

## A Canadian Retrospective on AIDS: Implications for Future Policy, Economics, Behaviour Modification, and Research†

THIS RETROSPECTIVE ON AIDS in Canada focuses on the implications that previous action (or inaction) may have for future policy, economics, behaviour modification, and research. It is indeed an honour to be able to reflect on the emerging epidemic that I have been involved with since its beginnings in Canada in 1982. It is a particular honour to be presenting a perspective on AIDS coming from "Western Canada," here in "Central Canada." The basis for this comment will become clear through this presentation.

### IN RETROSPECT

AIDS has been a particularly difficult area within which to find oneself immersed, especially for those who had become involved in this problem when the epidemic first was recognized in Canada, in 1982(1). It has been all-consuming, not only because of the unknowns early on in the epidemic but perhaps more because of our inability to convince governments (and the public) to commit resources to assist in dealing effectively with the emerging and burgeoning problem of AIDS. To put this in perspective, I quote Dr. William

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I should like to acknowledge the help of Dr. Tariq Bhatti and Ms. Ellie Robson of the Edmonton Board of Health respectively in the areas of health promotion and health education. The Laboratory Centre for Disease Control in Ottawa together with its National AIDS Centre have provided statistics. The Centers for Disease Control in Atlanta have been unstinting in their provision of information and colour slides. The homosexual community is acknowledged for its collective responsible actions and its participation in all facets of the AIDS crisis, well in advance of other groups in society. Finally, I acknowledge the many colleagues with whom I have brainstormed on the thorny issues around the emerging epidemic since 1982.

Haseltine of the Harvard School of Medicine on 14, November, 1986, whose sentiments I echo:

Over the last three or four years, we have seen every one of our worst predictions confirmed. We have, many of us, felt like Cassandra who could see the future, could speak the future, could be listened to, but would not be believed. I think from now on, the facts will speak for themselves. We are seeing the mounting number of AIDS cases in this country and around the world that we anticipated two or three years ago. We are seeing the devastating health effects and the impact on our health care delivery system. Those facts will speak for themselves.

It is only now, over the past few weeks, that the Reagan administration in the United States has acknowledged the subject and seriousness of AIDS, with Mr. Reagan himself mentioning the problem publicly (2-5). In Canada the response at the government level had been marginally more decisive than in the United States; but still, as in the United States (6-10), it remains woefully inadequate. In making this point it is important to distinguish the general excellence of the response of the United States' Public Health Service, its National Institutes of Health, its Centers for Disease Control, the Surgeon General of the United States, and other health professionals there, whose recommendations have so commonly fallen on deaf political ears. Indeed, political interference often has served to divert extremely limited resources into wasteful political battles. For example, the LaRouche Proposition, No. 64, in November 1986, proposed mandatory testing, quarantine, and labelling of infected people (11). We may be thankful that it failed, though at the cost of enormous financial and human resources.

To date the response to AIDS in most regions of the world has been "reactive" rather than planned, co-ordinated, and "pro-active." Reactively, resources mainly have been channelled into the "medical model," to the relative exclusion of the "social sciences." Primary prevention in AIDS will not be solved by the prescriptive, physical sciences approach alone.

As a consequence of continuing neglect—or at best, for a belated piecemeal approach to the problem, I suggest that an escalating price will be paid. Not only will an economic toll be exacted (12-15), but so will a toll in freedom and in social and political order (16-19). The sooner medical and social science recommendations are melded with political policy, the better (20).

Federal, provincial, municipal, and voluntary efforts against AIDS are only beginning to emerge in Canada's health care, education, and social service systems. Across the country, people only now are beginning to recognize the impact that AIDS will have on most segments of our society. In Alberta, for example, the provincial government has just started to *react* to the threat of AIDS. However, much more is needed: *new monies* must be found (6, 7); co-ordinated and planned pro-active medical and social science approaches must be reinforced by political leadership in a nationally unified policy framework.

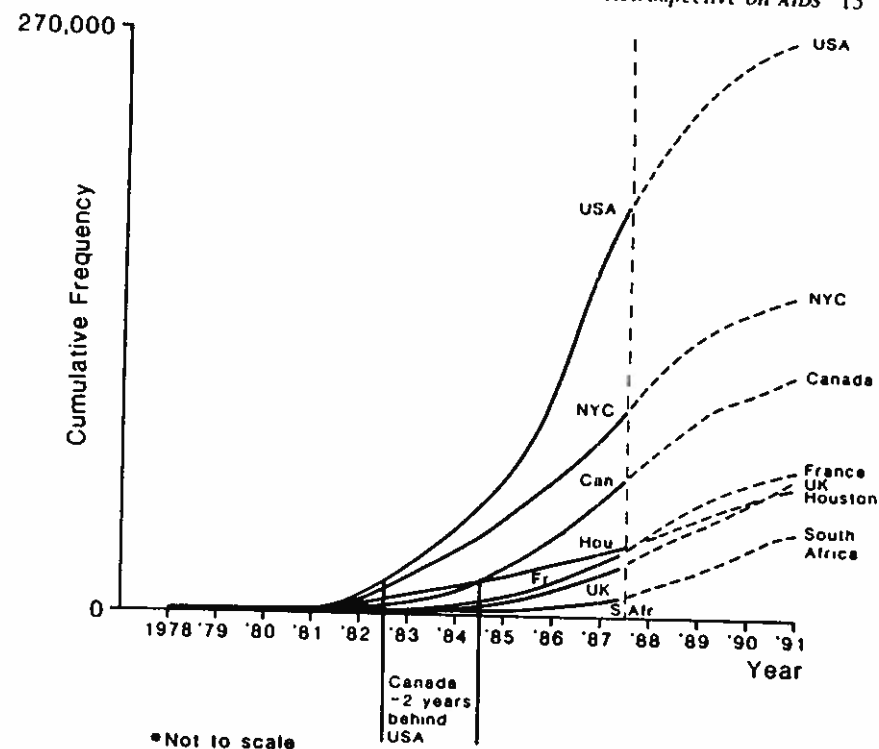


FIGURE 1. Hypothetical AIDS epidemic worldwide: selected regions.

The average direct cost for maintaining a patient with AIDS has been estimated at about \$40,000 in Canada (21), much less than the approximately \$100,000 (U.S.) south of the border (12-15, 22, 23). Dollars spent *now* on prevention and education are essential for minimizing the future projected economic impact of this epidemic on our health care system (6, 7). Legal, ethical, social, and political repercussions also may be minimized through preventive efforts started today (2, 6, 7, 9, 16, 18, 23-29). Each passing day sees the expansion of the human reservoir of virus (23, 29, 30), reducing steadily the potential effectiveness of any possible future interventions. Albeit belatedly, start we must, for it is not possible to recover those opportunities already lost through inaction (31).

In the AIDS epidemic, where does Canada stand? Figure 1 displays hypothetically the AIDS epidemic world-wide, based on the emergence of the epidemic in selected centres and countries. Canada ranks second only to the United States in terms of the cumulative number of affected individuals in the population among all developed countries. The fanning out effect shown in Figure 1 is typical of a propagated epidemic having time-delayed geographical distinct epicentres.

TABLE I  
*AIDS in Canada and Alberta: cumulative frequencies by date of diagnosis*

Date of diagnosis <sup>1</sup>	Cumulative frequencies <sup>2</sup>		
	Canada <sup>3</sup>	Alberta <sup>4</sup>	Edmonton <sup>5</sup>
1979	1	-	-
1980	4	-	-
1981	10	-	-
1982	32	-	-
1983 Jan-June	61	1	-
July-Dec	85	3	-
1984 Jan-June	146	7	-
July-Dec	226	13	2
1985 Jan-June	359	19	3
July-Dec	540	30	5
1986 Jan-June	745	37	7
July-Dec	985	49	13
1987 Jan-June	1,194	70	23

1 Annually from 1979 through 1983; bi-annually from 1983.

2 As on 20 July, 1987, and subject to change as new cases are reported to the Alberta Department of Community and Occupational Health and to the Laboratory Centre for Disease Control, Ottawa.

3 Canada's cumulative rate = 47.2/million.

4 Alberta's cumulative rate = 29.4/million.

5 Edmonton's cumulative rate = 35.4/million.

Table I displays the cumulative frequency of reported AIDS cases in Canada by period of diagnosis. The geometric progression in the data is clear. Today in Canada there are on average one to two new cases of AIDS reported each day, in comparison with the United States, which is reporting an average of approximately forty-six cases daily. Given that Canada contains a population that is about one-tenth that of the United States, and that Canada lies approximately two years behind the United States in terms of its phase on the epidemic curve, it is clear that Canada is following closely the course of the epidemic in the United States. The approximately two-year lag can be demonstrated by another comparison: at the end of May 1987 the attack rate per one million population in the United States was approximately 156 per million population, the Canadian rate approximately 41 per million population. The United States experienced this Canadian rate in April 1985, two years and two months earlier.

In 1983 in Toronto certain social and logistical questions concerning AIDS were being asked: 1) How do governments respond to a health problem/a

crisis/an epidemic? 2) Can the scientific community be mobilized? 3) Are medical health personnel adhering to Hippocratic oath principles? 4) What is the impact of privacy, ethics, and confidentiality on research? 5) What influences do the media and peer review have on the ability to conduct AIDS research?

Decisive action on the problem of AIDS has been seen to lack political will in Canada, perhaps paralleling the pattern in the United States. Early in the epidemic the scientific community could not be mobilized. Physicians tended to guard jealously their patient populations in order to protect their own potential to publish in pursuit of academic kudos. We have seen a disregard for the Hippocratic oath from health professionals over the duration of the AIDS epidemic to date (32), out of fear of homosexuality and fear of the virus. Questions of privacy, ethics, and confidentiality have constrained our ability to do research, particularly in terms of age limitations in recruiting subjects to epidemiological investigations, and in the lack of legislative safeguards to protect the rights of potential subjects; personal details that could be incriminating are needed for the successful conduct of epidemiologic research for understanding modes of transmission in particular. The need for public health education has sometimes had an adverse impact on the peer-review process in grant applications and in seeking funding support, as conflicts of interest emerged.

There have been soothsayers and doomsayers in the epidemic of AIDS. For example, in August 1983, from New York City came a question of whether the epidemic might be levelling off. Such hypotheses, made by people in the public health sector (8), perhaps because of a lack of resources to cope with the threat, could either have been expressing wishful thinking or, indeed, may have been manifesting conflict of interest. Such views, I suggest, have served to confuse messages to both government and the public and thereby to interfere with the need—early in the epidemic—to ensure adequate funding support for early interventions (31).

In March 1985 the United States had reported an accumulated total of almost 9,000 cases of AIDS, whereas today, just over two years later, there have been over 36,000 cases. This escalation underscores that the epidemic is of a slow virus nature, with a long incubation period that could exceed fourteen years and averages perhaps two to seven years (29). Each case of AIDS represents only an end-stage manifestation resulting from infection with the AIDS virus. Each case also represents a person in society who has become ill out of an ever-burgeoning reservoir of infected people. By March 1985 Canada had reported 189 cases of AIDS, whereas two years later Canada has had in excess of 1,034 cases of AIDS. In March 1985 150 new cases of AIDS were being reported each week in the United States, while today there are on average 325 new cases per week. By comparison, in March 1985 there were two new cases of AIDS being reported every three days in Canada; now, as mentioned earlier, there are reports of one to two new cases of AIDS every day.

Today in Canada the doubling time for the accumulated number of AIDS cases is twelve to fourteen months; in Alberta the equivalent period is every sixteen to eighteen months. Within countries, regional disparities must be recognized in developing national strategies.

#### A STATISTICAL REVIEW

The first Canadian case of AIDS was reported in a homosexual man from Windsor, Ontario (1). Since then the first Canadian case has been diagnosed retroactively to 1979. Since 1982 it has been possible to follow the epidemic's course (33). There had been a total of 1,034 cases of AIDS through 25 May 1987; as in the United States, approximately 50 per cent of these people have died.

British Columbia has the highest cumulative AIDS attack rate in Canada of 75 per million population, with a total of 226 cases reported (through 25 May, 1987). Quebec is second with 45.3 per million population affected and a total of 298 cases; Ontario is third with 41.5 per million population affected and a total of 399 cases; Alberta is fourth with an attack rate of 23.8 per million population and a total of 56 cases; Nova Scotia is fifth with 18.2 per million population affected and a total of 16 cases; Manitoba is sixth with an attack rate of 15.9 per million population and a total of 17 cases; Saskatchewan is seventh with 12.7 per million population affected and a total of 15 cases; New Brunswick is eighth with an attack rate of 8.3 per million population and a total of 6 cases; and Newfoundland is ninth with an attack rate of 1.7 per million population based on only 1 reported case. Neither in Prince Edward Island nor in the Yukon or Northwest Territories had any case of AIDS been reported through 25 May, 1987.

For comparative purposes, consider three dates: 22 November, 1984; 21 August, 1985; and 25 May 1987. Up to each of these dates Ontario had reported respectively an accumulated total of 56, 120, and 399 cases of AIDS; Quebec had reported 53, 84, and 298 cases; British Columbia had reported 28, 54, and 226; Alberta 8, 10, and 56; Nova Scotia 3, 6, and 16; Saskatchewan 1, 1, and 15; Manitoba 1, 1, and 17; and Newfoundland 1, 1, and 1, for Canadian totals of 151, 277, and 1,034 cases respectively.

Much akin to experience in the United States, approximately 90 per cent of all cases of AIDS in Canada have occurred in people under the age of 50 years, with the modal age category being the fourth decade of life (that is, 30 to 39 years of age).

Seventy-three per cent of AIDS cases have been born in Canada; 7.6 per cent were born in Haiti; 14 per cent were born in other countries; and in 5 per cent the country of birth could not be established.

Unlike the United States, Canada has 82.1 per cent of its cases falling into the homosexual/bisexual male category. Very different from experience in the United States and in Italy, Scotland, Portugal, and other countries is that in Canada 0.4 of 1 per cent of cases (that is, 4 individuals) have occurred among intravenous drug abusers. This distinction has been attributed to the availability

in Canada, unlike the United States, of sterile needles over the counter, without prescription. It should be noted that 28 of 850 homosexual / bisexual men also have reported the use of intravenous drugs in Canada. In Canada, 4 per cent of all cases have occurred among recipients of blood or blood products. Furthermore, 2.6 per cent (26 people) of the afflicted were heterosexual partners of high-risk individuals; 6.5 per cent (65 people) are from a region of the world where the disease is endemic, and for 2.7 per cent (28 people) among the adult groups there is inadequate information for categorization. There have been 19 paediatric cases of AIDS in Canada; 12 of these have been children aged 1 to 14 years; 7, infants under 12 months of age.

#### EARLY RESPONSES TO AIDS IN CANADA

Time being limited, the following review is necessarily incomplete. One source (34) has been helpful in outlining the Canadian response to AIDS and another in assessing specifically the research response to AIDS (35).

The first major event by way of a co-ordinated activity in Canada was the formation by a Vancouver group of the Vancouver Lymphadenopathy-AIDS Study, which succeeded in inducting 726 homosexual men from six private practices in the Vancouver area. That study began its prospective induction and follow-up of these individuals in November of 1982. Little or none of such activity had been going on in other parts of Canada at that time.

As Dr. Davey has indicated, the Canadian Red Cross Society Blood Transfusion Service (BTS) had first become involved in the study of AIDS in July of 1982. By 13 October, 1982, the BTS had been in communication with the Laboratory Centre for Disease Control in Ottawa over the problem. By 2 December, 1982, personnel from the BTS, the Haemophilia Society, the Laboratory Centre for Disease Control, the National Health Research and Development Program, the Ontario Ministry of Health, the University of Toronto, and the Ontario Cancer Treatment and Research Foundation (the author) had formed an ad hoc AIDS group to discuss funding for AIDS research (36).

By May 1983 the then minister of Health, the Honourable Monique Bégin, had authorized the establishment of a National Task Force on AIDS through the Laboratory Centre for Disease Control, Ottawa. In the summer of 1983 the Medical Research Council funded Dr. Phil Gold's proposed national haemophilia study out of Montreal. By the fall of 1983 the Ontario Provincial Advisory Committee on AIDS had been established, and by September of 1983 the National Task Force on AIDS had been transformed into a National Advisory Committee on AIDS. This committee comprised 16 positions, filled exclusively with physician-trained experts, except for one Ph.D.-trained epidemiologist (the author). By 1984 two community-based groups had established themselves, one in Toronto (the AIDS Committee of Toronto), and one in Vancouver (AIDS Vancouver).

For the 1983 / 1984 period of operation of the National Advisory Committee

on AIDS, the Treasury Branch of the federal government had allocated \$1.49 million over four years, which expenditures had included two National Advisory Committee meetings in Ottawa, funding to the reference laboratory of the Laboratory Centre for Disease Control in Ottawa, a *Canada Diseases Weekly Report* special supplement to the *Medical Post*, and a pamphlet for the general public on the subject of AIDS. Selected research grants were made available to groups in Montreal, cell-sorter rentals were paid for a number of laboratories, and some conference support was provided.

The National Advisory Committee on AIDS has subsequently produced, through the *Canada Diseases Weekly Report* as well as through special supplements in the *Medical Post* (once a year), information directed at health care professionals.

#### MORE RECENT CANADIAN REACTION

On 1 May, 1986, the minister of National Health and Welfare Canada announced a five-year, \$39 million plan for AIDS in Canada. This plan was recommended as the result of a parliamentary standing committee under the chairmanship of Dr. Bruce Halliday, M.P. for Oxford, Ontario (37). It is important to recognize that witnesses who were invited to provide evidence to the parliamentary standing committee came exclusively from the Montreal, Toronto, and Ottawa area, with only a single witness (one lay-group representative) from Vancouver. In my opinion this decision represented a tragic error of omission or commission. For, to this day, the federal perception of AIDS, in terms of funding allocations, is that it is a problem generally specific to Montreal, Ottawa, Toronto, and Vancouver.

I stated in my introduction that it is an honour to be here from Edmonton, presenting information on the subject of AIDS. Notwithstanding the fact that I have been in Edmonton for only two years after moving from Toronto, I am pleased to have an opportunity to register protest at the neglect that such a narrow-sighted policy accords low-prevalence regions which could have provided, in particular, relatively fertile opportunities for primary prevention interventions/demonstration programs, as well as basic science (virologic) research.

The terms of reference for the National Advisory Committee on AIDS (NAC-AIDS) included the mandate "to review the status of AIDS in Canada and in other countries and to make recommendations to the Minister of Health and other appropriate agencies which will lead to implementation of medical care, research and other strategies with regards to the diagnoses, treatment, control and prevention of AIDS in Canada." NAC-AIDS had established five subcommittees: 1) Epidemiology and public health; 2) Communications; 3) Laboratory; 4) Clinical; and 5) Research. Under the new five-year plan, the Research Subcommittee of NAC-AIDS was designated the task of participating in the research review process. Appeals and recommendations for the inclusion of

community group representatives on the national committee were rejected on the grounds that NAC-AIDS wished to remain a technically specialized group. Besides, funding was inadequate to expand the Committee.

The surveillance of AIDS across Canada is encouraged through the NAC-AIDS by way of recommendations to the provinces. As a result, AIDS by law is reportable in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, New Brunswick, Nova Scotia, and Prince Edward Island. In addition, in Manitoba, Ontario, and Nova Scotia, sero-positivity for human immunodeficiency virus antibody also is reportable. AIDS is not reportable in Newfoundland, the Yukon, or the Northwest Territories. In Quebec, a special committee on AIDS reviews all cases and submits reports to Ottawa.

#### IMPACT ON RESEARCH AND PEER REVIEW

Through June of 1986, AIDS research had been supported by the National Health Research and Development Program, the Medical Research Council, Health and Welfare Canada, and / or provincial ministries of health / agencies (34, 35). Seven studies were funded in the province of Quebec, three in Ontario, and three in British Columbia. Elsewhere, the Red Cross Society BTS supports research regarding the blood supply. More recently, in Alberta, the Alberta Heritage Foundation for Medical Research provided a technology transfer grant to a company involved in the production of thymidine, an ingredient in the new drug called AZT (or Retrovir).

Two major omissions were brought to the attention of the Federal Minister of Health arising from the parliamentary standing committee report on AIDS in Canada. First, the special interests and needs of low HIV-prevalence regions in Canada had not been included for consideration in the report. As a result, opportunities for early primary prevention and research were lost to these regions. Second, health education/promotion expertise was lacking in the development of the document outlining the five-year plan for AIDS in Canada. As a result, the need for education and health promotion was inadequately addressed in the report and hence only tokenly budgeted, as is seen in the slow and ineffective initiation of education programs across the country. In short, a lack of both regional and expert representation has allowed the implementation of a policy framework that, in practice, precludes 1) low prevalence regions around Canada, and 2) an effective national public education program.

NAC-AIDS remains a primary channel for all AIDS research grants, a body that is primarily oriented to the medical model. The implications are negative for primary prevention. Education-oriented proposals, for example, would profit more from the reviews of experts in the area of education evaluation. Those criteria that apply to the review of controlled scientific experimentation are not necessarily appropriate in the evaluation of educational programs. This situation is to be regretted especially when it is realized that the only antidote against AIDS is education (primary prevention); high-technology-dependent

solutions, such as a vaccine or a cure, should not be depended upon for the control of AIDS (6, 7, 23, 24, 29, 31).

#### HIERARCHICAL RESPONSES TO AIDS

There have been various AIDS activities generated at all levels of Canadian society: the federal government has been involved through the Laboratory Centre for Disease Control, the National AIDS Centre, the Canadian Public Health Association (since May 1986), Health and Welfare Canada, the National Health Research and Development Program, and the Medical Research Council. However, no apparent involvement exists within the Social Sciences and Humanities Research Council of Canada. At the provincial level, ministries of health, education, social services, medical care, and hospitals have had to react to the problem of AIDS. At the health district level, boards of health have become involved in the problem. At the community level, AIDS support groups have formed. A unique Interagency Council on AIDS formed in Edmonton. The media have been instrumental in the provision of public service announcements and in informing the public. Other organizations, particularly hospitals, have been occupied with patient care and the development of pastoral care programs.

#### CREATION OF A NATIONAL AIDS CENTRE

The National AIDS Centre in Ottawa is a unit formed within the Laboratory Centre for Disease Control in May, 1986. It arose as a recommendation from the report "AIDS in Canada" (37). The National AIDS Centre was designed to co-ordinate and facilitate AIDS related activities nationally, to perform a policy support role, and to provide recommendations on funding priorities.

#### RESEARCH FUNDING ALLOCATIONS

A total of three million federal dollars was made available for AIDS research in the 1986-87 fiscal period. The availability of funding for AIDS research was brought to the attention of researchers across the country initially by soliciting letters of intent. Few letters of intent were anticipated and yet, in fact, approximately 150 were submitted. After review, only 60 were invited to submit proposals and, of course, even fewer ultimately have been funded. Almost all of those known to have been supported were from Quebec and Ontario, with only one or two from the Vancouver area. Only one proposal known to have been supported was invited from Winnipeg and then only after protests were lodged with the federal minister of Health (whose riding is in Manitoba, southeast of Winnipeg). To the best of my knowledge, the prairies and eastern Canadian regions secured none of this research funding. I submit that this anomalous distribution may have arisen not because of the poor quality

of letters of intent or poor proposals from these regions but rather because the terms of reference as provided through the report "AIDS in Canada" for the consideration of research proposals could not accommodate the needs of low-prevalence prairie and eastern regions with an inadequate research budget.

Aside from the above process, the report "AIDS in Canada" ensured that grants would be provided to study hospices and palliative care. The study of legal and ethical studies went to Montreal. Funding was provided to community support groups across the country, to provide services within the community, particularly to AIDS-affected groups.

#### CANADA'S RESPONSE TO THE NEED FOR EDUCATION

The Canadian Public Health Association (CPHA) received an allotment of approximately \$3.7 million dollars over five years for public education programs across Canada. Of this allocation, \$700,000 was made available for the first year of operation. It is important to consider the seriousness with which the need for education could have been perceived when just \$700,000 was allocated in the first year. Some comparisons are in order. The United Kingdom, with less than half the per capita AIDS problem, devoted the equivalent of about CAN \$40 million to education in the same fiscal period (38, 39). A second comparison is also enlightening. The government of Canada allocated \$12 million to educate the Canadian public about its free-trade initiatives. I suggest that the feeble allocation of dollars for AIDS education in Canada demonstrates 1) the lack of educational expertise invited to provide input to "AIDS in Canada," and 2) the lack of political will to deal with a sensitive problem.

Briefly, for the benefit of those seeking primary sources of information, I should call attention to the existence of NAC-AIDS' annual reports since 1983/84. And more recently, beginning in 1987, the CPHA has produced a periodic newsletter, *The New Facts of Life*, dealing with AIDS education and awareness across Canada.

#### COMMUNITY SUPPORT GROUPS AND PROVINCIAL RESPONSES TO EDUCATION NEEDS

Various support groups, now numbering 16 across Canada, were initiated through major commitments on the part of the homosexual/bisexual community. These groups were first to produce cognitive information by way of pamphlets, with funding initially provided from within the homosexual community. This information has been directed not only to the homosexual/bisexual community but also to the public at large. To complement these efforts in Ontario, the Ontario Ministry of Health funded the production of a range of pamphlets dealing with separate subjects: 1) Detecting AIDS; 2) AIDS and health care workers; 3) AIDS and the workplace; 4) Women and AIDS; and 5)

## OTTAWA CHARTER FOR HEALTH PROMOTION

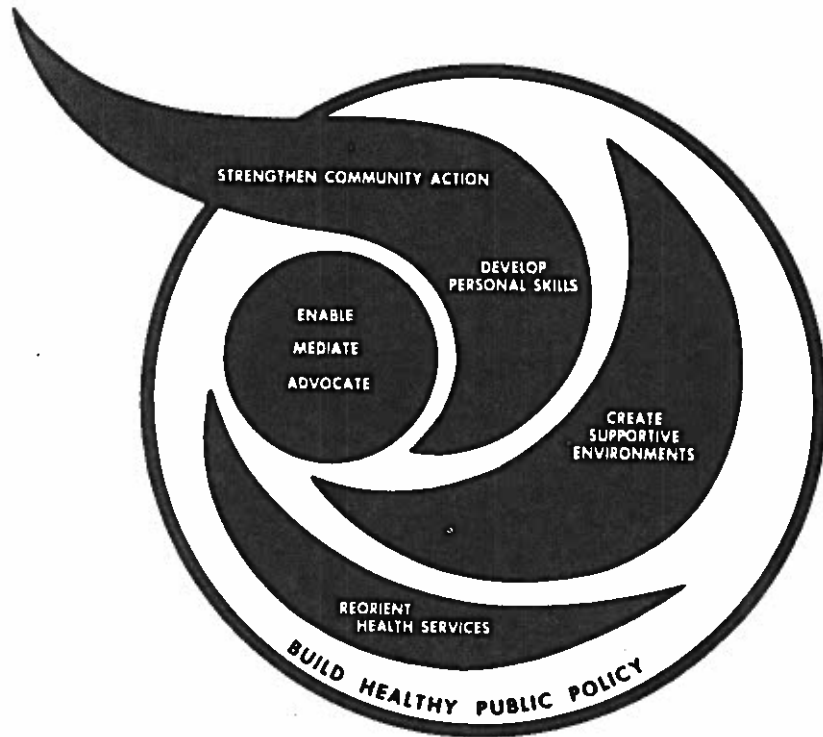


FIGURE 2.

Information about AIDS. These pamphlets began to become available in 1986, after the establishment of the Ontario Public Education Panel on AIDS. As stated earlier, the province of Alberta recently reacted to the problem of AIDS with the production of a pamphlet and with paid media spots encouraging people to obtain a copy of the pamphlet at local drugstores, health units, or physicians' offices. The demand for pamphlets exceeded expectations.

### A FUTURE COURSE

The piecemeal and reactive nature of Canada's response to AIDS has been emphasized in this paper; the medical emphasis on the problem has been highlighted. Now an alternative model is proposed to minimize the impact of AIDS. In 1986, unrelated to AIDS, Health and Welfare Canada, in conjunction

with the World Health Organization and the Canadian Public Health Association (CPHA), developed a model called "The Ottawa Charter for Health Promotion," schematically shown in Figure 2 (40). I propose that AIDS be considered the catalyst for the early implementation of this model, which is based on the notion that health is created and experienced by people within the setting of their everyday lives—where they learn, work, play and love. Health is created by caring for oneself and others, by being able to take decisions and have control over one's life circumstances, and by ensuring that the society within which one lives allows the attainment of health by all of its members.

Caring, holism, and ecology are essential issues in developing strategies for health promotion. Therefore, those involved should take as a guiding principle that in each phase of the planning, implementation, and evaluation of health promotion activities, women and men should become equal partners. The Ottawa Charter commitment to health promotion received a pledge from participants at its conference held in Ottawa in 1986 (1) to move into the arena of healthy public policy, and to advocate a clear political commitment to health and equity in all sectors; 2) to counteract the pressures towards harmful products, resource depletion, unhealthy living conditions and environments, and bad nutrition; and to focus attention on public health issues such as pollution, occupational hazards, housing, and settlements; 3) to respond to the health gap within and between societies and to tackle the inequities in health produced by the rules and practices of these societies; 4) to acknowledge people as the main health resource; to support and enable them to keep themselves, their families, and friends healthy through financial and other means, and to accept the community as the essential voice in matters of its health, living conditions, and well-being; 5) to reorient health services and their resources towards the promotion of health; and to share power with other sectors, other disciplines and, most importantly, with people themselves; 6) to recognize health and its maintenance as a major social investment and challenge; and 7) to address the overall ecological issue of our ways of living.

I submit that the adoption of this model will be essential for the effective containment of the spread of the human immunodeficiency virus (HIV)—the causative agent in AIDS—and the containment of health care costs. Some key factors in Figure 2, in terms of controlling the spread of HIV, include the development of personal skills on the part of the community and creating supportive environments through the elimination of alienating and stigmatizing attitudes (some reinforced by legislation) within the general context of a healthy public policy.

### THE MEDICAL MODEL VERSUS THE COMMUNITY HEALTH MODEL

Aside from the self-evident distinction of the medical model as one that is disease driven, from the community health model that is health oriented, other major distinctions between the medical model and the community health model

Medical model	Community Health model
Disease driven	Health oriented
Prescriptive	Facilitative
Power resides	Empower / enable
Assumed responsibility	Shared responsibility
High-technology dependent	Primary prevention approach
Highly professionalized	Lay persons' involvement valued
Accountability—legal obligation	Person monitors own progress and takes corrective action
Physical-sciences dependent	Human-sciences dependent

FIGURE 3. Distinguishing between the "Medical" and "Community Health" models.

are summarized in Figure 3. The medical model is prescriptive, with the patient providing information and the physician prescribing solutions; in contrast, the community health approach is more facilitative. Instead of teaching, it helps people to learn. Under the medical model, the power resides in the person doing the prescribing and little information is shared; the prescriber has the decision-making power, and there is not much community or individual participation in the decision-making process. In contrast, under the community health model, the health care professional performs the role of a facilitator, doing things *with* people, enabling and empowering them to achieve health. Under the medical model, there is an assumed responsibility, whereas under the public health model the responsibility is shared. Under the medical model, solutions are most frequently high-technology-dependent, whereas under the community health model, the aim is primary prevention. Of course, high-technology developments in the area of health promotion may be helpful in disseminating information and in motivating people to modify their behaviours. The medical model is highly professionalized, whereas in community health, the lay-person's expertise is more valued. People's own perceptions under the medical model are not as valued as they are under the community health model, which combines psycho-social and physiological information. Under the medical model, the assumption of responsibility induces a passive role for the patient, whereas under the community health model an active role is encouraged in a shared responsibility. There is a test of legal obligation under the medical model for an observed accountability where the doctor's permission is needed in making, or to ratify, all decisions pertaining to his or her patients. Under the community health model, all people have a role to play in which the individual assumes responsibility for his or her own actions. The person can monitor progress and take corrective action on his or her own.

Many examples that demonstrate actions contrary to the intent of the Ottawa Charter have occurred in relation to AIDS. In Canada, for example, the denial of access by community groups to participate in some way in NAC-AIDS is not consistent with the community health focus of the Ottawa Charter. In the United States, for example, on 30 May, 1987, it was reported (41) that President

Reagan was to form a special presidential commission to study AIDS, but had yet to appoint panel members. However, White House officials have said they would oppose an appointment based on sexual preference. In commenting on this refusal, the only avowed homosexual in the U.S. Congress stated that it is "equivalent to having a holocaust memorial without a Jew on it." Such insensitive action on the part of the president of the United States would be diametrically opposed to the concept of the Ottawa Charter, which implies the involvement of all sectors in a multi-strategy approach to achieve health for all.

The medical model for which President Reagan's aides are displaying a mania may be analogous to the structure of the Canadian NAC-AIDS. Or is it homophobia? Let us never forget, first, the early responsibility of the homosexual/bisexual community in educating its members and in participating in research studies. They are the unsung heroes (42) amid a terrible inexorable plague in their community who share intimacies and allow themselves to be examined and studied at repeated and regular intervals over long periods of time. Without the data gleaned from these studies, much information would be lacking on the question of modes of transmission and risk factors concerning AIDS. Second, it is compliance by the homosexual community with the self-deferral appeal of the HTS that provides major assurance for a "safe" blood supply. Perpetuating alienation and stigmatization cannot be expected to result in responsible behaviours. Canada should not follow many of the political examples set south of its border, policies perhaps motivated by genocidal inclinations on the part of some extreme fringe members of the American polity that have served to immobilize their government and retard urgently needed progress (8, 31). It should be self-evident to the rational observer that such reactions can serve only to harm the majority of Americans. Of course, the negative attitudes towards and blame-laying on homosexuals may continue, but because of the now recognized threat of AIDS within the heterosexual population, an adequate stimulus may exist to infuse the research and education effort with necessary resources. However, negative impacts on efforts to contain the spread of HIV still are likely to prevail as long as the homosexual community remains outside of mainstream society.

In 1984–85, a major effort was launched in Toronto to recruit the sexual contacts of homosexual men with AIDS or an AIDS-related illness into a study of AIDS. To that end, the media was invaluable in providing a supportive environment for the participation of individuals. The multi-sectoral approach implicit in the Ottawa Charter cannot be overstressed.

#### DISCRIMINATION AND ITS SELF-DESTRUCTIVE TENDENCY

A recent editorial (43) by Last recognized that "homosexuality is not regarded in these enlightened times as a crime or even a psychiatric aberration." Last mentions the very real nature of the love that can exist between homosexuals,



"a love that finds expression in the practice of sexual behaviours that many people disapprove of, or find repugnant." Last states:

It is these behaviours and their modification that are the issue for the ethicist to consider. Here there are no easy answers. It is easy, of course, to make ex-cathedra statements, and to enclose these in reinforcing phrases that have the authoritative ring of epidemiological knowledge or public health regulations. In many jurisdictions, we are dealing with legally, and in all jurisdictions, with morally proscribed behaviours. It is easy to allow our feelings to lead us so that our decisions become judgemental to the point of being prejudicial or condemnatory. This attitude, however, would lead quickly to a retreat even further into covert acts among consenting homosexuals, shrouding in even more secrecy the already well-guarded private activities of individuals who are harming no one, and who, in other respects, are members of the same society as the rest of us. It is not possible to change the overall sexual orientation. We have to ask, moreover, whether any good purpose would be served by attempting to change such behaviours among consenting, non-promiscuous homosexuals. The available evidence does, in fact, suggest that even among non-promiscuous homosexuals, a change of partners occurs on the average about once a year; and this can lead, over a 15-year period, to as high a risk of AIDS [virus] transmission as in the most promiscuous homosexuals, whose risk is higher initially, but declines over time as the proportion infected approaches 100 percent. Here, therefore, is epidemiological evidence to support the argument for intervention in the behaviours of homosexual men. The intervention is not gratuitous, but in the best interest of everybody.

A similar line of reasoning applies to efforts directed at altering the sexual behaviour and practices of the heterosexual community, the great majority of people—those at whom the CPHA-produced television messages are aimed. On moral as well as ethical grounds, it is essential to recognize the realities of human sexual behaviour, and to take all necessary steps to ensure that everyone at risk of acquiring AIDS is protected against this risk to the maximum extent possible. It serves no purpose at all to censor television messages advising about condom use, on the grounds that this condones promiscuity. The fatuous illogic of this argument is exceeded only by its hypocrisy. The fact is that a high proportion of people do have intercourse with more than one partner in an extended period of years, and this without being promiscuous. It is essential to ensure that all such people are adequately educated about the risks of AIDS.

If we accept this argument, we can justify on ethical grounds the position that CPHA has taken: wide public dissemination of information about the risks and how to reduce them is absolutely essential. Only the most uncaring and misinformed individuals could think otherwise.

Statements such as these by Last are long overdue in Canadian circles. Clearly, society is going to undergo change as a result of this epidemic, and we should prepare now for the type of society that we wish to see emerge from it. Simplistic solutions, I submit, will result not only in excess morbidity and

mortality in the short-term with continuing social and economic disruption, but also in successive waves of the AIDS epidemic well into the future.

As Last points out, it is hypocritical to deny the reality of the variety of sexual behaviours. Indeed, in a recent article by Klovdahl (44), a large social network structure was described, consisting of five regions, with individuals at three different levels of socio-economic status. The model describes persons in the elite group (high socio-economic status) as being highly interconnected and occupying structurally central positions which serve to maintain social relationships that, in turn, serve as bridges between different social groups. It is these interconnections from high status through middle status and on to low status groups that serve to transmit infectious agents on a global scale, inducing epidemics. Indeed, earlier studies from the Center for Disease Control in Atlanta (44) have demonstrated the social networks that facilitated the sexual transmission of the AIDS virus, showing an index case with other connected cases in Los Angeles and New York, with interconnections to New Jersey, San Francisco, Florida, Pennsylvania, and Texas. Each infected person in turn acts as an epicentre for successive waves of sexually transmissible agents.

#### THE ROLE OF CENTRAL GOVERNMENT

It is imperative that government take a leadership role on the issue of AIDS. Socially, epidemics involve a predictable human pattern with a macro-sequential response including, successively, denial, hysteria and blame, retrenchment, and accommodation. Government must act to facilitate societal accommodation as effectively and as expeditiously as possible. At an individual level, in the adaptation to a direct threat, Kubler-Ross (45) identified distinct reactions: 1) denial, 2) shock and hysteria, 3) anger and blame, 4) bargaining, 5) depression, and 6) acceptance. People oscillate among these before achieving "acceptance / accommodation"; governments too appear to reflect this behaviour. In Africa, governments denied their AIDS problem until the case-burden, in 1986, made continued denial impossible (46). However, the governments of Great Britain (38, 39, 47), Australia, Sweden (48), and the Netherlands, for example, have responded far more effectively from a public policy and resource allocation primary prevention perspective than either the United States or Canada.

An article in a Los Angeles newspaper asserts: "Epidemics are both medical and social phenomena. Medically, each is unique, involving different germs, with different modes of transmission, prevention and treatment. But socially, they involve a predictable pattern of denial, hysteria, retrenchment, and finally accommodation. Because they are much closer to AIDS than most heterosexuals, many gays have already begun to reach accommodation. Most straights are still in the denial / hysteria stage" (49). Clearly, governments must act to facilitate the needed behaviour change programs.

## SUCCESSIVE WAVES OF THE EPIDEMIC

An extension of the doubling time regarding the cumulative number of AIDS cases has been evident since 1983. However, AIDS reports represent the proverbial "tip of the iceberg," with a far greater number of people already infected with the AIDS virus or suffering from AIDS-related illnesses. Therefore, although the incremental rate of AIDS cases may be slowing, HIV-prevalence likely is growing. The development of AIDS itself likely requires trigger factors / co-factors / promotional insults to the immune system, such as reinfection with HIV, infections with other sexually transmitted diseases or with other viruses (26, 29). Therefore, ongoing, reinforcing educational messages to encourage the continuance of those behaviour changes that have occurred within the homosexual community will minimize the extent of recidivism or lapses in these behaviours and also may result in a lower proportion of those infected progressing to AIDS within relatively few years. In the absence of such messages and in the presence of recidivism, successive waves of the AIDS epidemic are likely well into the future. Thus, maintenance of behaviour change is imperative, at least until the trigger factors for the development of AIDS itself are better understood, and a cure or a vaccine is available.

## OBSTACLES TO EDUCATION

The problem of education for effective behaviour change (that is, risk reduction) is complex. According to Maslow's hierarchy of basic human needs, first is the homeostatic need for food, water, and air. Second is the need for safety and security. Third is the need for love and belonging. Fourth is the need for self-esteem. Fifth is the need for self-actualization. Sixth is the need to know and understand; and, seventh is the need for aesthetic expression. Sexual behaviour change means a modification to at least one basic (instinctual) human drive.

Tones (50) reported that "mass media may often have quite dramatic behavioural effects, but these usually occur incidentally rather than as a result of deliberate change attempts . . . . While mass media, if properly structured, produce cognitive change, they are unsuitable for modifying attitudes and changing behaviours."

To quote from a recent editorial by Osborn (28), "in the meantime, we must communicate patiently and clearly to a frightened public what we know and what we are learning. As always happens in times of panic, fringe groups are arising to raise the level of static and make the message hard to hear, and we will have to shout our message of prevention."

Educational efforts need to be directed first at the professional community in the areas of public health, blood workers, technicians and laboratory workers, nursing staff and administrators of hospitals and other institutions such as correctional facilities. Second, the public must be educated, both sexually

active adults and adolescents. Third, established risk groups must be educated. Fourth, special education must be given to infected persons; and fifth, people undeclared as to their risk group, representing the more difficult groups to reach in society, must be educated. This last group might include bisexual men who deny their sexual behaviours. Efforts ultimately must achieve behavioural changes that dramatically reduce the risk of HIV transmission.

## FUTURE CASE-LOAD PROJECTIONS

Since 1985, some researchers have attempted to discuss and model (6, 51-66) the AIDS epidemic and some have provided projections through and beyond 1991 (23, 26, 29, 67-74). Using a relatively less complex method, I have attempted to anticipate the number of AIDS cases and the growing number of infected individuals in Canada and in Alberta. The method depends on fewer assumptions and less sophisticated mathematical modelling techniques. It is noteworthy that results obtained by this simpler method are consistent with those derived by others (74).

To project the number of AIDS cases over the foreseeable future, the most valid and reliable projection equation would require a knowledge of the incubation period for AIDS, the annual incidence of seroconversion for HIV, the existing underlying population prevalence of infection with HIV, and the proportion of individuals who are infected that might be expected to develop AIDS per year. Clearly, the annual incidence of seroconversion is a function of duration of infectiousness and efficiency of transmission through behaviour modification adaptations to safer sexual practices. Regardless of the projection method employed, projections should be revised on at least an annual basis as more information becomes available from the ongoing and needed research (particularly in the social sciences) on all those factors incorporated into the projection formula used.

From the more simple approach to projecting the number of AIDS cases, Table 2 provides two sets of estimates for the period May 1987 through May 1998, one more optimistic, but less realistic, than the other which is labelled "current estimates." Given the uncertainties associated with the parameters needed for the equation, projections beyond 1991 likely are extremely unreliable. However, to apply some cross-validation in this modelling approach for estimating the proportions of individuals infected with the AIDS virus, projections beyond 1991 were necessary.

Three successive time periods are presented which differ only in that the doubling times through each of these periods are progressively extended. Thus, the doubling time is the single factor used for the projection equation in this more simple approach to modelling. Assumptions that have been made include: 1) accumulations are equally distributed within each doubling period; 2) the doubling times specified are averages anticipated through the period under consideration; 3) the base / seed number represents a stable cumulative estimate

TABLE 2

*Canada: projected AIDS cases, May 1987 through May 1998*

Year	More optimistic estimates		Current estimates	
	Accumulation	New cases	Accumulation	New cases
	24-month doubling time		18-month doubling time	
1987	1,012 <sup>1</sup>	-	1,012 <sup>1</sup>	-
1988	1,518	506	1,690	678
1989	2,024	506	2,692	1,002
1990	3,036	1,012	4,048	1,356
1991	4,048	1,012	6,760	2,712
	36-month doubling time		24-month doubling time	
1992	5,397	1,349	10,140	3,380
1993	6,747	1,350	13,520	3,380
1994	8,096	1,349	20,280	6,760
	48-month doubling time		36-month doubling time	
1995	10,120	2,024	27,040	6,760
1996	12,144	2,024	33,800	6,760
1997	14,168	2,024	40,560	6,760
1998	16,192	2,024	54,080	13,520

<sup>1</sup> Base/seed number.

through May 1987; 4) no interventions are likely (i.e., no vaccine and no cure); 5) adjustments owing to a slowing rate of infection through behaviour modification are reflected correctly in the periodically extended doubling times presented; and 6) current trends in the extending doubling times continue through the successive periods considered.

The "current estimates" support those projections provided by the Laboratory Centre for Disease Control, Ottawa, through 1991; by mid-1991, an accumulated Canadian total of about 6,500 cases of AIDS is likely. The "more optimistic" estimation approach employs more the soothsayer line which states that the doubling time will continue to be extended at a more accelerated rate. However, it is pointed out that with the more recently recognized extension of the incubation period for AIDS (to an average of about five years, rather than about two years) the "more optimistic" estimates indeed may be overly optimistic. In fact, the "current estimates" are likely the more prudent. Despite this, the "more optimistic" estimates through 1991 are only two-thirds of the more realistic "current estimates," and still predict a dramatic rise in the number of AIDS cases.

Table 3 presents estimates for the province of Alberta. This province accounts for approximately 10 per cent of the Canadian population. The "more optimistic" estimates may be more realistic only for smaller regions/centres where education may have had an effect earlier in the epidemic experienced in such regions. However, the base/seed number may adjust for this factor. Thus,

TABLE 3

*Alberta: projected AIDS cases, May 1987 through May 1998*

Year	More optimistic estimates		Current estimates	
	Accumulation	New cases	Accumulation	New cases
	24-month doubling time		18-month doubling time	
1987	59 <sup>1</sup>	-	59 <sup>1</sup>	-
1988	89	30	99	40
1989	118	29	157	58
1990	177	59	236	79
1991	236	59	394	158
	36-month doubling time		24-month doubling time	
1992	315	79	591	197
1993	393	78	788	197
1994	472	79	1,182	394
	48-month doubling time		36-month doubling time	
1995	590	118	1,576	394
1996	708	118	1,970	394
1997	826	118	2,364	394
1998	944	118	3,152	788

<sup>1</sup> Base/seed number.

through 1991, the more realistic "current estimates" project an accumulated case burden for Alberta of almost 400 cases. Again, the "more optimistic" estimate of about 250 cases is almost two-thirds of the more realistic estimate.

Estimates of those currently infected are needed to provide the base/seed number for estimating future infections. Methods of estimation are described below. Projections must assume an annual rate of seroconversion which itself will remain a function of behaviour change over time. For the purpose of Table 4, this rate is assumed to be 4 per cent. In addition, Table 4 is based on what I believe to be a conservative (lower) estimate of the population at risk for acquiring infection in each successive time period (i.e., 10 per cent of half of the estimated "more" sexually active population, between the ages of 15 and 70 years; or, 800,000 for Canada and 80,000 for Alberta, based on the 1981 census, assuming a stationary, non-migratory population). In the absence of any data to refute these assumptions, the estimates in Table 4 should be interpreted as being optimistically low.

The base/seed number used for Table 4 is less valid and less reliable than its counterparts used in Table 2 and Table 3, since AIDS is reportable and no HIV-prevalence studies have been undertaken across Canada. There are two ways that estimates are determined for the number of infected people in the population. First, for every person reported with AIDS, estimates have been made (from the ratio of those infected relative to those with AIDS in various groups under study) that there are perhaps 30 to 300 people, depending on the

TABLE 4  
Canada and Alberta: projected numbers of HIV-infected population<sup>1</sup>

	Canada		Alberta	
	Accumulation	New Infections	Accumulation	New Infections
1987	75,000 <sup>2</sup>	—	5,000 <sup>2</sup>	—
1988	104,000	29,000	8,000	3,000
1989	131,840	27,840	10,880	2,880
1990	158,567	26,727	13,645	2,765
1991	184,224	25,657	16,299	2,654
1992	208,855	24,000	18,847	2,548
1993	232,501	23,646	21,293	2,446
1994	255,201	22,700	23,641	2,348
1995	276,993	21,792	25,895	2,254
1996	297,913	20,920	28,059	2,164
1997	317,997	20,084	30,137	2,078
1998	337,277	19,280	32,132	1,995

1 Based on an estimated constant annual incidence of 4 per cent among 10 per cent of half of the estimated "more" sexually active population between ages 15 and 70 years: 800,000 for Canada and 80,000 for Alberta (stationary population).

2 Base/seed number.

risk group, already infected (75). A crude ratio of 1:100 often is used as an "average." It is important, therefore, to attempt to cross-validate wherever possible such crudely estimated numbers of people currently believed to be infected. To this end, if we assume that 1) 30 per cent of people infected will develop AIDS within a period of, say, eight years; and 2) most of those who will develop AIDS within the next five to 10 years already are infected with HIV; then, by reverse extrapolation—using the 1995 projected AIDS case-load from Table 2 and Table 3 respectively—two sets of estimates for each of the "more optimistic" and "current estimates" have been obtained. The first set is calculated by using the 1995 AIDS case-load projection. For example, from the Canadian "current estimates" in Table 2, the 1995 projection is for 27,040 cases of AIDS. Therefore, prevalent infection is calculated as  $(30 \div 100) \times X = 27,040$ ; that is  $X = 90,133$ . Similarly, based on the "more optimistic" estimates, prevalent infection is 34,000. For Alberta, the respective estimates are 5,250 and 2,000.

A crude upward adjustment of one-third, however, is deemed necessary to compensate for the extended doubling time constants (through 1995) applied in the empirical modelling in Table 2 and Table 3. Hence, for Canada, the "current" and "more optimistic" estimates are 134,300 and 50,750 respectively; equivalently for Alberta these are 7,850 and 3,000 respectively. This method of cross-validation provides some assurance that the base/seed numbers used in the calculations for Table 4 are not unreasonable. The method used for cross-validation is not unreasonable either, since the projected number

TABLE 5  
Canada and Alberta: expected living AIDS cases and expected hospital days<sup>1</sup> per year based on 50 per cent alive at any time<sup>2</sup>

	Canada		Alberta	
	Based on current AIDS estimates	Hospital days	Based on current AIDS estimates	Hospital days
1987	506	20,240	30	1,200
1988	805	32,200	50	2,000
1989	1,346	53,840	79	3,160
1990	2,024	80,960	118	4,720
1991	3,380	135,200	197	7,880
1992	5,070	202,800	296	11,840
1993	6,760	270,400	394	15,760
1994	10,140	405,600	591	23,640
1995	13,520	540,800	788	31,520
1996	16,900	676,000	985	39,400
1997	20,280	811,200	1,182	47,280
1998	27,040	1,081,600	1,576	63,040

1 Average hospital days (40) based on Graves and Moien (Ref. 78) and on 16 days/visit; 2.5 visits/year.

2 Assuming no treatments or cures emerging.

of AIDS cases through 1995 is calculated independent of any knowledge of the prevalence of HIV infection.

Table 5 projects for Canada and Alberta the potential impact on an aspect of the health care system, namely, in-patient hospital days, assuming no treatments or cures emerging. The numbers are calculated based on 50 per cent of the cumulative total number of AIDS cases expected to be alive at any one time and based on the "current estimates." Also assumed in these estimates is that current treatments will have little impact on hospital days, which could prove quite erroneous in the presence of current drug trials with AZT (Retrovir). Nevertheless, all hospitals must brace themselves for the coming of the epidemic to the neighbourhoods they serve; education, financial planning, and legal consciousness are the essential coping mechanisms (76, 77). The dramatic demand for health care (together with the urgent need to create supportive environments) exemplifies the central role of government for leadership in AIDS.

## CONCLUSIONS

In terms of limiting the spread of infection, the Canadian response to AIDS has been only marginally less neglectful than that of the United States. Particularly neglected in Canada have been the needs of low prevalence regions. It is suggested that with continuing neglect, research, and public health control

measures will continue to be irretrievably lost. The cost implications of the impact of AIDS over the next decade not only on health care delivery but also on social and political order will be significant. Urgent national and local strategies are needed to minimize longer-term ramifications.

## REFERENCES

- 1 Laboratory Centre for Disease Control. Canada Diseases Weekly Report. Pneumocystis carinii Pneumonia in a homosexual male—Ontario. 1982; 27 March, p. 43.
- 2 Fox DM. AIDS and the American health polity: the history and prospects of a crisis of authority. In: *The Milbank Quarterly, AIDS: The public context of an epidemic*, Cambridge University Press, Vol. 64, Supp. 1, 1986, pp. 7–33.
- 3 Altman D. The politics of AIDS. In: *AIDS: Public policy dimensions*. Publ. United Hospital Fund of New York, 1987, pp. 23–33.
- 4 Barnes DM. AIDS panel gets Reagan's approval. (News & Comment). *Science* 236, 15 May, 1987, pp. 771–2.
- 5 Reed JD, reported by Thompson D. At last, the battle is joined: Washington fights AIDS with modest proposals—and heated debate. *Time*, 15 June, 1987, pp. 54–6.
- 6 Institute of Medicine (National Academy of Sciences). *Confronting AIDS: Directions for public health, health care, and research*. National Academy Press, Washington, D.C., 1986.
- 7 Koop CE. Surgeon General's Report on Acquired Immune Deficiency Syndrome, Nov. 1986, 36 pp.
- 8 Krieger N. The politics of AIDS. A Frontline Pamphlet, 1986.
- 9 Kuller LH and Kingsley LA. The epidemic of AIDS: a failure of public health policy. In: *The Milbank Quarterly, AIDS: The public context of an epidemic*, Cambridge University Press, Vol. 64, Supp. 1, 1986, pp. 56–78.
- 10 Norman C. \$2-billion program urged for AIDS. (News & Comment). *Science* 234, 7 Nov., 1986, pp. 661–2.
- 11 Petit C. California to vote on AIDS proposition. (News & Comment). *Science* 234, 17 Oct., 1986, pp. 277–8.
- 12 Hardy, AM, Rauch K, Echenberg D, *et al.* The economic impact of the first 10,000 cases of acquired immunodeficiency syndrome in the United States. *JAMA* 255(9), 10 Jan., 1986, pp. 209–11.
- 13 Scitovsky AA and Rice DP. Estimates of the direct and indirect costs of acquired immunodeficiency syndrome in the United States, 1985, 1986, and 1991. *Public Health Rep* 102(1), Jan.–Feb. 1987, pp. 5–17.
- 14 Scitovsky AA, Cline M, and Lee PR. Medical care costs of patients with AIDS in San Francisco. *JAMA* 256(22), 12 Dec., 1986, pp. 3103–6.
- 15 Seage GR, Landers S, Barry A, *et al.* Medical care costs of AIDS in Massachusetts. *JAMA* 256(22), 12 Dec., 1986, pp. 3107–9.
- 16 Rosenberg CE. Disease and social order in America: perceptions and expectations. In: *The Milbank Quarterly, AIDS: The public context of an epidemic*, Cambridge University Press, Vol. 64, Supp. 1, 1986, pp. 34–55.
- 17 Gostin L. The future of communicable disease control: Toward a new concept in public health law. In: *The Milbank Quarterly, AIDS: The public context of an epidemic*, Cambridge University Press, Vol. 64, Supp. 1, 1986, pp. 79–96.
- 18 Bayer R. AIDS, power, and reason. In: *The Milbank Quarterly, AIDS: The public context of an epidemic*, Cambridge University Press, Vol. 64, Supp. 1, 1986, pp. 168–82.
- 19 Koshland DE. Epidemics and civil rights. (Editorial) *Science* 235, 13, Feb., 1987, p. 729.
- 20 Jenness D. Scientists' roles in AIDS control. (Editorial) *Science* 233, 22 Aug., 1986, p. 825.
- 21 Quinn A. Features of a selected group of Canadian patients with AIDS. *Can Med Assoc J* 133, 1 Nov., 1985, pp. 890–1.
- 22 Hardy AM. Planning for the health care needs of patients with AIDS. (Editorial). *JAMA* 256(22), 12 Dec., 1986, p. 3140.
- 23 Public Health Service. Plan for the prevention and control of AIDS and the AIDS virus. Report on the Coolfont Planning Conference, Berkeley Springs, West Virginia. U.S. Dept. of Health and Human Services. 4–6 June, 1986. *Public Health Rep* 101(4), July–Aug. 1986, pp. 341–8.
- 24 Hardy AM. The incidence rate of acquired immunodeficiency syndrome in selected populations. *JAMA* 253(2), 11 Jan., 1985, pp. 215–20.
- 25 Quinn TC. Perspectives on the future of AIDS. *JAMA* 253(2), 11 Jan., 1985, pp. 247–9.
- 26 Curran JW, Morgan MW, Hardy AM, *et al.* The epidemiology of AIDS: current status and future prospects. *Science* 229, 27 Sept., 1985, pp. 1352–7.
- 27 Curran JW. Epidemiologic trends of AIDS in the United States. *Cancer Res* 45 (9 Suppl), Sept. 1985, pp. 4602s–4604s.
- 28 Osborn JE. The AIDS Epidemic: multi-disciplinary trouble. *N Engl J Med* 314(12), 20 Mar., 1986, pp. 779–82.
- 29 Morgan JM and Curran JW. Acquired Immunodeficiency Syndrome: current and future trends. *Public Health Rep* 101(5), Sept.–Oct. 1986, pp. 459–64.
- 30 Barnes DM. Grim projections for AIDS epidemic. (News & Comment) *Science* 232, 27 June, 1986, pp. 1589–90.
- 31 De Gruttola V, Mayer K, and Bennett W. AIDS: Has the problem been adequately assessed? *Rev Inf Dis* 8(2), Mar.–Apr. 1986, pp. 295–305.
- 32 Anonymous. The doctor's duty towards AIDS patients. (Notes and News) *Lancet*, 30 May, 1987, p. 1274.
- 33 Laboratory Centre for Disease Control, Ottawa. Update: "AIDS" in Canada (monthly statistical update).
- 34 Health and Welfare Canada: Health Protection Branch. National AIDS Centre. Summary of AIDS material available and functions/services carried out in each of the provinces. 23 June, 1986.
- 35 Wainberg MA and Read SE. Public funding for AIDS research in Canada and the USA. (Editorial). *Can Med Assoc J* 134, 15 Jan., 1986, pp. 109–10.
- 36 Minutes of a meeting of the *ad hoc* AIDS Group to discuss mechanisms for obtaining funding for a project to identify indicators and causes of AIDS. 2 Dec., 1982 in the BTS Conference Room of the Canadian Red Cross Society, 95 Wellesley Street East, Toronto.
- 37 Standing Committee on National Health and Welfare, House of Commons, Canada. Report on AIDS in Canada. May, 1986. Halliday B, Chairman.
- 38 McKie D. Commentary from Westminster: Mr. Fowler's Summary of the Commons Debate on AIDS. *Lancet*, 29 Nov., 1986, pp. 1288–9.
- 39 Anonymous. Social Services Committee Report on AIDS. (Notes and News) *Lancet* 23 May, 1987, p. 1218.
- 40 Canadian Public Health Association. Health Digest 10(4), Dec. 1986. The Ottawa Charter, pp. 3–4.
- 41 Associated Press. Gay's exclusion in study deplored. *Edmonton Journal*, 30 May, 1987.
- 42 Norman C. The epidemic's unsung heroes. *Science* 230, 29 Nov., 1985, p. 1020.

- 43 Last JM. Ethics, mores and values—and AIDS. (Editorial) *Can J Pub Health* 78, Mar./Apr. 1987, pp. 75–6.
- 44 Klovdahl AS. Social Networks and the spread of infectious diseases: The AIDS example. *Soc Sci Med* 21(11), 1985, pp. 1203–16.
- 45 Kübler-Ross E. On death and dying. MacMillan, London, 1969.
- 46 Norman C. Politics and science clash on African AIDS (News & Comment). *Science* 230, 6 Dec., 1985, pp. 1140–2.
- 47 Acheson ED. AIDS: A challenge for the public health. *Lancet*, 22 Mar., 1986, pp. 662–5.
- 48 Study Group, National Commission on AIDS, Sweden. Information about HIV / AIDS: goals and strategy for public policy measures; further measures proposed. Ministry of Health and Social Affairs, Sweden, Sept. 1986, 57pp.
- 49 Anonymous. Beyond denial—coming to terms with the plague of the '80s. *Los Angeles Reader*, 8 Nov., 1985.
- 50 Tones BK. The use and abuse of mass media in health promotion. *Health Ed Res: Theory and Practice*. Pilot issue, 1985, pp. 9–14.
- 51 McEvoy M. AIDS for all by the year 2000? (Letter) *Br Med J [Clin Res]* 290(6466), 9 Feb., 1985, p. 463.
- 52 McEvoy M and Tillett HE. Some problems in the prediction of future numbers of cases of the acquired immunodeficiency syndrome in the UK. *Lancet*, 7 Sept., 1985, pp. 541–2.
- 53 Mortimer PP. Estimating AIDS, UK. (Letter) *Lancet*, 9 Nov., 1985, p. 1065.
- 54 Searle ES. AIDS: Predicting and planning (Letter) *Lancet*, 9 Nov., 1985, pp. 1064–5.
- 55 Norman C. AIDS trends: projections from limited data. *Science* 230, 29 Nov., 1985, pp. 1018–21.
- 56 McEvoy M. Estimating AIDS (UK). (Letter) *Lancet*, 30 Nov., 1985, p. 1248.
- 57 Rodriguez Artalejo F, Medrano Alberio MJ, Villar Alvarez F, *et al.* Predicting AIDS cases. (Letter) *Lancet*, 15 Feb., 1986, pp. 378–9.
- 58 Peto J. AIDS and promiscuity. (Letter) *Lancet*, 25 Oct., 1986, p. 979.
- 59 Tillett HE and McEvoy M. Reassessment of predicted numbers of AIDS cases in the UK. (Letter) *Lancet*, 8 Nov., 1986, p. 1104.
- 60 Schultz JM, Danila RN, MacDonald KL, *et al.* The epidemiology and health economics of acquired immunodeficiency syndrome in Minnesota: current status and future projections. AIDS Unit, Acute Disease Epidemiology Section, Minnesota Dept. of Health, Minneapolis, March 1986.
- 61 van Druten JAM, de Boo Th, Jager JC, *et al.* AIDS prediction and intervention. (Letter) *Lancet*, 12 Apr., 1986, pp. 852–3.
- 62 Lui KJ, Lawrence DN, Morgan WM, *et al.* A model-based approach for estimating the mean incubation period of transfusion associated acquired immunodeficiency syndrome. *Proc Natl Acad Sci, USA*, 83, May 1986, pp. 3051–5.
- 63 Rees M. The sombre view of AIDS. *Nature* 326, 26, Mar., 1987, pp. 343–5.
- 64 May RM and Anderson RM. Transmission dynamics of HIV infection. *Nature* 326, 12 Mar., 1987, pp. 137–42.
- 65 Pascal A. The costs of treating AIDS under Medicaid: 1986–1991. *Publ. The RAND Corporation*, Santa Monica, CA, May 1987, 52 pp.
- 66 Brookmeyer R and Gail MH. Minimum size of the acquired immunodeficiency syndrome (AIDS) epidemic in the United States. *Lancet*, 6 Dec., 1986, pp. 1320–2.
- 67 Anderson RM, Blythe SP, Medley GF, *et al.* Is it possible to predict the minimum size of the acquired immunodeficiency syndrome (AIDS) epidemic in the United Kingdom? *Lancet*, 9 May, 1987, pp. 1073–5.
- Soskolne: A Canadian Retrospective on AIDS 39
- 68 Brookmeyer R and Gail MH. Methods for projecting the AIDS epidemic. (Letter) *Lancet*, 11 July, 1987, p. 99.
- 69 Rees M. Describing the AIDS epidemic. (Letter) *Lancet*, 11 July, 1987, pp. 98–9.
- 70 Pickering J, Wiley JA, Lieb LE, *et al.* Modelling the incidence of acquired immunodeficiency Syndrome (AIDS) in New York, San Francisco and Los Angeles. Poster (TP.91) III International Conference on AIDS, 1–5 June, 1987, Washington, D.C. (Submitted to *Advances in Mathematics and Computers in Medicine*.)
- 71 Lemp GF, Barnhart L, Rutherford GW, *et al.* Projections of AIDS morbidity and mortality in San Francisco. Poster (TP.49) III International Conference on AIDS, 1–5 June, 1987, Washington, D.C.
- 72 Cardell NS, Kanouse DE, Gorman EM, *et al.* Modeling the spread of human immunodeficiency virus (HIV) in the United States. Poster (TP. 59), III International Conference on AIDS, 1–5 June, 1987, Washington, D.C.
- 73 Editorial. Who will get AIDS? *Lancet*, 25 Oct., 1986, pp. 953–4.
- 74 Cran JA. AltaPlan Consultants Ltd., Calgary, Alberta, 29 May, 1987.
- 75 Sivak SL and Wormser GP. How common is HTLV-III infection in the United States? *N Engl J Med* 313(21), 21 Nov., 1985, p. 1352.
- 76 Burda D. AIDS: a time bomb at hospitals' door. *Hospitals* 60(1), 5 Jan., 1986, pp. 54–61.
- 77 Johnson BJ and Soskolne CL. AIDS: medicolegal considerations for Canadian hospitals. *Can Med Assoc J* 135, 15 Nov., 1986, pp. 1091–6.
- 78 Graves EJ and Moien M. Hospitalizations for AIDS, United States, 1984–85. *Am J Public Health* 77(6), June 1987, pp. 729–30.