COST DRIVER ANALYSIS OF PROVINCIAL DRUG PLANS

MANITOBA

1995/96 - 1998/99

Federal/Provincial/Territorial

Working Group on Drug Prices

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EXECUTIVE SUMMARY

- The Federal Provincial Territorial (F/P/T) Task force on Pharmaceutical Prices[1] was established to examine pharmaceutical pricing issues facing provincial drug plans and Canadians in general.
- The study reports on the cost drivers of total pharmaceutical spending in the Government of Manitoba Drug Programs over the period 1995/96 to 1998/99.
- An examination of cost drivers, produced by the Patented Medicine Prices Review Board (PMPRB) on behalf of the F/P/T Working Group on Drug Prices, provides both public and private drug plan managers, policy makers and other stakeholders, including consumers, with a better understanding of the major components that influence annual changes in pharmaceutical spending.
- The focus of the report was to disaggregate annual changes in the cost of drugs into five components: price effect, volume effect, entry of new drugs, exiting drugs and others. A further break out of cost drivers was done by therapeutic class and patent status.
- In the period of 1995/96 and 1998/99 total drug expenditures increased from $122.8 million to $167.1 million. The $44.3 million increase in expenditure represents a 36.1% increase. On average, the change in price levels contributed 3.3% of this increase, volume effects contributed 108.4% and the introduction of new drugs contributed 30.8%. Exiting drugs and interactions of price and quantity changes reduced expenditure by -0.3% and - 42.2%, respectively. The findings demonstrate that utilization and the entry of new drugs accounted for the largest increase in expenditures over the period.
- In 1998/99, drugs that existed in 1995/96 and newer drugs (drugs that were introduced after 1995/96) accounted for 78.1% and 21.9%, respectively, of total expenditure.
- The proportion of total expenditure accounted for by patented drugs increased from 42.7% in 1995/96 to 55.0% in 1998/99.
- Among patented medicines, category 3 drugs made up the largest share of total patented drug expenditures. Of the 55.0% of expenditure accounted for by patented drug products, category 1 products accounted for 16.0% ($26.8 million), category 2 products accounted for 4.8% ($8.0 million), category 3 products accounted for 30.9% ($51.6 million) and older non-categorized patented products accounted for 3.3% ($5.5 M) of total expenditure.
- In 1998/99, drugs in eight Anatomical Therapeutic Chemical (ATC) groups (Alimentary Tract and Metabolism, Cardiovascular Systems, Central Nervous System, Genito-urinary System and Sex Hormones, General Anti-infectives for Systemic Use, Musculo-skeletal

[1] Presently known as F/P/T Working Group on Drug Prices.

System, Respiratory System and Sensory Organs.) accounted for $151.1 million or 90.5% of total expenditures. Three groups - Central Nervous System, Cardiovascular Systems, and Alimentary Tract and Metabolism - accounted for more than 70% of overall expenditure growth. (Individually, these groups contributed 30.5%, 24.8% and 15.1%, respectively.)

- Expenditure growth among second-level ATC classes was also examined . Psychoanaleptics made the largest contribution to overall expenditure growth (14.7%), followed by Agents Acting on the Renin-Angiotensin System (13.6%) and Lipid Reducing Agents (12.6%). Substantial contributions were also noted for Psycholeptics (9.1%) and Antacids (8.8%).

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MANITOBA 1995/96-1998/99

1.0 Introduction

In April 1997, the Task Force on Pharmaceutical Prices[2] prepared an overview paper which provided a description of the pharmaceutical sector in Canada, price and expenditure trends, and existing mechanisms used by private and public payers for regulating and/or influencing pharmaceutical prices.

The Task Force on Pharmaceutical Prices has made progress in the following areas:

- price trend analyses for the period 1990 to 1997 for prescription drug products covered by six provincial drug plans;
- an analysis of the relationship between price levels of generic and brand name drugs over the period 1990 to 1997;
- international price comparisons for the 1996 top selling non-patented single source drug products;
- comparisons of prices of non-breakthrough or non-substantial improvement (category 3) patented drugs introduced in 1995 and 1996 to other medicines in their therapeutic class; and,
- a comparison of prescription drug prices in six provincial drug plans (1990-1997).

This study updates a report on cost drivers of total pharmaceutical spending in Manitoba's drug benefit programs over the period 1995/96 to 1998/99[3]. Information on prices, quantities, total expenditures and market shares were obtained from the Drug Program Information Network (DPIN) database. Health Canada's Drug Product database was used to ensure that only those drugs defined by the *Food and Drug Act* were included. The Health Canada Drug Product database was also used to identify all drug products by their respective ATC classification.

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2 The Task Force has representatives from British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Nova Scotia, Health Canada and the Patented Medicine Prices Review Board. It was established to examine one of six pharmaceutical issues identified at the April, 1996 meeting of F/P/T Ministers of Health. The other issues included utilization, marketing, wastage, consumer education and research and development. The work is overseen by the Pharmaceutical Issues Committee, which reports to the Advisory Council on Health Services (ACHS).

3 The previous study was conducted on a calendar basis and price was calculated at the DIN level. This study is based on a fiscal year and price is calculated at the chemical level, ie. price for a chemical with an identical ingredient, strength, route, schedule and form. This change in definition was adapted in order to more fully capture the substitution within multi-source markets and refine the definition of a new drug.

Finally, the Patented Medicine Prices Review Board database was used to group drugs according to patent status and category.

The report is divided into the following sections: section 2 describes why a study of cost drivers provides important information to all stakeholders in the health care sector; section 3 describes the focal points of the cost driver analysis; section 4 reports on the growth of total drug costs in public and private drug plans for Manitoba over the period 1995/96 to 1998/99; section 5 presents the findings followed by a conclusion in section 6.

2.0 Why Study Cost Drivers?

An examination of cost drivers provides both public and private drug plan managers, policy makers and other stakeholders including consumers with a better understanding of the major components that influence annual increases and trends in pharmaceutical spending. During the 1990's, increases in the annual cost of drugs in Canada was, on average, approximately 10% per year[4]. This growth in total spending was occurring while average annual increases in overall prices was less than 3%[5]. This demonstrates that changes in annual costs of pharmaceuticals are reflective of a combination of many factors. These factors are summarized in Figure 1.[6]

Figure 1

Factors Affecting Total Drug Expenditures

1. Changes in the total population
2. Changes in the demographics and health status of the population (i.e. towards those with increased medication needs)
3. Changes in the unit prices of drugs (both patented and non-patented)
4. Changes in retail and wholesale mark-ups, and dispensing fees
5. Changes in the prescribing habits of physicians (i.e. from older, less expensive medications to newer, relatively more expensive medications [± improved therapeutic effect] to treat the same underlying diagnosis)
6. Changes in utilization of drugs on a per patient basis (i.e. more medications per patient per year)
7. Trends towards using drug therapy instead of other treatments (e.g. as alternatives to surgery in some cases)
8. New diseases to be treated and old diseases to be treated or better treated
9. Extended patent protection, barriers to entry and reduction in competition

While it is difficult to quantify the relative effect that the above factors[7] may have on increases in drug costs, some studies have attempted to do so.[8] These studies have employed different methodologies to assess the impact of the different factors. The main findings from these studies are that price changes represent only one factor which influence changes in the total cost of

4 1994 and 1996 had exceptionally low growth rates of approximately 3%

5 Statistics Canada, CANSIM, Series P200202

6 This figure was partially reproduced from the PMPRB's Discussion Paper, "*Examining the Role, Function and Methods of the Patented Medicine Prices Review Board.*", November 1997.

7 Another factor worth mentioning is the shift to community care over the last several years. In addition to replacing surgery, community based drug plans are experiencing utilization increases because more treatment is taking place in the community, that previously may have required hospitalization. An example of this trend is the growth in community based palliative care.

8 See for example Green Shield Canada *"A Report on Drug Costs",* 1994; Gorecki, P.K., *"Controlling Drug Expenditures in Canada, The Ontario Experience",* 1991; Angus, D.E. et al. *"Sustainable Health Care for Canadians",* 1995*;* and, Brogan Inc. (1998) "Handbook on Private Drug Plans: 1993 - 1996".

drugs. Other important factors include utilization (i.e. changes in the amount of drugs consumed) and the influence from the introduction of new drugs.

3.0 Focus of Report

This analysis attempts to break out annual changes in the cost of drugs into the following major components:

- annual volume (utilization) changes of older and newer drugs;
- annual price changes of older and newer drugs[9];
- annual influence from the introduction of new drugs (patented and non-patented); and,
- annual influence of newer drugs by therapeutic class or disease groups.

This analysis provides some insight into several factors outlined in Figure 1. Each of these factors is examined to assess their individual influence on annual drug cost changes. In other words, an evaluation of what percentage of the increase in annual cost of drugs is attributed to each of the above components will be done.[10] It is important to note that a more detailed review of price levels (rather than annual price change), substitution of older drugs; rapid market penetration of new drugs and trends in treatment costs are areas that need to be considered in much greater detail in further research and analysis.

A further disaggregation of cost drivers by therapeutic class allows an investigation of whether certain disease groups are experiencing proportionately greater increases in annual costs. Furthermore, an investigation of the extent to which new drugs are being substituted for older drugs and the relative cost of new drugs to older drugs can be done. Finally, breaking out the drugs into patented and non-patented drugs allows us to examine drugs by therapeutic novelty. In other words, to what extent is the introduction of new patented drugs that are line extensions (category 1), breakthrough or substantial improvement drugs (category 2) or, moderate, little or no improvement drugs (category 3) influencing annual changes in drug costs.

9 New drugs are defined at the chemical, dose, form and routine level. Generic bioequivalent products are not considered as new drugs in the major component decomposition.

10 See Appendix 1 for methodology details and details on change from previous study

4.0 Trends in Manitoba Drug Expenditures

4.1 General Information

The Government of Manitoba provides prescription drug benefits through the Pharmacare Program, implemented January 1, 1975; Social Allowance Health Services Drug Program (SAHS), implemented in the early sixties; and, the Personal Care Home Drug Program, implemented in January 1, 1973. Manitoba Health Provincial Drug Programs administer all three programs. For detailed information on each plan, please consult Appendix 2.

4.2 Major Program Changes

- In July 1988, Manitoba Health, in response to a request from the Manitoba Society of Pharmacists, agreed to eliminate the regulated maximum allowable dispensing fees and allow for competition in the market place to establish individual pharmacies' dispensing fees for Pharmacare beneficiaries.
- Deductibles increased in the 1990's starting at $163.65 ($92.75 for seniors) in January 1990 to $237.10 ($134.40 for seniors) by early 1996. In addition, in the same time period the co-payments were increased from 30% to 40% for those beneficiaries under 65 years of age and 20% to 30% for those beneficiaries 65 years of age and over.
- In July 1994, the Drug Program Information Network (DPIN) was implemented to provide point-of-sale, "real time" fiscal and clinical adjudication for prescriptions for beneficiaries of the Pharmacare, Personal Care Home and Social Allowance Health Services Drug Programs. The system also provides information related to drug interactions to pharmacists filling prescriptions on the system.
- The Pharmacare Program changed to an income based program on April 1, 1996. The Income-based Pharmacare Program mandates an annual application for benefit coverage and provides 100% financial assistance in excess of a pre-set deductible for eligible prescription drugs. The deductible is determined for each family unit on the basis of total family income - 2% for those with a family income up to $15,000.00 per year (minimum $100.00 deductible); 3% for those with family income greater than $15,000 per year. The family income is based on line 150 (gross income) of Revenue Canada's Assessment form, and includes the gross income of each spouse with an adjustment of $3,000.00 for each dependent child under 18 years and the spouse where applicable. Concurrent to the introduction of the Income based program, the Pharmacare benefit year was changed from a calendar year basis (January to December) to a fiscal year basis (April to March).
- In 1997, the Manitoba Drug Standards and Therapeutics Committee (MDSTC) changed from a bi-annual review schedule to a quarterly review schedule to ensure that appropriate drug benefits were made available to Manitobans on a timely basis.

4.3 Total Retail Private and Public Drug Expenditures[11]

Since the early 1980s, drug expenditures in Manitoba, as in the rest of Canada, have been the fastest growing component of total health care spending. In 1997 expenditures grew by 6.6% and 5.5% in 1998. These rates are faster than the annual rate of inflation, as measured by the Consumer Price Index (CPI) during this period.

In 1998 total retail spending on prescription drugs was $353.1 million which was divided into public spending at $157.4 million and private spending at $195.7 million.[12] . The provincial plan's (Pharmacare, Social Allowances Health Services and Personal Care Home Drug Programs) portion or public (Expenditures of Prescription Drug Plans) portion was $85.2 million or 54% of total public expenditures in 1998. Public (other) comprises the remaining 46% or $72.2 million, which represents drug expenditures in hospitals and federal programs. Total retail spending (public and private spending including OTC drugs) was $465.1 million in 1998. Spending on prescription drugs was 76% of total retail spending.

Over the years, the share of total public spending as a part of total spending has fallen. In 1995, total public spending accounted for 39.8% of total spending. In 1998, total public spending accounted for 33.8% of total spending.

4.4 Factors Affecting Pharmaceutical Expenditures

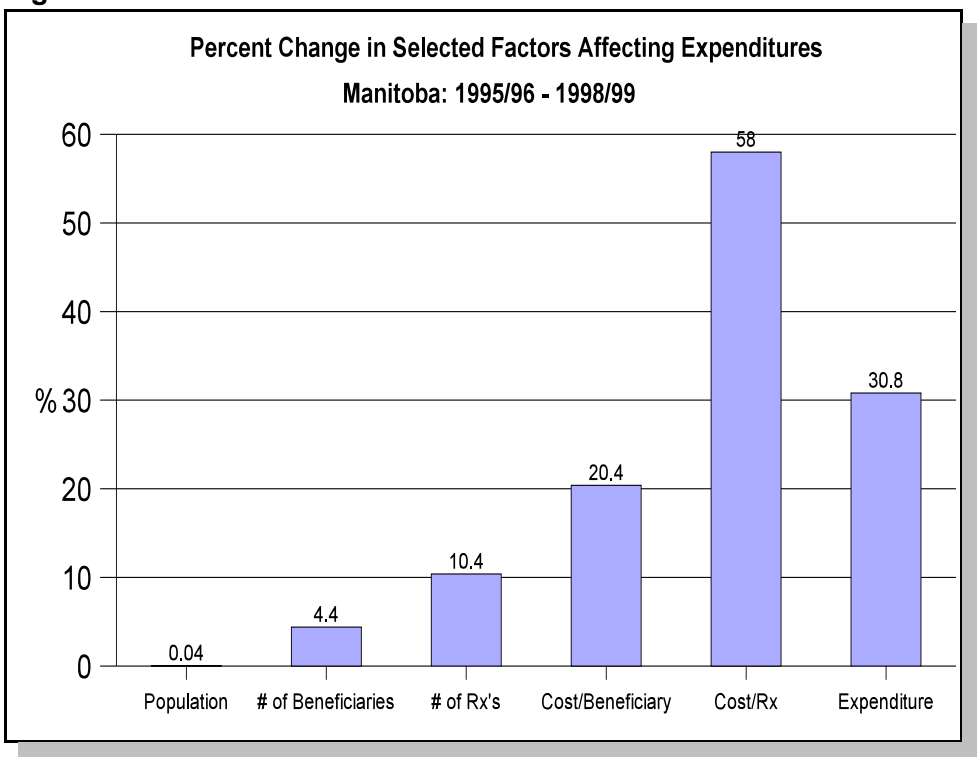
Figure 2[13] summarises some of the important factors described in Figure 1, which may have contributed to total pharmaceutical expenditures over the period 1995/96 to 1998/99.

[11] The figures used in this section are based on Health Canada and the Canadian Institute for Health Information (CIHI) numbers. Expenditure levels used for 1998 are preliminary estimates.

[12] Private spending includes co-pays and deductibles paid by beneficiaries of provincial prescription drug plans.

[13] Aside from the expenditure growth, other factors are based only on the Pharmacare plan. Information on number of beneficiaries was only available from 1996/97 on. 1996/97 was based on a 15 month deductible .

Figure 2



The figure shows that Manitoba's population increased by 0.4% over this period, the number of beneficiaries increased by 4.4%, and the number of prescriptions increased by 10.4%.[14] In addition, the cost per prescription, cost per beneficiary, and total expenditures on drugs increased by 58%, 20.4% and 30.8%, respectively. Factors that may influence the cost of prescription include: manufacturers' unit price; wholesale and retail mark-ups; changes in the size of prescriptions; changes in prescribing habits of physicians (i.e. from older less expensive therapies to newer relatively more expensive ones); the trend towards using drug therapy instead of other treatments; and, the inclusion of new indications and new drugs for diseases in which drug therapy was not previously available.

A more complete analysis is required to evaluate the separate effect that each of these factors may have on increasing annual drug expenditures.

[14] Statistics Canada, Catalogue no. 91-213

5.0 Analysis

5.1 Public Drug Expenditures in Manitoba: 1995/96 to 1998/99

During the period 1995/96 to 1998/99, public expenditures on drug products in Manitoba considered in this analysis increased from $122.8 million to $167.1 million. These amounts differ from the total of the Programs' expenditures, for the following reasons:

- drugs were only included in this analysis if they could be matched to those drugs in the Health Canada Health Protection Branch (HPB) database;
- the expenditure figures used in the analysis do not include dispensing fees and non-drug expenditures such as diagnostic test strips.
- the expenditure figures include patients portion of the accepted ingredient cost[15];

5.2 Breakdown of Changes in Expenditure by Components

The change in total annual expenditures has been broken out into the following components: Price Effect, Volume Effect, Entry of New Drugs, Exiting drugs and Others[16]. Table 1 summarizes the relative contribution each of the above components have on the total annual change in expenditures on an annual basis and on average between 1995/96 to 1998/99.

On average, between 1995/96 and 1998/99 per unit price changes seen by the province were responsible for 3.3%[17] of the expenditure change, volume change or utilization was responsible for 108.6.6%, entry of new drugs was responsible for 30.8%, while exiting drugs and other factors were responsible for -0.3% and -42.2% of expenditure changes. The findings demonstrate that utilization and the entry of new drugs accounted for the largest increase in

[15] Expenditures were based on total approved acquisition cost, which included the patients portion of the ingredient cost, as this was the only available field which excluded pharmacy mark-up and dispensing fees.

[16] Others represent the cross effect of price and volume. The cross effect is an interaction between changes in prices and changes in quantity. That is, it is a measure of the correlation between price changes and quantity changes. If a large change in price corresponds to a large change in quantity, the cross effect will be significant. The negative sign indicates that the changes are moving in opposite directions and are significant in magnitude. A negative cross effect is recorded when a large decrease in price is accompanied by a large increase in quantity, or conversely, when a large increase in price is accompanied by a large decrease in quantity.

[17] It is important to note that the analysis for British Columbia, Alberta, Saskatchewan, and Ontario recorded a significant negative price effect. As the periods under review for these four jurisdictions are significantly longer than Manitoba's, the negative price effects experienced in the other jurisdictions may not be captured, particularly since many of the low cost alternative policies were implemented prior to 1995/96 in most jurisdictions. The analysis for Nova Scotia also recorded a significantly negative price effect even though the period of review was also 1995/96 to 1998/99, policy difference between the jurisdictions would need to be reviewed more closely to determine the source of the difference(s).

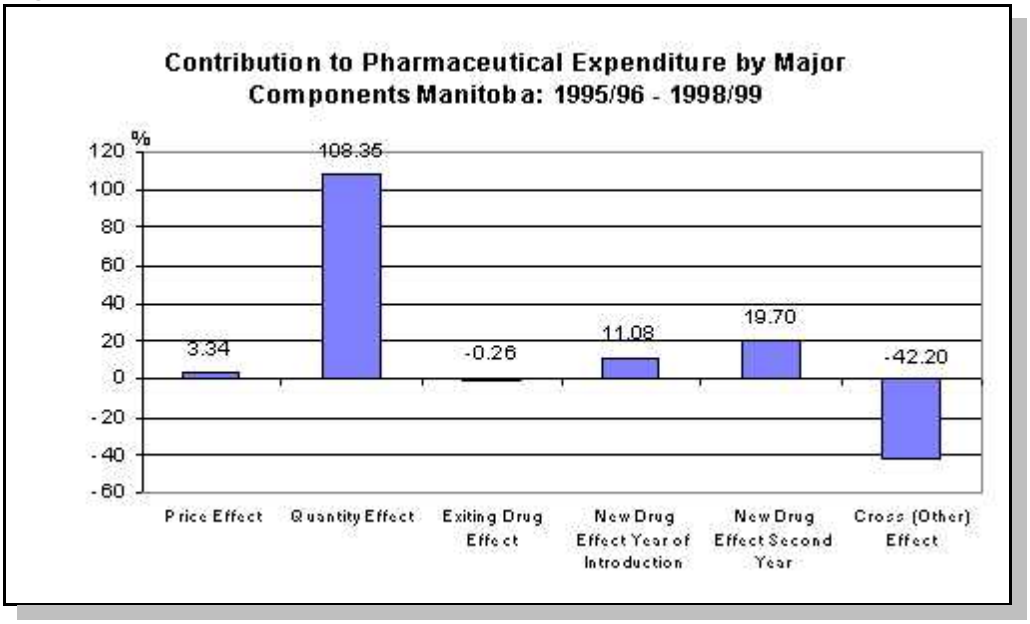
expenditures over the period. The annual variations in each of the factors are worthy of note. Specifically, the large negative price effect in 1996/97 to a large positive price effect in 1998/99 is especially pronounced.

In addition, Table 1 and Figure 3 illustrate that the impact of new drugs is significant in the year of introduction,11.1%, with an escalation to 19.7% in the first full year of coverage.

Table 1

Average Contribution to Pharmaceutical Expenditures by Major Components Manitoba: 1995/96 - 1998/99						
YEAR	Price Effect (%)	Quantity Effect (%)	New Drug Effect Year of Introduction (%)	New Drug Effect Second Year (%)	Exiting Drug Effect (%)	Cross (Other) Effect (%)
1996/97	-123.50	237.10	38.90	0.00	-0.50	-51.90
1997/98	-14.10	94.10	8.20	26.10	-0.20	-14.10
1998/99	48.60	90.20	7.00	18.80	-0.30	-64.30
Average	**3.34**	**108.35**	**11.08**	**19.70**	**-0.26**	**-42.2**

Figure 3



The findings presented above suggest that increases in utilization and coverage of new drugs significantly influence annual changes in expenditures. The expenditure decomposition provides a sense of the relative importance of changes in utilization of existing and newer drugs. It is

important to keep in mind that the effects reported represent the relative impact each component had on changes in expenditure levels. The negative price effect in this analysis is greatly influenced by generic competition, which reduces the cost of the entire therapeutic class. Absolute price reductions at the DIN level, particularly of top selling newer drug products, are not the main source of the large negative price effect. Future analysis of price level of new drugs and changes in prescribing patterns toward newer therapies; changes in treatment costs and/or the price levels (rather than annual change); marketing strategies for new drugs, rate of new drug market penetration and displacement of older drugs, and impact of public policy would provide more insight into results presented above.

Total expenditures increased from $122.8 million in 1995/96 to $167.1 million in 1998/99. Table 2 shows that although both "all drug category" and "existing drug category" rose from their 1995/96 levels in 1996/97, total expenditure for rose faster than expenditure on existing drugs. Total expenditure rose sharply in both 1997/98 and 1998/99.

Table 2

Pharmaceutical Expenditure
Manitoba: 1995/96 - 1998/99
(millions of dollars)

Year	All Drugs			Existing Drugs		
	Total Expenditure	Difference in Expenditure	% Growth Rates	Total Expenditure	Difference in Expenditure	% Growth Rates
1995/96	122.80			122.80		
1996/97	127.80	5.00	4.10	121.60	-1.20	-1.00
1997/98	146.00	18.20	14.20	125.30	3.70	3.00
1998/99	167.10	21.10	14.50	130.60	5.30	4.2

Figure 4 shows the contribution of each component as a percentage of average growth. Pharmaceutical expenditures were increasing, on average, at an annual rate of 10.8% from 1995/96 to 1998/99. Figure 4 shows that utilization, new drugs and price changes were responsible for 11.7%, 3.3% and 0.4% of that growth, respectively. Other effects contributed -4.6% to average growth rates. If not for other effects average expenditure growth rate would have been 15.4%.

Figure 4

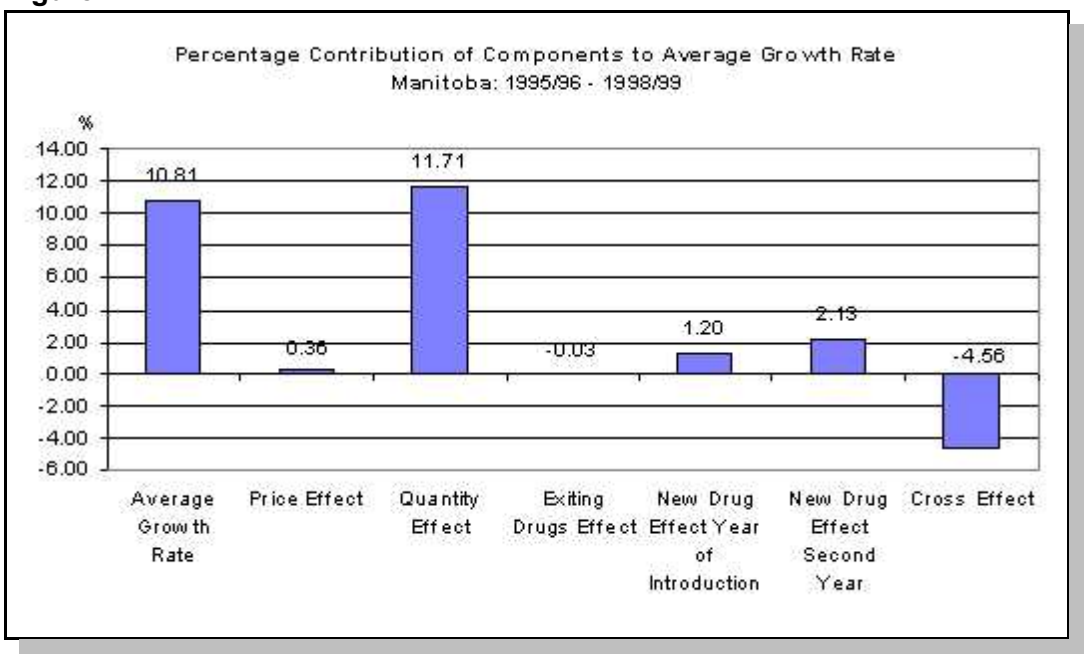


Figure 5 corresponds to Table 2; it shows the trends of expenditures on all, new and existing drug products. Most of the increase in total expenditure was due to new drugs: the share of expenditures on existing drugs fell steadily over the study period. In 1998/99, newer drugs accounted for 21.9% of overall expenditures. The expenditures on newer drugs represented 11.4% of the volume that year. The average price of newer drugs is significantly higher than existing therapies. In 1998/99 the average per unit price of a newer drug in Manitoba was $0.65, the average per unit price of an existing therapy was $0.30.

Figure 5

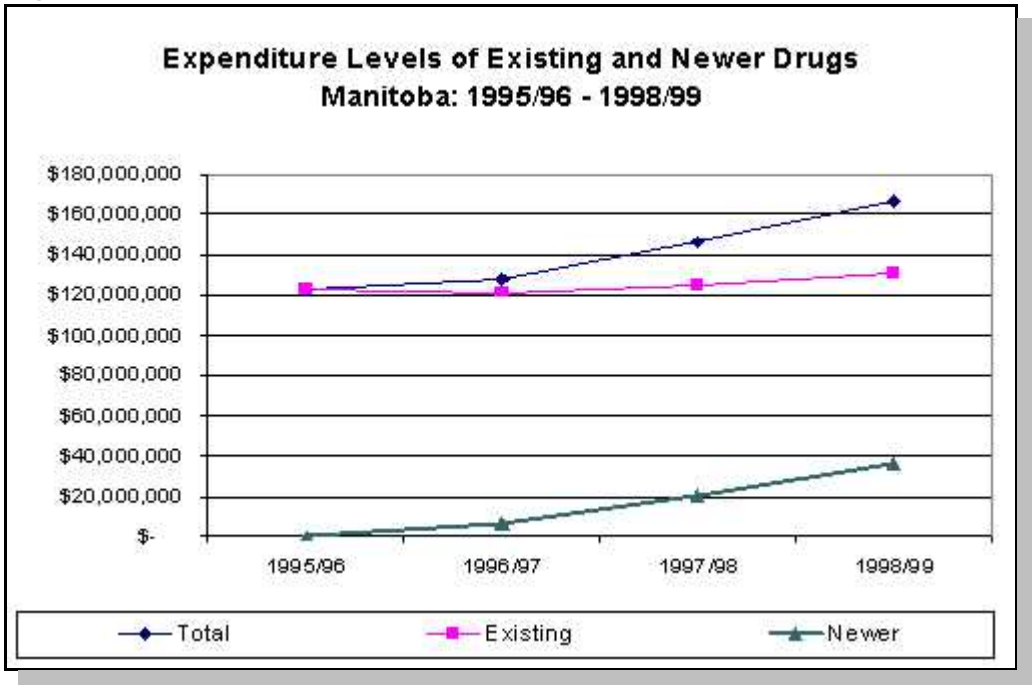
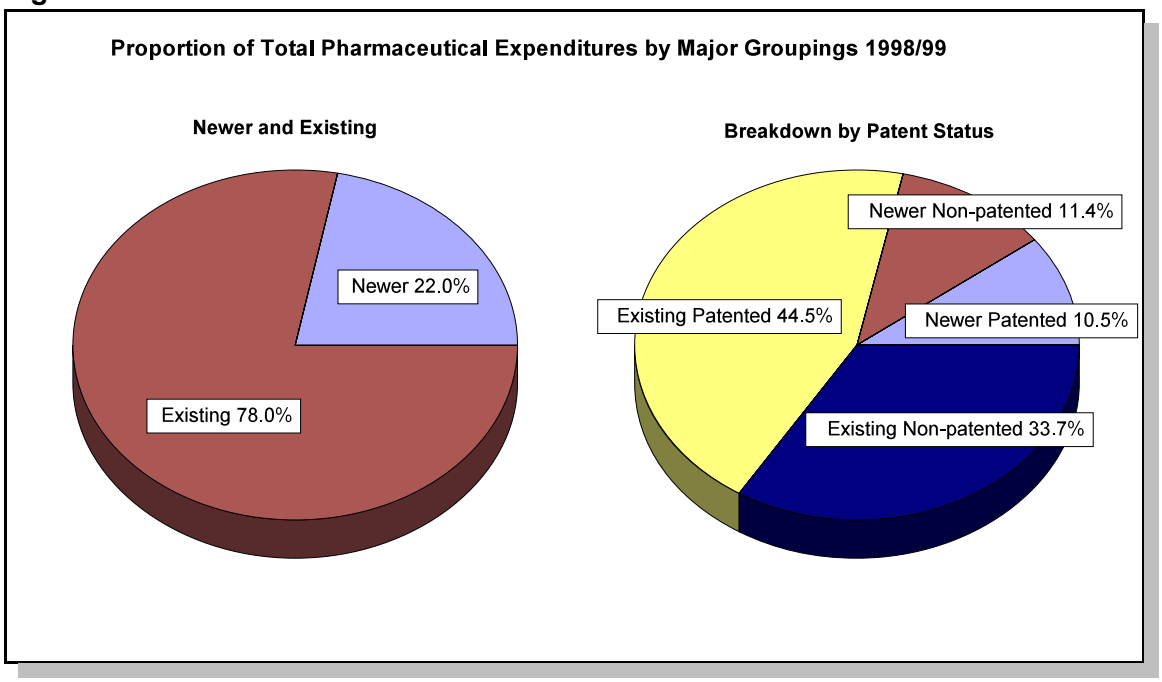


Figure 6 breaks out total pharmaceutical expenditures into patented and non-patented expenditures on newer and existing drugs. In 1998/99, the share of expenditures attributable to patented drugs increased 12.3% to 55% from 42.7% in 1995/96. Newer non-patented and patented products contributed to 21.9% of total pharmaceutical expenditures in 1998/99.

Figure 6



5.3 Breakdown of Pharmaceutical Expenditure: (By Patent Status and Category)

Figure 7 shows the share of patented and non-patented drug products in total pharmaceutical expenditures. The patented portion is broken out into category 1 (line extensions of an existing drug product); category 2 (a breakthrough drug or substantial improvement over an existing drug product); category 3 (moderate, little or no improvement over an existing drug product) and older non-categorized patented drug products. However, it should be noted that, while the expenditures for category 1, category 2 and category 3 drug products are reported separately, they are often different brands, strengths and dosage forms of a single medicine. Category 1 products are

sometimes a line extension of a category 2 or category 3 product and a category 3 drug product is often a moderate, little or no improvement over a category 2 product.[18]

Figure 7

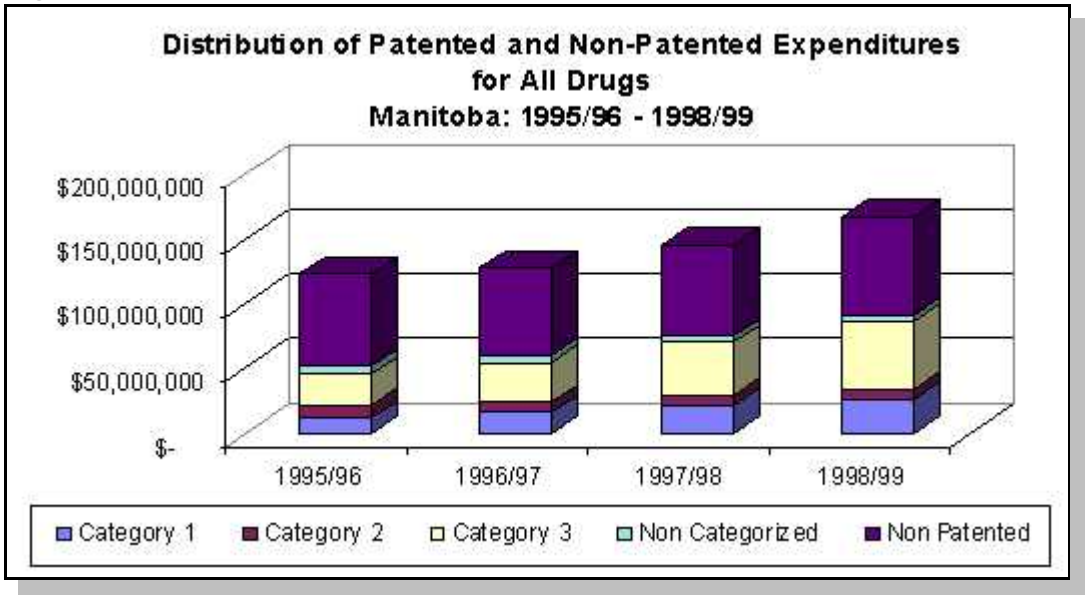


Figure 7 shows that in 1995/96 the proportion of patented and non-patented drug products in total expenditures was 42.7% ($ 52.4M) and 57.3% ($70.4 M) respectively. Of the 42.7% of expenditures accounted for by patented drug products, of category 1 drug products accounted for 9.5% ($11.6 million), category 2 drug products accounted for 8.8% ($10.8 million), category 3 drug products accounted for 19.4% ($23.8 million), and older non-categorized drug products accounted for 5.0% ($6.2 million) of total expenditure. In 1998/99, the proportions of patented and non-patented drug products in total expenditure were 55.0% ($91.9 million) and 45.0% ($75.2 million) respectively. Of the 55.0% of expenditure accounted for by patented drug products, category 1 products accounted for 16.0% ($26.8 million), category 2 products accounted for 4.8% ($8.0 million), category 3 products accounted for 30.9% ($51.6 million) and older non-categorized patented products accounted for 3.3% ($5.5 M) of total expenditure.

[18] For example, the Asthma medication Budesonide is available in many brands, strengths and dosage forms. Pulmicort Inhaler and Pulmicort Spacer, which are two different dosage forms of the brand Pulmicort, were introduced in 1988 as moderate improvements (category 3). Pulmicort Turbuhaler was introduced in 1990 as a line extension (category 1) and Pulmicort Nebuamp was introduced in 1992 as a breakthrough (category 2) product. Also, for example, Losec (20 mg/Cap) a brand of the medicine Omeprazole was introduced as a breakthrough (category 2) product in 1989. Losec (20 mg/Tab) was reintroduced in the same strength but different dosage form as a line extension (category 1) in 1996.

5.4 Growth of Expenditures on Newer Drug Products

The information in Table 3 demonstrates how fast the market responds to new drugs. For example, expenditure on drugs introduced in 1996/97 were $6.20 million in that year. Expenditure on these same drugs increased to $15.4 million the following year, and to $20.5 million by 1998/99. Drugs introduced in 1997/98 display a similarly rapid rise in expenditure. However, it should be noted that, depending on the month of introduction, expenditures during the year of introduction represent expenditures of a "partial" year. For example, if a drug was introduced in July, of any year, the data on expenditures would represent expenditures for six months only. Considering "full" years only, expenditure on new drugs rose on average by 33.0% between their first and second full year of coverage.

The rate with which new drugs are able to attain market share may be influenced by many factors; the maturity of the therapeutic market; the type of coverage provided (i.e. "full" or "partial"); and the delay between notice of compliance (NOC) and formulary listing decision.

Table 3

Expenditure on Newer Drugs
Manitoba: 1996/97 - 1998/99

Year of Introduction	1996/97 ($)	1997/98 ($)	1998/99 ($)
1996/97	6,150,177	15,412,852	20,505,919
1997/98		5,306,420	13,357,889
1998/99			2,652,427
Total	**6,150,177**	**20,719,273**	**36,516,234**

5.5 Therapeutic Class Analysis

In order to identify which disease groups are contributing proportionately more to increases in pharmaceutical expenditures, the analysis is broken down to the second level of their Anatomical Therapeutic Chemical (ATC) classifications. The second level of the ATC (ATC-2) classification groups drugs of different pharmacological classes that have the same main therapeutic use.[19] Sixteen therapeutic classes were identified based on their level of expenditures relative to other therapeutic classes. Table 4 shows the percentage contribution of the top sixteen therapeutic classes in total expenditure, as well as their contribution to change in expenditure between 1995/96 and 1998/99.

[19] For more detail on the ATC system, refer to Appendix 4.

Table 4

Percentage Contribution of Selected Therapeutic Classes to Total Expenditures
Manitoba: 1995/96 - 1998/99
(000's)

Therapeutic Class	Code	Contribution in 1995/96		Contribution in 1998/99		% of Total Expenditure Change	Average Rate of Expenditure Growth
		$ (thousands)	% of Total Expenditure	$ (thousands)	% of Total Expenditure		
Alimentary Tract and Metabolism	A	14,949	12.20	21,631	12.90	15.10	13.10
Antacids, drugs for treatment of peptic ulcer and flatulence	A02	8,575	7.00	12,451	7.50	8.80	13.20
Drugs used in diabetes	A10	3,121	2.50	4,417	2.60	2.90	12.30
Other		3,253	2.60	4,762	2.90	3.40	13.50
Cardiovascular System	C	43,568	35.50	54,574	32.70	24.80	7.80
Cardiac therapy	C01	3,315	2.70	3,956	2.40	1.40	6.10
Beta blocking agents	C07	4,658	3.80	4,419	2.60	-0.50	-1.70
Calcium channel blockers	C08	12,787	10.40	11,707	7.00	-2.40	-2.90
Agents acting on the renin-angiotensin system	C09	10,445	8.50	16,464	9.90	13.60	16.40
Serum lipid reducing agents	C10	10,502	8.60	16,066	9.60	12.60	15.20
Other		1,860	1.50	1,961	1.20	0.20	1.80
Genito Urinary System and Sex Hormones	G	8,851	7.20	9,033	5.40	0.40	0.70
Sex hormones and modulators of the genital system	G03	6,832	5.60	7,145	4.30	0.70	1.50
Other		2,019	1.60	1,888	1.10	-0.30	-2.20
General Antiinfectives for Systemic Use	J	8,081	6.60	11,292	6.80	7.20	11.80
Antibacterials for systemic use	J01	7,304	5.90	8,604	5.10	2.90	5.6
Other		777	0.60	2,688	1.60	4.30	51.20
Musculo-skeletal System	M	6,726	5.50	7,831	4.70	2.50	5.20
Anitiinflammatory and antirheumatic products	M01	6,174	5.00	5,649	3.40	-1.20	-2.90
Other		552	0.40	2,182	1.30	3.70	58.10
Nervous System	N	19,267	15.70	32,758	19.60	30.50	19.40

Therapeutic Class	Code	Contribution in 1995/96		Contribution in 1998/99		% of Total Expenditure Change	Average Rate of Expenditure Growth
		$ (thousands)	% of Total Expenditure	$ (thousands)	% of Total Expenditure		
Anesthetics	N02	2,718	2.20	3,804	2.30	2.50	11.90
Antiepileptics	N03	1,736	1.40	3,100	1.90	3.10	21.30
Psycholeptics	N05	3,698	3.00	7,749	4.60	9.10	28.00
Psychoanaleptics	N06	8,928	7.30	15,438	9.20	14.70	20.00
Other		2,187	1.80	2,668	1.60	1.10	6.90
Respiratory System	R	8,114	6.60	10,301	6.20	4.90	8.30
Anti-asthmatics	R03	6,934	5.60	8,202	4.90	2.90	5.80
Other		1,180	1.00	2,099	1.30	2.10	21.20
Sensory Organs	S	2,479	2.00	3,725	2.20	2.80	14.50
Ophthalmologicals	S01	2,309	1.90	3,566	2.10	2.80	15.60
Other		170	0.10	159	0.10	0.00	-2.20
Top ATC (Top 16-ATC2)		**100,038**	**81.50**	**132,738**	**79.40**	**73.80**	**9.90**
Top ATC (Top 8-ATC1)		**112,036**	**91.20**	**151,146**	**90.50**	**88.30**	**10.50**
Total Expenditures		**122,790**	**100.00**	**167,085**	**100.00**	**100.00**	**10.8**

The top sixteen therapeutic classes, which are approximately 20% of the total number of therapeutic classes (at second level), accounted for 79.4% ($132.7 million) of total pharmaceutical expenditure in 1998/99.

The top 16 ATC-2 classes belong to eight different general ATC groupings (ATC-1). The percentage contribution of the top sixteen second-level therapeutic classes to total expenditures as well as the contribution of each of the eight first-level ATC groups to which these sixteen therapeutic classes belong is also presented above. These eight ATC groups are: Alimentary Tract and Metabolism, Cardiovascular Systems, Genito Urinary System and Sex Hormones, Central Nervous System, Respiratory System, General Anti-Infectives, Antineoplastic and Immunomodulating Agents and Musculo-skeletal System. Expenditures on these eight ATC groups was $151.1 million or 90.5% of total expenditures in 1998/99.

Table 4 also presents the contribution of each of the eight ATC groups and top sixteen therapeutic classes to the total increase in expenditures between 1995/96 and 1998/99. Among the eight first-level ATC groups, drugs related to the Central Nervous System made the largest contribution to expenditure growth (30.5%), followed by Cardiovascular System (24.8%) and Alimentary Tract and Metabolism (15.1%). These three groups together accounted for more than 70% of overall expenditure growth.

Among second level therapeutic classes, Psychoanaleptics (14.7%) made the largest contribution to expenditure growth over the period 1995/96 to 1998/99, followed by ACE Inhibitors (13.6%) and Lipid Reducing Agents (12.6%). Psycholeptics (N05) and Antacids (A02) also contributed substantially to expenditure growth. These five therapeutic classes jointly accounted for almost three-fifths of expenditure growth. It is important to note that ACE Inhibitors, Serum Lipid Reducing Agents, and Psycholeptics are major cost drivers in all jurisdictions studied to date.

The average annual growth rate between 1995/96 and 1998/99 was 10.8%. Among the eight first-level ATC groups, drugs related to the Nervous System made the largest contribution to expenditure growth (30%), followed by Cardiovascular System (26%) and Alimentary Tract and Metabolism (15%).

The highest three growth rates among second level therapeutic classes all occur within the Central Nervous System group, the relevant classes being Psycholeptics (28.0%), Antiepileptics (21.3%) and Psychoanaleptics (20.0%). Table 4 also shows high rates of growth for ACE Inhibitors (16.4%), Ophthalmologicals (15.6%) and Lipid Reducing Agents (15.2%). Interestingly, with the exception of Psychoanaleptics, the therapeutic classes that contributed most to expenditure growth did not have the highest growth rates. These classes did all exhibit higher-than-average growth combined with relatively large base-year expenditure.

Table 5 below, reports on the average component contribution to expenditure change for the top 16 therapeutic classes. Generally speaking, the average trends reported in Table 1 are consistent with the results reported for the top sixteen classes. There is a notable deviation in the case of price effects: Table 5 indicates an average price effect of -24.1% for the top sixteen classes, as compared to the value of 3.3% calculated for all drugs. There are also substantial variations among therapeutic classes. For example, Table 5 reports negative price effects for all classes except ACE Inhibitors. The new drug effect calculated in the case of Lipid Reducing Agents is more than twice the 16-class average. Such variations suggest that therapeutic markets are different. Understanding these differences and the reasons behind them is one of the future research challenges.

Table 5

Average Contribution to Pharmaceutical Expenditures by Major Components Top 16 Therapeutic Classes Manitoba: 1995/96 - 1998/99							
Therapeutic Class	Code	**Price Effect (%)**	**Quantity Effect (%)**	**New Drug Effect Year of Introduction (%)**	**New Drug Effect Second Year (%)**	**Exiting Drug Effect (%)**	**Cross (Other) Effect (%)**
Antacids, drugs for treatment of peptic ulcer and flatulence	A02	-4.90	80.70	6.20	20.90	0.00	-2.90
Drugs used in diabetes	A10	-16.90	117.10	2.20	3.60	0.00	-6.00
Cardiac therapy	C01	-67.80	220.30	0.80	3.60	-1.00	-55.80
Beta blocking agents	C07	-251.10	177.10	0.20	12.50	-0.80	-37.90
Calcium channel blockers	C08	-225.20	77.40	9.80	2.30	0.00	35.60
Agents acting on the renin-angiotensin system	C09	18.10	74.40	5.10	3.80	0.00	-1.30
Serum lipid reducing agents	C10	-9.40	46.80	21.30	41.00	0.00	0.30
Sex hormones and modulators of the genital system	G03	-180.80	247.20	38.30	15.30	-0.30	-19.70
Antibacterials for systemic use	J01	-22.60	111.70	10.70	10.20	-0.50	-9.50
Anitiinflammatory and antirheumatic products	M01	-155.90	-6.00	4.70	61.70	-0.10	-4.50
Anesthetics	N02	-1.40	84.90	12.60	15.10	-0.30	-10.90
Antiepileptics	N03	-6.60	125.90	6.30	6.10	-0.10	-31.60
Psycholeptics	N05	-15.10	110.10	2.30	8.20	-0.10	-5.40
Psychoanaleptics	N06	-22.00	123.10	2.70	2.30	0.00	-6.20
Anti-asthmatics	R03	-49.70	239.20	20.60	35.30	-0.10	-145.30
Ophthalmologicals	S01	-7.60	11.40	8.80	87.00	-0.50	0.80
Total Average		-24.10	106.70	9.20	19.00	-0.10	-10.8

Following is a detailed analysis of the impact of existing and newer drugs for three major cost drivers: Psychoanaleptics, Agents Acting on the Renin-Angiotensin System and Lipid Reducing Agents. Appendix 4 provides a detailed analysis of the remaining therapeutic classes.

Psychoanaleptics:

Expenditures on Psychoanaleptics increased from $8.9 million in 1995/96 to $15.4 million in 1998/99, a 73% increase. Table 6 and Figure 8 summarize expenditure distribution among different types of drugs over the period of analysis.

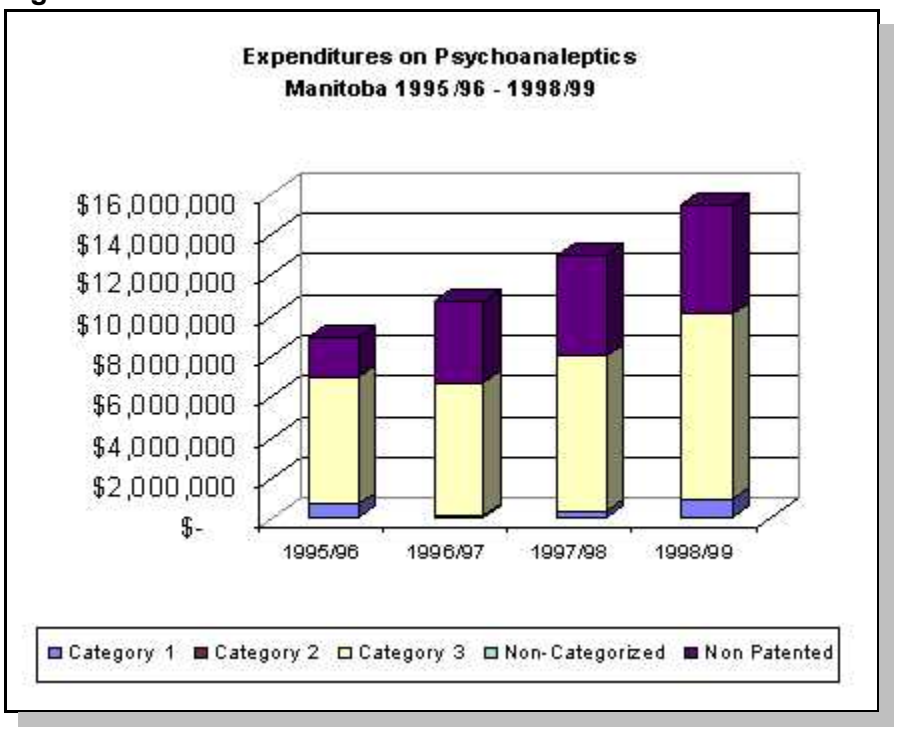
In 1995/96, the proportion of expenditures on patented drugs accounted for $6.98 million or 78.2% of total category expenditures. Category 1 and category 3 drugs, accounted for 70.4% and 7.8% of total expenditures. In 1998/99, the proportion of expenditure for patented drugs had decreased to 65.4% , reflecting a corresponding decline in the share of category 3 drugs to 59.3%.

Table 6

Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba 1995/96 - 1998/99
Psychoanaleptics
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		1,936	1,956	1,808	1,773
1995/96	1	700	1,582	1,356	1,332
1995/96	3	6,282	6,616	8,060	9,120
1995/96	NC	10	7	6	7
1996/97		0	578	1,193	1,420
1996/97	1	0	4	125	304
1997/98		0	0	433	1,036
1997/98	1	0	0	2	12
1997/98	NC	0	0	1	4
1998/99		0	0	0	44
1998/99	1	0	0	0	358
1998/99	3	0	0	0	27
Total Expenditure		**8,924**	**10,735**	**12,984**	**15,432**
Patented Expenditure		**6,983**	**6,729**	**8,016**	**10,092**
Non Patented Expenditure		**1,941**	**4,006**	**4,968**	**5,340**

Figure 8



In 1998/99 the top drug expenditures in this class were Paxil 20 mg, Zoloft 50 mg, and Zoloft 100 mg. These four drugs accounted for $6 million or 39% of expenditures on Psychoanaleptics in 1998/99.

Agents Acting on the Renin-Angiotensin System (ACE Inhibitors):

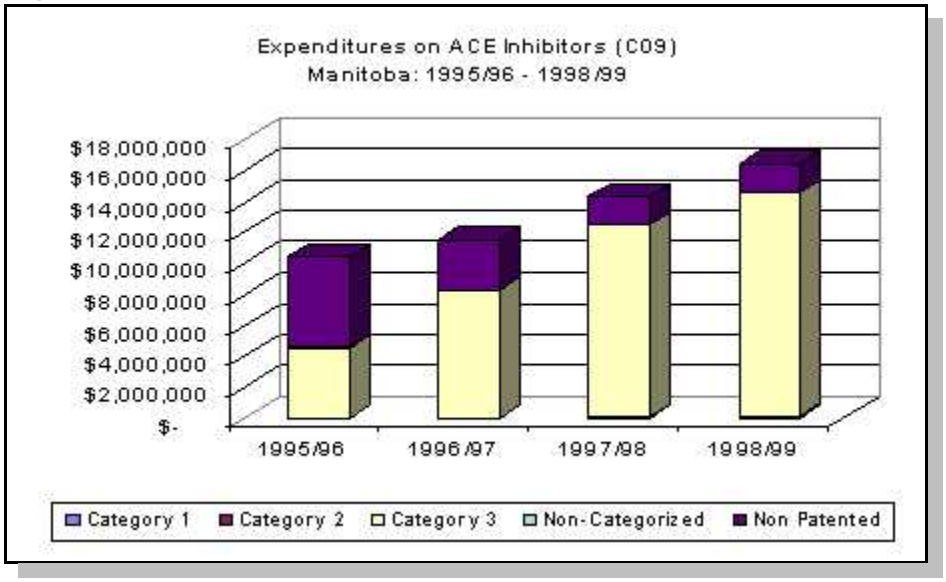
Agents Acting on the Renin-Angiotensin System made the second largest contribution to expenditure growth between 1995/96 and 1998/99. Table 7 and Figure 9 summarize expenditure distribution among different types of drugs over the period of analysis.

As shown in Table 7, total expenditures increased from $10.4 million in 1995/96 to $16.5 million in 1998/99. In 1995/96, 43.6% of the expenditure in this class went to patented drugs. By 1998/99, patented drugs comprised 88.5% of total expenditures.

Table 7

Impact of Existing and Newer Drug Products by Major Disease Groups Manitoba 1995/96 - 1998/99 Agents Acting on the Renin-Angiotensin System (thousands of dollars)					
Year of Introduction	**Category**	**1995/96**	**1996/97**	**1997/98**	**1998/99**
1995/96		5,891	3,357	1,549	1,512
1995/96	1	44	47	69	103
1995/96	3	4,462	8,175	12,293	13,677
1995/96	NC	48	18	19	15
1996/97				181	359
1996/97	3			160	422
1996/97	NC				
1997/98	1			2	71
1998/99	3				302
Total Expenditure		**10,448**	**11,597**	**14,271**	**16,463**
Patented Expenditure		**4,557**	**8,239**	**12,541**	**14,568**
Non Patented Expenditure		**5,891**	**3,358**	**1,730**	**1,895**

Figure 9



In 1998/99 the top drug expenditures in this class were Vasotec 5 mg, Vasotec 10 mg and Cozaar 100 mg. Expenditures on these products totalled $6 million or 36.4% of total expenditures.

Serum Lipid Reducing Agents:

Expenditures on Serum Lipid Reducing Agents increased from $10.5 million in 1995/96 to $16.1 million in 1998/99, a 53.3% increase. Table 8 and Figure 10 summarize expenditure distribution among different types of drugs over the period of analysis.

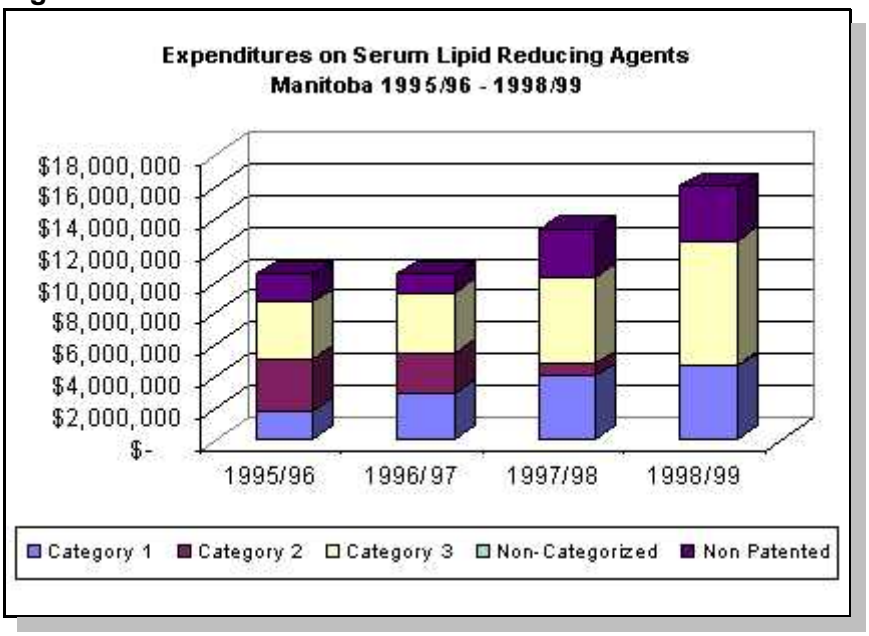
Expenditures for patented products dominated through out the period under review. In 1995/96, $8.7 million or 82.8% of total expenditure was attributable to patented products. In 1998/99, total patented expenditure increased to $12.7 million or 45.9% increase but the proportionate share of total expenditure declined slightly to 78.9%. Expenditure was dominated by category 3 drugs throughout the period, although the share of expenditure attributable to category 1 drugs rose steadily throughout the period.

Table 8

Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba 1995/96 - 1998/99
Serum Lipid Reducing Agents
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		1,236	822	714	601
1995/96	1	1,836	2,788	3,557	3,942
1995/96	2	3,259	2,558	676	29
1995/96	3	3,974	3,984	4,672	5,017
1995/96	NC	199	208	198	271
1996/97		0	7	17	13
1996/97	1	0	141	536	768
1997/98		0	0	2,100	2,495
1997/98	3	0	0	869	2,757
1998/99	3	0	0	0	174
Total Expenditure		**10,500**	**10,508**	**13,338**	**16,062**
Patented Expenditure		**8,697**	**9,370**	**10,297**	**12,674**
Non Patented Expenditure		**1,803**	**1,138**	**3,041**	**3,388**

Figure 10



In 1998/99 the top drug expenditures in this class were Pravachol 20 mg, Zocor 10 & 20 mg, and Apo-Lovastatin 20 mg. Expenditures on these products totalled $8.3 million or 51.6% of total expenditures.

6.0 Conclusions

The study reports on the cost drivers of total pharmaceutical spending in the Government of Manitoba Drug Programs over the period 1995/96 to 1998/99.

During the period under review, expenditures increased from $122.8 million to $167.1 million, a 36.1% increase. On average, between 1995/96 and 1998/99 per unit price changes seen by the province were responsible for 3.3% of the expenditure change, volume change or utilization was responsible for 108.6%, entry of new drugs was responsible for 30.8%, while exiting drugs and other factors were responsible for -0.3% and -42.2% of expenditure changes. The findings demonstrate that utilization and the entry of new drugs accounted for the largest increase in expenditures over the period.

The report also analyses the extent to which individual therapeutic classes and groups have contributed to expenditure growth. Drugs in just three groups (Nervous System, Cardiovascular Systems and Alimentary Tract and Metabolism) were attributable for more than 70% of additional spending between 1995/96 and 1998/99.

The Pharmacare Program underwent several changes during the 1990s. Further analysis is necessary to fully understand the policy effect that those changes had on total pharmaceutical expenditures and utilization trends.

Appendix 1

Methodology

This study analyses the cost drivers in total pharmaceutical spending from 1995/96 to 1998/99 in Manitoba.

In order to conduct the analysis, information on prices, quantities and expenditures were obtained from the Manitoba Pharmacare Database. Health Canada's Drug Product Database was used to ensure that only those drugs defined by the Food and Drug Act were included. The Patented Medicine Prices Review Board data base was used to group drugs according to patent status.

Prices used in this study are based on recognized actual acquisition cost; wholesale mark-ups are included, however, dispensing and/or compounding fees are excluded. The expenditures presented in this analysis include the patients portion of the cost in order to capture the full ingredient cost of the drug products.

This study reports expenditures by year of introduction of drugs. Year of Introduction is defined as the year of first sales recorded in Manitoba Drug Plan Database. Drugs with sales in 1995/96 or before, are termed as "existing" drugs while drugs with sales in 1996/97 and subsequent years are termed as "newer" drugs.

The study focuses on two aspects of expenditures change:

- the influence from existing drugs in terms of growth in price and quantity and exit
- the impact of new drugs in terms of replacement of older drugs

For this purpose, the annual change in pharmaceutical expenditures is broken down into five components: price effect, volume effect, entry of new drugs, exiting drugs and others. The following model was used to obtain the results. Prices used in this study include wholesale mark-ups but exclude dispensing fees.

$TE_o = P_oQ_o$ o = base period.....(1)

$\Delta TE_1 = P_1Q_1 - P_oQ_o$ 1 = first period.....(2)

$= P_o(Q_1 - Q_o) + Q_o(P_1 - P_o) + (P_1 - P_o)(Q_1 - Q_o) + P_{1n}Q_{1n} - P_o^oQ_o^o$

Where:

TE = Total Expenditure

$P_o(Q_1 - Q_o) = VolumeEffect$

$Q_o(P_1 - P_o) = PriceEffect$

$(P_1 - P_o)(Q_1 - Q_o) = InteractionTerm$

$P_{1n}Q_{1n} = NewDrugExpenditureInfluence$

$P_o^oQ_o^o = ExitingDrugs$

$P_o(Q_1 - Q_o) + Q_o(P_1 - P_o) + (P_1 - P_o)(Q_1 - Q_o)$ = Existing Drug Influence, Ei

After the first period,1, New drugs can be separated into Volume and Price influence on annual change in total expenditures:

$\Delta TE = P_2Q_2 - P_1Q_1$ 2 = Second Period.....(3)

$= P_1(Q_2 - Q_1) + Q_1(P_2 - P_1) + (P_2 - P_1)(Q_2 - Q_1) + P_{1n}(Q_{2n} - Q_{1n}) + Q_{1n}(P_{2n} - P_{1n})$

$+(P_{2n} - P_{1n})(Q_{2n} - Q_{1n}) + P_{2n}^*Q_{2n}^*$

Where,

$P_{2n}^*Q_{2n}^*$ = New Drugs inPeriod 2 = N_i^*

$P_1(Q_2 - Q_1)$ = New Drug Volume Influence

$Q_1(P_2 - P_1)$ = New Drug Price Influence

$(P_2 - P_1)(Q_2 - Q_1)$ = Interaction Term

$P_1(Q_2 - Q_1) + Q_1(P_2 - P_1) + (P_2 - P_1)(Q_2 - Q_1) = M$, New Drug Influence

$\therefore \Delta TE_i = E_i + \sum N_i + N_i^*$.....(4)

Divide(4)*by*ΔTE_i

$\Delta TE_i / \Delta TE_i = 1 = E_i / \Delta TE_i + \sum N_i / \Delta TE_i + N_i^* / \Delta TE_i$

Estimates the influence of each component

The previous study was conducted on a calender basis and price was calculated at the din level, this study is based on a fiscal year and price is calculated at the chemical level, i.e. price for a chemical with an identical ingredient, strength, route, schedule and form. This change in definition was adapted in order to better capture the substitution within multi-source markets and better represent the contribution of each cost driver component in the model.[20]

The impact of new drugs is tracked not only during the year of introduction, but also in the subsequent year. After the two periods, the effect of new drugs is recorded as part of the price, utilization and other effect.

The other major focus of the report was a breakdown of expenditures by therapeutic class and patent status over the period 1995/96 to 1998/99. This would enable us to:

- identify the extent to which each therapeutic class contributed to the increases in total Pharmacare expenditures over the period 1995/96 and 1998/99; This was done by calculating the difference between the level of expenditures of each therapeutic class between 1995/96 and 1998/99, and dividing the difference by the difference between the level of total expenditures between 1995/96 and 1998/99.

- identify the extent of substitution between new drugs and exiting drugs in each therapeutic class;

- identify the impact that category 1, 2 and 3 drugs have on the market.

[20] The previous version of cost drivers treated all new DIN's as new drugs, including generics.

Appendix 2

Manitoba

PROVINCIAL DRUG PLANS: MANITOBA

Provincial Plans	Eligibility Criteria	Deductible	Co-pay	Dispensing Fee	Benefit Level	Maximum Ingredient Cost	Drug Formulary Listing
Pharmacare	All provincial residents who are eligible for benefits under Manitoba Health's Provincial Drug Program,with the exception of resident covered under other Statues.	*Based on total family income *2% of <=$15,000 or 3% >$15,000 *Credit of $3,000 for spouse and dependent under 18 years old *Minimum of $100 deductible is applicable.	None	Established by market place competition	100% coverage for all eligible prescription s/products once deductible is satisfied.	Prescription products based on Medis wholesale price	Manitoba Drug Benefits and Interchangeability Formulary
Social Allowance Health Services	Individual Manitobans that are receiving drug benefits pursuant to the Social Assistance Health Services Drug Program.	None	None	Maximum $6.95	100% coverage for all eligible prescription s/products.	-Prescription products based on Medis wholesale price, -In addition OTC products (price + an upcharge)	Manitoba Benefits and Interchangeability Formulary ,and other OTC products.
Personal Care Home	Manitoba residents of Personal Care Home.	None	None	Included in capitation fee ($26.45 per month, per bed).	100% coverage for all eligible medication /products	-Prescription products based on Medis wholesale price, -In addition OTC products tailor to the geriatric population.	Manitoba Benefits and Interchangeability Formulary, PCH Prescribing Guide.

Appendix 3

The following table reports on population growth in Manitoba between 1995 and 1998 by age group. In 1995, the 30-39 age group represented the highest proportion of the total population, at 16.5%. This was followed by the 0-9 age group at 14.7% and the 20-29 age group at 14.2 % each. In 1998, the 30-39 age group remained the largest group at 15.6% of the total population. The 40-49 age group increased to 14.6%. The 0-9 age group decreased to 14.2% and 20-29 age group decreased to 13.8% of the total population.
Between 1995 and 1998, the highest growth was achieved by the 50-59+ (12.7%) age group. This group was followed by the 40-49 (5.5%) and 80-90+ (5.4%) age groups.

Population Growth
Manitoba 1995 - 1998

Age Group	1995	1995	1998	1998	Change	%Growth
0-9	166,170	14.71	161,300	14.17	-4,870	-2.93
10-19	159,559	14.12	161,387	14.18	1,828	1.15
20-29	160,296	14.19	157,177	13.81	-3,119	-1.95
30-39	186,072	16.47	177,236	15.57	-8,836	-4.75
40-49	157,223	13.92	165,940	14.58	8,717	5.54
50-59	103,122	9.13	116,281	10.22	13,159	12.76
60-69	87,332	7.73	85,408	7.50	-1,924	-2.20
70-79	70,639	6.25	71,836	6.31	1,197	1.69
80-90+	39,358	3.48	41,470	3.64	2,112	5.37
Seniors(65+)	152,933	13.54	155,099	13.63	2,166	1.42
AllAges	1,129,771	100.00	1,138,035	100.00	8,264	0.73

Source: Statistics Canada, Catalogue no. 91-213

Top 25 Patented and Non-Patented Drugs Manitoba: 1997/98 and 1998/99						
DIN	**Ingredient**	**Brand**	**ATC**	**Year of Introduction**	**Expenditures 1997/98($)**	**Expenditures 1998/99($)**
2190915	OMEPRAZOLE (OMEPRAZOLE MAGNESIUM)	LOSEC 20 MG	A	1995	5,209,319	6,418,269
1940481	PAROXETINE (PAROXETINE HYDROCHLORIDE)	PAXIL TAB 20 MG	N	1995	2,052,867	2,644,254
708879	ENALAPRIL MALEATE	VASOTEC TAB 5 MG	C	1995	2,373,842	2,520,119
893757	PRAVASTATIN SODIUM	PRAVACHOL TAB 20 MG	C	1995	2,131,380	2,437,388
670901	ENALAPRIL MALEATE	VASOTEC TAB 10 MG	C	1995	2,180,001	2,317,416
2155907	NIFEDIPINE	ADALAT XL-SRT 30 MG	C	1995	2,268,309	2,260,588
884340	SIMVASTATIN	ZOCOR TAB 20 MG	C	1995	1,859,882	2,147,263
878928	AMLODIPINE (AMLODIPINE BESYLATE)	NORVASC TAB 5 MG	C	1995	1,650,835	2,086,532
884332	SIMVASTATIN	ZOCOR TAB 10 MG	C	1995	1,917,904	1,932,343
2220172	LOVASTATIN	APO-LOVASTATIN-TAB 20 MG	C	1997	1,662,367	1,906,951
2230711	ATORVASTATIN (ATORVASTATIN CALCIUM)	LIPITOR 10 MG	C	1997	616,060	1,862,228
1962817	SERTRALINE (SERTRALINE HYDROCHLORIDE)	ZOLOFT CAP 50 MG	N	1995	1,527,876	1,829,113
2146959	FENOFIBRATE	LIPIDIL MICRO-CAP 200 MG	C	1995	1,485,027	1,740,250
1962779	SERTRALINE (SERTRALINE HYDROCHLORIDE)	ZOLOFT CAP 100MG	N	1995	1,245,588	1,570,180
2155990	NIFEDIPINE	ADALAT XL-SRT60MG	C	1995	1,333,480	1,492,701
2201011	ALENDRONATE (ALENDRONATE SODIUM)	FOSAMAX-TAB 10 MG	M	1996	710,414	1,328,410
2162776	TICLOPIDINE HYDROCHLORIDE	TICLID 250 MG TABLETS	B	1995	1,351,135	1,291,225
1917056	MISOPROSTOL	ARTHROTEC 50 TAB	M	1995	1,262,239	1,250,878
2215055	BECLOMETHASONE DIPROPIONATE	BECLOFORTE INHALER-AEM INH 250 MCG/AEM	R	1995	1,470,096	1,234,024
2182874	LOSARTAN POTASSIUM	COZAAR-TAB 50 MG	C	1995	956,706	1,195,615

DIN	Ingredient	Brand	ATC	Year of Introduction	Expenditures 1997/98($)	Expenditures 1998/99($)
1907107	FOSINOPRIL SODIUM	MONOPRILTAB10MG	C	1995	917,209	1,166,423
2207761	RANITIDINE (RANITIDINE HYDROCHLORIDE)	GEN-RANITIDINE-TAB 150 MG	A	1996	846,387	1,022,114
2036282	AMIODARONE HYDROCHLORIDE	CORDARONE TAB 200 MG	C	1995	784,719	1,009,545
2213605	FLUTICASONE PROPIONATE	FLOVENT INHALERS-AEM INH-ORL 125 MCG/AEM	R	1996	601,652	993,815
2155966	CIPROFLOXACIN (CIPROFLOXACIN HYDROCHLORIDE)	CIPRO 500-TAB 500 MG	J	1995	835,290	968,687

Top10 Category 1 Patented Drug Products
Manitoba: 1997/98 and 1998/99

DIN	Ingredient	Brand	ATC	Year of Introduction	Expenditures 1997/98 ($)	Expenditures 1998/99 ($)
2190915	OMEPRAZOLE (OMEPRAZOLE MAGNESIUM)	LOSEC20MG	A	1995	5,209,319	6,418,269
2155907	NIFEDIPINE	ADALAT XL-SRT30MG	C	1995	2,268,309	2,260,588
884340	SIMVASTATIN	ZOCORTAB20MG	C	1995	1,859,882	2,147,263
2146959	FENOFIBRATE	LIPIDIL MICRO-CAP200MG	C	1995	1,485,027	1,740,250
2155990	NIFEDIPINE	ADALAT XL-SRT60MG	C	1995	1,333,480	1,492,701
2213605	FLUTICASONE PROPIONATE	FLOVENT INHALERS-AEM INH-ORL125MCG/AEM	R	1996	601,652	993,815
851752	BUDESONIDE	PULMICORTTURBUHALER200MCG/DOSE	R	1995	838,444	890,035
2213613	FLUTICASONE PROPIONATE	FLOVENT INHALERS-AEM INH-ORL250MCG/AEM	R	1995	547,492	845,724
2229837	MISOPROSTOL	ARTHROTEC-75TABLETS	M	1996	346,367	695,499
870935	LEVODOPA	SINEMETCR200/50	N	1995	609,300	624,772

Top 10 Category 2 Patented Drug Products
Manitoba: 1997/98 and 1998/99

DIN	Ingredient	Brand	ATC	Year of Introduction	Expenditures 1997/98 ($)	Expenditures 1998/99 ($)
2155966	CIPROFLOXACIN (CIPROFLOXACIN HYDROCHLORIDE)	CIPRO500-TAB500MG	J	1995	835,290	968,687
2212161	SUMATRIPTAN (SUMATRIPTAN SUCCINATE)	IMITREX-TAB 100MG	N	1995	987,966	950,501
2169649	SODIUM CHLORIDE	BETASERON	L	1995	11,477	923,526
1968017	FILGRASTIM (R-METHUG-CSF)	NEUPOGEN INJ LIQ 0.3MG/ML	L	1995	827,734	855,141
2031116	TERBINAFINE (TERBINAFINE HYDROCHLORIDE)	LAMISIL TAB 250MG	D	1995	738,619	690,140
2010909	FINASTERIDE	PROSCAR TAB 5MG	G	1995	766,543	675,600
2025302	RISPERIDONE	RISPERDAL TAB 3MG	N	1995	437,871	495,891
2025299	RISPERIDONE	RISPERDAL TAB 2MG	N	1995	315,571	440,977
2155958	CIPROFLOXACIN (CIPROFLOXACIN HYDROCHLORIDE)	CIPRO250-TAB 250MG	J	1995	311,840	347,173
2216965	SAQUINAVIR (SAQUINAVIR MESYLATE)	INVIRASE -CAP 200MG	J	1996	362,707	301,311

Top10 Category 3 Patented Drug Products Manitoba:1997/98 and 1998/99						
DIN	**Ingredient**	**Brand**	**ATC**	**Year of Introduction**	**Expenditures 1997/98 ($)**	**Expenditures 1998/99 ($)**
1940481	PAROXETINE (PAROXETINE HYDROCHLORIDE)	PAXIL TAB 20MG	N	1995	2,052,867	2,644,254
708879	ENALAPRIL MALEATE	VASOTEC TAB 5MG	C	1995	2,373,842	2,520,119
893757	PRAVASTATIN SODIUM	PRAVACHOL TAB 20MG	C	1995	2,131,380	2,437,388
670901	ENALAPRIL MALEATE	VASOTEC TAB 10MG	C	1995	2,180,001	2,317,416
878928	AMLODIPINE(AMLODIPINE BESYLATE)	NORVASC TAB 5MG	C	1995	1,650,835	2,086,532
884332	SIMVASTATIN	ZOCOR TAB 10MG	C	1995	1,917,904	1,932,343
2230711	ATORVASTATIN (ATORVASTATIN CALCIUM)	LIPITOR 10 MG	C	1997	616,060	1,862,228
1962817	SERTRALINE (SERTRALINE HYDROCHLORIDE)	ZOLOFT CAP 50MG	N	1995	1,527,876	1,829,113
1962779	SERTRALINE (SERTRALINE HYDROCHLORIDE)	ZOLOFT CAP 100MG	N	1995	1,245,588	1,570,180
2201011	ALENDRONATE (ALENDRONATE SODIUM)	FOSAMAX-TAB 10MG	M	1996	710,414	1,328,410

Appendix 4

Therapeutic Class Analysis

Percentage Contribution by Therapeutic Classes to Total Expenditure Manitoba: 1995/96 - 1998/99					
Therapeutic Class	**Contribution in 1995/96**		**Contribution in 1998/99**		**% of Total Expenditure Change**
	(millions of dollars)	% of Total	(millions of dollars)	% of Total	
Cardiovascular System	43.57	35.48	54.57	32.66	24.85
Nervous System	19.27	15.69	32.76	19.61	30.46
Alimentary Tract and Metabolism	14.95	12.18	21.63	12.95	15.09
General Antiinfectives for Systemic Use	8.08	6.58	11.29	6.76	7.25
Respiratory System	8.11	6.60	10.3	6.16	4.94
Genito Urinary System and Sex Hormones	8.85	7.21	9.03	5.40	0.41
Musculo-Skeletal System	6.73	5.48	7.83	4.69	2.50
Antineoplastic and Immunomodulating Agents	3.07	2.50	6.49	3.88	7.71
Dermatologicals	3.56	2.90	3.93	2.35	0.83
Sensory Organs	2.48	2.02	3.73	2.23	2.81
Blood and Blood Forming Organs	2.23	1.82	3.05	1.83	1.85
Systemic Hormonal Preparations, Excluding Sex Hormones	1.23	1.00	1.6	0.96	0.83
Antiparasitic Products, Insecticides and Repellents	0.31	0.25	0.44	0.26	0.29
Unclassified	0.32	0.26	0.34	0.20	0.05
Various	0.04	0.03	0.1	0.06	0.14
Total	**122.79**	100.00	**167.08**	100.00	**100**

Anatomical Therapeutic Chemical (ATC)

The Anatomical Therapeutic Chemical (ATC) classification system [and the Defined Daily Dose (DDD)] as a measuring unit are recommended by the WHO for drug utilization studies.
In the ATC classification system, the drugs are divided into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties. Drugs are classified in groups at five different levels. The drugs are divided into fourteen main groups (1st level), with two therapeutic/pharmacological subgroups (2nd and 3rd levels). The 4th level is a therapeutic/pharmacological/chemical subgroup and the 5th level is the chemical substance. Medicinal products are classified according to the main therapeutic use of the main active ingredient, on the basic principle of only one ATC code for each pharmaceutical formulation (i.e. similar ingredients, strength and pharmaceutical form). A medicinal product can be given more than one ATC code if it is available in two or more strengths or formulations with clearly different therapeutic uses. The second level of the ATC classification system is used to represent a general disease grouping within the study.

ATC	Therapeutic Class	Subgroups*
A02	Antacids, drugs for treatment of peptic ulcer and flatulence	Antacids; H_2-receptor antagonists; Prostaglandins; Proton pump inhibitors; Combinations for eradication of *Helicobacter pylori* & Others such as sucralfate
A10	Drugs used in diabetes	Insulins and analogues; Biguanides; Sulfonamides; Alpha glucosidase inhibitors; Thiazolidinediones & Others such as repaglinide
B01	Antithrombotic agents	Vitamin K antagonists (warfarin); Heparin group (includes LMWH); Platelet aggregation inhibitors (clopidogrel, ticlopidine..,abciximab..); Enzymes (streptokinase, alteplase..) & Others (lepirudin)
C01	Cardiac Therapy	Cardiac glycosides (digoxin); Antiarrhythmics; Cardiac stimulants (adrenergic and dopaminergic agents, phosphodiesterase inhibitors); Vasodilators (organic nitrates) & Others such prostaglandins
C07	Beta blocking agents	Beta blocking agents; Beta blocking agents and Thiazides; Beta blocking agents and other diuretics; Beta blocking agents and Vasodilators & Beta blocking agents and Other antihypertensives
C08	Calcium channel blockers	Selective Calcium channel blockers with mainly vascular effects; Selective Calcium channel blockers with direct cardiac effects; Non-selective Calcium channel blockers & Calcium channel blockers and diuretics

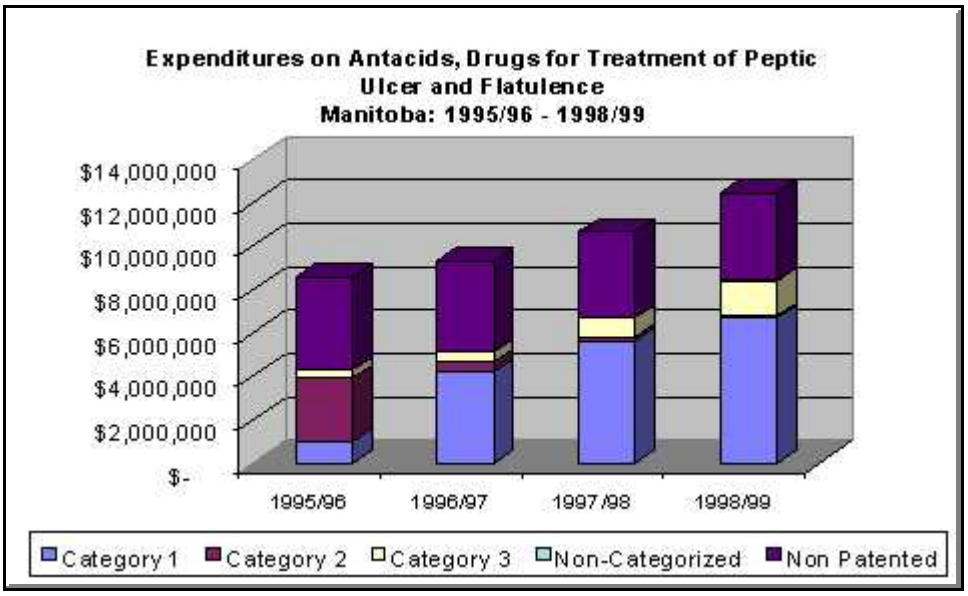
ATC	Therapeutic Class	Subgroups*
C09	Agents acting on the renin-angiotensin system	ACEIs, plain; ACEIs, combinations; Angiotensin II antagonists, plain; Angiotensin II antagonists, combinations & Others
C10	Serum lipid reducing agents	HMG CoA reductase inhibitors; Fibrates; Bile acid sequestrants; Nicotinic acid and derivatives
J01	Antibacterials for systemic use	Tetracyclines; Amphenicols (chloramphenicol); Penicillins; Beta-lactamase inhibitors; Cephalosporins; Monobactams; Carbapenems; Sulfonamides and Trimethoprim; Macrolides and Lincosamides (clindamycin); Aminoglycosides; Quinolones & Others such as vancomycin, fusidic acid, metronidazole
N02	Analgesics	Opioids (natural opium alkaloids such as morphine, codeine..; phenylpiperidines derivatives such as pethidine, fentanyl..; diphenylpropylamine derivatives such as methadone; pentazocine; morphinan derivative such as butorphanol and nalbuphine; opioids in combination with antispasmodics); Other analgesics and antipyretics (salicylic acid and derivatives, pyrazolones, anilides such as paracetamol); Antimigraine preparations (ergot alkaloids, selective $5HT_1$-receptor agonists & other antimigraine preparations such as pizotifen, clonidine)
N03	Antiepileptics	Barbiturates and derivatives; Hydantoin derivatives; Oxazolidine derivatives; Succinimide derivatives; Benzodiazepine derivatives (clonazepam); Carboxamide derivatives; Fatty acid derivatives (valproic acid, vigabatrin) & Others (lamotrigine, topiramate, gabapentin)
N04	Anti-parkinson drugs	Anticholinergic agents; Dopaminergic agents [Dopa and dopa derivatives; Adamantane derivatives (amantadine); Dopamine agonists; MAO type B inhibitors (selegiline); Others (entacapone)]
N05	Psycholeptics	Antipsychotics (phenothiazines; butyrophenone derivatives; indole derivatives; thioxanthene derivatives; diphenylbutylpiperidine derivatives such as pimozide; diazepines, oxazepines and thiazepines such as clozapine, olanzepine & quetiapine; neuroleptics in tardive dyskinesia such as tetrabenazine; benzamides; lithium); Anxiolytics (benzodiazepine derivatives, carbamates, buspirone); Hypnotics and sedatives (barbiturates-plain, barbiturates-combinations,aldehydes and derivatives, benzodiazepine derivatives, piperidinedione derivatives, benzodiazepine related drugs such as zopiclone)

ATC	Therapeutic Class	Subgroups*
N06	Psychoanaleptics	Antidepressants; Psychostimulants and nootropics (centrally acting sympathomimetics, xanthine derivatives); Psycholeptics and psychoanaleptics in combination (antidepressants in combination with psycholeptics); Anti-dementia drugs
R03	Anti-asthmatics	Adrenergics, inhalants; Other anti-asthmatics, inhalants (glucocorticoids, anticholinergics, antiallergic agents); Adrenergics for systemic use; Other anti-asthmatics for systemic use (xanthines, xanthines and adrenergics, leukotriene receptor antagonists)
S01	Ophthalmologicals	Anti-infectives (antibiotics, sulfonamides, antivirals, other anti-infectives); Anti-inflammatory agents (corticosteroids, plain; corticosteroids and mydriatics in combination; anti-inflammatory agents, non-steroids); Anti-inflammatory agents and anti-infectives in combination; Anti-glaucoma preparations and miotics; Mydriatics and cycloplegics; Decongestants and antiallergics; Local anesthetics; Diagnostic agents; Surgical aids; Others such as artificial tears

* main one listed

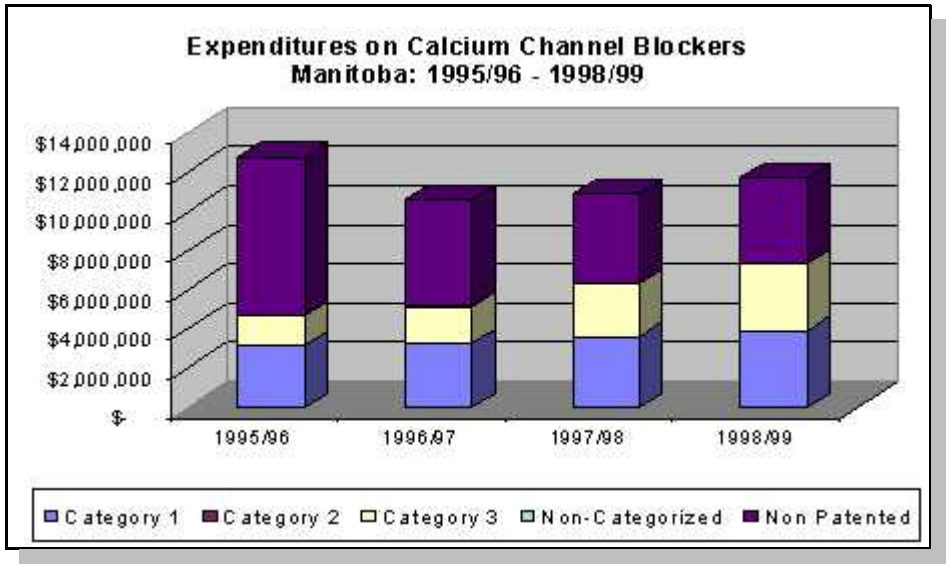
Impact of New and Existing Drug Products by Major Disease Groups
Manitoba: 1995/96 - 1998/99
Antacids and Drugs for Treatment of Peptic Ulcer and Flatulence
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		3,813	3,170	2,592	2,298
1995/96	1	1,054	4,268	5,696	6,756
1995/96	2	2,910	454	186	75
1995/96	3	347	331	377	310
1995/96	NC	452	397	391	350
1996/97		0	602	920	1,146
1996/97	3	0	95	325	600
1997/98		0	0	31	137
1997/98	1	0	0	3	4
1997/98	3	0	0	143	721
1998/99		0	0	0	54
1998/99	1	0	0	0	0
Total Expenditure		**8,575**	**9,317**	**10,662**	**12,451**
Patented Expenditure		**4,316**	**5,122**	**6,694**	**8,432**
Non Patented Expenditure		**4,259**	**4,195**	**3,968**	**4,019**


Expenditures on Antacids, Drugs for Treatment of Peptic Ulcer and Flatulence
Manitoba: 1995/96 - 1998/99
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

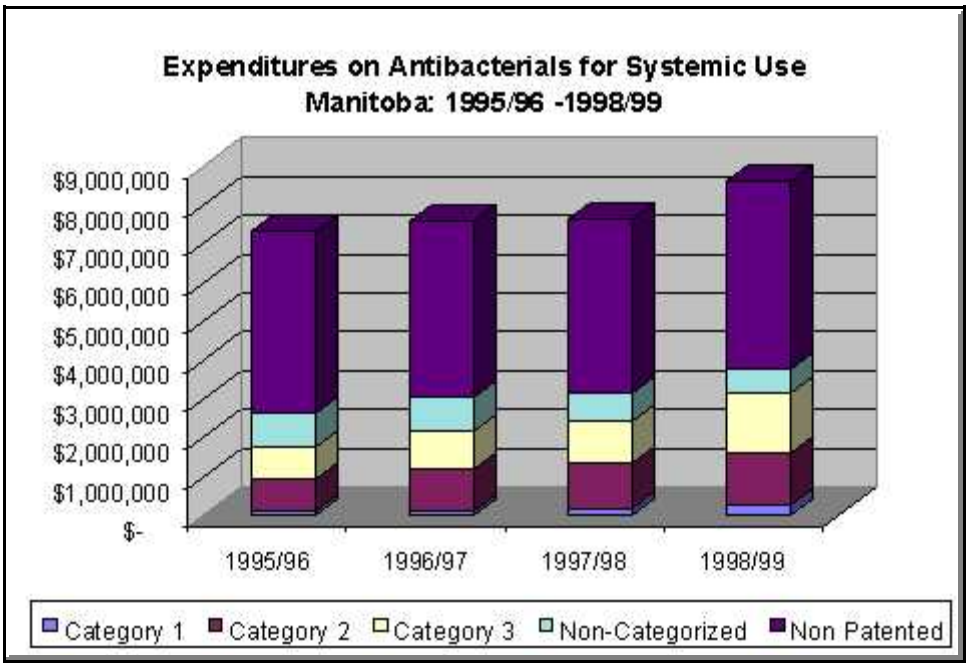
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba 1995/96-1998/99
Calcium Channel Blockers
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		8,093	4,139	1,795	1,518
1995/96	1	3,137	3,240	3,622	3,779
1995/96	2	7	3	5	5
1995/96	3	1,518	1,905	2,672	3,384
1995/96	NC	33	22	17	14
1996/97		0	1,264	2,483	1,888
1997/98		0	0	241	651
1997/98	1	0	0	48	328
1998/99		0	0	0	2
1998/99	1	0	0	0	139
Total Expenditure		**12,787**	**10,574**	**10,883**	**11,707**
Patented Expenditure		**4,695**	**5,170**	**6,317**	**7,321**
Non Patented Expenditure		**8,093**	**5,403**	**4,567**	**4,386**


Expenditures on Calcium Channel Blockers
Manitoba: 1995/96 - 1998/99
$14,000,000
$12,000,000
$10,000,000
$8,000,000
$6,000,000
$4,000,000
$2,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

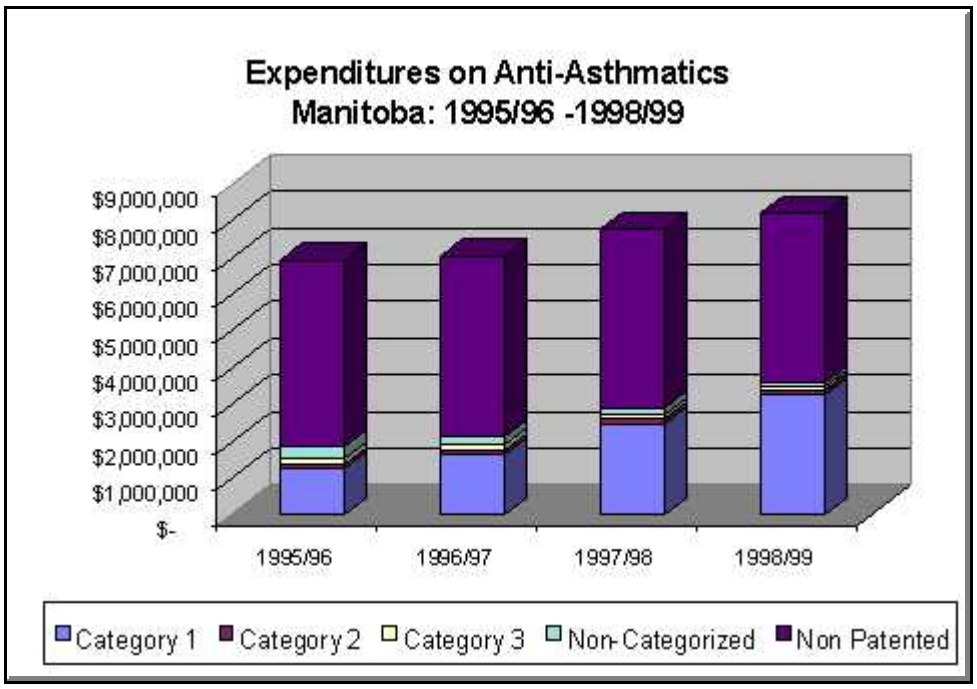
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Antibacterials for Systemic Use
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		4,479	4,301	4,109	4,340
1995/96	1	183	215	281	388
1995/96	2	856	1,052	1,147	1,316
1995/96	3	807	947	1,016	1,347
1995/96	NC	979	972	799	713
1996/97		0	51	124	95
1996/97	3	0	23	94	158
1996/97	NC	0	0	0	2
1997/98		0	0	66	82
1997/98	1	0	0	1	8
1997/98	NC	0	0	1	0
1998/99		0	0	0	86
1998/99	3	0	0	0	70
1998/99	NC	0	0	0	0
Total Expenditure		**7,304**	**7,562**	**7,638**	**8,604**
Patented Expenditure		**2,653**	**3,037**	**3,154**	**3,783**
Non Patented Expenditure		**4,650**	**4,524**	**4,483**	**4,822**

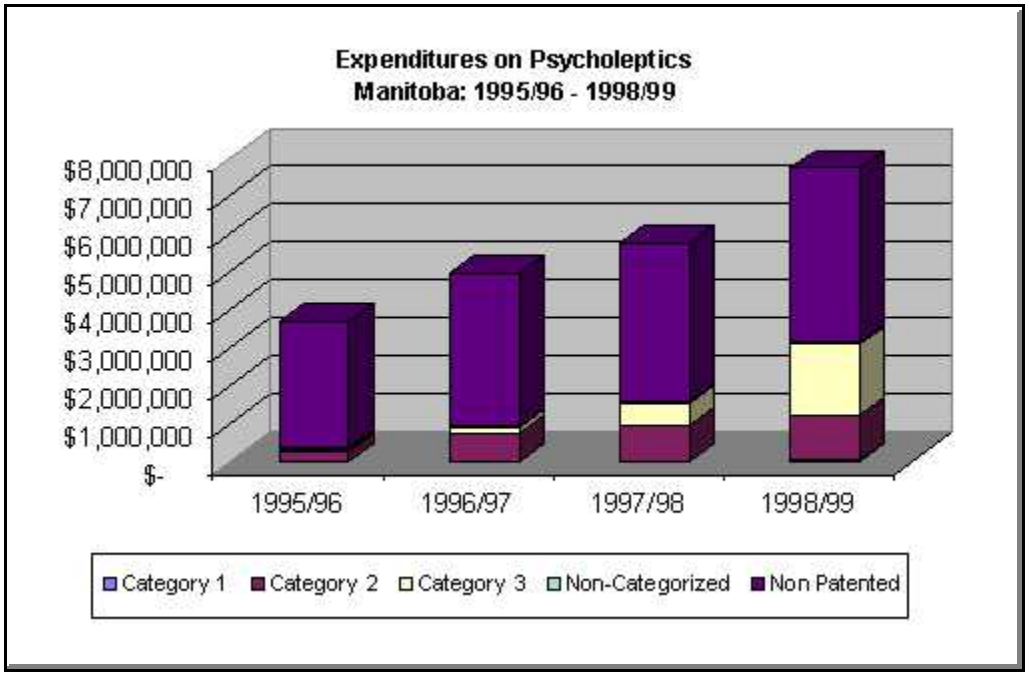

Expenditures on Antibacterials for Systemic Use
Manitoba: 1995/96 -1998/99
$9,000,000
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Anti-Asthmatics
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		3,912	3,646	3,364	3,001
1995/96	1	1,752	1,977	2,472	2,752
1995/96	2	116	127	135	135
1995/96	3	207	143	91	65
1995/96	NC	947	898	923	872
1996/97		0	37	168	120
1996/97	1	0	214	602	994
1996/97	3	0	1	7	7
1997/98		0	0	25	139
1997/98	1	0	0	1	25
1997/98	3	0	0	1	6
1998/99		0	0	0	47
1998/99	1	0	0	0	14
1998/99	3	0	0	0	24
Total Expenditure		**6,934**	**7,044**	**7,788**	**8,202**
Patented Expenditure		**1,832**	**2,124**	**2,890**	**3,600**
Non Patented Expenditure		**5,102**	**4,920**	**4,898**	**4,602**

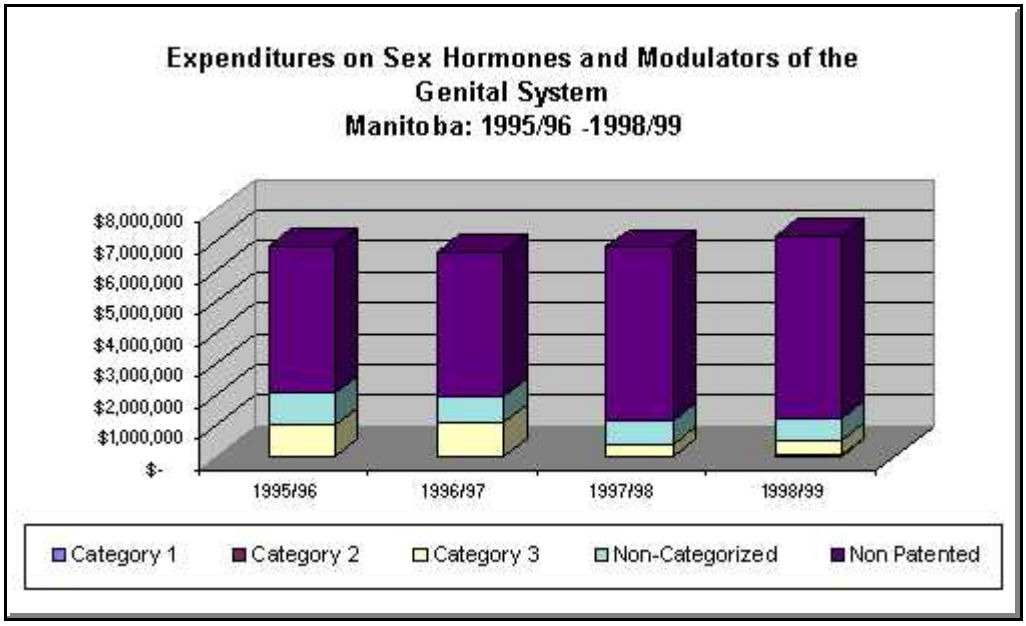

Expenditures on Anti-Asthmatics
Manitoba: 1995/96 -1998/99
$9,000,000
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

Impact of Existing and Newer Drug Products by Major Disease Groups Manitoba1995/96-1998/99 Psycholeptics (thousands of dollars)					
Year of Introduction	**Category**	**1995/96**	**1996/97**	**1997/98**	**1998/99**
1995/96		2,050	2,276	2,077	1,847
1995/96	1	15	9	9	7
1995/96	2	283	730	960	1,182
1995/96	3	703	357	320	500
1995/96	NC	647	831	765	1,080
1996/97		0	768	1,249	1,337
1996/97	3	0	15	302	1,369
1997/98		0	0	73	278
1997/98	1	0	0	0	33
1998/99		0	0	0	73
1998/99	1	0	0	0	0
1998/99	3	0	0	0	43
Total Expenditure		**3,698**	**4,987**	**5,755**	**7,749**
Patented Expenditure		**360**	**930**	**1,589**	**3,150**
Non Patented Expenditure		**3,338**	**4,057**	**4,166**	**4,599**


Expenditures on Psycholeptics
Manitoba: 1995/96 - 1998/99
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

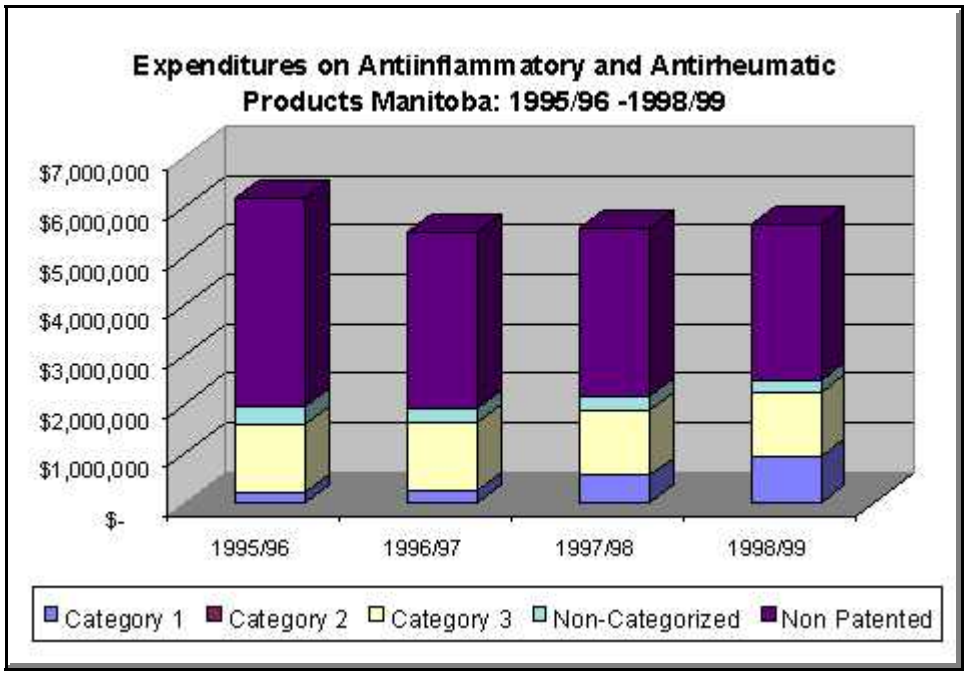
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Sex Hormones and Modulators of the Genital System
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		4,780	4,590	4,346	4,326
1995/96	3	1,023	1,119	1,270	1,402
1995/96	NC	1,029	844	784	728
1996/97		0	58	311	337
1996/97	1	0	3	28	41
1997/98		0	0	39	197
1998/99		0	0	0	102
1998/99	1	0	0	0	13
Total Expenditure		**6,832**	**6,615**	**6,777**	**7,145**
Patented Expenditure		**2,052**	**1,966**	**1,180**	**1,255**
Non Patented Expenditure		**4,780**	**4,649**	**5,597**	**5,890**


Expenditures on Sex Hormones and Modulators of the Genital System
Manitoba: 1995/96 -1998/99
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

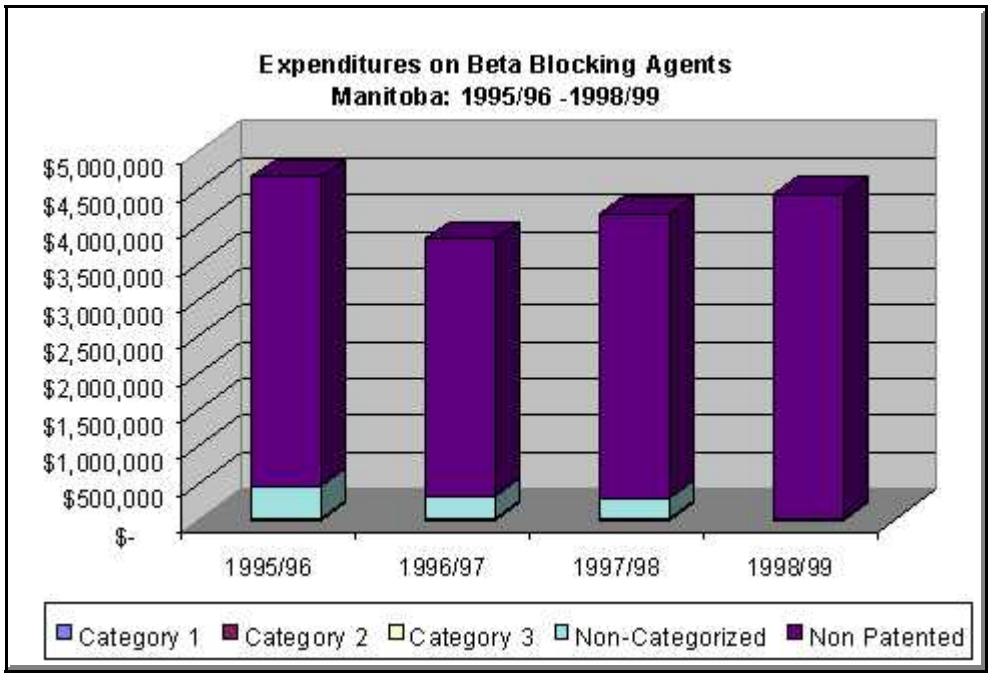
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Anti-inflammatory and Anti-rheumatic Products
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		3,562	3,270	3,106	2,705
1995/96	1	233	242	214	252
1995/96	3	1,373	1,507	1,346	1,302
1995/96	NC	1,005	439	479	422
1996/97		0	9	36	40
1996/97	1	0	24	346	695
1997/98		0	0	51	67
1998/99		0	0	0	166
Total Expenditure		**6,174**	**5,491**	**5,578**	**5,649**
Patented Expenditure		**1,957**	**1,905**	**2,146**	**2,490**
Non Patented Expenditure		**4,217**	**3,586**	**3,432**	**3,160**


Expenditures on Antiinflammatory and Antirheumatic Products Manitoba: 1995/96 -1998/99
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

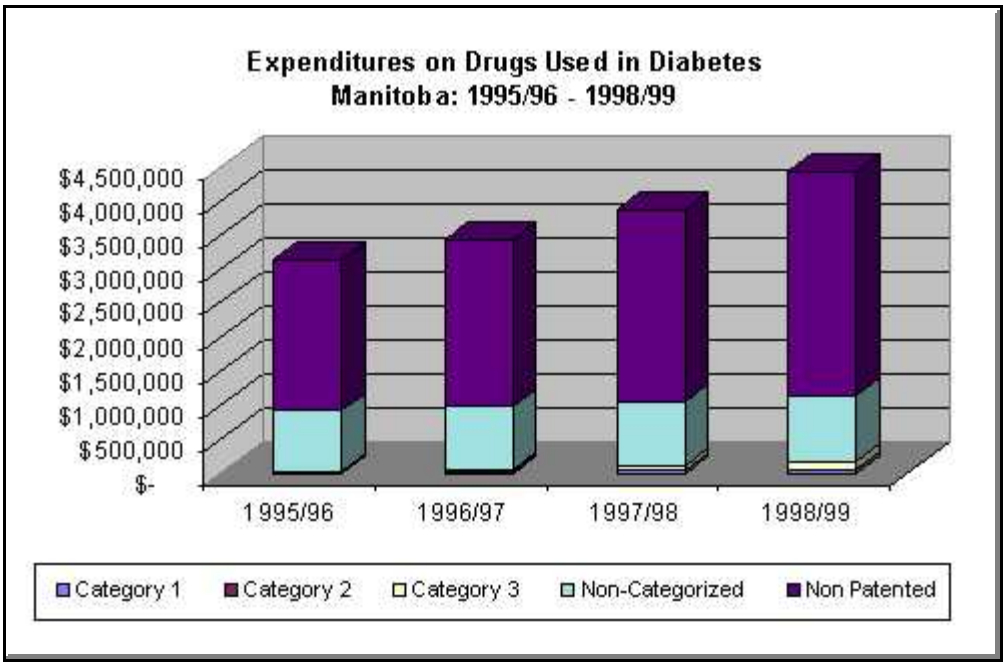
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Beta Blocking Agents
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		4,033	3,258	3,220	3,120
1995/96	1	29	26	29	32
1995/96	NC	596	391	381	393
1996/97		0	142	466	657
1996/97	1	0	0	0	0
1997/98		0	0	61	214
1998/99		0	0	0	4
Total Expenditure		**4,658**	**3,817**	**4,157**	**4,419**
Patented Expenditure		**455**	**313**	**299**	**12**
Non Patented Expenditure		**4,202**	**3,503**	**3,858**	**4,407**


Expenditures on Beta Blocking Agents
Manitoba: 1995/96 -1998/99
$5,000,000
$4,500,000
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

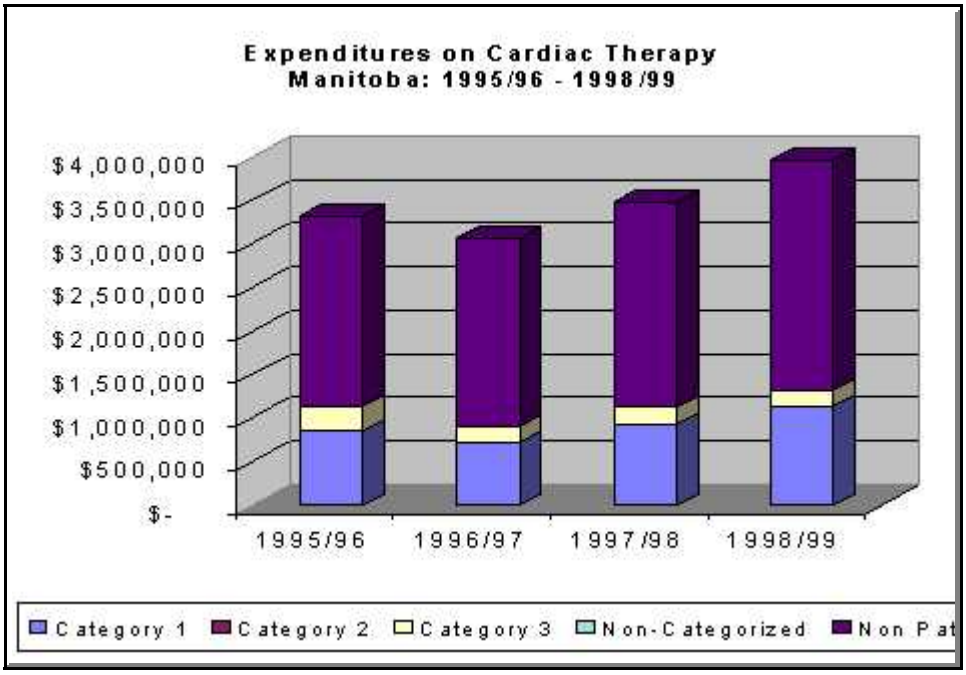
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Drugs Used in Diabetes
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		1,234	1,319	1,527	1,756
1995/96	1	229	301	377	481
1995/96	NC	1,658	1,750	1,744	1,742
1996/97		0	0	0	0
1996/97	3	0	29	76	117
1996/97	NC	0	17	78	178
1997/98		0	0	65	137
1998/99		0	0	0	4
Total Expenditure		**3,121**	**3,415**	**3,867**	**4,417**
Patented Expenditure		**923**	**983**	**1,052**	**1,139**
Non Patented Expenditure		**2,198**	**2,432**	**2,815**	**3,278**


Expenditures on Drugs Used in Diabetes
Manitoba: 1995/96 - 1998/99
$4,500,000
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

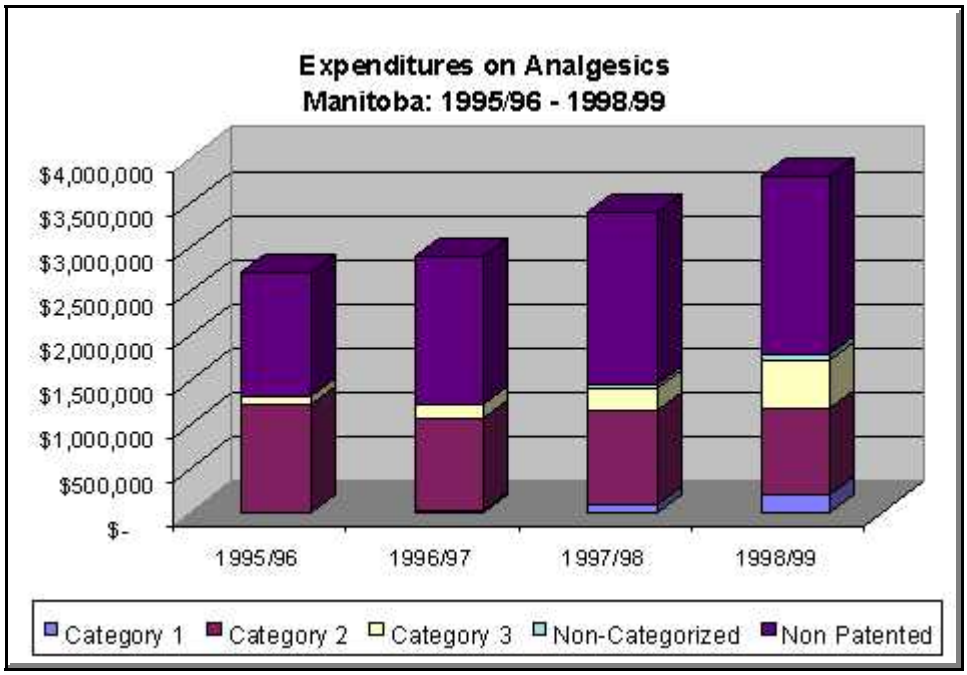
Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Cardiac Therapy
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		1,993	2,027	2,214	2,464
1995/96	1	864	722	911	1,090
1995/96	3	298	188	192	182
1995/96	NC	160	129	114	97
1996/97		0	0	0	0
1996/97	1	0	7	30	57
1997/98		0	0	23	33
1998/99		0	0	0	32
Total Expenditure		**3,315**	**3,071**	**3,485**	**3,956**
Patented Expenditure		**1,144**	**908**	**1,127**	**1,324**
Non Patented Expenditure		**2,171**	**2,164**	**2,358**	**2,632**

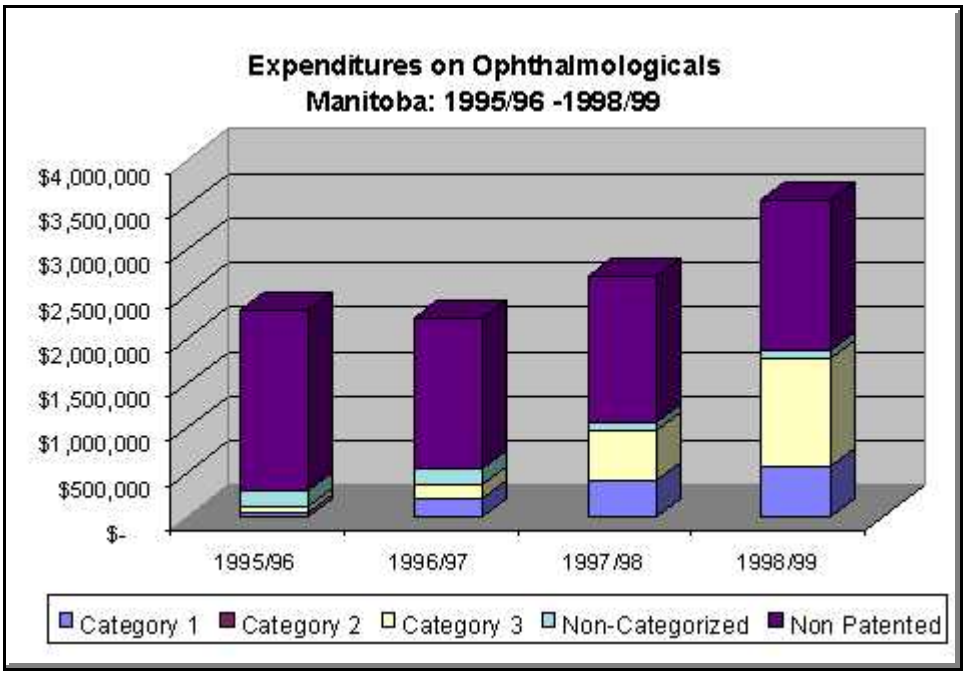

Expenditures on Cardiac Therapy
Manitoba: 1995/96 - 1998/99
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Pat

Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Analgesics
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		946	1,003	1,035	1,073
1995/96	1	27	65	86	156
1995/96	2	1,227	1,034	1,061	985
1995/96	3	77	158	195	389
1995/96	NC	440	611	766	787
1996/97		0	25	88	36
1996/97	1	0	11	67	122
1996/97	NC	0	0	50	70
1997/98		0	0	3	4
1997/98	1	0	0	1	12
1997/98	3	0	0	51	97
1997/98	NC	0	0	0	0
1998/99		0	0	0	1
1998/99	1	0	0	0	9
1998/99	3	0	0	0	62
Total Expenditure		**2,718**	**2,906**	**3,404**	**3,804**
Patented Expenditure		**1,307**	**1,224**	**1,453**	**1,793**
Non Patented Expenditure		**1,411**	**1,682**	**1,951**	**2,010**

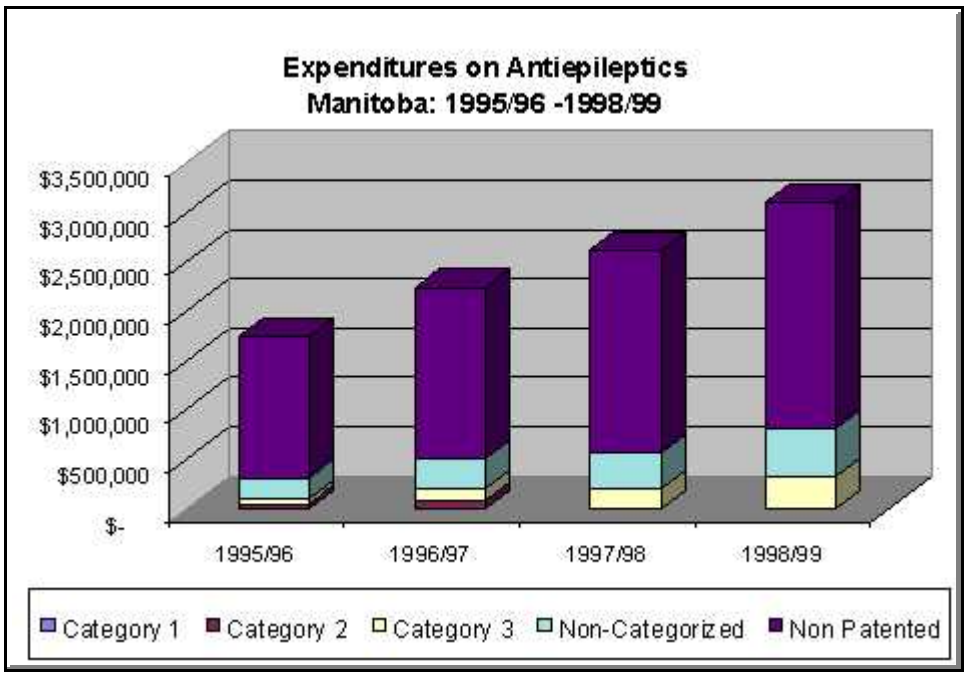

Expenditures on Analgesics
Manitoba: 1995/96 - 1998/99
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

Impact of Existing and Newer Drug Products by Major Disease Groups Manitoba1995/96-1998/99 Ophthalmologicals (thousands of dollars)					
Year of Introduction	**Category**	**1995/96**	**1996/97**	**1997/98**	**1998/99**
1995/96		820	714	653	595
1995/96	1	60	202	416	564
1995/96	3	92	105	141	208
1995/96	NC	1,337	810	618	555
1996/97		0	323	439	391
1996/97	3	0	77	400	458
1997/98		0	0	5	224
1997/98	3	0	0	30	569
1998/99		0	0	0	3
1998/99	1	0	0	0	0
Total Expenditure		**2,309**	**2,230**	**2,702**	**3,566**
Patented Expenditure		**292**	**542**	**1,059**	**1,877**
NonPatented Expenditure		**2,017**	**1,688**	**1,643**	**1,689**


Expenditures on Ophthalmologicals
Manitoba: 1995/96 -1998/99
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

Impact of Existing and Newer Drug Products by Major Disease Groups
Manitoba1995/96-1998/99
Antiepileptics
(thousands of dollars)

Year of Introduction	Category	1995/96	1996/97	1997/98	1998/99
1995/96		1,393	1,673	1,737	1,730
1995/96	2	44	74	65	43
1995/96	3	44	126	166	205
1995/96	NC	256	310	370	489
1996/97		0	53	217	233
1997/98		0	0	15	101
1997/98	3	0	0	36	119
1998/99		0	0	0	181
Total Expenditure		**1,736**	**2,235**	**2,607**	**3,100**
Patented Expenditure		**307**	**493**	**561**	**801**
Non Patented Expenditure		**1,429**	**1,742**	**2,047**	**2,299**


Expenditures on Antiepileptics
Manitoba: 1995/96 -1998/99
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$-
1995/96
1996/97
1997/98
1998/99
Category 1
Category 2
Category 3
Non-Categorized
Non Patented

Appendix 5

Glossary

Beneficiary
Pharmacare Program: A family unit that is receiving benefits
Personal Care Home Drug Program: A resident of a Personal Care Home.
Social Assistance Health Services Drug Program: Individual Manitobans that are receiving drug benefits pursuant to the Social Assistance Health Services Drug Program.

Category 1 Drugs
PMPRB DIN categorization - a new DIN of an existing or comparable dosage form of an existing medicines, usually a new strength of an existing drug (line extension).

Category 2 Drugs
PMPRB DIN categorization - the first drug product to treat effectively a particular illness or which provides a substantial improvement over existing drug products, often referred to as "breakthrough" or "substantial improvement".

Category 3 Drugs
PMPRB DIN categorization - a new drug or new dosage form of an existing medicine that provides moderate, little or no improvement over existing medicines.

Exiting Drug Effect
Exiting Drug Effect shows the amount by which expenditures decrease as a result of de-listing drugs from the formulary, discontinuation of the products by the manufacturer, or lack of claims during follow-up periods.

Existing Drug Products
In this Study, Existing Drug Products are defined as drug products that were already reimbursed pursuant to the Manitoba Drug Benefits Formulary in 1995/96 or earlier.

New Drug Effect
New Drug Effect shows the amount by which expenditures increase as a result of listing new drugs in the Manitoba Drug Formulary.

Newer Drug Products
In this Study, new drug products are defined as drug products that were listed in the Manitoba Drug Formulary in 1996/97 or during subsequent years.

Price Effect
Price effect shows the impact of prices on expenditures by holding volume consumed constant. In other words, it is the amount by which expenditures would change if volume consumed did not change from the previous year.

Total Pharmaceutical Expenditures
Total Pharmaceutical Expenditures in this study include expenditures made by Manitoba Government Drug Plans. Expenditures include accepted ingredient cost plus wholesale markups. Expenditures presented in this analysis include the patients portion of the drug cost. They do not include dispensing fees.

Volume Effect
Volume effect shows the impact of volume consumed on expenditures by holding prices constant. In other words, it is the amount by which expenditures would change if prices did not change from the previous year.