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Changing Pattern of HIV Transmission in the Caribbean

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Dr. Langmuir succeeds admirably in showing that any prediction regarding AIDS, unless stated very cautiously and for the shortest term, must be subject to serious doubt. His own detailed predictions are for the United States, with Pattern I transmission, and not for Africa and the Caribbean with Pattern II.

His paper contains some rather obvious truths, such as that a geometric progression cannot continue indefinitely in a finite population, and at least one "feeling" which many would agree with—that AIDS is not about to overwhelm the general population of the United States. Sexually transmitted diseases (STDs) have never overwhelmed whole populations, but neither have they gone away even when readily treatable.

It would be splendid if the right-hand side of Langmuir's Gaussian curve really represented the future of the epidemic, but there are reasons to doubt this. If the

epidemic were to peak in 1988, the curve for HIV infection should have peaked some years ago—perhaps before the disease was recognized—and the incidence of seroconversion should have been declining since. Is there evidence of this?

Further, the left-hand side of his curve may not truly represent events to date, and may have led to the false expectation that the epidemic would peak in the immediate future.

Dr. Langmuir's feeling that AIDS will remain within recognized risk groups seems to dismiss the half of heterosexual cases that would particularly interest us in the Third World—those with no known contact with the recognized risk groups.

Obviously, risk groups are not homogeneous. For example, within the category of homosexual males, promiscuity varies from person to person. Ignoring, for the moment, differences in sexual practices, it can be anticipated that the most promiscuous will, in general, become infected first. Imagining a "promis-

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cuity distribution curve" of some shape or other (it hardly will be a normal distribution), the first cases and the highest rates of transmission will be at the high, right-hand end of the curve. While there are no useful data from which to plot this curve, it is reasonable to postulate a declining rate of transmission, but among larger and larger numbers of susceptibles, as we move from right to left along the curve until that point at which the doubling time exceeds the mean incubation period (or the sexually active survival time of the HIV-infected, assuming some never develop AIDS itself). Presumably, the epidemic will not spread into the less promiscuous part of the homosexual risk group beyond that critical point.

The effect of new homosexuals entering the population is dismissed by Dr. Langmuir as insufficient to maintain geometric increase, but that is hardly the same as being unable to sustain an incidence of new infections.

If we apply the "promiscuity distribution" concept to the group of heterosexuals without known contact with other risk groups, we once again have no data to plot a real curve, but we know that heterosexual transmission occurs and that the most promiscuous at the right-hand tail of the curve will be at greatest risk. We would need to ask how far to the left along this imagined curve transmission can be sustained.

Recruits to heterosexual behavior—the great majority of young persons of either sex—will in some societies appear further to the right in their youth than they will in maturity. Thus, if there were data, "promiscuity distributions" could be plotted for each sex, for each sexually active age group, each culture, religion, socioeconomic group, occupation, etc.

For each imagined curve, the question again would be: How far to the left is HIV transmission sustainable, and what part

of the population lies under the residual part of the curve and can be regarded as not at risk?

One can accept Dr. Langmuir's point that a peak must be reached at some time, but his date for the event and his guess as to what the rest of the curve will look like do not seem well founded.

The left-hand side of his curve may begin too vertically and may end too horizontally. If we accept the fact that early in the epidemic diagnostic capability increased with time, the 1982 notifications may be well below the actual number of cases, even after including retrospective diagnoses. In subsequent years, this discrepancy would diminish. The proportion of diagnosed cases that were notified may have peaked once diagnostic proficiency was generally established in the United States, but may have declined since then. Substantial underreporting is accepted as a fact: With little to gain and much to lose, some patients can be expected to try avoiding diagnosis (and thus notification also).

Has the proportion of cases being notified fallen as the absolute numbers have continued to rise? If this has occurred, it is not only late notification but non-notification that may have artificially flattened the upper part of Dr. Langmuir's curve, exaggerating whatever real lengthening of the doubling time may have occurred. The true curve may still be closer to the linear than Langmuir has calculated; the gradient may be less and the peak may not yet be in evidence.

Any attempt to predict the impact of AIDS on the general population of the United States must be based on available information on heterosexual transmission of AIDS cases, which has tended to occur with disproportionate frequency in two minority groups—blacks and Hispanics. These two groups account for 26% and 13% of the AIDS cases, respectively, compared with the overall proportion

tion of blacks (12%) and Hispanics (6%) in the U.S. population (1), and account for 70% of the cases in heterosexual men, 70% of those in women, and 75% of those in children. The number of U.S.-born women with heterosexually acquired AIDS has been increasing (2), and women and children are the fastest growing groups of persons with AIDS. Most importantly, studies suggest that in some areas of New York, HIV seroprevalence in women of child-bearing age ranges from 2% to 5.9% (3), indicating that the level of infection in some heterosexual populations is high and will result in an increasing number of AIDS cases among heterosexual men and women and their children in the future.

The changing epidemiology of AIDS in the Caribbean may have important lessons for us. Analysis of data on reported AIDS cases suggests that transition from homosexual/bisexual to heterosexual transmission can occur, and once that happens, transmission in the latter population may take place quite rapidly and efficiently (see the article on pages 42-49 in this issue). In countries with smaller and more homogeneous populations, such as those in the Caribbean, this transition and its aftermath can be noticed more easily than in large countries, especially since, in our opinion, the AIDS epidemic is still at the initial stages.

AIDS in the 18 English-speaking Caribbean countries and Suriname (populations ranging from 8,000 to 2.3 million) was first reported in 1983. Until 1985, reported cases were among homosexual or bisexual males only. Thereafter, the heterosexually acquired cases started to increase. In Trinidad and Tobago they constituted 13% of the total in 1985; this proportion increased to 25% and 47% in 1986 and 1987, respectively. As a result, greater numbers of women with AIDS were reported, and the male to female ratio declined from 5.9:1 in or before 1985

to 3.3:1 in 1986 and 2.4:1 in 1988. By September 1988, 52% of the cases reported from Trinidad and Tobago and a majority of the cases reported from the Bahamas were among heterosexual men and women. Similarly, an initial transition from predominantly intravenous drug-related AIDS to heterosexually acquired cases has been seen in Bermuda. In 1985, 80% of reported cases from Bermuda were among intravenous drug users. This has now declined, with a concurrent increase in the proportion of heterosexual contact cases from 6% in 1985 to 24% in 1987.

In Guyana, on the other hand, which only started reporting cases in 1987, most cases (all but two) are in males, predominantly homosexuals or bisexuals. Given our experience in the Caribbean, this is likely to change in the future.

The underlying reason for this initial transition has been transmission from bisexual males to women, since most bisexual men in the Caribbean tend to be married. Further spread was probably facilitated by the sociocultural and sexual behavior of the population (4, 5). Important factors affecting transmission include fragile male-female relationships, men having multiple partners, teenagers engaging in unprotected sex, and the increasing incidence of other sexually transmitted diseases, particularly syphilis. Given the size of the heterosexual population, it is inevitable that transmission will continue to increase and the number of AIDS cases among heterosexual men, heterosexual women, and children will continue to grow.

Whether patterns in the United States will follow those seen in the Caribbean will be determined largely by the sociocultural and sexual behavior of various population groups in that country.

We agree that, based on current data, the number of cases among homosexuals in the United States will slow gradually

as a result of the "exhausting of susceptibles" and perhaps also due to the impact of health education campaigns directed toward the homosexual population. However, heterosexual transmission may continue to increase in the foreseeable future. This is likely to be an area of great concern, especially because of the number of susceptibles and because of the relatively low emphasis that public education has placed on heterosexual transmission so far. Therefore, the importance of heterosexual transmission must be stressed worldwide, and this problem should be emphasized when charting the future course of action in our fight against AIDS.

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Who Is Really Right?

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Dr. Langmuir's presentation addresses the highly controversial subject of AIDS projections in the United States. It is Dr. Langmuir's personal view that no communicable disease has an incidence that progresses geometrically over the long run. This is quite true, and I fully agree with him; no communicable disease until now has ever behaved this way.

Dr. Langmuir further argues, with much reason, that the modes of AIDS

transmission are unlikely to affect with any great intensity groups other than those already involved. So far the figures bear him out, for in heterosexuals, for example, the frequency of the disease, though somewhat higher, has not risen as much as it was expected to rise a few years ago. In general, the heterosexual case of AIDS is still the exception, male homosexuals/bisexuals and intravenous drug abusers remaining the two major groups at risk in the United States.

We have lately seen the rate of increase of AIDS cases among homosexuals decline, but this is counterbalanced by pro-

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