THE IMPLICATIONS OF
DIRECT BILLING FOR MEDICAL SERVICES

by

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Abstract

Between September 1992 and July 1993, 81 of British Columbia's approximately 7,000 practising physicians "opted-out" of the Medical Services Plan (MSP) and began direct billing their patients. This marked the first significant occurrence of direct billing for medical services since the introduction of the *Canada Health Act* (1984). Patients of opted-out physicians paid directly at the time of service and subsequently submitted their bills to the MSP for reimbursement. Patients' direct bills were, on average, 15% greater than the reimbursed amount.

The existing literature suggests that medical service user fees reduce patient demand. However, this reduction does not occur equally. Low-income patients and females appear to reduce their utilization to a greater degree. Moreover, user fees do not appear to target more "discretionary" types of care. Despite the reduction in patient demand, the overall effect of user fees on medical service utilization remains unclear. This is because physician response to reduced patient demand has not been definitively determined. It appears, from the few studies available, that physicians respond to dropping caseloads by "inducing" demand from remaining patients. This "physician-induced" demand may offset the reduction in patient demand. Consequently, total expenditures (insured + direct) may actually increase as a result of user fees.

This study analyzes the utilization patterns for patients of 73 opted-out BC physicians and their "matched pairs" (based upon specialty, community of practice, and previous billings). Patients' utilization patterns are analyzed from one year prior to one year following the date of opting-out. Physicians' responses are measured for both general practitioners and specialists.

The results of this study show that patient demand is negatively impacted by direct billing. However, this reduction does not occur uniformly. Opted-out general practitioners lose female patients. Opted-out specialists lose proportionately more low-income than high-income patients. It appears that, in response to direct billing, high-income patients switch to opted-in specialists. In contrast, low-income patients appear to delay seeking specialist care.

The results of this study suggest that direct billing physicians respond to reduced caseloads by "inducing" demand from remaining patients. MSP payments per patient increase for both opted-out specialists and opted-out general practitioners, *post* direct billing. This increase does not occur equally. Opted-out general practitioners increase payments for both low and high-income patients as well as the elderly. Opted-out specialists' payments increase for elderly patients. There are no corresponding increases in MSP payments for matched, opted-in general practitioners or specialists.

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1. Introduction

1.1 The Need for Research

There exists a long-standing policy debate surrounding user fees for

medical services in Canada. This debate is occurring amongst academics,

physicians, politicians, and the Canadian public. As discussed by Plain

(1982):

> The present health care policy debate [regarding direct billing for
> medical services] would be markedly assisted if the requisite
> hypotheses were tested and concrete evidence was used to
> support or reject a number of policy alternatives advanced by
> organized medicine and the Provincial and Federal Governments
> (p.15).

The user fee debate has gained renewed interest as Canadian federal

and provincial governments strive towards deficit and debt reduction. The

1995/96 federal government budget signifcantly intensified this debate. The

federal government has replaced the Established Programs Financing (EPF)

program, which funded health care and post-secondary education, and the

Canada Assistance Plan (CAP), which funded social services and social

assistance programs, with the Canada Health and Social Transfer (CHST).

Through the CHST, federal transfers for health care, post-secondary education,

and welfare are now provided as a block grant to each province. This grant

consists of cash and taxation points. Allocations within this transfer are now

provincial responsibility. Federal Department of Finance figures show that,

through the CHST, federal cash transfers to the provinces have dropped from

$18.6 billion in 1995/96 to $12.5 billion in 1997/98, a reduction of almost

33%.[1]

All Canadian provinces and territories must adhere to the principles

outlined in the *Canada Health Act* (1984) to receive federal health care funding.

The federal government enforces the principles of this *Act* through dollar for

dollar reductions in transfer payments to any province which charges user fees

for insured medical services. However, as a result of diminishing federal

funding for health care, highlighted by the change to the CHST, provincial

governments' acquiesence to federal standards for health care is no longer

guaranteed. Figure I highlights the decrease in federal funding and the

corresponding increase in private funding for health care from 1983 to 1994.

Figure I - Canadian Health Care Funding By Source (1983 & 1994)

1983

Federal
28.0%

Private
23.3%

Other Public
5.1%

Provincial
43.6%

1994

Federal
21.9%

Private
28.2%

Other Public
5.6%
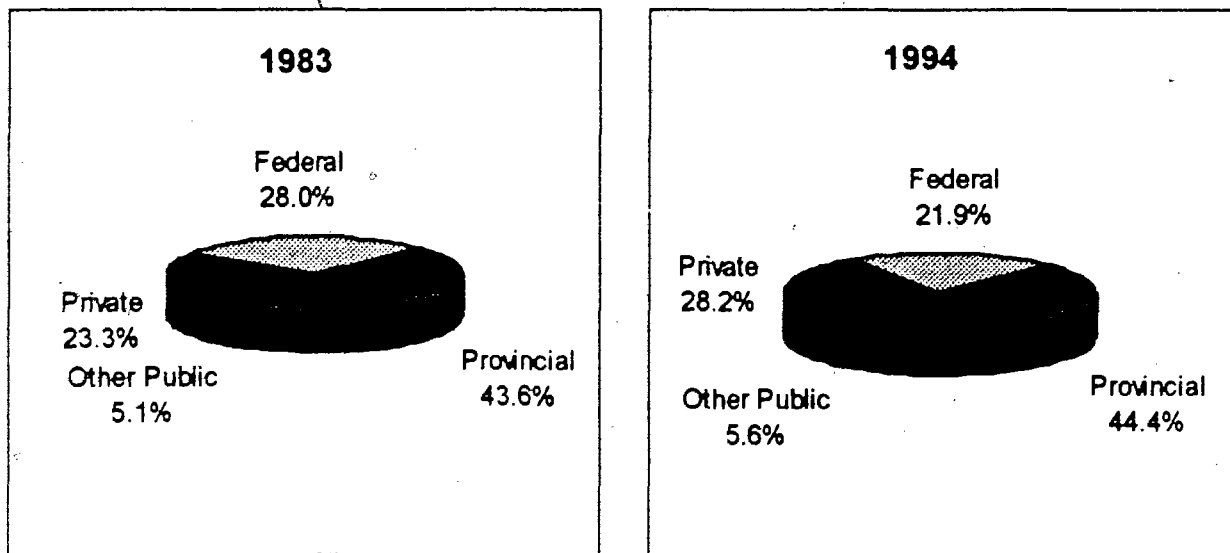
Provincial
44.4%

Source: Health Canada, Policy and Consultation Branch (1994).

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[1] as printed in The Vancouver Sun, May 23, 1997, p. A3.

1.2 Direct Billing for Medical Services in BC

BC physicians have the right to "opt-out" of the provincial Medical Services Plan (MSP) and bill their patients directly *(refer to Appendix A for regulations regarding opting-out across Canada)*. Patients of opted-out physicians submit their bills to the MSP for reimbursement. There was minimal experience with opting-out in BC until a 1992 disagreement between the BC Medical Association (BCMA) and the provincial government. Shortly after being elected in October 1991, the provincial government enacted the *Medical Practitioner Fee-for-Service Apportionment Act* (1991). This *Act* capped overall payments to BC physicians at $1.27 billion (2% higher than the previous year's expenditures) and introduced individual income caps of $300,000 for general practitioners and $360,000 for specialists. This *Act* also removed the BCMA's exclusive right to bargain for fees with government. At the same time, the provincial government introduced the *Professional Retirement Savings Plan Agreement Extinguishment Act* (1991) eliminating a $25 million doctors' pension fund.

In response to these *Acts*, between September 1992 and July 1993, 81 of BC's approximately 7,000 practising physicians "opted-out" of the MSP and began billing their patients directly. A 1992 "Direct Billing Guide" sent by the BCMA to its members described the benefits of direct billing as: (1) enhanced personal and professional satisfaction; (2) greater patient responsibility, and; (3) the ability to set a fee-for-service commensurate with training and responsibilities. Direct billing physicians became responsible for

administrative and other expenses associated with opting-out. They were also liable for bad debts. Opted-out physicians were no longer eligible for several benefit programs funded by the provincial government and administered by the BCMA. This loss of benefits included the Canadian Medical Protection Agency (CMPA) liability insurance rebate (ranging from $2,000 for General Practitioners to $15,000 for Obstetricians), continuing medical education funding, and group disability insurance.

Opted-out physicians were entitled to extra bill patients above the standard MSP fees. Individual fees were negotiated with patients prior to service. Patients paid directly at the time of service and subsequently submitted their claims to the MSP for reimbursement. Patients' reimbursement was limited to the standard MSP rates as negotiated between the BCMA and the provincial government. Opted-out physicians did not extra bill all of their patients. Opted-out physicians "price discriminated" based upon their personal estimate of their patient's ability to pay.

Unfortunately, the exact dollar amount extra billed, and to which patients, is unknown. Based upon discussions with several opted-out physicians and staff of the MSP, patients were typically charged an additional $5 for general practitioner office visits (MSP fee = $25) and $10 for specialist consults (MSP fees range from $48 - $146). On average, a 15% premium was charged for other services.

In December 1993, a new agreement was reached between the BCMA and government. Gradually, most of these 81 physicians began opting back in.

In September 1995, the BC government passed the *Medicare Protection Act*, disallowing extra-billing above the negotiated MSP rates. As of April 1997, only 15 BC physicians remain opted-out. All of these physicians have signed individual contracts with the MSP stipulating they will not charge above the standard rates.

1.3 Purpose of the Study

This study empirically analyzes the impact of direct billing for medical services. The research goals are: (1) to discover whether physicians with particular demographic and/or practice characteristics are more likely to direct bill their patients; (2) to investigate the impact of direct billing on patient demand for medical services, and; (3) to discover whether physicians respond to changing patient demand.

The 1993-1995 BC experience with opting-out marks the first significant occurrence of direct/extra billing for medical services since the introduction of the *Canada Health Act* (1984). A primary reason for the introduction of this *Act* was the federal government's desire to eliminate direct charges to patients for "medically necessary" services. The *Act* was introduced, to a significant degree, in response to large scale opting-out in Ontario in the 1970's.

The majority of the existing empirical evidence regarding user fees is based upon the experience of large American Health Maintenance Organizations (HMOs). These studies sample a largely working class, non-

elderly population. It is questionable to generalize the results of these studies to a universal health insurance system such as Canada's.

In contrast, this study analyzes the utilization patterns of a "population-based" sample. The rosters of BC's opted-out physicians included the poor and the elderly. Another benefit of the BC experience is that patients were free to switch physicians in response to direct billing. Consequently, patients "price" sensitivity to direct billing can be measured.

As previously discussed, opted-out physicians self-selectively extra billed. Direct/extra billing differs from non-reimbursed user fees. Patients faced with direct billing must pay "out-of-pocket" at the time of service. However, depending upon whether patients are extra billed, all or a significant portion of this up-front payment is subsequently reimbursed. This is an important distinction. The opportunity costs borne as a result of direct billing, e.g. financial, psychological, etc., differ from the costs imposed by non-reimbursed user fees. Patients and/or physicians may respond differently to direct billing than they do to non-reimbursed user fees. The majority of the existing literature analyzes the impact of non-reimbursed user fees and copayments. This study is a mixed test of experience with direct and extra billing. The results will show whether patients and physicians react differently to direct billing than they do to non-reimbursed user fees.

2. Literature Review

2.1 The Debate Over "Free" Medical Care

Public policy inevitably involves trade-offs between competing policy goals, including: efficiency, equity, political feasibility, and generation of government revenue (Weimer & Vining, 1992). Effective public policy maximizes social utility within given constraints while minimizing the loss associated with these trade-offs. The provision of "free" medical care has been characterized as the tradeoff between overconsumption and risk protection (Newhouse, 1993). "[Medical] insurance is shown plainly to have welfare-increasing properties though it seems clear also that optimal insurance may be less than complete insurance" (Culyer, 1989: 49).

Economists divide consumer goods into two primary categories: search goods and experience goods (Nelson, 1970). A search good is defined as one for which consumers can determine the quality prior to purchase, e.g. furniture. In contrast, the benefits of experience goods can only be determined after purchase, e.g. legal services. It has been argued there is even a third category, post-experience goods, for which it is difficult to determine the benefits even after consumption (Weimer & Vining, 1992). There exists an information asymmetry between the purchaser and provider of experience goods. Medical services are generally characterized as either experience or post-experience goods, depending upon their level of acuity and the frequency with which they are purchased (Weimer & Vining, 1992).

In Canada, medical services are typically provided by independent groups of physicians remunerated through fee-for-service. A principal-agent relationship exists between the patient and physician. The attending physician exercises authority on the patient's behalf. Market failure due to information asymmetry is the root cause of this agency transfer. Generally, the patient is not aware of the most effective course of treatment. "...patients cannot in general assess the relative quality of practitioners (in the outcome sense), if they could there would be no need of licensure to protect the public against incompetence" (Barer et. al., 1979: 87). Patients' inability to make informed consumption decisions leads them to delegate authority to the attending physician. The patient relies heavily upon the physician to diagnose the ailment and prescribe an appropriate course of treatment. The physician acts, in effect, as the "demander" of services on behalf of the uninformed patient. This agency transfer is also termed "uninformed demand".

Principal-agent relationships are inherently imperfect. The information asymmetry that arises in this relationship results in social surplus loss. In Figure II below, D_u represents the "uninformed" consumption level, i.e. the quantity of medical care that a patient would purchase in the absence of perfect information regarding its benefits. D_x represents the patient's "informed" demand schedule. The shaded area (abc) equals the "deadweight loss" in consumer surplus resulting from the over-consumption (Weimer & Vining, 1992).

Figure II - Consumer Surplus Loss from Uninformed Demand for Medical Services
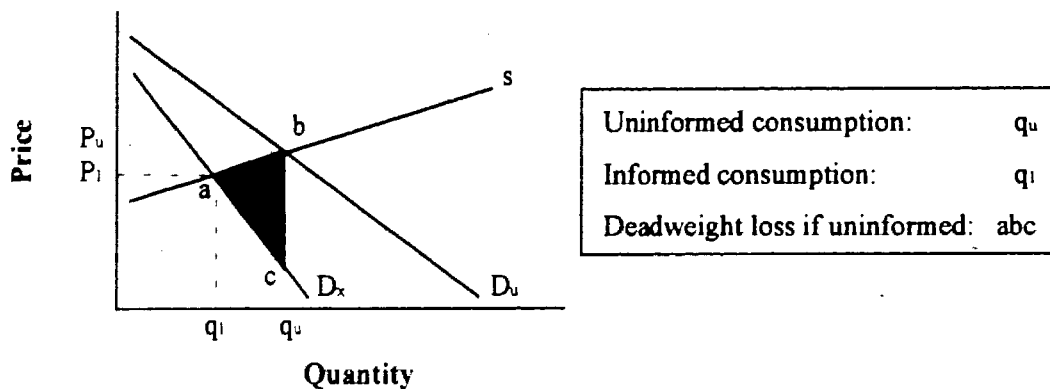
"The potential for inefficiency due to information asymmetry between buyers and sellers...is rarely great for search goods, often great for experience goods, and usually great for post-experience goods" (Weimer & Vining, 1992: 76). It is argued that inefficiency in the physician/patient relationship is less than in typical principal-agent relationships because the physician includes at least part of the patient's interests in his/her own objectives (Evans, 1984).

In Canada, regulatory mechanisms have been introduced to minimize agency loss between physicians and patients. These include but are not limited to:

1. only professionally qualified individuals are eligible to be licensed to practice medicine;

2. an independent professional College of Physicians and Surgeons regulates the practice of medicine by monitoring the activities of physicians;

3. patients require a referral from a general practitioner to see a specialist;

4. clinical practice guidelines have been developed to guide the physician's care decision and minimize variations in patterns of practice, and;.

5. the numbers of physicians and facilities available to them are rationed.

As discussed by Evans (1984):

> The primary public justification for professional self-regulation is
> to protect providers from competitive market pressures - both
> competition among themselves and market entry by non-
> professionals - which would tend to degrade or destroy the agency
> relationship (p.76).

In other jurisdictions, user fees for medical services have also been used to

improve the physician/patient agency relationship.

2.2 A Discussion of User Fees

The benefit of user fees for medical services is the subject of heated

academic debate. The primary area of disagreement surrounds the potential

efficiency gain versus the potential inequitable impact. Those opposed to user

fees emphasize their detrimental impact upon the poor and sick. Those in

favour of user fees emphasize the significant potential for reduced utilization.

The points of view regarding user fees appear to be geographically divided. In

general, American researchers have tended to view user fees quite positively,

emphasizing their potential efficiency gains. In contrast, Canadian and

European researchers have tended to question the overall efficiency of user fees

and emphasize equity concerns.

2.2.1 Arguments in Favour

Arguments in favour of user fees can be summarized under two main categories: provide correct incentives and prevention of "unnecessary" utilization of services.

2.2.1.i Provide Correct Incentives

Proponents of user fees argue that, if the patient views medical care as "free", patient accountability is inappropriately reduced and over-servicing results. Numerous studies show that cost sharing reduces patients' use of medical services (Beck, 1974; Roemer, 1975; Beck & Horne, 1980; Lohr et. al, 1986; Roddy et. al, 1986; Manning et. al. 1987; Cherkin et. al., 1989, 1990; Fahs, 1992; Newhouse, 1993). At the same time, revenue generated from user fees improves both providers' and government's balance sheets.

Evidence from other industries shows that agents are typically more risk averse than are principals (Stiglitz, 1974, 1975; Holmstom, 1982). In medicine, the physician is the agent and the patient is the principal. The implication is that physicians may, in an attempt to minimize risk for both patients and themselves, provide care that patients would otherwise not choose to receive. "The combination of professional training with the perfectly natural human desire to 'do good' for one's patient leads to an overestimate of the efficacy of interventions relative to what can be scientifically substantiated" (Evans, 1984: 77).

One of the appropriate policy responses to uninformed demand is to shift some of the risk to the principal (Stiglitz, 1974, 1975; Holmstom, 1982). User fees for medical services are one means to accomplish this shift. "If the health benefits of free care are minimal, one can infer that the positive externalities of free care are less important than the efficiency gains of cost-sharing" (Newhouse, 1993: 351).

2.2.1.ii Reduce Unnecessary Utilization

Proponents of user fees argue that an up-front charge tempers "unnecessary" use of medical services. This argument can be divided into three components: (1) medical care is currently oversupplied relative to population needs; (2) "unnecessary" use is the result of frivolous demands by patients, and; (3) in response to user fees, patients will selectively reduce or eliminate these frivolous demands. Unnecessary consumer demand for medical services has been termed the consumer's "moral hazard" (Newhouse, 1993). It is argued that "first-dollar" medical coverage encourages individuals to take less care in ensuring that illness does not occur and, when illness does occur, encourages patients to consume services beyond the point at which marginal cost equals marginal value (Culyer, 1989). There is some evidence that physicians who charge user fees "...report significantly less frivolous use of their services" (Wolfson & Tuohy, 1980: 70). It is very difficult to distinguish a "necessary" from an "unnecessary" medical service. Researchers have historically used change in patients' health status as a proxy for measuring the

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impact of user fees. Some American studies have concluded that user fees do not detrimentally impact population health status. The notable exception is the very sick and very poor (Lohr et. al., 1986; Manning et. al., 1987; Cherkin et. al., 1989, 1990; Newhouse, 1993).

Aiding the theoretical arguments in favour of user fees, it is apparent that the public's attitude towards direct charges for medical services is changing. A 1996 opinion poll of 1,040 Canadians by Insight Canada Research indicates that 59% of those surveyed object to the federal government's decision to penalize provinces who charge user fees for medical. People were asked the question, "do you support or oppose the federal government's decision to penalize provinces that allow facility fees to be charged to patients in private clinics receiving medically necessary services?". Support for user fees was highest in Western and Atlantic Canada.[3] Today, the public is more inclined to tie payment to levels of use. This phenomenon may be partially explained by the Canadian public's increasing exposure to user fees in other parts of the health care sector, e.g. prescription medications, physiotherapy, chiropractic services.

In 1994, the Organization for Economic Cooperation and Development (OECD) reviewed health care policies in seventeen developed countries and found that:

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[3] as printed in The Vancouver Sun, August 26, 1996, pp.A1,A4. The results of this survey are considered accurate to within 3.1%, 19 times out of 20.

Canada is the only country studied which, since 1984 [the introduction of the *Canada Health Act*], makes no charges for services covered by federal law. . . In most countries, charges have been increased moderately and extended to more items, particularly in the 1990's. . . Most countries have exemptions for the poor and certain other categories and have some maxima for the user charges patients can be called upon to pay during a specified period of time (OECD, 1994: 17).

Proponents of user fees generally conclude that some initial cost-sharing should be introduced, to temper unnecessary use, combined with a maximum "out-of-pocket" expenditure, to address the needs of lower income groups.

2.2.2 Arguments Opposed

Opponents of user fees argue-that the positive externalities gained by providing all members of society "first-dollar" medical coverage outweigh the potential inefficiency of some unnecessary utilization. It is argued that the significant information asymmetry that exists between the provider and recipient of care leads to a market failure that requires comprehensive insurance coverage (Barer et. al., 1993; Evans et. al., 1993c; Stoddart et. al., 1993).

2.2.2.i Do Not Target "Discretionary" Services

User fee opponents argue that a significant proportion of "necessary" utilization is reduced by copayments. It is argued that patients do not possess the necessary fore-knowledge to ascertain exactly when access is appropriate (Lindsay, 1969; Culyer, 1971; Roemer et. al., 1975; Evans, 1984). Moreover, there is a very small scope of "discretionary" services attributable to the patient

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(Evans et. al., 1993c). A 1970's Canadian review of user fees revealed that patient charges are as likely to discourage services which physicians regard as "needed" as those physicians judged to be "unneeded" (Barer et. al., 1979). As discussed by Evans et. al. (1993c):

> When people must pay out of pocket, they are less likely to seek care. But they are as likely to forego "needed" as "unneeded" care. . . There appears to be no evidence to support the proposition that user fees differentially discourage "abusive" care (p. 32).

Barer et. al. (1979) suggest that:

> There is little, if any, evidence to suggest that patients are the primary generators of marginally needed care and no evidence whatsoever to suggest that prices tend to deter that segment of care first. Therefore, while there are a number of potential avenues for introducing personal accountability, analyses of them converge upon the same conclusions - consumption of necessary care may be deterred, aggregate health care expenditures are influenced marginally, if at all, and there is little reason to believe that direct charges by an individual do not in themselves reduce health care use, since additional provider-generated utilization can easily offset this reduction (p. viii).

2.2.2.ii Physician-Induced Demand

User fees appear to incite both a negative demand and a positive supply effect (Beck, 1974; Beck & Horne, 1980; Fahs, 1992). Opponents of user fees argue that, in the absence of first-dollar coverage, consumer ignorance permits physicians to "induce" demand for medical services (Arrow, 1963; Evans, 1973, 1974; Reinhardt, 1978; Rice, 1983; Culyer, 1989; Fahs, 1992). This "physician-induced demand" argument challenges the assumption that consumer preferences ultimately determine patient demand. It is argued that,

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due to physicians' increased knowledge regarding the outcomes from treatment alternatives, physician preferences account for a significant proportion of demand for medical care. Physicians may induce demand when threatened by loss of income, i.e. when patients decrease utilization due to user fees. Physicians respond to a projected income loss by exerting upward pressure on the payments received per patient. Some have argued that physicians exercise this discretionary power to achieve a target income (Evans, 1973).

2.2.2.iii Disproportionate Impact Upon the Poor and Sick

Opponents of user fees emphasize their differential deterrent effect. Existing evidence suggests that user fees transfer the relative cost from the well to the sick and from the wealthy to the poor (Enterline et. al., 1973; Beck, 1974; Roemer et. al., 1975; Beck & Horne, 1980; Stoddart & Woodward, 1980). The utilization of medical services is not evenly distributed. Lower socio-economic groups traditionally use more medical services. Patient income and health status appear to be positively correlated (United States Center for Health Statistics, 1972; Beck & Horne, 1980; OECD, 1994). 30% of American health care expenditures are accounted for by only 1% of the population. The highest-using 10% of the American population account for 72% of total costs. Among the highest-using 1% of the American population, 48% are elderly (Berk & Monheit, 1992). Consequently, the proportionate dollar impact of a medical service user fee is greater upon the poor and sick (Beck, 1974; Barer et. al.,

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1979; Beck & Horne, 1980; Plain, 1982; Evans, 1984; Evans et. al., 1993; Stoddart et. al., 1993).

User fees have been broadly described as a "tax on the sick". "The primary effect of substituting user fees for tax finance is cost-shifting, the transfer of the burden of paying for health care from taxpayers to users of care" (Beck & Horne, 1980). As discussed by Evans et. al. (1993c):

> A shift to more user fee financing redistributes net income from lower to higher income people, and from sicker to healthier people. The wealthy and the healthy gain, the poor and sick lose... schemes to exempt those at lowest incomes, or to link charges to taxable income, mitigate but do not reverse the effect (pp. 2-3).

Barer et. al. (1979) state that:

> ...charges whose aggregate levels for a given family are direct functions of utilization only will involve perverse wealth transfers - from the ill to the health and, to the extent that the poor are less healthy than the rich, from low- to high-income earners (p. 111).

2.2.2.iv Political Implications

Opponents of medical service user fees describe them as a "slippery slope". Once user fees are introduced, the temptation to continually increase them is too much for politicians to resist. At some point, the burden of such charges on patients becomes sufficiently severe such that a ban on private insurance coverage cannot be sustained (Evans et. al., 1993c). As discussed by Barer et. al. (1979):

> . . . direct charges will benefit providers, private insurance companies, and the provincial government. Direct charges will serve as an injection of additional funds into the sector and thus as a source of increases in provider incomes. Furthermore, exposure to any significant direct charge is likely to lead

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consumers to seek supplementary private insurance coverage. Finally, direct charges provide a means of keeping the lid on health care expenditures in government budgets while allowing total (public plus private) expenditures to rise. The snare is not likely to end up empty. It will be filled by those unfortunate enough to become ill, for it is they, and only they, who will feel the effects of direct charges (p. viii).

Opponents of "system-wide" copayments acknowledge there may be circumstances where a selective service user fee can "steer people from a less to a more appropriate care setting, e.g. emergency room visits in which care could have been provided in a physician's office" (Evans et. al., 1993c: 26).

2.3 The International Experience with User Fees

The American experience with medical service user fees has been extensively studied. In contrast to Canada's universal, single-payer, public medical insurance system, the US system consists of numerous private insurers plus government sponsored programs for the elderly (Medicare) and welfare recipients (Medicaid). American health insurance is typically provided through employment. Employers contract with health insurers and pay some or all of the premiums for their employees. It is estimated that more than 40,000,000 American citizens, primarily the working poor, have no health insurance.

Due to the nature of the US health care system, American user fee research tends to be focused at a micro rather than system level. The reviewed studies empirically analyze the impact of user fees for a specific group of patients in a specific insurance setting. Most frequently, these studies capture

a working, non-elderly population. Clearly, this limits the studies'
generalizability to a universal insurance system.

2.3.1 The Rand Health Insurance Experiments

Arguably, the most well-known American user fee studies are the Rand
Corporation's series of experiments during the 1970's and 1980's. With a
supporting grant in excess of \$120M, the Rand Corporation analyzed the
utilization patterns for 2,000 non-elderly families.[4] The Rand Corporation
describes its experiments as "intended to illuminate the theoretical debate
regarding the cost-benefit of "free" care" (Newhouse, 1993: 351). The Rand
Corporation designed its sample to be representative of both urban and rural
regions throughout the United States. Families were assigned to one of
fourteen fee-for-service insurance plans covering hospital, medical, dental,
pharmaceutical, vision, rehab, and hearing services. Copayment rates among
the 14 plans were one of 0, 25, 50, or 95%. Enrollees were subject to one of
three maximum dollar expenditures (MDE), set at 5, 10, or 15% of annual
family income up to \$1,000US. Participation in the experiment ranged from
three to five years. For the duration of the experiment, participants' health
service utilization was restricted to their allocated insurance plan. The results
of the Rand Corporation studies are published in a series of articles by various
members of the insurance experiment group (Newhouse et. al., 1981; Manning

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[4] Medicare enrollees aged 62+ were not analyzed by the Rand Corporation.

et. al., 1981, 1984, 1987; Brook et. al., 1983; Keeler & Rolph, 1983; Lohr et. al., 1986; Newhouse, 1993).

The Rand Corporation concludes that "first-dollar" coverage of medical services increases total expenditure. Higher initial cost sharing significantly reduces hospital admission rates (Manning et. al., 1987). "The more families had to pay out-of pocket, the fewer medical services they used. Relative to the free care plan, the 25% copayment reduced utilization approximately 20%; 50% coinsurance about 25%; and 95% coinsurance about 30%." (Newhouse, 1993: 358). Expenditures in the "catastrophic" insurance plan were 31% lower than in the zero out-of-pocket plan. The Rand Corporation estimates the "price elasticity of demand" for medical services to be approximately -0.2, with a generally similar impact for both inpatient and outpatient care (Manning et. al., 1987). The only exception was for children's hospital admissions, which do not appear to be affected by copayment.

The Rand Corporation concludes that, although copayments appear to reduce overall utilization, they do not successfully target more "discretionary" medical services. The copyament schemes reduced the demand for both "necessary" and "unnecessary" care (Lohr et. al., 1986). With the exception of the "very poor" [5], all income categories showed similar reductions in utilization in response to copayment. For very poor families, however, copayments appear to inappropriately delay the onset of care. Very poor families used less

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[5] defined within Rand's sample as the most disadvantaged 6% of the population.

ambulatory services and more hospital services when faced with copayments (Newhouse, 1993, p. 340).

The Rand Corporation used several health status measures to answer whether or not copayments negatively impact patients' health status. They conclude that the only sociodemographic group whose health appears to be significantly adversely affected by copayment is the "very poor". Mortality rates for the very poor receiving "free" care were 10% lower than in the corresponding copayment plans. This was largely due to decreased blood pressure. When faced with copayment, the poor did not seek early enough intervention for high blood pressure. Very poor families on the 0% copayment plans also demonstrated better vision and dental health (Newhouse, 1993).

Based on their results, the Rand Corporation predicts that a widespread increase in copayments would reduce demand for medical services. "The majority of the employed population is neither sick nor poor. As a result, we can virtually rule out any substantial adverse effect among the group subject to increased initial cost sharing" (Newhouse, 1993: 344). "For most individuals, the cost of free care seems substantial and health benefits minimal. As a result, there is a good case for initial cost sharing for the majority of the population" (Newhouse, 1993: 351). The Rand Corporation concludes that more intensive medical services should be better covered than less intensive services. They note, however, that for the 6% of their sample that are very poor, the health benefits of free care are measurable and significant. The Rand Corporation argues that this result is primarily due to decreased blood

pressure and improved vision and dental health (Newhouse, 1993: 371).
Consequently, initial cost sharing for the very poor is not recommended.

Strong criticisms have been levied against the Rand Corporation's experiments, including "technical problems with the experimental design, failure to discuss pre- versus per-experimental data comparisons that weaken the reported results, and insufficiency of information in the reports and cited references to support the conclusions" (Welch et. al., 1987: 148). According to Rand's detractors, these fundamental limitations result in overstatements of the level of statistical significance in expenditure differences between the copaying and non-copaying insurance plans. Rand's critics question the validity of the proposed 30% reduction in utilization due to copayment. They argue that only 8-10% of the population accounts for over 56% of total health care expenditures. Moreover, the coefficient of variation for expenditures ranges from 200 to over 600% (Welch, 1986). In contrast to the Rand Corporation's conclusions, critics argue that, "[Rand's] observations suggest that the phenomena under study are more complex, and/or that the data available may be less useful than they seem" (Welch et. al., 1987: 152).

A fundamental limitation of the Rand Corporation experiments is that they offer no insight into the impact of copayments upon the elderly. The experiments exclude all Medicare eligible individuals, aged 62+. The Rand Corporation describes the rationale for excluding the elderly as: (1) minimal federal interest in changing the Medicare program at the time, (2) assumption that elderly reactions to cost-sharing would be different and should be

analyzed independently, and (3) administrative simplicity (Newhouse, 1993: 11). Detractors point out that the elderly are proportionately the largest users of the health care system. This age cohort accounts for about 60% of all health care spending. Moreover, the basically healthy mainstream population is a shrinking part of health care utilization. The high and rapidly growing proportion of costs are generated after the patient is placed in the system and, increasingly, for people whose circumstances are incompatible with informed choice (Evans, 1991).

Arguably, the most significant limitation of the Rand Corporation's experiments is that, by design, the impact of "system-wide" copayments cannot be ascertained (Stoddart et. al., 1993a). The sample of patients do not represent a significant proportion of physicians' rosters in any of the selected locations. At most, copaying patients comprise 2% of physicians' total patient population (Newhouse, 1993). Consequently, the impact of reduced patient demand upon physicians' incomes is minimal. By design, these experiments cannot account for the impact of physician behaviour changes in response to decreased patient demand (Evans et. al., 1993d). Critics argue that this limitation renders the results irrelevant to a universal health system in which an entire physician's roster would be subject to copayment (Evans, 1991; Evans et. al. 1993d). "The [Rand] study did not, and by design could not, show whether copayment led to an overall system-wide reduction in utilization and costs." (Evans et. al., 1993c: 15). Critics point out that the United States, which relies the most heavily of all OECD countries upon user fees to control

health care costs, is the country where health system costs are increasing most rapidly. The United States spends proportionately more of its GDP on health care than all other OECD countries, while more than 40 million Americans have no health insurance (OECD, 1994).

2.3.2 Other American Studies

Additional American research has focused on the impact of user fees for a captured population within a particular insurance environment. The study populations range from a large Health Maintenance Organization (HMO) in the Pacific Northwest, to the welfare population of California.

2.5.2.i The California Medicaid Copayment Experiment

Between January 1972 and July 1973, a $1 user charge was imposed on California Medicaid beneficiaries for the first two visits to a physician and $.50 for the first two drug prescriptions received each month. Medicaid is a government funded insurance program for low-income families. In 1973, there were more than 2,000,000 California Medicaid beneficiaries.

Roemer et. al. (1975) analyzes utilization patterns for a sample of 10,687 Medicaid beneficiaries from three California counties (San Francisco, Tulare, and Ventura). These counties were chosen to be representative of both urban/rural distribution and ethnic/racial composition of beneficiaries (p.459). The utilization patterns of this sample are compared to a matched, non-copaying control group. Utilization rates are analyzed for the 6 months

immediately preceding and the 12 months immediately following the introduction of the copayment. The results are divided into six quarter-year periods between July 1, 1971 and December 31, 1972.

Roemer et. al. (1975) find that, immediately following the introduction of copayment, utilization of ambulatory doctor visits declines. After a brief lag, however, hospitalization rates in the copay cohort rise to levels higher than those of the non-copaying control group. This increase in hospitalizations more than offsets the savings from physician visit reductions. Roemer et. al. (1975) conclude that the increase in hospitalizations is due to inappropriate postponement of ambulatory care. They propose that the user fee imposes a barrier to care for the Medicaid population. Roemer et. al. (1975) apply the existing cost for physician visits and hospital days to the identified utilization changes. Based on this data, Roemer et. al. (1975) estimate the "net cost" to the state of introducing user fees for Medicaid recipients to be $1,228,150. They conclude that copayments are "penny-wise and pound-foolish" (p.457).

2.3.2.ii United Mine Workers Health Plan

Until July 1977, members of the United Mine Workers of America (UMWA) received first-dollar coverage for physician and hospital services. Between July 1977 and March 1978, a 40% copayment for physician visits and out-patient hospital services was introduced, to a maximum of $500 per year. A $250 annual deductible for hospital inpatient services was also implemented. Following this five month period, the copayment was changed to a flat $5.00

user fee for physician services (to a maximum of $100 per year), a $5.00 user fee for prescription medications (to a maximum of $50 per year), and in-patient hospital services returned to first-dollar coverage.

Several studies analyze this experience (Scheffler, 1984; Roddy et. al., 1986; Fahs, 1992). Roddy et. al. (1986) analyze the utilization patterns of a sample of retired UMWA members from Pennsylvania. All persons sampled were non-Medicare beneficiaries. Roddy et. al. (1986) compare utilization rates from the pre-copayment period (January - July 1977) to the first and second years of copayment (April 1978 - March 1980). Fahs (1992) reviews patient utilization patterns in a single, large physician practice in Pennsylvania. Her data set consists of a copaying experimental group of UMWA workers and a non-copaying control group of United Steelworkers served by the same physician practice. Fahs (1992) analyzes utilization patterns over a three year period surrounding the introduction of copayment (one year preceding and two years following copayment). More than 80% of the physician practice reviewed is comprised of patients from either UMWA or United Steelworkers. Consequently, Fahs (1992) enables analysis of physician behaviour in response to changes in patient demand.

Roddy et. al. (1986) find that the introduction of copayment significantly decreases utilization of ambulatory services in the first year following copayment. However, utilization rates return to their pre-copayment levels in the second year of analysis. Roddy et. al. (1996) conclude that, "the effects of copayment on utilization. . . appear to be relatively short-lived, particularly for

ambulatory care visits of a less discretionary nature (visits that were neither for acute, self-limiting conditions nor for preventive care)" (p.876). Fahs (1992) finds that physicians react to this reduction in utilization by UMWA workers by increasing the number of subsequent visits, lengths of stay, and billed ambulatory care services for their non-copaying patients. Total expenditures for non-UMWA patients increased 7%. Expenditures for inpatient care rose by 19%. The average severity level for hospitalized patients, both UMWA and United Steelworkers, decreased following copayment. Fahs (1992) concludes that "when the economic effects of cost sharing on physician services' use are analyzed for all patients within a physician practice, the findings are remarkably different from those of an analysis limited to those patients directly affected by cost-sharing" (p.26). She argues that those elements most likely to be altered by "physician-induced demand" are those treatment steps initiated by physicians, e.g. lab tests, subsequent visits, etc. Fahs (1992) concludes that "the results provide substantial empirical evidence consistent with the predictions of the physician-induced demand hypothesis" (p.37).

2.3.2.iii Group Health Cooperative

An increasing share of the American population is enrolled in Health Maintenance Organizations (HMOs). HMOs provide a wide range of health care services in exchange for pre-paid premiums. They typically employ physicians and remunerate them through a salary or a combination of salary and performance incentives. Group Health Cooperative (GHC) in Washington State

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is one of the largest, non-profit HMOs in the United States with almost 700,000 enrollees. Outpatient visits were free of charge for all GHC enrollees until July 1985. Beginning July 1, 1985, GHC's more than 44,000 State of Washington employees and their dependents were required to pay a $5 copayment for all visits to physicians, physician assistants, nurse practitioners, optometrists, and physical therapists. Those unable to pay at the time of the visit were billed by mail.

Cherkin et. al. (1989, 1990) examine the impact of this user fee. A non-equivalent control group design compares the changes in utilization for four types of preventive care services: physical examinations, visits and prescriptions for persons with cardiovascular disease, childhood immunizations, and cancer screening tests. The utilization patterns of 30,415 State employees are compared to a matched control group of 21,633 Federal government employees and their dependents. Federal government employees were chosen as the control group because Cherkin et. al. believed they were the most sociodemographically similar to State employees. Utilization rates are compared for the last year prior to and the first year following introduction of the user fee. Cherkin et. al. (1989) note the main limitations of this study as (1) a single, established staff model HMO, (2) a middle-income employed population under 65 years old, and (3) persons who were enrolled continuously for a 2 year period (p.676).

Cherkin et. al. (1989) find no statistically significant differences between the experimental and control groups in terms of health status, race, and

income. The State employees do, however, have significantly higher levels of education than the Federal employees. The introduction of a $5 user fee for office visits results in an 11% decrease in primary care visits and a 3% drop in specialty care visits. This reduction is twice as large for women as for men under age 40. The user fee was a greater deterrent to persons who were previous "high users" (defined as those persons with more than 10 primary care visits in the previous year) (p. 669).

In their second study, Cherkin et. al. (1990) discover a 14% decline in the rate of physical examinations for State enrollees as compared to Federal enrollees, adjusted for age, sex, and family size. User fees have the largest effect on physical exams for children of both sexes, a 20-25% decrease. While no significant effect is noted for adult males, utilization rates for adult females decrease by 15% (p.29). User fees decrease primary care visits among users of cardiovascular medications by almost 20%. User fees do not, however, significantly decrease the number of cardiovascular prescriptions filled (p.31). The immunization rates for young children and the cancer screening rates of middle-aged women are not affected by the user fee (p.36).

Cherkin at. al (1990) conclude that, "for employed populations, cost-containment strategies that include small copayments for office visits have little adverse impact on utilization of the most valuable types of preventive services." The authors note that their samples do not contain low-income persons. Consequently, their conclusions cannot be generalized to poor populations.

2.3.3 International Research

The international research regarding medical service user fees is quite limited. In addition to the European study discussed below, a number of recent African studies were reviewed. These user fee studies are included in the reference list. They are not, however, specifically discussed in the following literature review. The applicability of the African user fee experience to a universal health system is very limited. The issues facing "developing" health systems are significantly different.

2.3.3.i Subsidized Dental Care in Norway

Dental care in Norway is provided free of charge for children up to 18 years of age. Norway does not, however, have a national insurance program for adult dental care. Some Norwegian counties recently introduced a 75% public dental subsidy for residents aged 19-20. Grytten et. al. (1996) review the impact of this subsidy on dental care utilization and dental health.

Grytten et. al. (1996) randomly sample 870, 19-20 year old males doing military service. In Norway, approximately 75% of males perform 1 year of military service. A logistic regression model estimates the impact of the subsidy program. Demand for dental services is the dependent variable. Price, individual income, employment status, and travel time to the dentist are the independent variables (p.122).

Grytten et. al. (1996) find that the introduction of the public subsidy scheme has no effect on the demand for dental care. In addition, the subsidy

scheme and dental health do not appear to be correlated (p.124). Grytten et. al. (1996) conclude that "once dental care is no longer free at the point of consumption, different levels of copayments have no or very little impact on demand" (p.125). These results mirror the conclusions of previous studies of dental care copayments. The greatest effect appears to be for those on a "free" plan compared to those with some form of copayment. There does not, however, appear to be much variation in utilization rates amongst varying levels of copayment (Manning et. al., 1985; Mueller and Monheit, 1988).

2.3.4 The Message of the International Experience

User fees reduce patient demand for medical services, at least over the short-term. It is unclear whether these reductions are sustained over the long-term. The most significant change in utilization appears to be at the shift from "free" care to some copayment, rather than amongst copayment rates. The reduction in patient demand does not occur uniformly. User fees appear to differentially affect females and low-income patients. It appears that, in response to user fees, "poor" patients delay seeking care to the point where their health status drops and their hospitalization rates increase. User fees do not appear to detrimentally impact "non-poor" patients' health status.

The applicability of existing international studies to Canada's universal medical insurance system is somewhat limited. None of the reviewed studies are drawn from a "population-based" patient sample. Most studies analyze only the non-elderly, working class. Clearly, overall population health needs

differ significantly from just the working population. Research has shown that age and utilization are positively correlated, while income and utilization are negatively correlated (United States Center for Health Statistics, 1972; Beck, 1974; Newhouse, 1993; OECD, 1994).

International research regarding physician response to changing patient demand is very limited. Only one of the reviewed studies was able to ascertain the "physician-induced" component of demand (Fahs, 1992). From this study, it appears that research ignoring the physician-induced component of demand is insufficient. User fees appear to incite both a negative demand and a positive supply effect. In response to dropping caseloads, physicians appear to "induce" demand from remaining patients. This result calls into question user fees' overall effectiveness at reducing utilization rates.

2.4 The Canadian Medical Insurance System

Canada has never had a "free market" for medical care. Private, for-profit hospitals have never played a significant role (Evans, 1984). In all Canadian provinces and territories, government is the single-payer for insured medical services. Payment from the individual patient is neither required nor allowed. There is no private competition for insured medical services. The publicly administered medical plan acts as an intermediary between the client (patient) and the physician. The medical plan pays physicians for all "medically necessary" services provided to insured residents of the province. The medical plan is funded through general taxation revenue and annual

medical premiums (in Alberta and British Columbia only). The nature of the

client/physician/payer relationship is depicted Figure III below:

Figure III - Nature of the Client/Physician/Payer Relationship
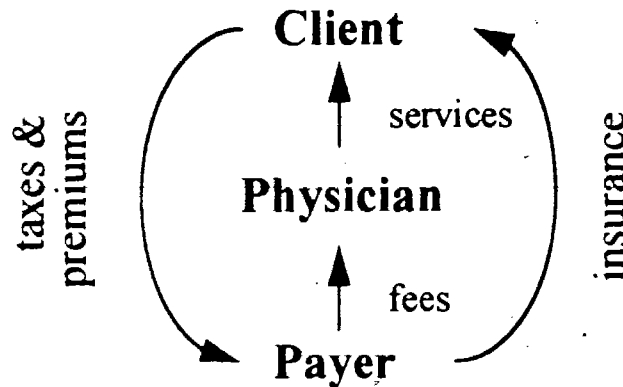
2.4.1 The Canada Health Act (1984)

Since 1968, Canada has had a universal, publicly funded medical

insurance system known as "Medicare". The fundamental principles upon

which Medicare was founded were first enacted in the *Health Insurance and*

Diagnostic Services Act (1957) and subsequently in the *Medical Care Act* (1966).

According to these *Acts*, all services performed by physicians in hospitals are

insured benefits for all residents of Canada. However, under these *Acts*

provinces were entitled to charge user fees for medical services.

The federal government enacted the *Canada Health Act* (1984) in

response to growing public concerns over "out-of-pocket" payments for insured

medical services. Since the introduction of the *Medical Care Act* (1966), several

provinces had experimented with user fees for medical services. In addition,

nearly 20% of Ontario's physicians had opted-out of the Ontario Health

Insurance Plan (OHIP) and were direct/extra billing their patients. The *Canada Health Act* (1984) entrenched the parameters of Medicare. The *Act* is based upon the principles of comprehensiveness, accessibility, universality, public administration, and portability. These five principles are discussed in Figure IV below:

Figure IV - Principles of the Canada Health Act (1984)

1. **Comprehensiveness** - all medically necessary hospital and physician services must be publicly insured.

2. **Accessibility** - reasonable access to medically necessary services must be provided in all provinces without financial or other barriers.

3. **Universality** - insured, medically necessary hospital and physician services must be made available for all residents on uniform terms and conditions.

4. **Public Administration** - all medically necessary hospital and medical services are to be provided without reference to private insurance schemes. Private insurance may, however, cover other services and benefits.

5. **Portability** - residents are eligible for insured coverage across Canada.

The federal government continues to enforce the principles of the *Canada Health Act* (1984) through dollar for dollar reductions in transfer payments to any province which charges user fees for insured medical services.

2.4.2 Direct Billing vs. The Canada Health Act

Physicians in each province are entitled to "opt-out" of their provincial medical insurance plan and bill patients directly. Each province has developed its own regulations regarding extra billing above the negotiated fee schedule

(refer to Appendix A). Patients who utilize opted-out physicians are faced with paying "up-front" for medical services. In contrast to the typical client/provider/payer relationship depicted in Figure III, the relationship amongst opted-out physicians, patients, and the payer is depicted in Figure V below:

Figure V - Nature of the Client/Physician/Payer Relationship for Direct Billing Physicians
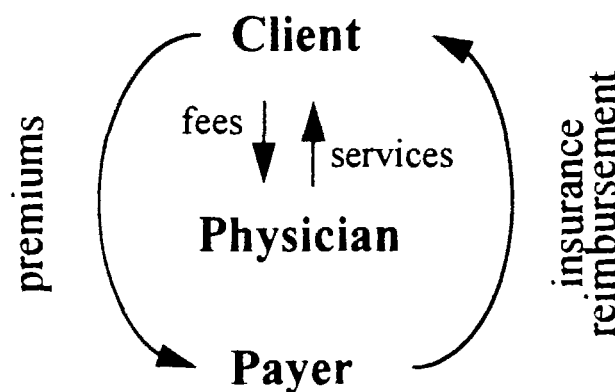
The *Canada Health Act* (1984) states that, "in order to satisfy the criterion respecting universality, the health care insurance plan of a province must entitle one-hundred percent of the insured persons of the province to the insured health services provided for by the plan <u>on uniform terms and conditions</u> [emphasis added]" (p.7). It is arguable that direct and extra billing contravene the universality requirement of the *Act*. Physicians who direct bill impose a financial burden on some patients and not others. Moreover, if physicians are allowed to "self selectively" opt-out, it is not likely that the entire province will be faced with direct billing. Such a circumstance may violate the

"uniform terms and conditions" criteria. The potential violation of the *Act* is less certain if patient reimbursement amounts to 100% of the direct billed amount. Extra billing appears to contradict the *Act*. Patients are reimbursed less than their out-of-pocket payment.

Probably the most intensely debated principle of the *Canada Health Act* (1984) is accessibility. The *Act* states that "reasonable access" to all medically necessary services must be provided in all provinces. However, the term "reasonable access" is not specifically defined within the *Act*. The scope of insured medical services has expanded significantly since the introduction of Medicare almost 30 years ago. This expansion is the result of growing medical knowledge, technology, and public expectations. In the 1990's, the affordability of an ever-expanding scope of publicly insured health care services has been called into question. This debate has been intensified by Canadian governments' need to constrain overall spending. Not surprisingly, politicians have shied away debating which specific health services should no longer receive public funding. Is reasonable access a third, fourth, or fifth opinion for the same medical condition? Is reasonable access high-tech, expensive treatment for end stage cancer or liver disease? Or is reasonable access a necessary level of publicly funded health care that can be sustainably afforded? "Reasonable access" is a complex concept, including at least timeliness and proximity to the patient.

While it is has been shown that user fees impede access (Beck & Horne, 1980; Wolfson & Tuohy, 1980; Plain, 1982; Newhouse, 1993), it is not clear

whether they impede <u>reasonable</u> access. Surely, reasonable access is more

than just the removal of a financial barrier. "First-dollar" access to a limited

scope of medical services is not necessarily reasonable. Similarly, a financial

barrier that inappropriately impedes access to a broad scope of medical

services is also not "reasonable". It does not appear that "reasonable access"

equals "first-dollar coverage". It can be argued, therefore, that reasonable

access can be obtained with or without user fees.

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2.5 The Canadian Experience with User Fees

Recent empirical Canadian research regarding the impact of medical

service user fees is very limited. This lack of empirical study is most likely the

result of the *Canada Health* Act (1984) which effectively eliminated user fees for

insured medical services *(refer to section 2.4.1 for more details)*. However,

several Canadian studies empirically review the experience with user fees prior

to the introduction of this *Act*.

2.5.1 The Saskatchewan Experience (1968 - 1972)

Between 1968 and 1972, the Saskatchewan government instituted a

33% copayment for insured medical services and a 6% copayment for in-

patient hospital services. The effect of these copayments is examined by Beck

(1974) and Beck & Horne (1980). Beck & Horne (1980) analyzes pooled, cross-

sectional random samples of 40,000 Saskatchewan families before, during, and

after copayments. Physician claims and hospital utilization statistics are

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analyzed from 1963 to 1973. Medical services per family are linearly regressed against marital status, patient gender, patient location (urban/rural), family income, patient age, and year in which the service was provided.

Beck & Horne (1980) find that user fees significantly reduce the utilization of medical services. The 33% copayment reduces the utilization of medical services by almost 6%. There is no corresponding reduction in utilization for in-patient hospital services. The impact of the copayment was not equal. The reduction in use from low-income groups (<$5,000 annual income) was three times stronger (an 18% reduction in medical service utilization).[6] Beck & Horne (1980) conclude that the copayment effect for medical services "likely understates the behavioural response of consumers to direct charges" because the supply response of physicians to decreased demand by patients is not measured (p.797). Beck & Horne (1980) do not conclude whether of not user fees differentially reduced "unnecessary" vs. "necessary" medical services.

2.5.2 The Quebec Experience (1969 - 1972)

The province of Quebec adopted compulsory, universal insurance for in-patient hospital services in 1961. Universal coverage was extended to medical services in 1970. Enterline et. al. (1973) examines the impact of this policy shift upon utilization of medical services and patient satisfaction with the

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[6] based upon the "average" family. Using sociodemographic characteristics of the sample.

health care system. Two household surveys are conducted on the "non-institutionalized" population of the metro-Montreal area of Quebec. In each of the two 12-month surveys (August 1, 1969 - July 31, 1970; August 1, 1971 - July 31, 1972), 6,000 households in the region were contacted. Respondents were asked to "self-report" their change in utilization as a result of the introduction of universal medical coverage. Patient demographic characteristics, frequency of physician visits, and attitudes towards services received were all captured (p.1175).

Enterline et. al. (1973) discover that the introduction of "first-dollar" coverage does not impact the overall utilization of medical services. Physician visits remain constant at approximately five per year. There is, however, a marked utilization shift from persons in higher to lower income groups. Persons in the lowest income category (<$3,000 family income) increase their visits per year by 18.2%. Persons in the highest income category (>$15,000 family income) reduce their number of visits per year by 9.4%. Enterline et. al. (1973) conclude that the equity of care provision, based upon medical need, improves with first-dollar coverage. They suggest that a barrier to care existed for low-income groups prior to universal medical insurance (p.1175).

Utilization change by age is inconsistent. For those aged <17 yrs, physician visits decrease by 6.8%. Persons aged 65+ increase their number of visits by 5.2% (p.1176). At the same time, physician telephone contacts decline 14%. Physician home visits decline 59%. Enterline et. al. (1973)

presume that telephone contacts and home visits are used when patients are sicker and can't get to the doctor.

This study reveals the political fallout from this policy shift. Only 8.0% of the Montreal population felt that the quality of care improved with the introduction of Medicare. There was a strong inverse correlation between respondent income and the percentage who believed that care improved. The wealthier population was less likely to see improvement (p. 1177). Based on their results, Enterline et. al. (1973) conclude that "the removal of economic barriers to medical care may actually improve the general health of the population" (p. 1178).

2.5.3 The Ontario Experience (1972 - 1979)

Between 1972 and 1980, nearly 20% of Ontario's physicians opted-out of OHIP and began direct billing their patients. Opted-out physicians were entitled to extra bill above the OHIP/Ontario Medical Association (OMA) negotiated fees. Patients of opted-out physicians were subsequently reimbursed at the OHIP rates.

Stoddart & Woodward (1980) examine the qualitative aspects of this experience. They conducted a telephone survey of 1,769 Ontario households. Their sample includes the four Ontario counties which had the highest percentage of opted-out general practitioners at that time. The study includes respondent groups with and without experience with extra-billing. Their

results rely upon self-reports. Consequently, it is not possible to confirm whether or not these self-reports corresponded to actual changes in utilization.

Stoddart & Woodward (1980) show that "self-selectively" physicians tend to opt-out in clusters. Opting-out ranged from a low of 5% in internal medicine to more than 40% of all obstetricians/gynaecologists. The opting-out rate also varied across Ontario counties, from 2% in Thunder Bay to almost 50% in Peterborough County. Ontario physicians with relatively high income patients were more likely to opt-out. Most patients responded to direct/extra billing by remaining with their existing physician and paying the difference between the direct fees and the OHIP reimbursement rate (pp.7-8).

Direct billing reduced patients' demand for medical services. 19% of respondents whose physician direct-billed reported that they visited the physician less often. A further 14% indicated there had been at least one occasion on which they should have seen a doctor but did not (p.18). The "poor" were more likely to report reduced utilization due to extra billing (p.13).[7]

Direct billing appears to reduce the public's satisfaction with medical services. Only 63% of respondents who faced direct billing were "satisfied" with their medical coverage as compared to 93% of those who did not face extra billing.

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[7]households were defined as "poor" if their incomes were $5,000 or less with a family size of one, $10,000 or less with a family size of two or three, and $15,000 with a family size of four or more

As a complement to Stoddard & Woodward (1980), Wolfson & Tuohy (1980) link interview data from Ontario physicians with OHIP practice profile data. Wolfson & Tuohy (1980) analyze the attitudes of Ontario physicians towards direct billing through a written questionnaire. The second stage of their analysis includes a regression model comparing the billing patterns of 386 opted-out physicians to matched, opted-in physicians. Billing patterns between May 1975 and January 1976 are analyzed.

Wolfson & Tuohy (1980) find that a physician's decision to opt-out is not taken in isolation. Each physician examines his/her circumstances relative to colleagues in a given medical community (p. ix). 21% of the opted-out respondents reported that the Ontario Medical Association (OMA) was influential in their decision to opt out. 37% reported that influence from peers affected their decision (p.49). Opted-out physicians had higher than average billings for their specialty prior to opting-out (p.67). Opted-out physicians were more likely to be Canadian citizens, located in a high average income county, and had been in practice for a longer period of time than their opted-in peers (p.55). 85% of opted-out physicians "price discriminated" according to their personal estimate of their patient's ability to pay (p.59). On average, opted-out physicians' prices exceeded the OHIP fee schedule by 16% (p.185).

Wolfson & Tuohy (1980) hypothesize that physicians opt-out to substitute price for volume. They presume that opted-out physicians will see less patients but bill more dollars per patient to make up the difference. In an earlier study, Wolfson (1975) found that opted-out general practitioners had

fewer patients per physician but provided more services per patient. Wolfson &

Tuohy (1980) find that patient loads of opted-out physicians are markedly

smaller than their opted-in counterparts (p.62). As a result, the net income of

opted-out general practitioners and medical specialists drop. The average

payments per patient were higher for opted-out surgical specialists but not

sufficiently so to compensate for smaller patient loads (p.64). Wolfson & Tuohy

(1980) conclude that:

> . . . there is no indication that opting out in itself made a
> difference to physicians' behaviour. Except in limited
> circumstances, the patient loads, hours of work, waiting times for
> appointments, or other important dimensions of a given
> physician's practice did not appear to differ according to whether
> he was opted in or opted out (p. ix).

They go on to state that:

> . . . there is no evidence that opted-out general practitioners spent
> more time with their patients or offered a different volume or mix
> of services than did opted-in general practitioners, over-all,
> opting-out does not seem in itself to have made much difference
> to medical practice behaviour. Our hypothesis that physicians
> opted-out to substitute price for volume instruments - to see fewer
> patients at less hurried rates and to generate fewer discretionary
> services - has not been borne out (p.188).

According to Wolfson & Tuohy (1980), the primary effect of opting-out is

a financial one. Opting-out presents patients with direct charges for medical

care. They conclude that "opting out constitutes a threat to the universality of

the health insurance system. It erects financial barriers to care while having

little effect on practice behaviour itself" (p.194).

2.5.4 The Alberta Experience (1979 - 1982)

Numerous Alberta physicians extra-billed patients in the late 1970's and early 1980's. The extra-bill per physician service was, on average, 33% higher than the negotiated Medicare payment rate. Extra billing ranged from 11% for x-rays to 55% for some medical procedures and surgeries (Plain, 1982).

Plain (1982) analyzes the prevalence of extra-billing in various specialties. He also reviews the rates charged in proportion to total billings, and the variation in charges by patient's age and income. In Alberta, the frequency of extra-billing ranged from a high of 92% for plastic surgery to a low of 17% for thoracic surgery. Only 8% of total services were extra-billed. However, the percentage of services extra-billed ranged from 40% in ophthalmology to just 2% in neurosurgery (p.6). Surgical specialist services were extra-billed more often than either medical specialist or general practitioner services. Plain (1982) presumes this is due to a higher "price elasticity of demand" for generalist services (p.4).

Extra-billing in Alberta was primarily an urban phenomenon. 47% of physicians in Alberta's cities engaged in extra-billing. Only 29% of physicians extra-billed in towns, 11% in villages, and 8% in rural locations (p.7). Physicians' average extra-billings in Calgary and Edmonton (Alberta's two largest cities) approximated $1,000/month. Extra-billed amounts were negligible in rural areas of the province (p.21). Plain (1982) discusses the urban dominance of direct billing as an unexpected result. He argues that patients in rural regions do not have the same opportunity to "doctor switch" as

do patients in urban areas. Plain (1982) explains this unexpected result as an oversupply of a number of specialties in Alberta's urban areas and a corresponding desire for these physicians to generate income. He also suggests that this result may be partially a function of urban physicians' ability to maintain anonymity (p.8).

The distribution of physician earnings from extra-billing was not uniform. The top 9% of Alberta extra-billers earned 43% of total extra-billing payments. Plain (1982) suggests that almost one-half of the extra-billers in Alberta served as a screen for the small number of "super extra-billers" (p.9). Alberta's extra-billing physicians "price-discriminated" based upon their personal perception of their patient's ability to pay. There is some evidence that this price discrimination was effective. The incidence of extra-billing was highest for patients in the highest income bracket (19%) and lowest for patients aged 65+ and welfare recipients (4%) (p.11). Physician's extra-billing of welfare recipients declined over the three-year review period. In contrast, extra-billed revenue from all other social sectors increased over this timeframe (p.11).

Plain (1982) concludes that "self-selected" direct/extra billing differentially affects patients in specific geographic locations and with particular medical needs. He states that "[because of extra-billing] the goal of ensuring all Canadians are guaranteed the right to utilize medical services in accordance with their medical needs rather than their ability to pay is as unattainable in 1982 as it was prior to the passage of the *Medical Care Act* in 1966" (p.20). "It is the magnitude of the individual extra-billing, the out-of-

pocket charge, which is relevant from an access and utilization viewpoint not the ratio of total extra-billing to the total payment" (p.5).

2.5.5 The Message of the Canadian Experience

The Canadian experience shows that user fees significantly reduce patient demand for medical services. User fees do not, however, appear to selectively target more "discretionary" types of care. Moreover, user fees appear to be a greater deterrent to low-income patients. Based on this evidence, Canadian researchers have concluded that a barrier to care exists for the poor in the absence of "first-dollar coverage" for medical services.

Physicians do not choose to direct bill in isolation. Direct billing occurs in geographic and specialty clusters. Consequently, "self-selected" direct billing differentially impacts patients in specific geographic locations with particular medical needs. There is some evidence that direct billing physicians attempt to "price discriminate" by differentially billing patients in higher income brackets. However, physicians' ability to effectively target patients with a greater ability to pay is unclear. Physician response to reduced patient demand has not been thoroughly studied in the Canadian context. Consequently, the overall impact of user fees on medical service utilization has not been definitively determined.

2.6 Summary and Implications

The existing literature consistently shows that user fees negatively affect patient demand. However, user fees' overall impact on medical service utilization remains unclear. This is because research regarding physician response to changes in patient demand is remarkably limited.

In the majority of the empirical studies reviewed (Lohr et. al., 1986; Manning et. al., 1981, 1984, 1985; Cherkin et. al., 1989, 1990; Newhouse, 1993), copaying patients comprised a very small proportion of sampled physicians' rosters. As a result, a significant drop in patient demand did not translate into a significant income drop for sampled physicians. As discussed by Fahs (1992), research focused solely on the patient-induced component of demand is inadequate:

> When the economic effects of cost sharing on physician services'
> use are analyzed for all patients within a physician practice, the
> findings are remarkably different from those of an analysis limited
> to those patients directly affected by cost-sharing" (p.26).

Some researchers suggest that total medical expenditures (public + private) actually increase following the introduction of user fees (Barer et. al., 1979; Evans et. al, 1993a).

A fundamental benefit of this study is that both patient and physician-induced components of demand will be empirically analyzed. Opted-out BC physicians direct billed their entire patient roster. Consequently, if direct billing exerted significant downward pressure on patient demand, opted-out physicians' incomes were significantly decreased.

In BC, patients of opted-out physicians were required to pay directly for medical services. However, all or a large portion of this cost was subsequently reimbursed. Physicians "price discriminated" based upon their personal estimate of their patients' ability to pay. Consequently, the opportunity costs borne by patients as a result of direct billing, e.g. financial, psychological, etc., differ from typical non-reimbursed user fees. The results of this study will show whether patients and/or physicians react differently to direct billing than they do to non-reimbursed user fees.

In contrast to the majority of the empirical research, this study is based upon the utilization patterns of a "population-based" sample. Patients of all income, age, and gender categories were affected by direct billing. The use of a population-based sample greatly enhances the generalizability of the results.

3. Hypotheses

> The present health care policy debate [regarding direct billing] would be markedly assisted if the requisite hypotheses were tested and concrete evidence was used to support or reject a number of policy alternatives advanced by organized medicine and the Provincial and Federal Governments (Plain, 1982: 15).

This study adds to the existing literature by empirically examining the impact of direct billing for medical services. Existing Canadian empirical research into user fees is based upon data from the 1960's and 1970's (Beck, 1974; Beck & Horne, 1980; Wolfson & Tuohy, 1980; Stoddart & Woodward, 1980; Plain, 1982). Much has changed in the socio-economic and political climate since that time. More recent Canadian studies (Barer et. al., 1993; Evans et. al., 1993; Stoddart et. al., 1993), are based upon literature reviews rather than original empirical study.

The first two hypotheses deal with the propensity for physicians to direct bill. Opted-out and opted-in physicians will be compared based upon their demographic and practice characteristics. The remaining hypotheses deal with the utilization of medical services in response to direct billing. Each hypothesis is written in the null form.

The first step in the analysis involves a determination of what types of physicians direct bill. The demographic and practice characteristics of opted-out and opted-in physicians are compared. This stage of the analysis examines whether direct billing physicians are representative of the medical profession.

Alternatively, are there particular demographic and/or practice characteristics that indicate a physician's predisposition towards direct billing?

Ho1: Opted-out physicians' age, gender, and years in practice in British Columbia are identical to opted-in physicians, pre direct billing.

Failure to reject the null hypothesis (Ho1) would suggest that the propensity to direct bill is shared by physicians of different ages, genders and years in practice. However, if (Ho1) is rejected, evidence is provided that physicians of a particular age, gender, and/or length of time in practice are more likely to self-selectively direct bill their patients.

Ho2: Prior to direct billing, opted-out physicians' total number of patients per physician and total Medical Services Plan (MSP) payments per patient are identical to opted-in physicians.

Failure to reject the null hypothesis (Ho2) would suggest that opted-out physicians had representative caseloads and practice styles prior to direct billing. If (Ho2) is rejected, evidence is provided that physicians' with particular practice caseloads and/or practice patterns are predisposed to self-selectively direct billing their patients.

The second stage of the analysis involves reviewing the impact of direct billing on patient demand for medical services.

Ho3: Total number of patients per physician does not change for direct billing physicians following the date of opting-out. Patients of different ages, genders, and income levels do not switch physicians or delay seeking care in response to direct billing.

Failure to reject the null hypothesis (Ho3) would indicate that direct billing does not impact patient demand for medical services. This result would suggest that direct billing affects patients differently than do non-reimbursed user fees. The existing literature suggests that user fees significantly reduce patient demand and are a greater deterrent to females and "poor" patients (Beck & Horne, 1980; Cherkin et. al., 1989, 1990; Newhouse, 1993; Stoddart et. al., 1993a). If the null hypothesis (Ho3) is rejected, the evidence would suggest that direct billing significantly changes patient demand for medical services. Moreover, this result would indicate that direct billing does not impact patients of different ages, incomes, and/or genders equally.

The last stage of the analysis examines the "physician-induced" component of demand for medical services. This analysis will show whether physicians respond to changing patient demand by altering their practice patterns.

Ho4: *Total Medical Services Plan (MSP) payments per patient do not change for direct billing physicians following the date of opting-out. Billing patterns for opted-in and opted-out physicians are the same for patients of different ages, incomes, and genders, pre and post direct billing.*

Failure to reject the null hypothesis (Ho4) would indicate that physicians do not "induce" demand for medical services. The existing literature is inconclusive regarding physician response to changing patient demand. In most of the studies reviewed, the sampled patients do not comprise a sufficient

percentage of physicians' rosters to enable analysis of physician-induced demand (Brook et. al, 1983; Lohr at. al., 1986; Newhouse, 1993). If (Ho4) is rejected, evidence would be provided that physicians respond to changing patient demand. This result would support the theory of "physician-induced demand" (Evans, 1984). This result would also show that direct billing does not affect patients of different ages, incomes, and/or genders equally.

The conclusions drawn from this study are applicable to other medical practice settings within Canada. All Canadian medical insurance plans are single-payer, publicly administered programs, governed by criteria laid out in the *Canada Health* Act (1984). It may, however, be inappropriate to apply the conclusions of this research to other health professions such as dentistry, physiotherapy, etc. The physician/patient relationship is unique. Patient and provider responses to direct billing for other health care services may be significantly different.

4. Method

4.1 Research Goals

This study empirically analyzes the impact of direct billing on the demand for medical services in BC. The research goals are: (1) to discover whether physicians with particular demographic and/or practice characteristics have a greater propensity to self-selectively direct bill their patients; (2) to investigate the impact of direct billing on patient demand for medical services, and; (3) to discover whether physicians' billing patterns change in response to changing patient demand.

4.2 Study Design

The hypotheses are tested using a quasi-experimental, pretest-posttest control group design (Campbell & Stanley, 1963; Cook & Campbell, 1979). More than 180,000 patient claims are reviewed over a 2 year period. The data are divided into 8 quarter-year periods, based upon the physician's exact date of opting-out. The 4 quarter-years immediately preceding the opting-out date are termed the *pre* period. The 4 quarter-years immediately following the opting-out date are termed the *post* period. The data include Medical Services Plan (MSP) billings for 73 opted-out physicians and their matched, opted-in pairs (based upon specialty, community of practice, and previous MSP billings). The research design is summarized in Figure VI below:

Figure VI – Pretest-Posttest Control Group Design								
Opted Out Physns	O_1	O_2	O_3	O_4	X	O_5	O_6	O_7	O_8
Matched Opted In	O_1	O_2	O_3	O_4		O_5	O_6	O_7	O_8
(O - observation, X - date of opting out)								

This study is not limited by experimental demand artifacts because secondary data is gathered from a naturally occurring setting. Similar methodologies have previously been employed to analyze the billing patterns of independent groups of physicians (Roemer et. al., 1975; Wolfson & Tuohy, 1980; Cherkin et. al., 1989, 1990; Fahs, 1992; Litvack & Bodart, 1993). This study is not, however, a true experiment. Physicians self-selectively opted-out. Consequently, sampled physicians could not be randomly assigned to a billing condition.

4.3 Sample

Between September 1992 and July 1993, a total of 81 BC physicians opted-out of the Medical Services Plan (MSP) and began direct billing their patients. A list of these 81 opted-out physicians was obtained from the BC Medical Association (BCMA). This list included the physician's name, MSP billing number, registered specialty, and registered location of practice. Unfortunately, adequate statistical information was unavailable for 8 of these opted-out physicians. The resulting sample consists of 73 opted-out physicians: 33 general practitioners and 40 specialists. More specifically, the

specialist sample consists of 9 general surgeons, 6 internists, 4 obstetricians/gynaecologists, 2 ophthalmologists, 9 orthopaedic surgeons, 3 plastic surgeons, 1 psychiatrist, and 6 urologists. These 73 opted-out physicians practice in 14 separate BC communities.

This study analyzes the billing patterns for a small and diverse sample of opted-out physicians. Consequently, it was not appropriate to randomly assign opted-in physicians to a control group for comparison. "Randomization only produces groups that are 'equal on the average' when the sample is large enough to allow the positive and negative deviations about the average to balance" (Churchill, 1995: 209). The 73 opted-out physicians are "matched" to 73 opted-in physicians for comparison. Matching improves the prior equality of the comparison groups, increasing statistical power (Kerlinger, 1986; Churchill, 1995). The primary objective of matching is the elimination of biased comparisons between cases and controls (Schlesselman, 1982). Three matching criteria are used: (1) the physician' registered specialty; (2) Medical Services Plan (MSP) billings in the year prior to the study, and; (3) the physician's designated community of practice. The three matching criteria are described in Figure VII below:

Figure VII - Matching Criteria
1. the physician's Royal College of Physicians and Surgeons of Canada (RCPSC) designated specialty;
2. MSP billings (+/-10%) in the fiscal year prior to the observation period (when neither physician direct billed);
3. registered location of practice for receipt of MSP billings.

The MSP annually publishes its payments to all physicians practising in BC. Opted-out physicians' billings for the fiscal year prior to the study were obtained from this publication. The College of Physicians and Surgeons of BC publishes an annual medical directory of physicians' specialty and community of practice. These directories were used to locate opted-in physicians in the same registered specialty and community of practice as the 73 opted-out physicians. The MSP published payments were again used to determine which opted-in physicians received similar MSP billings (+/-10%) in the year prior to the study. Figure VIII below describes a matching example:

Figure VIII - A Matching Example
Step1:   a Nanaimo-based General Practitioner opted-out on June 15, 1993 (within the 1993/94 fiscal year);
Step2:   his 1991/92 MSP billings were $160,000; *therefore,*
Step3:   "eligible", matched physicians are all opted-in Nanaimo-based GPs whose 1991/92 MSP billings ranged from $144,000 to $176,000 ($160,000 (+/-10%)).

The process described in Figure VIII established a set of "eligible", matched physicians. The exact "matched" physician was chosen from this list via random selection. The random number generator on Excel (Version 5.0) for Windows 3.1 was used to complete this task. Ideally, each opted-out physician would be matched to two or three opted-in physicians for comparison. However, due to the stringent matching criteria imposed, it was not possible to match each opted-out physician to more than one opted-in physician. A match

meeting the specialty and billings criteria could not be found in the same community of practice for 7 of the 33 opted-out general practitioners and 15 of the 40 opted-out specialists. In this circumstance, communities within the "most commonly referred to" Health Unit for that specialty were used as a secondary practice location. This referral information is based upon a publication from the University of British Columbia, <u>Fee Practice Medical Service Expenditures Per Capita, and Full-Time Equivalent Physicians in British Columbia, 1991-1992</u> (the most recent year for which this report had been published at the time of matching).

Matching added cost and complexity to the research design. However, the increased efficiency gains achieved through matching are significant. Matching improves the similarity of the comparison groups, enabling extensive statistical analysis of a fairly small experimental population. Matching provides more reliable and efficient estimates of population parameters because precision is increased and sampling error is reduced. This improves the generalizability of the results (Kerlinger, 1986; Churchill, 1995).

4.4 Data

The unit of analysis for this study is patients' Medical Services Plan (MSP) claims. Although the sample of 146 physicians opted-in and opted-out physicians is relatively small, this study analyzes more than 180,000 MSP claims over a 2 year period. The MSP patient claim includes information on the physician's dollar amount billed, number of services provided and type of

service provided. A large number of patient specific variables are also captured, including: age, gender, and income. These data enable differentiation amongst patient and physician type. The MSP does not capture patient claims for either the Insurance Corporation of BC (ICBC), which pays for accident related services for "not-at-fault" drivers, nor Workers' Compensation Board (WCB), which pays for work-related injuries.

In June 1996, a list of 73 opted-out physicians and their 73 opted-in matched pairs was forwarded to the MSP. A record of each patient claim for these 146 physicians over a two year period was requested. Patient claims are divided into 8 age/gender categories (male and female aged 1-19, 20-39, 40-64, and 65+ yrs)[8] and 3 income categories ($0-11,000, 11,001-19,000, >19,000 annual income) *(Appendix B details the MSP data request)*.

In BC, physicians self-selectively direct billed. Each physician included in this study has a unique opting-out date.[9] To obtain a true comparison between the *pre* and *post* periods, the MSP was requested to provide 2 years of billings data for each matched pair based upon the exact opting-out date. These data are based upon the date-of-service and are gathered from one year prior to one year following the date of opting-out. Figure IX below describes the

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[8] Note: data on patients aged <1 year was not gathered. MSP advised that confounding circumstances, including utilization patterns of the child's mother, significantly limits the accuracy of this information

[9] Note: some groups of physicians opted-out en masse.

process for selecting billing dates of opted-out physicians and their matched pairs:

Figure IX - Selecting Billing Dates		
Step1:	physician A opts-out on June 15, 1993;	
Step2:	physician B is an opted-in, matched pair for physician A;	
Step3:	the 8 quarter-years analyzed for this matched pair are:	

Qtr 1	Jun 15/92 - Sep 14/92	Qtr 5	Jun 15/93 - Sep 14/93
Qtr 2	Sep 15/92 - Dec 14/92	Qtr 6	Sep 15/93 - Dec 14/93
Qtr 3	Dec 15/92 - Mar 14/93	Qtr 7	Dec 15/93 - Mar 14/94
Qtr 4	Mar 15/93 - Jun 14/93	Qtr 8	Mar 15/94 - June 14/94

DATE OF OPTING-OUT

NOTE: the billing dates analyzed are unique for each matched pair

Because the data is based upon each physician's exact opting-out date, this study controls for seasonality effects, e.g. utilization is typically higher in the winter due to colds and flu.

Billings data were received from the MSP in ASCII format. Data were converted into Microsoft Access (Version 2.0) for manipulation and SPSS for Windows 95 for statistical analyses. Excel Version 5.0 for Windows was also used.

4.4.1 Constructs and Variables

The key construct operationalized in this study is the utilization of medical services. Medical service utilization is measured through two primary variables: (1) total number of patients per physician per period (# patients),

and; (2) total MSP payments per patient per period ($ payments). Changes in # patients measure patients' "price sensitivity" towards direct billing. For example, a reduced # patients for physicians following opting-out would suggest that patient demand is negatively impacted by direct billing. If # patients for the matched, opted-in physicians increases at the same time, it would appear that patients switch physicians in response to direct billing. However, if # patients for matched, opted-in physicians do not correspondingly increase in the *post* period, the results would suggest that direct billing reduces overall patient demand.

Total MSP payments per patient per period are used to measure physicians' responses to changing patient demand. If direct billing physicians do not respond to changing patient demand, their $ payments should stay the same following opting-out. Physicians may, however, increase their $ payments if direct billing causes their caseload to drop substantially. This result would suggest that physicians can "induce" demand for their services. The patient and physician specific behaviours under review are described in Table I below:

Table I - Primary Constructs and Variables

Constructs	Variables
• patient demand for medical services; • patient switching; • physician-induced demand; • physician practice patterns; • patient economic status	• # patients; • $ payments; • type of service provided, e.g. office visit, minor surgery, etc.; • MSP premium reimbursement.

4.4.2 Assumptions

It is recognized that the following assumptions introduce error into the results of this study. However, review of the existing literature indicates that similar approaches have been taken in the past and are believed to be methodologically sound (Beck, 1974; Beck & Horne, 1980; Wolfson & Tuohy, 1980; Plain, 1982).

1. *Physician Specialty* - Specialty is defined as the physician's "most recent" Royal College of Physicians and Surgeons of Canada specialty designation as listed on his/her MSP claims file. In practice, physicians may perform services outside of their registered specialty, e.g. GP anaesthesia, specialists offering primary care services in rural communities.

2. *Location of Practice* - It is assumed that a physician's MSP billing address is his/her actual location of practice. This assumption is problematic primarily for Pathologists who may receive payments in a single site but may practice in more than one location. No Pathologists are included in this study.

3. *Patient Income* - Ideally, an income cut-off based upon patients' most recent tax returns would be used to distinguish "low-income" from "high-income" patients. Unfortunately, the MSP database does not include tax return information. However, BC is one of only two Canadian provinces (Alberta is the other) that charge residents annual health care premiums. This premium reimbursement system is used to categorize patients into one of

three income levels. The MSP premium reimbursement system is

summarized in Table II, below:

Table II - MSP Premium Reimbursement System

Annual Income	MSP Premium Reimbursement
$0 - 11,000	full
$11,00} - 19,000	partial
$19,000 +	none

There are no means to differentiate amongst patients who receive greater

than $19,000 annual income.

4.5 Statistical Analysis

Four quarter-years of patient claims are analyzed prior to the physician's

date of opting-out, and four immediately following the opting-out date.

Quarters 1-4 are referred to as the *pre* period. Quarters 5-8 are referred to as

the *post* period. **Opted-out physicians began direct billing in quarter 5.**

The statistical analysis includes paired samples t-tests, repeated measures

analysis of variance, and multiple regression. Similar to an event study, the

quarterly data are aggregated into *pre* and *post* periods for statistical analysis.

Aggregation reduces quarterly variation and produces better estimation (Clover

& Balsley, 1979; Cook & Campbell, 1979; Chadwick et. al., 1984; Churchill,

1995). The data are stratified into four sub-sets for analysis: (1) opted-in

general practitioners, (2) opted-out general practitioners, (3) opted-in

specialists, and; (4) opted-out specialists. This stratification enables a comparison of the impact of direct billing upon general practitioners, who are a "point of entry" to care, and specialists, who require a GP referral and provide more episodic medical care.

4.5.1 Characteristics of Opted-Out Physicians

Paired samples t-tests are used to calculate the mean differences in demographic characteristics between opted-in and opted-out physicians, *pre* direct billing. The demographic characteristics include physician: age, gender, and years in practice (based upon the date of registration with the College of Physicians and Surgeons of BC). Paired samples t-tests are also used to compare opted-in and opted-out physicians' # patients and $ payments *pre* direct billing. These comparisons will offer some indication as to what types of physicians, if any, were predisposed to direct billing.

4.5.2 Demand for Medical Services

Two fundamental measures of medical service utilization are analyzed in this study: (1) total number of patients per physician per period (# patients), and; (2) total MSP payments per patient per period ($ payments). Each patient's treatment episode is the unit of analysis. Similar methodologies have previously been employed to analyze the impact of user fees on utilization patterns (Beck, 1974; Beck & Horne, 1980; Wolfson & Tuohy, 1980; Cherkin et. al., 1989, 1990; Fahs, 1992).

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Total number of patients per physician per period (# patients) is the primary variable used to measure patients' "price" sensitivity to direct billing. If patient demand is negatively affected by direct billing, opted-out physicians' # patients should drop in the *post* period. Total MSP payments per patient per period ($ payments) are used as the proxy for the "physician-induced" component of demand for medical services. Alternatively, the volume of services per patient could have been used. $ payments is, however, a superior measure of utilization than is volume of services per patient. Payments inherently reflect the intensity of the service provided. Intensity is generally reflected in a higher fee. It must be noted that physicians' MSP fees increased by 1.5% from 1991/92 - 1993/94, the time period under review. This fee increase may cause a general increase in $ payments for all physicians over the length of the study. It does not, however, skew comparisons between the experimental and control groups. The fee increase applied equally to opted-out and opted-in physicians.

4.5.2.i Analysis of Variance

Analysis of variance (anova) is used to test the impact of direct billing on patient-induced and physician-induced components of demand. It is recognized that # patients and $ payments are not independent from the *pre* to the *post* period. Consequently, a repeated-measures analysis of variance is used. The repeated-measures anova accounts for the lack of independence between the *pre* and the *post* measures and provides unbiased tests of the

differences in # patients and $ payments. It also applies appropriate error terms. The repeated measures anova increases the power of the results as error from between-physician differences is reduced (Cook & Campbell, 1979). Differences due to the effects of opting-out are measured <u>within</u> physicians (within-subjects effects) from the *pre* to the *post* period. The between and within-subjects factors are described in Table III below:

Table III - Design of the Repeated-Measures Anova

Between-Subjects Factors	
Physician Specialty	Billing Status
GP / Specialist	Opted-In / Out
Within-Subjects Factors	
$ Payments (*pre* and *post*)	
# Patients (*pre* and *post*)	

4.5.2.ii Regression Analysis

The repeated-measures anova provides unbiased tests of the effect of direct billing. However, the anova cannot measure either the direction or size of this effect. Consequently, linear regression analysis is performed to augment the analysis. Regression analysis measures the effect size and provides predictive models (Kennedy, 1985; Churchill, 1995). It is recognized that the regression tests do not adequately account for the repeated measures nature of the *pre* and *post* periods. Consequently, the standard errors of the regression coefficients are somewhat understated. However, an identical regression equation is defined for each of the four groups of physicians: (1) opted-in general practitioners, (2) opted-out general practitioners, (3) opted-in

specialists, and; (4) opted-out specialists. Therefore, the understated standard errors are common to all the regression models and do not introduce any systematic bias into the results. The regression equation for each of the four groups of physicians is defined as follows:

 # Patients and $ Payments $= \beta_0 + \beta_1 \text{Age1\_19} + \beta_2 \text{Age40\_64} + \beta_3 \text{Age65\_} + \beta_4 \text{LowInc} + \beta_5 \text{HighInc} + \beta_6 \text{Gender} + \beta_7 \text{Pos1\_19} + \beta_8 \text{Pos40\_64} + \beta_9 \text{Pos65\_} + \beta_{10} \text{LowPos} + \beta_{11} \text{HighPos} + \beta_{12} \text{GenPos} + \beta_{15} \text{PrePost} + e_i$

where:

Age	is a set of four dummy variables identifying patients aged 1-4, 5-19, 40-64, and 65+;
Pos	is a set of four dummy variables representing the same age categories <u>only in the post period</u>;
LowInc	is a dummy variable identifying patients with incomes of $0-11,000;
LowPos	is a dummy variable representing patients with incomes of $0-11,000 <u>only in the post period</u>;
HighInc	is a dummy variable representing patients with incomes > $19,000;
HighPos	is a dummy variable representing patients with incomes > $19,000 <u>only in the post period</u>;
Gender	is a dichotomous variable distinguishing males and females (0 = male, 1 = female);
GenPos	is a dichotomous variable distinguishing males and females <u>only in the post period</u> (0 = male, 1 = female);
PrePost	is a dichotomous variable distinguishing the four quarter-years prior to opting-out from the four quarter-years immediately following opting-out (0 = qtrs. 1-4; 1 = qtrs. 5-8).

PrePost was originally included as an independent variable in each of the regression equations. However, collinearity diagnostics revealed that PrePost is strongly correlated with other independent variables. PrePost was removed from the regression analysis due to multicollinearity concerns. The resulting tolerance values for the regression equations without PrePost improve to acceptable levels.

5. Results

5.1 A Description of Opted-Out Physicians

BC physicians opted-out and direct billed in clusters. 19 general practitioners opted-out in Nanaimo (95,000 pop., located 111 kms north of Victoria, BC's capital); 6 in Prince George (97,000 pop., located in BC's northern interior); 4 in Prince Rupert (17,000 pop., located on BC's north-west coast); and several others scattered throughout BC. With respect to specialists, 6 general surgeons, 5 orthopaedic surgeons, and 3 urologists opted-out in North Vancouver; 4 internists in Nanaimo; 3 obstetricians/gynaecologists in Prince George; and several others scattered throughout BC. 14 BC communities are represented in this study. This clustering phenomenon mirrors the late 1970's/early 1980's experiences with opting-out in Ontario and Alberta. In Ontario, opting-out ranged from a low of 2% of physicians in Thunder Bay to more than 50% of physicians in Peterborough County. In this experience, opted-out physicians were heavily influenced by their peers and their medical association in making the decision to direct bill (Stoddart & Woodward, 1980). Extra-billing in Alberta occurred twice as frequently in Calgary and Edmonton than in the remainder of the province (Plain, 1982).

It appears that younger BC general practitioners were more likely to opt-out. As depicted in Table V below, the mean age for opted-out general practitioners is 46.7 years. The mean age for matched, opted-in general practitioners is 53.4 years, significantly older (p=.05). In contrast, opted-out specialists are similar in age to their opted-in peers. The mean age for opted-out specialists is 50.5 years. The mean age for opted-in specialists is 52.9 years, not significantly different.

Opted-out and opted-in physicians have similar practice experience in BC. Years in practice (as measured by the physician's date of registration with the College of Physicians and Surgeons of BC) are not significantly different between opted-out and opted-in physicians. The mean length of time in BC practice is 17.6 years for opted-out general practitioners, 21.0 years for opted-in general practitioners, 19.7 years for opted-out specialists, and 21.2 years for opted-in specialists.

It appears that male specialists were more likely to opt-out. 100% of the opted-out specialists studied are male. Only 88% of the opted-in specialists are male, significantly fewer (p=.05). In contrast, the gender of opted-out versus opted-in general practitioners is not significantly different. 97% of opted-out GPs and 93% of opted-in GPs are male. Characteristics of opted-out and opted-in physicians are described in Table IV below:

Table IV - Physician Characteristics

	Opted-In GPs	Opted-Out GPs	Opted-In Spec's	Opted-Out Spec's
Age	53.4 yrs	46.7 yrs *	52.9 yrs	50.5 yrs
Years in BC Practice	21.0 yrs	17.6 yrs	21.2 yrs	19.7 yrs
Gender	93% male	97% male	88% male	100% male*
Pts./Physician Pre	970	980	896	938*
Payments/Pt. Pre	$41.87	$39.79*	$91.65	$89.12
* = significantly different (p=.05)				

Table V also describes physicians' practice characteristics *pre* opting-out. Opted-in and opted-out general practitioners had similar caseloads prior to the date of opting-out. Opted-in GPs saw an average of 970 patients per

quarter-year in the *pre* period. Opted-out GPs saw 980 patients per quarter-year in the *pre* period. However, opted-out GPs billed the Medical Services Plan (MSP) significantly less per patient in the *pre* period (p=.05). While opted-out GPs billed an average of $39.79 per patient per quarter-year prior to opting-out, opted-in GPs billed an average of $41.87.

It appears that specialists with larger caseloads were more likely to opt-out. In the *pre* period, opted-out specialists saw an average of 938 patients per quarter-year. Opted-in specialists saw significantly fewer patients, an average of 896 patients per quarter-year (p=.05). Opted-in and opted-out specialists billed similar amounts per patient in the *pre* period. Opted-out specialists billed an average of $89.12 per patient per quarter-year. Opted-in specialists billed an average of $91.65.

5.2 Impact of Direct Billing on Utilization Patterns

This study analyzes two fundamental measures of medical service utilization: (1) total number of patients per physician per period (# patients), and; (2) total MSP payments per patient per period ($ payments). Four quarter-years of patient claims are analyzed prior to the physician's date of opting-out, and four immediately following the opting-out date. Quarters 1-4 are referred to as the *pre* period. Quarters 5-8 are referred to as the *post* period. **Opted-out physicians began direct billing in quarter 5.** Changes in utilization patterns are measured through paired samples t-tests, repeated measures analysis of variance, and multiple regression.

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5.2.1 Patient Count

Conventional price theory suggests that, in a competitive market, price

increases to patients will decrease physicians' volumes of patients (Culyer,

1989). # patients reflects patients' attitudes toward direct billing. Patients will

switch away from opted-out physicians if they are "price" sensitive to direct

billing.

5.2.1.i General Practitioners

Figure X below displays the change in # patients for general

practitioners over the two years analyzed. Opted-out GPs began direct billing

in Quarter 5:

Figure X - # Patients per General Practitioner
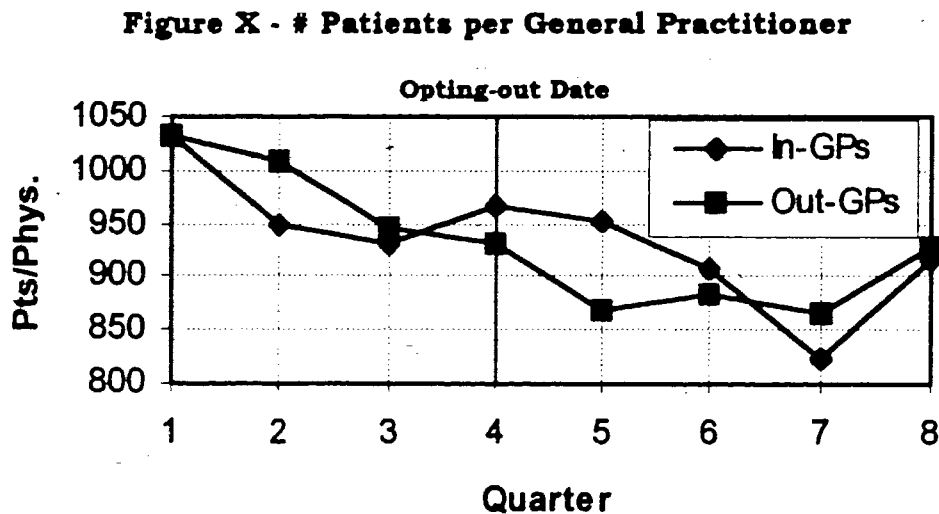
Direct billing GPs lose large numbers of patients immediately following

opting-out (between quarters 4 and 5). Opted-out GPs' caseloads appear to

stabilize from quarters 5 through 7. Their caseloads may even begin recovering

by quarter 8, one year into direct billing. This potential recovery in caseload must be interpreted with caution. Quarter 8 marks the first notable increase in opted-out GPs # patients following direct billing. Moreover, it is the last period for which data was gathered. It is nearly impossible to predict whether this recovery would be sustained over the long-term.

The results of the analysis of variance for general practitioners' # patients are displayed in Table V below:

Table V - The Effect of Direct Billing on General Practitioners' # Patients

Tests of Within-Subjects Effects - General Practitioners

Measure: PATIENT COUNT

Sphericity Assumed

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
PTCNT	1986.963	1	1986.963	70.182	.000	70.182	1.000
PTCNT * IN_OUT	329.007	1	329.007	11.621	.001	11.621	.926
Error(PTCNT)	838671	29623	28.311				

a. Computed using alpha = .05

The changes in # patients are measured within-subjects from the *pre* to the *post* period. The main effect (PTCNT) measures the change in # patients for all GPs, opted-in and opted-out. PTCNT shows that, overall, # patients per general practitioner changes significantly from the *pre* to the *post* period (p=.000). The analysis of variance cannot show the direction of this change. However, from Figure X above, there appears to be a general reduction in patients per GP over the two years analyzed. This result could be caused by cyclical changes or exogenous factors that shifted overall patient demand.

The null hypothesis (Ho3) that direct billing does not affect the total

number of patients per general practitioners is rejected. The two-way

interaction (PTCNT * IN_OUT) shows that, from the *pre* to the *post* period, the

change in # patients is significantly differently for opted-in versus opted-out

GPs (p=.001). However, the anova cannot measure either the strength or

direction of this change. Consequently, regression analysis is performed to

examine this question. The identical regression equation is entered for each

both opted-out and opted-in general practitioners *(refer to Chapter 4 for more

details)*. The regression results for the # patients of opted-out general

practitioners are depicted in Table VI below:

Table VI - Regression Coefficients for Opted-Out General Practitioners' # Patients

Net Patient Count - Coefficients for Opted-Out General Practitioner$

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	4.122	.217		18.980	.000		
	AGE1_4	-3.412	.358	-.073	-9.542	.000	.461	2.167
	AGE5_19	-2.009	.296	-.055	-6.790	.000	.415	2.412
	AGE40_64	-.481	.263	-.015	-1.831	.067	.408	2.452
	AGE65_	-3.046	.269	-.091	-11.332	.000	.415	2.410
	POS1_4	.216	.516	.003	.419	.675	.458	2.181
	POS5_19	.233	.418	.005	.558	.577	.396	2.526
	POS40_64	.251	.369	.006	.682	.495	.384	2.604
	POS65_	7.4E-02	.372	.002	.200	.842	.403	2.481
	LOWINC	3.198	.256	.113	12.478	.000	.331	3.019
	LOWPOS	.236	.315	.007	.751	.452	.354	2.822
	HIGHINC	6.482	.250	.235	25.962	.000	.331	3.023
	HIGHPOS	.414	.306	.012	1.354	.176	.323	3.094
	GENDER	3.7E-02	.194	.001	.192	.848	.553	1.809
	GENPOST	-.637	.279	-.019	-2.284	.022	.404	2.477

F= 109.86, sig. = .000; r2 = .042, adj. r2 = .041

a. Dependent Variable: PTCOUNT

The regression results show that females are more "price" sensitive to direct billing for general practitioners' services. GENPOST shows that direct billing GPs lose 15.5% of their female patients in the *post* period (p=.022) *(determined from the regression coefficients ((4.122-.637)/4.122))*. Direct billing general practitioners do not differentially lose patients in any particular age or income category in the *post* period.

The identical regression equation was entered for the control group of opted-in general practitioners. Table VII below displays the regression results for # patients of opted-in general practitioners:

Table VII - Regression Coefficients for Opted-In General Practitioners' # Patients

Net Patient Count - Coefficients for Opted-In General Practitioners

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3.161	.234		13.531	.000		
	AGE1_4	-2.839	.423	-.052	-6.709	.000	.462	2.163
	AGE5_19	-1.165	.334	-.029	-3.491	.000	.412	2.429
	AGE40_64	.989	.285	.029	3.471	.001	.390	2.564
	AGE65_	-.849	.280	-.026	-3.032	.002	.387	2.584
	POS1_4	-6.4E-02	.606	-.001	-.106	.916	.465	2.149
	POS5_19	-.131	.468	-.002	-.280	.779	.404	2.474
	POS40_64	4.9E-02	.390	.001	.126	.900	.373	2.683
	POS65_	-6.8E-02	.373	-.002	-.183	.855	.375	2.667
	LOWINC	3.231	.276	.107	11.709	.000	.335	2.985
	LOWPOST	-.214	.345	-.006	-.619	.536	.349	2.868
	HIGHINC	6.923	.268	.236	25.821	.000	.332	3.015
	HIGHPOST	.223	.331	.006	.674	.500	.313	3.197
	GENDER	-5.1E-02	.210	-.002	-.244	.807	.544	1.838
	GENPOST	7.0E-02	.296	.002	.236	.813	.400	2.499

F = 101.58, sig. = .000; r2 = .039, adj. r2 = .039

a. Dependent Variable: PTCOUNT

The # patients per opted-in general practitioner <u>does not change</u> from the *pre* to the *post* period. None of the independent age, income, or gender variables are correlated with the dependent PTCOUNT.

5.2.1.ii Specialists

A similar analysis is performed for the # patients of opted-out and opted-in specialists. The change in # patients per specialist over the two years studied is depicted in Figure XI below. Opted-out specialists began direct billing in Quarter 5:

Figure XI - # Patients per Specialist

Opting-out Date
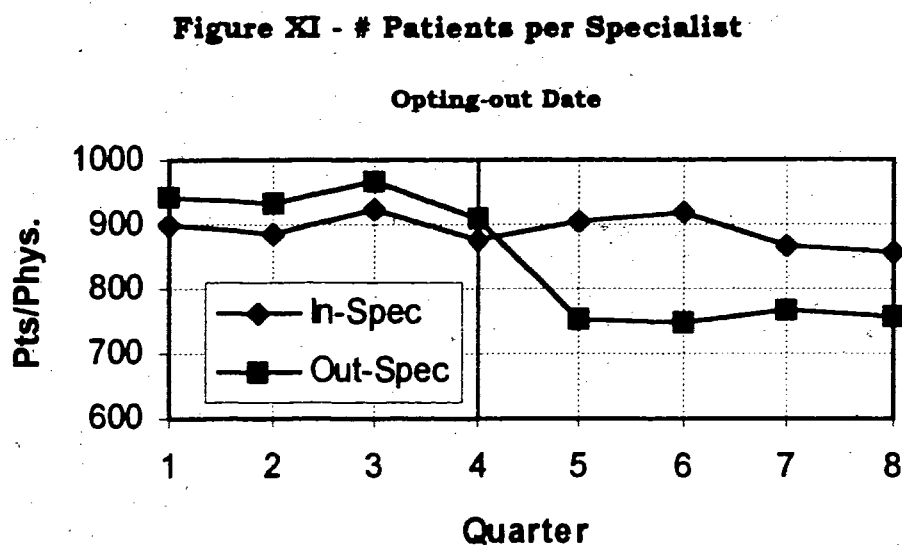
Figure XI shows that the # patients per opted-in specialist remains fairly constant over the two years of analysis. In contrast, the # patients per opted-out specialist drops from 909 in quarter 4 to only 754 in quarter 5, immediately following the date of opting-out. It appears that direct billing specialists' caseloads stabilize through the remaining 9 months of analysis.

The results of the analysis of variance for specialists' # patients are displayed in Table VIII below:

Table VIII - The Effect of Direct Billing on Specialists' # Patients

Tests of Within-Subjects Effects - Specialists

Measure: PATIENT COUNT
Sphericity Assumed

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
PTCNT	21421.6	1	21421.6	247.511	.000	247.511	1.000
PTCNT * IN_OUT	15218.0	1	15218.0	175.833	.000	175.833	1.000
Error(PTCNT)	2578438	29792	86.548				

a. Computed using alpha = .05

The change in specialists' # patients is measured within-subjects from the *pre* to the *post* period. The main effect (PTCNT) measures the change in # patients for all specialists. PTCNT reveals an overall change in specialists' # patients over the two years studied (p=.000). The direction of this change cannot be ascertained from the anova. However, from Figure XI above, it appears there is a general reduction in specialists' # patients over the two years analyzed. This overall change appears to be the result of a large drop in patients for opted-out specialists in the *post* period. Graphically, it does not appear that opted-in specialists' caseloads change significantly over the eight quarter-years.

The null hypothesis (Ho3) that direct billing does not affect the total number of patients per specialist is rejected. The two-way interaction (PTCNT * IN_OUT) reveals that the change in # patients from the *pre* to the *post* period is significantly different for opted-in versus opted-out specialists (p=.000). An

identical multiple regression equation is entered for both opted-in and opted-out specialists to estimate the direction and size of this change in patient demand *(refer to Chapter 4 for more details)*. The regression results for the # patients of opted-out specialists are depicted in Table IX below:

Table IX - Regression Coefficients for Opted-Out Specialists' # Patients

Net Patient Count - Coefficients for Opted-Out Specialists

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.065	.198		5.377	.000		
	AGE1_4	-5.530	.571	-.077	-9.681	.000	.407	2.454
	AGE5_19	-4.075	.352	-.100	-11.565	.000	.338	2.955
	AGE40_64	1.675	.231	.061	7.266	.000	.358	2.795
	AGE65_	3.183	.250	.114	12.749	.000	.319	3.139
	LOWINC	3.389	.259	.125	13.072	.000	.280	3.568
	HIGHINC	8.265	.249	.319	33.249	.000	.277	3.605
	GENDER	.187	.201	.007	.930	.353	.422	2.372
	POS1_4	.231	.758	.002	.305	.760	.407	2.460
	POS5_19	.165	.453	.003	.364	.716	.329	3.041
	POS40_64	.325	.301	.010	1.080	.280	.328	3.045
	POS65_	-.100	.305	-.003	-.329	.742	.299	3.344
	LOWPOS	-.757	.296	-.024	-2.558	.011	.297	3.369
	HIGHPOS	-.451	.282	-.016	-1.600	.110	.263	3.801
	GENPOS	-.128	.255	-.004	-.502	.616	.319	3.134

a. Dependent Variable: PTCOUNT   F = 236.11, sig. = .000; r2 = .084, adj. r2 = .084

Opted-out specialists lose significant numbers of patients as a result of direct billing. This drop does not occur equally across income groups. Opted-out specialists lose 17.0% of their "low-income" patients (<$11,000 income) in the *post* period (p=.011). "High-income" patients (>$19,000 income) appear to be less affected by direct billing. Opted-out specialists lose only 4.8% of their high-income patients in the post period (p=.110). Unlike direct billing general

practitioners, direct-billing specialists do not lose patients in any particular age or gender category.

The identical regression equation was entered for the control group of opted-in specialists. The regression results are displayed in Table XI below:

**Table X - Regression Coefficients for
Opted-In Specialists' # Patients**

Coefficients[a]

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1.	(Constant)	2.331	.252		9.241	.000		
	AGE1_4	-2.880	.531	-.043	-5.422	.000	.466	2.146
	AGE5_19	-1.489	.376	-.033	-3.956	.000	.429	2.332
	AGE40_64	1.110	.298	.032	3.724	.000	.402	2.485
	AGE65_	1.267	.236	.037	5.374	.000	.632	1.582
	LOWINC	3.264	.292	.101	11.180	.000	.361	2.767
	HIGHINC	8.981	.282	.289	31.827	.000	.358	2.795
	GENDER	-.265	.230	-.009	-1.150	.250	.535	1.868
	POS1_4	-8.0E-02	.736	-.001	-.108	.914	.480	2.085
	POS5_19	.171	.511	.003	.334	.738	.446	2.240
	POS40_64	-.162	.249	-.004	-.649	.516	.875	1.142
	POS65_	.267	.383	.006	.696	.487	.417	2.399
	LOWPOS	2.6E-02	.346	.001	.076	.939	.411	2.436
	HIGHPOS	1.152	.331	.031	3.481	.000	.371	2.695
	GENPOS	-2.1E-02	.320	-.001	-.066	.947	.393	2.544

a. Dependent Variable: PTCOUNT

F = 173.16, sig. = .000; r2 = .066, adj. r2 = .066

The regression results for opted-in specialists show that the number of "high-income" patients (>$19,000 income) increases by 10.1% in the *post* period (p=.000). Notably, opted-in specialists' caseloads do not increase for "low-income" patients in the *post* period. In addition, the # patients for opted-in specialists does not change for any of the patient age or gender categories.

5.2.2 Payments per Patient

Total Medical Services Plan (MSP) payments per patient per period ($ payments) measures the billed amount for each service provided. $ payments is a superior measure of utilization than is volume of services per patient. $ payments accounts for differences in intensity of service, reflected in a higher fee. In 1994/95, the average gross payments for BC specialists was $262,655 and for general practitioners was $140,086.[10] There was a 1.5% increase in MSP fees over the duration of this analysis (1991/92 - 1993/94). However, this increase does not bias comparisons between opted-in and opted-out physicians. Fees were increased for all BC physicians, opted-in and opted-out.

5.2.2.i General Practitioners

MSP payments per patient remain relatively constant for both opted-in and opted-out general practitioners throughout the *pre* period. However, opted-out general practitioners' $ payments increase from $39.21 to $42.75 immediately following opting-out (between quarters 4 and 5). In contrast, $ payments for opted-in general practitioners remain relatively constant over the entire two years analyzed. Figure XII below depicts the changes in $ payments for general practitioners:

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[10] Source: BC Medical Association Data Binder, February 1996.

Figure XII - General Practitioners' $ Payments

Opting-out Date
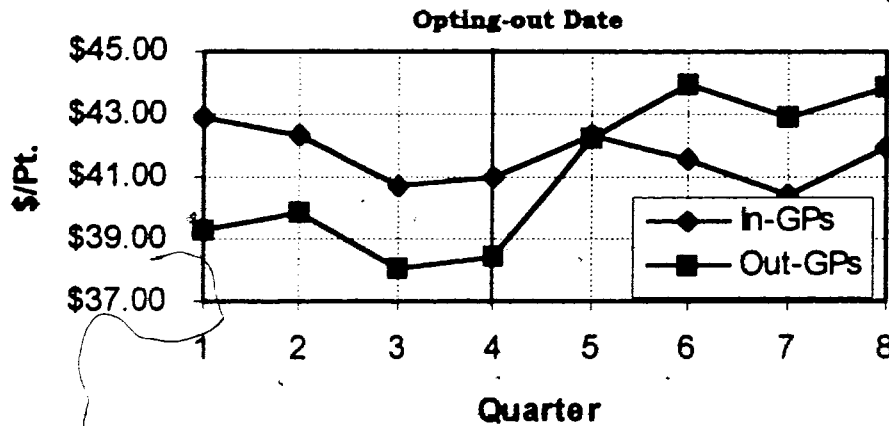
The effect of direct billing on general practitioners' $ payments is tested through analysis of variance. The anova results for general practitioners are displayed in Table XI below:

Table XI - The Effect of Direct Billing on General Practitioners' $ Payments

Tests of Within-Subjects Effects - General Practitioners

Measure: PAYMENTS PER PATIENT

Sphericity Assumed

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
PAY/PT	349.461	1	349.461	.344	.557	.344	.090
PAY/PT * IN_OUT	4188.375	1	4188.375	4.126	.042	4.126	.528
Error(PAY.PT)	3.0E+07	29623	1015.197				

a. Computed using alpha = .05

The change in $ payments is measured within-subjects from the *pre* to the *post* period. The main effect (PAY/PT) measures the change in payments for all general practitioners. PAY/PT shows that, overall, general practitioners'

, $ payments do not change from the *pre* to the *post* period. The main effect (PAY/PT) is not significant (p=.557).

The null hypothesis (Ho4) that direct billing does not affect general practitioners' payments per patient is rejected. The two-way interaction (PAY/PT • IN_OUT) measures the change in $ payments for opted-in versus opted-out general practitioners. This result shows that, from the *pre* to the *post* period, the change in $ payments is significantly different for opted-in versus opted-out general practitioners (p = .042). The anova cannot measure either the strength or direction of this change. Consequently, regression analysis is performed to examine this question. The regression results for opted-out general practitioners' $ payments are depicted in Table XII below:

**Table XII - Regression Coefficients for
Opted-Out General Practitioners' $ Payments**

Payments per Patient - Coefficients for Opted-Out General Practitioners

Model		Unstandardized Coefficients					Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	39.920	.655		60.910	.000		
	AGE1_4	-5.569	1.079	-.040	-5.161	.000	.461	2.167
	AGE5_19	-6.945	.893	-.064	-7.779	.000	.415	2.412
	AGE40_64	-2.565	.793	-.027	-3.237	.001	.408	2.452
	AGE65_	-.390	.811	-.004	-.481	.630	.415	2.410
	POS1_4	-1.307	1.557	-.007	-.840	.401	.458	2.181
	POS5_19	-.162	1.262	-.001	-.128	.898	.396	2.526
	POS40_64	.176	1.113	.001	.158	.874	.384	2.604
	POS65_	3.723	1.122	.028	3.319	.001	.403	2.481
	LOWINC	2.916	.774	.035	3.769	.000	.331	3.019
	LOWPOST	3.986	.950	.037	4.197	.000	.354	2.822
	HIGHINC	1.056	.753	.013	1.402	.161	.331	3.023
	HIGHPOST	3.068	.922	.031	3.327	.001	.323	3.094
	GENDER	-.153	.586	-.002	-.261	.794	.553	1.809
	GENPOST	.902	.842	.009	1.072	.284	.404	2.477

F = 25.966, sig. = .000; r2 = .010, adj. r2 = .010

a. Dependent Variable: PAY_PT

The regression results show that, over the *pre* and *post* periods, opted-out general practitioners' $ payments are highest for patients with less than $11,000 annual income (LOWINC) and the elderly (AGE 65_). These results are consistent with the findings of numerous previous studies. Age and utilization are positively correlated, while income and utilization are negatively correlated (United States Center for Health Statistics, 1972; Newhouse, 1993; OECD, 1994). In this study, there is no difference in general practitioners' $ payments for male versus female patients.

Direct billing general practitioners increase their $ payments in the *post* period. This increase does not occur equally across patient age, gender, and income groups. $ payments increase by $3.07 for "high-income" patients, 9.3% of the average cost (p=.001); $3.99 for "low-income" patients, 7.7% of the average cost (p=.000); and $3.72 for patients aged 65+, 9.3% of the average cost (p=.001).

The identical regression equation was entered for the matched, control group of opted-in general practitioners. The results of this analysis are presented in Table XIII below:

Payments per Patient - Coefficients for Opted-In General Practitioners

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	40.206	.702		57.287	.000		
	AGE1_4	-5.739	1.271	-.036	-4.513	.000	.462	2.163
	AGE5_19	-4.736	1.002	-.039	-4.725	.000	.412	2.429
	AGE40_64	-1.372	.856	-.014	-1.602	.109	.390	2.564
	AGE65_	4.326	.841	.044	5.140	.000	.387	2.584
	POS1_4	1.849	1.819	.008	1.016	.310	.465	2.149
	POS5_19	.181	1.406	.001	.129	.897	.404	2.474
	POS40_64	-5.9E-02	1.172	.000	-.050	.960	.373	2.683
	POS65_	-.529	1.121	-.004	-.472	.637	.375	2.667
	LOWINC	3.588	.829	.040	4.328	.000	.335	2.985
	LOWPOST	5.1E-03	1.036	.000	.005	.996	.349	2.868
	HIGHINC	1.290	.806	.015	1.602	.109	.332	3.015
	HIGHPOST	.181	.993	.002	.182	.855	.313	3.197
	GENDER	.627	.630	.007	.995	.320	.544	1.838
	GENPOST	-1.083	.889	-.010	-1.218	.223	.400	2.499

F = 15.524, sig. = .000; r2 = .006, adj. r2 = .006

a. Dependent Variable: PAY_PT

In contrast to opted-out general practitioners, $ payments do not change for opted-in GPs from the *pre* to the *post* period. Payments do not change for patients in any age, income or gender category.

5.2.2.ii Specialists

Specialists' $ payments remain fairly constant throughout the *pre* period. However, opted-out specialists' $ payments spike from $89.70 in quarter 4 to more than $97 in quarter 5, immediately following opting-out. Following this one-time increase, opted-out specialists' $ payments appear to level off over the remaining 9 months of analysis. In contrast, $ payments for opted-in specialists remain relatively constant over the two years reviewed.

Specialists' $ payments are depicted in Figure XIII below. Opted-out specialists

began direct billing in Quarter 5:

Figure XIII - Specialists' $ Payments
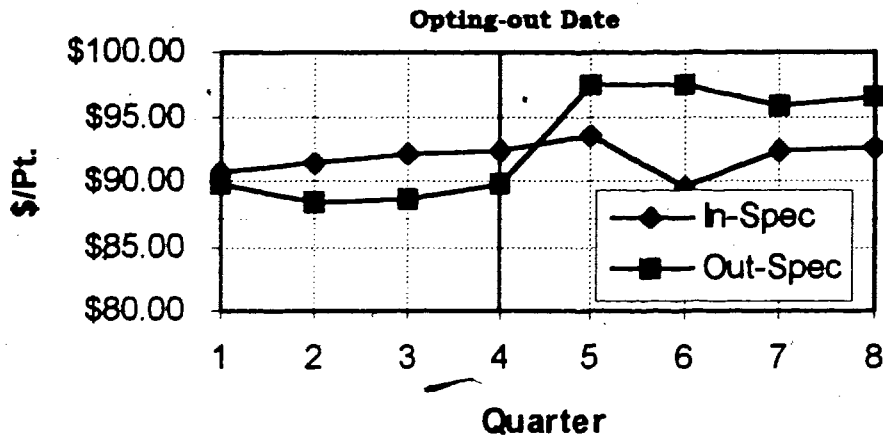
The effect of direct billing on specialists' $ payments is tested through

analysis of variance. The anova results for general practitioners are displayed

in Table XIV below:

**Table XIV - The Effect of Direct Billing
on Specialists' $ Payments**

Tests of Within-Subjects Effects - Specialists

Measure: PAYMENTS PER PATIENT
Sphericity Assumed

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Noncent. Parameter	Observed Power[a]
PAY.PT	925051	1	925051	106.365	.000	106.365	1.000
PAY.PT * IN_OUT	3708290	1	3708290	426.391	.000	426.391	1.000
Error(PAY.PT)	2.6E+08	29792	8696.928				

a. Computed using alpha = .05

Changes in $ payments are measured within-subjects from the *pre* to the *post* period. The main effect (PAY/PT) measures the change in $ payments for all specialists. PAY/PT shows that there is an overall change in specialists' $ payments over the two years analyzed (p=.000). The anova cannot show the direction of this change. However, Figure XIII above reveals an upward trend in specialists' $ payments. This upward trend is, at least partially, explained by the 1.5% fee increase over the period of the study.

The null hypothesis (Ho4) that direct billing does not affect specialists' MSP payments per patient is rejected. The two-way interaction (PAY/PT * IN_OUT) measures the change in $ payments for opted-in versus opted-out specialists. This result shows that the change in $ payments is significantly different for opted-in versus opted-out specialists (p = .000). The anova cannot measure either the strength or direction of this change. Consequently, regression analysis is performed to examine this question. The regression results for opted-out specialists' $ payments are depicted in Table XV below:

Table XV - Regression Coefficients for Opted-Out Specialists' $ Payments

Payments per Patient - Coefficients for Opted-Out Specialist

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	87.784	2.332		37.644	.000		
	AGE1_4	-13.657	6.725	-.017	-2.031	.042	.407	2.454
	AGE5_19	-6.205	4.149	-.014	-1.496	.135	.338	2.955
	AGE40_64	4.036	2.715	.013	1.487	.137	.358	2.795
	AGE65_	9.717	2.940	.031	3.305	.001	.319	3.139
	LOWINC	1.256	3.053	.004	.411	.681	.280	3.568
	HIGHINC	-5.717	2.927	-.020	=1.953	.051	.277	3.605
	GENDER	2.339	2.372	.008	.986	.324	.422	2.372
	POS1_4	10.066	8.928	.009	1.128	.260	.407	2.460
	POS5_19	-9.9E-02	5.336	.000	-.019	.985	.329	3.041
	POS40_64	5.572	3.541	.014	1.574	.116	.328	3.045
	POS65_	6.268	3.592	.017	1.745	.081	.299	3.344
	LOWPOS	1.531	3.487	.004	.439	.661	.297	3.369
	HIGHPOS	2.408	3.318	.007	.726	.468	.263	3.801
	GENPOST	.706	3.002	.002	.235	.814	.319	3.134

a. Dependent Variable: PAY_PT   F=9.071, sig. = .000; r2 = .004, adj. r2 = .003

The regression results show that patients with less than $11,000 annual income (LOWINC) and the elderly (AGE65_) are the highest users of opted-out specialists' services. These results are consistent with the findings of numerous previous studies. Age and utilization are positively correlated, while income and utilization are negatively correlated (United States Center for Health Statistics, 1972; Newhouse, 1993; OECD, 1994). In this study, there is no difference in specialists' $ payments for male versus female patients.

$ payments for opted-out specialists increase significantly in the *post* period. $ payments do not, however, change equally across patient age, income, and gender groups. Direct billing specialists' payments for patients aged 65+ increase by $6.27, 6.4% of the average cost (p=.081).

The identical regression equation was entered for the matched, control group of opted-in specialists. The results of this analysis are presented in Table XVI below:

Table XVI - Regression Coefficients for Opted-In Specialists' $ Payments

Coefficients[a]

Model		Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
		B	Std. Error				Tolerance	VIF
1	(Constant)	87.180	2.411		36.152	.000		
	AGE1_4	-12.729	5.078	-.021	-2.507	.012	.466	2.146
	AGE5_19	-9.244	3.598	-.022	-2.569	.010	.429	2.332
	AGE40_64	6.235	2.850	.019	2.187	.029	.402	2.485
	AGE65_	18.926	2.254	.059	8.397	.000	.632	1.582
	LOWINC	2.096	2.791	.007	.751	.453	.361	2.767
	HIGHINC	-5.846	2.697	-.020	-2.167	.030	.358	2.795
	GENDER	3.026	2.201	.011	1.375	.169	.535	1.868
	POS1_4	4.089	7.041	.005	.581	.561	.480	2.085
	POS5_19	2.653	4.883	.005	.543	.587	.446	2.240
	POS40_64	-1.799	2.379	-.005	-.756	.450	.875	1.142
	POS65_	2.039	3.663	.005	.557	.578	.417	2.399
	LOWPOS	1.774	3.304	.005	.537	.591	.411	2.436
	HIGHPOS	7.2E-02	3.164	.000	.023	.982	.371	2.695
	GENPOS	-.511	3.054	-.001	-.167	.867	.393	2.544

a. Dependent Variable: PAY_PT   F = 13.854, sig. = .000; r2 = .006, adj. r2 = .006

$ payments for opted-in specialists do not change from the *pre* to the *post* period. $ payments do not change for any age, income, or gender groups.

The null hypotheses and the corresponding test results are summarized in Table XVII below:

Table XVII: Summary of Hypotheses and Results

Null Hypothesis	Result
Ho1: Opted-in and opted-out physicians have similar demographic characteristics *pre* direct billing.	**Rejected** GPs: younger GPs more likely to direct bill Spec: male specialists more likely to direct bill
Ho2: Opted-in and opted-out physicians have similar practice characteristics *pre* direct billing.	**Rejected** GPs: less payments/patient more likely to direct bill Spec: higher caseloads more likely to direct bill
Ho3: Direct billing does not impact total number of patients per physician.	**Rejected** GPs: lose 15.5% of female patients Spec: lose 17.0% of low-income patients; lose 4.8% of high-income patients
Ho4: Direct billing does not impact physicians' MSP payments per patient.	**Rejected** GPs: direct billing ↑ payments/patient by 7.7% for low-income, 9.3% for high-income, and 9.3% for patients 65+ Spec: direct billing ↑ payments/patient by 6.4% for patients 65+

5.2.3 Physician Income

This section describes the impact of direct billing on physicians' Medical Services Plan (MSP) incomes. It is important to note that private billings are not captured in this data. Patient claims for the Insurance Corporation of BC (ICBC), which pays for the medical services of "not-at-fault" drivers, as well as Workers' Compensation Board (WCB) claims for injured workers, are also not captured.

Direct billing appears to reduce MSP incomes for specialists over the short-term. Referring to Figure XIV below, opted-out specialists' MSP incomes drop from quarter 3 through quarter 5, immediately following the date of

・opting-out. However, direct billing specialists' MSP incomes appear to rebound from this point onward. By quarter 7, nine months into direct billing, opted-out specialists' MSP payments have returned to their *pre* direct billing levels. This trend is sustained through the remaining 3 months of analysis.

Figure XIV - Average MSP Payments per Quarter
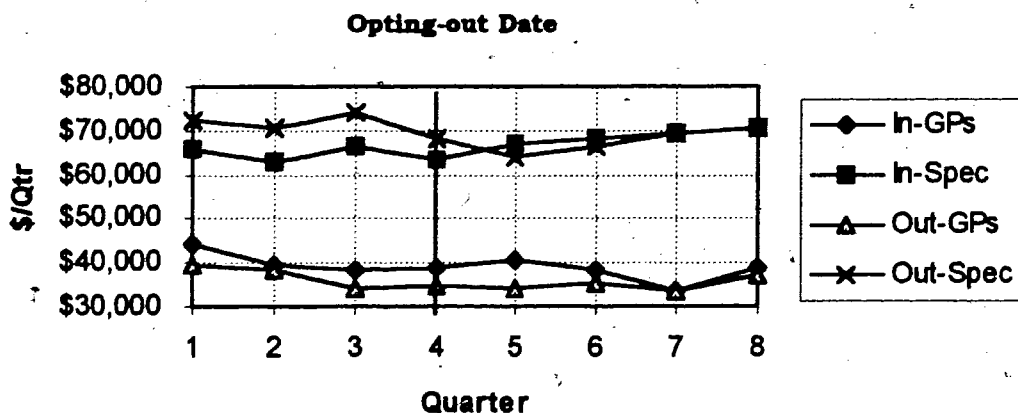
Direct billing general practitioners also appear to lose MSP income over the short-term. However, this income loss appears to be only temporary. By quarter 7, nine months into direct billing, MSP billings for opted-out general practitioners return to match that of opted-in GPs. This trend is maintained through the remaining 3 months of analysis.

It appears that income loss due to direct billing is a short-term phenomenon. In fact, direct billing may actually increase gross incomes for opted-out physicians over the long-term. The preceding figures include only MSP income. Opted-out physicians typically charged patients 15% higher than the negotiated MSP fees (varying by type of service and physician). Therefore,

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direct charges, combined with the return to *pre* direct billing levels of MSP income within 9 months of opting-out, made direct billing a revenue generator for opted-out physicians.

6. Discussion and Conclusions

6.1 Summary of Findings

The results of this study indicate that direct billing significantly reduces patient demand for medical services. However, overall utilization levels may not drop as a result of direct billing. It appears that opted-out physicians respond to dropping caseloads by "inducing" demand from remaining patients. The changes in # patients and $ payments for opted-in and opted-out physicians, *pre* and *post* direct billing, are summarized in Table XVIII below:

Table XVIII - Summary of Findings

	PtCnt Pre	PtCnt Post	Pay/Pt Pre	Pay/Pt Post
In GPs	970	900	$41.87	$42.92
Out GPs	980	885	$39.79	$43.23
In Specs	896	938	$91.65	$91.97
Out Specs	887	757	$89.12	$96.57

6.1.1 The Impact of Direct Billing on Patients

The third null hypothesis (Ho3) states that *"Total number of patients per physician does not change for direct billing physicians following the date of opting-out. Patients of different ages, genders, and income levels do not switch physicians or delay seeking care in response to direct billing"*. This null hypothesis is rejected.

6.1.1.i Utilization of General Practitioner Services

Direct billing negatively impacts patient demand for general practitioners' services. Opted-out GPs lose significant numbers of patients in the first 3 months following opting-out. Their caseloads appear to stabilize through the remaining 9 months of analysis. Exogenous factors do not appear to cause this drop in patients for direct billing GPs. Over the same time period, the # patients for matched, opted-in general practitioners does not change for patients in any age, income, or gender category.

The results of this study suggest that opted-out GPs' caseloads may begin to rebound after a year of direct billing. However, this result must be interpreted with caution. This rebound in caseload occurred in the last quarter-year of analysis. It is not possible to predict whether this recovery was sustained over the long-term.

The reduction in patient demand for direct billed GP services does not occur uniformly. Females appear to be more "price" sensitive to direct billing for primary care services. Opted-out general practitioners lose 15.5% of their female patients in the *post* period (p=.022). This finding is consistent with the 1980's experience in a large Washington State Health Maintenance Organization (HMO). As discussed by Cherkin et. al. (1990), a $5 user fee did not affect adult males' utilization of primary care services. However, females reduced their utilization by 15%.

In this study, the significant drop in female patients for opted-out GPs does not correspond to an increase in female patients for the matched, opted-in

general practitioners. This result may suggest that direct billing causes an overall reduction in females' utilization of GP services. Alternatively, these female patients switched to non-sampled, opted-in GPs.

The total number of general practitioners in each of the 14 communities represented in this study far exceeds both the experimental and control groups. Patients of opted-out general practitioners had numerous opted-in GPs to choose from. These GPs may or may not have been included in the sample. Therefore, it is not possible to definitively determine whether direct billing caused females to switch GPs or to delay seeking primary care.

No particular age or income group appears to be more "price" sensitive to direct billing for general practitioners' services. This result is inconsistent with the reviewed literature on non-reimbursed user fees. Historically, user fees have tended to differentially reduce the utilization rates of lower income patients (Beck, 1974; Beck & Horne, 1980; Newhouse, 1993). This contrary finding may be explained by the lower "out-of-pocket" expense imposed by direct billing. In this experience, patients were reimbursed for all but approximately 15% of the service fee. In addition, opted-out GPs "price discriminated" based upon their personal estimate of their patient's ability to pay. Patients were not always extra-billed. This result suggests that the lower the "out-of-pocket" expense imposed by the user fee, the less detrimental is the impact upon lower income patients.

6.1.1.ii Utilization of Specialist Services

Direct billing reduces patient demand for specialists' services. Opted-out specialists lose significant numbers of patients in the first 3 months following direct billing. Direct billing specialists' caseloads appear to stabilize through the remaining 9 months of analysis. Exogenous factors do not appear to cause this drop in patients. Over the same time period, the # patients for matched, opted-in specialists does not change for patients in any age or gender category.

Patients of different ages and genders appear to be equally affected by direct billing for specialists' services. However, direct billing for specialists' services differentially reduces the utilization of "low-income" patients. In the *post* period, opted-out specialists lose 17.0% of their low-income caseload (<$1'1,000 income) but only 4.8% of their high-income caseload (>$19,000 income). Furthermore, it appears that higher income patients switch specialists in response to direct billing. In the *post* period, the number of high-income patients seeing the control group of opted-in specialists increases by 10.1%. There is no corresponding increase in the number of low-income patients utilizing opted-in specialists. Consequently, it appears that direct billing may reduce the overall utilization rates of low-income patients. Low-income patients appear to delay seeking specialist care when faced with direct billing.

Direct billings' differential impact upon low-income patients is partially explained by the larger "out-of-pocket" cost imposed by direct billed specialist

services. Specialist services are typically much costlier than are GP services. In this study, the average service cost for opted-out GPs was $39.92. The average service cost for opted-out specialists was $87.78. From the results, it appears that an $88 out-of-pocket expense is a greater deterrent than is a $40 out-of-pocket expense. According to Plain (1982), "It is the magnitude of the individual extra-billing, the out-of-pocket charge, which is relevant from an access and utilization viewpoint not the ratio of total extra-billing to the total payment" (p.5).

6.1.1.iii The Referring GP

British Columbia specialists require a GP referral to see patients and bill the specialist fee schedule. In effect, general practitioners are the gatekeeper and "demander" of specialists' services. The drop in caseloads experienced by direct billing specialists is, at least partially, the result of general practitioners being less likely to refer patients to them. As opting-out became more prevalent, numerous general practitioners contacted the Medical Services Plan (MSP) requesting a list of non-direct billing specialists in their community.[11] These general practitioners did not wish to expose their patients to direct billing. Opting-out is a very politically sensitive and potentially divisive strategy for the medical profession to pursue. It did not garner unanimous support within the profession. This is evidenced by the relatively small

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[11] based upon discussions with staff at the BC Medical Services Plan (MSP).

proportion of BC physicians who exercised their right to direct bill, only 81 out of approximately 7,000 practising BC physicians.

6.1.2 The Impact of Direct Billing on Physicians

Direct billing appears to incite both a negative demand and a positive supply effect. The results of this study provide strong evidence for the theory of "supplier-induced" demand. Evans (1984) predicts that, in response to user fees, "...providers will provide more care to those patients who come. As a result, overall use may not fall at all, and utilization will shift from more to less price sensitive patients or types of care" (p. 90). These predictions appear to be realized from the BC experience with direct billing. The fourth null hypothesis (Ho4) states that *"Total MSP payments per patient do not change for direct billing physicians following the date of opting-out. Billing patterns for opted-in and opted-out physicians are the same for patients of different ages, incomes and genders pre and post direct billing."* This null hypothesis is rejected.

6.1.2.i General Practitioners

It appears that, when faced with a dropping caseload, opted-out GPs "induce" demand by increasing their MSP payments per remaining patient. This increase does not occur uniformly amongst patient age and income categories. Direct billing appears to impose a disproportionate burden upon patients who utilize GPs' services the most. Over the *pre* and *post* periods, the elderly and the poor are proportionately the highest users of GPs' services.

This result is consistent with the findings of numerous previous studies which show that income and utilization are negatively correlated, while age and utilization are positively correlated (United States Center for Health Statistics, 1972; OECD, 1994). In the *post* period, opted-out general practitioners' $ payments increase for both "low-income" (<$11,000 income), "high-income" (>$19,000 income), and elderly (aged 65+) patients. More specifically, opted-out general practitioners' $ payments increase by $3.07 for high-income patients (9.3% of the average service cost), $3.99 for low-income patients (7.7% of the average service cost), and $3.72 for patients aged 65+ (9.3% of the average service cost). Male and female patients appear to be equally affected by the increase in opted-out general practitioners' $ payments.

It does not appear that exogenous factors cause the increase in $ payments for opted-out general practitioners. The regression results show that males and females used similar amounts of GP services in the *pre* period. Therefore, although direct billing GPs lose female patients in the *post* period, their male dominated caseload is not intrinsically "needier" in the *post* period. In addition, the control group of opted-in general practitioners shows no change in # patients nor $ payments throughout the study.

Direct billing appears to result in a short-term loss of MSP income for opted-out general practitioners. This loss appears to be the result of significant numbers of female patients switching away from direct billing GPs. In response, opted-out GPs appear to "induce" demand by increasing MSP payments per remaining patient. The end result of these opposing forces is

that, within 9 months of opting-out, the MSP revenue generated by opted-out GPs rebounds to *pre* direct billing levels *(refer to Figure XIV)*. It is important to note that MSP income figures do not capture private revenue generated by opted-out general practitioners. Patients of opted-out GPs were extra billed an average of 15% above MSP rates. Consequently, direct/extra billing appears to be a revenue generator for opted-out GPs following the first 9 months of experience. Total expenditures (public + private) appear to increase as a result of direct billing.

6.1.2.ii Specialists

Direct billing specialists face the prospect of significantly declining caseloads immediately following opting-out. Patients, or the physicians that refer them, exercise their "price" sensitivity to direct billing by switching specialists. This switch does not occur uniformly. Direct billing specialists lose proportionately more "low-income" patients. In the *post* period, direct billing specialists lose 17.0% of their low-income patients (<$11,000 income) but only 4.8% of their high-income patients (>$19,000).

The regression results show that, overall, the poor and the elderly are the highest users of specialists' services. This result is consistent with the findings of numerous previous studies which show that income and utilization are negatively correlated, while age and utilization are positively correlated (United States Center for Health Statistics, 1972; OECD, 1994). Therefore, based upon changing patient demographics, one would expect that opted-out

specialists' $ payments would drop in the *post* period. Direct billing specialists

lose their proportionately higher utilizing patients. However, $ payments

increase for opted-out specialists in the *post* period. This result provides

strong evidence for the existence of "physician-induced" demand.

Direct billing appears to impose a disproportionate burden upon the

elderly, who are higher users of specialists' services. In the *post* period, opted-

out specialists' $ payments by $6.27 (6.4% of the average service cost) for

patients aged 65+. There is no increase in $ payments for any other age,

income or gender category.

Direct billing appears to result in a short-term loss in specialists' MSP

income. However, within 9 months of opting-out, specialists are able to

increase payments per remaining patient to the point where MSP income loss,

due to reduced caseloads, is negated. The average extra-bill for opted-out

specialists was 15% above the MSP negotiated rates. Consequently, direct

billing becomes a revenue generator for opted-out specialists following the first

9 months of experience. Moreover, total medical expenditures (public + private)

appear to increase as a result of direct billing.

6.2 Conclusion - is direct billing effective public policy?

Public policy inevitably involves trade-offs between competing policy

goals, including: efficiency, equity, political feasibility, and reduction in

government expenditure. Effective public policy maximizes social utility within

given constraints while minimizing the loss associated with these trade-offs (Weimer & Vining, 1992). The provision of "free" medical care has been characterized as the tradeoff between overconsumption and risk protection (Newhouse, 1993).

6.2.1 Efficiency

To be efficient, self-selected direct billing should encourage the provision of an appropriate supply of medical services to meet demand (allocative efficiency). Direct billing should also encourage the provision of necessary medical services at the lowest possible cost (productive efficiency). The results of this study indicate that direct billing imposes additional costs upon: (1) *Patients* - required to pay "out-of-pocket" for medical services and subsequently reimbursed; (2) *Physicians* - must process individual claims and become responsible for bad debts. Direct billing increases physicians' paperwork, direct costs and time costs, and; (3) *Payer (government)* - must process reimbursement cheques for each patient of an opted-out physician rather than a single cheque for the practitioner.

It appears, from the results of this study, that direct billing may reduce patient demand over the short-term. However, it is not clear that direct billing reduces the overall utilization of medical services over the long-term. Direct billing GPs lose 15.5% of their female caseload. However, this study cannot definitively determine whether these females switched GPs or delayed seeking primary care. Direct billing also reduces patient demand for specialists'

services. Opted-out specialists lose 17.0% of their "low-income" and 4.8% of their "high-income" patients. While it appears that the higher income patients switch to opted-in physicians, low-income patients appear to delay seeking care in response to direct billing. The drop in the number of low-income patients for opted-out specialists is not picked up by the matched, opted-in specialists in the *post* period.

The results of this study suggest that direct billing incites an immediate, one-time reduction in physicians' caseloads. However, following their first 3 months of direct billing, opted-out physicians' caseloads appear to stabilize at this lower level. Some evidence is provided that opted-out GPs' caseloads may rebound to *pre* opted-out levels after 1 year of direct billing.

As predicted by Evans (1984), reduced patient demand appears to be offset by a corresponding "physician-induced" demand. In the *post* period, direct billing physicians increase their payments per remaining patient to the point where, within 9 months of opting-out, their MSP incomes return to *pre* opting-out levels. In addition, opted-out physicians generate private revenues through direct charges. Consequently, the combination of public and private expenditures may actually increase as a result of direct billing. Fahs (1992) came to a similar conclusion:

> ...increasing cost sharing among large groups of patients may be less effective as a tool to reduce total health expenditures than has been implied by studies that omit the effect of cost sharing on physician practice patterns. It appears from this analysis that compensatory actions will be taken by physicians following the reduction in benefits by a large insurance carrier. (p.39)

6.2.2 Equity

The equity of direct billing is measured in terms of patients' geographic location and demographic characteristics. To be equitable, direct billing must not differentially impact particular categories of patients. However, the results of this study show that direct billing does not uniformly impact patients.

6.2.2.i Geographic

Self-selected direct billing does not occur in all geographic regions. Physicians tend to direct bill in clusters. As discussed by Stoddart & Woodward (1980), physicians are influenced by their medical association and their peers in their decision to direct bill. Rarely, do physicians direct bill in isolation. The results of this study are consistent with the findings of previous Canadian studies. In Alberta in the late 1970's/early 1980's, opting-out was twice as prevalent in Calgary and Edmonton as in the remainder of the province (Plain, 1982). In Ontario in the 1970's, the percentage of opted-out physicians ranged from only 2% in Thunder Bay to more than 50% in Peterborough County (Stoddart & Woodward, 1980). From a research perspective, this "clustering" phenomenon makes the opting-out experience more generalizable to a system-wide introduction of direct billing. From an equity perspective, self-selected direct billing imposes a barrier to access in a select number of communities, for patients with particular medical needs. Although direct billing in BC was not a significant phenomenon in relation to the total numbers of physicians, opted-out clusters represented a significant

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proportion of particular-types of services for patients in particular communities. Opted-out physicians, principally specialists, often represent one of few alternatives to patients in a given medical community. These patients are placed at a disadvantage if there is not an opted-in physician in the needed specialty within their region.

6.2.2.ii Gender

Females appear to be disproportionately affected by direct billing for general practitioners' services. In the *post* period, opted-out GPs lose 15.5% of their female clientele. It is not possible to definitively determine whether these females switch GPs or delay seeking care. Direct billing for specialists' services does not appear to differentially impact males or females.

6.2.2.iii Income

Direct billing for specialists' services appears to impose a barrier to care for "low-income" patients. Opted-out specialists lost significantly more low-income than high-income patients. It appears that these low-income patients delay seeking specialist care in response to direct billing. In contrast, higher income patients appear to switch specialists in response to direct billing.

Direct billing physicians "price discriminated" based upon their personal perception of their patient's ability to pay. The results of this study suggest that specialists' ability to effectively price discriminate is suspect. If specialists

had effectively price discriminated, direct billing should not have differentially

affected low-income patients

6.2.2.iv Age

The elderly appear to be disproportionately impacted by direct billing. In

this study, patients aged 65+ are the highest utilizing age category. This result

is consistent with the findings of numerous previous studies which show that

age and utilization are positively correlated (United States Center for Health

Statistics, 1972; OECD, 1994).

The results of this study suggest that the elderly are relatively insensitive

to direct charges. Additionally, in response to a dropping caseload, opted-out

physicians disproportionately increase their servicing of older patients. Direct

billing GPs increase payments per elderly patient by $3.72 (9.3% of the average

service cost). Direct billing specialists increase their payments per elderly

patient by $6.27 (6.4% of the average service cost).

6.2.3 Political Feasibility

Opponents of user fees describe them as a "slippery slope". They argue

that, once user fees are introduced, the temptation to continually increase

them is too much for politicians to resist. As discussed by Barer et. al. (1979):

> . . . direct charges will benefit providers, private insurance
> companies, and the provincial government. Direct charges will
> serve as an injection of additional funds into the sector and thus
> as a source of increases in provider incomes. Furthermore,
> exposure to any significant direct charge is likely to lead
> consumers to seek supplementary private insurance coverage.
> Finally, direct charges provide a means of keeping the lid on

health care expenditures in government budgets while allowing total (public plus private) expenditures to rise. The snare is not likely to end up empty. It will be filled by those unfortunate enough to become ill, for it is they, and only they, who will feel the effects of direct charges (p. viii).

6.2.3.i The Payer

Under the terms of the *Canada Health Act* (1984), Canadian provinces are penalized for all revenue generated through medical service user fees. Arguably, this includes the non-reimbursed extra bills charged to patients of direct billing physicians. Both the federal and BC provincial governments have recently expressed their commitments to Medicare and the principles contained within the *Canada Health Act* (1984). However, recent reductions in federal transfers for health care *(refer to Chapter 1)* cast doubt on continued provincial acquiesence to federal standards.

6.2.3.ii The Public

The Canadian public has come to expect "free" medical care through almost 30 years of Medicare. Stoddart & Woodward (1980) found that patients' satisfaction with their medical care declined significantly when they were direct billed. Politicians that enable a transfer from the public to the private purse for health care face the potential for public backlash.

Public expectations may be changing. The debate over user fees for medical services has intensified in recent years. Physicians in Alberta have experimented with charging "facility fees" for some medical services, e.g. cataract surgeries. For several years, the Alberta government ignored the

potential conflict these fees created with the *Canada Health Act* (1984). In 1996, the federal government responded by clawing back more than $3,000,000 in cash transfers to Alberta. A 1996 public opinion poll of 1,040 Canadians by Insight Canada Research indicated that 59% of persons surveyed objected to the federal government's decision to penalize provinces that charged user fees for physician services.[11] Support for user fees was highest in Western and Atlantic Canada.

6.2.3.iii Physicians

The right to opt-out is important to organized medicine in Canada. Opting-out symbolizes the independence of physicians and enhances the bargaining power of medical associations in negotiations with government. Opting-out provides a safety valve for physicians to protest government policy initiatives. As discussed by Justice Emmit Hall in his Royal Commission on Health Services in 1979:

> When the state grants a monopoly to an exclusive group to render
> an indispensable service, it automatically becomes involved in
> whether those services are available and on what terms and
> conditions...(p.23)

'Historically, physicians have argued the necessity for direct charges to discourage 'unnecessary' use of their services.

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[11] as printed in The Vancouver Sun, August 26, 1996, pp.A1,A4. These results are considered accurate to within 3.1%, 19 times out of 20.

The results of this study show that, within 9 months of opting-out, government generated revenues for opted-out physicians are not adversely affected by direct billing. At the same time, opted-out physicians generate additional private revenue. Based upon the average extra bill, opting-out in BC represented approximately a 15% increase in gross physician revenue over the long-term.

In December 1995, the BC Medical Association (BCMA) and the Medical Services Commission (MSC) agreed to a 2 year extension of their working agreement. This extension includes, for the first time, a hard cap for the medical services budget (approximately $1.4B for 1996/97). A primary mechanism for the MSC to ensure that the budget is not over-expended is to prorate medical fees for a certain portion of the fiscal year. Effective October 1, 1996, prorationing became a reality in BC. The MSC introduced a 3% fee discount from October 1, 1996 - March 31, 1997 to address an estimated budget overrun of $50-$70M. Physicians in other provinces had already experienced double-digit prorationing as a result of negotiated hard caps.

An unanswered policy question is whether opted-out physicians should be subject to prorationing. To date in BC, opted-out physicians have continued to bill the full tariff despite prorationing. Patients of these physicians continue to be reimbursed at the full tariff. The MSC has yet to clarify whether opted-out physicians will ultimately be included under prorationing. It is not clear whether patients of direct billing physicians will continue to be reimbursed at the full or prorated rates. Depending upon the MSC's policy response, opting-

out may become an increasingly popular avenue for physicians to sustain incomes in the face of significant prorationing. This outcome would clearly undermine the fiscal effectiveness of prorationing.

6.2.4 Impact on Government Expenditure

To the extent that direct billing enables government to transfer some of the cost of care to private sources of funding, government can better control its spending on medical services (Barer et. al., 1979). The results of this study show that MSP billings for opted-out physicians drop in the short-term. Some patients of opted-out physicians either switch physicians or delay seeking care. However, it appears that within 9 months of opting-out, direct billing physicians are able to "induce" demand from remaining patients to the point where their MSP revenues return to *pre* direct billing levels. Physician-induced demand appears to offset cost savings from reduced patient demand. Furthermore, patients of opted-out physicians were billed an average 15% premium for medical services. Consequently, total public plus private expenditures appear to increase as a result of direct billing.

The overall effectiveness of direct billing, based upon the preceding policy analysis, is displayed in Table XIX below:

Table XIX - Is Direct Billing Effective Public Policy?

POLICY GOALS	EFFECT OF DIRECT BILLING
Efficiency	
allocative - providing the appropriate supply of medical services to meet demand	? - may reduce female patient demand for GP services and low-income patient demand for specialist services over short-term. However, study cannot definitively determine if patients switch to non-sampled physicians. Reduction in patient demand appears to be offset by physician-induced demand.
productive - providing necessary services at lowest possible cost	*negative* - patients must pay out-of-pocket; physicians incur additional administrative costs and become responsible for bad debts, payer (gov't) must process individual patient claims instead of single claim for physicians
Equity	
geographic	*negative* - differentially affects patients in particular communities with specific medical needs
age	*negative* - direct billing physicians appear to differentially induce demand from the elderly
gender	*negative* - females differentially affected by direct billing of primary care services
income	*negative* - direct billing for specialists' services disproportionately affects low-income patients
Political Feasibility	
public	*somewhat negative* - literature shows that patients' facing direct billing are less satisfied with medical care. However, public attitude towards "free" care is changing.
physician	*somewhat positive* - allows physicians to generate private revenue with only short-term loss in MSP income. Divisive policy amongst medical profession.
payer (government)	*somewhat positive* - short-term reduction in medical expenditures. Placates medical lobby.
Reduce Gov't Expenditure	*positive in short-term* *? in long-term*

6.3 Limitations of the Study

There are a number of limitations inherent in the research design of this study. It is recognized that these limitations reduce the validity of the results. However, review of the existing literature reveals that similar approaches have been taken previously and are viewed to be appropriate (Roemer et. al., 1975; Beck & Horne, 1980; Wolfson & Tuohy, 1980; Cherkin et. al., 1989, 1990; Fahs, 1992; Litvack & Bodart, 1993).

The experimental and control groups (opted-out/opted-in) are not equal at the pre-test stage. The matching criteria (community of practice, specialty, previous year's MSP billings) introduce selection bias. Matching can never entirely account for inherent differences (Churchill, 1995). By design, however, the experimental and control groups are similar on the variables of interest.

The matching criteria (community of practice, specialty, previous year's MSP billings) are not ideal. Each physician's practice is unique in terms of the types of cases and patients seen. Although different physicians may bill approximately the same amount in a given year, they may not have comparable practice styles. Numerous factors including ambition, lifestyle, etc., influence physicians' billings from year to year. However, review of the literature revealed that physicians' billings are a commonly accepted surrogate for practice style (Beck, 1974; Roemer et. al., 1975; Beck & Horne, 1980; Wolfson & Tuohy, 1980; Lohr et. al., 1986; Roddy et. al., 1986; Cherkin et. al., 1989, 1990; Fahs, 1992; Newhouse, 1993). Moreover, the use of multiple matching

criteria attempts to equate the experimental and control groups to the greatest degree possible and minimize this source of error.

Ideally, one would ascertain the precise amount direct and/or extra billed to each patient. Unfortunately, data regarding the exact amount of the extra bill and to which patients were not available. The average extra bill (15%) is based upon self-reports of opted-out physicians and discussions with Medical Services Plan (MSP) personnel. Consequently, this study cannot precisely determine price elasticities of demand for medical services. The results stem from a mixture of direct and extra billing.

This study captures only the first year of experience with direct billing. Transitional issues may impact physicians' billings in this first year as both physicians and patients adjust to the new paradigm. Economic responses may take a longer period of time to develop. Transition reduces the representativeness of this experience with a longer-term study. One cannot expect this short-term experiment to be definitive. Practical limitations including the cost of data, recency of experience, and 1995 BC legislation which caused most opted-out physicians to opt back in *(refer to Chapter 1 for more details)*, make this limitation unavoidable. Transitional limitations are not unique to this study. None of the reviewed studies analyzed a longer experience with user fees.

Inevitably, this study cannot measure the impact of direct billing upon patients' health status. Practical circumstances preclude the attainment of this goal. None of the reviewed studies successfully ascertained the health status

impact of user fees to the satisfaction of the academic community. Even the $120,000,000 Rand Corporation experiments have been heavily criticized for their conclusions regarding the health status impact of user fees. This complex question is beyond the scope of this research project.

6.4 Directions for Future Research

This study empirically analyzed the direct billing experience. It would now be useful to survey physicians' and patients' opinions regarding direct billing. A survey would augment this study by enabling analysis of the qualitative aspects of the direct billing experience. It would be beneficial to discover whether patients' self-reported changes in utilization match their actual changes, as described in this study. It would also be beneficial to ascertain why patients switched from opted-out physicians.

A patient survey could examine whether direct billing enhanced or diminished patients' satisfaction with their medical care. Did direct billing cause patients to avoid seeking what they believed to be "necessary" care? Did, in the opinion of practising physicians, direct billing reduce the utilization of "unnecessary" services?

This study cannot definitively determine why physicians direct bill. The results of this study enable only a cursory comparison of opted-in versus opted-out physicians. It would be beneficial to determine, in more detail, what types of physicians are predisposed to direct billing their patients.

The empirical evidence provided by this study effectively explains the overall effect of direct billing upon the utilization of medical services. It would now be beneficial to perform a more micro "type of service" analysis. A type of service analysis would augment this study by reviewing which specific types of medical care are affected by direct billing. Did patients reduce their utilization of office visits in response to direct billing? In response to dropping caseloads did direct billing physicians increase the number of subsequent visits or lab testing for remaining patients? A type of service analysis would improve the understanding of whether direct billing targets more "discretionary" types of medical care.

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APPENDIX A - Opting-Out Regulations Across Canada

PROVINCE OR TERRITORY	REGULATIONS REGARDING OPTING-OUT
NEWFOUNDLAND	Physicians can opt-out of the provincial Medical Plan. A physician may charge the patient directly and the patient is entitled to reimbursement from the Plan at the provincial fee schedule rate. Opted-in physicians must accept payments from the Plan as payment in full. Therefore, the only way physicians who are being prorated can receive full tariff is to opt-out and bill the patient in full.
PRINCE EDWARD ISLAND	Legislation allows for selective service opting-out. A mechanism is in place for monitoring opted-out physicians. Prior notice must be given to the patient. A physician is entitled to bill the MSPEI fee schedule which is higher than that paid to opted-in physicians. The patient pays the physician directly and then submits a bill to the Medicare Plan which pays the patient at 100% of the schedule (despite current payment reductions for physicians).
NOVA SCOTIA	Physicians can practice outside of MSE. Selective opting-out is not allowed.
NEW BRUNSWICK	Legislation allows opting-out. The physician may charge Medicare rates and the patient will be entitled to reimbursement by Medicare. However, if the physician charges more than the Medicare rate, the patient will not receive any reimbursement.
QUEBEC	Physicians are entitled to opt-out. In the case where a physician remains in the RAMQ, the patient receives a cheque from the RAMQ for an amount negotiated by the FMSQ or FMOQ and then reimburses the physician for the service. In the case where a physician de-enrols of the RAMQ completely, the patient is not reimbursed by the RAMQ.
ONTARIO	Legislation allows opting out by physicians. The physician must charge OHIP rates, at the prorated or hold back level, and the patient will be entitled to reimbursement at the same level.
MANITOBA	Legislation does not prohibit opting out by physicians. However, the physician may not bill more than the negotiated fee schedule and the patient receives reimbursement from the government (either after or before the patient pays the physician).

SASKATCHEWAN	Opting-out is permitted when "reasonable access (by patients) to insured services is (not) jeopardized." The opted-out physician may charge more than the negotiated fee schedule but the patient is not entitled to reimbursement as those services are classified as "uninsured services."
ALBERTA	Physicians are entitled to opt-out of the plan and may bill more than the negotiated fee schedule but patients are not entitled to reimbursement from the government.
BRITISH COLUMBIA	Physicians may opt-out and charge patients directly. As a result of Bill 54, the *Medicare Protection Act* (Sept/95), the practitioner is not entitled to bill more than the MSP fee schedule. To date, opted-out physicians have not been subject to prorationing.
YUKON	Physicians are entitled to opt-out if three months notice is given to patients. Patients are reimbursed when they submit their bill to the Yukon Health Care Plan.
NORTHWEST TERRITORIES	Physicians are entitled to opt out of the Medical Care Plan by delivering to the Director a notice to that effect in writing. A physician may either send a copy of the statement of fees or charges for the insured service to the Director, or include in the statement of fees or charges for the insured service sent to the insured person a notice advising that the insured person is responsible for sending the claim to the Director. Unless he/she has made an election that is still in effect, no medical practitioner shall charge to or collect from an insured person a fee in excess of the benefit in respect of the insured service.

Source: Department of Health Policy and Economics, Canadian
            Medical Association, October 1995.

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APPENDIX B: Medical Services Plan Data Request
(June 1996)

Please provide a file with a record string for each of the 81 opted-out physicians (38 GPs, 43 Specialists), and the 81 matched, opted-in physicians (matched by community, specialty, and +/-10% billings).

For each physician, list:

- # of <u>discrete</u> patients within 8 age/gender categories (male and female 1-19yrs, 20-39, 40-64, 65+ yrs) and 3 income categories as defined by MSP premium subsidy ($0-11,000, $11,001-19,000, >$19,000);

Capture this data for the year prior to opting out and the first year following opting-out, <u>from the exact date of opting-out</u>:

e.g.   Physician opted-out on June 1, 1993 and was opted out for 400 days: Capture date of service data from June 1/92 - May 31/93 and June 1/93 - May 31/94.
Capture similar data for matched, opted-in physician for same time period.

For each physician, list the volume of services by type of service as follows:

MSP Type of Service Codes

01 Regional Examination	25 Specialist Home Visit
02 Consultation	26 Specialist Emergency Visit
03 Complete Examination	27 Specialist Institutional Visit
04 Counseling	28 Specialist Misc. and Other Visit
05 GP Home Visit	30 Specialist Critical Care Services
06 GP Emergency Visit	40 Anaesthesia
07 GP Institutional Visit	41 Cardiovascular Listing
08 GP Misc. and Other Visit	42 Obstetrics
09 Visit Premium	43 Surgery (non-minor)
22 Specialist Consultation	44 Minor Surgery
23 Subsequent Visit	49 Procedural Premiums
24 Counseling/Psychotherapy	93 GP Pathology
	98 Other

MSP will be provided with all 81 opted-out billing numbers and the matched 81 opted-in billing numbers (based upon specialty, community of practice, and +/-10% billings) as well as the specific timeframes required for each matched pair, based upon the exact date of opting-out.

MSP Billings Data

Quarter	Practitioner Number	Specialty Code	Service Code	Subsidy Code	Age Group	Gender	Patient Count	Paid Services	Paid Amount
1	12345	10	05	1	1	0	4	6	$200
2	12345	10	05	1	1	0	21	30	$1,000
. . .									
8	99999	99	99	3	4	1	56	300	$3,500

By capturing this data, changes in opted-out physicians' patient loads, age/gender/income distribution of patients, and volume of specific types of services can be compared to the control group (matched, opted-in physicians);