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Health Care Financing, Efficiency, and Equity  
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**ABSTRACT**

This paper examines the efficiency and equity implications of alternative health care system financing strategies. Using data across the OECD, I find that almost all financing choices are compatible with efficiency in the delivery of health care, and that there has been no consistent and systematic relationship between financing and cost containment. Using data on expenditures and life expectancy by income quintile from the Canadian health care system, I find that universal, publicly-funded health insurance is modestly redistributive. Putting \$1 of tax funds into the public health insurance system effectively channels between \$0.23 and \$0.26 toward the lowest income quintile people, and about \$0.50 to the bottom two income quintiles. Finally, a review of the literature across the OECD suggests that the progressivity of financing of the health insurance system has limited implications for overall income inequality, particularly over time.

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The most appropriate generalization of the financing of developed country health care systems is that they share no general characteristic. Few systems fall squarely into any single box and even systems that more-or-less do, have evolved in their financing over time. In 1960, the cost of health care in the OECD countries consumed just under 4% of their collective GDP. By 2000, it consumed twice as high a share of the GDP. This escalation in spending is nowhere accommodated without debate or modification.

Most countries intend that their health care system -- and its several components -- be financed in a manner that is both efficient and progressive. An efficient system minimizes the deadweight losses associated with raising and disbursing revenue. A progressive system redistributes resources from the rich toward the poor. This paper examines how alternative financing systems perform with respect to these two goals.

This paper will focus on choices among general revenue, social insurance, private insurance, and private out-of-pocket financing in all or portions of a health care system. These choices have efficiency and equity implications both in the collection and the disbursement of funds. These implications arise at three levels. First, financing choices affect the efficiency with which the health care system produces and supplies health care services. Second, these choices have redistributive implications within the health sector. Finally, the choice of how to collect funds cannot be disentangled from the functioning of the social service sector and the economy as a whole. They have implications for the general efficiency and equity of society broadly.

## 1. Defining Terms

The principal choices for financing a health care system are general revenues, social insurance financing, private insurance financing, and out-of-pocket payments. General revenue financing here refers to a system of revenue collection through a broad-based tax. All or a portion of this tax may be dedicated to the health care system (although this is generally just an accounting convention). General revenues may be raised at the federal, provincial/state, or local levels. Although often associated with progressive financing, general revenues can be raised through tax vehicles that are also more or less progressive – from a progressive income tax to a relatively regressive sales tax (or a highly regressive sin tax). General revenues are used to finance a portion of the health care system almost everywhere. In countries that rely primarily on social insurance, general revenue funds are often used to cover the costs of nonworkers. General revenue financing usually refers to a pay-as-you-go arrangement, where current revenues are used to finance current expenditures.

There is no clear definition of social insurance financing. I use the term here to refer to a system in which some group of people, usually workers, is mandated to make contributions to a health care financing (or, for example, retirement) program<sup>1</sup>. Social insurance contributions are usually either regressive (a flat per capita mandate) or proportional (a flat payroll tax rate). Social insurance financing based on payroll taxation faces the problem that the tax base, which excludes non-labor income, may be

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<sup>1</sup> According to the United Nations System of National Accounts, 1993, Annex IV, para. 4.111 an insurance programme is designated as a social insurance programme if at least one of the following three conditions are met:

- participation in the programme is compulsory either by law or by the conditions of employment; or
- the programme is operated on behalf of a group and restricted to group members; or
- an employer makes a contribution to the programme on behalf of an employee.

narrower than under broader scope general revenue financing (Amelung and Glied, 2003). Moreover, some social insurance systems cap the maximum contribution, reducing the progressivity of this financing mechanism. Contributions collected through the social insurance system should finance the full insured cost of the health program (or a pre-specified proportion of that cost). Thus, the contribution level or rate is tied to the cost of providing health insurance. Social insurance payments may vary with the choice of plan in a multi-plan system (as in Germany) or they may be fixed (as in the US Medicare program). Social insurance systems can employ pre-funding, building up “trust funds” to account for future expenses, but meaningful trust funds (that cannot be readily encroached) are rare.

Private insurance financing may be individual (although this is rare except in highly regulated contexts) or operate through employers or other purchasing organizations. Except in highly regulated contexts or in employer-sponsored groups, the price of coverage is related to expected health expenditures – older, sicker people pay more for coverage and premiums rise as health expenditures rise. The concept of progressivity does not have a clear analogue in the private pay case. Under private coverage, people choose both how much to purchase and, by extension, how much to pay as a share of their income. Even in a situation without health insurance, however, health care utilization rises less than proportionately with income (the income elasticity of health care utilization is, at the micro level, less than one). The premiums paid by lower income people are only slightly lower than those charged to higher income people, a situation that would be viewed as regressive if the premiums were taxes. A special (and particularly regressive) complication of private financing occurs through the favorable

tax treatment of private employer-sponsored health insurance premiums, which exists in many countries including Canada (in all provinces except Quebec), the United States, the UK, Denmark, France, and Australia. Here, a tax subsidy is regressively distributed in the context of otherwise privately financed health insurance. Finally, virtually all observed private health insurance contracts are of short duration – almost always only one year. This makes it difficult to pre-fund care, except through savings mechanisms outside the health system.

Out-of-pocket payments are those payments into the health care system that are made directly at the point of service. In this category, I include full payments (as in the case of pharmaceuticals or nursing home care for those without insurance coverage) as well as copayments and deductibles. A system with only out-of-pocket payment would (in a tax sense) finance health care regressively, since health service use rises less than proportionately with income.

Note that the revenue-raising and benefit-disbursing components of these systems work differently over the lifecycle than they do at a point in time. At a point in time, income taxes tend to be more progressive than social insurance taxes which, in turn, are generally more progressive than consumption and VAT taxes. When costs and benefits are computed over the lifecycle, however, relative progressivity can change because higher income people generally live longer than do those with lower incomes.

Consumption taxes are paid throughout life and reflect consumption (which generally exceeds income among older people). This means that survivors (who have higher lifetime incomes, on average) will pay more in lifetime consumption taxes than decedents (who have lower lifetime incomes), making this tax more progressive. Conversely,

income and particularly social insurance taxes appear less progressive in the lifecycle context. Younger people pay relatively higher taxes, but those with lower incomes may disproportionately fail to survive and collect benefits at older ages.

Figure 1 illustrates the composition of health care financing across the OECD countries. In most countries, insurance covers about 80% of health care costs, with out-of-pocket spending accounting for the remainder. The structure of out-of-pocket spending, however, varies substantially among countries. In the United States, which lacks universal insurance coverage for those under 65, a small number of individuals account for a large share of out-of-pocket costs. In some countries, certain services are excluded from public insurance coverage and out-of-pocket spending accounts for a large share of costs for these particular services. In other countries, a broader range of services is included in the health insurance package, but substantial copayments are required for all services.

Private insurance accounts for a substantial share of health care costs only in the United States, and even in the United States, private insurance accounts for only about 1/3 of health spending. Outside the United States, the private insurance share varies between 0 and 16% (Canada ranks 4<sup>th</sup> at 11.5%). In some countries, private insurance plays a large role in the health care market, even though it finances only a small proportion of care. Indeed, the prevalence of private insurance (that is, the proportion of the population covered by some private insurance) is greater in France, Switzerland, and the Netherlands than in the United States (Source OECD, 2006).

Countries differ markedly in their use of general revenues and social insurance funds to finance the public share of expenditures. In the English-speaking countries, as

well as in Italy, Sweden, and Denmark, general revenues finance virtually all public health expenditures. At the other extreme, in France and the Netherlands, general revenues play an insignificant role and social insurance pays the bulk of health expenditures.

Various combinations of general revenue and social insurance sources present different efficiency and equity tradeoffs. An assessment of the overall efficiency and progressivity of tax system usually requires complex modeling. Kesselman and Cheung summarize evidence on the progressivity of the Canadian tax system (2004).

Unfortunately, the studies they studies are somewhat dated and do not reflect recent changes in tax structure. Overall, Kesselman and Cheung find that in Canada, those in the lowest income quintile pay an average tax rate of about 17% (mainly through consumption, corporate, and payroll taxes), while those the highest income quintile pays an average tax rate of about 43%, with personal income taxes accounting for the bulk of these taxes. Kesselman and Cheung also report average tax rates by age group and family status. Younger adults and single people pay much higher average taxes than do single parents, single earner families, or older people. Thus, the Canadian tax system is fairly progressive, but progressivity differs across groups.

Financing systems also differ in the efficiency with which they raise funds. In general, financing systems are more efficient the less they distort individuals' choices (around work, consumption, investment, etc.). In this sense, private insurance (without a tax subsidy) and out-of-pocket payments are fully efficient. Tax-based financing systems are less efficient, but their relative efficiency depends on the entire structure of the tax system. For the purposes of this paper, I will focus on how financing affects efficiency in



the operation of the health care system, rather than on the efficiency of the financing system itself.

## 2. Financing Choices and the Efficiency of the Operation of the Health Care System

A health system operates in an economically efficient manner if health care resources cannot be reorganized in a way that would make all members of society better off. Technical efficiency occurs when health care system inputs are used optimally to address a particular health care need. As technical efficiency depends on the systems used to pay providers, any of the insurance financing systems is compatible with a range of provider payment mechanisms. For example, a general revenue financed system could pay providers using salaries (as in the UK), fee-for-service rates (as in Canada), case rates (DRGs) or capitated rates (as for primary care purchasers in the UK).

In market competition, the invisible hand of the market determines optimal payment rates for goods and services providers. There are many reasons that this happy outcome may not occur in the health care system and the market may bid prices up too high. Provider monopoly power or other related payment inefficiencies, however, do not affect the choice of financing system. Payment rates may also, in theory, be established independent of the form of financing, although this may be practically difficult to achieve. For example, by using regulation, systems with decentralized revenue collection can achieve the same monopsony payment rates that centralized payment systems can, as was the case in the all payer rate setting systems that set uniform payment rates for all payers and all hospitals in several US states during the 1980s and early 1990s..

Moreover, large private purchasers (as exist in the US, Germany, and the Netherlands) may have enough market power to exert appropriate countervailing pressure in the provider marketplace.

System efficiency begins to tie in to financing when consumer choices enter the health care system. The first place this occurs is in the decision to use care. The RAND health insurance experiment results (and common sense) suggest that systems with copayments or coinsurance will tend to reduce the use of services. As countless commentators have argued, there is no particular reason to believe that the decisions of uninformed consumers/patients to reduce their service utilization will be medically appropriate. There are, however, situations where requiring the consumer to face some cost consequences of specific decisions would improve the efficiency of the system. For example, consumers might be asked to make choices between initiating treatment with a less costly drug or initiating treatment with a more costly alternative. Requiring out-of-pocket payments in this context is compatible with any of the insurance financing arrangements. It may improve the efficiency of the system. The effects on equity depend on protections that are put in place for lower income people.

A connection between efficiency and financing may also arise in the context of system fragmentation. The difficulty of defining and measuring health care services, the complexity of services that need to be organized, and the problem of hand-offs among services suggest that more aggregated forms of payment – including payment to health plans or provider groups – may be preferable to provider-specific payment arrangements. Organizing care into multiple health plans (including plans with integrated delivery) paid risk-adjusted capitated rates may (in principle) improve the efficiency of care. Once a

system is divided into multiple distinct delivery systems, however, consumers/patients must either be compelled or be provided with incentives to make an appropriate selection and stick with it.

Consumers can be induced to choose efficient plans by allowing (risk-adjusted) premiums to vary among plans and requiring consumers to pay more for more costly plan choices (as in the Netherlands and Germany). Even in this case, however, any source of financing can be used to make the basic plan payment, and additional payments would be out-of-pocket. Moreover, efficient choice of plans can also be accomplished by paying plans risk-adjusted equivalent rates per capita, and then permitting plans to compete only on the scope of services included in the plan.

The options above suggest that achieving the goal of efficiency within the health care sector is fundamentally compatible with any form of general financing. Another element of efficiency, however, is choosing the appropriate size of the health care sector relative to spending on other goods and services. In pure general revenue systems, this can only be accomplished globally, through the political process. Within that process, providers and disease interest groups are likely to exert substantial political pressure to maintain or expand the size of the system. Moreover, since health care spending constitutes only one of many government services, it may be difficult for ordinary citizens to assess the efficiency of the system. The lack of transparency and political accountability of general revenue financed systems has led some analysts to prefer social insurance financing.

Under social insurance financing, the cost of health care is more transparent obvious to taxpayers, in the form of a tax rate or mandated premium payment<sup>2</sup>. Moreover, social insurance financed systems increasingly organize their systems into capitated health plans (paid risk-adjusted rates) so that consumers can adjust their consumption of health care and other goods at the margin. The basic social insurance payment to health plans can be set at a government-mandated minimum level and consumers who wish to consume more health care may choose more generous plans, paying out-of-pocket for the incremental valuation.

Private insurance systems can also have transparent payment levels and permit consumers to choose more or less expensive health plans. In practice, the existence of employer-sponsored insurance, the preferential tax treatment of premiums, and the existence of substantial risk selection between plans may make it more difficult for private insurance systems to achieve efficiency in the delivery of services.

In sum, almost all financing choices are compatible with efficiency in the delivery of health care. Arrangements with transparent costs, such as social insurance models, may reduce the ability of providers to exploit their concentration within the system. Arrangements that require consumers to pay for more costly than average choices may, at the margin, improve the efficiency of the mix between health care spending and other sectors.

Empirical assessment of the effects of financing arrangements on health care spending is necessarily constrained by the limited number of similar countries available for study. The OECD routinely collects data on the costs and financing of health care

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<sup>2</sup> Note that the transparency of the system may be obscured to the extent that the health care tax or premium payment for an individual also captures a redistributive component.

systems (SourceOECD). Consistent data are available for about 20 health care systems in the 1990s, and somewhat fewer in the 1980s and 1970s. There is considerable persistence in the per capita cost of health care across countries over time (see Figure 2), even as financing arrangements change. Thus, rather than examining the effect of financing on health care spending at a point in time, I use this extended time series to assess the relationship between financing arrangements and the rate of growth of health care spending over time during each 5-year period. I estimate (separately for each of 1975, 1980, 1985, 1990, 1995, and 2000) simple equations of the form:

$$\text{Total expenditure}_t = \alpha + \beta \text{general revenue share}_{t-5} + \chi \text{social insurance share}_{t-5} + \delta \text{out-of-pocket share}_{t-5} + \phi \text{total expenditure}_{t-5} + \varepsilon$$

I also estimated specifications that included controls for changes in the demographic composition of the population (aging) and repeated the analysis using financing composition at the end rather than the beginning of the period. These modifications did not substantively affect the results. Results of the main analysis are reported in Table 1. I report results including and excluding the United States.

The main finding of Table 1 is that there is no persistent and regular relationship between the structure of system financing and the rate of growth in per capita health expenditures in a health system. The results including the United States suggest that during the 1990-1995 period, countries that began the period with a greater proportion of health care expenditures funded from general revenues, social insurance, or out-of-pocket experienced less cost escalation did those with more private payment. Conversely, over the 1970-1980 period, countries with more private payment experienced less cost escalation. When the United States is excluded from the analysis, countries with more

general revenue financing or more out-of-pocket financing (but not those with more social insurance financing) experienced less cost growth than did those with more private insurance financing over the 1990-1995 period and there are no other statistically significant results. I also examined how the composition of public financing affected the rate of growth of public expenditures over time. The results are similarly variable over time, suggesting no clear pattern.

The findings of these analyses are consistent with the theoretical discussion above. While taxes vary in the efficiency and progressivity with which they raise funds, the efficiency of operation of the health care system itself appears to depend much more on how providers are paid and how the delivery of care is organized than on the method used to raise these funds.

### 3. Financing Choices and Lifecycle Equity

In addition to measuring financing choices in terms of their impact on the efficiency of operation of the system, it is also important to judge these choices on how they contribute to the equity of the system. The standard metric of progressivity used in public finance assesses progressivity as the ratio of taxes paid to income. This makes sense if the funds collected through taxation are used to fund public goods that are equally available to all. In the case of cash or in-kind transfers, however, equity requires an assessment of both revenue collection and transfers made. Equity suggests that there should be net benefit transfers to lower income people. For any given level of national health spending, the degree of equity in a health care system depends both on how

revenues for the system are raised and how spending in that system is disbursed among beneficiaries<sup>3</sup>.

In assessing the effect of system financing on system equity, I therefore follow the public finance literature and examine how the difference between payments made and benefits received from a health insurance program for higher income people compares with the difference for lower income people. In the case of a fully private system, this calculation is straightforward. Premiums paid each year reflect expected health care benefits for that person in that year. Premiums each year are, after a non-income related adjustment for loading, actuarially equal to benefits received that year. Lifetime premiums paid are actuarially equivalent to lifetime benefits received. Although the system generates ex post redistribution between the healthy and the sick, ex ante the system is entirely non-redistributive.

Social insurance and general revenue financed programs depart from this model in two ways. First, these programs pool all beneficiaries, so payments made in any given year reflect the average cost of all beneficiaries covered in that year, not individual specific costs. Second, payments into the system each year are related to current income, according to the design of the tax system. This means that lifetime premiums need not reflect lifetime benefits.

To see the implications of these two features, imagine that income was unrelated to either health expenditures or health status. In a progressive financing system, this would imply that in each year, higher income people would pay more into the system

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<sup>3</sup> Since health care costs have been rising more rapidly than financing, there are substantial intergenerational transfers in the health care system. I will treat these inter-cohort transfers as progressivity-neutral.

than they would receive (and vice versa). The same pattern would hold over people's lifetimes. The system would be redistributive from high to low income.

In most universal publicly-financed health care systems, including Canada's however, income is related to both health expenditures at a point in time and to health status. This relationship has three components. First, at any given age, lower income people are usually in worse health than are higher income people. This leads them to use more health care services, generating a progressive distribution of benefits. Second, conditional on need, higher income people and lower income people may use care differently, even under universal free access to care. Van Doorslaer and Masseria (2004) find that in about ½ of OECD countries (including Canada), conditional on need, lower income people are more likely to use hospital services than are higher income people, and in most countries, they spend more days in hospital once hospitalized. Conversely, in all OECD countries, conditional on need, higher income people are more likely to see any doctor, to use specialist services, and tend to have more specialist visits, than do lower income people (see also Roos and Mustard, 1997)<sup>4</sup>. On average, conditional on health status, higher income people use the system more intensively and use more costly health services than do lower income people.

Third, income is closely related to mortality. In Canada, in 1996, life expectancy at birth was about 5 years longer for men in the highest income quintile than for men in the lowest income quintile. Life expectancy for women was about 1.6 years longer in the highest than in the lowest income quintiles (Wilkins, Berthelot, and Ng, 2002)<sup>5</sup>.

Lower income people were much less likely to survive to age 75. While about 69% of

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<sup>4</sup> These income-related patterns are partially attributable to differences in access to health facilities in (higher income) urban and (lower income) rural areas.

<sup>5</sup> I am grateful to Russell Wilkins for sharing the mortality data with me.



higher income men survived to 75, only 53% of lower income men did (see Figure 3). Among women, 80% of higher income but only 73% of lower income survived to age 75 (see Figure 4). This pattern of differential survival, combined with similar spending at each age and increasing spending over the lifecycle, reduces the lifetime spending benefits of a public health insurance system for lower income people.

This combination of factors means that the extent to which benefits under a universal health insurance system are distributed in a progressive fashion, and the net progressivity of the system, is an empirical question.

A small literature examines the net progressivity of social welfare systems in lifecycle context. Several studies have examined this question in the context of pension systems in the US and Canada (see, for example, Brown 1998, who concludes that both the US and Canadian pension systems remain progressive after accounting for longevity) and in the context of the U.S. Medicare system, which provides universal health insurance to people 65 and over. Studies of the US Medicare system, a universal, social insurance financed health insurance program for people 65+, reach conflicting results on progressivity. In their basic calculations (omitting the utility value of insurance), McClellan and Skinner (2005) conclude that Medicare generates modest dollar transfers toward higher income people. Bhattacharya and Lakdawalla (2005), using education, rather than income as the measure of socioeconomic status, find that the hospital benefit in Medicare is somewhat progressive.

I examine this question in the Canadian context using data from the Canadian Community Health Survey 2000<sup>6</sup> (CCHS), data on mortality rates by income quintile in 1996 from Statistics Canada, and data on expenditures from SourceOECD. I compute the

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<sup>6</sup> Courtney Ward graciously provided these data to me.

average number of general practitioner visits, specialist visits, and hospital days by age group and gender and by income quintiles, using household-size adjusted income quintiles provided in the CCHS. I then assign a level of spending (intended to include associated ancillary services, diagnostic tests, etc.) to each general practitioner visit (\$75), specialist visit (\$375), and hospital day (\$1000), so that total spending for physician service use and hospital use corresponds (roughly) to the OECD population totals for Canada. I use these data to compute spending levels by quintile throughout the life cycle. Figures 5 and 6 present these spending patterns for men and women.

As expected, health care spending rises with age for both men and women. For both men and women, there is a pronounced difference in health spending between the three upper and two lower quintiles from ages 30 to about 55. After about age 55, spending patterns of the groups begin to converge. In late life, spending for the upper quintiles accelerates much more quickly than among the lower quintiles.

I next combine these data with the information on survival. Using these combined data, I compute lifetime public health care expenditures in Canada by quintile. I calculate these expenditures at age 12, at age 25 (not shown), and at age 65. These results are reported in Table 2. In each set of results, the first column reports results that do not adjust for life expectancy and do not discount later spending. The second column reports results that adjust for life expectancy but do not discount later spending. The third column reports results adjusted for life expectancy and discounted at 5%.

Undiscounted, unadjusted lifetime health care spending measured at age 12 ranges from about \$85,000 (high income men) to \$170,000 (low income women). Adjusting for differences in life expectancy reduces lifetime spending. For high income

men, the effect of adjusting for life expectancy (without discounting) is to reduce expected lifetime spending by about 22% for men (slightly more for lower income men) and by about 11% for women (slightly more for higher income women). Discounting substantially reduces lifetime spending, particularly measured at earlier ages, because most health care costs occur in later life. Discounted lifetime health care costs are between 12% and 65% higher for women than for men in each quintile.

The three rows below the quintile estimates indicate the ratio of lifetime health spending between the highest and lowest quintiles (Q1:Q5), the middle and lowest quintile (Q3:Q5), and the highest and middle quintile (Q1:Q3). The patterns are quite different for men and women. Using the discounted figures, among men, lifetime expenditures are about 10% higher for men in the lowest quintile men than for men in the middle quintile, while spending is about 50% higher for men in the middle quintile compared to those in the highest quintile. For women, the differences are smaller. Spending for women in the middle quintile is about 9% higher than spending in the highest quintile, while spending in the lowest quintile is about 40% higher than spending in the middle quintile.

Measuring lifetime expenditures at age 25, rather than age 12, has little effect on the patterns (not shown). Consistent with prior studies in the United States, however, lifetime expenditures beginning at age 65 tend to be slightly higher for higher income groups than for lower income groups.

The final column in each of the panels describes the redistributive impact of putting \$1 of tax funds into the health care system. The modest relationship between lifetime health care spending and income mean that a universal health insurance system

can only be slightly redistributive. Putting \$1 of tax funds into the public health insurance system effectively channels between \$0.23 and \$0.26 toward the lowest income people, and about \$0.50 to the bottom two income quintiles. For example, suppose all funds for a universal health insurance system were generated from the top three income quintiles. As these quintiles also use health care services, about ½ of the funds raised would be returned to them. The other ½ of the funds raised would be redistributed to the bottom two income quintiles.

The lifecycle and cross-service patterns of health care spending also suggest that some forms of health care spending are more progressive than others. Lower income people are disproportionate users of hospital days, perhaps because arranging discharge is more complicated for those with fewer resources (Van Doorslaer and Masseria, 2004). In most health care systems, low income people are less likely to initiate specialist care than are higher income people, despite their worse initial health status. In most countries, lower income people use more hospital days, conditional on hospitalization, than do higher income people. In Canada, higher income people also make disproportionate use of elective surgical procedures, such as hip replacement and knee replacement (Roos and Mustard, 1997). Finally, higher income people make more use of health care services at older ages, while lower income people have disproportionately higher use in mid-life.

These patterns suggest that focusing the marginal public health care dollar on skilled nursing days, access to general practitioners, and care associated with conditions that manifest in mid-life will have a more progressive effect than focusing additional tax dollars on elective surgical procedures or specialist care. At the margin, progressive financing sources should be devoted to progressive ends.

#### 4. Health Care in the Bigger Picture

The optimal design of health care system financing cannot be assessed in isolation from the rest of the components of the economy and the welfare state. Public funds used to finance health care cannot be used for other purposes. If health care spending rises, either taxes must increase or other services must be cut. This problem is acute in the case of health care spending because this sector is growing more rapidly than any other element of government budgets. Moreover, the relatively modest progressive impact of spending on health care raises the risk that rising health care spending is displacing more progressive cash or in-kind transfer programs.

A limited number of studies have examined the effect of in-kind transfer programs, such as health insurance programs, on the general progressivity of the welfare state. If non-cash benefits are very large relative to incomes, the inclusion of universal, uniformly-distributed, non-cash benefits would significantly reduce measured inequality in a population. If non-cash benefits are progressively distributed, their inclusion will reduce measured inequality still further. Smeeding et al. (1993) use data from the early-1980s to examine the impact of including non-cash benefits in the measurement of economic inequality across countries. In that study, inclusion of non-cash in-kind benefits (including public health insurance) had little effect on the relative rankings of countries in terms of economic inequality.

In a recent paper, Garfinkel, Rainwater, and Smeeding (2006) revisit this issue. Their analysis incorporates the value of in-kind educational and health transfers (measured at the average cost across countries), and the distributive impact of the taxes

used to finance these transfers. Note that Garfinkel, Rainwater and Smeeding conduct their analysis at a point in time and do not incorporate the lifecycle considerations described above. They find that the most important redistributive in-kind transfers are those that provide education to children. Inclusion of these benefits substantially alters the picture of relative well-being among children across countries.

Garfinkel, Rainwater, and Smeeding isolate the effects of health spending transfers by conducting analyses that focus only on the population 65 and over. In their analyses, health spending levels vary by age but not by income level. Empirically, health spending varies relatively little by income at older ages, suggesting that this assumption probably does not affect their results very much.

Garfinkel, Rainwater, and Smeeding report results for the population 65 and over using average values of health benefits across country<sup>7</sup>. As expected, they find that unadjusted income inequality tends to be higher in the English-speaking countries and lowest in the Scandinavian countries. Consistent with Smeeding's earlier study of the 1980s, however, the inclusion of the value of in-kind transfers (net of the impact on equity of the revenue collection to finance them) has very little effect on measured inequality, at least among older people. Inclusion of these benefits leads the inequality ratio for the low income vs. middle income population to fall slightly in most cases (by a maximum of 7 points, from 62 to 69 in Belgium) and actually generates a decline in equity in a few cases (by a maximum of 8 points, from 58 to 50, in Germany). The

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<sup>7</sup> Garfinkel, Rainwater, and Smeeding also report results using the actual value of health care benefits in each country. Using the average value of health benefits (as I do here) has the effect of reducing the impact of high US health care costs on the extent of inequality reduction achieved through health benefit transfers in the US.

effects on inequality between the high and middle income population are slightly greater in magnitude, but equally inconsistent in direction.

These results suggest that public financing of the health care system has surprisingly little impact on overall economic equality. This implies that the value of health benefits received, net of taxes paid, by income quintile is small relative to income and other components of well-being and, consistent with our findings above, that health spending at a point in time does not vary greatly with income.

The final question of interest is the impact of rising health care expenditures on equality. No studies have examined this question directly. Instead, I examine the evolution of health care spending and tax revenue over time.

Figure 7 shows how the tax share of GDP and the health care share of GDP have evolved across the OECD over time. The tax shares of most economies have risen substantially since 1975, but there is considerable variation among countries in rates of growth of taxation. The health share of GDP has also increased since 1975 in most countries, but in most countries, the health share of GDP has increased less than the tax share of GDP. In these countries, increases in taxation have more than accommodated rising health care spending. By contrast, in six countries – Canada, Germany, the Netherlands, Switzerland, the United Kingdom, and the United States – the rise in health care spending as a share of GDP has been greater than the rise in tax revenue. In most of these countries, this pattern reflects a relatively slow increase in tax revenue rather than a relatively rapid increase in health care costs. If all health care spending in these countries were public, other types of spending would have been displaced by health care expenditures.

Figure 8 repeats this analysis using the public health expenditure share of GDP. Although the six countries above differ substantially in the share of expenditures that are public, the pattern seen in Figure 7 is repeated in Figure 8. In these countries, tax policy has been constrained and has not accommodated increases in publicly-financed health care expenditures. Rather, the effect of constraining taxes has been that publicly-financed health care expenditures have displaced other forms of government spending. Without further information, however, it is not possible to ascertain the relative efficiency or equity of this displacement.

#### 5. Implications for Financing

The analyses presented in this paper suggest first, that the form of health care financing has no systematic relationship to the efficiency with which the health care system operates, at least to the extent that efficiency can be proxied by cost<sup>8</sup>. Second, over the lifecycle, public expenditures on health care appear to be modestly progressive, with the main progressive impact of this spending occurring among middle-aged people. In Canada, \$1 of tax money spent on health care generates about \$0.50 worth of benefits to the lower two income quintiles and about \$0.50 worth of benefits for the upper three income quintiles. Third, patterns of health service utilization in developed countries suggest that the marginal dollar of health care spending – money used to purchase high tech equipment or specialist services – is less progressively spent than the average dollar. Depending on the form of financing, this marginal dollar may not be distributed progressively at all. Fourth, health care spending has little impact on the general

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<sup>8</sup> As noted above, alternative sources of revenue themselves have efficiency implications, regardless of how the funding is used.



distribution of well-being in society. Distributing progressively-financed public funds through universal health insurance programs has limited impact on the distribution of total income. Finally, rising health expenditures threaten to displace other types of publicly-financed transfers. This outcome has already occurred in many relatively low tax share economies, including in Canada.

This pattern of results has two implications for the form of financing of the health care system. In terms of public financing, the results suggest that forms of revenue collection that tax both older adults and young people are more equitable, over the lifecycle, than those that tax younger people and cover older people. The greatest redistributive benefits of public health financing occur among middle-aged people who become seriously ill or disabled. Differential mortality and relatively equal health status among survivors make public financing of benefits to the elderly less redistributive.

In terms of the mix of public and private financing, the potential for public health insurance to crowd out other forms of redistributive benefits, without generating significant redistribution themselves, suggests that a mixed financing system may be the optimal way to balance efficiency and equity in health care. At the margin, increasing the level of public health expenditures to address ever-improving health care technologies will eventually – and, in some instances, may already -- reduce the overall level of equity in society by moving scarce tax revenues from cash to less redistributive in-kind transfers. Progressive taxes are most effectively deployed to provide progressive benefits. Targeting these funds toward lower income groups is likely to enable the maximum level of redistribution at the lowest efficiency cost.

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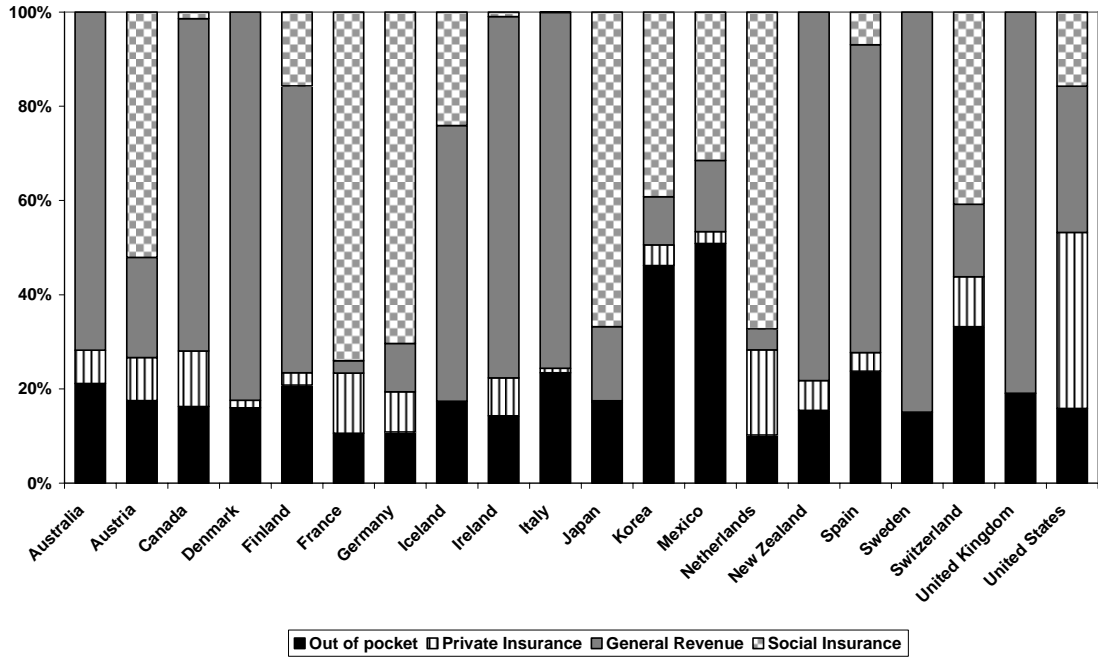
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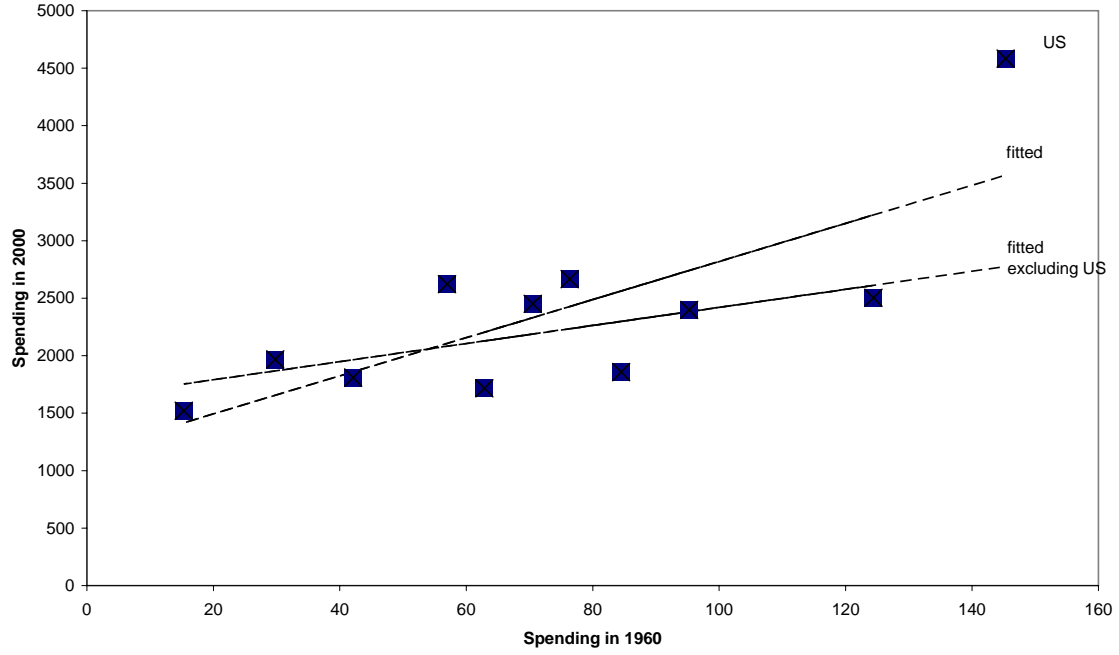
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Figure 1: Composition of Financing, 2000  
(SourceOECD, 2006)



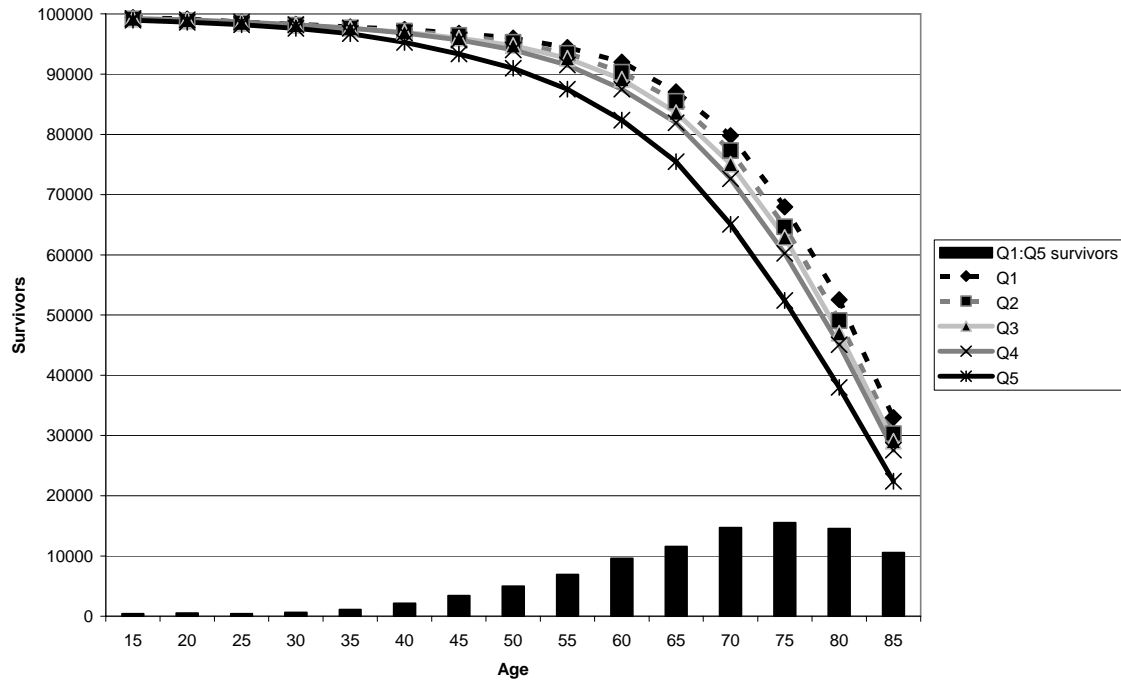
Source: SourceOECD, Online. Downloaded October 2006.

Figure 2: PPP Adjusted Health Care Spending per Capita 1960 and 1990  
Source: OECD, 2006



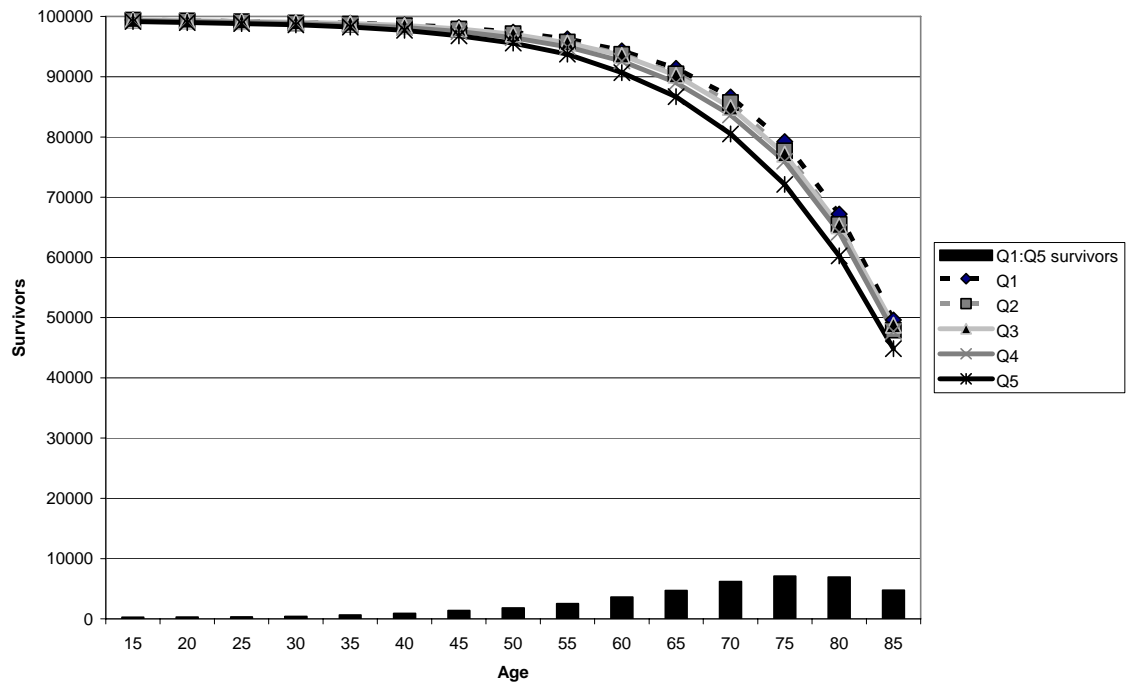
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Figure 3: Cohort Survival by Quintile: Canadian Men



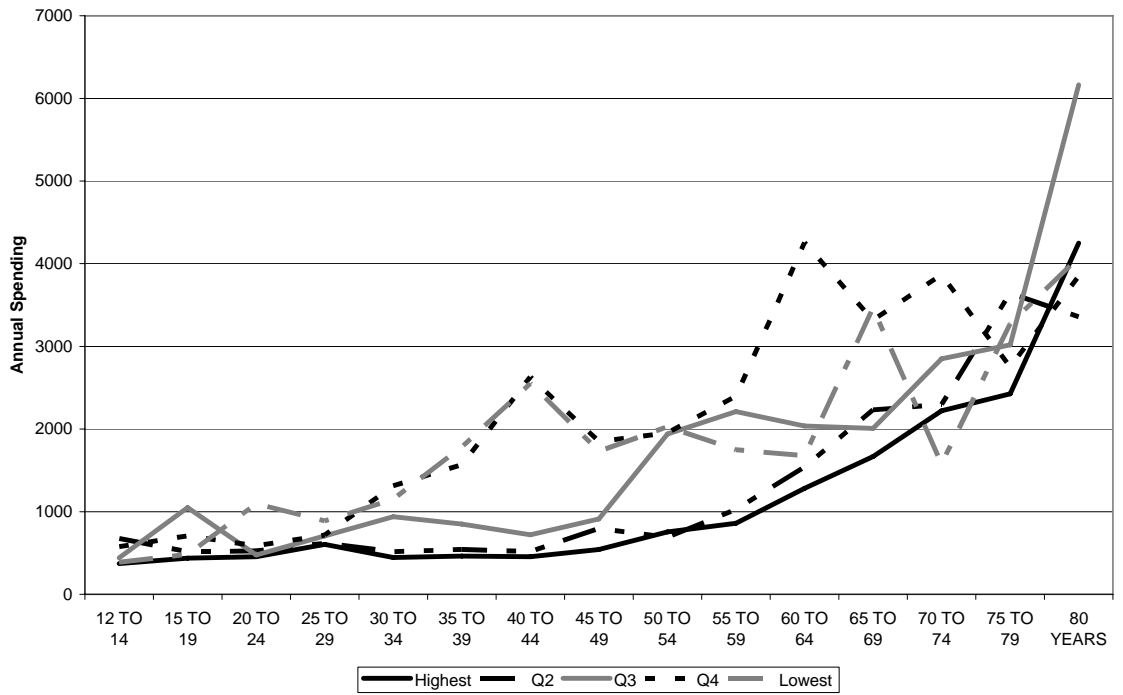
Source: Statistics Canada Life Table data, 1996. Provided by Russell Wilkins.

Figure 4: Cohort Survival by Quintile: Canadian Women



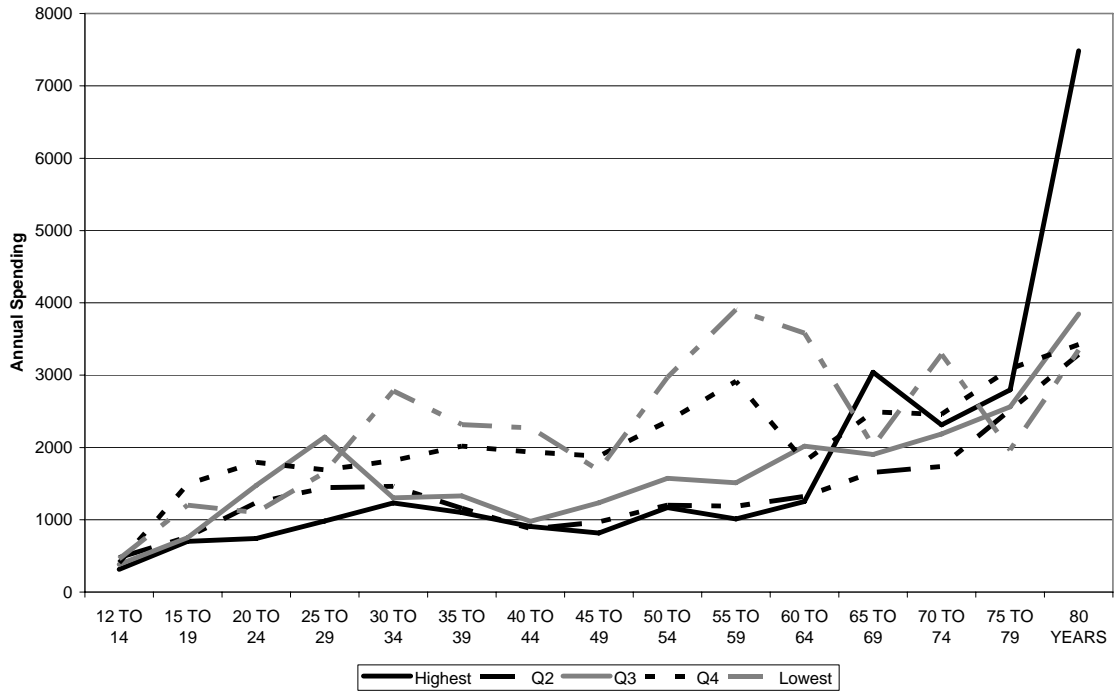
Source: Statistics Canada Life Table data, 1996. Provided by Russell Wilkins.

Figure 5: Annual Spending by Quintile, Men



Source: Author's tabulations of the Canadian Community Health Survey, 2000 combined with 1996 life table data from Statistics Canada.

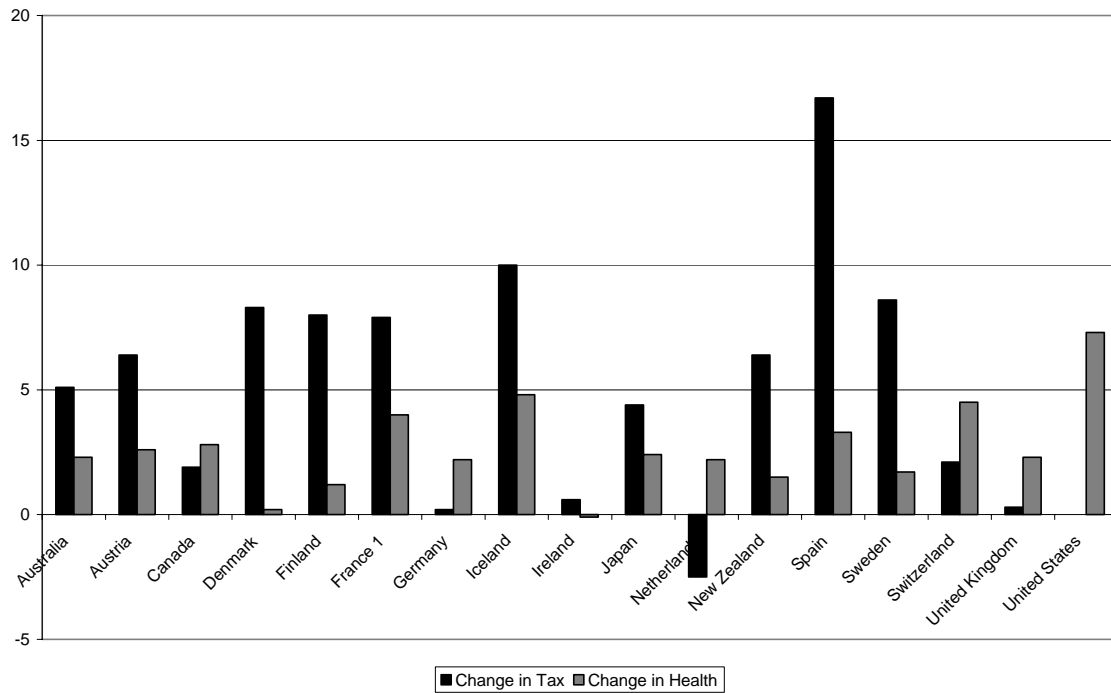
Figure 6: Annual Spending by Quintile, Women



Source: Author's tabulations of the Canadian Community Health Survey, 2000 combined with 1996 life table data from Statistics Canada.

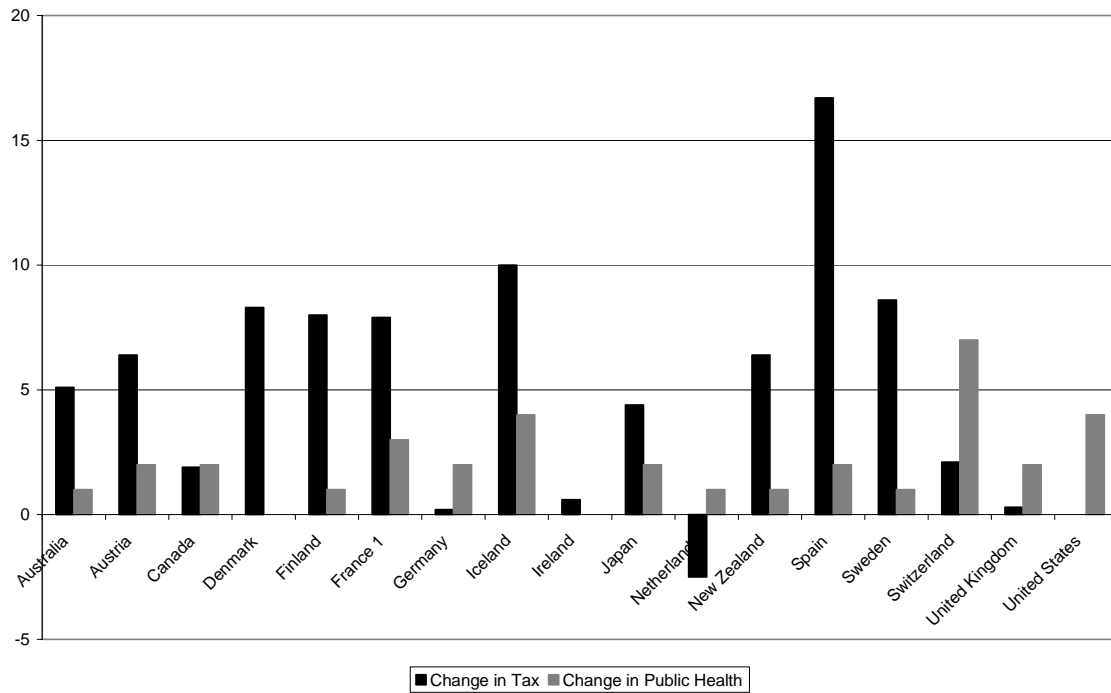


Figure 7: Change in Tax Share and Health Share of GDP, 1975-2003



Source: Health data from SourceOECD, downloaded October 2006. Tax share data from OECD Annual revenue statistics at <http://www.oecd.org/dataoecd/18/23/35471773.pdf>, Table 2.

Figure 8: Change in Tax Share and in Public Health Expenditure Share of GDP



Source: Health data from SourceOECD, downloaded October 2006. Tax share data from OECD Annual revenue statistics at <http://www.oecd.org/dataoecd/18/23/35471773.pdf>, Table 2.

Table 1: Relationship between Spending Composition and Spending Growth							
		<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Total Expenditures							
	Gen Rev	+	+	0	0	-	0
	Soc Ins	+	+	0	0	-	0
	OOP	NA	+	0	0	-	0
	(N)	(6)	(11)	(8)	(11)	(16)	(20)
Total Expenditures, No US							
	Gen Rev	0	+	0	0	-	0
	Soc Ins	0	+	0	0	0	0
	OOP	NA	NA	0	0	-	0
	(N)	(5)	(7)	(7)	(9)	(15)	(19)
Public Expenditures							
	Gen Rev		+	0	0	-	0
	Soc Ins		+	-	-	-	-
	OOP		+	-	-	-	-
	(N)		(6)	(8)	(10)	(16)	(20)
Public Expenditures, No US							
	Gen Rev			0	0	0	0
	Soc Ins			0	0	0	0
	OOP			0	0	-	0
	(N)			(7)	(9)	(15)	(19)

Data from SourceOECD, 2006 download. Results are from regressions of spending in column heading year regressed on expenditures (total or public, respectively) 5 years earlier, and on the composition of spending 5 years earlier. + indicates positive correlation, 0 indicates no significant correlation at 10% confidence level, - indicates negative correlation.

**Table 2: Lifetime Spending by Quintile and Redistributive Effect of Health Care Spending**

		At age 12				At Age 65			
		No LE	0%	5%	Redistributive Effect at 5%	No LE	0%	5%	Redistributive Effect at 5%
<b>MALE</b>									
	Highest	84953	66449	42332	0.13	52810	35521	19185	0.18
	Q2	95603	74698	48218	0.15	57653	38430	20927	0.20
	Q3	129646	99472	64762	0.21	70187	43042	23200	0.22
	Q4	159807	129991	86414	0.28	68912	44595	24542	0.23
	Lowest	138298	105591	72194	0.23	61943	34521	18959	0.18
	Low:High	1.63	1.59	1.71		1.17	0.97	0.99	
	Low:Mid	1.07	1.06	1.11		0.88	0.80	0.82	
	Mid:High	1.53	1.50	1.53		1.33	1.21	1.21	
<b>FEMALE</b>									
	Highest	127961	108881	69488	0.17	78174	60134	32276	0.27
	Q2	104700	92895	63603	0.16	45956	35450	19132	0.16
	Q3	124467	110567	75552	0.18	52484	40296	21766	0.18
	Q4	155599	139694	96697	0.24	57302	44085	23977	0.2
	Lowest	170540	151924	104844	0.26	53090	39145	21331	0.18
	Low:High	1.33	1.40	1.51		0.68	0.65	0.66	
	Low:Mid	1.37	1.37	1.39		1.01	0.97	0.98	
	Mid:High	0.97	1.02	1.09		0.67	0.67	0.67	

Source: Author's tabulations of the Canadian Community Health Survey, 2000 combined with 1996 life table data from Statistics Canada and SourceOECD October 2006. Spending computed as general practitioner visits @\$75, specialist visits @\$375, hospital days @\$1000. Redistributive effect describes share received by group from \$1 of health care spending, by gender.