Monitoring The Effects Of Family Health Benefits

For Low-Income Families In Saskatchewan

Final Report on an Inter-departmental Research Project

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RESEARCH TEAM

Trish Livingstone	Saskatchewan Health
Lisa Lix	Saskatchewan Health
Mary McNutt	Saskatchewan Health
Evan Morris	EcoTech Research Ltd.
William Osei	Saskatchewan Health
David Rosenbluth	Saskatchewan Social Services
Doug Scott	Saskatchewan Social Services
Felecia Watson	Saskatchewan Health

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Pat Cambridge
Alonzo Celis
Mitsi Fiissel
Roy Gough
Andrea Laturnas
Doug McKenzie
Sheena McRae
Duane Mombourquette
Carmelle Mondor
Barb Shea
Pat Toth
Ronn Wallace
Dave Warren
Lyn Yeo

Saskatchewan Social Services
Richard Deutscher
Corrine Englot
Alison Meehan
Kiet Truoung
Kevin Turner
Jan Yaworski

GDS and Associates Systems, Ltd.
Leah Lueck
Dawn Marr

All correspondence related to this report should be addressed to David Rosenbluth, Research and Evaluation Branch, Saskatchewan Social Services, drosenbluth@ss.gov.sk.ca

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EXECUTIVE SUMMARY

1.1 Background

Family Health Benefits (FHB) is a provincial program extending supplementary health coverage to low-income families to assist with the cost of raising children. The program provides additional children's coverage for dental, optometry, and chiropractic services, as well as prescription drugs, ambulance transportation, and medical supplies. More limited coverage for eye care, drugs, and chiropractic services is also provided to parents. Enrollment in the program is an almost automatic consequence of participation in one of two income support programs: the Saskatchewan Child Benefit (SCB) and/or National Child Benefit Supplement (NCBS) and, to a lesser extent, the Saskatchewan Employment Supplement (SES). FHB is administered by Saskatchewan Health, with families nominated for coverage by Saskatchewan Social Services.

FHB was launched in July 1998 as part of a restructuring of income support systems coinciding with the introduction of the federal National Child Benefit (NCB). By reducing the potential financial impact of obtaining necessary health services for children, the FHB program was intended to make it easier for parents on welfare to take low-wage or part-time employment, and prevent them from returning to welfare due to high health costs. Under the new program, "working poor" families receive several health benefits that had previously only been available to families on welfare.

This study examines the characteristics of FHB beneficiaries, investigates how the new benefits have been used, and explores how service use changes with changes in the type of health coverage. In so doing, it addresses important questions about the relationship between health service use and costs, and provides further evidence of the utility of the population health approach to health policy and planning.

The study was carried out by a project team comprised of representatives from Saskatchewan Health and Saskatchewan Social Services, with programming and consulting services provided by EcoTech Research Ltd. Financial support for the study was provided by Health Canada's Health Transition Fund.

1.2 Methodology

The study population is comprised of 105,337 adults and children who received supplementary health coverage through FHB for some period between July 1998 and January 2000. Health records were extracted for these individuals dating back to July 1997 and continuing to January 31, 2000. The one-year period prior to the introduction of FHB was selected to determine whether individuals had been receiving supplementary coverage through welfare or another income support program prior to receiving FHB, or had moved onto the FHB program from regular provincial health coverage.

In addition to tracking changes in health coverage, the study monitors use of health services and changes in the use of these services. Hospital and physician services are completely covered under the province's regular health insurance scheme. Other services, including optometric, chiropractic, and prescription drugs, are only partially covered under supplementary health benefit programs like FHB. Both types of services are examined to determine whether health services utilization is influenced by the type of health insurance coverage provided.

Only three of the six services which are partially covered by FHB are examined in this report. Of the three services not examined, dental services are perhaps most significant in terms of program costs. They were excluded from the study design because no comparative data on dental service use prior to FHB is recorded on health information systems. Ambulance and medical supply services are not examined because coverage for these services is extended primarily to children and levels of use are very low.

The impact of FHB on service use is examined in two main ways. The first method compares rates of service utilization during periods in which individuals were covered by FHB to rates of utilization during periods in which they were receiving regular health insurance coverage and other types of supplementary health coverage. The second method examines the sub-population of FHB recipients whose health coverage changed during the observation period and assesses the impact of coverage changes on rates of service use.

1.3 Key Findings

1.3.A Do Family Health Benefits Provide New Benefits to the Target Population?

- FHB benefits were new benefits for the vast majority of recipients (71%) during the first 18 months of the program. The remaining 29% of FHB recipients had been receiving other forms of supplementary health coverage, through welfare or other income support programs, prior to moving to FHB.

- Most of those moving to FHB from other forms of supplementary coverage (70%) had been receiving coverage through the province's welfare program, the Saskatchewan Assistance Plan (SAP). A smaller proportion (27%) had obtained coverage previously though the Family Income Plan (FIP), an income supplementation program for low income working families that was discontinued with income support restructuring in July 1998.

- New recipients of supplementary coverage through FHB differed from those moving to FHB from other forms of coverage in several important respects. Perhaps most notable was the finding that a large proportion of new recipients were living in rural municipalities. New recipients, both adults and children, were also older on average than those moving from previous forms of coverage, and were far less likely to dwell in single parent households.

- Virtually all of the new recipients qualified for FHB through their participation in the Saskatchewan Child Benefit/National Child Benefit Supplement (SCB/NCBS) introduced in July 1998. These findings reveal a great deal about the reach of the new income support programs for families.

1.3.B What Proportion of Eligible Families Receive Family Health Benefits?

- Families qualify for FHB through their participation in SCB/NCBS and, to a lesser extent, SES. SCB/NCBS applications are driven by the federal income tax system. Since the number and income characteristics of families that do not file a tax return are unknown, it is difficult to estimate both the size of the FHB eligible population and FHB take-up with precision. Nonetheless, when the October 1999 FHB caseload is expressed as a proportion of FHB eligible families from SCB/NCBS in the same month, it results in a very favourable take-up estimate of 93%.

- This research question was originally twofold; the second part concerning the characteristics of eligible families who do not enroll. It could not be addressed with available data.

1.3.C How Does the Use of Health Services Change as a Family's Coverage Changes?

- The study found distinctive patterns of service use among individuals with different forms of coverage, in part reflecting the correlation between low income and poor health. Overall, the highest rates of utilization were found among families on welfare and the PTA, programs for those who were not working or upgrading basic education. The lowest rates of utilization were generally found among families on FHB or FIP, programs designed for the working poor.

- In general, patterns of service use for FHB recipients more closely resembled patterns found for those on regular coverage than those for other low income populations. Among FHB recipients, rates of utilization were generally lower for new recipients than for those moving to FHB from other supplementary coverage programs. Among new recipients, rates were generally lowest overall among rural residents.

- *Hospital and physician use:* Use of both hospitals and physicians was lowest among those with FHB coverage, and especially among new beneficiaries in rural areas. The highest rates of hospital and physician use were found among SAP recipients, with a significant portion of this use related to mental health diagnoses.

  Almost all changes in type of coverage during the study period were associated with reduced use of both hospital and physician services. The reduction in hospital use is thought to be the result of the passage of time rather than a change in coverage type, reflecting the general decline in hospital use in the larger population over the period of the study.

- *Prescription drug use:* To get a better sense of the impact of FHB on prescription drug use, analyses were conducted with a subset of the study population which included only individuals who had moved to FHB from regular coverage. An examination of drug use one year before and one year after the introduction of FHB revealed that the

number of prescriptions increased by 16% among children and 13% among adults – three to four times the rate of increase for the general population over the same period (4%). Drug classes with the largest relative increases were gastrointestinal and hormones for children, and cardiovascular and central nervous system drugs for adults. These increases suggest that, by removing the patient costs of these drugs, FHB may result in better health management.

Analyses of drug use by type of coverage revealed the lowest utilization rates among those on regular coverage and FHB, and the highest utilization rates among those on SAP. Again, among FHB recipients, utilization was lowest among those who were new beneficiaries of supplementary health benefits.

- *Chiropractic service use:* Chiropractic services are partially covered under the province's regular health insurance scheme, with patients making a co-payment for every visit. FHB removes the co-payment obligation for both children and adults.

  Although overall use of chiropractic services remains low in comparison to other health services, utilization rates for both adults and children increase when families move to FHB from regular coverage (349% increase for children, 204% increase for adults). The magnitude of change is most pronounced among FHB recipients in rural areas.

  Rates of utilization are higher under FHB than under any other type of health coverage, including SAP and the Provincial Training Allowance (PTA). The reason for these differences is not clear. Increased use may be partially explained by differences in the age and sex structure of the FHB population and populations with other types of coverage.

- *Optometry service use:* Eye examinations are provided free of charge annually to all children in the province, but FHB provides new coverage for children's eyeglasses.

  Rates of eye examinations were calculated for children who had moved to FHB from regular coverage for the one year before and one year after the introduction of FHB. Four times as many children were receiving eye examinations under FHB than under regular coverage, indicating that the real or anticipated cost of eyeglasses significantly deters low income families from taking advantage of free eye examinations.

  An examination of rates of optometry service use among adults by coverage type reveals the recurrent pattern of low use among individuals with FHB and regular coverage and high use among individuals with SAP and PTA coverage. This pattern is not apparent among children, however. Rates of eye examinations are much higher among FHB children than among children in any other coverage group, including SAP.

1.4 Conclusions

Assuming health service utilization is at least partially reflective of well-being, this study suggests that the working poor are in better health than those on welfare or a training allowance. It also demonstrates that user charges can pose a deterrent to low income parents obtaining needed health services, like prescription drugs and optometric services, for themselves and their children. If access to health services is regarded as a basic right of citizenship, these findings affirm the need to provide extended health benefits to low income families beyond those available through last-resort programs such as welfare.

BACKGROUND AND OBJECTIVES

2.1 Background

In the mid 1990s two sets of social policy decisions converged, resulting in the most substantial changes to the welfare system in the past 30 years. The federal government's decision to block-fund welfare services through the Canada Health and Social Transfer (CHST), combined with the federal/provincial decision to put child benefit reform on the national social policy agenda, created opportunities for extensive restructuring of income assistance programs in all provinces.

As part of the welfare re-design in Saskatchewan, the province introduced a new package of publicly insured health benefits, targeted to low-income families. The Family Health Benefits program (FHB), was designed to smooth the way for welfare families moving into the workforce, and to prevent low-income families from falling into welfare, due to excessive health care costs.

It is well established that access to health care is one of many social, economic, environmental, and genetic factors that determine health. People who are economically disadvantaged tend to experience multiple risk factors that tend to reinforce one another, having detrimental impacts on health. As well, this segment of the population may experience both real and perceived barriers to health care. These include financial, transportation, time, and cultural barriers to health care.

In 1999, almost 30% of the costs of health care were paid privately, either through out-of-pockets spending or private insurance.[1] The bulk of private spending is for drugs, dental care, and vision care. The FHB program is designed to reduce financial barriers to health care, by limiting or removing the costs associated with these types of health services.

Health care is a major public issue in Saskatchewan. At a time when the health system is undergoing extensive review, it is timely to examine the manner in which supplementary health benefits, specifically Family Health Benefits, are used by low-income families. This study addresses issues of take up, eligibility, and utilization of insured and partially insured services. It also examines the use of health care services before and after Family Health Benefits became available.

2.1.A Health, Welfare and Child Benefit Theory

Welfare is very efficiently targeted to those in dire need. Welfare programs, however, are also intrusive, poorly tolerated by the public, and expensive to administer. Because benefits are reserved for people who are very poor, any additional income families receive is deducted at a high rate from eligible benefits. Parents who wish to leave the welfare system face disincentives – high tax-back rates on their income and loss of in-kind benefits, such as supplementary health coverage – that discourage work. For many families faced with the potential loss of benefits, welfare rather than work is the more rational decision.

[1] Canadian Institute for Health Information & Statistics Canada. (2000). *Health Care in Canada 2000: A First Annual Report.* Ottawa: Authors

Children's benefit reform is designed to help working poor families, and to change the relationship of 'welfare poor' families to the labour market. Prior to reform, families who relied on welfare for their income received additional benefits for their children through the welfare system. Under child benefit reform the strategy was to remove children's benefits from the narrowly targeted welfare system, and replace them with a simple income-tested system. This would allow low-income working families to retain all or some of the benefits previously only available to welfare families.

The National Child Benefit (NCB) initiative was based on the premise that the fight against child poverty should be a national priority. Under the NCB the federal government is taking on greater responsibility for basic income security of children, supplanting the amounts that had been paid by provincial welfare programs for children. As the federal government increases its investments in child benefits, the provinces are expected to reinvest welfare savings in programs which further benefit low-income families with children. The Family Health Benefits program is one of the ways in which Saskatchewan has reinvested welfare savings to benefit children in low income families.

Under the old welfare system, a family's health needs were covered under Supplementary Health Benefits. These benefits provided coverage for dental, drug, optometric, and chiropractic services, emergency ambulance and hearing aids. If a family acquired enough income to cross the welfare threshold ($975/month for a single parent with one child) they lost these benefits.

Family Health Benefits were introduced in July 1998, as part of a more general restructuring of the welfare system. The program was designed to prevent potential health costs associated with children from being a factor in a parent's decision to work. The program also addressed an equity issue between welfare and working poor families. By changing eligibility for health benefits from welfare eligibility to an income threshold, and setting this level above the welfare threshold, a family can be protected against a sudden rise in health cost risks when they cross the line from welfare to work.

This report examines how both welfare poor and working poor have used Family Health Benefits. Since this program is part of an overall reform of supports to low income families, it is important to understand the range of services before and after welfare reform.

2.2 Programs Before Restructuring

2.2.A Saskatchewan Assistance Plan (SAP)

Saskatchewan has a unified provincial social assistance program called the Saskatchewan Assistance Plan, administered by Saskatchewan Social Services. Benefits are paid out monthly, determined by a 'budget deficit' system. Applicant's income is compared to a pre-determined set of needs, as determined through a needs test, with the resulting difference being the benefit to which the individual or family is entitled. This program is worker intensive, requiring a large number of staff to interview potential applicants, assess benefits, and monitor any change in income or employment status.

Prior to July 1998, SAP included a benefit intended for basic food, clothing, household and personal needs of children. The benefit was calculated as $195 per month for the first child in a single parent family, and $160 per month for all other children.

The re-structuring of SAP has mainly affected the child benefit portion of a family's allowance. The program continues to operate after re-structuring with little other change to policy, delivery and administration.

2.2.B Family Income Plan (FIP)

From 1974 to 1998 Saskatchewan had a child benefit program called the Family Income Plan, also administered by Saskatchewan Social Services. The program was created in anticipation of a national income supplementation program for the working poor – a federal initiative that failed to materialize.

In its origins, FIP paid a benefit to working poor families for the basic needs of children – an amount equivalent to that paid by welfare. Over time, budget pressures caused FIP benefits to fall behind those available from welfare. As a result, low-income families drifted back to social assistance and FIP caseloads fell to very low levels. At the time of restructuring, the maximum FIP benefit was $120 per child per month. FIP families also were entitled to a very modest package of supplementary health benefits (see Appendix B for a comparison of FIP benefits to other programs).

2.2.C Extended Health Benefits for those on Social Assistance

Like other provinces, Saskatchewan has a universal public health insurance system, with additional benefits available to protect poorer individuals and families against some health care costs which members of the general public are expected to bear from their own pockets.

One of these additional health benefits is directed at indigent or welfare poor persons, with enrollment determined by eligibility for welfare benefits. Extended Health Benefits provide free or low-cost prescriptions, eyeglasses, medical supplies, and other services. Although the program is administered by Saskatchewan Health, staff at Saskatchewan Social Services make nominations for coverage.

2.3 Programs After Restructuring

2.3.A Saskatchewan Assistance Plan (SAP)

The most important change made to SAP in the 1998 restructuring was the elimination of the children's basic allowance for food, clothing, household and personal needs. After August 1998 these needs were met through the federal National Child Benefit Supplement (NCBS), and a new Saskatchewan Child Benefit program (SCB).

Eligibility for both the NCBS and the SCB come through the tax system rather than through welfare application. Because of this, there are more families covered under NCBS/SCB payments than just welfare poor. By administering children's benefits through the tax system, and increasing the income range of families eligible for these benefits, there is greater equality between welfare poor and working poor families.

2.3.B National Child Benefit Supplement and the Saskatchewan Child Benefit (NCBS and SCB)

The National Child Benefit Supplement is a benefit to low income families paid by the federal government through the tax system. The amount of the benefit depends both on the number of children and the income level of the family. In 1998, benefits were $605 per year for a first child, with decreasing amounts for additional children. For a family with two children, benefits were paid up to a threshold of $25,981 in taxable income. Each year the value of the NCBS has increased, so that by July 2001 it was $1,155 for a first child and $955 for a second child.

The Saskatchewan Child Benefit is a 'top-up' to the NCBS and is paid by the provincial government. The purpose of the benefit was to raise the total amount that low income families received from government sources to be equivalent to what was paid through the welfare system. In 1998 the value of the SCB was $900 for a first child. All families with income levels making them eligible for the NCBS also received the SCB. The reach of the SCB, therefore, is greater than just welfare families since many working poor families qualify for this benefit.

The SCB is structured so that as the benefits from the federal NCBS increase, the value of the SCB decreases by the same amount, so that families continue to receive the 'equivalent to welfare' in children's benefits.

2.3.C Saskatchewan Employment Supplement (SES)

The Saskatchewan Employment Supplement is a new program for low income working families administered by Saskatchewan Social Services. It has the policy goal of supporting labour force participation of low-income parents and reducing the demand for social assistance by supplementing earned income, and offsetting child-related costs of working.

The value of the supplement depends on a family's earned income and number of children. Supplements start at earned income levels of $125 per month and accelerate as incomes rise up to levels of $825 per month. Maximum benefit levels are retained to income levels of $1,075 per month. After that, the supplement declines until it is completely phased out at annual income levels of $21,300 (for families with 1 child).

2.3.D Provincial Training Allowance (PTA)

The Provincial Training Allowance is a benefit, roughly equivalent to social assistance, paid through Saskatchewan Post Secondary Education and Training. Eligible recipients are those enrolled in Adult Basic Education courses or Skills Training, and who otherwise would be eligible for social assistance. The benefit is delivered through the provincial regional colleges, where the education and training classes are available. The allowance provides monthly financial support necessary to help low income individuals and families access basic education and related training programs. Like social assistance, the value of the benefit is based on family size and includes childcare and supplementary health benefits for family members.

2.3.E Family Health Benefits (FHB)

The Family Health Benefits Program was designed to reduce the health cost risk to parents working at low income jobs, and to improve the health of children in low-income Saskatchewan families. By providing supplementary health benefits for children based on income rather than welfare eligibility, the program should also reduce disincentives for welfare parents to take a job and leave assistance.

Family Health Benefits provide additional public health insurance for families qualifying for the SES and the SCB, and who do not receive other supplementary health benefits. The FHB benefits package concentrates on the health needs of children, although adults are eligible for a limited benefit package. A list of services provided under the program is provided in Appendix B.

Like social assistance-based supplementary health benefits, FHB is a program of Saskatchewan Health, but with a client population nominated by Saskatchewan Social Services. There are two sources of nomination. The first is the Canada Customs and Revenue Agency and the tax system. Potentially eligible families are given consent forms, to be signed and mailed to Saskatchewan Social Services. Social Services then nominates eligible families to Saskatchewan Health. This is the route for families receiving only the SCB and not SES, social assistance, or the training allowance. The second source of nominations is from active recipients in the SES program. These recipients are nominated by Saskatchewan Social Services at the point of qualifying for SES. No additional application is required.

Families who are on SES or SCB and who also receive social assistance will generally continue to receive the higher level of coverage contained in the Supplementary Health Plan.

2.4 The Relationship Between Health Status And Poverty

Access to health care is one of many social, economic, environmental and genetic factors determining our health. The determinants of health include income (i.e. individual income and the degree of income equity in a society), status, education, power/control, social cohesion/support, nature of social, political and economic environments, and nature of personal health practice/coping skills.[2]

It is well documented that health status improves with increases in income or social status.[3] Income determines living conditions, such as safe housing. It has also been associated with health-promoting behaviours, such as not smoking and physical activity. Studies suggest that the distribution of income in a given society may be a more important determinant of health than the total amount of income earned by society members.

[2] Kahan, B. (2001). *Interactive Domain Model.* University of Toronto: Centre for Health Promotion.
[3] National Forum on Health. (1996). *What Determines Health?* (Cat #H21-126|3-1996E) Ottawa: Minister of Public Works and Government Services Canada.

The *Second Report on the Health of Canadians*[4] reports that only 47% of Canadians in the lowest income bracket rate their health as very good or excellent, compared with 73% of Canadians in the highest income group. Furthermore, low-income Canadians are more likely to die earlier and to suffer more illnesses than Canadians with higher incomes, regardless of age, sex, race and place of residence.

There is evidence to indicate that health service utilization also varies with levels of income and income-assistance. A recent study released by the Manitoba Centre for Health Policy and Evaluation[5] examined health service utilization among children living in income-assisted households. Children from families receiving assistance had higher hospitalization admission rates than those from families not receiving assistance. In fact, rates were 60 to 80% higher among some income-assisted children, resulting in an additional 5 to10 admissions per 100 children. Moreover, children in income assisted households were more likely than non-assistance children to receive treatment from a physician one or more times in the year for an acute medical condition. No differences between the groups were reported for treatment associated with acute recurrent or chronic/permanent conditions. The researchers also reported that children in income assisted homes see physicians less frequently for preventive care than children not in income assisted homes. Glazier et al. found that use of hospital resources was highest among Ontario neighbourhoods with the lowest incomes; both admissions and readmissions were responsible for the differences among neighbourhoods.[6]

2.5 Major Research Questions

The restructuring of income security programs, and the role of Family Health Benefits are predicated on assumptions about the behaviour of low income families and the incentives or disincentives they face in working. Clearly, a major tenet is that the risk of additional health-related costs is a deterrent to families moving from welfare to work. Additionally, having potential health costs of children covered through a public plan prevents some low-income families from falling into social assistance if they cannot cover those costs.

A major purpose of this research is to investigate how families have used the health services made available through FHB, and to what extent the assumptions underlying the program restructuring are empirically supported. The introduction of the new income security and health benefits programs has meant that some families now have higher levels of coverage than they had before, some families have slightly reduced coverage, and others have seen little or no change in their basic coverage. This situation creates conditions under which natural comparisons can be made among groups, to see how patterns of health utilization change as income and availability of health coverage regimes change.

[4] Federal, Provincial and Territorial Advisory Committee on Population Health. (1999). *Toward a Healthy Future: Second Report on the Health of Canadians,* (Cat #H39-468/1999E). Ottawa: Minister of Public Works and Government Services Canada.

[5] Kozyrskyj, A., Mustard, C., & Derksen, S. (2000). *Considering the Health Care Needs of Children Living in Households Receiving Income Assistance in Manitoba.* Winnipeg: Manitoba Centre for Health Policy and Evaluation.

[6] Glazier, R. H., Bradley, E. M., Gilbert, J. E., & Rothman, L. (2000). The nature of increased hospital use in poor neighbourhoods: Findings from a Canadian city. *Canadian Journal of Public Health, 91, 268-273.*

This research has been guided by three basic questions:

Do Family Health Benefits Provide New Benefits to the Target Population?
Since August 1998, Family Health Benefits have been extended to families qualifying for the new Child Benefit and Employment Supplement programs. It is important to understand and identify those families for whom these are new benefits, and those for whom it is little change from their previous circumstances. It is also important to understand the characteristics of these populations and how they differ from each other and from other families in the province.

What Proportion of Eligible Families Receive Family Health Benefits?
Not all families that are eligible for FHB apply for them. For public policy it is important to know what proportion of potentially eligible families are enrolled in the program and what accounts for partial uptake of the program.

How Does the Use of Health Services Change as a Family's Coverage Changes?
This is the main question examined in this report. Do people with new benefits use some or all health services more than they did previously? If so, what is the magnitude of the change in utilization of health services? Use of services is a function of need, cost and availability. As the availability and cost to families changes, this should be reflected in different patterns of use for different types of health services. This part of the study will examine how families respond to the different array of services that are available as costs to the family increase or decrease.

2.6 Summary

Family Health Benefits were designed alongside changes to the provincial income assistance system. Access to affordable health services is considered to be an important element in a person's decision to move from social assistance programs to greater participation in the labour force. This study examines patterns of health service use among people at the economic margins, where actual and potential private health costs are important considerations in the decision of whether, or how much, to work.

The study seeks to provide evidence on how low income families use health services and how utilization changes as costs get shifted from the individual to society. The study will also address the utility of the population health approach and the need for policy makers to address factors like employment and income in order to affect changes in health service utilization and health status.

METHOD

3.1 Design Of The Study

This was an exploratory study to: (a) determine the characteristics of recipients receiving Family Health Benefits, (b) describe the use of health services by FHB recipients, and (c) compare FHB health service utilization to that of other low-income groups. It was conducted using a pre/post design. The focus is primarily on utilization changes that occurred when individuals moved from regular coverage to FHB and when they left the FHB program and returned to regular coverage. The study also analyzes service changes for individuals on SAP, PTA, and FIP coverage who moved to or from FHB or regular coverage.

3.2 The Study Population

The study population consisted of all Saskatchewan residents who received FHB, FIP, SCB, SES, SAP or PTA benefits during the period from July 1, 1997 to January 31, 2000. Individuals who received FIP, FHB, SCB benefits were in family units with children aged under 18. Individuals who received SAP or PTA benefits could be single, or in family units with or without children.

For purposes of analysis the study population was broken down into adults (18 years of age and over) and children (under 18 years of age). Saskatchewan Health coverage benefits are based on these age categories.

3.3 Description Of Data Sets Used

A total of 13 data sets were examined in this study; three data sets were available from Saskatchewan Social Services and ten were available from Saskatchewan Health.

3.3.A Saskatchewan Social Services Data Sets

Saskatchewan Child Benefit: This data set contained information on individuals who were eligible to receive the SCB. Many of the individuals receiving the SCB were eligible for FHB. This data set contained information on family structure, as well as the monthly benefit the family received from federal and provincial child benefit programs.

Saskatchewan Employment Supplement: This data set contains monthly income information for families who are eligible for the Saskatchewan Employment Supplement. Many families on SES are also eligible for FHB.

Saskatchewan Assistance Plan: This data set contains information on family structure, earnings and benefit entitlement for individuals receiving social assistance payments.

3.3.B Saskatchewan Health Data Sets

Saskatchewan has a publicly funded health system whereby Saskatchewan Health, 32 district health boards and one health authority provide health services to the citizens of Saskatchewan. With funding from Saskatchewan Health, the district boards plan and deliver most services to people within their geographic jurisdictions based on the needs of their residents. Saskatchewan Health co-ordinates province-wide programs such as the Prescription Drug Plan and physician services and as a result has accumulated a large amount of administrative health information.

The Health Insurance Registration File (HIRF) is a registry of all residents eligible for Saskatchewan health services (i.e., the "covered population"). Excluded from eligibility, and therefore from the population registry, are people whose health care is fully funded by the federal government. This category, which includes members of the Royal Canadian Mounted Police, members of the Canadian Armed Forces, and inmates of federal penitentiaries, accounts for less than 1% of the total population. The registry is updated daily for name or address changes, births, deaths, new residents, departing residents, and those qualifying for social services supplementary health coverage.

Study Population: This data set contains the PHNs (Personal Health Numbers) of all individuals in the study population. Saskatchewan Health personnel created this data set from the HIRF file. This file included the PHNs of all individuals who had been on FHB, SAP, PTA, or FIP coverage during the period from July 1, 1997 to January 31, 2000.

HIRF1: This data set is based on Saskatchewan Health's HIRF file. It contains historical information on the coverage classification of individuals in the study population. Each time an individual in the study population changed coverage, a new record was created.

HIRF2: This data set is also based on Saskatchewan Health's HIRF file. It contains monthly coverage information on all individuals in the study population. For each month of the study period a record is created for every individual in the study population. This record contains the coverage code of the highest level of coverage the individual had during the month in question. This file also contains demographic information such as age, sex, marital status, and geographical location of residence.

Physician Services: Most physicians are reimbursed on a fee-for-service basis and the data collected are based on physicians' claims for payment. Saskatchewan Health created a list of physician services for members of the study population. This service data included billable physician services made from July 1, 1997 to December 13, 1999. Information selected included the date of service, service cost, International Classification of Disease, 9th revision (ICD-9) code grouped by chapter, location (hospital, clinic, etc.) and the service type (categorized using the fee-for-service code).

Chiropractic and Optometric Services: All Saskatchewan residents are eligible for benefits for chiropractic services. Chiropractors are reimbursed on a fee-for-service basis, and submit their claims to Saskatchewan Health. All Saskatchewan children and some adults are eligible for benefits for eye examinations. If the individual is covered for an eye examination, then the optometrist forwards the claim for service to Saskatchewan Health for payment. Saskatchewan Health created a list of chiropractic and optometric services for members of the study population. The range of dates for chiropractic and optometric services was July 1, 1997 to December 13, 1999. Information included the service date, practitioner number and the amount paid.

Saskatchewan Drug Plan: All Saskatchewan residents are eligible for benefits under the Prescription Drug Plan with the exception of approximately 9% of the population (primarily Registered Indians) for whom prescription costs are paid by another government agency. Drugs covered by the Drug Plan are listed in the Saskatchewan Formulary; non-formulary drugs generally are not covered, although there are exceptions. Pharmacies submit claims to Saskatchewan Health through point-of-service computer terminals connected to a central database. Information on prescription drug coverage is provided in Appendix B. All prescription data are collected (including those whose costs do not exceed the deductible) on an individual patient basis; information on the patient, drug, provider and cost is available. For this study, Saskatchewan Health created a data set containing all filled prescriptions for the study population for the period July 1, 1997 to January 31, 2000. Information in this data set includes the dispensing date, amount paid by the drug plan, total payment, and the therapeutic class of the drug.

Hospital Services: Separation forms are completed for all individuals who are discharged from hospital, transferred to another facility, or who die while in hospital. An individual appears in the records as many times as a separation form is filed for him or her. A separation form contains patient information, facility information, details of the client admission, treatment/procedures, and discharge information. For purposes of this study, the following data items were retrieved from the hospital separations database: claim type (inpatient, outpatient, physiotherapy, etc.), province, hospital code number, admission type (emergency, urgent, elective), admission date, level of care (rehabilitative, acute, etc.), three diagnoses, three procedures and the accident code. Diagnoses are recorded using the ICD-9 coding scheme. In this scheme, diagnoses are arranged into 17 major categories, or chapters. Up to three diagnoses can be recorded on a separation form. Hospitalization data were obtained from Acute and Emergency Services Branch of Saskatchewan Health for the period from July 1, 1997 to January 31, 2000. The data are compiled for residents of Saskatchewan, for hospitalizations that occur within the province, as well as in other Canadian jurisdictions or other international jurisdictions. Separation data were compiled into separation episodes, which control for the differential impact of inter-facility transfers on urban and rural residents; further details of this methodology are found in Appendix E. Beginning in the 1999/2000 fiscal year, all facilities provide separation records directly to the Canadian Institute for Health Information (CIHI). This organization in turn provides the data to Saskatchewan Health. Data are compiled on a fiscal year basis, with year-end of March 31.

Emergency Medical Services (EMS): Patient care reports (PCRs) are completed for all individuals who use ambulance services in Saskatchewan. The PCR contains information on the client, characteristics of the service pick up, delivery and ambulance crew, and the nature and characteristics of the response to the service request. For purposes of this study, the following data items were retrieved from the EMS database: service date, assessment codes, location of pick up and delivery, call priority (minor; serious; life threatening), payees, and payment amounts. Assessment codes are chosen by ambulance personnel to describe the nature or onset of an illness or condition; up to three codes are selected on a PCR. EMS data were compiled for the period from July 1, 1997 to January 31, 2000.

Dental Services: Data on use of dental services are only available for children receiving FHB, FIP, SAP and PTA, and for adults receiving SAP and PTA. Data were extracted for the period from July 1, 1998 to January 31, 2000. Data items extracted for analysis included the date of service, type of health benefits coverage, type of service (e.g. diagnostic, preventative, restorative, etc.), and the cost of service.

Medical Supplies and Appliances: Data on use of medical supplies are only available for children receiving FHB, FIP, SAP and PTA, and for adults receiving SAP and PTA. Data were extracted for the period from July 1, 1998 to January 31, 2000. Data items extracted for analysis included the date of service, type of health benefits coverage, type of equipment (i.e. services code), and cost.

3.4 Specifying The Study Population

The study population included Saskatchewan residents who had received some form of supplementary health coverage between July 1, 1997 and January 31, 2000. Supplementary health coverage is provided to adults and children who received benefits from any of the following programs: FHB, FIP, SAP, and PTA. Certain groups who receive supplementary health coverage were excluded from the study population. These groups include: seniors on supplemental coverage, assisted adoptions, inmates of jails and prisons, transients, and individuals living in hospital wards, unconverted homes, special care homes, and approved homes.

The following are the numbers of individuals in each of the SAP categories as of January 31, 2000:

SAP recipients retained in the study population	43,173	88%
Other SAP recipients:		
Group homes	1,379	3%
Special care homes	562	1%
Supervised accommodations	647	1%
Assisted adoptions	76	<1%
Wards of the state	3,390	7%
All SAP recipients	49,227[7]	100%

[7] The total of 49,227 SAP recipients represents the number of individuals receiving SAP health benefits from Saskatchewan Health. The total number of SAP recipients is much larger. SAP recipients who were Registered Indian persons have their health benefits paid by Indian and Northern Affairs Canada (INAC); Saskatchewan Health places them in a different coverage category than other SAP recipients.

SAP recipients in the study population were assigned to one of two types of health coverage. Most SAP recipients receive regular SAP coverage, but a small proportion receive a higher level of coverage. These included SAP recipients in rehabilitative centres, recipients who had more than five prescriptions a month, and mothers on SAP for the period of three months before and after the birth of a child. Unless stated otherwise, data have only been presented for the first category of SAP recipients.

Individuals who have been nominated for FHB may be rejected by Saskatchewan Health for various reasons. Often a nomination will be temporarily rejected until the individual provides missing or incorrect information in their Saskatchewan Health file. In this case, the rejected nomination is sent back to Saskatchewan Social Services. Social Services will subsequently resubmit the nomination to Saskatchewan Health, along with nominations for new individuals who were eligible for the program. It thus appears that there were (and still are) many incomplete nominations. The Saskatchewan Health database was therefore chosen as the source of information about the study population because it more accurately identified individuals receiving FHB.

However, there was an unforeseen consequence of using Saskatchewan Health data to specify the study population. Individuals who were on SAP would receive a SAP coverage code at Saskatchewan Health, with the exception of Registered Indians. Registered Indians receive a regular coverage code, regardless of whether or not they are on SAP, since the federal government pays for their medical care. As a result, the SAP recipients in our study do not include Registered Indians.

This exclusion of Registered Indians from the SAP population did not influence the results of this investigation because Registered Indians are not eligible for the program. Although Registered Indians are deemed to have regular coverage by Saskatchewan Health, the level of coverage provided by the federal government is considerably higher than that of FHB. Therefore, the program would not affect their utilization of health services. In order to determine the impact of the program, it was necessary to remove Registered Indians from the analysis.

One study question asks to what extent the characteristics of the FHB population are different from other low-income families. An obvious comparison is with SAP recipients. However, few members of the FHB population are Registered Indian persons. The SAP caseload for March 2000 consisted of 31% Registered Indians. To make appropriate comparisons, SAP recipients should be divided into two groups: Registered Indians and all other SAP recipients. It would then be possible to compare the demographic characteristics of these three groups, while controlling for ethnicity. This study only compared the demographic characteristics of SAP and FHB recipients who were not Registered Indians.

Saskatchewan Health provided a list of PHNs of all individuals who met the above criteria for at least one day of coverage during the study period. There were 179,663 such individuals.

3.5 Confidentiality Of Data In The Study Population

Saskatchewan Health and Saskatchewan Social Services both have an ongoing commitment to maintain the confidentiality of the data in their possession. To this end, the names and addresses of service users or providers did not appear in any of the files used in this analysis. Also, after the records from both departments were successfully linked, they were stripped of identifiers such as PHN and Social Insurance Number (SIN), and were identified solely through an assigned study ID number. Aggregation was performed as necessary to further ensure anonymity of individual members of the study population. This study has received approval from the Data Access Review Committee of Saskatchewan Health.

RESULTS

4.1 Question 1: Do Family Health Benefits provide new benefits to the target population?

This section describes the population receiving FHB and examines those for whom benefits are new (i.e., they previously had no supplementary coverage) and those for whom FHB are a different form of supplementary coverage. The previous and subsequent types of coverage provided to FHB recipients are also examined. If FHB is to be a 'stepping stone' for independence, one would expect to find a progression of people moving from social assistance programs onto FHB, and from there to regular benefits as their income rises and takes them past the thresholds for eligibility for SES or the SCB programs.

The study population consisted of all individuals who received coverage under FHB for some period between July 1998 and January 2000. Between these dates a total of 105,337 people received Family Health Benefits. Seventy-one percent of these people had no previous additional coverage; FHB was an enhancement over what they received through the regular provincial health coverage.

Data from July 1997 were extracted to determine if recipients had been on other supplementary health coverage before receiving FHB. Low-income families may have previously received extra health benefits through the SAP, FIP or PTA. For the 29% who had previous supplementary coverage, the majority (70%) had previously received health benefits from being on social assistance (Table 1).

Table 1 - Health Coverage in the Year Prior to Family Health Benefits

Coverage	New to FHB (n=75,204)	Prior Coverage (n=30,133)
Regular	100%	
FIP		27%
PTA		1%
SAP		70%
Other		2%

People can move on or off Family Health Benefits at any time. Changes in income level or family status can render an individual ineligible for the program. To determine the characteristics of people receiving Family Health Benefits, monthly snapshots were taken of the caseload.

Tables 2 and 3 show age and sex characteristics for FHB recipients and individuals in other low-income coverage programs. These tables are calculated for a sample month, October 1999. Because there is constant movement on and off the program, the actual number of recipients will vary from one month to the next. For example, in October 1998, near the beginning of the program, 68,954 people received FHB, and in October 1999 there were 81,590.

Table 2 - Age and Sex of Adults, October 1999

			Female			
Coverage	**18-25**	**26-35**	**36-45**	**46+**	**Total**	**Frequency**
Regular	35.8%	24.6%	23.8%	15.7%	100%	12,547
FHB, overall	14.4%	37.1%	38.7%	9.7%	100%	22,390
Prior coverage	24.1%	40.1%	29.5%	6.2%	100%	6,413
New coverage, urban	13.6%	40.2%	37.8%	8.4%	100%	10,978
New coverage, rural	3.7%	26.5%	52.6%	17.2%	100%	4,999
PTA	47.6%	34.6%	14.1%	3.7%	100%	462
SAP	29.3%	26.8%	21.3%	22.6%	100%	14,975
			Male			
Regular	33.6%	26.1%	23.1%	17.3%	100%	15,703
FHB, overall	5.6%	29.1%	43.0%	22.3%	100%	14,038
Prior coverage	10.4%	35.2%	35.3%	19.1%	100%	2,190
New coverage, urban	7.4%	35.2%	40.4%	17.1%	100%	6,994
New coverage, rural	1.0%	17.7%	50.2%	31.2%	100%	4,854
PTA	45.1%	27.8%	18.8%	8.2%	100%	255
SAP	21.5%	23.9%	24.2%	30.4%	100%	12,916

Table 3 - Age of Children, October 1999

		Age Group			
Coverage	**0-5**	**6-12**	**13+**	**Total**	**Frequency**
Regular	37.6%	38.4%	24.0%	100%	12,287
FHB, overall	31.3%	40.3%	28.3%	100%	45,162
Prior coverage	31.8%	43.4%	24.8%	100%	12,683
New coverage, urban	38.0%	37.0%	24.9%	100%	21,317
New coverage, rural	18.1%	43.1%	38.8%	100%	11,162
PTA	47.4%	39.8%	12.8%	100%	656
SAP	42.2%	37.8%	20.0%	100%	16,010

Among adults on FHB, there are more women than men (22,390 versus 14,038) reflecting the higher percentage of female single parents in low-income families. There are substantial age differences among the coverage groups. In particular, new FHB recipients from rural areas are the oldest in the study population. Seventy percent of females and

81% of males are over 35 years of age. In the total FHB group only 48% of females and 65% of males are over 35 years of age. Compared to any other type of coverage, new FHB child recipients from rural areas are similarly among the oldest.

There is a striking difference in residence between those for whom FHB was a new service, and those who had been on a prior supplementary health service. As may be seen in Table 3, 39% of new FHB recipients came from rural municipalities, as compared to 11% of other FHB recipients.

Table 4 - Residence of FHB Recipients

Residence	New to FHB (n=75,204)	Prior Coverage (n=30,133)
Regina	10.0%	19.0%
Saskatoon	12.5%	21.0%
Other cities	11.0%	20.0%
Towns	17.5%	19.0%
Villages	9.0%	8.0%
Rural municipalities	39.0%	11.0%
Other	1.0%	3.0%

The high percentage of FHB recipients from rural areas suggests that many of the new recipients are farm families whose incomes and assets make them ineligible for regular income assistance programs, but who nonetheless have very low net incomes, making them eligible for SCB.

Overall 48% of recipients were single parents – a very high percentage considering that single parents make up just over 12% of all families in the province.[8] Close to three-quarters (73%) of families who had been on other health benefit programs were single parents. Of those families moving onto FHB from regular coverage, there was a substantial difference in their family status according to residence. New families from rural areas were less likely to be single parents than those families from urban areas (10% of families from rural areas were single parents as compared to 49% from urban areas).

Table 5 - Family Type of FHB Recipients

Family Type	New coverage, Urban	New coverage, Rural	Prior coverage	Total
Single parent	49.4%	9.7%	72.9%	48.0%
Two parent	50.6%	90.3%	27.1%	52.0%
	100.0%	100.0%	100.0%	100.0%

[8] Statistics Canada. (1996). *Census Profile Series:Saskatchewan* (Cat #95F0262XCB96000). Ottawa.

Once on FHB, two thirds of these individuals stayed on the program throughout the duration of the study. Those for whom FHB was a new program were more likely to stay than other individuals. When they did change their coverage, the new FHB recipients were more likely to change to regular health coverage. By comparison, those who came from other income security programs were more likely to change to social assistance upon leaving FHB. One fifth of the 'other' group eventually moved onto SAP coverage, as compared to 2.5% of the 'new benefits' group.

Table 6 - Movement of FHB Recipients Out of the Program

	New to FHB		Prior Coverage		Total	
	n	%	n	%	n	%
Stayed on FHB	51,422	68.4%	18,656	61.9%	70,078	66.5%
Moved to regular coverage	21,309	28.3%	4,386	14.6%	25.695	24.4%
Moved to SAP	2,132	2.8%	6,427	21.3%	8,559	8.1%
Moved to PTA	221	0.3%	437	1.5%	658	0.6%
Other	120	0.2%	227	0.8%	347	0.3%

Generally, people who entered FHB from other income assistance programs moved in and out of the program most frequently. Ninety-six percent of the new recipients were on the program continuously after the initial registration. By contrast, 86% of the others received benefits just once and 13% received benefits for at least two separate periods of time.

Table 7 - Stability of FHB Recipients

Number of times on FHB	New to FHB (n=75,204)	Prior Coverage (n=30,133)	Total (n=105,337)
1 time	96.1%	86.4%	93.3%
2 times	3.8%	12.4%	6.2%
3 or more	0.2%	1.2%	0.4%

Income fluctuation is the major reason for people changing program status. Another reason is that children may reach the age of 18 years making the family ineligible for benefits. Those who already have been on income assistance programs are more likely to return to those programs than the client group who have never had other supplementary benefits.

4.2 Question 2: What proportion of eligible families receive Family Health Benefits?

Despite attempts to make FHB enrollment an almost automatic consequence of participation in other programs, not all low income families who are eligible actually receive FHB in a program year. The main source of this discrepancy is the return of consent forms delivered to SCB/NCBS families. Families who receive the form from the Canada Customs and Revenue Agency must provide their PHN, sign a statement authorizing CCRA to release information regarding SCB/NCBS entitlement to the province, and return the form to Saskatchewan Social Services before being enrolled in the FHB program. Some eligible families do not return the consent form and, consequently, are not enrolled in the program.

With available data it is difficult to arrive at a precise estimate of the proportion of eligible families who fail to complete this process. Although the number of families entitled to SCB is known, the number of families headed by Registered Indians, and hence, the number of families who are actually eligible for FHB is unknown, and can only be estimated.

CCRA data from October 1999 show that 43,273 families were entitled to receive SCB/NCBS. Of these, an estimated 8,800 families were Registered Indians living on-reserve and, therefore, not entitled to FHB.[9] Given that the proportions of Registered Indians living on- and off-reserve in 1999 were nearly identical[10], it is relatively safe to assume that another 8,800 such families were living off-reserve. Estimating the number of families eligible for FHB through SCB involves subtracting the estimated total Registered Indian population of 17,600 families (8,800 on-reserve plus 8,800 off-reserve) from the 43,273 families receiving SCB/NCBS. This results in an estimate of 25,673 families eligible for FHB nomination in October 1999.

43,273	– Families with SCB/NCBS entitlement in October 1999
– 17,600	– Families of Registered Indians living on- or off-reserve
25,673	– Families eligible for FHB nomination through SCB

FHB data shows that 23,867 families were actually enrolled in the program in October 1999, suggesting that approximately 7% of eligible families do not return consent forms to complete their nominations, for a program take-up rate of 93%.

$$\text{Take-up rate} = \frac{\text{23,867 Families enrolled in FHB, October 1999}}{\text{25,673 Families eligible for FHB nomination through SCB}} = 93\%$$

It should be noted that this method calculates uptake as a proportion of eligible SCB families only, and therefore over-estimates true program uptake; not all SCB eligible families actually file a tax return to apply for SCB benefits.

[9] This estimate of Registered Indians living on-reserve is one agreed to by all parties to the SCB/NCBS. SCB benefits for this population are paid by INAC.

[10] INAC records show that 49% of the Registered Indian population of Saskatchewan (50,535 persons) lived off-reserve in 1999. Indian and Northern Affairs Canada. (1999). *Registered Indian Population by Sex and Residence* (Catalogue Number R31-3/1999). Ottawa.

4.3 Question 3: How does the use of health services change as a family's coverage changes?

The use of health care in Saskatchewan, for all income groups, occurs within a context of changing use patterns of health care. Aging population, changes in medical technologies, and changes in the supply of medical services available to the population, will all affect use of different health care services. Before describing the patterns unique to low-income persons, it is useful to situate those patterns in a context of overall changes in the use of health care that has occurred in the province over the past five years. Urban and rural differences in health service use and access are also discussed.

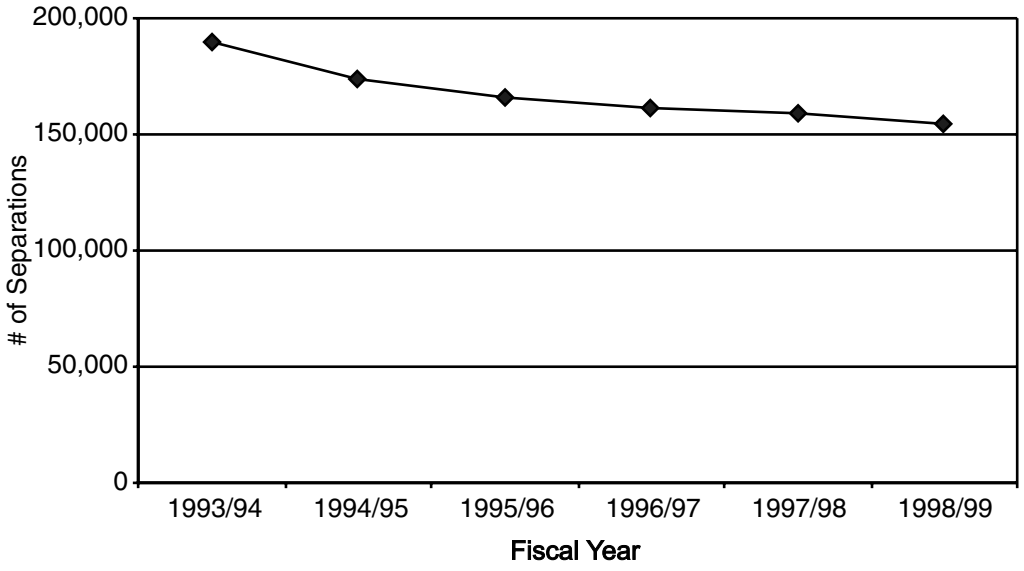
4.3.A Saskatchewan Trends in Health Care Use

4.3.A.1 Hospital Services

In Saskatchewan, the total number of hospitalizations has been decreasing over time, as shown in Figure 1. Between the fiscal years 1997/98 and 1998/99, the total number of separations decreased by approximately 2.5%. The crude rate of hospitalizations fell from 155.4 separations per 1,000 individuals in 1997/98 to 149.9 separations per 1,000 in 1998/99.

Increased day surgery, same day admission for surgery and diagnostics, and more outpatient services result in fewer inpatient admissions and shorter lengths of hospital stay. New procedures and techniques are less invasive, with less risk and discomfort, and lead to faster recovery.

Figure 1: Hospitalizations of Saskatchewan Residents



Source: Corporate Information and Technology Branch, Saskatchewan Health

There are many factors that influence the use of hospital services including health status, patient characteristics (e.g., health seeking behavior, age, sex, socioeconomic status), physician practice patterns, and personal or economic barriers to access (e.g., transportation issues). Recommending hospitalization for some conditions (e.g., pneumonia, nutritional deficiencies) is at the discretion of the physician while for other conditions (e.g., stroke, hip fracture), hospitalization requirements can be more clearly defined.

4.3.A.2 Prescription Drugs

The number of prescription drug beneficiaries declined while the number of prescriptions and total prescription cost increased between the years 1997/98 and 1999/00. Three factors that might contribute to this increased growth include corresponding increases in the number of prescriptions per beneficiary; average prescription cost; and cost of prescriptions per beneficiary (Table 8). Figures 2, 3 and 4 show time trends for these factors over three fiscal years.

Table 8 - Changes in Use of Prescriptions, 1997/98 to 1999/00

Number/Cost of Prescriptions	% increase
Average Number of Prescriptions per Active Beneficiary	9.7%
Average Prescription Cost	6.9%
Total Cost of Prescriptions Per Active Beneficiary	17.3%

Figure 2: Prescriptions per Beneficiary

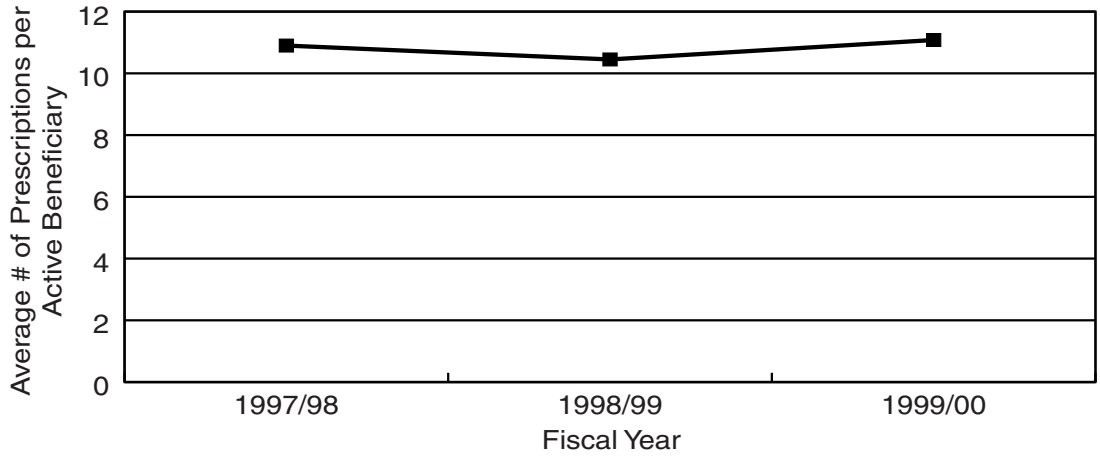


Figure 3: Average Prescription Costs
(includes drug acquisition cost, mark-up and dispensing fees)

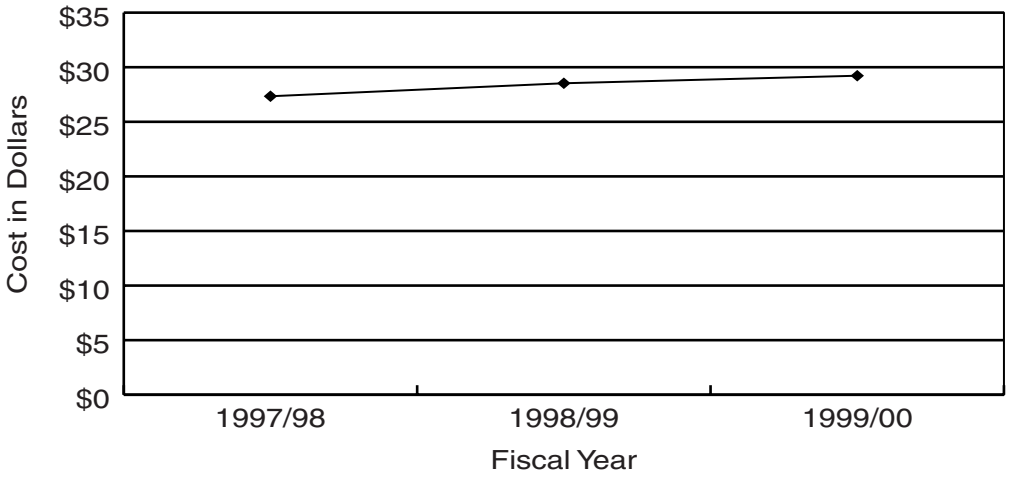
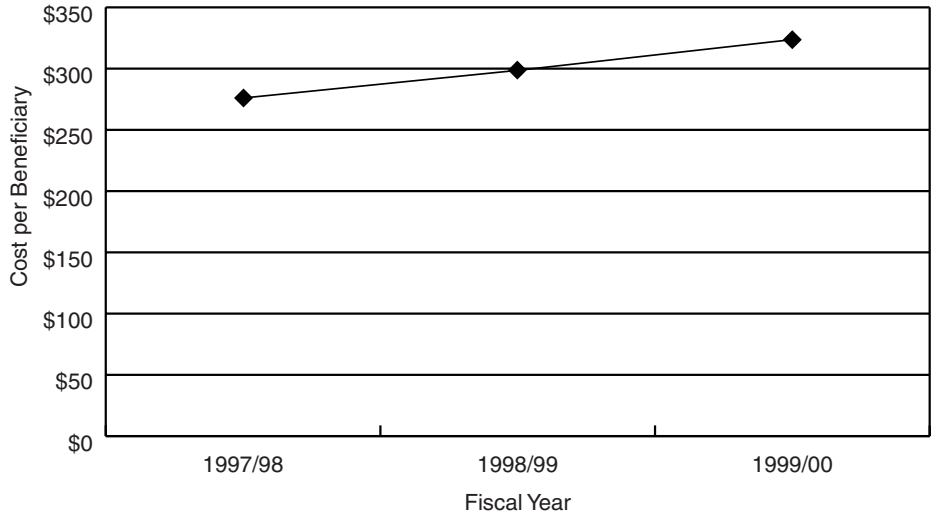


Figure 4: Total Cost of Prescriptions per Beneficiary



Source: Saskatchewan Health. *Drug Plan and Extended Health Benefits Branch: Annual Statistical Report, 1999-2000.* Regina: Government of Saskatchewan.

4.3.A.3 Physician Services

The number of physician services used in Saskatchewan has remained rather stable over the study period. Approximately 10.3 physician services per beneficiary were billed to the province each year between the fiscal years 1996/97 and 1999/2000. The total number of claims for physician services has also remained relatively stable over this same time period. In 1996/97, 7.3 million claims were made on behalf of 1,027,551 beneficiaries compared to 7.6 million on behalf of 1,041,256 beneficiaries in 1999/2000.[11]

[11] Saskatchewan Health. *Medical Services and Health Registration Branch Annual Statistical Reports., 1996-1997 to 1999-2000.* Regina: Government of Saskatchewan.

4.3.A.4 Rural and Urban Differences in Health Care Utilization

Research has shown that use of health services tends to vary with a number of factors, including geographic region of residences. For example, rates of possibly unnecessary hospitalizations vary considerably across the country. In 1998/99, they tended to be lowest in urban regions, while more remote regions often showed higher rates, possibly because alternatives to hospital care are not as available in rural and remote areas.[12]

According to the 1996 Census, 30.3% of Canadians live in rural communities. However, only 14.3% of generalist physicians and 2.9% of specialists serve the 9 million people living in rural Canada. In recent years, the number of generalist physicians, as a percentage of the population, has declined in both rural and urban Canada, but the decline has been sharper in small towns and the countryside. Between 1994 and 1998, the number of rural generalist physicians fell by 15%, while the number of urban physicians fell by about 4%. During the same period, the number of rural specialists fell by 17%, while the number of urban specialists increased by 2%.[13]

Canadians living in smaller communities have farther to travel to see a physician than do city dwellers. For Canadians living in low-income areas in rural Canada, the longer distance to doctors may be compounded by a lack of transportation and by limited public transportation. This problem is compounded in the north where nearly two-thirds of the population was 100 kilometres or more from the nearest doctor.[14]

A study investigating use of physician services across regions of Manitoba found no strong link between need (as measured by health status and socioeconomic risk) and use of physician services.[15] Physician supply does not necessarily drive physician access or contact even in rural regions, where contact with physicians, particularly specialists, may be more restrictive. In contrast, good access to services has been shown in these areas. Contact with pediatric physicians is inversely related to hospitalizations of children for some areas of Manitoba. From a regional perspective, factors affecting physician use are not as clear as for hospitalization.

4.3.A.5 Summary

In general, the total number of hospitalizations has been decreasing while the number of prescriptions for drugs and drug costs have been increasing over time. Differences in accessible services and utilization trends in rural and urban areas also have less clear implications for interpretation of this research.

[12] Federal, Provincial and Territorial Advisory Committee on Population Health. (1999). *Toward a Healthy Future: Second Report on the Health of Canadians* (Cat #H39-468/1999E). Ottawa: Minister of Public Works and Government Services.
[13] National Rural Health Strategy Subcommittee of the National Liberal Rural Caucus. (1999). *Toward the Development of a National Rural Health Strategy.* Report of the National Liberal Caucus Meeting, Location.
[14] Ng, E., Wilkins, R., Pole, J., and Adams, O. (1997). How far to the nearest physician? *Health Reports, 8 (4), 21-31.*
[15] Tataryn, D., Roos, N., and Black, C. (1995). Utilization of physician resources for ambulatory care. *Medical Care, 33 (12)* (Supplement), DS84-DS99.

4.3.B Hospital Services

Saskatchewan Health fully covers the cost of hospital stays for all residents of the province, with the exception of the nominal costs associated with private rooms. Hence, differences in hospitalization rates among members of the study population will reflect differences in health status, socioeconomic risk, physician admitting practices, health-care seeking behaviour of individuals, and accessibility of hospital services across time and region of the province. Higher hospitalization rates for populations with similar age/sex characteristics are likely to reflect greater physical health needs or greater needs related to social or family conditions, including income. For example, research has shown that hospital utilization tends to vary with income of individuals. Katz, Hofer, and Manning found that among a sample of low-income Ontario residents, the rate of separations per 1000 person-years was 228, while for those in the highest income bracket, the rate was only 125 per 1000 person- years.[16]

4.3.B.1 Rates of Utilization

Tables 9 and 10 provide information on the rate of hospitalizations for the different types of health insurance coverage represented in the study. It should be noted that rates are expressed per 1,000 individuals; hospitalization rates are typically small, fractional values that are easier to read if multiplied by a base number.

Table 9 reveals that across coverage categories, rates of adult hospital discharge varied considerably. Overall, individuals covered by the FHB program exhibited the lowest rate, at 172.8 separation episodes per 1,000. Use of hospital services was highest among recipients of SAP benefits; the rate was 330.6. Furthermore, the average number of days also exhibited substantial spread, from 2.9 for the entire FHB study population, to 5.2 for SAP recipients.

Within the FHB study population, individuals who had previously been covered under a different health benefits program had the highest rate; however, it was still 7% lower than the rate for regular health benefits recipients. Individuals who were new FHB benefit recipients and lived outside of urban centres had the lowest rate but the highest number of days of hospital stay per separation.

Table 9 - Hospital Utilization by Type of Coverage – Adults

Coverage	Separation Rate (x 1,000)	Days per Separation
Regular	220.7	4.2
FHB, overall	172.8	2.9
Prior coverage	205.6	2.8
New coverage, urban	176.9	2.9
New coverage, rural	139.5	3.0
FIP	218.5	3.0
PTA	206.3	3.1
SAP	330.6	5.2

[16] Katz, S. J., Hofer, T. P., & Manning, W. G. (1996). Hospital utilization in Ontario and the United States: The impact of socioeconomic status and health status. *Canadian Journal of Public Health*, *87*, 253-256.

Table 10 - Hospital Utilization by Type of Coverage – Children

Coverage	Separation Rate (x 1,000)	Days per Separation
Regular	157.5	4.0
FHB, overall	102.0	3.2
Prior coverage	84.5	2.8
New coverage, urban	125.6	3.4
New coverage, rural	76.7	3.3
FIP	126.0	3.8
PTA	174.0	3.2
SAP	201.8	3.9

Table 10 reveals that children within the five main types of coverage also had varying rates of utilization. These rates ranged from 201.8 per 1,000 for SAP recipients to 102.0 for all FHB recipients. The overall FHB rate was 35% lower than the rate for recipients of regular health benefits. Within the FHB group, children who were new to the FHB program and lived in urban areas had a significantly higher rate (125.6 separations per 1,000) and a greater average length of stay than either of the other two groups. While children who were new to the FHB program and lived in rural areas had the lowest utilization rate, the average length of stay per separation was almost equivalent to that of the FHB urban group.

For adults, at least some of the differences within the FHB study population can be ascribed to differences in demographic characteristics. Table 11 reveals that for adult women, utilization rates were always highest during the major childbearing years, that is, from 18 to 25 years. However, within this age category, rural women who received new coverage under FHB had higher utilization rates than did women in the other two FHB groups. In contrast, in the other age categories, rural women who were new to the FHB program had lower rates of utilization. For men, however, rates of utilization were always highest among those FHB recipients who had previously been covered under another health benefits program.

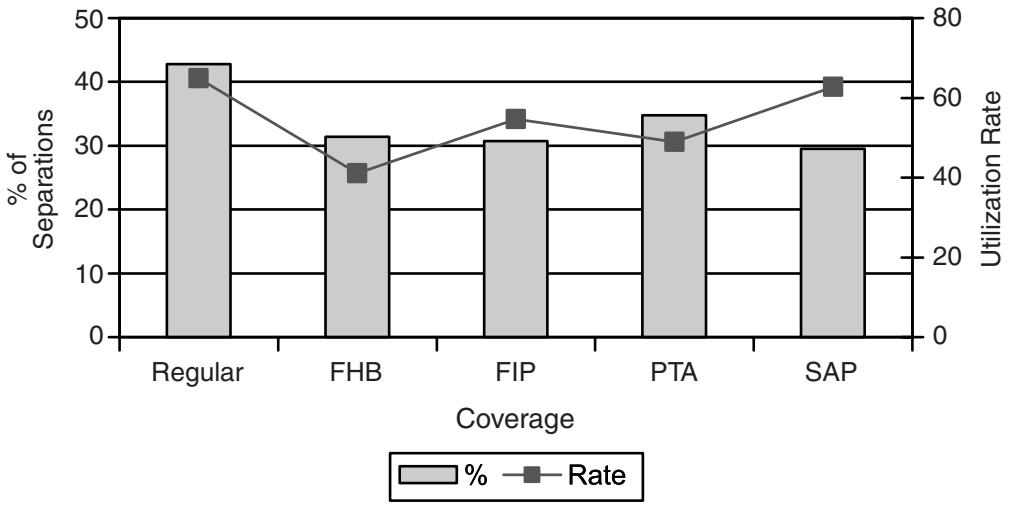
Table 11 - Hospital Separation Rates (per 1,000) for FHB Recipients – Adults

Age Category	Prior Coverage	New Coverage, Urban	New Coverage, Rural
		Females	
18-25 years	282.1	283.0	319.2
26-35 years	229.5	242.2	232.1
36-45 years	177.5	168.9	141.1
46+ years	224.2	190.1	152.8
		Males	
18-25 years	103.2	80.7	51.5
26-35 years	103.9	88.6	81.7
36-45 years	126.1	105.7	94.6
46+ years	236.7	181.8	123.6

4.3.B.2 Hospital Separation Diagnoses

For women of childbearing age, a substantial number of hospitalizations will be associated with reproduction, including conditions arising in the prenatal period, labour and delivery; these diagnoses are recorded in ICD-9 chapter 11. This chapter does not, however, include the monitoring of normal pregnancies or births. Overall, in this study population, 35.1% of hospitalizations of adult women were attributed to complications of pregnancy and childbirth. Figure 5 reveals that almost 43% of hospitalizations for regular benefit recipients were attributed to complications of pregnancy and childbirth, compared to 31.4% for FHB recipients; the rate among the former group was 64.9 separations per 1,000, compared to 41.1 per 1,000 for the FHB study group. Among SAP recipients, 29.5% of hospitalizations were for complications of pregnancy and childbirth, but the utilization rate was almost as high as for regular benefit recipients (62.8 per 1,000).

Figure 5: Hospital Separations for Complications of Pregnancy & Childbirth – Adult Women



Within the FHB study population, further analysis was done of the ICD-9 chapter 11 diagnoses by age and diagnosis categories. For women who had received prior coverage under another benefits program, 55.1% of hospitalizations in this category were for individuals between 18 and 25 years of age. In contrast, for new FHB benefit recipients who lived in urban areas, one third of hospitalizations were for women in this age group, and only 20.3% of hospitalizations among new rural FHB recipients were for women between 18 and 25 years. There were also differences in the primary diagnoses that were responsible for admission to hospital. Among prior benefit recipients, 29.8% of these hospitalizations were for termination of pregnancy, which includes miscarriage and abortion. Among new benefit recipients who lived in rural areas, 10.0% of hospitalizations were attributed to termination. Furthermore, among prior benefit recipients, 24.1% of the diagnoses were attributed to complications occurring in the course of labour and delivery, as compared to 31.6% of diagnoses for women who were new, urban benefit recipients.

Table 12 provides information on the rates of hospital separation for adults across selected ICD-9 diagnosis categories. Here, data for males and females are combined. Across all diagnostic categories, FHB recipients had lower rates than regular benefit recipients, while SAP recipients had the highest rates. To gain further insight into the health issues facing each of these population groups, subsequent analyses focussed on the proportions of separations attributable to each diagnostic category for each group of health benefit recipients. This information, for adults, is found in Figures 6 and 7.

Table 12 - Hospital Utilization by ICD-9 Classification and Type of Coverage – Adults

ICD-9 Category	Regular	FHB	FIP	PTA	SAP
Infectious/Parasitic Diseases	2.2	1.5	0.3	3.0	4.5
Neoplasms	8.1	7.8	8.0	5.4	13.7
Endocrine/Nutritional/Metabolic/Immunity	2.8	2.2	0.9	1.8	7.0
Mental Disorders	14.1	4.2	7.1	12.1	38.0
Nervous System/Senses	7.2	5.8	5.5	4.2	12.9
Circulatory	8.9	5.9	8.3	4.2	18.8
Respiratory	7.9	6.2	8.9	7.9	15.0
Digestive	25.9	24.5	28.3	24.2	40.6
Genitourinary	23.7	24.7	38.7	33.9	32.8
Skin/Tissue	2.8	2.0	2.8	5.4	5.0
Musculoskeletal	12.4	10.4	11.1	10.3	16.4
Symptoms/Signs/Other	10.7	8.5	13.8	12.1	18.3
Injury & Poisoning	12.6	7.1	8.3	17.5	21.8

Note: Selected categories with utilization rates near 0 (zero) were excluded from this table, as was the category of Complications of Labour/Delivery. Data are presented as separation rates per 1,000.

Figure 6 contains information on separations for selected ICD-9 categories and types of coverage for adult women. Within this segment of the study population, 13.6% of separations were for genitourinary diseases (which includes urinary tract infections and menstrual conditions), 10.2% were for digestive diseases, and 5.9% were for mental disorders. These were the three most common diagnoses, after complications arising in pregnancy and childbirth. Women in the FHB group had a greater proportion of hospitalizations due to genitourinary and digestive diseases than regular health benefit recipients did, but a lower proportion attributable to mental disorders. SAP recipients had a higher proportion of hospitalizations due to mental disorders (8.8%) than individuals in any of the other groups.

Figure 6: Selected Hospital Diagnoses by Coverage Type – Adult Women

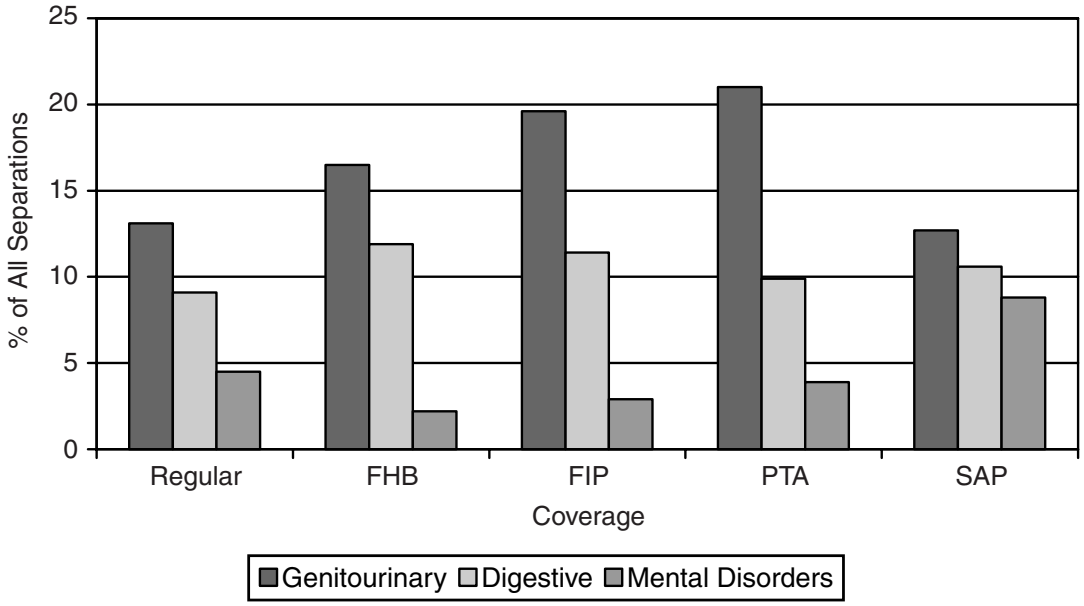


Figure 7 provides comparative information for adult men by ICD-9 classification and type of health benefits coverage, for the three most common hospital diagnoses. Overall, 17.1% of hospitalizations were for digestive disorders, another 12.7% were for mental disorders, and 10.8% were for injury and poisoning treatments. The proportion of hospitalizations for mental disorders was substantially higher for SAP recipients than for individuals in the remaining four groups, but was also substantially lower for FHB and FIP recipients than for regular and PTA recipients. FHB recipients had a higher proportion of separations due to digestive conditions than did men in the other four types of coverage.

Figure 7: Selected Hospital Diagnoses by Coverage Type – Adult Men

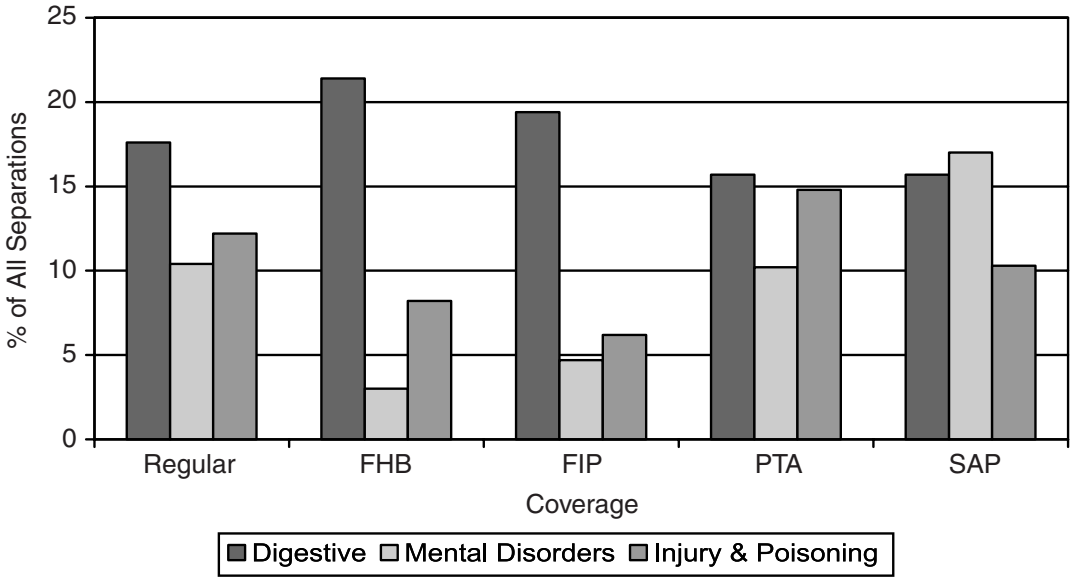


Table 13 contains information on separation rates across diagnostic and coverage categories for children. Rates for FHB children were lower than, or equal to, rates for regular recipients. SAP rates were the highest among the five study groups in some, but not all, diagnostic categories. Hospitalization rates for respiratory illness exhibited substantial variation; they were more than twice as high for SAP recipients as they were for FHB recipients. Children receiving PTA health benefits also had high rates for this diagnostic category.

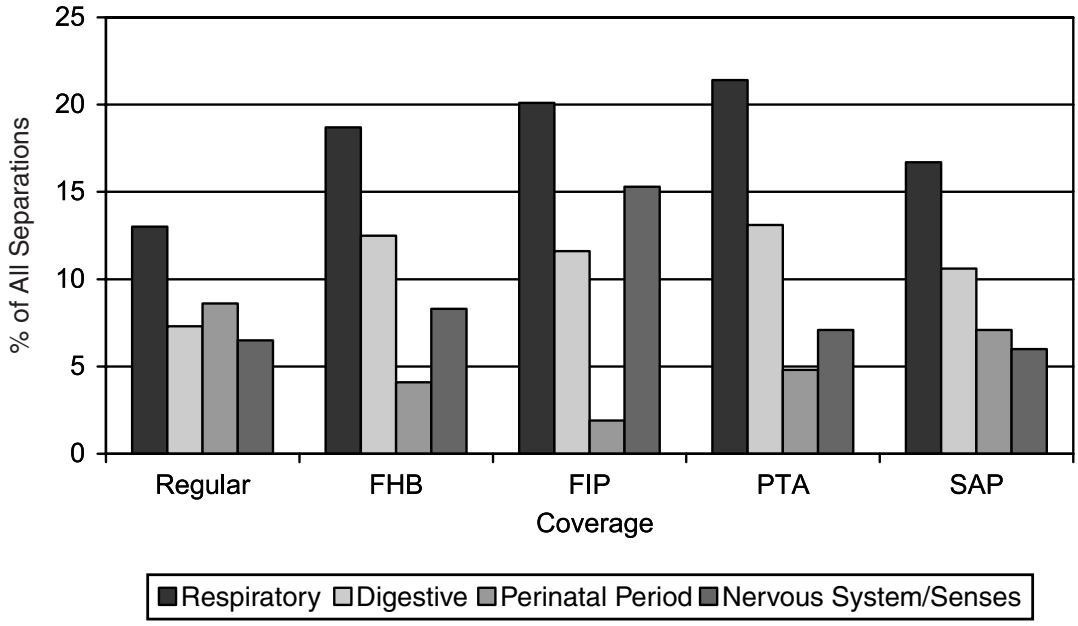
Table 13 - Hospital Utilization by ICD-9 Classification and Type of Coverage – Children

ICD-9 Category	Regular	FHB	FIP	PTA	SAP
Infectious/Parasitic Diseases	4.4	2.8	4.9	8.1	6.7
Mental Disorders	1.8	1.8	1.2	1.0	2.5
Nervous System/Senses	10.6	10.0	17.6	11.1	14.3
Respiratory	22.9	18.8	27.8	35.4	40.1
Digestive	12.6	12.7	18.3	20.2	20.9
Genitourinary	4.8	4.4	4.7	5.1	6.1
Pregnancy/Childbirth*	3.5	1.6	2.2	7.1	6.7
Skin/Tissue	2.0	1.5	2.6	7.1	2.3
Congenital Anomalies	3.8	3.0	4.9	8.1	5.0
Perinatal Period	14.4	4.7	2.2	9.1	14.9
Symptoms/Signs/Other	6.5	5.4	7.3	11.1	10.8
Injury & Poisoning	9.9	7.5	7.9	7.1	11.5

Note: Selected categories with utilization rates near 0 (zero) were excluded from this table.
*Includes female children 18 years of age and younger. Data are presented as rates per 1,000

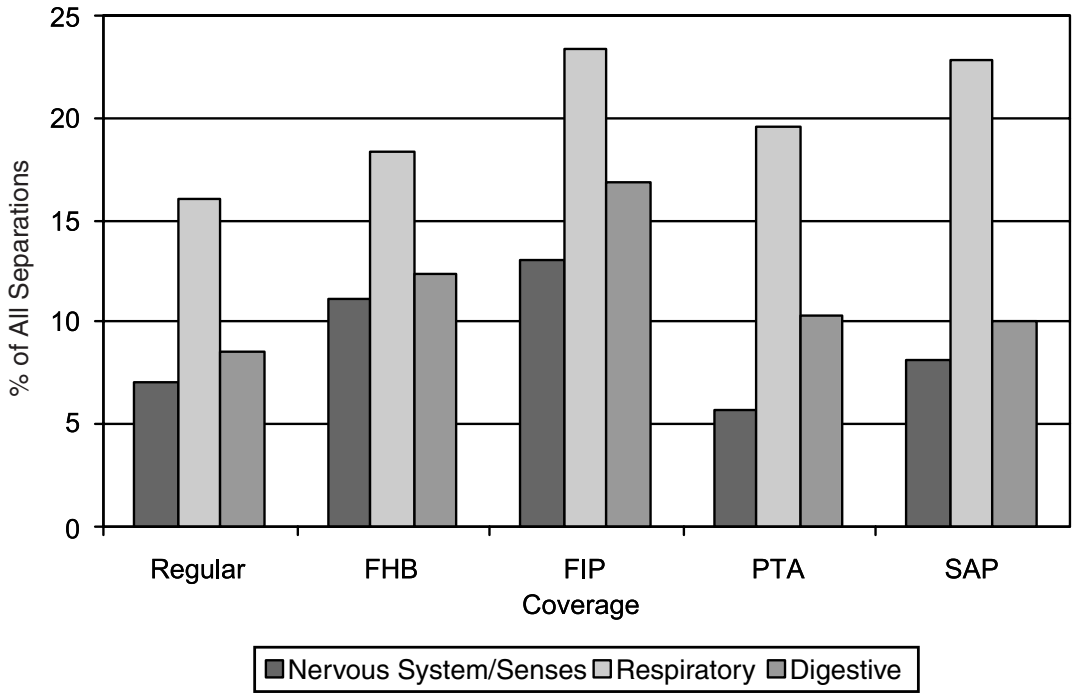
Figures 8 and 9 contain information on the most common causes of hospitalization for male and female children. For females (see Figure 8), the most common ICD-9 diagnoses recorded on hospital separation records were respiratory disease (15.7%), digestive disease (9.7%), and conditions arising in the perinatal period (7.0%), followed closely by diseases of the nervous system and sensory organs. For females, PTA and FIP recipients had a greater proportion of separations attributable to respiratory conditions (21.4% and 20.1%, respectively) than recipients in the other three types of coverage. Individuals with regular coverage had a greater proportion of hospitalizations due to conditions arising in the perinatal period than did any of the other groups (8.6%). FHB and FIP recipients had proportionately greater numbers of hospitalizations due to diseases of the nervous system and sensory organs; this category includes ear infections.

Figure 8: Selected Hospital Diagnoses by Coverage Type – Female Children



For males (Figure 9), the most common diagnoses were respiratory disease (19.0%), digestive disorders (10.2%), and diseases of the nervous system or sensory organs (8.4%). As with female children, FHB and FIP males had proportionately greater numbers of hospitalizations in the latter categories. Hospitalizations of SAP and FIP recipients were more commonly due to respiratory conditions.

Figure 9: Selected Hospital Diagnoses by Coverage Type – Male Children



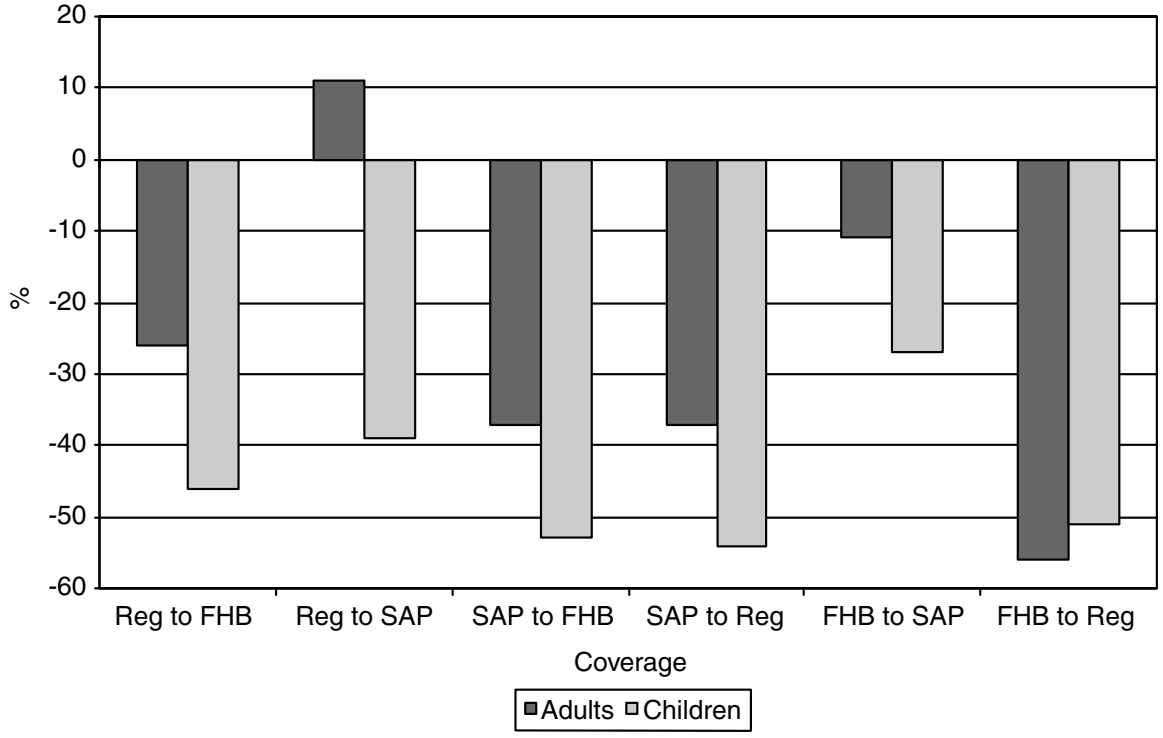
4.3.B.3 Changes in Utilization

It was of interest to determine whether utilization of health services changed when there was a corresponding change in the type of health insurance coverage received by an individual. From a theoretical point of view, an individual's use of services might change when he or she receives enhanced health coverage (i.e., FHB, SAP) instead of basic coverage (i.e., regular health benefits). This could be a reflection of a former unmet need for services being filled, or of changes in health status.

Figure 10 provides information on changes in hospitalization rates that occurred as members of the study population received different types of health benefits. Data were analyzed only for those individuals for whom the change in coverage was stable. That is, members of the study population had to change to a different type of coverage for at least 90 days to be included in the analysis.

The rate of hospital separations fell for individuals in all categories, with the exception of the category 'Reg to SAP', for adults. This category encompasses all adults who had received basic health benefits before moving to enhanced health benefits. For this group, utilization of hospital services increased by 11%. For the remaining categories of change, utilization fell between 11% and 56% for adults and between 27% and 54% for children. These data suggest that members of the study population who changed health benefits coverage over time generally experienced the effects of declining rates of hospitalization observed in the entire Saskatchewan population.

Figure 10: Changes in Hospitalization Utilization Rates



4.3.C Physician Services

4.3.C.1 Rates of Utilization

Tables 14 and 15 provide information on physician utilization rates for individuals with various types of health coverage. It should be noted that patient costs associated with use of physicians do not vary with the type of coverage. In general, patients do not pay any of the costs associated with a physician visit. Rather, Saskatchewan Health fully covers costs for all residents of the province.

For both adults and children, SAP recipients have high physician utilization rates, and individuals on FHB and regular coverage have the lowest utilization rates. As noted in previous sections of this report, regular coverage only includes individuals who have at one time been on SAP, PTA, FIP or FHB.

SAP adult recipients have the highest overall utilization rates among the five coverage categories. It was expected that SAP and PTA recipients would have similar utilization rates, because PTA recipients are primarily SAP recipients who are registered in training programs. Further analysis did not reveal substantial differences in age or sex between these two segments of the study population. Hence other factors, including health status, are likely to contribute to the differences in service utilization.

Within the FHB category, adults who had been previously covered under another health benefits program had a higher service utilization than individuals who had new coverage. Within the latter category, urban recipients had a higher utilization rate than rural recipients. There was the same relationship between service utilization and cost utilization among adults who comprised the study population.

Table 14 - Physician Service Utilization by Type of Coverage - Adults

Coverage	Service utilization rate	Relative rates	Cost utilization rate
Regular	9.7	100	267.00
FHB, overall	9.1	94	243.99
Prior coverage	11.5	119	299.10
New coverage, urban	9.2	95	249.48
New coverage, rural	7.0	73	191.32
FIP	10.3	107	263.51
PTA	10.6	109	263.66
SAP	14.0	144	397.27

Table 15 - Physician Service Utilization by Type of Coverage - Children

Coverage	Service utilization rate	Relative rates	Cost utilization rate
Regular	5.5	100	135.87
FHB, overall	5.5	100	134.09
Prior coverage	5.9	106	140.32
New coverage, urban	6.0	108	146.55
New coverage, rural	4.3	77	105.36
FIP	6.0	108	144.20
PTA	7.2	131	171.31
SAP	7.2	130	177.34

The differences among the three groups of FHB recipients were not so pronounced for children (see Table 15). Those FHB children who had previously been on another supplementary benefits program had essentially the same service utilization rate as urban children who were new to the program. Rural children who were new to the program had the lowest utilization rate across all types of coverage. Again, the cost utilization rate for the latter group was the lowest among all segments of the study population.

Overall, adults made substantially greater use of physician services than children in all types of coverage. This is consistent with the trends identified for hospital utilization.

Further analysis was conducted to determine the extent to which the use of physician services varied by the age and sex of adults within each type of coverage. The results presented in Table 16 indicate that across all categories, service utilization rates were higher among women than among men. However, for men, use of physician services increased with age across all categories. Moreover, SAP male recipients had higher utilization rates than males in other types of coverage. For females, utilization rates were highest in the 18 to 25 years age group and lowest in the 36 to 45 years age group. This reflects the tendency for women to exhibit greater use of services during their childbearing years. Rates in the 46 years and older age group were slightly higher than rates in the 36 to 45 years age group. This may indicate that utilization begins to increase as women enter menopause. Across all age groups, utilization rates for women were higher for SAP recipients than for recipients in other types of coverage.

Within the FHB study population, both men and women in the *prior coverage* category had higher utilization rates than individuals for whom the benefits were new. This trend was consistent across age groups. Within the new benefits group, individuals who lived in urban areas always had higher utilization rates than individuals who lived in rural areas, with the exception of women between the ages of 18 and 25 years.

Table 16 - Physician Service Rates by Type of Coverage, Age, and Sex

Coverage	Females				Males			
	18-25 years	26-35 years	36-45 years	46+ years	18-25 years	26-35 years	36-45 years	46+ years
Regular	17.7	12.6	10.1	12.6	5.1	5.2	5.9	9.1
FHB, overall	14.9	12.0	9.5	10.2	4.6	4.9	5.3	7.2
Prior Coverage	15.5	12.5	11.1	12.9	5.9	6.4	6.4	10.4
New Coverage, Urban	14.2	12.2	10.0	10.3	4.2	4.7	5.6	7.9
New Coverage, Rural	15.2	10.8	7.8	8.9	3.7	4.3	4.5	5.8
FIP	14.6	11.9	9.9	10.8	5.7	6.2	6.8	7.7
PTA	15.5	14.2	13.1	14.9	5.4	6.4	7.8	10.5
SAP	18.7	15.6	15.8	17.0	7.2	9.4	11.5	13.5

4.3.C.2 Physician Service Categories

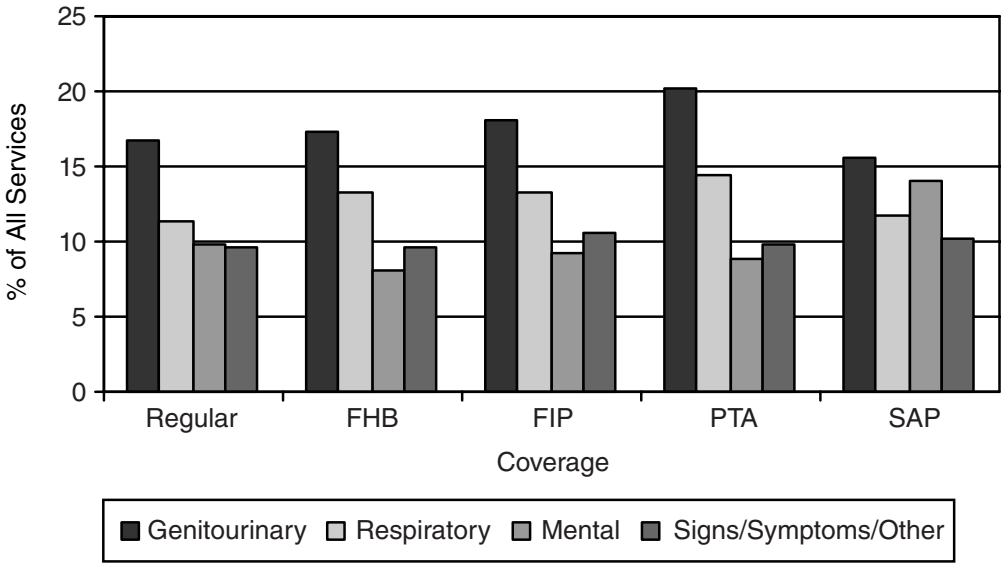
Table 17 provides information on the rates of physician service utilization for adults across selected ICD-9 diagnosis categories. A data limitation should be noted here in that only one diagnosis is recorded per physician visit even though more than one service may be provided during that visit (more information on the physician data is provided in Appendix E). The table reveals that rates for SAP recipients were the highest across most of the categories. In fact, their use of physician services for mental health treatment/consultation was significantly higher than for individuals with other types of coverage. FHB rates tended to be lower than, or equal to, rates for regular benefits recipients; the exceptions were for diseases of the nervous system/senses, respiratory conditions, and genitourinary diseases.

Table 17 - Physician Utilization by Rates ICD-9 Classification and Type of Coverage – Adults

ICD-9 Category	Regular	FHB	FIP	PTA	SAP
Infectious/Parasitic Diseases	0.23	0.22	0.25	0.33	0.33
Neoplasms	0.26	0.23	0.22	0.15	0.24
Endocrine/Nutritional/Metabolic/ Immunity	0.21	0.21	0.24	0.21	0.41
Mental Disorders	0.69	0.47	0.65	0.74	1.71
Nervous System/Senses	0.49	0.53	0.56	0.61	0.77
Circulatory	0.28	0.27	0.24	0.22	0.51
Respiratory	0.78	0.86	0.96	1.18	1.18
Digestive	0.31	0.31	0.35	0.37	0.53
Genitourinary	0.80	0.88	1.16	1.14	1.24
Pregnancy/Childbirth	0.31	0.21	0.21	0.24	0.28
Skin/Tissue	0.32	0.32	0.45	0.40	0.47
Musculoskeletal	0.55	0.53	0.61	0.58	0.90
Symptoms/Signs/Other	0.64	0.60	0.77	0.79	1.07
Injury & Poisoning	0.79	0.65	0.67	0.90	1.08

Note: Selected diagnosis categories with utilization rates close to 0 (zero) were excluded from this table. Saskatchewan Health records only one diagnosis of symptoms per claim even though the client may present with more than one condition.

Figure 11: Selected Physician Service Diagnoses by Type of Coverage – Adult Women



As with the hospital data, subsequent analyses were used to examine the proportion of services attributable to each diagnostic category. For adults, this information is found in Figures 11 and 12. Figure 11 contains information on services for selected ICD-9 categories and coverage codes for adult women. Of all services containing an ICD-9 code, the most common diagnoses were attributed to genitourinary disease (16.4%), respiratory disease (11.9%) mental disorders (11.3%), and signs, symptoms, and ill-defined conditions (9.9%). Among recipients of FHB, 13.3% of services were for respiratory conditions, compared to 11.4% of services among regular recipients. Consistent with the utilization rates, the proportion of services for mental disorders was higher for SAP recipients (14.1%) than for other segments of the study population (e.g., 9.8% for regular benefit recipients).

Data for adult men are contained in Figure 12. Overall, the most common ICD-9 diagnosis category was injury and poisoning (15.6%), followed by mental disorders (14.1%), respiratory disease (11.2%), and signs and symptoms (9.3%). Physician visits for injuries accounted for a slightly greater proportion of visits among regular benefit recipients (18.0%) than among FHB recipients (16.7%). For SAP recipients, this was a less common reason for visiting a doctor. However, the relative importance of doctors for treatment/diagnosis of mental disorders was greatest for this group (19.0% as compared to 5.8% for FHB recipients). Among FHB recipients, 14.3% of physician services were for respiratory disease, which is only slightly higher that the value of 12.0% for regular benefit recipients.

Figure 12: Selected Physician Service Diagnoses by Type of Coverage – Adult Men

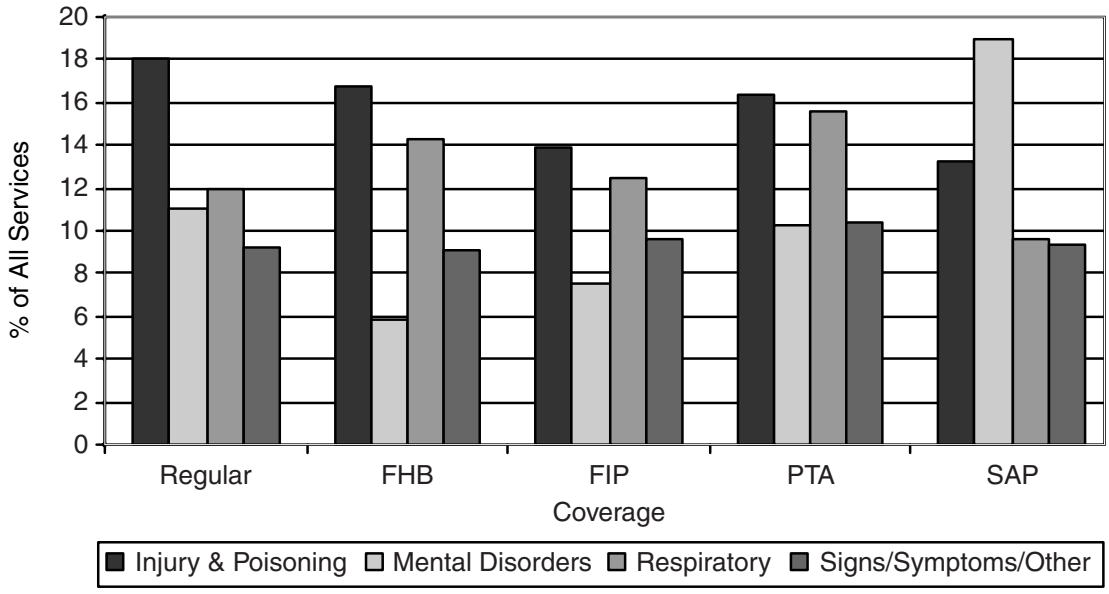


Table 18 provides physician service utilization information for children across ICD-9 diagnosis categories. Utilization rates for respiratory disease were highest across all health coverage types. For children in the FHB study group, this was followed by rates for diseases of the nervous system/sensory organs, and injury and poisoning. Rates for FHB recipients were similar to those for regular benefit recipients for all diagnoses but respiratory disease.

Table 18 - Physician Utilization by ICD-9 Classification and Type of Coverage – Children

ICD-9 Category	Regular	FHB	FIP	PTA	SAP
Infectious/Parasitic Diseases	0.40	0.40	0.42	0.56	0.53
Mental Disorders	0.14	0.15	0.18	0.22	0.28
Nervous System/Senses	0.73	0.75	0.87	0.93	0.89
Respiratory	1.34	1.44	1.58	1.96	1.89
Digestive	0.14	0.14	0.15	0.21	0.20
Genitourinary	0.18	0.17	0.18	0.30	0.22
Skin/Tissue	0.29	0.30	0.30	0.47	0.38
Musculoskeletal	0.12	0.13	0.14	0.11	0.12
Symptoms/Signs/Other	0.40	0.40	0.42	0.60	0.55
Injury & Poisoning	0.71	0.72	0.78	0.76	0.86

Note: Selected diagnosis categories with utilization rates close to 0 (zero) were excluded from this table. Saskatchewan Health records only one diagnosis of symptoms per claim even though the client may present with more than one condition.

Figure 13: Selected Physician Service Diagnoses by Type of Coverage – Children

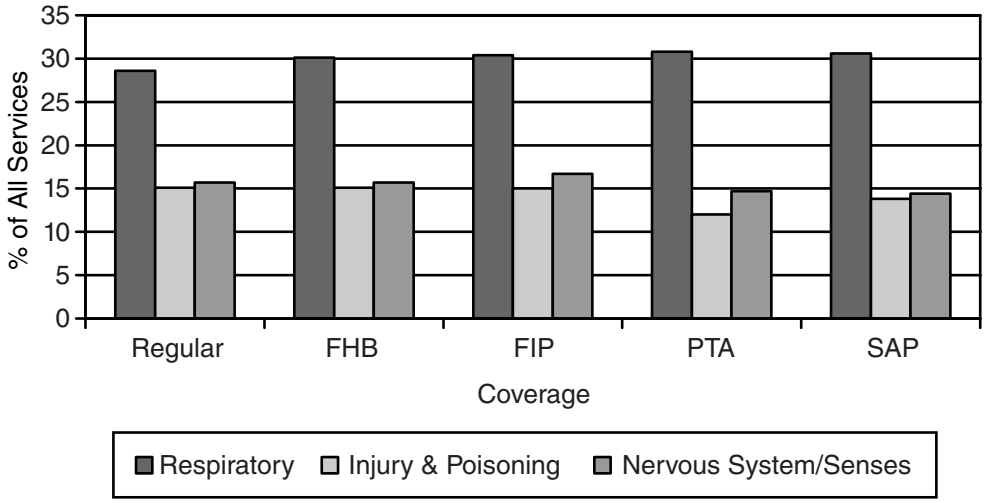


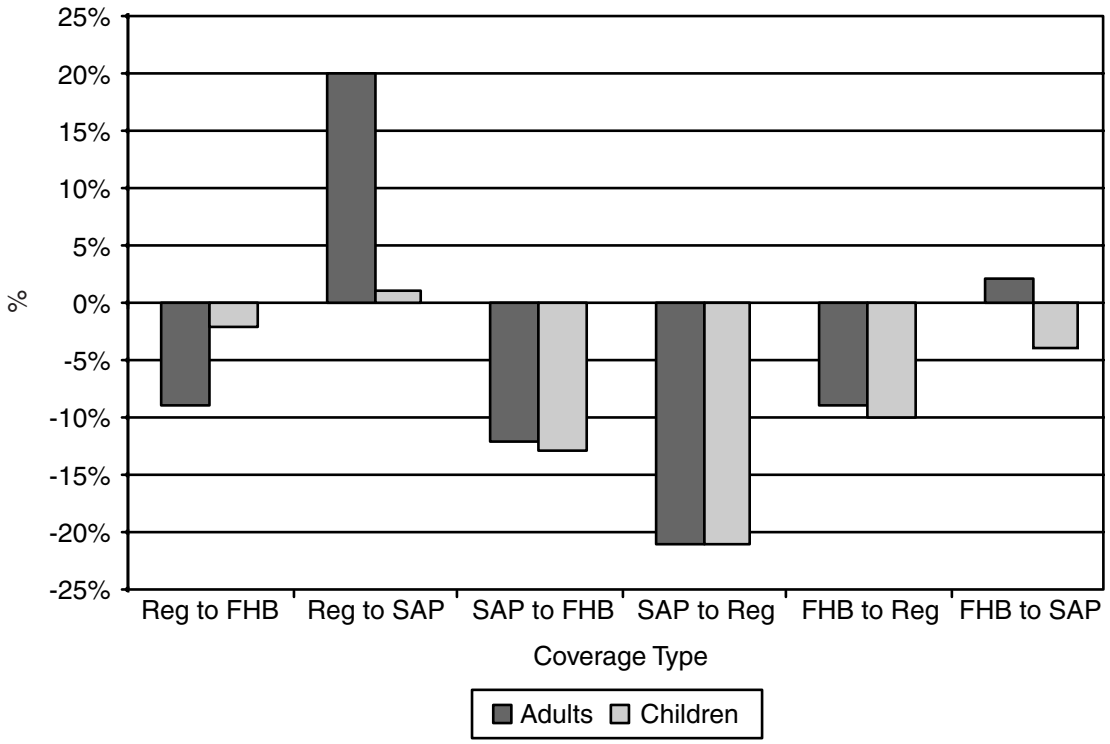
Figure 13 provides information on the proportion of all services that could be attributed to each ICD-9 diagnostic category. There were few differences for males and females, so the data are combined. However, male children had a higher proportion of visits for injury and poisoning (17.0%) than female children (12.3%). Figure 13 indicates that the three most common reasons for children's visits to doctors were respiratory disease (29.7%), conditions of the nervous system and senses (15.3%), and injury and poisoning (14.7%). There was little variation across the five coverage categories in terms of the relative importance of each of these diagnosis categories.

4.3.C.3 Changes in Utilization

Figure 14 provides information on changes in physician utilization rates that occurred as members of the study population changed their health benefits coverage. Data were only analyzed for those individuals for whom the change in coverage was stable (i.e., the change lasted at least 90 days).

The findings were similar to those for hospital utilization. Utilization rates for physicians fell for individuals in most categories. The exceptions were: adult recipients moving from regular benefits to SAP benefits, for whom utilization increased 20%; child recipients moving from regular benefits to SAP benefits, for whom utilization increased by a negligible 1%; and, adult FHB recipients moving to SAP benefits, for whom utilization increased by a modest 2%. It was anticipated that individuals moving from regular to FHB benefits might experience an increase in utilization of services due to changing health status. This hypothesis was not supported by the data. In fact, utilization for adults in this segment of the study population decreased by 9% and utilization for children decreased by a negligible value of 2%.

Figure 14: Changes in Physician Service Utilization Rates



4.3.D Prescription Drugs

The different types of coverage provided by the Drug Plan are described in Appendix B. When children receive special coverage such as FHB, FIP, SAP and PTA their drugs are fully insured. For adults, the coverage varies from partial to full depending on the type of benefit.

In addition, a Special Support program has been in existence since before the study period, and helps those families whose drug costs are high in relation to their income. The Drug Plan may lower a person's deductible and assign a lower co-payment, based on information provided in their application form along with Drug Plan records. The data used in the following analyses does not include an indicator for this program.

4.3.D.1 Drug Utilization One Year Before and One Year After the Introduction of the FHB

The analysis of the drug data is described in detail in Appendix E. Tables 19 and 20 show drug use among child and adult FHB beneficiaries one year before and one year after the introduction of the FHB program. The assumption is that coverage is the main factor to change among this population (apart from being one year older), though it is possible that the change in coverage may be due to factors other than the introduction of FHB.

Table 19 - Average Drug Use and Associated Costs One Year Before and One Year After the Introduction of FHB – Children

Averages/year	Regular	FHB	Percentage Change
Number of prescriptions per child	1.9	2.2	16%
Total cost	$ 38.37	$ 50.37	31%
Patient cost	$ 26.29	$ .54	-98%
Government cost	$ 12.07	$ 49.83	313%

n=25,212

Table 20 - Average Drug Use and Associated Costs One Year Before and One Year After the Introduction of FHB – Adults

Averages/year	Regular	FHB	Percentage Change
Number of prescriptions per adult	3.9	4.4	13%
Total cost	$114.22	$140.52	23%
Patient cost	$68.81	$61.38	-11%
Government cost	$45.40	$79.14	74%

n=23,339

The average number of prescriptions increased for both children (17%) and adults (13%) when they changed from regular coverage to FHB coverage. This is much higher than the increase in the number of prescriptions for the overall Saskatchewan population during a similar period (4%).[17]

The increase in drug utilization was greater for children than for adults. Under FHB all of the children's drug costs are covered, whereas for adults there is a semi-annual deductible of $100 and once they reach it they pay 35% of the remaining prescription costs. For children's prescriptions, the patient cost dropped almost to zero with the introduction of Family Health Benefits. For adults' prescriptions, the patient cost was reduced by 11%. The reasons the drop is fairly modest may be due to the increase in the number of prescriptions filled by adults and the increase in the cost of a prescription over the two year period.

The government's costs have increased for both adults (74%) and children (313%) in the study population during the year following the introduction of FHB. The government's cost for regular benefits increased by 14% during a similar period.

[17] Saskatchewan Health (2001). *Drug Plan and Extended Benefits Branch Annual Statistical Report, 1999-2000.* Regina: Government of Saskatchewan.

4.3.D.2 Changes in Types of Prescriptions – Adults

As shown in Table 20, prescription drug use increased by 13% among adults during the first year of FHB coverage. Table 21 shows drug usage by pharmacological-therapeutic classification. Appendix D provides information on the types of drugs included in each of the classes.

While the number of prescriptions increased for almost all drug classes, the largest relative increases were for cardiovascular drugs and central nervous system drugs (Table 21). Since these categories include many drugs which are essential for disease management and prevention, this raises the question of whether some people previously went without needed treatment because of financial barriers.

Table 21 - Frequency of Prescriptions by Pharmacological-Therapeutic Classification* and Type of Coverage – Adults

	Regular	FHB	Percentage Change
Central nervous system	20,662	24,376	18%
Hormones & substitutes	18,028	20,398	13%
Cardiovascular	10,750	12,993	21%
Anti-infective agents	17,553	18,297	4%
Gastrointestinal	5,171	5,792	12%
Skin & mucous membrane	4,467	4,882	9%
Eye,ear,nose & throat	3,645	4,056	11%
Autonomic drugs	3,665	4,059	11%
Electrolytic	1,885	2,199	17%
Vitamins	678	801	18%

*Classification used in the Saskatchewan Health Formulary. This table excludes several drug classes which had relatively few prescriptions as well as “unclassified therapeutic agents” which include a variety of drugs. Cancer drugs are not captured in these data because they are covered by the Saskatchewan Cancer Agency.

4.3.D.3 Changes in Types of Prescription – Children

As shown in Table 22, prescription drug use increased by 16% among children during the first year of FHB coverage. Increases were not consistent, but varied by the type of prescription. The largest percentage increase was for diagnostic agents used to monitor diabetes. Although the volume was low, this may reflect improved diabetes monitoring among children with the introduction of the FHB program. The diagnostic strips can be quite costly depending on the frequency of testing.

The increase in prescriptions was mainly in categories of gastrointestinal drugs (for which the volume is low) and hormones. Within the hormones category, the majority of the prescriptions were for inhaled steroids, used to treat asthma and other respiratory conditions, and these increased by 34%, up to 3,805 prescriptions per year for children with FHB coverage. Inhaled steroids are relatively expensive, and the 34% increase in their use after the introduction of the FHB program suggests that the program is facilitating

better asthma management for children in families where the income is low enough that they qualify for FHB. If this is the case, one would expect to see a reduction in hospitalizations due to asthma for children with FHB coverage following the introduction of the program. The hospitalization data show rates for all respiratory diagnoses increase as children switch from regular to FHB coverage. For children, bronchodilators are the main drugs used in the autonomic drug class which went up by 23%.

Other types of drugs included in the hormones class are anti-diabetic drugs and oral contraceptives. Anti-diabetic drugs used to treat child-onset diabetes increased by 26% suggesting that the FHB program is facilitating better management of diabetes. It has been reported that for diabetes and asthma poor quality primary care has been associated with increased hospital use.[18] Prescriptions for oral contraceptives increased by 247%, to 927 prescriptions.

The 25% increase in central nervous system drugs is significant given the high volume involved. Closer examination revealed that almost half of the prescriptions in this class were for methylphenidate (Ritalin), and these prescriptions increased by 6% as children switched from regular to FHB coverage. The frequency of prescriptions for other commonly used drugs in that class increased substantially: non-steroidal anti-inflammatory drugs by 77% (to 1,047 prescriptions), anticonvulsants by 18% (to 750 prescriptions), and antidepressants by 45% (to 329 prescriptions).

There was very little change in the number of prescriptions for anti-infective drugs, the most common type of drug prescribed to these children, suggesting that parents made it a priority to buy anti-infectives when their children had infections regardless of coverage.

Table 22 - Frequency of Prescriptions by Pharmacological-Therapeutic Classification* and Type of Coverage - Children

	Regular	FHB	Percentage Change
Hormones & substitutes	3,946	5,954	51%
Skin & mucous membrane	4,180	5,917	42%
Central nervous system	5,290	6,635	25%
Autonomic drugs	3,281	4,050	23%
Eye,ear,nose & throat	3,464	4,109	19%
Diagnostic agents	322	833	159%
Anti-infective agents	23,859	24,202	1%
Gastrointestinal	588	914	55%
Cardiovascular	448	555	24%

*Classification used in the Saskatchewan Health Formulary. This table excludes several drug classes which had relatively few prescriptions as well as “unclassified therapeutic agents” which include a variety of drugs. Cancer drugs are not captured in these data because they are covered by the Saskatchewan Cancer Agency.

[18] Gordon, D., Shaw, M., Dorling, D., Davey Smith, G. (Eds.). (1999). *Inequalities in health: The evidence*. UK: Policy Press.

4.3.D.4 Drug Utilization Rates for All Individuals in the Study Population, by Type of Coverage

The following utilization rates include all individuals in the study population, and the details of the methodology used to assign individuals to a given type of coverage are outlined in Appendix E. A minimum coverage of 90 days was required for these rate calculations. For each individual and for each coverage they were on, the number of prescriptions they filled during the coverage interval was counted, as well as the total amount paid by the individual and the government.

Table 23 - Prescription Utilization Rates by Type of Coverage

Adults		Children	
	Rate		Rate
Regular	4.2	Regular	1.8
FHB, overall	4.6	FHB, overall	2.5
Prior coverage	5.4	Prior coverage	2.9
New coverage, urban	4.4	New coverage, urban	2.5
New coverage, rural	4.4	New coverage, rural	2.0
FIP	4.7	FIP	2.7
PTA	5.6	PTA	3.4
SAP	12.1	SAP	3.6

The rate of prescription use for children while receiving FHB was 39% higher than for the same children while they were on regular coverage. For adults receiving FHB the rate was only marginally higher than that while they were receiving regular coverage. It should be noted that for all these analyses the rate on regular coverage refers to the rate that people in the study population experience while receiving regular coverage; none of the rates refer to people in the general population who have had regular coverage exclusively during the study period.

The rate of prescription use for adult SAP recipients was almost three times the rate for study individuals with regular coverage. This is probably because SAP recipients tend to have lower income and poorer health than FHB recipients, and possibly to some extent due to the greater coverage of the drug costs. Among children receiving SAP, the rate was almost twice that of children on regular coverage, presumably reflecting their poorer economic and social circumstances which may have existed for some time.

National Population Health Survey data indicate that although people with higher income were more likely to have medical insurance, prescription use became less likely as income rose.[19] For example, the use of three or more medications was only 73% as likely among higher income groups as among low income groups. The classes of drugs which were more commonly reported among respondents on low income were antidepressants, stomach remedies and asthma medications.

[19] Federal, Provincial and Territorial Advisory Committee on Population Heath. (1999). *Toward a Healthy Future: Second Report on the Health of Canadians.* (Cat #H39-468/1999E). Ottawa: Minister of Public Works and Government Services

4.3.D.5 Utilization Rates by Age and Sex

Data in Table 24 show that prescription rates are much higher among women for all age groups and coverage types, with the differential being more pronounced in the younger age groups. This is consistent with patterns in the general population. Rates are strikingly high for male and female SAP recipients in the 46 years and older age group.

Table 24 - Prescription Utilization Rates by Age, Sex and Type of Coverage

	Age 18-25		Age 26-35		Age 36-45		Age 46+	
	Female	Male	Female	Male	Female	Male	Female	Male
Regular	3.70	1.55	4.13	2.24	5.29	3.52	11.62	7.28
FHB, overall	4.61	1.70	4.63	2.52	5.41	3.53	8.96	6.72
Prior coverage	4.84	2.00	5.06	3.40	6.29	4.55	11.66	9.41
New coverage, urban	4.43	1.59	4.61	2.33	5.37	3.29	8.71	6.90
New coverage, rural	4.26	1.46	4.02	2.34	4.91	3.50	8.06	5.84
PTA	6.13	2.59	7.73	3.47	10.17	5.51	12.19	10.19
FIP	4.50	2.03	4.56	3.06	5.60	4.33	8.36	7.63
SAP	7.74	4.63	10.06	8.30	14.78	11.90	24.02	17.73

4.3.E Chiropractic Services

In recent years chiropractic services have been partially covered for everyone with regular coverage, with patients making a co-payment for every visit. As outlined in Appendix B, chiropractic services are fully covered for adults and children qualifying for FHB, FIP, SAP and PTA.

To give some context to the rates given below, please refer to Tables 2 and 3 which provide the number of people with each coverage code in a sample month, October 1999. These numbers change from month to month during the study period as people's coverage type changes.

4.3.E.1 Utilization Rates for Chiropractor Services

The methodology for analyzing the chiropractor data is outlined in Appendix E. The utilization rates among children by coverage codes are presented in Table 25. Children receiving FHB have higher chiropractor use rates than those with other types of coverage. Within the FHB group, rural children have slightly higher chiropractor use than the others.

Table 25 - Chiropractor Utilization Rates by Type of Coverage – Children

Coverage	Utilization
Regular	0.07
FHB, overall	0.27
Prior coverage	0.26
New coverage, urban	0.25
New coverage, rural	0.31
FIP	0.09
PTA	0.15
SAP	0.13

The utilization rates for adults across different types of coverage are presented in Table 26. The lowest rate was where people received regular coverage which requires a co-payment. The highest rate was for adults with FHB coverage, with marginally higher use among those who had had prior coverage.

Table 26 - Chiropractor Utilization Rates by Type of Coverage – Adults

Coverage	Utilization
Regular	0.5
FHB, overall	1.4
Prior coverage	1.6
New coverage, urban	1.5
New, rural	1.3
FIP	0.6
PTA	0.7
SAP	1.0

4.3.E.2 Utilization Rates: Regular to FHB Coverage

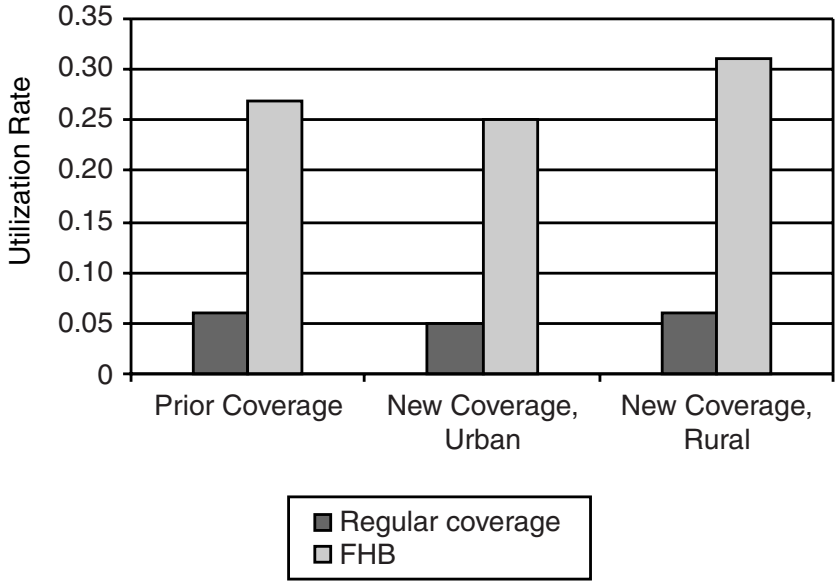
The data were also subdivided according to whether the children and adults had been on a benefit prior to FHB, or had previously received regular coverage. Only those who had previously received regular coverage were included in the following analysis, and were categorized into two groups based on whether or not they lived in rural Saskatchewan. A recipient had to be on a given type of coverage for at least 90 days for that coverage type to be included in the calculation.

For children in all FHB sub-groups, chiropractor use increased when children moved from regular to FHB coverage, with the greatest increase being for children living in RMs (Figure 15). Although the increase appears to be dramatic, it should be noted that the proportion of children receiving chiropractor services remains relatively small: 789 children received services while on regular coverage, and 2,555 children received services while on FHB coverage; the number of children with each type of coverage is given in Table 3.

Without further information it is impossible to understand why chiropractor use would increase so much with the introduction of the FHB.

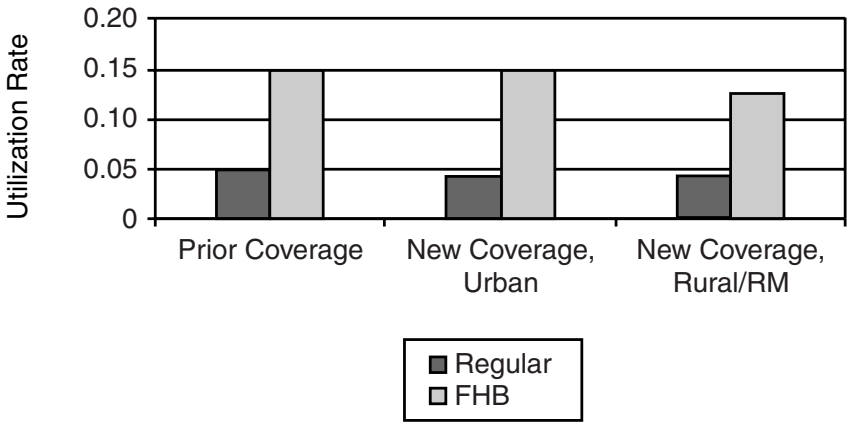
For children, the age distribution was very similar for those receiving regular coverage and those receiving FHB, with around 20% of services being for children aged 5 and under, around 47% being for children aged 6-12, and around 33% being for children aged 13-17. Diagnoses are not available for the chiropractor service data. It is likely that for children 6 and up, the primary reason for visiting a chiropractor is the treatment of sports-related injuries.

Figure 15: Average Rate of FHB Chiropractor Use per Person-Year by Prior Coverage – Children



The data for adults are shown in Figure 16. For all FHB groups, chiropractor use more than doubled when they moved from regular to FHB coverage, with the greatest increase being for urban adults. The increase was less marked for the adults than for the children, though use, as expected, is much lower among children.

Figure 16: Average Rate of FHB Chiropractor Use per Person-Year by Type of Prior Coverage – Adults



4.3.E.3 Chiropractor Service Cost Rates

The methodology for calculating costs is the same as for service utilization, with the cost of each service being totalled instead of the number of services. The chiropractic cost rates for children and adults are presented in Table 27, and show similar trends to the service utilization rates, with the highest costs for FHB recipients.

Table 27 - Chiropractor Cost Rate by Type of Coverage

Coverage	Cost Rate - Children	Cost Rate - Adults
Regular	0.82	5.09
FHB, Overall	4.00	20.98
Prior coverage	3.87	23.58
New coverage, urban	3.74	21.33
New coverage, rural	4.59	18.36
FIP	1.25	7.95
PTA	2.16	10.12
SAP	1.98	13.68

4.3.F Optometric Services

In Saskatchewan, routine eye examinations (one per 12-month period) are provided free of charge for all covered children under 18 years of age. Supplementary health coverage for optometry services varies among health benefit programs for adults and children. Appendix B outlines the various services covered for adults and children in each coverage category.

Use of optometry services was examined for the period from July 1, 1997 to December 13, 1999. Service and cost utilization rates and the average cost per service were calculated for adults and children. The service utilization rate is the average number of services performed per person-year. Services refer to eye examinations but not to the dispensing of eyeglasses. The cost utilization rate is the average cost per service per person-year. Costs reflect the expenses covered by the government and do not include charges paid by the patient. Rates were calculated for individuals on different types of coverage and weighted according to the length of time they were on a given coverage.

4.3.F.1 Rates of Utilization

Some variation in utilization rates for optometry services was evident across coverage codes for adults in the study (Table 28). Rates for those on regular coverage are unknown because the province is never billed for these services. As expected, adults who have coverage for eyeglasses (i.e., those on SAP or PTA) are using optometry services at a higher rate than those without eyeglass coverage (i.e., FHB or FIP). Of those receiving FHB, new rural recipients are using these services at a slightly higher rate than either the new non-rural recipients or those with previous coverage of some type.

Government costs for services were highest among those receiving PTA and lowest among FHB recipients, but the costs were very similar in all types of coverage.

Table 28 - Optometry Utilization Rates by Type of Coverage - Adults

Coverage	Utilization Rate Service	Cost Utilization Rate	Average Cost per Service*
Regular	N/A	N/A	N/A
FHB, overall	0.17	5.2	29.78
Prior coverage	0.16	5.0	31.38
New coverage, urban	0.17	5.2	30.33
New coverage, rural	0.19	5.4	27.90
FIP	0.06	1.7	30.66
PTA	0.25	8.0	32.73
SAP	0.24	6.8	28.48

*Costs reflect expenses covered by government only.

Table 29 provides utilization rates for optometry services for children in the study population. Rates for services were highest among children whose families were receiving FHB and lowest for those on regular coverage. FHB children were using optometry services at a rate nearly three times greater than those on regular coverage and twice as great as those on SAP. Average costs per service are relatively similar among all coverage categories.

Table 29 - Optometry Utilization Rates by Type of Coverage - Children

Coverage	Service Utilization Rate	Cost Utilization Rate	Average Cost per Service* ($)
Regular	0.12	4.2	36.08
FHB, overall	0.35	12.7	36.37
Prior coverage	0.30	11.0	36.45
New coverage, urban	0.33	12.0	36.35
New coverage, rural	0.43	15.5	36.33
FIP	0.10	3.6	35.43
PTA	0.24	8.6	36.59
SAP	0.17	6.0	36.39

*Costs reflect expenses covered by government only.

This analysis suggests that families were taking their children to the optometrist more frequently, once expenses for eyeglasses were covered. Since most FHB recipients came from regular coverage, these families would not previously have had expenses for their children's eyeglasses covered.

A second method was also used to calculate rates of use among children. Since exams are provided free on an annual basis to all children in the covered population, rates were calculated for children who were on regular coverage and then became FHB recipients. This group included the same children who were on each coverage code for a full year of coverage. Using this method, children have a service use rate of .10 when they were receiving regular coverage compared to .40 when they were receiving FHB. This analysis provides an even stronger indication of the impact of the program on children's use of optometry services. Four times as many children were receiving eye examinations when they were FHB recipients compared to when they were receiving regular coverage. The main difference in benefits between these groups was eyeglass coverage for children on FHB.

Further analysis was undertaken to examine how use of optometry services varied by sex and age within each type of coverage. For adults, rates for service use were higher among women than men for each type of coverage (Table 30). The largest differences between the sexes were evident in the PTA group; men had a rate of .32 compared to .17 for women. Females also had higher rates than males in each of the three categories of FHB recipients.

Table 30 - Optometry Utilization Rates by Sex and Type of Coverage - Adults

Coverage	Female	Male
Regular	N/A	N/A
FHB, overall	.20	.13
Prior coverage	.17	.12
New coverage, urban	.20	.13
New coverage, rural	.24	.15
FIP	.06	.04
PTA	.32	.17
SAP	.26	.22

Among children, use of optometry services was also higher for females than for males in each type of coverage (Table 31). The largest difference was evident for those children who were 'new rural' FHB recipients where females had a rate of .47 compared to .38 services per person-year for males.

Table 31 - Optometry Utilization Rates by Sex and Type of Coverage – Children

Coverage	Female	Male
Regular	.12	.11
FHB, overall	.38	.32
Prior coverage	.32	.28
New coverage, urban	.36	.31
New coverage, rural	.47	.38
FIP	.11	.10
PTA	.24	.23
SAP	.18	.15

When age of adults on various types of coverage was examined, the data revealed that use of optometry services increased with age (Table 32). For example, the rate for females 18 to 25 years of age receiving FHB was .14 compared to .35 services per year for those 46 years or older. Similarly, the rate for males 18 to 25 years of age receiving FHB was .06 compared to .22 services per year for those 46 years or older. Females in each age group had rates higher than the males in that age group for each type of coverage. Adults receiving SAP or PTA had higher rates of use than adults on FHB or FIP in each age category.

Table 32 - Optometry Utilization Rates by Sex, Age and Coverage Type – Adults

	Age 18-25		Age 26-35		Age 36-45		Age 46+	
	Female	Male	Female	Male	Female	Male	Female	Male
Regular	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
FHB, overall	0.14	0.06	0.14	0.07	0.26	0.15	0.35	0.22
Prior coverage	0.14	0.06	0.13	0.07	0.25	0.15	0.30	0.19
New coverage, urban	0.14	0.06	0.14	0.07	0.25	0.14	0.36	0.25
New coverage, rural	0.10	0.07	0.15	0.07	0.27	0.15	0.36	0.21
FIP	0.04	0.01	0.05	0.02	0.10	0.06	0.09	0.07
PTA	0.25	0.10	0.27	0.18	0.45	0.25	0.79	0.38
SAP	0.17	0.10	0.17	0.12	0.34	0.24	0.47	0.38

4.3.G Other Services

Data were compiled for other partially insured services under FHB, including EMS, dental, and medical supplies and appliances. However, the data were subjected to a cursory analysis only, for the following reasons.

An analysis of the EMS data revealed very low and sporadic patterns of use among members of the study population in the specified time period. This was not unexpected, as EMS tends to have the highest degree of utilization among older individuals, that is, individuals 65 years of age and older.

With respect to dental services, the data revealed that is was not possible to determine use of dental services before an individual received supplementary health coverage or after leaving a supplementary program; hence, pre/post comparisons of utilization could not be undertaken. Limited comparisons for children were possible, which involved SAP and FHB recipients. This analysis revealed that overall, recipients of SAP benefits had both higher service utilization and cost utilization rates than FHB recipients. However, within the FHB segment of the study population there was substantial variation. New FHB recipients living in rural areas of Saskatchewan had higher utilization rates than either new benefit recipients living in urban areas or individuals who had previously been covered under another supplementary benefits program. In fact, new FHB recipients in rural areas had slightly higher service utilization rates than children receiving SAP (3.64 and 3.16, respectively), as well as slightly higher cost utilization rates ($94.06 and $91.39, respectively). A comparative analysis of the types of dental services revealed that FHB recipients made greater use of preventative services than SAP recipients.

The data on use of medical supplies and appliances was not subjected to analysis. Preliminary inspection revealed that it was impossible to make comparisons of equipment utilization before and after the introduction of FHB. Further, the data were in a file structure that made comparison across FHB and SAP difficult.

[20] It is possible, however, that the same individual may be hospitalized more than once in a given year.

4.3.H Summary of Service Utilization

The health services that were examined in this section of the report include both basic insured services, as well as partially insured services. The former category includes hospital and physician services; the latter includes prescription drugs, optometric services, and chiropractic services. The utilization rate was used to measure differences in the use of health service across and within segments of the study population.

The data for basic insured health services reveal the following. Overall, almost 2 in 10 adult FHB recipients will experience a hospital stay in a given year[20]; this stay will, on average, last for three days. For children, 1 in 10 FHB recipients will experience a stay in hospital each year; this too will last approximately three days. On average, an adult who is covered by the FHB program will visit physicians for 9 different services in a given year; these services might be for diagnostic tests, general physical examinations, prescriptions, or treatment of specific conditions. For a child receiving family health benefits, slightly more than 5 services will be obtained from physicians each year.

However, the analysis reveals that not all FHB recipients use basic insured services in the same manner. Among new benefit recipients, rural residents tend to use these services less than urban residents; individuals who have migrated to FHB from another supplementary health benefits program tend to have slightly greater use. Some of this difference is attributable to the different demographic compositions of the FHB recipient groups; there was a higher percentage of males in the rural areas, and men tend to have lower health service utilization than women.

Prescription drugs, optometric services, and chiropractic services are partially insured services under the FHB program. In general, this study found that a reduction in user costs for these services resulted in increased use. This is consistent with expectations of the program. At the same time, the use of hospitals and physicians declined as individuals moved to enhanced health benefits coverage.

The analysis of the prescription drug data show that on average, adults on FHB filled slightly more than four prescriptions each year, while children on FHB filled slightly more than two prescriptions each year. In general, the same utilization patterns observed in the hospital and physician analyses were observed here; rural benefit recipients had the lowest utilization while individuals who were previously covered under another program had the highest use. For both adults and children, decreased cost associated with a move from regular health insurance to FHB resulted in a use that increased between 13% and 16%. Further analysis suggests that parents on FHB are using the program to monitor and control children's chronic conditions, such as asthma and diabetes.

[21] Although it is also possible that the same individual(s) will see an optometrist more than once in a given year.

While overall use of optometrists and chiropractors is fairly low within the study population, use of these services increased with the introduction of the FHB program.
In fact, children's use of chiropractic services was markedly different under FHB than under other types of health coverage. The analysis of this data indicates that three chiropractic services are used among every 10 children who receive FHB each year. In contrast, only about 1 chiropractor service is used among every 10 children on regular coverage in a given year. Within the FHB population, chiropractor use varied, and was highest among children in rural areas.

Eye exams also increased for children under FHB. Amongst the three FHB user groups, rural children showed the greatest use of optometry services; 4 in 10 will visit an optometrist each year.[21] In comparison, only about 1 in 10 children on regular coverage will see an optometrist each year. Since FHB covers the costs of eyeglasses, the increase in eye exams presumably also is an indication of acquisition of glasses. If an individual previously could not afford glasses, then there would be no point in having the eye exam. The data suggest that more parents take their children for exams and check-ups once eyeglasses become part of the benefits package.

Individuals receiving health benefits as part of the SAP program exhibited the highest utilization of hospitals, physicians, and prescription drugs. This suggests that SAP recipients may have distinct health care needs. However, use of optometry services by children in SAP families was surprisingly low; chiropractor use was also relatively low in comparison to regular benefit recipients. Optometry may be regarded as more of a preventive service than the other health services examined in this report. These two results are, however, consistent with a Manitoba study of social assistance children (Kozyrskyj et al.)[22] which found that children from single parent families on social assistance were less likely to receive preventive medical services than children not on social assistance.

[22] Kozyrskyj, A., Mustard, C., & Derksen, C. (2000). *Considering the Health Care Needs of Children Living in Households Receiving Income Assistance in Manitoba.* Winnipeg: Manitoba Centre for Health Policy and Evaluation.

DISCUSSION

The Family Health Benefits Program is premised on beliefs that out-of-pocket health care costs provide a disincentive for families moving away from assistance, and conversely having the benefits provides a safety net preventing low-earner families turning to social assistance in order to pay for medical services. The study has not directly tested these assumptions - to do so requires obtaining information directly from recipients on their reasons for using services and understanding how family decisions are made. Rather, the study has used administrative data to examine changing patterns of health care use between different groups of low-income families, and within families as their economic position changes, as reflected in transitions to different types of health coverage.

5.1 Size And Uptake Of The Family Health Benefits Program

The introduction of the Family Health Benefits program has greatly increased the number of people receiving expanded health benefits. Previously, expanded benefits were limited to persons without employment or who were marginally employed and eligible for social assistance. FHB has enlarged the population to include people working at low-wage employment and who qualify for the federal and provincial child benefit supplement. During the study period, over 105,000 individuals received coverage under FHB. Of this group 71% were new recipients, that is, they had not received additional health benefits under any of the other supplementary health programs.

The new recipients show markedly different patterns of service use than other FHB recipients. In particular, they show lower use of hospital, physician and drug services. They also have demographic differences that set them apart from the rest of the study population. New recipients tend to be older (and have older children) and are comprised of more two-parent families than the rest of the low-income groups. This results in a higher proportion of males among new recipients, as compared to other groups in the study population.

New recipients are more strongly attached to the labour market. One of the characteristics of FHB recipients is that they have employment income, albeit not large. New recipients were also four times as likely to come from rural areas of the province, as compared to recipients with prior coverage. All four factors, age, sex, employment and rural residence, are related to health status or access to health services, and thus may be expected to affect levels of health utilization.

As with any program where people must apply for benefits, there is always a risk of under-enrollment. For a variety of reasons people may be unaware of application procedures, may choose not to apply, or may simply forget to apply. While the exact take-up rate for the program is not known, the estimates from this study are that 93% of potentially eligible recipients have been registered with the program. This is a very high uptake, and reflects the success of the governments in making people aware of the program and making the application process relatively simple.

5.2 Differences Between Low-Income Groups

People are generally healthier while engaged in productive activity than when not employed at all. The study found a distinct pattern of service use among people registered in the different coverage programs. Overall, the rates for basic insured services were highest in the two health benefits programs where people were not working – SAP and PTA. These programs include people who are either on social assistance, or in adult basic education training programs. If one assumes that for treatment services (as opposed to services that are more preventative), higher service use is an indicator of poorer health, then this is consistent with expectations based on the poorer health status associated with unemployment.

Utilization rates for insured services were generally lower in the two benefits programs where people were employed – the FHB and FIP programs. Among FHB recipients, new applicants had lower utilization rates in all service areas than did people who were previously enrolled in a health benefits program. Among the new applicants, people from rural areas generally had the lowest rates of all. Some of this difference is attributable to sex differences and family characteristics in the two populations. The FHB program also has a higher proportion of two-parent families than other health benefit programs. Other reasons for this difference in use may be related to transportation and a more general inaccessibility of health services among rural populations.

People living on low income tend to experience a multiplicity of risk factors which reinforce each other and have detrimental health impacts. People from disadvantaged backgrounds (who generally have greater health needs) tend to face many barriers to health care, including financial, transportation and cultural barriers. For example, establishing a good dialogue with trained health professionals is more difficult for those with the least education – who also tend to be poorer and have the greatest health care needs. Another potential barrier to accessing health care is the high opportunity cost (in terms of lost income) of using health services, and that is most likely to be experienced by people working in low income jobs.[23] The phenomenon that those in greatest need of care are often least likely to receive a high standard of care has been coined the "inverse care law".[24]

The data on hospital and physician utilization indicate that for most recipients of health benefits, utilization tended to decrease as individuals moved from one type of coverage to another. This finding is contrary to expectations, if one assumes that a change in coverage corresponds to a change in health status. It is important to recognize that changes in benefits coverage occur in a complex environment in which multiple factors will influence health service utilization, including global changes in the structure of the health system over time.

Whether better access to needed services, such as prescription drugs, contributes to the lessened demand on hospital and physician services is not known. However, evidence from Quebec[25] suggests that when costs for drugs increase, so do hospital admissions.

[23] Gordon, S., Shaw, M., Dorling, D., & Davey Smith, D. (Eds.). (1999). *Inequalities in health: The evidence.* UK: Policy Press.

[24] Hart, T.J. (1971). The inverse care law. *Lancet, 1,* 405-412.

[25] Tamblyn, R., Latimer, E., Perrault, R., McLeod, P., Huang, H., Larochelle, P., & Mallet, L. (2001). Adverse events associated with prescription drug cost-sharing among poor and elderly persons. *Journal of the American Medical Association, 285 (4),* 421-429.

When the province introduced drug-cost sharing for people who previously had free medication, use of essential drugs decreased by 9% in elderly persons and by 14.5% in welfare recipients. Use of non-essential drugs decreased by 15% and 22% respectively. The rate of serious adverse events associated with reductions in use of essential drugs increased for both groups as did the rate of emergency room visits. The findings of the study reinforce the importance of policies aimed at removing financial barriers to drug costs, and the need to look broadly at health outcomes when evaluating such policies.

By making drugs more affordable for low-income families people may be better able to manage their health conditions and require fewer frequent visits to doctors or emergency admissions. The detailed analysis of drug use changes – particularly among children – suggests that parents on Family Health Benefits are using the program to monitor and control children's chronic conditions, such as asthma and diabetes. Earlier control of these conditions may reduce costs of more expensive medical care later in life.

While overall use of optometrists and chiropractors is fairly low in the study population, use of these services increased with the introduction of Family Health Benefits. Children in FHB families used optometry services more than children in SAP families. Optometry may be considered a more preventive than treatment service. This finding is consistent with observations from a Manitoba[26] study, suggesting that children from single parent families on social assistance were less likely to receive preventive medical services than children not on social assistance.

Previous studies among low income populations have concluded that health status among social assistance recipients is generally worse than that of the working poor population – except when the working poor do not seek, or have access to, prescription medication.[27] If health service utilization is at all an indicator of well-being, this study also shows higher levels of health among the working poor than those on social assistance or on a training allowance. It also shows that the working poor are more likely to use services to control and manage chronic conditions when costs are reduced and benefits provided with other programs to help maintain income levels and employment.

5.3 Urban And Rural Differences Among The Populations

The lowest service utilization rates were observed among new FHB recipients, particularly from rural areas of the province. Some of this difference is attributable to demographic differences between the rural populations and other health benefit recipients.

For low-income families generally, and for families on income assistance programs specifically, there is a high percentage of female single parents. The introduction of FHB, however, has created a different mix of families. Whereas 73% of people with previous coverage through income assistance programs were in single parent families, only 36% of the new FHB recipients were in single parent families and 73% from two parent families. New recipients from rural areas in particular were most likely to be from two parent families (90%).

[26] Kozyrskyj, A., Mustard, C., & Derksen, S. (2000). *Considering the Health Care Needs of Children Living in Households Receiving Social Assistance in Manitoba.* Winnipeg: Manitoba Centre for Health Policy and Evaluation.
[27] Williamson, D., & Fast. J. (1998). Poverty status, health behaviours and health: Implications for social assistance and health care policy. *Canadian Public Policy, 24 (1)*, 1-25.

Family Health Benefit recipients tend to be older than other low-income families. Among adults, 59% of new FHB recipients are 36 years of age or older. Within the overall population of low-income recipients only 47% are older than 35 years. New FHB recipients from rural areas tend to be the oldest, with 75% being older than 35, and 24% being 46 years or older.

Besides demographic differences, other causes for differential rates of service use may be related to transportation difficulties for low-income people in rural areas, and a more general inaccessibility of health services among rural populations.

It is possible that differences in utilization reflect differential access to services. For example, individuals living in rural areas of Saskatchewan may have poorer access to hospital and physician services, perhaps because of transportation barriers. The study by Kozyrskyj et al. similarly found that utilization of physician services by Manitoba children living in income-assisted households was greater for urban residents than for rural residents, but the reverse was true for hospital utilization. Access may also vary by family structure. Individuals living in single parent families may experience access restrictions because of time and financial issues.

5.4 Measuring Need From Service Use

In studies such as this it is difficult to determine why people use the services they do, and whether 'use' is a measure of 'need'. Without the ability to adjust for need it is not possible to know whether differences in access to care or to treatment indicate inequity, nor whether high levels of intervention are appropriate or effective.

Differential access to services is obviously an important consideration in understanding use. In some instances the utilization rate may be related to health status. For example, increases in prescription drug use, other things being equal, may reflect greater health problems. Other areas where extra health coverage has been included may be considered as more preventive services. For optometric services, use may be encouraged as it may reduce the need for more intensive or more costly services later on. Therefore, one must carefully interpret what the usage rate means for each of the types of services discussed in this report.

One purpose of this study was to examine use of acute care hospital services and medical services provided by physicians. The descriptive analyses revealed that there was substantial variation in the use of these health services across segments of the study population. However, across adult and children population groups, a consistent trend was observed. SAP recipients were always the greatest users of these services and new FHB recipients living in rural parts of Saskatchewan used these services the least. For adults, the hospital separation rate for SAP recipients was 137% higher than the rate for new, rural recipients of FHB. Similarly for children, the SAP hospital utilization rate was 163% higher than the rate for new FHB recipients living in rural areas. With respect to physician service use by adults, the rate was 100% higher for SAP recipients than for FHB

recipients living in rural areas. Among children, there was a slightly smaller difference, the utilization rate for the former group was only 67% higher than the utilization rate for the latter group.

The reason for these differences is unclear, however. It is possible that differences in hospital and physician utilization reflects actual differences in health status. Individuals receiving health benefits under social assistance may have poorer health status than individuals receiving benefits under the Family Health Benefits program. This would indicate that greater use of services reflects greater need. An investigation of utilization rates for specific diagnostic categories indicates that at least some of the variation may be attributed to a higher number of mental health diagnoses among SAP recipients. This is consistent with other research. In Ontario, a recent study found a high rate of depressive disorder (45%) among single parents receiving social assistance (Byrne et al 1998).[28] This rate was compared with 10% among single mothers generally in Ontario and 5% among Ontario mothers in two parent families. Parents with depression also reported higher rates of developmental delay and behavior problems in their children. This should serve as a reminder that health status encompasses physical as well as psychological well-being.

It is also possible that differences in utilization reflect differences in purposes for seeking care, particularly with respect to physician services. At least some of these services will be for preventive care, including well-baby checkups and annual physical examinations. Other services will be for diagnostic or treatment purposes, including management of chronic conditions.

It is more conceivable, that a combination of health status, access, and purpose is responsible for the differences in health care utilization across segments of the study population. Further research is needed to fully understand: (a) the reasons for variations in utilization, and (b) the resultant policy implications for the design and implementation of family support programs.

Differences in need may be influenced, in part, by the nature of health conditions which confront young children and their families; the study by Kozyrskyj et al. sought to explain health services utilization of Manitoban children terms of acute, recurrent, and permanent conditions, as well as preventive health services. For 60% of those children who accessed the health system, treatment was for acute conditions. However, there were few differences between children living in income-assisted households and children in other Manitoba households in terms of health services utilization for these three types of conditions.

The data have shown that when the costs of some health services are reduced for recipients, service use increases. This has occurred within a context of overall declining use of hospital services in the province and unchanged use of physician services. This is consistent with expectations of the program. Though not always the case, higher use of services, such as needed prescription drugs and eyeglasses reflects better health status and health care.

[28] Byrne, C., Browne, G., Roberts, J., Ewart, B., Schuster, M., Underwood, J., Flynn-Kingston, S., Rennick, K., Bell, B., Gafni, A., Watt, S., Ashford, Y., & Jamieson, E. (1998). Surviving social assistance: 12-month prevalence of depression in sole-support parents receiving social assistance. *Canadian Medical Association Journal, 158*, 881-888.

5.5 Policy Importance

This study has examined the health care response to a program aimed at supporting low-income families in the labour market. The policy rationale for providing Family Health Benefits was to maintain one's level of health and to ensure that the costs of health care were not a barrier to leaving assistance. The evidence shows that when user charges are reduced or removed, parents and children obtain health services they need, such as prescription drugs and optometric services.

The Family Health Benefit program was built on an understanding that health policy and social policy should support one another. The research provides further evidence for including health considerations in developing public policy and programs for low-income people. Unemployed and marginally employed parents face higher health risks and health needs than other types of low-income people. Addressing these health issues through equitable access and affordable health services achieves goals of better health and economic outcomes for low-income families.

Within the FHB program it is recognized that some types of health service use are to be encouraged, and higher utilization reflects a measure of program success. This is particularly the case where service use is related to preventive health or the management of chronic conditions among adults or children. The findings of this study emphasize the importance of forms of transitional benefits to people once they leave social assistance. They also speak to the need for investing in programs that ensure affordable access to health services for all low-income people, regardless of their position in or out of the labour market. Over the long term these programs will enhance the health of adults and children living in low-income families. Better health among those living in low-income families will ultimately decrease the need for public expenditures on more costly and intensive health care.

APPENDICES

APPENDIX A

Glossary Of Terms

Canada Customs and Revenue Agency (CCRA) – The federal department responsible for income tax, formerly known as Revenue Canada.

Covered Population - All Saskatchewan residents who are eligible for Saskatchewan Health services. Excluded from eligibility are those people whose health care is fully funded by the federal government; this represents less than 1% of the provincial population. Those excluded from coverage include members of the Royal Canadian Mounted Police, Canadian Forces, and inmates of federal penitentiaries.

Data Access Review Committee (DARC) - Saskatchewan Health committee responsible for monitoring requests for data from the Department's administrative databases, and for providing approval to link these databases based on an individual's PHN.

Family Health Benefits (FHB) - The Family Health Benefits program provides benefits for: (1) families eligible for the Saskatchewan Child Benefit, and (2) families eligible for the Saskatchewan Employment Supplement. Children are covered for:

- Most dental services
- Eye examinations once a year; basic eyeglasses
- Emergency ambulance
- Basic medical supplies (some items require prior approval)
- Chiropractic services
- Formulary drugs.

Parents or legal guardians are covered for chiropractic services, an eye examination every two years, drug coverage with $100 semi-annual family deductible and 35% consumer co-payment thereafter.

Family Income Plan (FIP) – A program started in 1974 to provide an income supplement for low-income families with dependent children. Payments under this program helped families with food costs, clothing, and other essential expenses for children. The program was ceased in 1998, and replaced by other support programs.

Health Insurance Registration File (HIRF) – Database maintained by Saskatchewan Health which contains information on health insurance coverage classification, as well as personal information such as sex, date of birth, residence, and mailing address.

Hospital Separation – A separation form is completed upon discharge or death of an inpatient. Discharge may be due to transfer to another facility or return to domicile. An inpatient is a patient who is admitted to a hospital for diagnosis or treatment and who occupies a bed or bassinet.

Hospital Separation Episode – An episode includes an initial hospitalization, as well as any subsequent hospitalization that may have occurred within a one-day time period. For example, if an individual is admitted to one hospital, transferred to another hospital, and later transferred to a third hospital, all within one day, this would be counted as one episode, but three hospitalizations. Episodes, rather than hospitalizations, were used in the analysis of hospital utilization because they are less likely to over-represent hospital utilization in rural areas where transfers from local to regional and tertiary facilities are common.

International Classification of Disease, 9th revision (ICD-9) – System for classification of diagnoses/diseases developed by the World Health Organization.

National Child Benefit Supplement (NCBS) - A benefit to low income families paid by the federal government through the tax system. The amount of the benefit depends on both on the number of children and the income level of the family.

Personal Health Number (PHN) – Unique number assigned to each individual who is covered by universal health insurance in Saskatchewan.

Provincial Training Allowance (PTA) - A benefit, equivalent to social assistance, paid through Saskatchewan Post Secondary Education and Skills Training. Eligible recipients are those taking Adult Basic Education or Skills Training, and who otherwise would be eligible for social assistance

Registered Indian – Registered Indian and Status Indian persons are those persons registered with the federal government through the Department of Indian and Northern Affairs Canada and its authority as granted in the Indian Act. The term “Non-status Indian” is applied to people who may be considered as “Indians” according to ethnic criteria, but who, for various reasons, are not entitled to registration under the Indian Act.

Rural Municipality (RM) – Geographic and administrative unit in rural Saskatchewan. Towns, villages, and hamlets are excluded from the RM designation.

Saskatchewan Assistance Plan (SAP) – Saskatchewan’s unified provincial social assistance program, commonly known as welfare. It provides financial assistance to people in need who have little or no income.

Saskatchewan Child Benefit (SCB) – Introduced in July 1998, the SCB provides a monthly allowance to assist lower income families with the cost of raising children. Revenue Canada administers the SCB on behalf of the province and benefits are combined with the National Child Benefit Supplement.

Saskatchewan Employment Supplement (SES) – A program for low income working families administered by Saskatchewan Social Services and introduced in July 1998. It provides a monthly supplement to wages, child and/or spousal maintenance payments, and self-employment earnings of lower income parents. The program assists parents with the child-related costs of going to work and supports their decision to work.

APPENDIX B

Health Benefits By Type Of Coverage[1]

The study population contains individuals receiving the following types of coverage:
- Regular
- Social Assistance (SAP) and Provincial Training Allowance (PTA)
- Family Income Plan (FIP)
- Family Health Benefits (FHB)

The health benefits of individuals on SAP and PTA are identical.

Drug Plan

	Adults	**Children**
Regular	$850 semi-annual deductible[2]. Patient pays 35% of all drug costs above their deductible.	$850 semi-annual deductible. Patient pays 35% of all drug costs above their deductible.
FHB	$100 semi-annual deductible. Patient pays 35% of all drug costs above their deductible.	Government pays the entire amount. There is no deductible.
FIP	Same as FHB	Same as FHB
SAP & PTA – level 1	$2 dispensing fee for prescriptions. (Exceptions are anti-diabetic drugs, oral hypoglycemics, injectable vitamin B12, allergenic extracts and oral contraceptives, which have no dispensing fee.)	Government pays the entire amount. There is no deductible.
SAP & PTA – level 2	No dispensing fee. Level 2 benefits are available to: • mothers on SAP for the period 3 months before and 3 months after the birth of their child • SAP clients who are in rehab centres • clients who had more than five prescriptions a month. This coverage is not automatic. Clients have to apply to the Drug Plan for it.	Government pays the entire amount. There is no deductible.

[1] Sources for health benefits by level of coverage are:
Saskatchewan Health, *Annual Statistical Report 1997-98*, Drug Plan and Extended Benefits Branch
Saskatchewan Health, *Annual Statistical Report 1998-99*, Drug Plan and Extended Benefits Branch
[2] The semi-annual deductibles are for families, not for each individual in a family.

Optometric Services

	Adults	Children
Regular	Patient pays the entire amount for eye examinations and eyeglasses.	Covered for one eye examination every 12 months. Patient pays for glasses.
FHB	Covered for one eye examination every two years.	Covered for one eye examination every 12 months. Covered for glasses.
FIP	Same as FHB	Same as FHB
SAP & PTA	Covered for one eye examination every two years. Covered for glasses.	Covered for one eye examination every 12 months. Covered for glasses.

Chiropractic Services

	Adults	Children
Regular	The government pays approximately 50% of the cost.[3] When a patient visits a chiropractor for the first time, the chiropractor does an initial examination of the patient and carries out the first treatment. Chiropractors charge more for the initial visit than for subsequent visits. For individuals on regular coverage, the government pays $10.40 per treatment. The balance of the payment, usually $11.00, is paid by the patient.	Same as for adults.
FHB	Covered by Saskatchewan Health.	Covered by Saskatchewan Health
FIP	Covered by Saskatchewan Health.	Covered by Saskatchewan Health.
SAP & PTA	Covered by Saskatchewan Health.	Covered by Saskatchewan Health.

Physician Services

All covered individuals in the province receive the same health coverage for insured physician services. Most services are included. The provincial government pays for physician services and no fee is charged to the patient.

Hospital Services

All covered individuals in the province receive the same health coverage for medically necessary hospital inpatient stays. No fee is charged to the patient.

[3] The actual amount paid by Saskatchewan Health changed slightly during the study period.

Medical Supplies and Appliances

	Adults	Children
Regular	Not covered.	Not covered.
FHB	Not covered.	Covered by Saskatchewan Health.
FIP	Not covered.	Covered by Saskatchewan Health.
SAP & PTA	Covered by Saskatchewan Health.	Covered by Saskatchewan Health.

Emergency Medical Services

	Adults	Children
Regular	Not covered.	Not covered.
FHB	Not covered.	Covered by Saskatchewan Health.
FIP	Not covered.	Covered by Saskatchewan Health.
SAP & PTA	Covered by Saskatchewan Health.	Covered by Saskatchewan Health.

Dental

	Adults	Children
Regular	Not covered.	Not covered.
FHB	Not covered.	Covered by Saskatchewan Health.
FIP	Not covered.	Covered by Saskatchewan Health.
SAP & PTA	Covered by Saskatchewan Health.	Covered by Saskatchewan Health.

APPENDIX C

ICD-9 Chapter Titles And Descriptions

Chapter #	Chapter Title	Description/Examples
1	Infectious and Parasitic Diseases	Diseases generally recognized as communicable or transmissible, as well as a few diseases of unknown but possible infectious origin. Examples: tuberculosis; whooping cough
2	Neoplasms	All cancers, regardless of whether they are functionally active. Examples: breast cancer; lung cancer
3	Endocrine, Nutritional, and Metabolic Diseases, and Immunity Disorders	Examples: thyroid conditions; diabetes; nutritional deficiencies
4	Diseases of Blood and Blood-Forming Organs	Examples: anemia; diseases associated with blood clotting
5	Mental Disorders	Examples: schizophrenia; paranoia; neurotic disorders; drug & alcohol dependence; stress disorders
6	Diseases of the Nervous System and Sense Organs	Examples: meningitis; degenerative brain conditions such as Alzheimer's and Parkinson's; ear infections; eye conditions
7	Diseases of the Circulatory System	Examples: rheumatic fever; heart disease; stroke
8	Diseases of the Respiratory System	Examples: tonsillitis; bronchitis; asthma; pneumonia
9	Diseases of the Digestive System	Examples: ulcers; appendicitis; digestive disorders; liver disease
10	Diseases of the Genitourinary System	Examples: kidney infections; menstrual abnormalities
11	Complications of Pregnancy, Childbirth, and the Puerperium	Examples: miscarriages; abortions; problems in labour and delivery
12	Diseases of the Skin and Subcutaneous Tissue	Examples: cellulitis; dermatitis
13	Diseases of the Musculoskeletal System and Connective Tissue	Examples: back conditions; rheumatoid arthritis; rheumatism
14	Congenital Anomalies	Illnesses or conditions that are present at birth. Examples: spina bifida; cleft palate
15	Conditions Originating in the Perinatal Period	Conditions which have their origin in the perinatal period, even though death or illness may occur later. Examples: conditions related to low birthweight; injuries occurring during birth
16	Symptoms, Signs, and Ill-defined Conditions	Symptoms, signs, abnormal results of laboratory tests or other investigative procedures, and ill-defined conditions regarding which no diagnosis classifiable elsewhere is recorded. Examples: convulsions; chest pains
17	Injury and Poisoning	Fractures; dislocations; sprains; internal injuries

APPENDIX D

Categories Of Prescription Drugs

Pharmacological-Therapeutic Classification of Prescription Drug*	Types of drugs
central nervous system	Painkillers (anti-inflammatory and narcotic), anticonvulsants, antidepressants, antipsychotics, anti-anxiety agents, sedatives, hypnotics, anti-mania agents and central nervous stimulants such a methylphenidate (Ritalin)
hormones & substitutes	Includes inhaled steroids used to treat asthma and other respiratory conditions, androgens, contraceptives, hormone replacement therapy, thyroid agents and anti-diabetic drugs/insulin
cardiovascular	Cardiac drugs, cholesterol-lowering agents, antihypertensives, vasodilators
anti-infective agents	Includes antibiotics, antifungals, anti-virals, antiretrovirals, antimalarial agents and sulfonamides
gastrointestinal	Includes anti-ulcer agents, antidiarrhea agents, cathartics, laxatives, digestants, anti-emetics and other miscellaneous agents
skin & mucous membrane	Includes topical forms of antibiotics, anti-fungals and anti-inflammatory agents
eye, ear, nose & throat	Includes anti-infectives, anti-inflammatory agents and anti-glaucoma drugs
autonomic drugs	Includes antiparkinsonian agents, antimuscarinics, antispasmodics, adrenergic agents (such as inhaled bronchodilators used to treat asthma), antimigraine drugs, and skeletal muscle relaxants
electrolytic	Includes replacement agents and diuretics
vitamins	Includes prescribed vitamins A, B and D, but vitamins purchased over the counter are not included

* Classification used in the Saskatchewan Formulary

APPENDIX E

Calculation of Utilization Rates

In order to determine how health utilization changes with coverage, utilization rates were calculated for the intervals individuals were on each coverage code.

Individuals covered by Saskatchewan Health are assigned a coverage code that specifies the level of health benefits they are entitled to receive. An individual's coverage code may change as their family, financial or health circumstances change. A coverage code may be in effect for as little as one day, or for many years. For each individual and for each coverage code for that individual, the number of days they were on that coverage was recorded. Separate records are created if an individual was on the same coverage more than once.

To calculate service utilization rates, the number of services was counted for each individual during each coverage interval. The service utilization rate for a coverage code was calculated by dividing the total number of services by the total number of coverage days for all individuals with that code.

$$\text{Service utilization per person-day} = \frac{\textit{total services}}{\textit{total days}}$$

This rate is a weighted average, where an individual's service is weighted according to the length of time they have received a specific type of coverage. The yearly service utilization rate is calculated by multiplying the above rate by 365.

The methodology for calculating the cost utilization rate is the same as for service utilization rates. The only difference is that the cost of each service is totalled, instead of the number of services. Cost utilization rates are based on the cost of services paid for by the Saskatchewan government. The portion of costs paid by an individual is not included in these rates.

Separate utilization rates were calculated for adults and children in each coverage code.

Two methods were used to analyze utilization rates:

- Analysis by coverage code
- Analysis by change in coverage code

Analysis By Coverage Code

Utilization rates are calculated for the important codes in the study population: Regular, PTA, FIP, FHB, and SAP coverage. Separate rates were calculated for adults and children.

When comparing rates it is important to remember that Regular coverage does not include the majority of the Saskatchewan population who had Regular coverage exclusively during the study period. It only includes individuals who have been on some form of supplementary health coverage during the study period. The utilization rates for individuals on Regular coverage measure rates for the low-income portion of the Saskatchewan population while they are not on supplementary health benefits.

Analysis By Change In Coverage Code

Changes in service utilization that occur when an individual moves from one health coverage code to another were also compared. The method used controlled for individual differences. For example, when comparing utilization rate changes for individuals moving from FHB to SAP, the average FHB and average SAP utilization rates are not compared. Instead, the average of the difference in the rates for each individual is compared for a subset of the population that moved from FHB to SAP.

Individuals who received Family Health Benefits can experience one or more of the following coverage type changes:

- Regular to FHB
- SAP to FHB
- PTA to FHB
- FIP to FHB
- FHB to regular
- FHB to SAP
- FHB to PTA

When utilization changes were compared for the above groups, efforts were made to ensure that the intervals during which individuals received each type of coverage followed one another closely. For the purposes of this study, the maximum gap allowed between types of coverage was less than 45 days and individuals had to be on each type of coverage for at least 90 days. A gap of 45 days was selected because frequently there are shorter gaps that occur for administrative purposes when individuals are being temporarily assigned to a different coverage code or when reinstatement does not occur immediately. This method eliminated these types of temporary misclassifications without significantly affecting the sample size. For the case of individuals moving from Regular coverage to FHB coverage, the study population does not include any individuals who had an average length of stay on each type of coverage less than 1 year.

Physician Methodology

When a patient visits a physician, the physician may perform one or more billable services for the patient. To determine utilization, services were counted. The service utilization rate is the average number of services performed per person-year. The physician cost utilization rate is the average physician cost per person-year. The rates are calculated for the entire population, and have been broken down by coverage code, sex and age.

At the time the study was started, physician data were only available for the period July 1, 1997 to December 13, 1999. All physician service and cost rates are calculated for this time.

The physician service records also contain adjustment records. When Saskatchewan Health disallows a charge, a new record is made out for the service, and the amount paid is adjusted. Usually these adjustments are negative values. To prevent double counting of service records, all records with a government payment of zero or fewer dollars were

ignored in calculating the total number of services. This removes the bulk of adjustment records from the calculation of service rates. Adjustment records were kept in the calculation of cost utilization rates. Adjustment records made up 1.14% of all service records.

Hospitalization Methodology

Data were compiled on total numbers and rates of hospitalizations for the study population for the period from July 1, 1997 to January 31, 2000. Hospitalization statistics are derived from hospital separation statistics supplied by short-term care facilities. Separation data were analyzed by coverage code, age category (adult, child/youth), type of diagnosis (ICD-9), and by geographic region of residence. Appendix C provides a brief description of each of the 17 diagnoses categories found in the ICD-9 classification scheme.

Separation episodes were the units of analysis used in this study. An episode includes an initial hospitalization, as well as any subsequent hospitalizations that may have occurred within a one-day time period. For example, if an individual is admitted to Hospital X, transferred to Hospital Y, and later transferred to Hospital Z, all within one day, then this would count as one episode, but three separations. Episodes were used in the analyses rather than separations because latter are likely to over-represent hospital utilization in rural areas where transfers from local to regional and tertiary facilities are common.

Chiropractor Methodology

Chiropractor service data was available for the period July 1, 1997 to December 13, 1999.

When a patient visits a chiropractor, the chiropractor typically performs one billable service for the patient. In a few cases, there may be a second billable service performed, such as an X-ray. Typically there is one billable service per visit. Individuals who visit a chiropractor typically make a series of visits during their treatment program. If a patient makes 7 visits to a chiropractor, then there are typically 7 services for that patient.

The chiropractor service utilization rate is the number of services performed per person-year.

The service records contain adjustment records. When Saskatchewan Health disallows a charge, a new record is made out for the service, and the amount paid is adjusted. Usually these adjustments are negative values. For example, a chiropractor typically charges $10.40 for a service. If Saskatchewan Health disallows this charge for whatever reason, a second record for the service is made with a cost of -$10.40. To prevent double counting of service records, all records with a government payment of less than ten dollars were ignored in calculating the total number of services. This removes the bulk of adjustment records from the calculation of service rates.

The service utilization rate is the average number of chiropractic services performed per person-year. The cost utilization rate is the average chiropractic cost per person-year. This cost refers to the amount paid by the government for the service but does not reflect the total amount charged (to the patient and the government) by the chiropractor. Adjustment records are kept in the calculations of cost.

Optometry Methodology

Optometry service data was available for the period July 1, 1997 to December 13, 1999. A service utilization rate was calculated by averaging the number of services performed per person-year. Services refer to eye examinations but not to the dispensing of eyeglasses. The cost utilization rate refers to the average cost per service per person-year. Costs reflect the expenses covered by the government and do not include charges paid by the patient. Rates were calculated for individuals on different coverage codes and weighted according to the length of time they were on a given coverage code.

The service records contain adjustment records. To prevent double counting of service records, all records with a government payment of less than or equal to zero dollars were ignored in calculating the total number of services.

Those in the study sample who were 45 years of age and older may have slightly inflated rates because they routinely receive a service known as tonometry (a test for glaucoma) in addition to their eye examinations. In such a case, they would have received more than one service at their visit and this does not necessarily reflect poorer eye health.

Rates for adults on regular coverage are unknown, because the province is never billed for these services.

Drug Plan Methodology

Drug plan information was available for the period July 1, 1997 to January 31, 2000.

Service and cost utilization rates were calculated based on the number of prescriptions dispensed. The total amounts paid by the individual and government were also counted.

The service and cost utilization rates were calculated by coverage interval and age (adult/child).

A second method was used to explore changes in utilization that occurred following changes in type of coverage. This sample included only those individuals who had all the following characteristics:

- They were individuals for whom Family Health benefits were their first supplementary health coverage since July 1, 1997. Individuals who had been on SAP, FIP, or PTA prior to receiving FHB were excluded from this group.
- Individuals had to be on regular health coverage continuously for at least 365 days prior to receiving the FHB.
- The same individuals had to be on FHB for at least 365 days after being on regular health coverage.

There were 25,212 children and 23,339 adults who had these characteristics.

This method allows us to calculate before and after utilization averages based on the same individuals. The major difference between the two groups is the type of health coverage they receive. One other difference between the populations is that the individuals on FHB will be one year older than when they were on regular coverage.

Service utilization calculations were limited to the 365 days on general coverage immediately prior to receiving FHB, and to the first 365 days of FHB coverage.

A period of one year of coverage was chosen for several reasons:

- A period of one year allows us to capture events that may only take place once a year, such as eye examinations, dental examinations, etc.
- Individuals may want to change their use of services immediately, but may not be able to get appointments right away, such as for dental work. Individuals who were on FHB for only one or two months may have lower utilization rates for such services compared to individuals who had longer coverage periods.
- There was a concern that individuals may 'load up' on services when they know they are going to be cut off from a higher health coverage, or they may postpone services if they know they are going to a higher coverage. By selecting a one-year period, such fluctuations from the first to the last month of coverage are minimized.
- It was stated that when the FHB program began a number of individuals were on FHB coverage, but were not informed for a month or two. As a result they would not have changed utilization practices as a result of the changed coverage. Selecting a one-year time period would ensure that individuals had sufficient time to change their utilization behaviour.

It is only possible to accurately estimate drug utilization rates if the study period is a multiple of 6 months. This was discovered when utilization changes were examined for individuals who stopped receiving FHB coverage and changed to regular coverage. For example, a large number of individuals were dropped from FHB coverage in October 1999, and went on to regular coverage. Calculations showed that cost utilization dropped dramatically. This is an artifact due to the 6-month deductible period. When individuals were dropped from FHB in October, many had reached their deductible limit. Their drug costs dropped substantially in November and December, only to increase again in January. By ensuring that individuals had at least 6 months of full coverage, this artifact was eliminated.

APPENDIX F

Determining The Coverage Of Individuals

Saskatchewan Health assigned various coverage codes to individuals receiving supplementary health benefits. These codes had different meanings over time.

Prior to July 1, 1998

	Adult	Child	Cancellation
FIP	30F	AF	3AF

July 1, 1998 to July 31, 1999
FIP ended on June 30, 1998. At that time the NCB, SCB and SES programs came into effect. Saskatchewan Health extended FIP coverage until August 31, 1998 for those who had it on June 30, 1998. This administrative procedure was done to allow Social Services time to determine who was eligible for the FHB program. The same coverage code as FIP (30F) was used for these individuals. The 30F code was also used to represent all FHB clients after July 1, 1998. Thus, there is no way to distinguish who received Family Health Benefits as a result of being on SCB or SES.

Family Health Benefit Codes: On and after **July 1, 1998 to July 31, 1999**

	Adult	Child	Cancellation
SCB	30F	AF	3AF
SES	30F	AF	3AF
Child Benefit Adjusted	30F	AF	3AF

August 1, 1999 to October 31, 1999
In June 1999, the National Child Benefit amount increased and SCB levels correspondingly decreased. The total amount that each recipient received remained the same. The effect was that some families who had previously been eligible for SCB were now eliminated from the program. As a result they would automatically have been dropped from FHB. Since the size of benefits had not increased for many individuals, the government wanted to ensure that these individuals continued to receive health benefits.

To prevent people being cut off health benefits, families who had been receiving the SCB but were no longer eligible, were automatically given coverage until October 31, 1999. The code 30X came into effect on August 31 to represent these individuals who had their coverage extended. This covered about 6,300 families. Those families who had a low enough income to be eligible for the SCB kept the code 30F.

Family Health Benefit Codes: On and after **August 1, 1999 to October 31, 1999**

	Adult	Child	Cancellation
SCB	30F	AF	3AF
Off SCB, coverage extended	30X	AX	3AX
SES	30W	AW	3AW
Child Benefit Adjusted	30C	AC	3AC

November 1, 1999 to present

	Adult	Child	Cancellation
SCB	30F	AF	3AF
SES	30W	AW	3AW
NCB	30X	AX	3AX
Child Benefit Adjusted	30C	AC	3AC

The cancellation codes represent individuals who are eligible for Family Health Benefits, but whose SAP code was cancelled. Individuals on SAP have benefit cards that are valid for three months (ending in March, June, September and December). If individuals stop receiving SAP and begin receiving FHB, they immediately receive FHB coverage, but they also retain the SAP benefits covered by the benefit card. All other SAP coverage is cancelled. For example, extended drug benefits are cancelled immediately, as well as paid optometrist visits or any service requiring the prior approval of Saskatchewan Health. Access to services that do not require prior approval is retained until the end of the 3-month period. These include ambulance services, some medical supplies, etc.

For the purposes of this study, individuals with FHB cancellation codes were considered to be a part of the FHB recipient population.

Other Groups In The Study Population And Their Codes
Apart from individuals receiving Family Health Benefits, there are two other populations that are included in the study: individuals receiving PTA benefits and SAP clients.

Those receiving PTA benefits are represented by code AN. AN has no cancellation code because the benefits are instated only for an established period of time When individuals finish a training program, or drop out, a new record with a new code is established.

SAP clients in the study have the following codes: AY, BY, as well as cancellation codes.

There are other SAP client codes, but they have been omitted from the study population for reasons described previously.