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Emerging Issues in Today's HIV Response: Debate I

# Test and Treat: Can We Treat Our Way Out of the HIV Epidemic?



THE WORLD BANK 2010

More than 100 people attended the first debate of the series, with more than 150 joining virtually, via videoconference and webcasting.

## Executive Summary<sup>1</sup>

On Wednesday, May 19, 2010, the World Bank and the U.S. Agency for International Development (USAID) co-hosted the first in a series of debates on emerging issues in the global response to HIV/AIDS. The purpose of the debate series is to provide governments, civil society organizations, and other partners with the best evidence and knowledge to ensure that development dollars go further in pursuit of better results, of particular importance in an era when development aid is under heavy pressure and the dynamics of the pandemic are constantly changing. The World Bank's Global Development Learning Network video conferencing and web-based technologies allowed country teams in Africa and other partners from across the globe to participate in real time in the debate, which took place in Washington, DC. Additional information about the debate series can be found at <http://go.worldbank.org/A47FWU5140>.

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<sup>1</sup> The views expressed in this report are not necessarily those of USAID, the World Bank, or the organizations to which the panelists are affiliated. Statements in this document have not been checked for factual accuracy and should not be cited.

The debate was based on the following proposition: “Testing and treating approaches should immediately be built into and consume at least 50 percent of HIV prevention resources in Africa.” The debate was prompted, in part, by a 2009 article by Reuben Granich and others in *The Lancet* that suggests an annual and universal test and treat strategy whereby individuals who test positive (as a result of annual compulsory testing of the entire population) would immediately receive antiretroviral treatment (ART) regardless of CD4 cell count. Using mathematical modeling and data from South Africa, the paper postulated that the number of HIV cases could be reduced to 1 per 1,000 people per year within a decade, leading to eventual elimination of the epidemic.<sup>2</sup>

The debate was moderated by Dr. Ward Cates, President for Research at Family Health International. Two panelists spoke in favor of the proposition: Dr. Julio Montaner, Chair in AIDS Research and head of the Division of AIDS at the Faculty of Medicine of the University of British Columbia, and Dr. Peter Kilmarx, Chief of the Epidemiology Branch in the Division of HIV/AIDS Prevention at the Centers for Disease Control and Prevention (CDC), Atlanta. The two panelists who spoke against the proposition were Dr. Norman Hearst, Director of Family Medicine Research Fellowship at the University of California at San Francisco, and Professor Sally Blower, Director of the Center for Biomedical Modeling and Professor in the David Geffen School of Medicine at the University of California Los Angeles.

None of the panelists fully endorsed or fully opposed the proposition, but rather supported and/or opposed different elements of a test and treat strategy. The panelists who spoke in favor of the strategy cited recent studies that indicate treatment can reduce transmission of HIV at both the individual and population levels and propose more cost-effective variations on the Granich model, such as universal testing every three to five years. However, the proponents did not feel that current funding should be shifted away from effective prevention efforts, but that funds need to be available for both prevention and treatment and for good research to understand what is truly effective in HIV prevention.

The panelists who spoke against the proposition contended that there is not enough evidence to implement a universal test and treat strategy at this time, and that the modeling analyses in Granich’s paper and associated papers are missing key components that could demonstrate a need for a larger and more costly scale-up effort. They also noted that behavioral disinhibition resulting from a test and treat strategy could counteract decreases in HIV incidence, and questioned how test and treat could be implemented when current demand for treatment exceeds available resources. The opponents agreed with their debate partners that funds should not be diverted from prevention efforts to treatment.

A short question and answer session after the debate addressed the human rights issues, operational implementation, and risk compensation effects of a universal test and treat strategy. All four panelists agreed that the model proposed in *The Lancet* article was not realistic, and that more research is necessary before a test and treat strategy can be implemented. Dr. David Wilson, Acting Director of the World Bank Global HIV/AIDS Program, closed the debate, commenting that it showed we can debate with passion and civility while contesting the pros and cons of an important topic on the minds of researchers, implementers, and other key stakeholders working in HIV/AIDS today.

The debate was accessible via the Internet and videoconference. Over 100 people attended the live debate at the World Bank, while more than 150 participated in the live webcast. The debate was also broadcast at 13 videoconference sites in Africa, Canada, and Europe.

This report summarizes the arguments panelists made for and against the proposition, the questions and answers that occurred after the debate, and provides additional resources to learn more about the topic.

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<sup>2</sup> Because treatment reduces the viral load in the body, a carrier receiving ART is less infectious and therefore less likely to transmit the virus. At the population level, this decrease in individual infectiousness will reduce incidence, and then prevalence, eventually leading to “elimination” of the epidemic.

# Test and Treat

Dr. Cates introduced the proposition, “Testing and treating approaches should immediately be built into and consume at least 50 percent of HIV prevention resources in Africa,” as an issue that “had been on the front burner of every HIV discussion” since *The Lancet* article appeared in 2009. He added that the concept of treating our way out of the HIV epidemic had been around since the 1990s. Although none of the panelists endorsed the proposition in its entirety, the mix of perspectives made for a spirited debate about testing and treating as a prevention strategy.

The four panelists each had 10 minutes to present their arguments in favor of or against the proposition. Following the final presentation, each panelist had two minutes to rebut any arguments made. Once the rebuttals concluded, the moderator asked the panelists questions submitted by participants in Washington and via webcast.

## Arguments Defending the Proposition

The following is a summary of key points panelists made in favor of a test and treat strategy.

### **The strategy described in the Granich paper is just the starting point.**

The consensus among all four panelists was that the test and treat model described in the Granich paper was overly optimistic, and that alterations to this strategy are necessary. In 2009, a think tank brought together prevention and treatment advocates in the United States, who developed a strategy known as testing and linkage to care, or TLC-Plus. TLC-Plus was characterized as an active approach to linkage to care, risk reduction, care and support, and treatment at higher CD4 cell counts that respects the autonomy of the individual. Another approach cited is based on an article written by Peter Dodd. His paper used more realistic modeling assumptions to show how test and treat could reduce HIV transmission and concluded that less frequent testing (i.e., every three to five years) could be more cost effective, depending on the epidemiologic context.

### **Investments in prevention should be reviewed for effectiveness.**

According to one panelist, nearly 30 percent of the overall 2009 budget for the U.S. President’s Emergency Plan for AIDS Relief went to prevention, with the following breakdown: 1 percent of the overall budget for male circumcision (MC), 7 percent for prevention of mother-to-child transmission (PMTCT) services, 6 percent for counseling and testing, 6 percent for promoting abstinence and being faithful, and 7 percent for other efforts to prevent sexual transmission, such as condom distribution. But this allocation of resources does not necessarily reflect what has been proven effective in prevention programming. PMTCT and MC programs have demonstrated effectiveness, while behavioral efforts focusing on abstinence and faithfulness have not. Moreover, a recent review in the journal *AIDS* looked at hundreds of studies on prevention for youth in sub-Saharan Africa that showed no reduction in HIV incidence. While panelists did not support shifting funding from prevention to treatment, they argued that prevention programs should demonstrate effectiveness and impact.

### **Test and treat reduces transmission at the individual level.**

Panelists contended that testing reduces HIV transmission, citing recent studies that show individuals will change their risky sexual behavior when they learn they are living with HIV. Furthermore, several studies suggest that transmission can be successfully reduced when individuals living with HIV are put on treatment, which reduces their viral load to undetectable levels. An observational study on serodiscordant heterosexual couples demonstrated an 80 percent reduction in HIV transmission when the infected partner is on treatment. Furthermore, a meta-analysis of discordant couples shows no transmission when the infected partner is on ART. Treatment has been shown to reduce semen, vaginal, and rectal viral load to

undetectable levels. Ongoing clinical trials of discordant couples being treated at higher CD4 cell counts will provide useful information for future prevention efforts.

### **Treatment reduces HIV transmission at the population level.**

A paper presented at the 2010 Conference on Retroviruses and Opportunistic Infections provided evidence from British Columbia (BC) that increasing treatment reduces the collective viral load in a community where there is a population that continues to engage in high-risk behavior. In 1996, a voluntary program with enhanced ART coverage was initiated in BC, which led to a decrease in new HIV diagnoses over the following decade. Of interest is that this decrease occurred even though BC was simultaneously experiencing a syphilis epidemic, a strong indication of increased risky behavior that—thanks to broad ART coverage—did not lead to higher HIV transmission. Additionally, a population level study in San Francisco demonstrated a 60 percent reduction in HIV transmission after ART introduction.

## **Arguments Opposing the Proposition**

The following is a summary of key points panelists made in opposition to a test and treat strategy.

### **Current models show test and treat effectiveness is flawed.**

Panelists opposing the proposition contended that, because modeling often displays the bias of its creators, current test and treat models are hard to trust. They asserted that the evidence on whether and how ART affects infectivity is neither clear nor conclusive. Unless ART continuously reduces infectivity, there will not be a huge population impact on reduction. Moreover, this assumes that people on ART will change their behavior to reduce their risk of infecting others, although models demonstrate that even a 10 percent increase in risky behaviors could wipe out the impact of any reduction from ART.

A panelist stressed that heterogeneity<sup>3</sup> at the population level needs to be taken into account, especially for such countries as South Africa. Heterogeneity was stressed in terms of behavior because the response to treatment is crucial and cost will drive policy.

One panelist noted that while the Dodd paper provided a more cost-effective model, it too was unrealistic because it did not incorporate heterogeneity and inadequately analyzed economic factors. Small studies can demonstrate effectiveness, but when larger, heterogeneous populations are inputted into the models, results change. For example, a San Francisco study showed that 5 to 30 percent of patients under treatment did not experience viral suppression to undetectable levels, and so they were at higher levels of risk for transmitting HIV, as well as for transmitting treatment-resistant strains. Drug suppression was not considered in the Granich or Dodd papers. A considerable amount of drug resistance can build up if the model takes heterogeneity into account.

In addition to universal testing and treatment, the proposed test and treat strategy in the Granich paper includes other interventions, such as condom promotion, and assumes these interventions would reduce HIV transmission by 40 percent. It is unknown if other interventions could reduce transmission by 40 percent, let alone sustain the reduction over the decades.

### **The costs of testing and treating could be astronomical.**

*The Lancet* article lacks a cost analysis for an intervention scale-up. The model proposed by Granich and his colleagues would require a massive scale-up in health care delivery in order to implement test and treat at a universal level. A panelist noted that the projected estimate of US\$5 billion appears to be a gross underestimate and should prompt health economists to determine the actual costs of universal test and treat.

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<sup>3</sup> Heterogeneity in this context refers to the presence of different factors (at different levels) that influence the spread of HIV within different communities, such as a population that injects drugs, high rates of sexually transmitted infections, and socioeconomic factors that may lead to transactional sex. Within one country, heterogeneity among regions and populations makes it difficult to characterize a national epidemic.

### **There is no adequate evidence to radically alter the Prevention Budget.**

One panelist noted, “There is currently nowhere near the evidence needed to gut the prevention budget and add more to treatment.” It was noted that it has proven difficult to measure the impact of many prevention interventions.

The panelists (for and against) agreed that money should not be diverted from prevention budgets to fund an unproven strategy. One panelist stressed that the burden is on proponents of test and treat to demonstrate not only that the strategy might work based on hypothetical mathematical models but that it actually does work in Africa. When it comes to proving public health impact, it was pointed out that medical and public health professionals understand that out of a hundred strategies or treatments that theoretically seem effective, only a few may show impact in the real world. Population-wide studies are thus needed prior to any large scale implementation.

### **Current demand for treatment exceeds supply.**

The implementation of universal test and treat would bring many more people onto treatment, which would require exponentially more resources for treatment, including massive scale-up of health systems. The current demand for treatment resources exceeds the supply, and there are not enough treatment spots. Even if 100 percent of the prevention budget were diverted to treatment, drug supplies would run out within months. Without a large increase for treatment funding, universal test and treat is unrealistic and unsustainable. Without levels of coverage similar to the United States or Canada, all arguments about population-level impact are dubious.

### **Behavioral disinhibition can compromise any decrease in incidence.**

After ART became available in San Francisco, new HIV infection rates increased and people showed disinhibition over time. Similar results of disinhibition have been observed in Brazil and Uganda. The San Francisco rates have since decreased, but it is unclear why. A panelist noted that, “it could be natural epidemic dynamics” that “make any intervention look good.” But the panelist added that it is indeed quite possible that the latest downturn in San Francisco is due to testing and treatment.

### **Test and treat cannot effectively capture acute infections.**

The test and treat strategy does not reduce transmission during the highly infectious window period<sup>4</sup> when many new infections are thought to occur. HIV can rapidly spread long before infected individuals seek testing, feel symptoms, or get on treatment, further eroding the argument for the strategy’s effectiveness.

## **Key Points Raised During the Rebuttal**

### **By Those Panelists in Favor of the Proposition**

The panelists supporting the test and treat strategy made the following points in response to the opponents’ arguments.

- There is sufficient evidence that test and treat works.
- If the standard of evidence to implement the test and treat strategy is too high, then the intervention will never be tried.
- More money should be spent on both treatment and prevention, but treatment should not be expanded at the expense of prevention.
- We need to urgently move to achieve goals for treatment already set by the international community.

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<sup>4</sup>The time period (three to six months) between a person’s infection with HIV and the appearance of detectable anti-HIV antibodies.

## **Panelists who Opposed the Proposition**

The panelists opposing the proposition made the following points in response to the proponents' arguments.

- Small, well-controlled studies show that test and treat can reduce transmission. However, these studies cannot capture population heterogeneity with respect to ART-related viral suppression, risk behaviors, and adherence.
- There is not complete viral suppression in everyone. Ten to 30 percent of those receiving ART will not be virally suppressed. Therefore, viral suppression at a population level cannot be achieved.
- Evidence that testing results in reduced risky behavior is oversold.
- There are not enough data to conclude that testing by itself is a prevention strategy.

## **Key Themes Covered During the Question and Answer Session**

After the debate, attendees submitted questions to the panel. Questions addressed the issues of human rights, operationalizing the proposed strategy, and the effects of risk compensation on a test and treat strategy.

### **Human Rights Concerns**

The first question concerned how a country with finite treatment slots would determine who gets treatment. Panelists answered that this would have to be determined by the country context. Panelists also noted that while treatment priority criteria are operative in some places, who receives treatment would ultimately depend on who actually shows up at the clinic, which is difficult to determine.

Another attendee asked how increased testing could be done in a non-coercive manner. One panelist referenced an opt-out approach in Botswana and argued against mandatory testing as a violation of human rights. However, it was noted that increased testing reduces stigma. Data from the CDC show that 60 percent of men who have sex with men (MSM) in San Francisco and New York do not know their serostatus. It is very difficult to push testing, especially in the United States, with the exception of infant testing. A panelist also pointed out, "Test and treat means treating people even when they feel fine, which is difficult to sell." It is difficult to get compliance to decrease the viral load for the benefit of public health.

### **How the Test and Treat Strategy Would Work, and Alternatives to the Strategy**

An audience member asked if a test and treat strategy would be more effective if it targeted high-risk populations such as among intravenous drug users (IDUs). One panelist responded that from a practical point of view, test and treat would work well in a concentrated epidemic setting such as the San Francisco gay community.

Given the limitations in the Granich model cited by the panelists, someone asked what an alternative approach would be. Panelists noted that it was important to focus on economics and resource allocation. For example, if 4.8 million people are on treatment in South Africa, it would be important to know how much it would cost to scale-up and maintain a test and treat approach. Another panelist responded that it would be helpful to do more modeling for feasible strategies. Viral suppression is not 100 percent effective, but that is true for all interventions, so this should not stop research toward an effective intervention.

An audience member expressed skepticism that the TLC-Plus model could address the window period. A panelist agreed, noting that treatment alone cannot eradicate HIV, another argument for strengthening prevention. Although HIV transmission can be reduced through test and treat approaches, there will always be a reservoir of infection in the absence of behavioral prevention interventions. There should be increased funding for prevention evaluations.

The panelists were asked which investments outside of HIV programming should be made a priority. One panelist responded that there is a need to improve infrastructure and to focus on health system strengthening. Another panelist added that, given levels of HIV infection among health care workers, there will be no health care infrastructure left if HIV is not addressed. It is easy to say more treatment is needed, and it would be great to do more test and treat, but this is not “in the cards,” given current resources.

## **Limited Resources**

A participant asked how test and treat can be balanced with prevention, given limited resources. One panelist answered that health economists could determine how to scale-up the costs for 4.8 million people in South Africa on treatment in the next five years. Another solution offered was to target those at highest risk for transmission, such as pregnant women, sex workers, MSM, and IDUs.

One panelist argued that it is not sustainable to treat only the sickest people. Early treatment will reduce the overall costs of the epidemic if it helps prevent new infections; the result of treating only the sickest people is that the “treatment mortgage grows.” Another panelist countered this assertion by noting that when we take into account what we do know now (e.g., different types of viral suppression, less than perfect adherence, and behavioral factors), test and treat approaches alone are not likely to demonstrate a large impact on HIV transmission.

## **Risk Compensation**

Two questions were asked about how newly infected individuals can overcome social and psychological barriers to access care and how to make risk compensation a central feature of HIV intervention. A panelist responded that there is a need to distinguish between individual and community risk compensation. For individuals, most treatment programs have done a good job of incorporating prevention and working with clients to help them act responsibly. However, a bigger challenge with community risk compensation is the “general perception of how bad AIDS is.” A careful balance is needed between encouraging people to access testing and treatment services and combating stigma, while motivating people to avoid risk for HIV infection. It was noted that, “Ultimately, people still need to fear AIDS,” even though treatment prolongs life.

In South Africa, there is a massive effort to increase testing. South Africa averages 1,000 new patients every day and to reach the requirements for test and treat, they would have to increase treatment an additional ten-fold. The practicality of scaling-up treatment to cover 5 to 6 million people is another issue. It was noted that efforts in South Africa will serve as a roadmap for the rest of the world.

## **Next Debate**

The next debate will be held on June 29, 2010, and will focus on behavioral prevention. The proposition that will be debated is the following: “Behavior change in generalized epidemics has not reduced new HIV infections and is an unwise use of HIV prevention resources.”

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