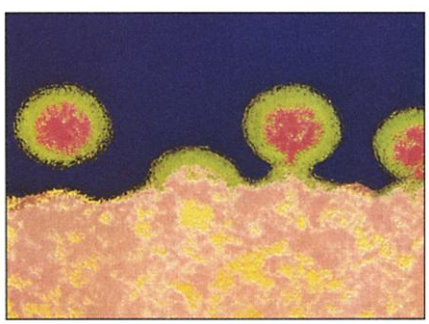
Priorities in HIV Prevention

FUNDING FOR HIV PREVENTION, J. A. CATANIA and coauthors argue in their Policy Forum (27 Oct., p. 717), is disproportionately allotted to those with heterosexual exposure risk at the implied expense of men who have sex with men (MSM). The authors say that HIV prevalence among heterosexuals has decreased over the past decade. Although I agree that MSM are a risk group in need of continued and improved HIV prevention programs, I question the authors' interpretation of current data regarding heterosexual risk.

According to a 1999 *HIV/AIDS Surveillance Report* from the Centers for Disease Control and Prevention (*1*), "During the 1990s the epidemic shifted steadily toward a growing proportion of AIDS cases in blacks and Hispanics and in women and toward a decreasing proportion in MSM, although this group remains the largest single exposure group....The proportion of women with AIDS increased steadily, reaching 23% in 1999, and the proportion infected heterosexually also increased, surpassing (in 1994) the proportion infected through injection drug use." Although data from recent Job Corps and military applicants are encouraging (*2*), these groups might not be typical of the heterosexual population at risk in the United States; the underrepresentation of women in these cohorts supports that concern. Data from the Survey of Childbearing Women (*2*) do not support Catania *et al.*'s contention that HIV prevalence has decreased among heterosexual women over the past decade. Finally, information on global HIV/AIDS prevalence indicates that heterosexuals, women, and the children of infected heterosexual women face an enormous exposure risk worldwide (*3*). Efforts to prevent similar patterns in the United States cannot be overemphasized.



Troops off to war: HIV viruses bud from a T cell, ready to spread the infection. (Magnification, about ×86,000)

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Research that demonstrates effective behavioral and medical interventions that decrease HIV/AIDS incidence benefits many risk groups. Postexposure prophylaxis was first shown to be effective in neonates (*4*) and healthcare workers (*5*), but has since been extrapolated to prevention efforts for men and women after high-risk sexual exposures (*6*). Rather than cavil over the distribution of limited funds for prevention, we should seek to increased funding for effective interventions for all risk groups.

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THE MAIN POINT THAT CATANIA AND colleagues make in their Policy Forum, which I agree with, is that HIV prevention funding should follow the epidemiology of the infection. But in their closing paragraph they say, "The United States has yet, however, to finance long-term HIV surveillance systems of high-risk populations that are based on current advances in scientific sampling. Unfortunately, greater emphasis is placed on HIV case reporting than on surveillance. The former is a window to the past; the latter is the much-needed window on the future." This statement seems to imply that we do not have surveillance for HIV infection in the United States. In fact, California is the only high-incidence state that has not implemented HIV infection case reporting. Contrary to the authors' statement, timely and complete HIV case reporting is vital for an HIV surveillance system. Certainly we also need sero-incidence measures of high-risk populations, as Catania et al. point out, but it is HIV case reporting that can identify emerging populations at risk for HIV infection.

In Michigan we have had HIV case reporting for more than 10 years. Although other states have turned this issue into a "political football," Michigan and 24 other states have had integrated HIV/AIDS case reporting since the mid 1990s and use these data to inform prevention and care planning processes in their states. These systems are woefully underfunded, but the suggestion that HIV case reporting is somehow a dated part of HIV surveillance will not help the efforts to improve funding for these programs.

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Response

IN ANSWER TO BEHRMAN, IT IS UNFORTUNATE that HIV surveillance and prevention efforts in the United States have become overly reliant on the tentative interpretations that may be derived from AIDS case load data. There are problems with generalizing trends in AIDS cases to the underlying distribution of HIV infection, most notably that AIDS cases may be 10 years out of phase with actual infections. Furthermore, the interpretation of AIDS case levels and trends at national, regional, and local levels are complicated by the effects of migration, geotemporal differences in the epidemic, changes in population size in critical subpopulations, historical changes in HIV treatment efficacy and AIDS diagnostic criteria, and the clumping of AIDS cases in

Letters to the Editor

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particular years because of changing rates in HIV testing. To identify where the HIV epidemic is moving, we need data on HIV prevalence and incidence rates for specific populations that exhibit high-risk behaviors. Only by understanding where new infections are occurring can we cost-effectively allocate HIV prevention dollars.

With regard to heterosexuals at risk, the Job Corps and military applicants studies provide the best long-term surveillance data on HIV prevalence. Both studies reflect population segments having demographic characteristics associated with high-risk behavior and HIV cofactors. A substantial proportion of Job Corps participants are female (~35%) and African American (~50%), thereby allowing analyses of HIV prevalence trends by gender and ethnicity. Valleroy and colleagues (*1*), for instance, reported significant downward trends in HIV prevalence for both African-American men and women in the Job Corps study. A third, now discontinued, surveillance study, the Survey of Childbearing Women (1989 to 1995), represents a segment of sexually active women age 15 to 44 years who were pregnant in the preceding year. Pregnant women are less likely to have used birth control, including condoms, in the year or years before or during pregnancy; consequently, this study might indicate the level of HIV infection in the absence of adequate condom use. Trends analysis revealed that HIV prevalence levels in this survey did not change substantially over time (*2*), suggesting that even with little protection HIV levels did not increase significantly among the larger population of heterosexual women in the first half of the 1990s. In general, these various surveillance studies may be biased because they are based on opportunistic rather than probability-based samples. If, however, we discount the results of these studies, we are then left with the disturbing possibility that we've lost track of the HIV epidemic among heterosexuals.

As for funding distributions, we agree that increases for HIV prevention are important. However, even with more funds, allocations and priorities should be established on the basis of reliable data that show where new infections are occurring.

Behrman also refers to information about global HIV/AIDS prevalence and possible implications for the United States, but it seems unlikely that the current HIV epidemics in Africa and Asia presage a similar epidemic in the United States. For instance, research on sexual mixing in the United States suggests, although not unambiguously, that many large segments of the population are "sexually isolated" (*3*), which may prevent a large-scale heterosexual epidemic. There may be, however, localized outbreaks of HIV infection among U.S. heterosexuals that occur in areas with high rates of intravenous drug use and a high prevalence of syphilis infection. These are relatively rare circumstances; nevertheless, this is not a reason to discontinue or limit support for prevention programs. The results of the Job Corps and military applicants studies provide a basis for encouraging increased support for such prevention efforts.

"...problems with generalizing trends in AIDS cases to the underlying distribution of HIV infection..."

In response to Mokotoff, HIV infection trends that are based on reporting systems in place in the United States are problematic with respect to validity (*4*). For instance, prior research has shown that more than half of infected persons find out that they are infected only within 1 year of their diagnosis with AIDS, nearly 10 years after infection, and about one-third discover that they are infected with HIV at the time they are diagnosed with AIDS. Thus, HIV surveillance systems that depend on self-referral cannot reflect where in the population new HIV infections are occurring nor provide unbiased trends data. These systems reflect the time that individuals chose to be tested rather than when an individual became infected. Although surveillance windows based on opportunistic sampling and self-referral are manageable, low-cost systems that may be easier to maintain, they need to be validated by studies based on methodologies that provide representative samples (that is, based on probability sampling techniques) from at-risk populations.

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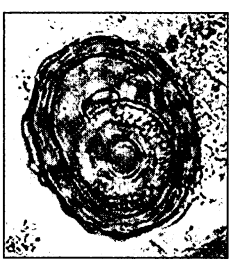
Helminthic Infection and HIV Vaccine Trials

CLINICAL AIDS IN RHESUS MONKEYS WAS prevented, as D. H. Barouch and colleagues report in their research article (20 Oct., p. 486), when a DNA vaccine was used in conjunction with an adjuvant consisting either of a fusion protein of interleukin-2 (IL-2) and the Fc portion of immunoglobulin G (IgG), or of a plasmid encoding IL-2/Ig (*1*). The adjuvant augmented the protective immune reaction, apparently by boosting the virus-specific response from cytotoxic T lymphocytes (CTLs) that was elicited by the vaccine. This CTL response is critical for controlling replication of HIV-1 in humans (*1*).

There is certainly evidence that IL-2 has a therapeutic effect in humans when injected into patients with AIDS (*2*). Together, these findings highlight a potential problem associated with the fact that worm infections of various kinds are widespread among inhabitants of sub-Saharan Africa, a situation that does not occur in most developed countries (*3*).



This helminth, *Ascaris lumbricoides* (egg shown with a larva), parasitizes 25% of the world's population.

Helminthiasis results in an impaired T helper cell type 1 (T_H1) response (which is characterized by production of IL-2, among other effects) to tetanus toxoid and to *Bacillus Calmette-Guérin* vaccination against tuberculosis (*4*). Consequently, a question must be asked: Could helminthic infestations, if not treated before anti-HIV vaccination, similarly compromise the efficacy of particular types of HIV vaccines? Prevention of helminthiasis is another option if worms do, in fact, represent a complication in relation to vaccination against HIV. We suggest that unless the immunological implications of helminthiasis and other preexisting infections are taken into account, HIV vaccine trials in Africa and certain other parts of the world may in some instances be seriously flawed.

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