

THE TREATMENT 2.0 FRAMEWORK FOR ACTION:
CATALYSING THE NEXT PHASE OF TREATMENT,
CARE AND SUPPORT

WHO Library Cataloguing-in-Publication Data:

The treatment 2.0 framework for action: catalysing the next phase of treatment, care and support.

1.HIV infections - therapy. 2.Acquired immunodeficiency syndrome - therapy. 3.Acquired immunodeficiency syndrome - prevention and control. 4.Anti-retroviral agents. I.World Health Organization. II.UNAIDS.

ISBN 978 92 4 150193 4

(NLM classification: WC 503.2)

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Printed by the WHO Document Production Services, Geneva, Switzerland

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INTRODUCTION

In June 2010, the UNAIDS Secretariat and WHO launched *Treatment 2.0*, an initiative designed to achieve and sustain universal access and maximize the preventive benefits of antiretroviral therapy (ART). *Treatment 2.0* builds on '3 by 5' and the programmatic and clinical evidence and experience over the last 10 years to expand access to HIV diagnosis, treatment and care through a series of innovations in five priority work areas: drugs, diagnostics, costs, service delivery and community mobilization. The principles and priorities of *Treatment 2.0* address the need for innovation and efficiency gains in HIV programmes, in greater effectiveness, intervention coverage and impact in terms of both HIV-specific and broader health outcomes.

Since the launch of *Treatment 2.0*, the UNAIDS Secretariat and WHO have worked with other UNAIDS co-sponsoring organizations, technical experts and global partners to further elaborate and begin implementing *Treatment 2.0*. The *Treatment 2.0 Framework for Action* outlines the five priority work areas which comprise the core elements of the initiative and establishes a strategic framework to guide action within each of them over the next decade. The *Framework for Action* reflects commitments outlined in *Getting to Zero: 2011 - 2015 Strategy*ⁱ, UNAIDS and the WHO *Global Health-Sector Strategy on HIV, 2011 - 2015*ⁱⁱ, the guiding strategies for the multi-sectoral and health-sector responses to the HIV pandemic.

The *Framework for Action* is structured as follows:

- '3 by 5' and Beyond
- Towards *Treatment 2.0*: An Evolving Revolution
- Maximizing the Preventive Benefits of Treatment
- *Treatment 2.0* Priority Work Areas
 1. Optimize Drug Regimens
 2. Provide Access to Point-of-Care Diagnostics
 3. Reduce Costs
 4. Adapt Delivery Systems
 5. Mobilize Communities
- What Countries Are Doing to Advance *Treatment 2.0*
- Partnerships
- Accountability: Monitoring and Reporting Progress
- Conclusion
- Works Cited

ⁱ The description of this policy is available at: http://www.unaids.org/en/media/unaids/contentassets/documents/unaids-publication/2010/JC2034_UNAIDS_Strategy_en.pdf

ⁱⁱ The description of this policy is available at: http://whqlibdoc.who.int/publications/2011/9789241501651_eng.pdf

'3 BY 5' AND BEYOND

The commitments made at the 2001 United Nations General Assembly Special Session on HIV/AIDS (UNGASS) and the establishment of The Global Fund to Fight AIDS, Tuberculosis and Malaria in 2002 established the foundation for a decade of rapid change in the global response to HIV. On World AIDS Day in 2003, WHO launched its signature contribution to expanding ART access: the '3 by 5' Initiative, which aimed to place 3 million people on ART by the end of 2005. When WHO Director-General Dr. Lee Jong-Wook launched the initiative, only 400,000 people had access to treatment in low and middle-income countries, and over 30,000,000 were living with HIV.^{1, 2}

In support of '3 by 5', WHO published 'The Public Health Approach to ART: Overcoming Constraints', a paper that laid out a strategic rationale for the rapid scale-up of HIV treatment in low and middle-income countries.³ Key elements of this public health approach included using standardized treatment protocols and simplified clinical monitoring, maximizing coverage with limited resources, optimizing the use of human resources, involving people living with and affected by HIV in programme design, management and support, and minimizing costs.

A Decade of Progress

- 2000** XIII International AIDS Conference in South Africa calls for end to treatment inequity between developed and developing world
- 2001** UNGASS Declaration of Commitment on HIV/AIDS
- 2002** The Global Fund to Fight AIDS, Tuberculosis and Malaria established
- 2003** PEPFAR launched: \$15 billion, five-year, bilateral AIDS programme (renewed as \$48 billion programme in 2008)

WHO/UNAIDS launch '3 by 5' initiative on World AIDS Day
- 2006** UN Member States commit to universal access to HIV prevention, treatment, care and support to all in need by 2010

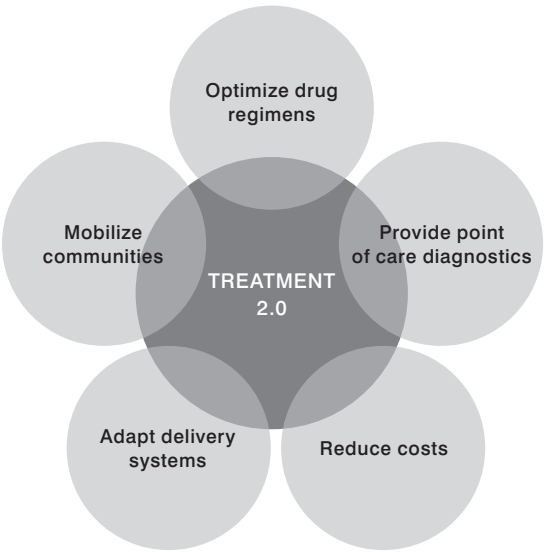
Major increases in AIDS financing from public and private sector provides additional resources for ART scale-up
- 2007** The '3 by 5' goal of 3 million people on ART reached
- 2009** Increasing evidence that earlier ART initiation reduces HIV-and TB related morbidity and mortality and reduces HIV and TB transmission
- 2010** Updated WHO ART guidelines released recommending earlier ART initiation

UNAIDS/WHO launch 'Treatment 2.0'
6.6 million people on ART at the end of 2010
- 2011** Randomized, controlled clinical trial demonstrates efficacy of ART to prevent sexual transmission of HIV in serodiscordant couples

High Level Meeting recommits to universal access, establishes target of 15 million on treatment by 2015

A rapid expansion in HIV services and dedicated AIDS financing followed these developments, with commitments from bilateral programmes, multilateral agencies and the private sector rising from US\$1.6 billion in 2001 to US\$15.9 billion in 2009.⁴ During this period investments were categorized as being made in treatment versus prevention. The prevention benefit of treatment had not yet been established. More than half of all resources available were invested in treatment programmes, with almost a quarter allocated for HIV prevention.⁵ An estimated 6.6 million adults and children in low- and middle-income countries were receiving ART by the end of 2010, a 22-fold increase since 2001.⁶ By the end of 2009, the number of new infections per year had declined by 21% globally from its peak in 1997, with some countries in sub-Saharan Africa reporting declines of more than 25%.⁴ The precipitous declines in life expectancy in high-burden countries as a result of AIDS-related mortality had halted and began to reverse.⁷⁻⁹

Figure 1: Priority work areas of *Treatment 2.0* strategy



WHO ART guidelines were launched in 2002 and updated in 2003, 2006 and 2010 as new scientific and programmatic evidence emerged; the 2010 revision reflects evidence that earlier ART initiation significantly reduces morbidity and mortality.¹⁰⁻¹⁴ ART also has a significant impact on reducing HIV and TB transmission, with recent evidence suggesting it may also have an impact on reducing malaria incidence.^{15, 16} Modelling and implementation studies have indicated substantial cost-savings, disability-adjusted life years gained and significantly improved tolerability of ART regimens recommended in the 2010 guidelines.¹⁷⁻¹⁹

TOWARDS TREATMENT 2.0: EXPANDING AND EVOLVING

Despite the enormous gains in reducing transmission and HIV-related illness and death over the past decade, the global response to HIV faces formidable financial and technical challenges in achieving the goal of universal access for all in need. Access to HIV and non-HIV health services in many low and middle-income countries (LMICs) is constrained by under-resourced health

systems, and many ART programmes are not well-integrated with other health services. Within the next decade, most of the 34 million people currently living with HIV will, according to the current eligibility criteria of ≤ 350 CD4 cell count, require treatment; the total number of people eligible for treatment continues to expand even as the rate of new infections declines from its peak of 3.2 million infections in 1997 to 2.6 million in 2009.⁴ UNAIDS estimates that there was a US \$10 billion shortfall in 2010 for a comprehensive and effective AIDS response.⁴ At the end of 2010 an estimated nine million treatment-eligible people (based on 2010 WHO guidelines) were not receiving life-saving ART, and this number will grow unless concerted action is taken. Structural barriers, including human rights violations and gender inequality, continue to result in inequitable access to care and treatment for key populations.⁴

Treatment 2.0 was developed to meet these challenges by stimulating innovation and dramatically improving the efficiency and impact of HIV care and treatment programmes in resource-limited countries. The concepts of radical simplification, standardization, community mobilization and cost reduction build on the original principles of the WHO Public Health Approach to ART as well as the best practices that have emerged from HIV programme implementation. *Treatment 2.0* provides an opportunity to further refine these principles, to strengthen coordination and integration of global and country-level stakeholders and accelerate the scale-up of HIV treatment and care through a cohesive, strategic blueprint: *The Treatment 2.0 Framework for Action*. Innovations in R&D for drugs and diagnostics, for example, will benefit from being

2015 Targets

- Eliminate new HIV infections in children
- Reduce TB deaths among people living with HIV by 50%
- Place 15 million people on ART

Political Declaration on HIV/AIDS, Intensifying our efforts to eliminate HIV/AIDS, June 2011ⁱⁱⁱ

Investing in an Effective HIV Response

The strategic investments needed to achieve universal access to HIV prevention, treatment, care and support by 2015 peak at US \$22 billion (in 2015). Investing in approaches and intervention tailored to national epidemics would avert an additional 12.2 million infections between 2011 and 2020, 7.4 million AIDS deaths and result in an estimated 29.4 million life years gained.

ⁱⁱⁱ The Political Declaration on HIV/AIDS is available at: http://www.unaids.org/en/media/unaids/contentassets/documents/document/2011/06/20110610_UN_A-RES-65-277_en.pdf

guided by a coordinated strategy among key global partners, all of which have important contributions to make in guiding these efforts towards common goals. Similar, coordinated efforts are needed to decrease the costs of treatment, expand access to integrated, decentralized services and mobilize communities to increase uptake and play a more central role in delivering services.

The *Framework for Action* outlines how UNAIDS and WHO will work with partner organizations to accelerate global efforts to scale up treatment towards sustained universal access, optimizing both HIV-specific and broader health outcomes, including maximizing the HIV and TB preventive benefits of ART. It reflects the need for innovation, for efficiency gains, for shifts in how programmes are financed and delivered, and for additional investments up front that will ultimately reduce costs in the medium and long-term.²⁰

The five interrelated priority work areas of *Treatment 2.0* are:

- 1. Optimize drug regimens**
- 2. Provide point-of-care (POC) and other simplified diagnostic and monitoring tools**
- 3. Reduce costs**
- 4. Adapt service delivery**
- 5. Mobilize communities**

Implementation of *Treatment 2.0* is guided by the principles outlined in the box above, and includes a range of activities designed to adapt to the evolving global health and development architecture, as well as the challenges posed by fiscal constraints on health and development budgets. The name of the initiative uses software development nomenclature, acknowledging that approaches to delivering care, treatment and support in low and middle-income countries are evolving from the first phase of care and treatment scale up ('3 by 5'), with sequential improvements in programme design, simplicity and efficiency. Advances among the five priority work areas are interdependent: optimizing ART regimens, for example, will require concurrent advances in reliable, affordable, quality-assured POC diagnostics, and greater investment in community system strengthening and mobilization to deliver services. The timelines and deliverables in the *Framework for Action* reflect the need to produce concrete results through stepwise improvements in each area, and for effective and strategic collaboration among a broad range of stakeholders.

Treatment 2.0 Principles

- Simplification
- Innovation
- Efficiency
- Effectiveness & Cost-effectiveness
- Accessibility
- Affordability
- Equity
- Decentralization & Integration
- Community involvement

MAXIMIZING THE PREVENTIVE BENEFITS OF TREATMENT

ARVs have been used effectively to prevent HIV transmission for more than 10 years – as ARV prophylaxis to prevent vertical transmission as a component of preventing mother-to-child transmission (PMTCT) and as post-exposure prophylaxis in occupational and non-occupational settings. There is convincing evidence that ART reduces HIV transmission at the individual level by reducing the amount of virus in blood, semen and vaginal fluids, and over the past few years evidence has accumulated from a number of ecological studies documenting the population or community-level impact of ART on reducing transmission in a wide range of settings and populations.^{15, 21} In May 2011, the landmark HPTN 052 randomized controlled trial of 1763 HIV serodiscordant heterosexual couples confirmed the magnitude of the prevention benefit of early ART initiation, which reduced HIV transmission in the immediate (versus deferred) treatment arm by 96%.²²

Research and Development

ART for prevention is a rapidly evolving area of research and there are a number of planned and ongoing studies to answer a broad range of questions, such as the feasibility and cost-effectiveness of broad implementation of early ART to prevent transmission. Countries also need to be prepared to consider how to best optimize the benefit of ART on broader health outcomes, including TB, maternal and child health, sexual and reproductive health and primary health. Additional ongoing and planned studies are expected to expand the evidence base and refine strategies for using ARVs as part of a comprehensive package of treatment and prevention interventions. Basic, clinical and operations research findings from the *Treatment 2.0* research agenda will lead to updates in normative guidance, rapid advice recommendations, adaptation guidance and technical assistance available to national HIV programmes and organizations delivering frontline HIV services.

WHO is convening a high-level expert panel to review the evidence and advise on potential revision of current normative guidelines, including ART for adults and children, TB/HIV policy, PMTCT guidelines and guidelines for PEP, PrEP and other prevention interventions using ARVs. The panel will make broad recommendations in 2012 on the future use of ARVs to treat and prevent HIV infection.

"New pharmaceutical compounds will lead to a 'smarter, better pill' that will be less toxic, longer-acting and easier to use."

Getting to Zero: UNAIDS Strategy on HIV/AIDS, 2011-2015

TREATMENT 2.0 PRIORITY WORK AREAS

1. Optimize Drug Regimens

2020 Goal: Effective, affordable, one pill, once-daily potent ARV regimens with minimal toxicities or drug interactions and high barriers to resistance are available in LMICs

Context

A cornerstone of the *Treatment 2.0* initiative is to promote the development and use of simplified, less toxic drug regimens, with high barriers to drug resistance, that require minimal clinical monitoring while maintaining therapeutic efficacy. Drug regimen optimization includes establishing optimal dosages of ARVs (including possible dose reductions of existing ARVs), reducing pill burden by developing 'one pill a day' (or less often) fixed-dose combinations (FDCs), developing improved paediatric formulations and/or "scored" FDCs, and expanding access to effective, safer, and affordable first-, second- and third-line drug regimens. Among the potential areas for optimization will be improving the efficacy, durability and tolerability of therapeutic regimens. Strategies that promote simplification of the active pharmaceutical ingredient (API) production process, improved drug bioavailability, dose reduction, improved formulations and use of new, more affordable drugs can increase adherence, reduce pill burden, minimize side effects and reduce costs.

The 2010 WHO ART guidelines reflect important new recommendations based on advances in clinical and programmatic evidence on ART use in LMICs: phasing out of stavudine (d4T) because of its significant toxicity profile; ART initiation at CD4+ counts ≤ 350 cells/mm³ (rather than < 200 cells/mm³); and guidance for the co-administration of ART and TB treatment. However, preferred first, second and third-line ART regimens remain complex and are not harmonized across populations. *Treatment 2.0* drug regimens should meet 'target product profiles' that include once-daily dosing of FDCs that are inexpensive, have minimal toxicities, are durable, and can be used safely and effectively by children and adults, including by pregnant and breastfeeding women and by people receiving treatment for co-infections such as TB and viral hepatitis.

Research and development

Reaching this ideal regimen requires intensified research and development of ARVs and formulations, in particular for LMIC settings. While fully optimal regimens that meet the target product profile may not be available commercially during the next ten years, in the interim there is much that can be done with current ARVs and formulations while providing incentives for innovator and generic drug manufacturers to invest in R&D. The results of strategic R&D investments and optimization studies of currently available ARVs will inform normative guidance and, in turn, help shape market dynamics to achieve the

‘smarter, better pill’ envisioned in the *UNAIDS Strategy: 2011 - 2015*. Likewise, influencing market dynamics that affect the availability of ARVs will incentivize R&D efforts to produce stepwise improvements in the quality, efficacy, tolerability and dosage requirements of ARVs and FDCs.

Normative guidance and technical support

Timely adoption of normative guidance and policies, including implementation of new recommendations, and the promotion of better procurement and delivery systems are critical: not only for ARVs, but also for diagnostics and service delivery approaches that are linked to other areas of health care in a variety of settings. WHO released adaptation guidance in 2011 to support countries transition from current drug regimens to those in the 2010 recommendations, and this guidance will be updated for release in conjunction with future ART guidelines.²³ WHO and UNAIDS will provide technical support through regional and country offices, together with a range of technical and implementation partners. It is likely that over the next couple of years further revisions to guidelines on the use of ARVs and ART for treatment and prevention will occur.

Programmatic adaptation and scale-up

National HIV programmes are already adapting and implementing the 2010 WHO ART guidelines. A situational assessment (including the status of treatment scale-up, the number of people still in need of treatment, anticipated funding streams and health system capacity), undertaken by country-level programme managers will assist countries to determine priorities. A WHO survey conducted in 52 countries at the end of 2010, indicated that 43 national HIV programmes had changed the CD4 criteria for when to start ART (i.e., $CD4 \leq 350$ cells/mm³) and 38 had started replacing d4T with a less toxic option.²⁴

A critical component of ART programme scale-up to meet national universal access goals will be ensuring community organizations, bilateral programmes and NGOs are fully engaged in drug optimization efforts, including planning for medium and long-

Progress on Drug Optimization

Medicines Patent Pool / UNITAID/WHO

Developed and submitted a list of 2010 WHO-recommended ARVs and formulations missing from the Essential Medicines List to the WHO Expert Committee on Essential Medicines (February 2011).

WHO

Developed and published a list of priority short-term (1 – 3 years) actions for ART drug optimization for first-line and second-line ART for adults/adolescents and children, based on an expert consultation (July 2011).

These recommendations will guide developers to make real progress on the availability of simpler and less toxic regimens.

term drug optimization. Programmatic experience, including care and treatment programme evaluations, operations research and case studies, will inform policy development, technical support and normative guidance on drug optimization, along with emerging clinical evidence.

Progress on Drug Optimization

In the lead-up to the next WHO review of ART guidelines, WHO, UNAIDS and its partners have achieved several key milestones in setting priorities for drug optimization. A list of missed formulations and short term priorities needed for improvement of first- and second- line ART for adults, adolescents and children were established in recent expert consultations, and will guide drug manufacturers to develop simpler and less toxic regimens.

2. Provide Access to Point-of-Care and Other Simplified Diagnostics and Monitoring Tools

2020 Goal: A package of simple, affordable, reliable, quality-assured POC and other simplified diagnostics are available and accessible in LMICs

Context

A package of affordable and easily-performed diagnostics using point-of-care (POC) and other simplified technologies needs to be developed and validated in order to permit an expansion of HIV testing and counselling and treatment monitoring, in particular at the primary health centre and community levels. To establish this package, evaluations of the efficacy and robustness of HIV, TB, STI, viral hepatitis and other diagnostics (including diagnosis, staging and monitoring tools) are necessary, both to assess POC tools currently available and accelerate the development of those in the research and development (R&D) pipeline.

While advances have been made in developing POC and other simplified diagnostics, many currently available tools have a variety of disadvantages that limit their availability and effectiveness in (LMICs). Some are expensive and/or require significant technical expertise, some do not have adequate quality assurance controls or reliability safeguards, and none provide simple, high-throughput, multi-platform tools (i.e., for HIV, TB, STI, viral hepatitis and malaria diagnosis) for use at the POC. The need for POC technologies is particularly key for ensuring rapid, reliable diagnostic results outside major urban areas and/or in settings with limited access to centralized laboratory services.

"In addition to HIV diagnostics, Treatment 2.0 will include evaluating a package of affordable, accessible TB and viral hepatitis diagnostics for use in a range of health care settings."

WHO Global Health Sector Strategy on HIV/AIDS, 2011-2015

The market for diagnostics presents additional challenges; it is fragmented among a few early, expensive, predominantly high level laboratory-based entrants, and the pipeline for promising new POC technologies - while improving - remains much less robust compared to ARVs. UNAIDS and WHO will work with global and country-level partners to harmonize and standardize performance and quality requirements, increase R&D, influence market dynamics and reduce barriers to the rapid approval and uptake of new, more promising diagnostics and monitoring tools.

Some countries are already moving to advance access to POC and other simplified technologies available in decentralized health care settings. Recently, a real time PCR assay for TB diagnosis that simultaneously detects rifampicin resistance was developed on the GeneXpert platform, which integrates sample processing and greatly simplifies testing.^{25, 26} South Africa has recently made a large purchase of the GeneXpert TB/MDR TB diagnostic platform. Several CD4+ and viral load tests using POC technologies are also under development.^{27, 28} After a long period of very little progress on the development of POC diagnostics, a number of exciting new products are likely to come to market over the next few years.

Research and development

Some promising candidates are in the pipeline for POC CD4 and viral load monitoring. UNAIDS and WHO are working with technical experts and partners to identify the ideal *Treatment 2.0* "package" of currently or soon to be available POC diagnostics and other simplified monitoring tools to optimize diagnosis, care, treatment and support services, identify the bottlenecks to development and delivery of new technologies, and accelerate the critical path towards making them available. Establishing consensus on performance and quality standards against which to evaluate current technologies and those in the R&D pipeline is key to driving innovation and competition in this field in order to meet the optimal target product profile for laboratory-based and POC diagnostics. Recent evidence on the use of dried blood spot (DBS) technology for viral load quantification, POC CD4, and early infant diagnosis have provided an important foundation that must be translated into quality-assured, widely available, standardized tools for health care providers.^{29, 30}

Progress on POC & Simplified Lab Diagnostics

UNITAID

Coordinated and published a synthesis of available R&D and market dynamics data on commercially available diagnostics in LMICs and those in late stage development (May 2011).

WHO and UNAIDS

Established a Treatment 2.0 Diagnostics Working Group, including CDC, UNITAID, Gates Foundation and CHAI to guide work on the diagnostics work stream (May 2011).

Normative guidance and technical support

WHO will include additional guidance on the use of diagnostics in conjunction with its future ART clinical guidelines. Normative guidance and country-level leadership and technical support will reflect the need for flexibility in selecting the right diagnostic tools for specific settings and service delivery approaches: middle-income countries, for example, may focus more on strengthening laboratory capacity and reduce the cost and turnaround times for testing. Other countries may focus on the POC technologies which are needed in rural or remote settings, or in countries with limited centralized laboratory capacity.

Programmatic Adaptation and Scale-up

National HIV programmes are currently struggling with a fragmented marketplace and a limited number of either POC or simpler laboratory-based technologies. Adapting normative guidance on diagnostics and including diagnostics in pooled procurement mechanisms will provide important opportunities to both strengthen diagnostic capacity and reduce costs. Coordination at the country level among Ministries of Health, regulatory agencies, bilateral programmes and NGOs and community-based organizations will be key to scaling up diagnostics in support of HIV testing, counselling, treatment and care.

3. Reduce Costs

2020 Goal: High-quality HIV care and treatment programmes are available at the lowest possible cost with optimal efficiency to all in need in LMICs

Context

ART programmes and other HIV services are currently facing enormous financial pressures, and overall domestic and donor health spending may not increase in the short term as steeply as it did between 2001 and 2010. UNAIDS released estimates prior to the High Level Meeting in June 2011 on the investments required in HIV programmes to reach universal access and MDG targets by 2015, including providing access to ART for 15 million treatment-eligible people.²⁰

Advocacy is required to ensure the donor and domestic financing required to achieve and sustain universal access to HIV prevention, diagnosis and treatment. Clearly more resources than currently available are required. However, there are significant opportunities for cost reductions and efficiency gains in HIV programmes. Commodity costs can be reduced by pooled procurement of drugs and diagnostics, as well as through simplified manufacturing processes, potential dose reductions and negotiations for cost reductions of the active pharmaceutical ingredients (APIs) of the drugs and the drugs themselves. Efficiency gains can be achieved in service delivery, particularly through task-shifting and an expanded role for communities in service delivery.

LMICs can also take better advantage of flexibilities under the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement to ensure life-saving health commodities are available to all in need.

UNAIDS recently coordinated the development and costing of a new strategic investment framework for the HIV response, which estimates a USD 22 billion price tag for the overall HIV response by 2015, approximately one-third of which should be devoted to treatment.²⁰ If monies are targeted efficiently by countries, using a human rights framework and clear analysis of local epidemiological characteristics, with an emphasis on six evidence-based basic programme activities (including treatment), critical enablers and synergies, by 2020 the resource needs will decline together with reductions in HIV transmission, morbidity and mortality.

Normative Guidance and Technical Support

UNAIDS, WHO and UNDP will work with country-level partners to provide technical support and guidance on employing TRIPS flexibilities and other strategies to reduce costs and improve access to treatment. UNAIDS and WHO will support countries to address the scourge of counterfeit and substandard drugs and strengthen the use of the Global Price Reporting Mechanism and other strategic drug databases, which are key to continued transparency and efforts to forecast need and drive down the cost of quality-assured drugs, working with the Global Fund, PEPFAR, CHAI, UNITAID and other partners.

Working collaboratively with both innovator and generic companies to forecast market demands and reduce drug costs throughout the manufacturing, supply and procurement process is important to reducing costs, as is tiered drug pricing and competitive sourcing of active pharmaceutical ingredients. The exponential decline in prices for first-line drug regimens over the past decade (almost 99% between 2000 and 2010) demonstrates the impact these strategies can have on prices as demand increases.^{2, 31} New mechanisms aimed at accelerating voluntary licensure of new drugs and technologies, such as the Medicines Patent Pool, are providing additional opportunities to expand access to vital health commodities.

Progress on Reducing Costs

As part of ongoing work to reduce costs, UNDP, UNAIDS and WHO have released guidance on policy options for countries in employing TRIPS flexibilities (see Table 1). Additional cost-effectiveness analysis will help inform opportunities for reducing costs throughout the manufacturing, procurement, supply chain management and service delivery process.

Unit costs have been falling significantly in recent years, primarily due to efforts by the major procurement agencies, such as PEPFAR, to reduce in-country drug costs.

Table 1: Health-Related TRIPS Flexibilities at a Glance

Types of TRIPS Flexibilities	Examples
Preventative: <i>Policy options to ensure that patents do not hinder access to affordable medicines.</i> <i>Advantages: easier, faster, less politically sensitive compared to some remedial measure.</i>	Exclusion from Patentability: Exclude new use of known substances, methods and processes (Articles 27.2 and 27.3). Patentability Criteria: Develop and apply strict patentability criteria for examination of pharmaceutical patents. Mitigate frivolous patents and “ever greening” opportunities. (Articles 1 and 27.1). Patent Opposition: Allow pre-grant and post-grant patent opposition in fast, accessible and cost-efficient manner. Waiver for LDCs: LDCs should utilize the waiver to provide patent protection for pharmaceuticals until 1 January 2016 (and possibly longer, if extended).
Remedial: <i>Preventative flexibilities cannot always be used to meet existing and emerging needs to secure access to affordable medicines. Therefore, series of remedial flexibilities are included in the TRIPS Agreement.</i>	Compulsory Licenses and Government Use Orders (Article 31 (a)–(j)). Compulsory Licenses for Export under the WTO 30 August, 2003 Decision. Exceptions: <i>Bolar</i> (early working) exception, research and experimental use exception, individual use (Article 30). Use of National Competition Laws to prevent IPR abuse and provide remedies (Articles 8.2, 31(k) and 40). Parallel Importation (Article 6).
Enforcement: <i>Related to obligations under Part III of the TRIPS Agreement, which sets minimum standards for IPR enforcement.</i>	No border measures for suspected patent infringement (Article 51). No criminalization of patent infringement (Part III, Section 5).

Source: Good practice guide: Improving access to treatment by utilizing public health flexibilities in the WTO TRIPS agreement, 2010³²

4. Adapt Delivery Systems

2020 Goal: HIV care and treatment programmes are decentralized and appropriately integrated with other HIV and non-HIV health services, with increased community engagement in service delivery and improved retention in care

Context

Despite updated WHO ART guidelines that recommend early ART initiation, the reality is that many ART programmes continue to see clients at first visit who have advanced HIV disease and/or CD4 cell counts far below 200 cells/mm³.³³ Expanding treatment access to all those eligible will require a dramatic increase in the number of people who receive HIV testing and counselling (HTC) earlier in the course of their HIV infection and referral to care and treatment programmes, using a variety of health sector and community-based models that protect and promote human rights. Increasing HTC uptake and reducing late-stage presentation and late treatment initiation will significantly reduce HIV-related morbidity and mortality and strengthen the preventive benefits of ART.

"Cost-effective service delivery models that deliver good health outcomes need to be selected – or adapted – to meet the need of populations, with a strong focus on expanding access and improving HIV service quality through integrated, decentralized approaches that leverage community-based systems."

WHO Global Health Sector Strategy on HIV/AIDS, 2011-2015

Decentralizing and integrating treatment with other areas of health care, such as drug dependency services, maternal and child health or TB services will help leverage scarce resources for maximum effect; one example of this is in Lusaka, Zambia, where the integration of ART into existing public sector maternal and child health clinics increased uptake and doubled the proportion of eligible women initiating treatment.³⁴ Integrating and simplifying approaches to delivering the four pillars of PMTCT: preventing unwanted pregnancies, preventing primary HIV infection, preventing mother to child transmission, and care and treatment for women, their infants and families with other areas, such as sexual and reproductive health services, is critical to expanding access to treatment-eligible individuals and gaining efficiencies. A guidance document released by UNICEF/WHO/UNAIDS, for example, outlines how to integrate HIV services with sexual and reproductive health services that will help expand treatment to women, children and their families.³⁶

Although there have been large-scale increases in the numbers of health facilities providing ART, further expansion of ART care and treatment services is required to primary health centres (PHCs), with a concomitant need to expand and link community systems at the local level. PHC services are closer to where most people in need of treatment live and access other services. Despite standardized treatment guidelines and algorithms, ART programmes too often remain dependent on relatively few medical doctors. In some countries, national guidelines still restrict the ability of trained nurses to initiate and maintain patients on ART or implement other task-shifting or task-sharing

strategies, despite mounting evidence that such strategies are effective at both expanding health system capacity, maintaining quality of care and achieving national targets for ART access.³⁷⁻³⁹

Previous work by WHO through the Integrated Management of Childhood Illness (IMCI), Integrated Management of Adolescent and Adult Illness (IMAI) and the Integrated Management of Pregnancy and Childbirth (IMPAC) have included HIV-specific modules and other tools to support task-sharing and integration of HIV care in primary care settings. WHO is building upon this experience to develop global guidance on decentralized, integrated service delivery that maximizes community participation.

There is enormous untapped potential to leverage health and community system capacity, built to provide chronic HIV treatment services, to help strengthen chronic care for other conditions, including non-communicable diseases.⁴⁰

Research and Development

A recent Kenyan study of a week-long multiple disease prevention programme demonstrated 96% uptake of the over 47,000 people who attended the campaign, demonstrating the potential impact of integrated prevention, testing and treatment programmes on HIV, malaria and diarrhoeal diseases.⁴¹ Operations research and implementation science like this is strengthening the evidence base on optimal service delivery in a variety of settings and resource-limited contexts. Building on the case studies released in conjunction with '3 by 5', WHO and UNAIDS are reviewing additional programmatic data and peer-reviewed literature to expand the evidence base related to integrated, decentralized service delivery, using an evaluation framework that uses equity, HIV outcomes, non-HIV outcomes, cost, community engagement, systems impact and security/socioeconomic impact as key analytic criteria.

Integrating ART provision with comprehensive PMTCT, antenatal care, MNCH, TB and harm reduction programmes are areas where clinical and programmatic evidence and experience will help inform global guidance. WHO and UNAIDS will convene expert consultations with partners to develop and guide the implementation of a *Treatment 2.0* research agenda designed to address knowledge gaps in optimizing service delivery modalities that will expand access to evidence-based, integrated, decentralized HIV services in which community-centred services will play a central role.

Normative Guidance and Technical Support

Programmatic evidence and operations research findings will inform the development of new WHO normative guidance on adapting service delivery systems in conjunction with related technical areas, such as ART and diagnostic guidance and adaptation support. Technical support and normative guidance will address the unmet need for

increased uptake of HIV testing and counselling in a range of settings using both provider and community-based approaches. Guidance and technical support will include addressing the significant gaps between diagnosis, referral to ART programmes, ART initiation and retention in care.

The challenges in the supply and procurement of health commodities must be addressed through strong normative guidance and technical support to HIV treatment programmes, particularly on how to ensure that procurement and supply chain management systems can adequately deliver commodities to those in need and minimize the risk of drug stock outs or wastage.

5. Mobilize Communities

2020 Goal: People living with HIV and key populations are fully involved in the demand creation, planning, delivery and evaluation of quality-assured, rights-based HIV care and treatment programmes in all LMICs

Context

The full engagement of people living with HIV and their affected families and communities is essential to the success of *Treatment 2.0*. National and global advocacy and activism will increase the demand for financial resources, HIV testing and counselling services, ART and related health services. Fully engaged, mobilized communities are essential to drive the demand side of the equation, to ensure fair prices for medicines and other health commodities, to improve and expand access to services – particularly for underserved most-at-risk populations (MARPs) – and to ensure that care and treatment programmes promote and protect human rights. Decentralizing service delivery will bring services closer to people living with HIV and

"To strengthen national and community systems to deliver treatment, care and support, community system capacity needs major expansion in order to deliver decentralized, integrated services."

Getting to Zero: UNAIDS Strategy on HIV/AIDS, 2011-2015

Progress on Adapting Service Delivery

WHO/UNAIDS

Developed an evaluation framework and conducted a literature review to identify and assess available evidence & identify knowledge gaps (April 2011).

WHO

Released guidelines on testing and counselling of couples and recommendations on treatment as prevention within HIV serodiscordant couples. (July 2011).

WHO/UNAIDS

Organizing an expert conference on service delivery options for improving retention in care (September 2011).

their families, thereby facilitating access to treatment and care. This is particularly important when transport costs, long distances to clinics, and having to attend multiple clinics to receive different health services are contributing to high loss to follow up (LTFU). Local, decentralized health services must be expanded and strongly linked to expanded community-based services, such as adherence support, treatment literacy, prevention counselling and nutritional support.

Consultation and Mobilization

Evidence indicates that MARPs continue to be underserved in most low and middle-income countries.⁴ Addressing the equity deficit must be a critical component of the AIDS response and a core value of health service delivery. Available evidence and case studies demonstrating that community-based services result in better and more equitable health services must inform programme design and additional programmatic experience documented as part of the *Treatment 2.0* research agenda.⁴²⁻⁴⁴

Financing and Technical Support

Increasing the involvement of PLHIV and key populations in ART programme design and delivery, as well as policy development, will be critical to success. AIDS activism began in the early 1980's with the rallying cry, "nothing about us without us." NGOs and community-based service providers will require increased financing and technical support to mobilize communities and expand community-based services required to achieve *Treatment 2.0* goals. Support to community mobilization through such mechanisms as the Global Fund's Community System Strengthening envelope, will be key to ensuring the network of NGOs and community-based organizations have the resources to expand the range and quality of services to meet *Treatment 2.0* targets.

Progress on Community Mobilization

As part of ongoing work consult with and mobilize communities in support of *Treatment 2.0*, UNAIDS has partnered with the International Treatment Preparedness Coalition (ITPC) to conduct a series of consultations that are serving to both mobilize community support and identify the needs of communities in taking on an expanded role in the delivery and management of HIV testing, counselling, care and treatment programmes. The results of these regional consultations are being incorporated into normative guidance and policy development, technical support and guidance for research.

WHAT COUNTRIES ARE DOING ON *TREATMENT 2.0*

While *Treatment 2.0* is a long-range initiative in which the full realization of goals may take many years, there are many actions that national HIV programmes and country-level financing and implementing agencies can – and are – taking in the short-term to advance the *Treatment 2.0* agenda and achieve universal access:

- Adapt and implement the 2010 WHO ART guidelines for adults/adolescents, infants/children and pregnant/lactating women; use 2011 WHO adaptation guidance to ensure early ART initiation, a smooth transition to new regimens, use of FDCs and to improved retention in care.
- Work with WHO and financing and implementing agencies to strengthen and harmonize regulatory pathways for pre-qualified drugs and diagnostics.
- Review supply and procurement strategies for drugs and diagnostics and maximize the use of available strategic information and tools, such as the Global Fund's voluntary pooled and regional procurement mechanisms.
- Increase use of the Global Price Reporting Mechanism and reports from the AIDS Medicines and Diagnostic Services (AMDS), CHAI, UNITAID and others to shape domestic market dynamics, increase competition and reduce prices.
- Review policy options for employing TRIPS flexibilities and ensure that bilateral and regional free trade agreements do not restrict TRIPS safeguards.
- Establish or use existing multi-stakeholder mechanisms (such as Country Coordinating Mechanisms) to plan for financing and implementing decentralized, integrated HIV service delivery approaches that incorporate an expanded role for community-based service delivery across the care, treatment and support continuum.
- Invest in HIV response, using domestic and international resources, using the five work priorities of the *Treatment 2.0 Framework for Action* to guide investments for maximum impact.
- Implement the 12-point Policy for Collaborative TB/HIV Activities^{iv} and integrate HIV programmes with other HIV and non-HIV services, including drug dependency, SRH, TB, MNCH and harm reduction.

A number of countries, including Swaziland, Malawi, China and Vietnam, are early adopters of the five priority work streams of *Treatment 2.0*. UNAIDS and WHO will publish a number of country case studies over the next year to illustrate their experiences.

^{iv} The description of this policy is available at <http://www.who.int/hiv/topics/tb/actions/en/index.html>

PARTNERSHIP AND ACCOUNTABILITY: COLLABORATING AND REPORTING ON *TREATMENT 2.0*

The UNAIDS Secretariat and WHO will provide leadership on *Treatment 2.0*, report on progress through the annual UNAIDS/WHO/UNICEF *Towards Universal Access* reports and UNGASS High-Level Meetings, and collaborate with global and country-level partners to implement and monitor progress on *Treatment 2.0*.

Treatment 2.0 was endorsed by the UN Inter-Agency Working Group on HIV care and treatment and TB/HIV; each of the UNAIDS co-sponsors is contributing to implementing *Treatment 2.0*, based on the updated UNAIDS Division of Labour.^v A number of financing and implementing organizations, research granting agencies, civil society organizations and private foundations endorsed *Treatment 2.0* at a global partners meeting in February 2011 and are collaborating with WHO, the UNAIDS Secretariat, and other UNAIDS co-sponsoring agencies and country-level partners to advance work in each area.^{vi} While the UNAIDS Secretariat and WHO are leading the implementation of *Treatment 2.0*, ultimately it will be at the country level that it must demonstrate results: in universal access to efficient, rights-based HIV programmes that deliver evidence-based care, treatment and support services, tailored to national epidemics.

Pangaea Foundation is providing technical and secretariat support to UNAIDS and WHO to advance *Treatment 2.0*.

Monitoring and Reporting on *Treatment 2.0*

WHO and UNAIDS have developed a series of indicators, including those outlined in the WHO Global Health Sector Strategy on HIV, to support countries to improve information related to the quality, coverage, outcome and impact of HIV services. UNAIDS and WHO will use these indicators and the targets outlined in each priority work area to monitor and report on progress in implementing *Treatment 2.0*.

^v The UN Inter-agency working group on HIV treatment and care and TB/HIV includes UNAIDS Secretariat, WHO, UNICEF, UNDP, UNHCR, ILO, UNODC and WFP.

^{vi} Global partners include UNITAID, the Medicines Patent Pool, International AIDS Society, International Treatment Preparedness Coalition, Health GAP, President's Emergency Plan for AIDS Relief, Clinton Health Access Initiative, Bill & Melinda Gates Foundation, Pangaea Foundation, the Agence Nationale de Recherche sur le Sida (ANRS) and US National Institutes of Health (NIH).

CONCLUSION

Treatment 2.0 requires the global health community to collaborate on re-energizing and accelerating a public health approach to ART that will drive innovation, improve efficiencies, enhance quality, ensure equity, and enable sustained universal access to HIV treatment for those who need it and to maximize the preventive benefits of ART. The challenges facing the global health community are also opportunities to strengthen those elements that have resulted in such remarkable success over the past decade: innovation, partnership, investment and accountability. These are the ingredients that will make global aspirations for universal access a reality and turn the tide on the HIV pandemic.

WORKS CITED

1. WHO. Treating 3 million by 2005: Making it happen. Geneva: WHO; 2003. Available at: <http://www.who.int/3by5/publications/documents/isbn9241591129/en/>. Accessed 21 June 2011.
2. WHO/UNAIDS/UNICEF. Towards Universal Access: Scaling up Priority HIV Interventions in the Health Sector. Progress Report 2010. Geneva: WHO/UNAIDS/UNICEF; 2010. Available at: <http://www.who.int/hiv/pub/2010progressreport/en/>. Accessed 21 June 2011.
3. Grubb I, Perriens J, Schwärtlander B. A Public Health Approach to Antiretroviral Therapy: Overcoming Constraints. Geneva: WHO; 2003. Available at: http://www.who.int/hiv/pub/prev_care/en/PublicHealthApproach_E.pdf. Accessed 21 June 2011.
4. UNAIDS. UNAIDS Report on the Global AIDS Epidemic. Geneva: UNAIDS; 2010. Available at: http://www.unaids.org/globalreport/global_report.htm. Accessed 21 June 2011.
5. UNAIDS. UNAIDS Outlook Report 2011. Geneva: UNAIDS; 2011. Available at: http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/20110607_JC2069_30Outlook_en.pdf. Accessed 21 June 2011.
6. UNAIDS. AIDS at 30: Nations at the crossroads. Geneva: UNAIDS; 2011. Available at: http://www.unaids.org/unaids_resources/aidsat30/aids-at-30.pdf. Accessed 21 June 2011.
7. Rajaratnam JK, Marcus JR, Levin-Rector A, Chalupka AN, Wang H, Dwyer L, et al. Worldwide mortality in men and women aged 15 - 59 years from 1970 to 2010: a systematic analysis. *Lancet*. 2010; **375**: 1704 - 20.
8. Reniers G, Araya T, Davey G, Nagelkerke N, Berhane Y, Coutinho R, Sanders EJ. Steep declines in population-level AIDS mortality following the introduction of antiretroviral therapy in Addis Ababa, Ethiopia. *AIDS*. 2009; **23**: 511 - 8.
9. Herbst AJ, Cooke GS, Barnighausen T, KanyKany A, Tanser F, Newell ML. Adult mortality and antiretroviral treatment roll-out in rural KwaZulu-Natal, South Africa. *Bulletin World Health Organization*. 2009; **87**: 754-62.
10. WHO. Antiretroviral therapy for HIV infection in infants and children: towards universal access: Recommendations for a public health approach. Geneva: WHO; 2010. Available at: <http://www.who.int/hiv/pub/guidelines/paediatric020907.pdf>. Accessed 21 June 2011.

11. Siegfried N, Uthman OA, Rutherford GW. Optimal time for initiation of antiretroviral therapy in asymptomatic, HIV-infected, treatment-naïve adults. *Cochrane Database Syst Rev*. 2010; (3): CD008272.
12. Kitahata MM, Gange SJ, Abraham AG, Merriman B, Saag MS, Justice AC, et al. Effect of early versus deferred antiretroviral therapy for HIV on survival. *N Engl J Med*. 2009; **360**(18): 1815-26.
13. Gilks CF, Crowley S, Ekpini R, Gove S, Perriens J, Souteyrand Y, et al. The WHO public-health approach to antiretroviral treatment against HIV in resource-limited settings. *Lancet*. 2006; **368**(9534): 505-10.
14. Severe P, Juste MA, Ambroise A, Eliacin L, Marchand C, Apollon S, et al. Early versus standard antiretroviral therapy for HIV-infected adults in Haiti. *N Engl J Med*. 2010; **363**(3): 257-65.
15. Donnell D, Beaten JM, Kiarie J, Thomas KK, Stevens W, Cohen CR, et al. Heterosexual HIV-1 transmission after initiation of antiretroviral therapy: a prospective cohort analysis. *Lancet*. 2010; **375**(9731): 2092-8.
16. Kasirye R, Levin J, Munderi P, Okell L, Walker S, Mugisha A, Grosskurth H. Epidemiology of malaria in HIV infected patients on ART in Uganda: a prospective cohort study. Presented at the XVIII International AIDS Conference, 2010; Vienna, Austria; 2010.
17. Bygrave H, Ford N, van Cutsem G, Hilderbrand K, Jouquet G, Goemaere E, et al. Implementing a Tenofovir-Based First-Line Regimen in Rural Lesotho: Clinical Outcomes and Toxicities After Two Years. *J Acquir Immune Defic Syndr*. 2011; **56**(3): e75 - e8.
18. Kahn JG, Granich R, Bennett R, Holmes CB, Garg N, Serenata C, Sabin M, Makhoulouf-Obermeyer C, De Fillippo Mack C, William P, Johnes L, Smyth C, Kutch KA, Lo YR, Vitoria M, Souteyrand Y, Crowley S, Korenromp EL, Williams GB. Expanding ART for Treatment and Prevention of HIV in South Africa: Estimated Cost and Cost-Effectiveness 2011 - 2050. In review.
19. Walensky RP, Wood R, Ciaranello AL, Paltiel AD, Lorenzana SB, Anglaret X, et al. Scaling up the 2010 World Health Organization HIV Treatment Guidelines in resource-limited settings: a model-based analysis. *PLoS medicine*. 2010; **7**(12): e1000382.
20. Schwartlander B, Stover J, Hallett T, Atun R, Avila C, Gouws E, et al. Towards an improved investment approach for an effective response to HIV/AIDS. *Lancet*. 2011. *Lancet*, 2011; **377**(9782): 2031-41.

21. Attia S, Egger M, Muller M, Zwahlen M, Low N. Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis. *AIDS*. 2009; **23**(11): 1397-404.
22. National Institute of Allergy and Infectious Diseases. Treating HIV-infected People with Antiretrovirals Protects Partners from Infection. Findings Result from NIH-funded International Study; 2011. Available at: <http://www.niaid.nih.gov/news/newsreleases/2011/Pages/HPTN052.aspx>. Accessed 21 June 2011.
23. WHO. Adapting WHO Normative HIV Guidelines for National Programmes: Essential Principles and Processes. Geneva: WHO; 2011. Available July 2011 at: <http://www.who.int/hiv/pub/en/>.
24. Renauld-Thery F. Annual 2010 Survey on ARV Use and Trends in Implementation of WHO 2010 ART. Presented at WHO & UNAIDS Annual Consultation with Pharmaceutical Companies - Global Forecasts of Antiretroviral Demand 2011-2012. Geneva, December 2010. Available at: http://www.who.int/hiv/amds/who_arv_trends_f_renaud.pdf. Accessed 21 June 2011.
25. Boehme CC, Nicol MP, Nabeta P, Michael JS, Gotuzzo E, Tahirli R, et al. Feasibility, diagnostic accuracy, and effectiveness of decentralised use of the Xpert MTB/RIF test for diagnosis of tuberculosis and multidrug resistance: a multicentre implementation study. *Lancet*. 2011; **377**(9776): 1495-505.
26. Banada PP, Sivasubramani SK, Blakemore R, Boehme C, Perkins MD, Fennelly K, et al. Containment of bioaerosol infection risk by the Xpert MTB/RIF assay and its applicability to point-of-care settings. *J Clin Microbiol*. 2010; **48**(10): 3551-7.
27. Mtapuri-Zinyowera S, Chideme M, Mangwanya D, Mugurungi O, Gudukeya S, Hatzold K, et al. . Evaluation of the PIMA Point-of-Care CD4 Analyzer in VCT Clinics in Zimbabwe. *J Acquir Immune Defic Syndr*. 2010; **155**(1): 1-7.
28. UNITAID Secretariat/WHO. UNITAID Technical Report: HIV/AIDS Diagnostic Landscape. Geneva: WHO; 2011. Available at: http://www.unitaid.eu/images/marketdynamics/publications/unitaid_md_technical_report_diagnostics_landscape_web.pdf. Accessed 21 June 2011.
29. van Deursen P, Oosterlaken T, Andre P, Verhoeven A, Bertens L, Traub-Darsatz M, et al. Measuring human immunodeficiency virus type 1 RNA loads in dried blood spot specimens using NucliSENS EasyQ HIV-1 v2.0. *J Clin Virol*. 2010; **47**(2): 120-5.
30. Jani I, Sitoe N, Chongo P, Quevedo J, Tobaiwa O, Lehe J, et al. Evaluation of point-of-care CD4 and toxicity monitoring for resource-limited ART clinic settings in Mozambique. Presented at the XVIII International AIDS Conference; 2010; Vienna, Austria; 2010.

31. UNAIDS, WHO, UNDP. Using TRIPS Flexibilities to Improve Access to HIV Treatment (Policy Brief); 2011. Available at: http://content.undp.org/go/cms-service/stream/asset/?asset_id=3259436. Accessed 21 June 2011.
32. UNDP. Good practice guide: Improving access to treatment by utilizing public health flexibilities in the WTO TRIPS agreement. New York: UNDP; 2010. Available at: <http://apps.who.int/medicinedocs/documents/s17762en/s17762en.pdf>. Accessed 21 June 2011.
33. Kigozi IM, Dobkin LM, Martin JN, Geng EH, Muyindike W, Emenyonu NI, et al. Late-disease stage at presentation to an HIV clinic in the era of free antiretroviral therapy in Sub-Saharan Africa. *J Acquir Immune Defic Syndr*. 2009; **52**(2): 280-9.
34. Torpey K, Kabase M, Kasonde P, Dirks R, Bweupe M, Thompson C, et al. Increasing the uptake of prevention of mother-to child transmission of HIV services in a resource-limited setting. *BMC Health Services Research*. 2010; **10**(29).
35. Killam WP, Tambatamba BC, Chintu N, Rouse D, Stringer E, Bweupe M, et al. Antiretroviral therapy in antenatal care to increase treatment initiation in HIV-infected pregnant women: a stepped wedge evaluation. *AIDS*. 2010; **24**: 856-6124.
36. UNFPA/WHO/UNAIDS/IPPF. Sexual and Reproductive Health and HIV/AIDS: A Framework for Priority Linkages. Geneva: WHO; 2005. Available at: http://www.who.int/reproductivehealth/publications/linkages/HIV_05_5/en/index.html. Accessed 21 June 2011.
37. Bemelmans M, Van Den Akker T, Ford N, Philips M, Zachariah R, Harries A, et al. Providing universal access to antiretroviral therapy in Thyolo, Malawi through task shifting and decentralization of HIV/AIDS care. *Tropical medicine & international health* 2010; **15**(12): 1413-20.
38. Shumbusho F, van Griensven J, Lowrance D, Turate I, Weaver MA, Price J, et al. Task shifting for scale-up of HIV care: evaluation of nurse-centered antiretroviral treatment at rural health centers in Rwanda. *PLoS medicine*. 2009; **6**(10): e1000163.
39. Morris MB, Chapula BT, Chi BH, Mwango A, Chi HF, Mwanza J, et al. Use of task-shifting to rapidly scale-up HIV treatment services: experiences from Lusaka, Zambia. *BMC Health Serv Res*. 2009; **9**(5).
40. UNAIDS. Chronic care of HIV and non-communicable diseases: How to leverage the HIV experience. Geneva: UNAIDS; 2011. Available at: http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/20110526_JC2145_Chronic_care_of_HIV.pdf. Accessed 21 June 2011.

41. Lugada E, Millar D, Haskew J, Grabowsky M, Garg N, Vestergaard M, et al. Rapid implementation of an integrated large-scale HIV counseling and testing, malaria, and diarrhea prevention campaign in rural Kenya. *PLoS One*. 2010; **5**(8): e12435.
42. Médecins sans Frontières South Africa, Department of Public Health at the University of Cape Town, Provincial Administration of the Western Cape. Antiretroviral Therapy in Primary Health Care: Experience of the Khayelitsha Programme in South Africa. Geneva: WHO; 2003. Available at: http://www.who.int/hiv/pub/prev_care/en/South_Africa_E.pdf. Accessed 21 June 2011.
43. Mukherjee J, Colas M, Farmer P, Léandre F, Lambert W, Raymonville M, et al. Access to Antiretroviral Treatment and Care: The Experience of the HIV Equity Initiative, Cange, Haiti. Geneva: WHO; 2003. Available at: <http://whqlibdoc.who.int/publications/2003/9241590882.pdf>. Accessed 21 June 2011.
44. Zachariah R, Teck R, Buhendwa L, Fitzerland M, Labana S, Chinji C, et al. Community support is associated with better antiretroviral treatment outcomes in a resource-limited rural district in Malawi. *Trans R Soc Trop Med Hyg*. 2007; **101**(1): 79-84.

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ISBN 978 92 4 150193 4



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