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Paying Taxes and Using Health Care Services: The Distributional Consequences of Tax Financed Universal Health Insurance in a Canadian Province

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Abstract

Limited information is available on the distribution effects of the financing mechanism of the Canadian health care system, where revenues derived from tax sources are allocated to the provision of health care to those with medical needs. The progressivity profile of the various tax sources which are used to finance publicly insured health care services are well described in Canada. What is less well understood is the very significant inequality in the incidence of health care benefits in relation to income, with use of health care services generally varying inversely with household income. The combination of a tax system with overall progressivity and a 'pro-poor' incidence of health care benefits results in potentially large redistributive impact of tax-financed universal health insurance programs in this country.

This paper provides a detailed empirical estimate of the redistributive consequences of the finance and delivery of health care services by public programs in the province of Manitoba at two points in time: 1986 and 1994. The methodology applied in this work has two principal components: 1) the estimation of the incidence of taxes paid by economic families and 2) the estimation of health care resources consumed by economic families. The estimation of economic family taxation incidence was based on information contained in Statistics Canada's Social Policy Simulation Database and Model, which simulates household demographic characteristics, labour force participation, income sources and taxation payments for a representative sample of Canadian households. Four sources of household tax liability were estimated: federal and provincial income taxes and federal and provincial consumption taxes. From this database economic family income

(combining market income and transfer income) and tax incidence were estimated for 1986 and 1994. The use of publicly insured physician services, acute care hospital services and institutional long term care services were estimated from a stratified random 5% sample of Manitoba households for which micro-level 1986 census records have been linked to computerized records of individual health care encounters maintained by the Manitoba Health Services Insurance Plan for fiscal year 1986/87. This sample provides detailed information on the use of health sources by economic family income. For each time period, the incidence of taxation and the incidence of health care benefits (valued in dollars) were calculated for ten equal sized population groups, ranked from lowest to highest economic family income. Observed use of health care resources by income decile in 1986 was projected to the 1994 population.

In 1986, total earned income by Manitoba households was estimated to be $11.739 billion. These households paid $1.961 billion in federal income and consumption taxes and $1,463 billion in provincial income and consumption taxes and used an estimated $1.269 billion in publicly insured health care services. In 1994, total earned income by Manitoba households was estimated to be $15.354 billion. These households paid $2.750 billion in federal income and consumption taxes and $1.997 billion in provincial income and consumption taxes and used an estimated $1.756 billion in publicly insured health care services.

In 1986, the ratio of market income earned by the top decile to the ratio earned by the bottom decile (90:10) was 12.3:1. The ratio of the top to bottom decile on total income,

which includes transfer income, was 4.54:1. The top decile to bottom decile ratio for consumable income, defined as total income less income taxes, consumption taxes and payroll taxes, was 3.49:1. After incorporating the dollar value of non-cash health benefits, this ratio was reduced to 2.82:1. The results for 1994 were similar.

The Gini coefficients for the 1986 period for market income, total income and consumable income were, respectively, 0.3361, 0.2523 and 0.2152. After incorporating the value of non-cash health benefits received by each income decile, the estimated Gini coefficient was 0.1978. The respective Gini coefficients in 1994 for market income, total income, consumable income and consumable income plus non-cash health benefits were 0.3428, 0.2502, 0.2139 and 0.1980.

This study documents a progressive redistributive effect on household economic well-being in the incidence of non-cash health care benefits financed by taxation sources in a Canadian province. In describing this redistribution, the study has not specifically described the magnitude of intergenerational transfer from tax-paying labour force participants to elderly economic families with a high incidence of health care use. However, this intergenerational transfer is understood to be substantial. The results of this work also suggest that the combined incidence of taxation and health care benefits had similar redistributive effects in 1986 and 1994.

INTRODUCTION

Limited information is available on the distribution effects of the financing mechanism of the Canadian health care system, where revenues derived from tax sources are allocated to the provision of health care for those in medical need. In part, the relative absence of information on the distribution effects of public health insurance is due to the complexity involved in resolving both macro and micro level allocation issues in the incidence of taxation (1-3). However, a second obstacle has been the absence of household-level data which combine comprehensive and longitudinal information on the use of insured health care services with detailed information on household structure and income sources.

While the goals of the publicly-financed health insurance system in Canada are not explicit (4), some commentators have suggested that they can be represented by two objectives: the reduction of risk and the transfer of wealth (5-6). Risk reduction is the traditional function of insurance, where the pooled contributions from all persons at risk of an adverse event indemnify the minority of the pool who experience the adverse event. The wealth transfer objective is not an inherent principle of private insurance markets; instead it is a social policy welfare principle, where public programs are financed by proportional or progressive taxation. In fulfilling this welfare principle, publicly financed health insurance redistributes resources, in the form of non-cash health benefits, from higher income households to lower income households. This paper focuses on estimating the magnitude of this redistribution.

The Public Finance of Health Care

While provincial governments are the principal payers of health care in Canada, it is ultimately individuals and families that pay the large majority of health care costs, through three mechanisms: out-of-pocket expenditures, insurance premiums, or federal and provincial taxes. In Manitoba, there are no insurance premiums and the sources of tax revenue relevant to this study derive from two flows: personal and corporate income taxes, and sales and excise taxes levied on consumption. Income and consumption taxes have different distribution consequences (7). Income taxation policy in Canada is marginally progressive, while consumption taxes are generally viewed as regressive (8). In the study of expenditure incidence, the distribution effects at a given income level will reflect the relative role of income and consumption taxes in the net tax paid by the household.

Estimating the true incidence of taxation on household economies is a complex and uncertain procedure (7-9). While the incidence of personal income taxation is relatively transparent, accounting for the household incidence of consumption taxes such as sales taxes, fuel taxes and excise taxes on alcohol and tobacco is approximate. In addition, controversies surround a number of tax allocation issues concerning the distinction between the individual legally responsible for paying taxes and the individual who actually bears the tax burden. For example, competing perspectives argue that the burden of corporate income tax is borne by the owners of capital, and conversely, that this tax is

actually shifted to consumers through higher prices and to workers in the form of lower wages (4,7,10). Finally, as has been recently shown by Gillespie and colleagues, estimates of tax incidence and the distribution of taxes across income classes is very sensitive to the specific definition of household income (8).

The conceptual framework of tax incidence analysis is well established, and involves: 1) a definition of household income sources, 2) the identification of specific government tax revenue sources, 3) a set of explicit assumptions concerning the shifting of taxes, and 4) the explicit approach to adjusting household income or taxation estimates such that tax incidence estimates at the household level aggregate to equal total government revenues from taxation (8). Three general approaches to measuring household economic well-being have emerged in the public finance literature: pre-fisc income, broad income and post-fisc income (11). Pre-fisc income includes earnings from employment and investment of capital, while excluding sources of income received from government transfers. Broad income is pre-fisc income, plus government transfers. Post-fisc income adds to broad income an estimate of resources received by households in the form of government goods and services, imputed as in-kind non-money income (8).

The income distribution structure in Canada has remained relatively unchanged in the post-World War II period, with the poorest 20% of households receiving approximately 4% of total income (after accounting for government transfers) and the wealthiest 20% of

households receiving 40% of total income (12,28-29,30). Over this same period, the share of GNP devoted to social, education and health expenditures by governments has increased dramatically, from 6.5% in 1951 to 18.4% in 1981 (12). Based on work completed in the early years of Medicare, most researchers have concluded that the incidence of benefits associated with these program expenditures have produced a very slight reduction in income inequality (13-15). For example, Morreale has estimated that the introduction of medicare in Quebec resulted in a reduction in the percentage of household income spend on health care in the lowest income group from 3.7% before medicare to 2.7% following the program's introduction (15).

STUDY OBJECTIVE

The objective of this study, based on data describing the use of health care services and household income for a sample of Manitoba households in FY86/87 was to estimate the net transfer effects of the public health care insurance program across income deciles, calculated from estimates of the incidence of household tax payments and the use of publicly insured health care services. The study has used a unique research resource created through the collaboration of Statistics Canada, the Government of Manitoba and the Manitoba Centre for Health Policy and Evaluation, University of Manitoba. In brief outline, the study is a cross-sectional analysis of a stratified random 5% sample of Manitoba households, grouped into deciles on the basis of income. The analysis estimates the incidence of household tax payments and the dollar value of household use of

publicly insured health care services. Information on household income and structure was derived from the 1986 census. Health care was enumerated directly from computerized records of individual health care encounters maintained by the Manitoba Health Services Insurance (MHSIP) Plan for the period April 1, 1986 to March 31, 1987.

The benefit incidence analysis in this study focuses exclusively on publicly insured health care services, which is defined to include forms of publicly financed health care expenditures, such as hospital capital programs, health care research or the training of health care personnel which may conceptually be deemed expenditures to improve access to services, rather than the consumption of services (16). The study will not attempt to estimate direct private expenditures on health care services. While estimated to represent approximately 25-28% of total health expenditures in Canada during the study period (17), estimating direct expenditures across income deciles requires household survey data not available to this study.

METHODS

Study Design

This study is a cross-sectional analysis of a stratified random sample of Manitoba households estimating the use of publicly insured hospital and medical services by income decile. The analysis is comprehensive for all disorders presenting for insured medical and hospital care.

Sources of Data

The study is based on a database which has linked electronic records of the use of insured hospital services, institutional long term care and medical services with 1986 census records at the individual level, for a stratified random sample of 16,627 Manitoba households which completed the 2B census questionnaire in 1986. Records describing use of services include physician claims for reimbursement of ambulatory and inpatient care, laboratory tests and diagnostic imaging exams in private facilities, and hospital separation abstracts for inpatient and outpatient services in acute care hospitals in the province. For each person represented in the sample, records of health care utilization have been linked to the complete 1986 census record of information reported on the 2A and 2B census forms, which includes data on sources and amounts of income, attained education, occupation and labour force participation for all residents of private dwellings over the age of fifteen.

Sample

The sample unit in this study is the census economic family which includes residents of private dwellings, non-institutional collective dwellings and institutions. The methodology and results of the record linkage process are described in detail elsewhere (18-19,27). In summary, all individuals in the 82,728 Manitoba households which completed the 2B questionnaire were eligible for linkage to a file containing person-level demographic information for all known registrants with MHSIP in June 1986.

Deterministic and probabilistic record linkage procedures were performed by Statistics Canada personnel. No actual names or dwelling addresses were used in the linkage. A total of 74% of individual records in the census sample were successfully linked to an identity in the MHSIP insurance registry with 95.5% accuracy. From the pool of linked records, a stratified sample of 16,627 households was drawn (N=47,935 individuals), representing an approximate 5% sample of the Manitoba population.

Measures

Health Care Expenditures: In this study, the consumption of insured health care is measured in dollars. The public administration of insured physician services includes the detailed accounting of payment of fees, and this financial information is included in the computerized records of medical service claims. Estimating the cost of an episode of hospital care, however, has historically been a challenge in the Canadian system, where hospital care is funded globally on an institutional basis, rather than on the basis of direct payment for each service encounter (20).

Physician Services: All fee-for-service physician services used by individuals in the sample were enumerated for this study. At the time of this study, approximately 3.0% of total physician services were provided by salaried physicians in provincial mental health institutions, community based clinics and some hospital emergency and radiology departments. Diagnostic and laboratory services provided by fee-for-service private

facilities are included in the enumeration of insured medical services.

Hospital Care: Accurate cost information for individual hospital admissions is generally unavailable in Canada, a legacy of the administrative practice of globally funding institutional budgets. Because the cost of hospital care attributable to differing illness and severity profiles may differ across income deciles in ways that are not captured by the use of crude hospital per diems, this study applied an adaptation of the RDRG case costing methodology which accounts for the severity or complexity of illness (21). In outline, this method groups hospital admissions into clinically meaningful categories, called diagnosis-related groups (DRGs) on the basis of diagnoses, procedures and similarity of length of stay and resource use. Each DRG is assigned a case weight, which reflects the costliness of care relative to the mean hospital admission.

Despite shortcomings, this approach remains the most appropriate method available for accounting for the costs of inpatient hospital care on a case basis. In this application, hospital charge information from the regulated hospital system in the state of Maryland in 1992 has been used (21). The US hospital charge data are used only to establish the relative cost of care: for example, to quantify the relative cost difference between a gastrointestinal surgical procedure and an open heart procedure. While there is some evidence the Canadian hospital system is more efficient than American hospitals in the use of technology (22), we know of no work which has demonstrated that the relative

distribution of health care resources across RDRG groups differs substantially between the two countries, and it is on this basis that we use the US hospital charge data for the purposes of this study.

This method is applicable only to the assignment of the cost of inpatient services. No satisfactory methodology currently exists for costing the diverse range of outpatient services provided by Canadian hospitals, which are estimated to represent approximately 21% of total hospital expenditures in Manitoba in this period (21,23). These services range from high cost procedures such as dialysis and diagnostic imaging, to lower cost programs in antenatal care and outpatient mental health care services. The estimated $128 million of outpatient resource use has been allocated to income deciles proportionate to observed inpatient use, as has approximately $69 million of services provided in facilities which are not defined as acute care hospitals and $99.9 million in other costs associated with education and research programs, interest and depreciation charges and non-patient costs (21).

Household Income: A measure of total economic family income was derived from census responses provided by each household member over the age of 15. In this study, there are 17,210 economic family units described in this study, which group kinship-related individuals occupying a common private dwelling. Total family monetary income was calculated to include gross wages and salaries from employment, net income from

self-employment, pension income and government transfers which includes family allowances, unemployment insurance, child tax credits, workers compensation payments and other disability benefits. This definition is equivalent to Gillespie's broad income concept (8).

Families were grouped into income deciles, ranked from the poorest 10% to the wealthiest 10% of families, with approximately 5,000 individual observations per decile. The census does not collect income information for residents of institutional facilities. Individuals resident in institutions on census day have been retained in the analysis of health care utilization, but have not been classified to an income decile.

Household Tax Incidence: The methodology for estimating household tax incidence used in this study has been described in detail elsewhere (8), and has been used to apply a set of tax rates to a representative sample of household profiles in Statistics Canada's Social Policy Simulation Database and Model (24). In this model, the consolidated tax rate (combining income and consumption taxes) is approximately proportional over the income distribution, ranging from 30% of poorest households to 33-35% for highest income households. The SPSDM was also the source of information for three measures of economic family income: market income, representing earnings from labour market participation and interest income, total income, which combines labour market income

with cash transfers from government and consumable income, which is defined as total income less all income and consumption taxes.

RESULTS

Figure 1 portrays the distribution of total public and private health care expenditures ($1.889.5 billion) in Manitoba in 1986 by sector. The public share of expenditures ranged from 100% of physician services to less than 15% of expenditures on non-physician health professionals. In 1986, the public share of total expenditures was 75.4%, declining to 72.2% by 1994 (17).

The distribution of health care resource use by economic family income decile in 1986 is reported in Figure 2, adjusted for age and sex. This figure reports the distribution of directly observed resource use in the hospital and medical services sectors ($590.5 million, 64.2% of total public expenditures in these two sectors). As noted previously in the description of the study methods, the distribution profile of directly observed health care use has been used to allocate total public expenditures, with the exception of approximately $205 million in institutional long term care services, which have been allocated directly to the institutionalized population.

Figure 2 documents the pro-poor profile of health care resource use in Canada, a response

to socioeconomic inequalities in the distribution of health and disease (30). As has been observed in many Canadian studies, the patterns of hospital use and physician service use in relation to household income are not concordant. In this setting, per capita consumption of physician services are not differential by economic family income decile.

The incidence of taxation and the incidence of non-cash health care benefits across income deciles in 1986 is reported in Table 1a. In 1986, total earned income by Manitoba households was estimated to be $11.739 billion. These households paid $1.961 billion in federal income and consumption taxes and $1,463 billion in provincial income and consumption taxes and used an estimated $1.269 billion in publicly insured health care services. For the purposes of this study, we have assumed that the financing of these publicly funded services is fully bourne by household taxation sources. In 1986, the federal share of publicly funded health care expenditures in Manitoba was 39.7%. Household taxation by federal and provincial sources has been allocated to health care financing on this basis (see Column A, Table 1a, Total tax contribution to health).

In 1986, 42.4% and 6.4% of public health expenditures were contributed by tax revenues received, respectively, from the top and bottom income quintiles (Income deciles 9-10 vs Income deciles 1-2). The use of health care services was distributed inversely to this pattern: 11.7% and 24.6% of health care service expenditures were received, respectively by the top and bottom income quintiles.

Table 2a reports income distribution characteristics for the Manitoba population in 1986 using three measures of economic family income: market income, representing earnings from labour market participation and interest income, total income, which combines labour market and interest income with cash transfers from government, and consumable income, which is defined as total income less all income and consumption taxes. In addition, the table reports a fourth measure of economic family income, which is the estimated distribution of economic resources when consumable income is combined with the dollar value of non-cash health benefits.

In 1986, the ratio of market income earned by the top decile to the ratio earned by the bottom decile (90:10) was 12.3:1. The ratio of the top to bottom decile on total income, which includes transfer income, was 4.54:1. The top decile to bottom decile ratio for consumable income, defined as total income less income taxes, consumption taxes and payroll taxes, was 3.49:1. After incorporating the dollar value of non-cash health benefits, this ratio was reduced to 2.82:1.

The Gini coefficients for the 1986 period for market income, total income and consumable income were, respectively, 0.3361, 0.2523 and 0.2152. After incorporating the value of non-cash health benefits received by each income decile, the estimated Gini coefficient was 0.1978.

The distribution profile of tax incidence and the incidence of health care benefits in 1994 is reported in Tables 1b and 2b. The results are broadly similar to the findings for 1986.

DISCUSSION

This study documents a progressive redistributive effect on household economic well-being in the incidence of non-cash health care benefits financed by taxation sources in a Canadian province. The results of this work also suggest that the combined incidence of taxation and health care benefits had similar redistributive effects in 1986 and 1994.

The magnitude of the redistributive effect is significant and the results of this study are consistent with those provided by an earlier Canadian study which used different methods for estimating household use of health care services (29). In estimating this redistributive effect, we have chosen to provide a series of comparisons with alternate measure of household income, prior to and following the incidence of taxes and transfers. It is of some important to note that a comparison between a purely private health care finance mechanism, in which everyone pays his or her own costs, and a system financed on the basis of taxation, would produce even stronger redistributive consequences.

In describing this redistribution, the study has not specifically described the magnitude of intergenerational transfer from tax-paying labour force participants to elderly economic

families with a high incidence of health care use (This work is in progress). However, this intergenerational transfer is understood to be substantial. This study has examined the distribution effects of the publicly-financed insurance mechanism on a cross-sectional rather than a life course basis. While cross-sectional analyses can be used to produce a simulation of life course benefit incidence using an approach similar to the estimation of a total fertility rate in demographic studies, the validity of this methodology is critically dependent on an assumption of constant age-specific health care utilization over time. Empirical evidence suggests this assumption is untenable in the case of health care services (25-26).

This description of the incidence of benefits under the insurance mechanism of the Canadian health care system is relevant for a number of reasons. First, the majority of previous studies of benefit incidence in Canada date from the first decade of universally insured services. In the following two decades, health expenditures have climbed from 7.1% of GNP in 1975 to a current share of 10.1% in 1993, from an estimated 5% of GNP in 1960. As the health share of GNP has increased, the distribution of benefits across income groups may have changed. Second, the current public policy debate concerning the scale and structure of the publicly financed health care sector will potentially benefit from explicit information on income-related patterns of the consumption of health care. For example, the proposition that user fees may be an appropriate mechanism for the partial financing of health care services persists without a clear understanding of the existing income distribution in the consumption of health services.

In summary, strong income-related differences in hospital utilization, previously described in earlier Canadian studies, persist after 25 years of universal health insurance in this setting. Given that the system is financed by tax revenues which are, on balance, marginally progressive, non-cash health care benefits represent a substantial income redistribution mechanism in this setting.

References

1. Barer ML, Manga P, Shillington ER, Siegel GC. Income class and hospital use in Ontario. Occasional Paper 14. Ontario Economic Council, Toronto, 1982.

2. Musgrave RA, Musgrave PB. Public finance in theory and practice. New York, McGraw-Hill, 1976.

3. Gillespie WI. Taxes, expenditures and the redistribution of income in Canada, 1951-1977. pp25-50 in: The Conference on Canadian Incomes. Ottawa, Economic Council of Canada, 1979.

4. Fraser R. The distributional impact of government funded health care. In: A Research Agenda for Health Economics. Ontario Economic Council, Working Paper 3, 1975.

6. Barer ML, Evans RG, Stoddart GL. Controlling health care costs by direct charges to patients: snare or delusion? Occasional Paper 10. Ontario Economic Council, Toronto, 1980.

7. Goffman IJ. The burden of Canadian taxation: allocation of federal, provincial and local taxes among income classes. Canadian Tax Foundation, Toronto, July 1962.

8. Vermaeten F, Gillespie WI, Vermaeten A. Tax Incidence in Canada. Canadian Tax Journal 1994;42:348-416.

9. Dahlby BG. The incidence of government expenditures and taxes in Canada. In Vaillancourt F (ed), Income distribution and economic security in Canada. 1985, University of Toronto Press, Toronto.

10. Statistics Canada. Family Expenditure in Canada 1986. Catalogue 62-555, 1986, Ottawa.

11. Gillespie WI. The redistribution of income in Canada. Gage Publishing, Ottawa, 1980.

12. Vaillancourt F. Income distribution and economic security in Canada: an overview. In Vaillancourt F (ed), Income distribution and economic security in Canada. 1985, University of Toronto Press, Toronto.

13. Boulet J-A, Henderson DM. Distributional and redistributional aspects of government health insurance programs in Canada. Economic Council of Canada Discussion Paper #146. 1979, Ottawa: ECC.

14. Statistics Canada. Distributional effects of health and education benefits. Canada, 1974. (Catalogue 13-561, Occasional, Ottawa, 1977).

15. Morreale JC. The distributional effects of national health insurance in Quebec. Journal of Health Politics, Policy and Law 1978;2:479-507.

16. Evans, RG. Strained Mercy: The Economics of Canadian Health Care. 1984, Butterworths, Toronto.

17. Health Expenditures, Canadian Institute for Health Information, Ottawa, 1998

18. Mustard CA, Derksen S, Berthelot JM, Wolfson M, Roos LL. Age-Specific Education and Income Gradients in Morbidity and Mortality in a Canadian Province. In press, Social Science and Medicine.

19. Houle C., Berthelot J. M., David P., Mustard C. A., Roos L. L. and Wolfson M. C. Project on matching Census 1986 database and Manitoba health care files: private households component. Statistics canada, Analytic Studies Branch Research Paper Series, No. 91, March 1996.

20. Black C, Frohlich N. Hospital funding within the Health Care System: Moving Towards Effectiveness. Report 91.05. Manitoba Centre for Health Policy and Evaluation, 1991, Winnipeg, Manitoba.

21. Shanahan M, Loyd M, Roos NP, Brownell M. Hospital Case Mix Costing. Manitoba Centre for Health Policy and Evaluation, 1994, Winnipeg, Manitoba.

22. Redelmeier DA, Fuchs VR. Hospital expenditures in the United States and Canada. N Eng J Med 1993;328:772.

23. Wall R, DeCoster C, Roos N. Estimating Per Diem Costs for Manitoba Hospitals: A First Step. Manitoba Centre for Health Policy and Evaluation, unpublished, February 1994.

24. Bordt M, Cameron GJ, Gribble SF, Murphy BB, Rowe GT, Wolfson MC. The social policy simulation database and model: an integrated tool for tax/transfer policy analysis. Canadian Tax Journal 1990;38:48-65.2

25. Roos NP, Havens B, Black C. Living longer but doing worse: Assessing health status in elderly persons at two points in time in Manitoba, Canada, 1971 and 1983. Soc Sci Med 1993;36:273-282.

26. Hertzman C, Pulcins IR, Barer ML, Evans RG, Anderson GM, Lomas J. Flat on your back or back to your flat? Sources of increased hospital services utilization among the elderly in British Columbia. Soc Sci Med 1990;30:819-828.

27. Mustard CA, Derksen S, Berthelot JM, Wolfson M, Roos LL. Age-Specific Education and Income Gradients in Morbidity and Mortality in a Canadian Province. Social Science and Medicine 1997;45:383-397.

28. Beach CM, Slotsve GA. Are we becoming two societies? C.D. Howe Institute, Toronto, 1996.

29. Cameron G, Wolfson M. Missing transfers: adjusting household incomes for non-cash benefits. 23rd General Conference, International Association for Research in Income and Wealth, St Andrews, NB, August 1994.

30. Mustard CA, Shanahan M, Derksen S, Barer ML, Horne J, Evans RG. Use of Insured Health Care Services in Relation to Household Income in a Canadian Province. In: Barer ML, Getzen TE, Stoddart GL, eds. Health, Health Care and Health Economics: Perspectives on Distribution. London, John Wiley and Sons, Ltd, 1998: 159-180.

31. Wolfson MC, Murphy BB. New views on inequality trends in Canada and the United States. Monthly Labour Review, April 1998, p3-23.

Figure 1
Public Expenditure by Health Care Sector,
Manitoba 1986
Public Share of Total Expenditures: 74.6%

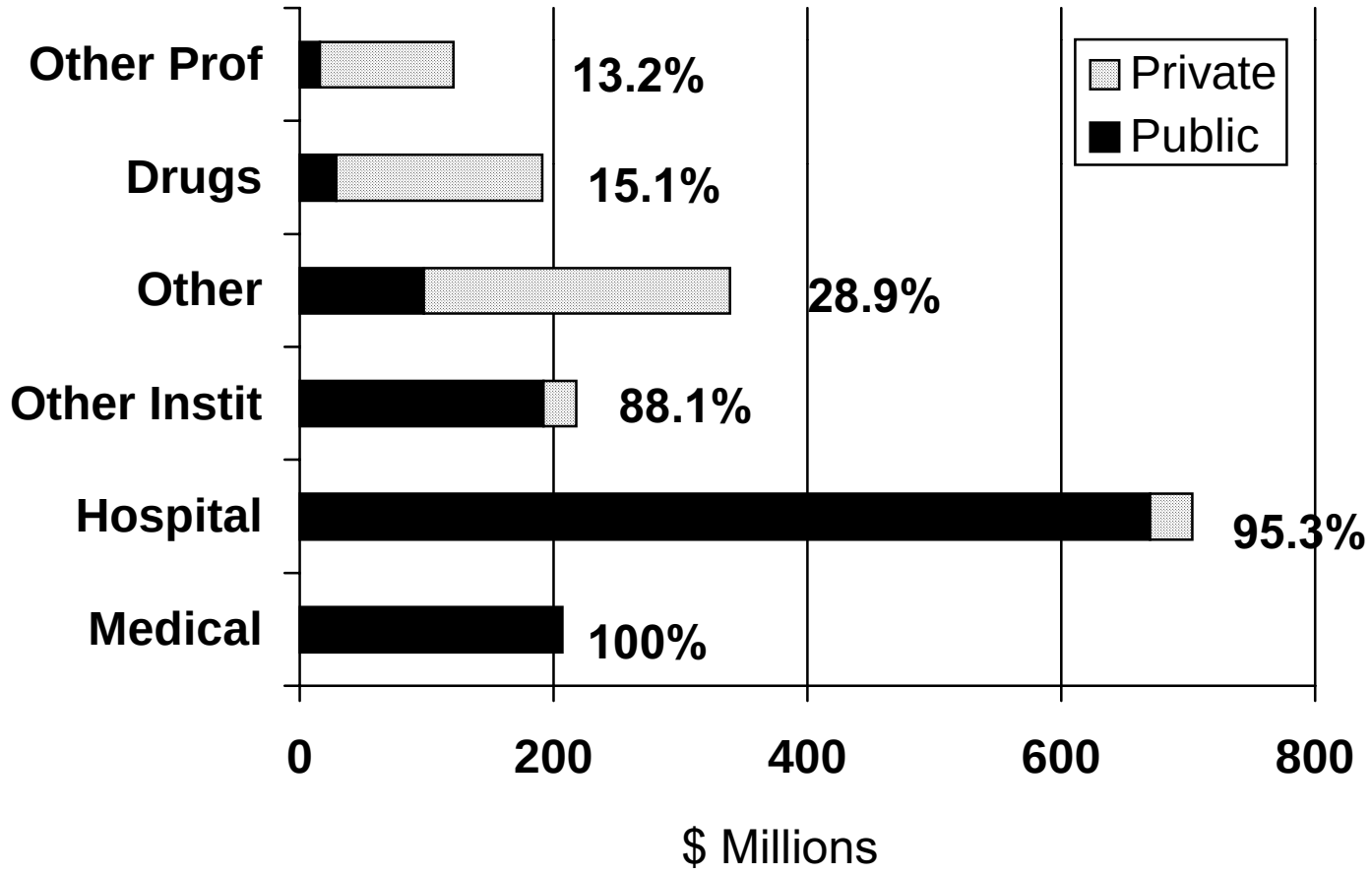

Figure 2
Use of Health Care Resources
By Income Decile, Age and Sex Adjusted
Manitoba 1986

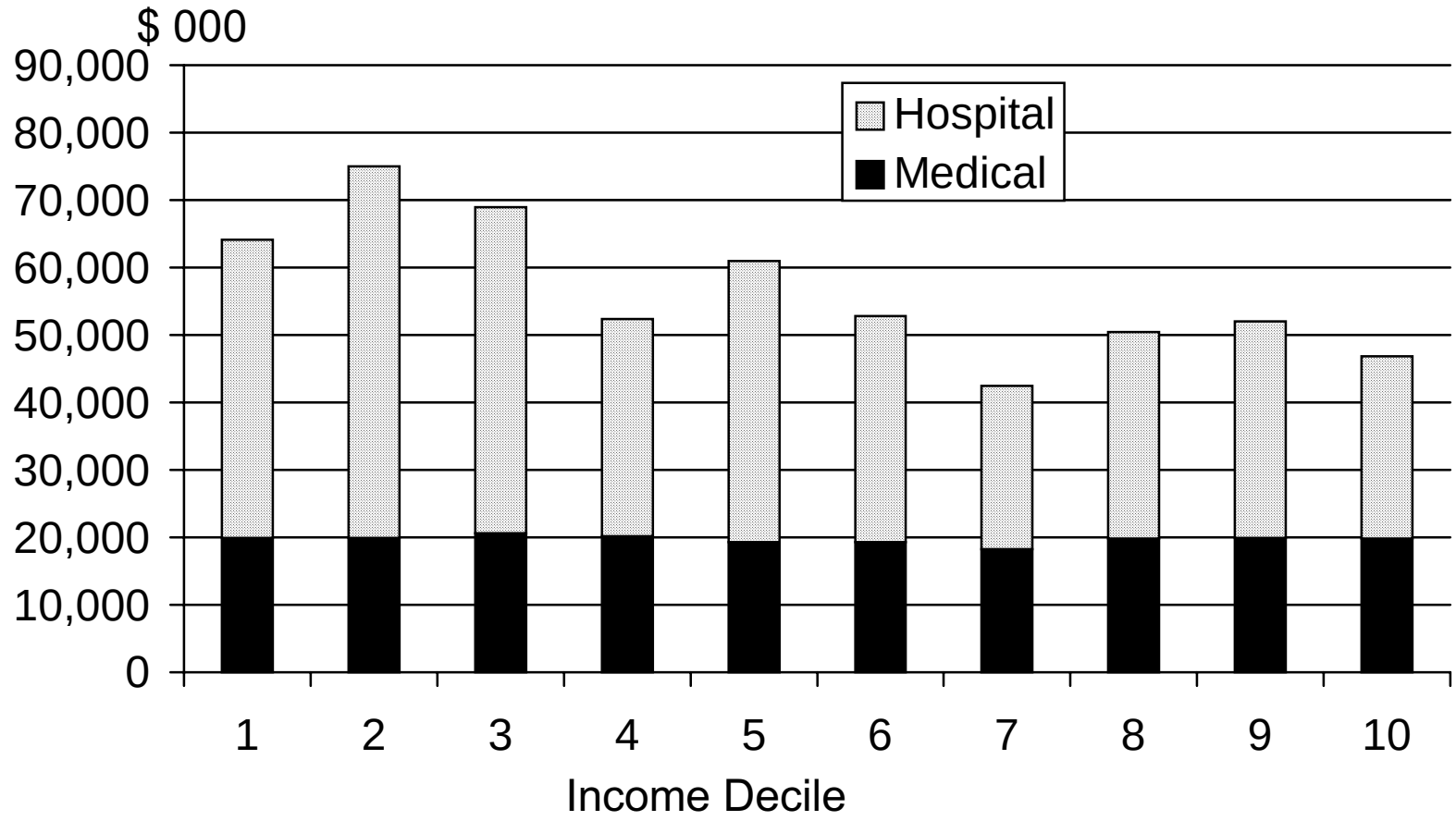

Figure 3
Incidence of Taxation and Incidence of Health Care Benefits, By Economic Family Income Decile,
Manitoba 1994

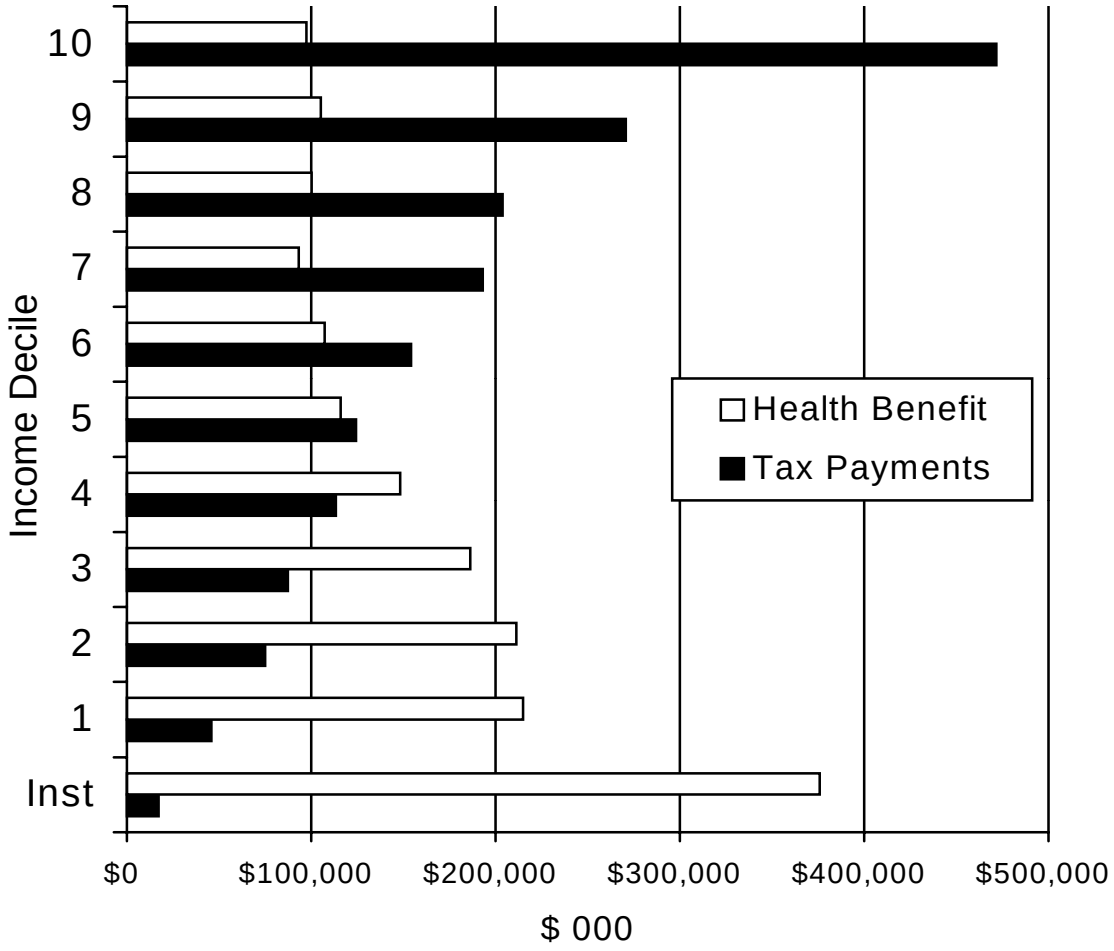

Figure 4
Net Benefit as a % of Household Income
By Economic Family Income Decile,
Manitoba 1994

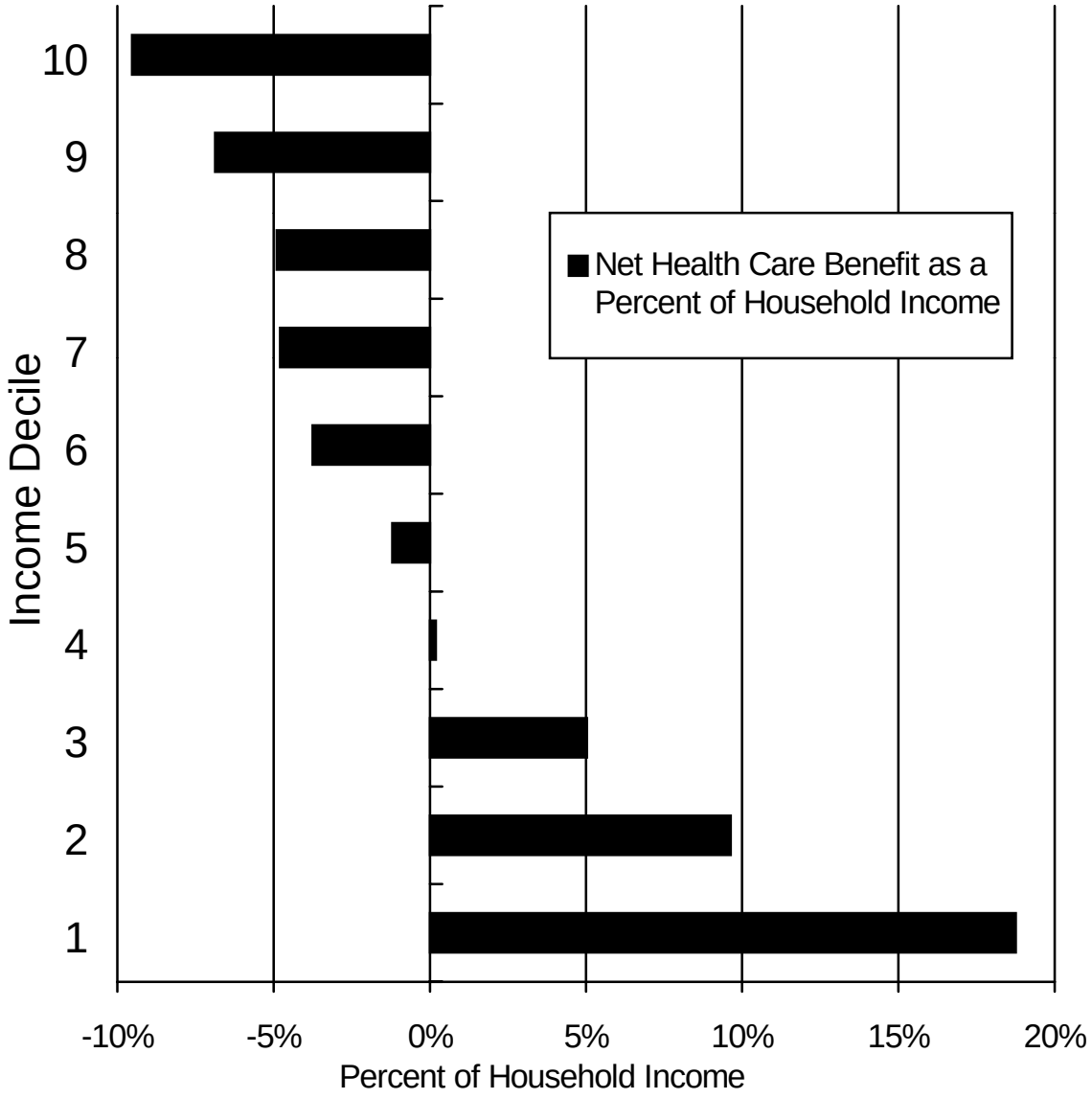

Table 1a

Incidence of Taxation and Incidence of Non-Cash Health Benefits, By Economic Family Income Decile

1986

Income Decile	Number of Economic Families	Number of Persons	Taxes: Total Tax (2) $ 000	Taxes: Total Tax as a Percent of Total Income	A: Total Tax Contribution to Health (5) $ 000	A: Share of Total	B: Estimated Total Insured Health Care Use (Including Nursing Homes) $ 000	B: Share of Total
Institutional Population	12,943	12,943	18,366.1	11.54	7,112.9	0.56	255,200.7	20.1
Household Population								
1: $0-$12,900	78,618	102,247	89,467.3	13.55	33,476.0	2.64	158,025.3	12.4
2: $12,900-$17,800	48,619	101,876	133,799.5	17.74	47,839.0	3.77	155,285.7	12.2
3: $17,800-$23,600	47,067	101,983	213,354.7	22.21	72,890.2	5.74	136,887.9	10.8
4: $23,600-$29,200	39,920	102,150	256,725.5	24.36	86,388.4	6.80	109,003.8	8.6
5: $29,200-$34,000	33,164	102,128	272,608.1	26.09	90,803.1	7.15	85,208.6	6.7
6: $34,000-$40,100	33,361	101,532	340,949.4	27.61	115,022.6	9.06	78,807.7	6.2
7: $40,100-$47,500	32,189	102,311	392,223.0	27.89	130,587.9	10.29	68,560.3	5.4
8: $47,500-$55,200	29,098	101,630	440,485.5	29.60	146,871.6	11.57	73,677.4	5.8
9: $55,200-$70,500	30,269	102,090	560,975.4	29.88	188,000.9	14.81	77,374.3	6.1
10: $70,500 +	29,298	102,169	1,012,714.7	33.71	350,607.4	27.62	71,567.9	5.6
Total	414,546	1,033,059	3,731,669.2	27.35	1,269,600.0	100.00	1,269,599.6	100.0

(2) Total taxes include federal income and consumption taxes and Manitoba income and consumption taxes

(5) In this model, household tax contributions are ssumed to finance 100% of health care expenditures

Table 1b

Incidence of Taxation and Incidence of Non-Cash Health Benefits, By Economic Family Income Decile

1994

Income Decile	Number of Economic Families	Number of Persons	Taxes: Total Tax (2) $ 000	Taxes: Total Tax as a Percent of Total Income	A: Total Tax Contribution to Health (5) $ 000	A: Share of Total	B: Estimated Total Insured Health Care Use (Including Nursing Homes) $ 000	B: Share of Total
Institutional Population	18,677	18,677	46,318.9	14.43	17,158.1	0.98	375,892.4	21.4
Household Population								
1: $0-$15,600	81,093	105,838	125,694.1	14.25	45,867.3	2.61	215,089.7	12.2
2: $15,600-$23,300	57,861	105,582	221,318.3	19.17	75,099.2	4.28	211,360.7	12.0
3: $23,300-$29,800	45,950	105,797	265,223.4	21.89	87,393.8	4.98	186,319.4	10.6
4: $29,800-$36,200	41,887	105,753	348,918.7	25.23	113,322.4	6.45	148,366.1	8.4
5: $36,200-$42,300	36,090	105,468	387,967.5	27.46	124,325.3	7.08	115,978.1	6.6
6: $42,300-$50,100	35,240	105,902	475,880.9	29.39	154,149.3	8.78	107,265.8	6.1
7: $50,100-$58,800	35,807	106,036	595,291.3	30.70	193,178.0	11.00	93,318.0	5.3
8: $58,800-$68,100	31,753	105,715	627,820.3	31.22	203,804.8	11.60	100,282.9	5.7
9: $68,100-$86,200	33,071	105,215	824,559.2	32.70	270,588.2	15.40	105,314.8	6.0
10: $86,200+	31,741	105,767	1,394,509.1	35.59	471,713.6	26.85	97,411.7	5.5
Total	449,170	1,075,750	5,313,502.0	28.92	1,756,600.0	100.00	1,756,599.7	100.0

(2) Total taxes include federal income and consumption taxes and Manitoba income and consumption taxes

(5) In this model, household tax contributions are ssumed to finance 100% of health care expenditures

Table 2a
Redistributive Effects of Non-Cash Health Care Benefits
Manitoba 1986 (includes Long term Care resources)

Income Decile	Share of Market Income	Share of Total Income	Share of Consumable Income	Share of Consumable Income Plus Health Benefit
Institutional Population	0.53	1.17	1.42	3.54
Household Population				
1: $0-$12,900	2.03	4.84	5.76	6.52
2: $12,900-$17,800	3.37	5.53	6.26	6.94
3: $17,800-$23,600	6.21	7.04	7.54	7.91
4: $23,600-$29,200	7.46	7.72	8.04	8.10
5: $29,200-$34,000	7.79	7.66	7.79	7.67
6: $34,000-$40,100	9.35	9.05	9.02	8.70
7: $40,100-$47,500	11.07	10.31	10.23	9.68
8: $47,500-$55,200	12.03	10.91	10.57	10.03
9: $55,200-$70,500	15.16	13.76	13.28	12.47
10: $70,500 +	25.00	22.02	20.09	18.45
Total	100.00	100.00	100.00	100.00
Ratio 90:10	12.30	4.54	3.49	2.82
Gini	0.3361	0.2523	0.2152	0.1978

Table 2b
Redistributive Effects of Non-Cash Health Care Benefits
Manitoba 1994 (includes Long term Care resources)

Income Decile	Share of Market Income	Share of Total Income	Share of Consumable Income	Share of Consumable Income Plus Health Benefit
Institutional Population	0.75	1.75	2.12	4.36
Household Population				
1: $0-$15,600	1.90	4.80	5.70	6.46
2: $15,600-$23,300	4.04	6.28	7.10	7.67
3: $23,300-$29,800	5.32	6.59	7.04	7.46
4: $29,800-$36,200	7.06	7.53	7.82	7.89
5: $36,200-$42,300	7.79	7.69	7.80	7.66
6: $42,300-$50,100	9.24	8.81	8.76	8.45
7: $50,100-$58,800	11.51	10.56	10.45	9.86
8: $58,800-$68,100	12.09	10.94	10.58	10.01
9: $68,100-$86,200	15.41	13.72	13.22	12.38
10: $86,200+	24.90	21.32	19.41	17.80
Total	100.00	100.00	100.00	100.00
Ratio 90:10	13.08	4.44	3.40	2.76
Gini Coefficient	0.3428	0.2502	0.2139	0.198