

# Health Systems Development



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## World Bank – Health Systems Development — December 2005

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### Economic Viewpoint



In this Economic Viewpoint on *Treatment and Prevention of HIV/AIDS*, **Mead Over**, Lead Economist, The World Bank and Prasada Rao, former Director of India's National AIDS Control Organization, discuss the difficult challenges governments in low income countries face in addressing the HIV/AIDS crisis and in responding to pressure from the international donor community to treat patients with expensive antiretroviral therapies. [Read the article](#)

### Feature Reading



**HIV/AIDS Treatment and Prevention in India: Modeling the Costs and Consequences**, by Mead Over, Elliot Marseille, Julian Gold, Peter Heywood, Subhash Hira, Indrani Gupta, June 2004.

### Related Event

World AIDS Day  
Dec 1, 2005



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(Monday, November 28<sup>th</sup> through  
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## Treatment and Prevention of HIV/AIDS in India: Modeling the Costs and Consequences

Author **Mead Over**, Lead Economist, The World Bank and co-author Prasada Rao, former Director of India's National AIDS Control Organization.



The world has fallen short of achieving the publicly announced "3 by 5" goal of placing three million AIDS patients in poor countries on publicly financed antiretroviral therapy by 2005. (See: <http://www.who.int/3by5/progressreportJune2005/en>). Under WHO's leadership, AIDS policy makers are currently formulating a new objective for the year 2010. Such ambitious goals have implications. The results of a 2003 study of India show that AIDS treatment is more effective and affordable than ever before, but also warns that greatly expanded access to treatment can be ineffective or even worsen the epidemic unless difficult problems are properly addressed.

India is growing more rapidly than at any time in its history, benefiting from increased international demand for its skilled workforce and exporting an increasing array of high quality products and services. But like other successfully growing countries, India must struggle to assure that improvements in the life of the poor accompany the economic gains of the middle and upper classes. This challenge is difficult under the best of circumstances. Unfortunately India's serious and growing AIDS epidemic threatens not only to slow improvements in well-being, but to immiserate the worst affected households and communities, as it robs infected people of their future and condemns their children to orphanhood. In 2004 India has as many HIV infected people as any country in the world. And scientists tell us that an effective vaccine against AIDS is unlikely for at least another decade.

Yet there is hope that the devastation of the AIDS epidemic can be slowed and even reversed in India. Awareness of the threat of AIDS and willingness to take precautions to prevent infection have both improved dramatically since 1990, with condom use on high risk sexual contacts rising from almost zero in 1990 to 50 percent nationally and to up to 85 percent in some states. These changes have already prevented millions of infections. Further increases in condom use on high risk contacts can prevent millions more infections. And reaching these saturation levels of condom use among high risk contacts will require more effort to engage local public and private partners in the battle against AIDS, to de-stigmatize the disease so that people can better prevent it or seek treatment for it and to educate our youth in the basic risks of unprotected sexual activity and how to avoid them.

Now as the epidemic matures, HIV infected people are falling ill with AIDS in ever increasing numbers and looking to the Indian health care system for care and support. This new burden would be difficult for any government to cope with, but is particularly difficult in India where 80 percent of national health expenditure passes through the private sector.

In the area of treatment took, there is new hope. India has benefited for years from the entrepreneurial dynamism of its private pharmaceutical industry. Companies like Cipla and Ranbaxy have developed innovative new processes for manufacturing complex pharmaceutical products and marketed those products in India and to the world in competition with similar but much higher priced brand name products developed in the OECD countries. The unfolding of this competitive process in India has led to a dramatic reduction of the price of antiretroviral medication here by a factor of 30 to 40 over the last fifteen years. These lower prices have made it possible for resource constrained countries like India to consider for the first time the financing of antiretroviral therapy for their citizens.

What are the economic costs and benefits of government financed antiretroviral therapy for AIDS patients in India? One of us, Mr. Prasada Rao, while the Director of India's National AIDS Control Organization, requested the World Bank to assemble a team of public health specialists, epidemiologists and economists to analyze the costs and benefits of several different options for financing and distributing antiretroviral therapy relative to a future world in which India's policy on antiretroviral medication would remain unchanged. They first presented the results of this study to the Indian government in draft form in

January, 2003. Subsequently, in January 2004, the Indian government announced the decision to roll out publicly financed access to these remarkable life-prolonging medications.

The report analyzes three alternative plans for financing antiretroviral therapy (ART) in India. These alternative plans, or "scenarios", are a minimally interventionist plan to strengthen the private sector's ability to manage ART, a moderately interventionist plan to provide free ART to HIV-positive pregnant women and, if they are also infected, their spouses and children and a more generous plan to finance ART for the poorest 40 percent of all Indians with HIV infection. (The study refers to these three scenarios respectively as the "Adhere scenario", the "MTCT+ scenario" and the "BPL scenario". See the annex at the end of this article for the full contents of a CD-ROM which is included in the book.)

In fact, the government's program has elements of all three of the options analyzed in this study. By choosing to provide universal access, but to prioritize the worst affected states and, within those states, the infected mothers and their families, the government is adopting a mixture of the second and third scenarios. Measures under discussion to strengthen the ability of private sector physicians to administer ART are related in spirit to the private sector option discussed in this study. Thus, while none of the options discussed here exactly matches the policy the government is currently implementing, each option reflects one or more component of the government's program. Thus the calculations made here of the total financial cost of the program and of the cost-effectiveness of the various options can serve as a foundation for planning the scale-up of India's treatment programs, for manipulating the mix of components in order to have the most effect and for designing monitoring and evaluation mechanisms which provide advance notice of successful implementation and early warning of problems.

The good news from this study that has implications for India's current policies is that all three of the analyzed ART financing options are cost-effective. Because of the low cost and high efficacy of Indian manufactured ART drugs, this study estimates that the government's treatment program might add thousands of years of healthy productive life to the Indian population at a cost of around \$280 per healthy life year. Since this is only about half of India's current gross national income per capita, the treatment investment makes sense on internationally accepted economic criteria. To the degree that India is able to finance much of these costs from ART-specific grants from external donors, the case for rapid expansion of the government's current policy is strengthened.

The study also issues several warnings to the Indian government and implicitly to any government planning to dramatically increase public funding for AIDS treatment. While some may decry any note of skepticism in a public document on AIDS treatment, governments and persons living with AIDS would be poorly served by a study that did not point out possible dangers - and thus help the Government and its partners to avoid them.

First, the study finds that its favorable cost-effectiveness results will only be attainable if patients receive high quality medical care and thus are able to adhere quite strictly to the sometimes onerous ART regimens prescribed by their physicians. More recent work modeling the roll-out of AIDS treatment in Thailand suggests that adherence is greatly enhanced when the government facilitates the establishment of patient support groups at all sites of antiretroviral therapy.

Second, the study assumes that patients will enter treatment relatively early rather than waiting until they are sick and harder to help. To achieve this early recruitment into treatment will require a greatly expanded effort to reduce the social stigma associated with a positive HIV diagnosis and to attract people into voluntary counseling and testing centers so they learn their infection status and can be referred to treatment programs.

Third, the study shows that even if the Indian government succeeds in scaling up the most generous of the three options so that 2.1 million Indians are under government-financed ART in the year 2013, AIDS treatment alone will not materially slow the spread of HIV infection. Indeed, unless prevention efforts are greatly strengthened, the commitment to universal access will become more expensive with every passing year, as newly infected AIDS patients become eligible for ART and are added to those already using it.

Fourth, the attractive cost-effectiveness results depend upon the assumption that India's achievements in increasing condom use on high risk sexual contacts can be sustained despite the spreading news of freely accessible AIDS treatment. This assumption may be wrong. If people come to believe that the availability of treatment reduces the danger of casual or commercial sex and therefore practice riskier sex, or if government spending for treatment crowds out government spending on HIV prevention, the new HIV infections resulting from this increased risk can more than offset the health gains from treatment and greatly increase the future budgetary implications of the government's commitment to it.

India must accept the challenge of treatment, take advantage of its national wealth of pharmaceutical and public health expertise and of the proffered assistance of international agencies and, using these resources, it must extend a therapeutic hand to its AIDS patients. But the cautious notes in this study must also be heeded. Together with the Indian Medical Association and other private medical groups and with its international partners, the government has a responsibility to assure that AIDS therapy is delivered with high standards that maximize the patient's chance of adhering to the drug regimens. The government and its partners must invest heavily in improving the voluntary counseling and testing network in order to recruit AIDS patients early enough to help them. The government and its partners must counteract any possible tendency for treatment availability to induce relaxation of prevention programs by vigorously initiating programs which strengthen positive synergy between treatment and prevention. Finally, the government must rigorously evaluate both the direct and the indirect effects of ART to assure that the nation gains the benefits projected by this report and avoids the pitfalls it warns us against.

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## Annex

### **Contents of the CD which Accompanies "HIV/AIDS Treatment and Prevention in India: Modeling the Costs and Consequences", World Bank, 2004.**

This CD has three folders/subdirectories:

#### (1) Modelkinetix

This folder/subdirectory contains a trial version of ModelMaker 4.0, which can be used for 30 days at no cost. Use after 30 days from installation requires that the user purchase a license from ModelKinetix. To install it, double-click on the autorun.exe file in that folder. You may also want to read the ReadMe.txt file found there.

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#### (2) India AIDS models

This folder/subdirectory contains files related to the models used in the book; with ModelMaker installed you will be able to view, edit and run the models developed by the authors of the background paper on modeling and the authors of the book.

#### (3) Background papers

This folder/subdirectory contains the background papers and notes for the book. Below is a list of the papers available in that folder:

"A Note on Epidemiologically Consistent Estimates of HIV in India" by Abhaya Indrayan

"Epidemiology" by Peter Heywood and Abhaya Indrayan

"Epidemiology of HIV/AIDS in India: Lessons and Challenges" by Abhaya Indrayan

"Sensitivity Analysis of the Estimate of Total HIV Positives in India in the Year 2001" by Abhaya Indrayan

"The External Effects of HAART" by Elliot Marseille

"The Opportunity Costs of Government Resources Used for ART" by Elliot Marseille

"HIV Anti-retroviral Therapy for India: Biological and Therapeutic Considerations" by Julian Gold and Subhash Hira

"Review of Opportunistic Infection Management as related to the availability of ART in Resource Poor Countries" by Julian Gold

"Does the availability of antiretroviral therapy (ART) make HIV positive or negative people more likely to engage in unsafe sex? Therefore, can the provision of ART contribute to the spread of HIV?" by Julian Gold

"Study of ART prescribing physicians in India" by Dr. Subhash Hira

"Treatment-seeking Behaviour and the Willingness to Pay for Antiretroviral Therapy of HIV Positive Patients in India" by Indrani Gupta and Deepa Sankar

"The Projected Impact of Alternative Policies Towards ART on HIV Transmission and Mortality in India: A Mathematical Epidemiological Model" by Nico J.D Nagelkerke, Arni S.R.S. Rao, S.J. DeVlas, Elliot Marseille