Canadians' Access to Insurance for Prescription Medicines

Volume 2 The Un-Insured and Under-Insured

Submitted to : He	ealth Canada
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DISCLAIMER

The descriptions of federal, provincial and territorial drug plans and related data contained in the study have been developed from information provided by governments. The analysis and conclusions are those of the consultants and do not necessarily reflect government policies or positions.

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1. EXECUTIVE SUMMARY

1.1 Mandate

Although all Canadians are provided with insurance for general health services from hospitals and physicians under the *Canada Health Act*, coverage for the cost of prescription drugs provided outside hospitals is not included under the *Act*.

There are a wide variety of sources of drug insurance including government plans, employee benefit plans and individual insurance policies. Coverage under these plans depends on a variety of sociodemographic factors such as province of residence, age, family status and employment. Consequently, the determination of who is covered for drug expenses and the type of coverage they have is somewhat complex.

The Health Transition Fund of Health Canada funded this review of Canadians' coverage for prescription drugs and analysis of the Un-Insured and Under-Insured.

This study is in two volumes. Volume 1 describes the design features of public and private plans, including issues of eligibility, financial arrangements, co-payments and deductibles. As well, Volume 1 describes the benefits, eligibility and costs of various types of coverage and discusses the particular circumstances of individuals and families depending on their province of residence, socio-economic circumstances, and drug needs.

This volume (Volume 2) measures the extent that Canadians have access to insurance for prescription drug expenses and the quality of that coverage by determining the number of Canadians with no or inadequate coverage.

This reports deals with the status of drug insurance coverage during 1998.

1.2 Methodology

Given the complexity of the issue, there is no single database or survey that can be used to determine the extent and type of drug insurance for Canadians.

One approach might be to conduct a representative survey of all Canadians and to ask them about their drug insurance policies. There are two problems with such an approach. First, executing such a survey would be extremely expensive, especially if one wanted reasonably accurate estimates of smaller subpopulations.

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Secondly, and more importantly, the issue of drug insurance does not lend itself particularly well to a survey approach. Most respondents, unless they had a serious medical condition requiring expensive drugs, would not be familiar with the technical details of their particular policy and would not be able to provide accurate information.

In the alternative methodology used here, we have combined various surveys from Statistics Canada with administrative data from various government and private drug plans to create what we call the Project Database, which provides a model of the Canadian population and the details of their drug plan coverage in 1998.

1.3 Measures

We use three approaches to define "under-insurance". The first, designed to measure coverage for routine expenses, is the First Dollar Coverage Index. This measures the amount an individual would be reimbursed for \$1,000 of drug expenses (including dispensing fees) in a calendar year. We express this as a percentage, so 100 percent is equivalent to full reimbursement. We define under-insurance as any value between 1 and 64 percent inclusive. The maximum value of 64 percent was arrived at empirically from the data. Most values are well above this level so those which fall below are indicative of poor coverage.

The second approach is the Last Dollar Coverage Index, which is a measure of how well individuals are protected against catastrophic expenses. This measures the amount an individual would be reimbursed on the last \$1,000 of \$50,000 of drug expense in a calendar year. Like the First Dollar Index, it is expressed as a percentage, where 100 percent would be equivalent to full reimbursement of the marginal expense.

Finally we use a measure called the Ability to Pay Index. This is the percentage of gross family income an individual would be required to pay out of pocket for \$1,000 of drug expenses in a calendar year. Those paying more than 2.5 percent of their gross family income for drugs are considered Under-Insured while 4.5 percent is considered equivalent to Un-Insured. The choice of cut offs was influenced by the 3 percent threshold used for the Medical Care Tax Credit in the federal *Income Tax Act* and by the statistical distribution.

	Routine Expense	Catastrophic Expense	Ability to Pay
Measurement Tool	First Dollar Index	Last Dollar Index	Ability to Pay Index
Defined as	Proportion of first \$1,000 of annual drug expense covered by the plan	Proportion of \$1,000 between \$49,000 and \$50,000 of annual drug expense covered by the plan	Amount paid out of pocket for \$1,000 of drug expense covered by the plan divided by gross family income
Full Coverage =	100 percent	100 percent	0%
Under-Insured =	64 percent or less	99 percent or less	2.5% but less than 4.5%
Un-Insured =	0	0	4.5% or more

Summary of Measurement Scales

1.4 Results

This section summarizes the key findings.

1.4.1 FIRST DOLLAR INDEX (ROUTINE EXPENSES)

Among the overall population, 90 percent have some coverage for routine drug expenses. 11 percent have full reimbursement coverage, 69 percent have coverage with modest co-payments and 10 percent (3 million individuals) are Under-Insured (paying 35 percent or more of their costs out of pocket). 10 percent (3 million individuals) are Un-Insured. There is substantial variation by various demographic characteristics.

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Province of Residence

In Québec, no one is Un-Insured or Under-Insured (reimbursed less than \$650 for \$1,000 of drug expenses). But Québec, along with Ontario, also has one of the lowest levels of full reimbursement coverage (7 percent) compared to the other provinces.

Alberta and British Columbia also have no residents that are Un-Insured, but 27 percent and 32 percent respectively are Under-Insured. Overall, 41 percent of those in Saskatchewan are Under-Insured or Un-Insured, although full reimbursement coverage is also the highest at 25 percent. Manitoba has a similar percentage of full reimbursement (21 percent), but a lower percentage of Under- and Un-Insurance (24 percent).

Full reimbursement for the Atlantic provinces ranges from 12 percent to 22 percent.



Chart 1 - Summary, Coverage for Routine Expense by Province

Age

Coverage by age is fairly constant. The most notable variations occur in the older age categories, where Under-Insurance and Un-Insurance peak for the 55-64 group (27 percent), but then drop to 4 percent for those 65 and older. This difference reflects the broad eligibility of seniors under provincial and territorial government drug programs. But at the same time, since those over age 65 have normally left the workforce, employment based coverage is less frequent. Consequently, they have the lowest full reimbursement coverage, at 5 percent.

Those 18-24 have the highest level of Under-Insurance, at 14 percent. The combined percentage of Underand Un-Insurance for this group (25 percent) is second only to those 55-64 (27 percent).



Chart 2 - Summary, Coverage for Routine Expense by Age

Labour Force Status

Although the percentage of those who are Un-Insured differs little between full time and part time status (11 percent versus 12 percent), the percentage receiving limited reimbursement (\$1 to \$649), is somewhat higher among those who work part time (13 percent versus 9 percent).

Those not in the labour force have the lowest level of Under-Insureds and Un-Insureds (14 percent) due to the high proportion of seniors and social assistance recipients in this group.

However, there is little difference in the percentage receiving 100 percent reimbursement. Levels range vary from 8 percent of those not working to 12 percent of those employed full time.





Aboriginal Status

Registered Indians and eligible Inuit and Innu have 100 percent coverage on all drug expenses compared with 26 percent of Métis and Non Status Indians and 9 percent of Non-Aboriginals.

25 percent of Métis and Non Status Indians are Un-Insured or Under-Insured (6 percent receive no reimbursement on \$1,000 of expenses, 19 percent receive between \$1 and \$649) whereas among Non-Aboriginals, 10 percent are Un-Insured and 10 percent are Under-Insured.



Chart 4 - Summary, Coverage for Routine Expense by Aboriginal Status

Note: Métis includes Métis and Non Status Indians

Note: Métis includes Métis and Non Status Indians

1.4.2 LAST DOLLAR INDEX (CATASTROPHIC EXPENSES)

In contrast to the First Dollar Index, levels of reimbursement for the Last Dollar Index are concentrated at relatively few values. The most common level of coverage is 100 percent reimbursement, which is available to about 93 percent of Canadians. About 4 percent of Canadians have plans that require a co-payment from the individual, commonly 20 percent. Another 3 percent of Canadians have no coverage against very high levels of drug expense.

Province

Province of residence is the major factor affecting coverage measured by the Last Dollar Index. Other sociodemographic factors have little effect.

Residents of Québec, Ontario, Manitoba, Saskatchewan and British Columbia all have 100 percent reimbursement for high levels of drug expenses. Other provinces have between 50 percent to 64 percent of the population Under-Insured or Un-Insured for catastrophic costs.

In the Atlantic provinces, about 30 percent have no coverage for high levels of drug expense.



Chart 5 - Summary, Coverage for Catastrophic Expense by Province

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1.4.3 ABILITY TO PAY INDEX

Overall, 2 percent of Canadians would have to pay more than 4.5 percent of their gross family income should they require drugs costing \$1,000.

Province

There are provincial differences in the ability to pay. In the four Atlantic provinces, between 6 percent to 7 percent of the population might have to pay more than 4.5 percent of their family income if they incur \$1,000 of drug expense. Ontario, Manitoba and Saskatchewan have income tested programs which generally insure that no one pays more than 4.5 percent. (In Manitoba, no one with income under \$15,000 pays more that 2 percent, others pay no more than 3 percent. In Saskatchewan no one pays more than 3.4 percent).





Age

The age group most vulnerable to high out of pocket costs is the 18 to 24 year olds (7 percent), followed by the 55 to 64 year olds (4 percent). Less than one percent of seniors would be exposed to this level of impact.



Chart 7 - Summary, Ability to Pay by Age

Because Canadians are insured against drug expenses by a multiplicity of overlapping public and private plans, there are no simple determinants of Under-Insurance or Un-Insurance.

Province of residence is the strongest determinant of whether an individual will have adequate coverage against catastrophic drug expenses.

Coverage under employer sponsored group plans (either directly or as a family member) or status as a senior, a person on social assistance or a registered Indian/Inuit/Innu are the primary determinants of whether an individual will have adequate coverage against routine drug expenses.

- While the size of the Un-Insured or Under-Insured population varies depending on how it is defined and calculated, several groups appear less likely to have adequate coverage.
 - Residents of the Atlantic provinces, other than those in targeted government programs (seniors, social assistance) and those in employer sponsored group programs have no protection against catastrophic levels of drug expense.
 - In all provinces, other than Québec, those working part time or in low wage occupations are more likely to be Un-Insured or Under-Insured for routine drug expense compared to the general population under age 65 due to their lower coverage rates under employer sponsored group plans.
 - In all provinces, other than Québec, there is a clear reduction in coverage in the age 55 to 64 group as adults start to withdraw from the labour force and are less likely to have an employer sponsored group plan and do not yet qualify for seniors' programs.
 - Overall, approximately 90 percent of Canadians have some coverage for routine drug expenses.
 - 11 percent of Canadians can obtain routine drug prescriptions without out of pocket cost, most often from either social assistance or employer sponsored group programs.

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- An additional 69 percent of Canadians have drug plan coverage with relatively modest deductibles and co-payments.
- 10 percent are covered but could be considered Under-Insured since their plan would pay less than 35% of a \$1,000 of annual expense.
- Approximately 10 percent, or 3 million people, are considered Un-Insured for routine drug expenses having no plan coverage or having a plan that would only cover annual expenses higher than \$1,000.
- Should they require unusually expensive drug treatment, 93 percent of Canadians can depend on a combination of public and private drug insurance plans to provide sufficient protection to prevent serious financial hardship. About 4 percent of the population would be considered Under-Insured since their coverage would reimburse only a portion of their bills. The remaining 3 percent are Un-Insured.
- Five provinces (Québec, Ontario, Manitoba, Saskatchewan and British Columbia) have public policies or programs ensuring all residents full reimbursement of catastrophic drug costs beyond some defined threshold. Government programs in Alberta offer residents substantial protection but residents who choose not to enrol may have reduced protection. In the Atlantic provinces, over 25 percent of their residents are without catastrophic coverage and another 25 percent might be considered Under-Insured.

- Among low income groups, those on welfare are well covered against routine drug expense while the "working poor" are more likely, in all provinces other than Québec, to be Un-Insured or Under-Insured for routine drug expense.
- Seniors have the lowest levels of Un-insurance or Under-Insurance due to targeted provincial government programs in every province. However, because these programs typically have co-payments, seniors also have the lowest level of full reimbursement coverage.
- Aboriginals who are Registered Indians or eligible Inuit and Innu have very good coverage due to the federal Non-Insured Health Benefits program. Métis and Non Status Indians are more likely to be Under-Insured or Un-Insured than the Non-Aboriginal population.

2. INTRODUCTION

2.1 Mandate

The purpose of this report is to measure the extent that Canadians have access to insurance for prescription drug expenses and the quality of that coverage by determining the number of Canadians with no or inadequate coverage.

To accomplish this task, we developed a Project Database which models the drug insurance coverage for the entire Canadian population. Using this Project Database, we explore the continuum of coverage variations among Canadians allowing the reader to assess the issue of Un-Insurance and Under-Insurance from a number of perspectives and using a range of benchmarks.

Production of this document has been made possible by a financial contribution from the Health Transition Fund, Health Canada.

2.2 Time Frame

This reports deals with the status of drug insurance coverage during 1998. Source data from earlier periods were adjusted when necessary to advance data to 1998. Appendix 3 provides further information on the "aging" methodology.

2.3 Definition of Plan Coverage

We define "plan coverage" for the purpose of this report as membership in a plan which reimburses some portion of potential drug expenses, regardless of the level of benefits in the plan.

While most plans have administrative rules requiring some form of registration in order to actually obtain reimbursement, our definition of "plan coverage" does not require that these registration requirements have been met. For example, we consider all residents of Québec to be covered because the law in that province requires group plans to accept all applicants and requires all other residents to be covered by the province. However, it is possible that some employers and some individuals evade the administrative requirements of the law.

Individuals are considered to have "plan coverage" if they have purchased public or private insurance or if they are entitled to coverage through an employer or government program. By this definition,

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people are not covered if they have not purchased insurance even if it is available at a "reasonable" cost.

2.4 Alberta Special Case

We have made an exception in the case of the Alberta government "Non Group" plan available to all residents under age 65. Because the coverage is available on request without health evidence subject to a three month waiting period, we have defined those eligible **but not enrolled in any other plan** as having notional membership in a plan with a deductible equal to the drug costs incurred during the three month waiting period.

In addition, while the published descriptions of all Alberta government plans indicate that there is a \$25,000 annual maximum, we have assumed that this restriction is routinely waived based on information received from managers of the Alberta drug plan.

These two assumptions dramatically reduce the estimates of the Un-Insured or Under-Insured population in Alberta.

2.5 Other Definitions

This section defines some of the key terms that are used throughout this report.

Aboriginal Canadians means First Nations peoples registered under the Indian Act, First Nations peoples not registered under the Indian Act, Métis people, Inuit and Innu.

Beneficiary means a person who has a right to receive benefits from a plan in specific circumstances. The term is not restricted to those who have received benefits. We use it synonymously with the concept of membership or coverage.

Catastrophic means drug expenses of a magnitude that is relatively infrequent but financially devastating to most Canadian families. The term is also used more narrowly in describing coverage quantified by use of the Last Dollar Index which addresses specifically the marginal \$1,000 following \$49,000 of expenses.

Co-payment or Co-pay refers to cost-sharing arrangements in effect after any initial deductible is satisfied for drugs included in insurance coverage. We further define co-payment as an amount that the insured must pay in normal circumstances as a result of intrinsic plan design excluding amounts associated with other Cost Containment Features (see below).

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Cost Containment Features refer to plan provisions other than explicit deductibles and co-payments that may result in plan members not receiving full reimbursement but where the primary purpose is to control provider behavior or to encourage certain consumer behavior. Some examples include:

- reimbursing at the cost of the lowest cost generic equivalent of a brand name drug (lowest cost alternative pricing)
- reimbursing at the cost of the lowest cost drug in a therapeutic class (therapeutic reference pricing)
- limiting drug ingredient costs by defining the cost that will be reimbursed
- "preferred provider" arrangements where disincentives apply when a provider outside the designated provider network is used
- requiring that certain drugs be pre-authorized prior to prescribing, dispensing or reimbursement
- excluding certain classes of drugs
- ensuring appropriate drug utilization.

Deductible refers to amounts that must be paid in full by the plan member during a benefit period (usually a calendar year) before any reimbursement is available from a plan.

Dispensing fees are fees charged by pharmacists for filling a prescription. In some provinces and territories, the provincial or territorial government sets dispensing fees. Other jurisdictions and some insurers negotiate a fee for the services provided to their own plan beneficiaries.

Drugs is used to mean prescription medications approved for use in Canada by Health Canada, available normally by prescription only and dispensed by hospital or community pharmacists. Where the context requires, drugs may also include insulin and vaccines.

Government Drug Plans include social insurance programs created by federal, provincial and territorial governments to cover drug expense for certain individuals. The term also includes government programs that absorb the expense of providing drugs to individuals in certain circumstances, such as those in institutions. The term however excludes employee benefit plans created by governments in their role as employers. We deal with these plans together with those of other employers under Private Drug Plans.

Guaranteed Income Supplement (GIS) is a federal income-tested support program for low-income seniors.

Maximums refer to thresholds of annual or lifetime costs for a family or an individual, beyond which a plan will no longer pay benefits.

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NIHB - The Non-Insured Health Benefits program is provided by Health Canada to Registered Indians, Inuit and Innu.

Non-Aboriginal Canadians are all Canadians other than Aboriginal Canadians defined above.

Out-of-Pocket means the amount the insured person pays from his own resources after receiving reimbursement, if any, from a drug insurance plan.

Out-of-Pocket Limit is a feature in some drug insurance plans that waives deductibles and co-payments once the insured has paid a specified amount Out-of-Pocket.

Plan Sponsor is an employer, a group of employers or a union that offers plan benefits to a defined group of beneficiaries.

Poor means having family income below the Statistics Canada Low-Income Cut-Off (LICO). This statistic is an income value used to identify families living in "straitened circumstances". It is calculated by analyzing expenditures on necessities by families. The LICO is set where families are spending about 20% more on necessities than average families. Statistics Canada does not call this a poverty measure although most research on poverty in Canada is calculated using this measure.

Private Drug Plans refer most often to employment related group benefit plans but also include group insurance arrangements sponsored by membership groups and individual insurance policies sold to the general public.

Retiree Coverage refers to coverage provided by employers to former employees and their families. These individuals may be either under age 65 (early retirees) as well as age 65 and over.

Routine means drug expenses of a magnitude that is relatively common but sufficiently high to be at least financially inconvenient to most Canadian families. The term is also used more narrowly in describing coverage quantified by use of the First Dollar Index which addresses specifically the first \$1,000 of annual expense.

Seniors are individuals aged 65 and over.

Social Assistance is used as a generic term for provincial and territorial means tested programs designed to provide the minimum necessities of life for those without other income resources.

Under-Insured is used in conceptual contexts to indicate an individual whose insurance coverage is inadequate. When associated with statistical estimates, the term refers to an individual who falls below a certain cut off on one of the three measurement indices used in this analysis.

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Un-Insured is used in conceptual contexts to indicate an individual who has no insurance coverage. When associated with statistical estimates, the term refers to an individual who falls below a certain cut off on one of the three measurement indices used in this analysis.

Universal is the term used to describe provincial and territorial government plans which cover either all residents or all residents not already covered under other more targeted provincial and territorial plans such as seniors or social assistance.

Working Poor refers to individuals who are poor (defined by the Statistics Canada Low-Income Cut-Off) and who are not on social assistance.

3. SOURCES OF COVERAGE

Drug coverage is available in a number of ways including private employer sponsored group plans and public government programs. (See Table 1)

	Private Plans		Government Plans
C C C	employment benefit plans individual insurance policies affinity related group plans (e.g. university students, professional association)	с с с с с с с	seniors social assistance universal programs available to all residents Aboriginals veterans institutionalized populations, (health related and corrections) military

 Table 1 - Sources of Coverage

Volume 1 of this Report provides descriptive information on these programs.

We note that the *Federal Income Tax Act* provides a non-refundable tax credit for medical expenses which exceed 3 percent of income. Prescription drugs are a qualifying expense as are premiums for drug insurance plans.

While this provision provides some relief to individuals with exceptionally high drug expenses, we do not consider it insurance because it only benefits those individuals with taxable incomes and because the "reimbursement" could be a year or more in the future.

3.1 Government Plans

Federal, provincial and territorial governments all sponsor drug insurance arrangements for groups of their citizens. The following summarizes the features of the major programs.

3.1.1 SENIORS

All provincial and territorial governments offer some form of drug plan coverage for seniors. In provinces with universal programs, seniors generally have some level of financial assistance over and above the coverage available to all residents.

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Newfoundland & Labrador and New Brunswick provide coverage only for low income seniors on federal Guaranteed Income Supplements (GIS) or for those who qualify through another assessment of income. In New Brunswick, all other seniors can obtain coverage from a Blue Cross plan which the province jointly sponsors. The province provides a premium subsidy for lower income seniors.

Nova Scotia provides an optional program to seniors with subsidized premium.

Saskatchewan does not have a program specifically for seniors except for those who receive the GIS. However, those who do not receive GIS have access to the Saskatchewan drug plan available to all residents.

In other provinces, all seniors have provincial drug coverage.

Table 2 shows the number of seniors covered in each province.

Province	Number Covered Under Seniors' Plans	Percentage of Seniors
NF	44,000	72%
PE	18,000	100%
NS	102,000	84%
NB	59,000	61%
QC	901,000	100%
ON	1,352,000	100%
MB	154,000	100%
SK	146,000	100%
AB	277,000	100%
BC	477,000	100%
Total All Provinces	3,530,000	98%
Source: Project Database (See Appendices)		
Note: Excludes permanent residents of nursing homes		

Table 2 - Coverage under Seniors' Plans

3.1.2 SOCIAL ASSISTANCE

Most people on social assistance have coverage for their health needs beyond services covered under the *Canada Health Act*. All provinces provide drug plan coverage to social assistance recipients.

Table 3 shows the numbers of social assistance recipients and their relationship to all children and adults under age 65. Human Resources Development Canada is the source of the data on the number of social assistance recipients. The National Council on Welfare data is the source of estimates of the number of children on social assistance.

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Province	Number Covered Under Social Assistance	Percentage of Population Under age 65
NF	65,000	13%
PE	11,000	9%
NS	86,000	11%
NB	67,000	10%
QC	726,000	11%
ON	1,091,000	11%
MB	73,000	7%
SK	73,000	8%
AB	77,000	3%
BC	297,000	8%
Total All Provinces	2,566,000	10%
Source: Project Database (See Appendices) Human Resources Development Canada (private communication) National Council on Welfare, "Profile of Welfare: Myths and Realities" Spring 1998, page 37.		

Table 3 - Coverage under Social Assistance

3.1.3 UNIVERSAL PROGRAMS

Five provinces have programs which ensure coverage for all residents not covered by seniors or social assistance plans.

- Manitoba, Saskatchewan and British Columbia provide coverage for all residents.
- Québec mandates coverage for all residents either through an employer-sponsored drug plan or through the provincially administered plan.
- Ontario's Trillium Program is a program that provides back up coverage for all residents with high drug costs relative to income.

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In addition, Alberta offers a subsidized premium based plan to any resident who chooses to purchase it. Although coverage is optional, its availability on demand (subject to a waiting period) provides a certain element of universal protection to residents of that province.

Table 4 shows the number of people covered by these programs.

Province	Number Covered Under Universal Programs	Percentage of Population Under age 65
NF	n/a	0%
PE	n/a	0%
NS	n/a	0%
NB	n/a	0%
QC	1,804,000	28%
ON	9,017,000	90%
MB	848,000	86%
SK	792,000	90%
AB "Non Group" Actual Enrollment	130,000	5%
AB "Non Group" Notional Enrollment	797,000	31%
BC	2,723,000	89%
Total All Provinces	16,111,000	61%
Source: Project Database (See Appendices)	
Notes: See Section 2.4 Alberta Special Case All Universal plans cover less than 100% of the population under age 65 since some residents are covered by social assistance and NIHB. In Québec, another 61% are covered by group plans as mandated by provincial law. n/a - Not applicable		

Table 4 - Coverage under Universal ProgramsPopulation Under Age 65

3.1.4 ABORIGINAL POPULATION

Native Canadians receive specific health benefits from the federal government. Registered Indians and eligible Inuit and Innu have drug coverage through the Non-Insured Health Benefits (NIHB) Program,

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Medical Services Branch, Health Canada. The program provides coverage without deductibles and copayments for these beneficiaries.

There are no specific federal or provincial programs targeted to provide coverage for Métis and Non Status Indians. In the Northwest Territories, the territorial government provides Métis and Non Status Indians with coverage similar to what Health Canada provides to Registered Indians and eligible Inuit and Innu except it requires a co-payment.

In other provinces and territories, Métis and Non Status Indians would be eligible for coverage under any plan available to the Non-Aboriginal population.

Table 5 shows the numbers of Aboriginal persons covered by the NIHB program.

Province	Number Covered Under NIHB	Percentage of Provincial Residents	
NF	9,000	2%	
PE	1,000	1%	
NS	12,000	1%	
NB	11,000	1%	
QC	49,000	1%	
ON	144,000	1%	
MB	99,000	9%	
SK	99,000	10%	
AB	79,000	3%	
BC	106,000	3%	
Total All Provinces	607,000	2%	
Source: Project Database (See Appendices) Health Canada - NIHB			

Table 5 - NIHB Coverage

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3.1.5 VETERANS

Qualified veterans have full reimbursement coverage for drugs.

Through agreements with the provinces and territories, the federal government reimburses for the full cost of health care for any service-related disability. In addition, for medical conditions not related to military service, the federal government "tops up" the provincial and territorial coverage or provides direct coverage for those who do not have any access to provincial and territorial government programs.

Since most veterans are now over age 65, this coverage tends to supplement coverage provided by provincial and territorial drug plans for seniors.

Table 6 shows the number of veterans in each province.

Province	Number Covered by Veterans Affairs	Percentage of seniors covered as veterans
NF	4,000	6%
PE	3,000	13%
NS	13,000	10%
NB	9,000	9%
QC	21,000	2%
ON	57,000	4%
MB	9,000	5%
SK	7,000	4%
AB	14,000	4%
BC	31,000	6%
Total All Provinces	168,000	4%
Source: Veterans Affairs Canada		
Note: About 89% of veterans are seniors. To calculate veterans as a percent of seniors 89% are assumed to be seniors in each province.		

Table 6 - Veterans' Coverage

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3.2 Employer Sponsored Plans

Employer sponsored plans provide coverage for employees and their dependents. In some cases, these plans also provide coverage for retired employees.

3.2.1 ACTIVE EMPLOYEES

Employers often make group medical and dental plans available to their employees. The medical component of these plans normally covers prescription drugs.

Coverage for drugs is provided by employers as part of a compensation package necessary to attract and retain employees. In unionized environments, the provision of group benefits is usually part of collective agreements.

Group plans also cover the family of the employee including the spouse and dependent children of the employee.

Table 7 shows the numbers of paid workers covered by group benefits. Table 8 shows the total number of individuals including dependents covered by group benefits.

Coverage levels in Saskatchewan are substantially lower than in other provinces. Two factors tend to explain this.

Across Canada, employer sponsored plans are less common among small employers and are less common within the agricultural sector. The Saskatchewan economy is over-weighted in both areas.

In addition, because the Saskatchewan universal plan was very comprehensive until a few years ago, a number of large employers in the province never had drug coverage in their employee benefit programs. These employers have not yet responded to the recent changes in the provincial programs.
Province	Paid Workers Covered By Employer Plans	Percentage of all Paid Workers		
NF	145,000	66%		
PE	37,000	59%		
NS	238,000	60%		
NB	204,000	60%		
QC	1,906,000	60%		
ON	2,949,000	59%		
MB	286,000	57%		
SK	187,000	45%		
AB	720,000	54%		
BC	921,000	55%		
Total All Provinces	7,593,000	58%		
Source: Project Database (See Appendices) Survey of Work Arrangements - Statistics Canada				

Table 7 - Paid Workers Covered by Employer Sponsored Drug Plans

Province	Number Covered Under Employer Plans (Workers and Family Members)		Percenta	ge of All
	Adults	Children	Adults	Children
NF	226,000	89,000	64%	68%
PE	56,000	25,000	67%	71%
NS	384,000	141,000	65%	64%
NB	312,000	123,000	65%	70%
QC	2,904,000	1,056,000	61%	63%
ON	4,510,000	1,701,000	62%	62%
MB	404,000	156,000	58%	55%
SK	283,000	131,000	48%	48%
AB	1,131,000	470,000	61%	62%
BC	1,376,000	501,000	54%	54%
Total All Provinces	11,585,000	4,394,000	60%	61%

Table 8 - Workers and Family Members Covered by Employer Sponsored Drug PlansPopulation Under Age 65

3.2.2 RETIRED EMPLOYEES

Group programs may also cover individuals retired from these employers. For retirees age 65 and over, the employer sponsored drug plan coverage will normally supplement the provincial/territorial government plan for seniors.

For retired individuals under 65, this may be their primary or only coverage.

Table 9 presents estimates of the number of retired individuals with employer sponsored drug coverage. These estimates were developed within this project (See Appendix 7).

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Province	Number C Under Emple (Retirees and Far	Covered oyer Plans nily Members)	Percentage of all	
	Under 65	Over 65	Under 65	Over 65
NF, PE, NS, NB	48,000	43,000	3%	15%
QC	128,000	146,000	3%	17%
ON	240,000	432,000	3%	31%
MB	22,000	39,000	3%	24%
SK	15,000	35,000	3%	23%
AB	31,000	74,000	2%	26%
BC	50,000	176,000	2%	34%
Total All Provinces	534,000	944,000	3%	26%
Source: Projec	t Database (See Appendices)			
Note: The Atlantic provinces were combined in this analysis because of the small populations involved.				

Table 9 - Retirees and Family Members Covered by Employer Sponsored Drug Plans(By Age)

3.3 Individual Drug Plans

There are no comprehensive data available on how many Canadians have purchased individual drug plan coverage.

Table 10 presents estimates we have made based on statistical information provided by cooperating providers of individual health insurance policies. These estimates include an allowance for individuals who have purchased drug coverage outside of an employer sponsored plan through group insurance policies issued to membership organizations rather than to employers.

These estimates were developed within this project (See Appendix 8).

Some people who purchase individual policies also have employer sponsored group coverage for a variety of reasons but, for the most part, individual policy owners do not have other private coverage.

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Province	Number Covered Under Individual Insurance Plans		Percentage of all	
	Adults	Children	Adults	Children
NF	9,000	1,000	2%	1%
PE	9,000	1,000	9%	3%
NS	16,000	2,000	2%	1%
NB	17,000	-	3%	<.5%
QC	21,000	1,000	<.5%	<.5%
ON	25,000	7,000	<.5%	<.5%
MB	-	-	0%	0%
SK	9,000	3,000	1%	1%
AB	23,000	9,000	1%	1%
BC	44,000	18,000	1%	2%
Total All Provinces	173,000	42,000	1%	1%
Source: Project Database	e (See Appendices)			

Table 10 - Individuals Covered by Individual Drug Insurance PlansPopulation Under Age 65

3.4 Other Categories

For completeness, we deal briefly with the relatively small number of individuals who receive prescription medicines through various institutional arrangements.

For methodological reasons, the analyses presented in the remainder of this report generally exclude these individuals (See Appendix 1).

Approximately 300,000 Canadians live in nursing homes or long-term care facilities and receive financial assistance for drug benefits either directly through provincial and territorial government drug plans or indirectly through funding for nursing home or long term care.

Members of the military receive drugs directly from dispensaries on military bases and do not require insurance coverage. The federal government provides benefits for their families in a similar fashion to benefits provided by private plan sponsors. In 1998, there were 60,000 members of the Canadian Armed Forces.

Prisoners incarcerated in correctional facilities receive drugs directly from the institution.

4. METHODOLOGY AND DATA SOURCES

4.1 Data Sources

We have estimated the number of Canadians with drug plan coverage using data from a number of sources. We list the major ones below noting as well the appendix which provides further information:

Data Source	Appendix
The 1997 Survey of Consumer Finances, 1996 reference year (SCF) from Statistics Canada provides the basic demographic framework for our estimates	1, 9
The 1995 Survey of Work Arrangements (SWA) from Statistics Canada is the major source of information on the prevalence of employer sponsored group plans	1, 9
The 1996 Census provides important data on the distribution of the population by age, sex and region. Census data are also used for estimates of the number of Indians, Métis, Inuit and Innu populations in each province.	1, 3, 4
Administrative data are used to identify for each province the number of social assistance recipients, veteran beneficiaries and Guaranteed Income Supplement recipients.	1, 3
The Federal/Provincial/Territorial Drug Plan Description File, constructed for this project, is the basis for the Government Plan Parameter File.	1 See also Volume 1, Appendix 1
The Employer Plan Statistical File, constructed for this project from private insurance industry data, is the basis for the Employer Plan Parameter File.	1, 5, 6
The <i>Omnitel</i> Survey, conducted for this project using the Thompson-Lightstone Omnitel omnibus survey facility is used to validate the use of SWA data which asked about "health plan" but not directly about "drug plan". This survey also provides data useful in estimating the number of individuals covered by employer sponsored drug coverage for retirees.	1, 5, 7

Table 11 - Data Sources for Project Database

4.2 Methodology

Our estimation of the prevalence and scope of drug insurance coverage involves the steps described below and represented graphically in Chart 8. This process produces the Project Database which models the drug insurance coverage for the entire Canadian population based on the 69,000 survey respondents in the Statistics Canada Survey of Consumer Finances (SCF).

- 1. We "aged" the 1996 Survey of Consumer Finances data to represent the 1998 population. To achieve this, the survey weights for the SCF database were adjusted so that the database matched the characteristics of the 1998 population. Adjustments were made for population growth in each province, age distribution, number of Social Assistance Recipients and labour force status (unemployment rates, etc). As well, incomes were increased by the increase in average wages. (Appendix 3)
- 2. Because the SCF excludes persons living on First Nations reserves, we synthesized survey records to represent this group and reweighted these records to reproduce the Census characteristics of this population segment. (Appendix 4)
- 3. Using the Survey of Work Arrangements, we modeled the relationship between drug coverage and such demographic and labour force characteristics as province, industry, age, sex, job hours and job tenure using statistical regression techniques. (Appendices 1 and 9)
- 4. The employer plan coverage rates were adjusted slightly using the *Omnitel* survey results. Coverage rates were adjusted up or down based on the ratio of reported drug coverage to health coverage from that survey. (Appendix 1)
- 5. We assigned a probability of having employer sponsored coverage to each survey respondent in the Survey of Consumer Finances based on their labour force and demographic characteristics using the regression parameters derived from the Survey of Work Arrangements. Since the Survey of Consumer Finances interviews all individuals age 15 and older in selected families, we used the "key file" from Statistics Canada to reconstruct the original survey families. This allowed us to count individuals who may be covered as family members of a covered worker and to identify duplication of coverage where more than one family member had paid employment. (Appendix 1)
- 6. The above processes transformed the Survey of Consumer Finances data set into the Population File of our Project Database. We then proceeded to construct the Population Coverage File using administrative data from the insurance industry.

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- 7. We randomly assigned Employer Plan Stereotypes to those records with imputed Employer Plan coverage with probabilities weighted to match the observed frequencies in each region of the country. Employer Plan Stereotypes are simplified plan descriptions which represent the most common features of employer sponsored group plans (Appendices 5 and 6).
- 8. We identified the population eligible for government drug coverage programs based on their demographic characteristics such as age, income, social assistance status and the eligibility rules for these drug plans and assigned corresponding Government Plan Stereotypes to these records.
- 9. We used our Retiree Coverage Model to randomly impute this source of coverage to some of the records without group coverage (Appendices 1, 7). The level of reported pension income was used to create the probability factors.
- 10. We used our Individual Coverage Model to randomly impute this source of coverage to some of the records without group coverage (Appendices 1, 8). The probability factors were based on the purchase of individual life insurance and increased with income up to \$40,000.

The above steps created a model of the Canadian population which predicts who has drug coverage, from what source and with what payment parameters.

- 11. We then computed the values of the First Dollar Index, Last Dollar Index and Ability to Pay Index for each respondent.
- 12. The estimated coverage and coverage parameters derived in steps 7 to 11 comprise the Population Coverage File.
- 13. Finally, we linked the Population File and Population Coverage File to produce the various measures of Under-Insurance.





4.3 Developing the Plan Parameter Files

In the previous section, we outlined the process of assigning membership in specific drug insurance plans to records in the Project Database. The specifics of the coverage provided by these plans are provided in the Plan Parameter files. The two major files are the Government Plan Parameter File and the Employer Plan Parameter File. A Parameter File was also developed for Individual Plans.

The Government Plan Parameter File contains coded information on deductibles, co-payment and other reimbursement mechanisms used by government plans. The source is the Federal/Provincial/Territorial Plan Description File which is a text file compiled for this project from information provided by the jurisdictions. It is included as Appendix 1 in Volume 1 of this report.

The Employer Plan Parameter File contains similar data used to compute reimbursements from private plans. In order to provide an estimate of plan payment provisions for the individuals in the SCF database, we condensed data from thousands of different plans into a limited number of "Plan Stereotypes" representing the most common plan designs and analyzed their frequency by province.

Table 12 presents the amount of approximation involved in the mapping onto Plan Stereotypes.

We note that although the Mapping Table allows for 13,122 different combinations of the plan variables, only 34 combinations actually appeared in the mapping of 81,000 records in the Employer Plan Statistical File. This result is indicative of the competitive pressures which push employers to use a limited range of commonly accepted plan designs.

Although the mapping procedure involves some loss of precision, it increases the reliability of the probabilistic process of assigning plan descriptions to the SCF sample which is being used to represent the entire Canadian population.

	Percent of Cases Where			
Parameter	Actual Values exactly equal Stereotype Value	Approximated Actual Values are within range of Stereotype Values	Approximated Actual Values are outside range of Stereotype Values	
Deductible	71%	29%	< .5%	
Co-payment Type	98%	2%	0%	
Co-Payment Amount	77%	19%	4%	
Out-of-Pocket Limit	98%	2%	< .5%	
Annual Maximum	97%	2%	1%	
Lifetime Maximum	99%	less than .5%	1%	

Table 12 - Accuracy of Plan Stereotype Mapping

See Appendices 5 and 6 for more detailed descriptions of this process.

The Individual Plan Parameter File is based on the Stereotype concept as well. One or two plan stereotypes were developed for each province based on the most common plan designs sold by the insurance company with the largest market share in that province.

All those with Retiree coverage were assigned a single Plan Stereotype. We chose one of the least generous group plan stereotypes to be conservative in our approach since we had limited data on this source of coverage. Because those with Retiree coverage are relatively well covered by most measures, the choice of Stereotype here has virtually no effect on our conclusions relating to Under-Insurance.

4.4 Precision of Estimates

The construction of the Project Database which underlies estimates presented in this report used a variety of sources including:

- the Census
- government administrative records
- probability sample surveys such as the Survey of Consumer Finances, the Survey of Work Arrangements and the Omnitel survey
- non probability sample surveys, most notably the Employer Plan Statistical File

In all data sources, there is the possibility of data capture error and structural bias in collection methodologies. With survey data, there is the added possibility of sampling error.

The major potential sources of error are:

- interpretation errors among respondents to the Survey of Work Arrangements concerning the existence of employer based group coverage. Lack of respondent knowledge of their own coverage may result in under-reporting. We believe over-reporting is highly unlikely.
- the imputation of family based coverage using family characteristics from the Survey of Consumer Finance and the individual results from the Survey of Work Arrangements relies on statistical relationships rather than actual survey data. We are unable to estimate the magnitude or likely direction of any possible bias in this process.
- because no reliable statistics exist on the prevalence of group coverage of former employees who are now retired, we used estimates derived by modeling data from the Employer Plan Statistical File and the Omnitel survey (Appendix 7).
- the extrapolation from incomplete data of estimates for individual coverage (Appendix 8).

Because the Statistics Canada surveys are quite large, from 20,000 to over 69,000 respondents, sampling errors are of limited concern. Some representative error margins are set out below.

Survey/ Level of Aggregation	Error Margin at 95% Confidence	Error Margin at 99% Confidence	
SWA - Canada	0.6%	0.8%	
SWA - Ontario	1.1%	1.4%	
SWA -Nova Scotia	2.5%	3.2%	
Omnitel - Canada	1.5%	2.0%	
Omnitel - Ontario	3.1%	4.1%	
Omnitel - Atlantic	4.3%	5.7%	
Notes: SWA=Survey of Work Arrangements, Statistics Canada			

Table 13 - Representative Error Marginsin Probability Sample Surveys

More important are the non-sampling sources of error such as how individuals interpret questions or errors in reporting income.

Since estimates for the provincial plans are based on demographic characteristics combined with census data (supplemented in some cases with administrative data), these estimates have very high levels of accuracy.

Coverage rates for employer plans are based on survey data and statistical imputation. The process does not allow a statistically based estimate of error margins and confidence intervals.

Based on our knowledge of the data and processes involved, we estimate that the accuracy of coverage rates for employer plans might be analogous to an error margin of 2 percent with 80 percent confidence.

The estimates for individual and employee sponsored retiree coverage could have a margin of error of 10 to 20 percent since they are based on limited data. However, since the absolute numbers for individual insurance are very small and since much of private plan retiree coverage supplements government plans, the net effect on total estimates of the Un-Insured or Under-Insured would be unlikely to exceed 1 percent.

It is also important to note that, due to a lack of data, all estimates on the Métis and Non Status Indians are based on an assumption that their coverage is similar to those in the general population with similar income and employment characteristics.

5. MEASURES OF UNDER-INSURANCE

There is no generally accepted definition of "under-insurance". As commonly used, the term often combines both objective criteria (the ability to absorb loss) and subjective attitudes (risk tolerance).

We identified three approaches to defining under-insurance for the purpose of this report:

- insurance should allow ready access to necessary medicines without financial barriers (see First Dollar Coverage Index below)
- insurance should protect people from catastrophic financial loss associated with the cost of extremely high cost drug therapies (see Last Dollar Coverage Index below)
- insurance should ensure that the financial burden of necessary medicines does not exceed a given proportion of family income (see Ability to Pay Index below)

Because each of these approaches can be identified in existing social policy and programs, we created three separate numerical indices which might measure the adequacy of existing population coverage against benchmarks consistent with each of these approaches.

Note on Methodology

Each of these indices is based on hypothetical expenditures. It is important to note that, unlike the methodology used in Volume 1 for the "basket of drugs" analysis, the methodology here uses constant **retail** costs rather than constant **factory** costs.

Another difference from Volume 1 is that due to a lack of private sector data, this analysis does not incorporate any modeling of premiums.

Although we use a range of benchmarks within each philosophical approach to present the results of our analysis, we leave the selection of the most appropriate benchmark to the reader.

While the status of "Un-Insured" might appear to be independent of any index of adequacy, in this analysis we consider Un-Insurance as the end point of the Under-Insurance continuum. Thus we define Un-Insurance as a relative condition to be determined within each of the three approaches identified above.

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5.1 First Dollar Coverage Index

The First Dollar Coverage Index is one way to describe the insurance coverage that an individual may derive from a government plan, a private plan or some combination of plans. This index corresponds to the concept that "good plan coverage" should cover most of an individual's drug expenses.

We define the First Dollar Coverage Index as the amount of reimbursement drug plans provide for an individual who incurs \$1,000 of drug expense in a calendar year. An index value of 100 means that the plan covers completely the first \$1,000 of drug expense.

Thus, coverage which scored 100 on this index would completely reimburse the routine drug requirements of most Canadians.

The choice of \$1,000 as a benchmark was based on several considerations:

- It is roughly two or three standard deviations in excess of average individual drug expenditures. Based on actuarial submissions made to the Québec Minister of Health by the insurance industry, we estimate that 90 percent of the population would not exceed \$1,000 of annual drug expense.
- It is not near the deductible thresholds used by major public plans to determine reimbursement levels.
- It represents a level of expense that is a relatively likely and sufficiently inconvenient to make insurance coverage an important consideration.

The value of this index is driven primarily by deductibles and co-payments although Out-of-Pocket limits also have an influence.

The relative distribution of First Dollar Index values is essentially insensitive to small variations from the \$1,000 chosen for the index key value.

For instance, approximately 20 percent of the population falls at either end of the scale - either 0 or 100. These values would not change until the index key value (\$1,000) drops below the \$800 used by BC Pharmacare for most of its population. At this point, a large portion of the BC population would move from low non-zero (Under-Insured) values to zero (Un-Insured).

Increasing the key value has even less impact. A small shift would occur if the key value increased beyond \$1,700 because of the Saskatchewan Pharmacare plan.

The index is calculated by

- subtracting from \$1,000 the amount of any deductibles and co-payments
- applying any annual or lifetime maximums
- applying any Out-of-Pocket limits
- and then dividing this amount by \$1,000 and multiplying by 100 to produce an index value ranging from zero to 100

For exposition purposes, index values lower than 65 were considered Under-Insured. The choice of 65 as a cut off was somewhat arbitrary although it was strongly influenced by the statistical distribution (about 80 percent of the population has higher values while only 10 percent have values in the 1-64 range). However, we also took note of the fact that several major public plans are based on reimbursement levels in the range of 65-75 percent after satisfying a deductible.

Example

Drug Expenses	\$1,000
Subtract Deductible of \$100	900
Subtract Co-pay of 20%	720
Compare to Annual Maximum Not Applicable	720
Compare to Out-of-Pocket Limit = \$750	720
÷ \$1,000 X 100 = Index	72

See Section 6 below for a discussion on the interpretation of index values.

5.2 Last Dollar Coverage Index

The Last Dollar Coverage Index is another way to describe the insurance coverage that an individual may derive from a government plan, a private plan or some combination of plans. This index corresponds best to the technical concept that "good plan coverage" provides protection against catastrophic loss.

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We define the Last Dollar Index as the amount of reimbursement drug plans provide on the last \$1,000 for an individual who incurs \$50,000 of drug expense in a calendar year. An index value of 100 means the individual's plan is completely covering the last \$1,000 of drug expenses.

The choice of \$50,000 was based on the idea that adequate insurance should provide coverage against events that are plausible even if they are rare. Anecdotal evidence from both government and private plan managers indicate that while annual claims in excess of \$25,000 are infrequent, they do occur with predictable regularity.

We also took note of the decision by the insurance industry in Québec which has revised the pooling arrangements required by Québec law in order to provide protection for claims in excess of \$50,000 for all insured groups in addition to lower levels for smaller firms.

An argument might be made for a higher amount or perhaps a lower amount. In fact, because of the distribution of plan designs, the index would behave identically for any reference value from \$26,000 to \$99,000.

The value of this index is driven largely by co-payment features but is very sensitive to the existence of annual or lifetime maximums.

The Last Dollar Index is calculated by

- calculating reimbursement amounts for both \$50,000 and \$49,000 and finding the difference
- then dividing this amount by \$1,000 and multiplying by 100 to produce an index value ranging from zero to 100

For exposition purposes, index values lower than 100 are considered Under-Insured. The choice was based on a belief by the authors that virtually no one has the financial resources to pay significant portions of a \$50,000 drug bill.

Example

Drug Expenses	\$50,000	\$49,000	
Subtract Deductible of \$100	49,900	48,900	
Subtract Co-pay of 20%	39,920	39,120	
Compare to Annual Maximum Not Applicable	39,920	39,120	
Compare to Out-of-Pocket limit = Not applicable	39,920	39,120	
Find the difference			800
÷ \$1,000 X 100 = Index			80

Example

Drug Expenses	\$50,000	\$49,000	
Subtract Deductible of \$100	49,900	48,900	
Subtract Co-pay of 20%	39,920	39,120	
Compare to Annual Maximum Not Applicable	39,920	39,120	
Compare to Out-of-Pocket limit = \$750	50,000-750= 49,250	49,000-750= 48,250	
Find the difference			1,000
÷ \$1,000 X 100 = Index			100

See Section 7 below for a discussion on the interpretation of index values.

5.3 Ability to Pay Index

The Ability to Pay Index approaches the issue of under-insurance subjectively based on the circumstances of each individual. It is based on the concept that "good plan coverage" will prevent undue financial hardship.

We define this index as the amount of Out-of-Pocket expense which is required from an individual who incurs \$1,000 of drug expense in a calendar year divided by family income. The index is expressed as a percent.

This index is based on a \$1,000 of annual drug expense for the same reasons presented for the First Dollar Index and in order to maintain internal consistency within this report.

For exposition purposes, values of 2.5 percent and higher were considered to represent inadequate insurance and values of 4.5 percent and higher were considered analogous to being Un-Insured. The choice was influenced by the 3 percent threshold used for the Medical Care Tax Credit in the federal *Income Tax Act* (which covers all medical expenses in addition to drugs) as well as by the statistical distribution.

Given the construction of this index, it is impossible for a person with family income of over \$40,000 to exceed the 2.5 percent cut off labeled as Under-Insured and impossible for a person with family income of over \$22,222 to exceed the 4.5 percent cut off labeled as Un-Insured.

Examples

Family Income	\$20,000	\$50,000
Individual Drug Expenses	\$1,000	\$1,000
Subtract Deductible of \$100	900	900
Subtract Co-pay of 20%	720	720
Compare to Annual Maximum Not Applicable	720	720
Compare to Out-of-Pocket limit = \$750	720	720
Out-of-Pocket to Individual	280	280
Divide by Family Income = Index	1.4%	0.6%

See section 8 for more information on the interpretation of this index.

While this index is a useful tool for exploring the relationship of drug plan coverage to income, it has a number of methodological limitations of which the reader should be aware.

- Because the index is based on two attributes of an individual, plan coverage and income, and has an open ended scale, the index is relatively unstable compared to the other Indices.
- The choice of benchmarks is more arbitrary since the statistical distribution does not present significant spikes or voids.
- The index compares the exposure to risk of Out-of-Pocket expenditure of an individual to family income. It does not measure the total exposure of a family. Consequently, the index is insensitive to family size. Two individuals with the same plan coverage and same family income would score identically on this index. However, the larger family would be exposed to greater total burden than a smaller family (unless the plan reimburses 100 percent). Total exposure increases with the number of individuals in the family while family income is, by definition, fixed.
- The scale has only one fixed end point (zero). The other (maximum) end point varies depending on the individual's family income and is equal to the index key value of \$1,000 divided by family income. Thus, as income increases, the range of possible

values shrinks. It is impossible for a person with family income of over \$40,000 to exceed the 2.5 percent cut off labeled as Under-Insured and impossible for a person with family income of over \$22,222 to exceed the 4.5 percent cut off labeled as Un-Insured.

Family Income	Minimum Index Value Out-of-Pocket = 0	Maximum Index Value Out-of-Pocket =1,000
\$10,000	0.0%	10.0%
\$20,000	0.0%	5.0%
\$30,000	0.0%	3.3%
\$40,000	0.0%	2.5%
\$50,000	0.0%	2.0%
\$100,000	0.0%	1.0%

Table 14 - Ability to Pay Index Maximum Values

• Because of rounding, this index inherently measures variations in plan coverage with less precision than the First Dollar and Last Dollar Indices. The latter indices always have 101 possible values (0 to 100). The Ability to Pay Index at family income = \$20,000 has only 51 values available (0.0, 0.1,...2.5) and the range of values decreases with increasing income.

6. RESULTS - First Dollar Coverage Index

This section analyses the quality of drug insurance coverage among the Canadian population from the perspective of first dollar coverage and will answer the following questions

- how many people have full reimbursement coverage for routine drug therapy?
- how many people have less than full reimbursement coverage?
- how many people have no effective coverage?
- what are the characteristics of those who are Un-Insured and those who might be considered Under-Insured?

Succeeding sections will examine the quality of coverage question from the perspective of the Last Dollar Index and the Ability to Pay Index.

The perspective of first dollar coverage has important implications for:

- access to medication
- general health of the broader population
- compliance with prescribed therapies
- appropriate allocation of resources to hospital based care and community based care

Our primary analytical tools are the Project Database and the First Dollar Index defined in section 5.1.

6.1 Interpretation of Index Values

The interpretation of these index values requires some care. In particular, we point out that an Index Value of zero does not mean that there is no plan coverage but only that there is no coverage of the first \$1,000 of annual drug expenses. For example, for many people, the First Dollar Index value for the Ontario Trillium Plan is zero because this plan is designed to cover expenses that exceed a certain percentage of income and would pay nothing for the first \$1,000 of annual expense.

Furthermore, the Index is computed based only on the deductible, co-payment and maximum features of plans. The Index does not measure breadth of formulary and consumer choice features which may involve extra cost to the consumer even if the plan coverage scores 100 on the Index.

The following table shows sample index values and their interpretation.

First Dollar Index Value	Interpretation
0	Drug plans provide no reimbursement for the first \$1,000 of annual drug purchases. The individual pays the entire \$1,000 Out-of-Pocket. This may indicate that the individual has no coverage or that there is coverage but the annual deductible exceeds \$1,000.
15	Drug plans reimburse 15% (\$150) of the first \$1,000 of annual drug purchases. The individual pays \$850 Out-of-Pocket. Typically, an index value at this level indicates that the drug plan coverage has deductibles and possibly co-payments.
80	Drug plans reimburse 80% (\$800) of the first \$1,000 of annual drug purchases. The individual pays \$200 Out-of-Pocket. This index value would describe a plan with no deductible and a 20% co- payment. It would also describe a plan with a combination of modest deductibles and co-payments.
100	Drug plans reimburse 100% of the first \$1,000 of annual drug purchases. The individual pays nothing. This index value would describe a plan with no deductible and no co-payments.

Table 15 - Interpretation of First Dollar Index Values

6.2 Range of Values - First Dollar Coverage Index

Table 16 shows the distribution of First Dollar Index Values for the Canadian population represented in the Project Database and Chart 9 shows the actual values.

Index	Values	Percentage of Population	Cumulative Totals	
100		11%	11%	
90-99		15%	26%	
80-89		29%	55%	
70-79		19%	74%	
60-69		7%	81%	
50-59		3%	84%	
40-49		1%	85%	
30-39		1%	86%	
20-29		1%	87%	
10-19		4%	91%	
1-9		0%	91%	
0		10%	101%	
Source:	Project Data	ıbase		
Notes:	First Dollar Index measures the percentage of costs covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding			

Table 16 - Range of First Dollar Index Values among Total Population

Some observations from Chart 9 below:

- the values are not smoothly distributed there are several spikes at both the 100 and the 0 values as well as at a number of intervening values
- most of the distribution lies in the 65 to 100 range the 1-64 value range is sparsely populated
- 11 percent of the population would have full reimbursement of routine drug expenses while 10 percent would have no reimbursement
- 26 percent would pay no more than \$100 of \$1,000 of their routine drug expense Out-of-Pocket (i.e. index values \$90)
- 73 percent would pay no more than \$300 Out-of-Pocket (i.e. index values \$70).

It is also clear from Chart 9 that the selected cut off value of 65 is at the lower boundary of the densest portion of the distribution of index values.



Chart 9 - Distribution of First Dollar Index Values

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6.3 Results by Province - First Dollar Coverage Index

There are substantial variations by province due in large part to the design of provincial programs for seniors, people on social assistance and the balance of the population.

Table 17 shows the cumulative proportion of the population covered for 65 percent, 90 percent and 100 percent of routine drug expenses. The table also identifies the segment of each province's population with limited coverage (less than 65 percent) and those with no effective coverage for these expenses.

Some observations from this table:

- Saskatchewan has the highest proportion of population covered with an Index Value of 100 (25 percent) due to part to the large proportion of its population covered by NIHB while Ontario and Québec have the lowest (7 percent).
- for an Index Value of 90 or higher, Manitoba and Saskatchewan have the highest proportion of population covered (34-36 percent) while Nova Scotia, New Brunswick and Québec are below the national average (15-18 percent versus 25 percent)
- for an Index Value of 65 or higher, all provinces are close to 75 percent except for Québec (100 percent) and Saskatchewan (59 percent)
- for an Index Value of 0, indicating no effective coverage for routine expenses, Saskatchewan and the Atlantic provinces have more than 20 percent of their residents in this category
- Manitoba, Saskatchewan and British Columbia, due to the effect of public plans with high deductibles have the highest proportion of population with index values in the range 1-64
- in Alberta, 27 percent have no coverage but are given an index value in the 1-64 range because government coverage is available on request subject to a brief waiting period (Sec Section 2.4 Alberta Special Case).

Province	e	Values equal to or greater than: (Cumulative)				Va equa (Non-Cu	lues al to: mulative)
		100	\$90	\$65		1 to 64	0
NF		22%	24%	79%		0%	21%
PE		17%	21%	69%		9%	22%
NS		12%	15%	77%		0%	23%
NB		12%	17%	76%		0%	24%
QC		7%	18%	100%		0%	0%
ON		7%	30%	76%		6%	18%
MB		21%	34%	76%		13%	11%
SK		25%	36%	59%		18%	23%
AB		13%	22%	73%		27%	0%
BC		15%	25%	68%		32%	0%
Total Populatio	n	11%	25%	80%		10%	10%
Source: Pr	ojec	et Database (See A	ppendices)				
Notes: Fi ar Co Pe In gc St	 Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. In Alberta, 27% actually have no coverage but are given an index value in the 1-64 range because government coverage is available on request subject to a brief waiting period (Sec Section 2.4 Alberta Special Case). Without this assumption, Alberta would appear as below 						
AB		13%	22%	73%		0%	27%

Table 17 - First Dollar Index by Provinceamong Total Population

Table 18 below takes a closer look at those who do not have coverage or have relatively little coverage under the First Dollar Index. Many of these people may however have adequate coverage for more serious levels of expenditure, an issue which will be examined in the next section.

Approximately 3 million people have relatively little coverage for routine drug expenses and 2.9 million have none. Nearly 80 percent of these individuals live in Ontario, Alberta and British Columbia (which account for 60% of the total Canadian population) while 9 percent live in the Atlantic provinces (8 percent of the total Canadian population).

Of the 2.9 million without any coverage on this measure, 70 percent live in Ontario. This is a consequence both of Ontario's large population (37% of the total Canadian population) and of its higher than average rate of Un-Insureds.

Province	"Under-Insured" Values =1 to 64		"Un-In Valu	"Un-Insured" Value = 0		"Under-Insured" plus "Un-Insured"	
	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un- Insured	
NF	-	0%	114,000	4%	114,000	2%	
PE	12,000	< 0.5%	30,000	1%	43,000	1%	
NS	-	0%	208,000	7%	208,000	3%	
NB	-	0%	167,000	6%	167,000	3%	
QC	-	0%	-	0%	-	0%	
ON	630,000	21%	2,048,000	70%	2,677,000	45%	
MB	147,000	5%	126,000	4%	273,000	5%	
SK	183,000	6%	232,000	8%	415,000	7%	
AB	797,000	26%	-	0%	797,000	13%	
BC	1,287,000	42%	-	0%	1,287,000	22%	
Total	3,055,000	100%	2,925,000	100%	5,980,000	100%	
	(10% of population)		(10% of population)		(20% of population)		
Source: Project Database (See Appendices)							
 Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. In Alberta, 797,000 people actually have no coverage but are given an index value in the 1-64 range because government coverage is available on request subject to a brief waiting period (Sec Section 2.4 Alberta Special Case). Without this assumption, Alberta would appear as below 							
AB	-	0%	797,000	21%	797,000	13%	

Table 18 - First Dollar Index by Provinceamong those Under-Insured and Un-Insured (from Table 17)

6.4 Results by Gender - First Dollar Coverage Index

There are no significant differences between males and females in quality of coverage as measured by this index. This results from the fact that most insurance plans, both government and private, cover family units which most often include both males and females. While not shown here, the parity of genders persists across age groups.

Gender	Values equ (C	al to or great Cumulative)	Values eq (Non-Cum	ual to: ılative)		
	100	\$90	\$65	1 to 64	0	
Male	11%	25%	80%	10%	10%	
Female	11%	26%	80%	10%	9%	
Total Population	11%	25%	80%	10%	10%	
Source: Project Database (See Appendices)						
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.						

Table 19 - First Dollar Index by Genderamong Total Population

6.5 Results by Age

There are differences in quality of coverage by age group:

- Only 1 percent of seniors have no coverage on this index
- Children are slightly better covered than adults under age 65. Since children normally have the same coverage as their parents, this implies that adults without children have poorer coverage than those with children.
- There is a deterioration in coverage at age 55 as adults start to withdraw from the labour force.
- Those aged 18-24 are the most likely to have poorer coverage in the 1-64 range.

Age	Values equal to or greater than: (Cumulative)				Values equal to: (Non-Cumulative)		
	100	\$90	\$65		1 - 64	0	
0	12%	26%	79%		11%	10%	
18-24	11%	22%	75%		14%	11%	
25-34	11%	24%	77%		12%	11%	
35-44	11%	24%	80%		10%	10%	
45-54	12%	23%	80%		9%	11%	
55-64	9%	19%	73%		13%	14%	
65 +	5%	36%	95%		3%	1%	
Total Population	11%	25%	80%		10%	10%	
Source: Project Database (See Appendices)							
Notes: The First Dollar Index values measure the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.							

Table 20 - First Dollar Index Values by Ageamong Total Population

Approximately 25 percent of those with limited or no coverage for routine drug expenses are children with most of the remainder being adults under age 65. As indicated above, children are slightly less likely than adults under 65 to have limited or no coverage. Seniors generally have better coverage than others and make up only 3 percent of those with limited or no coverage.

Age	"Under-Insured" Values =1 to 64		"Un-In Valu	sured" e = 0	"Under-Insured" plus "Un-Insured"		
	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un-Insured	
0	777,000	25%	721,000	25%	1,491,000	25%	
18-24	392,000	13%	309,000	11%	700,000	12%	
25-34	535,000	18%	526,000	18%	1,062,000	18%	
35-44	504,000	17%	531,000	18%	1,036,000	17%	
45-54	375,000	12%	427,000	15%	803,000	13%	
55-64	354,000	12%	369,000	13%	723,000	12%	
65 +	125,000	4%	41,000	1%	166,000	3%	
Total	3,055,000	100%	2,925,000	100%	5,980,000	100%	
	(10% of total population)		(10% of total population)		(20% of total population)		
Source: Project Database (See Appendices)							
 Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. 							

Table 21 - First Dollar Index Values by Ageamong those Under-Insured and Un-Insured (from Table 20)

6.6 Results by Labour Force Status - First Dollar Coverage Index

There is little difference in coverage between full time and part time workers although part time workers are somewhat more likely to have little or no coverage. Some of the similarity in rates for full time and part time workers is probably a consequence of part time workers securing coverage through their full time spouses (or vice versa, although this is less likely).

Those not in the labour force, a group which includes seniors or social assistance recipients, tend to have better coverage.

Labour Force	Values equal to or greater than: (Cumulative)				Values equal to: (Non-Cumulative)	
Status	100	\$90	\$65		1 - 64	0
Full-Time Full Year	12%	22%	80%		9%	11%
Part-Time or Part Year	10%	21%	75%		13%	12%
Did Not Work	8%	31%	85%		8%	6%
Total Population Age 15 and Older	10%	25%	80%		10%	10%
Source: Project Database (S	ee Appendices)				-	
Notes: First Dollar Index me expenses. Coverage estimates a Percentages may not Excludes children ur	easures the percentag are as of 1998. add to 100 due to ro ader age 15.	ze of expenses cover	ed by drug plans fo	or the f	irst \$1000 of ann	ual drug

Table 22 - First Dollar Index Values by Labour Force Statusamong Population Age 15 and Older

Because of their weight in the population, full time workers make up the largest segment of those with little or no coverage for routine drug expenses.

Labour Force	"Under-Insured" Values=1 to 65		"Un-Insured" Value=0		"Under-Insured" plus "Un- Insured"		
Status	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un-Insured	
Full-Time Full-Year	872,000	36%	1,079,000	46%	1,952,000	41%	
Part-Time or Part Year	846,000	35%	742,000	32%	1,588,000	34%	
Did Not Work	684,000	28%	516,000	22%	1,200,000	25%	
Total Population age 15+	2,402,000	100%	2,337,000	100%	4,739,000	100%	
Source: Project Database (See Appendices)							
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. Excludes children under age 15.							

Table 23 - First Dollar Index Values by Labour Force Status among those Under-Insured and Un-Insured (from Table 22)

6.7 Results by Industry - First Dollar Coverage Index

The level of drug coverage varies with the industry in which someone works. The proportion of individuals at or above an index value of 65 ranges from 92 percent for public administration to a low of 56 percent for agriculture. These variations are driven largely by variations in the existence of coverage by employer sponsored group insurance plans by industry.
Industry	Values ec	jual to or gre (Cumulative	(1	Values e Non-Cur	equal to: nulative)			
	100	\$90	\$65	1	1-64	0		
Public Admin.	14%	27%	92%		3%	5%		
Manuf non-durable	11%	25%	87%		4%	8%		
Manuf durable	11%	25%	86%		5%	9%		
Last Work 5yr+	8%	32%	86%		8%	6%		
Comm. Service	12%	23%	84%		8%	8%		
Fin., ins., r.e.	12%	24%	84%		7%	10%		
Never Worked	9%	28%	83%		9%	8%		
Trans. cumm. utilities	12%	24%	82%		9%	9%		
Other Primary	15%	24%	79%		13%	8%		
Wholesale Trade	12%	22%	74%		12%	14%		
Retail Trade	10%	19%	73%		14%	14%		
Pers. Service	10%	19%	71%		17%	12%		
Bus. Service	9%	17%	68%		15%	17%		
Construction	10%	19%	67%		17%	16%		
Agriculture	8%	16%	56%		24%	20%		
Total Population age 15 and older	10%	25%	80%		10%	10%		
Source: Project Database (See Appendices)								
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. "The table is sorted on Index Value \$ 65. Last Work 5vr+" are individuals who have been out of the labour force for more than 5 years.								

Table 24 - First Dollar Index Values by Industry
among Total Population (age 15 and over)

"Never Worked" are individuals who have never held paid employment.

When we examine the significance of industry in terms of the actual numbers of people with little or no coverage for routine drug expenses, we find a different ranking. Those not currently working are the largest component of people with little or no coverage for routine drug expenses followed by Retail Trade and Business Service.

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Industry	"Under-Insured" Values=1-64		"Un-Iı Val	nsured" ue=0	"Under-Insured" plus "Un-Insured"		
	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un- Insured	
Public Admin.	28,000	1%	43,000	2%	72,000	2%	
Other Primary	44,000	2%	29,000	1%	73,000	2%	
Finance, insurance, real estate.	59,000	2%	81,000	3%	140,000	3%	
Manuf non-durable	49,000	2%	97,000	4%	146,000	3%	
Manuf durable	63,000	3%	98,000	4%	161,000	3%	
Wholesale Trade	87,000	4%	104,000	4%	191,000	4%	
Transportation, communication, utilities	100,000	4%	106,000	5%	206,000	4%	
Agriculture	120,000	5%	101,000	4%	221,000	5%	
Construction	160,000	7%	153,000	7%	313,000	7%	
Never Worked	211,000	9%	175,000	7%	385,000	8%	
Pers. Service	260,000	11%	183,000	8%	443,000	9%	
Comm. Service	237,000	10%	243,000	10%	480,000	10%	
Bus. Service	251,000	10%	279,000	12%	531,000	11%	
Retail Trade	266,000	11%	265,000	11%	531,000	11%	
Last Work 5yr+	467,000	19%	380,000	16%	847,000	18%	
Total Population age 15 and older	2,402,000	100%	2,337,000	100%	4,739,000	100%	
Source: Project Database (See Append	dices)						
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.							

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6.8 Results by Family Status - First Dollar Coverage Index

There are only subtle differences in the quality of coverage by family type:

- families with children are more likely to be Un-Insured (compared to Husband-Wife only families and Unattached Individuals)
- single parent and dual parent families are more likely than others to have full reimbursement coverage

Family Status	Family Status Values equal to or greater than: (Cumulative)			Values eq (Non-Cum	ual to: ulative
	100	\$90	\$65	1 - 64	0
Husband-Wife only	9%	27%	83%	8%	8%
Husband-Wife with Children only	12%	23%	80%	8%	11%
Lone-Parent Families	12%	32%	77%	14%	9%
Other Husband-Wife families	9%	24%	78%	11%	11%
All other Families	9%	26%	74%	14%	12%
Unattached Individuals	8%	26%	79%	15%	6%
Total Population	11%	25%	80%	10%	10%
Source: Project Database (See Appendices	3)				
Notes: First Dollar Index measures the performance of the expenses. Coverage estimates are as of 1998 Percentages may not add to 100 d "Economic families" are used for or marriage contributing economi "Other Husband and Wife Families" spouse. "All other Families" would include	ercentage of expe ercentage of expe lue to rounding. the above analys cally to a comme es" would includ le an individual r	rnses covered by sis. An "econor on household. le a married cou raising a grandc	y drug plans for th nic family" consis uple living with the	e first \$1000 of annua sts of individuals relate e parents or siblings of	al drug ed by blood f either

Table 26 - First Dollar Index Values by Family Statusamong Total Population

Those in two-parent nuclear families, because of their weight in the population, constitute nearly half of all individuals with little or no coverage for routine drug expenses.

Unattached individuals make up 14 percent of those with little or no coverage for routine drug expenses and those in lone parent families make up 11 percent.

Family Status	"Under-Insured" Values=1-64		"Un-I Va	nsured" lue=0	"Under-Insured" plus "Un-Insured"		
	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un- Insured	
Husband-Wife only	481,000	16%	485,000	17%	966,000	16%	
Husband-Wife with children only	1,236,000	40%	1,630,000	56%	2,866,000	48%	
Lone-Parent Families	391,000	13%	269,000	9%	661,000	11%	
Other Husband-Wife families	179,000	6%	169,000	6%	348,000	6%	
All other Families	150,000	5%	130,000	4%	280,000	5%	
Unattached Individuals	617,000	20%	242,000	8%	860,000	14%	
Total Population	3,055,000	100%	2,925,000	100%	5,980,000	100%	
Source: Project Database (See Appendices)							
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.							

Table 27 - First Dollar Index by Family Statusamong those Under-Insured and Un-Insured (from Table 26)

6.9 Results by Income Level - First Dollar Coverage Index

Those earning less than \$20,000 are the least likely to be Un-Insured. Only about 2 percent have no coverage, compared to those with higher incomes, whose rates range from 9 percent to 13 percent.

The most likely to be Under-Insured are those earning under \$30,000, with Under-Insurance frequencies of 15-18 percent compared to 4-10 percent for higher income individuals.

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Family Income	Values equal to or greater than: (Cumulative)				Values e (Non-Cun	qual to: nulative)	
	100	\$90	\$65		1 - 64	0	
1,000-9,999	14%	34%	82%		15%	3%	
10,000-19,999	10%	31%	80%		18%	2%	
20,000-29,999	9%	23%	74%		16%	10%	
30,000-39,999	10%	23%	76%		10%	13%	
40,000-49,999	11%	24%	80%		8%	12%	
50,000-59,999	12%	23%	81%		7%	12%	
60,000-69,999	10%	24%	82%		6%	12%	
70,000-79,999	12%	25%	84%		5%	10%	
80,000-89,999	13%	25%	85%		4%	11%	
90,000-99,999	12%	27%	86%		5%	9%	
100,000 +	11%	23%	83%		5%	12%	
Total Population with11%Income over \$1,000		25%	80%		10%	10%	
Source: Project Database (See Appendices)							
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. Individuals with incomes under \$1,000 or negative incomes are excluded.							

Table 28 - First Dollar Index Values by Income Levelamong Total Population

6.10 Results by Poverty Status - First Dollar Coverage Index

The poor have better coverage than the non-poor in terms of actual plan provisions, without any consideration of ability to pay. Coverage relative to ability to pay is discussed in Section 8.

We use the Statistics Canada "Low Income Cut Off" to define "poor" although Statistics Canada does not sanction the use of this statistic as an indicator of poverty. The Low Income Cut Off is the income level at which a family spends 20% more of its income on the necessities of life than the average family of the same size and geographical location.

The poor are more likely to have 100 percent and 90 percent reimbursement than the non-poor.

However, 67 percent of the poor would have to pay \$100 or more Out-of-Pocket if they needed \$1,000 of drugs. Four percent of the poor have no coverage at all for routine drug expenses while 18 percent have Out-of-Pocket deductibles and co-payments exceeding 35 percent of their drug expenses.

Among low income groups, those on welfare are well covered against routine drug expense. Consequently, the "working poor" are more likely, in all provinces other than Québec, to be Un-Insured or Under-Insured for routine drug expense compared to the averages for all poor.

Poverty S	status	Values equal to or greater than: (Cumulative)				Values equal to: (Non-Cumulative)			
		100	\$90	\$65		1 - 64	0		
Poor		12%	33%	79%		18%	4%		
Not Poor		10%	23%	80%		8%	11%		
Total Popula	tion	11%	25%	80%		10%	10%		
Source: Projec	arce: Project Database (See Appendices)								
Notes: First L drug e "Poor" Cover: Percer	 First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. "Poor" indicates those below the Statistics Canada Low Income Cut Off. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. 								

Table 29 - First Dollar Index by Poverty Statusamong Total Population

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The poor make up 21 percent of those with little or no coverage for routine drug expenses.

Poverty Status	"Under-Insured" Values=1 to 64		"Un-Insured" Value=0		"Under-Insured" plus "Un-Insured"		
	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un- Insured	
Poor	1,018,000	33%	221,000	8%	1,238,000	21%	
Not Poor	2,037,000	67%	2,705,000	92%	4,742,000	79%	
Total	3,055,000	100%	2,925,000	100%	5,980,000	100%	
	(10% of total population)		(10% of total population)		(20% of total population)		
Source: Project Database (See Appendices)							
Source: Project Database (see Appendices) Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. "Poor" indicates those below the Statistics Canada Low Income Cut Off. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.							

Table 30 - First Dollar Index by Poverty Status among those Under-Insured and Un-Insured (from Table 29)

6.11 Results by Aboriginal Status - First Dollar Coverage Index

The federal government through the NIHB provides full reimbursement coverage for eligible Inuit, Innu and Registered Indians.

Métis and Non Status Indians are entitled to the same coverage as Non-Aboriginal Canadians in similar socio-economic circumstances with the exception of a targeted program in the Northwest Territories. We note that Métis and Non Status Indians are more likely to have higher rates of complete coverage than Non-Aboriginals (26 percent versus 9 percent). However, they are also more likely to be Under-Insured.

Aboriginal Status	Values equal to or greater than: (Cumulative)				Values e (Non-Cun	qual to: nulative)	
	100	\$90	\$65		1 - 64	0	
Registered Indian	100%	100%	100%		0%	0%	
Eligible Inuit, Innu	100%	100%	100%		0%	0%	
Métis and Non Status Indians	26%	35%	75%		19%	6%	
Non-Aboriginal	9%	24%	80%		10%	10%	
Total Population	11%	25%	80%		10%	10%	
Source: Project Database (See Appendices)							
Notes: First Dollar Index me annual drug expenses Coverage estimates a Percentages may not	 First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. 						

Table 31 - First Dollar Index Values by Aboriginal Statusamong Total Population

While Métis and Non Status Indians are more likely than Non-Aboriginals to have little or no coverage for routine drug expenses, their actual numbers are very small as a proportion of all of those with little or no coverage for routine drug expenses.

Aboriginal Status	"Under-] Values	Insured" =1 to 64	"Un-Insured" Value=0		"Under-Insured" plus "Un-Insured"	
	Number	Percent of all Under- Insured	Number	Percent of all Un- Insured	Number	Percent of all Under- and Un- Insured
Registered Indian	-	0%	-	0%	-	0%
Eligible Inuit, Innu	-	0%	-	0%	-	0%
Métis and Non Status Indians	39,000	1%	11,000	<0.5%	50,000	1%
Non- Aboriginal	3,016,000	99%	2,914,000	100%	5,930,000	99%
Total	3,055,000	100%	2,925,000	100%	5,980,000	100%
Source: Project Database (See Appendices)						
Notes: First Dollar Index measures the percentage of expenses covered by drug plans for the first \$1000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.						

Table 32 - First Dollar Index by Aboriginal Status among those Under-Insured and Un-Insured (from Table 31)

7. RESULTS - Last Dollar Coverage Index

This section analyses the quality of drug insurance coverage among the Canadian population from the perspective of catastrophic coverage and will answer the following questions

- how many people have full reimbursement coverage for drug costs exceeding the ordinary
- how many people have less than full reimbursement coverage
- how many people have no effective coverage
- what are the characteristics of those who are Un-Insured and those who might be considered Under-Insured

The perspective of catastrophic coverage has important implications for:

- access to medication for the seriously ill
- the financial security of individuals
- appropriate allocation of resources to hospital based care and community based care

Our primary analytical tools are the Project Database and the Last Dollar Index defined in section 5.2.

7.1 Interpretation of Index Values

The interpretation of index values requires some care. In particular, we point out that a Last Dollar Index Value of zero does not mean that there is no plan coverage, although this is the most common case, but only that there is no coverage for the last \$1,000 of high annual drug expenses. For example, there might be an annual or lifetime maximum that restricts reimbursement for large claims.

Furthermore, the Index is computed based only on the deductible, co-payment and maximum features of plans. The Index does not measure breadth of formulary and consumer choice features which that may involve extra cost to the consumer even if the plan coverage scores 100 on the Index.

It is also important to emphasize that this index does not measure the total reimbursement of Out-of-Pocket expenses associated with a high claim, only those associated with the last \$1,000 of a very large expense. In many plans, individuals will pay deductibles and co-payments on initial expenses before qualifying for full reimbursement of succeeding expenses.

This index focuses on whether an individual's drug insurance plans will prevent serious burden if that individual incurs high levels of drug expense.

Last Dollar Index Value	Interpretation
0	Drug plans provide no reimbursement for annual drug purchases between \$49,000 and \$50,000. The individual pays the entire \$1,000 Out-of-Pocket. This indicates either that the individual has no drug plan coverage or that there is coverage but the annual maximum is less than \$49,000.
80	Drug plans reimburse 80% (\$800) of the annual drug purchases between \$49,000 and \$50,000. The individual pays \$200 Out-of-Pocket. This index value would almost certainly describe a plan with a 20% co-payment.
100	Drug plans reimburse 100 percent (\$1,000) of the annual drug purchases between \$49,000 and \$50,000. The individual pays nothing. This index value would most likely describe a plan with no co-payment but might result from coverage under two or more plans.

Table 33 - Interpretation of Last Dollar Index Values

7.2 Range of Values - Last Dollar Coverage Index

Table 34 shows the distribution of Last Dollar Index Values for the Canadian population represented in the Project Database.

Some observations from this table:

- very few values are actually populated (This is, in part, a consequence of our methodology which has mapped all private plan co-payments onto either 100 or 80. However, this mapping affects only 23 percent of private plan participants and does not affect public plan participants.)
- 92 percent of the population would have full reimbursement of the final portion of their high level drug expenses
- 4 percent would pay 20 percent of the final portion of their high level drug expenses
- 3 percent would have no reimbursement and would be required to pay the entire portion Out-of-Pocket

Index Values	Percentage	Cumulative Totals					
100	92%	92%					
80	4%	97%					
0	3%	100%					
Source: Pro	Project Database (See Appendices)						
Notes: Las exp \$1, Co Per rou	Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding						

Table 34 - Range of Values - "Last Dollar Index" (Total Population)

7.3 Results by Province - Last Dollar Coverage Index

The Atlantic provinces and Alberta are the only provinces where many residents have little or no protection against extremely high drug expenses.

In all other provinces (Ontario, Québec, Manitoba, Saskatchewan, and British Columbia) all residents score 100 on this index due to public plans and programs that ensure full reimbursement coverage after certain levels of drug expense.

As noted in Section 2.4, we have made some assumptions about the Alberta government plans. With regard to catastrophic expense, we have assumed (based on information from Alberta) that the published maximums of \$25,000 are routinely and consistently waived. Without these assumptions, the number of Un-Insured reported in Alberta would be substantially higher.

Province		V	alues equal to)	
		100	80	0	
NF		53%	19%	29%	
PE		53%	18%	29%	
NS		54%	17%	29%	
NB		50%	19%	31%	
QC		100%	0%	0%	
ON		100%	0%	0%	
MB		100%	0%	0%	
SK		100%	0%	0%	
AB		64%	25%	11%	
BC		100%	0%	0%	
Total All Provinces		93%	4%	3%	
Source:	urce: Project Database (See Appendices)				
 Notes: Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding In Alberta, 27% actually have no coverage but are given an index value of 100 because government coverage is available on request subject to a brief waiting period (Sec Section 2.4 Alberta Special Case).Without this assumption, Alberta would appear as below 					
AB	AB 37% 25% 38%				

Table 35 - Last Dollar Index Values by Provinceamong Total Population

7.4 Results by Gender - Last Dollar Coverage Index

There are no significant differences in the coverage of males and females under this index.

Gender	Values equal to			
	100	80	0	
Male	93%	4%	3%	
Female	93%	4%	3%	
Total Population	93%	4%	3%	
Source: Project Database (See Appendices)				
Notes: Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding				

Table 36 - Last Dollar Index Values by Gender among Total Population

7.5 Results by Age- Last Dollar Coverage Index

There are no differences in coverage by age other than those over age 65 who have better coverage than non-seniors.

Age	Values equal to			
	100	80	0	
0	92%	4%	4%	
18-24	92%	4%	4%	
25-34	92%	4%	4%	
35-44	92%	5%	4%	
45-54	92%	4%	4%	
55-64	92%	4%	4%	
65 +	100%	0%	0%	
Total All Ages	93%	4%	3%	
Source: Project I	ct Database (See Appendices)			
Notes: Last Dol covered l annual dr A small values of Coverage Percentag	The end of th			

Table 37 - Last Dollar Index Values by Ageamong Total Population

7.6 Results by Labour Force Status - Last Dollar Coverage Index

The full time and part time employed have similar levels of coverage for catastrophic levels of drug expense (92 percent and 91 percent).

Those who do not work have the highest level of coverage (96 percent). This group includes individuals on social assistance and most of those over age 65.

Labour Force	Values equal to			
Status	100	80	0	
Full-Time Full-Year	92%	5%	3%	
Part-Time or Part Year	91%	5%	5%	
Did Not Work	96%	2%	2%	
Total Population Age 15 and Older	93%	4%	3%	
Source: Project Database (See Appendices)				
Notes: Last Dollar Index drug plans on the l Coverage estimates Percentages may n	Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding			

Table 38 - Last Dollar Index Values by Labour Force Status among Population Age 15 and Older

7.7 Results by Industry - Last Dollar Coverage Index

There are few significant differences in Last Dollar Coverage by industry; most values vary between 90 percent and 96 percent. The major exception is Other Primary (which includes mining, forestry and fishing), where coverage for catastrophic levels of drug expense is significantly below other industries at 75 percent.

Industry	Valu	Values equal to		
	100	80	0	
Last Work 5yr+	96%	2%	2%	
Manuf durable	96%	3%	2%	
Never Worked	95%	2%	2%	
Agriculture	94%	3%	3%	
Finance, insurance, real estate	93%	4%	3%	
Bus. Service	93%	3%	3%	
Manuf non-durable	93%	4%	3%	
Wholesale Trade	92%	4%	4%	
Transportation, communications, utilities	92%	5%	3%	
Construction	91%	4%	5%	
Pers. Service	91%	4%	4%	
Retail Trade	91%	4%	4%	
Community Service	91%	5%	4%	
Public Admin.	90%	6%	4%	
Other Primary	75%	14%	11%	
Total Population Age 15 and Older	93%	4%	3%	
Source: Project Database (See Appendie	Source: Project Database (See Appendices)			
Notes: Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding				

Table 39 - Last Dollar Index Values by Industry
among Population Age 15 and Older

7.8 Results by Family Status - Last Dollar Coverage Index

There are only minor differences among family types. Families composed of husband and wife with children are slightly less likely to have 100 percent coverage than other family types.

Family Status	Values equal to			
	100	80	0	
Husband-Wife only	94%	3%	3%	
Husband-Wife with children only	91%	5%	4%	
Lone-Parent Families	95%	2%	3%	
Other Husband-Wife families	93%	4%	3%	
All other Families	93%	3%	4%	
Unattached Individuals	95%	2%	3%	
Total Population	93%	4%	3%	
Source: Project Database (See Appendices)				
Notes: Last Dollar Index measures the perturbed the last \$1,000 of \$50,000 of ann Coverage estimates are as of 1999 Percentages may not add to 100 c	 Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding 			

Table 40 - Last Dollar Index Values by Family Statusamong Total Population

7.9 Results by Income Level - Last Dollar Coverage Index

There is very little variation by family income levels. The percentage with full reimbursement coverage on the Last Dollar Index varies between 91 percent and 95 percent by income while the percentage with no coverage varies from 2 percent to 4 percent.

Income		Values equal to		
		100	80	0
1,000-10,00	0	95%	1%	4%
10,000-20,0	00	96%	2%	3%
20,000-30,0	00	93%	3%	4%
30,000-40,0	00	92%	4%	4%
40,000-50,0	00	91%	5%	4%
50,000-60,0	00	91%	5%	3%
60,000-70,000		93%	5%	3%
70,000-80,000		92%	5%	3%
80,000-90,000		93%	5%	2%
90,000-100,000		94%	4%	3%
100,000 +		93%	5%	2%
Total Population with Income over \$1,000		93%	4%	3%
Source: Project Database (See Appendices)				
Notes: Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding Individuals with incomes under \$1,000 or negative incomes are excluded				

Table 41 - Last Dollar Index Values by Income among Total Population

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7.10 Results by Poverty Status - Last Dollar Coverage Index

We use the Statistics Canada "Low Income Cut Off" to define "poor" although Statistics Canada does not sanction the use of this statistic as an indicator of poverty. The Low Income Cut Off is the income level at which a family spends 20% more of its income on the necessities of life than the average family of the same size and geographical location.

The poor are more likely to have 100 percent reimbursement than the non-poor. The poor and the non-poor are equally likely to have no coverage.

Poverty Status		Values equal to			
		100	80	0	
Poor		96%	1%	3%	
Not Poor		92%	4%	3%	
Total Population		93%	4%	3%	
Source:	Project Database (See Appendices)				
Notes:	Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. "Poor" indicates those below the Statistics Canada Low Income Cut Off. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding				

Table 42 - Last Dollar Index Values by Poverty Status among Total Population

7.11 Results by Aboriginal Status - Last Dollar Coverage Index

Because of the federal government NIHB program, all Registered Indians and eligible Inuit and Innu have full coverage on this index.

Although rates of non-coverage are similar, Métis and Non Status Indians are more likely than Non-Aboriginal Canadians to have incomplete coverage.

Aboriginal Status	Values equal to			
	100	80	0	
Registered Indian	100%	0%	0%	
Eligible Inuit, Innu	100%	0%	0%	
Métis and Non Status Indians	90%	7%	3%	
Non-Aboriginal	93%	4%	3%	
Total Population	93%	4%	3%	
Source: Project Database	rrce: Project Database (See Appendices)			
Notes: Last Dollar Index by drug plans on expenses. Coverage estimate Percentages may r	Last Dollar Index measures the percentage of expenses covered by drug plans on the last \$1,000 of \$50,000 of annual drug expenses. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding			

Table 43 - Last Dollar Index Values by Aboriginal Statusamong Total Population

8. RESULTS - Ability to Pay Index

This section analyses the quality of drug insurance coverage among the Canadian population from the perspective of ability to pay and will answer the following questions

- how does coverage for routine levels of drug expense relate to need as measured by ability to pay?
- for how many people are Out-of-Pocket drug expenses a relatively large percentage of income?

The perspective of ability to pay has important implications for:

- access to medication
- general health of the broader population
- compliance with prescribed therapies
- maintenance of an adequate standard of living

Our primary analytical tools are the Project Database and the Ability to Pay Index defined in section 5.3.

8.1 Interpretation of Index Values

The Ability to Pay Index is a completely different kind of measurement than the First Dollar and Last Dollar Indices which describe the behaviour of insurance plans in a given situation.

The Ability to Pay Index measures the value of the plan coverage in relation to the financial circumstances of the insured person.

Structurally, this Index is quite different. Unlike the earlier indices which ranged in values from 0 to 100 with 100 being the "good" end, this index starts with 0.0% as the "good" end and increases without limit. The maximum value varies with each person's family income.

Given the construction of this index, it is impossible for a person with family income of over \$40,000 to exceed the 2.5 percent cut off labeled as Under-Insured and impossible for a person with family income of over \$22,222 to exceed the 4.5 percent cut off labeled as Un-Insured.

However, the calculation of the Ability to Pay Index values is relatively straightforward. The tables present Out-of-Pocket drug expenses **after insurance plan reimbursement**, if any, (assuming \$1,000 of annual expenses) divided by gross family income.

It is important to remember that this index as well as the earlier ones measures the coverage provided to individuals in the event they incur drug expenses. This report does not discuss the actual drug expenditures of individuals nor how they were financed.

The Ability to Pay Index tables show higher numbers of people with full reimbursement coverage for drug expense than the First Dollar Index tables although both are based on \$1,000 of annual drug expense. The reason is that, in addition to individuals who truly pay zero Out-of-Pocket, there are a large number of people who would pay approximately \$20 Out-of-Pocket on a \$1,000 of drug expenses. This rounds to zero percent of income for incomes greater than \$40,000.

Ability to Pay Index Value	Out-of for Family	-Pocket / Income of	Notes	
	\$20,000	\$80,000		
0.0%	\$0-9	\$0-39	Essentially full reimbursement coverage.	
0.5%	\$90-109	\$360-439		
1.0%	\$190-209	\$760-839		
1.3%	\$250-269	\$1,000	The \$80,000 individual has no effective coverage for routine expenses.	
2.5%	\$490-509	na	We use this Index Value as our indicator of Under-Insurance	
4.5%	\$890-909	na	We use this Index Value as our indicator of Un-Insurance	
5.0%	\$1,000	na	The \$20,000 individual has no effective coverage for routine expenses.	

Table 44 - Interpretation of Ability to Pay Index Values

8.2 Range of Values - Ability to Pay Index

Chart 10 and Table 45 show the distribution of First Dollar Index Values for the Canadian population represented in the Project Database.

Some observations from this chart and table:

- the values are concentrated at low index values
- greater than 80 percent of the distribution lies in the 0.0 to 2.0 range
- 11 percent of the population would pay more than 2.5 percent of their income Out-of-Pocket in the event they needed \$1,000 of drugs
- 3 percent of the population would pay more than 4.5 percent of their income Out-of-Pocket in the event they needed \$1,000 of drugs





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Ind	ex Values	Percentage	Cumulative Totals					
0		15%	15%					
0.1 to 0.5	5	41%	56%					
0.6 to 1.0)	16%	72%					
1.1 to 1.5	5	9%	81%					
1.6 to 2.0)	6%	87%					
2.1 to 2.5	5	3%	90%					
2.6 to 3.0)	2%	92%					
3.1 to 3.5	5	2%	94%					
3.6 to 4.0)	2%	96%					
4.1 to 4.5	5	2%	98%					
4.6 to 5.0		1%	98%					
5.1 and higher		2%	100%					
Source: 1	Source: Project Database (See Appendices)							
Notes:	Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. Coverage estimates are as of 1998							

Table 45 - Ability to Pay Index Valuesamong Total Population

8.3 Results by Province - Ability to Pay Index

Newfoundland & Labrador, Manitoba and Saskatchewan have the highest proportion of their residents who receive drugs without Out-of-Pocket cost. The rates in Manitoba and Saskatchewan reflect in part the high proportion of their population who are First Nations people covered by NIHB.

Three provinces incorporate income considerations into their universal programs. Manitoba has provincial drug programs designed to ensure that no resident pays more than 3 percent of adjusted family income on drugs. Saskatchewan programs are targeted to keep family drug expenses under 3.4 percent of adjusted family income. In Ontario, the Trillium Program has a deductible equivalent to approximately 4 percent of income.

In other provinces, the proportion of residents exposed to spending more than 4.5 percent of income on drugs ranges from 3 to 7 percent.

Province	Index Values less than or equal to (Cumulative)							More
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		than 4.5%
NF	23%	57%	77%	86%	91%	94%		6%
PE	18%	55%	73%	82%	89%	94%		6%
NS	12%	49%	76%	85%	89%	93%		7%
NB	13%	53%	74%	85%	90%	93%		7%
QC	12%	53%	86%	95%	98%	98%		2%
ON	14%	59%	81%	88%	92%	98%		2%
MB	24%	64%	82%	100%	100%	100%		0%
SK	29%	51%	64%	80%	100%	100%		0%
AB	16%	57%	85%	93%	96%	97%		3%
BC	20%	57%	77%	87%	93%	96%		4%
Total All Provinces	15%	56%	81%	90%	94%	98%		2%
Source: Project Database (See Appendices)								
 Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. 								

Table 46 - Ability to Pay Index Values by Provinceamong Total Population

8.4 Results by Gender - Ability to Pay Index

There are few differences in the Ability to Pay Index values between males and females. Equal numbers of males and females would have to spend more than 2.5 percent of their income on Out-of-Pocket drug expenses.

Gender	Gender Index Values less than or equal to (Cumulative)							More	
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		than 4.5%	
Male	16% 58% 82% 90% 94%		98%		2%				
Female	15%	55%	80%	90%	94%	98%		2%	
Total Population	15%	56%	81%	90%	94%	98%		2%	
Source: Project Database (See Appendices)									
Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.									

Table 47 - Ability to Pay Index Values by Genderamong Total Population

8.5 Results by Age - Ability to Pay Index

Ability to Pay Index values vary by age group. Seniors are less likely than average to have full reimbursement for their expenses.

Individuals aged 18-24 and those aged 55-64 are more likely to have limited or no coverage than other age groups relative to ability to pay.

Age			More						
	0.0%	#0.5% #1.5%		#2.5% #3.5%		#4.5%		than 4.5%	
0	18%	62%	84%	92%	95%	98%		2%	
18-24	15%	52%	74%	82%	88%	93%		7%	
25-34	16%	54%	79%	88%	93%	98%		2%	
35-44	17%	63%	84%	92%	95%	98%		2%	
45-54	18%	63%	83%	91%	95%	98%		2%	
55-64	12%	47%	71%	83%	90%	96%		4%	
65 +	6%	42%	83%	97%	99%	100%		0%	
Total Population	15%	56%	81%	90%	94%	98%		2%	
Source: Project Database (See Appendices)									
 Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. 									

Table 48 - Ability to Pay Index Values by Ageamong Total Population

8.6 Results by Labour Force Status - Ability to Pay Index

As might be expected, full time workers would need to spend less of their income on Out-of-Pocket drug expenses than part time workers despite similar levels of coverage. (See section 6.6).

Part time workers and those who do not work (including seniors) are much more likely as full time workers to have to spend more than 4.5 percent of income on drugs (4 percent versus 1 percent).

Labour Force Status	our Force Values less than or equal to: Status (Cumulative)									
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		than 4.5%		
Full-Time Full Year	18%	67%	87%	94%	97%	99%		1%		
Part-Time or Part Year	15%	53%	77%	86%	91%	96%		4%		
Did Not Work	11%	43%	75%	87%	92%	96%		4%		
Total Population Age 15 and Older	15%	55%	80%	89%	94%	97%		3%		
Source: Project Database (See Appendices)										
Notes: Ability to pay Index in a calendar year. Coverage estimates Percentages may not	 Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. 									

Table 49 - Ability to Pay Index Values by Labour Force Statusamong Population 15 Years and Older

8.7 Results by Industry - Ability to Pay Index

The industries which rank the highest on the Ability to Pay Index are those that offer good benefit plans or good salaries or both. Public Administration workers have the highest index values with Finance and Manufacturing in second and third place.

Agriculture and Personal Services show the lowest levels of coverage relative to income.

The Never Worked and Last Worked over 5 years ago groups rank low on this scale although they are about average on the First Dollar Index indicating that their low score here derives from low incomes rather than lower rates of drug insurance coverage.
Industry	Values less than or equal to: (Cumulative)						Mo
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%	tha 4.5%
Public Admin.	22%	79%	94%	97%	98%	99%	19
Manuf durable	20%	70%	89%	95%	97%	99%	10
Manuf non-durable	18%	69%	89%	95%	97%	99%	19
Finance, insurance, real estate	19%	71%	90%	94%	97%	99%	19
Other Primary	19%	66%	87%	93%	97%	99%	19
Comm. Service	19%	69%	88%	93%	96%	99%	19
Transportation, communication, utilities	19%	68%	86%	93%	96%	99%	19
Wholesale Trade	18%	58%	81%	90%	95%	98%	29
Last Work 5yr+	10%	43%	76%	88%	94%	97%	3%
Construction	14%	49%	76%	87%	93%	97%	39
Retail Trade	15%	55%	79%	87%	92%	97%	39
Bus. Service	13%	51%	77%	87%	92%	97%	3%
Never Worked	12%	45%	73%	85%	90%	95%	5%
Agriculture	10%	35%	68%	84%	93%	98%	29
Pers. Service	13%	48%	73%	83%	89%	95%	5%
Total population 15+	15%	55%	80%	89%	94%	97%	3%
Source: Project Database (See Appen	dices)						•

Table 50 - Ability to Pay Index Values by Industryamong Total Population 15 Years and Older

Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year.

Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.

Sorted on 2.5% of income

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8.8 Results by Family Status - Ability to Pay Index

Married couples with children have the best coverage on this index with childless married couples close behind.

Other families with children including single parent families would pay higher percentages of their income on Out-of-Pocket drug expenses - roughly an additional one percent of income.

Unattached individuals and other families fare most poorly on this measure of coverage with 7 percent of them needing to pay more than 4.5 percent of income for \$1,000 of drug expenditures.

Family Status	Values less than or equal to: (Cumulative)							0
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		4.5%
Husband-Wife only	14%	57%	85%	92%	96%	99%		1%
Husband-Wife with Child only	19%	69%	88%	95%	97%	99%		1%
Lone-Parent Families	13%	42%	73%	84%	89%	97%		3%
Other Husband- Wife Families	12%	50%	76%	86%	90%	94%		6%
All other Families	11%	40%	69%	81%	87%	93%		7%
Unattached Individuals	9%	30%	60%	77%	87%	93%		7%
Total Population	15%	56%	81%	90%	94%	98%		2%
Source: Project Database (See Appendices)								
Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.								

Table 51 - Ability to Pay Index Values by Family Statusamong Total Population

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8.9 Results by Income Level - Ability to Pay Index

Not surprisingly, the Ability to Pay Index varies dramatically with income level. Given the construction of this index, it is impossible for a person with family income of over \$40,000 to exceed the 2.5 percent cut off labeled as Under-Insured and impossible for a person with family income of over \$22,222 to exceed the 4.5 percent cut off labeled as Un-Insured.

Family Income		Values less than or equal to (Cumulative)						
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		4.5%
1,000-9,999	14%	16%	31%	45%	57%	63%		37%
10,000-19,999	10%	26%	59%	79%	85%	97%		3%
20,000-29,999	9%	24%	74%	80%	88%	100%		0%
30,000-39,999	10%	42%	80%	88%	100%	100%		0%
40,000-49,999	12%	64%	83%	100%	100%	100%		0%
50,000-59,999	19%	76%	86%	100%	100%	100%		0%
60,000-69,999	21%	82%	97%	100%	100%	100%		0%
70,000-79,999	22%	84%	100%	100%	100%	100%		0%
80,000-89,999	23%	86%	100%	100%	100%	100%		0%
90,000-99,999	26%	88%	100%	100%	100%	100%		0%
100,000 +	22%	89%	100%	100%	100%	100%		0%
Total Population with Income over \$1,000	15%	56%	81%	90%	94%	98%		2%
Source: Project Database (See Appendices)								

Table 52 - Ability to Pay Index Values by Income Levelamong Total Population

Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year.

Coverage estimates are as of 1998.

Percentages may not add to 100 due to rounding.

Individuals with incomes under \$1,000 or negative incomes are excluded.

Because of the way this index is constructed, high income individuals will tend to have low relative levels of Out-of-Pocket expense even if they lack insurance coverage.

8.10 Results by Poverty Status - Ability to Pay Index

We use the Statistics Canada "Low Income Cut Off" to define "poor" although Statistics Canada does not sanction the use of this statistic as an indicator of poverty. The Low Income Cut Off is the income level at which a family spends 20% more of its income on the necessities of life than the average family of the same size and geographical location.

The Ability to Pay Index varies considerably by poverty status. On the whole, a larger number of poor have to pay a higher proportion of their incomes to cover drug expenses than those who are not poor. For example, 44 percent had to pay more than 1.5%, as opposed to only 13 percent of the non-poor. The disparity is particularly evident for those paying over 4.5 percent (10 percent versus 1 percent).

Poverty Status	Values less than or equal to: (Cumulative)							Over
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		4.5%
Poor	11%	26%	56%	71%	79%	90%		10%
Not Poor	16%	64%	87%	94%	98%	99%] [1%
Total Population	15%	56%	81%	90%	94%	98%		2%
Source: Proje	ct Database (See	e Appendices)						
Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year. "Poor" indicates those below the Statistics Canada Low Income Cut Off. Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding. No one earning more than \$22,000 will pay more than 4.5% of their income on \$1,000 of drug expenses.								

Table 53 - Ability to Pay Index Values by Poverty Statusamong Total Population

8.11 Results by Aboriginal Status - Ability to Pay Index

Considerable differences exist among Registered Indians, Métis and Non Status Indians, and Non-Aboriginals. All Registered Indians and the Inuit score 0% on the Ability to Pay Index (i.e. they pay no Out-of-Pocket expenses). Only 28 percent of Métis and Non Status Indians have coverage this comprehensive. The proportion of Non-Aboriginals who would pay negligible amounts Out-of-Pocket as measured by the Ability to Pay Index is much lower (14 percent).

Aboriginal Status	Values less than or equal to: (Cumulative)							More	
	0.0%	#0.5%	#1.5%	#2.5%	#3.5%	#4.5%		4.5%	
Registered Indian	100%	100%	100%	100%	100%	100%		0%	
Eligible Inuit, Innu	100%	100%	100%	100%	100%	100%		0%	
Métis and Non Status Indians	28%	56%	77%	90%	97%	98%		2%	
Non-Aboriginal	14%	56%	81%	90%	94%	98%		2%	
Total Population	15%	56%	81%	90%	94%	98%		2%	
Source: Project Databa	Source: Project Database (See Appendices)								
Notes: Ability to pay Index measures the percentage of Out-of-Pocket family income required to pay for \$1,000 of drug expenses in a calendar year Coverage estimates are as of 1998. Percentages may not add to 100 due to rounding.									

Table 54 - Ability to Pay Index Values by Aboriginal Statusamong Total Population

9. SUMMARY

The purpose of this report is to estimate the numbers of Canadians who have no insurance for drug expenses (the Un-Insured) or who have inadequate insurance coverage for drug expenses (the Under-Insured) and to describe the socio-economic and demographic characteristics of these individuals.

Using Statistics Canada survey data, government drug plan administrative data and proprietary insurance industry data, we have developed a micro-model of the Canadian population and their coverage for drug expenses. Using this Project Database, we measure the prevalence of Un-Insured and Under-Insured by computing the level of Out-of-Pocket expenses borne by individuals in standardized scenarios after drug plan reimbursement .

Computing the number of Un-Insured and Under-Insured requires a choice of perspective of what constitutes good insurance. There are two fundamental approaches:

- coverage of routine expenses
- coverage of catastrophic expenses

The coverage of routine expenses is measured in this report by the First Dollar Index which computes the proportion of the first \$1,000 of annual drug expenses which is paid for by drug insurance plans. For the purposes of this report, individuals with less than \$650 of reimbursement are considered Under-Insured. Those with no coverage on this measure are considered Un-Insured.

The coverage of catastrophic expenses is measured in this report by the Last Dollar Index which computes the proportion of the last \$1,000 from \$50,000 in annual drug expenses which is covered by drug insurance plans. Individuals with less than \$1,000 of coverage are considered Under-Insured. Those with no coverage on this measure are considered Un-Insured.

Findings from each of these two approaches are summarized in the charts and discussion below.

A supplementary analysis considers the adequacy of insurance relative to one's ability to pay.

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Province	Routine Drug Expenses (As measured by First Dollar Index)			Catastrop Expenses (As Last Dolla	hic Drug measured by ar Index)
	Un-Insured	Under- Insured		Un-Insured	Under- Insured
NF	21%	0%		29%	19%
PE	22%	9%		29%	18%
NS	23%	0%		29%	17%
NB	24%	0%		31%	19%
QC	0%	0%		0%	0%
ON	18 %	6%		0%	0%
MB	11%	13%		0%	0%
SK	23%	18%		0%	25%
AB	0%	27%		11%	0%
BC	0%	32%		0%	0%
Total All Provinces	10%	10%		3%	4%
Source: Pro	ject Database (See	e Appendices)			
Notes: Rot Un- Un- Cat Un- Un-	utine Drug Expens Insured Routine r der-Insured Routin astrophic Drug Ex Insured Catastrop der-Insured Catast	ses = \$1,000 per a neans First Dollar ne means First Do apenses = final \$1 shic means Last D rophic means Last	annum r Index ollar In ,000 o ollar In st Dolla	value of 0 dex values 1 to 64 f \$50,000 total exp ndex value of 0 ar Index values und	enses ler 100

Table 55 - The Un-Insured and Under-Insured(Percent of Total Population)

9.1 Coverage for Routine Drug Costs

Except for those on social assistance and for eligible Inuit and Innu and Registered Indians, an individual's coverage for "routine" drug expenses (defined as relatively likely and sufficiently costly to be inconvenient- i.e. up to \$1,000 per year) is largely determined by his or her province of residence if a senior and by employment status otherwise. In this context, under-insurance means that out-of-pocket expenses would be \$350 or more out of \$1,000 of total annual drug costs.

- About 2.9 million or 10 percent of Canadians are Un-Insured for routine drug costs. An additional 3.0 million (10 percent) are Under-Insured.
- There is substantial variation among provinces in those Un-Insured or Under-Insured for routine costs. Québec is the only province with no one Un-Insured or Under-Insured as defined in this report.
- The Atlantic provinces and Saskatchewan have higher proportions of their populations Un-Insured for routine drug costs, ranging from 21 percent to 24 percent.
- No one in Alberta and British Columbia is Un-Insured; 27 and 32 percent respectively of these provincial populations are designated Under-Insured.
- Ontario residents constitute 70 percent of those Un-Insured for routine expenses and 21 percent of those Under-Insured (versus 37% of the overall Canadian population). This reflects Ontario's large proportion of Canada's total population as well as its higher than average rate of Un-Insured and Under-Insured residents.
- Only about 1 percent of seniors are Un-Insured for routine drug costs; another 3 percent are Under-Insured. In each province, seniors have substantially better drug coverage than other Canadians.
- Compared to the total population, the 55-64 age group has slightly higher proportions Un-Insured (14 versus 10 percent) and Under-Insured (13 versus 10 percent). These higher levels of exposure may be due to early departures from the labour force. Similarly, those between age ages of 18-24 have the highest proportion of Under-Insured (14 versus 10 percent).
- Children have the same rate of coverage as other Canadians. Thus, since children constitute 25% of the Canadian population, they constitute about 25 percent of those Un-Insured or Under-Insured for routine drug costs.

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- The proportion of Canadians Un-Insured and Under-Insured for routine drug costs varies by industry. The Public Administration industrial sector has the lowest rate of Un-Insureds - 5 percent. The highest levels of Un-Insureds are in Construction (16 percent); Business Service Industries (17 percent); and Agriculture (20 percent).
- Those in the income group \$10,000-\$30,000 tend to have a higher percentage of Under-Insureds (16 percent to 18 percent). The level of Under-Insurance then gradually declines to about 5 percent for the highest income categories.
- Registered Indians and eligible Inuit and Innu are well covered due to the federal National Insured Health Benefits (NIHB).
- Métis and Non Status Indians are more likely than Non-Aboriginal Canadians to be Under-Insured because of their income, employment and province of residence characteristics.

9.2 Coverage for Catastrophic Drug Costs

For individuals with catastrophically high drug costs (i.e. relatively unlikely, but extremely high-cost - i.e. \$50,000), Under-Insurance is defined as anything less than full coverage of expenses between \$49,000 and \$50,000.

- About 1 million or 3 percent of Canadians are Un-Insured for catastrophic drug costs. A further 1.3 million or 4 percent of Canadians are Under-Insured for catastrophic drug costs.
- Québec, Ontario, Manitoba, Saskatchewan and British Columbia have public policies or programs that provide full reimbursement coverage for the catastrophic portion of drug costs.
- In the Atlantic provinces, approximately half the population is Un-Insured or Under-Insured for catastrophic drug costs.
- In Alberta, 25 percent are Un-Insured and 11 percent are Under-Insured for catastrophic drug costs.

9.3 Ability to Pay

Individuals can also be considered Under-Insured or Un-Insured if Out-of-Pocket costs for routine drug expenses creates a substantial financial burden (defined in this analysis as exceeding 4.5 percent of gross family income).

- About 2 percent of the population would face a substantial financial burden if they incurred drug costs of \$1,000.
- Residents of the Atlantic provinces are more likely to face a substantial burden. Exposure ranges between 6 percent and 7 percent.
- The risk of substantial burden is more likely to be high for young adults, age 18-24 (7 percent), and for those age 55-64 (4 percent).
- Those who do not work or work part-time are more likely to face a significant burden (4 percent).
- Single people and those in family types other than two parent families are more likely to face a significant cost relative to family income. (3 to 7 percent).
- No one with family income over \$22,000 would face a substantial burden **as defined here** due to routine drug costs of \$1,000. However, some of these individuals have no insurance coverage and could face a substantial burden if drug costs were higher than \$1,000.

9.4 Conclusions

Because Canadians are insured against drug expenses by a multiplicity of overlapping public and private plans, there are no simple determinants of Under-Insurance or Un-Insurance.

Province of residence is the strongest determinant of whether an individual will have adequate coverage against catastrophic drug expenses.

Coverage under employer sponsored group plans (either directly or as a family member) or status as a senior, a person on social assistance or a registered Indian/Inuit/Innu are the primary determinants of whether an individual will have adequate coverage against routine drug expenses.

- While the size of the Un-Insured or Under-Insured population varies depending on how it is defined and calculated, several groups appear less likely to have adequate coverage.
 - Residents of the Atlantic provinces, other than those in targeted government programs (seniors, social assistance) and those in employer sponsored group programs have no protection against catastrophic levels of drug expense.
 - In all provinces, other than Québec, those working part time or in low wage occupations are more likely to be Un-Insured or Under-Insured for routine drug expense compared to the general population under age 65 due to their lower coverage rates under employer sponsored group plans.
 - In all provinces, other than Québec, there is a clear reduction in coverage in the age 55 to 64 group as adults start to withdraw from the labour force and are less likely to have an employer sponsored group plan and do not yet qualify for seniors' programs.
 - Overall, approximately 90 percent of Canadians have some coverage for routine drug expenses.
 - 11 percent of Canadians can obtain routine drug prescriptions without Out-of-Pocket cost, most often from either social assistance or employer sponsored group programs.

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- An additional 69 percent of Canadians have drug plan coverage with relatively modest deductibles and co-payments.
- 10 percent are covered but could be considered Under-Insured since their plan would pay less than 35% of a \$1,000 of annual expense.
- Approximately 10 percent, or 3 million people, are considered Un-Insured for routine drug expenses having no plan coverage or having a plan that would only cover annual expenses higher than \$1,000.
- Should they require unusually expensive drug treatment, 93 percent of Canadians can depend on a combination of public and private drug insurance plans to provide sufficient protection to prevent serious financial hardship. About 4 percent of the population would be considered Under-Insured since their coverage would reimburse only a portion of their bills. The remaining 3 percent are Un-Insured.
- Five provinces (Québec, Ontario, Manitoba, Saskatchewan and British Columbia) have public policies or programs ensuring all residents full reimbursement of catastrophic drug costs beyond some defined threshold. Government programs in Alberta offer residents substantial protection but residents who choose not to enrol may have reduced protection. In the Atlantic provinces, over 25 percent of their residents are without catastrophic coverage and another 25 percent might be considered Under-Insured.

- Among low income groups, those on social assistance are well covered against routine drug expense while the "working poor" are more likely, in all provinces other than Québec, to be Un-Insured or Under-Insured for routine drug expense.
- Seniors have the lowest levels of Un-insurance or Under-Insurance due to targeted provincial government programs in every province. However, because these programs typically have co-payments, seniors also have the lowest level of full reimbursement coverage.
- Aboriginals who are Registered Indians or eligible Inuit and Innu have very good coverage due to the federal Non-Insured Health Benefits program. Métis and Non Status Indians are more likely to be Under-Insured or Un-Insured than the Non-Aboriginal population.

- The estimates presented in this report are derived from a model constructed from a variety of sources including: the Census, government administrative records and probability sample surveys such as the Survey of Consumer Finances. Each of these data sources have their own limitations in terms of validity and reliability.
- Constructing a model from diverse data sources involves the resolution of data definition variances, the use of statistical techniques and the judgement of the authors. Inevitably this process involves the possibility of both statistical and non-statistical error.
- The existence and quality of coverage was based on measurement scales constructed for this analysis. Scales constructed on different principles would yield different estimates.
- The quality of coverage scale was based only on payment mechanisms such as deductibles, co-payments and maximums. There is no consideration of such issues as breadth of formulary, reimbursement processes or cost of premiums.
- There is no commonly accepted definition of the term "Under-Insured". The determination of those Under-Insured in this report is based on cut off points on a continuous numerical scale constructed for this analysis. The use of alternative cutoffs would produce different estimates of those considered Under-Insured.
- Estimates for provinces and demographic sub groups have inherently less precision than the national estimates.
- Due to the limitation of source data, the territories are excluded from most of the analysis presented here.
- Due to a lack of data, all estimates on the Métis and Non Status Indians are based on an assumption that their coverage is similar to those in the general population with similar income and employment characteristics.

References

- 1. <u>Survey of Work Arrangements for 1995;</u> Statistics Canada; reported employer sponsored coverage for "Extended Health Benefits".
- 2. <u>Survey of Consumer Finances for 1996 Incomes</u>; Statistics Canada; Micro-Database used as the fundamental building block for the Project Database.
- 3. <u>1996 Census Data</u>, Statistics Canada; Population by Province by Age Group.
- 4. <u>1996 Census Data</u>, Statistics Canada; Population by Aboriginal Ethnic Origin and Age Group.
- 5. <u>Data on Employment per Population</u> in 1998 compared to 1996; Statistics Canada http://WWW.StatCan.CA/english/Pgdb/Economy/Economic/econ10.htm
- 6. Data Provided by HRDC on the population covered by Veterans benefits by province and the age composition. (Tab 151 and Tab 153 provided by HRDC).
- 7. Data Provided by HRDC on the Population in receipt of OAS and GIS by Province.
- 8. Data Provided by HRDC on the Population in receipt of Social Assistance by Province.
- 9. Data published by the National Council of Welfare on the Number of Children in families receiving Social Assistance. (National Council of Welfare, <u>Profiles of Welfare: Myths and Realities</u>, Spring 1998).
- 10. Medical Services Branch/Non-Insured Health Benefits Program; <u>Annual Report: "Non-Insured</u> <u>Health Benefits Program - 1997-1998"</u>, data on the population in receiving NIHB Benefits.
- 11. <u>Family Expenditure Data 1996</u>, Statistics Canada, the proportion of families with expenditures for individual life insurance by family income groups.
- 12. Omnitel Survey conducted for this project on the reported employer coverage for drug benefits and extended health benefits.
- 13. Database of Employer Plan Stereotypes based on administrative databases compiled by Fraser Group and using the Applied Management Consultants database.
- 14. Drug Insurance Pooling Mechanism proposed by the Insurance Industry to the (Québec) Health Minister, Canadian Life and Health Insurance Association, 1996.

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Appendix 1

Project Database Description and Methodology

Appendix 1 - Project Database Description and Methodology

The "Project Database" is a relational database consisting of the following files

- Population File
- Population Coverage File
- Government Plan Parameter File
- Employer Plan Parameter File (Stereotypes)
- Other Plan Parameter File (Stereotypes)
- Software code used to generate values in the Population Coverage File using the other files

The Population File is derived from the Statistics Canada microdata file "Individuals, Aged 15 years and Over, With and Without Income in 1996" which contains data collected in the 1997 Survey of Consumer Finances (SCF). The SCF surveys all adults in randomly selected households and gathers, in addition, demographic information on all children in those households.

The SCF respondent set includes 69,461 individuals. This file contains income as well as personal and labour-related characteristics of individuals aged 15 years and older. The file also includes children but without any income or labour force data. Using the "key file" from Statistics Canada, we reconstituted the approximately 40,000 households from which these respondents were selected thus allowing estimates of family coverage.

The SCF is a weighted probability sample of the Canadian population: the sampling frame excludes the following:

- residents in the Yukon and Northwest Territories
- residents of First Nations reserves
- inmates of correctional and long term care facilities

The age, income and labour status data in this file were adjusted to reflect the population composition in 1998 (See Appendix 3).

The file was also expanded to include records representing the on reserve First Nations individuals. Flags were added to impute aboriginal status for both on reserve and off reserve people. (See Appendix 4)

While the SCF includes employment status, it does not include any information on employment related benefits. However, information on employment related benefits is available from the Statistics Canada Survey of Work Arrangements.

Using logistic regression techniques, a statistical model was developed predicting the likelihood of having coverage based on:

- province
- age group
- gender
- full-time, part-time status
- industry sector
- job tenure

Further details on the regression analysis can be found in Appendix 9.

We then identified those respondent records in the modified SCF data with a non-zero probability of employment related drug coverage, i.e. those employed. These records were duplicated and the survey weights split in proportion to the probability of having or not having coverage.

Example - Record B has a 61% probability of having group coverage.

Before Processing	Employed	Has Group	Survey Weight
Record A	No	?	100
Record B	Yes	?	100

After Processing	Employer	Has Group	Survey Weight
Record A	No	No	100
Record B1	Yes	No	39
Record B2	Yes	Yes	61

Retiree and individual coverages were handled in a similar way.

All Statistics Canada files used in this analysis are available to the general public subject to standard licencing requirements.

A potential weakness in using the Survey of Work Arrangements to estimate drug insurance coverage from employer sponsored plans is that the SWA does not directly ask about drug coverage. It asks about "a health plan other than provincial medicare".

There is widespread agreement among benefit consultants and insurance company executives that employer health plans almost always cover drugs. However, there seemed to be some risk in assuming that the general public

responding to the SWA would have the same awareness as these key informants.

Consequently, we administered a questionnaire to a random sample of 4,066 Canadians using a commercial omnibus survey facility - Omnitel. The survey was designed to test the hypothesis that respondents with drug coverage would respond positively to a question about "health plans", that is, they would understand that a drug plan is a subset of a health plan.

Table 1

Number of Respondents Reporting Employment related Coverage through own or spouse's employment						
Additional Health Plan Coverage Insurance Coverage for Drugs	55% 60%					
Note: the analysis is based on Yes or No re responses (2%) are ignored.	esponses only. Non-					
Source: Omnitel Survey for Dec. 98 and J	an. 99					

Two questions were asked.

The first question asked if they had health plan coverage other than medicare using the same terminology used in the Survey of Work Arrangements.

The second question asked directly if they had coverage for prescription drugs from an employer plan.

Somewhat surprisingly, more respondents responded yes to a question about drug plan coverage than had said yes to the Additional Health Coverage. This suggests that there is a greater awareness of drug coverage than health coverage.

It was apparent that not all health plans include drug coverage and that this was disproportionately so in Manitoba and Saskatchewan. This finding is consistent with expert observers who note that the introduction of universal plans in these provinces inhibited the inclusion of drugs in employer health plans and with our own observation of plan designs in the Applied Management Database.

Table 2

Proportion of Families with Insurance Coverage for Drugs Among those with Additional Health Plan Coverage		
Canada	92%	
Atlantic	94%	
Quebec	95%	
Ontario	94%	
Man./Sask.	79%	
Alberta	95%	
B.C.	86%	
Source: Omnitel Survey for Dec. 98 and Jan. 99		

The results led us to three conclusions:

- Given the substantial agreement between the responses to the two questions, the SWA provides a reasonable approximation of drug coverage.
- The SWA tends to understate the amount of drug coverage and modest adjustments to SWA coverage rates are indicated (upward in aggregate).
- The specific adjustments vary by province and are negative in Saskatchewan and Manitoba.

The **Population Coverage File** is a set of records corresponding to each record in the modified SCF file with fields identifying the government and private plan coverages in effect and storing the amount of reimbursement generated in certain scenarios. Where an individual is covered by both government and private plans, the government plan coverage is computed first consistent with a general rule that governments plans are first payer. Any uncovered expense is then considered a claim against the private coverage. These coverage indicators and reimbursement amounts are computed and written to the file by a series of SAS program modules.

The **Government Plan Parameter File** contains a list of all government plans with fields indicating the amount of deductibles, co-payments and other features that determine the amount of reimbursement (See Appendix 2). This file was created from information gathered for this project and published in Appendix 1 of Volume 1 of this report. This file is used to determine how much reimbursement would be provided by each government plan.

The **Employer Plan Parameter File** contains a list of Employer Plan Stereotypes with fields indicating the amount of deductibles, co-payments and other features that determine the amount of reimbursement together with probability weights based on province (See Appendices 5 and 6).

Appendix 2

Project Database Record Layouts

The following is a list of the variables used for the various file in the Project Database.

Population File

Based on the Survey of Consumer Finances (SCF), this file contains one record for each survey respondent. The vast majority of these variables come directly from the SCF Individual File supplemented with family summaries which are developed using the SCF Key File.

The only additional information is based on the imputed probability of group coverage based on demographic characteristics

The Variable codes are as they appear in the SCF documentation.

Variable	Label
AGE	Age
AGEGRP	Age Group
CF_INC	Census Family Income - 1996
CF_INC98	Census Family Income - aged to 1998
CF_NUM	Census Family Number
CF_OAS	Census Family OAS/GIS/SPA Income
CF_PEN	Census Family Pensions Income
CF_POOR	Census Family Poverty Status
CF_PROV	Province
CF_REL	Relation to Census Family Head
CF_SA	Census Family SA Income
CF_TYPE	Census Family Type
CF_URB	Census Family Urban/Rural Category
CLASS	Class of Employment
CMA	Census Metropolitan Area
EARNINGS	Individual's Earnings
EDUC2	Education
FTPT	Full-Time/Part-Time Employment
GIS	OAS/GIS/SPA Income
H_AGE	Census Family's Head's Age
H_CLASS	Census Family's Head's Employment Class
H_FTPT	Census Family's Head's Employment Full/Part- Time
H_IND16	Census Family's Head's Employment Industry
H_SEX	Census Family's Head's Sex
H_TEN	Census Family's Head's Tenure
INCOME	Income
INDUST	Industry
IND_NUM	Individual Number
LFATT	Labour Force Attachment
NUM_ADLT	Census Family - Number of Adults
NUM_ELD	Census Family - Number Elderly

Appendix 2 - Project Database Record Layouts

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NUM KIDS
          Census Family - Number of Kids
NUM PERS Census Family - Number of Persons
OAS GIS
          OAS/GIS/SPA Income
PENSIONS Pension Income
POOR
          Poverty Indicator
PROVINCE Province
          Social Assistance Income
SA
SEX
SP_AGE
          Sex
          Census Family's Spouse's Age
          Census Family's Spouse's Income
S CLASS
          Census Family's Spouse's Employment Class
          Census Family's Spouse's Employment Full/Part-Time
S FTPT
S IND16
          Census Family's Spouse's Employment Industry
          Census Family's Spouse's Sex
S SEX
S TEN
          Census Family's Spouse's Tenure
TENURE
          Employment Tenure
TYPE FAM Census Family Type
          Urban/Rural Category
URBAN
          Employment Wages
WAGES
WEIGHT
          Survey Weight
```

The following variables were added to the SCF database. These variables indicate the existence of public coverage (using the variable PLANCODE), and the probability of group coverage. Group coverage, (and Retirement, or Individual Coverage) is captured in two variables CF_GRP which indicates the probability of coverage and GRP_PLN which captures the plan characteristics; deductibles, co-payments and limits.

ABOR	Aboriginal Status - imputed
SA_IMP	Social Assistance Recipient - imputed
CF GRP	Census Family Probability of Group Coverage
GRP PLN	Characteristics of their Group Plan Coverage
PLANCODE	Code for any Public Plan

The Government Plan Parameter File

This file is linked to the Population File as part of the steps in creating the Population Coverage File. When this file is linked, PLANCODE already identifies the public plan for which the individual is eligible. The linkage adds information to the database about the characteristics of that plan.

This Database includes two variables:

PLANCODE The Name of the Public Plan - e.g. "Sask-sa" PARAMTRS The Parameters for each Public Plan including the Deductible, Co-payments and maximums; e.g. "PBL-D100-CPT2-CPA500-L0-AM0-LM100"

Employer Plan Parameter File (Stereotypes)

This file has one record for each province and employer plan stereotype. The employer plan stereotypes are, as described in Appendix 5, of the form "PBL-D100-CPT2-CPA500-L0-AM0-LM100".

The database indicates for each stereotype of an employer plan, the proportion of employees in each province who are covered by that type of plan.

This database is used to impute the parameters of coverage onto the Population file for those individuals which some positive probability of an employer group plan.

The **Population Coverage File** includes the plan characteristics of the population as well as the cost implications of the scenarios tested.

AGE Abor CF_INC CF_POOR CF_TYPE COST1G	Age Aboriginal Status Census Family Income Poverty Status - LICO Family Type Cost to the Group Plan - \$ 1,000
COST1P	Cost to the Public Plan - \$ 1,000
FTPT	Full-Time Part-Time Status
GRP_PLN	The Parameters of the Group Plan
INDEX1	First Dollar Index
INDEX2	Last Dollar Index
INDEX3	Ability to Pay Index
INDUST	Industry
LFATT	Labour Force Attachment
NUM_PERS	Number of Persons in Census Family
PLANCODE	Public Drug Plan
PROVINCE	Province
SEX	Sex
TENURE	Job Tenure
URBAN	Urban Rural Category
WEIGHT	Survey Weight

Appendix 3

"Aging" Source Data to the Year 1998

For Population Aging

The survey weights were adjusted to replicate the estimated population of 30,300,000 for 1998 published by Statistics Canada and its age and gender composition. (http://WWW.StatCan.CA/english/Pgdb/People/Population/demo10a.htm.

As well, population estimates by province were used based on values published by Statistics Canada. (Statistics Canada - The Daily - Sept. 24, 1998).

For Income Growth

Income values were adjusted to reflect the average increase in personal income as reported by National Accounts. Specifically, the value of incomes were increased by 3.7% to account for the average growth between 1996 and 1998. An average value of 1.8% was observed for 1996/1997 (http://WWW.StatCan.CA/english/Pgdb/Economy/Economic/econ03.htm).

For Changes in Social Assistance Case Loads

The survey weights were adjusted to reflect the changes between 1996 and 1998 in social assistance case loads. Data were adjusted to reflect the number in receipt of social assistance as reported by Human Resources Development Canada for March 1998.

For Changes in Employment and Unemployment

The survey weights were adjusted to reflect the changes between 1996 and 1998 in employment rates (http://WWW.StatCan.CA/english/Pgdb/Economy/Economic/econ10.htm). Specifically the weights of those employed full-time was increased by 2.2%; employed part-time by 0.4% and for those unemployed weights were reduced by 10.2%.

Appendix 4

Imputation of Aboriginal Status

Appendix 4 - Imputation of Aboriginal Status

Unfortunately, a significant demographic characteristic is not identified on the Survey of Consumer Finances (SCF). That is the identification of the aboriginal population.

In order to include the aboriginal population in the analysis of drug coverage, it was necessary to include records on the database which represented aboriginal families.

This was done by labeling some records as aboriginal. Government statistics provided the target for the number of aboriginal families in each province. Records were selected at random within each province and identified as aboriginal. The chances of being selected was adjusted based on the known socio-economic distribution of aboriginals compared to other Canadians; for example, low-income families were more likely to be selected.

Having been selected for aboriginal status, the records were identified as either Status, Inuit/Innu or Other (Métis and Non-Status). The identification was again done to match the known numbers in each province based on available Census data.

The creation of "new" aboriginal records on the database did not increase the total population. The survey weight which was associated with the original respondent was split between the two new records; the one identified as aboriginal and the non-aboriginal one. For example, if the original survey weight were 100, it might be split between 2 for the aboriginal record and 98 for the non-aboriginal record.

Appendix 5

Employer Plan Statistical File

The Employer Plan Statistical File was developed for use in this project.

The file has been built up from two main data sources:

- policy administration records from eight insurance companies for employers with less than 1,000 employees
- a proprietary database compiled by Applied Management for employers with 1,000 and more employees (Applied Management Database).

Insurance company data

The insurance company data were gathered specifically for this project.

The eight insurance companies include:

- large and small firms
- commercial and non-profit firms
- national and regional firms.

Company	Characteristics	Employees in I Contributio	Data n
Atlantic Blue Cross	Regional, Non Profit, Mid sized	76,066	7%
Crown Life	National, Commercial, Mid sized	55,316	5%
Empire Life	National, Commercial, Small	50,964	5%
Great-West Life	National, Commercial, Large	450,621	40%
Liberty Health	Regional, Commercial, Large	87,595	8%
Manulife	National, Commercial, Large	221,634	20%
Saskatchewan Blue Cross	Regional, Non Profit, Small	7,648	1%
Standard Life	National, Commercial, Mid sized	175,770	16%
Total All Companies		1,125,614	100%

The market penetration of our group of data contributors varies substantially across the country as shown below. The reason for this is that the drug insurance industry consists of national companies operating in all provinces and regional firms operating only in one region. The major regional firms in Quebec, Manitoba, Alberta and British Columbia are not in our group of contributing firms.

Region	Proportion of Market (Medical Benefit Revenues)	
Atlantic Canada	61%	
Quebec	36%	
Ontario	48%	
Manitoba	41%	
Sask	45%	
Alberta	34%	
B.C.	25%	
CANADA	44%	
Source: Group Universe Report; Fraser Group		
Notes: Private Plans often insure drugs in combination with other medical services. Drug benefits account for approximately 80% to 90% of Medical Benefit revenues.		

Employer Plan Statistical File Sample to Universe Ratios

To increase our comfort in provinces with lower penetration ratios, we conducted brief telephone interviews with major non-contributing carriers in Quebec, Manitoba, Alberta and British Columbia. Executives in each firm firmly stated their opinion that the plan designs of their clients were similar to the plans sold by their competitors.

Applied Management Database

The Applied Management Database is a proprietary database compiled by Applied Management directly from large employer human resource personnel using telephone and mail questionnaires.

Applied Management has attempted to identify and solicit data from all employers in Canada with at least 1,000 employees. The Database does not include data on firms which declined to participate. It is also possible that a few firms of this size were not identified in the survey process.

We estimate that the Applied Management Database represents approximately half of the employers with 1,000 employees and more including the federal government and six of the provincial governments.

Appendix 5 - Development of the Employer Plan Statistical File

The Applied Management Database was used in addition to insurance industry data because large employer plans are typically self-administered and often self-funded. Consequently, the data held by insurance companies on these plans are limited and are sometimes inaccessible due to the technical design of insurance company administrative systems.

Construction of the Employer Plan Statistical File

Data were received from the various contributors as extracts from information system files together with documentation which allowed us to map these data into our record layout. (See below.)

Some fields were not available in all data sources. In some cases, we were able to impute values from other data contained in the submission and from written and verbal qualitative information. The database contains fields which identify data repaired in this manner.

The final Employer Plan Statistical File results from the combination of all individual data contributions.

Data Source	Physical Records	Estimated Employers	Number of Employees
AMC Database	2,117	295	1,985,104
Insurance Carriers	79,204	40,850	1,123,434
Total	81,321	41145	3,108,538

Employer Plan Statistical File Dimensions

The physical records have no intrinsic meaning. A single employer may have from one to several dozen physical records depending on complexities in plan design or in record keeping requirements.

The record layout for this file is presented at the end of this appendix.

Assessment of Representativeness

The Employer Plan Statistical File is drawn from two sources - data contributed by insurance carriers covering employers under 1,000 employees and data from the Applied Management Database covering employers with 1,000 or more employees.

The contributing insurance firms collectively insure an estimated 44% of the employees of employers with less than 1,000 employees. We have assumed that the plan reimbursement characteristics (deductibles, co-payments and maximums) of the remaining 56% do not differ significantly. We believe this assumption is reasonable for our purposes given that:

• employer plan design decisions are made by employers, not insurance companies

Appendix 5 - Development of the Employer Plan Statistical File

- (although very small employers may be limited to a set of specified options)
- employers frequently change from one carrier to another (turnover rates exceed 10% annually)
- employers perceive few differences in the capabilities of carriers and often solicit proposals from a dozen or more insurance companies.
- insurance carriers say they are in competition with virtually every other insurance carrier.

We also note that while Great-West comprises 40% of the exposure, approximately half of this exposure was acquired through the acquisition in the last two years of the London Life and Prudential Insurance books of business. Thus, the data file represents the marketing and underwriting influences of ten firms.

The net effect of these market structures is that one carrier's book of business is very similar to that of any other carrier with respect to those plan features typically determined by the employer such as deductible and co-payment. There are however variations in those features which rely on a carrier's administrative capabilities, such as pay direct mechanisms and managed formularies.

The Applied Management Database has been compiled from mail and phone questionnaires directed at all firms in Canada identified as having 1,000 or more employees. It is estimated that the responding firms represent approximately 50% of all employers in this size range.

Comparison with External Benchmarks

The insurance industry administrative records made available to us provided a minimum of demographic data. Only two characteristics allow for a comparison with external benchmarks.

The first is gender. Although gender information is available for only 50% of the records and only 43% of the employees contained in the Employer Plan Statistical File, the male/female proportions correspond well with general population of those with drug coverage as measured by the Survey of Work Arrangements.

Gender	Employer Plan Statistical File	Survey of Work Arrangements - Individuals with employer health plans
Males	58%	56%
Females	42%	44%
Notes Gender information is available for only 50% of the records and only 43% of the employees contained in the Employer Plan Statistical File.		

Comparison of Gender Composition in Covered Population Percent of Individuals

The second characteristic available for comparison is industry category. 83% of the records and 96% of the employee exposure are coded for industry. However, the comparison is made difficult because we coded the Employer Plan Statistical File following the Survey of Consumer Finances coding scheme while Statistics Canada uses a different scheme in the Survey of Work Arrangements.

Industry	Survey of Work
	Arrangements -
	Individuals with employer
	health plans
AGRICULTURE	0.4%
BUSINESS AND PERSONAL	7.9%
SERVICES	
COMMUNICATIONS	3.4%
COMMUNITY SERVICE	23.5%
CONSTRUCTION	3.2%
FINANCE	7.2%
MANUFACTURING	22.7%
MISCELLANEOUS SERVICE	1.4%
OTHER PRIMARY	2.6%
PUBLIC ADMINISTRATION	9.8%
TRADE	11.8%
TRANSPORTATION	4.3%
UTILITIES	1.9%

Industry	Employer Plan Statistical File
Agriculture	0.4%
Primary	3.3%
Manuf nondurable	5.8%
Manuf durables	9.8%
Construction	1.4%
Trans,Comm,Util	10.8%
Wholesale trade	4.3%
Retail Trade	7.1%
Finance, Insurance, Real Estate	7.7%
Community Serv	10.4%
Pers Serv	0.8%
Bus Misc Serv	5.9%
Public Administration	32.1%

Appendix 5 - Development of the Employer Plan Statistical File

We do know that the Public Administration sector is somewhat over represented in the Employer Plan Statistical File because it includes the entire federal civil service as well as a majority of the provinces compared to roughly half of other industries. Because the health and education sectors are classified differently in the two schemes, we add Community Service to Public Administration below.

Industry	Survey of Work Arrangements	Employer Plan Statistical File
Community Service	23.5%	10.4%
Public Administration	9.8%	32.1%
Sum of Community Service and Public Administration	33.3%	42.5%

In addition, public administration employers have higher levels of retirees relative to active employees than other employers. Retirees are included in the Employer Plan Statistical File but not in the Survey of Work Arrangements.
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Employer Plan Statistical File

FIELDNAME	Size	Definition	Comments
1 SOURCE	8	Carrier	
2 RECNUM	8	Record number assigned by Fraser within a carrier	r, unique
3 ID1	10	Policy	carrier provided ID
4 ID2	5	Division	carrier provided ID
5 ID3	5	Class	carrier provided ID
6 ID	20	Composite of all carrier Ids	,
7 PROV	2	Residence	BC, AB, SK,NS, NF but also Atlantic Provinces = AT
8 SICGIVEN	5	Industry code provided	
9 SIC	2	Industry code we will use	two digit 1980 SIC
10 OCC	2	Occupation imputed to employees	Richard's combined code
11 FIRMSIZE	1	Validity for next field (LOGICAL)	TRUE = actual
12 FIRMSIZE	6	total employees on the policy, all divisions	
13 ERCONTRIB	3	Percent paid by employer	eg 50, 51=contributory but we don't know split, U=not known
WAIT		Validity for next field (LOGICAL)	TRUE = actual
14 WAIT	5	Number of months before	EG. 3.0, 2.5
15 RETIREES	1	retirees covered?	Y="yes" N="no" B="both active and retired", blank = don't know
16 CROSSTAB	1	Validity for next 4 fields (LOGICAL)	false if imputed
17 MS	5	number of employees male single	
18 MF	5	number of employees male family	
19 FS	5	number of employees female	
		single	
20 FF	5	number of employees female	
		family	
21 GENDER_	1	is gender data real (LOGICAL)	faise if imputed
22 MALES	5	Covered Males	
23 FEMALES	5	Covered Females	

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Employer Plan Statistical File

FIELDNAME	Size	Definition	Comments
24 FAMILY_	1	Is family status data real (LOGICAL)	false if imputed
25 SINGLE	5	Covered Single	
26 FAMILY	5	Covered Family	
27 COUNT	6	number of employees	
28 DRUGSONLY	1	Is this a stand alone drug plan	N= EHC plan, U=not known
29 MAXYR	8	Annual Maximum	blank for unlimited,"U" =don't know
30 MAXLIFE	8	Lifetime maximum value	blank for unlimited,"U" =don't know
31 DED_IND	4	Individual deductible	annual value
32 DED_FAM	4	Family deductible	annual value
33 DED_IS_FEE	1	Is the per script deductible = dispensing fee	1=yes, 2= yes plus markup
34 DEDSCRIPT	6	Per scrip _deductible	eg. 7.50, blank if = disp fee
35 COINS_R1	8	Co-insurance Range 1	blank means unlimited
36 COINS_V1	3	Co-insurance Value 1	Percent paid by employee eg. 20
37 COINS_R2	8	Co-insurance Range 2	blank means unlimited
38 COINS_V2	3	Co-insurance Value 2	blank means same as Value 1
39 SCRIPTMAX	5	Maximum Coinsurance per script	blank means no maximum
40 OUTOFPOCK	5	Out_of_Pocket	Maximum paid by employee annually
41 PRE-X	1	Pre_existing condition restriction	Y="yes" N="no" blank = don't know
42 FORMULARY	1	Formulary	P=Any prescribed, R=Requires prescription, M=managed list
43 PAYMETHOD	1	Pay_Method	D = Direct, R= Reimbursement
44 EVIDENCE	1	Is evidence required for coverage	Y="yes" N="no" blank = don't know
45 STEREOTYPE	40 240	Assigned stereotype	

Appendix 6

Development of Employer Plan Stereotypes

Plan Stereotypes are the mechanism used to attach private plan coverage characteristics to the individuals in the Population File.

The Employer Plan Parameter File is a component of the Project Database. It consists of a list of Plan Stereotypes and their relative weights by region.

The Employer Plan Parameter File contains data used to compute reimbursements from private plans. In order to provide an estimate of plan payment provisions for the individuals in the SCF database, we condensed data from thousands of different plans into a limited number of "Plan Stereotypes" representing the most common plan designs and analysed their frequency by province.

Stereotypes are based on the values of five parameters:

- a. Deductible
- b. Co-Payment
- c. Out-of-Pocket Limit
- d. Annual Maximum
- e. Lifetime Maximum

Parameter	Stereotype Values	#Values
Deductible	Nil,\$25,\$100	3
Co-Payment	Nil,20%,\$5 per script	3
Out-of-Pocket Limit	NA, \$750	2
Annual Maximum	\$10,000 or Unlimited	2
Lifetime Maximum	\$25,000 or \$1,000,000	2
Combined		72

Stereotypes are uniquely identified on the File by codes in the form

Grp-D0-CPT0-CPA0-L0-AM0-LM0 Grp-D25-CPT1-CPA20-L0-AM25-LM0 Grp-D100-CPT2-CPA500-L0-AM0-LM100 Grp-D0-CPT0-CPA0-L0-AM0-LM0

"Grp" = Group "Ind" = Individual

The D code is followed by the Deductible in Dollars per year.

Appendix 6 - Development of Employer Plan Stereotypes

The CPT code is followed by an indicator of the type: 0 no co-payment 1 is percentage of claim amount 2 is fixed amount per prescription.

The CPA code is followed by the amount of copay. e.g. 20 for 20% if CPT is 1 500 for \$5 if CPT is 2

The L indicates the out-of-pocket limit - annual X for no limit value of limit if greater than zero.

The AM code is for the Annual Maximum (in \$1,000's) - X if Unlimited

The LM code is for the Lifetime Maximum (in \$1,000's) - X if Unlimited

Each record in the Employer Plan Statistical File is passed through a program that maps the actual values for the parameters onto the available Stereotype parameters (See Mapping Table below). Although the Mapping Table allows for 13,122 different combinations of the five variables, only 34 combinations are needed to code all 81,000 records in the Employer Plan Statistical File. This result is indicative of the competitive pressures which push employers to use a limited range of commonly accepted plan designs.

The Employer Plan Statistical File is then summed for each Stereotype within each province (the four Atlantic provinces are grouped for this analysis).

Each record in the Population File where employer plan coverage was imputed (see Appendix 1) is then cloned and randomly assigned Plan Stereotypes weighted by province.

Parameter	Actual Values	Stereotype Value	Parameter Code
Deductible	zero	0	D0
	1-50	25	D25
	>50	100	D100
Co-payment Type	None	None	СРТО
	Percentage	Percentage	CPT1
	Per Script	Per Script	CPT2
	Combined	Percentage	CPT1
Co-payment Amount	None	None	CPA0
	\$X per script where 0 <x<(< td=""><td>\$5.00</td><td>CPA500</td></x<(<>	\$5.00	CPA500
	All Others	20%	CPA20
Out-of-Pocket Limit	None	None	LX
	All Others	\$750	L750
Annual Maximum	Under \$25,000	\$10,000	AM10
	All Others	Unlimited	AMX
	Unknown	Unlimited	AMX
Lifetime Maximum	Under \$50,000	\$25,000	LM25
	\$50,000 and over	\$1,000,000	LM1000
	Unknown	\$1,000,000	LM1000

Mapping Table for Group Plans

The table below presents the amount of approximation involved in the mapping onto Plan Stereotypes.

		Percent of Cases Where			
Parameter	Actual Values exactly equal Stereotype Value	Approximated Actual Values are within range of Stereotype Values	Approximated Actual Values are outside range of Stereotype Values		
Deductible	71%	29%	< .5%		
Co-payment Type	98%	2%	0%		
Co-payment Amount	77%	19%	4%		
Out-of-Pocket Limit	98%	2%	< .5%		
Annual Maximum	97%	2%	1%		
Lifetime Maximum	99%	less than .5%	1%		

Accuracy of Plan Stereotype Mapping

Appendix 7

Estimates of Retiree Coverage

Appendix 7 - Estimates of Retiree Coverage

Many large and some small employers provide drug expense coverage to former employees who have met certain requirements - often being in receipt of a retirement pension.

For the purposes of this project, we need to distinguish between those under and over age 65. For those aged 65 and over, "retiree coverage" usually supplements coverage under provincial seniors' programs. For those under 65, this may be the primary source of drug expense insurance.

It is important to note that these recipients of "retiree coverage" need not be retired in the conventional sense. Some recipients have taken on new employment after "retiring" from a previous employer.

It is also important to note that "retiree coverage" also provides coverage for the family members of the former employee.

"Retiree coverage" is a significant source of coverage in the population and is particularly important for those in the 55-64 age group and for seniors in the Atlantic provinces.

Unfortunately, there are few sources of data on this element of coverage.

Our estimates in the Project Database assume that 1.5 million people are covered under "retiree coverage". This estimate was created using a strategy of estimating the probable percentage of retired workers with drug coverage to active workers with drug coverage using two methodologies and then applying this percentage to the known count of active workers with coverage.

1. The Employer Plan Statistical File yielded the following information.

Retired to Active Employees by Employer Size

Employer Size (Employees)	Active Employees	Retired Employees	Retired to Active (%)
Under 500	301,784	853	0.3%
500 -999	5,131	404	7.9%
1,000-9,999	967,576	94,573	9.8%
10,000 +	821,298	402,114	49.0%
Total	1,794,005	497,091	27.7%

However, the portion of this file based on insurance company data (under 1,000 employees) is known to under-report retirees. Data from the Applied Management Database for employers 500-999 is more reliable on this issue and shows a retiree to

active percentage of 10.4% (compared to 7.9% for this group in the Employer Plan Statistical File). We concluded the under reporting was not serious. The low percentage in the Under 500 employers is consistent with observations by expert observers.

- 2. The high number of retirees to active employees in the 10,000+ band is heavily influenced by the federal and provincial civil service plans which have a retired to active percentage of 78.6% versus 12.1% for remaining employers.
- 3. Removing the federal and provincial governments from our data because of their atypical retiree levels, we summarized the retired to active employee percentages for the remaining employers as follows (the government retirees are added back later in the process). The groups over 500 employees were compressed to an average of 11.1% weighted by our data exposure for application below. Because of under reporting of both the exposure and percentage in the 500-999 group, the final factor (11.1%) may understate the actual number with "retiree coverage".

Employer Size (Employees)	Retired to Active (%)
Under 500	0.3%
500 -999	7.9%
1,000-9,999	9.8%
10,000 +	12.1%
Total 500+	11.1%

Firm Size	Full time employees	<i>times</i> RETIRED Percentage	<i>equals</i> Estimated Retirees
<20	1,727,253	0.3%	5,182
20-99	1,460,829	0.3%	4,382
100-499	1,634,212	0.3%	4,903
500+	3,726,972	11.1%	413,694
Interim total All Sizes	8,549,266		428,161
fed	350,000		
Total All Sizes	8,549,266	9.1%	778,161

4. These factors were then applied to the number of full time employees reported in the Survey of Work Arrangements.

5. Based on Omnitel data, we assumed that 67 percent of "retirees" have spouses, we conclude that the total with "retiree coverage" is 1,230,000, a percentage of 15.2% compared to the number of full time employees.

The comparable percentage in the Omnitel survey is 19.4%.

We averaged the two values to come up with a factor of 17.3% which yields an estimate of 1,478,000 with retired coverage.

6. In the Omnitel Survey, 31% of those self-identifying as "retired" said they had drug coverage.

7. It was important for our purposes to separate those with retiree coverage between those under age 65 and those over age 65 since the coverage over age 65 usually does not affect the number of Un-Insured or Under-Insured due to provincial senior programs.

Rather than use the average 31%, we relied on the Omnitel survey age distribution of retirees with drug coverage to resolve the 31% as follows:

Age Group	Coverage	Number with retiree coverage
Under age 65	43%	534,000
Age 65 and over	27%	944,000
All retirees	31%	1,478,000

The over 65 number is consistent with census estimates of the number of people over 65 not in the labour force.

8. The total number of estimated persons with coverage under employer sponsored retiree coverage was distributed regionally with the Project Database using the distribution of pension income as an indicator that the individual might have coverage under an employer retiree plan.

Because of the small populations involved, the Atlantic provinces were treated as one region for this analysis.

Appendix 8

Estimates of Individual Policy Coverage

Individual insurance policies make a small contribution to the total amount of drug insurance in Canada. Our estimate is that 216,000 people are covered which is about 0.8 percent of all Canadians with coverage.

Relatively few insurance companies write individual policies covering drug expenses. Within each province, one regional carrier accounts for 75% to 90% of the market. Consequently, we requested and secured, on a confidential basis, statistical and descriptive data on individual policies from:

Atlantic Blue Cross Quebec Blue Cross Liberty Health Manitoba Blue Cross Saskatchewan Blue Cross Alberta Blue Cross Pacific Blue Cross

We also had more limited data from Great-West Life and Desjardins-Laurentian on policies they write.

Our estimates in the Project Database are based on the actual administrative data from the leading seven carriers plus a 20% allowance to accommodate the policies offered by other carriers. This allowance is based solely on the judgement of the authors. The true number could be 10% lower and could be 20% higher.

However, in terms of national and provincial totals, these variances represent less than 0.1 percent of our overall estimates.

In each province, we created one or two Plan Stereotypes based on the most popular plan designs reported by the leading carrier.

Appendix 9

Documentation of Regression Analysis between the Survey of Consumer Finances and the Survey of Work Arrangements

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The Logistic Regression was undertaken using the Survey of Work Arrangements database. This database included about 20,000 observations for paid employees. It included a question about the existence of extended health benefits which might be available from an employer.

The Logistic Regression used the response to this question as the dependent variable.

Readers looking for technical details concerning the Logistic Regression analysis will find the output from the SAS procedure below of interest. As well, an analysis was conducted to test the predictive validity of the logistic regression. The results of the analysis are presented below after the regression output.

The regression analysis was performed using the paid workers included in the Survey of Work Arrangements. The independent variables used in the regression analysis were indicator variables (taking the values of zero or one) for:

Province PROV1-PROV9 - Variables PROV1 is Nfld. PROV2 is P.E.I. PROV3 is N.S. PROV4 is N.B. PROV5 is Oue. PROV6 is Ont. PROV7 is Man. PROV8 is Sask. PROV9 is Alta. PROV10 is B.C. LFSex Sex - Variable 1 is Male 2 is Female Age Group - Variables AGE1-AGE7 AGE1 is 15-16 AGE2 is 17-19 AGE3 is 20-24 AGE4 is 25-34 AGE5 is 35-44 AGE6 is 45-54 AGE7 is 55-64 AGE8 is 65+

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Industry - Variables IND1-IND9

IND1 = AGRICULTURE IND2 = OTHER PRIMARY IND3 = MANUFACTURING IND4 = CONSTRUCTION IND5 = TRANSPORTATION or COMMUNICATIONS or UTILITIES IND6 = TRADE IND7 = FINANCE IND7 = FINANCE IND8 = COMMUNITY SERVICE IND9 = BUSINESS AND PERSONAL SERVICE OR MISCELLANEOUS SERVICE IND10 = PUBLIC ADMINISTRATION

Tenure - Variables TEN1-TEN5 TEN1 = 1-6 MONTHS TEN2 = 7-12MONTHS TEN3 = 1-5 YEARS TEN4 = 6-10YEARS TEN5 = 11-20 YEARS TEN6 = OVER 20 YEARS Full/Part-Time - Variable FT_PT 1 = 30+ HOURS

2 = UNDER 30 HOURS

The Logistic Regression was carried out with the variables indicated. Thus the reference population for the regression was B.C., in Public Administration, with more than 20 years tenure.

By way of commentary, a review of the Logistic Regression output reveals that each of the 32 independent variables was statistically significant in the logistic regression. The significance levels were all below one in 10,000. This level of significance should not be too surprising given the very high sample size in the regression.

These results leave little doubt that the correlations observed in the data between reported extended health coverage and the independent variables are not due to chance.

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The LOGISTIC Procedure

Data Set: WORK.PAID Response Variable: DRUG_COV Response Levels: 2 Number of Observations: 20981 Weight Variable: WEIGHT Sum of Weights: 10919526.374 Link Function: Logit

Response Profile

Ordered Value	DRUG_COV	Count	Total Weight
1	0	8770	4482422.9
2	1	12211	6437103.5

Simple Statistics for Explanatory Variables

		Standard		
Variable	Mean	Deviation	Minimum	Maximum
PROV1	0.014847	2.759081	0.00000	1.00000
PROV2	0.004111	1.459703	0.00000	1.00000
PROV3	0.029247	3.844065	0.00000	1.00000
PROV4	0.023407	3.449256	0.00000	1.00000
PROV5	0.242495	9.777844	0.00000	1.00000
PROV6	0.398216	11.168087	0.00000	1.00000
PROV7	0.037026	4.307852	0.00000	1.00000
PROV8	0.029202	3.841205	0.00000	1.00000
PROV9	0.096268	6.729152	0.00000	1.00000
IND1	0.010137	2.285308	0.00000	1.00000
IND2	0.021008	3.271781	0.00000	1.00000
IND3	0.180659	8.777310	0.00000	1.00000
IND4	0.041647	4.557778	0.00000	1.00000
IND5	0.079146	6.158983	0.00000	1.00000
IND6	0.167499	8.519168	0.00000	1.00000
IND7	0.058071	5.335636	0.00000	1.00000
IND8	0.215107	9.374142	0.00000	1.00000
IND9	0.157553	8.311588	0.00000	1.00000
LFSEX	1.479596	11.397438	1.00000	2.00000
TEN1	0.154755	8.251122	0.00000	1.00000
TEN2	0.073726	5.961839	0.00000	1.00000
TEN3	0.279022	10.232442	0.00000	1.00000
TEN4	0.199880	9.123491	0.00000	1.00000
TEN5	0.185167	8.861661	0.00000	1.00000
AGE1	0.013465	2.629398	0.00000	1.00000
AGE2	0.042990	4.627453	0.00000	1.00000
AGE3	0.105735	7.015212	0.00000	1.00000
AGE4	0.273435	10.168649	0.00000	1.00000
AGE5	0.299788	10.452519	0.00000	1.00000
AGE6	0.195115	9.040900	0.00000	1.00000
AGE7	0.065089	5.627803	0.00000	1.00000
FT_PT	1.192082	8.987229	1.00000	2.00000

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	011001	101 101 11000001	
Criterion	Intercept Only	Intercept and Covariates	Chi-Square for Covariates
AIC	14785884	10596571	
SC	14785892	10596833	
-2 LOG L	14785882	10596505	4189376.7 with 32 DF (p=0.0
Score			3635423.2 with 32 DF (p=0.0

)

)

Criteria for Assessing Model Fit

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July 26, 1999 26

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The LOGISTIC Procedure

Analysis of Maximum Likelihood Estimates

	Parameter	Standard	Wald	Pr >	Standardized
Variable	Estimate	Error	Chi-Square	Chi-Square	Estimate
INTERCPT	-4.0785	0.0127	103884.791	0.0	•
Intercept					
PROV1	-0.0664	0.00670	98.2233	0.0001	-0.100966
PROV2	0.0636	0.0121	27.4132	0.0001	0.051187
PROV3	0.0527	0.00494	114.0651	0.0001	0.111749
PROV4	0.1883	0.00535	1239.0265	0.0001	0.358158
PROV5	0.0642	0.00262	599.8535	0.0001	0.346218
PROV6	-0.0493	0.00245	406.0037	0.0001	-0.303505
PROV7	0.0252	0.00451	31.1277	0.0001	0.059770
PROV8	0.7893	0.00485	26506.4091	0.0	1.671451
PROV9	0.0280	0.00321	76.0221	0.0001	0.103768
IND1	2.5066	0.00900	77623.2740	0.0	3.158171
IND2	0.5757	0.00632	8297.9794	0.0	1.038448
IND3	0.5754	0.00398	20909.5654	0.0	2.784514
IND4	1.5928	0.00489	105975.508	0.0	4.002412
IND5	0.6907	0.00445	24055.8327	0.0	2.345372
IND6	1.3729	0.00396	120479.183	0.0	6.448270
IND7	0.2944	0.00479	3781.7446	0.0	0.866172
IND8	0.5000	0.00391	16324.2963	0.0	2.583893
IND9	1.5838	0.00399	157514.584	0.0	7.257788
LFSEX	0.2297	0.00167	18970.9172	0.0	1.443202
TEN1	2.8312	0.00400	502104.984	0.0	12.879267
TEN2	2.2175	0.00428	267894.177	0.0	7.288670
TEN3	1.7389	0.00365	227100.291	0.0	9.809865
TEN4	1.1996	0.00368	105982.770	0.0	6.033800
TEN5	0.6637	0.00376	31196.6415	0.0	3.242872
AGE1	0.4131	0.0210	387.7872	0.0001	0.598921
AGE2	0.1450	0.0128	128.2506	0.0001	0.370027
AGE3	-0.8151	0.0116	4905.3648	0.0	-3.152604
AGE4	-1.3725	0.0115	14302.7737	0.0	-7.694500
AGE5	-1.3500	0.0115	13901.1203	0.0	-7.780021
AGE6	-1.0915	0.0115	9040.1166	0.0	-5.440382
AGE7	-0.7764	0.0117	4396.3906	0.0	-2.409056
FT PT	1.7761	0.00231	591062.761	0.0	8.800395

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Association of Predicted Probabilities and Observed Responses

Concordant	= 83.7%	Somers' D	=	0.677
Discordant	= 16.1%	Gamma	=	0.678
Tied	= 0.2%	Tau-a	=	0.329
(107090470	pairs)	С	=	0.838

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Assessing the Predictive Validity of the Logistic Regression

The purpose of this statistical analysis is to assess the "predictive validity" of the Logistic Regression.

Methodology

The purpose of this analysis is to assess what variance one might expect from the prediction of coverage using the Survey of Consumer Finances – the SCF. More precisely how much confidence would we have in a statement that we expect X% of a particular population to have group coverage. The result will depend on the sample size, the bigger the group the greater the absolute error and the smaller the relative error we expect. In particular, predicting the extent of drug coverage for a group of five respondents could be quite a "hit or miss" affair – for a population of 1,000 respondents the extent of coverage should be reasonably predictable.

To test the predictive validity of the Logistic Regress the following approach was used. The database was split randomly into two pieces; one was used to fit the regression model, the other was used to assess the predictive validity. That is, the parameter estimates from the regression on the first database were used to predict the outcome for the second database. The assessment of predictive validity was based on comparing the predicted number of respondents with drug plan coverage with the actual number.

Results

The results confirm that for larger populations the average extent of coverage can be predicted with a reasonable level of precision; plus or minus a few percentage points. The error becomes as high as +/-10% when the sample is only 25 observations.

Precision of Logistic Regression for Prediction

Average Population SWA - 95	Average Error
13,048	13.8%
52,204	6.3%
521,538	2.0%
	Average Population SWA - 95 13,048 52,204 521,538

Note: The error is the difference between the predicted and actual outcomes as a percent of the population.

The predicted proportions were compared to the actual for each province. In general the predictions were closer to actual results in larger populations. The result with the greatest error was in Newfoundland where the error was as high as 7%.

Recall that the error is measured as the difference between the predicted proportion of the population with extended health coverage and the actual proportion.

Average Error as a
% of the Population

Total	0.3%
Nfld.	7.1%
P.E.I.	3.1%
N.S.	0.9%
N.B.	0.0%
Que.	3.1%
Ont	2.1%
Man.	1.9%
Sask.	2.8%
Alta.	0.1%
B.C.	0.3%

Note: The error is the difference between the predicted and actual outcomes as a percent of the population.