Mandatory Premarital Testing for Human Immunodeficiency Virus

The Illinois Experience

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During the first 6 months of legislatively mandated premarital testing for human immunodeficiency virus in Illinois, 8 of 70 846 applicants for marriage licenses were found to be seropositive, yielding a seroprevalence of 0.011%. The total cost of the testing program for 6 months is estimated at $2.5 million or $312 000 per seropositive individual identified. Half of the reported seropositive individuals reported a history of risky behavior. During the same period, the number of marriage licenses issued in Illinois decreased by 22.5%, while the number of licenses issued to Illinois residents in surrounding states increased significantly. We conclude that mandatory premarital testing is not a cost-effective method for the control of human immunodeficiency virus infection.

TO DATE, more than 94 000 cases of acquired immunodeficiency syndrome (AIDS) have been reported to the federal Centers for Disease Control, Atlanta, Ga.1 It is expected that by 1991, a total of 270 000 cases will have been reported.1 One frequently proposed, although controversial, measure to slow the spread of the virus is mandatory premarital screening for infection with the human immunodeficiency virus (HIV). In 1985, seventeen states considered legislation that would require such testing and in 1987, a total of 33 states considered such legislation.2 In 1987, Louisiana and Illinois adopted legislation mandating premarital screening for HIV infection, while Texas adopted legislation requiring such screening when the seroprevalence among the population at large reaches 0.83%.2 In mid-1988, the Louisiana legislature repealed its law 6 months after enactment, leaving Illinois as the only state currently mandating premarital screening for HIV infection.

The Illinois experience provides the opportunity to examine the actual fiscal, social, and public health implications of mandatory premarital testing programs. This experience may also be useful and instructive as other programs requiring the mandatory and widespread testing of populations with a very low incidence of infection are considered as AIDS prevention and control measures.

METHODS

Data to assess the impact of mandatory premarital HIV antibody testing in Illinois are available from data sets of the Illinois Department of Public Health (IDPH) through its Division of Vital Records and AIDS Activity Section.

Premarital HIV Antibody Testing

The Illinois Marriage and Dissolution of Marriage Act was amended, effective January 1, 1988, to prohibit the issuance of a marriage license to any individual who fails to present a certificate, signed by a physician, stating that both parties to the proposed marriage have been tested for HIV antibodies and advised of the test results.3 The law requires an initial enzyme-linked immunosorbent assay (ELISA) screening test and the confirmation of all positive ELISA tests with a Western blot assay or “other more reliable test.”4 This provision amends and adds to a previously existing requirement that all persons must present certification that they are free from transmissible syphilis prior to issuance of a marriage license.5 Citing the ineffectiveness of premarital testing for syphilis in identifying new cases, 25 states have rescinded this requirement in the last 6 years.6

The physician who performs the test is required to communicate the HIV test results to both parties to the proposed marriage and to sign a certificate stating that he/she has done so (Fig 1). If the confirmatory test results are positive, the results must be communicated in person. Test results are not placed on the certificate, nor are seropositive individuals prohibited from marrying. Positive HIV tests and certain demographic information must be reported to the IDPH. Nonconsensual disclosure of the results is legally prohibited. There is no mechanism to determine whether seropositive applicants actually continue with their marriage plans.

The new premarital testing requirement was widely publicized by the IDPH. In addition to press releases, department personnel appeared on numerous radio and television news and talk shows to explain the new requirement. Explanatory brochures, in both English and Spanish, were distributed through county clerk’s offices, local health departments, and physicians’ offices. In addition, information concerning the new requirement was mailed directly to every licensed physician and all ordained clergy in the state.

Marriage License Applications Issued

In Illinois, marriage licenses are issued and marriages are registered by the 102 county clerks in the state. To obtain a license, applicants must demonstrate that they have been tested for HIV antibodies within the preceding 30 days. Once issued, the marriage license is valid for 60 days. The county clerks report the number of marriage licenses

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For editorial comment see p 3458.
Table 1—Human Immunodeficiency Virus Seroprevalence for Selected Populations in Illinois

<table>
<thead>
<tr>
<th>Population</th>
<th>No. Tested</th>
<th>No. Positive</th>
<th>Seroprevalence, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private physician patients (12/85-7/88)</td>
<td>1868</td>
<td>337</td>
<td>18.9</td>
</tr>
<tr>
<td>Counseling and testing site clients (12/85-7/88)</td>
<td>17160</td>
<td>841</td>
<td>4.9</td>
</tr>
<tr>
<td>Homosexually active men</td>
<td>4127</td>
<td>249</td>
<td>6.4</td>
</tr>
<tr>
<td>Intravenous drug users</td>
<td>1562</td>
<td>120</td>
<td>7.7</td>
</tr>
<tr>
<td>Illinois military recruits (10/85-9/86)</td>
<td>70310</td>
<td>90</td>
<td>0.14</td>
</tr>
<tr>
<td>Volunteer blood donors (6/85-12/87)</td>
<td>1411208</td>
<td>194</td>
<td>0.02</td>
</tr>
<tr>
<td>Marriage license applicants (1/85-7/88)</td>
<td>70546</td>
<td>8</td>
<td>0.01</td>
</tr>
</tbody>
</table>

*Diagnostic specimens submitted to the Illinois Department of Public Health laboratory by physicians in private practices.

Issued in their county each month to the registry of vital records maintained by the IDPH. In each county, clergy and others performing marriages must register marriages with the county clerk, within 10 days of the wedding. The county clerks then have 45 days to report the registered marriages to the IDPH Registry of Vital Records. Therefore, the number of marriage licenses issued, rather than number of marriages performed, will be used as the denominator in estimating seroprevalence. This will provide a more accurate estimate as all marriage license applicants are required to be tested, regardless of whether the marriage actually takes place.

IDPH AIDS Program

The IDPH's AIDS Activity Section is responsible for Illinois' AIDS surveillance and prevention programs. In addition to surveillance and investigation of cases meeting the Centers for Disease Control case definition, the section receives reports on the seroprevalence of HIV antibodies among clients of the state's counseling and testing site program, voluntary blood donors, and military recruits. Since May 1988, physicians and laboratories in Illinois have been required to report certain demographic information about all seropositive individuals to the IDPH.

Physicians have been required to report positive premarital test results since the screening program was instituted on January 1, 1988. Included in each report is the individual's race, sex, age, county of residence, and risk behavior, if known. Individual-identifying information is not collected.

Reports are made through the local health departments, which also contact physicians to obtain any missing demographic information, offer counseling assistance, and provide physicians with information regarding available sources for additional counseling and medical evaluation. Physicians are also encouraged to refer seropositive individuals to the state's HIV antibody counseling and testing sites for follow-up counseling.

RESULTS

Premarital Testing Seroprevalence

During the first 6 months of the mandatory premarital screening program in Illinois (January to June 1988), a total of 35,423 marriage licenses were issued to 70,846 persons in the state. During that same period, eight positive premarital test results were reported to the IDPH, yielding a seropositivity rate of 0.011%.

This rate is lower than that observed for any other population in Illinois for whom seroprevalence data are available and is far lower than that predicted by the IDPH. Based on the observed seroprevalence among voluntary blood donors, the IDPH had predicted that premarital testing would identify approximately 80 seropositive individuals annually.

Demographic and Risk Factors

The demographic characteristics of seropositive marriage license applicants are shown in Table 2. The most surprising result is the female-to-male ratio of 1.6, although this difference is not statistically significant ($P > .25$). Five of the eight cases report a history of behavior associated with an increased risk of HIV infection.

Impact on Marriages

During the first 6 months of 1988, there was a 22.5% decrease in the number of marriage licenses issued in the state when compared with the same 6-month period in 1987 ($P = .001$). This contrasts with a 2.4% increase in marriage licenses issued during the first 6 months of 1987 when compared with 1986 (Fig 2). This decrease in the number of marriage licenses issued was observed in nearly every county of the state, with increases reported in only 5 of the state's 102 counties. Sixty-three (63%) of the 102 counties in Illinois reported a decrease of greater than 20% in the number of marriage licenses issued during the first 6 months of 1988 and 17 counties (16%) reported a decrease of greater than 50%.

This decrease has been associated with a dramatic increase in the number of marriage licenses issued to Illinois residents by neighboring states (Fig 3). The number of licenses issued in December 1987, the month prior to implement-
Table 2.—Demographic Characteristics of Seropositive Individuals Identified Through Mandatory Premarital Screening and Through Counseling and Testing Sites in Illinois

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Total No. seropositive</td>
<td>841*</td>
<td>6</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3</td>
<td>792</td>
</tr>
<tr>
<td>F</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>4</td>
<td>442</td>
</tr>
<tr>
<td>Black</td>
<td>3</td>
<td>291</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
<td>107</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Risk factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intravenous drug use</td>
<td>2</td>
<td>124</td>
</tr>
<tr>
<td>Sex contact to person at risk</td>
<td>3</td>
<td>124†</td>
</tr>
<tr>
<td>Undetermined</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

*Includes 574 seropositive homosexually active men and 19 seropositive homosexually active IV drug users.
†Includes heterosexuals with multiple sexual partners.

Generally, an additional $24.10 to $167 (mean, $60.50) is charged for confirmatory Western blot testing.

Using the mean charge of $20.94 for an ELISA test, the first 6 months of premarital AIDS testing in Illinois cost marriage license applicants $2.1 million on an estimated $4.2 million annually. This is probably a conservative estimate, as the number of licenses issued during the last 6 months of the year is greater than the number of licenses issued during the first 6 months. According to a survey of Illinois blood banks conducted by the IDPH, 0.32% of voluntary blood donors yield reactive ELISA test results (IDPH, unpublished data, 1987). Assuming a similar rate among marriage license applicants, an additional $13,784 ($27,468 annually) was spent for 227 Western blot assays. These must be viewed as conservative figures, as they represent only the laboratory charges for tests and do not include physician’s professional fees. There is anecdotal information that the cost often exceeds $150 when physician fees are included.

A more accurate estimate of the cost of the entire counseling and testing process might be the cost for these services through the state’s counseling and testing program. This program provides a pretest and posttest counseling session and HIV antibody testing, including repeated ELISA tests and Western blot tests as appropriate for a per capita cost of $38. Assuming this figure is more representative of the actual cost of premarital screening to the individual, the screening program has cost marriage license applicants approximately $2.5 million ($5 million annually).

COMMENT

The goal of any screening program is to identify infected individuals so that appropriate intervention measures can be taken to prevent the further spread of disease. The effectiveness of any screening program is dependent on four factors: the efficiency with which infected individuals are identified, the provision of effective intervention measures, the cost of the program, and the target population’s acceptance and support of the screening program.

Screening Efficiency

The efficiency of the screening program in identifying infected individuals is directly dependent on the prevalence of the disease in the target population. Marriage license applicants in Illinois are a very low-prevalence population. The observed seropositivity rate of 0.011% is considerably lower than previously published estimates that have been made for the population of illinois.
ranged from 0.04% to 0.18%.' There are several possible reasons the observed seroprevalence is much lower than these estimates.

First, previous estimates of the seroprevalence in this population have primarily been based on the observed seroprevalence for voluntary blood donors and military recruits. Neither of these is representative of marriage license applicants. The age distribution of voluntary blood donors differs markedly from that of marriage license applicants, and persons at high risk of infection are actively discouraged from donating blood. Similarly, persons most likely to be infected, homosexually active men and intravenous drug users, are probably underrepresented in the population of marriage license applicants. Military recruits are, on the other hand, more likely to be homosexual men, intravenous drug users, or sexually active than marriage license applicants. Second, the positive premartial test results are possibly underreported. While no analysis of the level of reporting has been attempted, this possibility is highly unlikely. The premartial testing law and reporting requirements received extensive media coverage and all local health departments were surveyed every 2 weeks to determine whether any premartial testing results had been received and to stimulate them to notify appropriate providers in their jurisdiction. The high level of awareness of and interest in this program makes significant underreporting an unlikely possibility.

Third, it is possible that marriage applicants with a history of risk behaviors are leaving the state to obtain marriage licenses to avoid the testing requirement. The decline in the number of marriage licenses issued is a statewide phenomenon and has not been limited to those areas with a significant population of persons at risk, suggesting that this is not the case. However, this possibility cannot be ruled out as there are no data available concerning possible risk behaviors among persons leaving the state to marry.

While the observed seropositivity rate is 0.011%, the true seroprevalence in this population may actually be much lower. Using the model described by Cleary et al., and assuming that 0.02% of blood will yield repeatedly reactive ELISA results (based on our experience with voluntary blood donors) and that the seroprevalence equals the observed seropositivity rate of 0.011%, the proportion of persons with positive ELISA and Western blot assay results who are truly infected decreases to 0.4%.

A false-positive test result may seriously disrupt an individual’s life, as marriage plans are cancelled and decisions not to have children, or to abort current pregnancies, are made. Discrimination by insurers and employers and social ostracism may also result if information is not held confidential by the intended spouse or their family. The human cost of this anguish is impossible to calculate.

**Intervention Measures**

Currently, there is a nearly universal agreement that individualized counseling in AIDS prevention and risk reduction is one of the most effective intervention measures available. Theoretically, premartial screening presents the opportunity to provide widespread counseling to a sexually active population. However, 62% of the seropositive individuals identified during the first 8 months of screening reported a history of risk behavior, and counseling could probably be more efficiently identified through programs targeted to populations with a higher prevalence of infection.

**Cost Considerations**

Although the cost of the screening program has been borne by marriage license applicants, and not by public funds, the program is nonetheless exceedingly costly. The $5 million estimated annual cost of premartial testing is nearly 1½ times the $3.5 million allocated in the current state budget to support all AIDS surveillance, prevention, education, and counseling programs. The cost per positive individual identified through the screening program to date is $312,000, compared with a cost of less than $2500 per individual identified through our counseling and testing program. Similarly, the cost of partner notification is estimated to be $140 to locate and counsel a contact to a seropositive individual.

An additional cost of premartial testing is the loss of marriage license revenue. The migration of an estimated 10,000 marriage license applicants to other states in 6 months has cost the state $77,250 in revenue from marriage license fees ($154,500 annually).

**Acceptance**

Finally, a significant proportion of the target population does not support this program, as fewer individuals are applying for marriage licenses in the state. While it is clear that many persons are traveling to neighboring states to get married, there is anecdotal evidence that some individuals may not be getting married at all. Cook County Hospital, which provides services to hundreds of poor and uninsured residents of Chicago, was forced to discontinue its program of offering premartial HIV testing (free or for a reduced cost) only 6 weeks after its inception because the demand for the service far exceeded the hospital’s ability to provide it (A. Sweers, T. Brune, Chicago Sun-Times, January 26, 1988). Many physicians at the hospital feel that the poor are choosing not to get married because of the cost of the test (T. Willkerson, New York Times, January 26, 1988:1). A significant proportion of the population, in choosing to avoid premartial testing, is essentially subverting the screening program’s goal of protecting spouses and offspring from infection.

**CONCLUSION**

In 6 months, the premartial screening program in Illinois identified only eight seropositive individuals, at an estimated cost of $2.5 million ($312,000 per infected individual). This is far less cost-effective than other screening programs targeting populations with a higher seroprevalence of infection.

The annual cost of this program (though not supported with public funds) in nearly 1½ times the state appropriation for all other AIDS surveillance, prevention, and education programs combined in fiscal year 1989. The limited public resources available to support AIDS prevention programs are most effectively used for general education and counseling and testing programs targeting populations with a higher seroprevalence. The Illinois experience with premartial testing provides a strong argument against widespread mandatory or publicly supported HIV antibody screening of low prevalence populations.

We would like to thank the Division of Vital Records, the Division of Communications, and the staff of the AIDS Activity Section, IPPS, for their assistance in the collection of data.

**References**

Premarital AIDS Testing: Public Policy Abandoned at the Altar

In detailing the impact over 6 months of the legislatively mandated premarital human immunodeficiency virus (HIV) screening program in Illinois, Turnock and Kelly's article in this issue of The JOURNAL (p. 3415) is an important effort by a public health agency to subject a legislative initiative to a comprehensive impact analysis. The article establishes that eight seropositive individuals were identified out of 70,840 applicants for marriage licenses, at an estimated cost of $2.5 million. After analyzing the economic, social, and public health implications of the program, the article concludes that Illinois' experience with premarital HIV screening shows mandatory or publicly supported HIV antibody screening of low-prevalence populations is not cost-effective and has no positive impact on disease prevention.

See also p. 3415.

This adds firm evidence to the impressions in other localities attempting or considering such programs. In New York City, premarital HIV screening was one of a range of public policy issues that presented themselves early and urgently. Because our surveillance data indicated that the epidemic focused on groups that would not be reliably reached through the marriage license setting—men who have sex with men and intravenous drug users and their sexual partners and children—we rejected mandatory premarital HIV screening as an ineffective use of public resources. The marriage license setting was more appropriate for promoting individual HIV risk assessment with educational materials. Applying limited resources more effectively, we placed educational pamphlets on acquired immunodeficiency syndrome (AIDS) at county clerk offices in all five boroughs.

With other public policy changes, we struck similar balances between protecting the individual and protecting society, and between burgeoning resource demands and limited resources. With little clinical intervention to offer seropositive individuals, we opposed mandatory testing, rejected registration of seropositive individuals, and undertook cautious attempts at contact tracing. These strategies best helped us draw people into the highest-risk subset of our education and prevention system. Always we maintained the principle reflected in Turnock and Kelly's article: the need to base policy decisions on the most current research and knowledge of the epidemic.

A corollary to this principle is another — as the epidemic and our understanding of it evolve, so too must our policies evolve. Today we are fast approaching a major crossroad that will require us to rethink the wisdom and effectiveness of many of our current public policy stands.

Changes in the epidemic since the early days are bringing us to that point. The demographics have shifted; the rates of growth in cases and spread of infection among men who have sex with men have slowed, while the rates of HIV-related morbidity and mortality among intravenous drug users and their female sexual partners and children have had virtually unabated increases. Intravenous cocaine injection has become a major route of HIV transmission, and crack and the hypersexuality associated with it, including sex-for-drugs transactions, have led to increases in genital ulcer disease, HIV transmission, and heterosexual HIV infection.

The panic and paranoia of the epidemic's early days seem to be behind us (though not the era of bitter fights) as the result of several years of public debate and education around AIDS issues, and, in New York, a strong state law that sets forth parameters for testing for HIV infection and mandates confidentiality of HIV-related information and records. Other changes include increasing concern over whether risks to health care workers may be greater than previously thought, and whether our health care system will be able to respond to AIDS pressures.

Perhaps the most significant change has been our broadening awareness that early diagnosis of HIV infection is medically beneficial. More therapies are becoming available for treating and preventing opportunistic infections. More HIV-infected patients benefit from early diagnosis of HIV infection and early access and entry into treatment for earlier forms of HIV illness and even asymptomatic infection.

It is only a matter of time before a reliable and published study demonstrates the effectiveness of treatment for the asymptomatic HIV-infected person, or a means for preventing seroconversion in an exposed person, or reducing infectiousness of the seropositive individual. We will then have entered a new era, that of a public health model of HIV infection and disease control along the lines of classic tuberculosis control practices. Medically confidential counseling and testing will continue, but we will see registration of seropositive children within a public health system, more aggressive contact tracing, and routine counseling and testing in high-prevalence areas at a variety of points, such as hospital admissions, newborns, and possibly clinical providers. This shift toward a disease control public health approach must be accompanied by better availability of needed clinical and social services.

When useful chemoprophylaxis and effective treatment of asymptomatic seropositive individuals become clinical realities, which may come sooner than we think, we will have no choice but to make changes in some of our most basic HIV-related policies. Meanwhile, in the current time of transition, as at every other point in the constantly evolving AIDS epidemic, we will be best served by relying on the willingness to engage in open debate about these policies, the flexibility to make such changes as we deem necessary, and the kind of well-informed data that Turnock and Kelly's article contributes.

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