

Redesigning the AIDS response for long-term impact

Heidi J Larson,^a Stefano Bertozzi^b & Peter Piot^a

Abstract Three decades since the human immunodeficiency virus (HIV) was identified, the pandemic of acquired immunodeficiency syndrome (AIDS) has developed into diverse epidemics around the world. In many populations, HIV infection has become endemic. While there is good progress on expanding access to treatment, with an estimated 6.6 million people on antiretroviral therapy at the end of 2010, prevention efforts are still highly inadequate with 2.6 million new infections occurring in 2009. Demand for treatment is increasing while funding is becoming more scarce and activism is waning. In 2007, the Joint United Nations Programme on HIV/AIDS (UNAIDS) established an independent forum called *aids2031* to take a critical look at the global HIV/AIDS response. This paper outlines four key areas for a re-designed AIDS response based on the deliberations of this initiative and on the learning and experience of the first three decades of the epidemic: (i) a new culture of knowledge generation and utilization; (ii) transformed prevention and treatment to increase effectiveness; (iii) increased efficiency through better management and maximizing synergies with other programmes; and (iv) investment for the long term. Across all these areas is a strong emphasis on local capacity building, leadership, programme priorities and budgets.

Abstracts in **عربي**, **中文**, **Français**, **Русский** and **Español** at the end of each article.

Why *aids2031*?

Despite signs of progress, the world is far from beating the acquired immunodeficiency syndrome (AIDS).¹ In 2009 alone there were an estimated 2.6 million new human immunodeficiency virus (HIV) infections and 1.8 million deaths globally.² In 2009, 69% of the world's new HIV infections and 72% of the deaths were in sub-Saharan Africa, where average life expectancy in several countries has decreased by 20 years or more since 1990.² In these hyperendemic countries in sub-Saharan Africa, AIDS has had a significant adverse effect on maternal mortality rates³ and is still the first cause of death overall.

Recognizing the need for a shift in the AIDS response from "crisis management to sustained strategic response",⁴ the Joint United Nations Programme on HIV/AIDS (UNAIDS) established an independent forum called *aids2031*, engaging scientists, policy-makers, programme managers and activists to take a long-term view on the direction of the epidemic and to consider what is needed to achieve better outcomes by 2031, the year that will mark 50 years since AIDS was first recognized.⁵ The recent global financial crisis has also added urgency as resources for competing global problems become tighter.

Between 2007 and 2010, the *aids2031* consortium convened working groups that focused on nine areas: social drivers of the epidemic, epidemiological and economic modelling, science and technology, the programmatic response, communications, leadership, financing, hyperendemic countries in sub-Saharan Africa, and countries in rapid economic transition in Asia. The working group participants, selected from a variety of disciplines and geographical areas, along with a group of young leaders, together engaged more than 500 people around the world to bring new ideas to address a pandemic that is still growing despite great investment and efforts to control it. The consortium's mandate was to ask what needs to be done better or differently now to radically reduce the number of new HIV infections and AIDS deaths by 2031.

The working groups consultations have resulted in international forums and debates, more than 30 working papers,

reports^{6,7} and a book⁷ capturing key findings and recommendations. The *aids2031* analyses assume a changing global context with many uncertainties – in politics, the environment, economics, technology and overall health and development. By 2031, changes will likely include a further shift in the global geopolitical and economic centre to Asia, especially China and India; unpredicted social changes; important advances in information technologies;⁸ different models of development aid and global health funding; climate change;⁹ and an already emerging dramatic shift in the global disease burden to higher rates of chronic diseases,¹⁰ alongside persisting old and possibly new infectious diseases. By 2030, the world's population is expected to reach 8.3 billion people.¹¹

Several recent events have changed the AIDS landscape. On the research side, there have been positive breakthroughs in demonstrating the effectiveness of treatment as prevention¹² as well as for oral and topical pre-exposure prophylaxis.^{13–15} On the political side, the June 2011 United Nations' Security Council Resolution on HIV/AIDS¹⁶ and General Assembly Political Declaration on HIV/AIDS¹⁷ reflect renewed political engagement and a changed strategy that focuses on highest risk populations, even though this may be more politically sensitive.¹⁸

The first three decades

The AIDS epidemic has evolved in a unique way.¹⁹ First, there were rapid scientific breakthroughs. However, early over-optimistic statements encouraged the public to believe that medical science could develop a vaccine in a much shorter time-frame than has been feasible. The difficulty of changing sexual and drug-using behaviours was also greatly underestimated.

Second, the AIDS epidemic engaged an exceptional coalition of scientists, activists and policy-makers that helped mobilize funds. International funds for low- and middle-income countries grew from 292 million United States dollars (US\$) in 1996 to US\$ 15.9 billion by 2009.²⁰ For the first time, global AIDS funding decreased in 2010. AIDS was the first

^a London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT, England.

^b Bill & Melinda Gates Foundation, Seattle, WA, United States of America.

Correspondence to Heidi J Larson (e-mail: Heidi.Larson@lshtm.ac.uk).

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infectious disease to which the response was driven by human rights concerns, and one of its greatest hallmarks has been the engagement and activism of people living with HIV.

A third unprecedented aspect of the AIDS response was that it was the first time that high-income countries committed to fund treatment for a chronic illness in low- and middle-income countries. Mechanisms for sustained support for long-term treatment, though, were not adequately considered.

Finally, sensitivities around sex, sexual orientation and drug use have posed significant obstacles. Politics, religion, culture and societal stigma and discrimination have hampered the effective use of available interventions.²¹ Preventing HIV transmission among injecting drug users has perhaps been the most neglected of interventions, particularly in eastern Europe, which is now paying a high price for that neglect.

Projections from the aids2031 Modelling Working Group suggest that, even with highly intensified efforts, there will probably still be at least one million new annual HIV infections in 2031. With continued efforts at today's current levels, the numbers will be much higher.⁷

Redesigning the response

The aids2031 analyses recognize that there are several uncertainties around the evolution and spread of the virus and the development of drug resistance – and how these will be affected by social or political change. The most important breakthrough would be the discovery of an effective vaccine or a cure. Without either of these we will probably not be able to eliminate AIDS, but it should be possible to reduce new infections with wider availability of antiretroviral treatment (ART) and new tools such as pre-exposure prophylaxis and microbicides.

Key elements for a redesigned strategy include: (i) a new culture of knowledge generation and utilization; (ii) transformed prevention and treatment to increase effectiveness; (iii) increased efficiency through better management and maximizing synergies with other programmes; and (iv) investment for the long term.

Culture of knowledge

A more knowledge-driven approach to AIDS is a central tenet of a long-term approach – which includes investment

in gathering social, demographic, epidemiological and political information at the local level. This will allow better targeting of resources and will improve outcomes in the long term.

Systematic evaluation

Although there is already evidence of a growing emphasis on implementation and operational research in major programmes such as the United States President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria, prevention tools continue to be implemented without evaluating their effectiveness in different settings. This inefficiency allows poor quality programmes to continue while the best ones are not emulated. Continuous systematic programme monitoring and evaluation with prompt analysis and feedback are needed.²²

Research and development

We are still in great need of new tools and knowledge, particularly for prevention of HIV infection. The search for a vaccine, microbicide, pre-exposure prophylaxis or cure should be based on a long-term vision and be conducted in a more coordinated and strategic way.^{23,24} Vaccine research would greatly benefit from a mission-driven approach in addition to investigator-initiated research. Closer integration of clinical trials and basic research, evaluation of combinations of prevention interventions, and funding global multi-disciplinary consortia in this field should be a priority.

Better diagnostics, including for tuberculosis, are also needed. One of the key recommendations of the aids2031 Science and Technology Working Group is a global initiative to develop and deliver better diagnostic (e.g. tests for viral load) and monitoring tools (in particular an assay to measure HIV incidence) for use in low-income countries.^{25,26}

Prevention and treatment

After successive waves of emphasizing either prevention or treatment, it is clear that an effective AIDS response must be based on both, particularly now that it has been demonstrated that ART reduces the rate of HIV transmission.¹³

Combination prevention

There are three key dimensions to transforming prevention: (i) to create incentives and stimulate demand for preven-

tion, (ii) to customize combinations of prevention interventions for maximum effectiveness for local settings, and (iii) to measure incidence of HIV infection to evaluate programmes. Redesigning the AIDS prevention response means moving from a predominantly global approach to one that applies global learning to highly heterogeneous local epidemics. This includes tracking the local epidemiological profile, as well as understanding the social, cultural, economic and political context.²⁷ Short-sighted approaches that do not invest adequately in such local analyses and mathematical modelling will result in less efficiency and impact and greater long-term costs.

There is no “silver bullet” for prevention. A combination of prevention approaches (e.g. partner limitation, condoms, male circumcision, couples HIV testing, antiretroviral treatment and harm reduction)²⁸ should be tailored to each setting, and new tools adopted (e.g. pre-exposure prophylaxis) in the most strategic and cost-effective ways. Monitoring and evaluation can help guide the development of prevention packages for each community.²⁹ Strong leadership is also needed to overcome political obstacles to using proven prevention approaches such as harm reduction. The notion of “know your epidemic, act on its politics” is crucial.¹⁷

Finally, we should be explicit that “universal access for HIV prevention” is not appropriate in every setting. Instead, the most effective prevention interventions should be targeted where they are most needed, recognizing that some settings will require significantly more investment of certain interventions than others.

Optimize treatment

Current treatment approaches require a critical review to ensure that they save the most lives with available resources. There are more ongoing systematic efforts to improve the effectiveness and quality of ART than there are for HIV prevention.³⁰ These include: more cost-effective therapeutic choices, such as fixed-dose combinations and optimization of first-line regimens; more effective adherence strategies; improving the feasibility and reducing costs of delivery through task shifting – such as using non-physician health workers to assess patients' eligibility for ART, starting patients on ART and monitoring

outcomes;³¹ using community workers to improve adherence;³² and lowering the costs of laboratory monitoring.³³ In this regard, the “Treatment 2.0” concept (by UNAIDS) which advocates for better treatment regimens, cheaper and simpler diagnostic tools, and community-led approaches to delivery is a timely initiative.³⁴

Address the drivers

Epidemiological and qualitative research has shown that human rights, gender issues and economic factors do have an influence on the spread of HIV. However, there is little empirical evidence that structural interventions can actually reduce HIV transmission and so more research is needed.³⁵

One of the key recommendations of the aids2031 Social Drivers Working Group is that “there is a package of reforms that constitute a minimum legal standard for facilitating an enabling environment for AIDS resilience”.³⁶ These include the decriminalization of: HIV status, transmission and exposure; same-sex relationships/sexual practices; and harm-reduction approaches for prevention of AIDS among injecting drug users.³⁷ These measures are not just human rights imperatives; they create an environment to allow effective implementation of programmes and are an integral part of the AIDS agenda.

Increase efficiency

The current financial crisis is a major incentive to optimize the use of existing funds.³⁸ Maximizing synergies with other health programmes and strengthening health services are key strategies to increasing efficiency and have become criteria for programmes supported by both PEPFAR and the Global Fund to Fight AIDS, Tuberculosis and Malaria.^{39,40}

Good management practices

The efficiency of AIDS programmes can be greatly increased by adopting sound management practices, in particular management information systems that provide prompt feedback on performance at the local implementation level. User-friendly, real-time monitoring systems are already available for social marketing and community-based programmes and can be adapted to monitor other prevention activities, as the Avahan project did in India.⁴¹

Learn from the private sector

HIV prevention programmes have largely been based on behaviour change

theories that have been of limited use in designing effective, large-scale programmes. Pragmatic business-like marketing and consumer influencing approaches are needed that continuously improve the “product” (i.e. prevention tools) and generate demand (marketing) so as to maximize “returns” (infections prevented).⁴²

Integrate services intelligently

Given the early reluctance and lack of experience of the public health and medical establishment to deal with AIDS, separation of AIDS programmes from general health services and social programmes was justified in the beginning. However, it is now essential to move rapidly to intelligent integration. Where HIV/tuberculosis co-infection is common, clinics that treat HIV should be “tuberculosis-competent” and vice versa; ART provision can be seamlessly integrated into primary care in high-prevalence settings; and prevention of mother-to-child transmission can become part and parcel of maternal, neonatal and child services – as exemplified in the recent PEPFAR support to a global plan to eliminate mother-to-child HIV transmission.⁴³ Community-based services and government services can work in a continuum; in many of the best HIV clinics, community-based organizations work alongside government providers, supporting treatment adherence and other services.

Invest for the long term

Asking whether today’s efforts are sustainable obscures the reality that existing efforts and resources are insufficient to bring AIDS under control in low- and middle-income countries. With population growth the world is generating the largest cohort of sexually active people in history, thus expanding the number of individuals susceptible to HIV infection. Access to treatment has significantly increased over the past decade, with more than 6 million people now on ART. But, what are the long-term plans to sustain the growing demand for treatment? A recent paper by Schwärlander et al. outlines a proposed investment approach for an effective HIV/AIDS response towards 2020 and makes it clear that significantly more resources will be needed.³⁸

Multiyear funding

The importance of long-term funding is evident, yet short-term funding cycles

persist, mostly because of fiscal imperatives. One- or two-year funding cycles do not allow an adequate time frame for testing the long-term impact of structural approaches. Short-term goals may motivate programmes to initiate patients on treatment, for example, but fall short of serving the longer term goals of ensuring quality, adherence and sustained effective treatment. Even if planning is done for 5 years, it needs to be done with a horizon of at least 10–15 years so that programmes can make investments – such as in capacity building, in changing social norms or in addressing structural barriers to prevention – that will bear fruit beyond the current funding or planning cycle.

Performance indicators

Since performance targets and indicators often drive programme content, it is vital that they reflect the need for long-term outcomes. For example, when evaluating ART, counting the number of people who initiate treatment should be modified to focus on the durability of therapy, especially on lower-cost, first-line therapy. When evaluating prevention, reducing the incidence of HIV infection should be the key indicator; it is not sufficient to demonstrate the delivery of services.

Capacity building

Although most AIDS programmes contain a capacity building element, it is often limited to retraining medical personnel and is generally poorly funded. Many national AIDS programmes, particularly in Africa, still rely heavily on expensive consultants and intermediaries from high-income countries. While this can accelerate programme implementation, it may also create dependency, lack of local ownership and even undermine local capacity. Long-term success requires sustained investment in building the local cadre of senior medical and management personnel. AIDS funding should therefore be made conditional on investments in local capacity building and the use of local institutions.

Finally, the engagement of people living with HIV has been one of the most important achievements in the AIDS response. However, meaningful involvement in decision-making and resource allocation by affected communities is still not the norm.³⁰ Specific opportunities for engaging people liv-

ing with HIV must be created, particularly for prevention programmes. Evaluations should be conducted to determine the increased effectiveness of prevention workers who are also living with HIV.

An extraordinary approach in Africa

The elements of a long-term response to AIDS are relevant for all societies, but are probably insufficient to bring the epidemic in sub-Saharan Africa under control. The aids2031 Working Group on Hyperendemic Countries stressed that nothing less than extraordinary and sustained society-wide action will reduce the AIDS-related devastation sufficiently to enable these countries to devote adequate attention and resources to other pressing development concerns. A recent report, by the Institute of Medicine on AIDS in Africa towards 2020, recommended 10-year country roadmaps, more efficient models of care and treatment, the integration of AIDS interventions with other relevant health programmes, and an analysis and long-term plan to meet workforce needs.⁴⁴

An exceptional AIDS response in sub-Saharan Africa is needed urgently, as confirmed by the June 2011 United Nations Political Declaration on HIV/AIDS. Ideally, an intensified response would include:

- i) A comprehensive prevention effort led from the highest levels of government, the media and society maximizing demand, supply and quality of proven HIV prevention interventions such as condoms, male circumcision, couple counselling and testing, provision of antiretroviral therapy and prevention of mother-to-child transmission. Particular attention to gender issues is crucial, as sub-Saharan Africa has the highest prevalence of HIV infection among young women. Better understanding is also needed on how to reach men who have sex with men and injecting drug users who are just starting to be acknowledged in Africa.
- ii) Every adult citizen should know his or her HIV status and be supported and treated if infected with HIV. Different prevention services should be provided for those who are HIV-negative and HIV-positive, with a special focus on those at higher risk

of becoming infected or transmitting HIV.

- iii) Bold efforts, led by government where possible, to change social norms regarding gender inequality, sexual violence, age disparity among couples, and concurrent partnerships.
- iv) A targeted, tailored strategy for prevention and treatment is also needed for migrant labour, an urgent issue highlighted by the aids2031 Working Group on Hyperendemic Countries.

A road map of tough choices

One of the biggest challenges will be how to deal with competing issues for political attention, funding and delivery capacity. While there has been a remarkable mobilization of resources for AIDS in the past decade, new competing health and development priorities, the economic crisis and AIDS “fatigue” present new challenges that will need innovative funding strategies and mechanisms to meet the growing needs.

Efficiencies in spending are a matter of urgency, not only for AIDS programmes but for other development activities. Identifying areas of potential convergence (such as with maternal and child health and prevention of mother-to-child transmission, and primary care services for ART) will not only be a cost-saving measure, but may help address other problems, such as workforce shortages, while contributing to strengthening health systems.

Every society will have to address its own barriers to an effective AIDS response and make some tough choices. The aids2031 consortium has identified some key measures to consider:

- Leaders, societies and religious entities need to come to terms with the realities of sexuality and the implications for HIV transmission, and stand up for proven policies and interventions, despite their political unpopularity. Harm reduction measures for injecting drug users are particularly important.
- All countries should adopt a package of minimum legal standards as outlined earlier in this paper and discussed in the report of the aids2031 Social Drivers Working Group.³⁰
- AIDS funding should no longer support interventions of marginal benefit (e.g. universal access for preven-

tion for people at lowest risk, control of sexually-transmitted infections for HIV prevention, or universal hygiene precautions for broader infection control, with the exception of safe blood and injections) until the most effective interventions are fully scaled-up for the populations most at risk.⁴⁵

- International funding should be prioritized for low-income and highly-affected middle-income countries.
- A mission-driven, coordinated approach to vaccine and other research with better sharing of data is critical.
- Each country, international agency, research funder and nongovernmental organization should urgently review its AIDS strategy and programmes to ensure that they are designed to maximize the reduction of HIV-related morbidity and mortality over the long term.

AIDS is not an equally important issue everywhere and there is no “one size fits all” solution to the epidemic. Governance and leadership on AIDS must adapt to the setting – some places need stronger leadership while others may need to reposition AIDS in the light of other more pressing priorities. However, in high-prevalence countries, AIDS must be a central societal issue, requiring both emergency and long-term strategies. AIDS will remain a generations-long challenge. Its response demands a fundamental redesign to truly halt the epidemic. There are no short-term solutions. ■

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de Ferranti (Results for Development, USA), William Fisher (Clark University, USA), Geoffrey Garnett (Imperial College London, United Kingdom), Denise Gray Felder (Communication for Social Change, USA), Geeta Rao Gupta (UNICEF, formerly International Center for Research on Women, USA), Robert Hecht (Results for Development, USA), Robert Hemmer (National Service of Infectious Diseases, Centre

Hospitalier de Luxembourg), Callisto Madavo (Georgetown University, USA), Malegapuru Makgoba (University of Kwazulu-Natal, South Africa), Michael Merson (Duke University, USA), Sigrun Møgedal (formerly Ministry of Foreign Affairs, Norway), Prasada Rao (UNAIDS, India), Michel Sidibe (UNAIDS, Geneva), Leonardo Simão (Joachim Chissano Foundation, Mozambique), Todd Summers (formerly Bill & Me-

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الملخص

إعادة تصميم التصدي للإيدز من حيث التأثير طويل الأمد

إيدز 2031 لإلقاء نظرة متفحصة على التصدي العالمي للإيدز والعدوى بفيروسه. وتحدد هذه الورقة العلمية أربعة مجالات رئيسية لإعادة تخطيط التصدي للإيدز استناداً إلى نقاشات هذه المبادرة والدروس والخبرات المستفادة خلال العقود الثلاثة الأولى للوباء وهي: (1) وجود ثقافة جديدة لتوليد المعارف والاستفادة منها؛ (2) التحول في الوقاية والعلاج من أجل زيادة الفعالية؛ (3) زيادة الكفاءة من خلال تحسين الإدارة وتعظيم التأزر بين البرامج الأخرى؛ (4) الاستثمار لأمد طويل. وعبر جميع هذه المجالات هناك تأكيد قوي على بناء القدرات المحلية، والقيادة، وتحديد أولويات وميزانيات البرنامج.

انقضت ثلاثة عقود منذ اكتشاف فيروس العوز المناعي البشري، وقد تطورت جائحة الإيدز إلى أوبئة متنوعة تقع حول العالم، وأصبح هذا الفيروس متوطناً بين الكثير من السكان. ومع أن هناك تقدماً طيباً في مجال توسيع نطاق الحصول على العلاج، حيث بلغ العدد التقديري لمن حصلوا على معالجة بمضادات الفيروسات القهقرية 6.6 مليون شخص في نهاية عام 2010، إلا أن جهود الوقاية مازالت غير كافية إلى حد كبير، حيث وقعت 2.6 مليون عدوى جديدة في عام 2009. وبينما يتزايد الطلب على العلاج تزداد ندرة التمويل، وتترنح أنشطة توفيره. وفي عام 2007، أسس برنامج الأمم المتحدة المشترك لمكافحة الإيدز منتدى مستقلاً يسمى

الخلاصة

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Résumé

Repenser la riposte au sida pour un impact à long terme

Trente ans après l'identification du virus VIH, la pandémie du sida s'est développée en diverses épidémies dans le monde entier. Dans de nombreuses populations, le VIH est devenu endémique. Bien que des progrès satisfaisants aient été réalisés en matière d'élargissement de l'accès au traitement, avec 6,6 millions de personnes qui bénéficient d'une thérapie antirétrovirale fin 2010, les efforts de prévention sont encore très inadaptés puisque 2,6 millions de nouvelles infections ont été enregistrées en 2009. La demande de traitement augmente tandis que le financement se réduit et que le militantisme décline. En 2007, le Programme commun de Nations Unies sur le VIH/SIDA (ONUSIDA) a créé un forum indépendant, appelé aids2031, pour que celui-ci examine de manière critique la riposte mondiale au VIH/SIDA. Ce document présente quatre domaines clés pour une riposte au sida repensée, en se fondant sur les délibérations de cette initiative, ainsi que sur l'apprentissage et l'expérience des trois premières décennies

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Резюме

Реструктуризация ответа на СПИД в расчете на долгосрочное воздействие

Спустя 30 лет после выявления вируса ВИЧ пандемия СПИДа превратилась в ряд разнообразных эпидемий в странах мира. ВИЧ стал эндемичным во многих группах населения. Несмотря на успехи в расширении доступа к лечению – по оценкам, в конце 2010 года антиретровирусную терапию получали 6,6 млн чел., – усилия в области профилактики все еще недостаточны: в 2009 году произошло 2,6 млн новых случаев заражения инфекцией. Спрос на лечение растет, в то время как финансирование становится все более скудным, а энтузиазм идет на убыль. В 2007 году Совместная программа Организации Объединенных Наций по ВИЧ/СПИДу (ЮНЭЙДС) основала независимый форум *aids2031* с тем, чтобы критически оценить результаты ответа на ВИЧ/СПИД

в мире. В статье определены четыре ключевые сферы, в которых должна происходить реструктуризация ответа на СПИД на основе анализа этой инициативы, а также знаний и опыта, приобретенных за первые 30 лет эпидемии: (i) новая культура накопления и использования знаний; (ii) преобразования в области профилактики и лечения в целях увеличения результативности; (iii) повышение экономической эффективности благодаря улучшению управления и максимизации синергетического эффекта от взаимодействия с другими программами; и (iv) долгосрочные инвестиции. Во всех этих сферах делается сильный акцент на формирование потенциала, лидерство, приоритетные цели программ и бюджеты на местном уровне.

Resumen

Desde que hace tres décadas se identificó el virus del VIH, la pandemia del SIDA se ha desarrollado en diversas epidemias a lo largo y ancho del mundo. En muchas poblaciones, el VIH se ha convertido en endémico. Mientras que el progreso en la expansión del acceso al tratamiento es bueno, se estima que 6,6 millones de personas seguían un tratamiento antirretroviral a finales del año 2010, los esfuerzos de prevención siguen siendo altamente inadecuados, con 2,6 millones de nuevas infecciones que se produjeron en 2009. La demanda de tratamiento está incrementando mientras que los fondos se han reducido y el activismo está disminuyendo. En 2007, el Programa Conjunto de las Naciones Unidas sobre el VIH/SIDA (ONUSIDA) estableció un foro independiente

llamado *aids2031* para observar críticamente la respuesta global al VIH/SIDA. Este documento destaca las cuatro áreas clave para rediseñar una respuesta al SIDA en base a las deliberaciones de esta iniciativa y al aprendizaje y experiencia de las primeras tres décadas de la epidemia: (i) una nueva cultura de generación y utilización de conocimientos; (ii) prevención transformada y tratamiento para incrementar la eficacia; (iii) eficiencia incrementada mediante una mejor gestión y la maximización de las sinergias con otros programas; y (iv) inversión para el largo plazo. En todas estas áreas existe se enfatiza fuertemente la construcción de capacidad local, liderazgo, prioridades y presupuestos del programa.

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Corrigendum

In Volume 89, Number 10, October 2011, p. 708, the first sentence of the fifth paragraph should read: "The Planning Commission, the government agency responsible for the country's Five-Year Plans, has pledged to spend more on health in the next plan, which begins next year."

In volume 89, Number 10, October 2011, p. 749, the author line should have read: "Shaheen P Shah,^a Clare E Gilbert,^a Hessom Razavi,^a Elizabeth L Turner^a & Robert J Lindfield^a on behalf of the International Eye Research Network."