AIDS Revisited

by Lynn W. Kitchen, M.D.

The durability of the Soviet Union is only one of the prevailing assumptions of the 1980s that have not stood the test of time. Two hypotheses about AIDS refuted by current worldwide case reports were the categorizations of the disease as "an African plague" or alternatively (in the words of columnist James J. Kilpatrick, June 1988) "overwhelmingly... a disease that afflicts two classes—drug addicts and homosexual men... a tiny fraction of the population whose willful behavior results in the infection." It is now clear that the epidemic has not yet peaked anywhere and that no nation on any continent is likely to be AIDS-free by the end of the century. Projections that Asia could overtake Africa and account for 42 percent of the world's HIV infections by the year 2000 as compared to 31 percent for sub-Saharan Africa, combined with the increasing AIDS caseloads in Latin America and the countries of the former USSR (many of whose health care systems are in a state of collapse), underscore the necessity of dealing with the pandemic as a global phenomenon.

Estimates of the numbers who will be HIV-infected worldwide by the end of the century range from the 1992 projection of the World Health Organization (WHO) of 30-40 million to the 40-110 million range predicted by a group led by Dr. Jonathan Mann of the Harvard School of Public Health. (Dr. Mann argues that WHO, as an agency of the United Nations, is vulnerable to political pressure by member nations.)

The Tuberculosis Factor

In considering the cited projections, as I noted in a 1988 contribution to CSIS Africa Notes, it is important to take into account "the possibility that immunosuppressed HIV-infected persons could serve as a reservoir of other diseases which could then spread to the HIV-uninfected part of the population and perhaps create secondary epidemics" ("AIDS as a Factor in U.S. Foreign Relations," issue no. 93, December 1988). This already appears to be happening on a worldwide basis with tuberculosis, although the TB data available for countries outside the developed world is comparatively unreliable.

As recently as two years ago, those of us instructing infectious disease specialists-in-training were inclined to counsel that typical tuberculosis be considered in the differential diagnosis of opportunistic infection only when the HIV-infected person involved was from the developing world. Today,
serious problem in many areas of the United States. (See George J. Annas, J.D., M.P.H., "Control of Tuberculosis—The Law and the Public’s Health," The New England Journal of Medicine, February 25, 1993.)

Although the surge in tuberculosis cases among AIDS patients can be ascribed largely to the reactivation of latent tuberculosis infections acquired prior to HIV infection, recent evidence also documents the large-scale transmission of new infections in hospitals, clinics, substance-abuse treatment centers, hospices, and prisons. Because of the extraordinary vulnerability of HIV-positive persons to tuberculosis, high rates of overt disease follow quickly after infection. (See Dr. Michael Isman et al., "Directly Observed Treatment of Tuberculosis: We Can’t Afford Not to Try It," The New England Journal of Medicine, February 25, 1993.) Former U.S. Secretary of Health, Education, and Welfare Joseph A. Califano Jr. has described the staggering public health threat posed by AIDS, substance abuse, and drug-resistant tuberculosis as "an American Carcerus—a vicious, three-headed dog, not only guarding the gates of the hells we have created in inner cities, but also running loose into every part of our nation. This combination threatens every man, woman, child and fetus in America . . . ." He points out that "[i]n pockets of poverty in America, TB rates are worse than those of the poorest countries in sub-Saharan Africa [and] it takes $250,000 to treat an individual with drug-resistant tuberculosis [—a figure that] doesn’t include high-ticket infrastructure costs, such as isolation rooms and negative-pressure facilities" (The Washington Post, December 21, 1992). Mr. Califano did not mention the problem of the costs involved in confining the tubercular patient who declines treatment.

The most important determinants of tubercular contagion are the closeness of contact and the infectiousness of the source, which vary widely from situation to situation. Some microepidemics in closed environments have been marked by high infection rates. One patient with cavitary tuberculosis on a submarine infected 45 percent of the entire crew; 80 percent of personnel in the initially infected individual’s sleeping compartment were infected. In a nursing home epidemic, one case of open tuberculosis infected 31 percent of the susceptible (tuberculin-negative) patients in the home and 79 percent of those located in the same wing as the original case. Given these data, the spread of infection among passengers in aircraft cabins warrants study. We should also give priority to finding alternatives (e.g., addiction treatment) to incarceration in overcrowded prisons for nonviolent offenders. Control of tuberculosis is likely to require international cooperation.

**Interventions**

**Vaccines.** The short-term outlook for an effective preventive vaccine for HIV is still not promising. Dr. Max Essex of the Harvard School of Public Health is not alone in his recent observation that "[w]e can’t be sure we will have a vaccine, ever." The problems in HIV vaccine development have been attributed to a lack of understanding of (1) the nature of an effective immune response following HIV exposure and (2) the pathogenesis (disease development process) of AIDS following HIV infection. But it is also unclear whether even a much more complete understanding of the basic biology of the virus would be enough to assure the timely creation of an effective vaccine.

As Duke University’s Dr. Dani Bolognesi has pointed out, a number of genetically engineered HIV vaccines (containing noninfectious synthetic HIV particles) have been constructed and some do produce an immune response against HIV, but the responses are so weak that they probably would not provide adequate protection in real-world scenarios. The potential health risks of a "traditional vaccine" (containing either live but weakened HIV or whole killed HIV) are unknown.

**Therapeutics.** Although there are frequent reports of "potential cures," eradication of HIV from an infected host (even following such high-tech methods as bone-marrow transplantation) has not yet been demonstrated. A number of drugs used in the developed world offer HIV-infected patients an improved quality of life (and sometimes longer life), but such agents eventually lose their effectiveness in any given patient because of the emergence of drug-resistant microorganisms.

In light of the growing doubts that an effective HIV vaccine will be developed within the next decade, it is time to reexamine the low relevance accorded to possible therapies for HIV-infected persons in the developing world, where few of the standard measures employed in the West are available or affordable. Shouldn’t appropriate and available drugs be targeted, on a worldwide basis, toward prevention of communicable
opportunist infections (i.e., tuberculosis) and prevention of horizontal/vertical HIV transmission? Given that the cost and complexity of per patient administration are critical factors in Asia and Africa, shouldn't high priority be given to studying promising drugs that are inexpensive and easy to administer? Physicians also need to know when and how (i.e., in what combinations) to use these agents so as to minimize the development of drug-resistant microbes. And if optimal results are to be achieved, drug therapy may have to be coordinated with other techniques such as cesarean sections to reduce mother-to-infant HIV spread and improvement of living standards to decrease transmission of tuberculosis. Enhanced educational efforts aimed at reducing the spread of HIV are also essential. This unified approach will require integration of health care and public health.

**The Politics of AIDS Research**

As I noted in my previously cited 1988 contribution to CSIS Africa Notes:

Research focused on the development of antiviral drugs capable of increasing the survival time of AIDS patients faces challenges that are not exclusively scientific. Because of the expense involved in bringing drugs to the market stage, the funding mechanisms of the U.S. National Institutes of Health (NIH) have favored efforts by pharmaceutical companies to develop AIDS treatments, so that NIH would be relieved of some of the drug development costs. Since pharmaceutical companies are profit-oriented, the focus, as in other diseases, tends to be on new and therefore patentable drugs.

These generalizations on the politics of AIDS research are illustrated by my personal experience over the past several years, a period in which much of my laboratory work was focused on exploring the relevance for AIDS of some low-cost, easily administered drug (diethylcarbamazine [DEC] long used for treatment of filariasis in humans residing in tropical regions but marketed in the United States only for animal use (primarily canine heartworm).

The preliminary results (published in several peer-reviewed biomedical journals) appeared sufficiently promising that in 1990 the National Institute of Allergy and Infectious Diseases (NIAID), a part of NIH, decided to commission an independent confirmatory study. For reasons never explained to me, NIAID neither released the raw data obtained in its commissioned research nor provided any statistical analysis of these findings. Given the critical importance of such an independent evaluation in either justifying or discouraging further exploration of the drug’s potential, I can only assume that the decision not to make the results available derived from an assessment that the commissioned study had design flaws.

Meanwhile, most NIAID-sponsored research continues to focus on “high-tech” approaches to reviving the immune system. Virtually all these approaches involve repeated parenteral (needle) administration and are therefore largely unsuitable for use in developing countries even if proven effective. As for the pharmaceutical companies with which I have discussed my research, the responses have been lukewarm at best. The fact that the drug is no longer under patent may have something to do with this lack of enthusiasm.

In view of the limited prospects (based on the cited bureaucratic impediments to “low-tech” approaches and the unavailability in the United States of the version of DEC approved for human use), I am winding down my research with cat, rat, and mouse models and am focusing primary attention on a joint project undertaken with colleagues in Guatemala to administer DEC selectively to HIV-infected human volunteers. This persistence does not reflect a prejudgment on our part about the value of the particular drug we are studying, but rather a determination to explore fully whatever utility it might have against HIV itself and/or the devastating opportunistic infections that accompany AIDS. We are inclined to share the view of Dr. Samuel Broder, director of the National Cancer Institute, that improved treatment results for AIDS are more likely to come from harnessing existing knowledge to improve combinations of already licensed drugs than from the discovery of radical new drugs (The New York Times, July 21, 1992).

**Prevention/Education**

In the absence of an imminent vaccine or drug-based AIDS cure, efforts to teach individuals how to avoid

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getting infected should be a priority in all countries. In this connection, the factors that have contributed to the success of some community programs should be determined and, where possible, duplicated at the national and international level. Potential priorities include (1) empowering women in traditionally male-dominated societies to protect themselves from HIV and thereby avoid transmitting the disease to their children; (2) promoting collaborative relationships between researchers in developed and developing countries; (3) integrating preventive and therapeutic efforts within a community (which would promote a sense of "caring" as opposed to mere "preaching" that might reinforce the educational message); (4) linking community efforts (to share resources); (5) making blood screening facilities available prior to blood transfusions.

We need leaders who understand the importance of health-care issues in a world where, for example, the scarcity of sterile needles in a given country can have consequences that do not stop at that country's borders. In this connection, it was encouraging to hear President Clinton acknowledge in his inaugural address that "There is no longer a clear division between what is foreign and what is domestic. The world economy, the world environment, the world AIDS crisis, the world arms race—they affect us all." Implementation of the recommendations of the Institute of Medicine of the National Academy of Sciences that the United States take the lead in establishing a global surveillance system for infectious diseases would be a logical follow-up step.

A Note to Our Readers

This issue of CSIS Africa Notes is one of several dealing with various aspects of AIDS in Africa the author has contributed to the African Studies Program's monthly briefing paper series since 1987. It is not a publication of the recently launched CSIS Working Group on Global HIV/AIDS, which will convene in mid-April on Capitol Hill for the third of a sequence of half-day meetings that will continue through 1993.