

The AIDS crisis in the United States is not over

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Abstract. In 1999, the United States Centers for Disease Control and Prevention requested that the Institute of Medicine, National Academy of Sciences, convene a committee to review current HIV-prevention efforts in the United States. The committee found that HIV-prevention efforts in the United States must be improved. This improvement will require a new way of thinking about cost effectiveness as a guiding principle for HIV prevention. New leadership, accountability, and coordination are also required because even the best prevention strategy cannot be fully effective under conditions of poor leadership and inadequate political commitment. Interventions must be provided for those who are HIV infected and for those women, youth, and racial and ethnic minorities who are increasingly affected by the epidemic. Interventions that prevent HIV in research settings must be more effectively translated into activities that prevent HIV in communities. Lastly, obstacles that impede the implementation of interventions that are known to be effective must be removed.

Despite two decades of experience with the AIDS epidemic, the United States still does not have a comprehensive strategy for preventing the spread of HIV. The need for a national strategy is crucial. The great successes of medical treatments for HIV infection and AIDS have fostered a growing sense of complacency about the importance of and continued need for prevention. This complacency exists in many sectors of the government, the general public, some populations of HIV-infected persons, and those at high risk of infection.

With this in mind, the United States Centers for Disease Control and Prevention requested that the Institute of Medicine, National Academy of Sciences, convene a committee to review current HIV-prevention efforts in the United States. The committee was asked to (a) develop a visionary framework for a national HIV-prevention strategy that could significantly reduce new HIV infections and (b) suggest the roles that public and private-sector agencies should have within this framework. The committee examined the available published evidence as well as information from federal, state, and local agencies and from community-based organizations involved in HIV-prevention research and program implementation.

On September 28, 2000, the committee released its findings in a report called "No Time to Lose: Getting More From HIV Prevention." The following is a summary of their findings. The complete report is available online at <http://books.nap.edu/catalog/9964.html>.

Making prevention even more effective

As a starting point, the committee recommended that the nation adopt an explicit prevention goal: to avert as many new HIV infections as possible with the resources available for HIV prevention. Although this goal may seem obvious, the committee found that several significant barriers currently prevent the United States, as a nation, from meeting the goal of averting the maximum number of infections possible and fully reaping the benefits of the many proven HIV-prevention strategies.

Tracking the epidemic

The current epidemiological surveillance system used in the United States is based primarily on AIDS case reporting and, more recently, on HIV case reporting in selected states. Although useful for tracking AIDS prevalence, this system does not provide a complete or accurate picture of HIV incidence because the time between initial HIV infection and a clinical AIDS diagnosis is about 10 years without treatment. This lag time may be even longer given the successes of today's potent antiretroviral therapies in delaying HIV-related symptomatology. Furthermore, this lag between initial infection and AIDS diagnosis is problematic because the epidemic has shifted into new population groups. Women, youth, and racial and ethnic minorities now account for a growing proportion of new AIDS cases in the United States, and increasing numbers of cases are emerging in rural and smaller urban areas (1). Although men who have sex with men are still the largest exposure group, an increasing proportion of new AIDS cases are now being linked to heterosexual exposure (1). Some of these groups, such as racial and ethnic minorities, are at increased risk of infection and often do not have access to much-needed prevention interventions and services.

By focusing primarily on AIDS cases, today's surveillance tracks where the epidemic has been rather than where it is going. In doing so, it is difficult to appropriately plan and evaluate existing HIV-prevention activities and allocate new resources for HIV prevention. Thus, the committee recommended that the Centers for Disease Control and Prevention create a surveillance system that could provide national-level, population-based estimates of HIV incidence. This surveillance system would use blinded serosurveys of sentinel populations that are representative of the groups at greatest risk of infection, such as drug users in treatment, people attending clinics for sexually transmitted diseases, and women of reproductive age. These serosurveys would employ advanced testing technologies, such as the detuned assay (2), that are capable of identifying recent HIV infections (i.e., <120 days old). Information on recent incidence is important because it provides a clearer picture of where the newest infections are occurring and, therefore, where HIV-prevention programs and services are most needed.

Improved allocation of HIV-prevention resources

Currently, there is no explicit strategy that guides the investment of federal funds for HIV prevention. Allocation of HIV-prevention resources is influenced by many factors including administrative and legislative decisions shaped in response to available data, congressional mandates and earmarks, constituency pressures, personal values, and the professional judgment of program managers. The resource-allocation strategy that results from these decisions can best

be described as "proportionality," meaning that funding is distributed to states in direct proportion to the number of AIDS cases in those states. A strategy based on numbers of AIDS cases is not appropriate for the purpose of preventing new infections. Current funding decisions are too often made without evaluating whether they are cost effective. Furthermore, agencies that fund prevention research often do not require or support assessments of whether these same activities are cost effective. Better decisions about the overall investment of prevention resources must be made to avert as many new infections as possible.

To illustrate this point, take the example of two different HIV-prevention interventions: the screening of the nation's blood supply and needle-exchange programs. Since the development of the HIV antibody test in 1985, all blood donations in the United States are screened for HIV infection. This screening has greatly reduced the number of new HIV infections related to blood transfusions. However, screening is not 100% effective. There is a "window period" between the time of infection and the time when HIV antibodies can be detected by the screening test. Blood donated during this period may carry the AIDS virus. With the standard antibody test, the window period is estimated at 22 days (3-5). The p24 antigen assay, used since 1996, has reduced the window to about 16 days (4-6). Although the use of the p24 antigen test lowered the number of infectious donations that entered the blood supply by about 27%, the absolute number of infections prevented is low because the blood supply was already very safe. In all, an estimated eight additional transfusion-related cases of HIV were prevented, producing a cost-effectiveness ratio of \$7.5 million per HIV infection prevented.

In contrast, needle-exchange programs that enable injecting drug users (a group that may account for an estimated 50% of new HIV infections)(7) to trade used needles and syringes for clean equipment have proven valuable and cost effective in HIV prevention. Many published evaluations of needle-exchange programs, including separate reviews by the National Research Council, the Centers for Disease Control and Prevention, and the U.S. General Accounting Office, have concluded that such programs reduce the spread of HIV without increasing the incidence of drug abuse in the community (8, 9). Depending on the specific program model used, the cost effectiveness of needle-exchange programs is estimated to range from \$3000 to \$50,000 per HIV infection prevented (10, 11).

Based on estimates of HIV incidence and the use of interventions that are cost effective, this new strategy could prevent an estimated 20% to 30% more infections than does the current allocation of HIV-prevention funds. Evaluation of the cost effectiveness of prevention interventions should be a major component of resource-allocation decision-making so that cost-effective interventions would continue to be funded and those that are not cost effective would be discontinued.

Integrating prevention into clinical settings

The committee recommended that prevention services for HIV-infected persons become a standard of care in all clinical settings, such as primary care centers, sexually transmitted diseases clinics, drug treatment facilities, and mental health centers. For these services to be appropriately delivered, health care providers should have adequate training, time, and resources to conduct effective HIV-prevention counseling. To date, prevention efforts have not given enough attention to those who are already HIV infected. Although there were sound reasons for

this omission in the past (e.g., to avoid further stigmatization of an already stigmatized population), the widespread use of potent antiretroviral regimens is contributing to a growing population of infected persons who are living longer, healthier lives than anyone thought possible in the initial years of the epidemic. In addition to treatment needs, these infected individuals may still engage in risky behavior and, therefore, are also in need of prevention services.

According to recent data, most HIV-infected persons in the United States who know their serostatus are in the treatment system (12) and may receive at least some information about prevention. However, as many as one-third of infected persons may not know their HIV status (13). The committee also believes that efforts should be made to increase the number of infected individuals who are aware of their status. Because individuals at high risk for HIV infection often come in contact with the health care system for services at a variety of different entry points, each of these clinical settings provides valuable opportunities for delivering HIV-prevention services.

Translating research into community-level action

Substantial evidence exists in the literature to demonstrate that prevention interventions are efficacious; however, limited information is available on the performance and cost-effectiveness of prevention programs implemented in community settings under nonexperimental conditions. The effective translation of prevention research to field settings also requires that the interventions be adapted so that they are culturally sensitive and appropriate to the prevention needs of community members. The committee recommended that federal agencies invest in research on how best to adapt effective experimental programs for use in community-level interventions and identify what constitutes effective technical assistance for optimal research-to-community transfer of prevention programs. These efforts will require the participation and collaboration of the funding agencies, researchers, service providers, and communities.

Furthermore, community-based organizations must have both the human and fiscal resources necessary to ensure that interventions are being appropriately implemented and sustained. Building this level of capacity often requires substantial technical assistance from agencies (such as those at the federal level) and organizations (such as university research centers) that have the expertise to solve problems of difficult situations, train workers in HIV prevention, and assist with program evaluations. To this end, federal agencies funding HIV-prevention research and interventions should also invest in strengthening local capacity to develop, evaluate, implement, and support effective programs in communities.

Investing in the development of new tools for HIV prevention

Biotechnological advances, such as the development of an antibody test and the use of antiretroviral drugs to prevent perinatal transmission of HIV, have contributed greatly to the successes of HIV prevention. Given these achievements, investment in new tools and technologies is clearly warranted. Research and product advances in the areas of HIV vaccines, antiretroviral and antimicrobial therapy, microbicides, and barrier methods (such as female condoms) can significantly increase the effectiveness of existing HIV-prevention efforts.

However, the committee found significant barriers to development, approval, and distribution of technological innovations. These barriers include inadequate funding for new product research, development, and testing, and disinterest in the private development of specific products.

To address these barriers, federal agencies should continue to invest in developing products and technologies linked to HIV prevention and give high priority to the development of anti-HIV microbicides and vaccines. Efforts should be accelerated to approve prevention technologies that show promise in clinical trials and approve products (such as rapid testing assays) that are already being successfully used elsewhere in the world. Federal agencies should also seek to develop stronger research collaborations with private industry and offer incentives to encourage private industry investment.

Overcoming social barriers

The committee recommends that the United States strive to overcome social barriers and remove policy barriers that impede HIV-prevention efforts. Not only have social, economic, and cultural forces shaped the progression and course of the AIDS epidemic, they have also influenced the United States' response to the epidemic. For example, poverty, racism, gender inequality, and the stigma attached to HIV and AIDS continue to seriously impede HIV-prevention efforts. Furthermore, societal attitudes surrounding sexual activity and drug use have fostered policies that have created barriers to the implementation of proven HIV-prevention interventions and the efficient use of prevention resources. Opportunities are missed to prevent new HIV infections, funds are wasted, and lives lost. The committee believes that because federal leadership for the nation's HIV-prevention efforts is sorely lacking, the United States is hindered in its ability to capitalize on the unrealized opportunities in HIV prevention.

A new vision for HIV prevention

The committee firmly believes the HIV-prevention efforts in the United States must be improved. This improvement will require a new way of thinking about cost effectiveness as a guiding principle for HIV prevention. It will require new leadership, accountability, and coordination. The best prevention strategy cannot be fully implemented under conditions of poor leadership and inadequate political commitment. It will require directing interventions to those who are HIV infected and to those women, youth, and racial and ethnic minorities who are increasingly affected by the epidemic. It will require more effective translation of interventions that prevent HIV in research settings into activities that are effective in communities. And it will require removing obstacles that impede the implementation of those interventions that are known to be effective. The committee believes that as a nation, the United States can and should do more to prevent HIV infection--and we have no time to lose.

References

1. United States Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. HIV/AIDS Surveillance Rep. 11(2) (2000).
<http://www.cdc.gov/hiv/stats/hasr1102.pdf>

2. R.S. Janssen, *et al. J. Am. Med. Assoc.* **280**, 42 (1998).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9660362&dopt=Abstract
3. L.R. Petersen, *et al. Transfusion* **34**, 283 (1994).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8178324&dopt=Abstract
4. M.P. Busch *et al. Transfusion* **35**, 91 (1995).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7825218&dopt=Abstract
5. United States General Accounting Office. Blood plasma safety: plasma products risks are low if good manufacturing practices are followed. (GAO/HEHS-98-205). Washington, DC. (1998).
<http://www.gao.gov/archive/1998/he98205.pdf>
6. J.P. AuBuchon *et al. Ann. Intern. Med.* **127**, 904 (1997).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9382369&dopt=Abstract
7. S.D. Holmberg. *Am. J. Public Health* **86**, 642 (1996).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8629714&dopt=Abstract
8. United States General Accounting Office. Needle exchange programs: research suggests promise as an AIDS prevention strategy. (GAO/HRD-93-60). Washington, DC. (1993)
9. National Academy of Sciences, National Research Council, Institute of Medicine. Preventing HIV Transmission: The Role of Sterile Needles and Bleach. Normand J, Vlahov D, and Moses LE (eds.). Washington, DC: National Academy Press (1995).
10. E.H. Kaplan. *AIDS* **9**, 1113 (1995).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8519446&dopt=Abstract
11. J.G. Kahn. Economic Evaluation of Primary HIV Prevention in Injection Drug Users. In Holtgrave DR (ed.), Handbook of Economic Evaluation of HIV Prevention Programs. New York: Plenum Press. Pp. 45-62 (1998).
12. S.A. Bozzette *et al. N. Engl. J. Med.* **339**, 1897 (1998).
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9862946&dopt=Abstract
13. United States Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. Trends in the HIV and AIDS epidemic (1998).
<http://www.cdc.gov/hiv/stats.htm>