C4D2 TRAINING
ROME | CENTER FOR DEVELOPMENT DATA

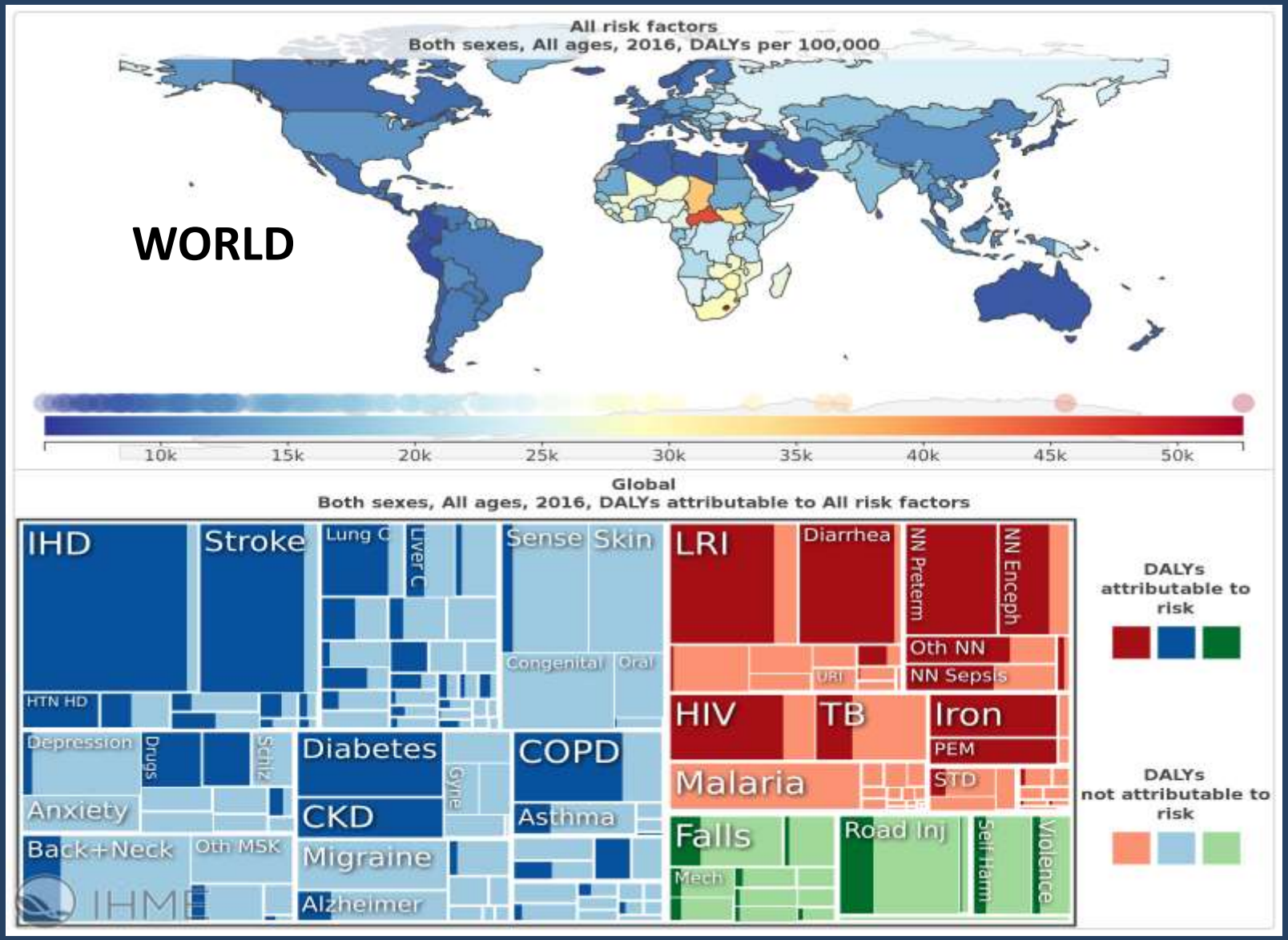
Partnership for Capacity Development in Household Surveys for Welfare Analysis

*Measuring Income and Wealth through Household Surveys for Welfare Monitoring*

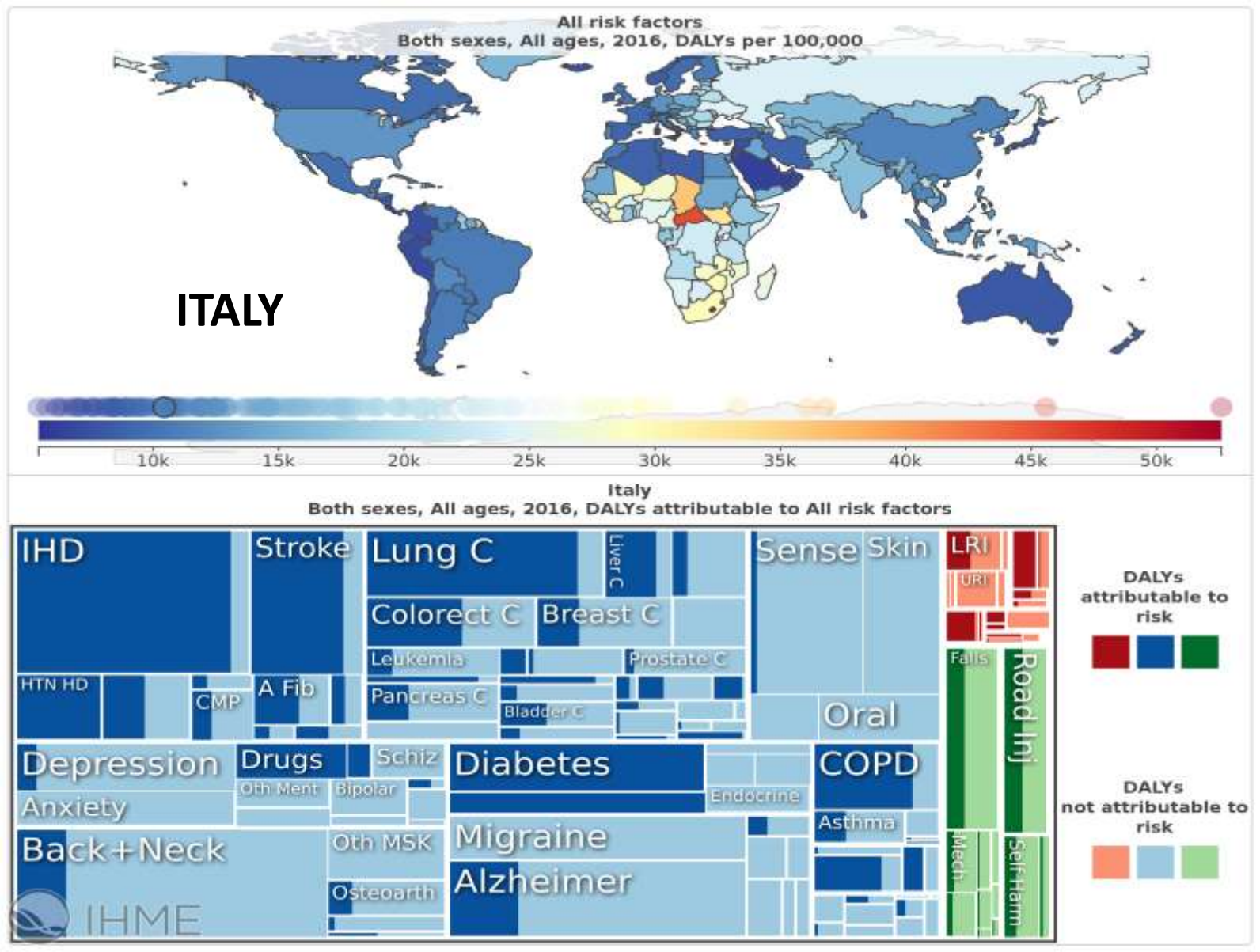
# The Concept of Global Health

Stefano Vella MD
Italian National Institute of Health

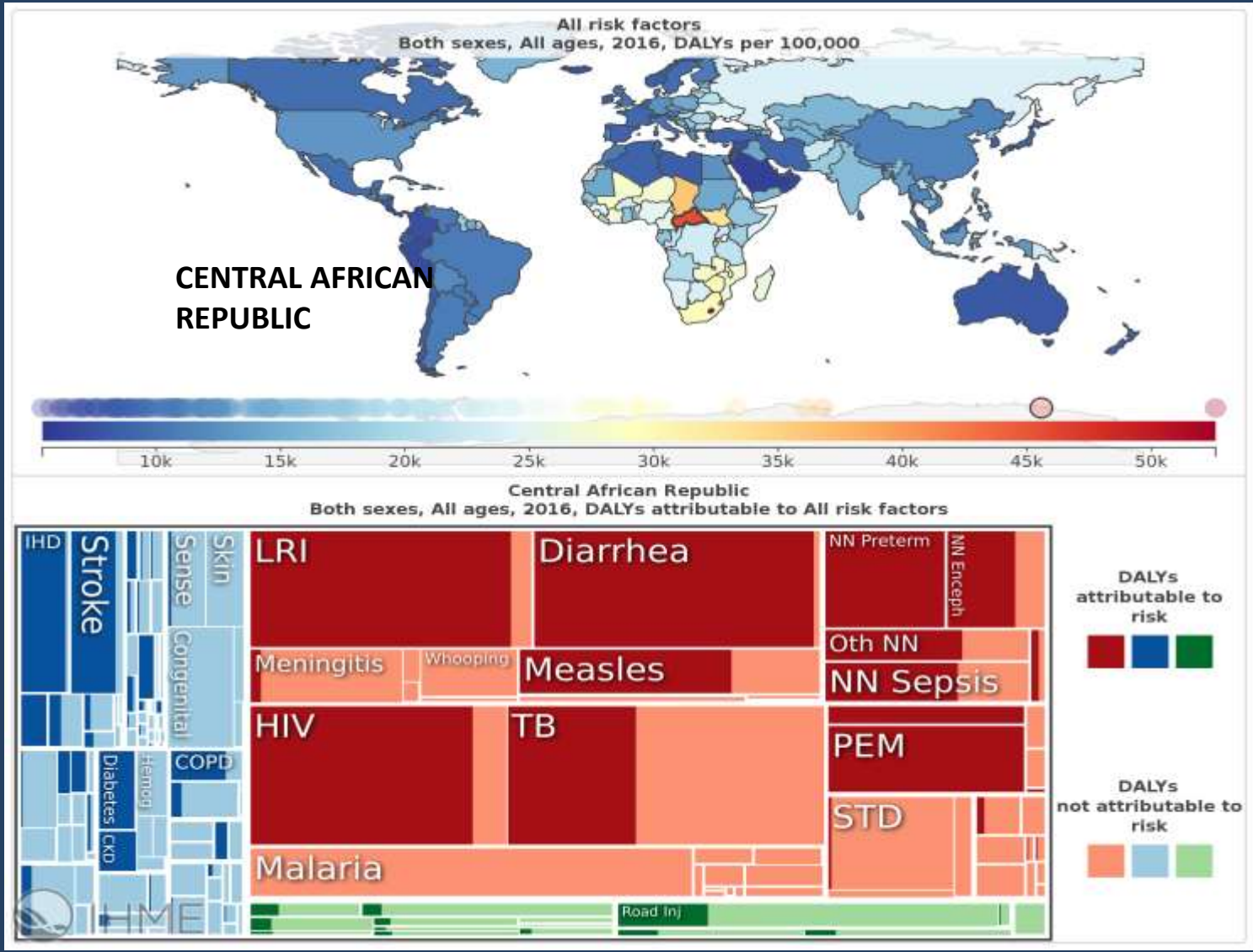
# Global Burden of Disease



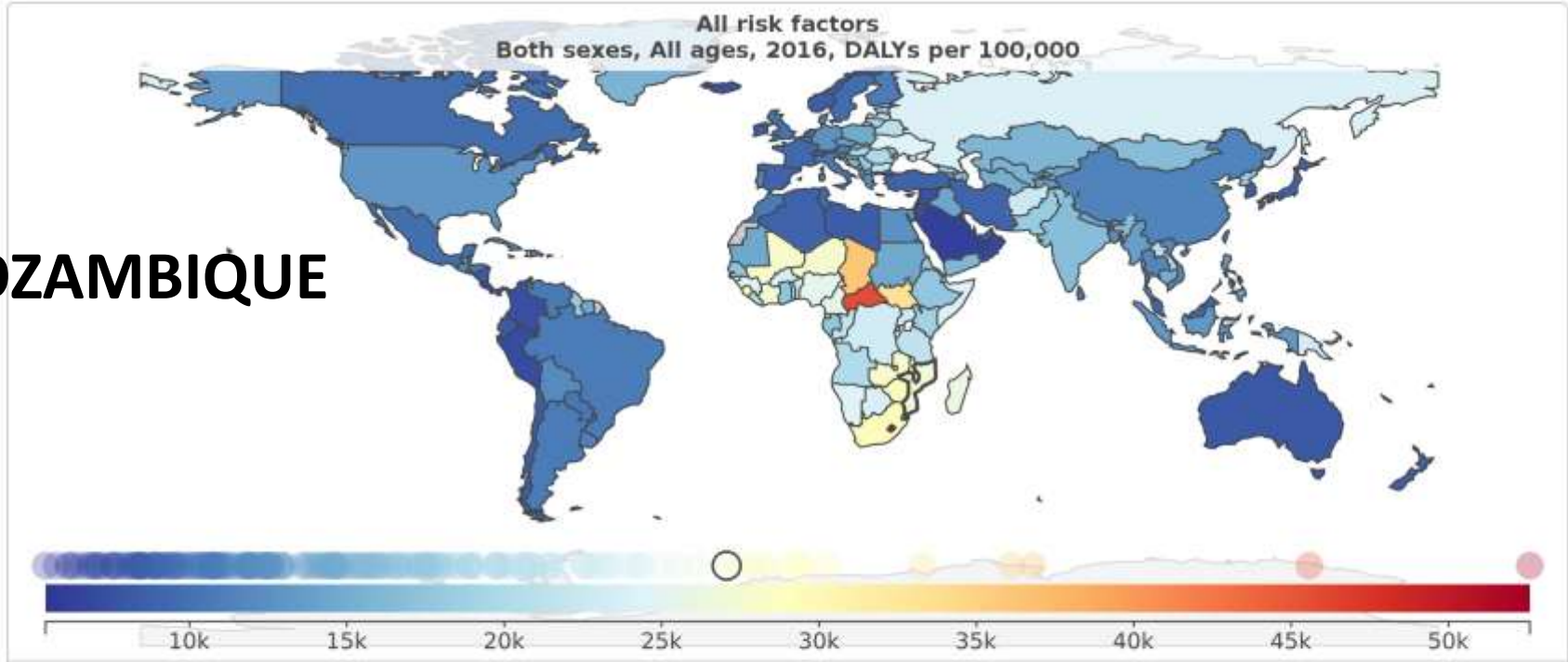
# Global Burden of Disease

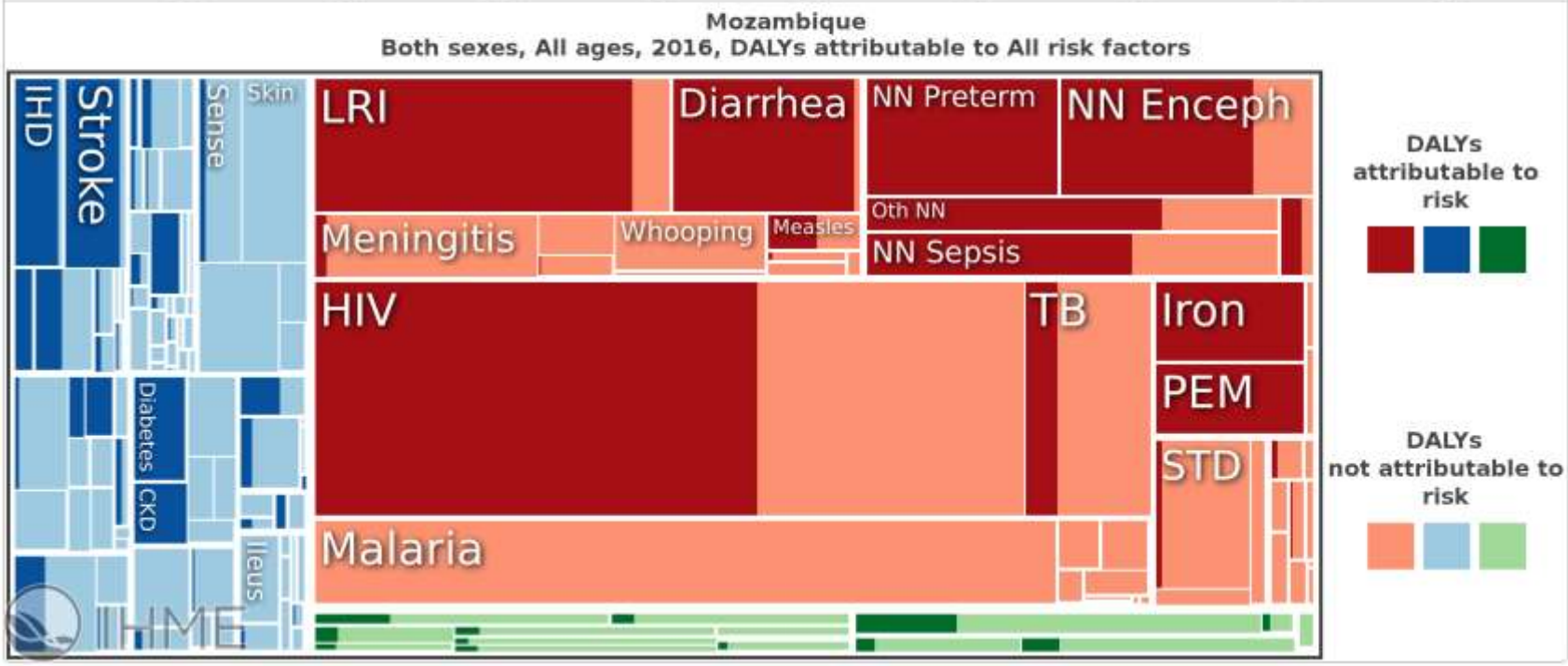


# Global Burden of Disease

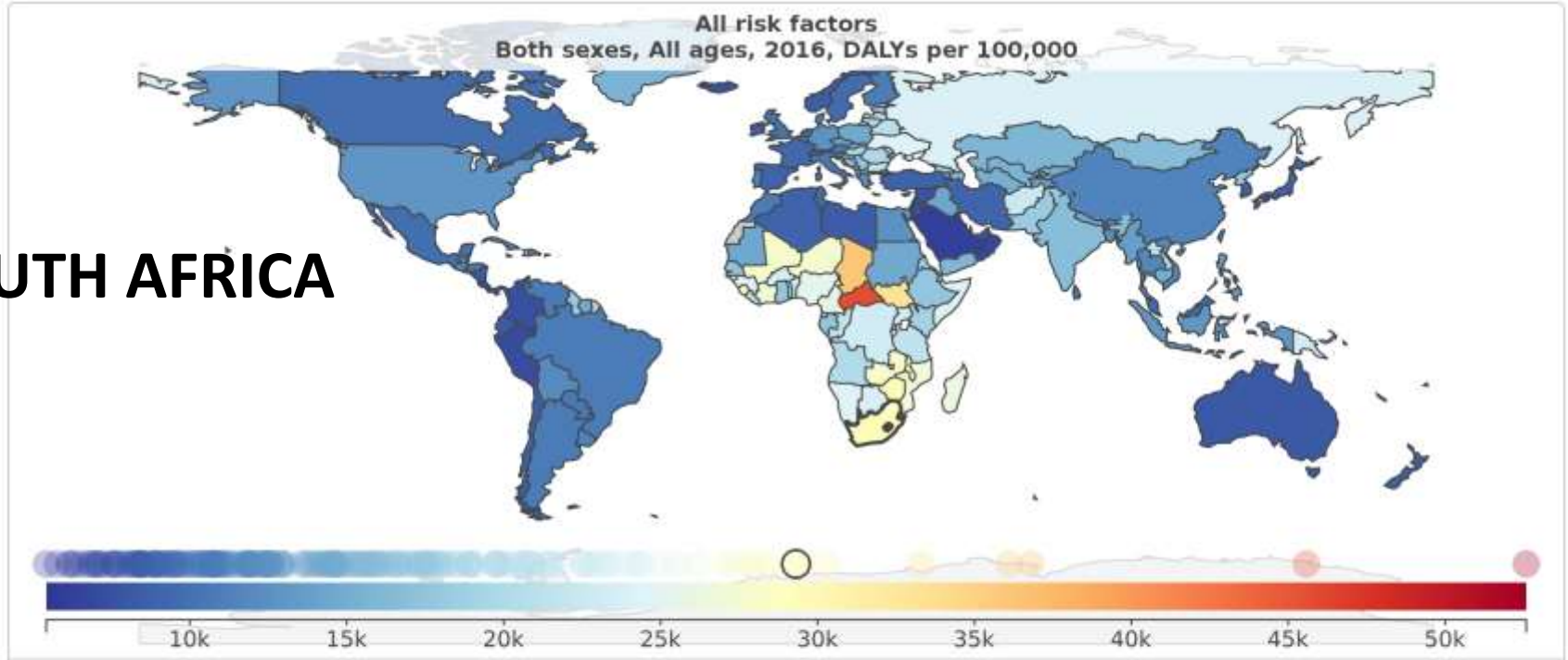


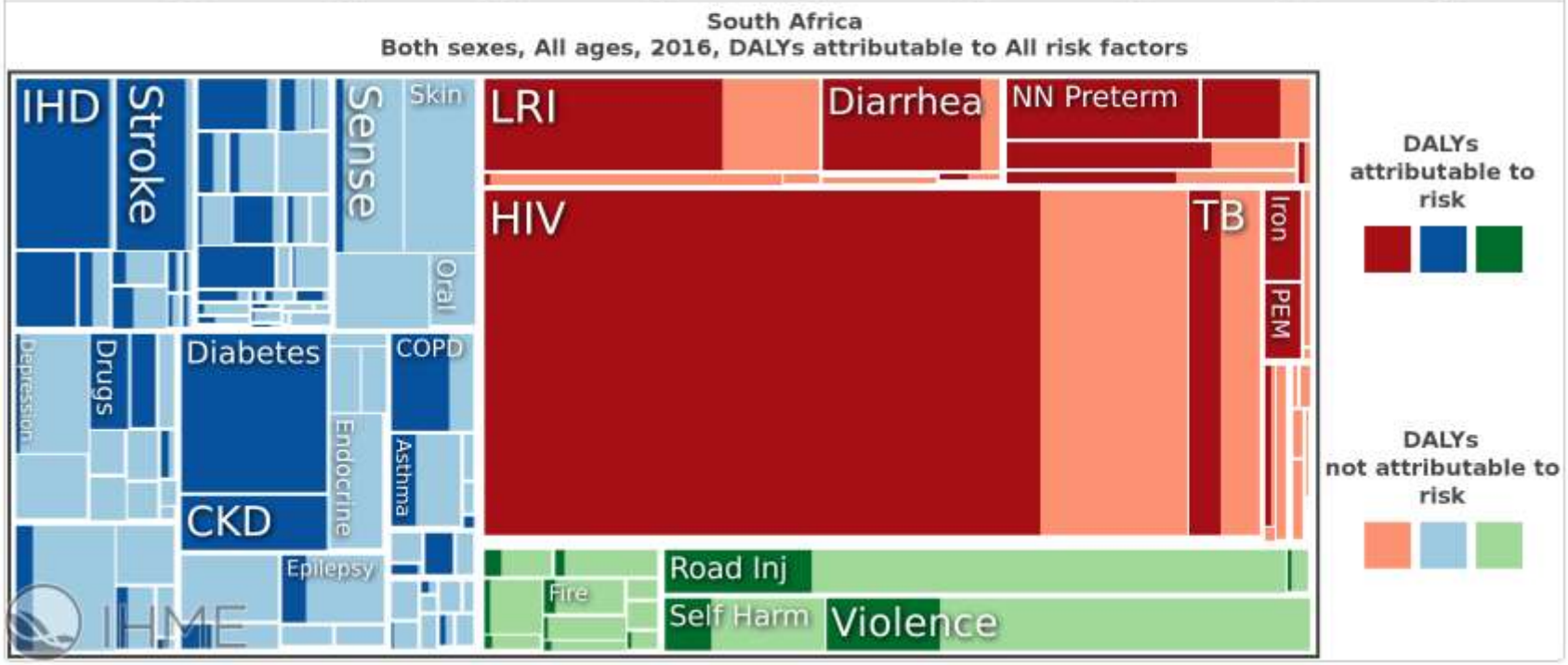
# MOZAMBIQUE


All risk factors
Both sexes, All ages, 2016, DALYs per 100,000
10k
15k
20k
25k
30k
35k
40k
45k
50k

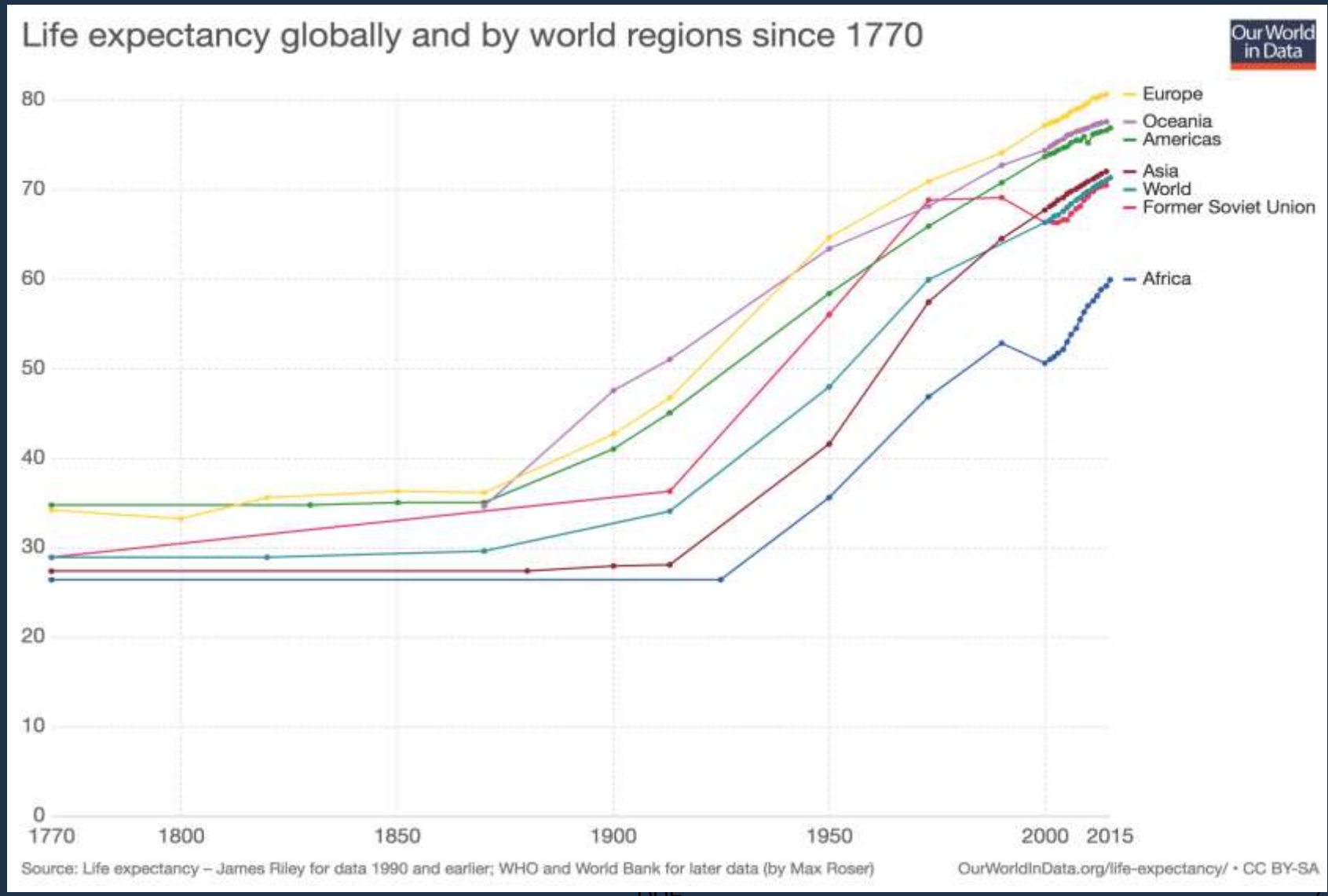

Mozambique
Both sexes, All ages, 2016, DALYs attributable to All risk factors
IHD
Stroke
Sense
Skin
LRI
Diarrhea
NN Preterm
NN Enceph
Oth NN
Meningitis
Whooping
Measles
NN Sepsis
HIV
TB
Iron
PEM
STD
Malaria
Diabetes
CKD
Ileus
IHME
DALYs attributable to risk
DALYs not attributable to risk

# SOUTH AFRICA

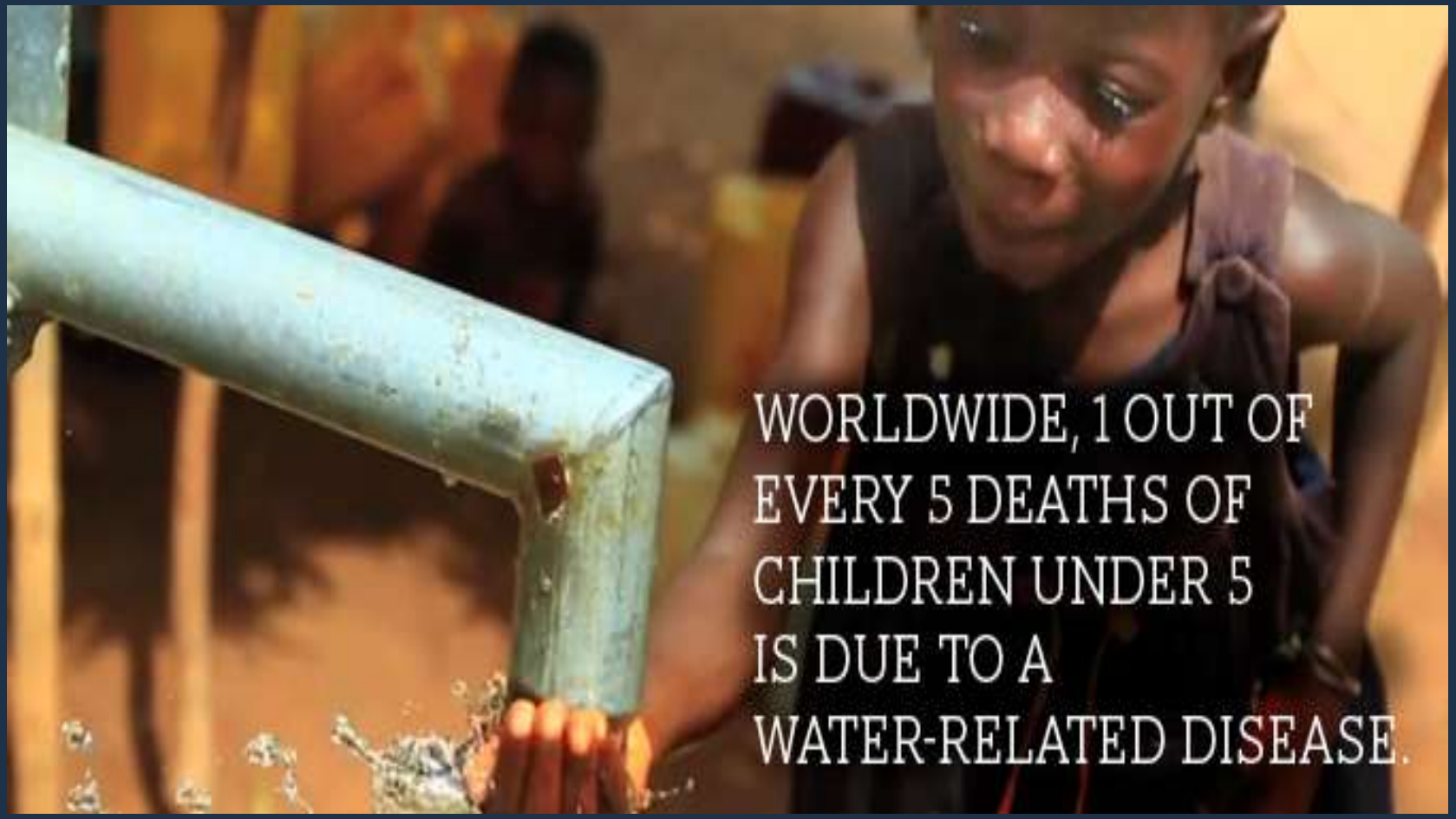


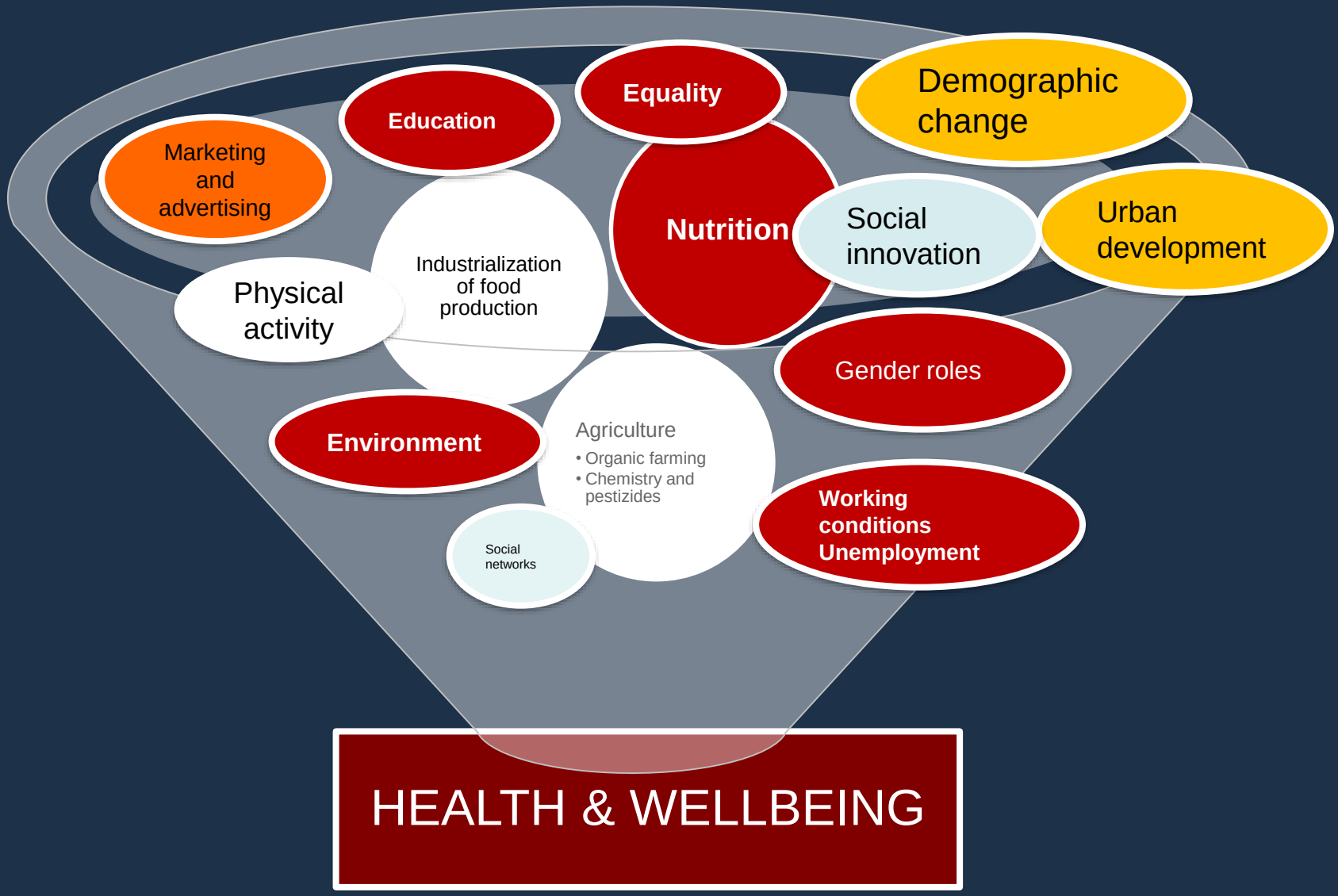
# THE RISE OF LIFE EXPECTANCY

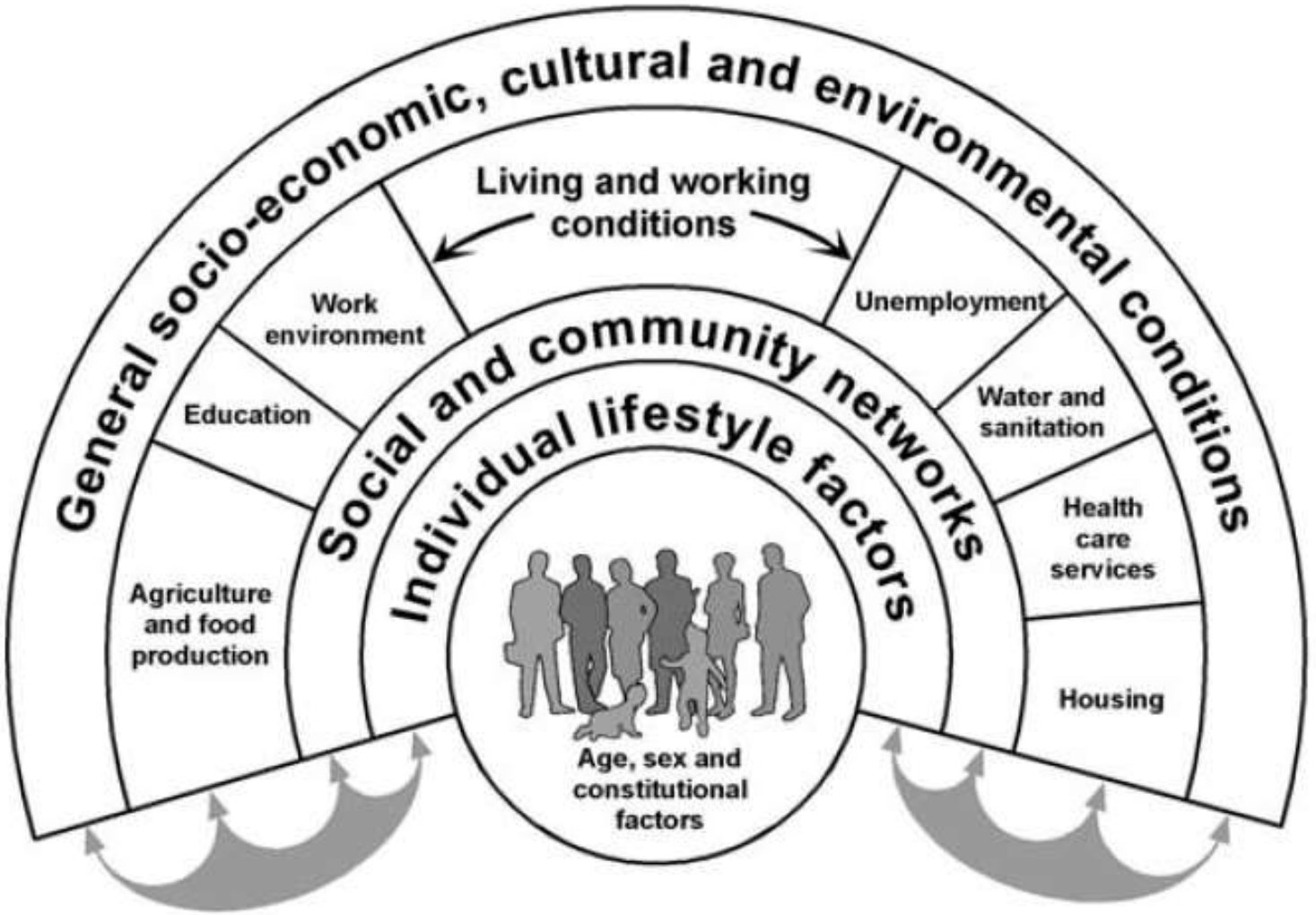


# THE DRIVERS.....1. CLEAN WATER



# THE DRIVERS.....**2. SOCIAL DETERMINANTS**




General socio-economic, cultural and environmental conditions
Living and working conditions
Work environment
Unemployment
Education
Water and sanitation
Social and community networks
Individual lifestyle factors
Health care services
Agriculture and food production
Housing
Age, sex and constitutional factors

# THE DRIVERS.....**3. ADVANCES OF MEDICINE**

**1796**

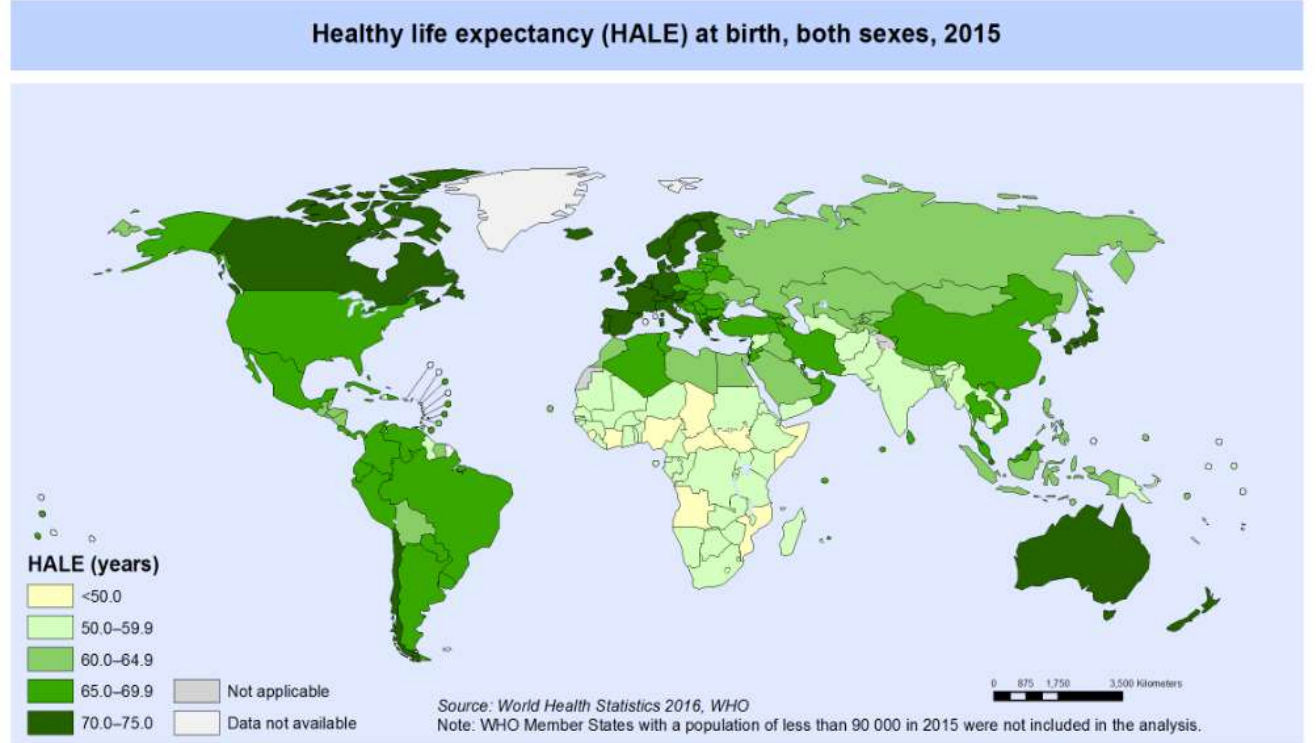
# What Global Health is not

At least 30 million people die **prematurely** (half of then before the age of 5) in developing countries for lack of adequate access to basic health care. **They die for causes that are very often preventable or treatable.**

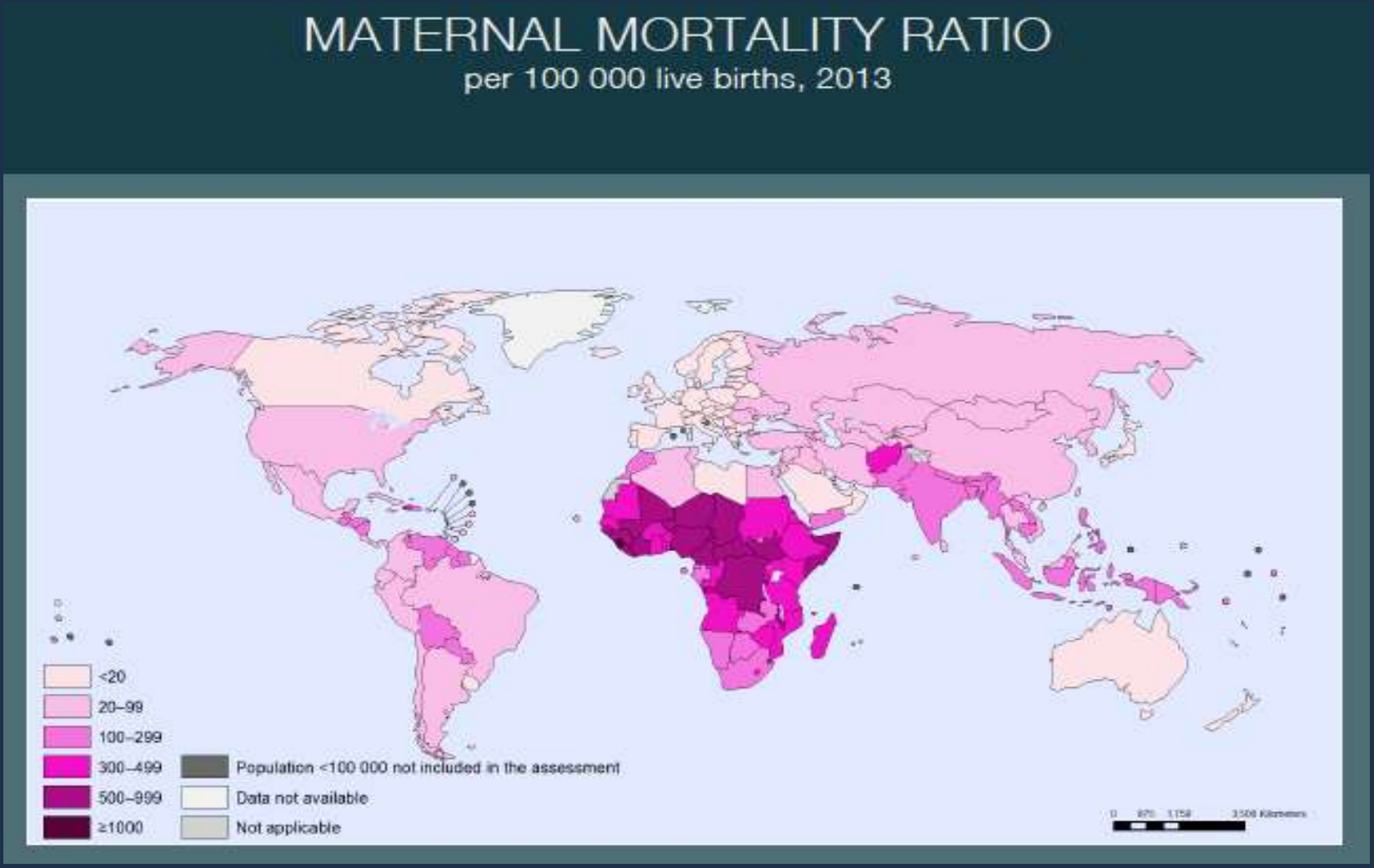
Despite the convergence on the concept of health as a human right, there still exist intolerable global inequalities in accessing health and health services and in terms of life expectancy and morbidity and mortality from **communicable and non-communicable diseases.**

The persistence of inequalities in terms of health - **not only between rich and poor countries, but also between different regions in the same country -** is also a contradiction to science, given the growing geographic interdependence of the **biomedical causes and of the social determinants of health and diseases**.

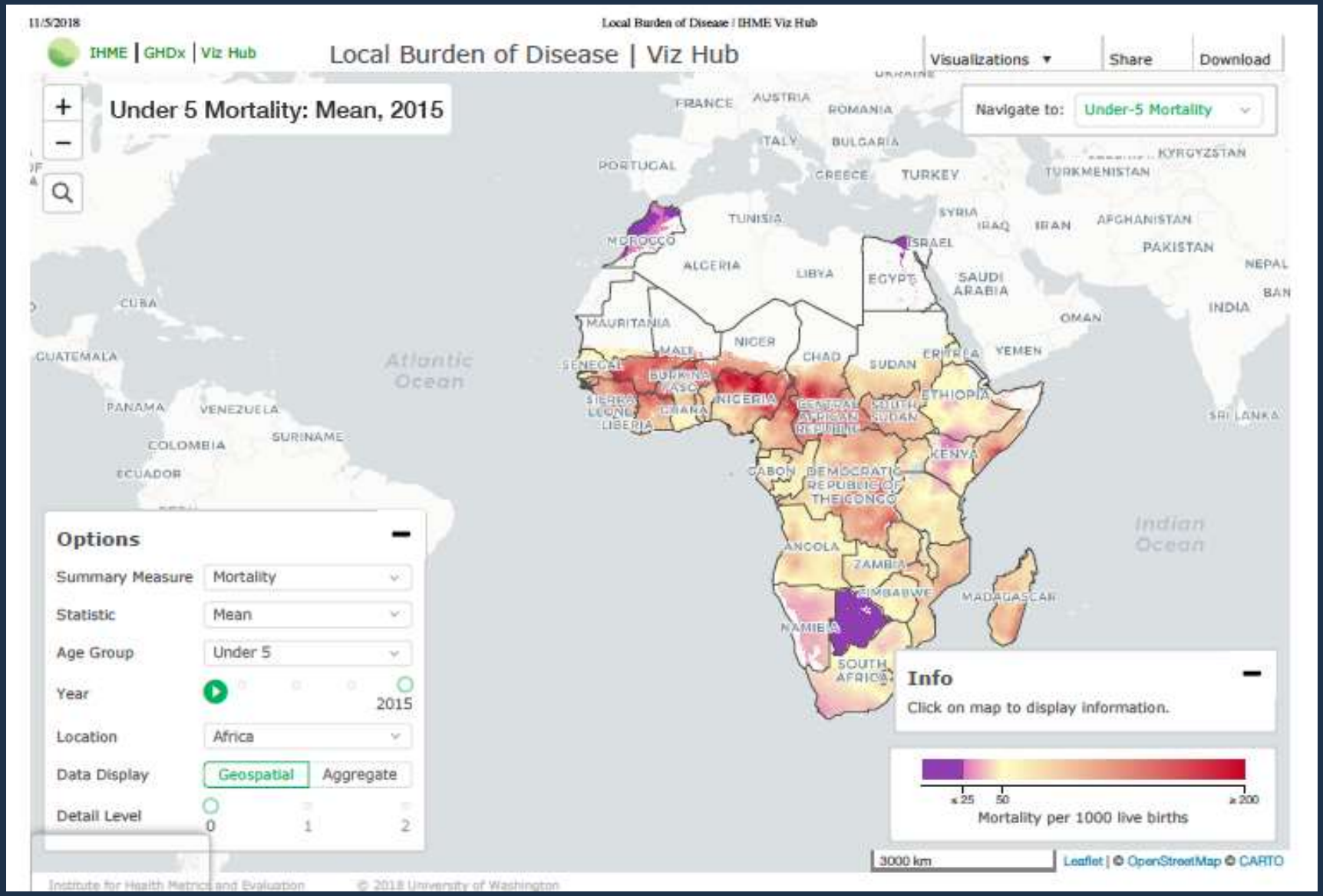
## *The unequal rise of «healthy» life expectancy*



## *What Global Health is….not*



# *What Global Health is….not*



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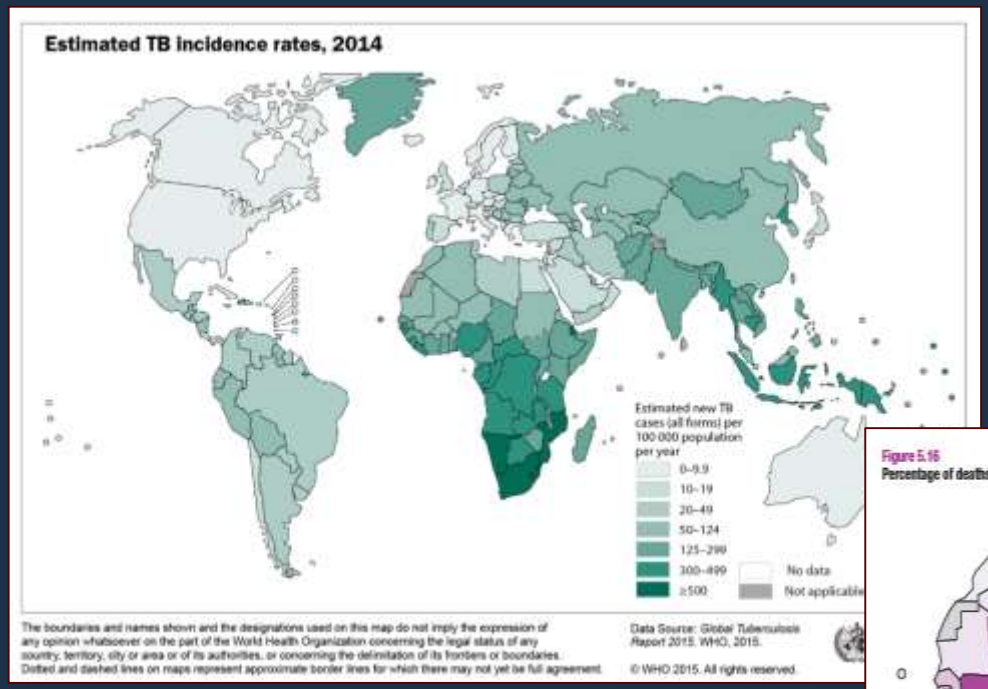


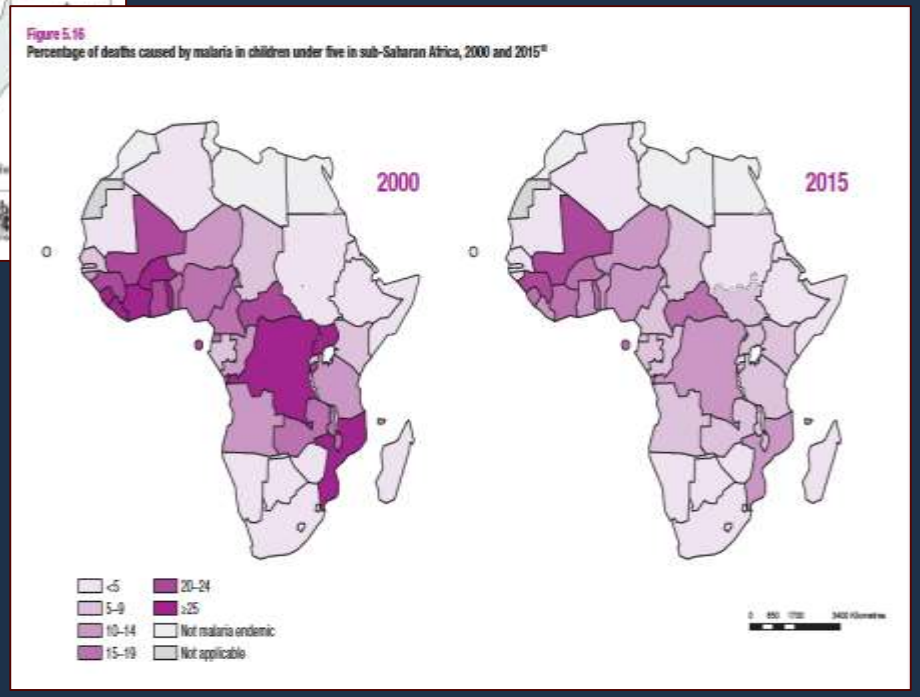
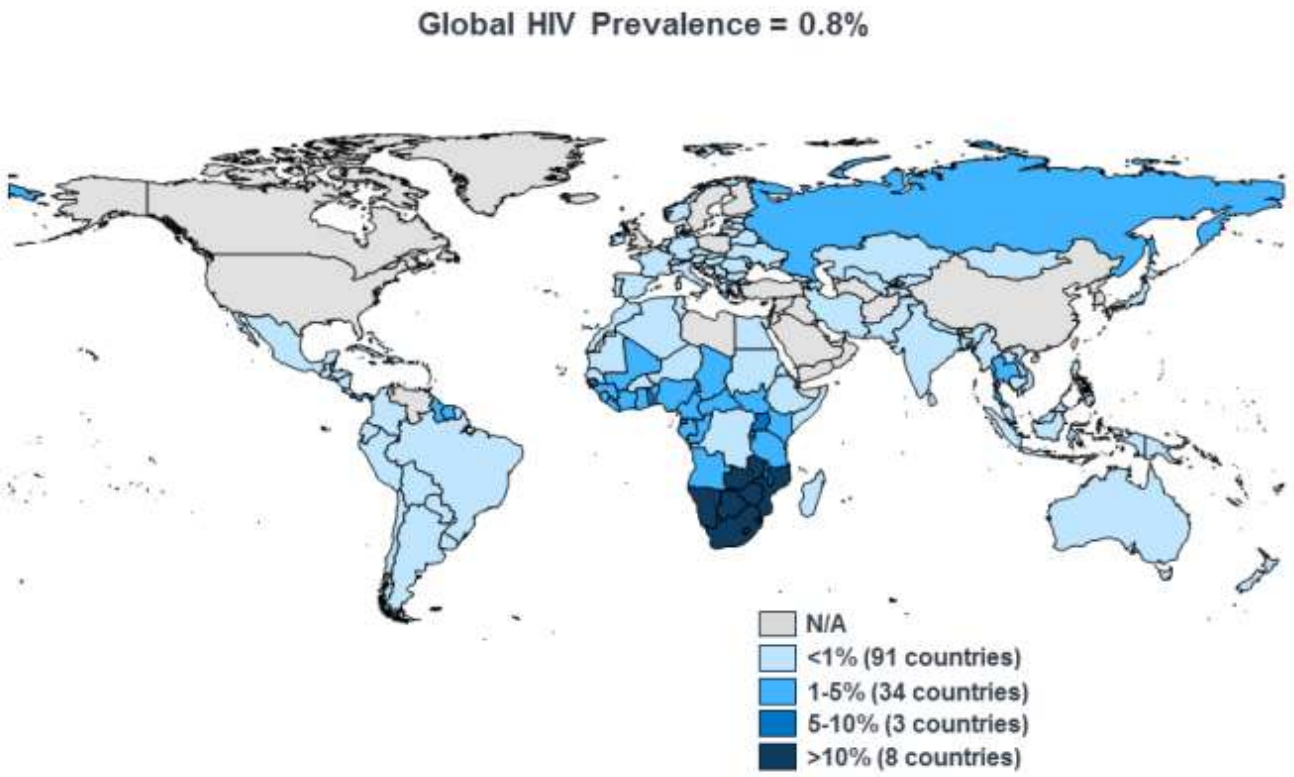



Figure 1

# Adult HIV Prevalence, 2017




NOTES: Data are estimates. Prevalence includes adults ages 15-49.
SOURCES: Kaiser Family Foundation, based on UNAIDS, AIDSinfo, Accessed July 2018

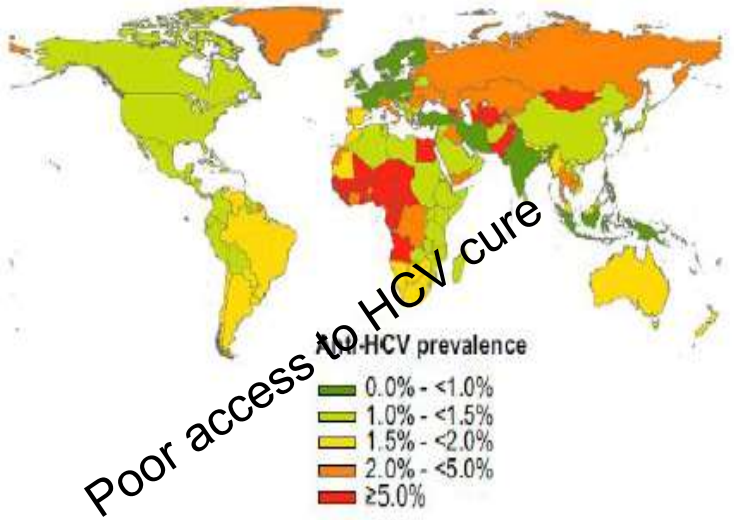
KFF

# *What Global Health is….not*

Prevalence of hepatitis B infection, adults 19-89 years, 2005

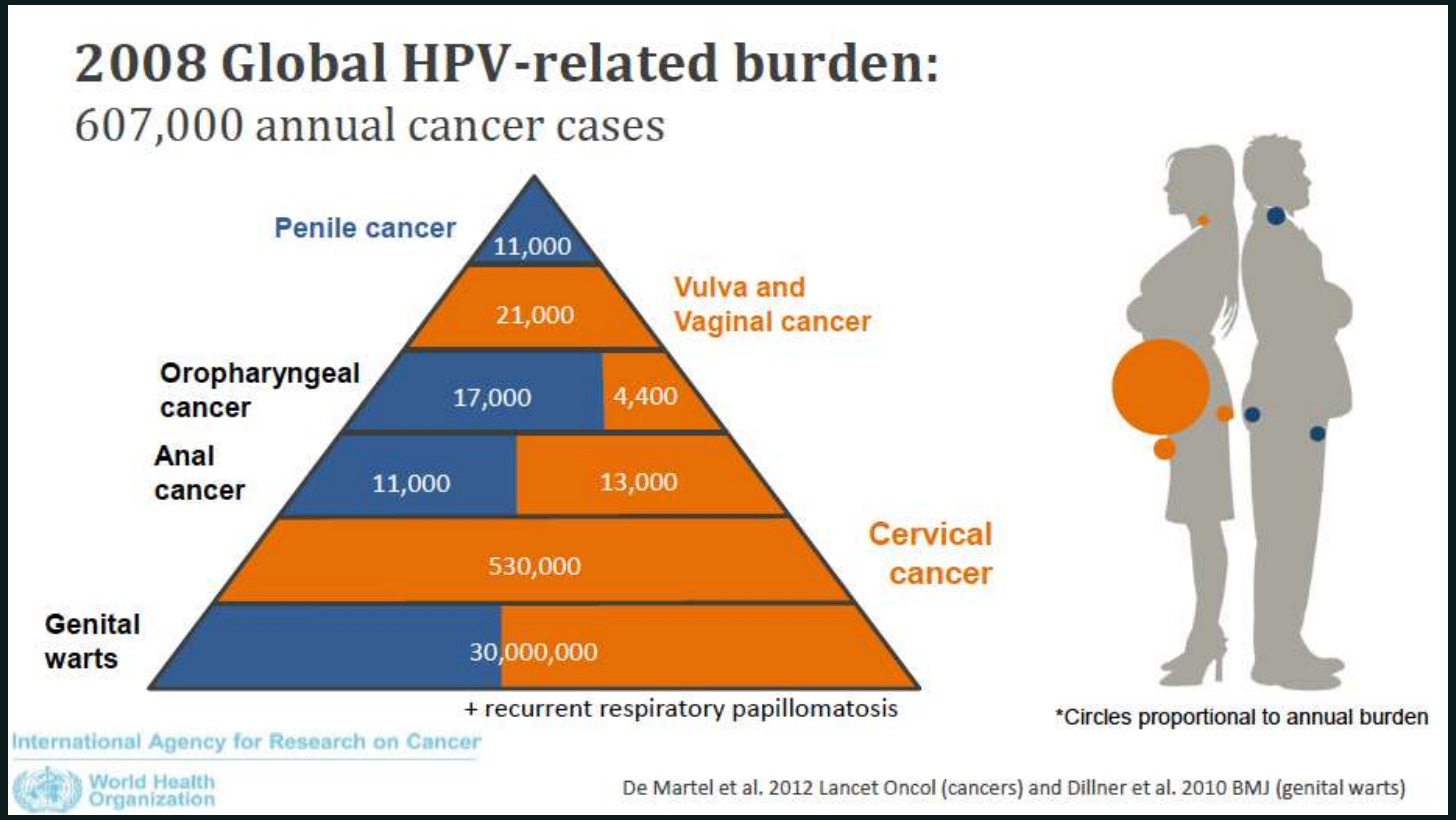

Ott, J. J., G. A. Stevens, J. Groeger, and S. T. Wiersma. "Global epidemiology of hepatitis B virus infection: new estimates of age-specific HBsAg seroprevalence and endemicity." *Vaccine* 30, no. 12 (2012): 2212-2219.

Prevalence of anti-hepatitis C virus




Gower, E., Estes, C., Blach, S., Razavi-Shearer, K., & Razavi, H. (2014). Global epidemiology and genotype distribution of the hepatitis C virus infection. Journal of hepatology, 61(1), S45-S57.

# *What Global Health is….not*



## *What Global Health is….not*

# Efficacy and effectiveness of an rVSV-vectored vaccine in preventing Ebola virus disease: final results from the Guinea ring vaccination, open-label, cluster-randomised trial (Ebola Ça Suffit!)

Ana Maria Henao-Restrepo, Anton Camacho, Ira M Longini, Conall H Watson, W John Edmunds, Matthias Egger, Miles W Carroll, Natasha E Dean, Ibrahima Diatta, Moussa Doumbia, Bertrand Draguez, Sophie Duraffour, Godwin Enwere, Rebecca Grais, Stephan Gunther, Pierre-Stéphane Gsell, Stefanie Hossmann, Sara Watson Watle, Mandy Kader Kondé, Sakoba Kéïta, Souleymane Kone, Eeuwe Kuisma, Myron M Levine, Sema Mandal, Thomas Mauget, Gunnstein Norheim, Xavier Riveros, Aboubacar Soumah, Sven Trelle, Andrea S Vicari, John Aylward Rottingen*, Marie-Paule Kieny*

## Summary

**Background** rVSV-ZEBOV is a recombinant, replication competent vesicular stomatitis virus-based candidate vaccine expressing a surface glycoprotein of Zaire Ebolavirus. We tested the effect of rVSV-ZEBOV in preventing Ebola virus disease in contacts and contacts of contacts of recently confirmed cases in Guinea, west Africa.

**Methods** We did an open-label, cluster-randomised ring vaccination trial (Ebola ça Suffit!) in the communities of Conakry and eight surrounding prefectures in the Basse-Guinée region of Guinea, and in Tomkolili and Bombali in Sierra Leone. We assessed the efficacy of a single intramuscular dose of rVSV-ZEBOV ($2\times10^7$ plaque-forming units administered in the deltoid muscle) in the prevention of laboratory confirmed Ebola virus disease. After confirmation of a case of Ebola virus disease, we definitively enumerated on a list a ring (cluster) of all their contacts and contacts of contacts including named contacts and contacts of contacts who were absent at the time of the trial team visit. The list was archived, then we randomly assigned clusters (1:1) to either immediate vaccination or delayed vaccination (21 days later) of all eligible individuals (eg, those aged ≥18 years and not pregnant, breastfeeding, or severely ill). An independent statistician generated the assignment sequence using block randomisation with randomly varying blocks, stratified by location (urban *vs* rural) and size of rings (≤20 individuals *vs* >20 individuals). Ebola response teams and laboratory workers were unaware of assignments. After a recommendation by an independent data and safety monitoring board, randomisation was stopped and immediate vaccination was also offered to children aged 6–17 years and all identified rings. The prespecified primary outcome was a laboratory confirmed case of Ebola virus disease with onset 10 days or more from randomisation. The primary analysis compared the incidence of Ebola virus disease in eligible and vaccinated individuals assigned to immediate vaccination versus eligible contacts and contacts of contacts assigned to delayed vaccination. This trial is registered with the Pan African Clinical Trials Registry, number PACTR201510001057191.

**Findings** In the randomised part of the trial we identified 4539 contacts and contacts of contacts in 51 clusters randomly assigned to immediate vaccination (of whom 3232 were eligible, 2351 consented, and 2119 were immediately vaccinated) and 4557 contacts and contacts of contacts in 47 clusters randomly assigned to delayed vaccination (of whom 3096 were eligible, 2539 consented, and 2041 were vaccinated 21 days after randomisation). No cases of Ebola virus disease occurred 10 days or more after randomisation among randomly assigned contacts and contacts of contacts vaccinated in immediate clusters versus 16 cases (7 clusters affected) among all eligible individuals in delayed clusters. Vaccine efficacy was 100% (95% CI 68·3–100·0, p=0·0045), and the calculated intraclass correlation coefficient was 0·035. Additionally, we defined 19 non-randomised clusters in which we enumerated 2745 contacts and contacts of contacts, 2086 of whom were eligible and 1677 were immediately vaccinated, including 194 children. The evidence from all 117 clusters showed that no cases of Ebola virus disease occurred 10 days or more after randomisation among all immediately vaccinated contacts and contacts of contacts versus 23 cases (11 clusters affected) among all eligible contacts and contacts of contacts in delayed plus all eligible contacts and contacts of contacts never vaccinated in immediate clusters. The estimated vaccine efficacy here was 100% (95% CI 79·3–100·0, p=0·0013). 52% of contacts and contacts of contacts assigned to immediate vaccination and in non-randomised clusters received the vaccine immediately; vaccination protected both vaccinated and unvaccinated people in these clusters. 5837 individuals in total received the vaccine (5643 adults and 194 children), and all vaccinees were followed up for 84 days. 3149 (53·9%) of 5837 individuals reported at least one adverse event in the 14 days after vaccination; these were typically mild (87·5% of all 7231 adverse events). Headache (1832 [25·4%]), fatigue (1561 [21·9%]), and muscle pain (942 [13·1%]) were the most commonly reported adverse events in this period across all age groups. 80 serious adverse events were identified, of which two were judged to be

Lancet 2017; 389: 505–18

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This online publication has been corrected. The first correction version appeared at thelancet.com on December 23, 2016. The second corrected version appeared on February 3, 2017

See Comment page 473

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# In Congo outbreak, Ebola vaccine faces reality tests

Friday, May 18, 2018 6:16 a.m. EDT

FILE PHOTO: Congolese Health Ministry officials carry the first batch of experimental Ebola vaccines in Kinshasa, Democratic Republic of Con

By Kate Kelland

LONDON (Reuters) - An experimental Ebola vaccine to be deployed in an outbreak in Democratic Republic of Congo has conquered some major scientific hurdles in giving high protection, but it now faces extreme real-world tests including heat, humidity, language barriers and lack of roads.

Because it is not yet licensed, the Merck & Co vaccine has been offered to Congo under a "compassionate use" protocol agreed by national and international health and ethics authorities.

This means fully informed, signed consent is needed from every person who wants the shot. And in the current Ebola outbreak, that makes logistical, cultural and language barriers the ultimate challenges, global health specialists say.

The hurdles illustrate how hard it can be to move from laboratory to real life, especially in remote communities with no functioning health systems. The Congo outbreak is a chance to reality-test a vaccine against a disease epidemic that can't be replicated in controlled environments.

# Potential Viral Pathogens

| Family | Prototype (s) | Licensed Vaccines |
|---|---|---|
| Paramyxo | Measles, Mumps, *Nipah, RSV* | Live-attenuated |
| Toga | Rubella, *Chikungunya, WEVEE* | Live-attenuated |
| Reo | Rotavirus | Live-attenuated |
| Orthomyxo | Influenza A, B | Live-attenuated, whole-inactivated |
| Adeno | Adenovirus 4, 7, 14 | Live-attenuated |
| Rhabdo | Rabies | Live-attenuated |
| Picorna | Polio 1,2,3, Hepatitis A, *EV68, 71* | Live-attenuated, whole-inactivated |
| Papilloma | HPV 6, 11, 16, 18 | VLP |
| Pox | Variola | Live-attenuated |
| Hepadna | Hepatitis B | VLP |
| Herpes | Varicella | Live-attenuated |
| Flavi | Yellow Fever, TBE, JEV, Dengue, Zika | Live-attenuated, whole-inactivated, Live-chimeric |
| Hepe | Hepatitis E | VLP (China) |
| Filo | Ebola, Marburg | |
| Retro | HIV-1 | |
| Corona | SARS, MERS | |
| Parvo | B19, Boca | |
| Calici | Noro | |
| Polyoma | JC, BK | |
| Arena | Lassa, Machupo | |
| Bunya | Hanta, Rift Valley | |
| Astro | Astrovirus | |

Virus families with at least one representative licensed vaccine

Viruses with active vaccine research

Viruses with minimal vaccine research activity

**Choose prototypic viruses within each family or each distinct genus**

- Define structures of surface proteins and particles
- Determine extent of genetic variability
- Define tropism, entry mechanisms, receptors
- Study pathogenesis and establish animal models
- Isolate human mAbs and determine mechanisms of NT
- Develop assays for diagnosis and immunogenicity testing
- Define immune correlates of protection

# NIPHA VIRUS

The New York Times

## *Nipah Virus, Rare and Dangerous, Spreads in India*

The infection, an emerging threat, has killed virtually all of its victims so far in India.

By Emily Baumgaertner

June 4, 2018

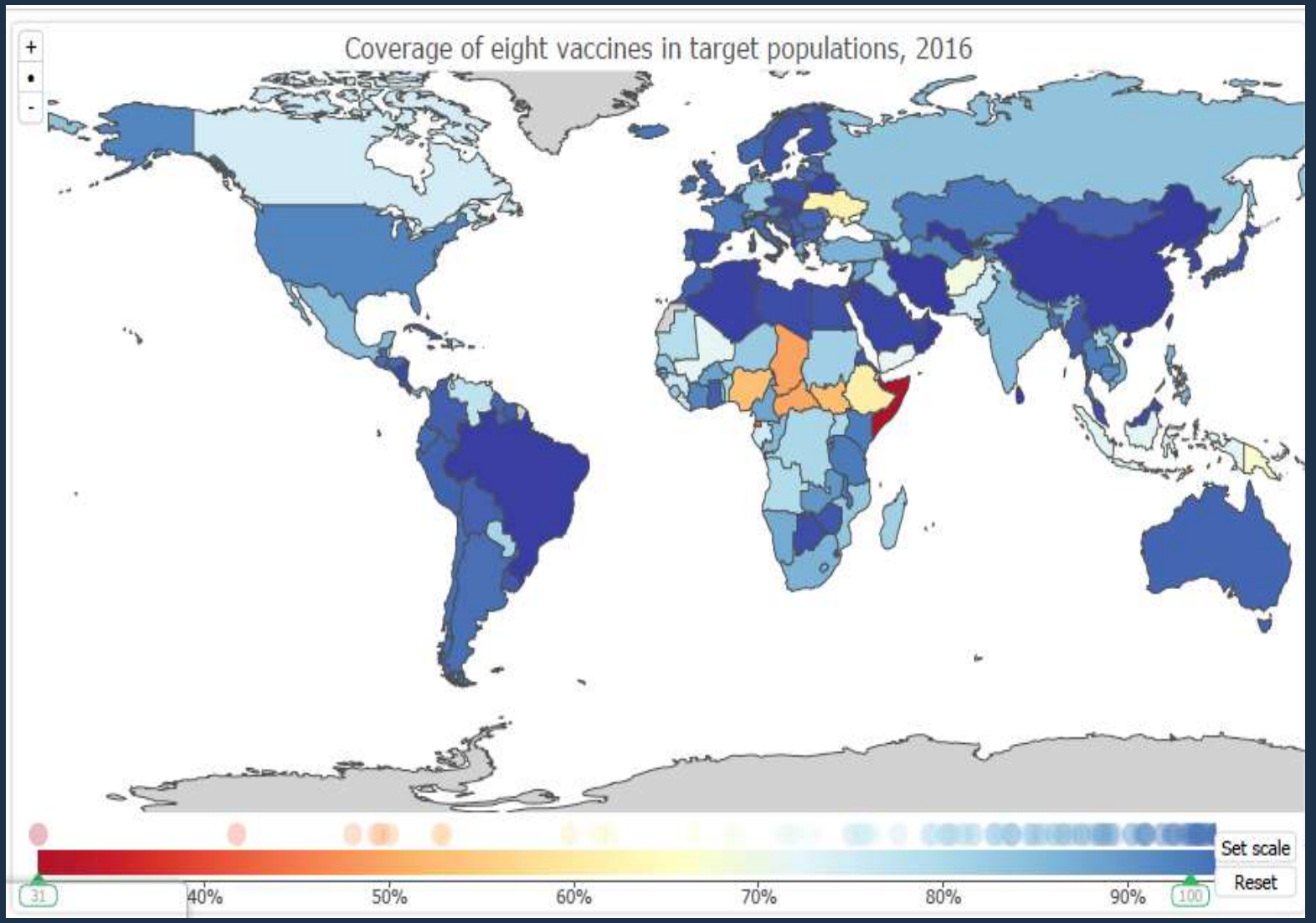
Burying a victim of the Nipah virus in Kozhikode, southern India. There is no vaccine and no cure for the disease. K.Sujith/Associated Press

A rare, brain-damaging virus that experts consider a possible epidemic threat has broken out in the state of Kerala, India, for the first time, infecting at least 18 people and killing 17 of them, according to the World Health Organization.

The Nipah virus naturally resides in fruit bats across South and Southeast Asia, and can spread to humans through contact with the animals' bodily fluids. There is no vaccine and no cure.

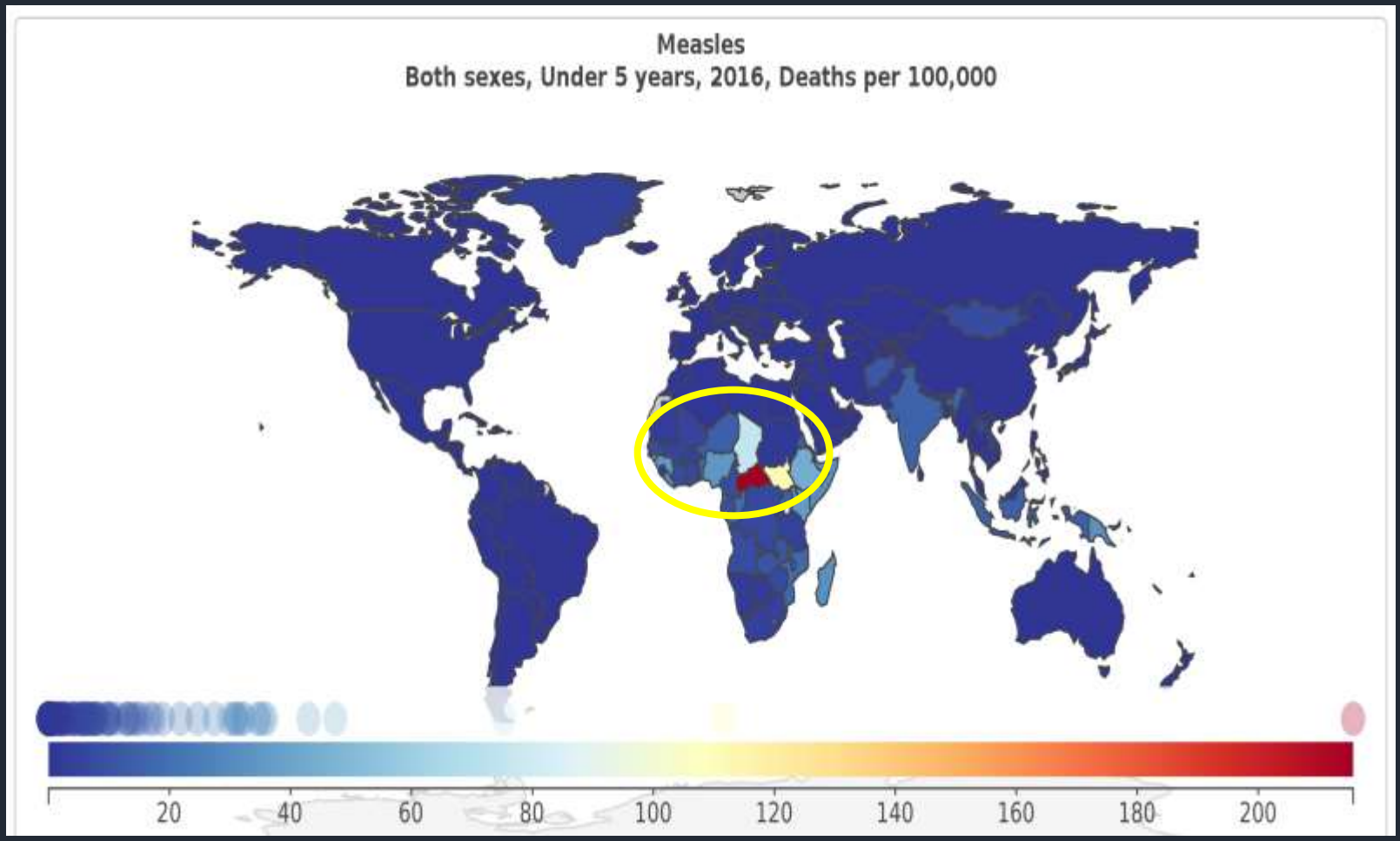
The virus is listed by the W.H.O. as a high priority for research. Current treatment measures are insufficient, according to Dr. Stuart Nichol, the head of the viral special pathogens branch at the Centers for Disease Control and Prevention.

# *What Global Health is….not*

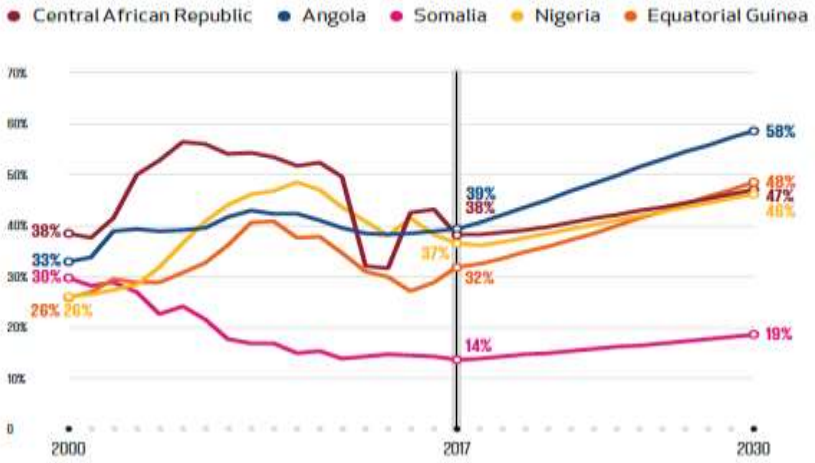


**Measles immunization coverage**
**(**% of children ages 12-23 months) (2016)

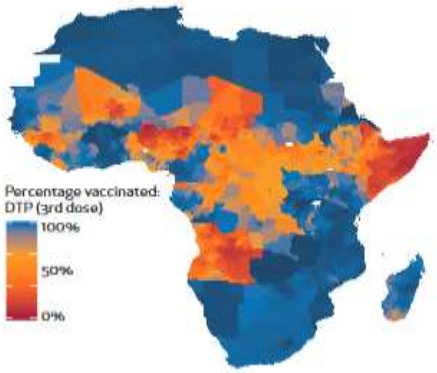
# Measles mortality



## NATIONAL DTP3 COVERAGE




## SUB-NATIONAL DTP3 COVERAGE 2016




60 percent through 2030. Dramatic improvements are needed to increase coverage and avoid leaving children behind in these settings.

The heatmap shows that even within countries that may be doing well, certain areas can be neglected. More than half of children haven't received the necessary three doses of DTP in 26 percent of districts in sub-Saharan Africa.

The priority now is replicating successful strategies in the most challenging places so that all people everywhere receive lifesaving vaccines.

## *What Global Health is….not*

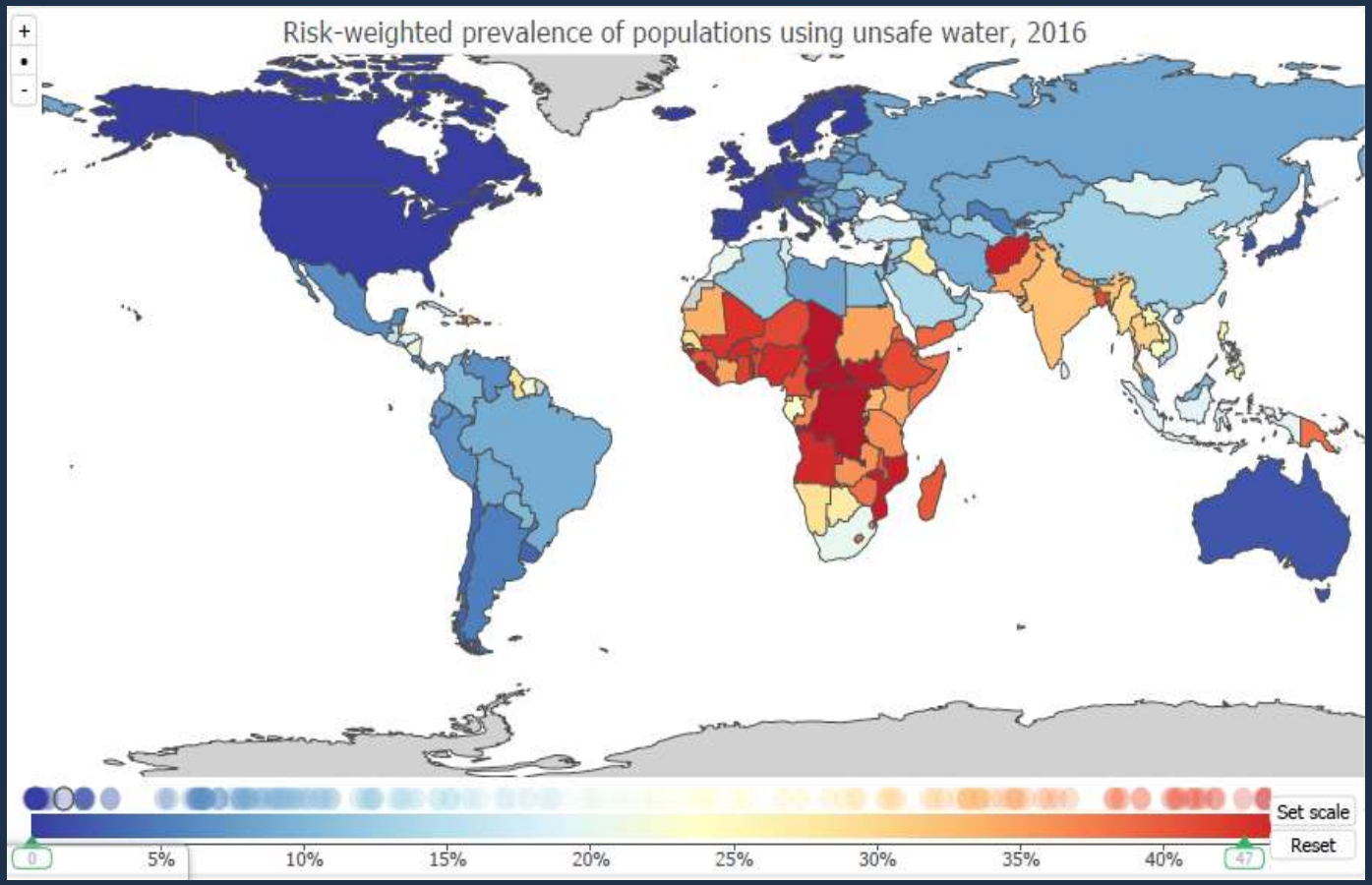
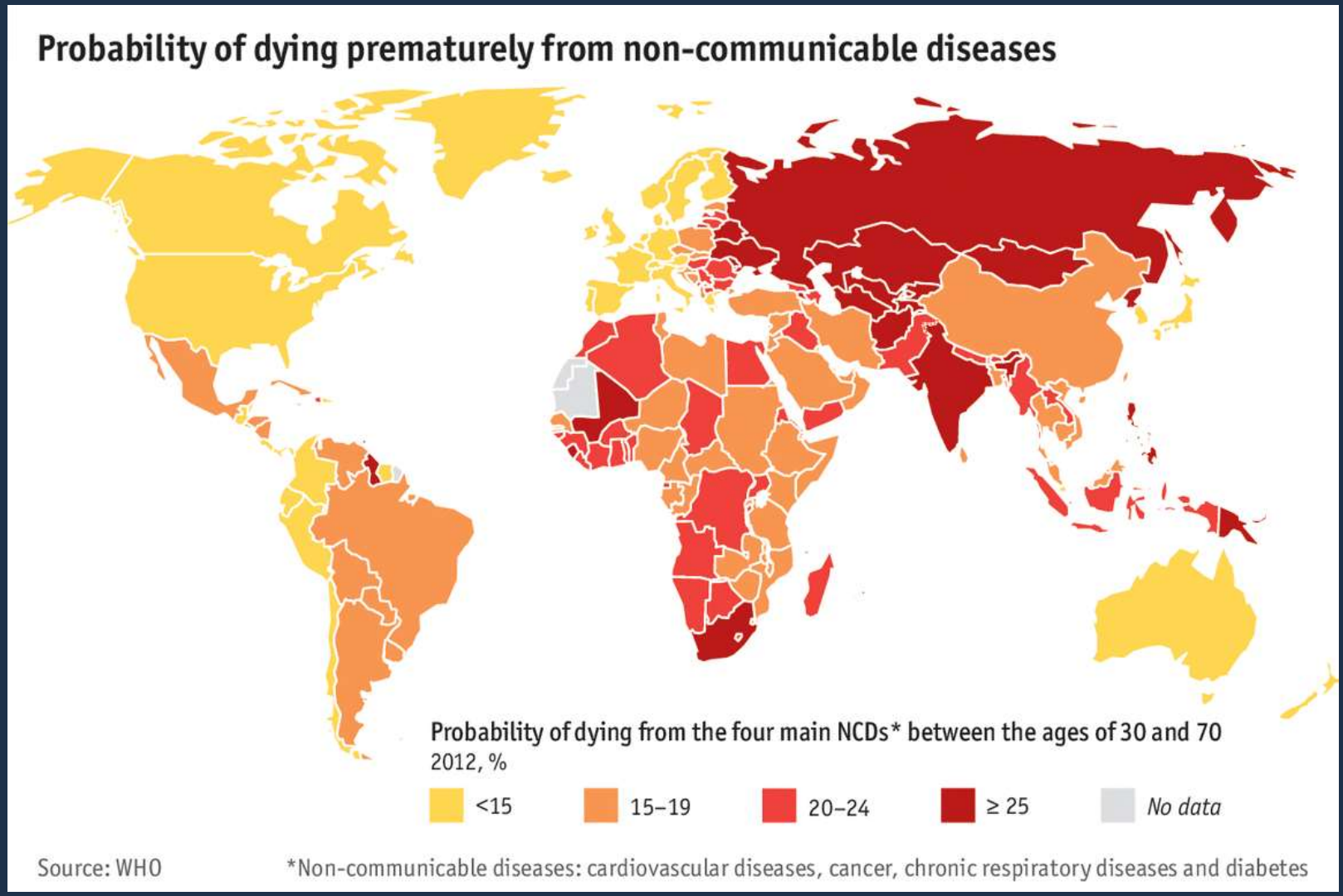


Fig. 3.4
Countries reporting cholera deaths and imported cases, 2016

## *What Global Health is….not*

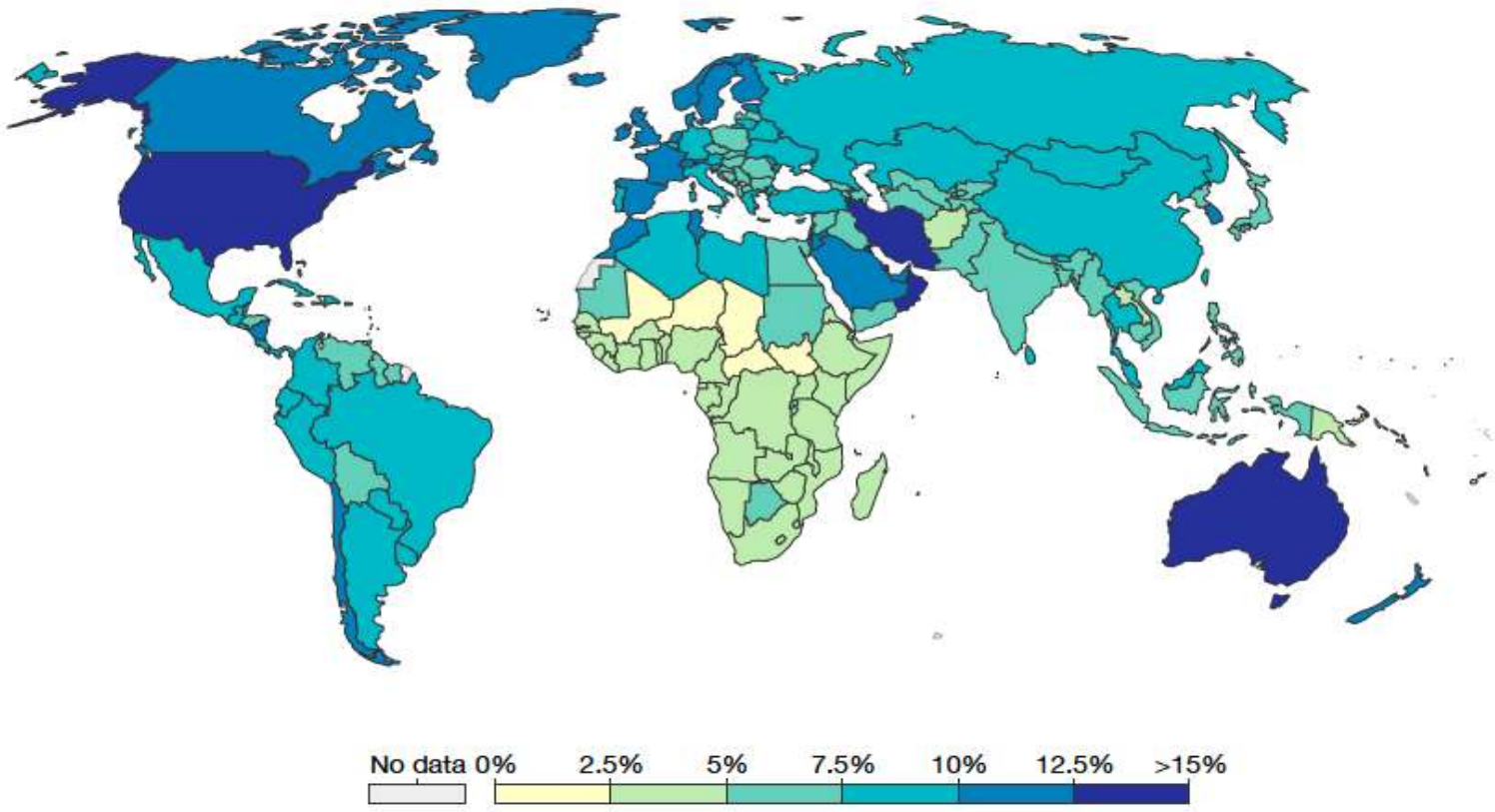


# Mental Health

## Mental and substance use disorders as a share of total disease burden, 2016

Our World in Data

Mental health and substance use disorders as a share of total disease burden. Disease burden is measured in DALYs (Disability-Adjusted Life Years). DALYs measure total burden of disease, both from years of life lost and years lived with a disability. One DALY equals one lost year of healthy life.



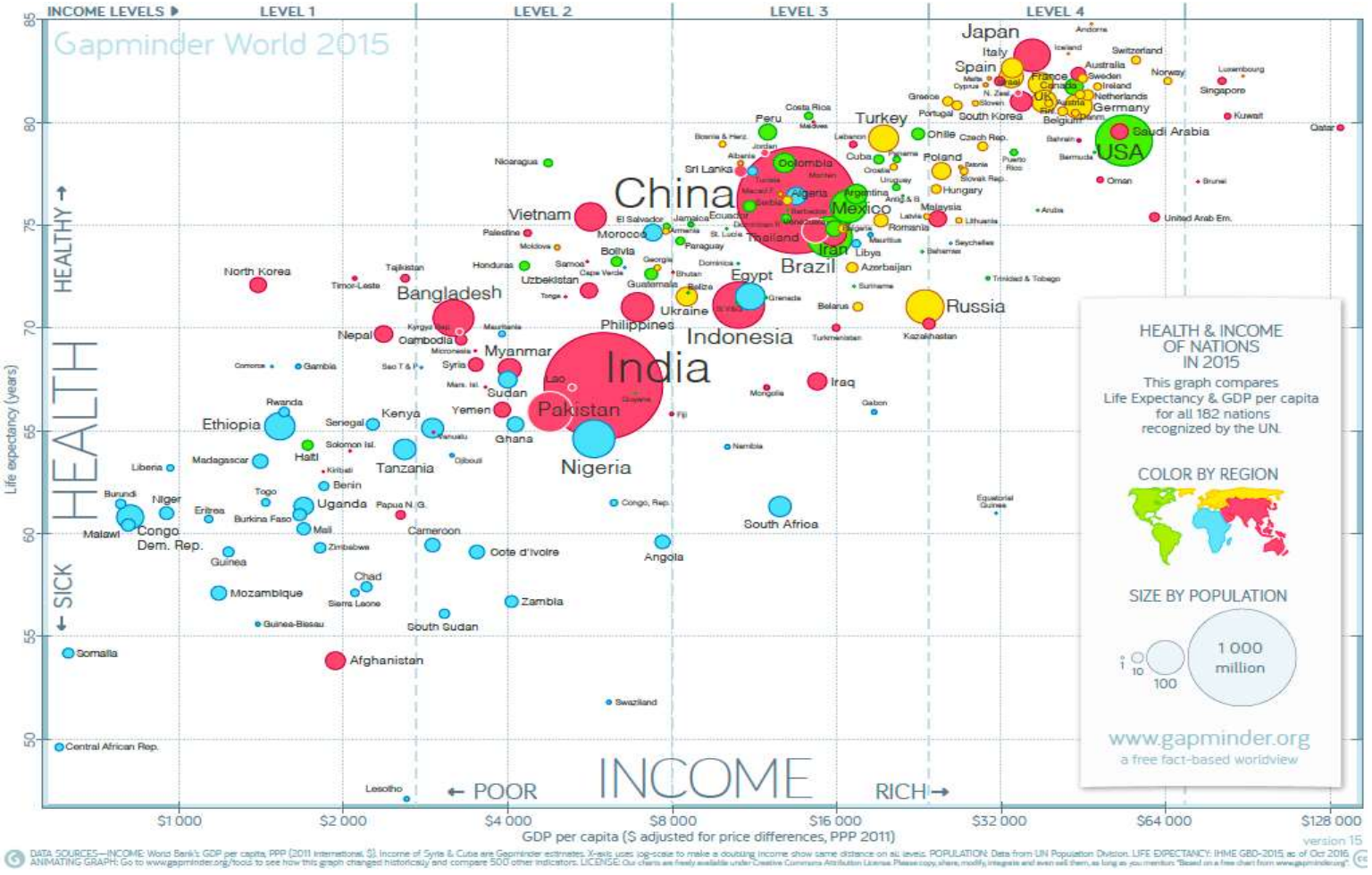

Source: IHME, Global Burden of Disease

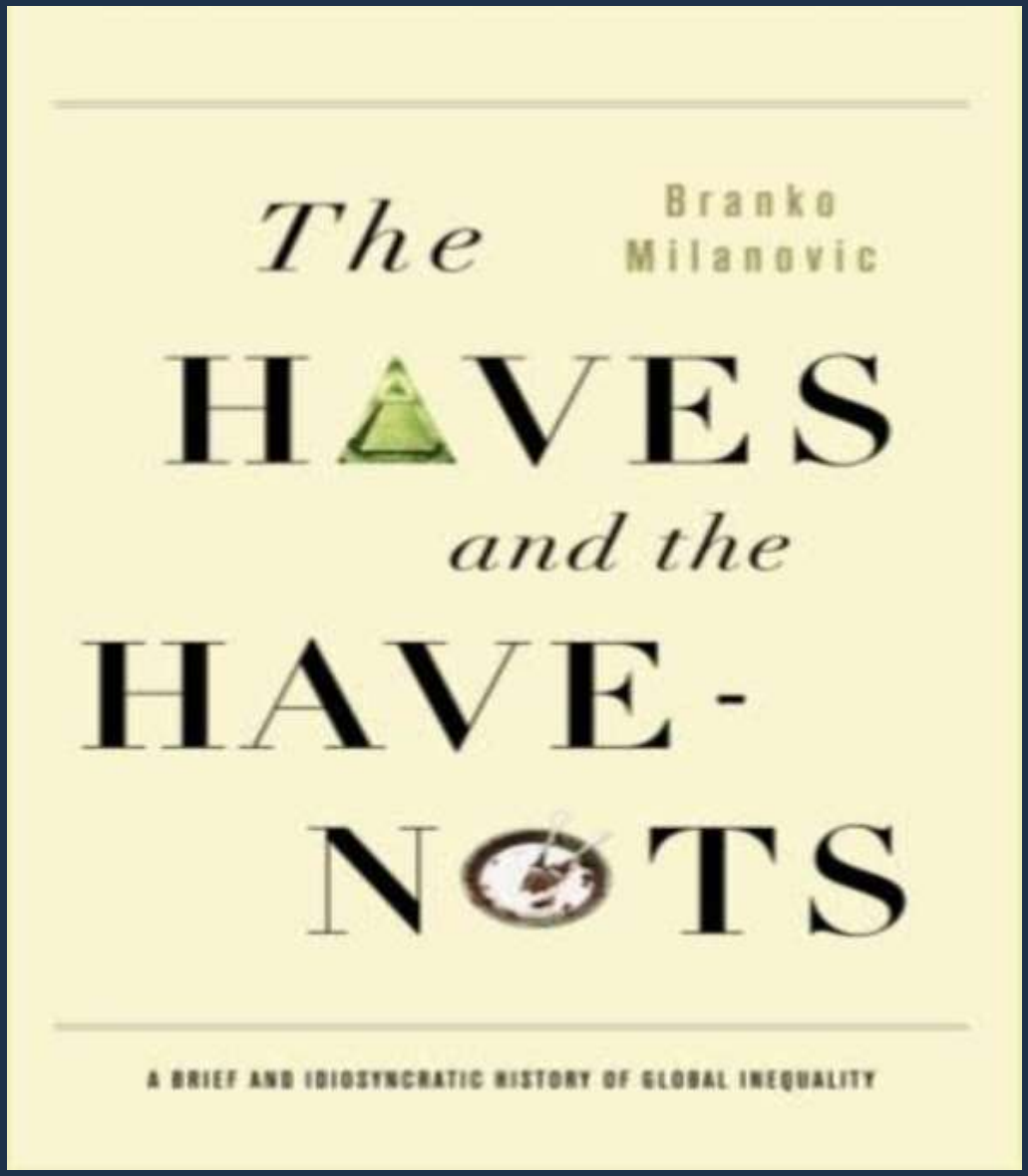
# Globalization and Health

1. The current version of globalization has delivered economic growth.

2. But at enormous cost: massive environmental destruction, growing lawlessness, rising inequalities.

3. The causes of poor health for millions globally are rooted in political, social and economic injustices.




Branko Milanovic
The HAVES and the HAVE-NOTS
A BRIEF AND IDIOSYNCRATIC HISTORY OF GLOBAL INEQUALITY

| | Total wealth | Change in total wealth | |
|---|---|---|---|
| | 2018 | 2017–18 | 2017–18 |
| | USD bn | USD bn | % |
| Africa | 2,553 | 108 | 4.4 |
| Asia-Pacific | 56,715 | 929 | 1.7 |
| China | 51,874 | 2,266 | 4.6 |
| Europe | 85,402 | 4,432 | 5.5 |
| India | 5,972 | 151 | 2.6 |
| Latin America | 8,055 | -415 | -4.9 |
| North America | 106,513 | 6,486 | 6.5 |
| World | 317,084 | 13,958 | 4.6 |

Figure 3: World Wealth Map 2018


Source: James Davies, Rodrigo Lluberas and Anthony Shorrocks, Credit Suisse Global Wealth Databook 2018

**Only 1% of people owns 50.4% of the global wealth;**
**2.4 billion adults own only 1%**

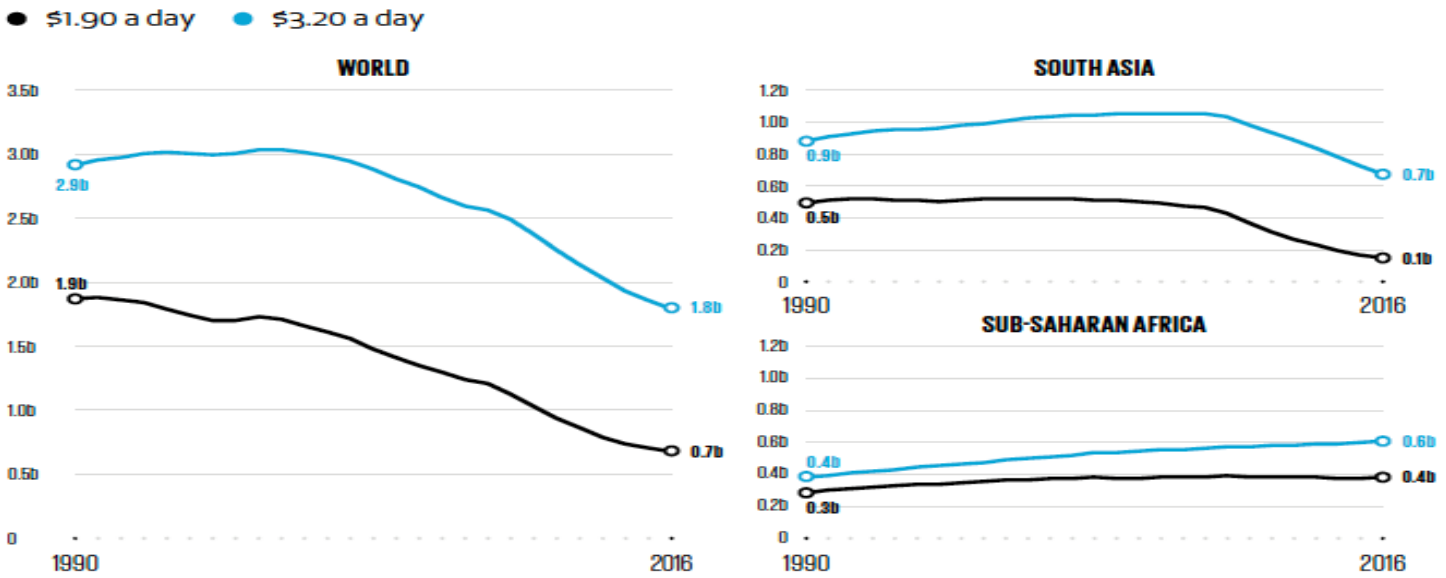
**2015 Global Wealth Report Credit Suisse.**

GOALKEEPERS

# ABSOLUTE POVERTY DECLINED; BUT NOT EVERYWHERE

## POVERTY

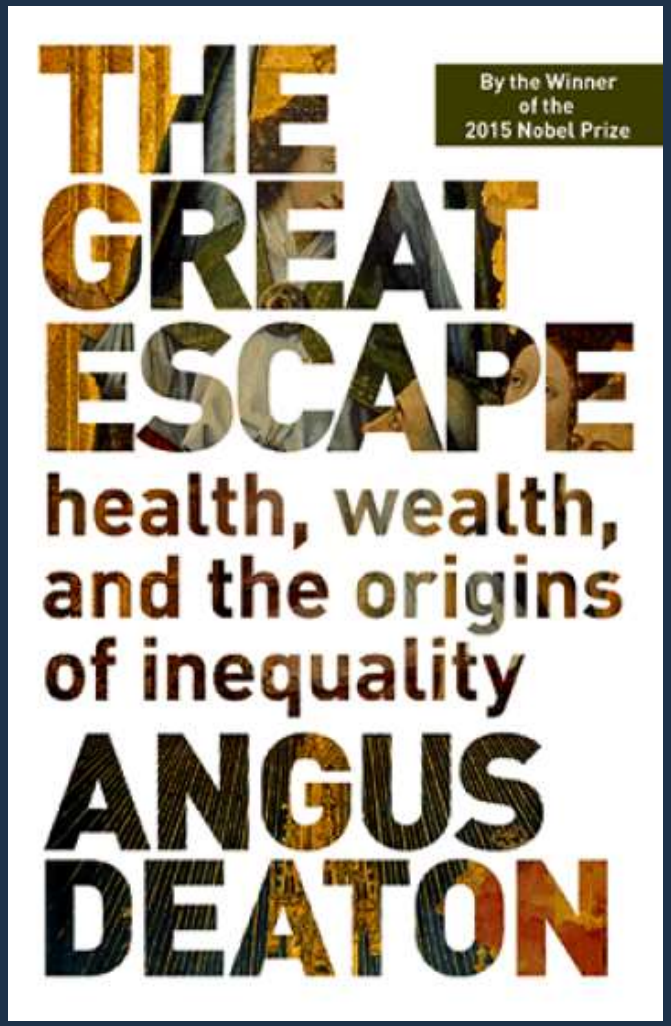
### NUMBER OF PEOPLE LIVING AT DIFFERENT POVERTY THRESHOLDS




SDG Target: Eradicate extreme poverty for all people everywhere.

# The poor, the marginalised groups and the vulnerable populations are the most affected by health inequalities

# 1.5 billion people live in slums




**THE GREAT ESCAPE** is a movie about men escaping from a prisoner-of-war camp in World War II. The Great Escape of this book is the story of mankind's escaping from deprivation and early death, of how people have managed to make their lives better, and led the way for others to follow.

## Migrants

## Displaced

# What Global Health is not

# What  Global Health actually is

# Global Health

- Global health is the health of populations in a global context
- It transcends the perspectives and concerns of individual nations
- Global health is an extensive multisectorial domain that **links health with the areas of development, humanitarian aid, and research**
- It deals with:
  - worldwide improvement of health
  - reduction of disparities and inequalities, abroad and at home
  - protection against global threats

# Global Health:
# lessons from the HIV/AIDS response

18TL0624

The Lancet Commissions

JG

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Doctopic: Review and Opinion

## Advancing global health and strengthening the HIV response in the era of Sustainable Development Goals: the International AIDS Society—*Lancet* Commission report

### Executive summary

Inspired by unprecedented improvements in human health and development in recent decades, our world has embarked on a quest that only a generation ago would have been considered unreachable—achieving sustainable health and development for all. Improving the health and wellbeing of the world's people is at the core of the Sustainable Development Goals (SDGs), reflected in targets that call for ending the epidemics of AIDS, tuberculosis, and malaria; achieving enormous improvements in maternal and child health; and tackling the growing burden of non-communicable diseases (NCDs). Attaining universal health coverage is the means by which these ambitious health targets are to be achieved.

Although on their face, the SDGs reflect an unprecedented level of global solidarity and resolve, the trends that increasingly define our world in 2018 are inconsistent with the sentiments that underlie the SDGs and with the ethos that generated such striking health and development gains in recent years. Democracy is in retreat, and the space for civil society is declining and the human rights environment deteriorating in many countries. Official development assistance for health has stalled, as an inward-looking nationalism has in many places supplanted recognition of the need for global collaboration to address shared challenges. The loss of momentum on global health ignores the urgent need to strengthen health systems to address the steady growth of NCDs, which now account for seven out of 10 deaths worldwide.

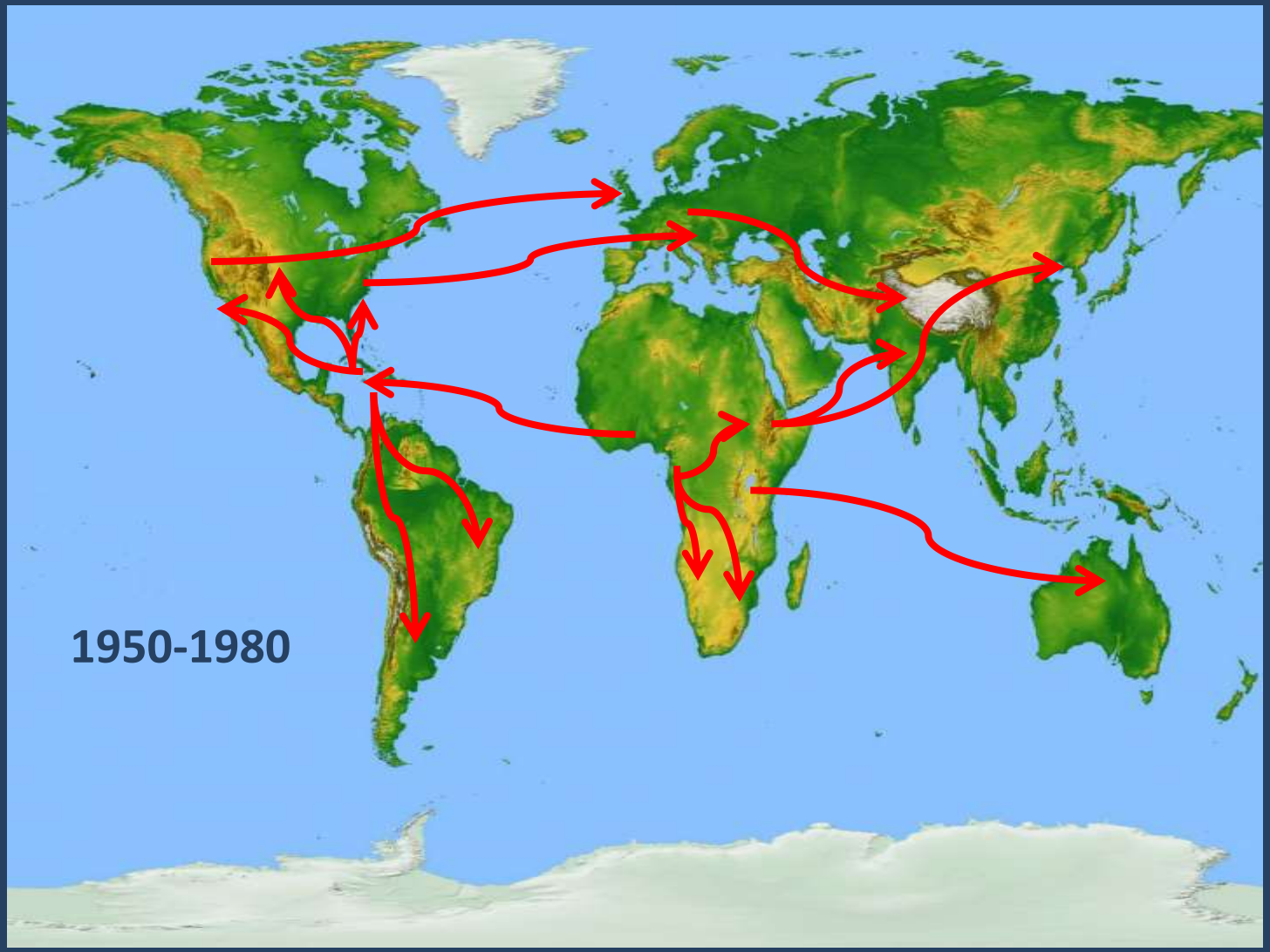
Recent trends in the HIV response are especially concerning. Although the number of new HIV infections and AIDS-related deaths have markedly decreased since the epidemic peaked, little progress has been made in reducing new infections in the past decade. Without further reductions in HIV incidence, a resurgence of the epidemic is inevitable, as the largest ever generation of young people age into adolescence and adulthood. Yet where vigilance and renewed efforts are needed, there are disturbing indications that the world's commitment is waning. Allowing the HIV epidemic to rebound would be catastrophic for the communities most affected by HIV and for the broader field of global health. If the world cannot follow through on HIV, which prompted such an unprecedented global mobilisation, hopes for achieving the ambitious health aims outlined in the SDGs will inevitably dim.

At this moment of uncertainty for the future of the HIV response and for global health generally, the International AIDS Society and *The Lancet* convened an

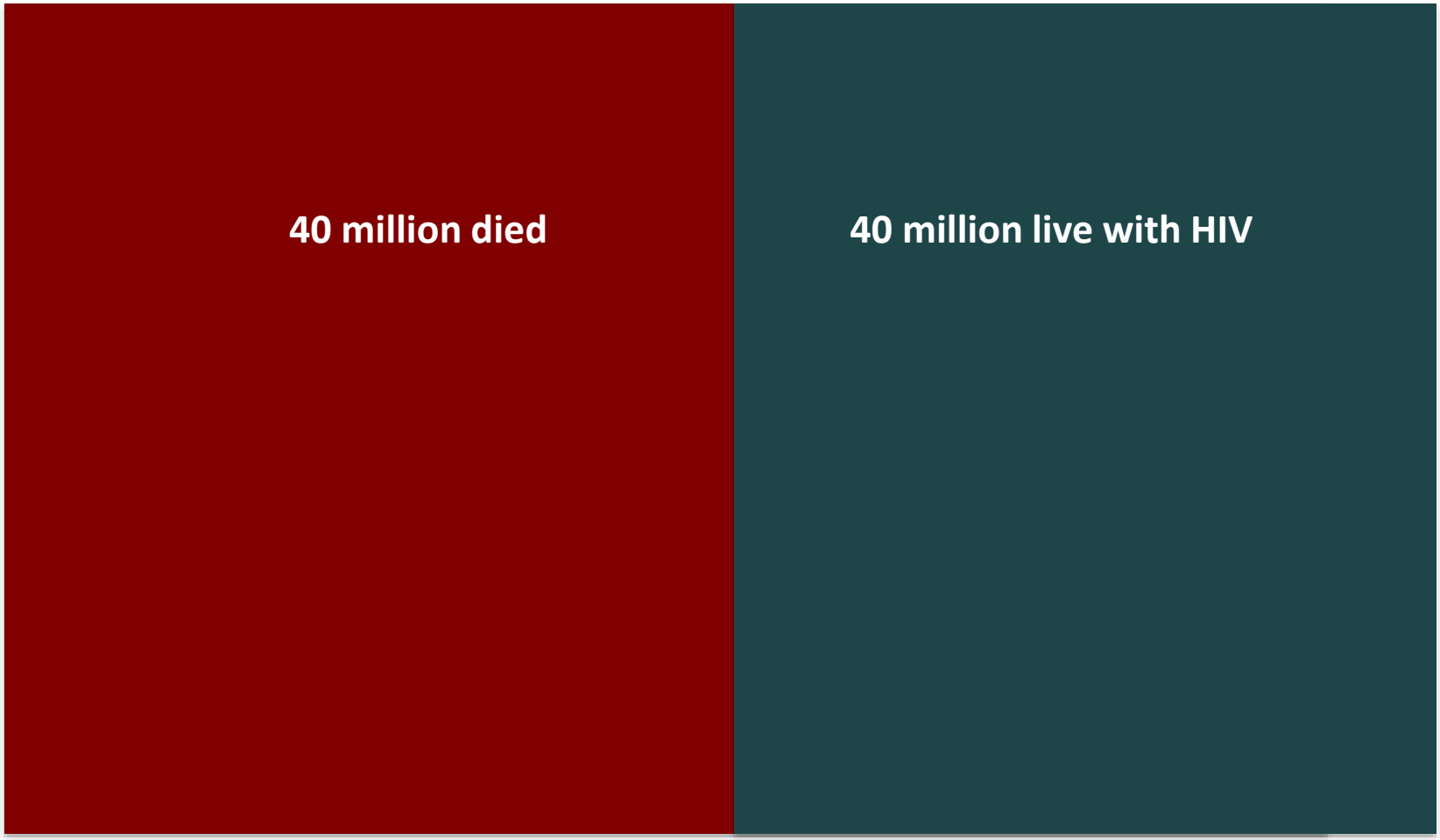
#### Key messages

- The HIV pandemic is not on track to end, and the prevailing discourse on ending AIDS has bred a dangerous complacency and may have hastened the weakening of global resolve to combat HIV
- Existing tools and strategies are insufficient, and although dramatic gains can be made through maximising existing prevention and treatment strategies, the HIV pandemic is likely to remain a major global challenge for the foreseeable future
- Tens of millions of people will require sustained access to antiretroviral therapy for decades to come, vigilance will be needed to prevent a resurgence of the epidemic as the largest ever generation of young people age into adolescence and young adulthood, and intensified efforts are required to address HIV among populations and settings that are being left behind
- Allowing the pandemic to rebound after achieving such remarkable progress would not only increase the human and financial costs of HIV, but it would potentially demoralise the global health field and diminish support for similarly ambitious global health undertakings
- A rejuvenated global effort on HIV is essential to renew and strengthen the global HIV response, the world's impressive commitment to the scaling up of HIV treatment services must be matched by a similarly robust commitment to expanded access to HIV prevention
- The HIV response must make common cause with the broader global field to herald a new era of global solidarity for health, and specific action is urgently needed to respond to the rapidly rising health toll associated with non-communicable diseases, including taking health into account in the development of public policies of all kinds. HIV services should, where feasible, be integrated with broader health services, in co-located sites where possible, with the aim of improving both HIV-related and non-HIV-specific health outcomes; greater integration of HIV and global health must preserve and build on key attributes of the HIV response, including participatory community and civil society engagement and an ironclad commitment to human rights, gender equality, and equitable access to health and social justice
- The new era of global health solidarity should focus on the development of robust, flexible, people-centred health systems to end communicable diseases, develop effective measures to address the steady rise of non-communicable diseases, achieve universal health coverage, provide coordinated services tailored to the needs of health service users, and effectively address the social and structural determinants of health

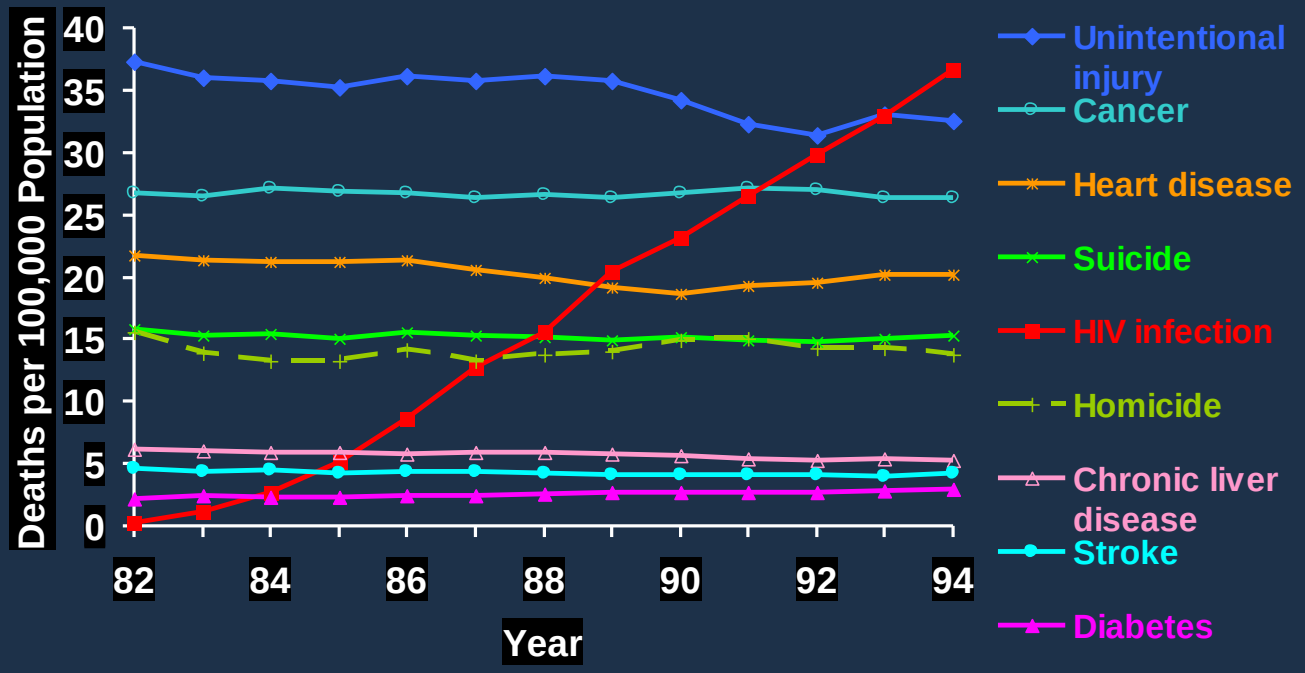

1920
© Magdalena Lukasik (JGI)


1950-1980

# AIDS: a devastating impact in just a few years



## Trends in Annual Rates of Death from Leading Causes of Death Among Persons 25-44 Years Old, USA



# Antiretroviral Therapy for HIV Infection in 1996

## Recommendations of an International Panel

Charles C. J. Carpenter, MD; Margaret A. Fischl, MD; Scott M. Hammer, MD; Martin S. Hirsch, MD; Donna M. Jacobsen; David A. Katzenstein, MD; Julio S. G. Montaner, MD; Douglas D. Richman, MD; Michael S. Saag, MD; Robert T. Schooley, MD; Melanie A. Thompson, MD; Stefano Vella, MD; Patrick G. Yeni, MD; Paul A. Volberding, MD; for the International AIDS Society–USA

**Objective.**—To provide clinical recommendations for antiretroviral therapy for human immunodeficiency virus (HIV) disease with currently (mid 1996) available drugs. When to start therapy, what to start with, when to change, and what to change to were addressed.

**Participants.**—A 13-member panel representing international expertise in antiretroviral research and HIV patient care was selected by the International AIDS Society–USA.

**Evidence.**—Available clinical and basic science data, including phase 3 controlled trials, clinical endpoint data, virologic and immunologic endpoint data, interim analyses, studies of HIV pathophysiology, and expert opinions of panel members were considered. Recommendations were limited to drugs available in mid 1996.

**Process.**—For each question posed, 1 or more member(s) reviewed and presented available data. Recommendations were determined by group consensus (January 1996); revisions as warranted by new data were incorporated by group consensus (February-May 1996).

**Conclusions.**—Recent data on HIV pathogenesis, methods to determine plasma HIV RNA, clinical trial data, and availability of new drugs point to the need for new approaches to treatment. Therapy is recommended based on $CD4^+$ cell count, plasma HIV RNA level, or clinical status. Preferred initial drug regimens include nucleoside combinations; at present protease inhibitors are probably best reserved for patients at higher progression risk. For treatment failure or drug intolerance, subsequent regimen considerations include reasons for changing therapy, available drug options, disease stage, underlying conditions, and concomitant medication(s). Therapy for primary (acute) infection, high-risk exposures to HIV, and maternal-to-fetal transmission are also addressed. Therapeutic approaches need to be updated as new data continue to emerge.

*JAMA*. 1996;276:146-154

From Brown University School of Medicine, Providence, RI (Dr Carpenter); the University of Miami (Fla) School of Medicine (Dr Fischl); Harvard Medical School, Boston, Mass (Drs Hammer and Hirsch); The International AIDS Society–USA, San Francisco, Calif (Ms Jacobsen); Stanford (Calif) University Medical Center (Dr Katzenstein); St Paul's Hospital, Vancouver, British Columbia (Dr Montaner); University of California San Diego, and San Diego Veterans Affairs Medical Center (Dr Richman); the University of Alabama at Birmingham (Dr Saag); the University of Colorado School of Medicine, Denver (Dr Schooley); AIDS Research Consortium of Atlanta (Ga) (Dr Thompson); Istituto Superiore di Sanità, Rome, Italy (Dr Vella); Hôpital Bichat-Claude Bernard, X. Bichat Medical School, Paris, France (Dr Yeni); and the University of California San Francisco (Dr Volberding).

Financial disclosures appear at the end of this article.

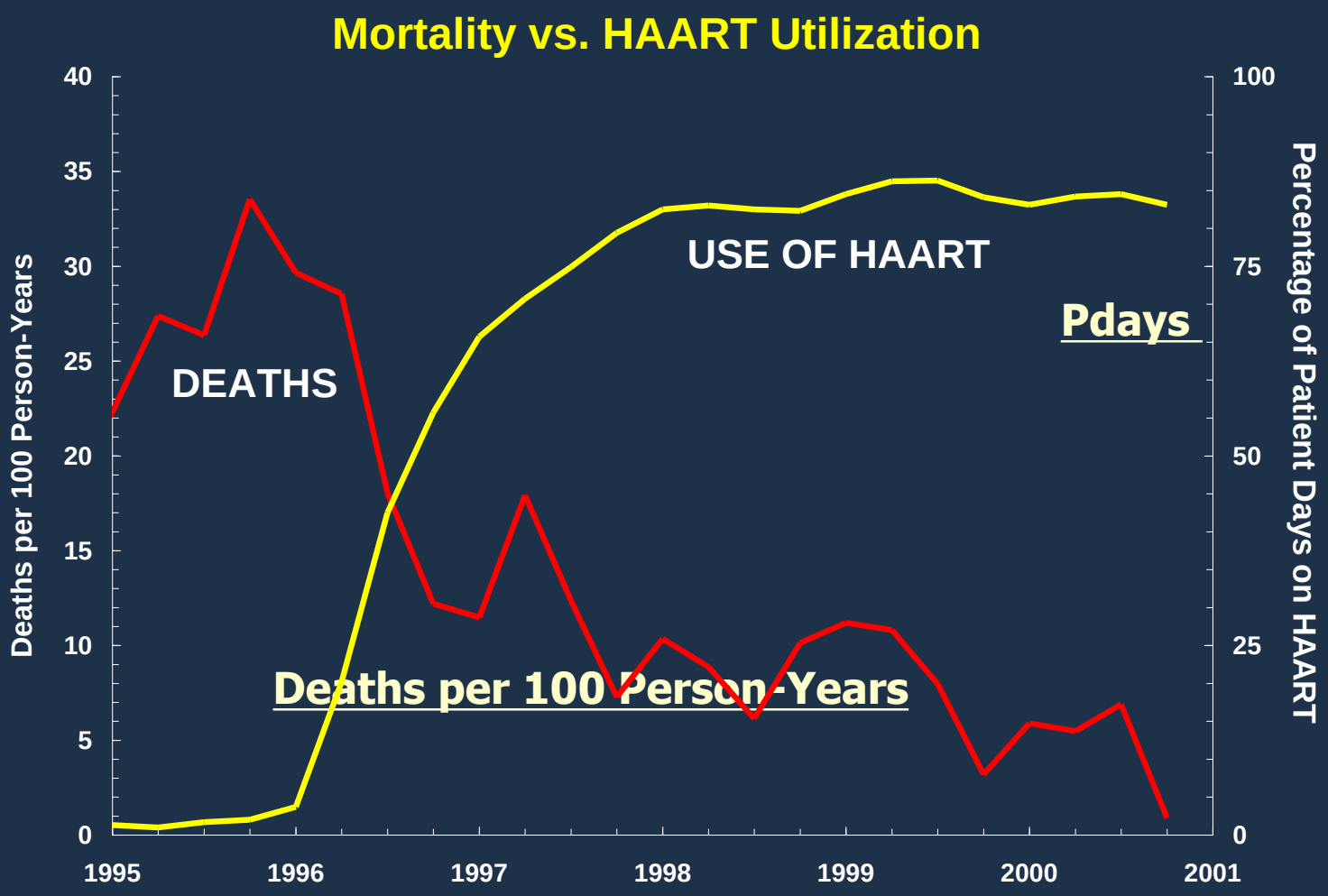
Reprints: International AIDS Society–USA, 353 Kearny St, San Francisco, CA 94108.

IMPORTANT ADVANCES in understanding the biology and treatment of human immunodeficiency virus (HIV) infection have occurred during the past 18 months. As a result, new scientifically sound approaches to therapy have been developed that offer new options for persons with HIV infection. The relevant recent advances fall into 4 major categories: (1) a better understanding of the replication kinetics of HIV throughout all stages of disease; (2) the development of assays to determine the viral load in individual patients; (3) the availability of several new effective drugs; and (4) the demonstration that combination therapy is more effective than zidovudine monotherapy.

In light of these advances, the recommendations of earlier state-of-the-art guidelines[1,2] are no longer applicable to clinical decision making in 1996. Therefore, an international panel of clinical investigators experienced in HIV patient care was selected and convened by the International AIDS Society–USA to develop current recommendations for the clinical management of HIV-infected individuals.

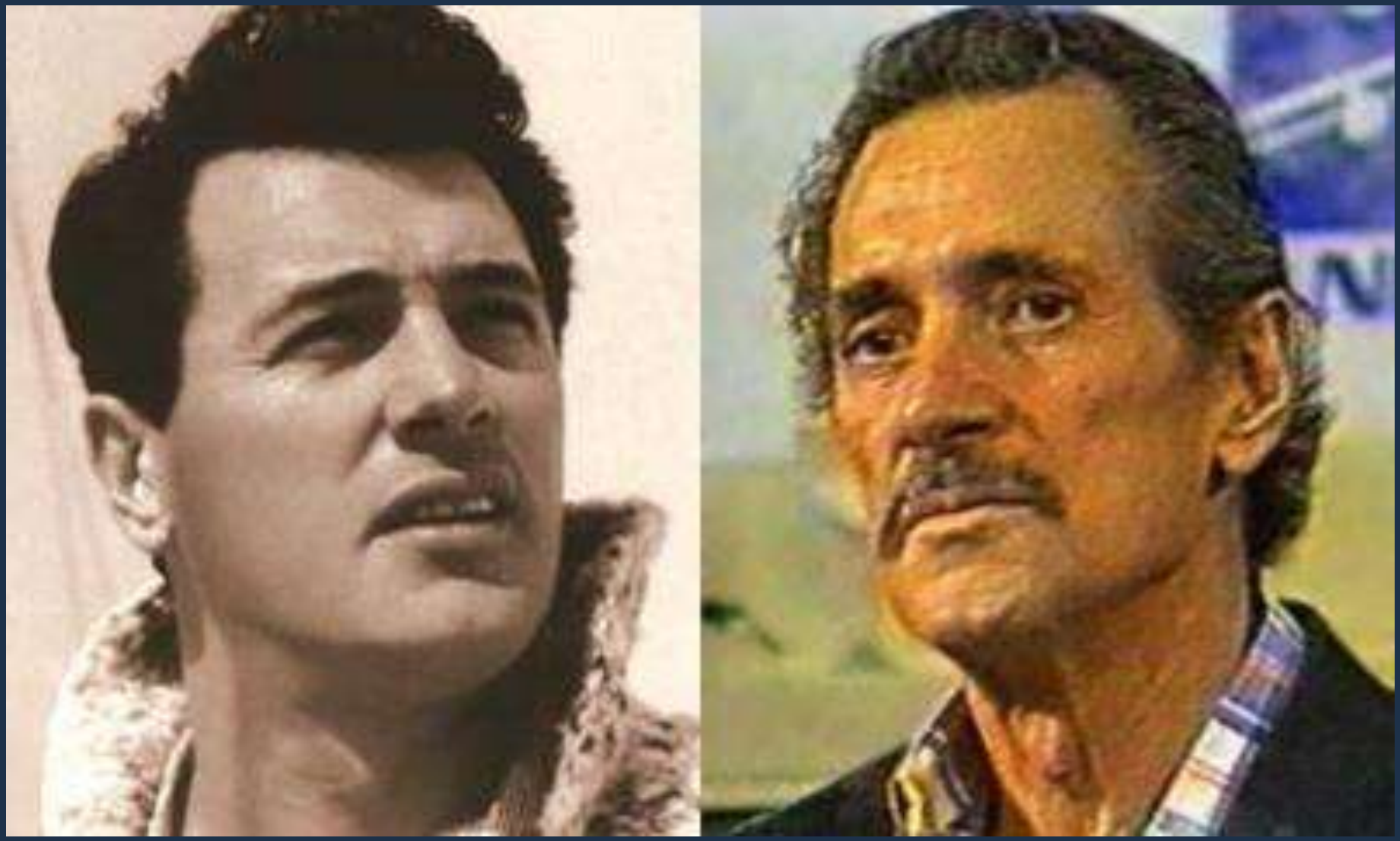
The panel addressed 4 central questions about antiretroviral therapy: when to initiate therapy, which types of drugs to use, when to change therapy, and which types of drugs to use when a change in therapy is indicated. In addition, the treatment of primary HIV infection, prevention of vertical transmission, and postexposure prophylaxis were addressed. The recommendations are not solely based on the results of controlled clinical trials with well-defined clinical endpoints. Developing clinical guidelines in the HIV field at this time requires an approach firmly anchored in data from controlled, double-blind clinical trials when available, but must also include information from trials in progress and available virologic and immunologic endpoint data, as well as extrapolations from studies of the pathophysiology of HIV infection. Clinical decisions must be made for best use of up to 8 available antiretroviral drugs, at a time when long-term studies with clinical endpoints have been completed for only a few possible combinations.

The recommendations herein reflect the panel's agreement on the importance of plasma HIV RNA measurements for predicting risk of clinical progression as well as of the recent demonstration from clinical trials of combination therapies that reductions in plasma HIV RNA

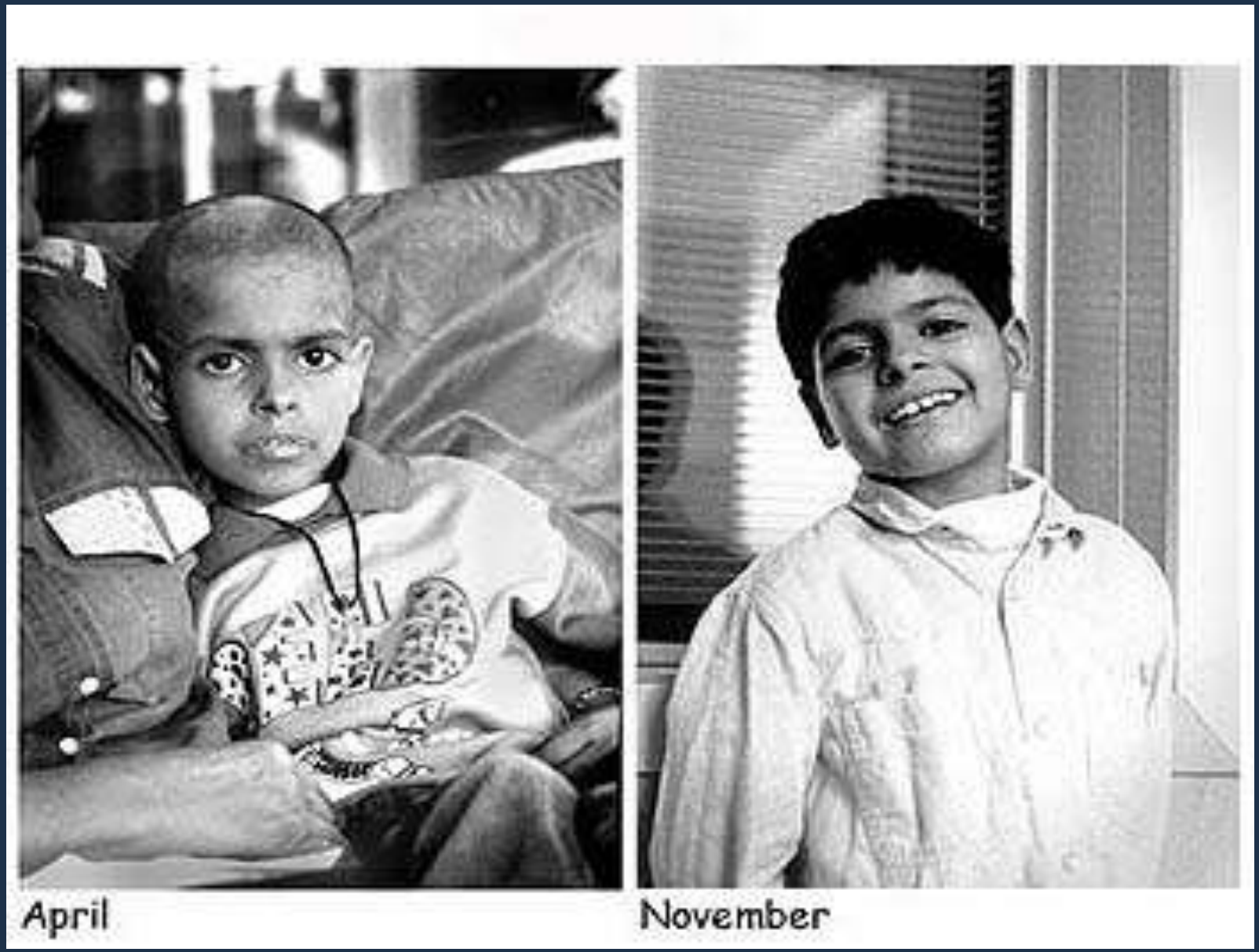



*Palella F et al, HOPS Study*

# 1985



# 1998



Per Stefano Vella la prospettiva di cura è in un cocktail di farmaci dai costi elevatissimi

# Ma la terapia sarà solo per pochi

GIANCARLO ANGELONI

■ È una bella o brutta notizia quella di Robert Gallo, secondo cui «entro dieci anni si curerà l'Aids»? È un'uscita elusiva e generica, che presta il fianco ad una certa informazione disinvolta, interessata solo a conoscere «date» e «linee di tragguardo», oppure contiene intrizioni autentiche dello scienziato? Certo, è strano che ad ogni anno che passa, ci si debba rinovare a fare il gioco delle scommesse: e tanto più in questo 1995 che, anche a seguito della sospensione di tutte le sperimentazioni umane dei vaccini, ha fatto agli inizi pensare al peggio. Facciamo un sano passo indietro, hanno detto alcuni. Sì, per ricominciare e capire, hanno risposto altri: così, faremo due passi in avanti. E, in effetti, se le cose nuove nascono davvero dalle crisi, il ripensamento ha funzionato. Quasi inaspettatamente, due fatti, negli studi sulla patogenesi della malattia e sul fronte della terapia, hanno riportato un po' di sereno. «Ma non è ancora il cielo terso e azzurro – avverte Stefano Vella, direttore del reparto retrovirus nel laboratorio di virologia dell'Istituto superiore di sanità – perché non si devono scambiare i risultati ottenuti, pur importanti, con la cura dell'Aids: a dieci anni e più dall'inizio della pandemia, il ruolo dell'informazione squilibrata in questo campo è ancora un problema non risolto».

Nelle ultime settimane, Stefano Vella è stato invitato ad entrare, come uno dei tre membri per l'Europa, nell'organo di governo dello Ias, l'International Aids Society, che sovrintende alle conferenze internazionali, attualmente a cadenza biennale. Lo scorso anno ha tenuto, alla conferenza internazionale sull'Aids a Yokohama, la lettura inaugurale sulle terapie. E, di recente, al Congresso europeo di Copenaghen sull'Aids, ha discusso dei risultati dello studio europeo-australiano Delta, che ha impegnato, fin dal '92, lo stesso Istituto superiore di sanità, e che si è alleanzato a un altro «trial» molto importante, l'Actg 175, condotto negli Stati Uniti dal National Institutes of Health. Ora, a distanza di un paio di mesi da quell'incontro di Copenaghen, Stefano Vella ricorda: «C'è stato un momento in sala, in cui tra i ricercatori è prevalsa l'emozione. Sì, proprio l'emozione che prova un medico quando si accorge di poter cambiare finalmente la vita del proprio paziente, di essere sulla strada giusta».

**E qual è questa strada, dottor Vella?**

Noi abbiamo diviso lo studio Delta in due parti: nella prima abbiamo sperimentato una terapia combinata, Azt e ddI o Azt e ddC, su pazienti mai trattati in precedenza con antiretrovirali; nella seconda abbiamo invece arruolato, sempre per la stessa terapia combinata, pazienti che avevano avuto un trattamento con Azt di almeno tre mesi precedente all'arruolamento. Bene, sia per la progressione verso l'Aids, sia per la sopravvivenza, i risultati nel primo gruppo sono stati molto più lusinghieri che nel secondo, tanto che nei pazienti mai trattati prima attraverso la monoterapia con Azt, la riduzione di mortalità, mediante l'uso della terapia di combinazione, è stata stimata intorno al 40 per cento. Il confronto, dunque, è stato tra monoterapia e terapia di combinazione, ma il risultato vero dello studio Delta è stato quello di aver ottenuto una risposta sul «come cominciare»: occorre iniziare subito, e a dose piena, con la terapia di combinazione, perché questa, al contrario della monoterapia, ha mostrato di poter modificare la storia naturale della malattia e ha stabilito, in un rapporto di causa ed effetto, che la replicazione del virus e la progressione della malattia sono legate tra di loro.

**Ma, nella prospettiva, ci sono altre opzioni terapeutiche?**

Certo. Lo studio Delta e quello americano hanno tenuto conto solo degli antiretrovirali già disponibili e non di quelli, sempre appartenenti alla famiglia dell'Azt, in via di approvazione da parte dell'Fda e delle stesse autorità europee, come il 3Tc e il D4t. Senza pensare, poi, che in «trial» molto avanzati ci sono gli inibitori delle proteasi, di diversa concezione e di potenza di gran lunga superiore agli analoghi dell'Azt, e che in futuro, forse, si potrà contare su altri inibitori, come quelli dell'integrasi. La prospettiva, dunque, è quella di usare tre o quattro farmaci contemporaneamente, e poi di cambiare le combinazioni, regolamentandole, però, secondo un uso mirato e non selvaggio. Purtroppo, c'è da dire che questa prospettiva riguarderà solo il 5 per cento di coloro che nel mondo sono infetti, perché per le moltitudini dei sieropositivi che vivono in Africa e in Asia nelle condizioni di miseria che sappiamo, i costi molto alti delle terapie di combinazione saranno semplicemente una cosa lunare.

**E non c'è nessun altro intervento possibile?**

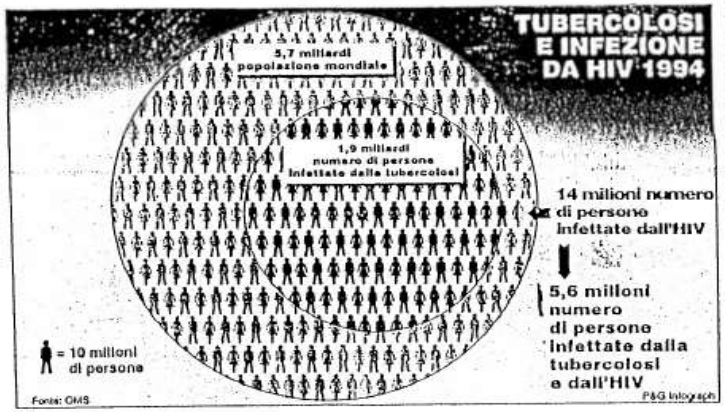
Allo stato dei fatti, l'unico intervento di tipo farmacologico è la prevenzione della trasmissione materno-fetale del virus, come sta cercando di verificare uno studio molto ampio, coordinato dall'Oms, in pratica, si vuol vedere se, somministrando farmaci antiretrovirali nelle fasi più vicine al parto, si riesce ad evitare la trasmissione dell'Hiv nel neonato. Il «trial» prevede una somministrazione che non superi i dieci giorni, perché questo è il limite che le disponibilità economiche pongono.

**Diversa sarebbe la situazione se ci fosse un vaccino?**

Sì, per i suoi bassi costi. Ma, allo stato attuale, non c'è davvero molto da sperare che il problema venga risolto, perché, nel caso dell'Hiv, il sistema immunitario, pur funzionando, non è in grado di contrastare il virus con una risposta efficace. E poi, un'ulteriore complicazione è costituita dalla via di trasmissione, che è generalmente sessuale. Si dovrebbe costituire, insomma, una protezione alla porta di ingresso del virus, cioè al livello delle mucose genitali. Ciò che oggi si pensa, in realtà, è che se un vaccino ci sarà, si tratterà di un «vaccino minore», che impedirà solo la progressione dell'infezione. In questo modo si rallenterebbe il corso della malattia, ma il paziente continuerebbe ad essere infettante.

**Un ultimo punto: la patogenesi. Quali conoscenze nuove hanno portato i lavori pubblicati da «Nature» nel gennaio scorso, di cui si è tanto parlato?**

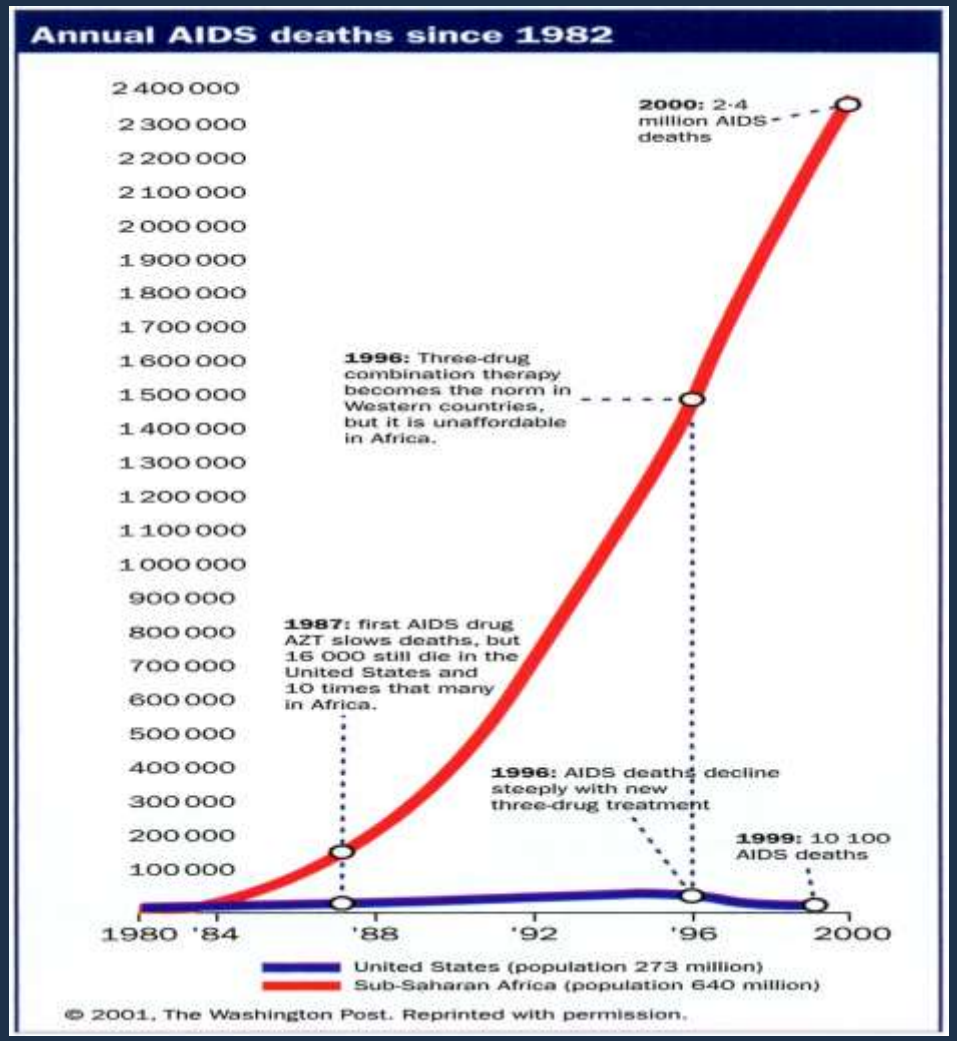
Hanno riconsiderato l'infezione Hiv in un quadro infettivo più classico, secondo un'immagine dinamica che è più vicina alla realtà patologica, e hanno dimostrato che non è vero che il sistema immunitario non funziona a dovere. Anzi, esso regge benissimo all'attacco del virus, e lo fa fino a quando, dopo anni, l'Hiv non riesce a sbaragliare le linee. Se non fosse così, la persona infetta, mediamente entro qualche mese in questo senso, il sistema immunitario va vinto come l'alleato essenziale della terapia.



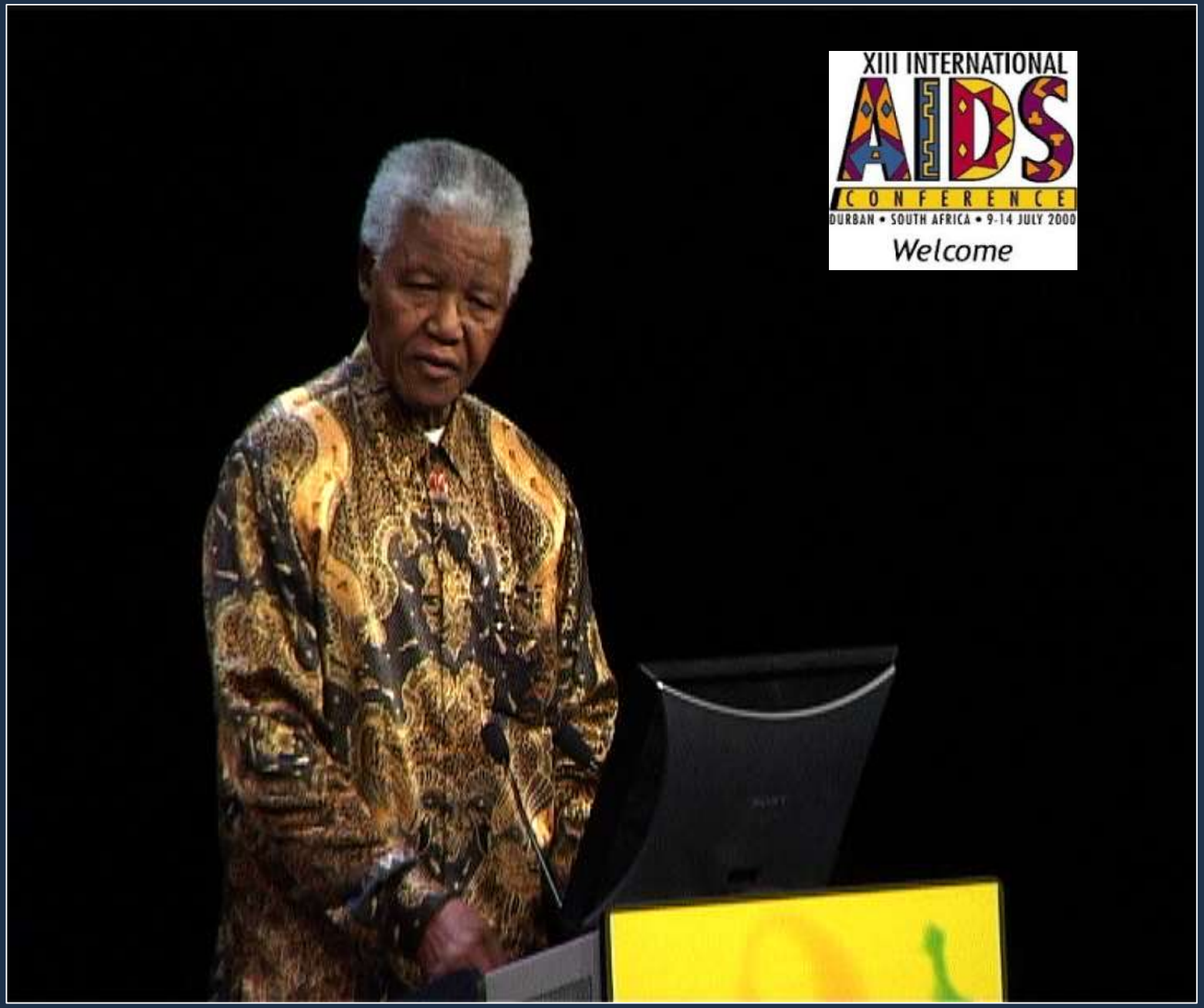

## Tubercolosi più Hiv, il «doppio problema» di domani

**È stata definita «the double trouble», il doppio problema. Sì, perché l'associazione «infezione da Hiv più infezione da tubercolosi» crea molti grattacapi alle autorità sanitarie. E ne creerà sempre di più. L'infezione da tubercolosi è molto diffusa: colpisce nel mondo una persona al secondo e si stima che nei prossimi dieci anni ucciderà 30 milioni di persone. Ma solo il 10 % degli infettati ha il 10 % di probabilità di sviluppare la malattia nel corso della vita. Il rischio però aumenta enormemente se la persona è infettata dal virus dell'Aids. In quel caso le probabilità di ammalarsi aumenta fino al 5 % all'anno. E qui si innesta un circolo vizioso. Il contagio della tbc avviene tramite una persona ammalata, questo vuol dire che un aumento del numero di malati (tra i sieropositivi) comporta un aumento della circolazione della Tbc anche nella popolazione «sana». Negli Usa si è calcolato che l'aumento di Tbc verificatosi dall'85 è dovuto per il 30 % alla diffusione dell'Hiv (le altre cause sono l'aumento di povertà, quello dei senza tetto e il difficile accesso alla cura dei soggetti marginali). In alcuni paesi dell'Africa i casi di tubercolosi sono addirittura raddoppiati. In Italia, secondo uno studio condotto sul nostro territorio, questo fenomeno potrebbe portare a un aumento di circa 1000 casi l'anno.**

# YEAR 2000: difference in mortality between the rich north and the poor south




XIII INTERNATIONAL
AIDS
CONFERENCE
DURBAN • SOUTH AFRICA • 9-14 JULY 2000
Welcome


XIII INTERNATIONAL
AIDS
CONFERENCE
DURBAN • SOUTH AFRICA • 9-14 JULY 2000
Welcome

# Community mobilization

# Durban 2000 – Activism from the South


**Global March for access to HIV treatment**
Treatment Access Campaign (and others)

**EVERYONE HAS THE RIGHT TO HEALTH*!***

All people with HIV/AIDS have a right to access treatments in addition to health care, employment, education, clean water, adequate nutrition, and housing. Denying people with HIV/AIDS access to affordable medicines in order to protect profits or intellectual property rights, is tantamount to genocide.

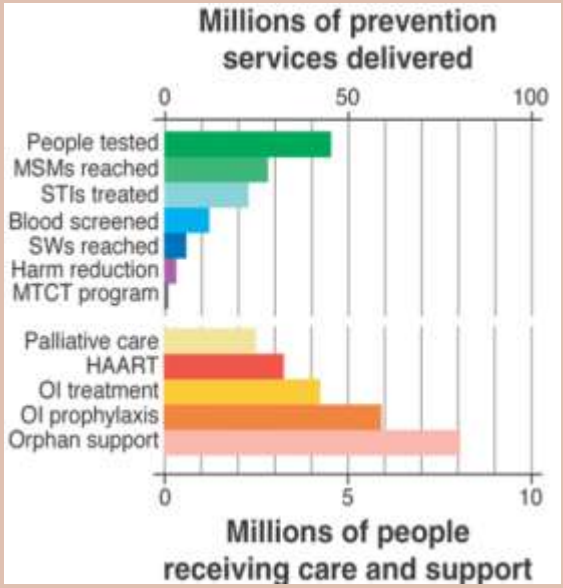
# 2001 – Global Commitment

Investing in our future
The Global Fund
To Fight AIDS, Tuberculosis and Malaria

**Kofi Annan, UN Secretary General:**

**Call for 7 – 10 billion war chest against AIDS and the creation of the Global Fund (launched Jan 2002) *"… we must put care and treatment within everyone's reach".***

**Resource Needs for HIV/AIDS**



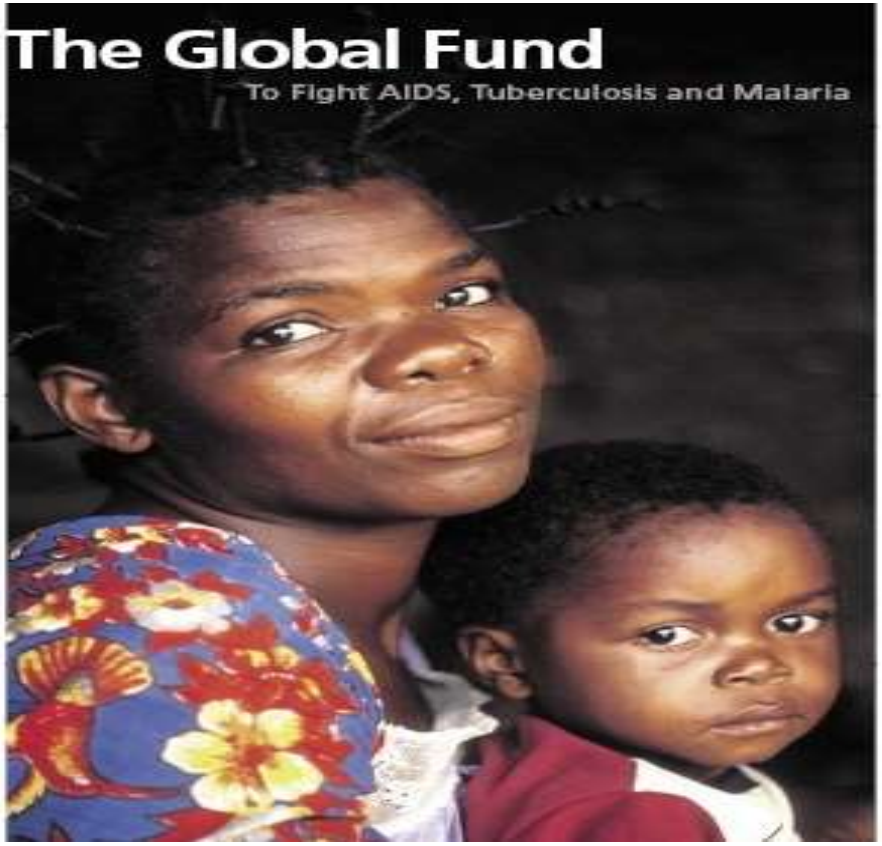

Schwartländer et al, Science, June 2001

**UNGASS AIDS, June 2001**

**Declaration of Commitment:**

**"… make every effort to provide … the highest attainable standard of treatment for HIV/AIDS, including … the effective use of quality-controlled anti-retroviral therapy …"**

# UNGASS 2001:
# THE GLOBAL FUND WAS BORN



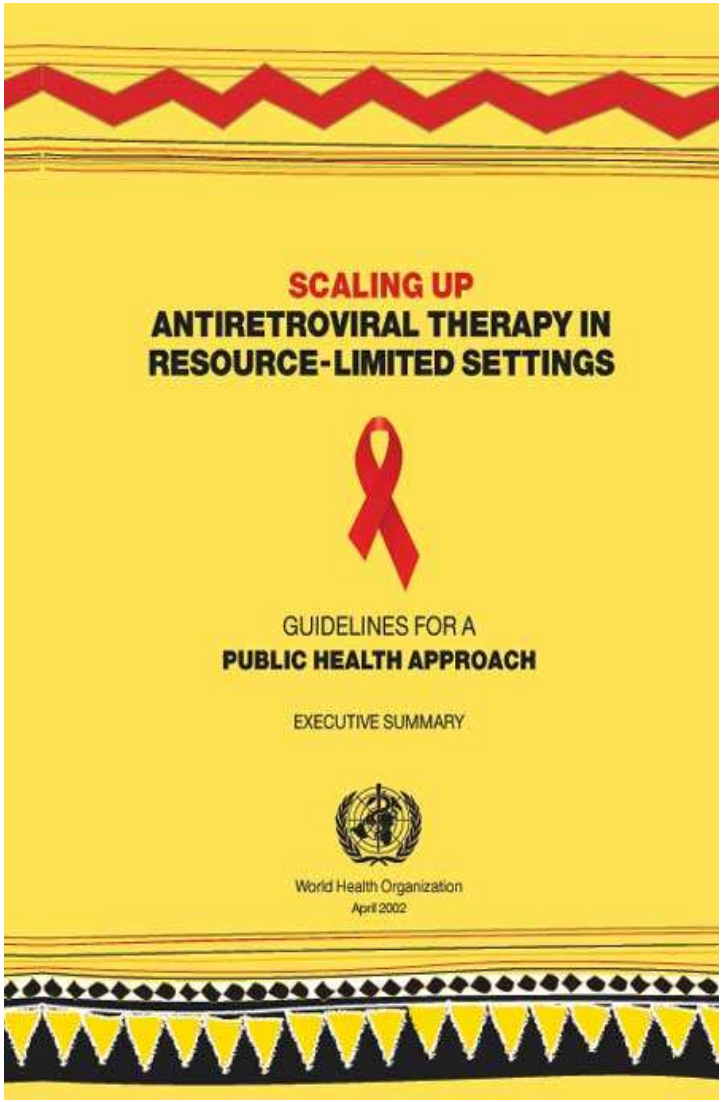

**The Lancet** *Vol 360, November 30, 2002*

Investing in our future
The Global Fund
To Fight AIDS, Tuberculosis and Malaria

# Time to act: global apathy towards HIV/AIDS is a crime against humanity

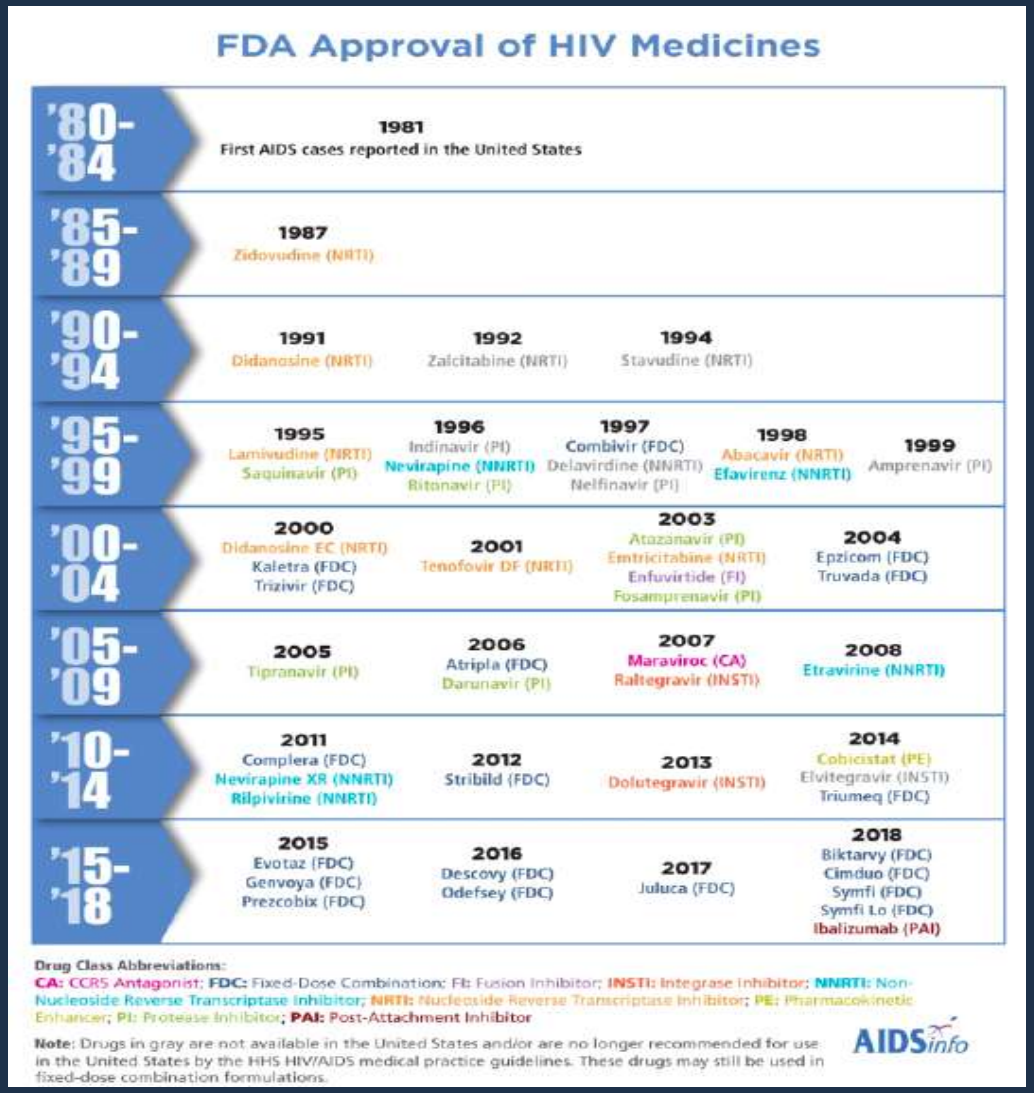
Robert Hogg, Pedro Cahn, Elly Katabira, Joep Lange, NM
Samuel, Michael O'Shaughnessy,
Stefano Vella, Mark Wainberg, Julio Montaner

# The Public Health Approach to ART




**In June 2002, WHO includes 10 ARVs in the list of essential medicines.**

# HIV PHARMACEUTICAL INNOVATION

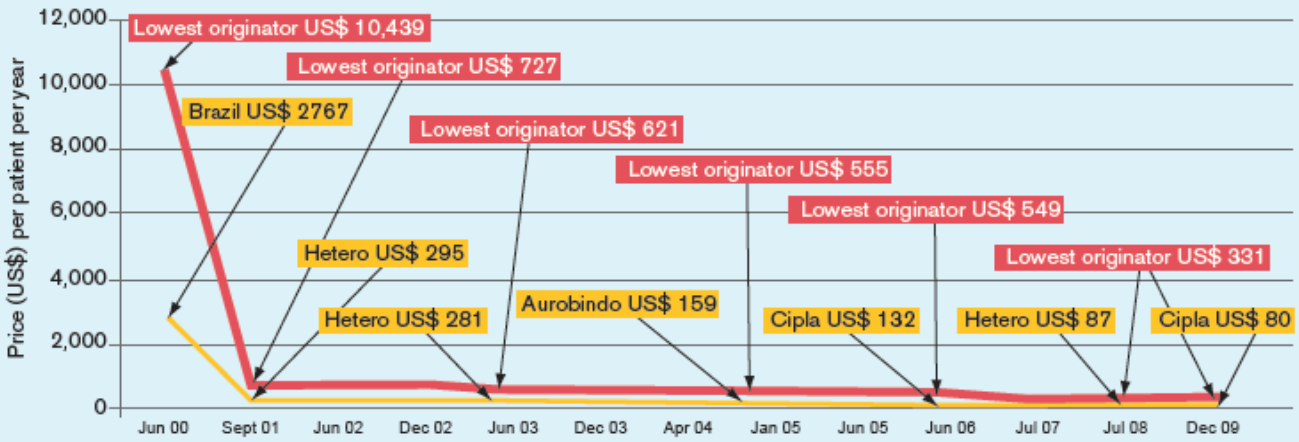


# HIV DRUG PRICING INNOVATION

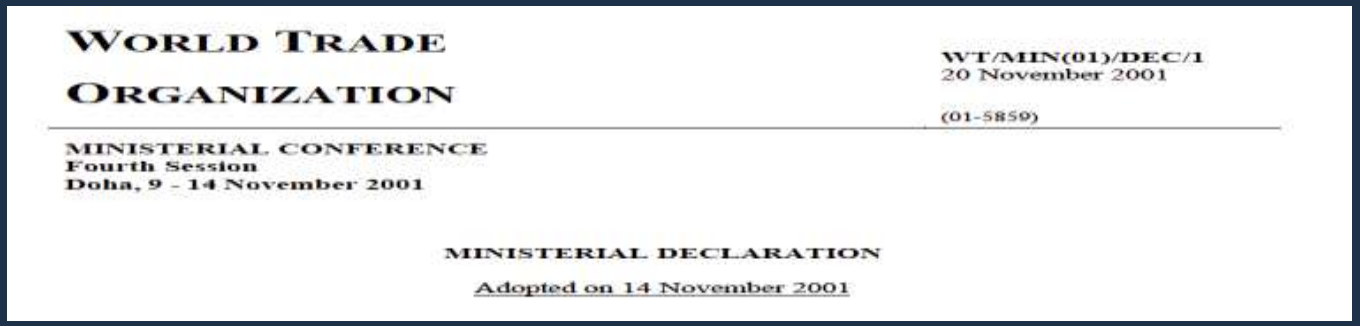
**Box 4: Access to medicines and the Doha Declaration on TRIPS and Public Health**

Measuring access to medicines is a complex task, but price is one key factor among others. The Doha Declaration on TRIPS and Public Health recognized concerns about effects on prices while noting the need for innovation. Since the Declaration was adopted in 2001, prices for many treatments have fallen significantly, in part due to generic competition and tiered pricing schemes (see graph below). Surveys also show a marked increase in the use of TRIPS flexibilities to promote access to medicines.

**Falling prices of first-line combinations of some first-line anti-retroviral therapies for HIV-AIDS since 2000**




*Source:* Extract from MSF, *Untangling the Web of Price Reductions*, January 2010 at http://www.msfaccess.org.



WORLD TRADE ORGANIZATION

WT/MIN(01)/DEC/1
20 November 2001

(01-5859)

MINISTERIAL CONFERENCE
Fourth Session
Doha, 9 - 14 November 2001

MINISTERIAL DECLARATION

Adopted on 14 November 2001

- **"Each member has the right to grant compulsory licences and the freedom to determine the grounds upon which such licences are granted" and**
- **"to determine what constitutes a national emergency or other circumstances of extreme urgency".**

- **Public health crises include "those relating to HIV/AIDS, tuberculosis, malaria and other epidemics" and "other circumstances of extreme urgency".**

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

GLOBAL HEALTH

# Response to the AIDS Pandemic — A Global Health Model

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JUST OVER THREE DECADES AGO, A NEW OUTBREAK OF OPPORTUNISTIC INfections and Kaposi's sarcoma was reported in a small number of homosexual men in California and New York.[1,2] This universally fatal disease, which was eventually called the acquired immunodeficiency syndrome (AIDS), was associated with a complete loss of CD4+ T cells. Within the first year of its description, the disease was also identified in patients with hemophilia, users of injection drugs, blood-transfusion recipients, and infants born to affected mothers. Soon thereafter, a heterosexual epidemic of AIDS was reported in Central Africa, preferentially affecting women.[3,4] Little did we know at the time that this small number of cases would eventually mushroom into tens of millions of cases, becoming one of the greatest pandemics of modern times.

Within 2 years after the initial reports of AIDS, a retrovirus, later called the human immunodeficiency virus (HIV), was identified as the cause of AIDS.[5] Diagnostic tests were developed to protect the blood supply and to identify those infected. Additional prevention measures were implemented, including risk-reduction programs, counseling and testing, condom distribution, and needle-exchange programs. However, HIV continued to spread, infecting 10 million persons within the first decade after its identification.

*An interactive graphic including a prevalence map, a timeline, and details of HIV structure and life cycle is available at NEJM.org*

The second decade of AIDS was marked by further intensification of the epidemic in other areas of the world, including the southern cone of Africa, which saw an explosive HIV epidemic. Asia and the countries of the former Soviet Union also reported a marked increase in the spread of HIV. However, by the mid-1990s, with the discovery of highly active antiretroviral therapy, rates of death in developed countries started to decline. The use of antiretroviral drugs during pregnancy also resulted in a substantial decline in mother-to-child transmission of HIV in high-income countries. However, without access to antiretroviral drugs in low- and middle-income countries, rates of death and mother-to-child transmission continued to increase, with 2.4 million deaths and more than 3 million new infections reported in 2001. Of these new infections, two thirds occurred in sub-Saharan Africa.[6]

## INTERNATIONAL RESPONSE TO AIDS — A GLOBAL HEALTH MODEL

It was not until the third decade of the epidemic that the world's public health officials, community leaders, and politicians united to combat AIDS. In 2001, the United Nations General Assembly endorsed a historic Declaration of Commitment on HIV/AIDS, a commitment that was renewed in 2011.[7] These actions resulted in the formation of the Global Fund to Fight AIDS, Tuberculosis, and Malaria, which was established to finance anti-AIDS activities in developing countries. In 2003, President George W. Bush announced the President's Emergency Plan for AIDS

# HIV AS A MODEL FOR GLOBAL HEALTH

1. It drew together towards the common objective of fighting health inequalities

- ✓ **scientists,**
- ✓ **clinicians,**
- ✓ **public health officials,**
- ✓ **visionary politicians,**
- ✓ **economists,**
- ✓ **NGOs, faith based-organizations**
- ✓ **and patients**

# HIV AS A MODEL FOR GLOBAL HEALTH

2. It recognized the **supranational character of problems of disease** and their amelioration, and the fact that no individual country can adequately address diseases in the face of the movement of people, trade, microbes, and risks.

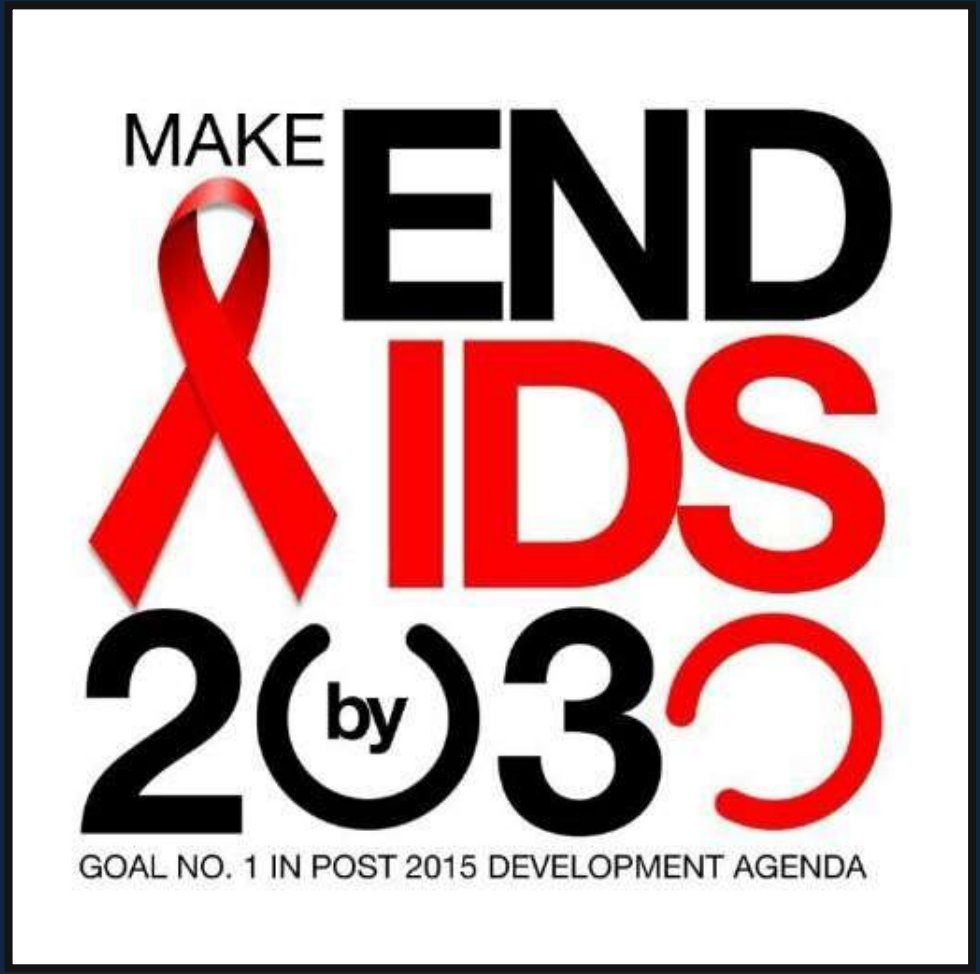
3. It mobilized innovative drug production, pricing and procurement, both from generic and proprietary manufacturers

# HIV AS A MODEL FOR GLOBAL HEALTH

4. it focused on deeper knowledge of the burden of disease to **identify key health disparities and develop strategies for their reduction**.

5. it recognized that **people affected by disease have a crucial role in the discovery and advocacy of new modes of treatment and prevention and their equitable access**

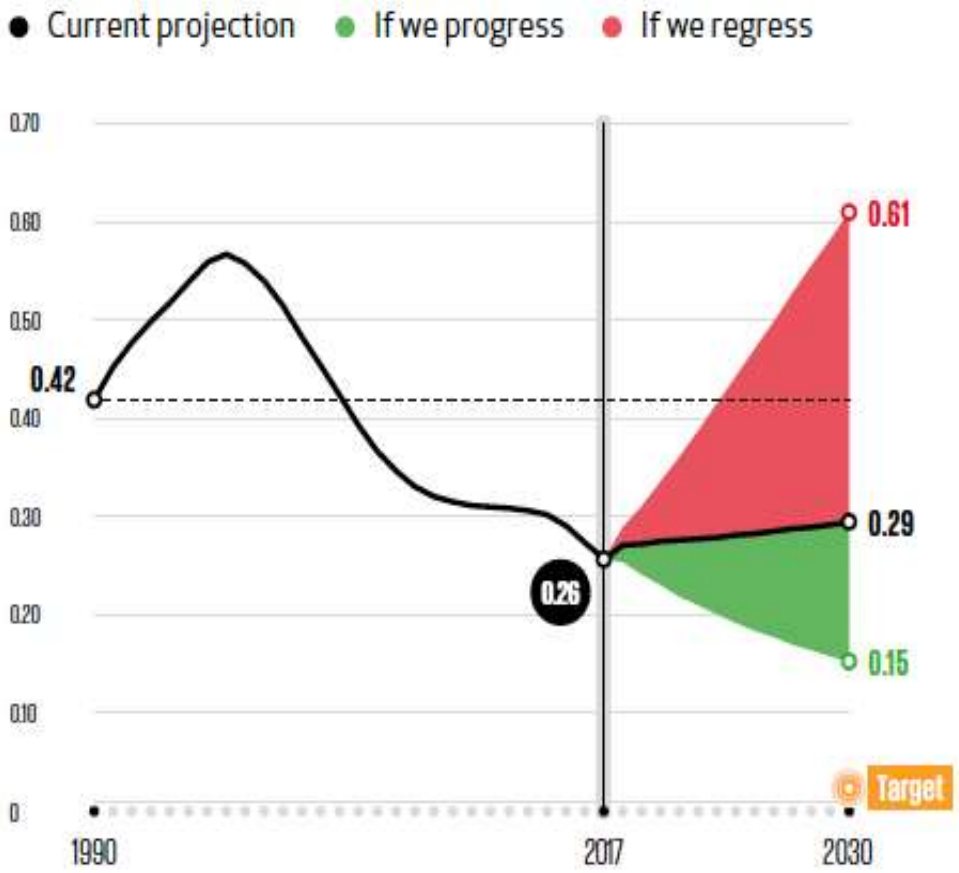
6. It based the action on **ethical and moral values that recognize that equity and rights are central** to the larger goals of preventing and treating diseases worldwide.


MAKE
END
AIDS
2030
by
GOAL NO. 1 IN POST 2015 DEVELOPMENT AGENDA

# HIV

**New cases of HIV per 1,000 people**

HIV treatment helps prevent new infections. An important step toward universal treatment is making sure that people living with HIV know their status. Currently, only 70 percent do. Studies from around the world demonstrate that people, especially those who are hard to reach and at risk, prefer self-testing to clinic-based testing. So far, approximately 40 countries have self-testing policies. If that number goes up, the number of new infections will go down.




SDG Target: End the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases. Target shown on chart has been extrapolated from UNAIDS target of 200,000 new infections among adults in 2030.

# Addressing barriers to the end of AIDS by 2030

The introduction of combination antiretroviral therapy (ART) in 1996 was the first milestone in the fight against HIV/AIDS, and its impact has been huge. Today, we have solid proof that early ART initiation provides benefit for the health of the HIV infected people[1,2] and reduces the risk of HIV transmission.[3] The concept of treatment as prevention is gaining ground, with decreasing HIV incidences proportional to ART coverage.[4,5] However, with HIV testing lagging behind, prevention cannot rely solely on expanded access to ART: combination prevention shall necessarily include both biomedical and non-biomedical interventions. On the biomedical side, the efficacy of pre-exposure prophylaxis (PrEP) has been confirmed by numerous randomised trials, with PrEP "on demand" adding convenience to this preventive strategy.[6] Therapeutic developments are also on the way, with injectable, long half-life antiretrovirals (possibly helping to increase ART adherence, definitely suitable for prevention). Finally, in the search for a cure, recent breakthroughs suggest that reactivation and killing of latently infected cells could be possible one day. Will a cure or remission strategy, whenever available, be accessible to the millions already infected? That's another question.

In the year 2000, opening the Durban IAS Conference, Justice Edwin Cameron said that "our overriding and immediate concern should be to find ways to make accessible for the poor what is within reach of the affluent". The subsequent creation of the Global Fund to Fight AIDS, Tuberculosis, and Malaria and of the Presidents Emergency Plan for AIDS Relief, the increasing penetration of generic antiretrovirals, and the availability of resources for countries' AIDS programmes, held enormous promise. A promise that has actually delivered—with 15 million people on ART before the end of 2015, an accomplishment considered very difficult when this target was set in 2011 by UNAIDS.[7]

Unfortunately, despite the undebatable successes, 2 million new infections happen every year worldwide, and a significant proportion of the 40 million infected people are estimated to live undiagnosed. These numbers will be sobering for those with enthusiastic views regarding the third Sustainable Development Goal (SDG)—*Ensure healthy lives and promote well-being for all at all ages*—which calls for an end to the AIDS epidemic by 2030. To make it happen, three major challenges are in front of us.

The first challenge is scientific: the discovery of an HIV vaccine. Treatment as prevention alone will not be able to stop the epidemic. Despite increasing ART access, there will be no end of AIDS without a preventive vaccine made available for populations living in high prevalence areas and for key affected and marginalised populations around the world. New constructs of HIV epitopes eliciting broadly neutralising antibodies, indicate that an HIV vaccine may be closer than thought just a few years ago.[8] And a vaccine providing even relatively weak protection might still have an important synergistic effect with increased ART coverage, because the number of potential HIV transmitters will be smaller.

The second challenge is operational. Expansion of HIV treatment programmes is expected in years to come, not least because of the switch of the eligibility criteria from starting treatment when CD4 count is less than 500 cells per µL to treatment of all infected. Although the rise in numbers to be treated may not be huge, it will still represent a challenge for already stressed health systems. Clinical and transmission benefits will become evident in the years to come, but the immediate benefits may not be so evident to programme managers. Wafaa El Sadr posed several important questions during the 2015 Vancouver conference: Shall all populations start early? How will the START trial be interpreted in the real world? How will we sustain ART for all, and who will pay? And how do we minimise inequalities and disparities?

In addition, ART attrition represents a substantial barrier to the achievement and maintenance of the UNAIDS targets of 90% in care and 90% with viral suppression. Barriers are not only biomedical (eg, ART toxicity) but also structural and behavioural. Because of the new entry criteria, the proportion of asymptomatic patients will increase: these patients may perceive no short-term benefit from treatment, with consequent treatment cessation, especially in the face of onerous ART procurement or toxic regimens. Therefore, the aspirational dream of implementing a test-and-treat approach for millions of HIV-infected will never be accomplished without innovative models of care: patient-centred, decentralised, and outside of health facilities. Indeed, lay health-care workers and



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# End of AIDS on the horizon, but innovation needed to end HIV

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See Online/Articles
http://dx.doi.org/10.1016/S2352-3018(15)00017-X

In *The Lancet HIV*, Viviane Lima and colleagues describe the amazing progress achieved in the clinical care of HIV-infected patients in British Columbia, Canada. Declines in numbers of deaths and AIDS defining events after the adoption of potent antiretroviral therapy (ART), are well documented.[1] In fact, the many potent drug combinations available today can recover the immune system even in patients presenting at a very advanced stage. In high income countries, 90% of patients adherent to antiretroviral therapy can achieve full HIV suppression.

In resource limited settings, at least in countries where free ART programmes have been implemented, similar trends have been described: UNAIDS estimates that global mortality declined by 35% from 2005 to 2013.[2] The picture may get progressively better, with further reduction of mortality, thanks to the adoption of WHO's 2013 guidelines, which aligned the global standard of care by moving the CD4 count treshold for starting ART to 500 cell per µL and introducing a fixed-dose combination as the first-line treatment of choice.[3-5]

However, an important conceptual difference exist between decreasing local AIDS incidence, and decreasing global HIV incidence. This latter goal, well described in the UNAIDS 90-90-90 strategic paper, is based on the ability of ART to stop HIV transmission. Indeed, the vision of ending the HIV epidemic by 2030 may remain very aspirational, without an honest reality check. The modelling exercise supporting the 90-90-90 strategy predicts that at least 73% of all HIV positive individuals shall be suppressed to have a significant effect on HIV transmission at a population level.[6] Unfortunately, even in British Columbia, a high-income setting, data on the cascade of care shows that only 35% of the overall HIV population is fully suppressed.[7] In the USA, the Centers for Disease Control estimate that only 25% of HIV-positive people are suppressed.[8]

decentralisation, knowing your epidemic and reaching the right people; targeting of key populations; training of health-care workers to recognise signature diseases; fully involving the community; destigmatisation and human rights; and taking advantage of the new testing technologies.

Innovation will also be aggressively pursued—through operational research—in access and retention in care (the second 90): community and peer engagement and motivational counselling will be reinforced, specifically for earlier stages of infection. ART uptake and retention is indeed associated with perceptions of personal necessity for treatment and concerns about potential for adverse events. These are key barriers to linkage, particularly now that we are thinking at a global test-and-treat approach. Again, this is an area where new technologies, like point of care CD4 and RNA diagnostics, but also mobile technologies will be key elements for success.

Finally, to reach the third 90, the therapeutic armamentarium available in high-income settings must be made available to all populations at affordable prices. If this is not achieved, the extraordinary successes of the past 10 years could be progressively lost. In a few years, an epidemic of treatment failures may emerge in low-income settings, because of patients' non-adherence or fragility and side-effects of the currently used regimens (despite having saved millions of lives so far). In the absence of viral load monitoring, failures will not be diagnosed in time and will not be manageable with the few second-line treatments currently available.[9,10]

As our visionary friend Joep Lange used to say, almost a decade ago, "first line shall not fail". This will become a reality only if the best drug combinations, including new classes, are made available worldwide. In other words, the current standard of care needs a second global alignment.

# Definitely far away….

## From Durban to Durban: end of AIDS further than hoped

The International AIDS Conference in July celebrated the success of antiretroviral treatment (ART) in reducing illness and death.[1] The pall of despair that hung over the the previous Durban conference in 2000 has truly lifted, and in one of the great success stories of global health 17 million people have begun ART. Despite this achievement the mood was sombre as the goal of an end to AIDS receded; but it was also purposeful, and we can do much to bring the goal closer.

We commend the UNAIDS 90-90-90 strategy for fostering testing and linkage to treatment and WHO for guidelines to support it.[2,3] However, substantial implementation obstacles exist, the greatest of which is that a large proportion of people living with HIV do not know they are infected. In particular, key populations are less likely to access HIV services because of the stigma and discrimination reinforced by laws that criminalise people who inject drugs, men who have sex with men, and sex workers. Even if expanded testing enables us to achieve the first 90 (assuming we know the correct country denominators) and even if patients are retained and adherent for life (regrettably improbable), the 90-90-90 cascade omits 27% of those with HIV. Transmission dynamics are complex, and the 27% left behind most probably include hard-to-reach, stigmatised populations and people with difficult to detect acute primary infection, who together are responsible for most transmissions. The UNAIDS prevention gap report shows new HIV infections stagnating at 2·1 million annually, with many countries experiencing unexpected increases.[4] IHME's independent estimates are even higher—74 countries with increased HIV incidence and 2·5 million new infections every year.[5] In many countries, including Botswana, South Africa, and Swaziland, HIV incidence remains distressingly high, even as we approach or attain the ambitious 90-90-90 treatment goals. Moreover, in a cluster randomised test and treat trial in KwaZulu-Natal, TasP did not reduce new HIV infections.[6] True that the HPTN 052 results provide incontestable proof of treatment as prevention efficacy among carefully selected stable partners in a meticulously monitored research setting.[7] But we are not yet seeing, nor should we expect to see, comparable population level effectiveness in the real world. Without underestimating the transformative effects of treatment in reducing AIDS morbidity and mortality and slowing HIV transmission, we will not end this epidemic with tablets alone.

The START[8] and Temprano[9] trials finally showed that immediate ART initiation in adults with CD4 counts greater than 500 cells per μL reduces the risk of primary events by 57% compared with deferring ART until CD4 count falls below 350 per μL. The number of deaths, however, was the same in both arms and the absolute difference in the primary clinical endpoint was modest, perhaps because both trials were stopped prematurely.[10,11] On balance, the personal health benefits combined with the public health benefit



*"We have never ended a global epidemic without a vaccine or a cure and HIV will not be an exception"*

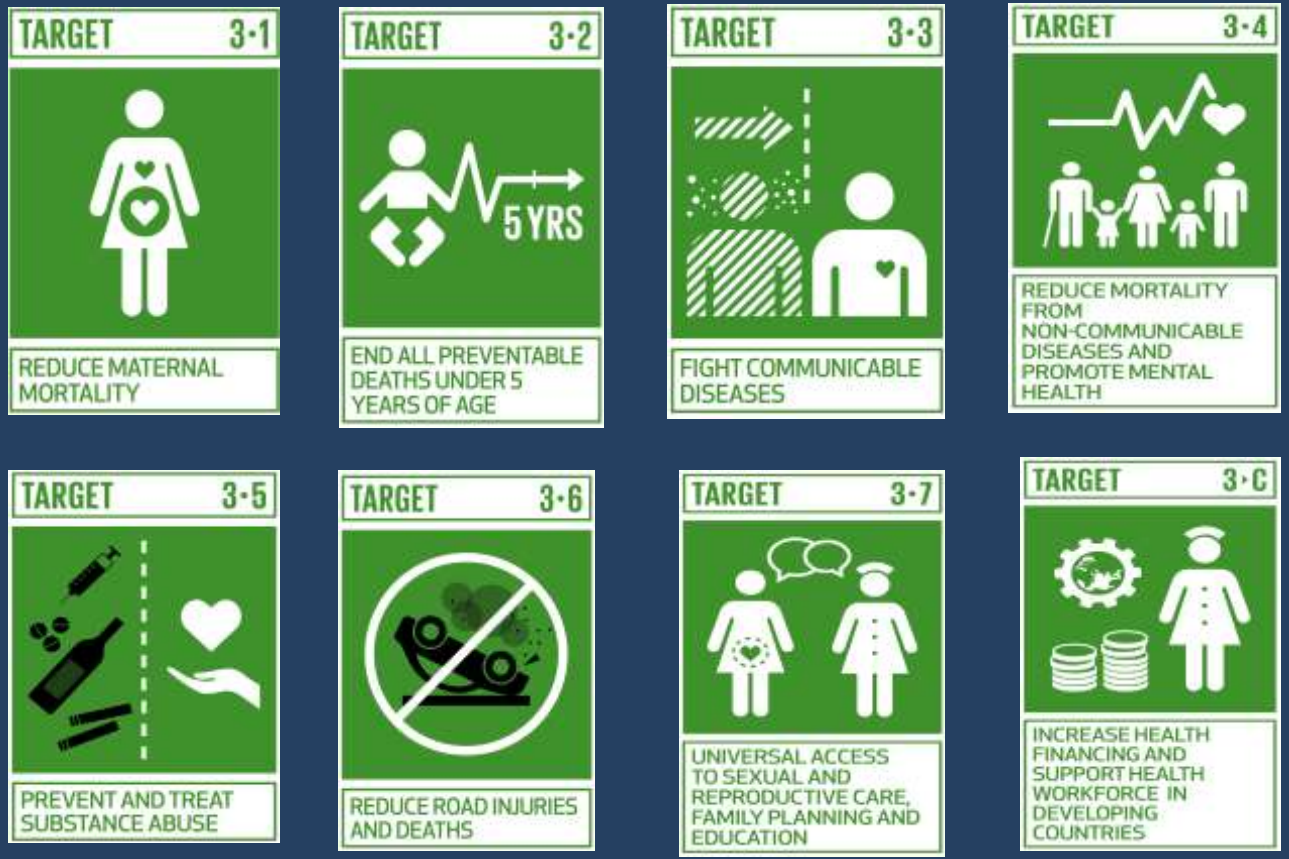
Vella S. Wilson D. From Durban to Durban: end of AIDS further than hoped. **Lancet HIV**, Vol 3, September 2016, e403-405.

# A way forward: the agenda 2030


SUSTAINABLE DEVELOPMENT GOALS
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS


3
GOOD HEALTH
AND WELL-BEING

# SDG 3 - TARGETS



# The Sustainable Development Goals are interlinked

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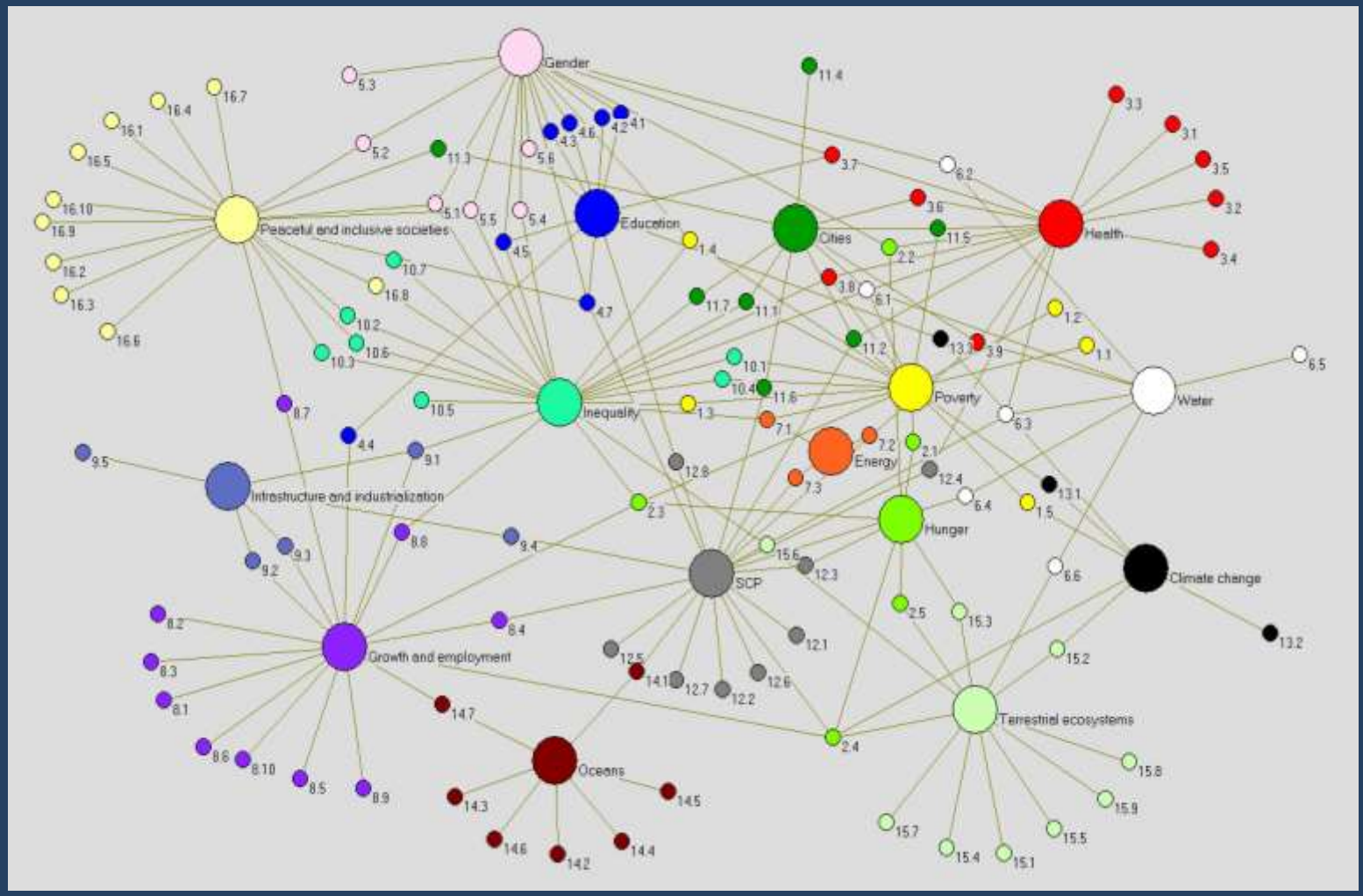


*500 million people worldwide lack health care including access to essential medicines, vaccines, diagnostics, medical devices, and health technologies that prevent and treat diseases*

# Access to medicines: lessons from the HIV response

Just two decades ago, HIV/AIDS treatments were prohibitively expensive and accessible in only a few affluent countries. But remarkable reductions in costs have enabled treatment expansion that has reduced mortality and transmission. Today, first-line HIV drugs cost less than US$100 per person per year, a 99% reduction from more than $10 000 in 2000. The number of people receiving HIV treatment doubled in just 5 years, from 9 million in 2011 to more than 18 million today.[1]

In a world facing growing inequalities, the HIV response has lessons for low and middle-income countries (LMIC)—but also for high-income countries—on access to care and treatment for communicable diseases and for non-communicable chronic diseases, a global pandemic that dwarfs the HIV epidemic in scale.[2]

The transformative power of the HIV response was underpinned by moral rather than technical arguments. A unique coalition of activists, scientists, celebrities, and religious and community leaders from all over the world argued that no one should be denied life-saving treatment because of area of residence or income. The moral imperative was operationalised by activism for more urgent drug discovery, regulatory approval, and voluntary and compulsory licensing, followed by shifts towards large-scale generic production. Economies of scale underpinned a drive towards more efficient, cheaper production, and drove prices down. Major donors such as the Global Fund to Fight AIDS, Tuberculosis, and Malaria and the US President's Emergency Plan for AIDS Relief bought generic drugs. The Clinton Health Access Initiative negotiated price-volume discounts



Vella S, Wilson D. Access to medicines: lessons from the HIV response.
Lancet HIV. 2017 Apr;4(4):e147-e149. doi: 10.1016/S2352-3018(17)30052-8.

# Cost Considerations and Antiretroviral Therapy

Last Updated: October 17, 2017; Last Reviewed: October 17, 2017

| Coformulated Combination Products as Single Tablet Regimens | | | | |
|---|---|---|---|---|
| **Dolutegravir/Abacavir/Lamivudine** | 50/600/300 mg tablet | 1 tablet daily | 30 tablets | $3,118.62 |
| **Efavirenz/Tenofovir Disoproxil Fumarate/Emtricitabine** | 600/300/200 mg tablet | 1 tablet daily | 30 tablets | $3,057.89 |
| **Elvitegravir/Cobicistat/Tenofovir Alafenamide/Emtricitabine** | 150/150/10/200 mg tablet | 1 tablet daily | 30 tablets | $3,306.92 |

**The regimen which contains DTG (dolutegravir)**

**is becoming extensively available in LMIC countries**

**for about 1/100 of the current price – around US $75 per person per year.**

UNITED NATIONS SECRETARY-GENERAL'S HIGH-LEVEL PANEL ON ACCESS TO MEDICINES

# Promoting Innovation and Access

medicines • vaccines • diagnostics • health technologies

## A New Deal to Close the Gap in Health Innovation and Access

The rising costs of health technologies and the lack of new tools to tackle health problems like disease outbreaks and antimicrobial resistance is a growing problem. Catalyzing innovation, especially for rare diseases, diseases of the poor, and the development of new antibiotics has proven very difficult without market incentives.

**The twin challenges of innovation and access constrain health outcomes and hinder social and economic development in rich and poor countries.**

## The Imbalance Between Human Rights, Intellectual Property Rights and Public Health Objectives is Leaving People Behind


TARGET 3.8
ACHIEVE UNIVERSAL HEALTH COVERAGE

# Universal Health Coverage (UHC)

means that ALL PEOPLE can obtain the quality health services they need without suffering financial hardship.

# The concept of “public good”

**non exclusive: anyone can use them**

**non competitive: their use will not limit others to use them**

# The concept of “public good”

**Progress of medicine and essential medicines shall be considered as global public goods and be accessible to all human beings living on our planet**

# Thank you

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