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Beyond the Medical Marketplace: Expenditure, Utilization, and Pricing of Insured Health Care in Canada

THE ORGANIZATION OF NATIONAL HEALTH INSURANCE IN CANADA

To understand the structure of health care legislation in Canada, one must begin with federal-provincial relations. The division of powers between the federal government in Ottawa and the ten provincial governments is Canada's longest and most carefully defended border, and this division of powers (based on sections 91 and 92 of the British North America Act) clearly designates health

This paper owes a great deal to initial discussions with Uwe Reinhardt. At the conference, Herbert Klarman and Anne Scitovsky, the discussants, were both very helpful, as were Victor Fuchs, Lee Soderstrom, and other participants. Their improving influence should be obvious; the rest is mine.

Data used in the text are not separately referenced; a detailed discussion of sources is given in the appendix.

as a matter for provincial jurisdiction.¹ In a strict sense, there cannot be "national" health insurance in Canada; rather, there are ten separate "provincial" health insurance plans. Federal jurisdiction is limited to Indians, Eskimos, sick mariners, and the Armed Forces, and to a variety of specific services such as quarantine, immigration, food and drug control, and many other small areas.

And yet quite obviously there is a national health program covering hospital and medical care (with minimal specific exclusions) for almost all Canadian residents. It came about through a constitutional subterfuge whereby the federal government contributes a significant share of the total operating costs to any provincial plan meeting certain specified federal standards. The constitutional niceties thus are preserved, and indeed no province was forced to follow the federal lead and set up a conforming plan. Since the formulas for cost sharing cover roughly 50 per cent of each provincial plan's total operating costs, however, the financial pressures on the provinces to set up qualifying plans were irresistible.² The Hospital Insurance and Diagnostic Services Act of 1957 specified July 1, 1958, as the earliest date on which federal cost sharing for hospital care became available. Newfoundland, Saskatchewan, Alberta, and B.C. already had operating hospital plans that qualified for cost sharing and Manitoba initiated a plan on that date. The pressure on the remaining provinces brought in Prince Edward Island, Nova Scotia, New Brunswick, and Ontario in 1959, and finally Quebec in 1961. A similar scenario followed the passage of the Medical Care Act; B.C. and Saskatchewan had qualifying plans on July 1, 1968, and Manitoba, Nova Scotia, Newfoundland, Alberta, and Ontario initiated plans at various dates during 1969. Quebec and Prince Edward Island set up plans toward the end of 1970, and New Brunswick joined at the beginning of 1971. Thus 1971 is the first complete year of Canadian experience with both hospital and medical insurance. It is also the latest year for which expenditure data of all forms are currently available.³

The federal standards/shared funding/provincial administration structure that is required by the Canadian constitutional structure is very clearly a mixed blessing. On the positive side, national average-based cost sharing makes possible a more uniform level of service availability insofar as the federal contribution rises proportionately in the poorer provinces. Relating the federal contribution to national averages of expenditure brings it up over 60 per cent of hospital spending and over 80 per cent of medical spending in the poorest provinces,⁴ thus permitting a national standard of health services that would have been quite out of reach of the provinces

acting alone.⁵ But the total effects of the minimum criteria for eligibility are much less clear.

In brief, these criteria are portability of coverage across provinces, universal access on equal terms and conditions to all, comprehensive coverage, and administration by a nonprofit public agency.⁶ Portability clearly works to the general interest by preventing cost-conscious provincial agencies from finding ways of dropping migrants out of the system, while the requirement of public, nonprofit administration specified the initial form of organization believed most likely to achieve the other objectives with minimal overhead cost.⁷ Universal access is becoming less relevant as provinces are recognizing that "premiums" represent a rather regressive poll tax and are shifting over time to total general revenue financing. But "equal terms and conditions" and "comprehensive coverage" do in fact impose significant limitations on the modifications that can be made on the supply side, insofar as they can be interpreted as prohibiting incentives directed at consumers to choose one form of delivery over another. A user of a closed panel plan, for example, could not receive a premium rebate if his plan were shown to use fewer hospital days, nor could one earn such a rebate by signing up with a well-baby clinic and agreeing not to use a pediatrician unless referred by the clinic.

Furthermore, cost sharing both distorts the structure of care delivery and dilutes incentives to economize. Provincial agencies are acutely aware of what services are or are not cost shareable; no provincial bureaucrat worthy of the name would allocate funds for a non-shareable program if the same result could be attained through a shareable route, even if the former were cheaper. This problem creates steady pressure to expand the coverage of the provincial plans—ambulatory care in hospitals must be insured since otherwise the insurance plan leads to excess hospitalization; extended care facilities should be covered in order to reduce acute care hospital use. Home care programs should also be subsidized with federal cost sharing. Thus, the open-ended nature of the federal commitment to currently covered services, combined with the steady pressure to "rationalize" utilization by expanding coverage, has stimulated interest in ways of dismantling the cost-sharing system and transferring full fiscal responsibility to the provincial governments. In return, the federal government would release to the provinces a larger share of personal income tax revenues, and/or revenues from other federal taxes (alcohol and tobacco). As yet, however, no package acceptable to both sides has been worked out.⁸

The provinces finance their share of the cost of hospital and medical care by a mix of taxes. Many provinces introduced retail sales taxes at the time the hospital plans were set up, and in some cases these were initially labeled hospital taxes. This revenue is not earmarked, however, and merely flows into general revenue. All provinces receive a share of the federal personal and corporate income tax collected from their residents. Quebec also levies its own personal income tax as well as an 0.8 per cent payroll tax introduced along with Medicare. The federal income tax was augmented by a "Social Development" surtax of 2 per cent (\$100 maximum) when Medicare was introduced.

Revenue sources specifically associated with the hospital and medical insurance plans include "premiums" in some provinces and in a few, "utilization charges," but the universal access condition of federal participation restricts the role of such charges.⁹ Thus the premium must not interfere with the requirement that 99 per cent of the population be insured—this requirement can be achieved by compulsion (making the premium a poll tax), by setting premiums well below expected cost per family (which would exclude nonpayers who have already paid most of the cost through other taxes), or by relatively high premiums combined with subsidies to low-income families (making the poll tax less regressive but more costly to administer). The regressiveness, expense of administration, and general pointlessness of the premium system is slowly leading provincial governments toward full general revenue financing of integrated medical and hospital "insurance." There are still a few voices raised arguing that premiums are desirable as a utilization control; if people are aware of the costs of the plans they may use less. No evidence for this argument has ever been adduced, however, any more than for the contrary position that visible premiums lead people to "get their money's worth." In any case, current premiums in no way reflect plan costs and could not be made to do so. They appear to be a transitional feature only.

A scattering of utilization charges persists, without clear rationale. Thus, B.C. charges \$1.00 per day of hospital inpatient stay, and \$2.00 per visit to a hospital outpatient department. Saskatchewan experimented with a \$2.50 physician office visit fee and \$2.50 per day hospital charge in 1968 but dropped both in 1971. It appears that the result of the medical charge was to reduce utilization on balance by lowering use by lower-income groups and raising use by upper-income groups.¹⁰ In general, the purpose of the public plans is to reduce the inequality of access to services by income class.¹¹ And the "universal access on equal terms and

conditions" principle is not consistent with utilization fees having a significant effect on use. Thus they are restricted to specific circumstances; it is proposed, for example, that elderly patients in B.C. extended care facilities should be charged a daily rate sufficient to mop up their monthly federal old age pensions rather than cumulating these payments for their heirs. But most utilization charges are said to cost as much to collect as they return in revenue, although of course the costing has never been done, so no one knows.

There is, however, a patchwork of arrangements, differing in each province, governing physician bills to the patient. When the plans were introduced, many provinces reimbursed physicians at a discount from the fee schedule (90 per cent or 85 per cent) to allow for the reduced uncollectable ratio. Treatment of the remaining 10 per cent or 15 per cent varied. In some provinces the physician was allowed to try to collect these amounts from the patient. Furthermore, some provinces permit physicians to bill the patient above the fee schedule—in Ontario physicians began after 1969 to bill the province for 90 per cent and then to bill the patient for whatever they might get. This practice was prohibited in 1971. Now if a physician submits a bill to the plan, he is not permitted to bill the patient as well. If he chooses, he may bill the patient directly and let the patient bill the plan. In Quebec, physicians may bill the plan or the patient at plan rates; in the latter case the patient is reimbursed. Only "nonparticipating" physicians may bill patients above plan rates, and their patients will not be reimbursed at all. In B.C. the physician may bill the patient directly, up to or above the fee schedule, if he has notified the patient in advance and obtained written consent. Otherwise the patient is not obligated to pay, and the B.C. Medical Association must disallow the bill if challenged. But the patient doesn't know this! It is not known how significant the practice of extra-billing direct to the patient is in those provinces where it is permitted, but informed opinion is that it is trivial. This would seem to agree with the public perception of Canadian medical care as "free."

If the economic relationships between third-party and consumer are relatively uninteresting in the Canadian insurance system, those between payment agency and provider are the heart of the whole system. Initially, it appears to have been the intent of the designers of both hospital and medical insurance plans to intervene as little as possible in the process of health service supply and merely to pay legitimate charges arising from an independent transaction between patient and provider. This may be an over-

simplified view of the hospital insurance plan, since the federal requirements went beyond mere audit to ensure legitimacy of charges and included inspection and supervision to upgrade the quality of hospital services. However, the belief appears to have been that as long as hospitals and paying agencies were organized as not-for-profit entities, their economic behavior could safely be disregarded. In establishing the medical care plan, economic behavior of providers seems to have been ignored without even the safeguard of not-for-profit providers!

The implicit model of the delivery system underlying this approach was the naive medico-technical view of disease conditions arising independently in the population, requiring necessary care as defined by medical technology, and generating costs, again according to a fairly well-defined production technology and price structure. Expenditures for medical and hospital care were of course expected to rise insofar as it was believed that in the pre-insurance period patients were failing to seek "needed" care because they could not afford it, or providers were giving "charity" services on a volunteer basis. But nowhere in the legislation or procedures establishing either insurance plan was there any recognition that all three components of the delivery process—care seeking, choice of technique, and input costs—might shift in response to insurance coverage.

Care seeking in response to health status stimuli is likely to increase. This is the obvious response of demand to price, but appears to be a relatively small component of the Canadian insurance experience. Shifts also occur in definitions of best-practice health technology—more is performed at greater expense for any given disease state. And most difficult of all to deal with, health providers at all levels, from physicians down through hospital janitors, seem to have revised their income aspirations upward in response to the observation that the payment process was open-ended. If medical care payments were to be made according to fee schedules promulgated by medical associations alone, what besides adjustment lags limits physicians' fees and incomes? If hospital budgets are increased as required to cover wages negotiated by an increasingly unionized labor force, what besides the public spirit of trustees and administrators limits wage levels? And so it has turned out that the single most prominent influence of health insurance in Canada has been to increase the earnings of health providers.¹²

If one examines the net earnings of physicians, comparing their first full year of experience under insurance with their last year of

earnings prior to insurance (a two-year span, except for New Brunswick, which began its plan on January 1, 1971), the following picture emerges.

Province	Time Period	Change in Net Physician Earnings	Change in Weekly Wages and Salaries	Relative Income Gain
Saskatchewan	1961-63	36.5%	6.6%	28.0%
B.C.	1967-69	14.5	13.0	1.3
Newfoundland	1968-70	36.3	18.7	14.8
Nova Scotia	1968-70	45.2	18.2	22.8
Ontario	1968-70	21.5	15.9	4.8
Manitoba	1968-70	48.1	15.3	28.4
Alberta	1968-70	19.4	18.6	0.7
Quebec	1969-71	51.0	15.6	30.6
P.E.I.	1969-71	70.1	11.2	53.0
New Brunswick	1969-71	34.6	17.1	14.9

SOURCES: Data appendix.

The final column adjusts for changes in the overall rate of inflation, which was accelerating in the late sixties, and brings out the dramatic gain in the relative income status of physicians that occurred in the insurance period. As will emerge below, the same pattern of dramatic income gains has also been true for hospital workers but over a longer time perspective.¹³

In fact, the peculiar federal-provincial structure of the Canadian insurance scheme militates against expenditure controls. In adopting a policy of "pay the bills," the federal government merely recognized its lack of constitutional authority to engage in regulatory activity with respect to the provincial plans. It could of course impose requirements to check fraud or raise quality standards as conditions for federal funding, and it went further to permit disallowance of claims for "medically unnecessary" procedures. But other than placing some limits on elective surgery, this provision has been empty. There is no payment limit for removal of healthy appendixes or for ritual tonsillectomies, for example.

The uniform standards of accounting for hospitals required by the federal participation agreement have, however, led to the generation of a formidable data base detailing the operations of each of the "budget review" hospitals in Canada whose services are reimbursed by the provincial agencies. This set of data is remarkable,

not only for the vast amount of detailed information that it provides on the activities of hospitals, levels and patterns of output, utilization and cost of inputs, and so on, but also for the surprisingly weak management and control tool it has turned out to be. When the need arises to make estimates of the full costs of particular activities in Canadian hospitals, or the relative costs of hospitals engaged in similar activities, the data require vigorous massage to yield approximate answers. The reporting systems installed at the time hospital insurance was initiated are descriptive and epidemiological rather than managerial control systems—suitable for a strategy of minimal intervention by the public agency—in spite of their level of detail.

Standard hospital reports in Canada are of several types. Each hospital returns annually federal reports HS-1 and HS-2 providing information on facilities, services, and finances. In addition, each patient discharged generates a form documenting the episode for reimbursement purposes which is returned to the provincial agency. The basic content of these returns is standardized nationwide. Each provincial payment agency may impose its own budgetary returns, overlapping or extending the HS-1 and HS-2. Finally, hospitals may participate in a quarterly federal survey of major hospital indicators (partial HS-1 and HS-2) or return data to nonprofit agencies such as PAS or HMRI. But the federal statistical returns and the patient discharge forms, covering the whole population of hospitals and patients, respectively, form the backbone of the system.

The discharge forms report patient name, age, address, dates of admission and discharge, attending physician, discharge diagnosis (primary and secondary), and surgery and/or anesthesia if any. They provide a comprehensive picture of the in-hospital morbidity patterns of the Canadian population, as well as of the case-mix structure of each hospital. Unfortunately, none of this data can be directly linked either to ambulatory care or to the cost structures of specific hospitals. Much work can be done on the age and regional structure of morbidity, regional patterns of patient flow, etc., but it is only within the past five years that provinces have seriously tackled the problems of machine processing these data. Within another five years most provinces will have established common patient and physician identifiers linking ambulatory and hospital records, but current ambulatory reporting is by fee schedule item and thus is procedural rather than diagnosis-specific.

The hospital statistical returns are institution-specific, keyed to line-item input budgets. They have been modified over time, but in their present form they divide all hospital expenditure into nursing

services (wards, operating and recovery rooms, emergency, central supply, labor and delivery rooms, and nursery); special services (diagnostic and investigative units, special clinics, ambulatory services, and services such as pharmacy, physiotherapy, etc.); educational services (direct costs only of salaries or stipends to staff or students in medical, nursing, or other educational programs); and general services (administration, laundry, linen, records, physical plant, and all other nonclinical services). Each area reports direct expense for salaries and paid hours (medical and nonmedical) and supplies and other expenses. Separate totals for drugs and medical and surgical supplies are reported hospital-wide but are not allocated. Reports include not only cost and personnel input by area, but also a range of physical outputs—patient days (short and long term), admissions, discharges, deliveries, lab tests done (on a standard unit basis), radiological films taken, visits to each class of clinic, pounds of laundry processed, meal days produced, etc. (Not, however, stamps licked by administrative staff.)¹⁴

Compared to this vast array of data, much of which is tabulated and published and all of which is now on tape, the records of the medical plans are relatively sketchy. Medical data are generated by provider/patient contacts only, whereas hospital data report both contacts and annual descriptions of providers. The medical plans grew out of private, nonprofit, often physician-sponsored prepayment plans (see Shillington, 1972) in which participating physicians had agreed to accept payment according to uniform provincial fee schedules promulgated independently by the provincial medical association. These plans recorded only who did what to whom and paid accordingly.

These schedules vary from province to province, and definitions of procedures tend to shift both over time and across provinces. Thus one can be fairly sure about how many surgical operations of a particular type were performed; but, for example, the line between first and subsequent office visits (same condition), or general and partial examinations, is very blurred and seems to shift over time. Data are not generally collected on why procedures were carried out, although some provinces also request diagnostic data. And no data at all are collected on provider units (employees, capital, etc.) except for the information required by medical associations (name, age, residence, date and place of medical graduation, specialty)¹⁵ and some additional data on billing (whether solo practice, grouped but billing separately, or grouped but billing jointly, whether or not eligible to bill as a specialist) required by the payment agency in reimbursing claims.

The weakness of both of these data collection systems is that they provide no link between costs and inputs, and any meaningful measure of output. Hospitals measure direct costs by department, but departmental services are not independently costed out or related back to patients and overhead cost is not allocated. Thus one can calculate direct laundry cost per pound of laundry processed for any hospital in the land, but in no hospital can one do more than estimate (rather crudely) the division of budget into inpatient, outpatient, and educational expense. Moreover, linkages between cost structure and patterns of patient output seem to have been examined only by academics; the public reimbursing agencies have not generally tried to relate cost to diagnostic mix in any systematic way in spite of the fact that they are consequently unable to make any but very crude cross-hospital or cross-time comparisons.¹⁶ "Similarities" among hospitals for budget review purposes are assumed on the basis of indicators like size and location, rather than specific information on workload. Budgetary over-runs or requests for further funding are difficult to evaluate since changes in output patterns (diagnostic mix, length of stay or occupancy) are not related to changes in cost patterns. Thus when the initial relatively permissive attitude toward hospital expenditure began to harden in the mid-sixties, adequate informational tools to interpret and control cost escalation were simply not available.

A similar problem underlies medical care statistics. At first glance it might appear that fee schedules provide a firm price fixed to levels of output. Initially it was argued that fee schedules should remain the prerogative of medical associations, with government carrying on the "hands off" policy of its private, physician-sponsored predecessors.¹⁷ The enormous increases in physician incomes and effective (though not list) prices before and during the introduction of Medicare eliminated that idea rather swiftly. In most provinces now, fee schedules are *de facto* negotiated with provincial governments although the process is often obscure to preserve the appearance of professional autonomy.¹⁸

The weakness in the process, of course, is that fee schedules price procedures, not care episodes. The mix and definition of procedures used during an episode can be and are varied at the discretion of the physician. Thus rates of payment to physicians tend to climb steadily over time, even given constant fee schedules; prior to Medicare this phenomenon could be explained by changing collection ratios but it has persisted since. Moreover, levels of procedures seem to depend on the available supply of physicians, as much as on the demographic structure of the population.¹⁹ The

profession and the paying agencies have responded in some provinces by developing "provider profiles" showing the patterns of procedures performed by individual physicians relative to groups of similar physicians (by region and specialty). These monitoring systems identify practitioners with unusual billing patterns (rates more than two standard deviations away from norm) and thus help to draw all providers toward uniform patterns. But they leave unanswered crucial questions such as: How well are procedures performed? Should they be performed at all? What is happening to patterns over time? Profile monitoring provides information neither on quality of care nor on the benefit from steady increases over time in procedural volume. It merely isolates a very few cases of apparent malfeasance. Like hospital audit, it is an instrument to detect fraud, not to manage performance.

The spectacular movements in hospital and medical expenditures in Canada, which we will now move to discuss in some detail, can thus be related, first, to a relatively naive initial policy of paying the legitimate bills and minimizing management intervention on the supply side,²⁰ and second, to an inadequate information structure on which to base efforts at management. The statistical record can be analyzed to try to observe what did (and did not) happen as national insurance was introduced; this will provide a backdrop for discussing the policy responses that have been attempted and that are now recommended.

THE QUANTITATIVE IMPACT OF NATIONAL HEALTH INSURANCE

Historical Patterns of Health Care Expenditure

The interpretation of patterns of use of and expenditure on health care in Canada, before, during, and after the introduction of the two national health insurance plans, is a complex problem that must be pursued at the level of particular classes of institutions and often of individual provinces. But an initial overview of the industry is provided by the data in tables 1 to 3, showing the distribution of personal health care spending from 1953 to 1971 in current dollars, current dollars per capita, and percentage of personal income. The effects of introducing first hospital and then medical insurance show up in the expenditure series for general and allied special

TABLE 1 Expenditure on Personal Health Care in Canada, 1953-1971 (\$ million)

	General and Allied Special Hospitals	Other Hospitals	Physicians	Dentists	Prescription Drugs	Total
1953	280.4	123.6	176.6	60.5	48.8	689.9
1954	314.0	132.8	188.6	66.4	52.1	753.9
1955	342.4	137.6	206.5	68.6	59.5	814.6
1956	380.8	149.0	240.1	81.5	71.8	923.2
1957	422.9	164.5	271.8	85.0	103.2 ^a	1047.4 ^a
1958	462.3	178.3	301.3	90.5	112.4	1144.9
1959	543.7	191.9	325.7	99.0	130.2	1290.5
1960	640.6	204.4	355.0	109.6	132.6	1442.2
1961	722.1	226.9	388.3	116.7	135.8	1589.9
1962	811.8	242.3	406.1	121.5	144.4	1726.2
1963	909.8	265.1	453.4	136.9	161.7	1922.0
1964	1015.1	285.1	495.7	147.8	178.6	2122.3
1965	1144.5	317.4	545.1	160.1	211.5	2378.6
1966	1319.0	349.0	605.2	176.4	232.0	2682.3
1967	1523.0	393.3	686.2	187.2	265.5	3055.1
1968	1790.0	428.4	788.1	213.7	297.3	3517.5
1969	2024.7	476.6	901.4	239.7	318.5	3960.9
1970	2302.6	523.5	1028.9	262.1	360.4	4477.5
1971	2594.6	557.4	1236.2	298.8	422.5	5109.5
Annual % change						
1953-1959	11.7	7.6	10.7	8.6	12.3	11.0
1959-1965	13.2	8.7	9.0	8.3	8.4	10.7
1965-1971	14.6	9.8	14.6	11.0	12.2	13.6
1953-1971	13.2	8.7	11.4	9.3	10.6	12.0

^aThe definitions underlying the prescription drug expense series changed in this year. Annual average rates are from 1957 on.

hospitals and for physicians, which dominate personal health care spending. Personal health care spending in turn makes up about three-quarters of national health expenditures in Canada. The conceptual differences are discussed in the appendix.

The first thing that commands attention in the Canadian health care industry is the rapid growth in its level of expenditures. This increase is, of course, an international phenomenon, but in Canada the pattern of increase correlates well with extensions in insurance. The insured components—hospital and medical care—are the

TABLE 2 Per Capita Expenditure on Personal Health Care in Canada, 1953-1971 (\$ million)

	General and Allied Special Hospitals	Other Hospitals	Physicians	Dentists	Prescription Drugs	Total
1953	18.89	8.32	11.90	4.08	3.29	46.47
1954	20.54	8.69	12.34	4.34	3.41	49.32
1955	21.81	8.77	13.15	4.37	3.79	51.90
1956	23.68	9.27	14.93	5.07	4.46	57.41
1957	25.46	9.90	16.36	5.12	6.21 ^a	63.06 ^a
1958	27.07	10.44	17.64	5.30	6.58	67.03
1959	31.09	10.98	18.63	5.66	7.45	73.81
1960	35.77	11.41	19.82	6.12	7.40	80.53
1961	39.52	12.42	21.25	6.39	7.43	87.02
1962	43.61	13.02	21.82	6.53	7.76	92.74
1963	47.97	13.98	23.91	7.22	8.53	101.61
1964	52.53	14.75	25.65	7.65	9.24	109.82
1965	58.16	16.12	27.70	8.13	10.75	120.87
1966	65.79	17.44	30.19	8.80	11.57	133.80
1967	74.61	19.27	33.62	9.17	13.01	149.67
1968	86.35	20.67	38.02	10.31	14.34	169.69
1969	96.29	22.66	42.87	11.40	15.15	188.36
1970	107.96	24.54	48.24	12.29	16.90	209.94
1971	120.15	25.5	57.24	13.84	19.56	236.61
Annual % change						
1953-1959	8.7	4.5	7.8	5.6	9.5	8.2
1959-1965	11.0	6.6	6.8	6.2	6.3	8.6
1965-1971	12.9	8.2	12.9	9.3	10.5	11.8
1953-1971	10.8	6.5	9.1	7.0	8.5	9.9

^aSee note to Table 1.

largest and fastest growing. Moreover, in each case the introduction of the national insurance plan is associated with significant increases in expenditure. In 1959 hospital insurance covered all provinces except Quebec—in 1959 and 1960 hospital expenditures were up nearly 18 per cent in each year. No other year in the period matches these. Medical care insurance was phased in province by province from 1968 to 1971—in 1969 and 1970 annual expenditure increases were over 14 per cent. In 1971 they jumped to 20 per cent. If we look only at these “leading sectors” and compute the

TABLE 3 Expenditure on Personal Health Care in Canada, 1953-1971 (as a percentage of personal income)

	General and Allied Special Hospitals	Other Hospitals	Physicians	Dentists	Prescription Drugs	Total
1953	1.43	0.63	0.90	0.31	0.25	3.53
1954	1.59	0.67	0.96	0.34	0.26	3.82
1955	1.61	0.65	0.97	0.32	0.28	3.83
1956	1.62	0.63	1.02	0.35	0.31	3.92
1957	1.68	0.65	1.08	0.34	0.41 ^a	4.16 ^a
1958	1.73	0.67	1.13	0.34	0.42	4.30
1959	1.93	0.68	1.16	0.35	0.46	4.59
1960	2.17	0.69	1.20	0.37	0.45	4.88
1961	2.40	0.75	1.29	0.39	0.45	5.29
1962	2.48	0.74	1.24	0.37	0.44	5.28
1963	2.62	0.76	1.30	0.39	0.47	5.54
1964	2.73	0.76	1.33	0.40	0.48	5.70
1965	2.79	0.77	1.33	0.39	0.52	5.80
1966	2.87	0.76	1.32	0.38	0.50	5.83
1967	3.02	0.78	1.36	0.37	0.53	6.05
1968	3.22	0.77	1.42	0.38	0.53	6.33
1969	3.28	0.77	1.46	0.39	0.52	6.42
1970	3.46	0.79	1.55	0.39	0.54	6.74
1971	3.54	0.76	1.68	0.41	0.58	6.96
Annual % change						
1953-1959	5.1	1.3	4.3	2.0	5.9	5.0
1959-1965	6.3	2.1	2.3	1.8	2.1	4.0
1965-1971	4.0	-0.2	4.0	0.8	1.8	3.1
1953-1971	5.2	1.0	3.5	1.6	2.5	3.7

^aSee note to Table 1.

share of total hospital and medical expenditures going to hospitals over this period, the movements in this share correlate precisely with the introduction of the two national plans. The hospital share drifted from 61.4 per cent in 1953 down to 60.5 per cent in 1958, then began a steady rise until 1968, when it peaked at 69.4 per cent. By 1971 it was down to 67.7 per cent.

The same coincidence of timing appears in Table 3. The total expenditure and expenditure per capita data are muddled by accelerating general inflation trends but the personal income share series corrects for this condition. Hospital spending increased its

share of income fastest in the 1959–1965 period, whereas medical spending moved up fastest in the 1965–1971 period. From 1958 to 1961 the hospital share rose 38.7 per cent, or 11.5 per cent per year; from 1953 to 1958 and from 1961 to 1971 it rose about 4 per cent per year. The physician series is less dramatic, but it is clear that the upward trend accelerated after 1966. Clearly, public insurance has been closely associated with significant jumps in spending.²¹

But the *mechanism* is less obvious. Conventional economic explanations might focus on the pressure of increased demand on relatively inelastic supply, leading to a combination of utilization and price increase. There is reason to believe that demand-driven adjustments were not very important in the Canadian experience; this will emerge from the more detailed discussion below. A suggestion that supply-side factors may be of considerable importance emerges, however, if we point out that the relative availability of physicians and hospital beds also shifted over this period. General and allied special beds per fee-practice physician reached a peak of 7.18 in 1966, having drifted up slowly from 7.00 in 1958. From 1968 to 1971, however, they dropped over 10 per cent, from 7.12 to 6.38. The increase in physician share was associated with a rapid *increase* in the relative availability of physicians, far too rapid to be a response to insurance-induced demand. Noting also that the mid-1950s saw a rapid increase in the relative availability of hospital beds (Table 4 below), it rather looks as if plans were made to expand the supply of beds in the 1950s and of physicians in the 1960s (recalling that these are to a large degree policy variables in Canada) in anticipation of insurance. The mere observation of increased expenditure may be telling us more about supplier behavior than about increased demand, and we cannot resolve the issue without more detailed data.

The Response of the Hospital Industry—Administered Inflation

Expenditures on general and allied special hospitals dominate Canadian health spending. This sector is also the first to have been covered by universal health insurance. The dramatic increase in expenditures, from \$280.4 million in 1953 to \$2,594.6 million in 1971, or nearly 10 times, is the product of a combination of many factors that may or may not be associated with insurance coverage. It is thus of some interest to sort out the quantitative effects of population growth, utilization, general price inflation, sectoral

TABLE 4 Canadian Public Hospitals, Selected Operating Statistics, 1953-1971

	No. of Hospitals	No. of Beds	Beds per 000 Pop.	Expense per Patient Day	Patient Days per 000 Pop.	Admissions per 000 Pop.
1953	857	76224	5.13	12.47	1473.1	130.2
1954	870	79281	5.19	13.30	1532.7	132.0
1955	897	84761	5.40	14.05	1530.6	134.9
1956	909	86433	5.37	14.91	1578.1	141.4
1957	924	90154	5.43	16.11	1578.5	142.1
1958	955	94665	5.54	17.84	1624.1	143.0
1959	982	100059	5.72	18.88	1649.7	144.8
1960	972	101352	5.67	21.32	1643.2	146.1
1961	946	100506 ^a	5.51 ^a	23.10	1639.5	145.9
1962	964	106718	5.74	24.82	1721.0	149.7
1963	976	111165	5.87	26.87	1753.4	151.1
1964	996	114545	5.94	29.18	1762.4	152.8
1965	1011	117021	5.96	31.92	1778.3	152.2
1966	1027	122315	6.11	36.06	1793.9	152.0
1967	1036	126182	6.18	40.38	1806.2	151.6
1968	1043	129856	6.26	45.01	1850.8	155.1
1969	1040	132340	6.28	50.69	1854.9	156.4
1970	1039	135877	6.36	56.24	1880.2	161.1
1971	1043	138280	6.41	61.58	1896.6	164.9
% Change						
1953-1959	14.6	31.3	11.5	51.4	12.0	11.2
1959-1965	3.0	17.0	4.2	69.1	7.8	5.1
1965-1971	3.2	18.2	7.6	92.9	6.7	8.3
1953-1971	21.7	81.4	25.0	393.8	28.7	26.7

^aThe beds total for this year appears to be too low because of a classification error; neither beds nor beds per capita appears reliable.

price inflation, and changes in service mix over this period. It is not possible, owing to changes in the reporting procedures and reliability of data, to present a detailed picture of what happened, but several major trends are evident.

First of all, the 9.25 ratio of 1971 expenditures to 1953 is the outcome of a 45.3 per cent increase in population and an increase from \$18.89 to \$120.15 in expenditure per capita (Table 2). Moreover, patient days per thousand population rose from 1,473.1 in 1953 to 1,896.6 in 1971, or 28.7 per cent. Thus the expenditure per patient day implicit in these data increases from \$12.82 to \$63.35, or by 9.3 per cent per year. The reported data are \$12.47 and \$61.58 (Table 4; see also appendix), also yielding a 9.3 per cent increase annually. The increase of 13.2 per cent annually in hospital expenditure in Canada between 1953 and 1971 thus resolves into increases of 2.1 per cent in population, 1.4 per cent in patient day utilization, and 9.3 per cent in expenditure per patient day.

This increase has, of course, several sources. Ideally, one would like to trace out its shifts through the full accounting detail provided in present-day hospital statistics; but that would be a major paper in itself and in any case could not be carried back to 1953 because the detail is missing. Certain clear trends, however, emerge. In 1953 the cost per patient day of \$12.47 was divided into \$7.20 gross wages and salaries, 51¢ medical and surgical supplies, 53¢ drugs, and \$4.23 other supplies and expense. By 1971 these components were \$41.82, \$1.93, \$1.78, and \$16.06, or had increased by 10.3 per cent, 7.7 per cent, 7.0 per cent, and 7.7 per cent annually. Wages and salaries rose from 57.7 per cent of the hospital budget to 67.9 per cent.²²

The wage and salary component can be split into "price" and "quantity" components (if we assume that hours are a homogeneous commodity) since in 1953 9.18 hours were worked per patient day and in 1971 this figure had risen to 13.29 paid hours per patient day. A difficulty is that in 1953, 1.62 hours per patient day were worked by student nurses or interns who were then paid little or nothing. If these are treated as part of hours worked in both years, the increase in wages and salaries is made up of a 44.8 per cent increase in hours worked and a 303.8 per cent increase in wages and salaries per hour worked (from 78¢ to \$3.14 at an average of 8.1 per cent per year).

Comparing these shifts with general trends in the Canadian economy, we find that over the period 1953-1971 the Consumer Price Index rose 2.2 per cent annually, the G.N.E. deflator rose 2.5

per cent, and average weekly wages and salaries (industrial composite) were up 5.0 per cent. Price indexes are not available for the various components of hospital expenditure, now or in 1953, but if we assumed that prices of hospital goods rose more or less in line with the rest of the economy, we would estimate quantity increases of 5.4 per cent annually for medical and surgical supplies, 4.7 per cent for drugs, 5.4 per cent for supplies and other expense, and about 2.1 per cent annually for labor input. These figures should not be taken too seriously, however, as no real price indexes exist. Still, they suggest a tendency for real resource use in hospitals to have increased fastest in supplies and drugs, less rapidly in labor input. The single largest component of the cost increase is clearly the change in levels of remuneration of hospital workers.

If we take the increase in average weekly wages of 139.2 per cent and assume that because of changes in hours worked per week a "true" hourly index might have increased 150 per cent, then assuming that hospital workers had merely moved up in line with workers generally, the wage bill in 1971 would have been \$25.92 per patient day instead of \$41.82. Out of expense per patient day of \$61.58 in 1971, \$15.90, or 25.8 per cent, is attributable to the increase in average hourly wages of hospital workers *relative* to all other workers. This observation, of course, says nothing at all about the division of this increase into differences in skill mix, "catch-up" effects left over from the period of charity hospitals, or pure inflation.

There are, of course, certain other effects that one can look for in the longer-term data. One might expect that changes in the pattern of the care episode, or in the mix of hospitals examined, might affect these results. Yet in fact such shifts in the relation between patient day and care episode have not had much effect. Average lengths of stay per separation and occupancy rates have both fluctuated somewhat, but stays were 10.9 days in 1953, 11.3 in 1971, and occupancy rates were 81.2 per cent and 81.3 per cent. Corresponding to these sluggish movements, admissions per bed fell from 26.3 to 25.7. Thus changes in patient day costs are clearly not explicable by changes in short-run capacity utilization.

Changes in hospital class of activity are a bit more complex. General and allied special hospitals include chronic and convalescent, specialty, and teaching hospitals, all of which exhibit relatively different activity patterns and cost experience. Chronic and convalescent hospitals are too small a portion of the total for shifts in their share to affect costs; for general (acute care) hospitals alone costs per day rose from \$12.79 to \$65.58, or 9.5 per cent annually. It

is more difficult, however, to sort out the effects on patient day costs of growth in educational and outpatient expense since the departmental distribution of reported expenditure in 1953 was still relatively loose. Separate expenditures were reported for nursing schools; outpatients, emergency, and social service; laboratory; and radiology, the latter two departments having a significant proportion of outpatient work. These groups accounted for 1.76 per cent, 1.05 per cent, 2.49 per cent, and 3.34 per cent of total hospital expenditure. The difficulty is that 17.44 per cent of total expenditure is "unattributed" in 1953; if that component were equally spread over all departments, the above percentages become 2.13 per cent, 1.27 per cent, 3.02 per cent, and 4.05 per cent.

By 1971 nursing education had increased to 3.41 per cent of total budget, and total education was up to 6.48 per cent. If one assumed that education costs other than nursing were zero in 1953, the increase in direct educational costs per patient day would be from 27¢ to \$3.99, or an increase of nearly 15 times. But in fact this is too small a budget component to matter, patient day expense net of education and special research projects is reported as \$58.44 in 1971 compared with \$12.20 expense net of nursing schools in 1953. Even assuming medical education and research at zero in 1953, the increase in expense net of education is 9.1 per cent annually. This line of argument, however, ignores the high indirect costs associated with education. Thus one could be underestimating the effects of expanding the educational sector.

In 1971, teaching hospitals of 500 beds or more had expenses per patient day of \$83.70 if full teaching and \$67.56 if partial teaching, whereas in 1953, all 500+bed hospitals had costs per patient day of \$15.93. If we assume that 500-bed full-teaching hospitals in 1971 are roughly equivalent to 500+bed hospitals in 1953, it appears that costs have risen somewhat faster for this group—9.7 per cent annually compared with 9.3 per cent. But the difference is not large and is probably biased upward since not all 500+bed hospitals are full-teaching. Nor has there been any major shift in the numbers of hospitals with full or partial teaching programs, and the share of such hospitals in total patient activity has not expanded significantly. Hence we may tentatively conclude that although educational programs are undoubtedly much more expensive to operate than their direct costs would indicate, the *increase* in costs from 1953 to 1971 does not seem to be traceable to the expansion of educational programs.

Turning to outpatient clinics (which include short stay patients or day care surgery where relevant) we find that in 1971, outpatient

clinics, emergency, and social service account for \$1.82 per patient day. This compares with 16¢ per patient day in 1953, confirming the widespread view that such activity has increased in importance substantially faster than the regular inpatient service. These data also show clearly, however, that quantitatively the effects of this increase are trivial. Even after due allowance is made for indirect costs and overheads associated with an outpatient department, it appears that this sort of activity, like education, does not affect the conclusions reached above.

The above discussion suggests that the reported increases in expenditures per patient day really do reflect shifts in the cost of providing inpatient services, rather than being a result of shifts in the heterogeneous mix of hospital activities that are reflected in "per diems." To relate these increases to changes in insurance coverage, we must examine the behavior of expenses by subperiods and draw on some additional data on wages and hours worked. For this purpose we have divided the eighteen-year span into three equal subperiods: a pre-insurance phase 1953-1959, a "digestion" phase, 1959-1965, and a post-insurance phase, 1965-1971. The initial period is not really pre-insurance, since several provincial plans were in operation during that period; but the two largest provinces, Ontario and Quebec, began their plans in 1959 and 1961, respectively, so that 1959 rather than 1958 may be treated as a transitional year. This is supported by the observation that cost per day rose at an average rate of 7.2 per cent annually from 1953 to 1959 but only 5.8 per cent from 1958 to 1959. In 1960 it took off, to 12.9 per cent.

In these three subperiods, costs per day rose at average rates of 7.2 per cent, 9.2 per cent, and 11.6 per cent. Relative to the Consumer Price Index, these figures reduce to 5.6 per cent, 7.5 per cent, and 7.6 per cent. There is of course no particular rationale for using the CPI as a deflator, except that no hospital price index exists. This pattern suggests that the apparent cost surge after 1966 is in fact tied in with the general rate of inflation, but that a break in behavior did occur at the time national insurance was introduced. Hospital costs per day were rising substantially faster than general inflation rates prior to national health insurance, but their relative increase speeded up both during and after the period of introduction of the public plans. The fact that the share of personal income going to hospitals increased much faster in the 1959-1961 period than subsequently, in spite of the observations that both utilization and (price-adjusted) costs per day increases are relatively similar from 1959-1965 to 1965-1971, may be traced to the recession in

1961 that held down personal income growth. Whether national insurance served to insulate the hospital sector against this downturn, or whether hospital expenditures would have climbed through the recession without public insurance, we do not know.

What is fairly clear from Table 4 is that national insurance did not have any observable effect on utilization. Patient days and admissions per thousand population rose almost twice as fast annually in the pre-insurance period 1953–1959 and have generally been slowing down since the public plans were introduced. Increases continue, but are now less than 1 per cent per year. If not correlated with insurance, utilization does move very closely with bed availability. It seems in fact to be responding to new bed construction, partially stimulated by a federal building subsidy program started in 1948. This program provided a fixed dollar grant per bed, so was progressively eroded by inflation and finally terminated in 1970, although it had some effect in the 1950s.

More information emerges if we look at the components of cost per day by subperiods. The share of total expense accounted for by gross wages and salaries, and its relation to hours worked, is as follows:

	Per Patient Day							
	Gross Salaries and Wages	% Change	% of Total Budget	Hours Worked	% Change	Implicit Wage	% Change	Relative Wage Gain %
1953	\$ 7.20		57.7	9.2		\$0.78		
1959	11.72	62.8	62.1	10.6	15.2	1.11	42.3	11.4
1965	20.77	77.2	65.1	13.0	22.6	1.60	44.1	16.2
1971	41.82	101.3	67.9	13.3	2.2	3.14	96.3	29.9

Relative wage gain is the percentage increase in hospital wages relative to the average weekly wage (industrial composite); it measures the improvement in the relative income status of hospital workers.

This table suggests that there were some differences in behavior over these subperiods. The share of hospital budget going to wages and salaries has been rising but at a diminishing rate; the relative earnings of hospital workers have grown at an accelerating rate; and inputs of hours worked have first increased rapidly and then slowed down. In fact, hours worked per patient day rose after 1965 and then fell to its present level.

This suggests a behavior pattern of a rapidly expanding hospital sector in the 1950s, perhaps driven by the new funds made available through private and provincial insurance plans. Hospital workers were making income gains, labor inputs were rising, federal funds were adding new beds, and physicians were generating patients to fill them. Since the nonlabor budget share rose from \$5.27 to \$7.16 over this period, or 35.9 per cent, and prices generally rose only 9.5 per cent, it would appear that nonlabor inputs rose even faster than labor inputs. But our lack of any sort of hospital nonlabor price index is a hindrance here.

During the introduction of national insurance, all cost increases speeded up whereas utilization increases slowed down. Labor input increased 22.6 per cent compared with 15.2 per cent in the previous six years; relative hospital workers' wages rose 16.2 per cent faster than the general wage rate, and nonwage expense rose from \$7.16 per day to \$11.15, or 55.7 per cent, compared with general price increases of 9.7 per cent. It would appear that the initial impact of insurance was to increase substantially the real inputs to the hospital sector as well as to increase slightly the rate of increase in hospital workers' income status.

In the third phase, 1965–1971, increasing rates of cost increase have begun to generate official concern and reaction. Utilization increases are slowing down still more and labor inputs per patient day are nearly static. Nonlabor inputs have risen from \$11.15 to \$19.76, or 77.2 per cent; relative to the general price level increase of 24.2 per cent, this amounts to a 42.7 per cent increase (compared with 24.1 per cent, 1953–1959, and 41.9 per cent, 1959–1965), so it may be that nonlabor inputs are still accelerating. But it may also be that their prices have outstripped the CPI—we do not know. What is most striking about the 1965–1971 period is the dramatic increase in hospital workers' wages per paid hour—96.3 per cent, or 29.9 per cent faster than wages generally. This amounts to a rate of wage status gain of 4.5 per cent annually, sustained for six years. On a base of \$20.77, 29.9 per cent yields \$6.21; or 10 per cent of total hospital costs is attributable to the relative wage gains of hospital workers during the last six years. Over the whole span, if hospital wages had just kept pace with industry generally, they would have risen to \$1.87 per hour.

Of course, whether this is attributable to national health insurance is another question. Relative wage gains did speed up during the period when insurance was being introduced but became much more rapid in the later period. One could argue that this is a delayed effect of insurance—it took time for employees to absorb

the implications of cost-pass-through and unionization for them to apply the lesson. On the basis of this argument, insurance shifted the rate of expansion of hospital costs to a new higher trend, and workers learned to exploit this fact. But one could also argue that in an industry with inelastic demand and growing private insurance, cost-pass-through would have been discovered regardless of national insurance. Canadian experience alone cannot answer this question; some U.S. comparisons might be helpful. It is clear, however, that if future cost increases are to be moderated, some way of establishing appropriate relative incomes for hospital workers must be found. If they try to play catch-up with physicians, the cost inflation is only beginning!

It is, of course, true that the above line of argument still has not identified and pinned down the process of hospital expenditure increase in a fully satisfactory manner; there exists the major issue of shifts in labor force composition. It may well be that hospitals respond to insurance, not just by adding more personnel and machines, but by adding more complex and highly trained personnel. Thus the wage change series might include a significant increase in human capital input rather than merely input price change.

It turns out that this is a remarkably difficult proposition to test, not because of conceptual problems, but because numerous changes in reporting systems and a very detailed but constantly changing specification of the hospital labor force make the reconstruction of a set of consistent historical series a major research project in itself. This project is beyond the bounds of a survey paper such as this one. It cries out to be done as a federal research study.²³ However, a bit of indirect evidence can be brought to bear on the problem.

First of all, despite the attention given to complex diagnostic procedures and highly specialized forms of treatment, nursing services and general support staff (dietary, laundry, administrative) are still the backbone of the hospital. A series of longitudinal studies of particular classes of hospital manpower over the period 1961–1968 shows that the professional and technical classes of employees (radiologists, pathologists, radiology and laboratory technicians, psychologists, social workers, medical record librarians, pharmacists, dietitians, and physical and occupational therapists) increased their share of total hospital employment from 3.44 per cent to 4.68 per cent of total full-time employment in this field. The percentage increase is large (36 per cent increase in an expanding industry) but the absolute numbers are too small to affect total wage

movements. Their share in part-time employment also rose, from 5.67 per cent to 6.32 per cent, but part-time employees are only about 10 per cent of the total.

In the same period, full-time graduate nurses and nursing assistants rose from 6.42 per cent and 19.00 per cent of total full-time employment to 8.90 per cent and 21.60 per cent, a smaller change (20 per cent) but a more significant quantitative shift. Thus, a picture emerges of a proportional increase in nursing and nursing assistant staff and a corresponding reduction in relative employment of the unskilled "other" category. It is thus plausible to argue that in fact the human capital input per hour worked did rise somewhat over the period under consideration.

But this change, it turns out, does not appear to explain the wage shift. The reason is that average wages for nursing personnel generally (graduates and assistants) are not markedly different from those of other staff. In the first half of 1971, nurses on short-term units averaged \$3.11 per hour and on long-term, \$2.86 per hour. These made up 80 per cent of all nursing hours in public hospitals. By comparison, averages in general services were: administration \$3.28, dietary \$3.36, medical records \$2.76, housekeeping \$2.21, plant operation and security \$3.28, and laundry and linen \$2.19. Thus the pattern of wage differentials is simply not large enough to explain a major shift in the average from a change of 10 per cent or even 20 per cent. We may conclude that shifting personnel mix has had very little to do with the overall pattern of wage inflation.

Two other points deserve comment before leaving this issue. Part of the wage increase has clearly been attributable to the phasing out of the unpaid or almost unpaid workforce of student nurses. In 1953, student nurses, nursing assistants, and interns accounted for 1.62 out of 9.18 hours worked per patient day. Yet even if we pulled *all* of these out of the base for computing wage and salary cost in 1953, we divide wage and salary cost per patient day of \$7.20 by 7.56 to arrive at an average wage of 95¢ and an increase in average wages from 1953 to 1971 of 232 per cent. Although substantially below 304 per cent, this figure is also well above the approximately 140 per cent increase in general wage levels—on the *maximum* possible allowance for the effects of eliminating unpaid or low-paid student labor. And of course student labor is not yet fully phased out.

Finally, one should note that the elimination of student labor has been associated in the latter part of the period with the closing of hospital nursing schools. Thus the relative constancy of hours per patient day masks a reduction in education hours and a continued

rise in patient care hours. The hospitals have responded to budgetary pressures by shedding functions; thus the experience of stable hours input during this period may be only a temporary trend break.

A report recently prepared by the Health Economics and Statistics Branch of the Department of National Health and Welfare (*Sources of Increase in Budget Review Hospital Expenditures in Canada, 1961 to 1971*, Ottawa: December, 1973), essentially confirms this picture in the post-insurance period. From this report we see that from 1961 to 1971 total hospital expenditures rose 13.7 per cent annually, patient days rising 3.0 per cent and costs per day rising 10.3 per cent. The authors of the report also conclude that outpatient workload shifts were not large enough to affect the pattern of expenditures and that morbidity shifts in patient diagnostic mix may be important but cannot be identified.

Sources of expenditure increase are identified by department, but unfortunately only expenditure on supplies and other nonlabor expense is so allocated. Gross salaries and wages, drugs, and medical and surgical supplies are each treated as aggregates. But the labor cost per patient day is shown to have increased over the period 1961-1971 substantially faster than the nonlabor cost (11.2 per cent annually against 8.5 per cent) and to account for roughly three-quarters of the increase in cost per patient day compared with one-quarter for nonlabor cost. During this period, paid hours of work per patient day rose 2.1 per cent annually and labor cost per paid hour rose 8.7 per cent. Thus wage increase accounts for about seven-eighths of labor cost increase per patient day. This source is shown to have accounted for over 50 per cent of total expenditure increase in budget-review hospitals, even including effects of population growth and higher utilization. The possible effects of shifts in labor force composition in this process are touched on, and shifts are described in general terms, but the quantitative effects of such shifts are unknown. The relative significance of labor cost per hour as a source of expenditure increase over the period is accelerating, but much of this can be accounted for by general inflation in the economy. The rate of *relative* wage gain is, however, somewhat faster in the later period; hospital hourly wages as reported in *Sources of Increase* rose 8.1 per cent faster than general industry wages, 1961-1965, and 21.3 per cent faster, 1965-1971. This may be partly a result of the timing of the phase out of nursing education—the impact of the shift away from hospital nursing education and toward more medical education on hospital total costs and average hourly wages has not yet been analyzed. In

analyzing the response of hospital expenditure to insurance, however, the message of the report parallels that of this paper—wage inflation in the hospital sector is the main source of increase and the timing does not particularly correspond to the extension of insurance, the expansion of utilization, or even the expansion of employment. The most rapid *relative* wage increases have come in the late 1960s, when paid hours per patient day have been static and both population and utilization increase have slowed down.

Summing up, a picture seems to emerge of rapid increases in hospital capacity and utilization as a precursor to national health insurance. During the pre-insurance period hospital inputs, wages, and costs were rising rapidly, and hospital relative wages also were moving up. Private insurance may have fed this process, but government insurance was more likely a result of it. This would follow insofar as expenditure increases prior to the national plan increased burdens on the uninsured and further restricted their access. Moreover, provincial and private insurance plans came under increasing fiscal strain. Most of the discussion surrounding the national hospital plan focused on its role as a vehicle for moving more resources into the hospital sector (it worked!) and thus was a response to increasing expenditure burdens. The initial insurance period saw a jump in hospital expenses, as hospitals appear to have accelerated their expansion of paid hours per patient day. Hospital wages rose at about the same rate as prior to insurance, although their relative status improved faster. The picture does not suggest a strong demand-induced wage inflation resulting from expanded employment. Finally, the very rapid expansion in hospital expenditures in the mid-sixties triggered a bureaucratic response that has been fairly successful in containing increases in labor inputs. But the problem of relative hospital wages continues unaffected, as hospital employees seem to be improving their wage status at an accelerating rate. In the absence of a detailed job breakdown in the industry, of course, it is not possible to say whether they are still "catching-up"; the industrial composite weekly wage of \$137.64 in 1971 divided by 40 yields an "average" hourly wage of \$3.44, which is still above the hospital average of \$3.14. But neither wage rate is skill adjusted or experience adjusted. In any case, it is clear that present bargaining and budget-setting procedures in hospitals do not approximate a competitive market process! Thus it is far from clear that continuation or completion of catch-up would have any relevance to future trends. The problem of hospital wage determination is still unresolved.

Policy Responses to Hospital Cost Inflation

This subject leads into the issues surrounding hospital reimbursement and budgetary control. We have argued that the problems of hospital cost inflation in Canada have little to do with utilization, insurance-induced or otherwise, but rather a lot to do with increases in earnings of hospital workers and secondarily with increases in real resource use per patient day (whether "quality" upgrading by managers, pressure for more hands to lighten the load from employees, or demands for further services by physicians). The process of budgetary control has not been particularly successful in promoting efficiency and/or containing costs.

As mentioned above, the initial intention of the Canadian hospital insurance system was to provide a method of paying whatever expenses the hospital system generated. Insofar as a policy toward appropriate levels of expenditure existed, it seemed to involve encouraging increase; the point of a federal program was to mobilize more resources, to lower financial barriers to utilization, and to maintain or increase standards of care. Consequently, the process of budget review did not initially emphasize efficiency or cost control; and when it became apparent in the late 1960s that hospital expenditures were taking an accelerating share of national resources and that "something" should be done, neither the review and reimbursement process nor the statistical framework that surrounded it proved adequate for the task. After more than five years of discussion and study, they still are not.

The budget review process varies in detail from province to province, and in fact from year to year in a given province, depending on the state of the provincial treasury. For most of the first decade of insurance, provinces employed some variant of a line-item budget approval prior to the budget year, combined with a review and settlement at year's end.²⁴ The prospective budget is based on an expected patient day load, and the ratio of total budget to forecast load creates a synthetic per diem that is used as a basis for distributing the hospital's budget over the year but is not an independent price in the sense that if actual load is above or below forecast, the total budget will not be adjusted proportionately. If there are significant deviations from forecast, partial adjustments may be made at year's end. But both agency and hospital are well aware of the difference between average and marginal costs per day, at least in this context.²⁵

The patient day forecast is generally based on the preceding year's experience adjusted for any known special factors in or

outside each hospital. It tends to be quite accurate. It is not defined in terms of diagnostic mix, although certain special subpopulations (such as renal dialysis cases) would be forecast separately. For each hospital, expected procedure workloads and input requirements by category are then developed from this forecast; the particular procedure forecasts thus implicitly embody some judgement about diagnostic and severity mix based on the past experience of the hospital. But the judgement never becomes explicit. Once physical requirements, personnel, supplies, and equipment by category are approved, the final budget will then depend on negotiated wage scales for the positions in each hospital's approved establishment. Formally, these negotiations take place between hospital managements (on a provincial basis) and provincial unions or associations. But since wage costs are usually passed directly to the provincial reimbursing agency, it is not entirely clear what besides public interest stiffens the negotiators for management.²⁶ This may be one explanation for the unusually rapid wage increases in hospitals.

The review process has required provincial reimbursing agencies to accumulate a great deal of detailed information about each hospital, much of it informal. In Ontario, the Hospital Services Commission appoints financial representatives, each responsible for several hospitals, whose task is to work within the hospital as the Commission's agent during the preparation of a budget but to act as the hospital's representative in steering the budget through the Commission. In B.C., the Hospital Insurance Service maintains a budget "model" of each hospital (which is *not* revealed to that hospital!) which it uses in evaluating the annual submissions. Thus the reimbursement process is very information-intensive.

The problem, however, is that none of this information is organized in a way linking expenditure with output. Neither hospital nor reimbursing agency knows total costs of inpatient care in a given hospital (except for hospitals with no outpatient or educational activity) since all data is based on inputs. Direct laundry costs per pound processed, or nursing ward costs per patient day, can be calculated, but no allocation of overhead or indirect costs is carried out. If a hospital's diagnostic mix shifts, or if its patient day load and/or length of stay changes, the reimbursing agency may know in which direction the budget should shift, but never by how much. Thus hospitals are exhorted to lower length of stay. They reply that this would raise their per diem, and that the paying agency would not approve all the necessary increase. The paying agency says that it will approve the *necessary* increase, but no more. Yet no one knows what is necessary. The same problem arises if patient day

forecasts are over- or under-run; no one knows by how much a marginal patient day costs less than average. Arbitrary rules of thumb are used. Nor can comparisons across hospitals be made with any confidence, because "similarity" embodies no adjustment for differences in diagnostic mix. Everyone knows this is important; and this has been shown analytically,²⁷ but no one is sure what the appropriate adjustment should be. Thus similarity is judged on proxies such as size, location, or educational role. The process of negotiation and budget determination for the largest hospitals in each province is one of the financial responsibilities of senior financial and health officials in the provincial government and is given appropriate attention and weight; but the data from which the province might determine what it is buying simply do not exist. As long as budgets are based on levels of inputs, and inputs cannot be associated in any comprehensive way with outputs (in terms of cases treated by type or students trained), budgeters fall back on incrementalism (last year plus X per cent) and add in the special requests generated by medical technology and the relatively loose wage negotiation process. Hence the statistical outcomes mentioned above.

As the inability of budget review to limit cost escalation has become more apparent, public policy has responded along two main lines. Efforts have been made to encourage greater efficiency in hospitals and to reduce the size of the inpatient hospital sector by substituting other forms of care. Both policies have tended to move the problem out of the hospital sphere and into the realm of medical practice organization; neither has come to grips with the ballooning incomes of hospital workers.

The "management" orientation is reflected in Volume II of the 1969 *Task Force Report* dealing with hospital services. Much was made of the poor management practices in hospitals, and the recommendations covered the range of training (and even licencing!) better hospital managers, giving them more scope, and creating incentives for efficiency. Hospital reimbursement has correspondingly moved toward global budgeting, using line-item input reports as a guide to setting global amounts but giving administrators more discretion in allocating expenditures within total budgets. Experiments have been tried with fixing annual target budgets and allowing managers to share under-runs and use their share for capital expansion or other projects—the incentive reimbursement approach. It seems fair to say, however, that the managerial approach has been relatively unsuccessful for several reasons.

First, the limited possibilities of comparison across hospitals with existing data make reliable identification of "good" and "bad" management impossible. Moreover, detailed analysis suggests that there is very little variance across hospitals in *relative* efficiency within each province; the style of medical practice and the pattern of reimbursement jointly determine most of hospital behavior.²⁸ The administrator may not have much discretion. Even if one could identify desirable behavior and if the administrator had enough control over style of care delivery to do what the reimbursing agency desired, creation of incentives is almost impossible. Reimbursement incentives work only if a dollar of "profit" (shared cost under-runs) is worth more to management than a dollar of operational expense. In a nonprofit industry whose capital expansion needs are met out of a separate budget on the basis of regional and political needs, this is not so. Direct incentives to managers themselves are likewise ruled out as long as hospitals are nominally controlled by independent boards of trustees—the careers of administrators and/or their levels of remuneration are only indirectly influenced by payment agencies. Rewarding efficiency by "promotion" to a larger hospital is not possible. And finally, everyone knows that hospitals cannot be allowed to go bankrupt. The penalties for inadequate performance can never be absolute; at worst one can fire the administrator. But this weakens any ability he might have to run a tight ship even if he wanted to—the organization itself is never at risk. The focus on improved management has not been abandoned—it is still obviously true that better management can yield more health care for a given budget—but as a technique for overall cost containment it is of less interest.²⁹

Attention thus shifts to ways of reducing hospital utilization—by providing institutional alternatives such as convalescent care, day care surgery, home care; by shifting medical practice away from fee-for-service practice and toward salaried group practice or other arrangements; or by simply closing beds. All of these efforts are currently underway; and although it is too early to make any final judgement about their success, certain patterns have become apparent.

The institutional alternatives approach has the advantage of being supported by medical as well as economic opinion; the deleterious effects of excessive hospitalization on the patient are well recognized and are often more important than economic objectives in initiating new programs. Particularly in the pediatric area, it has been demonstrated that significant medical improvements as well as economic savings can be achieved through day

care surgery units or ambulatory medical treatment facilities.³⁰ The main problems with this approach are twofold. First, the tendency for utilization to rise to match supply ensures that unless new facilities are balanced by withdrawal of old, total costs rise. If a home care program or convalescent beds move less severely ill patients out of acute hospitals, new acute care patients flow in. Moreover, discharge from lower intensity facilities is more difficult. Canadian experience parallels Feldstein's judgement in the U.S.,³¹ provinces with well-developed convalescent care systems, like Alberta, have relatively higher hospital costs per capita.

A further problem arises because of the structure of reimbursement. Ambulatory alternatives to inpatient care have tended to be based in hospitals. But hospitals' budgets are geared to inpatient care; and administrators tend to view reduced days of care as threatening reimbursements. Thus a day surgery unit that eliminates a two-day stay minor surgery case is perceived as "costing" the hospital two per diems. The unit price or reimbursement received for an ambulatory case is less than would have been received for a corresponding inpatient. As the hospital's inpatient base shrinks, and its ambulatory load expands, it must negotiate (legitimately) ever higher per diems, and this is not easy to do. Reimbursing agencies see the problem differently. They see *total* inpatient utilization failing to fall as ambulatory care expands and they are less willing to negotiate higher rates. The crucial aspects of the problem are the responsiveness of utilization to facilities and the inability of either agency or hospital to quantify the full unit costs associated with either inpatient or ambulatory episodes. If episodes could be accurately priced and reimbursed independently of treatment mode, the process of moving patients out of inpatient care would be strongly encouraged.

The utilization response, in Canada as in the U.S., has been traced to the mode of organization of medical practice. Evidence exists that physician groups paid on a salary basis use substantially less hospital care for their patients than does the fee-for-service sector.³² This has led numerous observers and some government study groups to recommend reorganization of medical practice into community health centers (now a very elastic term with features paralleling HMO's) as ways of moderating hospital costs.³³ But there is general agreement that this is a long, slow process. Several provincial governments are committed to the idea in principle, but organized medicine is strongly opposed to modification of the present system.

As for the most simple-minded approach, closing beds, this has

been adopted as official or unofficial policy in several provinces. "Standards" of numbers of "needed" acute care beds per thousand population, which never were based on anything very much, are being revised downward; and provincial governments are mounting increased resistance to providing capital for new hospitals or hospital expansion. This tactic is of course easiest in provinces with rapidly growing populations such as Ontario and B.C., but actual closure of hospitals is politically extremely difficult. (The first province to adopt bed limitation as an official tactic was, however, Quebec, after the Castonguay Report stated that at least a third of the province's beds were unnecessary.) This approach probably holds the greatest promise of cost moderation in the near term, whereas long-run efforts at control will probably depend on reorganization of medical practice and some improved method of hospital wage determination.

Medical Insurance and Medical Expenditures—Cause or Effect

The question of reorganizing medical practice leads directly into consideration of the impact of Medicare on service supply. Statistical evaluation of this impact is hampered by the fact that the program is so recent, 1971 being the first full year of national coverage for which complete data are available. Moreover, in each of the provinces private nonprofit plans pre-dated the public program and provided a significant degree of insurance coverage.³⁴ The introduction of insurance is not a clear-cut, point-in-time phenomenon.

Table 5 shows, however, that when data are examined at the provincial level the timing of the public plans is quite apparent. The proportion of personal income in each province spent on physicians' services takes an abrupt jump away from its previous pattern in each province either in the year the public plan was introduced (underlined) or immediately after. The Saskatchewan picture is of course muddled by the physician strike of 1962 and its aftermath and Alberta physicians seem to show a degree of anticipation, but elsewhere the change is very systematic. Whether this is a new plateau share of personal income or a new upward trend is too soon to tell (total Canadian personal income was up 10.4 per cent in 1971, so the apparent leveling off of the "physician share" may be exogenous). But it is clear that in each province public insurance was associated with significant increases in the share of personal

TABLE 5 Physician Expenditures as a Percentage of Personal Income, Canada and Provinces, 1957-1971

	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Nfld.	Can.
1957	1.25	1.17	1.40	1.37	1.10	.96	1.10	1.20	1.33	.79	1.11
1958	1.36	1.16	1.35	1.36	1.16	1.04	1.16	1.18	1.44	.86	1.16
1959	1.44	1.18	1.35	1.46	1.18	1.05	1.08	1.22	1.33	.86	1.18
1960	1.48	1.25	1.35	1.33	1.19	1.05	1.19	1.26	1.40	.97	1.20
1961	1.52	1.30	1.69	1.60	1.27	1.15	1.27	1.30	1.34	.95	1.20
1962	1.48	1.31	<u>1.03</u>	1.47	1.23	1.16	1.20	1.29	1.19	.93	1.24
1963	1.43	1.27	<u>1.45</u>	1.47	1.31	1.23	1.27	1.25	1.42	1.00	1.30
1964	1.49	1.32	1.65	1.41	1.35	1.21	1.26	1.31	1.29	1.04	1.33
1965	1.44	1.31	1.48	1.46	1.36	1.22	1.25	1.31	1.35	.97	1.33
1966	1.49	1.27	1.41	1.46	1.33	1.23	1.17	1.33	1.29	.95	1.32
1967	1.48	1.45	1.57	1.43	1.39	1.23	1.30	1.27	1.29	.96	1.36
1968	<u>1.56</u>	<u>1.67</u>	<u>1.45</u>	<u>1.43</u>	<u>1.45</u>	<u>1.26</u>	<u>1.29</u>	<u>1.41</u>	<u>1.33</u>	<u>1.12</u>	<u>1.42</u>
1969	<u>1.63</u>	<u>1.62</u>	<u>1.52</u>	<u>1.67</u>	<u>1.48</u>	<u>1.28</u>	<u>1.31</u>	<u>1.51</u>	<u>1.49</u>	<u>1.46</u>	<u>1.46</u>
1970	1.73	1.76	1.75	1.90	1.60	1.24	1.31	1.75	<u>1.33</u>	1.56	1.55
1971	1.67	1.82	1.58	1.78	1.66	<u>1.71</u>	<u>1.48</u>	1.75	1.86	1.51	1.68
% Change											
1957-1964	19.2	12.8	17.9	2.9	22.7	26.0	14.6	9.2	-3.0	31.7	19.8
1964-1971	12.1	37.9	-4.2	26.2	23.0	41.3	17.5	33.6	44.2	45.2	26.3
1957-1971	33.6	55.6	12.9	29.9	50.9	78.1	34.6	45.8	39.9	91.1	51.4

NOTE: Data of entry to Medicare underlined.

income received by physicians. (Table 5 also shows that this increase was superimposed on a general uptrend which may have been leveling off in the mid-sixties.)

Why this was so is less clear. In conventional economics, of course, the answer is obvious—lower prices to consumers, greater demand, greater utilization, and higher prices charged by suppliers. And undoubtedly some of these changes occurred. But tracing them down is not all that easy. First of all, list prices of physician services did not particularly respond to public insurance. Table 6 contains provincial fee schedule indexes (after Medicare the index reports benefits paid by the provincial agency) compiled by the Department of National Health and Welfare since December 1963 and compares these indexes with total expenditure and total expenditure per capita.³⁵ Expenditure data are standardized to the same base as prices in 1964; no average fee level for 1963 is available. This table shows, first, that both total expenditure and

TABLE 6 Indexes of Fee/Benefit Schedules (annual averages), and Corresponding Indexes of Total Expenditure and Total Expenditure per Capita on Physicians' Services, Canada and Provinces, 1963-1973

	B.C.	Alta.	Sask.	Man.	Ont.	N.B.	N.S.	P.E.I.	Nfld.	Can. (Ex. Que.)
Dec. 1963										
FB	100	100	100	100	100	100	100	100	100	100
1964										
FB	103.7	101.8	100.0	100.0	100.0	100.0	100.0	112.1	100.0	100.6
TX	103.7	101.8	100.0	100.0	100.0	100.0	100.0	112.1	100.0	100.6
TXPC	103.7	101.8	100.0	100.0	100.0	100.0	100.0	112.1	100.0	100.6
1965										
FB	103.7	104.2	100.0	100.0	105.9	100.0	100.0	112.1	100.0	103.6
TX	111.6	112.5	104.4	110.9	110.9	108.0	107.2	125.6	106.0	109.0
TXPC	108.3	111.0	103.4	110.4	108.5	107.4	107.0	125.6	105.1	107.2
1966										
FB	103.7	107.6	100.0	100.0	107.8	112.7	100.0	112.6	100.0	105.4
TX	130.3	124.8	113.9	119.3	121.8	112.4	120.0	132.5	116.1	120.7
TXPC	121.3	121.9	112.2	119.0	116.2	111.4	119.6	132.5	113.8	116.4
1967										
FB	114.0	116.6	100.9	111.0	117.0	125.4	105.7	112.7	105.5	114.0
TX	143.9	155.0	119.2	130.3	140.9	135.8	126.5	146.8	131.3	137.8
TXPC	129.2	148.5	117.2	129.9	131.2	133.7	125.4	146.8	127.1	130.2

total expenditure per capita rose steadily year by year in each province whether or not list fees rose. Fee increases accelerated the process; their absence did not inhibit it. Of course, much of this is attributable to improving collections ratios over the period, and probably also greater adherence to fee schedules. But this pattern of behavior persists after Medicare is introduced. The mechanism that drives expenditure clearly does not operate through listed fees alone (or even primarily), and since listed fees are now pegged to actual fees it does not seem to operate through actual fees either. Unfortunately we have no data at all to adjust collections ratios and approximate actual fee movements prior to Medicare.

In Table 7 the same point emerges at the aggregate level. Here the nine-province fee benefit index (weighted by 1964 provincial populations) has been linked to the Consumer Price Index Medical Care Component for earlier years. It shows physicians' fees rising at about the same rate as all prices from 1957 to 1971, faster than the general price level before Medicare, but substantially slower since. Recalling that actual prices probably moved faster than list in the pre-Medicare years, but not since, it follows that relative price increases in the medical care industry have *slowed down* since insurance went into effect. Yet expenditures go on climbing. If list prices really reflected actual prices over this period, one could derive an apparent quantity increase for 1957-1971 by dividing expenditure change by price change—this "quantity" estimate increases by 8.0 per cent per year. Adjusting for population change brings this rate down to 5.9 per cent per year, still a very healthy rate of "real" service input.³⁶

These rapid increases in expenditure, whether "quantity" or hidden price change, should show up either as increases in average gross receipts per physician or as increases in the number of physicians available per capita. These data are displayed in tables 8 and 9. As pointed out in the appendix, they apply to fee-practice physicians only; although this represents only about two-thirds of the total physician stock, the remainder are not included in physician expenditure data and neither set nor collect fees. The increase of 28.7 per cent in physician stock per capita combines with an increase of 173.1 per cent in gross receipts per physician to yield an increase of 251.5 per cent in physician expenditures per capita, and a 29.9 per cent increase in population yields the 350 per cent increase in physician expenditures of Table 7.³⁷ Annualizing, population rose 1.9 per cent per year; physicians per capita, 1.8 per cent, and gross receipts per physician, 7.4 per cent, for a total of 11.4 per cent.

TABLE 7 Physician "Price" Movements in Canada, 1957-1973 and Implicit "Quantity" Changes (1961 = 100)

	Physician Services ^a (list price)	Consumer Price Index	Physician Services Expenditure ^b	Apparent "Quantity" Index ^c	"Quantity" per Capita
1957	89.5	94.4	70.0	78.2	85.9
1958	94.4	96.8	77.6	82.2	87.8
1959	97.1	97.9	83.9	86.4	90.1
1960	98.4	99.1	91.4	92.9	94.8
1961	100.0	100.0	100.0	100.0	100.0
1962	103.0	101.2	104.6	101.6	99.7
1963	104.9	102.9	116.8	111.3	107.2
1964	107.1	104.8	127.6	119.1	112.6
1965	110.3	107.4	140.4	127.3	118.2
1966	112.2	111.4	155.9	138.9	126.6
1967	121.4	115.3	176.7	145.6	130.3
1968	127.9	120.1	203.0	158.7	139.8
1969	134.8	125.5	232.1	172.2	149.5
1970	137.0	129.7	265.0	193.4	165.6
1971	139.6	133.4	318.4	228.0	192.8
1972	142.3	139.8			
1973	145.7	150.4			
% Change					
1957-1971			354.9%	191.6%	124.4%
1957-1973	62.8%	59.3%			
Per annum	3.1%	3.0%	11.4%	8.0%	5.9%

^a Average value of the C.P.I. physicians' fees component, 1957-1964, linked in 1965 to the N.H.W. Fee Benefit Index (Table 6).

^b Expenditure on physician services (Table 1), indexed on 1961=100.

^c Physician services expenditure ÷ list price.

Several interesting points emerge from these data. First of all, the rise in physician stock has been twice as rapid as that of the population, and has been accelerating. The introduction of Medicare coincides with a significant increase in the rate of additions to the physician stock. Furthermore, gross receipts per physician have gone ahead much more rapidly than list prices. If one accepted the Table 7 list price increase of 56.0 per cent from 1957 to 1971, the implicit average increase in real output per physician would be 4.1 per cent per year. Yet physician practices are not adding new inputs rapidly; physician practice expenses rose at 5.8 per cent per year from 1957 to 1971 compared with general price level increases of

TABLE 8 Indexes of Average Gross Receipts per Active Fee-Practice Physician, Canada and Provinces, 1957-1971, Canada Average 1957 (\$20,804) = 100

	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Nfld.	Can.	Can. ^a	Can. ^b
1957	114.1	112.3	109.1	113.8	105.8	81.2	88.5	94.4	74.6	109.6	100.0	100.0	3.78
1958	119.7	119.3	113.0	120.3	112.6	87.8	93.9	94.5	85.6	117.0	106.2	107.2	3.91
1959	128.0	121.4	113.9	132.5	116.1	90.0	90.9	102.6	90.6	118.6	110.1	113.5	3.87
1960	134.9	134.7	130.1	123.9	122.7	94.5	108.3	109.6	97.0	137.4	116.7	122.4	4.15
1961	133.9	140.5	130.3	139.7	130.8	106.3	116.4	111.7	96.1	130.7	124.3	128.2	4.21
1962	132.2	149.9	111.7	139.4	133.5	112.6	115.3	112.0	94.6	119.3	126.5	132.0	4.21
1963	133.0	148.6	171.4	138.9	147.3	123.8	126.8	112.7	112.5	134.1	137.9	145.4	4.37
1964	146.7	157.1	175.4	139.9	159.6	128.9	133.6	123.7	111.3	147.2	147.0	159.4	4.73
1965	152.3	170.1	180.1	153.4	171.9	139.4	142.4	132.1	123.0	152.0	157.7	171.7	4.85
1966	173.3	182.0	193.0	161.5	183.9	148.5	145.5	144.0	126.3	161.9	169.3	181.0	4.83
1967	185.6	210.6	193.0	176.2	205.3	160.8	172.5	146.1	138.1	175.5	185.9	203.0	5.08
1968	201.2	249.4	199.7	192.7	228.0	173.9	187.1	172.2	156.6	207.9	205.6	222.7	5.21
1969	214.9	251.8	216.4	236.8	246.0	187.7	203.6	197.6	180.3	249.8	222.7	240.1	5.25
1970	235.0	285.8	236.4	280.4	278.1	186.9	223.0	234.5	181.5	276.5	244.3	267.4	5.42
1971	239.7	298.9	244.7	271.7	296.4	259.5	260.5	234.9	246.4	264.8	273.1	305.0	5.70
% Change	110.1	166.2	124.3	138.8	180.2	219.6	194.4	148.8	230.3	141.6	173.1	205.0	50.79
Per annum	5.4	7.2	5.9	6.4	7.6	8.7	8.0	6.7	8.9	6.5	7.4	8.3	3.0

NOTE: Data of entry to Medicare underlined.

^a Canada net receipts (100 = \$12,852).

^b Canada net relative to average wage (average weekly wage × 50).

Changes in Canada:	1957-1964		1964-1971	
	Average gross	47.0%	Average gross	85.8%
Average net	59.4		Average net	91.3
Relative net	25.1		Relative net	20.5

TABLE 9 Active Fee-Practice Physicians (per 100,000 pop.), Canada and Provinces, 1975-1971

	B.C.	Alta.	Sask.	Man. ^a	Ont.	Que.	N.B.	N.S.	P.E.I.	Nfld. ^a	Can. ^a
1957	94.5	73.3	71.4	72.9	88.1	73.6	58.0	66.8	66.7	22.9	78.0
1958	95.6	73.7	72.8	74.4	89.2	74.8	59.0	67.4	66.0	23.6	79.1
1959	98.4	74.2	73.9	75.6	90.8	76.2	59.8	67.9	66.3	24.0	80.5
1960	100.6	73.7	73.3	76.9	90.8	76.6	59.4	69.9	65.0	26.1	81.0
1961	103.3	73.5	72.9	78.1	91.0	77.0	58.9	71.6	64.8	27.7	81.5
1962	105.8	73.6	72.6	79.5	91.4	77.5	58.5	73.5	64.5	29.5	82.2
1963	106.2	74.1	73.1	80.2	91.8	77.9	59.1	74.0	65.8	30.0	82.7
1964	106.8	74.6	73.7	80.6	92.2	78.4	59.7	74.3	65.1	30.6	83.2
1965	107.5	75.1	74.2	81.0	92.7	78.9	60.2	74.5	66.1	30.9	83.8
				(86.9)						(50.4)	(84.6)
1966	105.9	77.2	75.3	83.4	92.9	81.8	61.1	76.6	67.9	31.8	85.1
				(89.5)						(51.5)	(85.9)
1967	105.0	81.3	78.5	83.5	93.6	82.5	61.9	79.4	68.8	32.2	86.2
				(89.8)						(52.2)	(86.7)
1968	108.2	86.3	79.2	83.9	95.4	83.3	62.5	81.3	70.0	33.9	87.9
				(90.0)						(54.4)	(88.7)
1969	117.0	91.0	80.1	85.1	99.1	84.9	64.3	84.2	73.6	38.5	91.4
				(91.7)						(59.7)	(92.3)
1970	120.3	94.3	82.6	84.4	102.6	88.4	63.6	87.2	74.5	40.4	94.8
				(95.3)						(63.8)	(95.6)
1971	125.8	101.8	88.3	89.7	107.4	95.4	67.2	93.0	81.3	44.3	100.4
				(101.2)						(69.3)	(101.5)
% Change	33.1	38.9	23.7	23.0	21.9	29.6	15.9	39.2	21.9	93.4	28.7

^aNumbers in parentheses include salaried practitioners, which are aggregated in other provinces.

3.2 per cent and wage increases of 5.2 per cent. Physician net incomes rose steadily relative to the average weekly wage, as shown in the last column of Table 8. What is striking is that average earnings of physicians relative to this industrial composite rose *faster* in the period 1957–1964 than in the Medicare period 1964–1971. The difference is not great, but it is enough to suggest that the introduction of Medicare did not bring about a change in the longer-run forces that drive the relative incomes of physicians.

Thus we are left with the observations that Medicare was associated with rapid increases in the numbers of physicians and rates of expenditure on their services, but not with major changes in physician list prices. Physician relative income continued to climb rapidly, but no faster than before Medicare; actual prices and real outputs per physician are unknown. We have, however, some fragmentary data on real outputs. The before-and-after Medicare study of physician utilization in Montreal reports that aggregate visit rates did not rise in response to insurance and that physician hours of work did not increase. Instead, physicians reorganized their practice patterns and generated more income from a given number of initial patient contacts.³⁸ This is supported by data from Trans-Canada Medical Plans showing that in insured populations, rates of physician-generated services per capita tend to rise faster over time and to be more closely associated with physician availability than are rates of patient-generated services.³⁹ Aggregate data from Quebec for 1971 and 1972, the first two years of insurance, show the same phenomenon, incredible quarter-to-quarter rates of increase of certain specific physician-generated services as well as a shift across fee schedule items from, for example, “ordinary” to “complete” office examinations.⁴⁰

Rather than a linkage from demand through price and quantity to physician expense driven by independent shifts in demand, we seem to be observing a linkage from supply of physicians through quantity of services as determined by the physician to total expense. What we observe, and what generates expense, is not demand in the economist’s sense but utilization, and utilization is the outcome of patient demand and physician behavior. This behavior is at least partially dependent on the relation between desired and actual physician incomes. The role of national health insurance may simply have been to relax further any market constraints on how physicians manipulate utilization to generate income. Table 8 suggests, however, that these constraints were not very significant before Medicare. Undoubtedly there was also a once-for-all increase in the ratio of actual to list prices as the plans

drove uncollectables to zero in one year, but the primary force driving up physician expenditures in the late 1960s is the increase in physician stock and the changes in physician practice patterns.

This creates a rather puzzling inconsistency. In the time series data, each province shows a clear jump in share of income devoted to medical services when public insurance is introduced; and as pointed out above, in most provinces physician incomes rose rapidly in the years spanning the introduction. Yet over the longer period, physician incomes relative to wages and salaries generally have moved up about 3 per cent per year, and this increase did not accelerate in the 1968–1971 period. Of course, wages and salaries do not move with personal income; over this period they have tended to lag behind. But the key question is the difference made by insurance. In the absence of the public plan, would the rapid increase in physicians per capita from 1968 to 1971 (14.2 per cent in three years) have driven down average physician incomes? Or would it merely have given rise to price and quantity adjustments in the private market that would have pushed up costs anyway? There is some evidence cross-sectionally in Canada that although *absolute numbers* of physicians per capita have little systematic effect on relative physician income, *rapid rates of growth* of the stock push down relative incomes (Evanš, 1972, Ch. 3). The evidence is not worth much, but we might tentatively suggest that national insurance speeded up physician reactions to an increase in numbers and affected the timing of their income-maintaining responses. Had Medicare not been introduced, the influx of physicians to the market might have held down income increases in the short run and generated pressure for increases in list prices and changes in individual billing practices. Medicare speeded up the process by shifting actual prices relative to list (hence the slower movement of list prices post-Medicare) and by enabling billing practices to shift rapidly without patient backlash (the Enterline findings). Physician influence over the private market seemed to be strong enough, however, that over the long haul they would have been able to absorb the influx and restore their incomes to the long-term upward trend. Of course, this is all hypothetical; we have very little post-Medicare data yet and political variables have now superseded whatever market forces were previously operative.⁴¹

Table 10 merely provides some corroborative evidence on the role of physician pricing behavior. It shows the variation across provinces in fee levels: B.C., Manitoba, Alberta, and Ontario tend to be high priced whereas the eastern provinces are lower. Highest of all is B.C. Yet these are also the provinces with the largest

TABLE 10 Relative "Prices" of Medical Services across Provinces, Various Years (Ontario = 100)

	1968	1969		1973	
	All Services Fee Schedule (Sept. 1)	All Services Fee Schedule (Sept. 1)	All Services Benefits Paid (Oct. 1)	All Services All Services ^b	All Services Benefits Paid Visits Only
General Practitioners					
B.C.	110.9	106.5	106.5	117.25	122.19
Alta.	99.4	106.6	113.2	115.53	121.28
Sask.	104.7	95.2	89.9	92.25	95.14
Man.	127.3	115.5	109.1	103.95	103.30
Ont.	100.0	100.0	100.0	100.00	100.00
Que. ^a	—	—	—	—	92.72
N.B.	98.3	97.9	92.5	—	86.07
N.S.	110.2	99.1	93.6	—	96.38
P.E.I.	98.7	89.0	98.9	—	85.66
Nfld.	96.6	86.8	86.8	—	85.65
Specialists					
B.C.	108.9	112.7	112.7	103.64	124.20
Alta.	99.9	99.0	97.4	101.75	104.31
Sask.	103.4	95.4	90.1	87.44	90.34
Man.	112.9	106.1	100.2	92.05	93.02
Ont.	100.0	100.0	100.0	100.00	100.00
Que.	108.1	101.2	101.2	—	91.80
N.B.	95.6	101.4	95.8	—	89.38
N.S.	109.5	101.9	96.2	—	98.14
P.E.I.	104.9	96.5	107.2	—	101.78
Nfld.	100.0	94.1	94.1	—	91.90
All Physicians					
B.C.	109.6	110.8	110.8	110.33	122.84
Alta.	99.7	102.1	103.4	108.53	115.78
Sask.	103.9	95.3	90.0	89.80	93.58
Man.	118.6	108.7	102.7	97.90	99.96
Ont.	100.0	100.0	100.0	100.00	100.00
Que. ^a	—	—	—	—	92.42
N.B.	96.2	98.7	93.2	—	87.15
N.S.	109.9	99.2	93.7	—	96.95
P.E.I.	99.8	92.0	102.2	—	90.88
Nfld.	97.8	89.2	89.2	—	87.67

^a Quebec general practitioners had no fee schedule in 1968 or 1969.

^b Payments for laboratory services in eastern provinces are not on a unit basis.

number of physicians per capita. B.C. is the most prominent example—always at or near the top of all provinces in prices, yet far ahead of the others in numbers of physicians (Table 9) and near bottom in physician incomes (Table 8). The inference is that as increases in physician stock spread the patient load more thinly, incomes per physician fall. The response is to try to drive *up* prices and/or to generate more output. Neither tactic has been fully successful in B.C., but then the physician stock is abnormally large there and probably includes a relatively larger number of semi-retired practitioners.⁴²

If in fact physician behavior is the key to utilization and expenditure behavior, as Canadian insurance experience suggests,⁴³ it follows that efforts to modify patterns of expenditure by incentives directed at the consumer of care cannot hope to influence overall cost trends. Copayment is pretty much a dead issue in Canada, both because of its distributional effects and because it cannot come to grips with the real problems.⁴⁴ Public policy has instead been directed at two approaches—control within the existing structure of medical practice, and modification of that structure.

Control in the existing structure includes negotiation of list fees and could be extended to unilateral determination of such fees by government (although this has not been suggested out loud). The evidence now seems fairly clear that this will not work because billings can be expanded almost indefinitely on a given schedule. Moreover, procedural multiplication can be harmful to the patient's health and can generate substantial external costs in the hospital sector and elsewhere. The "provider profiles" mentioned above merely identify very unusual practitioners; they give no leverage to government over changes in general practice standards over time. A variety of gimmicks have been suggested or tried—absolute limits on physician earnings (Newfoundland) merely lead to more physician leisure. Prorating of billings against a fixed pool of reimbursement has been suggested as a short-run measure, but in the long run it seems to accentuate the pressures on physicians to multiply procedures by penalizing the "non-multipliers" for the excesses of their colleagues.⁴⁵ So far the only sure-fire method of cost containment appears to be the current suggestion by the Council of Health Ministers that physician immigration be restricted. Fewer doctors, like fewer hospital beds, surely does mean lower costs. Combined with "physician-extender" programs, it may not mean fewer services. Thus the escalation of medical costs could be limited to that generated by the income aspirations of current physicians and future Canadian graduates.

Income aspirations of physicians seem to be somewhat muted at

present, partly because of large gains in the 1960s, but also because the last five years have seen an outpouring of public and private opinion that "something" should be done about the private practice, fee-for-service mode of medical care delivery. Just as this form of medical care delivery seems to make rationalization of hospital use almost impossible, so it stands in the way of achieving limitations on medical costs. The root of the problem is that although fee-for-service creates incentives for unnecessary care, private practice blocks any information channel that would enable a regulatory agency to determine necessity (or even the accuracy of the billing). The best that can be done is to identify "unusual" patient or provider patterns. As much as 50, or 90, per cent of tonsillectomies may be unnecessary, but which ones? And who has authority or ability to decide? Thus, attempts to achieve public accountability for medical care delivery fail before the enormous information advantage possessed by the physician, exactly the same problem that made the private market useless as a regulatory device.

The recommended solution in Canada is some form of public organization, owning facilities and hiring physicians, tied into a much more complete network of patient information. The label attached is usually "Community Health Center," although the name means something different to almost everyone using it. The primary features of the C.H.C. are, however, that it combines conventional medical practice with a more general social and public health concern, that it is not dependent on fee for service, and that unlike a medical practice it is nonprofit. It is also quite far down the road as a system of medical care delivery, and the road itself is far from clear. Nevertheless, almost every group that has studied the Canadian health insurance system agrees that we cannot stay where we are. Insurance changes only the demand side of health care—the supply side is crucial. The hardest part of the job lies ahead.

APPENDIX

Data Sources for Text Tables

The most comprehensive data on health care costs in Canada are prepared by the Health Economics and Statistics Directorate of the

Department of National Health and Welfare, Government of Canada. Their personal health care concept, generally speaking, covers all health care expenditures that are, or prior to the public medical and hospital plans were, made by persons from family budgets, payments to hospitals, physicians, dentists, and for prescription drugs. It excludes public health, research, and educational expenditures on health care, but does include governmental expenditures on special-category hospitals. Research charged to a hospital budget is included in PHC, which also includes hospital operating costs but not capital expenditures.

The personal health care concept also excludes health expenditures that are not directed by the health care provider "establishment," such as nonprescription drugs, eyeglasses and appliances, services of health professionals outside hospitals other than physicians and dentists, and nursing home care. The line between nursing homes (excluded) and private convalescent hospitals (included) becomes a little fuzzy but is drawn on the basis of administrative arrangements. Private hospitals contracting with the provincial agency and providing insured care for all or part of their patients are included with respect to their expenditure on insured patients. The amounts involved are trivial.

Annual PHC data for Canada and the provinces are published irregularly, the latest being Canada, Department of National Health and Welfare, *Expenditure on Personal Health Care in Canada, 1960-1971*, Ottawa, n.d. This is the basis for Table 1; pre-1960 data are from Canada, Department of National Health and Welfare, *Expenditures on Personal Health Care in Canada, 1953-1961*, Health Care Series Memorandum #16, Ottawa, March 1963. In 1960 and earlier, expenditure in hospitals run by the Department of National Defense (like private hospitals, a very small part of the Canadian hospital industry) are excluded. The earlier prescription drug series also fails to include prescribed drugs sold outside retail pharmacies. The inclusive series can be pushed back to 1957 by earlier "occasional memoranda" from Health and Welfare but the series breaks there.

A more inclusive definition of the health care industry is the basis for a new data series, recently released as Canada, Department of National Health and Welfare, *National Health Expenditures in Canada, 1960-1971*, Ottawa, October 1973 (including comparative U.S. data). It adds to PHC nursing home care, nonprescription drugs, eyeglasses and other appliances, services of other health professionals outside institutions, costs of prepayment administration, voluntary organizations, research, new-facility construction,

and public health activity. Some specific exclusions are made (such as government of Canada hospital facility construction) but these are quantitatively trivial. This comprehensive series indicates that total health expenditures per capita in Canada rose from \$113.50 in 1960 to \$306.11 in 1971, compared with \$80.53 and \$236.61 for PHC. Thus the PHC percentage has risen from 71.0 per cent to 77.3 per cent, indicating the faster growth of the hospital and physician sectors.

Data on the physician stock and physician incomes are generated along with the health care expenditure series and are reported in Canada, Department of National Health and Welfare, *Earnings of Physicians in Canada, 1961-1971*, Health Care Series #30, Ottawa, n.d. Earlier data are from *Earnings of Physicians in Canada 1957-1965*, Health Care Series #21, Ottawa, April 1967. This series covers "active fee practice" physicians, those "whose main employment is in the provision of personal medical care services" and "whose professional income is mainly in the form of fees for services rendered." It thus excludes all salaried physicians providing medical care, whether in a private group practice, on a hospital staff, or in public service. In fact, however, prior to 1970 a small number of salaried physicians working in group practices were included; only those in Manitoba and Newfoundland where salaried service was quantitatively important were excluded. In 1970 all salaried group practitioners were excluded, so that the reported increase in manpower in 1971 over 1970 is remarkably low. In this paper we have added back-salaried physicians outside Manitoba and Newfoundland for 1970 and 1971 to keep the series consistent. Bracketed figures in the text tables show the effects of adding back-salaried practitioners in those two provinces as well.

As a measure of the availability of physician services, the fee practice physician is somewhat unsatisfactory. To compare, for example, service availability in Newfoundland with the national average by looking at fee practitioners only is grossly inaccurate. Similarly, it appears that some of the discrepancy between Quebec and Ontario in physicians *per capita* is made up by larger teaching programs in Quebec with more hospital staff, interns, and residents supplying medical services but appearing in hospital budgets. (Quebec, Commission d'enquête sur la santé et le bien-être social, *Analyse comparative des coûts de l'hospitalisation au Québec et en Ontario*, Annexe I du rapport, Gouvernement de Québec, September 1967.) Total active civilian physicians in Canada in 1971 are reported as 32,625 (Canada, Department of National Health and Welfare, *Health Manpower Inventory, 1972*, Ottawa, October 1972)

but this includes administration, teaching, part-time practitioners, etc. This source, which also includes stock estimates back to 1963, merely references the Canadian Medical Directory, but another federal publication, *Health Services in Canada, 1973*, produces the same figure and refers to it as prepared by the Ministry of National Health and Welfare, based on data from Medical Marketing Systems, Ltd. (Seccombe House, formerly Canadian Mailings Ltd.), which maintain records for the drug detail men and other medical suppliers. The Health Manpower Inventory divides this total of 32,625 into 12,566 general practitioners, 13,616 specialists, 1,257 "not in private practice," and 5,186 interns and residents. Yet this breakdown implies 26,182 active practitioners, or 20 per cent more than the 21,895 active fee-practice physicians in 1971 reported in *Earnings of Physicians* (see above) when all reporting salaried practitioners are added in. No "reconciliation statement" is prepared. Moreover, no documentation is provided about the methodology employed in the tabulation, so the primary official source of data on the physician stock is effectively undocumented (in contrast, for example, to the detailed methodology available in *Earnings of Physicians*). For further discussion of alternative estimates prior to the manpower inventory, see R. G. Evans, *Price Formation in the Market for Physician Services in Canada, 1957-1969*, Ottawa, 1973, especially Chapter III and Appendix III-3.

The active fee-practice series is, however, preferable as a basis for analyzing market behavior since this group sets fees and receives them and is the provider of almost all insured care under the Medicare plan. The income series associated with this group and reported in the text has certain problems as well. It includes part-time physicians who are semi-retired, or who entered practice part way through the year. This is partly corrected by focusing on the physicians with net incomes above some arbitrary minimum—in 1971 this minimum is \$15,000. Any self-employed practitioner netting less than \$15,000 *cannot* be fully employed! In 1971 average gross and net incomes for this group were \$61,516 and \$42,624 compared with \$56,824 and \$39,203 for all fee-practice physicians. Thus, \$42,624 would be a better estimate of the net earnings of a "representative" fully employed practitioner. Unfortunately, a time series of this sort is not very meaningful since it would move with the (arbitrary) choice of full-time cutoff. There are also problems in the gross income and expenses of practice data as a result of disentangling group practices with salaried physicians; and the investment earnings component of nonprofessional income is almost certainly understated since all data are drawn from tax

returns that do not include capital gains prior to 1972. Physicians tend to invest in assets (such as medical arts buildings) yielding high capital gain but low income, and it is hard to believe that the average physician in fee practice earned only \$798 from all nonfee sources in 1971, including incidental wages and salaries, given one's fragmentary knowledge of physician-owned real estate holding companies! Some of this may be picked up in 1972 and after, as half of capital gain must now be reported as income (when realized). The same sort of problem arises with expenses of practice, some of which of course reemerge as investment income. Still, it is doubtful if these factors influence trends over time to any great degree.

The physician price series for earlier years is the Consumer Price Index, physicians' fees component, prepared by the Dominion Bureau of Statistics and reported in Canada, Department of National Health and Welfare, Research and Statistics Memo, *Health Care Price Movements*, Ottawa, April 1968. The overall CPI is from Canada, Dominion Bureau of Statistics, *Canadian Statistical Review: Historical Summary 1970*, Ottawa, August 1972. Updating of statistics in this issue was from the February 1974 issue of the *Canadian Statistical Review* (monthly). All population data (June 1st annual data) and average weekly and hourly wage data are drawn from these sources.

The CPI index was relatively limited—fees for office visits, home visits, an obstetrical confinement, and an appendectomy as reported by six general practitioners in each metropolitan area to a semi-annual telephone survey. It was phased out city by city as Medicare spread across the provinces. The Department of National Health and Welfare also prepares an index of provincial fee schedules, starting in December 1963. In earlier years this index might differ substantially from fees charged to uninsured patients. As each province entered Medicare, this index was shifted from a listed-fees to a benefits-paid basis (since many provinces pay less than 100 per cent of the schedule or impose administrative limitations). These data are unpublished but were generously supplied by the Health Economics and Statistics Division, Health Programs Branch, National Health and Welfare. A compound index was constructed using the CPI index to 1964, the N.H.W. fee schedule index to 1968 or whenever each province entered Medicare, and the N.H.W. benefits paid index thereafter. The 1965 overlap between CPI and N.H.W. was used to link these two series (the CPI is Laspeyres, the N.H.W. Paasche) and the second point of linkage was implicit in the N.H.W. procedure that reports only

month, year, and size of percentage increase in fee or benefit schedule from December 1963 to the present by province. Until 1970, however, when Quebec entered Medicare, Quebec general practitioners had no fee schedule. Thus the Canadian average fee benefit schedule (FB) is a weighted average of the nine other provinces. An index of total expenditure on physicians' services can then be derived from the personal health care data and compared to changes in listed prices or benefits to indicate the extent to which listed fees account for changes in total expenditure. A similar sort of comparison can be made between list prices and physician gross receipts.

The primary source of hospital data is the set of *Hospital Statistics* volumes published annually by the Dominion Bureau of Statistics. Hospital reporting by D.B.S. began in 1932 but in 1952 a new and more extensive reporting system was introduced and the reports expanded to two volumes. Since then, the structure and content of the reports have changed from time to time but the volume of data collected has steadily expanded until now seven volumes are published annually in addition to Mental and Tuberculosis Hospital statistics and numerous occasional studies on manpower and salaries.

In dealing with the text data, a number of points must be kept in mind. First of all, "general and allied special hospitals" in the D.B.S. data excludes all private hospitals since these do not report the same detailed federal returns. In the total personal health care expenditure, however, national health and welfare includes any private hospital providing care under contract with a provincial agency. The discrepancy is not large, but is just enough to keep the numbers inconsistent! Data on number of hospitals and number of beds in the text are taken from Canada, D.B.S., *Hospital Statistics, Vol. I—Hospital Beds, 1971*, Ottawa, November 1973, historical data, pp. 46–50. Patient days are adult and child only and include chronic, convalescent, rehabilitation, and other specialties. Patient days per thousand population were calculated by taking the reported average daily number of patients for each year, multiplying by 365 (or 366), and dividing by national population. Admissions per thousand population were calculated by dividing reported total admissions by population. The ratio of the two does not equal reported mean stay per separation (discharge or death) presumably because in an expanding hospital sector, admissions systematically outran separations in every year.

This may not be the whole explanation; a number of small arithmetic discrepancies turn up in this vast array of data, particu-

larly in earlier years. As mentioned in the text, total hospital beds in general and allied special hospitals seem to be undercounted in 1961. Data on p. 33 of *Hospital Beds, 1971* suggest that in 1961 about 1,800 chronic, convalescent, and rehabilitation beds were shifted to mental and "restored" the following year.

Costs per patient day in the text always refer to total expenditures per adult and child patient day, excluding new-borns. Earlier data sources often include new-borns, whole or part-weighted. Cost per day back to 1956 is reported on pp. 28-30 of Canada, D.B.S., *Hospital Statistics, Vol. VI: Hospital Expenditures, 1971*, Ottawa, October 1973. For the earlier years, data were taken from *Hospital Statistics, Vol. II, Expenditures* for each year. Reconstructing these data, however, it must be noted that prior to 1956 net expenditure per patient day was reported, excluding courtesy rebates to staff and revenue from nurses' board. Reported patient day costs from p. 89, Col. 5, of the 1953 publication (\$11.95) have, for example, been adjusted upward by the ratio of gross to net (p. 105), and similarly in 1954 and 1955. The 1953 total was then allocated by class of expenditure using the proportions in *Hospital Statistics, Vol. II*, p. 88 (wages and salaries, drugs, etc.). No allocation by department was possible since throughout the 1950s reporting procedures permitted a very high "undistributed expenditure" component that was nearly a fifth of the total. The breakdown in 1971 used data reported in tables 30-33 of Canada, D.B.S., *Hospital Statistics, Vol. VII: Hospital Indicators, 1971*, Ottawa, August 1973; Table 18 provided paid hours data to compare with the hours data in Table 31 of *Hospital Statistics, Vol. I, 1953*. Historical length of stay and occupancy data came from *Hospital Statistics, Vol. I, 1971*, and all 1953 and 1971 disaggregated expenditure data came from *Hospital Statistics, Vol. VI, 1971*, and *Vol. II, 1953*.

Data for the subperiods between 1953 and 1971 are much less comprehensive than one would like, because reporting categories and definitions kept changing so as to make the construction of long and consistent series on the internal expenditure components of hospitals rather difficult. Gross salaries and wages and paid hours are drawn from the 1953 *Hospital Statistics, Vol. II*. Gross salaries and wages for 1959, 1965, and 1971 are drawn from *Hospital Statistics, Vol. VI*. Expenditures and paid hours are from *Hospital Statistics, Vol. VII, Indicators*. Data on numbers and wages of professional and technical employees over the period 1961-1968 are taken from a series of twelve occasional papers published by D.B.S., *Health Manpower in Hospitals, 1961-1968*, the first general and each following paper covering eleven specific occupations and

reporting *inter alia* the share of total hospital budgets made up by their wages. Wages per paid hour by occupation in 1971 are from Canada, Dominion Bureau of Statistics, *Hospital Indicators, January-June 1971*, Ottawa, October 1971, which was based on the quarterly survey but not reproduced in the annual volume.

The general principles followed in data preparation were, first, to emphasize construction of consistent series over time, and, second, to choose data concepts as closely as possible related to potential insurance responses or behavior. There is a huge quantity of statistical data on hospitals that could be used to show the responses of detailed hospital budgets wherein shifts occurred after the insurance programs were introduced; but such a project was well beyond the resources available for this paper. The Department of National Health and Welfare has made a good beginning with its *Sources of Increase in Budget Review Hospital Expenditures in Canada, 1961 to 1971*, Ottawa, December 1973. It is to be hoped that this project will be pushed back to pre-insurance days and expanded in detail. It would also be helpful if federal statisticians could spend some time on indicating the appropriate reconciliation of sources, where possible! So far, number generation has tended to outrun either documentation or reconciliation, but the trends appear favorable.

NOTES

1. Thus, the federal publication *Health Services in Canada 1973* (Ottawa: Department of National Health and Welfare, 1973), which summarizes the national programs, opens its first sentence by referring to the B.N.A. Act. This publication, issued annually in previous years as *Health and Welfare Services in Canada*, is a good overview of the general provisions of the provincial hospital and medical programs as well as the direct service programs of the federal government. In earlier years it also provides a statistical sketch of the hospital system at a point in time, amplifying material in the annual Canada Year Book published by the Dominion Bureau of Statistics.
2. The federal government pays 25 per cent of each province's own per capita cost for covered hospital services, plus 25 per cent of the national average per capita cost of such services, plus 50 per cent of the national average per capita cost of covered medical services, all multiplied by the provincial population.
3. A brief history of the development of health insurance in Canada is provided by Malcolm G. Taylor, "The Canadian Health Insurance Program," *Public Administration Review*, 33 (January-February 1973). Other brief descriptions are J.E.F. Hastings, "Federal-Provincial Insurance for Hospital and Physician's Care in Canada," *International Journal of Health Services*, 1 (1971); R. Kohn, "Medical Care in Canada," in J. Fry and W.A.J. Farndale (editors), *International Medical Care* (Oxford: Medical and Technical Publishing Co., 1972) and

A. P. Ruderman, "The Organization and Financing of Medical Care in Canada," in British Medical Association, *Health Services Financing* (London, 1970). Hastings tends to focus relatively more on current administrative questions and on the impact of health insurance on other health and social services and the organization of health personnel; Kohn provides a current snapshot description of health services, insured or uninsured, which tends to cover the "official" features with limited analysis; Ruderman in his description discusses the relatively limited role of price and income effects in the Canadian system and argues that the private market economy approach is not and never was particularly relevant. A more extensive history of the pre-Medicare nonprofit comprehensive insurance plans from which Medicare evolved is C. H. Shillington, *The Road to Medicare in Canada* (Toronto: Del Graphics, 1972). Symposia on the hospital system include the September 16, 1962 issue of *Hospitals: J.A.H.A.*, Vol. 35, No. 18, and *Medical Care*, Vol. 7, No. 6, Supplement (November-December 1969). The cornerstones of description in this field are, of course, the *Report of the Royal Commission on Health Services* (Hall Commission) (Ottawa: The Queen's Printer, 1964); and supporting studies: the *Report of the Commission d'enquête sur la santé et le bien-être social* (Castonguay-Nepveu Commission) (Quebec: Gouvernement de Québec, 1970); and *The Report of the Ontario Committee on the Healing Arts* (Toronto: The Queen's Printer, 1969). Someone, somewhere, may have read all this. John Evans suggests that Canadians spend more time and effort studying health care than most other countries do delivering it; see "Physicians in a Public Enterprise," *Journal of Medical Education*, 48 (November 1973). The present author strives to uphold that tradition.

4. Taylor, op. cit.
5. It must be recalled, of course, that standards of services cannot be measured only by expenditure. The dramatic increase in provider incomes, physicians, and hospital workers (see below), which have been the principal quantitative effect of health insurance, have tended to even out provincial differentials. Thus, health providers have moved faster up the wage structure in poorer provinces, without any observable associated improvement in health status. In medical care, however, much of this behavior pre-dated the federal legislation—see R. G. Evans, *Price Formation in the Market for Physician Services 1957-1969* (Ottawa: The Queen's Printer, 1972), Ch. 3.
6. These terms are spelled out in more detail in the annual *Health Services in Canada*. The hospital program required participating provinces to sign an agreement with the federal government detailing licensing, inspection, and supervision requirements and federal audit. These requirements were not imposed in the medical care plan, either as Taylor suggests because of provincial objections to federal intervention, or because public regulation of physicians is a much more contentious issue than regulation of hospitals!
7. Administrative costs have certainly been held down—in 1971 prepayment and administration of health plans cost Canadians \$5.54 per capita compared with \$12.83 in the U.S.; total health expenditures per capita are \$306.11 and \$386.92. Canada, Department of National Health and Welfare, *National Health Expenditures in Canada, 1960-1971* (Ottawa: 1973). (Both countries, of course, bury compliance costs in provider budgets, but it seems likely that compliance costs are also lower given a uniform national system.) The bargain looks a little different, of course, when one discovers that the existing system of administration does not generate data sufficient to understand or control operating expense! But at least the U.S. is no better off.

8. The nub of the problem appears to be the desire of the federal government to turn over tax revenues that will initially yield revenues higher than current health costs but that will grow less rapidly (alcohol and tobacco levies). The provinces prefer a larger income tax share, since the income elasticity of this tax will keep pace with past rates of cost increase. The federal authorities note that their plan provides incentives to rationalize delivery at the provincial level, as well as initial resources to support change. The provinces argue that this scheme imposes all the risks of cost containment on them (as well as the political unpopularity).
9. Moreover, revenues thus collected are subtracted from shareable costs, making them "50¢ dollar" revenues from a provincial standpoint.
10. R. G. Beck, *The Demand for Physicians' Services in Saskatchewan*, Ph.D. dissertation, University of Alberta, 1971. The charge also lowered use among large families and aged-head families, and was politically unpopular. The Liberal government that imposed it was defeated in 1971 and the charge removed by the incoming N.D.P.
11. This is not solidly established but emerges in several studies—e.g., Beck, *The Demand for Physicians' Services in Saskatchewan*, shows a steady weakening in the relation between income and utilization after Medicare. P. E. Enterline *et al.*, "The Distribution of Medical Services Before and After 'Free' Medical Care—The Quebec Experience," *New England Journal of Medicine*, 289 (November 29, 1973), report a shift in number of visits—up for lower-income families, down for upper-income families, zero net change. R. E. Badgley *et al.*, "The Impact of Medicare in Wheatville, Saskatchewan, 1960–1965," *Canadian Journal of Public Health*, 58 (March 1967), show evidence of a similar shift, although less concrete in the absence of visit data.
12. Anne Scitovsky has correctly pointed out that although this paper identifies sources of expenditure increase in insured health care and relates them to increased provider incomes, it does not establish that these developments are a result of national health insurance. In some sense one could never establish this. Who knows what would have happened? But it is true that although a short-run expenditure response to national insurance is identifiable in both hospital and medical care, the response of provider incomes are less clear-cut. The hospital response, if it is that, has a long lag, whereas the physician response, on the contrary, may be merely a speeding up of long-run trends that would have happened anyway. If this all sounds a little *ad hoc*, it is. I've also changed some of the hospital wage numbers and their explanation. I regret undercutting Anne's comments but it made a better paper!
13. It is, of course, true that relative earnings of health care providers rose prior to the public insurance plans as well. To what extent this was attributable to the spread of private insurance no one knows.
14. A detailed description of the reporting is available in a pair of booklets published annually by the Dominion Bureau of Statistics and the Department of National Health and Welfare, *Instructions and Definitions for the Annual Return of Hospitals Form HS-1, Facilities and Services and Form HS-2, Financial*.
15. In Quebec the medical association collects additional data from each practitioner on auxiliary personnel employed, hours of work, and distribution of activity of hours of work. Analysis of the relationships among practice characteristics, physician characteristics, and pattern of workload is now being carried out by A. P. Contandriopoulos and J. M. Lance, "Modèle de Préviation de la Main-D'Oeuvre Médicale," Document de Travail No. 8, McGill University,

- May 1974. The authors express some reservations about the quality of the practice characteristics data.
16. Some efforts have been made to carry out such estimates—e.g., R. G. Evans, "Behavioural Cost Functions for Hospitals," *Canadian Journal of Economics*, 4 (May 1971); and R. G. Evans and H. D. Walker, "Information Theory and the Analysis of Hospital Cost Structure," *Canadian Journal of Economics*, 5 (August 1972).
 17. This view was still being urged in 1969; see Canada, Department of National Health and Welfare, *Task Force Reports on the Costs of Health Services in Canada*, Vol. III, pp. 170–182. That particular report, on medical prices, seems more concerned with physician autonomy.
 18. Thus in 1970 the B.C. Medical Association promulgated a new fee schedule. The province declared it too high, and said that the plan would not pay it. The profession replied that its members would collect the increase from patients. The government advised patients not to pay, and published (by name) each physician's gross receipts from the plan in the newspapers. The profession thereupon lowered its schedule and a compromise was adopted; but it worked to defeat the government at the next election. In most provinces the process is less open.
 19. This is an implication of empirical research in B.C. See R. G. Evans *et al.*, "Medical Productivity, Scale Effects, and Demand Generation," *Canadian Journal of Economics*, 4 (August 1973). It has also been commented on by informed observers. (John Evans, "Physicians in a Public Enterprise.")
 20. This was expressed as a positive goal in the Hall Commission Health Charter for Canada. "BASED on freedom of choice, and upon free and self-governing professions. . . ." Report of the Royal Commission, pp. 11–12.
 21. These comparisons also illustrate the dangers of interpreting share movements. In 1961, a recession year, personal income was down and the jump in hospital share was accentuated. The long boom of the early sixties held the physician share nearly constant from 1961 to 1966; only when the growth of the economy slowed did physicians' share move up again.
 22. Canadian hospital accounts do not include employee benefits in gross salaries and wages but classify these as "supplies and other expense." These amount to about 9 per cent of the total budget in recent years. (Notice that hospital budgets include little or no capital expense.) In 1969, radiologist and pathologist remuneration was transferred from "supplies and expense" to "gross salaries and wages"; this amounts to about 2.5 per cent of total budget and has been transferred back to supplies and expense in this paper for consistency. The 1971 data also reflect an exclusion from hours worked of intern and resident time and classroom hours, thus biasing downward the change in hours per patient day from 1965 to 1971. The effect appears, however, to be quantitatively insignificant (of the order of 0.2 to 0.3 hours per patient day).
 23. One study has been conducted that attempts to examine wage change by employment category within the hospital labor force and relate such changes to wages in similar occupations elsewhere in the economy: Canada, Department of National Health and Welfare Research and Statistics Memo, *Salaries and Wages in Canadian Hospitals 1962 to 1970*, Ottawa, n.d. (1971). This source draws on data from the Department of Labour as well as D.B.S. and N.H.W. Unfortunately, the longest data span assembled is 1962 to 1969, and in this case the 1969 data are contaminated by failure to include a major subsequent retroactive agreement in Quebec in 1970. The report is carefully documented

and extremely honest about its limitations; it does show that by 1969 hospital employees in such service trade occupations as cooks, laundry workers, maids, and seamstresses were paid well above their private industry counterparts. But its coverage, both cross-sectionally and over time, is far too limited to support any general conclusions.

24. Saskatchewan, typically, tried out a variety of innovative approaches in the 1940s, long before anyone else had considered the problem. See B. Roth *et al.*, "The Saskatchewan Experience in Payment for Hospital Care," *American Journal of Public Health*, 43 (June 1953).
25. Although in calculating savings to be achieved by reduced utilization of acute inpatient facilities, for example, this distinction may be forgotten by exponents of alternative programs.
26. On one occasion, however, the Minister of Health in B.C. simply refused to pay all of the negotiated wage increases and forced hospitals to find the differential by cutting staff or using their own revenue sources (e.g., the preferred accommodation differential). The policy was monumentally unpopular, and it is asserted that hospitals merely ran up their lengths of stay; but there is some evidence that it slowed cost trends. In Quebec the provincial government has participated directly in wage negotiations since 1966.
27. Evans, "Behavioural Cost Functions for Hospitals," and Evans and Walker, "Information Theory and the Analysis of Hospital Cost Structure."
28. *Ibid.* These findings relate to aggregate hospital budgets. Some provinces, particularly Quebec, are using cross-hospital subindexes, such as dollars per pound of laundry processed, as control devices to identify and place administrative pressure on hospitals that are above average on these direct departmental costs. This may simply lead back to standardizing the internal structure of hospital budgets—uniform inefficiency again.
29. A cynic might fear that better managers in the existing structure might make the problem worse; they'll simply negotiate better for more money!
30. R. G. Evans and G. C. Robinson, *An Evaluation of the Economic Implications of a Day Care Surgery Unit*, Final Report, N.H.W. Grant #610-21-14, Vancouver, October 1973.
31. M. Feldstein, in "An Econometric Model of the Medicare System," *Quarterly Journal of Economics*, 85 (February 1971), reports that extended care facilities raise costs per hospital *episode*—what is saved on lower acute care stays is lost in long extended care stays.
32. J. L. McPhee, *Community Health Association Clinics* (Regina: Saskatchewan Department of Public Health, August 1973); and J. E. F. Hastings *et al.*, "Prepaid Group Practice in Sault Ste. Marie, Ontario: Part I," *Medical Care*, (March–April 1973).
33. The *locus classicus* is the report of the Commission d'enquête (Castonguay Commission). The federal equivalent was the Community Health Centre Project, directed by J. E. F. Hastings, which reported to the Council of Health Ministers in July of 1972 and supported the C.H.C. concept strongly. More recently the Report of the British Columbia Health Security Programme Project (Victoria: December 1973) also endorsed the C.H.C. idea.
34. The nonprofits on which the national program was modeled, provincially based but affiliated as Trans Canada Medical Plans, covered 30 per cent of the population in 1967 (adding in the population of Saskatchewan, which had a universal public plan since 1962). Coverage was, however, proportionally much higher in the western provinces. Moreover, most of the population had *some* medical coverage, although private insurance plans were more likely to

- limit coverage to in-hospital care and/or impose copayment features. With reference to the role of insurance in expanding demand for care, the TCMP plans had an average cost per insured of \$34.95 in 1967, compared with a national average of \$33.63 for medical expenditures of all Canadians. Moreover, TCMP subscribers were concentrated in high-cost provinces. See Evans, *Price Formation in the Market for Physician Services*, Ch. 2; or Trans-Canada Medical Plans, *Annual Enrollment Experience and Annual Financial and Statistical Experience Report, 1967 Year* (mimeo.), July 1968.
35. The indexes are current-weighted composites derived from a sample of key items in each provincial fee schedule, with the size of the sample growing over time. By contrast, the C.P.I. Component (discontinued after Medicare) was a base-weighted index of prices of four procedures performed by general practitioners in urban areas, measured by telephone survey. For further discussion, see R. G. Evans, *Price Formation in the Market for Physician Services*, Ch. 1 and Appendix 1-2, where it is also shown that although the proportion of specialists in Canada rose from 35 per cent in 1957 to just over 50 per cent, the impact of this change on measured prices is almost certainly less than 10 per cent overall.
 36. The table suggests that this "quantity" increase has accelerated since Medicare, but the 1971 increase is distorted by the massive effects of the introduction of the Quebec program. In that province average gross incomes of physicians jumped 38.9 per cent, 1971 over 1970, and net incomes were up 50.1 per cent. Expenses of practice rose 8.6 per cent on average. This leads to the suspicion that there was substantial under-reporting of income in Quebec prior to 1971.
 37. There are a few conceptual discrepancies in moving from physicians to physician services. See *Earnings of Physicians in Canada, 1961-1971*.
 38. Enterline *et al.*, "The Distribution of Medical Services Before and After 'Free' Medical Care"; and A. D. MacDonald *et al.*, "Physician Service in Montreal Before Universal Health Insurance," *Medical Care*, 11 (July-August 1973).
 39. Evans, *Price Formation in the Market for Physician Services*, Ch. 4.
 40. Regie de l'Assurance-Maladie du Quebec, *Annual Statistics 1972*, Quebec, n.d.
 41. This whole paragraph is in response to Anne Scitovsky's comment that this paper really says more about the forces driving expenditure increase than about the role of health insurance, and that its treatment of the impact of insurance on physician incomes was inconsistent. I have attempted to rationalize the inconsistency, but I confess I do not know the answer.
 42. Within B.C., however, the effects of differing physician density across regions on regional provider incomes seem to have been almost entirely (about 85 per cent) wiped out by variations in practice patterns; Evans *et al.*, "Medical Productivity, Scale Effects, and Demand Generation."
 43. This is, of course, a growing view in the U.S., V. Fuchs and M. Kramer, *Determinants of Expenditures for Physicians' Services in the United States 1948-1968* (New York: National Bureau of Economic Research, Occasional Paper No. 117, 1972) being perhaps its leading exponents. The discretionary behavior of the physician and his influence over demand emerges also in the work of M. Feldstein, U. Reinhardt, and J. Newhouse, often by default.
 44. Moreover, if copayment were to become large enough to reduce demand and utilization, private insurance would return for the good risks.
 45. J. Y. Rivard, *La Rémunération du corps médical*, Annexe 13 to the Castonguay Report; also Ch. 5 of Evans, *Price Formation in the Market for Physician Services*.

11 | COMMENTS

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Evans' paper is really a short monograph that might just as well be entitled "What Every Interested American Ought to Know about Canadian Health Insurance." The Canadian experience with health insurance is important to this country because (1) it has coupled public financing with continued private production of health services; (2) variation among its provinces in approach and in timing has produced evidence from several significant social laboratories; and (3) a good many Canadian institutions, including the federal structure of government and relationships between physicians and hospitals, resemble our own. In chronological time, Canadian actions with respect to health insurance have preceded ours, so that they may provide us with a leading indicator.

In preparing this paper, Evans has intentionally cast a wide net. To continue the metaphor, he has achieved a substantial catch. The quality of the catch is variable, however. The paper could benefit from more work; it affords rewarding reading even now.

Beginning with an elegant introduction to the Canadian Constitution (the British North America Act), Evans relates how a central government that apparently lacks authority in the health field has managed to establish a roughly uniform nationwide system of nearly universal hospital and medical insurance by wielding the instrument of federal-provincial cost sharing. The hospital plan went into operation in the provinces in the period 1958–1961; the medical plan, in 1968–1970. Evans describes the two insurance plans in considerable detail—their respective benefits, sources of financing, methods of paying providers, and the basic data systems. Both structure and function are depicted with a broad brush, but also with a sense of the degree of diversity that characterizes the several Canadian provinces. (Under the circumstances, the latter aspect is not quite systematic.)

Ten numbered tables plus four more text tables, supported by an appendix on the data sources and on the splicing of time series, constitute a gold mine of trend data on personal health expenditures in Canada by object, on health care prices, and on health services utilization. Several tables also furnish detail by province. At almost every point the data beg for comparison with the United States; in small measure I shall try to respond to this need. Throughout, the paper invites more detailed description or more refined analysis; for this a discussant can only encourage the author to continue his good work and to amplify it.

POLICY PROPOSITIONS

Owing to time limitations in preparing the paper, Evans' policy propositions are not so well supported by the analyses developed in the paper at hand as they might be. Nevertheless, Evans is both a scholar and a man of experience, and his views on policy are worthy of respect for themselves. More important for this context, however, his policy views help the reader to understand why certain problems were selected for study and others were neglected.

I trust that what follows is a fair presentation of Evans' policy propositions stemming from his interpretation of the Canadian experience with health insurance:

1. Copayment by consumers is beside the point, for physician behavior is dominant. (In a footnote Evans adds: if copayment turned out to be important enough, private health insurance would sell policies to cover it.)
2. It is difficult to discover incentives toward greater managerial efficiency if managers are not allowed to do anything much with the savings they achieve or to apply them toward doing a better job.
3. Profiles and audits of providers are of limited value. They can only detect fraud.
4. It follows that it is necessary to try to control the flow of funds. The question, which is not answered, is how.
5. It comes down to this: Health insurance is a limited device. Complementary instruments are required.
6. As a practical matter, it is important to take steps to curtail the supply of hospital beds.
7. Canada will move toward a policy of restricting the number of physicians.

None of these propositions strikes me as unreasonable or implausible. Indeed, I incline to put even greater emphasis on a reduction in the supply of hospital beds in the long run. With respect to physicians, it is essential to explore the implications of their relationship with hospitals.

THIRD PARTIES AND CONSUMERS

Evans concludes that the economic relationships between third parties and consumers in Canada are relatively uninteresting. Why? He gives these reasons.

1. The existing system of health insurance premiums is pointless.
2. There is a scattering of utilization charges among the provinces, without rationale.
3. Utilization charges are probably costly to collect.
4. Extra billing by physicians is trivial (in contrast to the United States experience under Medicare).

Evans' conclusion on this score is important not only for policy purposes, but also because it leads him to emphasize a different set of economic

relationships, those between third parties and providers. It would be highly useful, therefore, to document this conclusion. Of special interest are case materials that attempt to describe which policies have been tried and what ensued. Such materials serve administrators of health plans; they also shed light on the inferences drawn from quantitative studies.

THIRD PARTIES AND PROVIDERS' EARNINGS

For Evans, the economic relationships between payment agencies and providers of health services are at the heart of the Canadian health insurance system. How can this be, given the original lack of intention and desire on the part of government to intervene in the provision of services?

His answer is that certain consequences of health insurance were not foreseen. Utilization of services has increased somewhat; more expensive techniques are being adopted; and, in an open-ended payment system, providers revise their income aspirations upward.

Indeed, for Evans, the most prominent effect of health insurance in Canada has been the increase of earnings by health providers, both physicians and hospitals. Two factors are involved: (1) the policy adopted at the outset to pay all legitimate bills and to minimize interference with management; and (2) the inadequacy of the information structure on which intervention on the supply side might be based.

PHYSICIANS

Closer examination of the Canadian data, as well as comparison with data for the United States in the same intervals, suggests that in the case of physician services, health insurance must have been only one of the factors involved, for it appeared rather late. Table 1 presents annual rates of increase in expenditures in both countries; to show the component factors as well and to save space, panel A is for Canada and panel B is for the United States.

Early in the 1960s expenditures for physician services rose at the same rates in the two countries—7 to 8 per cent a year. The figure rose in both countries to 10 per cent a year by 1965. After that the Canadian rate of increase was higher, 13 vs. 10 per cent by 1968, and still higher in the next interval, 16 vs. 11 per cent.

However, the Canadian data indicate an increase in the per capita use of services of 11 per cent in the last interval. The figure is dubious on several grounds: It is considerably higher than any past figure; it is accompanied by a low—indeed, lower—rate of price increase; and it departs appreciably from the United States experience. It is not unreasonable to postulate some spillover between the United States and Canada.

TABLE 1 Physician Services: Annual Rates of Increase in Expenditures, Population, Price, and per Capita Use, Canada and the United States, Selected Intervals

Interval	Expenditures	Population	Price	Per Capita Use
A. Canada				
1953-1956	10.8%	3.0%	N/A	N/A
1956-1959	10.7	3.1	N/A	N/A
1959-1962	7.7	2.3	2.0%	3.4%
1962-1965	10.3	2.1	2.3	5.8
1965-1968	13.1	2.0	5.0	5.7
1968-1971	16.2	1.5	3.0	11.3
B. United States				
1950-1955	6.0%	1.7%	3.4%	0.9%
1955-1960	9.1	1.7	3.3	4.1
1960-1962	7.0	1.6	2.6	2.8
1962-1965	10.4	1.4	2.6	6.4
1965-1968	9.8	1.1	6.2	2.5
1968-1971	10.9	0.9	7.1	2.9

SOURCES: *Canada*—Evans' paper provides basic data for my computations. *United States*—Herbert E. Klarman, Dorothy P. Rice, Barbara L. Cooper, and H. Louis Stettler, *Sources of Increase in Selected Medical Care Expenditures, 1929-1969* (Washington, D.C., Social Security Administration, 1970); for subsequent years, Social Security Administration, unpublished data.

One can only surmise about plausible explanations. Is it possible that medical insurance in Canada, by establishing a single source of payment within a province, led simultaneously to a more correct reporting of earnings by physicians? If so, there would be a one-time shift in the data base. Utilization changes would be overstated, if price increases were understated for whatever reason. An improved ratio of collections to charges would serve to increase earnings while official prices remained the same. In the United States there is good reason to believe that after 1965 the fractionation of fees became widespread, thereby understating the official rise in fees; has Canada had a similar experience?

Certainly the fact of an appreciable increase in physician earnings is not contestable. However, because of the high increase in per capita utilization reported in his data, Evans may be neglecting prices unduly over the long run. Evans appropriately emphasizes the discretion of the physician in prescribing additional visits and services. In the United States Rappleye¹ and Ginzberg² have long made this the core of their policy positions on health manpower. Fuchs and Kramer offer this ability of physicians to generate more services as their preferred explanation of the statistical significance of the physician supply variable in their demand equation.³ Adam Smith does not

distinguish between influence on quantity of service and on price when he recognizes that the reward of physicians must be such "as may give them that rank in society which so important a trust requires."⁴ To have better judgment on the Canadian fee data, more needs to be known than is reported in this paper about how physicians are actually paid. May I add that Evans is uniquely able to furnish such information.⁵

There is a wealth of provincial data that Evans does not explore and that I am unable to handle. Take Saskatchewan, for example. Table 6 shows it to have been successful in keeping down physician services expenditures. How? Not by keeping down the number of physicians; its supply rose at the overall Canadian rate, according to Table 9. What about its fee level? Well, it rose at a rate slightly higher than for Canada, according to Table 6; or it may have risen at a lower rate in recent years, according to Table 10. A reconciliation of the fee data, which are undoubtedly ambiguous in spots, would be a useful endeavor.

HOSPITALS

In Canada, average earnings of hospital employees have increased by 8 per cent a year. For a similar period, earnings of hospital employees in the United States rose by 5 per cent a year.

Evans asks whether the increase in average employee earnings reflects in part a higher personnel mix. Data bearing directly on the question are not available to him, but on balance he concludes that a change in personnel mix probably had nothing to do with it. For the United States, Feldstein reports a reduction in the average skill level of hospital workers. This trend was

TABLE 2 Hospitals: Annual Rates of Increase in Cost Components, Canada, 1953-1971, and the United States, 1955-1968

Cost Component	Canada	United States
Average Cost/Patient Day	9.3%	7.8%
Labor Cost/Patient Day	10.5	7.5
Personnel/Patient Day	2.1	2.3
Average Annual Earnings	8.3	5.1
Nonlabor Cost/Patient Day	7.2	8.2
Proportion Labor to Total:		
Initial Year	57.7	61.7
Terminal Year	70.3	59.6

SOURCES: Canada—Computed from basic data in Evans' paper.
 United States—Martin S. Feldstein, *The Rising Cost of Hospital Care* (Washington, D.C.: Information Resources Press, 1971), p. 17.

coupled with increases in wages for some hospital occupations that brought them to levels above those in other industries.⁶

Although staffing ratios are lower in Canada than in the United States (and appropriately so, given the longer average duration of stay in the former—13.3 hours per patient day vs. 14.9 hours), the rate of increase in the former still lags—2.1 vs. 2.3 per cent a year (Table 2). However, labor cost per patient day has increased at a higher rate in Canada, owing to the higher rate of increase in average earnings. The result, which is not easy to understand, is that in Canada labor costs have risen to 70 per cent of total cost from a base year figure of 58 per cent, whereas in the United States the trend was gradually downward, from 62 to 60 per cent (Table 2).

A possible approach to reconciling some of these divergent tendencies is to examine differences in the definition of accounts. In the United States fringe benefits are classified as nonlabor expenses; are they so classified in Canada? In the United States nonlabor expenses incorporate increasing amounts of depreciation, which used to be neglected; does the situation differ in Canada?

Evans concludes that wage inflation is the main source of increase in hospital expenditures in Canada. The timing of the wage inflation does not correspond to the extension of health insurance, nor to the increase in hospital use, nor even to the expansion of hospital employment. Indeed, the increase in use was small, and corresponded to the increase in hospital beds. It is not clear what led to the increase in wages. From the experience of the United States after Medicare, either of two explanations is tenable: the extension and then operation of universal hospital insurance; or the method employed to pay hospitals. Can the experience in Canada help one choose between them?

REGULATION OR CONTROL THROUGH REIMBURSEMENT

For both types of provider, Evans stresses the importance of negotiated earnings and sees no obvious basis for the exercise of restraint.

He mentions the accumulation of a formidable hospital data base and regrets the failure hitherto to apply it. He looks forward to better coding and machine processing of the data. Furthermore, he would employ the data to explain differences in cost among hospitals and to set prices for inpatient and outpatient services. For these purposes direct departmental expenses, without any allocation of overhead, are useless, in Evans' opinion.

Here I differ. The fact is that economists do not yet know how to explain cost differences among hospitals. Moreover, for a multiproduct firm, it is not possible to calculate the average cost of each product; only the marginal cost is calculable.⁷ If so, what is the use of allocating overhead expenses? At least direct departmental expenses can help in making comparisons within a hospital over time and among institutions, preferably also over time.

Evans is doubtful about the efficacy of close monitoring of institutions to

achieve greater efficiency. Believing that he is right, I should still like to see some documentation from the Canadian experience.

Evans concludes from his study of Canadian health insurance that the supply side is crucial. Again I tend to agree; the study of demand has preoccupied us unduly. It is salubrious to hear a call for increased concentration on supply factors at a conference devoted exclusively to the economics of health insurance.

NOTES

1. Willard E. Rappleye, *Personnel—The Key to Effective Health Programs* (New York: Josiah Macy, Jr. Foundation, 1950).
2. Eli Ginzberg, *Men, Money and Medicine* (New York: Columbia University Press, 1969).
3. Victor R. Fuchs and Marcia J. Kramer, *Determinants of Expenditures for Physicians' Services in the United States, 1948–1968* (New York: National Bureau of Economic Research, Occasional Paper No. 117, 1972), p. 36.
4. Adam Smith, *The Wealth of Nations* (New York: Random House, 1937), p. 105.
5. Robert Evans, *Price Formation in the Market for Physician Services in Canada, 1957–1969* (Ottawa: Information Canada, 1973).
6. Martin S. Feldstein, *The Rising Cost of Hospital Care* (Washington, D.C.: Information Resources Press, 1971), pp. 56, 61.
7. George Stigler, *The Theory of Price* (New York: Macmillan, 1946), p. 307.

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Like Professor Klarman, I am much impressed by Professor Evans' paper. He has tackled a formidable problem and really combined three if not four different papers in one. There is, to begin with, a historical-descriptive section on the organization of national health insurance in Canada. This is followed, first, by a detailed analysis of the rise in hospital expenditures in the period 1953–1971, and then by a somewhat less detailed analysis of the increase in physician expenditures in the period 1957–1971. Finally, the sections on hospital and physician expenditures contain a discussion and evaluation of government policy responses to hospital cost inflation as well as Professor Evans' own recommendations on how to solve the problem of medical care cost inflation in Canada. He has assembled and analyzed a vast body of data that I am sure future researchers will heavily draw from. Let me therefore preface my comments by saying that any criticisms I have are minor compared to the job he has done.

My main comment is that Professor Evans' paper is not so much a study of the effects of national health insurance in Canada as an analysis of the

increase in hospital expenditures in the period 1953–1971 and in physician expenditures in the period 1957–1971. Early in his introductory section, he does say: "... the single most prominent influence of health insurance in Canada has been to increase the earnings of health providers." The earnings of health providers, both in the hospital sector and in the physician sector, did indeed rise very substantially during these periods. But his data do not really show that this was the result of national health insurance.

For example, he shows that hospital workers' wage rates as well as gross wages and salaries per patient day actually rose *less* in the period 1959–1965 (the immediate post-hospital insurance period) than in either the preceding or the subsequent six-year periods. He himself seems to change his mind about what exactly health insurance had to do with the inflation of costs as he proceeds to analyze the data in detail. In the section on hospital costs, he refers to a Canadian government report on hospital expenditures over the period 1961–1971 and says: "In analyzing the response of hospital expenditure to insurance ... the message of the report parallels that of this paper—wage inflation in the hospital sector is the main source of increase and *the timing does not particularly correspond to the extension of insurance, the expansion of utilization, or even the expansion of employment*" (italics mine). Actually, let me add that what increase in utilization there has been also does not seem to correspond to the extension of insurance. As Table 4 shows, the rate of increase in utilization, in terms of both admissions and patient days per 1,000 population, was slower in the post-insurance than in the pre-insurance period. Only employment as measured by hours worked per patient day shows some relation to the extension of insurance. As the table on p. 457 shows, it rose at a somewhat faster rate in the post-insurance period—22.6 per cent between 1959 and 1965 as against 15.2 per cent between 1953 and 1959; however, this increase accounts for only a very small part of the increase in average labor costs per patient day between 1959 and 1965. Thus, the role of national health insurance is a relatively minor factor in explaining the increase in hospital costs, and we have to look to other factors for an explanation.

This Professor Evans does very thoroughly and, I think, successfully, in the hospital sector of the paper, and more superficially in the physician sector. To begin with the hospital part of his paper, his data bear out his thesis that it was supplier behavior—the rapid and considerable increase in hospital workers' wages and in labor costs per patient day—that was the major factor underlying the increase. However, although he shows that the rise in wage rates cannot be explained as demand-induced wage inflation resulting from expanded employment, he does not really come up with a satisfactory explanation. He explores various possible explanations. For example, he considers that there may have been a shift in the mix of hospital personnel from less-skilled to more-skilled workers, but concludes that this was not the case, although here his data are not entirely satisfactory. He also explores the possibility that the phasing out of unpaid or almost unpaid workers (student nurses, nursing assistants, and interns), which in 1953 accounted for about 17–18 per cent of hours worked per patient day, may have been a factor. But

even when he adjusts for this change he finds that it explains only a small part of the increase in hospital wage rates (about 24 per cent). He mentions the possibility that hospital workers' wages were still catching up from the period of very low wages during the period of charity hospitals, and he shows that in 1971, the average hourly hospital wage was still somewhat below that of the average industrial hourly wage—\$3.26 compared to \$3.44. Unfortunately, lack of data on the mix of skills in both the hospital and the industrial sectors prevent him from pursuing this possible explanation. The reason for the increase in hospital wages is therefore left largely unexplained.

I also want to raise a question that bothers me. According to Professor Evans, 70 per cent of the average cost per patient day in Canada in 1971 was labor cost; in the United States in the same year, it was about 58 per cent. Yet in Canada, hours worked per patient day in 1971 were 13.29, or 1.66 hospital workers per day, assuming an eight-hour work day, whereas in the United States it was 3.01 workers per day. What is the explanation? Do the U.S. figures for cost per patient day include some costs that are not included in the Canadian figures? Or do the Canadian figures for labor cost per patient day include something not included in the U.S. figures? Or do Canadian hospitals employ a higher proportion of highly skilled employees? The explanation may lie in the longer average length of stay in Canada than in the U.S. (11.3 days in 1971 in Canada as against 8.03 days in the U.S.). Since shorter stays result in higher average costs per day because the first few days of any hospital stay are the most expensive, involving a high percentage of nonlabor costs (operating room, x-rays, lab tests, etc.), this seems one possible explanation. I don't want to belabor this point, but it does intrigue me.

To turn to the physician expenditures part of Professor Evans' paper, as I already said, his analysis here is less thorough. He compares the period 1957–1964 with the period 1964–1971. His choice of 1964 as the dividing point between the pre- and post-Medicare periods puzzles me since Medicare was enacted only in 1966, and all but one of the ten provinces have introduced programs only quite recently—one in 1968, five in 1969, two in 1970, and one in 1971. In addition, I have some questions about his analysis of the changes in expenditures that occurred in the period 1957–1971.

Any analysis of physician expenditures hinges on the adequacy of the index used to deflate expenditures. Professor Evans does not tell us what exactly is included in the new N.H.W. benefits paid index nor what the implications of linking the old CPI physician fee index to the new index are. He himself seems to have some doubts about the index since he says: "If list prices really reflected actual prices over this period, one would derive an apparent quantity increase for 1957–1971 by dividing expenditure change by price change—this quantity estimate increases by 8.0 per cent per year." Again, a bit later, he says: "If one accepted the Table 7 list price increase of 56 per cent from 1957 to 1971, the implicit average increase in real output of physician would be 4.1 per cent per year (*italics mine in both quotations*). A more detailed explanation of the index, and Professor Evans' reasons for being so tentative about it, would therefore seem to be called for in a paper of this kind.

Not knowing what exactly the fee/benefit index reflects leaves it to the reader to speculate about what some of the causes of the increased "real" output might be, especially since Professor Evans does not make much of an attempt to explain it. He does state that the stock of physicians rose twice as fast as population in the period 1957-1971. But this does not explain the increase in "real" output *per physician*. On the basis of some fragmentary evidence, he doubts that physician visit rates have increased. He concludes, therefore, that the increase in "real" output is attributable to the fact that physicians to a large extent are able to determine the demand for their services and, as he puts it, "manipulate utilization to generate income." I am the first to agree that the physician can and does play an important role in determining the demand for his services, and have argued so for a long time. Undoubtedly this explains a good part of the increased "real" output. But another possible contributory factor that Professor Evans does not mention is the possible increase in the percentage of specialists as against general practitioners. This may, of course, be accounted for in the index but, as I said, I have no way of knowing. If it is not, and there was such a shift in Canada, this could explain at least part of the increased "real" output since specialists not only charge higher fees than GP's but also generate more ancillary services such as lab tests and x-rays per visit. It would be interesting to know, therefore, if and in what way the distribution of Canadian physicians by field of specialty changed in the period 1957-1971.

Just one more point on this subject. Many physicians undoubtedly "manipulate" demand to increase their income by ordering too many lab tests or x-rays or by performing marginal or even unnecessary surgery; or, as Professor Evans points out, they may "shift across fee schedule items from, for example, 'ordinary' to 'complete' office examinations." But there are also other changes in practice patterns that increase physician income and are not quite in the same "manipulative" category. Take, for example, a fairly recent study of "The Effects of 'Free' Medical Care on Medical Practice—the Quebec Experience," reported by Philip Enterline in the *New England Journal of Medicine* (May 31, 1973). He interviewed a random sample of Montreal physicians before and after the Province of Quebec put Medicare in effect in November 1970 (the surveys were done October 1969-May 1970 and October 1971-May 1972). He found that the total number of *all* patient contacts declined by almost 10 per cent in the post-Medicare period. However, when you look at the change by type of contact, you find that total face-to-face contacts increased by 4.8 per cent. Telephone contacts declined by 41 per cent, office visits increased by 32 per cent, hospital inpatient visits dropped by 16 per cent, hospital clinic visits stayed about the same, and home visits dropped by 63 per cent. This change in practice patterns undoubtedly raised physicians' incomes, since telephone calls are probably rarely charged for and since home visits (at least in the U.S.) are relatively underpriced in relation to other types of visits (a doctor can see several patients in his office—at a fee not much lower than that for a home visit—for every one home visit he makes and thus make more money). If this type of change in practice patterns occurred in other parts of Canada, either as a result of Medicare or because of a long-term trend (in the

U.S., for example, there has been a steady decline in home visits), this also would explain some of the increase in "real" output.

In conclusion, let me say that I am in full agreement with Professor Evans that copayment on the part of patients is not the answer to stemming the rise in medical care costs, or rather not the *sole* answer. I do not think that copayment is as ineffective as Professor Evans seems to think, and I believe that some copayment on the part of patients is desirable. But I feel very strongly, and have argued so in a recent paper, that some forms of restraints on suppliers of medical services have to be devised—primarily on physicians since they to a large extent determine not only the demand for their own services but the demand for hospital services. The hospitals, as somebody said recently, don't have patients—they only have doctors. I am not sure that I agree with Professor Evans' recommended solution, but I have to admit that I have no counter-proposal.

