

Factors explaining the increase in cost for physician care in Quebec's elderly population

Marie Demers, PhD

Abstract • Résumé

Objective: To examine what role demographic factors and increases in physician fees and utilization played in the rise in costs of physician services provided for elderly people in Quebec between 1982 and 1992, and to investigate changes in patterns of care (type and amount of services) related to utilization.

Design: Retrospective study of population-based data.

Setting: Province of Quebec.

Subjects: Elderly people (65 years of age and over) in Quebec in 1982 (n = 589 800) and in 1992 (n = 803 600).

Outcome measures: Proportion of the increase in physician care costs attributable to (a) aging (defined as a shift in the age distribution) of the elderly population, (b) the increase in the size of the elderly population, (c) the increase in physician fees and (d) the increase in utilization of physician services; proportion of care provided by general practitioners (GPs) and by specialists; proportion of minor and complete examinations provided by GPs; and rates of hospital admissions and surgery.

Results: Aging was responsible for 0.5% of the increase in physician care costs between 1982 and 1992, population growth for 27.0% and the increase in physician fees for 25.5%. The increased utilization accounted for 47.0% of the total cost increase. Analyses of the utilization data revealed a shift toward more costly services, more visits to specialists and higher rates of hospital admissions and surgery in 1992 than in 1982.

Conclusions: Aging and population growth had minor effects on the increase in physician care costs between 1982 and 1992. Increased utilization was the most important factor. The appropriateness of this trend needs to be verified.

Objectif : Déterminer le rôle des facteurs démographiques ainsi que de l'augmentation des tarifs des actes médicaux et de l'utilisation dans l'augmentation des coûts des services médicaux dispensés aux personnes âgées au Québec entre 1982 et 1992 et examiner les changements survenus dans l'utilisation des services (type de services et volume) au cours de cette période.

Conception : Étude rétrospective de données de population.

Contexte : Province de Québec.

Participants : L'ensemble des personnes âgées (65 ans ou plus) du Québec en 1982 (n = 589 800) et en 1992 (n = 803 600).

Mesure des résultats : Pourcentage d'augmentation des coûts attribuable, (a) au vieillissement (changement dans la structure d'âge), (b) à l'accroissement du nombre de personnes âgées, (c) à l'augmentation des tarifs des actes médicaux et (d) à la hausse de l'utilisation des services; proportion des services d'omnipraticien et de spécialité, proportion des examens ordinaires et complets faits par des omnipraticiens, et taux d'hospitalisation et de chirurgie.

Résultats : Le vieillissement est responsable de 0,5 % de l'augmentation des coûts des services médicaux entre 1982 et 1992, alors que l'augmentation du nombre de personnes âgées compte pour

From the Direction des affaires médicales et de l'évaluation des programmes, Régie de l'assurance-maladie du Québec, Sillery, Que.

Correspondence to: Marie Demers, Direction des affaires médicales et de l'évaluation des programmes, Régie de l'assurance-maladie du Québec, 1125, chemin Saint-Louis, Sillery QC G1S 1E7; fax 418 646-0043

© 1996 Canadian Medical Association (text and abstract/résumé)

27,0 % de la hausse et l'augmentation des tarifs des actes médicaux, pour 25,5 %. L'augmentation de l'utilisation des services per capita compte pour 47 % du total de la hausse des coûts. L'analyse des données d'utilisation révèle un déplacement de la pratique vers des services plus coûteux, l'intensification du recours aux spécialistes, une augmentation des taux d'hospitalisation et de chirurgie en 1992 par rapport à 1982.

Conclusions : Le vieillissement et l'augmentation de la population ont joué un rôle secondaire dans la hausse des coûts des services médicaux dispensés aux personnes âgées entre 1982 et 1992. La hausse de l'utilisation a été le facteur principal. Il faudra d'autres études pour voir si cette tendance est justifiée.

Among member countries of the OECD (Organization for Economic Cooperation and Development), Canada is second only to the United States in the share of gross national product it devotes to health care spending. This share has grown slowly but steadily since the implementation of the public health care program in 1970, and in 1992 it reached 10%.¹

It has been suggested that the aging of the population (defined as the shift in age distribution) and the growing number of elderly people will have a major impact on the increase in health care costs.^{2,3} Alarmist projections of future cost increases based on current levels of utilization are often made,⁴ commonly referred to as "the population-aging crisis scenario."^{5,6} However, these projections often do not take into account different factors involved in the rise of health care costs.

Recent studies carried out in Canada⁷⁻¹⁰ and the United States^{11,12} that examined factors affecting increases in health care costs showed that aging and population growth seem to have a much smaller impact than expected. Other factors included increased physician fees, increased utilization of health care services and increased costs of drug therapy and institutional care. In a cost-effectiveness analysis of the Canadian health care system, Angus and associates⁷ found that aging alone was responsible for less than 5% of the increase in health care costs between 1980 and 1990; the proportion attributed to total population growth was 10%.

Despite these unequivocal results concerning the minor role played by aging and population growth in health care cost increases, many people concerned with cost-containment strategies continue to emphasize the impact of demographic changes.² The existing confusion possibly arises from the disproportionate amount of health care devoted to elderly people in relation to their proportion of the population: in Quebec people 65 years of age and over represented 11.2% of the population in 1992, but they accounted for 25% of the costs of physician services.¹³ The confusion also stems from the concern about the rapid rate at which the number and proportion of elderly people are increasing. However, the fact that more resources than ever before are being directed to this part of the population does not imply that aging and population growth are the only or even the main factors responsible for the increase in health care costs.

This study investigated the effects of aging and population growth on physician care costs devoted specifically to elderly people. It did not deal with the population as a whole as other studies have, nor did it look at total health care costs. Emphasis was put on the cost of physician services; in 1992 these services accounted for 16% of the \$13 billion of public health expenditures in Quebec.¹³ This study also examined the evolution of utilization patterns in the elderly population.

Methods

All elderly people (those 65 years of age and over) in Quebec in 1982 (n = 589 800) and 1992 (n = 803 600)^{14,15} were included.

The data used in this study were collected from the claim files of the Régie de l'assurance-maladie du Québec. This government agency pays for all physician services, regardless of where they are provided (private office, outpatient clinic, hospital or nursing home) or who the provider is (general practitioner or specialist). Fee-for-service payments accounted for 87% (\$1.7 billion) of the costs of physician services in 1992.

Claim files contain information on the age and sex of the patient, the number of services delivered to that patient, the nature and the provider of the services, the fee paid to the physician, the date of delivery and the clinical setting where the services were provided. There is no deductible or copayment for physician services. The data in these files are believed to reflect accurately and reliably the services provided by physicians, because underreporting is not in the providers' interest. Overreporting is limited by monitoring of individual patterns of practice and other control measures carried out by the government.

Data on the number of days in hospital came from the provincial ministry of health. Its databank contains exhaustive information received periodically from all Quebec hospitals.

To compare costs over time, 1992 costs were adjusted to the fee levels in effect in 1982. The fee index reflects the increase in physician fees between 1982 and 1992 and is periodically revised by the ministry of health to take into account modifications to the fee schedule. This index was used to adjust costs in this study because only physician services were considered.

Per capita costs were adjusted by using the 1992 age

distribution (expected and real) as a weighting system. The results were compared with physician costs obtained in 1982 and 1992. This procedure allowed for control of one factor at a time. First, fee-adjusted costs per capita were determined by dividing the total fee-adjusted costs for the year by the total number of elderly people for the same year. The fee-adjusted cost per capita was then calculated for each age group and for each year. These per capita costs were multiplied by the age distribution of the elderly population in 1982 and 1992 and by the expected population in 1992 if the age distribution were identical to that of 1982. These calculations allowed for determination of the share of physician expenditures attributable to the following factors: aging, population growth, increased physician fees and increased utilization. A similar methodology was used by Barer and collaborators.⁹

Results

Demographic changes

Between 1982 and 1992 the elderly population in Quebec grew more rapidly than the total population (36.3% v. 8.3%); its share of the total population went from 8.9% to 11.2%. Table 1 shows the distribution of the elderly population by age group for both years and the percent increase in each age group. The greatest increases occurred in the two oldest groups, which reflected the aging of the elderly population.

Factors contributing to increases in physician care costs

The cost of physician services for elderly people in Quebec rose from \$126 million in 1982 to \$383 million in 1992, an increase of 204% (Table 2). The overall increase in the level of physician fees between 1982 and 1992 was 52%; the fee-adjusted cost for physician services in 1992 was therefore \$252 million. For the same period, the increase in the Canadian Consumer Price Index was 53.1%, slightly more than the increase in the level of fees. The fee-adjusted cost of physician services per capita was \$214 in 1982 and \$314 in 1992, an increase of 46.9%.

Table 3 gives the age-specific costs of physician ser-

vices per capita in 1982 and 1992. It also shows the distribution of people by age group in the two years as well as the expected numbers in 1992 if the age distribution were identical to that in 1982. These numbers helped to determine the share of physician expenditures attributable to each of the factors studied.

The actual 1982 fee-for-service costs by age group are listed in Table 4, column 1. Column 2 gives the expected fee-adjusted costs in 1992 based on the 1982 costs per capita and the 1982 age distribution (column 1 × column 4 in Table 3). The difference between columns 2 and 1 in Table 4 reflects the increase in costs attributable to the growth of the elderly population.

Column 3 of Table 4 gives the age-specific fee-adjusted costs in 1992 if there were no change in the utilization level between 1982 and 1992 (i.e., if the cost per capita were identical to that in 1982 [column 1 × column 5 of Table 3]). The difference between columns 3 and 2 of Table 4 is the increase in costs attributable to the shift in the age structure of the elderly population.

The last column of Table 4 shows the actual 1992 age-specific fee-adjusted costs. The difference between this column and column 3 is the cost increase attributable to increases in utilization.

The total fee-adjusted cost of \$252 million in 1992 includes the cost increases attributable to the shift in the age structure, to the growth of the elderly population and to the increased utilization level. These three amounts were multiplied by the fee index in order to determine the increases in 1992 dollars (Table 5). Only 0.5% of the total cost increase in 1992 could be attributed to the shift in the age distribution and 27.0% to the growth of the elderly population. Almost half of the total cost increase was attributed to a rise in utilization of physician services. By subtracting these three components from the total cost increase between 1982 and 1992 (\$257 million in 1992 dollars), one can determine that the increase in physician fees was responsible for 25.5% of the total cost increase in 1992 (Table 5).

Changes in utilization patterns

The overall proportion of elderly people for whom physician services were provided (the participation rate)

Table 1: Growth of the elderly population in Quebec from 1982 to 1992, by age group^{14,15}

Age group, yr	Year; no. (and %) of people		% increase
	1982	1992	
65-69	215 500 (36.5)	277 400 (34.4)	28.7
70-74	163 500 (27.7)	213 600 (26.6)	30.6
75-79	109 700 (18.6)	150 900 (18.8)	37.6
80-84	61 100 (10.4)	94 500 (11.8)	54.7
≥ 85	39 900 (6.8)	67 200 (8.4)	68.4
Total	589 800 (100.0)	803 600 (100.0)	36.3

Table 2: Costs of physician services provided to elderly people in Quebec in 1982 and 1992

Variable	1982	1992
Total fee-for-service cost	\$125 994 825	\$383 393 829
Physician fee index*	100.0	152.0
Fee-adjusted cost†	\$125 994 825	\$252 232 782
Elderly population	589 800	803 600
Fee-adjusted cost per capita	\$213.62	\$313.88

*Reflects increase in physician fee levels between 1982 and 1992.
†1992 fee-for-service cost adjusted according to 1982 physician fee level.

was 90% in 1982 and in 1992. However, the number of services per capita increased from 13.2 to 17.6. Fig. 1 shows the age-specific number of services per capita for both years. Despite a high overall participation rate, there were strong individual variations in utilization: in both years one third of the elderly population accounted for almost 80% of the physician care costs.

Over the study period, there was an increase in utilization of specialist care. The proportion of people who saw at least one specialist per year was higher in 1992 than in 1982 (78.6% v. 70.9%). On average, an elderly person who received physician services visited 2.2 specialists in 1982 and 3.1 in 1992, an increase of 40.9%; he or she received 6.9 services from specialists in 1982 and

11 services in 1992, an increase of 59.4%. On the other hand, the number of general practitioners (GPs) seen per patient rose from 1.7 to 2.2, an increase of 29.4%, and the average number of services received from GPs per person went from 7.8 to 8.5, an increase of only 9.0%. The share of physician services provided by specialists increased over the study period, from 47.0% in 1982 to 56.2% in 1992.

Among GPs, a shift toward the provision of more expensive services was observed in 1992 compared with 1982. Services provided by GPs are mainly of three types: minor examinations, complete examinations and full evaluations. Complete examinations accounted for 35.7% of all examinations in 1982 and for 49.5% in 1992.

Table 3: Costs per capita and population distribution by age group

Age, yr	1982 cost per capita, \$	1992 fee-adjusted cost per capita, \$	1982 population	1992 population based on 1982 age distribution*	1992 population
65-69	193.13	267.75	215 500	293 314	277 400
70-74	214.79	314.42	163 500	222 597	213 600
75-79	229.73	350.75	109 700	149 470	150 900
80-84	237.44	364.77	61 100	83 574	94 500
≥ 85	239.31	348.19	39 900	54 645	67 200
All	213.62	313.88	589 800	803 600	803 600

*Distributed according to proportion of elderly people in each age group in 1982 (see Table 1).

Table 4: Factors affecting increases in physician costs, by age group

Age, yr	Actual 1982 fee-for-service cost, \$	Expected 1992 fee-adjusted cost based on 1982 cost per capita and age distribution, \$	Expected 1992 fee-adjusted cost based on 1982 cost per capita and 1992 age distribution, \$	Actual 1992 fee-adjusted cost, \$
65-69	41 619 281	56 647 733	53 574 262	74 274 380
70-74	35 118 119	47 811 610	45 879 144	67 160 791
75-79	25 201 679	34 337 743	34 666 257	52 928 151
80-84	14 507 474	19 843 811	22 438 080	34 471 218
≥ 85	9 548 273	13 077 095	16 081 632	23 398 242
Total	125 994 825	171 717 992	172 639 375	252 232 782

Difference is attributable to population growth	Difference is attributable to aging	Difference is attributable to increased utilization
---	-------------------------------------	---

Table 5: Effect of study factors on increases in cost of physician services

Factor (and calculation)	Cost increase, \$ (1992 dollars)	% of total increase
Total cost increase in physician services (\$383 393 829 - \$125 994 825)	257 399 004	100.0
Increase in cost attributed to population growth (\$171 717 992 - 125 994 825 × 1.52 [fee index])	69 499 214	27.0
Increase in cost attributed to aging (\$172 639 375 - \$171 717 992 × 1.52)	1 400 502	0.5
Increase in cost attributed to increased utilization (\$252 232 782 - \$172 639 375 × 1.52)	120 981 979	47.0
Increase in cost attributed to fee increase (\$257 399 004 - [\$69 499 214 + \$1 400 502 + \$81 20 981 979])	65 517 309	25.5

Hospital care in short-term care facilities contributed to the increased utilization level. Increases were observed from 1982 to 1992 in the rate of hospital admission (14.1% v. 18.3%; Fig. 2), the rate of surgery (16.9% v. 20.8%) and the number of days in hospital per 1000 elderly patients (4559 days v. 4915 days) despite a slight decrease observed in the mean length of stay).

Discussion

Increased utilization was the most important factor responsible for the rise in physician care costs in the elderly population of Quebec between 1982 and 1992. The growth of the elderly population was the second most important factor. Aging played a minor role in the increase in costs. These results are in agreement with those from previous studies.⁷⁻¹²

The focus on the elderly population allowed determination of the increase in costs attributable to the growth of this population and to the increase in their utilization of physician services. Since utilization factors rather than demographic factors were found to play a major role in the rise of health care costs, the reasons underlying the increase in utilization need to be examined.

Although morbidity and frailty increase with age, age-specific prevalence of disease and disability have been declining over time. The rate of stroke and heart disease among North Americans has decreased,¹⁶⁻¹⁸ and the rate of chronic disability among elderly people is decreasing in many countries.¹⁸ Therefore, it is difficult to attribute the increase in utilization observed in this study to a deterioration of the health status of the elderly. Black and colleagues,¹⁹ in a study of the impact of changing patterns of morbidity on utilization of ambulatory physician services by elderly people in Canada between 1971 and 1983, concluded that morbidity played only a minor role.

Increased utilization does not necessarily mean increased demand for medical care from elderly people.²⁰ In this study, ambulatory visits, which are more likely to

be initiated by the patient than are other physician services, increased in number from 1982 to 1992, but not to the extent that other services did. Previous studies have found that the proportion of physician-initiated visits increased with the age of the patient and with the presence of a chronic condition.^{21,22} It is also possible that some changes occurred in the health-care-seeking behaviour of the elderly people over the study period; however, this factor alone cannot account for the difference in utilization between 1982 and 1992.

This study dealt with fee-for-service costs only. This focus allowed adjustment of the costs according to the fee index, which reflected the exact change in physician fees between 1982 and 1992. There is not as accurate an index available when all health care costs are included.

Some might argue that aging and population growth would be responsible for a larger part of the cost increase if costs for hospital and nursing-home care were included. However, Canadian and US data do not support this. In studies that did include other health care costs, aging and population growth still played a minor role.^{7,12} In addition, the present study did take into account the cost of physician services provided in hospitals and nursing homes.

The analysis of the utilization data revealed changes in physician practice patterns between 1982 and 1992. There was a shift toward the provision of more costly services: the proportion of complete examinations performed by GPs increased between 1982 and 1992. Because the percent fee increase was the same for each type of examination, the shift cannot be attributed to a differential fee increase. In addition, there were increases in the utilization of specialist care and in the rates of hospital admissions and surgery. These changes may have been due in part to the introduction of new technologies, which often require the intervention of specialists rather than GPs. The availability of new drugs, diagnostic techniques and surgical procedures has made it possible to treat older and more seriously ill patients than was possible previously.

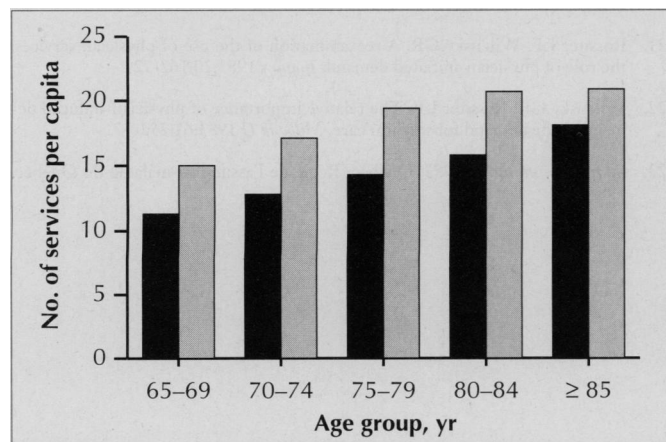


Fig. 1: Number of physician services per capita provided to elderly people in Quebec in 1982 (black bars) and 1992 (screened bars).

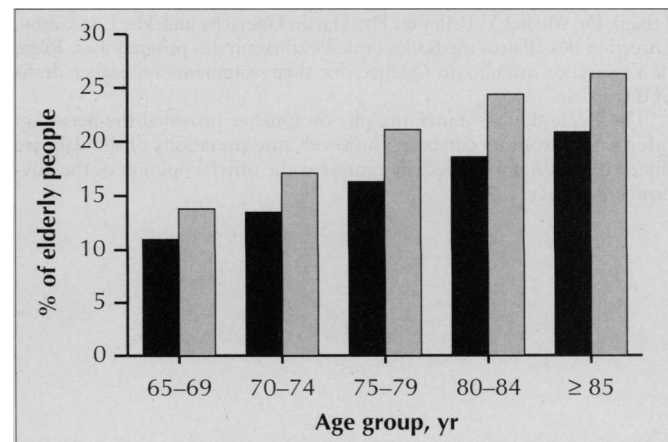


Fig. 2: Proportion of elderly population in Quebec admitted to acute care hospitals in 1982 and 1992. Bar designations as in Fig. 1.

Another factor may explain the increased utilization of specialist care: an increased knowledge of specific disorders affecting elderly people may have prompted more visits to a specialist for diagnosis or treatment. Moreover, GPs referred more of their patients to a specialist in 1992 than in 1982. However, the increase in specialist care cannot be attributed to the development of geriatrics between 1982 and 1992. The development of this discipline has been surprisingly slow and was not important enough to explain the growth in specialist care in the elderly population.

One of the limitations of the study was that costs of physician services not covered under the fee-for-service method of remuneration were not included. These costs accounted for 9.3% of physician costs in 1982²³ and 12.6% in 1992.¹³ Because non-fee-for-service costs increased between 1982 and 1992 but were not included in the total costs, there was a slight underestimation of the increase in physician costs between the two years. Because the 1992 costs enter only in the calculation of the utilization increase (see Table 4, column headings), the results of the present study slightly underestimate the share attributed to this factor.

It was beyond the scope of this study to evaluate whether or not the level of physician care delivered to the elderly population was appropriate. It is not possible to state whether there was underservicing in 1982 or overservicing in 1992. The observed increase in utilization could have been beneficial to the health of the patients, but that aspect cannot be assessed here. The important finding is that the increase in physician costs is more strongly related to the way the health care system responds to the health problems of the elderly population rather than to demographic factors. Therefore, it would be advisable to investigate the appropriateness of health care delivery to this population. Data on this subject are scarce, probably because of the emphasis put on demographic changes in the health policy debate.

I thank Dr. Michel Y. Pelletier, Dr. Martin Gamache and Ms. Lise Caron, Direction des affaires médicales et de l'évaluation des programmes, Régie de l'assurance-maladie du Québec, for their comments on earlier drafts of this article.

The Régie de l'assurance-maladie du Québec provided the necessary information from its databases; however, interpretations of the data are my own and do not necessarily represent the official opinion of the government agency.

1. Nair C, Karim R. An overview of health care systems: Canada and selected OECD countries. *Health Rep* 1993;5:259-79.
2. Schneider EL, Guralnik JM. The aging of America: impact on health care costs. *JAMA* 1990;263:2335-40.
3. Henripin J. The financial consequences of population aging. *Can Public Policy* 1994;20:78-94.
4. Denton FT, Spencer BG. Demographic change and the cost of publicly funded health care. *Can J Aging* 1995;14:174-92.
5. McDaniel SA. Demographic aging as a guiding paradigm in Canada's welfare state. *Can Public Policy* 1987;13:330-6.
6. Northcott HC. Public perceptions of the population aging "crisis." *Can Public Policy* 1994;20:66-77.
7. Angus DE, Auer L, Cloutier JE, Albert T. *Sustainable health care for Canada*. Ottawa: University of Ottawa, 1995.
8. Barer ML, Evans RG, Hertzman C. Avalanche or glacier? Health care and the demographic rhetoric. *Can J Aging* 1995;14:193-224.
9. Barer ML, Pulcins IR, Evans RG, Hertzman C, Lomas J, Anderson GM. Trends in use of medical services by the elderly in British Columbia. *Can Med Assoc J* 1989;141:39-45.
10. Marzouk MS. Aging, age-specific health care costs and the future health care burden in Canada. *Can Public Policy* 1991;17:490-506.
11. Lubitz J, Beebe J, Baker C. Longevity and Medicare expenditures. *N Engl J Med* 1995;332:999-1003.
12. Mendelson DN, Schwartz WB. The effect of aging and population growth on health care costs. *Health Affairs* 1993;12:119-25.
13. *Statistiques annuelles 1992*. Québec: Régie de l'assurance-maladie du Québec, 1993.
14. *Revised intercensal population and family estimates, July 1, 1971-1991*. Ottawa: Statistics Canada, 1994. Cat no 91-537.
15. *Annual demographic statistics*. Ottawa: Statistics Canada, 1993. Cat no 91-213.
16. Duchesne L. *La situation démographique au Québec. Edition 1994*. Québec: Bureau de la statistique du Québec, Les Publications du Québec, 1994.
17. Manton KG. The dynamics of population aging: demography and policy analysis. *Milbank Q* 1991;69:309-40.
18. Manton KG, Corder LS, Stallard E. Estimates of change in chronic disability and institutional incidence and prevalence rates in the U.S. elderly population from 1982, 1984 and 1989 National Long term Care Survey. *J Gerontol* 1993;48:S153-S166.
19. Black C, Roos NP, Havens B, MacWilliam L. Rising use of physician services by the elderly: the contribution of morbidity. *Can J Aging* 1995;14:225-44.
20. Eisenberg JM. *Doctors' decisions and the cost of medical care*. Ann Arbor (MI): Health Administration Press Perspective, 1986.
21. Rossiter LF, Wilensky GR. A reexamination of the use of physician services: the role of physician-initiated demand. *Inquiry* 1983;20:162-72.
22. Wilensky GR, Rossiter LF. The relative importance of physician-induced demand in the demand for medical care. *Milbank Q* 1983;61:252-77.
23. *Statistiques annuelles 1982*. Québec: Régie de l'assurance-maladie du Québec, 1983.