Fee Controls as Cost Control: Tales From the Frozen North

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WHILE CONCERNS OVER ESCALATION IN HEALTH care costs are virtually universal in the industrialized world, the forms of policy response, and their relative success, have been quite variable. Payments for physician services, which in most countries run a significant second to institutional care in their share of total health costs, tend to be the most difficult and controversial to control. Yet, in those countries in which physician incomes are primarily derived from fees for service, the rate of increase of those fees is a natural target.

In some countries (Canada, West Germany) uniform schedules of physician fees are established by direct bargaining between professional associations and reimbursement agencies. The outcome of these negotiations has a significant bearing on the success of cost-control policies. In contrast, physicians in the United States have traditionally set their fees individually at "whatever the market will bear." Reimbursement agencies might employ "usual, customary, or reasonable" (UCR) fee screens or, in the case of state Medicaid agencies, impose ceilings. But UCR screens only limit the reimburser's liability—the physician may still demand the balance of the bill from the patient—and Medicaid covers only the low-income population which in an earlier day might not have paid full rates in any case.

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In this environment, physicians' fees have consistently escalated faster than general inflation levels over the entire postwar period. Indeed, in the most recent data the rate of real increase appears to be accelerating. Some observers maintain, on the basis of simple "supply and demand" arguments, that steady growth in the numbers of physicians in an increasingly competitive environment is about to reverse this trend. But supporting evidence has so far steadfastly refused to emerge. In fact, at least down to 1986, increases in the supply of physicians have been associated with *increases* in fees, not the decreases that the simpler constructs of economic theory predict.[1] Such observations have led to recent growing interest in the United States in uniform and binding physician fee schedules as a possible instrument of medical cost control. This has taken concrete form in the establishment by Congress of the Physician Payment Review Commission (see also Harvard University 1986; U.S. Congress, Office of Technology Assessment 1986; Fein 1986).

While the principal focus of this interest appears to be cost control, the arguments for uniform and binding fee schedules are more broadly based. When individual physicians set their own fees, and a multiplicity of different insurers each determine how much they will reimburse, the patient is left vulnerable to any gap between physician and reimburser perceptions of appropriate fees. In this context, a uniform and binding schedule of fees can serve both to improve patients' access to care and to spread the costs of that care more equitably.

Support for such fee schedules is, however, far from universal. The opposition from physician associations, on the basis of economic self-interest, is predictable. Since costs of physicians' services are equivalent to incomes of physicians, and a principal objective of fee control is to limit the growth of physician incomes, it would be naive and foolish to expect their representatives to accept the general objective of cost control.

[1] Of course economic theory demands nothing of the sort. It is remarkably flexible, yielding any desired prediction given sufficient massage. The association between increasing supply and rising price is interpreted by some as causal, by others as evidence of a market still [forever?] in disequilibrium, and by still others as an ongoing statistical artifact resulting from changes in other and unobserved factors tending to increase the demand for medical care (Schaafsma and Walsh 1981; Sloan and Schwartz 1983; *Business Week* 1981). Whatever the appropriate degree of massage appropriate to the real world circumstances, the unadorned popular microeconomic theory is so far unconfirmed.

But there are less self-interested counter-arguments which, interestingly, flow from two radically different theories of the determinants of medical care utilization. These different theories have directly contradictory predictions as to the effect of fee control on utilization, but agree that behavioral reactions within the health care system itself will dilute or vitiate the effects on costs.

One school of thought observes that physicians exercise a significant degree of influence over the use of their own services (within the constraints of professional ethics). They can then use this influence, through a combination of pricing and output decisions, to maintain some roughly specified level of target income. (The "target income" may appear a bit ad hoc, but can be derived from a more general, underlying utility-maximizing model of physician behavior [Evans 1972, 1976, 1984; Wolfson 1975; Evans and Wolfson 1980; Wolfson and Tuohy 1980].) Fee controls are likely to lead to offsetting increases in utilization, or at least billings, and thus be ineffective in controlling costs. There are several experiences in the United States with fee controls consistent with this interpretation (Fuchs 1978; Holahan et al. 1979; Holahan, Sulvetta, and Scanlon 1981: Held, Holahan, and Carlson 1983: Rice, 1983, 1984; Gabel and Rice 1985; Reinhardt 1985).

The second line of criticism arises from the simple "supply and demand" view of the world. If rising fee levels are, in fact, the result of increasing patient demands outpacing a more slowly expanding physician-servicing capacity, then attempts to restrain those increases artificially will lead to rationing, unequal access, and black market activity, and (possibly) deterioration in quality of care. The *measured* costs of physicians' services may be held down, as reported fees will be lower and physicians will provide fewer services in response. But the hidden costs of rationing, queuing, and simple failure to receive services will more than outweigh these apparent gains. Indeed, the development of black market activity or incomplete price reporting would mean that some part of health care costs simply fell out of the official statistics, creating the illusion rather than the reality of control.

There is, however, no a priori presumption in economic theory that price controls result in a decrease in the quantity of services supplied (relative to the "uncontrolled" environment). In an industry with restricted entry, dominated by self-employed practitioners, a "backward bending supply curve of labor," or at least of professional

own-time, is not merely a theoretical curiosity. Reductions in fees, by reducing professionals' incomes, may result in decisions to offset the income erosion by increasing hours of work.

The theoretical debate continues in the United States, partly for obvious political and ideological reasons, but partly because the domestic empirical evidence is very limited. What there is covers short time periods and is derived from settings with questionable generalizability. Meanwhile, supply, fees, and medical care costs continue to escalate.

Yet, the vast unexplored area north of the Canadian border is a source of much more extensive evidence. Since 1971 every province in Canada has reimbursed physicians under a universal and comprehensive, public medical insurance program, according to fee schedules negotiated periodically between provincial Ministries of Health and professional associations. For the individual physician, fees are externally determined data; for physicians collectively, the level and structure of fees can be influenced through the negotiation process but not independently chosen.

In this environment, the experience with fee increases has been very different from that in the United States. Since 1971 physicians' fees in all the provinces of Canada have risen no more rapidly than general inflation rates, and in some provinces and/or time periods have lagged well behind. This is in marked contrast not only to the American pattern of consistent increases in inflation-adjusted fees, but also to the Canadian experience in the period before 1971. In the earlier environment of mixed public and private insurance and out-of-pocket payment with independent fee-setting by physicians, fees in Canada used to outrun general inflation rates by about the same margin as in the United States.

The divergence in fee experience since 1971 has been associated with a sharp break in health care cost trends in Canada, a break which has not been observed in the United States. As shown in figure 1a, the percentage of national income spent on health care rose steadily in both countries at more or less the same rate over the quarter century prior to 1971. Since then, the Canadian percentage has stabilized, while the United States has experienced a continuing "cost explosion." Ginzberg (1987) presents preliminary estimates for 1986 and 1987, suggesting that the United States still shows no sign of slowing down, and in 1987 may reach 11.4 percent. Preliminary Canadian estimates from Health and Welfare Canada (unpublished) indicate the Canadian

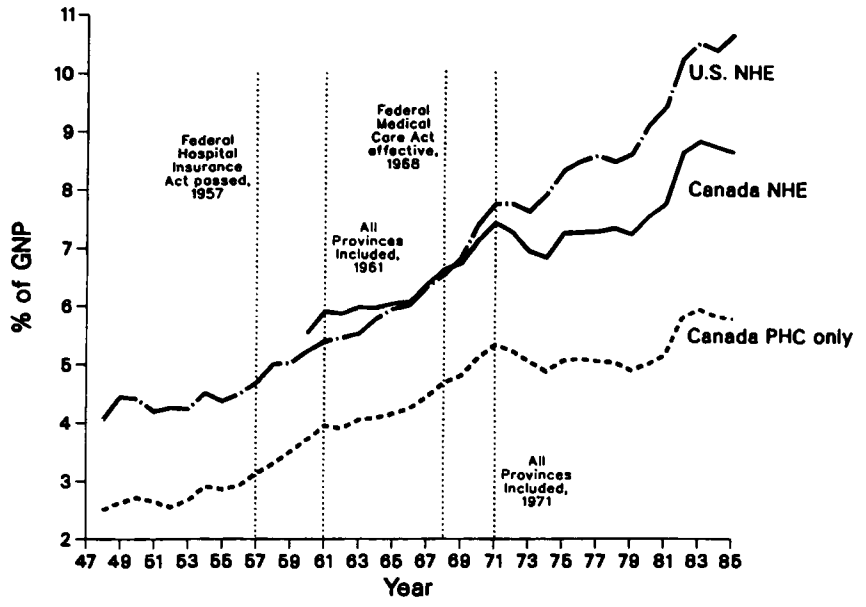

FIG. 1a. Health expenditure as share of GNP Canada & U.S., 1948–1985.

ratio is holding at 8.6 percent. Figure 1b records that the divergence in national experiences has been even more pronounced with respect to physicians' services.

The current American interest in the effects of administered fee schedules, and the Canadian experience since 1971, are the motivation for a detailed examination of the effects of Canadian policy on medical care costs and utilization. In this article, we first provide a brief outline of the organizational, legal, and financial structure of the Canadian medical insurance plans, and the types of policies developed within that context. Binding fee schedules, or more generally fee controls, cannot be viewed either in isolation or as a one-shot activity. They represent a continuing negotiating process, and are part of the more general evolution of public health care policy.

We then go on to provide a concise statistical view of the outcome of that process in terms of its impact on fee levels, utilization rates, and per capita costs of care. The contrasts between the pre- and post-1971 experiences are highlighted. But this examination also makes apparent the diversity among provinces that aggregates to the "Canadian" outcome.

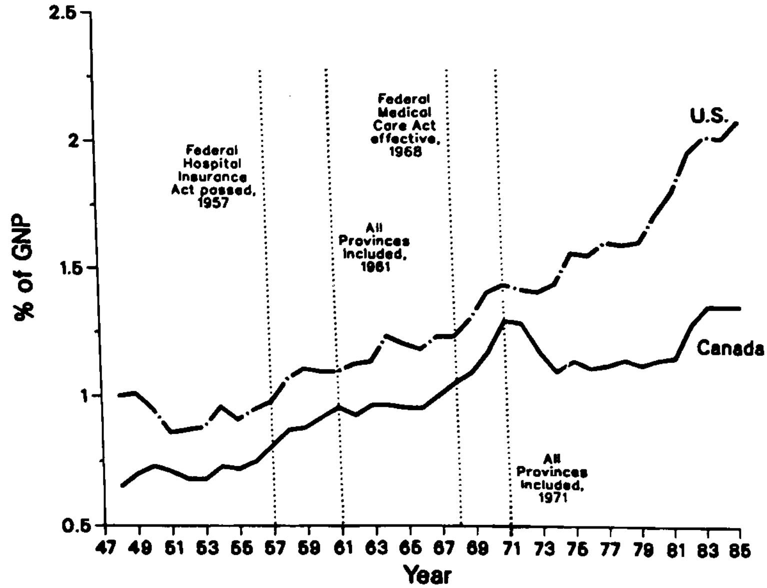

FIG. 1b. M.D. expenditure as share of GNP, Canada & U.S., 1948–1985.

The resolve with which fee controls have been applied, and their effects, have varied greatly both across provinces and over time within provinces, depending on the prevailing political and economic climate. A detailed examination of the experiences of all ten provinces, however, would tax the patience of reader and writers alike. Instead, we provide a detailed analysis of the experiences of two provinces, which are in some ways at opposite ends of the fee spectrum, and yet display important policy parallels. (A longer and more detailed report from which this article is drawn [Barer, Evans, and Labelle 1985] examines the experiences of four provinces in depth—British Columbia, Quebec, Manitoba, and Saskatchewan.)

British Columbia and Quebec were the provinces with the most and least rapid rates of fee increase over the period from 1971 to 1984. By no coincidence, they have also been the sites of some of the more innovative policy attempts to control medical care fees and costs—in one as cause, in the other as effect of fee experience. For each province, we analyze in detail the components of growth in physician costs, and relate these to the evolution of specific provincial policies.

This selection of specific provincial patterns is then set in the context of evidence from other jurisdictions on the relation between fees and utilization. The article concludes by attempting to draw lessons for the United States from the Canadian experience.

Paying the Doctor in Canada

Canada is often described, particularly by external observers, as having a national health insurance system. (It is sometimes even less accurately described as "socialized medicine," an expression that has long since ceased to have any agreed-on meaning, other than as a disapproving noise.) Like all generalizations this is false, or at least misleading. The distinctively Canadian form of financing is more accurately described as a federal-provincial system of public reimbursement for the costs of hospital and medical care, most of which is provided by private medical practitioners and not-for-profit hospitals. The former are paid fees for their services, the latter receive annually negotiated global budgets. The public reimbursement plans are run by each of the ten Canadian provinces, and cover the entire population for the costs of all medically necessary care, ambulatory or institutional. More detailed descriptions are available in Barer, Evans, and Labelle (1985), Soderstrom (1978), and Taylor (1978, 1986).

The federal government itself neither provides nor reimburses the providers of health care for the general population. The location of responsibility for program operation at the provincial level is required by the Canadian constitution, which places matters relating to health in the provincial jurisdiction.

Nevertheless, the Canadian insurance system is *federal*-provincial, because despite the constitutional assignment, the federal government has played a major role in its establishment and subsequently at critical points in its history (Taylor 1978, 1986). The federal initiatives have been pursued through conditional grants to the provinces. Federal legislation, which forms the cornerstone of the system, provides that Ottawa will make certain contributions toward the costs of provincial health insurance plans that conform to specific criteria established in that legislation. Since these contributions are in the range of 50 percent of program costs, the fiscal pressure created by the federal offer has been irresistible.

Over the years, both the form and the conditions of transfer have changed significantly, with consequent effects on the administration of the provincial insurance systems. But the general outline, of major but conditional federal support for provincial insurance programs varying in detail but conforming to a common pattern, has been maintained and, in the Canada Health Act of 1984, reaffirmed.

The programs covering physician and hospital services are those with which most citizens come in contact, and under which all are covered. These are the most "characteristically Canadian" form of health care financing—universal and comprehensive first-dollar insurance coverage with public administration and financing. These programs receive the most budgetary attention and are the most externally visible, but, in fact, they cover only a bit more than one-half of health care expenditures ($22.2 billion out of $39.2 billion (in Canadian dollars) in 1985) (see appendix table A1).

Government spending on health care, however, makes up about three-quarters of total health outlays (about $30 billion in 1985, or just under $1,200 per capita). These outlays receive the principal share of policy attention. Government payments to "physicians" and "hospitals," in turn, account for almost three-quarters of this spending, with the remainder distributed among province-specific categorical programs for long-term care and other items of personal and nonpersonal health expenditures.

Expenditures on services of physicians, which are the focus of this article, make up about 16 percent of health spending, in marked contrast with the United States where they reach nearly 20 percent. Nevertheless, the reimbursement of physicians takes on political and administrative importance out of all proportion to its share of total expenditures. The role of the physician in directing other servicing patterns in the health care system is obvious. Furthermore, in a fee-for-service system physicians have control of their own work patterns and can influence their own "budgets" in a way impossible for salaried workers on an administratively determined budget. Payments to physicians have historically represented the largest "open-ended" fiscal commitment of provincial governments.

In addition, physicians collectively carry more political weight than any other group in health care. Their access to the headlines, and their degree of organization and commitment, assures that their concerns will remain at or near the top of the public policy agenda. They may

not always win their points, but they can always ensure that they are debated, often to the exclusion of issues which may seem to others to be more substantial. Indeed, this overloading of the policy process, of the public debate and of the attention and energy of policy makers, may be a significant cost of the process of fee control. When everyone spends so much time arguing about how, and how much, physicians should be paid, it is hard to find time to deal with broader issues.

The Legislative Framework

The Hospital Insurance and Diagnostic Services Act (HIDS), passed by the federal government in 1957, was the first of the twin legislative pillars on which the Canadian health insurance system was built. It had a long history in federal and provincial politics (Taylor 1978), and several of the provinces had already established programs on their own initiative, starting with Saskatchewan in 1946. But the HIDS act was the basis for a universal system and served as a model for the Medical Care Act of 1966.

The key feature of the HIDS act was that public insurance coverage for hospital services was *universal,* across the population as a whole, rather than as on the American pattern in the mid-1960s, covering only selected population groups.

Furthermore, public reimbursement for included services was *complete;* it was not supplemented by either private insurance or self-payment. There was no provision for a system of general coinsurance or deductible charges, although the act did permit selected "authorized" charges. Rather than reimbursing particular patients, as a nonuniversal or partial-coverage system must inevitably do, the Canadian hospital insurance system reimbursed hospitals on a prospective budget-review basis. The patient was no longer financially involved in the transaction. Hospital costs became a matter for negotiation between individual hospitals and the provincial governments, which reimbursed them from what was de facto general revenue drawn from taxation. Thus, at a later stage, the attempts by provincial governments to control hospital costs have been fought out by direct negotiation between the parties concerned; the patient has not been involved as a "residual payer" when governments try to cut their spending.

While HIDS embodied "socialized insurance," it was not "socialized medicine." The hospitals remained, as they had been before, "voluntary"

not-for-profit organizations run by boards of trustees, very similar to the American pattern. Only the reimbursement system was taken over by government. The short-run implications of this were primarily for the distribution of the economic burden of hospital care, rather than for the control of patterns and volumes of care themselves. The long-run implications for the locus of system control, of course, are quite different.

In particular, universal coverage permitted, and indeed virtually implied, reimbursement on a budgetary basis. Reimbursement on some sort of "unit-of-service" basis would have been possible, but transparently illogical for a single payer. This, in turn, not only had implications for the success of cost control in the hospital sector, but also significantly influenced the pattern and amount of physician reimbursement. Diagnostic services, such as laboratory testing and imaging, were concentrated in the hospital and reimbursed on a global budget. Their unit costs are in consequence far below the fees charged for such services in the United States, where diagnostic services are profit centers for not-for-profit and for-profit institutions alike (e.g., Bailey 1979; Conn 1978).

Private, physician-owned labs and radiology facilities exist in a number of provinces, but the presence of the hospital sector as an alternative source of services has enabled provincial reimbursers to control the proliferation of many diagnostic services outside the hospitals by restricting physicians' rights to bill the provincial plan. Provinces may specify certain services as reimbursable to all physicians, others only to a designated subset, and still others as reimbursable only within the operating budgets of hospitals. The costs of new and expensive imaging technologies are generally reimbursable only in hospitals (or in some cases specifically approved private facilities), and then only if the initial installation has been approved. A private physician or clinic that purchased such equipment would not be permitted to bill the province for its use. Direct billing of private individuals is unlikely to develop, since private insurance coverage for publicly available services is prohibited.

By 1961 all provinces had joined the system, hospital coverage was universal, and attention was focused on physicians' services as the logical next step. As in the United States, most physicians are private practitioners who have admitting privileges at one or more hospitals, rather than being on salaried staff. Thus, hospital insurance left patients

still responsible for physicians' charges for services in hospital as well as out.

There was considerable tension and debate as to whether public medical insurance should follow the pattern established for hospitals. A minority view favored a system more on contemporary American lines, with a mix of public and private coverage, out-of-pocket payment, and distinctions among population groups. This view was championed by physician associations and insurance companies, but had no broad base of support, and was difficult to maintain in the face of the obvious success of the hospital plans (Barer, Evans, and Labelle 1985). In particular, the principles implicit in the hospital plans were expressed explicitly as the "four points" on which medical insurance was to be based—universality, comprehensivess, portability, and non-profit administration.

The federal Medical Care Act of 1966 embodied these four principles in its definition of conforming plans. For such plans, provinces were to be reimbursed 50 percent of the *national* per capita costs of "medically necessary" care, multiplied by the covered provincial population. By January 1, 1971, residents of all provinces had public medical insurance coverage. From the patient's point of view there have been few significant changes since.

Provincial plans would pay the fees for all "medically necessary" services, provided in or out of hospitals, directly to physicians. (Excluded were optional cosmetic surgery, administrative examinations, and some other minor categories.) How those fees were to be set, however, was not specified—and thereby hangs our tale.

Conflicts of Interest: Governments and Physicians

Initially, the provincial medical insurance programs followed very closely the model of their predecessors, the not-for-profit, physician-sponsored programs in each province that were affiliated in Trans Canada Medical Plans (Shillington 1972; Taylor 1978). These plans were analogous to the American Blue Shield plans, except that they required participating physicians to accept uniform fee schedules as payment in full. They had formed the backbone of private coverage for physicians' services, although for-profit firms selling a wider range of experience-rated policies were moving into the market. But the process of fee determination was significantly changed.

The uniform fee schedules used by the not-for-profit plans in the pre-Medicare years were issued at periodic intervals by physician associations. These schedules were "guides" to their members; they had no binding force on practitioners. Since they were used for reimbursement purposes by the physician-sponsored insurers, however, they were generally accepted by physicians for the uninsured population as well. Insurance premiums were then determined so as to cover the costs generated by these fee levels. Occasionally, the resulting outlays exceeded the resources of the plans, and a temporary pro rata cut in reimbursement rates was negotiated ex post facto. Such rare circumstances, however, were recognized not as a form of cost control but as an administrative error, and premiums would subsequently be raised to correct the situation.

Not too surprisingly, physicians' fees escalated steadily during the pre-Medicare period. From 1951 to 1971, phyicians' fees rose 26.6 percent relative to the general Consumer Price Index, while the combined effects of increased collections ratios, actual charges moving up toward the schedules, and de facto fee increases through changes in schedule structure added an even larger additional amount, probably 30 percent or more (Barer and Evans 1983).

When the provincial governments took over the reimbursement process, however, the balance of both interest and power was shifted. Whereas previously the physician-controlled insurance programs had essentially administered an orderly escalation of fees and incomes, under the new regime provincial governments had to bear the political costs of raising the necessary funds. Fee schedules were subsequently negotiated, not promulgated, and the negotiations became serious.

Each side, provincial government and professional association, appoints a negotiating team, and the teams meet to hammer out an agreement that must be ratified by their principals—the provincial cabinet and the members of the professional association. The negotiations have become progressively "professionalized" as particular civil servants have specialized in this function, and recently some associations have employed professional negotiators.

The general form of the fee-schedule negotiations was carried over from the earlier not-for-profit plans: the medical associations determine the structure of the fee schedules and the bargaining is over the percentage increase in the whole structure. At each negotiating session (now usually annual in each province) the pattern of utilization of

services or number of items billed in each fee-schedule category in the previous period is adjusted upward to allow for the estimated effects of increases in population and in per capita utilization rates (the latter correlating closely with increases in numbers of practitioners). This is used as a base to estimate what the total expenditures/receipts would be under the old schedule. The struggle is then over the percentage increase in this global amount, with the outcome of the negotiations expressed as an average percentage increase in the whole schedule.

In consequence, the negotiations are always implicitly, and usually explicitly, about incomes. Since the physician stock in any province for the period subsequent to negotiations can be projected quite accurately, and the ratio of gross to net incomes is stable over short periods of time, the determination of projected gross outlays by the provincial government is simultaneously determination of the gross receipts of the physician community, and thus average gross receipts per physician and, more or less, average net incomes (before tax).

Indeed, discussions in the news media commonly refer to the bargaining as taking place over physicians' "salaries," which is quite inaccurate in a fee-for-service system, but does express the underlying reality that it is average income levels, not the level of reimbursement for particular items, that is at stake.

Moreover, increases have historically tended, in most provinces, to be approximately proportionate across the whole schedule, in effect increases in an implicit fee per "relative value unit" (RVU). Revisions to the internal weights of the schedule are politically difficult and dangerous for the profession; they tend to undermine and fragment the united front by pitting different groups of physicians against each other (McQuaig 1986; *Canadian Medical Association Journal* 1986).

Provincial governments have, in general, not made extensive use of the potential power to steer or manage the medical care process by manipulating the internal structure of the schedule. And, in any case in an inflationary environment, proportionate revisions in the effective RVU serve to stabilize real incomes without raising additional issues. There are, however, important qualifications to this general characterization of the implicit process of negotiating over incomes.

First, there is the problem of "cost creep," or the process of increase in total provincial outlays and average physician incomes, independent of increases in fees—a process which is a major focus of this article.

Such "creep" can occur in several ways. A new, demanding, and uncommon procedure or technique will commonly be introduced at a high fee (and small impact on overall outlays), but subsequently come into common use (and cost) without downward adjustment in the fee. Or a procedure or service may be comparatively trivial when undertaken in conjunction with a related service (e.g., extra patient seen on home visit) but the fee schedule does not distinguish between single and multiple services. A shift in service patterns can then increase billings. More generally, performance of a procedure or service may proliferate if the reimbursement rate exceeds the cost to the practitioner in terms of time and trouble. Finally, if the distinctions between services are imprecise, latitute is provided for physicians to "relabel" services for higher reimbursement rates.

Second, provincial governments or medical associations have, from time to time, objectives in the negotiations that are only partly related to the overall level of expenditure, but which involve shifts in the relative value structure of entire blocks of a fee schedule. Current efforts by general practitioners in a number of provinces to increase the level of their fees relative to those of specialists is a case in point (Rich 1987). Similarly, Boutin (1979) describes the 1976/1977 Quebec accords as embodying selective increases intended to promote several government objectives: to favor ambulatory over hospital care, to encourage the growth of home care, and to halt the trend toward more costly examinations.

Historically then, governments have dealt with the problems of "fee creep" and specific objectives by trying to negotiate a combination of selective increases or decreases in particular fees, and of more or less ad hoc rules governing the reimbursement of problematic items. They have also tended to avoid fine distinctions in the fee schedule, such that problems of monitoring would make control impossible. An office visit is an office visit and the reimbursement rate is not sensitive to its content, because that content would be very difficult for a reimburser to check. The result is a reimbursement system that encourages quick and frequent visits, and penalizes practitioners who choose not to practice in this way. The implications for quality and efficacy of care are, of course, unknown.

This negotiating process need not, however, always find closure, leaving the very important and politically difficult question of what happens, or should happen, when agreement is *not* reached. This issue

has been a problem since the beginning of the public plans, and quite probably will remain so indefinitely. In the old days of physician-sponsored insurance plans, medical associations simply promulgated their new schedules, and insurers found the money to pay them. Under the public regimes, physicians complain that the situation is reversed. Provincial governments can, if they choose, simply impose schedules, and no true negotiation takes place.

There is clearly some truth to this claim, although the negotiating process is intensely political and is often played out, especially in case of conflict, before the general public as well as provincial treasury boards and medical association members. Individual physicians have direct access both to patients and to individual members of provincial parliaments, and, therefore, have powerful lobbying channels to get their message across. "Image" advertising by medical associations is becoming increasingly common; it can hardly be countered by "negative image" responses! And the climax of bargaining is often accompanied by what the British call "shroud-waving"—if physicians' incomes are unsatisfactory, the quality of care will fall (for reasons never fully spelled out). Threats of collective "job action" and "study sessions" by physicians have accompanied some negotiations, though actual strikes are rare and politically dangerous for physicians, as demonstrated by the recent strike in Ontario. But in the end the provincial government can determine what fees it will pay on a "take it or leave" basis.

This situation, however, is a recent development. For the entire period covered by our analysis in subsequent sections of this article, physicians in some provinces had other options, which are described in detail elsewhere (Barer, Evans, and Labelle, 1985). These involved billing patients directly in addition to, or instead of, billing the provincial plan at prevailing rates. Such extra billing, though practiced by very few physicians, was widely viewed by the profession as a "safety valve," protecting not only incomes but its "professional autonomy" as well.[2]

By the public, however, such charges were viewed as taxes on

[2] The existence of direct billing of patients creates a problem for accurate description, though not for quantitative analysis. The general picture, that for over 15 years all medically necessary services have been free to the whole population at time of use, with physicians reimbursed at fee schedules uniform within each province, is valid. Extra billing never accounted for more than 5 percent of total medical care costs nation-wide, and was virtually nonexistent in the two provinces selected for more detailed statistical examination.

illness and breaches of the universal accessibility provisions of Medicare. Provinces permitting such charges were accordingly subjected to federal financial penalties through the enactment of the Canada Health Act in 1984. In the subsequent three years, such charges have virtually disappeared.

But the suppression of extra billing leaves open the question of how failures to reach agreement over fee schedules will be resolved in future. Justice Hall, acting as special commissioner for the federal government to examine the health insurance system, recommended some form of compulsory arbitration (Hall 1980). This was strongly rejected by both provincial governments and physicians' associations. The former fear the generosity of arbitrators who are not responsible for raising the funds required by their awards, and point to the difficulty of reconciling this procedure with the ultimate constitutional principle of parliamentary accountability for expenditure. The latter appear to feel that they are ethically entitled to set their own fees and incomes, and to recover any difference between their objectives and governments' willingness to pay from the patient. Abandoning this principle is alleged to make them "civil servants," and there is even more heated rhetoric about "civil conscription." Clearly, the underlying problem of competing legitimacy has not yet been put to rest.

While the resolve with which fee control was applied has varied considerably across provinces, the process described above is representative of that in each province. The overall effects of this "Canadian experience," and their contrast with that in the United States, are revealed in the following section.

The National View: Aggregate Canadian Experience

Over the whole period from 1971 to the mid-1980s, the Canadian experience provides strong support for the hypothesis that utilization per physician increases to offset controls on fees. From fiscal years 1971/1972 to 1983/1984, physicians' fees (as reported in the federal government's annual reports required by the Medical Care Act) lagged behind the general inflation rate (Consumer Price Index) (CPI) by an average of 1.7 percent per year—falling a total of 18 percent in real terms (appendix table A2). Utilization per physician, however, rose

at an average rate of 1.4 percent per year, such that "real billings" (billings per physician, after adjusting for general price increases) fell a total of only 3.4 percent over the twelve years.

A closer look at the annual data, however, shows a more complex picture. There appear to be two distinct "regimes" or patterns of behavior in the data, one from 1971/1972 to 1975/1976, and the other from 1977/1978 to 1983/1984, with an intermediate or transition stage between 1975/1976 and 1977/1978. Moreover, these different statistical "regimes" correspond to the administrative history of the period. Indeed, as we shall see later, the "national" picture from 1975/1976 to 1977/1978 is heavily influenced by very significant changes which took place in Quebec.

Real (inflation-adjusted) fees dropped by 18 percent between 1971/1972 and 1975/1976, or 4.7 percent per year. The net movement since then has been to all intents and purposes zero. It would appear that, after 1975/1976, the balance of interests and power in the negotiating process has led to a pattern of stability in real fees.

There is some year-to-year fluctuation, reflecting lags in the negotiation process. Fee-schedule adjustments tend to run behind unanticipated increases or decreases in the overall inflation rate. There is also considerable variation among the different provinces. But these fluctuations and variations average out at the national level, over a longer time horizon.

Utilization per physician (billings adjusted for the change in fees) rose rapidly in the early 1970s, consistent with the "target income" view of physician behavior. The increase of nearly 10 percent from 1971/1972 to 1975/1976 was not, however, large enough to offset the decrease in fees; "real billings" per physician (adjusted for increases in the CPI rather than in physicians' fees) fell by about 10 percent over these four years. This suggests that a sufficiently aggressive fee-control policy may overwhelm the utilization response.

Since 1977/1978, however, utilization per physician has settled down to a steady growth (average, Canada-wide) of about 1 to 1.5 percent per year. Superimposing this rate of increase on stable real fees results in an average annual increase of about 1 to 1.5 percent in real billings. Canadian physicians have managed to maintain growing real incomes, in the face of stable real fees, by steady increases in billing activity.

These increases translate into steady increases in services per person

covered. Utilization per capita, however, is also affected by trends in physician supply. Rapid physician immigration drove up the physician-to-population ratio very rapidly in the late 1960s and early 1970s. But in February 1975 physician immigration was sharply curtailed by changes in federal immigration rules, and the growth in physicians per capita fell from nearly 4 percent annually to about 2 percent. Correspondingly, growth in utilization per capita fell from 6.2 percent (annual average 1971/1972 to 1975/1976) to 3.4 percent (since 1977–1978).

The early 1970s seem to have been a "shake-down" period, followed by a period of stable but unspectacular growth. Steady growth rates in both physician supply and utilization per physician, however, may eventually cumulate to create substantial fiscal pressures. By the mid-1980s these pressures have apparently become severe enough to require further changes.

The annual reports under the Medical Care Act provide data only at the federal level, from 1971/1972 to 1983/1984, being concerned only with the operations of the public insurance plans. The federal Department of National Health and Welfare also compiles, however, National Health Expenditures tabulations, including expenditures on physicians' services, which are very comparable to the similar American data set. These are currently available by calendar year to 1985, and by province back to 1960. The national total is estimated back to 1926.

These data enable us to examine total expenditures on physicians' services— in or out of public plans—for Canada and the United States relative to the total population, to physician stock (whether or not in private, fee-for-service practice), and to fee levels relative to the general inflation rate. They are assembled, with sources, in appendix table A3.

From 1971 to 1985 fees in Canada rose more slowly than in the United States, by an average of 6.9 percent per year compared with 8.3 percent. At the same time, however, general price levels were rising more rapidly in Canada. (Unfortunately, in the United States there is a significant difference between the two most commonly used measures of general inflation, the all-items Consumer Price Index, and the more comprehensive implicit price deflator for Gross National Expenditure (GNE), over this period. Accordingly we present comparisons with both in table 3; both tell the same general story, but

the United States/Canada contrast is much more marked when one uses the GNE deflator.) Relative to the Consumer Price Index, physicians' fees in Canada *fell* by 15.9 percent from 1971 to 1985; in the United States they rose by 15.6 percent. In real terms, then, American fees outpaced Canadian by 37.5 percent, or 2.3 percent per year, over fourteen years.

If the Gross National Expenditure deflator is used instead as the measure of price change, the implied overall American inflation rate is substantially lower and real American fees rise more rapidly—22.3 percent—over the 1971 to 1985 period. The United States/Canada discrepancy increases to 49.3 percent, or 2.9 percent per year, sustained for a decade and a half. It should be no surprise if American physicians regard Canada as the Frozen North!

As noted above, however, the really large drop in real fees in Canada was concentrated in the 1971 to 1975 period. After 1975 physicians' fees have more or less kept pace with inflation. From this perspective, the dramatic squeeze on real fees was a short-term phenomenon at the beginning of the public programs, now long over. (Interestingly enough, the United States went through a similar, although much less pronounced, period of falling real fees in the early 1970s, suggesting that the Economic Stabilization Program was not wholly without effect. The American fall, however, was much smaller, about 5 percent, and turned around earlier; the Canadian drop bottomed out at over 20 percent.)

The post-1975 history, however, shows a continuing, though more slowly growing, discrepancy with American experience. While in Canada real fees have been virtually stable from 1975 to 1985, in the United States they have risen (depending on one's choice of measure of general inflation) 17.8 percent or 25.3 percent. More recent data show the gap widening even further, despite much anticipation in the United States of the hypothesized effects of a physician "glut" and a more competitive market. In 1986 physicians' fees in the United States have risen nearly 6 percent in real terms, while remaining stable again in Canada (*Medical Benefits* 1987; Canada, Health and Welfare Canada, unpublished data).

How did physicians in the two countries respond to these differences in fee trends? To measure this, we have constructed indexes of "real" utilization or activity levels per physician similar to those reported from the Medical Care Act annual reports in appendix table A2. We

divided reported total expenditures on physicians' services in each country by an index of fees and then by total numbers of physicians. These activity indexes are set equal to 100.0 in 1971 in each country.

These indexes show that, in accordance with the arguments made by some American critics of fee controls, apparent activity levels per physician *do,* in fact, rise substantially faster in Canada, 25.1 percent compared with 7.0 percent. Moreover, while most of this increase occurred in the 1971 to 1975 period—13.6 percent or over 3 percent per year—utilization per physician continued to grow at about 1 percent per year after 1975. Interestingly, the increase in apparent output per physician in the United States also rose fastest in the early 1970s, just when real fees in the United States were falling. But it rose much less rapidly than in Canada and, as noted, real fees in the United States fell much less.

The increases in activity per physician in Canada have been large enough to offset the fall in real fees. Multiplying the index of real fees by the index of activity levels per physician, one gets a measure of "real billings" per physician, or expenditures per physician adjusted for the general price level. This measure of real billings *rose* by 5.2 percent (or 2.5 percent, depending on whether one measures inflation by the CPI, or by the GNE deflator) over the whole period of 1971 to 1985. In the earlier period, 1971 to 1975, physicians could not keep up with rapidly falling real fees. But over the next decade, they recouped the loss in real incomes, with a little to spare.

While they increased their billing activity more rapidly than their counterparts in the United States, however, Canadian physicians were not able to make up for their shortfall in real fees. Real billings per American physician rose 23.7 percent, or 30.9 percent, (depending on ones choice of inflation measure) from 1971 to 1985. Canadian physicians, therefore, fell behind by either 15.0 percent or 21.7 percent—a substantial amount either way. For the post-1975 period the numbers are smaller: Canadian physicians fell behind by 6.6 percent or 10.1 percent. The major adjustment had taken place by 1975, but the gap in average inflation-adjusted outlays per physician continues to grow slowly.

The world did not, however, begin in 1971. One might reasonably ask if the divergences between American and Canadian fee and utilization trends began at that date, or whether they were of longer standing. The answer to this question, however, requires us to go quite far

back in time. The years immediately prior to 1971 are the time of introduction of the provincial plans, which came in at different dates, and which significantly affected the rates of fees collected and the billing patterns of physicians. These years show nominal rates of increase of activity per physician which are too high to be credible, as well as being inconsistent with contemporary evidence, indicating that the data on fee increases, collected if not posted, are badly biased downwards (Barer and Evans 1983).

Such data as are available, however, indicate that in the years prior to 1968, Canadian physicians' fees rose faster than the general price level, and by about the same margin as in the United States. Utilization per physician rose in both countries as well. The roughly parallel movement of medical expenditures as a share of national income, shown in figure 1b, had its counterpart in parallel movements in the expenditure components.

It is the introduction of public insurance, and of fee negotiation, that ushers in the large discrepancies in fee trends. The impact of this fee control, or at least limitation, is less marked on inflation-adjusted expenditures per physician than it is on fees *per se;* physicians do, apparently, respond by increasing their billings. But the net effect of fee control is still noticeable, relative to both pre-Medicare patterns and contemporary American experience. While now much less dramatic than in the early years of the program, it is still associated with a difference in cost escalation of about 1 percent per year.

Disaggregating the National Experience

One would be wrong to conclude from this, however, that direct control of fees is necessarily limited to such small, though nontrivial, impacts. The aggregate Canadian experience is a combination of the outcomes in ten different provinces with quite varied political priorities and economic circumstances. These are reflected in corresponding differences in patterns of physicians' fees and apparent activity levels. Table 1 displays, on a base of 1971 = 100.0 in each province, the levels of "real" fees adjusted to the national Consumer Price Index in each of the provinces in 1975 and 1985. The table also includes the corresponding activity levels by province and the product of these two—"real billings" per physician.

The extreme Quebec experience stands out in sharp relief. In Quebec

TABLE 1
Indexes of Inflation-adjusted Fees and Billings, and of Real Output per Physician*, by Province, 1975 and 1985 (1971 = 100.0, each province).

	"Real" fees		Activity per physician		"Real billings" per physician	
	1975	1985	1975	1985	1975	1985
Nfld.	87.0	79.2	104.5	129.4	90.9	95.4
P.E.I.	84.1	80.6	102.3	105.5	86.0	85.1
N.S.	101.1	104.2	102.2	99.4	103.3	103.5
N.B.	81.4	81.8	106.9	135.7	87.1	110.9
Que.	72.1	56.6	130.5	145.9	94.1	82.6
Ont.	81.0	89.1	109.6	122.9	88.7	109.5
Man.	80.3	76.6	98.1	109.2	78.7	83.7
Sask.	89.7	96.9	97.5	108.0	87.4	104.7
Alta.	83.2	87.9	127.3	129.3	105.9	113.9
B.C.	101.3	101.4	113.5	123.0	115.0	124.7
Canada	82.4	84.1	113.7	122.4	93.7	102.9

* The measure of "physicians" used in these calculations differs from that in appendix table A3, by excluding interns and residents from the total of "active civilian physicians (ACP). This, of course, raises the level of "real billings" per physician, but at the national level makes very little difference to the trends. The inclusive ACP definition used in appendix table A3 is consistent with the American sources, and is available farther into the past. For certain provinces, however, and Quebec in particular, the exclusion makes a great deal of difference. Since subsequent provincial data on detailed service patterns are based on the activity only of fee-for-service physicians, it is appropriate at this point to exclude the hospital-based interns and residents. See the appendix for further details.
Sources: Calculated from fee data in Canada, Health and Welfare Canada 1986, expenditure data in Canada, Health and Welfare Canada 1987, and physician numbers in Canada, Health and Welfare Canada, *Canada Health Manpower Inventory*, various years.

fees fell faster than elsewhere during the contraction of 1971 to 1975, 27.9 percent compared with 17.6 percent for the national average, and they went on falling another 21.5 percent from 1975 to 1985.

But Quebec *is* part of the national average; the province makes up about one-quarter of the Canadian population. The other nine provinces taken together show a rebound in real fees of nearly 10 percent between 1975 and 1985. The "Canadian" data after 1975 combine two quite different experiences—Quebec and the rest.

The major quantity response to fee control, a combination of increased

productivity, procedural multiplication, and relabelling, has occurred in Quebec. Utilization per physician rose 45.9 percent in Quebec over fourteen years, or 2.7 percent per year, compared with the national average of 1.5 percent. With Quebec removed, the residual national average would be about 1 percent. At the same time, of course, physician supply per capita was rising rapidly all across the country.

The Quebec experience thus dramatically confirms the hypothesis of a linkage between control of real fees and an offsetting increase in apparent activity per physician. But the rapid growth in billing activity was not enough to offset the fall in fees. "Real billings" per Quebec physician fell by 17.4 percent between 1971 and 1985, while the national average was rising 2.9 percent.

In the 1971 to 1975 period, increased activity per physician *did* offset much of the fall in real fees. But after 1975 the situation has obviously tightened in Quebec while loosening up elsewhere; the national average rose 9.0 percent while Quebec fell 12.2 percent. Indeed, this loosening in other provinces was such that, if one restricts the focus of attention to the remaining nine provinces and to the period after 1975, much of the differential between Canada and the United States in trends in "real billings" disappears.

Fee negotiation has continued to limit the rate of fee escalation in the other provinces relative to contemporary American trends, but faster increases in utilization in Canada have largely offset the impact on real expenditures per physician. Only in the early 1970s, and subsequently only in Quebec (and perhaps Manitoba), has fee control translated into expenditure control.

But the link between relative fees and utilization per physician is not always tight. There was no significant reduction in real fees in British Columbia before or after 1975. Yet, billing activity per physician rose nonetheless, and at about the same rate as the national average. "Real billings" per physician in British Columbia, therefore, gained over 20 percent relative to the national average level by 1985, all due to above-average rates of increasing fees. British Columbia is an obvious outlier on the high side, as Quebec is on the low.

The other eight provinces are distributed between these two extremes as illustrated in table 1 (and discussed in more detail in Barer, Evans, and Labelle 1985). Overall, however, real billings are high where real

fees are high, and low where low. Offsetting behavior clearly occurs, and New Brunswick is a general exception, but, on average, greater increases in fees lead to greater increases in payments.

Nevertheless, the variability in outcomes is remarkable. British Columbia physicians increased their real billings, on average, by 40 percent relative to Quebec in the space of fourteen years. Fee negotiations matter. Moreover, the diversity of patterns of activity response emphasizes the fact that there is much more to fee negotiations than simply haggling over the dollar value of the implicit relative value unit. The schedule structure, rules of payment, and institutional environment, as well as perhaps the professional "culture," can have a powerful influence on how physician activity levels respond to changes in real fees, and on the resulting expenditure patterns.

Selected Provincial Experiences

The following sections are based on data published by the respective *provincial* medical insurance plans. These sources provide detailed data on specific medical services, and enable us to focus on those physicians paid by fee for service. These represent the vast majority of all physicians, but there are also significant numbers paid on a salary or sessional basis, particularly for some hospital-based subspecialty services. This shift in data sources and coverage leads to some quantitative inconsistencies with the numbers presented above, although the qualitative story is not changed.

Quebec

Over the period from 1971 to 1985 fees in Quebec rose an average of 4 percent per year in the face of an 8.2 percent average national rate of inflation. But this rapid erosion of physicians' real fees is only the surface of the unique Quebec experience. Three events have particular bearing on the issues addressed in this article (Contandriopoulos 1986). First, Quebec physicians received *no* fee increase over the period from 1970 to 1975, and then only a 1 percent increase in 1976. The C.P.I. rose 53 percent over these years, so Quebec physicians began the Medicare period with a massive cut in real fees.

Second, an apparent 16.5 percent increase in fees in 1977 was, in reality, much less, involving a repackaging of fee items that severely reduced the number of billable procedures, and the opportunities for future procedural multiplication. Thus, much of the increase reflected the incorporation of 26 diagnostic and minor therapeutic procedures, performed as a result of an examination or consultation, into the examination or consultation fee. Similarly, minor surgery performed concurrently with major surgery was no longer separately billable, but incorporated into an appropriate fee item, and specialist procedures performed by practitioners without the appropriate specialization received reduced fees (Quebec, Régie de l'Assurance-Maladie du Québec 1978, 23).

Third, the agreements that came into force in November 1976 (general practitioners) and January 1977 (specialists) saw the introduction of individual "income ceilings" for general practitioners, and ex post facto fee adjustments, based on average gross receipts, for all practitioners. Once a general practitioner reached the ceiling, subsequent claims for the trimester were reimbursed at 25 percent of the allowable fee. Increases to this quarterly ceiling have been negotiated each year; by 1984 it stood at $32,504 (A-P. Contandriopoulos 1985, personal communication).

The second part of the incomes policy, directed at all physicians, took the form of an adjustment to fee levels in response to average income growth. In 1984 the targets were $96,779 for general practitioners and $118,725 for specialists; the cut-offs for inclusion in the average income calculation were $8,284 per quarter for general practitioners and $30,300 per annum for specialists. If incomes exceed these targets, fee increases for the next period are adjusted downward so as to bring income growth in line with provincial growth targets (S. D'Annunzio, A.-P. Contandriopoulos, 1985, personal communications).

Associated with this package of policy initiatives in 1976–1977 is a sharp break in Quebec's record of global payments to fee-for-service physicians. Growth was over 2 percent per annum faster before 1976 than after. Population growth was not a significant factor. Real cost per capita has *fallen* by 0.54 percent per year since 1977, and by 1982 was lower than in 1971! There has been a sharp turnaround since then which will bear watching, but the overall picture is one

of remarkable stability. (Appendix Table A4 contains annual data on total and per capita cost, nominal and real, as well as fee-adjusted per capita cost.)

But while real per capita costs were flat, fees and utilization definitely were not. Nominal fee levels rose a total of 1 percent over the period from 1971 to 1976, implying a drop in the purchasing power of physician fees of some 7.5 *percent per year for five years*. The slow growth in real costs per capita in the face of the sharp decline in real fees reflects the dramatic increase in utilization over this period. While fees were held constant from 1971 to 1976, services per capita grew at an annual rate of 9.6 percent, or a cumulative increase of 58 percent in utilization *per capita*!

While the subsequent erosion in real fees has been less severe, it has still averaged a substantial 3 percent annually since 1977. The rate of growth in per capita utilization has also been much slower—2.5 percent annually.[3] Average real incomes of physicians continued to fall as physician supply continued to grow. Since 1982 real incomes of physicians have recovered somewhat, on the strength of a sustained increase in per capita use of services, and (in two of the three years) real fee growth (appendix table A4). This represents a novel trend in Quebec.

The 1977 policy of incorporating a number of minor diagnostic and therapeutic procedures within the corresponding examination or consultation fee was a response to rapid increases in billings for such procedures. In the face of constant fee levels, "actes complementaires" (diagnostic and therapeutic procedures, surgical assists, and anaesthesia) *per capita* rose about 14 percent per year prior to 1976 (appendix table A5).

Growth in the provision of basic services (consultations, examinations, and surgery) over the period from 1971 to 1976 was a less dramatic but still substantial 8.4 percent per capita per year—split roughly 60:40 into increased services per capita and a shift toward a more costly mix of services (Barer, Evans, and Labelle 1985). In particular,

[3] The large fee increase with item restructuring of 1977 has associated with it a sharp reversal in implicit utilization. But, of course, even in the face of the income ceilings, both the fee increase and the decline in utilization are overstated because of the consolidation of the 26 ancillary fee items. Accordingly, there is little one can infer about experience from 1976 to 1977, at least at this level of aggregation.

there was a steady shift to the more comprehensive, higher fee types of examinations.

Increases in procedural frequency thus buffered physicians' incomes against the drop in real fees in the early 1970s; this need not indicate that physicians deliberately chose to perform more of such services in order to maintain their incomes. Conceivably physicians were simply responding to the availability of new services and/or of new public resources to pay for previously available services, and were shifting their practice styles in a direction which they regarded as better quality patient care. This would imply that the increase in procedural frequency would have occurred even if real fees had not fallen; if so, the quantitative impact of fee controls on total expenditure would be much greater than we have suggested above.

This alternative view must always serve as a qualification to the suggestion that falling (real) fees *caused* a quantity response. But available data on patterns of procedural utilization, as well as the policy responses of the Régie de l'Assurance-Maladie du Québec, are consistent with the causal inference.

First, the rapid increases in the numbers of ancillary services performed were accompanied by little change in their average cost (appendix table A5), suggesting proliferation rather than innovation. Secondly, by 1975 there was for general practitioners (GPs) a clear pattern of association between the gross receipts of a physician and his/her provision of ancillary services. GPs in the highest-income class (over $100,000) provided more than three times as many complementary procedures per patient contact as those in the lowest class ($20,000–$40,000), at a lower average cost per procedure (Boutin 1979, table 7). Relative to the average for all GPs, the highest-income physicians earned four times as much, on average, from such procedures. Procedures were profitable.

Not surprisingly, other GPs were moving toward the high-cost style. Boutin found that between 1975 and 1976 the frequency of provision of other procedures per patient contact rose in every GP income class but the highest, and rose faster the lower the income class.

The Regie de l'Assurance-Maladie du Quebec clearly regarded the practice styles of the "high rollers" as inappropriate rather than as worthy of emulation. The combination of individual practitioner ceilings and elimination of separate reimbursement for the 26 minor procedures

struck hardest at the upper levels of the income scale. As pointed out below, at least in the short run these measures had more effect on the distribution of incomes than on the average level. This supports an inference of a deliberate attempt to *discourage* large numbers of procedures per contact.

Per capita utilization of actes complementaires dropped by 17 percent in 1977 (from $17.59 to $14.55—table A-5), reflecting 35 percent fewer services billed, plus some combination of (i) increased relative fees for those ancillary service items not consolidated, and (ii) the fact that the remaining ancillary services were, even in the absence of fee increases, the more costly (on average) of such services. The average price for separately billed ancillary services was almost 50 percent higher in 1977 than in 1976.

The year 1977 does not generate the same sort of anomaly for the base services, because the fee item restructuring affected primarily actes complementaires. Nevertheless, growth in fee-adjusted cost per capita was significantly slower than in any of the years between 1971 and 1976, reflecting a halt in the growth of examinations and the incorporation of minor surgery fee items within major surgical procedures.

Since 1977 billing trends have been quite different. Utilization per capita has grown far more slowly (2.5 percent per year vs 9.6 percent from 1971 to 1976 [appendix table A4]). Base service costs per capita have grown far less rapidly, with the decline coming both in rates of servicing and in relative unit costs. But the change was even more marked for ancillary services. Subsequent to the restructuring of 1977, there has been virtually no overall increase in ancillary service utilization per capita. The shift from à la carte to inclusive billing clearly had the intended effect of choking off growth in utilization of (or at least in payments for/reporting of) diagnostic and therapeutic procedures.[4]

[4] The data for 1977 to 1985 show, however, an actual *decline* from 1977 to 1984, with a sharp uptick in 1985. This may reflect a new change in physician billing patterns, which would require a further response by RAMQ. The sharp increase in average fee-adjusted cost per acte complementaire since 1983 has been accompanied by an equally dramatic decline in the number of such services provided per base service, and even per capita, from a peak of 2.02 in 1983, to 1.81 in 1985. The major changes since 1983 have been in actes therapeutiques. The highest frequency item in this category, injection of a sclerosing agent for varicose veins, was phased out because of its perceived abuse by physicians (A. Saucier, personal communication, 1987). From over 30 percent of all actes therapeutiques under $15 in 1983, billings

Within this period, however, the year 1980 is of particular interest. Physicians received a 1.3 percent fee increase, while general prices rose 10 percent. Real fees thus dropped 8 percent in one year, the most significant erosion since 1975. There was a concurrent significant shift toward a more costly mix of ancillary services, and a 3.8 percent increase in the number of such services per capita. In no other year since the restructuring does this occur simultaneously, suggesting again that practice patterns shifted under the extreme pressure on real fees. It should also be noted, however, that in this period there was both a strike of hospital workers and a temporary removal of the income ceilings (Québec, Régie de l'Assurance-Maladie du Québec 1982, 48). The former likely had a bearing on the increasingly costly mix (more work done in private offices), and the latter on the overall increased rate of servicing.

Per capita utilization of all three categories of base services (examinations, consultations, and surgical procedures) also increased rapidly in 1980. In particular, consultations rose 10.6 percent. (Recall the temporary removal of the income ceilings.) Furthermore, there was both rapid growth in surgical rates and a significant mix shift toward more costly surgical procedures.

In general, however, the period of 1977 to 1985 shows no dominant pattern of association between year-by-year changes in relative service costs among components of base services, and corresponding service utilization. Surgical procedures showed a relative decline in per service costs, but also the slowest growth in utilization. The fastest growth in servicing was in consultations, whereas the relative cost of examinations grew most rapidly.

The policy of rigorous control over fee increases, and latterly over rates and patterns of utilization, was imposed on a rapidly increasing supply of physicians, with significant implications for physician incomes. The number of physicians in Quebec increased 67 percent over the fourteen years, 3 percent per year faster than the general population. This growth was most rapid in the early 1970s; from 1971 to 1976 the supply of physicians rose over 6.3 percent per year.

During this five-year period fees rose only 1 percent, as noted above, falling behind inflation rates at an average rate of 7.5 percent

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for such injections virtually disappeared in 1985. Since it was an extremely low cost item ($1.50 in 1983), this would account for much of the observed shift in servicing and cost per service among actes complementaires.

annually. Yet, utilization per practitioner increased 3.8 percent per year, holding the loss in real income to 4 percent per year (appendix table A6). Despite the increase in their numbers, physicians continued, on average, to provide a virtually constant number of base services while each increasing the provision of auxiliary services by over 8 percent per year!

The period from 1977 to 1985 was one of slower growth in the supply of physicians (2.3 percent annually vs. 6.3 percent), and of much faster growth in nominal fee levels. But with a rise in the rate of general inflation in this later period, and a dramatic drop in the rate of increase in utilization per physician, real incomes continued to fall at about the same rate (3.9 percent per year) from 1976 to 1982. Only in the most recent three years has there been any real recovery.

This decline in service provision per physician shows up most vividly in the contrasting patterns of billing for actes complementaires. Relative to base services, the number of actes complementaires actually fell over the period from 1977 to 1985, in sharp contrast to the almost 9 percent per year relative growth for the period from 1971 to 1976 (appendix table A5). With many of the most frequently employed ancillary service items embodied within base services, the opportunity for increased utilization would appear to have been shut down.

The post-1976 experience reflects the combined effects on utilization of restraints on overall fee increases, fee item restructuring, individual practitioner income ceilings, and the setting of target average incomes. The first and last of these are really indistinguishable, since average incomes above targets are reflected in next period's overall fee pressure. The comparison of the two periods shows a major change in utilization trends. General pressure on fees was not the whole story.

The change, in turn, is principally a consequence of fee item restructuring. Analysis carried out by the Régie de l'Assurance-Maladie du Québec (Boutin 1979) indicated that the individual (gross) income ceilings affected no more than 6 to 7 percent of general practitioners in the first year. The individual ceilings were estimated to account for an average drop of about 15 percent in patient contacts per GP among those billing over $100,000 per year in the first year of the agreement (1977 over 1976), but less than 5 percent in the next (gross) income group, and there was no detectable change across the whole GP group studied.

Boutin concluded that while high earners were substantially affected, as might have been expected, they represent such a small proportion of the total GP population that the overall impact is at most 2 to 3 percent. It is also possible that other GPs were picking up the patient contacts dropped by the high earners. The high earners reduced their days of work (longer vacations) and their contacts per day worked. But again these rates showed no change for the whole group of GPs, suggesting a redistribution of work load rather than an overall reduction.

The income ceilings affected very few physicians, at least in their initial implementation, and had little or no impact on overall utilization. The consolidation of minor diagnostic and therapeutic procedures within patient contact (examinations, consultations, etc.) fees must, therefore, have been the major causal element in the dramatic change in per capita utilization trends in Quebec after 1976.

To summarize the aggregate Quebec experience with universal medical insurance: over fourteen years fees rose 73 percent (all since 1975), but in real terms (relative to the Consumer Price Index) they actually *fell* 43 percent! Utilization per capita, however, rose by a remarkable 88 percent, so that real cost per capita actually rose slightly (0.5 percent per year). This rapid increase in utilization, combined with the increase in fees after 1976, raised fee payments *per capita* by 225 percent over the fourteen years.

The minimal increase in real expenditures per capita, distributed across a physician supply which increased by 67 percent, led to a fall of about 30 percent in real (gross) income per physician. But it is notable that, despite the large increase in their numbers relative to the population, utilization per fee for service physician rose 23 percent!

This experience suggests three general themes. An increase in physician supply translates directly into increased servicing and costs, through proportionate increases in patient contacts. Downward pressure on fees, on the other hand, results (where possible) in increased rates of ancillary servicing per contact and/or a shift to more costly types of contact. Finally, changes in the overall structure of the fee schedule can have a very significant impact on the extent to which physicians can offset pressure on fees with increases in utilization. These themes reemerge in the experience in British Columbia, which also provides additional information on the effects of overall ceilings or caps on medical outlays.

British Columbia

At the other pole of the Canadian experience, fee increases have kept British Columbian physicians at or near the top of the national heap since 1971. By 1983/1984, physician fees in British Columbia were about one-third above the national average (Canada, Health and Welfare Canada 1986; Barer and Evans 1986). Fees were frozen for the next two years; in addition, a global expenditure cap was negotiated in 1985/1986. That cap came off for part of 1986/1987, but a new one was imposed about half-way through that fiscal year.

Over the twelve years from 1973/1974 to 1985/1986, total fee-for-service payments for medical services in British Columbia increased almost 400 percent, or over 14 percent per year. (British Columbia provincial sources do not provide detailed data on services and payments prior to 1973–1974.) With general Canadian prices increasing about 8.5 percent per year, and the population of British Columbia growing at just under 2 percent per annum over this period, payments per capita increased in real terms by about 3.3 percent per year, or 48 percent overall. This is in stark contrast to the Quebec experience of an aggregate *fall* of 1.3 percent in real per capita costs over the same period. (Real expenditures per capita in Quebec rose slightly between 1971 and 1985. Over the shorter period, 1973 to 1985, however, they fell slightly. The difference reflects the surge in utilization in the first two years of Medicare in Quebec.

During this time, there were three distinct subperiods of cost experience—1974/1975 to 1980/1981, 1980/1981 to 1983–1984, and the last two years—which correspond to identifiable events in fee negotiations. A huge fee increase, amounting to 40 percent over two years, was awarded to physicians in British Columbia in 1981. The period since 1983/1984 has been characterized by concerted efforts by the Ministry of Health not only to hold the line on fees, but to cap total medical care costs. Thus, we find average annual increases in real cost per capita for these three subperiods of 3.6 percent, 6.8 percent, and -2.8 percent!

These swings in costs were primarily fee-determined. Fee levels followed the general price level quite closely from 1974/1975 to 1980/1981. Over the next three years they shot ahead of inflation by over 10 percent, only to fall back nearly as far by 1985/1986. But utilization per capita has been far more stable. The rate of increase

has been substantial, averaging about 3.5 percent per year from 1974/1975 to 1983/1984, then slowing somewhat in the latest two years. The swings in real fees do not appear to have been reflected in off-setting (or any) responses in utilization (appendix table A7). Indeed, the two years since 1983/1984 show a combination of sharply lower real fees, and the slowest growth on record in per capita utilization.

But the data for British Columbia cannot be interpreted in innocence of the broader policy context, and the measures instituted by the Ministry of Health since 1983 specifically to control utilization. These measures have been a response to the cost implications of post-1980 fee settlements, and the highest physician-to-population ratio in Canada.

In April of 1981 physicians in British Columbia were awarded a two-year contract, providing for average increases to medical fees of 20 percent in the first year, and a further 14 percent compounded, effective April 1, 1982. Then, in the early summer of 1982, as part of a broad provincial initiative of public-sector restraint (and in the context of a collapse of the resource-based provincial economy), the Ministry of Health approached the medical profession in search of some relief from the 14 percent increase in 1982.

The result of a protracted series of backroom negotiations (within the profession as well as between the ministry and the profession) was an agreement by the medical profession to make a "gift" of a temporary reduction in fees that would not affect the fee base. Radiology fees were reduced by 6 percent, pathology by 5 percent, and all other medical and surgical fee items by 7 percent for the period September 1, 1982 through March 31, 1983. This "gift" did not induce any off-setting increase in utilization per physician (Barer et al. 1987). But its overall impact was minor—even allowing for the rollback, fee increases in the second year of the two-year agreement exceeded the rate of inflation.

Meanwhile, discussions between the ministry and the British Columbia Medical Association over ways to rein in per capita utilization had been ongoing since at least 1979, both during formal fee negotiations and through vehicles such as joint utilization review and medical manpower committees. Frustrated by lack of progress, the ministry moved unilaterally in 1983, introducing legislation that empowered the Medical Services Commission to restrict the issuance of "billing numbers," without which practitioners are not able to receive remuneration from the public program. Without ever passing this draft

care costs relative to the national income. For the previous quarter century, the escalation of this share had paralleled that in the United States; after 1971 the Canadian share levelled out. By 1985 the United States was spending over two percentage points of GNP more (and growing) on health care, compared with a virtually equal ratio in 1971.

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Thus, fee controls that are not backed up by some form of global payment caps will be at best only partially successful in controlling costs, in an environment of increasing physician supply. In the United States, where fee controls in public programs would cover only a

segment of the population, a combination of Canadian-style cost creep plus patient shifting (toward those not covered by fee-controlled programs) would further attenuate any effects.

The data tell a more complicated story, however, when disaggregated by province and year. They suggest a significant distinction between two time periods and two policy jurisdictions. The "Canadian experience" might better be described as that of Quebec, considered separately, and of all the other provinces considered together (once again, Quebec is not a province like the others), and as being significantly different in the early 1970s from subsequently.

This diversity of experience underlines the range of possibilities available. An aggressive policy, as in Quebec, or in most provinces prior to 1975, does indeed yield a degree of expenditure control. But it requiries a willingness to manage the fee schedule actively, a resolve which must be political as well as administrative. For the "other nine" provinces after 1975, this will has been largely lacking. As a result, although fees have risen less rapidly (relative to general inflation) than in the United States, the increase in activity per physician has kept "real billings" (inflation adjusted) quite close to American trends.

But the counter-pressures are not dead, only sleeping. The most recent policies in British Columbia, borrowing from Quebec approaches, are increasingly relying on direct caps on overall outlays, built explicitly into the negotiating process. The policies of these two provinces suggest that efforts to control utilization increases through fee-schedule structure may no longer be sufficient (although they undoubtedly remain necessary).

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The Canadian experience emphasizes the need for a multipronged approach to cost control, addressing simultaneously fee levels, rates and patterns of servicing per physician, and numbers of physicians

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National Health Expenditures, Canada and United States, 1985, per Capita, by Component, and Percentage of GNP*

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	Canada	U.S.	Canada	U.S.	Canada	U.S.
Total	$1,568	$1,721	100.00%	100.00%	8.62%	10.63%
Subtotal: personal health care	1,378	1,504	87.90	87.39	7.58	9.29
Institutions	831	818	53.02	47.50	4.57	5.05
Hospitals	634	675	40.43	39.22	3.48	4.17
Other institutions and related	197	143	12.59	8.28	1.09	0.88
Professional services	353	496	22.50	28.82	1.94	3.06
Physicians	246	335	15.70	19.48	1.35	2.07
Dentists	86	110	5.47	6.38	0.47	0.68
Other	21	51	1.32	2.96	0.11	0.32
Drugs/appliances	194	146	12.39	8.47	1.07	0.90
Rx drugs	86	115	5.47	6.71	0.47	0.71
OTC drugs	74		4.70		0.40	
Eyeglasses	26	30	1.65	1.76	0.14	0.19
Other applicances	9		0.57		0.05	
Other personal health expenditures	—	45	—	2.59	—	0.28
Subtotal: other costs	190	217	12.10	12.59	1.04	1.34
Prepayment	21	106	1.33	6.16	0.11	0.66
Public health	66	48	4.21	2.80	0.36	0.30
Construction	69	33	4.42	1.91	0.38	0.20
Research	14	30	0.90	1.74	0.08	0.19
Miscellaneous	20	—	1.24	—	0.11	—

* Figures may not sum due to rounding.
Sources: Canada, Health and Welfare Canada 1987; Waldo, Levit, and Lazenby 1986.

data in table A1, are related to physician supply, fee levels, and growth in real fees, as reported in table A3. These sources provide data that are comparable between Canada and the United States, and which include observations prior to 1971 and later than 1983/1984.

The indexes of physicians' fees in table A3 are the physicians' fee component of the Consumer Price Index for the United States, and a weighted average of the provincial fee/benefit schedules for the Canadian provinces, compiled by Health and Welfare Canada, subsequent to 1971. Canadian data prior to 1971 are a combination of averages of pre-Medicare fee guides issued by provincial medical associations, and the physicians' fees component of the Canadian CPI, as compiled and described in Barer and Evans (1983).

Quebec

Data on total cost in table A4 are taken from the annual reports of the Régie de l'Assurance-Maladie du Québec, and represent fee-for-service remuneration to physicians participating in the Quebec medical care insurance program. Real cost per capita is cost per capita deflated by the Canadian Consumer Price Index. Similarly, the real fees index deflates the fee index based at 1971 = 100 by the Canadian CPI. Our implicit utilization series, the final set of columns in table A4, is then simply cost per capita divided by the fee index. Thus, it portrays cost per capita as if overall fees had been constant throughout the period.

In table A5, we disaggregate this fee-adjusted cost per capita series in two ways. First, it is broken out into four specific service categories—consultations, examinations, surgery, and "actes complementaires" (comprising diagnostic and therapeutic procedures, surgical assists and anaesthesia). Second, for each service the fee-adjusted cost per capita is split into fee-adjusted cost per service, and services per capita. This allows us to distinguish between changes in utilization which are, and apparent changes in utilization which result, instead, from relative increases in the average fee paid within each service grouping—shifts in the mix rather than in the absolute rate of provision.

The final Quebec table, A6, reports the expenditure data over a physicians denominator. Thus, for example, "fee-adjusted $ per M.D." represents total fee-for-service payments, divided by number of physicians and by the fee index. It may be interpreted as a "productivity" o

of 2.5 percent per year. A series of widely reported studies used claims data from the California Medicare and Medicaid programs to assess the impact of controls on utilization, reasonable charges, the Medicare and Medicaid portions of physicians' income, procedure composition, and total program costs (Hadley, Holahan, and Scanlon 1979; Hadley and Lee 1979; Holahan et al. 1979; Holahan, Sulvetta, and Scanlon 1981).

Annual data for over 3,600 physicians in northern California were used to compare utilization and cost, by program and specialty, during price control (1972–1974) and noncontrol (1975) years. The main conclusion was that although price controls were successful in constraining the rise in physicians' fees (held to around the ESP target of 2.5 percent per year), they were not successful in moderating the rate of increase of Medicare expenditures for physicians' services.

Expenditure increases were maintained during the control period by increases in the quantity and complexity of services supplied by physicians to Medicare patients. In 1975, after controls were lifted, charges to Medicare patients rose approximately 23 percent but the quantity of services delivered (or at least billed for) fell by as much as 9.3 percent (for general practitioners). The investigators concluded that the ESP program had little or no impact on Medicaid charges, services consumed, or program costs, presumably because Medicaid fees were effectively controlled prior to the introduction of ESP.

The investigators estimated, however, that by reducing the differential between private and public program fees, the ESP program raised the supply of services to Medicare patients by as much as 17 percent (15 percent for Medicaid patients). They concluded that "when all fees were constrained, physicians responded by increasing the quantities of care provided to the two public programs" and, more importantly, that "simply limiting average fee growth *by itself* may not effectively limit undesirable growth in expenditures on physicians' services, at least over a short time period" [emphasis added] (Holahan et al. 1979, 202–7).

The failure of reimbursement controls to control program expenditures in the American system was confirmed by a second set of studies, also conducted on California physician data (Holahan, Sulvetta, and Scanlon 1981; Held, Holahan, and Carlson 1983). These analyzed the effects of Medicaid fee freezes on medical expenditures in the period from 1974 to 1976, by comparing utilization rates in this

period to the rates observed after fees were increased substantially in 1976. Between 1974 and 1976 the average payment per service increased by 11 percent for general practitioners, 14 percent for general surgeons, and 20 percent for pediatricians, in spite of the freeze on fees. Changes in the intensity of services billed were primarily responsible for the increase in expenditures; when fees were increased in 1976 the complexity of services billed decreased by 2 to 6 percent.

Changes in the Medicare-reimbursement rate structure in Colorado provided another natural experiment from which data on physicians' responses to fee changes could be obtained and analyzed. Administrative changes in 1976 resulted in substantial relative increases in the prevailing charges (one component of the CPR calculation) of nonurban physicians and relative decreases in the charges of urban physicians. Rice (1983, 1984) and Rice and McCall (1982) analyzed data from the Medicare claims of all 1,264 practising physicians in Colorado for the years from 1976 to 1978 to test the hypothesis that changes in reimbursement rates would affect patterns of service provision by physicians.

As Rice points out, the natural experiment in Colorado is one of the best opportunities to date for testing the SID hypothesis, because: (1) the fee schedule shock was exogenously determined and apparently occurred without prior notification; (2) the change in reimbursement levels was large enough to have a significant impact on physician incomes (fees increased by 23.7 to 33.5 percent for nonurban physicians); (3) there was sufficient variation in the reimbursement variable (i.e., the change affected different physicians in different ways) to allow for the estimation of reliable regression coefficients; (4) the change was permanent in nature; and (5) the data base was accurate and comprehensive, covering over two million observations.

The study examined the impact of the reimbursement rate change on three aspects of practice style: the intensity or complexity of services provided (defined as the change in the average number of relative value units (RVUs) billed per service), the number of services provided (excluding initial office visits), and the number of ancillary services (laboratory tests and x-rays) ordered.

Regression analyses showed that changes in reimbursement rates did indeed influence physician-servicing intensity. A 10 percent decrease in the "reasonable charge" for medical services led to a 6.1 percent increase in the RVUs per medical service, as well as a 2.7 percent increase in surgical services. A corresponding 10 percent cut for surgical

reimbursement rates led to a 1.5 percent increase in RVUs per surgical service, and a 1.4 percent increase in the number of surgical services. Ancillary services also responded to fees: a 10 percent decrease in the laboratory reimbursement rate was associated with a 5.2 percent increase in the number of laboratory services ordered per medical service.

While Rice's results are a clear reflection of the ability of physicians to soften the impact of fee reductions with increases in billing activity, the observed response is considerably less than sufficient to offset the full effects of the drop. On the other hand, the Colorado data set identifies follow-up visits in a way which may lead to a downward bias in the estimated strength of the utilization response.

A third "natural experiment" reported in the literature occurred in Massachusetts, where the state legislature responded to rapidly rising health care costs by mandating a 30 percent reduction in the reimbursement rates for Medicaid-sponsored surgical procedures, beginning in February 1976. (A 30 percent reduction in the primary-care fee schedule was also mandated in February of 1976 but rescinded in November of that year.) Using Medicaid claims data for 1975 to 1978, Schwartz et al. (1981) analyzed the effect of the fee reduction on the rate of performance of eight elective surgical procedures in the covered population.

The decrease in surgical fees had little impact on procedure rates per capita, except for tonsillectomies/adenoidectomies. Three possible explanations are offered by the authors. One, consistent with a supplier-induced demand view of the "market," is that as a result of the decrease in fees, fewer physicians opted to treat Medicaid patients, while those physicians who maintained a Medicaid practice provided more services per patient. Alternatively, the procedures examined may not have constituted a share of the average physician's practice large enough to warrant changing behavior. They also suggest that the existence of an excess supply of surgeons prior to the fee cut was responsible for the willingness to provide services even at a reduced rate, particularly for relatively expensive procedures such as disk surgery.

Finally, the effects of changes in the level and type of reimbursement subsequent to the introduction of universal medical insurance in the province of Quebec were analysed by Berry et al. (1978), using a fixed cohort of Quebec practitioners billing in all study years. The Quebec experience was further examined by Gabel and Rice (1985).

Berry et al. found that during the four-year period (1971–1975)

in which fees were unchanged, average gross payments per active general practitioner in their cohort rose by 13.4 percent, or 3.2 percent per year; payments to general surgeons rose significantly less at 0.5 percent per year. Their data, like ours, show a marked shift from "ordinary" examinations to more costly (and remunerative) "complete" and "major complete" exams, as well as an increase in total gross payments per visit or consultation.

Gabel and Rice explored the impact of the changes to the reimbursement system that the Quebec government introduced between 1976 and 1979. As detailed above, these reduced the opportunities for and attractiveness of generating and/or providing more complex services. They found that the average increase in expenditures for the period from 1977 to 1979 was somewhat lower than in the three years prior to these initiatives.

Gabel and Rice also provide an excellent summary and review of other studies of the effects of exogenous changes in physician payment levels, focusing on the impact of changes in reimbursement on both access to care and program costs. They conclude that "freezing or reducing payment levels is not effective in controlling expenditures, because physicians respond by increasing the quantity and complexity of services provided" (Gabel and Rice, 1985, 595).

Summary and Discussion

Our more detailed analysis of the Canadian experience since the introduction of universal public medical insurance suggests that this conclusion is incomplete. Gabel and Rice do, however, focus attention on the critical question in fee control policy (or indeed any other health care policy): How will physicians respond? Moreover, if their conclusion is interpreted to refer to fee freezes *alone,* with no supporting framework of negotiation and adjustment, then our findings generally support theirs. The administrative processes whereby both fee levels and fee schedule structures are determined, are critical to the success or failure of cost control through such means.

On the *feasibility* of controlling the escalation of expenditures, the Canadian experience since 1971 leaves little room for doubt. As is generally known, the completion of the system of universal public health insurance in Canada ushered in a period of stability in health

care costs relative to the national income. For the previous quarter century, the escalation of this share had paralleled that in the United States; after 1971 the Canadian share levelled out. By 1985 the United States was spending over two percentage points of GNP more (and growing) on health care, compared with a virtually equal ratio in 1971.

Physicians' services, in particular, amounted to 1.32 percent of the GNP in 1971, and 1,35 percent in 1985. The corresponding American figures are 1.44 percent and 2.07 percent. The difference amounts to one-half a percentage point more of the GNP. Yet, total physician supply per capita increased at roughly the same rate in both countries, 2.1 percent in Canada and 2.4 percent in the United States, and utilization per capita (expenditures adjusted for fee changes) rose somewhat more rapidly in Canada. The key difference has been in fees: In the United States physicians' fees consistently rose more rapidly than the general price level; in Canada they rose less. When physicians must negotiate their fees collectively with a single reimbursing agency, and negotiate not only the implicit relative value unit, but also the structure and the rules of payment, both fees and total expenditures rise less rapidly.

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TABLE A1

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Research	14	30	0.90	1.74	0.08	0.19
Miscellaneous	20	—	1.24	—	0.11	—

* Figures may not sum due to rounding.

Sources: Canada, Health and Welfare Canada 1987; Waldo, Levit, and Lazenby 1986.

expenditures, as in the case of public health or research. Or they come from partial-coverage programs for drugs or dentistry, set up by some of the provinces at their own initiative and expense, without federal oversight or contribution. Expenditures for long-term care blend into support programs for the elderly, chronically ill, and indigent; and welfare programs support some drug and appliance expenditure. Of this mixed bag, long-term institutional care for the elderly outside hospitals is the largest and fastest-growing component. But all these expenditure components are outside the "national health insurance" program.

National patterns of physician expenditure in the post-1971 period are provided in two different sources, both assembled from provincial data by the federal Department of National Health and Welfare. The minister of National Health and Welfare is required to make an annual report to Parliament on the operations of the Medical Care Act, and subsequent to 1984 under the Canada Health Act, a report that includes aggregate information on total expenditures under the act, persons covered, average fees paid, and number of physicians reimbursed.

These data, however, do not provide a complete description of expenditures on physicians' services. A certain proportion of such services are covered by other agencies (e.g., Workers' Compensation) or are uninsured (e.g., insurance exams or elective cosmetic surgery), and some provinces in this period permitted physicians to extra bill patients on various terms. The Department of National Health and Welfare, therefore, prepares an annual series estimating total expenditures on physicians' services in Canada, as part of its annual estimates of national health expenditures by province and component. These are the data reported in table A1.

Table A2, on the other hand, presents data assembled from successive annual reports under the Medical Care Act, showing the disaggregation of growth rates in expenditures reported therein. These cover twelve years of experience, from fiscal 1971/1972 (the first year all provinces were included under the Act) to 1983/1984 (when the passage of the Canada Health Act changed reporting requirements). Table A2 reports the partitioning of expenditure increases across population, physician supply, general prices, and real fees, by providing five "alternative views" of the increases.

The more comprehensive estimates of total expenditures on physicians' services, compiled by Health and Welfare Canada, which underly the

TABLE A2

Adjusted Total Program Expenditures under the Medical Care Act: Average Annual Rates of Change in Selected Components of Fee Payments to Physicians in Canada, 1971 to 1983

	1971–1974	1974–1975	1975–1976	1976–1977	1977–1978	1978–1979	1979–1980	1980–1981	1981–1982	1982–1983
Aggregate increase in fee payments to physicians:	10.2%	14.8%	11.2%	10.0%	10.9%	11.4%	15.9%	13.8%	19.6%	14.3%
Components of fee payment increase:										
Insured population	1.4	1.5	1.2	1.0	0.9	0.9	1.3	1.2	1.1	1.0
Per capita fee payment	8.6	13.1	9.9	8.9	10.0	10.5	14.5	12.4	18.3	13.2
Price (fee level)	2.4	6.2	8.1	7.8	6.2	6.7	10.7	10.9	12.5	9.2
Consumer Price Index	7.7	10.8	7.5	8.0	9.0	9.0	10.2	12.5	10.8	5.8
Real fee increase	−4.9	−4.2	0.6	−0.2	−2.5	−2.2	0.5	−1.4	1.5	3.2
Utilization	7.5	8.1	2.9	2.0	4.4	4.4	4.7	2.6	6.4	4.7
Physician supply	5.5	4.8	3.9	3.2	2.5	2.9	3.1	2.8	3.2	3.0
Payments per physician	4.6	9.5	7.0	6.6	8.2	8.3	12.5	10.7	16.0	11.0
Insured population	1.4	1.5	1.2	1.0	0.9	0.9	1.3	1.2	1.1	1.0
Price (fee level)	2.4	6.2	8.1	7.8	6.2	6.7	10.7	10.9	12.5	9.2
Per capita utilization	6.1	6.5	1.6	1.0	3.5	3.5	3.4	1.4	5.2	3.6
Insured population	1.4	1.5	1.2	1.0	0.9	0 9	1.3	1.2	1.1	1.0
Price (fee level)	2.4	6.2	8.1	7.8	6.2	6.7	10.7	10.9	12.5	9.2
Physicians per capital	3.9	3.3	2.7	2.2	1.6	2.0	1.8	1.6	2.0	2.0
Activity per physician	2.1	3.1	−1.0	−1.1	1.9	1.5	1.6	−0.2	3.1	1.6

Sources: Canada, Health and Welfare Canada *Annual Report Respecting Operations of the Medical Care Act*, annually from 1974/1975 to 1983/1984. Ottawa.

data in table A1, are related to physician supply, fee levels, and growth in real fees, as reported in table A3. These sources provide data that are comparable between Canada and the United States, and which include observations prior to 1971 and later than 1983/1984.

The indexes of physicians' fees in table A3 are the physicians' fees component of the Consumer Price Index for the United States, and a weighted average of the provincial fee/benefit schedules for the Canadian provinces, compiled by Health and Welfare Canada, subsequent to 1971. Canadian data prior to 1971 are a combination of averages of pre-Medicare fee guides issued by provincial medical associations, and the physicians' fees component of the Canadian CPI, as compiled and described in Barer and Evans (1983).

Quebec

Data on total cost in table A4 are taken from the annual reports of the Régie de l'Assurance-Maladie du Québec, and represent fee-for-service remuneration to physicians participating in the Quebec medical care insurance program. Real cost per capita is cost per capita deflated by the Canadian Consumer Price Index. Similarly, the real fees index deflates the fee index based at 1971 = 100 by the Canadian CPI. Our implicit utilization series, the final set of columns in table A4, is then simply cost per capita divided by the fee index. Thus, it portrays cost per capita as if overall fees had been constant throughout the period.

In table A5, we disaggregate this fee-adjusted cost per capita series in two ways. First, it is broken out into four specific service categories—consultations, examinations, surgery, and "actes complementaires" (comprising diagnostic and therapeutic procedures, surgical assists, and anaesthesia). Second, for each service the fee-adjusted cost per capita is split into fee-adjusted cost per service, and services per capita. This allows us to distinguish between changes in utilization which are, and apparent changes in utilization which result, instead, from relative increases in the average fee paid within each service grouping—shifts in the mix rather than in the absolute rate of provision.

The final Quebec table, A6, reports the expenditure data over a physicians denominator. Thus, for example, "fee-adjusted $ per M.D." represents total fee-for-service payments, divided by number of physicians and by the fee index. It may be interpreted as a "productivity" or

TABLE A3
Expenditures on Physicians' Services, Canada and United States

Year	Expenditures per capita		Physicians' fees[1]		Utilization per capita[1]		Physicians per (000) capita		"Real billings" per physician[1]		Physicians' fees/CPI[1]		Physicians' fees/ GNP deflator[1]	
	Canada	U.S.	Canada	U.S.	Canada	U.S.	Canada	U.S.	Canada	U.S.	Canada	U.S.	Canada	U.S.
1960	$ 19.82	$ 29.93	69.9	59.3	49.0	69.1	1.138	1.366	65.2	78.4	94.1	81.1	96.9	85.2
1961	21.25	30.59	71.1	60.8	51.6	68.8	1.158	1.345	67.6	79.3	94.9	82.3	98.2	86.5
1962	21.82	33.24	73.2	62.6	51.5	72.6	1.242	1.355	62.9	83.2	96.6	83.8	99.7	87.1
1963	23.91	34.75	74.5	64.0	55.4	74.3	1.263	1.374	66.5	83.9	96.5	84.6	99.6	87.7
1964	25.65	40.08	76.1	65.6	58.2	83.6	1.279	1.394	69.1	93.0	96.8	85.6	99.3	88.5
1965	27.70	41.65	78.7	68.0	60.8	83.8	1.284	1.414	71.6	91.9	97.8	87.3	99.5	89.3
1966	30.19	44.53	80.1	71.9	65.1	84.7	1.316	1.438	75.0	91.4	95.9	89.7	97.0	91.2
1967	33.62	48.42	86.6	77.0	67.0	86.0	1.342	1.464	75.8	91.1	100.1	93.4	100.8	95.2
1968	38.02	52.71	90.6	81.3	72.5	88.7	1.351	1.462	81.3	94.1	100.7	94.6	102.1	95.7
1969	42.87	59.21	96.1	86.9	77.0	93.2	1.401	1.479	83.4	97.8	102.1	96.0	103.9	97.0
1970	48.80	66.48	97.8	93.5	86.2	97.3	1.451	1.518	89.9	99.4	100.6	97.5	100.9	98.8
1971	57.91	73.10	100.0	100.0	100.0	100.0	1.517	1.551	100.0	100.0	100.0	100.0	100.0	100.0
1972	63.52	78.36	101.4	103.0	108.2	104.1	1.572	1.587	104.4	101.7	96.7	99.7	96.6	98.4
1973	67.21	86.31	102.7	106.4	113.0	111.0	1.616	1.607	105.9	107.1	91.2	97.0	89.6	95.4
1974	74.11	95.07	107.4	116.2	119.2	111.9	1.653	1.659	109.2	104.7	85.9	95.4	81.3	95.5
1975	84.78	110.72	114.2	130.4	128.2	116.1	1.709	1.710	113.6	105.4	82.5	98.1	78.1	97.6
1976	94.07	121.75	121.4	145.1	133.8	114.8	1.733	1.762	117.1	101.0	81.6	103.2	75.7	102.1
1977	102.60	139.67	132.1	158.6	134.1	120.5	1.767	1.777	115.2	105.2	82.2	106.0	76.7	104.6
1978	113.93	155.25	139.6	171.7	140.9	123.7	1.786	1.839	119.7	104.3	79.7	106.6	76.0	105.6
1979	126.85	172.68	150.0	187.5	146.1	126.0	1.805	1.892	122.6	103.3	78.4	104.6	74.0	105.9
1980	142.96	198.90	165.5	207.3	149.2	131.2	1.828	1.944	123.8	104.7	78.6	101.9	73.3	107.4
1981	163.24	230.45	184.9	230.2	152.5	137.0	1.858	1.962	124.4	108.3	78.0	102.5	74.0	108.7
1982	188.67	257.29	209.1	251.8	155.8	139.8	1.912	2.014	123.7	107.7	79.7	105.7	75.9	111.8
1983	213.71	282.06	231.6	271.2	159.3	142.3	1.953	2.067	123.9	106.8	83.4	110.2	79.7	116.0
1984	231.05	308.13	244.6	290.3	163.1	145.2	1.976	2.118	125.3	106.3	84.4	113.2	81.7	119.2
1985	246.23	335.36	253.4	307.0	167.8	149.4	2.036	2.166	125.1	107.0	84.1	115.6	81.9	122.3

[1] 1971 = 100.

Sources: Canada, Health and Welfare Canada 1979, 1984, 1986, 1987; Canada, Health and Welfare Canada, *Canada Health Manpower Inventory,* various years; Barer and Evans 1983; Canada, Department of Finance 1986; Waldo, Levit, and Lazenby 1986; U.S. Bureau of the Census, *Statistical Abstract of the United States,* various years; U.S. Department of Commerce 1986.

TABLE A4
Medical Care Cost and Utilization per Capita in Quebec, 1971–1985

Year	Cost per capita	Change	Real cost per capita	Change	Fee index	Change	Real fees	Change	Fee-adjusted cost per capita	Change
1971	$ 44.65		$44.65		1.00		1.000		$44.65	
1972	49.04	9.83%	46.79	4.80%	1.00	0.00%	0.954	−4.58%	49.04	9.83%
1973	54.97	12.09	48.78	4.23	1.00	0.00	0.887	−7.01	54.97	12.09
1974	59.54	8.31	47.63	−2.35	1.00	0.00	0.800	−9.84	59.54	8.31
1975	66.43	11.58	47.97	0.70	1.00	0.00	0.722	−9.75	66.43	11.58
1976	71.44	7.54	47.98	0.03	1.01	1.00	0.678	−6.06	70.74	6.48
1977	80.86	13.18	50.29	4.80	1.18	16.49	0.732	7.87	68.73	−2.84
1978	86.54	7.02	49.39	−1.78	1.21	3.22	0.693	−5.26	71.26	3.68
1979	93.70	8.28	49.01	−0.78	1.27	4.27	0.662	−4.46	74.00	3.85
1980	102.70	9.61	48.77	−0.49	1.28	1.34	0.609	−8.00	80.04	8.16
1981	107.35	4.53	45.32	−7.07	1.37	6.99	0.580	−4.89	78.20	−2.30
1982	111.89	4.22	42.62	−5.94	1.47	7.04	0.560	−3.40	76.14	−2.63
1983	127.16	13.65	45.81	7.47	1.58	7.80	0.571	1.94	80.27	5.42
1984	134.61	5.86	46.46	1.43	1.67	5.48	0.577	1.07	80.56	0.36
1985	145.03	7.74	48.13	3.59	1.73	3.34	0.573	−0.64	83.99	4.26
				Average annual percentage change						
1971–1985		8.78%		0.54%		3.98%		−3.90%		4.62%
1971–1976		9.86		1.45		0.20		−7.47		9.64
1977–1985		7.58		−0.54		4.91		−3.01		2.54

Sources: Fee index is from Canada, Health and Welfare Canada 1986. CPI is from *Canadian Statistical Review*. All other data are from Quebec. Régie de l'Assurance-Maladie du Quebec, various years, except for 1971–1974, taken from Quebec, Ministère des Affaires Sociales 1980.

TABLE A5
Services per capita and Fee-adjusted Cost per Service, by Broad Type of Service, Quebec, 1971–1985

Year	Consultations		Examinations		Surgery		Actes complementaires		Actes complementaires per base service
	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service	No.
1971	0.15	$22.14	3.41	$6.09	0.22	$46.04	1.40	$6.48	0.36
1976	0.23	23.02	4.21	7.78	0.28	43.40	2.70	6.45	0.55
1977	0.25	22.79	4.22	8.05	0.27	43.15	1.75	8.29	0.36
1981	0.31	22.24	4.70	9.00	0.29	38.28	1.93	7.64	0.35
1985	0.32	22.87	4.95	9.35	0.31	37.27	1.81	8.51	0.31
	Average annual percentage change:								
1971–1976	9.47%	0.78%	4.30%	5.03%	4.95%	−1.18%	14.01%	−0.08%	8.71%
1977–1985	3.12	0.04	2.01	1.89	1.79	−1.81	0.38	0.34	−1.59%

Sources: Quebec, Régie de l'Assurance-Maladie du Quebec, various years.

TABLE A6
Cost and Utilization per Physician, Quebec, 1971–1985

Year	Population per physician	Change	Real $ per M.D.	Change	Fee-adjusted $ per M.D.	Change	Base services per M.D.	Change	AC per M.D.	Change
1971	872		$38,945		$38,945		3,366		1,222	
1972	784	−10.08%	36,701	−5.76%	38,462	−1.24%	3,155	−6.27%	1,297	6.13%
1973	741	−5.48	36,158	−1.48	40,750	5.95	3,201	1.47	1.447	11.60
1974	715	−3.58	34,047	−5.84	42,559	4.44	3,219	0.56	1,548	7.02
1975	686	−4.07	32,891	−3.40	45,553	7.04	3,250	0.94	1,800	16.26
1976	663	−3.24	31,833	−3.22	46,932	3.03	3,247	−0.07	1,809	0.48
1977	650	−2.06	32,676	2.65	44,661	−4.84	3,196	−1.58	1,138	−37.10
1978	643	−1.04	31,761	−2.80	45,824	2.60	3,234	1.17	1,180	3.73
1979	628	−2.38	30,762	−3.15	46,451	1.37	3,267	1.04	1,183	0.21
1980	610	−2.75	29,769	−3.23	48,859	5.18	3,371	3.19	1,193	0.91
1981	597	−2.24	27,043	−9.16	46,664	−4.49	3,264	−3.19	1,155	−3.19
1982	589	−1.38	25,085	−7.24	44,807	−3.98	3,235	−0.87	1,136	−1.71
1983	575	−2.32	26,333	4.98	46,142	2.98	3,267	0.99	1,160	2.14
1984	582	1.30	27,057	2.75	46,909	1.66	3,346	2.42	1,101	−5.08
1985	572	−1.79	27,529	1.74	48,033	2.39	3,297	−1.48	1,033	−6.18
					Average annual percentage change:					
1971–1985		−2.97%		−2.45%		1.51%		−0.15%		−1.19%
1971–1976		−5.32		−3.95		3.80		−0.71		8.16
1977–1985		−1.58		−2.12		0.91		0.39		−1.20

Sources: See table A5.

"service provision" index. In this regard, it is worth noting that over the fourteen-year period, fee-adjusted dollars per physician rose an average 1.5 percent per year, while both base services and actes complementaires per physican were, on average, falling each year. As an example, in 1985 utilization rose an average 2.4 percent per physician, yet base services per physican fell 1.5 percent and actes complementaires fell 6.2 percent. This must imply a major shift toward more costly fee items (either new or already existing), and the whole period results are strongly influenced by the fee item consolidation of 1976/1977.

British Columbia

In table A7 and subsequent tables we have partitioned the summary statistics into the periods of 1974/1975 to 1983/1984, and 1983/1984 to 1985/1986. The break was dictated by the marked change in experience in the most recent two years. While health policy was not static during the earlier nine years, only since 1983/1984 has serious pressure on fees and utilization been applied in British Columbia.

Annual reports from the British Columbia Ministry of Health (Department of Health until 1977) provide the requisite payment and services data, on a fiscal year basis, only since 1973/1974. The service-specific detail was found only for the period back to 1974/1975, and the accrual-based cost data for 1975/1976, which imply a 31 percent increase in costs over one year, seem somewhat suspect. By the same token, however, we presume the 7 percent increase in 1976/1977 is understated.

As with the Quebec data, "total cost" refers to aggregate fee-for-service payments to physicians through the province's "Medical Services Plan." The rest of the table follows the pattern and methodology of the corresponding Quebec table (A4). Table A8 provides disaggregated detail on the final series in table A7, fee-adjusted cost per capita, for the major broad types of service. These five categories accounted for about 80 percent of total expenditures in each year. Once again we report the components of fee-adjusted cost per capita for each type of service.

In table A9 the data are presented from the "physician view," showing trends in average fee incomes and "productivity" or "service provision."

TABLE A7
Medical Care Cost and Utilization per Capita, British Columbia, 1974–1975 to 1985–1986

Year	Cost per capita	Change	Real cost per cap.	Change	Fee index	Change	Real fees	Change	Fee-adjusted cost per capita	Change
1973/1974	$ 68.80		$61.05		1.14		1.01		$60.40	
1974/1975	79.29	15.25%	63.43	3.91%	1.25	9.39%	1.00	−1.37%	63.63	5.35%
1975/1976	102.57	29.37	74.06	16.76	1.43	14.93	1.03	3.73	71.63	12.56
1976/1977	108.75	6.02	73.04	−1.38	1.55	8.17	1.04	0.62	70.21	−1.99
1977/1978	118.88	9.31	73.93	1.22	1.64	5.55	1.02	−2.26	72.71	3.56
1978/1979	131.87	10.93	75.27	1.81	1.75	7.16	1.00	−1.65	75.27	3.52
1979/1980	147.14	11.58	76.95	2.24	1.89	8.11	0.99	−0.94	77.69	3.21
1980/1981	165.44	12.44	78.56	2.08	2.08	9.71	0.99	−0.39	79.62	2.48
1981/1982	203.59	23.06	85.94	9.40	2.49	20.02	1.05	6.70	81.63	2.53
1982/1983	239.73	17.75	91.32	6.27	2.79	12.03	1.06	1.10	85.80	5.11
1983/1984	265.37	10.70	95.59	4.68	3.03	8.48	1.09	2.58	87.55	2.04
1984/1985	268.70	1.25	92.75	−2.97	3.03	0.00	1.05	−4.18	88.65	1.25
1985/1986	272.40	1.38	90.41	−2.53	3.03	0.00	1.01	−3.85	89.87	1.38
					Average annual percentage change:					
1974–1983		14.37%		4.66%		10.38%		1.02%		3.61%
1983–1985		1.32		−2.75		0.00		−4.01		1.32
1973–1985		12.15		3.33		8.50		−0.04		3.37

Sources: Total cost is from British Columbia Ministry of Health 1978–1987 and British Columbia Department of Health 1976, 1977. Population and CPI are taken from the *Canadian Statistical Review.* The physician fee index is from Canada, Health and Welfare Canada 1986.

TABLE A8

Services per Capita, and Fee-adjusted Cost per Service, by Broad Type of Service, British Columbia 1974/1975 to 1985/1986

	Gen. prac. exams and visits		Specialist consults & visits		Surgical services		Laboratory services		Radiology services	
Year	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service	No. per cap	Fee-adj. cost per service
1974/1975	3.82	$6.10	0.62	$13.56	0.17	$51.73	2.07	$2.74	0.45	$10.72
1977/1978	3.98	6.57	0.75	13.53	0.18	50.85	2.65	2.92	0.46	10.74
1980/1981	4.24	6.75	0.85	13.90	0.18	46.85	3.38	3.03	0.46	10.99
1983/1984	4.65	6.59	0.98	14.28	0.22	41.63	3.84	3.10	0.48	10.58
1985/1986	4.76	6.71	0.98	14.46	0.23	43.48	3.65	3.37	0.49	10.83
				Average annual percentge change						
1974–77	1.42%	2.48%	6.80%	−0.08%	1.07%	−0.57%	8.61%	2.11%	0.69%	0.06%
1977–80	2.12	0.88	4.26	0.90	1.39	−2.69	8.54	1.23	0.04	0.76
1980–83	3.10	−0.78	4.63	0.90	6.14	−3.87	4.28	0.77	1.71	−1.26
1983–85	1.21	0.92	0.30	0.65	1.76	2.20	−2.52	4.27	1.33	1.17
1974–83	2.21	0.85	5.22	0.57	2.84	−2.38	7.12	1.37	0.81	−0.15
1974–85	2.03	0.87	4.31	0.59	2.64	−1.57	5.30	1.89	0.91	0.09

Source: British Columbia Ministry of Health 1978–1987 and British Columbia Department of Health 1976, 1977.

TABLE A9
Cost and Utilization per Physician, British Columbia, 1974/1975 to 1985/1986

Year	Population per M.D.	Change	Fee payments per M.D.	Change	Real fee payments per M.D.	Change	Fee-adj. payments per M.D.	Change
1974/1975	633		$ 50,198		$40,159		$40,288	
1975/1976	619	−2.26%	63,475	26.45%	45,830	14.12%	44,326	10.02%
1976/1977	603	−2.59	65,551	3.27	44,023	−3.94	42,318	−4.53
1977/1978	602	−0.16	71,542	9.14	44,491	1.06	43,756	3.40
1978/1979	594	−1.28	78,346	9.51	44,718	0.51	44,718	2.20
1979/1980	580	−2.43	85,288	8.86	44,607	−0.25	45,031	0.70
1980/1981	570	−1.61	94,355	10.63	44,803	0.44	45,407	0.83
1981/1982	572	0.33	116,494	23.46	49,174	9.76	46,710	2.87
1982/1983	562	−1.76	134,754	15.68	51,335	4.39	48,230	3.25
1983/1984	553	−1.71	146,619	8.80	52,817	2.89	48,373	0.30
1984/1985	549	−0.62	147,534	0.62	50,927	−3.58	48,675	0.62
1985/1986	533	−2.99	145,091	−1.66	48,155	−5.44	47,869	−1.66
			Average annual percentage change					
1974/1975 to 1983/1984		−1.50%		12.65%		3.09%		2.05%
1983/1984 to 1985/1986		−1.81		−0.52		−4.51		−0.52
1974/1975 to 1985/1986		−1.56		10.13		1.66		1.58

Sources: Number of M.D.s billing Medical Services Plan was calculated from magnetic tapes containing physician payment profiles for each year, provided by the British Columbia Ministry of Health. Total fee payments is from British Columbia Ministry of Health 1978–1987 and British Columbia Department of Health 1976, 1977.

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