Partner Notification Program and Possibility of Including it in the HIV Prevention Strategies in Japan

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This article discusses the possibility of implementing partner notification program as a part of HIV prevention strategy in Japan. Relevant factors, like HIV seroprevalence, general population attitudes toward HIV, legislation, resources, barriers, behavioral changes, cost and effectiveness are analyzed in Japanese perspective. Effectiveness of this program is also predicted based on the two informal contact tracing program in Japan. At the same time a review was made on the global perspectives of partner notification program and operational procedures are also outlined. Published literatures were investigated regarding prevalence of new HIV infection among the partners who underwent testing (11.39%), cost per new HIV positive case found (US $810-3,205), and secondary infection rate (11-20%) in Japan. Having considered all relevant factors we recommend that the partner notification program be implemented, initially in a limited area, then all over Japan. Further analysis on cost-benefit of this program remains to be done.

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In 1936, Thomas Parran, the architect of the US anti-venereal disease program, told in the National Conference on Venereal Disease Control "Every case must be located, reported, its sources ascertained and all contacts then informed about the possibility of infection, and, if infected, treated". Only such an effort, he believed, could break the "chain of transmission". In 1937 this system which was called partner notification or contact tracing was instituted by the US Surgeon General to combat the spread of sexually transmitted diseases (STD). The aim was to break the chain of disease transmission by early identification and treatment of exposed people and thereby limiting further spread of diseases. It has played a central role in controlling STD, especially syphilis and gonorrhea. This system has been used not only in the USA but also in other developed and some developing countries.

The success of partner notification in syphilitic, gonococcal and chlamydial infections was due to several factors: short incubation period (i.e., only recent partners needed to be notified); the presence of symptomatic phase of infection; the availability of curative treatment. HIV infection, on the other hand, did not possess most of these factors, making it difficult to introduce partner notification program in controlling HIV infection. However, in 1991, antiviral agent zidovudine was shown to be effective, though not curative, in delaying the progression of PCP (Pneumocystis carinii pneumonia) and AIDS, thereby increasing the overall survival. Both placebo-controlled and observational studies showed that early treatment with zidovudine has prolonged the asymptomatic phase of infection and prophylaxis against PCP has decreased the severity of this disease.

Some Important Definitions
Partner
In case of HIV infection the term partner means someone who had sexual contact, or shared needles with infected person.
Partner Notification
It is the process to make informed the partners of HIV infected persons about their high risk of being or becoming infected. There are three distinct notification process: patient referral, health provider referral and a combination of the two.
Index Case

HIV infected individuals selected to notify their partners in partner notification program.

I. Partner notification program - global perspectives

The related published literatures in English since 1983 were accessed from the MEDLINE and also by manual efforts. Results of partner notification programs in USA, Sweden, UK,

| Place and study period | Method of referral | No. of index patients | No. of partners named | No. of partners identified | No. of partners tested | No. of new HIV case found | Authors view about partner notification program |
|------------------------|--------------------|-----------------------|-----------------------|---------------------------|------------------------|---------------------------|------------------------------------------------|
| USA 1985              | Mixed              | 120                   | 118                   | 59                        | 59                     | 23/59 (39%)               | N.A.                                           |
| 1985-87               | Provider           | 51                    | 135                   | 59                        | 34                     | 7/34 (21%)                | Cost-effective to prevent vertical transmission of HIV. |
| 1986                  | Patient            | 91                    | 485                   | 290                       | 280                    | 49/280 (18%)              | Can produce behavioral change in a rural setting. N.A. |
| 1986-87               | Mixed              | 387                   | N.A.                  | 318                       | 318                    | 44/318 (14%)              | N.A.                                           |
| 1986-87               | Provider           | 282                   | 508                   | 414                       | 296                    | 45/296 (15%)              | N.A.                                           |
| 1987                  | Provider           | 1                     | 90                    | 69                        | 68                     | 12/68 (18%)               | By reaching persons exposed but apparently not yet infected, it can have maximal impact on prevention. Most successful among population who may not be reached by other interventions. Provider referral should be offered to all HIV positives of that state. |
| 1988-90               | Patient            | 308                   | 890                   | 499                       | 279                    | 39/279 (14%)              | N.A.                                           |
| 1988                  | Mixed              | 231                   | 239                   | 188                       | 80                     | 17/280 (21%)              | N.A.                                           |
| Sweden 1985-86        | Provider           | 91                    | 188                   | 188                       | 188                    | 21/188 (21%)              | Valuable and effective tool in the control of HIV infection. |
| 1989                  | Provider           | 463                   | 1456                  | 800                       | 561                    | 118/561 (21%)             | It can be introduced in all HIV positives provided patients motivation and cooperation are attained by professionalism. |
| 1989-90               | Mixed              | 365                   | 564                   | 390                       | 350                    | 53/350 (15%)              | Countries having low prevalence of HIV, it is cost-effective. N.A. |
| N.A. 1990             | Provider           | 455                   | N.A.                  | 601                       | 601                    | 120/601 (20%)             | N.A.                                           |
| UK 1985-92            | Patient            | 114                   | 80                    | 80                        | 79                     | 25/79 (34%)               | It is an effective method to control HIV. |
| Belgium 1987-88       | Provider           | 45                    | N.A.                  | 92                        | 92                     | 36/92 (39%)               | N.A.                                           |
| Norway N.A. 1990      | Provider           | 190                   | 225                   | 172                       | 172                    | 61/172 (38%)              | N.A.                                           |

N.A. - Not Available
Belgium, and Norway were shown in Table 1.

**General Debate**

There are sparkling debates regarding partner notification all over the world. Although everybody agrees that the partners of HIV infected individuals are at high risk of HIV infection, the main debate is centered on the societal impact, efficacy, and cost of the partner notification program.

Those who support the partner notification system argue that it is affordable; quite feasible; operationally simple; cost-effective in the country where general HIV prevalence is low; can be conducted within existing frameworks of STD management; can effectively reach high-risk persons; can accurately target those who need education and testing; and can produce positive behavior change. Those who oppose argue that it is labor-intensive; expensive; difficult in locating partners due to long incubation period of HIV; a large number of partners are unlikely to be located; may drive the disease underground; and there is unclear benefit.

It would be more effective in areas of low HIV prevalence where the number of sex partners is small rather than in areas of high HIV prevalence where the number of sex partners is large and unmanageable for the already overburdened health facilities. Others say that partner notification is not considered as a primary strategy for the management of HIV epidemic due to the lack of definitive treatment for HIV infection and therefore should rather be considered as a part of comprehensive HIV management strategy.

**Implementing Countries**

Up to now USA, Canada, Sweden, Belgium, Norway, UK, the Netherlands and other developing countries such as Botswana, Senegal have implemented partner notification program for HIV infection. The Centers for Disease Control and Prevention recommended partner notification in 1985 and stated in 1987: "Persons who are HIV-antibody positive should be instructed how to notify their partners and to refer them for counseling and testing. If they are unwilling to notify their partners or if it can not be assured that their partners seek counseling, physicians or health department personnel should use confidential procedures to assure that the partners are notified."

**Legislation**

In some countries there is a law to facilitate the activities of partner notification program for STD, including HIV, but with little enforcement. North Carolina’s Communicable Disease Control Law requires all HIV-positive persons to contact their partners, either by themselves or through a counselor employed by the state and violation of which is punishable by a fine, a prison term or both. In Sweden, there is similar law though it is rarely enforced.

**Cost and Effectiveness**

Table 2 presents the costs of the partner notification program in different settings in USA. Factors which influence total cost of the program are as follows: number of efforts (field visits, phone calls) required to locate index patients and their partners, time taken for counseling, number of partners referred by the index patients, distance to the residence of the partners, and length of the program. High cost per HIV case found in the study of Pavia et al., was due to efforts to find out the partners from other states. Cost of the partner notification is one of the important topics for debate. Some studies claimed that it is more expensive than widely targeted AIDS prevention and education efforts and “staggering”, while others say that it is quite feasible and cost-effective.

In the USA, partner notification in some form is the pre-requisite for state and local public health departments to get federal HIV prevention fund. CDC estimated that at least 20 new HIV infection can be averted per 100 HIV infected persons identified through partner notification program. CDC also estimated that partner notification program could have a 20:1 benefit-cost ratio.

There are extra benefits with partner notification program; reduction (86%) of other STDs; increase in the use of condoms (current percentages of condom use are 0% to 80% for HIV antibody-positive men and 0% to 69% for HIV antibody-negative men); increase in self-awareness of high risk of infection;

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| Authors and references | Total No. of index patients | Total cost of program | Cost per partner identified | Cost per partner tested | Cost per new HIV positive case found |
|------------------------|-----------------------------|-----------------------|-----------------------------|-------------------------|------------------------------------|
| Spencer et al. (14)    | 231                         | 19496                 | 104                         | 244                     | 1625                               |
| Wykoff et al. (12)     | 1                           | 6500                  | 103                         | 103                     | 810                                |
| Pavia et al. (13)      | 308                         | 125000                | 155                         | 373                     | 3205                               |
| Rutherford et al. (16) | 51                          | 15420                 | 261                         | 454                     | 2203                               |
determination of demographics; elucidation of behavioral patterns and ethnicity to infectiousness among the persons at high risk for HIV infection 11, 13, 21, 26.

II. Partner notification program - possibility of including it in the HIV prevention strategies in Japan

Why Japan does not have partner notification program?

Japan does not have formal partner notification program, although some informal studies are reported 27, 28). The relatively low prevalence of HIV infection, the misunderstanding that HIV infection occurs only in the hemophiliacs and certain high risk behavior groups, the assumption that it will not create major public health problem in the future, and fear of criticism from the media and public, are thought to be underlying factors of negative attitudes towards this program in Japan. Even in the USA, leaders of gay and civil liberty groups initially opposed to and threatened against this program 1). But now it is believed to be the major element in public health efforts of controlling HIV infection in U.S.A. 11.

Pre-Requisite

The success of partner notification is highly dependent on the voluntary participation of HIV positive individuals and their partners. Driving force for voluntary participation is determined by the cultural, social, political and educational factors as well as the level of public consciousness about AIDS/HIV. Thus it is pre-requisite to thoroughly scrutinize these factors before considering introduction of partner notification program. Other important factors to be analyzed should include HIV seroprevalence, patterns of transmission, KABP (Knowledge, Attitudes, Belief and Practice) of the relevant population about HIV infection, resources, relevant legislation, cultural considerations, social climate, political realities, and existing AIDS prevention and control activities 29).

Analyses of the Relevant Factors for Implementing Partner Notification Program

1) HIV Seroprevalence

The total number of HIV carrier and AIDS patients up to the end of December, 1995 in Japan was reported to be 4,096 and 1,154 respectively 30. Seroprevalence of HIV among the blood donors is .00047 - .00134% 31, 0.5 - 3% 37) among the homosexuals and 2.3 - 4.2% 33,34) among the Thai females engaged in sex business. The knowledge about the seroprevalence among groups of high risk behavior is necessary because it provides idea about the manpower needed for this program. Low prevalence among these groups are in favor of this program in Japan because the burden of managing the HIV carriers and their partners will be tolerable.

2) Attitudes of general population towards HIV

As a whole, people's attitudes towards HIV/AIDS is discriminatory in Japan. It is reported that some HIV carriers have been fired from jobs, rejected by their families, and refused to lodge at accommodation facilities. Even some of them have been rejected, avoided or denied medical treatment 38. These irrational attitudes must be corrected by mass media campaigning and information, education, communication, materials before implementing partner notification program.

3) Relevant Legislation

The law concerning the prevention of AIDS (so-called AIDS prevention law) was instituted in February, 1989. It includes anonymous reporting of every HIV infection (except hemophiliacs), keeping confidentiality and protection of human rights of HIV infected persons 36). To implement partner notification program, however, it would be necessary to establish another law to facilitate this program as well as to protect the HIV carrier from any kind of discrimination and to maintain confidentiality for HIV carriers and their partners.

Table 3. A summary of results of two studies regarding contact tracing for HIV in Japan

| Category | Matsuda et al. 27 | Negishi M. 28 |
|----------|------------------|---------------|
| Study period | 1993 | 1995 |
| Number of index cases | 104 | 35 |
| Sex | M-86, F-18 | M-31, F-4 |
| Age | 34yrs (17-73) | 39yrs.(23-76) |
| Stage of infection | | |
| AIDS | 17 | 5 |
| ARC | 8 | 4 |
| AC | 79 | 26 |
| Transmission category | | |
| Heterosexuals | 34 | 17 |
| Homosexuals/Bisexuals | 44 | 15 |
| IVDU | 3 | 1 |
| By blood products | 19 | 1 |
| By blood transfusion | 3 | 1 |
| Unknown | 1 | 1 |
| Type of index cases according to the behavioral pattern | | |
| Type I: They had no chance to infect others | 17 | 6 |
| Type II: They had chance but did not infect others | 33 | 13 |
| Type III: They were not sure whether they infected others or not | 33 | 11 |
| Type IV: They infected other individuals | 21 | 4 |
4) Cost-Effectiveness of Partner Notification Program

The cost of partner notification program mainly depends on the number of named partners and efforts to locate the partners. Existing public health centers all over Japan are already conducting voluntary counseling and testing for HIV infection. These centers can play major roles in this program because marginal costs would be small. Most of the extra fund would be spent in the efforts to locate the partners. In two informal settings of contact tracing in Japan, secondary infection rate among the contacts was at least 0.20 and 0.11 (in average 0.17 by combining two studies). Based on this average estimate, 67 (392 x 0.17) new HIV carrier could be found in 1992 by partner notification program. The lifetime cost of treating a non-hemophiliac AIDS patient is about $81,300 in Japan (100 yen = 1US $). So, if partner notification program can prevent even a very small number of HIV infections in a specific period of time, it may well prove cost-effective.

5) Barriers of Partner Notification Program

As there are many chances to be discriminated in the society, the HIV carriers and their partners would initially rather like to avoid this kind of program. This should be overcome by counseling. Potential barriers of partner notification program are listed in Table 4.

6) Behavioral Changes

Significant behavioral changes (Table 5) have been reported among the HIV carriers following counseling in Japan.

7) Resources

Ministry of Health and Welfare of Japan spent 10.13 billion yen for the "Stop AIDS Plan 1993" to organize the hospitals which accept AIDS patient, to establish counseling and testing systems, to provide fund for the research, to provide correct knowledge to the general public and to prevent discrimination against HIV carrier and AIDS patients. In this context, the partner notification program which is relatively inexpensive seems to be logistically feasible.

III. Partner notification program - operational procedure

Procedure of Notifying Partners

A team should be formed by specially trained counselors, STD investigator, nurses and one physician supervisor for each specified region. This team will counsel the index patients, locate the partners in case of provider referral, guide the index patients to notify the partners in case of patient referral. Index patients are identified when they return to know the result of their HIV testing. In the first sitting, the counselors will inform them of their test results and provide standard counseling. The health authority can choose any of the three partner notification processes. After obtaining informed consent, the counselors

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**Table 4. Potential barriers for partner notification program**

In other countries (USA, UK etc.) 10,12,17,26
1. Insufficient information was given by the index case to identify their partners.
2. False name and addresses of the partners were given by the index cases.
3. Partners live outside the county or state.
4. Partners declined to participate.
5. Large number of anonymous partners were named.
6. Both the index cases and their partners had concern about confidentiality.

In Japan 27, 28
1. HIV infection occurred in abroad.
2. Too many partners were to notify.
3. Physicians were not trusted.
4. Infected patient did not notify partners.
5. Infected patient did notify their partners but the partners did not show for counseling.
6. Patient unaware of the source.

**Table 5. Changes in sexual behavior among index cases after counseling in Japan** 24

| Changing patterns | Percentages |
|-------------------|-------------|
| 1. No sexual intercourse at all | 43% |
| 2. Condom use | 37% |
| 3. Reducing the number of sexual partners | 57% |
will collect the names of partners, information about how to locate them, and information on the mode of transmission which possibly occurred in the past 2-3 years. The advantages and disadvantages of the referral systems are presented in Table 6.24,38-40. Patient or provider referral should be done by a letter, in which the public health department requests the partner to set a time for meeting without mentioning the reason behind this.

In the patient referral method, index patients are asked to locate their partners and request them to go for counseling, testing or both within a specific time. The counselors will guide the index patients in the various ways to talk to partners about HIV exposure and discuss difficulties in notifying. At the end of specified period of time, the counselors themselves may try with consent from index patients to locate all partners unable to come to the health department.

In the provider referral method, the public health counselor will notify the partners after discussion with them. In the combined method, the HIV infected patients will choose to notify some partners within his ability, and public health counselor will notify the remaining partners as well as all other partners who are unable to appear at the health department. Extensive efforts should be made to locate partners if reasonable amount of identifying information is available. If the partner is living in other prefecture referral letter should be sent to the health department of the prefecture. Partners should be notified in a face-to-face interview and the identity of the infected person should not be revealed by any means.

Then the partners should be referred to the counseling and testing site.

_Procedure of Counseling and Testing_

Counseling and testing persons who are infected or at risk of acquiring HIV infection are important components of prevention strategy.22 The primary goals of the counseling and testing are to help uninfected individuals to initiate and sustain behavioral changes that reduce their risk of becoming infected, and to help infected individuals to avoid infecting others.23 The index patients should not be forced to participate in the partner notification program but must be made aware of his or her important role in a campaign to stop the spread of HIV infection to others.

_Provider Referral_

The public health personnel responsible for counseling fills out forms, one copy for index patient and the others for the partners. Interviews should be conducted at a place of patient’s preference, either patient’s home or public health centers. At the health department, counseling before HIV antibody testing should be performed by a trained counselor for about 30 minutes regarding AIDS/HIV, associated risk factors, purpose of investigation, the nature of confidentiality, encouraging safer-sex behaviors with current and future partners and public health benefits. Then they will be asked to undergo HIV testing with informed consent. Testing should be done by ELISA method and all positive test results should be confirmed by the ELISA method again and finally by Western blot test as recommended.42 All individuals, regardless of blood test results, should be included for posttest counseling. For HIV antibody negative partners, posttest counseling should include meaning of test results, the nature of HIV/AIDS and way of decreasing individual risk of infection. For HIV positive partners, posttest counseling should include explaining the meaning of test results and risk of others caused by HIV positive individuals, as well as eliciting information about sex contacts in the preceding 36 months. The same process should be applied to their partners. Children born within the last 7 years to HIV infected women are considered as potentially exposed and should receive HIV counseling and testing, with the mother’s consent.

Patient Referral

When patient referral is used, all patients positive for HIV should be given epidemiological information about their infection, including relevant detail of disease transmission, asymptomatic carriage, critical period of infectiousness, the consequences of not informing partners, and safer-sex practices.38 Once the partners have come to contact the public health department, the counseling procedure employed will be the same as that described for the provider referral system.

Testing System

Partners can choose anonymous (patients are identified by numbers) or confidential (patients are identified by name) testing system. Availability of anonymous testing system is likely to increase the overall demand for testing in significant amount. It is reported in the USA that the demand for testing increased by 50% and that the number of seropositive persons doubled within three and half months as after anonymous testing system became available.41

Confidentiality and Antidiscrimination

Strict confidentiality of patient information regarding HIV infection is mandatory to gain public support and to increase number of persons being counseled and tested for HIV infection. National law should be reinforced, if necessary, to maintain strict confidentiality. Only narrowly designated personnel within public health agencies should have access to patient names and their partners.38 Assurance against discrimination in social life is also necessary to encourage people to participate in the counseling and testing. There is no known medical reason to avoid an infected person in the social situations like employment, housing, school admission, since the cumulative evidence is strong in indicating that HIV infection does not spread through casual contact.32
Data Collection

Data obtained from partner notification program can be collected by the format prepared by A. Satin. Two sets of data need to be collected; one for the index patient; and the another for each named partner. The data sheet for the patient should include name, age, sex, occupation, marital status, address, telephone number, patient ID, date of HIV testing, date of interview for the partner notification, past history, information about sexual orientation and practices, and information regarding numbers and kinds of partners. The data sheet for the partner should include name, age, sex, marital status, address, occupation, telephone number, date of interview, ID number, relationship with the patient, date of last sexual intercourse or needle sharing with the HIV carrier, and information whether he or she is already traced or not.

Monitoring and Evaluation

There should be persistent monitoring and evaluation procedures to assess the effectiveness of the partner notification system. The suggested items for monitoring and evaluation include the number of index patients; number of partners identified, notified, counseled, tested and the seroprevalence among them; satisfaction, compliance and acceptability of the index patients and their partners; assessment of the counseling services, confidentiality, legal protections; and cost of the program.

CONCLUSION

The partner notification program should be initiated after attaining optimum level of consciousness on HIV/AIDS among the public. Proper public awareness on HIV/AIDS has to be achieved in a relatively short period of time for the partner notification program to become an effective part of HIV prevention strategies. In Japan only four HIV carriers have agreed to appear in mass media to raise public awareness on HIV/AIDS in the current discriminatory environment. Massive public awareness and legislative measures are the key elements to change this situation. This should be followed by the KABP survey of different groups of people in the society to assess the degree of improvement of the discriminatory environment. As there is no vaccine or a definitive treatment for HIV infection and even there is no hope within near future, attention must be given towards an only available measure, i.e., alteration of human behaviors responsible for HIV transmission. Partner notification program can act as an important behavioral modification tool for the individuals involved to disrupt the chain of HIV transmission. It is certain that there will be protest from the human rights organizations, mass media, and gay leaders at an early stage following implementation of this program as seen in other countries. But its benefits outweigh its disadvantages and it is ethically acceptable and epidemiologically necessary. Thus we believe that partner notification program, if confidentialities maintained, should become an important strategy to prevent HIV infection in Japan.

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