Access to treatment for HIV/AIDS in resource-limited settings

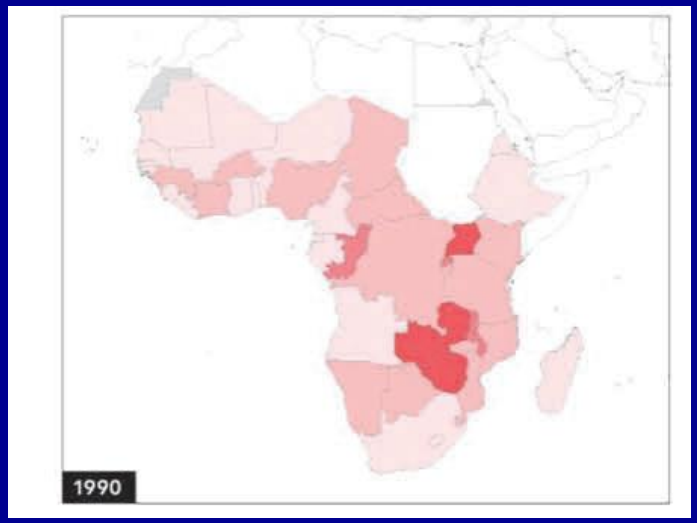
Challenges, successes and future perspectives

Nathan Ford

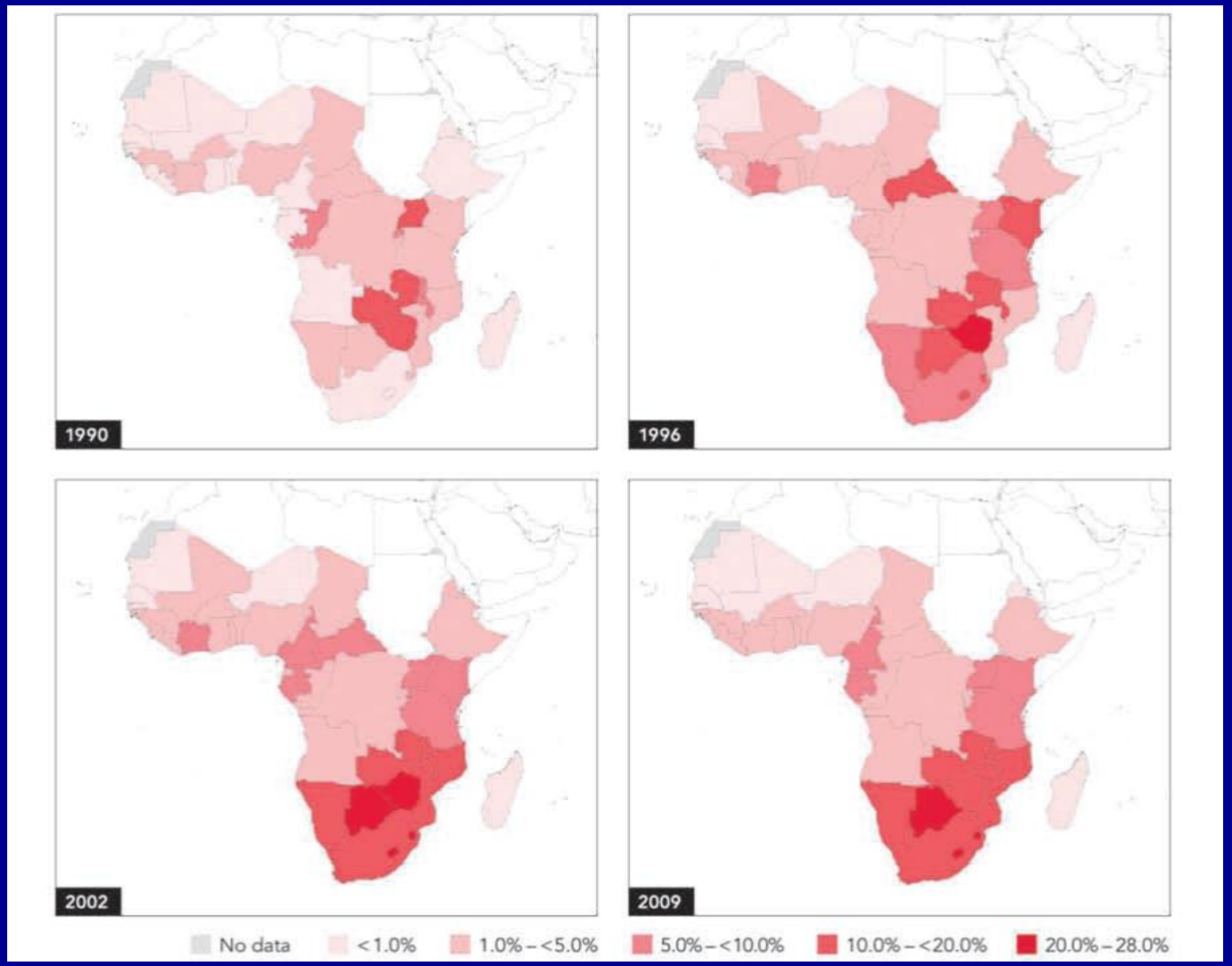
Imperial college

26 October 2012

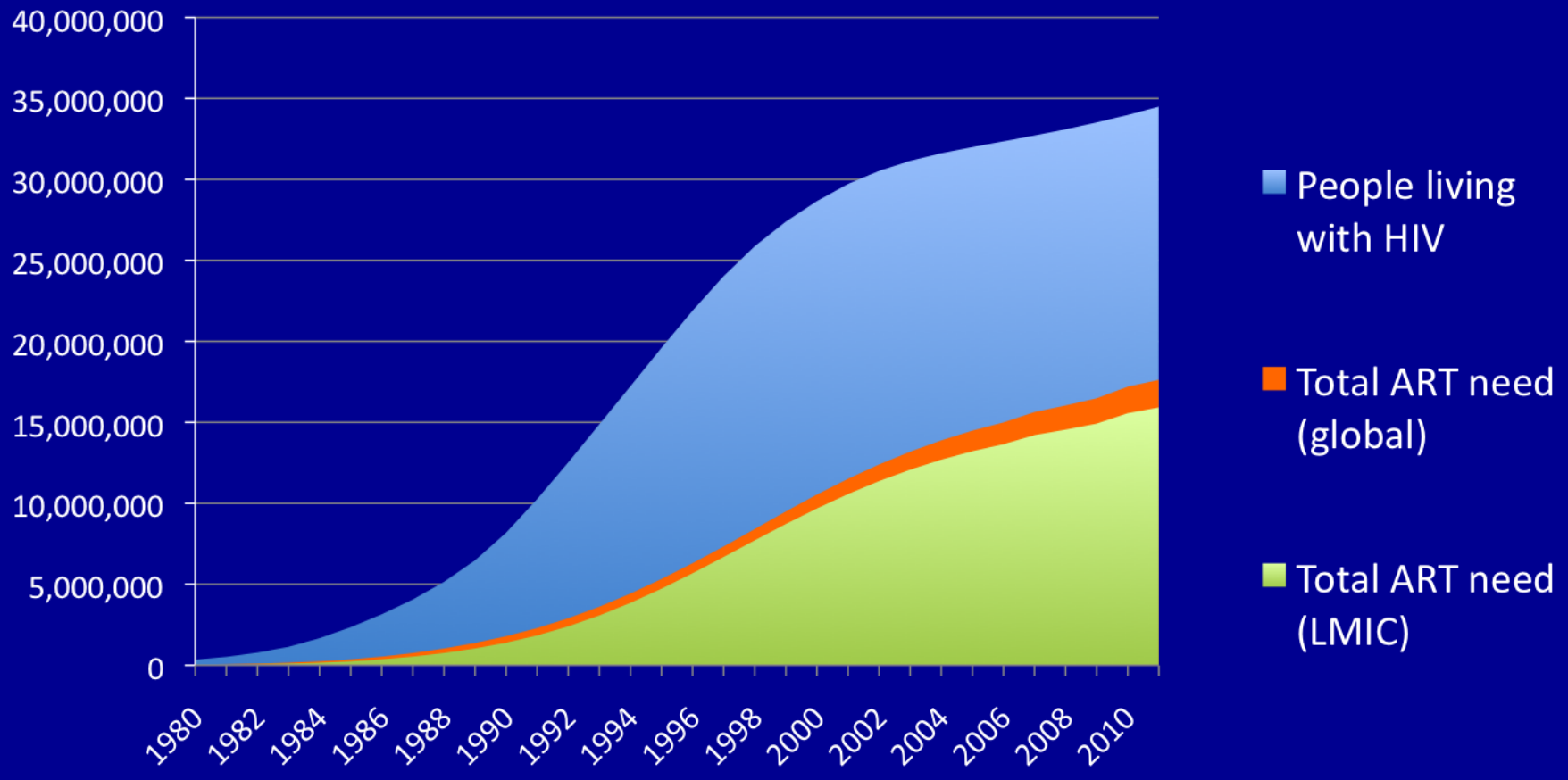
HIV prevalence in Africa over the last 20 years



HIV prevalence in Africa over the last 20 years

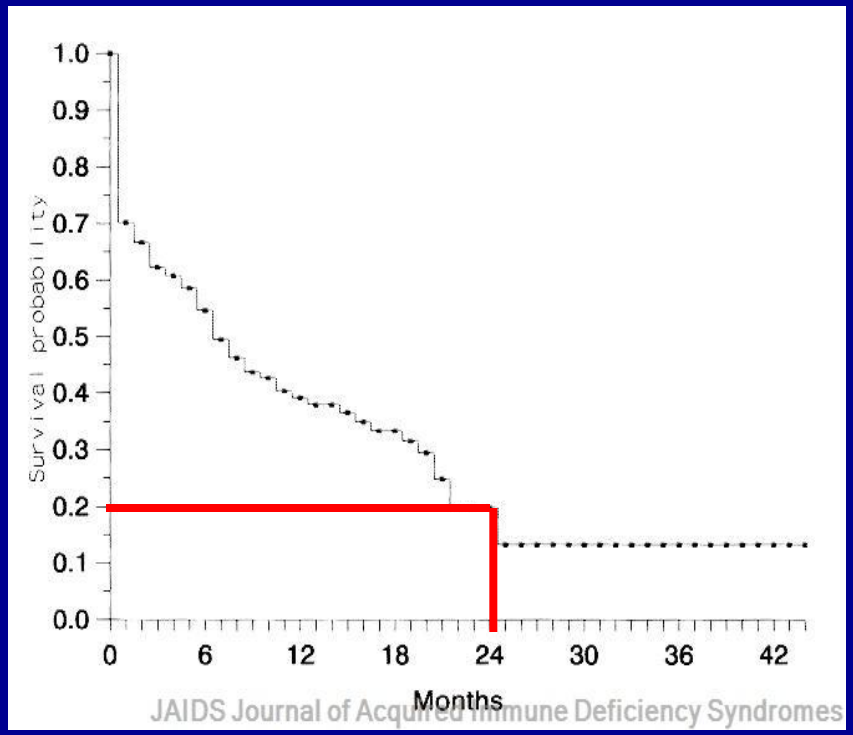


Rapidly rising need for prevention and treatment



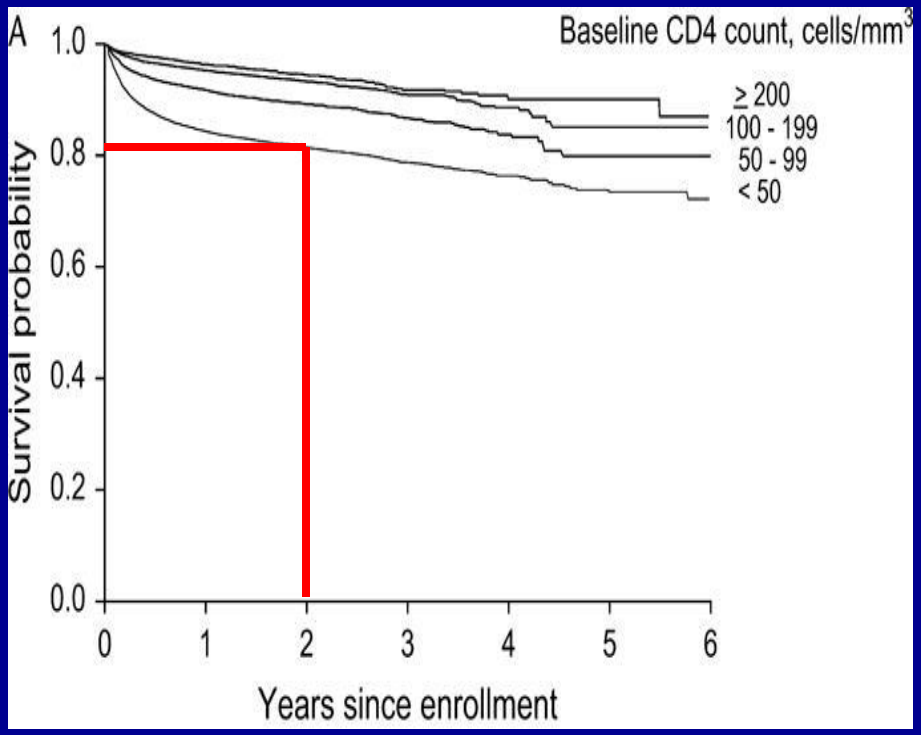
Mortality before and after treatment

Without ART



Kitayaporn et al, *JAIDS* 1996

With ART



Chasombat et al, *JAIDS* 2009

The benefits of antiretroviral therapy

Farmer P, NEJM 2006

Four key challenges to scaling up access to antiretroviral therapy

- Access to medicines
- Funding
- Human resources
- Models of delivery

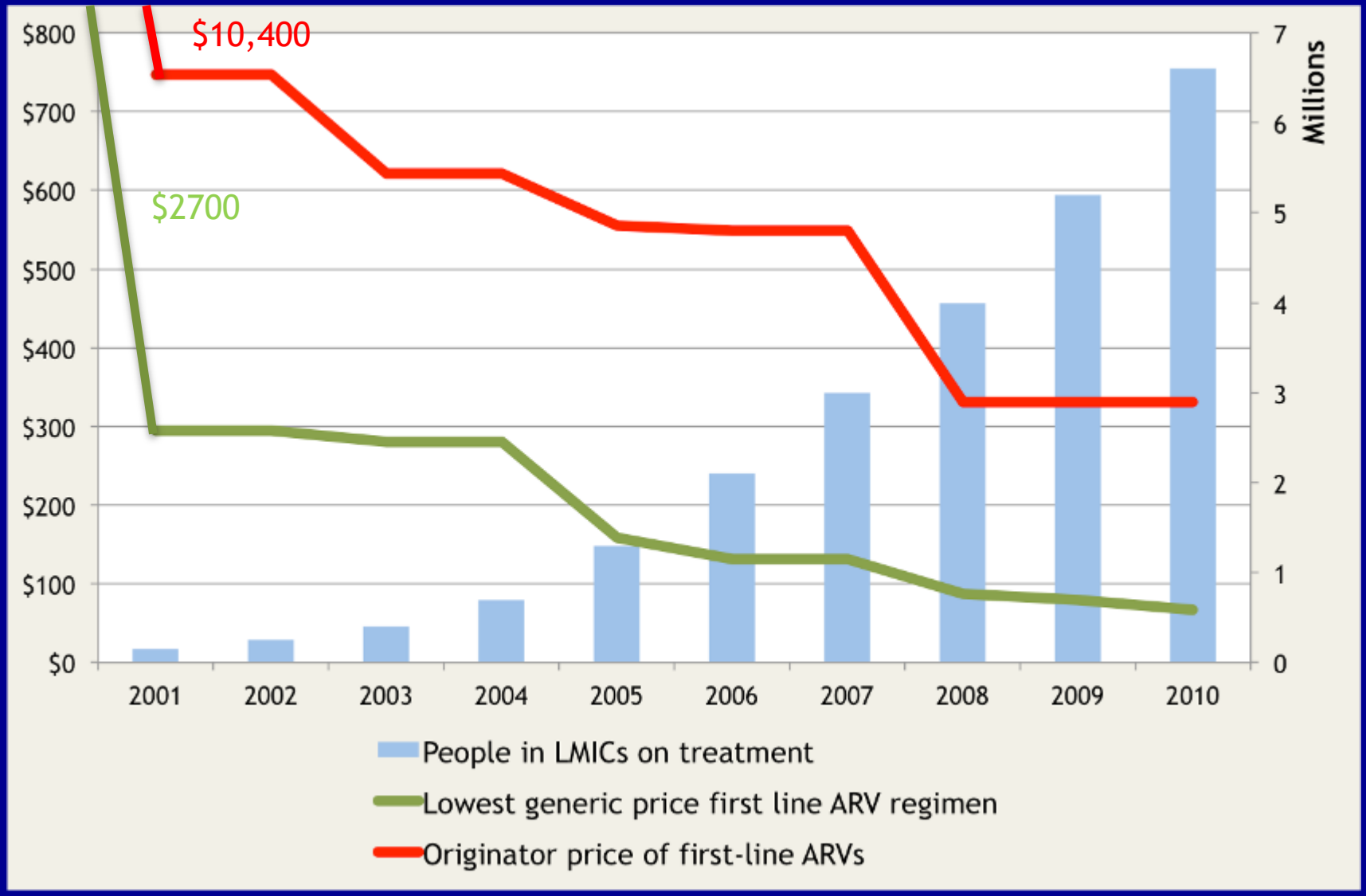
Access to fluconazole

Manufacturer	Country	Price ($US)
Biolab	Thailand	0.29
Cipla	India	0.64
Pfizer	Thailand	6.20
Pfizer	South Africa	8.25
Pfizer	Kenya	10.50
Pfizer	USA	12.20
Pfizer	Guatemala	27.60

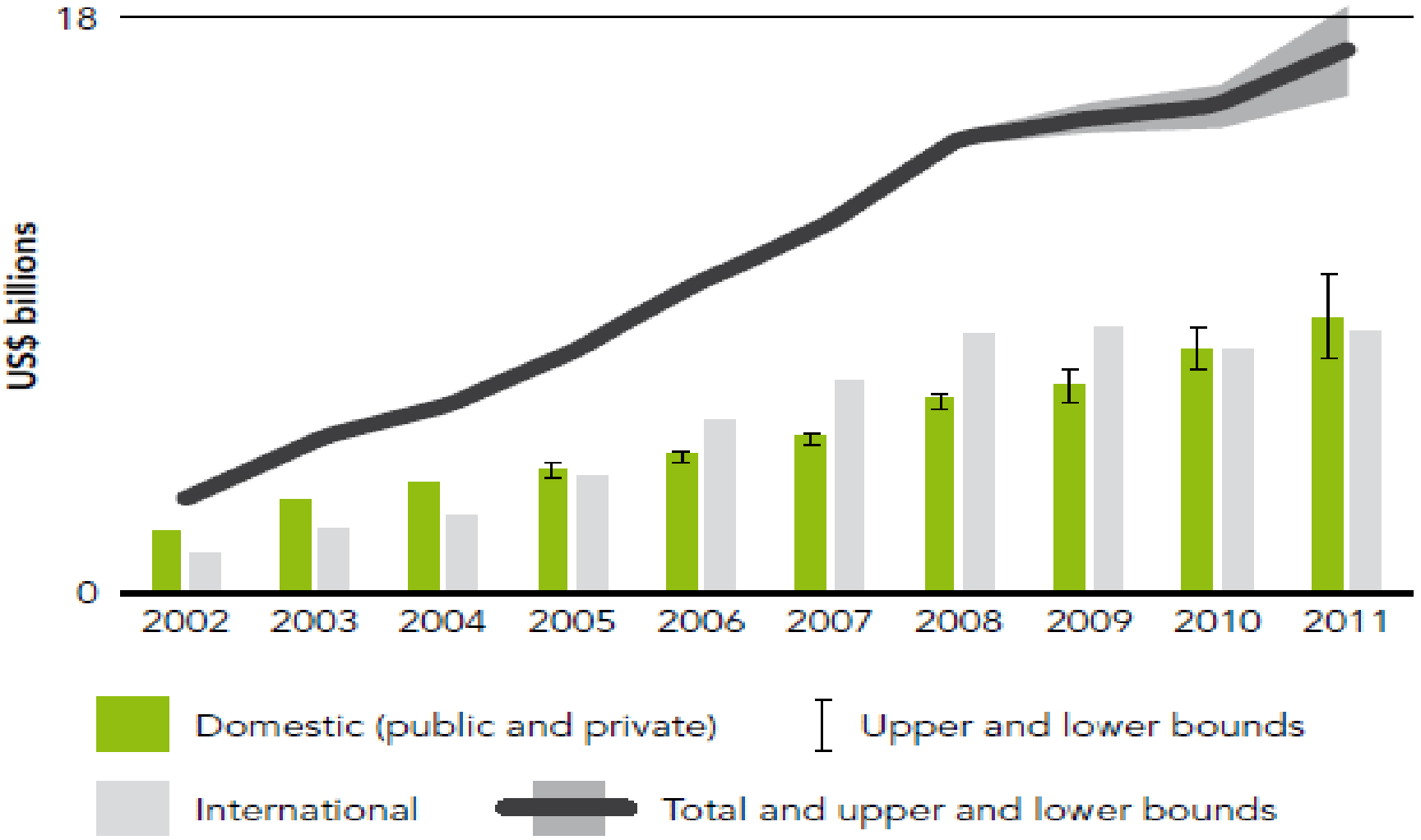
Perez et al, *Lancet* 2000


LIVES BEFORE PROFIT
AIDS PROFITEER
COSATU SUPPORTS THE MEDICINES ACT
DRUGS
STOP DRUG COMPAN
PROFITEERING
TREAT HIV/AIDS

Price competition & treatment scale-Up



Resources available for HIV in low- and middle-income countries, 2002–2011



Health worker distribution

Country	Doctors (100,000 population)	Nurses (100,000 population)
WHO minimum standard	20	100
USA	256	937
UK	230	1212
Malawi	2	59
Lesotho	5	62
Mozambique	3	21
South Africa	77	408

- Malawi: 100x less doctors/population than the UK
- Lesotho: 89 doctors for 1.8 million people (1 in 4 adults HIV positive)
- South Africa: 14 times less doctors in rural vs urban areas

What should be done?

Task shifting

The delegation of tasks to health workers with lower qualifications. Task shifting could include shifting tasks to an existing lower-level cadre or to new cadres

Task shifting to address health worker shortage

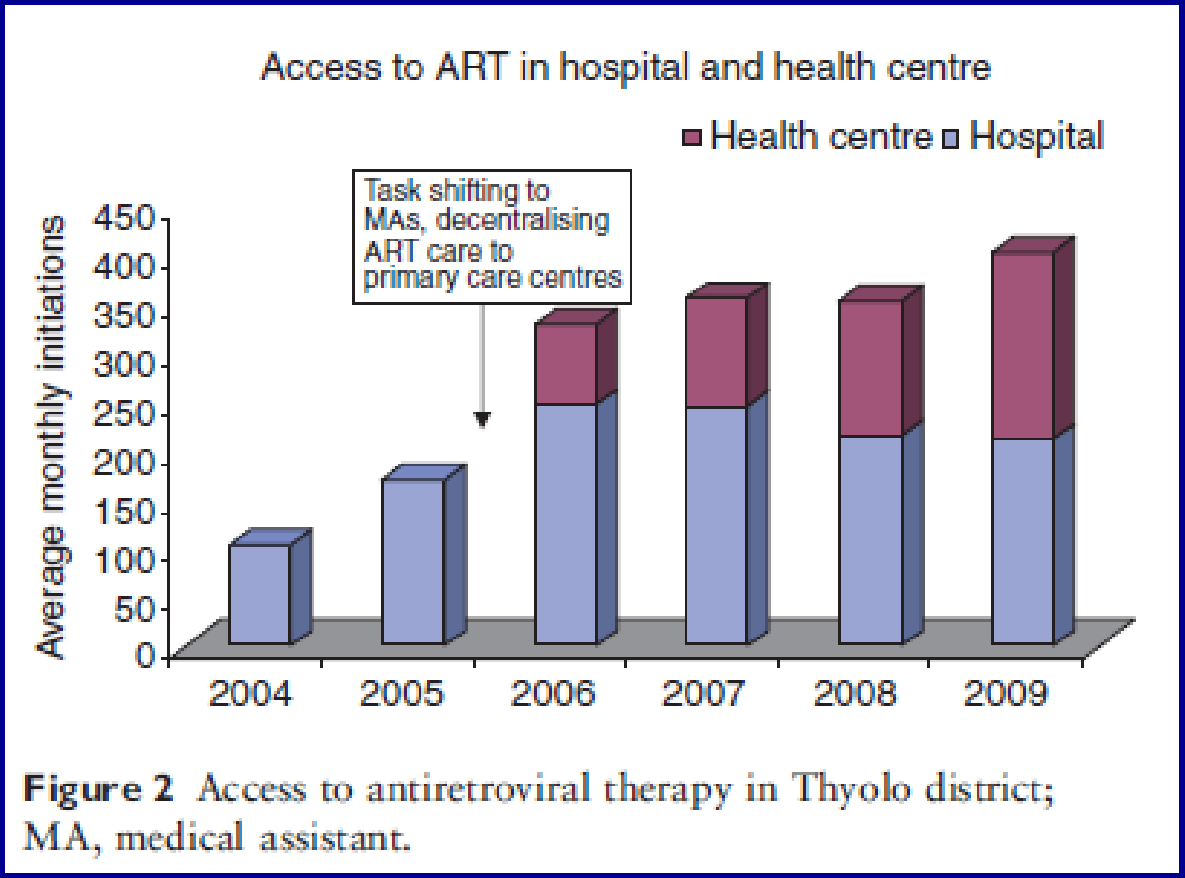


Figure 2 Access to antiretroviral therapy in Thyolo district; MA, medical assistant.

Time to ART initiation decreased from nearly 100 days in 2003 to less than 3 weeks in 2009

Bemelmans M et al. Tropical Medicine and International Health, 2010, 15(12):141.

Task shifted ART delivery in Malawi

- 347, 983 people alive and on ART

33,336 initiated in Q1 2012

- 80% retention at 12 months

http://www.hivunitmohmw.org/

Task shifting to address health worker shortage

Task shifting of antiretroviral treatment from doctors to primary-care nurses in South Africa (STRETCH): a pragmatic, parallel, cluster-randomised trial

Lara Fairall, Max O Bachmann, Carl Lombard, Venessa Timmerman, Kerry Uebel, Merrick Zwarenstein, Andrew Boulle, Daniella Georgeu, Christopher J Colvin, Simon Lewin, Gill Faris, Ruth Cornick, Beverly Draper, Mvula Tshabalala, Eduan Kotze, Cloete van Vuuren, Dewald Steyn, Ronald Chapman, Eric Bateman

Summary

Background Robust evidence of the effectiveness of task shifting of antiretroviral therapy (ART) from doctors to other health workers is scarce. We aimed to assess the effects on mortality, viral suppression, and other health outcomes and quality indicators of the Streamlining Tasks and Roles to Expand Treatment and Care for HIV (STRETCH) programme, which provides educational outreach training of nurses to initiate and represcribe ART, and to decentralise care.

Methods We undertook a pragmatic, parallel, cluster-randomised trial in South Africa between Jan 28, 2008, and June 30, 2010. We randomly assigned 31 primary-care ART clinics to implement the STRETCH programme (intervention group) or to continue with standard care (control group). The ratio of randomisation depended on how many clinics were in each of nine strata. Two cohorts were enrolled: eligible patients in cohort 1 were adults (aged ≥16 years) with CD4 counts of 350 cells per μL or less who were not receiving ART; those in cohort 2 were adults who had already received ART for at least 6 months and were being treated at enrolment. The primary outcome in cohort 1 was time to death (superiority analysis). The primary outcome in cohort 2 was the proportion with undetectable viral loads (<400 copies per mL) 12 months after enrolment (equivalence analysis, prespecified difference <6%). Patients and clinicians could not be masked to group assignment. The interim analysis was blind, but data analysts were not masked after the database was locked for final analysis. Analyses were done by intention to treat. This trial is registered, number ISRCTN46836853.

Findings 5390 patients in cohort 1 and 3029 in cohort 2 were in the intervention group, and 3862 in cohort 1 and 3202 in cohort 2 were in the control group. Median follow-up was 16·3 months (IQR 12·2–18·0) in cohort 1 and 18·0 months (18·0–18·0) in cohort 2. In cohort 1, 997 (20%) of 4943 patients analysed in the intervention group and 747 (19%) of 3862 in the control group with known vital status at the end of the trial had died. Time to death did not differ (hazard ratio [HR] 0·94, 95% CI 0·76–1·15). In a preplanned subgroup analysis of patients with baseline CD4 counts of 201–350 cells per μL, mortality was slightly lower in the intervention group than in the control group (0·73, 0·54–1.00; p=0·052), but it did not differ between groups in patients with baseline CD4 of 200 cells per μL or less (0·94, 0·76–1·15; p=0·577). In cohort 2, viral load suppression 12 months after enrolment was equivalent in intervention (2156 [71%] of 3029 patients) and control groups (2230 [70%] of 3202; risk difference 1·1%, 95% CI −2·4 to 4·6).

Interpretation Expansion of primary-care nurses' roles to include ART initiation and represcription can be done safely, and improve health outcomes and quality of care, but might not reduce time to ART or mortality.

Funding UK Medical Research Council, Development Cooperation Ireland, and Canadian International Development Agency.

Introduction

Since 2006, efforts to increase access to antiretroviral therapy (ART) in Africa have emphasised task shifting—ie, delegation of clinical tasks from doctors to other health-care workers.[1] However, robust evidence of its effectiveness is scarce. A 2010 systematic review of task shifting in care of patients with HIV infection[2] showed that it is effective and can provide high-quality care, but of 25 original studies reviewed, only 11 made comparisons with alternatives, and only two of those were randomised trials. Neither trial assessed the effect of task shifting on mortality in people awaiting ART, which in both was initiated by doctors.[3,4]

In South Africa, a major obstacle to ART expansion has been the shortage of doctors available to initiate treatment, because of an absolute shortfall and also because doctors spend much of their time represcribing ART. Delayed ART initiation has resulted in high mortality rates in patients who are eligible for ART but waiting for treatment.[3,4] Thus, evidence from randomised trials is needed on whether other health workers can effectively and safely identify patients eligible for ART,

Lancet 2012; 380: 889–98
Published Online
August 15, 2012
http://dx.doi.org/10.1016/S0140-6736(12)60730-2

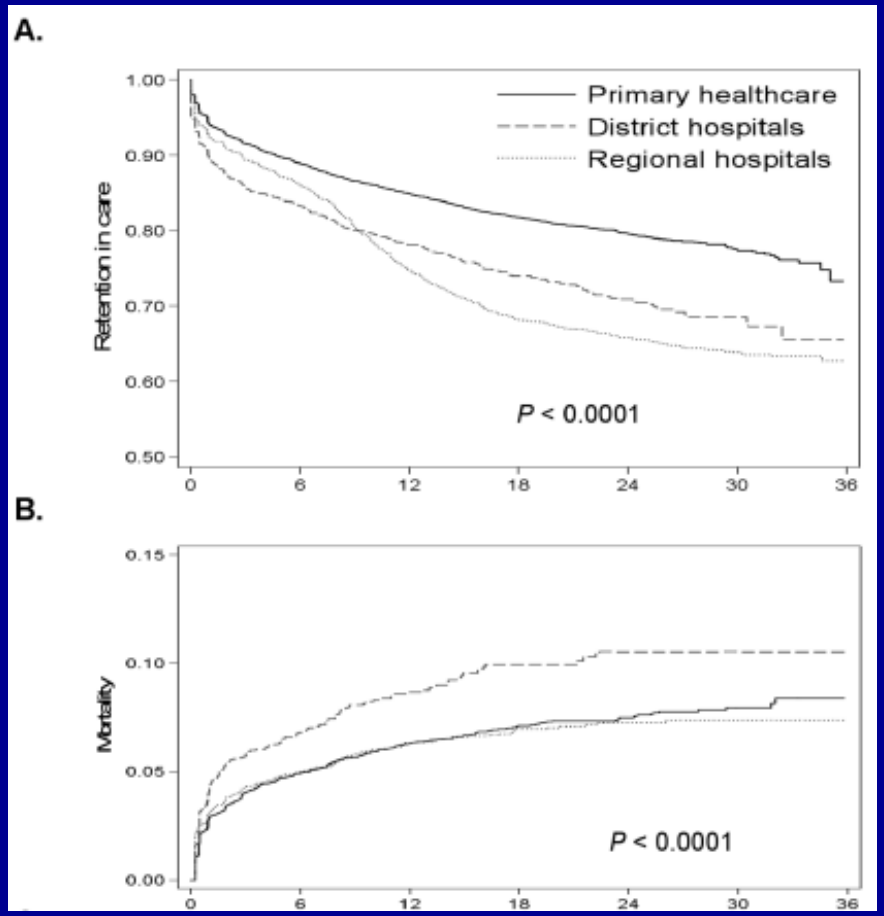
See Comment page 865

Knowledge Translation Unit, University of Cape Town Lung Institute (L Fairall PhD, V Timmerman MSc, K Uebel MBChB, M Zwarenstein PhD, D Georgeu Dip Nursing, G Faris Dip General Nursing, R Cornick MBChB, B Draper MBChB), **Department of Medicine** (L Fairall, Prof E Bateman MD), **and School of Public Health and Family Medicine** (A Boulle PhD, C J Colvin PhD), **University of Cape Town, Cape Town, South Africa; Norwich Medical School, University of East Anglia, Norwich, UK** (Prof M O Bachmann PhD); **Biostatistics Division** (C Lombard PhD) **and Health Systems Research Unit** (S Lewin PhD), **Medical Research Council, Cape Town, South Africa; Sunnybrook Research Institute and Department of Health Policy, Management and Evaluation, University of Toronto, Toronto, ON, Canada** (M Zwarenstein); **Karolinska Institute, Stockholm, Sweden** (M Zwarenstein); **Department of Family Medicine, Western University, London, ON, Canada** (M Zwarenstein); **Norwegian Knowledge Centre for Health Services, Oslo, Norway** (S Lewin); **Free State Department of Health, Bloemfontein, South Africa** (M Tshabalala MBChB, R Chapman MMed); **and Department of Computer Science and Informatics** (E Kotze PhD), **and Department of Medicine** (K Uebel, C van Vuuren MBChB, D Steyn MBChB), **University of the Free State, Bloemfontein, South Africa**

"Expansion of primary-care nurses' roles to include ART initiation and prescribing can be done safely, and improve health outcomes and quality of care"

Decentralization of care

Better outcomes through decentralization of ART service delivery in South Africa

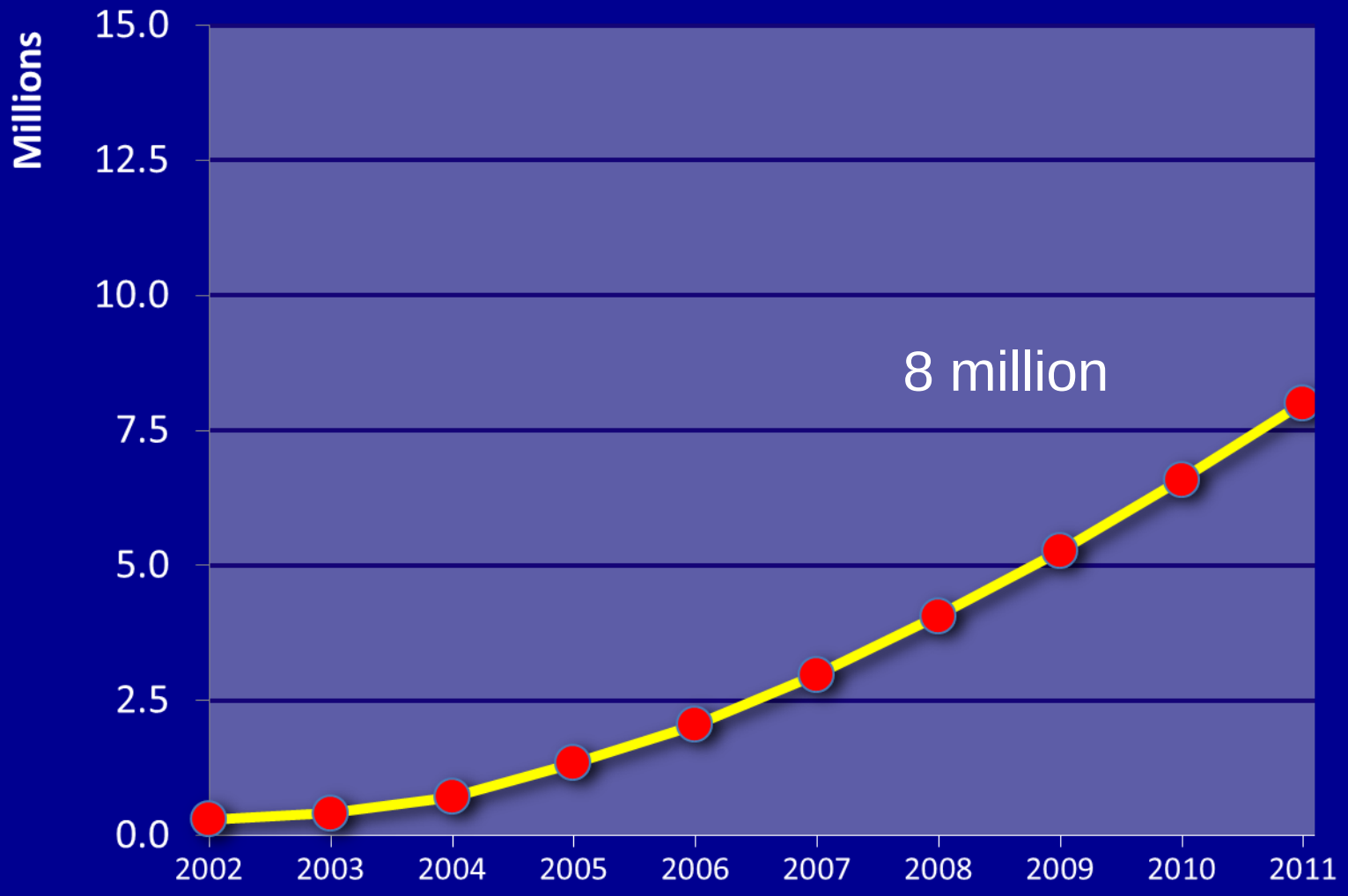


Fatti G et al. PLoS ONE 2010.

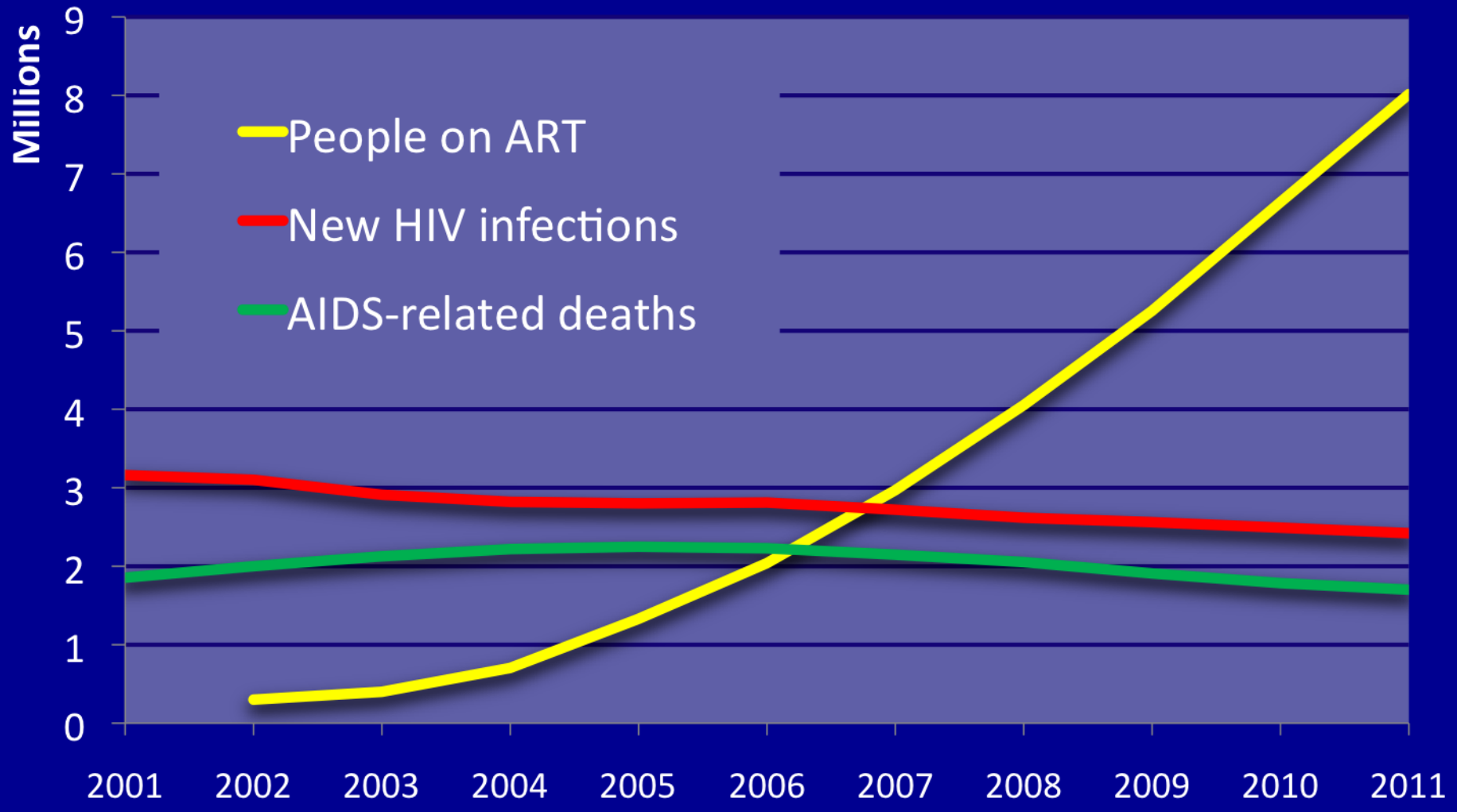
Patients at PHC had:

- Better retention in care
- Lower mortality rates
- Equivalent treatment response

ART scale up over the last decade

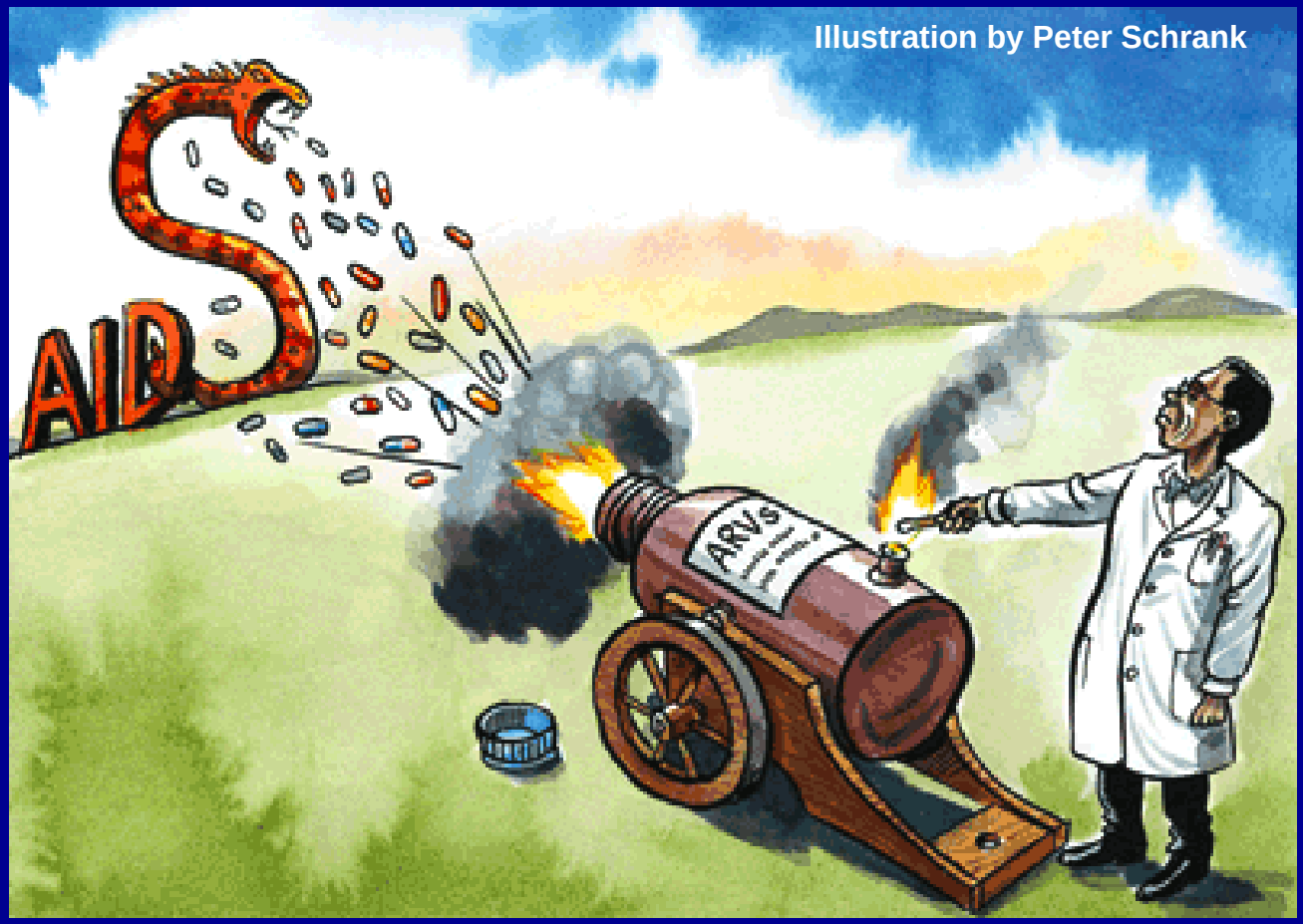


Scale-up of ART, number of AIDS deaths and new HIV infections in LMIC*, 2001–2011



* LMIC= Low- and middle-income countries

“Deploying the drugs used to treat AIDS may be the way to limit its spread”



The Economist, Nov 27th 2008

Treatment as prevention

VIRAL LOAD AND HETEROSEXUAL TRANSMISSION OF HUMAN IMMUNODEFICIENCY VIRUS TYPE 1

VIRAL LOAD AND HETEROSEXUAL TRANSMISSION OF HUMAN IMMUNODEFICIENCY VIRUS TYPE 1

THOMAS C. QUINN, M.D., MARIA J. WAWER, M.D., NELSON SEWANKAMBO, M.B., DAVID SERWADDA, M.B., CHUANJUN LI, M.D., FRED WABWIRE-MANGEN, PH.D., MARY O. MEEHAN, B.S., THOMAS LUTALO, M.A., AND RONALD H. GRAY, M.D., FOR THE RAKAI PROJECT STUDY GROUP

ABSTRACT

Background and Methods We examined the influence of viral load in relation to other risk factors for the heterosexual transmission of human immunodeficiency virus type 1 (HIV-1). In a community-based study of 15,127 persons in a rural district of Uganda, we identified 415 couples in which one partner was HIV-1–positive and one was initially HIV-1–negative and followed them prospectively for up to 30 months. The incidence of HIV-1 infection per 100 person-years among the initially seronegative partners was examined in relation to behavioral and biologic variables.

Results The male partner was HIV-1–positive in 228 couples, and the female partner was HIV-1–positive in 187 couples. Ninety of the 415 initially HIV-1–negative partners seroconverted (incidence, 11.8 per 100 person-years). The rate of male-to-female transmission was not significantly different from the rate of female-to-male transmission (12.0 per 100 person-years vs. 11.6 per 100 person-years). The incidence of seroconversion was highest among the partners who were 15 to 19 years of age (15.3 per 100 person-years). The incidence was 16.7 per 100 person-years among 137 uncircumcised male partners, whereas there were no seroconversions among the 50 circumcised male partners ($P<0.001$). The mean serum HIV-1 RNA level was significantly higher among HIV-1–positive subjects whose partners seroconverted than among those whose partners did not seroconvert (90,254 copies per milliliter vs. 38,029 copies per milliliter, $P=0.01$). There were no instances of transmission among the 51 subjects with serum HIV-1 RNA levels of less than 1500 copies per milliliter; there was a significant dose–response relation of increased transmission with increasing viral load. In multivariate analyses of log-transformed HIV-1 RNA levels, each log increment in the viral load was associated with a rate ratio of 2.45 for seroconversion (95 percent confidence interval, 1.85 to 3.26).

Conclusions The viral load is the chief predictor of the risk of heterosexual transmission of HIV-1, and transmission is rare among persons with levels of less than 1500 copies of HIV-1 RNA per milliliter. (N Engl J Med 2000;342:921-9.)

IN sub-Saharan Africa, the predominant mode of transmission of human immunodeficiency virus type 1 (HIV-1) is through heterosexual contact, and the rate of transmission by this means is increasing throughout Asia and in many industrialized countries.[1,2] A wide variety of behavioral and biologic risk factors are associated with the risk of transmission, including the frequency[3-5] and types[6] of sexual contact, the use or nonuse of condoms,[5,7] immunologic status,[8] and the presence or absence of the acquired immunodeficiency syndrome (AIDS),[8] circumcision (in men),[9-11] and sexually transmitted diseases.[6,12,13] Other potential factors include plasma HIV-1 RNA levels,[14-17] the presence or absence of chemokine receptors,[18,19] and the use or nonuse of antiretroviral therapy.[20] Improved understanding of the way in which these factors influence both the infectiousness of and the susceptibility to HIV-1 could facilitate efforts to prevent transmission of the virus.

To delineate the risk factors associated with heterosexual transmission of HIV-1 more clearly, we prospectively followed couples discordant for HIV-1 status in stable sexual relationships in a group of communities with a high prevalence of infection with HIV-1 (16.1 percent), mainly subtypes A and D. We were able to identify these couples retrospectively from a community-based trial of 15,127 persons residing in the rural district of Rakai, Uganda.[21] We analyzed sociodemographic, behavioral, and biologic factors, with particular emphasis on the effects of serum viral load on the risk of heterosexual transmission of HIV-1.

METHODS

Study Population

The Sexually Transmitted Diseases Control for AIDS Prevention Study, a community-based randomized trial, was conducted in Rakai between November 1994 and October 1998. The design and results of the study have been reported previously.[21] In brief, rural communities on secondary roads were aggregated into 10 clusters; 5 clusters were randomly assigned to receive intervention for sexually transmitted diseases, and 5 clusters were randomly assigned to a control group. Five community-based surveys were conducted at intervals of 10 months.

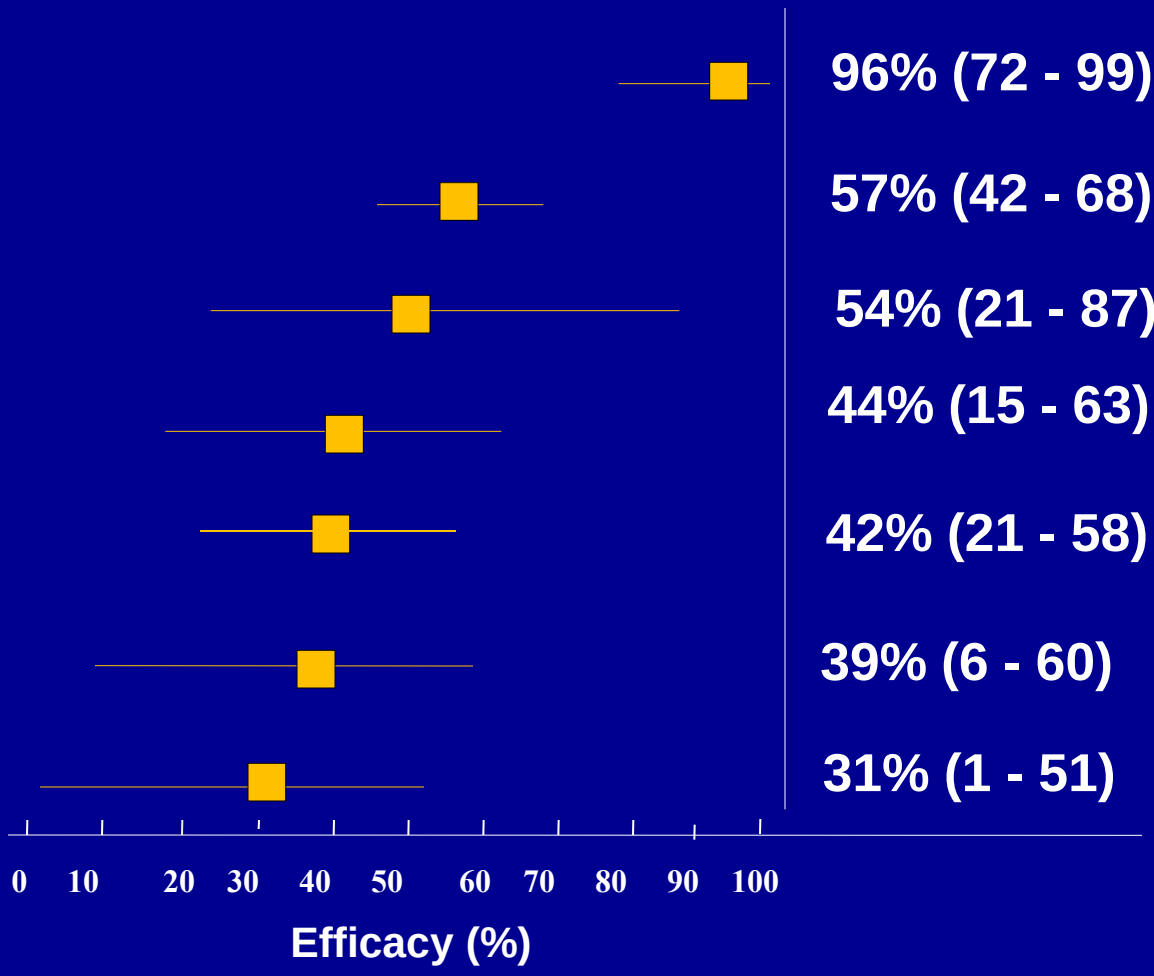
From the National Institute of Allergy and Infectious Diseases, Bethesda, Md. (T.C.Q.); Johns Hopkins University, Baltimore (T.C.Q., C.L., R.H.G.); Columbia University, New York (M.J.W., M.O.M.); and the Faculty of Medicine, Makerere University, Kampala, Uganda (N.S., D.S., F.W.-M., T.L.). Address reprint requests to Dr. Quinn at the Division of Infectious Diseases, Johns Hopkins University, 720 Rutland Ave., Ross 1159, Baltimore, MD 21205-2196.

- "Viral load is the chief predictor of the risk of HIV transmission"

Quinn *et al NEJM,* 2000

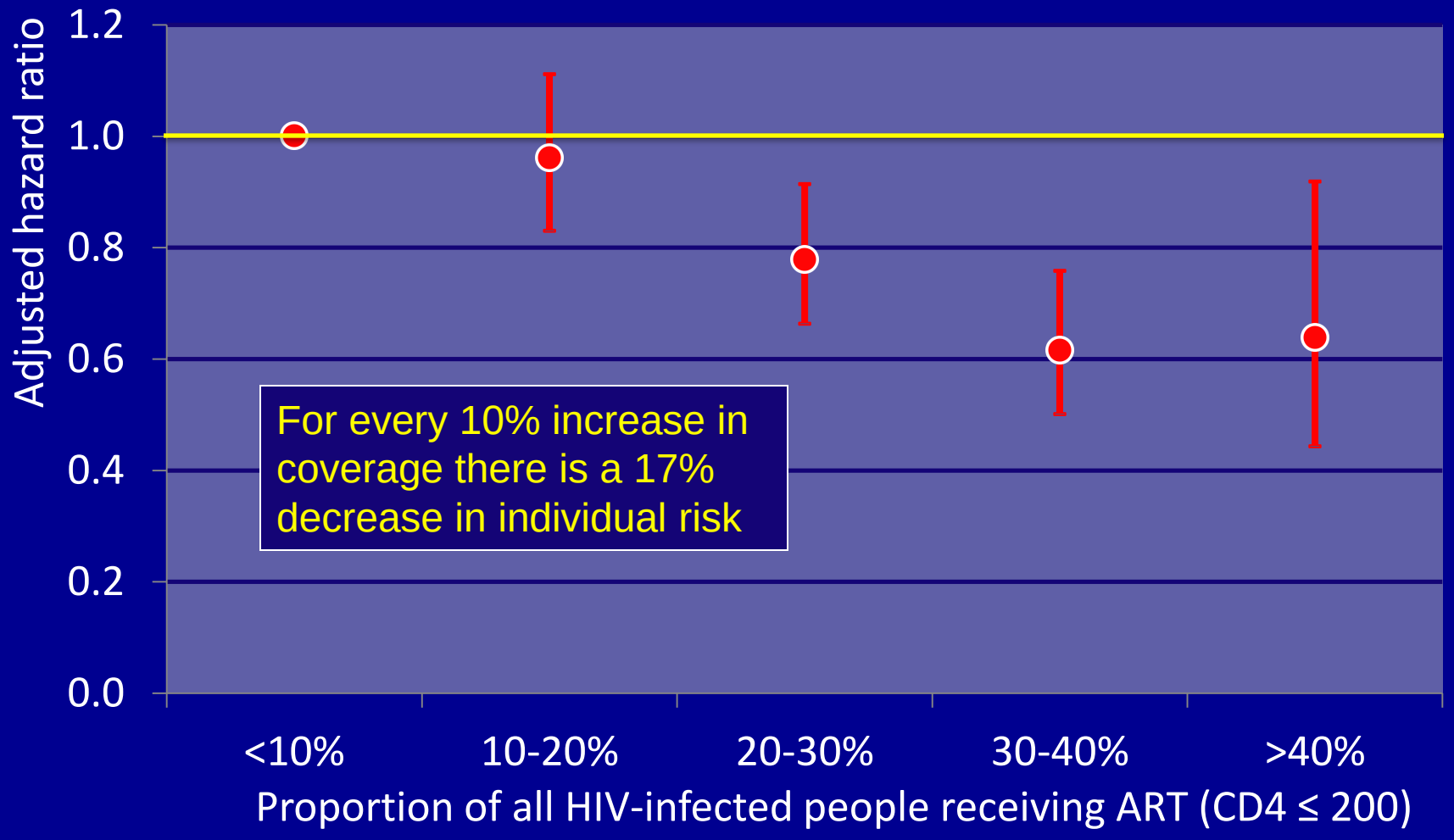
Major Biomedical Interventions for Sexual Transmission of HIV

Major Studies*	Effect size (CI)
ART in HIV+ partner (HPTN 052)	96% (72 - 99)
Male circumcision (Orange Farm, Rakai, Kisumu)	57% (42 - 68)
Condom Use (Metanalyis - 13 studies)	54% (21 - 87)
PrEP (iPrEx - oral tenfovir/emtricitabine)	44% (15 - 63)
STD treatment (Mwanza)	42% (21 - 58)
Microbicide (CAPRISA 004 - tenofovir gel)	39% (6 - 60)
HIV Vaccine (Thai RV144)	31% (1 - 51)



Adapted from Padian et al, 2010; Abdool Karim, 2010; Grant et al , 2010; Cohen et al, 2011; Scott-Sheldon, et al 2011

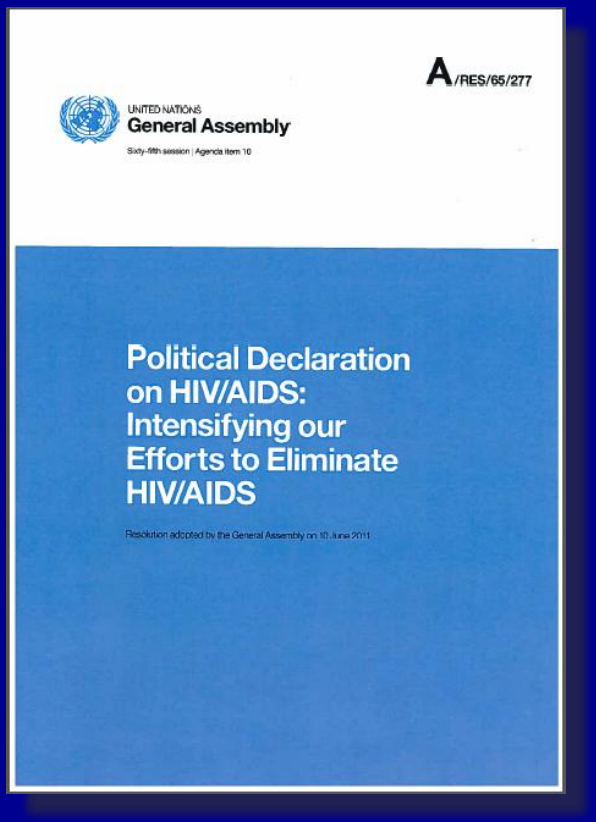
Effect of ART coverage on rate of new HIV infections in a rural South African population



Source: Tanser F et al. CROI 2012

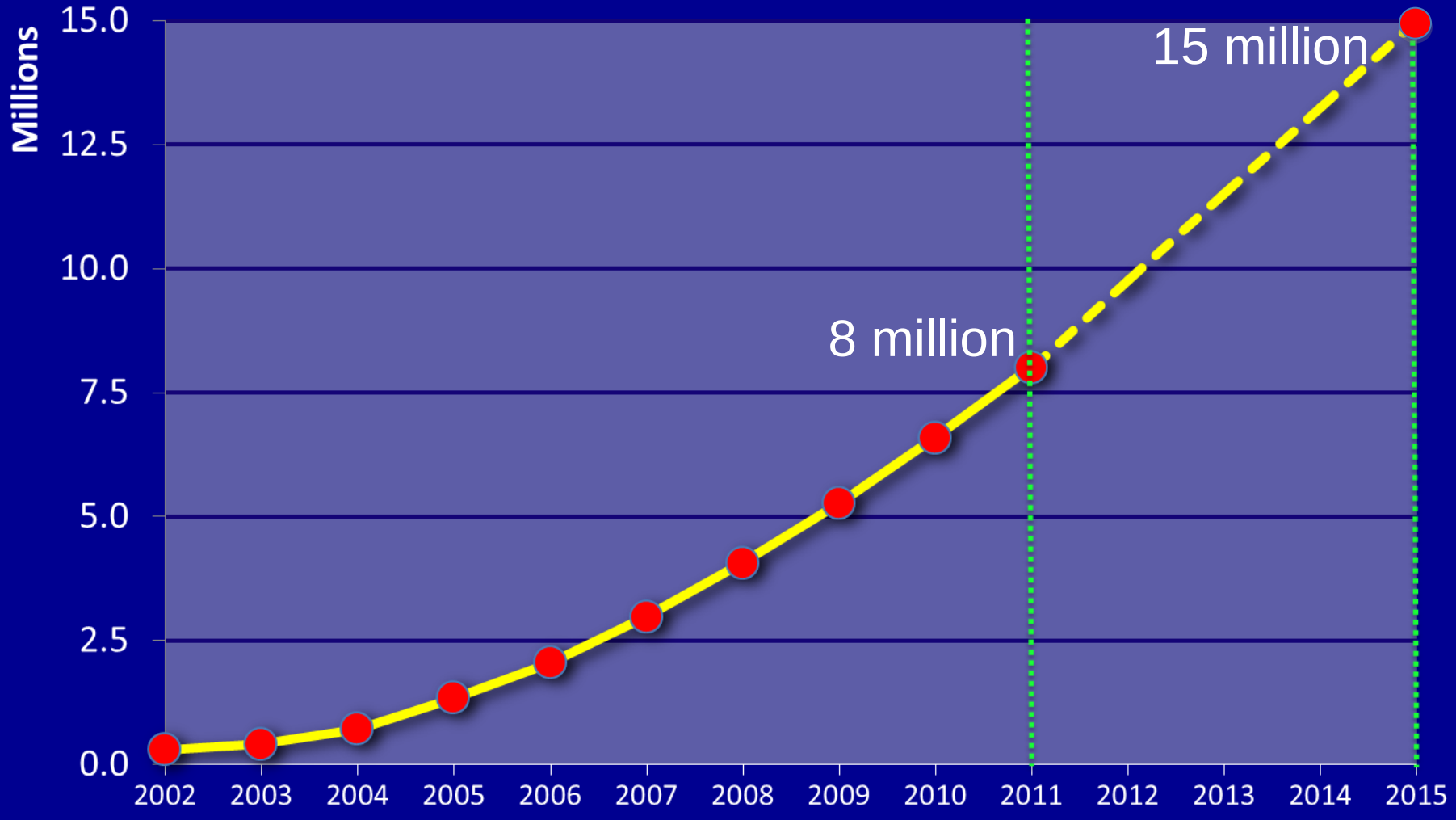
Bold targets for 2015

- Eliminate new HIV infections in children
- Reduce TB deaths among PLHIV by 50%
- Intensify HIV prevention
  - men who have sex with men
  - people who inject drugs
  - sex workers
- 15 million people on ART

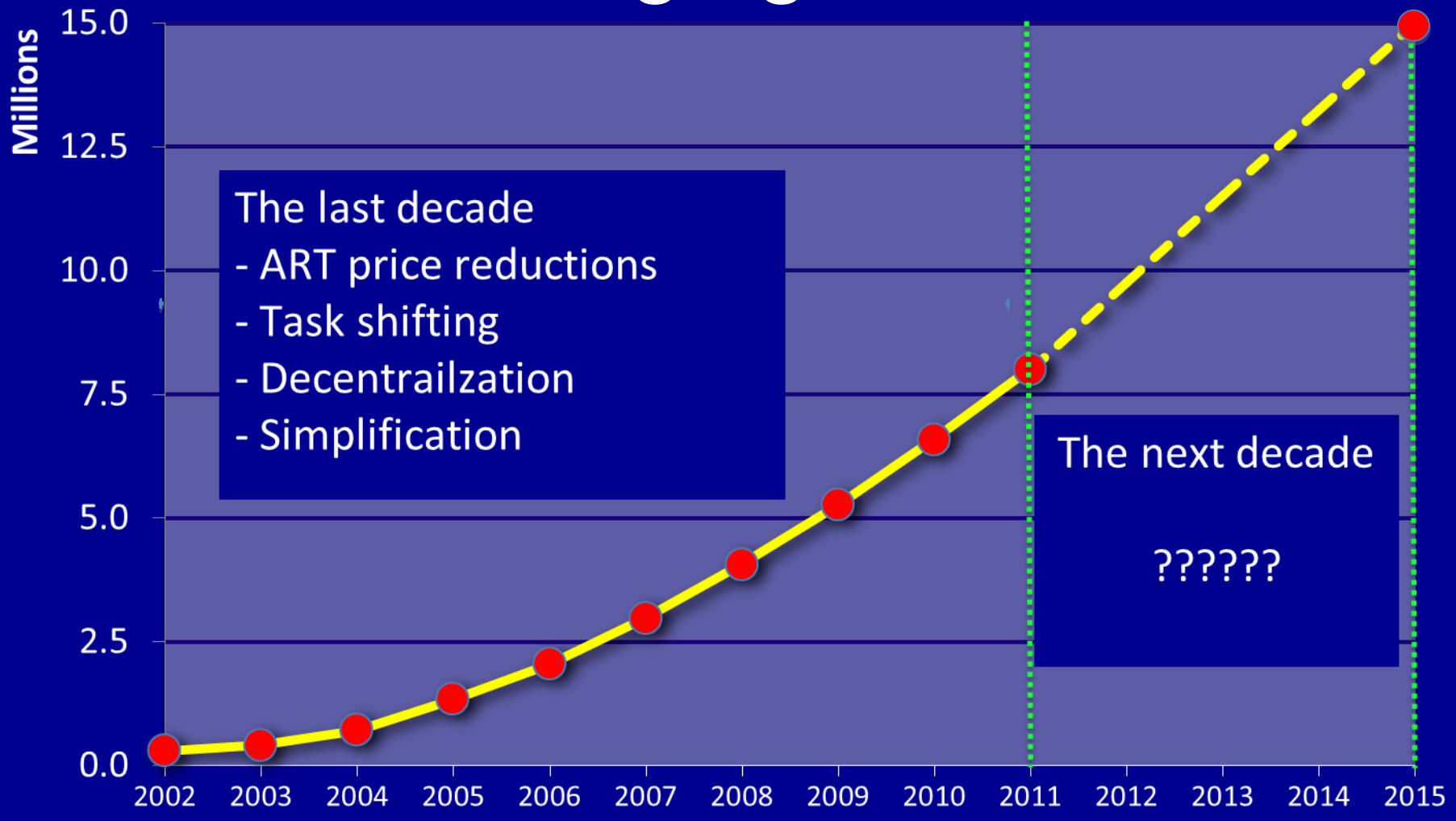


Is 15 by 15 achievable?

8 million on ART by end 2011
…15 million is achievable



BUT…have we picked all the 'low hanging fruit'



Challenges to 15 by 15

- Late diagnosis
- Complexity of current treatment
- High rates of attrition
- Financing and human resources constrains

"Treatment 2.0": Re-energizing the Public Health Approach to ART

THE LANCET

Comment

Treatment 2.0: catalysing the next phase of scale-up

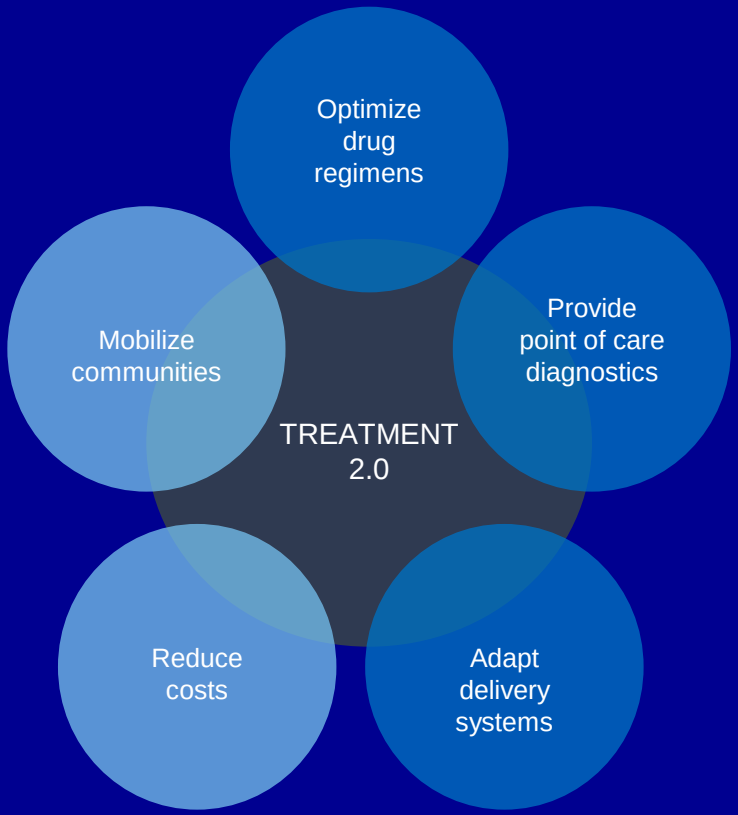
Published Online February 25, 2011 DOI:10.1016/S0140-6736(11)60247-X

Treatment 2.0 is an initiative coordinated by UNAIDS and WHO to provide leadership and technical guidance to catalyse the next phase of scale-up in HIV treatment.[1] Radical simplification, innovation in drug design and diagnostics, renewed commitment and resources, and adapted delivery systems will be crucial to reach universal and sustainable coverage of treatment for those in need. The Treatment 2.0 framework is guiding UNAIDS, WHO, and partners to scale up treatment over the next decade.

In 2003, WHO published *The public health approach to antiretroviral therapy: overcoming constraints*,[2] in which the organisation laid out a strategic rationale for the rapid scale-up of antiretroviral therapy (ART) in low-income and middle-income countries—the report paved the way for the 3 by 5 initiative of UNAIDS and WHO. Key elements of the public health approach include using standardised treatment protocols and simplified clinical monitoring, optimising the use of human resources, involving people living with HIV in programme design and implementation, and minimising costs. In 2006, all and non-HIV health services in many poor countries is limited by fragile health systems and often fragmented health services. 10 million people who are eligible do not have access to ART, with structural barriers, such as discriminatory laws and outdated drug control policies, exacerbating inequities in access.[10]

Treatment 2.0 is designed to maximise the efficiency and effectiveness of HIV treatment through focus on five priorities: optimising drug regimens, advancing point-of-care and other simplified platforms for diagnosis and monitoring, reducing costs, adapting delivery systems, and mobilising communities.

In the short term, there are many avenues being pursued to optimise currently available drugs and regimens, including studies aimed at dose reduction, simplified process chemistry, and one-pill-per-day formulations. Efforts are underway to standardise simplified platforms for diagnosis and treatment monitoring with available technologies. Reduced costs can be achieved through commodity price reductions, use of market and trade



Increasing access to care: self-testing

- Practiced 'informally' by many health workers[1]
- Included in Kenyan National Guidelines
- Available over the internet and in pharmacies in some countries
- Approved by US FDA in July 2012

[1]Napierala S, (2011). HIV self-testing among health workers

Scaling up HIV testing in the community

- Home-based (door-to-door)
  - >90% acceptance
- Campaigns plus
  - HTC-plus –malaria, safe water
  - Non-communicable diseases
- Mobile outreach
- Workplaces, schools

Community ART dispensing in Mozambique

Stable patients receive ART from peers in the community

Outcomes at 1 year

- 98% Remaining in care
- 0.2% Defaulting

Implementation and Operational Research: Clinical Science

Distribution of Antiretroviral Treatment Through Self-Forming Groups of Patients in Tete Province, Mozambique

Tom Decroo, MD, Barbara Telfer, MPH,* Marc Biot, MD, MSc,* Jacob Maikéré, MD, MSc, PhD,† Sergio Dezembro,* Luisa Isabel Cumba, MD,‡ Carla das Dores, MD,‡ Kathryn Chu, MD, MSc,§‖ and Nathan Ford, MPH, PhD§¶*

Background: As antiretroviral treatment cohorts continue to expand, ensuring patient retention over time is an increasingly important concern. This, together with capacity and human resource constraints, has led to the consideration of out-of-clinic models for the delivery of antiretroviral therapy (ART). In 2008, Médecins Sans Frontières and the Provincial authorities launched a model of ART distribution and adherence monitoring by community groups in Tete Province, Mozambique.

Programme Approach: Patients who were stable on ART for 6 months were informed about the community ART group model and invited to form groups. Group members had 4 key functions: facilitate monthly ART distribution to other group members in the community, provide adherence and social support, monitor outcomes, and ensure each group member undergoes a clinical consultation at least once every 6 months. Group members visit the health centre on a rotational basis, such that each group member has contact with the health service every 6 months.

Results: Between February 2008 and May 2010, 1304 members were enrolled into 291 groups. Median follow-up time within a group was 12.9 months (IQR 8.5–14.1). During this time, 83 (6%) were transferred out, and of the 1301 patients still in community groups, 1269 (97.5%) were remaining in care, 30 (2%) had died, and 2 (0.2%) were lost to follow-up.

Discussion: The Community ART Group model was initiated by patients to improve access, patient retention, and decongest health services. Early outcomes are highly satisfactory in terms of mortality and retention in care, lending support to such out-of-clinic approaches.

Received for publication August 22, 2010; accepted November 3, 2010.

From the *Médecins Sans Frontières, Tete, Mozambique; †Médecins Sans Frontières, Maputo, Mozambique; ‡Provincial Health Department, Tete, Mozambique; §Médecins Sans Frontières, Khayelitsha, South Africa; ‖Department of International Health, Johns Hopkins School of Public Health, Baltimore, MD; and ¶Centre for Infectious Disease Epidemiology and Research, University of Cape Town, Cape Town, South Africa.

The authors have no funding or conflicts of interest to disclose.

Correspondence: Tom Decroo, MD, MPH, PhD, Médecins Sans Frontières, PO Box 2740, Rhine Road, Sea Point 8030, Cape Town, South Africa (email: tom.decroo@capetown.msf.org).

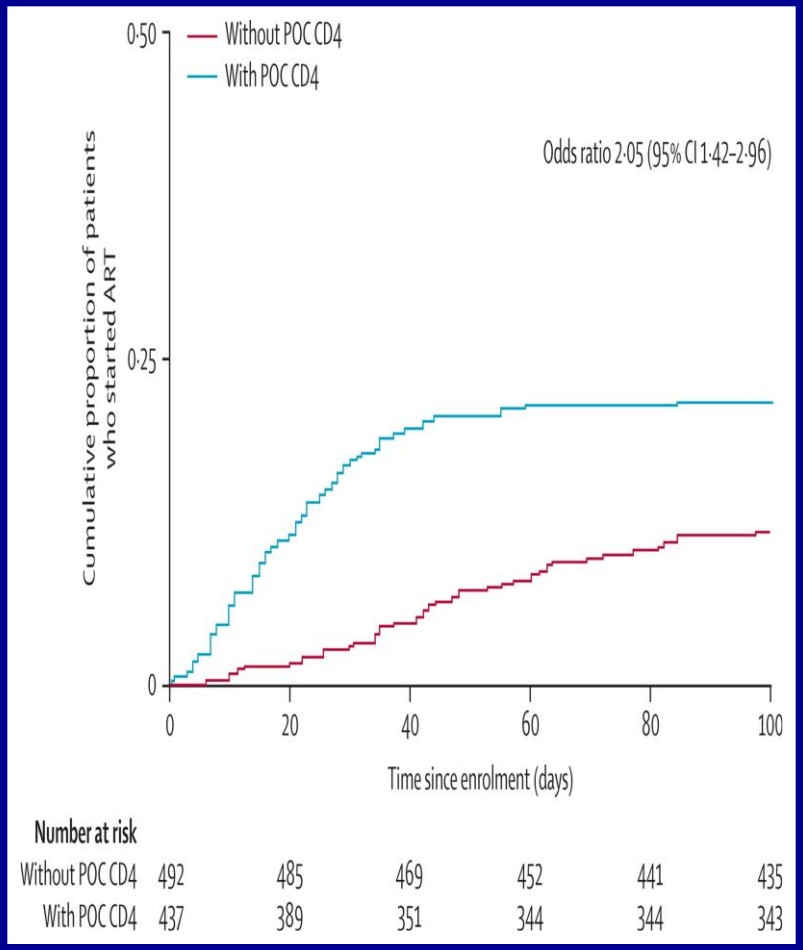
J Acquir Immune Defic Syndr • Volume 56, Number 2, February 1, 2011

Decroo et al, *JAIDS* 2010

Making treatment more accessible, affordable, simple and efficient

Drug	Approach	Expected cost in USD (per patient/year)
TDF	Process chemistry and dose optimization	63 (⇩28%)
AZT	Dose optimization	60 (⇩33%)
EFV	Reformulation and dose optimization	31 (⇩51%)

New point-of-care technologies



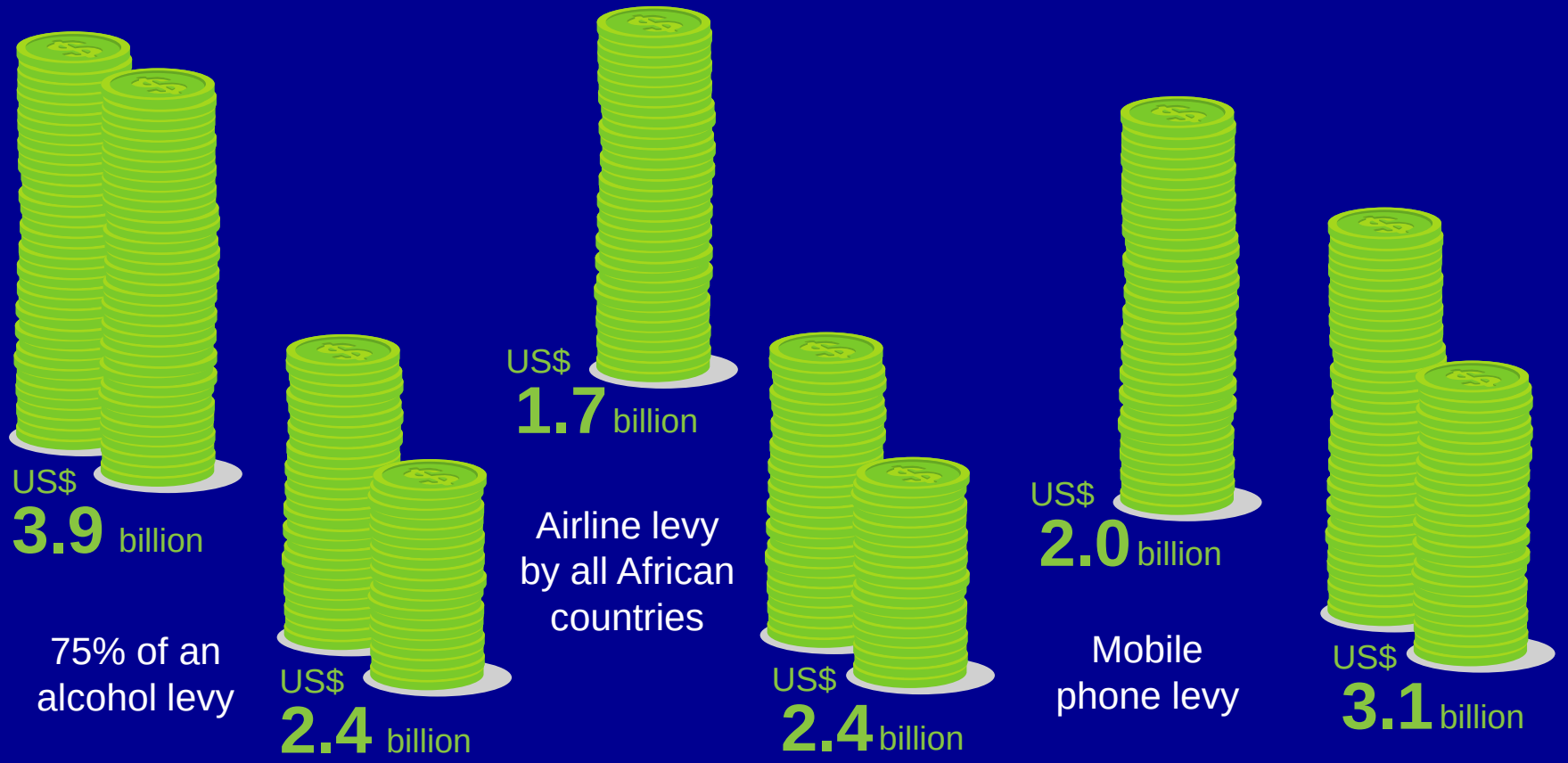
Jani et al, Lancet 2011

CD4 and haematology in lake Malawi

Global Financial Crisis

How can we afford to treat 15-30 million people with HIV in the future?

Options for increasing HIV financing in Africa



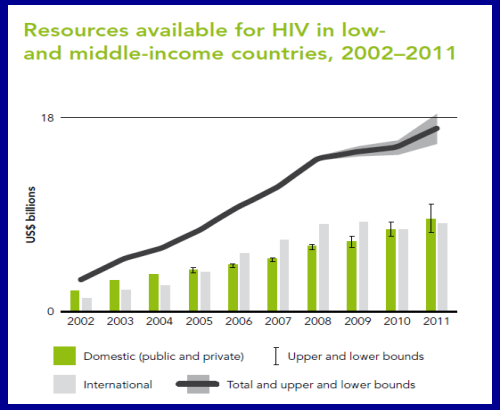
Source: Estimates for UNAIDS by Oxford Policy Management, 2012

Lessons for global health

Activism

Models of delivery

Human resources



Funding

Surgery

- 11% of global disease burden
- Sierra Leone: >1/3 of people have a condition that needed surgery
- East Africa, 1 surgeon per 400,000 population

Groen et al, Lancet August 14, 2012

Task shifting for surgery?

Essay

Surgical Task Shifting in Sub-Saharan Africa

Kathryn Chu[1]*, Peter Rosseel[2], Pierre Gielis[2], Nathan Ford[1]

1 Médecins Sans Frontières, Johannesburg, Gauteng, South Africa, 2 Médecins Sans Frontières, Brussels, Belgium

Introduction

The poor availability of surgical services in developing countries is a long neglected problem that has recently gained attention [1,2]. Violence, injury, and obstetric emergencies are among leading causes of mortality and morbidity that can be mitigated through surgical intervention. Surgically treatable problems are estimated to account for up to 11% of the world's disability-adjusted life years [1]. In addition to this massive disease burden there are problems that are seriously debilitating (cataract) or stigmatizing (fistula).

Surgical interventions are often viewed as expensive and complex, but many common problems amenable to surgery in resource-limited settings are cost-effective and do not require specialized staff and equipment. The World Health Organization (WHO) has prioritized a list of cost-effective surgical interventions for developing countries including emergency care of trauma, obstetrical complications, and acute abdomens as well as elective care of hernias, clubfoot, cataracts, hydroceles, and otitis media [3].

One of the main barriers to surgical care—defined as the safe provision of preoperative, operative, and post-operative surgical and anesthesia services—in resource-limited settings is the shortage of trained health workers. Africa accounts for 24% of the global disease burden but only 3% of the global health workforce [4]. The reasons for this are well documented and include inadequate salaries and poor working conditions leading to staff attrition, unwillingness of international donors to support financing for human resources [5], an insufficiency of medical schools [6], and the brain drain of health staff to resource-rich countries [4,7,8]. The human resource crisis is most acute at the level of specialists, including surgeons and anesthesiologists [9,10]. In East Africa, there are 0.25 fully trained surgeons per 100,000 persons compared to 5.69 per 100,000 in the United States [11,12]. The actual minimum number of surgeons required is unknown.

The Essay section contains opinion pieces on topics of broad interest to a general medical audience.

Summary Points

- Surgically treatable problems account for a significant proportion of disease burden in resource-limited settings, but are neglected due to lack of skilled professionals, adequate infrastructure and equipment, and the perception that surgical services are complex and expensive.
- In the absence of trained surgeons, surgical tasks are often performed by non-specialist physicians and non-physician clinicians. While evaluations have proven the effectiveness of such task shifting, this is often done de facto, with little supervisory or training framework in place.
- As efforts increase to scale up surgical care in the developing world, a number of important lessons from task shifting in the field of HIV/AIDS care could serve to support task shifting in surgery.
- These include clearly defining the limits of task shifting, ensuring adequate training and supervision, providing adequate recognition and remuneration, developing simplified tools and guidelines, ensuring engagement with regulatory bodies, and mobilizing community health workers.

Given the unlikelihood of even a modest increase in the number of surgeons and anesthesiologists working in Africa in the near future, a number of approaches are being piloted to overcome the skills shortage. These include surgical camps and specialist outreach programs (often supported by international experts) and the mobilization of non-physician clinicians (NPCs) to perform surgical and anesthetic tasks [13]. This latter approach, which involves the shifting of tasks from surgeons and anesthesiologists to non-specialists, has the greatest potential to provide coverage of basic surgical care, especially in rural areas. Task shifting involves the delegation of certain medical responsibilities to less specialized health care workers. In sub-Saharan Africa, task shifting has recently been promoted and formalized to help address the HIV/AIDS epidemic [14]. This paper discusses some of the experiences of surgical task shifting to date, and outlines lessons from task shifting in the delivery of HIV/AIDS care.

Task Shifting in Surgery

The concept of a surgeon as a university-trained physician is a relatively modern one—prior to 1745 surgeons were still part of the Company of Barbers—but today surgery has become a highly specialized profession. Currently, much of the global surgical workforce is comprised of non-specialist physicians whose only formal surgical training is during medical school. In Uganda, a study of five general hospitals reported that over 5,000 surgical procedures were performed annually by non-specialist physicians [13]. In many coun-

Citation: Chu K, Rosseel P, Gielis P, Ford N (2009) Surgical Task Shifting in Sub-Saharan Africa. PLoS Med 6(5): e1000078. doi:10.1371/journal.pmed.1000078

Published May 19, 2009

Funding: No funding was received for this work.

Competing Interests: The authors have declared that no competing interests exist.

Abbreviations: CHW, community health worker; MoH, Ministry of Health; NPC, non-physician clinician.

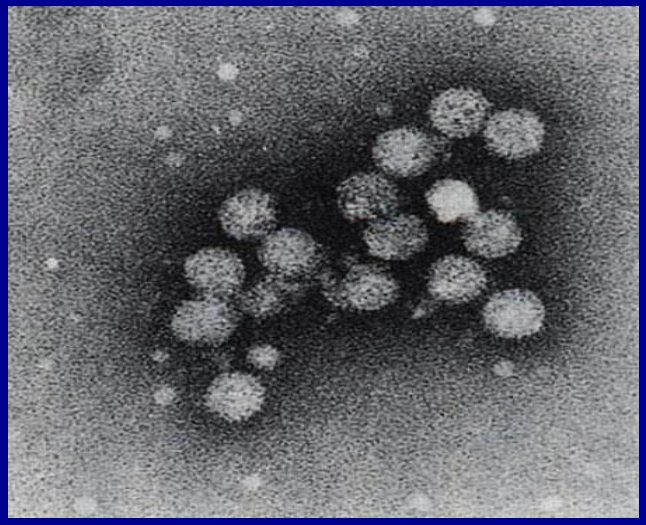
* E-mail: kathryn.chu@joburg.msf.org

Provenance: Not commissioned; externally peer reviewed

Cadre	Task
Surgeon	Neurosurgery Thoracic surgery
Doctor/non-physician clinical	Male medical circumcision C-sections
Community health worker	Basic wound care management Pre-hospital trauma care

Chu et al, Plos Medicine 2012

Hepatitis C



- 180 million people infected
- Burden of disease greatest in resource limited settings
- High level political commitment
- Treatment complex/expensive

Making HCV treatment affordable and simple

Expanding Access to Treatment for Hepatitis C in Resource-Limited Settings: Lessons From HIV/AIDS

Nathan Ford,[1,2] Kasha Singh,[4] Graham S Cooke,[3,5] Edward J Mills,[7] Tido von Schoen-Angerer,[1] Adeeba Kamarulzaman,[8] and Philipp du Cros[6]

[1]Médecins Sans Frontières, Geneva, Switzerland; [2]Centre for Infectious Disease Epidemiology and Research, University of Cape Town, and [3]Africa Centre for Health and Population Studies, University of KwaZulu-Natal, South Africa; [4]Centre for Clinical Microbiology, University College London, [5]Faculty of Medicine, Imperial College London, and [6]Médecins Sans Frontières, Manson Unit, London, United Kingdom; [7]Faculty of Health Sciences, University of Ottawa, Canada; and [8]Department of Medicine, Center of Excellence for Research in AIDS, University of Malaya, Kuala Lumpur, Malaysia

The need to improve access to care and treatment for chronic hepatitis C virus (HCV) infection in resource-limited settings is receiving increasing attention. Key priorities for scaling up HCV treatment and care include reducing the cost of current and future treatment; simplifying the package of care; identifying opportunities to shift specific tasks to nonspecialists to overcome human resource constraints; service integration with human immunodeficiency virus (HIV) clinics, prison health services, and needle syringe and oral substitution therapy programs; improving surveillance, monitoring, and research; encouraging patient and community engagement; focusing specifically on the needs of vulnerable groups; and increasing financial and political commitment. Many of these obstacles have been addressed in rolling out treatment for human immunodeficiency virus during the last decade, and a number of lessons can be drawn to help improve access to HCV care.

Hepatitis C virus (HCV) infection is a growing public health concern, with an estimated 170 million persons infected globally and 350 000 deaths each year due to hepatitis C–related liver disease [1]. In 2010 the World Health Assembly adopted a resolution promoting integrated and cost-effective approaches to the prevention, control, and management of viral hepatitis and noted in particular the need to address hepatitis in the context of the human immunodeficiency virus (HIV) epidemic [2]. A number of countries in resource-limited settings are providing treatment of HCV infection through dedicated services with reasonable success [3]. Generally, however, access to care remains limited, particularly in poorer regions such as India and sub-Saharan Africa [4].

Challenges to increasing access to treatment of HCV infection in resource-limited settings include the high cost and perceived complexity of treatment, side effects that hamper adherence, long treatment duration, and insufficient political commitment. Early efforts to increase access to antiretroviral therapy (ART) for HIV/AIDS in resource-limited settings were impeded by similar challenges. We reflect on the experience of scaling up access to ART during the last decade and draw lessons for improving access to treatment and care for persons with HCV.

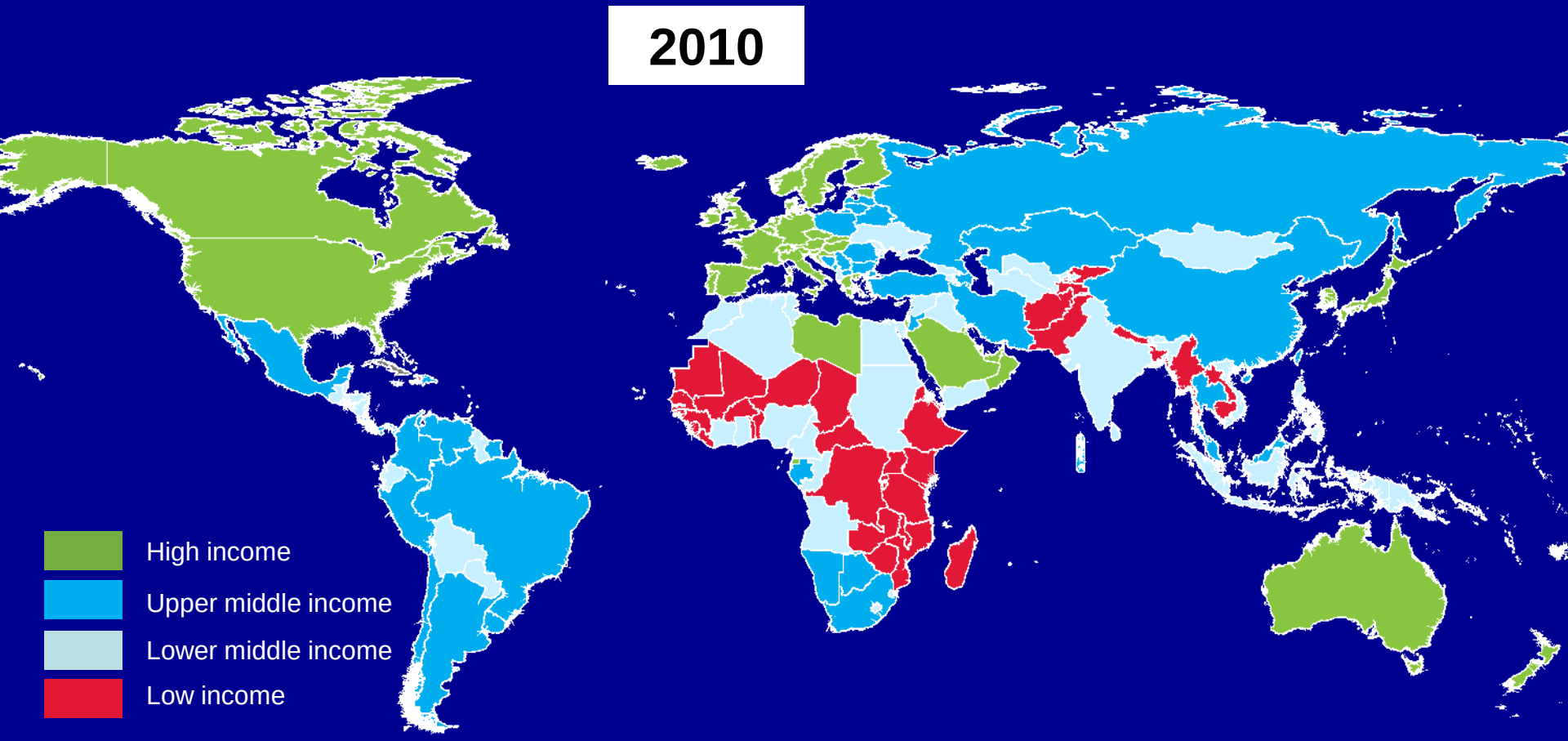
A decade ago, treatment for persons living with HIV/AIDS was unavailable in most developing countries, and there was debate about whether treatment should be considered given the considerable challenges faced [5]. Yet despite these early concerns, >6.6 million persons are now receiving ART in the developing world [6]. Several critical issues had to be confronted before large-scale HIV treatment programs could be

Received 23 November 2011; accepted 30 January 2012.
Correspondence: Nathan Ford, PhD, Médecins Sans Frontières, Geneva, Switzerland (nathan.ford@msf.org).
Clinical Infectious Diseases

DOI: 10.1093/cid/cis227

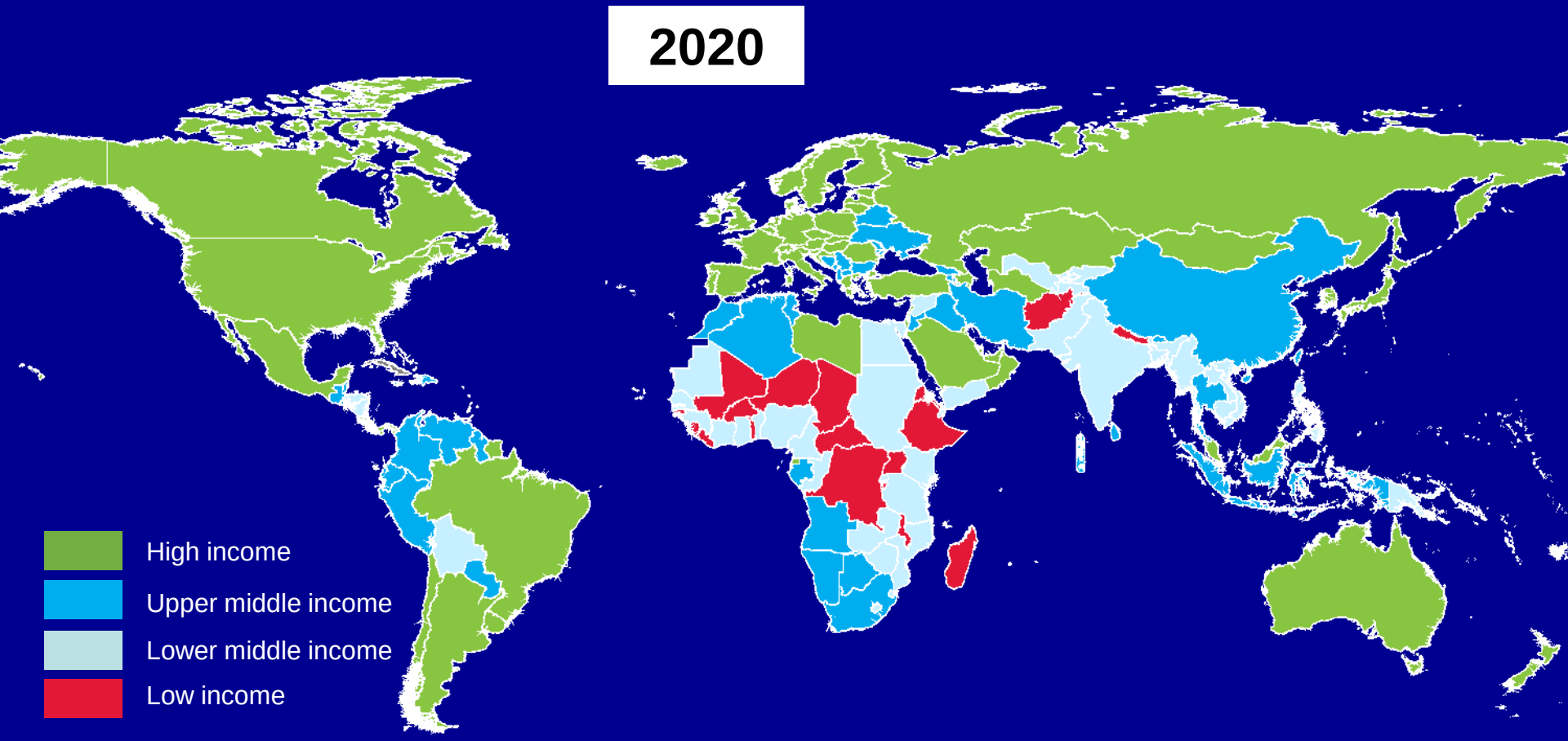
- Wide disparities in treatment costs
  - peg-IFN $1,500 to >$20,000
- Operational research to define adapted delivery models
- Need for guidelines adapted to resource-limited settings
- Novel financing mechanisms

Economic growth is rapidly changing the world order



Source: IMF data, extrapolated 2017-2020

Economic growth is rapidly changing the world order



Source: IMF data, extrapolated 2017-2020

Non-communicable diseases

- 36 million deaths each year
- 80% in low and middle-income countries
  - 70% of cancer cases but 5% of the resources
- Critical need for a public health approach

Non-communicable diseases

Maher *et al. Globalization and Health* 2012, **8**:14
http://www.globalizationandhealth.com/content/8/1/14

GLOBALIZATION AND HEALTH

DEBATE Open Access

Priorities for developing countries in the global response to non-communicable diseases

Dermot Maher[1], Nathan Ford[2,3*] and Nigel Unwin[4]

Abstract

The growing global burden of non communicable diseases (NCDs) is now killing 36 million people each year and needs urgent and comprehensive action. This article provides an overview of key critical issues that need to be resolved to ensure that recent political commitments are translated into practical action. These include: (i) categorizing and prioritizing NCDs in order to inform donor funding commitments and priorities for intervention; (ii) finding the right balance between the relative importance of treatment and prevention to ensure that responses cover those at risk, and those who are already sick; (iii) defining the appropriate health systems response to address the needs of patients with diseases characterized by long duration and often slow progression; (iv) research needs, in particular translational research in the delivery of care; and (v) sustained funding to support the global NCD response.

Keywords: Non-communicable diseases, Prevention, Treatment

Background

The growing global non-communicable disease (NCD) crisis is now killing 36 million people each year and needs urgent and comprehensive action [1]. Rapidly increasing globalization is accompanied by urbanization, population growth and ageing, and trends towards unhealthy lifestyles, including unhealthy diets, physical inactivity, obesity, and immoderate alcohol and tobacco use. Chronic NCDs are defined by the World Health Organization (WHO) as cardiovascular diseases (CVD), diabetes, chronic respiratory diseases, and cancer. This grouping of chronic NCDs reflects their association with common shared risk factors: harmful use of alcohol, tobacco use, physical inactivity and unhealthy diets [2]. Non-communicable diseases in low-income and middle-income countries currently account for 80% of the worldwide NCD mortality caused by CVD, cancers, diabetes and chronic lung diseases [3].

Attention to NCDs is increasing for several reasons. First country-level data show that these conditions are contributing to epidemiological transition in a wide range of low- and middle-income countries [3]. Second, these data support estimated disease projections of a growing burden of morbidity and mortality associated with chronic NCDs. Third, NCDs have a huge negative economic impact [4] and represent a significant impediment to human development [5]. Fourth, recent progress in mobilising funds and improving the response to infectious diseases (especially HIV/AIDS, tuberculosis and malaria) has stimulated a broader global health outlook. These factors culminated in a United Nations (UN) High-Level Meeting on NCDs in New York in September 2011 [6].

A worldwide goal for the prevention and control of NCDs has been proposed to complement existing MDG targets for communicable disease control, with the accompanying target of an additional 2% per year reduction in death rates attributable to the main chronic diseases (heart disease, stroke, cancer, diabetes, and chronic respiratory diseases) [7]. Achieving this goal will require comprehensive action covering the range of diseases and risk factors through a two-pronged approach: implementation of the multisectoral policies aimed at decreasing population-level risks for NCDs, and effective and affordable delivery of health sector interventions for patients with NCDs.

Feasible and cost-effective health sector interventions exist for the priority chronic NCDs. For example,

* Correspondence: nathan.ford@msf.org
[2]Médecins Sans Frontières, Geneva, Switzerland
[3]Centre for Infectious Disease Epidemiology and Research, University of Cape Town, Cape Town, South Africa
Full list of author information is available at the end of the article

- Reduce treatment costs
- Adapt model of delivery
- Fund scale up

Conclusions

- Global progress on scale-up of ART has been extraordinary: 15 million can be reached
- This will require forward-looking policies, effective and more innovative approaches, together with further investments
- If used strategically, ARVs for treatment and prevention will help to end the HIV epidemic
- The global response over the last decade offers important lessons for global health

Acknowledgements

Tim O'Dempsey
Peter Winstanley
Eric Goemaere
Gottfried Hirnschall
Marco Vitoria
Dermot Maher
Kathryn Chu
Philipp duCros