Evaluation of the Quebec Public Information Campaign and Human Immunodeficiency Virus (HIV) Antibody Screening Program Directed to Persons Transfused Between 1978 and 1985

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Since November 1985, all donated blood in Canada has been screened for HIV antibodies, and so the risk of contracting HIV infection from a current blood transfusion is very low.1 However, cases of HIV infection through unscreened blood transfusion between 1978 and 1985 have occurred, although their exact number is not known. Different measures have been used to reach recipients of blood potentially infected with HIV, such as various public and physician education activities, and Canadian Red Cross Society look-back and trace-back programs beginning with a known infected recipient or donor.2,3 Despite these efforts, there are still persons infected with HIV through blood transfusion who are unaware of their infection and may be spreading HIV to offspring and sexual partners.4

In the province of Quebec, it is estimated that 400,000 persons received a blood transfusion between 1978 and 1985, of whom approximately 160,000 were still living by 1993.3 Using a mathematical model, Remis and Palmer estimated that between 150 and 200 Quebecers were infected by HIV through transfusion before 1985.6 From a comparison of the database from the Programme de surveillance du sida du Québec7 and that from the Red Cross Society, and according to the McDonald report,8 it is estimated that as of 1993 between 60 and 70 HIV-infected blood recipients had been informed of their serologic status. According to these estimates, 80 to 140 Quebec HIV-positive blood recipients were unaware of their infection at that time.

In this context and following the recommendation of an expert committee,1 the Ministère de la Santé et des Services sociaux du Québec initiated a public information campaign and an HIV antibody screening program in September 1993, directed to persons given transfusion between 1978 and 1985, called "Opération-Transfusion". The objectives of the present study were to estimate the number of Quebec patients who received transfusion between 1978 and 1985 who were tested for HIV infection as a result of the program directed to them, to estimate the number of HIV-seropositive subjects thus identified, and to describe these persons.

METHODS

Description of the program

All physicians in the province of Quebec were provided with a special pre-
RESULTS

Characteristics of participants

A total of 6,348 special prescription forms for HIV testing were received in the context of the Opération-Transfusion. The sex, age and area of residence of participants are shown in Table I. Women were younger than men: 43.4 years (SD: 15.4) vs 47.6 years (SD: 20.6), p < 0.001. If subjects for whom there were missing data were excluded, women represented 66% of the participants; nearly 50% of patients tested were living in the region of Montreal.

The main reasons reported as indications for transfusions were cardiovascular surgery (14.7%) and obstetrical indications, including ectopic pregnancy (15.2%) (Table I). When subjects with unknown year of transfusion were excluded, the majority (53.1%) of HIV tests were prescribed for persons given transfusion during years 1983, 1984 and 1985 when the risk of exposure to HIV through infected blood was highest (Table I).

Prevalence of HIV infection

Of the 6,348 blood samples corresponding to the forms that were received, 33 (0.5%) were sent to the LSPQ for confirmatory testing because of two positive EIA results. Seven of these 33 samples yielded a positive result and one an undetermined result by RIPA. Excluding the latter, the prevalence of HIV infection was 0.1% (95% CI: 0.04% - 0.2%). The prevalence was higher among men than women, but the difference was not statistically significant: 0.3% (5/1,934) vs 0.06% (2/3,533), p = 0.1. The median age of seropositive subjects was 43 years (range: 26 to 65), and five of them were living in the Montreal region. Six of the 7 seropositive subjects received blood between 1979 and 1985. The year of transfusion and the name of physician were unknown for the other. The personal physicians of six seropositive subjects were contacted, and, according to the medical history, transfusion was the sole risk factor for three seropositive subjects whereas other risk factors, such as multiple sexual partners, male homosexual behaviour or intravenous drug use, were reported by three others.

Estimated increase in the number of HIV tests

A total of 94,073 HIV tests were reported to the Programme québécois de diagnostic de l’infection au VIH during the study period. This number represented an increase of 24% (18,222/75,851) over the number of tests reported during the corresponding period one year before (Figure 1). However, an increase in the number of tests of 7.5% (2,866/38,043) occurred during the first 15 weeks of 1993 (from January 1 to April 15) as compared with the corresponding period during 1992. After adjustment for this rise, the increase has been estimated at 12,061 tests, 16.5% of 73,211. More than 80% of these additional tests were reported by six physicians.
tional HIV tests were carried out during the first seven weeks after the announce-
ment of the program. Nevertheless, the increase has not been accompanied by an
increase in the proportion of positive results.

**DISCUSSION**

The results related to the number of
HIV tests performed in the context of the
Quebec Opération-Transfusion and the
number of HIV-seropositive subjects thus
identified were consistent with those
observed in similar programs elsewhere in
Canada, but less than expected.

**Quality of data**

One of the important limits of this study
was the reliability of the source of data. It
is difficult to know with certainty whether
physicians used the special form for all elig-
able patients and only for them. Only
6,348 special prescription forms were used
during the study period, whereas an
increase of 12,061 HIV tests has been esti-
imated. This difference may indicate that
some physicians prescribed HIV tests for
eligible patients and did not use the special
form. It is also possible that the increase
may be related, at least in part, to the
increase in testing among others than the
targeted group. Likewise some special pre-
scription forms may have been used for
ineligible subjects. In addition, duplicate
testing may be possible for some patients.
Unfortunately, it is impossible to estimate
this duplication rate. Finally, the amount
of missing data constitutes another impor-
tant limit of this study. Nevertheless, the
characteristics of participants seem com-
patible with those of survivors of transfu-
sion: the majority were women, and 52%
received their transfusion for a surgical or
an obstetric indication.

**Estimated increase in the number of tests**

The results showed an estimated increase
of 6,000 HIV tests during the first six
weeks and 12,000 after 30 weeks. Even
though these results are less than expected,
they seem consistent with those observed in
Ontario. With a larger population and a
different method of adjustment, Ontario
reported an estimated increase of 12,500
HIV tests during the first four months
after the beginning of the provincial
screening program (C. Major, HIV
Laboratory, Central Public Health
Laboratory, Ontario Ministry of Health: personal communication). Unfortunately,
no information from other Canadian
provinces with similar programs—New
Brunswick, British Columbia and
Alberta—has been reported.

Some events may have had an effect on
the number of HIV tests performed during
the study period. First, in April 1993 a
project initiated by the Hospital for Sick
Children in Toronto to notify the parents
of blood recipients received considerable
media attention throughout Canada.11
During the four weeks after the announce-
ment of this project, Ontario noted a daily
increase of 60% (400/650) in HIV tests. In
Quebec, the LSPQ recorded an increase of
30% in the number of HIV tests
(2,906/10,586) over a five-week period as
compared with the corresponding period
in 1992. As a rise of 10% was already
noted five weeks before and after this peri-
od, it is possible that some Quebec patients
given transfusion had already been tested
when the program was launched.

On the other hand, it seems that neither
the Ontario screening program announced
in July 1993 directed to persons who had
received blood, nor the media attention
surrounding the Montreal session of the
federal Commission of Inquiry on the
Blood System in Canada in January 1994,
had any perceptible effect on the number
of HIV tests performed in Quebec. In con-
trast, the Montreal Children’s Hospital
program13 to notify young patients may
explain the increase in the number of these
patients tested after January 1994. Indeed,
31% of persons tested after January 31,
1994, were aged less than 20 years vs 9%
of those tested before this date, p < 0.001.
According to the results of the Montreal
Children program, it seems that up to
36% of the persons did not know that
transfusion had been given.13 This may
explain in part why the number of tests
performed during the study period was
lower than expected.

**Number of seropositive patients identi-
fied**

The Quebec Opération-Transfusion
allowed identification of seven seropositive
subjects who were unaware of their infec-
tion. This result is similar to that obtained
in Ontario, where six HIV-seropositive
persons were identified out of an estimated
12,500 persons tested as a result of the
provincial program (C. Major, personal
communication). This is far lower than the
figure of 80 to 140 HIV-seropositive per-
sons unaware of their infection that was
estimated using a back calculation
method,6 but is within the limits of the
more recent projection estimated at between 0 and 50.\footnote{13}
Indeed, it seems that the former figure could have been an overestimate. First, the HIV seroprevalence rate (6 per 10,000 blood donors) used in the mathematical model was that observed among Queen's blood donors during the first three months after the introduction of screening of all donated blood. During the same period, this rate was 2 per 10,000 among Canadian blood donors.\footnote{14} It appears that the difference was related in part to the fact that testing was not available in clinical settings in the province of Quebec at that time, and in spite of efforts of blood centres to exclude them, many persons with risk factors for HIV infection donated blood so that they would learn their serostatus. The more recent estimation took this factor into account.\footnote{15} Second, the survival rate of 40% after one year among all persons who had been given blood could also overestimate the number of transfusion-associated HIV-positive subjects who were still living and unaware of their infection. Indeed, the risk of HIV infection is higher among persons who received many blood units than among those who received few blood units. As the mortality rate is probably also higher among this group,\footnote{10} it is likely that some HIV-positive transfusion recipients were dead without having known their serostatus. Thus, these persons have to be withdrawn from the pool of infected persons still living and unaware of their infection.

The design of this study did not allow an assessment of the cost-effectiveness of the program. If we assume that the main costs of the program are attributable to the public campaign (estimated at between $75,000 and $150,000) and to the increase in the number of HIV tests (estimated at between $60,000 and $96,000), the cost by HIV-seropositive subject identified as a result of the program would be between approximately $20,000 and $35,000. Unfortunately, no data on the costs of other programs are available for comparison; neither do we know whether secondary cases were prevented because these seropositive subjects were henceforth aware of their status. Other important objectives, such as determining the proportion of persons given a transfusion who received information on the risk of transmission of HIV infection by contaminated blood, were not assessed. However, according to the results of a telephone survey among a representative sample of the Quebec population conducted during the sixth week after the beginning of the program, 80% (805 of 1000 participants) of interviewed persons reported having heard about the Quebec HIV screening program, and 56% of those who had received blood between 1978 and 1985 (18/32) had seen their family physician.\footnote{16} Finally the present analysis did not include the blood recipients who visited their physician after the end of the study period and who received relevant information and testing.

In conclusion, because lack of awareness of transfusion seems an important limitation to seeking testing, multiple strategies, including direct notification of transfusion recipients and particularly pediatric patients, are probably necessary to identify HIV-infected persons who received blood between 1978 and 1985 and are still unaware of their infection.

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**REFERENCES**


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