eliminate MTCT and keep mothers alive

On target to eliminate, but new data won't meet goal



# Key gaps in preventing MTCT

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- ▶ A 90% reduction in MTCT by 2015 is possible, but requires additional scale-up
- ▶ 20% of women in Sub-Saharan Africa who want to stop having children lack access to family planning
- ▶ Worldwide treatment coverage is 64% for all adults, but 58% for pregnant women and 34% for children  
nearly half the number of children who need get it opposed to adults
- ▶ Severe lack of early infant diagnosis  
lack of postnatal care for babies

# UNAIDS 2015 targets

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# UNAIDS 2015 targets

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## Place 15 million people on ART

- ▶ Save lives of infected people      prolong and prove quality of life
- ▶ Prevent transmission of HIV      by suppressing viral loads
- ▶ Prevent development and transmission of tuberculosis      Drug resist.  
TB
- ▶ 9.7 million people in low- and middle-income countries on ART as of December 2012      TB: major killer of HIV+ ppl in the developing world      have to adhere just like HIV ART      2/3 of the way to the goal

# Treat 15 million people by 2015

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2010 criteria: when to put someone on therapy:

- ▶ WHO, 2010: Start ART when  $CD4 \leq 350/\mu l$
- ▶ By this measure, ~60% of eligible people in low- and middle-income countries had access to therapy in 2012.

# The New York Times

## W.H.O. Issues Guidelines for Earlier H.I.V. Treatment

By DONALD G. McNEIL Jr.

Published: June 30, 2013

People infected with H.I.V. should be put on antiretroviral therapy even sooner than they are now, the World Health Organization said Sunday as it released new treatment guidelines.



# Treat 15 million people by 2015

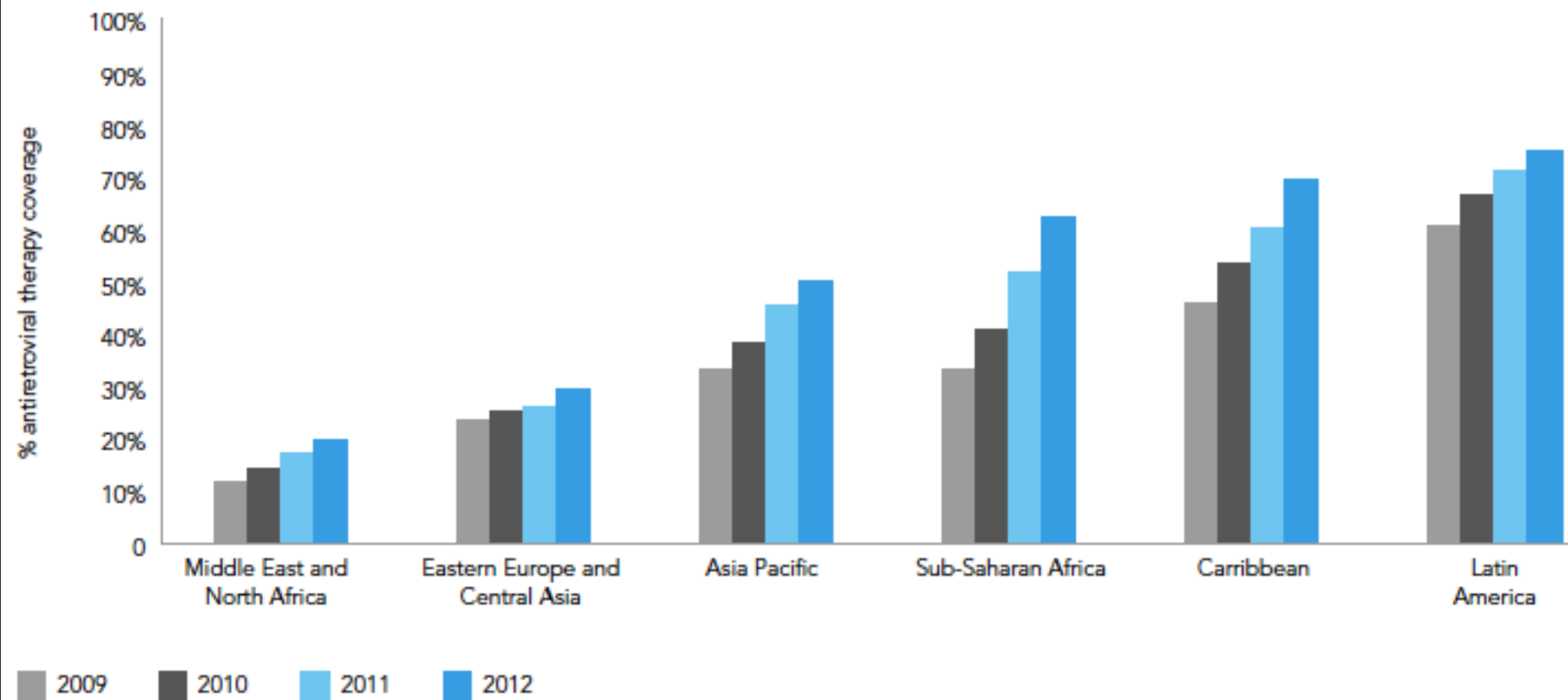
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- ▶ WHO, 2013: Start ART:
  - ▶ When  $CD4 \leq 500/\mu l$ , or *immediately* for:
    - ▶ HIV+ partners in serodiscordant couples
    - ▶ Pregnant women
    - ▶ Children under 5 years old
    - ▶ People with active TB or hepatitis B
- ▶ By this measure, ~34% of eligible people in low- and middle-income countries had access to therapy in 2012.

Redefine criterion: now 1/3

still more scaling up that needs to happen

# 5 million new people on ART since 2009



**What are important barriers to improving treatment access?**

# Key barriers to improving ART access

clinics, ambulances, etc.

- ▶ Lack of health infrastructure and health care workers

task shifting: training ppl that are not exactly MD  
but can help get ppl to take drugs on time

- ▶ Lack of access to testing and care

- ▶ Lack of reliable data for important target populations:

- ▶ MSM

- ▶ Commercial sex workers

- ▶ IVDU      injecting Drug users

- ▶ Adolescents aged 10-19 are the only demographic in which AIDS deaths have increased since 2001

# Key barriers to improving ART access

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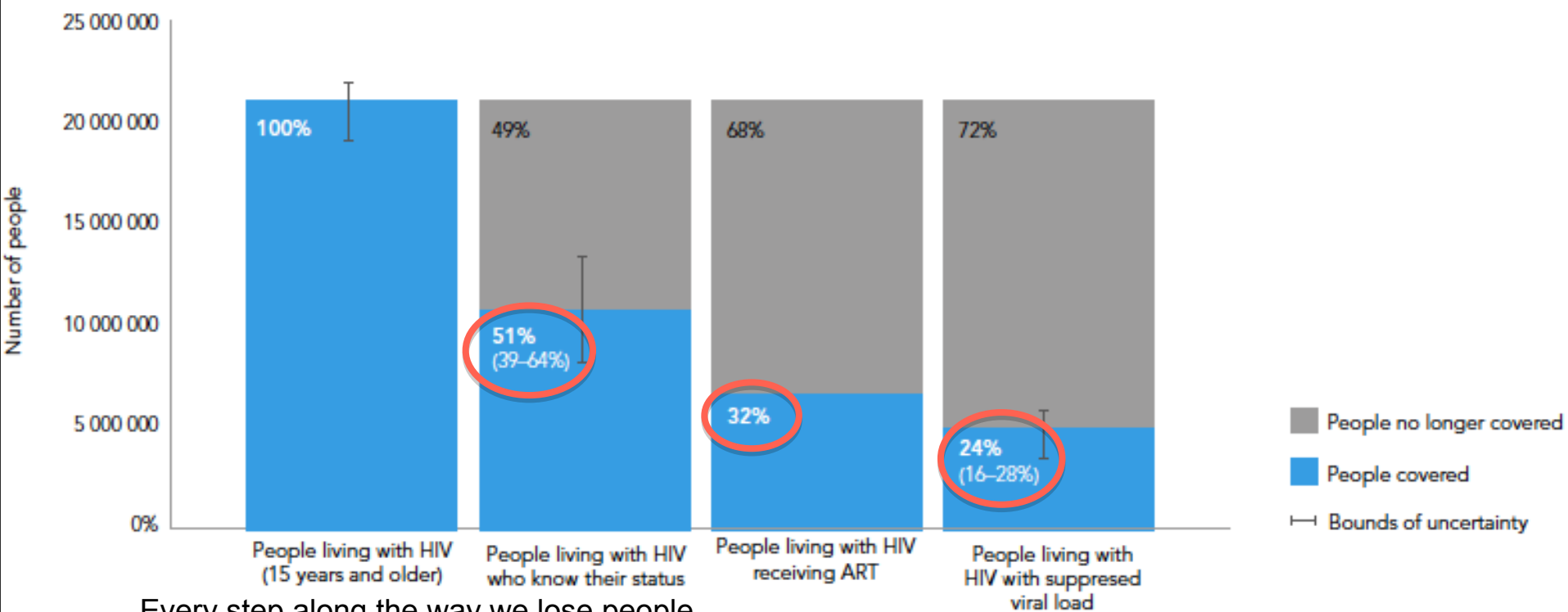
- ▶ ART is expensive!
- ▶ \$10 billion was available for ART in 2012, but this is not sufficient to expand coverage to target  
Have relied on donations which is not sustainable
- ▶ Countries need to transition to sustainable sources  
goals of the next ten is to find a way for developing countries to fund access to treatment on their own
- ▶ Methods to reduce cost:
  - ▶ Negotiate lower prices (Clinton Foundation)  
deal with pharmaceuticals to lower prices
  - ▶ Purchase generics Brazil and India May have patents to negotiate; have to deal with on company to company and drug by drug basis
  - ▶ Produce ARVs domestically (intellectual property concerns)

The process by which people gain access to long-term care is called the ***treatment cascade.***

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steps of treatment of HIV;  
each step you lose people

# Treatment cascade in Sub-Saharan Africa



Every step along the way we lose people

# UNAIDS 2015 targets

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## **Integrate disparate activities**

need to provide a comprehensive package of prevent measures

- ▶ No single prevention strategy is 100% effective  
How to best provide combo therapy
- ▶ Combination prevention requires coordination of multiple activities on regional, national and international levels
- ▶ But integrated combination prevention has not been rigorously tested!

**How can we integrate activities?**

**What approaches should be  
combined into our comprehensive  
prevention strategies?**



Test combination prevention

**HPTN 071** (Population Effects of Antiretroviral Therapy to Reduce HIV Transmission, or PopART) is a large-scale randomized controlled trial of combination prevention in 21 communities in 2 countries.



[http://www.hptn.org/research\\_studies/hptn071.asp](http://www.hptn.org/research_studies/hptn071.asp)

# Hypothesis



Universal voluntary HIV testing with appropriate combination prevention offered to all those testing HIV negative - in addition to immediate ART for all those testing HIV positive - will have a substantial impact on HIV incidence at population level

# PopART (HPTN 071) interventions

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- ▶ Universal door-to-door, in-home voluntary testing
- ▶ For HIV+, linkage to care coordinated by “CHiPs”
  - Community HIV Prevention workers: task shifting
- ▶ Voluntary circumcision for HIV- men
  - Prevent of Mother to child transmi
- ▶ PMTCT for HIV+ pregnant women
- ▶ Immediate ART and care for HIV+ people
- ▶ Support for STI treatment and TB care
- ▶ Condoms      Increase access, social marketing of them

# PopART (HPTN 071) study design

Arm A (7 sites)	Arm B (7 sites)	Arm C (7 sites)
<u>“Full PopART”</u>	<u>PopART when CD4 &lt; 350</u>	<u>Standard of care</u>

- ▶ Randomized trial of 3 interventions
- ▶ 21 communities, ~1.2 million people total
- ▶ Each community randomized to 1 of 3 interventions
- ▶ Measure HIV incidence over 3 years in subset of ~50,000

# PopART (HPTN 071) study main questions

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- ▶ Does combination prevention (at either level) reduce HIV transmission?
- ▶ Are any effects on HIV transmission sustainable over time?
- ▶ How does combination prevention affect treatment cascade?
- ▶ Does availability change sexual risk behavior?



# Summary

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- ▶ It is now possible to imagine an AIDS-free generation
- ▶ Achieving this goal likely requires combination prevention
- ▶ Dramatic reduction in MTCT is possible by 2015
- ▶ Other goals present political, logistical, financial challenges
- ▶ The first large-scale trial of combination prevention is beginning in Zambia and South Africa