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Evaluation of the Vermont Pharmacy Assistance Programs for Low-Income Medicare Beneficiaries: Findings from the Enrollee and Nonenrollee Surveys

Final Report

Prepared for

Teresa A. Coughlin, M.P.H.
The Urban Institute

Paul Boben, Ph.D.
Centers for Medicare & Medicaid Services
ORDI/REG/DSPR
7500 Security Boulevard, C3-19-07
Baltimore, MD 21244-1850

Prepared by

Boyd Gilman, Ph.D.
Barbara Gage, Ph.D.
Susan Haber, Sc.D.
Sonja Hoover, M.P.P.
Jeremy Green, B.A.
RTI International
Health, Social, and Economics Research
Waltham, MA 02452

Anne Ciemnecki
Karen CyBulski
Nancy Clusen
Mathematica Policy Research, Inc.

RTI Project Number 08502.003.002

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Boyd Gilman, Ph.D.
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Sonja Hoover, M.P.P.
Jeremy Green, B.A.

and

Mathematica Policy Research, Inc.

Anne Ciemnecki
Karen CyBulski
Nancy Clusen

Scientific Reviewer: Greg Pope, M.S.

Federal Project Officer: Paul Boben, Ph.D.

RTI International*

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CONTENTS

ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY	ES-1
ES.1 Introduction	ES-1
ES.2 Purpose of the Evaluation	ES-1
ES.3 Policy Context	ES-2
ES.4 Survey Methodology	ES-2
ES.5 Major Findings	ES-3
ES.6 Lessons Learned	ES-6
ES.7 Areas for Future Research	ES-7
CHAPTER 1 INTRODUCTION	1
1.1 Background	1
1.2 Prescription Drug Coverage and Spending among the Elderly	1
1.3 Implications of Medicare Drug Benefit	4
1.4 Objectives of the Evaluation	4
1.5 Organization of the Report	6
CHAPTER 2 DESCRIPTION OF VERMONT'S LOW-INCOME PHARMACY ASSISTANCE PROGRAMS	7
2.1 Introduction	7
2.2 History and Objectives of Vermont Pharmacy Programs	7
2.3 Eligibility, Benefits and Enrollee Cost Sharing	8
2.3.1 Eligibility Requirements	8
2.3.2 Pharmacy Benefits	9
2.3.3 Enrollee Cost Sharing	11
2.4 Administration and Funding of VScript and VHAP Pharmacy	13
2.5 Healthy Vermonters Drug Discount Card Program	13
CHAPTER 3 SURVEY METHODOLOGY	15
3.1 Introduction	15
3.2 Sample Design	16
3.2.1 Sample Selection	16
3.2.2 Second Stage Sample	18
3.3 Data Collection Procedures	20
3.3.1 Interviewer Training	20
3.3.2 Data Collection	20
3.3.3 Obtaining Contact Information for Sample Members	22
3.3.4 Survey Eligibility	23
3.3.5 Response Rates and Reasons for Non-response	23
3.4 Data Editing and Coding Open Ended Responses	24
3.5 Non-Response Adjustments	24

CHAPTER 4 ANALYSIS OF ENROLLMENT.....	29
4.1 Introduction	29
4.2 Data and Methods.....	30
4.2.1 Data and Sample.....	30
4.2.2 Methods.....	31
4.3 Results	33
4.3.1 Descriptive Results.....	33
4.3.2 Regression Results	47
4.3.3 Comparison of Eligible and Near-eligible Populations.....	49
4.4 Conclusions	52
 CHAPTER 5 ANALYSIS OF DRUG COSTS AND UTILIZATION.....	 57
5.1 Introduction	57
5.2 Data and Methods.....	58
5.2.1 Data and Sample.....	58
5.2.2 Methods.....	58
5.3 Results	60
5.3.1 Descriptive Results.....	60
5.3.2 Regression Results	65
5.4 Conclusions	70
 CHAPTER 6 IMPACT OF ENROLLMENT ON USE AND COST OF MEDICAL SERVICES	 73
6.1 Introduction	73
6.2 Data and Methods.....	74
6.2.1 Data and Sample.....	74
6.2.2 Methods.....	75
6.3 Results	78
6.3.1 Descriptive Statistics.....	78
6.3.2 Regression Results	81
6.4 Conclusions	92
 CHAPTER 7 CONCLUSIONS AND IMPLICATIONS FOR THE MEDICARE DRUG BENEFIT.....	 93
7.1 Implications for Enrollment	93
7.2 Implications for Use and Costs of Prescription Drugs.....	94
7.3 Implications for Use and Costs of Medical Services	95
7.4 Future of Vermont’s State Pharmacy Assistance Programs under Medicare Part D.....	97
7.5 Areas for Future Research.....	98
 REFERENCES.....	 100

LIST OF FIGURES

Figure 2-1	Income Thresholds for VHAP Pharmacy, VScript and VScript Expanded.....	10
Figure 3-1	Advance Letter	21

LIST OF TABLES

Table 2-1	Comparison of Vermont programs with pharmacy assistance, 2003.....	8
Table 2-2	Changes in cost-sharing requirements of Vermont’s pharmacy assistance programs, 1989-2004.....	12
Table 3-1	Sampling strata.....	16
Table 3-2	Second stage strata selected with certainty for second stage sample.....	19
Table 3-3	Second stage strata for subsampling in second stage sample.....	19
Table 3-4	Completed interviews by week	21
Table 3-4	Completed interviews by week	22
Table 3-5	Response rates	24
Table 4-1	Self-reported sociodemographic characteristics of pharmacy assistance program enrollees and eligible nonenrollees	34
Table 4-2	Self-reported health status of pharmacy assistance program enrollees and eligible nonenrollees	37
Table 4-3	Self-reported prescription drug utilization of pharmacy assistance program enrollees and eligible nonenrollees ¹	38
Table 4-4	Self-reported prescription drug coverage of pharmacy assistance program enrollees and eligible nonenrollees ¹	40
Table 4-5	Effect of enrollment in pharmacy assistance program on self-reported other prescription drug coverage by type of coverage ¹	42
Table 4-6	Self-reported enrollment in pharmacy assistance programs	43
Table 4-7	How enrollees learn about the pharmacy assistance program ¹	45
Table 4-8	Interest in pharmacy assistance programs among eligible nonenrollees.....	46
Table 4-9	Factors predicting enrollment in pharmacy assistance program	48
Table 4-10	Self-reported sociodemographic characteristics of pharmacy assistance program eligibles and near-eligibles.....	50
Table 4-11	Self-reported health status of pharmacy assistance program eligibles and near eligibles	51
Table 4-12	Self-reported prescription drug utilization of pharmacy assistance program eligibles and near eligibles ¹	53
Table 4-13	Self-reported prescription drug coverage of pharmacy assistance program eligibles and near eligibles ¹	54
Table 5-1	Demographics of Pharmacy Assistance Program Enrollees and Eligible Non-Enrollees.....	61
Table 5-2	Self-Reported Medical Conditions of Pharmacy Assistance Program Enrollees and Eligible Non-Enrollees	62
Table 5-3	Self-reported insurance coverage of pharmacy assistance program enrollees and eligible non-enrollees	63
Table 5-4	Self-reported prescription use/costs of pharmacy assistance program enrollees and eligible non-enrollees	64

Table 5-5	Self-reported unmet needs of pharmacy assistance program enrollees and eligible non-enrollees	66
Table 5-6	Number of Prescriptions Filled Per year	67
Table 5-7	Out of Pocket Costs and Unmet Needs for P.A.P.E & NE	68
Table 6-1	Self-Reported Sociodemographic and Health Status Characteristics of Pharmacy Assistance Program Enrollees versus Nonenrollees	79
Table 6-2	Unadjusted Service Use Rate and Mean Expenditures Enrollees versus Nonenrollees.....	82
Table 6-3	Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services: First Stage Logistic and Conditional OLS Results based on Self-Reported Survey Data	83
Table 6-4	Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services: First Stage Logistic and Conditional OLS Results by Program Enrollment based on Self-Reported Survey Data.....	87
Table 6-5	Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services Results from Two-Part Model based on Self-Reported Survey Data	89
Table 6-6	Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services: Results from Two-Part Model by Program Enrollment based on Self-Reported Survey Data	91
Table 6-7	Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services: Results from Two-Part Model for Selected Conditions based on Self-Reported Survey Data	92
Table 7-1	Comparison of Medicare Part D and Vermont State Pharmacy Assistance Drug Benefits.....	99

EXECUTIVE SUMMARY

ES.1 Introduction

This report represents the second and final set of analyses conducted under contract to the Centers for Medicare & Medicaid Services (CMS) to evaluate Vermont's state pharmacy assistance programs for low income disabled and elderly beneficiaries. Two of the Vermont's three publicly subsidized drug programs are incorporated into the state's 1115 Medicaid waiver and, therefore, eligible for federal matching dollars. The first report, titled "*Evaluation of Vermont's Pharmacy Assistance Programs for Low Income Beneficiaries: First Round Evaluation Final Report*," was submitted on February 28, 2003 and is publicly available on the CMS Website. While the first report was based on an analysis of Medicare and Medicaid claims data, this report is based primarily on information collected from a survey of enrolled and eligible or near-eligible but nonenrolled beneficiaries in Vermont conducted between March and June 2004. Because of the new information available from the survey, this report represents a significant expansion in both the scope and richness of the original study.

At the same time, this second-phase study offered the authors an opportunity to consider more closely the implications of enrollment in a voluntary publicly provided prescription drug program for the soon-to-be implemented Part D Medicare drug benefit. The findings from these analyses only apply to low-income, aged Medicare beneficiaries who are not dually eligible for Medicaid and, therefore, are not generalizable to the entire Medicare population. However, the low-income population covered by Vermont's pharmacy assistance programs is the group most likely to lack prescription drug coverage and to have difficulty paying for medications. As such, they are a key target of the Medicare Part D program. Furthermore, a program adopted by a single state, particularly a small one such as Vermont, does not have the potential of a program like Medicare Part D to exert profound influences on the health care market. Nonetheless, the experience in Vermont may provide some important lessons for Medicare as it moves toward implementing the Part D benefit. The study may also offer guidance to states as they grapple with the implications for Part D for the design of the pharmacy assistance programs.

ES.2 Purpose of the Evaluation

This study fills an important gap in the literature by assessing the demand for publicly sponsored prescription drug coverage among the low income elderly and the impact of coverage on the use of drug and non-drug medical services just 16 months prior to the implementation of the comprehensive Medicare prescription drug benefit. The three principal objectives of the study were:

- to identify the primary determinants of enrollment, including an examination of the evidence of adverse selection and crowd out;
- to assess the impact of enrollment on the use and cost of drugs, as well as unmet drug needs; and
- to analyze the impact of enrollment on the use and cost of non-drug medical services.

We compare the major outcomes of the study between enrollees and non-enrollees who lack other supplemental drug coverage. We also investigate the differences between enrollees in each of the three Vermont state pharmacy assistance programs. Finally, we examine the differential effects of drug coverage for selected chronic conditions.

ES.3 Policy Context

Vermont currently offers three pharmacy benefit programs to its low-income elderly and disabled residents. The first, called *VScript*, was started in 1989 as a state-funded program to offer low-income Medicare beneficiaries a subsidy on maintenance prescription drugs. The second, called *VHAP Pharmacy*, was introduced seven years later under the state's 1115 Medicaid waiver. It employed both state and federal dollars to provide a more generous drug benefit package with less enrollee cost-sharing to seniors and disabled residents with slightly lower incomes. In 1999, *VScript* program became absorbed into the Medicaid waiver as well and, as a result, the state-funded portion was extended to a higher income population. The expanded state-only program is referred to as *VScript Expanded*.

During the year under review for this evaluation, *VHAP Pharmacy* included beneficiaries with incomes up to 150 percent of the Federal Poverty Level (FPL), required a nominal two-tier copayment based on the cost of the prescription, and covered all drugs. Expenditures were eligible for federal matching dollars. The *VScript* program included beneficiaries between 150 and 175 percent of poverty, also used a nominal two-tier copayment, and covered only maintenance drugs. Expenditures under *VScript* were also eligible for the federal match. The third program, *VScript Expanded*, included beneficiaries between 175 and 225 percent of poverty, required a \$275 deductible and a 41 percent coinsurance payment, and covered only maintenance drugs. Money spent under *VScript Expanded* was not eligible for federal matching dollars. In January 2004, however, the cost sharing requirements under each of the three programs were replaced by a sliding scale premium.

ES.4 Survey Methodology

The analysis is based primarily on a survey of two groups of Medicare beneficiaries: those enrolled in the state pharmacy assistance programs; and those who met or nearly met the programs' income eligibility criteria, but who were not enrolled in either these programs. Beneficiaries who were younger than 65 years of age, diagnosed end-stage renal disease; under hospice care; and dually eligible for full Medicaid benefits were excluded from the sample. The enrollee sample was divided into three equal strata based on program of enrollment. Data were collected by telephone during a 12 week period between March 23 and June 13, 2004. A total of 2,680 18-minute interviews were completed. Of these, 1,356 interviews were completed with beneficiaries in the enrollee group and 1,324 interviews were completed with beneficiaries in the eligible nonenrollee group. The unweighted response rate for the enrollee group was 77 percent. The unweighted response rate for the eligible nonenrollee group was 72 percent. The sampling weights were adjusted for survey non-response and post-stratified to population control totals.

The survey collected information on: (1) outpatient prescription drug coverage prior to enrollment in the pharmacy assistance programs; (2) differences in health status between those who were enrolled in the programs and those who were not enrolled; (3) differences in utilization

of prescription drugs between those enrolled and those not enrolled; (4) access to prescription drugs among enrollees and non-enrollees; (5) awareness of the pharmacy assistance programs among those who were not enrolled; (6) reasons for enrolling or not enrolling in the programs; (7) adequacy of coverage among enrollees and non-enrollees; and (8) unmet drug needs among enrollees and nonenrollees. The survey also collected information on nine chronic conditions; on sociodemographic characteristics (education, employment, income and living arrangements); and on supplemental medical and outpatient prescription drug coverage. Additional demographic information was obtained from the Medicare denominator file. Finally, Medicare claims for sampled beneficiaries were merged with the survey data to obtain information on expenditures and service utilization for Medicare-covered services. The enrollee and nonenrollee survey questionnaires are included in Appendix A and B, respectively.

ES.5 Major Findings

The major findings for each of the three principal sets of analyses are summarized below.

Findings on Enrollment

- Vermont's pharmacy assistance program enrolls the most vulnerable individuals among the population eligible for coverage. Compared to people who are eligible for, but not enrolled in the program, enrollees are more likely to be older, have less education, have lower income, and live alone.
- Sicker individuals are more likely to enroll in the program. People who report themselves as being in fair or poor health have 75 percent greater odds of enrolling than those in excellent or very good health. Having certain chronic conditions, including hypertension, heart disease, and arthritis also increases the likelihood of enrolling. This adverse selection suggests that the program enrolls people with higher than average needs for prescription drugs and, potentially, higher than average costs. Although VScript and VScript Expanded target drugs for chronic conditions, there are a few differences in health status across programs. This is consistent with previous findings that showed little difference between programs in the types of medications purchased (Gilman, et al., 2003).
- People for whom purchasing prescription medications poses the greatest financial burden are substantially more likely to enroll in the pharmacy assistance program. Having to forgo basic needs such as food or heat triples the odds of enrolling, while needing assistance from family or friend to pay for medications more than doubles the odds. Descriptive analyses show that people with higher out-of-pocket expenses prior to enrollment are more likely to enroll, but the level of out-of-pocket spending was not significant in multivariate analyses. Surprisingly, greater utilization of prescription drugs prior to enrolling does not increase the likelihood that a person will join the program. Given their poorer health status, lower pre-enrollment utilization may indicate greater unmet needs in the enrollee population, whereas people with high levels of prescription drug utilization may have found ways to access needed medications without this assistance.

- Crowd-out does not appear to be a problem in Vermont’s pharmacy assistance program. Having prescription drug coverage dramatically reduces the likelihood of enrolling and people with coverage have 85 percent lower odds of enrolling compared to people without coverage. Only 20 percent of enrollees had any type of prescription drug coverage in the year prior to enrolling and 60 percent had never had coverage. Given the low levels of prior prescription drug coverage among enrollees, there is minimal potential for crowd-out. We estimate that the maximum potential crowd-out is only about 7 percent of enrollees. This includes all people who said they voluntarily dropped their Medigap or employment-based insurance to join the pharmacy assistance program or who said they involuntarily lost their employment-based coverage.
- Enrollment in the pharmacy assistance program is stable and more than two-thirds had been enrolled two or more years. A variety of factors drive the decision to enroll in the pharmacy assistance program. Nearly all (90 percent) said they wanted the future protection provided by drug coverage. Many people enroll because they have no alternative for receiving coverage. Over 80 percent said they enrolled because they did not have prescription drug coverage and close to 80 percent indicated that they could not afford other forms of coverage. For three-fifths of the enrollees, the decision to apply was precipitated by a specific medical need, either the diagnosis of new condition or a change in treatment for an existing condition.
- Like other public assistance programs, lack of awareness is a barrier to enrolling people in the pharmacy assistance program, although 43 percent of eligible nonenrollees were familiar with the program. Unlike many other public assistance programs, the pharmacy assistance program appears to have widespread acceptance among the potentially eligible population and two-thirds said they would apply if they were eligible. Most people who would not apply either already have coverage or do not feel they need it. Burdensome application procedures and welfare stigma are not significant deterrents to applying.

Findings on the Impact of Enrollment on Use and Costs of Prescription Drugs

- The results from the drug use and unmet need analyses reveal that Vermont’s pharmacy assistance programs are increasing access for those with higher prescription drug needs and lowering out-of-pocket costs. The results further show that enrollees are less likely to be skipping medications, reducing their dosages, or not filling prescriptions because of costs.
- Enrollment in one of the state pharmacy assistance plans is associated with an increase in the number of outpatient prescription drugs purchased. Following enrollment in the state pharmacy assistance programs, enrollees were almost twice as likely to have more than 20 prescriptions filled per year compared with nonenrollees, although the finding was not statistically significant at the 10 percent level. Further, 65 percent of enrollees had more than 20 prescriptions filled within the preceding year. While the survey does not allow us to compare the change in the total number of prescriptions filled before versus after enrollment, pre-enrollment evidence on the

number of *unique* prescriptions filled further suggests that the state pharmacy assistance programs greatly improved access to outpatient prescription drugs.

- In addition to higher prescription drug purchases, enrollees had lower out of pocket costs. Enrollees are 82 percent less likely than nonenrollees to have out of pocket costs of 200+ /month. This effect differs across the three pharmacy assistance programs with VHAP Pharmacy enrollees being 90 percent less likely than nonenrollees to have those high costs, VScript enrollees 85 percent less likely, and VScript Expanded only 48 percent less likely than nonenrollees.
- Enrollees are also less likely to have unmet needs than nonenrollees. In the past 12 months, enrollees are 48 percent less likely than nonenrollees to have skipped drugs or taken fewer than prescribed, although this is mostly attributable to VHAP Pharmacy enrollees who are 65 percent less likely than nonenrollees to answer yes to either of these questions. Similarly, enrollees are 62 percent less likely to not fill a prescription item because of cost. Again, this effect is greatest for VHAP Pharmacy enrollees who are 77 percent less likely to not fill a prescription because of cost. However, VScript enrollees also are less likely to have unmet need, with the enrollees being 55 percent less likely to not fill a script.

Findings on the Impact of Enrollment on Use and Costs of Medical Services

- The results of the medical expenditure analysis provides additional support to the views expressed in other recent studies (Lichtenberg, 2003; Yang, 2003) that consistent and timely access to outpatient prescription drugs among Medicare beneficiaries may serve as a substitute for acute inpatient services. Enrollment in Vermont's state pharmacy assistance programs was associated with a 17 percent reduction in annual expenditures for inpatient services, although the offset at the overall program level was statistically insignificant at the 10 percent level. The results further suggest that drug coverage among the elderly may be a complement to outpatient services, particularly those administered in a physician's office. Enrollment in the state pharmacy assistance programs was also associated with a 19 percent increase in annual expenditures for professional services and this result was significant at the ten percent level. While access to prescription medications may help prevent avoidable hospitalizations, they may also require regular monitoring of drug treatment regimes and carry potential side effects that require the services of a physician or other professional health care provider.
- The complementarity effects appear strongest among beneficiaries who suffer from particular chronic conditions. Enrollment in VScript and VScript Expanded, programs whose benefits are limited to maintenance medications for chronic conditions, was associated with a statistically significant 35 percent increase in annual expenditures for professional services. Enrollees in VScript Expanded also exhibit a statistically significant 25 percent increase in facility costs for services administered in an outpatient setting. These results suggest that, despite the higher cost sharing required under VScript and, in particular, VScript Expanded, complementarities between drugs and outpatient services may be more likely among beneficiaries who

suffer from chronic conditions requiring consistent and timely use of outpatient medications. In contrast, the offsets observed on the inpatient side were higher among VHAP Pharmacy enrollees. But the results were not statistically significant.

- The enhanced effects of drug coverage on medical service use and costs among beneficiaries with chronic conditions are further evidenced when the models were estimated over subgroups with specific diseases. Enrollment in a state pharmacy assistance program was correlated with lower inpatient spending for people with two of the three conditions we examined in this study: hypertension and arthritis. However, none of the inpatient offsets for the disease-specific analyses was statistically significant. In contrast, annual expenditures for professional services increased 19 percent for enrollees with hypertension and 24 percent for those with a heart condition. Both of these complementarities with services covered under Part B were statistically significant at the ten percent level or higher.
- However, it should be pointed out that analyses of both pharmacy claims data and self-reported survey data indicate a remarkable similarity in both the types and amounts of drugs purchased by VHAP Pharmacy enrollees and VScript and VScript Expended enrollees. The eight most commonly purchased drugs in terms of both number of prescriptions and expenditures were the same for VHAP Pharmacy and VScript. These included drugs for such common chronic conditions as stomach acids or ulcers, cholesterol, heart disease, diabetes, and mental disorders.
- Given these opposing relationships, the net effect of drug coverage on medical spending is difficult to ascertain and depends on the magnitude and sign of the individual service-level effects. The only total effect that was statistically significant for beneficiaries who reported having heart disease. For people with heart disease, drug coverage was associated with higher medical spending for inpatient, outpatient and professional services. The net effect was a statistically significant \$1,266 increase in annual medical expenditures.

ES.6 Lessons Learned

Our analysis of Vermont's pharmacy assistance programs has important implications, especially for the recently enacted new drug benefit under Medicare. First, state pharmacy assistance programs and, ultimately, Part D, play an extremely important role in providing outpatient prescription drug coverage to one of the most vulnerable and least insured groups of Medicare beneficiaries. Subsidies provided under Part D to the non-dually eligible low-income population will be crucial for building on the achievements made by states and ensuring continued access to outpatient prescription drugs among the near-poor. Participants in publicly subsidized drug programs also tend to be those with the greatest needs. However, late enrollment penalties imposed under Part D should help limit the deleterious impact of adverse selection on future plan costs.

Vermont's experience suggests that Part D is likely to be successful in enrolling low-income beneficiaries. The greatest barrier to enrollment in Vermont's program is lack of awareness, but it is likely that there will be extensive publicity surrounding Part D and high

levels of beneficiary awareness. Although welfare stigma was not a deterrent to enrollment in Vermont, this will be even less of an issue in Part D because it is part of Medicare and not restricted to low-income populations. However, the complexity of selecting a plan and the cost-sharing structure for people with incomes over 135 percent FPL could pose barriers for some people.

Finally, while the new Medicare drug benefit may help reduce the number of unnecessary hospitalizations and lower inpatient expenditures, Part D may conversely lead to higher outpatient and Part B expenditures. The potential for savings is likely to be greatest among beneficiaries with chronic conditions where outpatient prescription medication is particularly effective for avoiding illness and preventing unnecessary medical service use. It may, thus, be useful to consider condition- and drug-specific factors when Part D and Medicare Advantage plans develop their drug formularies and cost sharing rules.

ES.7 Areas for Future Research

It will be extremely important to understand the impact of the new Medicare drug benefit on the future design and scope of state pharmacy assistance programs, which beneficiaries choose to enroll in Part D versus those who opt to remain covered under a state plan, and the costs of restructured freestanding or wrap-around programs to the state. It will also be important to understand the impact of Part D on low-income individuals previously eligible for state coverage in terms of both enrollee cost sharing and drug coverage. Finally, additional research will be necessary to further investigate the impact of Part D on the Medicaid spend-down rate, on unmet prescription drug needs and out-of-pocket spending, and on use and cost of prescription medications and non-drug medical services.

CHAPTER 1 INTRODUCTION

1.1 Background

This report represents the second and final set of analyses conducted under contract to the Centers for Medicare & Medicaid Services (CMS) to evaluate Vermont's state pharmacy assistance programs for low income disabled and elderly beneficiaries. Two of the Vermont's three publicly subsidized drug programs are incorporated into the state's 1115 Medicaid waiver and, therefore, eligible for federal matching dollars. The first report, titled "*Evaluation of Vermont's Pharmacy Assistance Programs for Low Income Beneficiaries: First Round Evaluation Final Report*," was submitted on February 28, 2003 and is publicly available on the CMS Website. While the first report was based on an analysis of Medicare and Medicaid claims data, this report is based primarily on information collected from a survey of enrolled and eligible but nonenrolled beneficiaries in Vermont conducted between March and June 2004. Because of the new information available from the survey, this report represents a significant expansion in both the scope and richness of the original study.

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1.2 Prescription Drug Coverage and Spending among the Elderly

According to analyses conducted by the Actuarial Research Corporation on behalf of the Henry J. Kaiser Family Foundation (KFF) based data from the Medicare Current Beneficiary Survey (MCBS), average total prescription drug expenditures among non-institutionalized Medicare beneficiaries in 2003 were \$2,322.¹ Prescription drug spending represented roughly ten percent of beneficiaries' total health care expenditures. Average annual prescription drug spending among beneficiaries in fair or poor health was over one-third above this amount. Moreover, spending for prescription medications has grown by almost 15 percent annually in recent years, nearly five times the rate of growth in hospital spending and three times the rate of growth in physician spending. Nationwide, prescription drug spending is expected to increase by

¹ The Medicare beneficiary prescription drug spending and coverage figures presented in this section were taken from a variety of sources, including the KFF (2003), Laschober (2004), Heffler (2001), Kreling (2001), Poisal and Chulis (1999); Poisal and Murray (2000); Davis and Poisal, *et al.* (1999); Poisal and Murray, *et al.*, (1999); and Murray and Eppig (1999). Additional information was obtained from the KFF Website on Medicare, <http://www.kff.org/rxdrugs/medicare.cfm>.

more than 12 percent per year on average over the next few years, ultimately reaching 16 percent of all health care expenditures in 2010.

Despite the growing reliance on pharmaceuticals for treating illness and maintaining health, prescription medications are the least insured medical good or service for the non-institutionalized elderly and disabled population. Approximately 38 percent of all non-institutionalized Medicare beneficiaries had no outpatient prescription drug coverage in 2001 (Laschober, 2003).² The rate of uninsurance for pharmaceuticals was highest among individuals with incomes between 100 and 200 percent of poverty. People in this income category are typically too poor to purchase commercial drug policies, but not poor enough to qualify for drug benefits under Medicaid. Since Medicare does not yet offer an outpatient prescription benefit, 46 percent of those beneficiaries with drug coverage obtained insurance through an employer-sponsored plan, 23 percent through a Medicare risk HMO, 17 percent through Medicaid, 11 percent through a private supplemental plan, 4 percent through a state pharmacy assistance program or other public program. However, these plans often impose high enrollee cost sharing (via deductibles, co-payments, co-insurance and spending caps) and restrictive drug formularies. Meanwhile, many of the plans that previously offered prescription benefits, such as Medicare risk HMOs and employer-sponsored retiree plans, have begun to drop their outpatient drug coverage and those that still do are raising their premiums or further restricting benefits.

The absence of a Medicare outpatient prescription drug benefit, together with high co-insurance and limited coverage for those who are covered, mean that nearly half of all prescription drug costs are paid for directly by the beneficiary. Average out-of-pocket spending on prescription drugs in 2003 totaled \$999, accounting for 43 percent of all drug expenditures, including medications administered in an inpatient setting. Out-of-pocket spending on prescription drugs, measured as a share of total drug expenditures, was highest among individuals with incomes between 100 and 200 percent of the federal poverty level, those least likely to be insured. In addition, recent evidence reveals that individuals without prescription drug coverage use fewer drugs than those with drug coverage. Moreover, the gap in drug use between those with versus those without drug benefits has been widening over time. These competing forces – increasing reliance on newer and better drugs to maintain health and uneven access to such medications – have made outpatient drug benefits one of the most pressing issues facing Medicare today and helped secure final approval of the new Medicare drug benefit under the Medicare Prescription Drug, Modernization and Improvement Act (MMA) of 2003.

In the absence of a comprehensive Medicare outpatient drug benefit, many states had begun taking the initiative and implementing programs to fill the gap in prescription drug coverage for their low-income elderly and disabled residents.³ By August 2003, 22 states had

² This figure represents a point-in-time estimate during 2001. Estimates of uninsurance among the elderly based on whether an individual had coverage at any time during the course of a year will yield a lower percentage of uninsured.

³ The information presented in this section on the characteristics of state pharmacy assistance programs was obtained from Trail (2004) and Fox (2004).

implemented some type of an outpatient drug subsidy program for Medicare beneficiaries.⁴ Eight additional states had passed legislation authorizing the creation of such programs that have not yet become operational. These state subsidy programs provided outpatient drug benefits to nearly one and a half million low-income elderly and disabled individuals in 2001. On average, state pharmacy assistance enrollees accounted for only six percent of beneficiaries in states that had such a program. The proportion of beneficiaries enrolled in a state program varied widely, however, from roughly one-fifth in three states to less than one percent in five states.

While these state-based pharmacy assistance programs vary in detail, they share many common goals and features. All programs cover the over 65 population, yet half extend coverage to other groups with special drug needs such as people with disabilities or those suffering from specific chronic illnesses. All states impose some type of income requirement. In 2002, state income requirements ranged from 100 to 500 percent of FPL, although the level of subsidy generally diminishes as income rises. One state requires that beneficiaries' prescription drug costs exceed a fixed proportion of their monthly income prior to enrollment. Two other states waive their income requirements if prescription drug costs exceeded 40 percent of a person's income. Very few states have asset restrictions. All states have residency requirements and generally allow individuals with private drug coverage to enroll, although specific rules vary.

Most programs cover all prescription drugs, although a few limit coverage to drugs for specific conditions or maintenance drugs, such as those used to treat diabetes and hypertension. All programs impose some form of enrollee cost sharing, either through annual enrollment fees, deductibles, co-payments, co-insurance or annual spending limits. Coinsurance was the most common form of point-of-sale cost sharing. Six programs used two-tiered generic and brand named copayments and five programs used multi-tiered copayments. Seven programs had deductibles and six programs required applicants to pay a fee or premium to join. Eight programs had benefit caps on the cost or number of drugs covered. In contrast, ten programs limited enrollees' out-of-pocket expenditures, after which participants either paid nothing or a small copay for their remaining drug purchases. All pharmacy assistance programs are funded by state appropriations from general revenues plus, in a few cases, dedicated revenues from special taxes and/or tobacco settlement monies. Only seven states receive federal funds through a Title XIX pharmacy benefit program (New Jersey, Illinois, South Carolina, Florida, Wisconsin, and Vermont) or a Section 1115 Comprehensive Health Reform Demonstration (Maryland).

Emerging evidence suggests that state pharmacy assistance programs have helped reduce the number of low-income elderly and disabled Medicare beneficiaries without drug coverage. An estimated 1.4 million individuals were enrolled in state pharmacy assistance programs in 2002, accounting for nearly four percent of the insured population. Presumably, the majority of these individuals would have remained uninsured without the state initiatives. The proportion of those without prescription drug coverage fell most for individuals in the 100-200 percent poverty group. Between 1996 and 1998, the share of Medicare beneficiaries without prescription drug

⁴ As of August 2003, 20 states had also authorized a drug discount program to reduce the costs of prescription drugs to consumers without any direct subsidy by the state. However, the legality of extending federally-negotiated drug price discounts to people not enrolled in Medicaid has been challenged and won by the pharmaceutical industry in several states.

coverage with incomes greater than 400 percent of poverty fell by only seven percent, compared with 15 percent for those with incomes between 100-175 percent of poverty and 27 percent for those with incomes between 176-200 percent of poverty. The impact of state pharmacy assistance programs can also be seen in the relative decline in the share of out-of-pocket spending across income groups. The share of out-of-pocket spending for prescription drugs fell nearly 30 percent for Medicare beneficiaries with incomes between 136-150 percent of poverty, compared with less than ten percent for those with incomes below poverty (and, hence, likely to be eligible for drug coverage under Medicaid) and less than five percent for those with incomes above 300 percent of poverty.

1.3 Implications of Medicare Drug Benefit

In January 2006, comprehensive outpatient prescription drug coverage will become available for the first time under Medicare. Medicare beneficiaries who are currently entitled to full benefits under Medicaid, including drug benefits, will automatically be enrolled under Part D. Enrollment for beneficiaries currently participating in Vermont's pharmacy assistance programs, however, is optional. The Medicare drug benefit provides subsidies on a sliding scale basis to enrollees with incomes up to 150 percent of poverty and assets below \$6,000 for an individual and \$9,000 for a couple, at which point beneficiaries will be required to pay the full cost sharing amounts. States may choose to provide additional coverage or to cover the cost sharing requirements for its low income non-dually eligible residents through a state-only plan. However, funds expended on non-dually eligible wrap-around policies are not eligible for matching federal dollars. Thus, under the Medicare drug benefit, the federal government will assume full financial responsibility for some VHAP Pharmacy enrollees. However, Vermont will also lose access to federal funds for VHAP Pharmacy and VScript, while, at the same time, many of the enrollees in the state's pharmacy assistance programs will not be eligible for federal subsidies under Part D.

1.4 Objectives of the Evaluation

This study fills an important gap in the literature by assessing the demand for publicly sponsored prescription drug coverage among the low income elderly just 16 months prior to the implementation of Part D. The specific objectives and research questions underlying the set of analyses described in this report are presented in *Table 1-1*. The three principal objectives of the study were: (1) to identify the primary determinants of enrollment, (2) to assess the impact of enrollment on the use and cost of drugs, and (3) to assess the impact of enrollment on the use and cost of non-drug medical services.

First, we assess the determinants of enrollment and disenrollment from the Vermont state pharmacy assistance programs. We examine differences in demographic and socioeconomic characteristics, health status, and supplemental medical insurance coverage between enrollees and non-enrollees. The findings are further used to assess the extent of adverse selection into voluntary publicly-subsidized drug coverage programs and to evaluate the implications for program expenditures. The findings are also used to investigate the extent of substitution of public for private drug coverage. The determinants of enrollment are assessed for each of the three state pharmacy assistance programs separately.

Table 1-1
Objectives and Research Questions of the Study

Objectives	Research Questions
1. What are the primary determinants of program enrollment?	<ul style="list-style-type: none"> • How do people learn about the programs? • Why do people choose to enroll in the programs? • Why do people choose not to enroll in the programs? • Do baseline characteristics of enrollees differ from non-enrollees? • Is there evidence of adverse selection into the programs? • Is there evidence of crowd out under the programs? • What are the lessons on enrollment for Medicare Part D?
2. How does program enrollment impact the use and cost of drugs?	<ul style="list-style-type: none"> • How does drug use/cost of enrollees differ from non-enrollees? • What is the impact of drug coverage on use/cost of drugs? • How does drug use/cost differ by type of program? • How adequate are the programs for meeting the needs of enrollee? • What is the impact of drug coverage on unmet needs? • How do enrollees respond to unmet needs? • Do unmet needs vary by type of health status or medical condition? • How does drug use/cost differ by type of medical condition? • How does drug use/cost differ by health status?
3. How does program enrollment impact the use and cost of non-drug medical services?	<ul style="list-style-type: none"> • How does medical cost/use of enrollees differ from non-enrollees? • How does impact of coverage differ by type of program? • How does impact of coverage differ by type of condition? • How does impact of coverage differ by health status? • How does impact of coverage differ by type of service?

Second, we assess the impact of prescription drug coverage on the use and cost of prescription medications. We compare self-reported use of prescription medications among enrollees and non-enrollees who lack other supplemental drug coverage. Outcomes include the use of any prescription medications, the number of prescriptions filled, and out-of-pocket spending over the prior 12 months. The differential effects of drug coverage on use and costs are assessed for selected chronic conditions as reported on the survey. We also use the survey data to assess the impact of drug coverage on access to needed medications by comparing the inability to fill any prescribed medications, the inability to fill specific types of medications, the number of prescribed medications not filled, and the use of drug skimping strategies between enrollees and non-enrollees without supplemental drug coverage. Differences in drug use and costs are assessed for each program separately.

Finally, we assess the impact of prescription drug coverage on the use and cost of other medical services covered by Medicare. The analysis is conducted by comparing the use and cost of inpatient, outpatient, and professional services during calendar year 2003 for elderly beneficiaries covered under the state pharmacy assistance programs and non-participants who lack other supplemental drug coverage. The two outcomes, medical service use and

expenditures, are drawn from Medicare claims data and are annualized for partial year enrollment in Part A and B. The impact of drug coverage on service use is estimated over inpatient, outpatient and physician services separately using logistic models. The impact of drug coverage on medical costs conditional on using services is also estimated over each service category separately using log linear models. Finally, aggregated expenditures are estimated using a two-part model. To control for selection bias, we include self-reported health status and other correlates with health in the model. Other controls include demographic and socioeconomic characteristics, supplemental medical coverage, and drug coverage and drug discount card membership among eligible nonenrollees. We also examine the differential impacts of drug coverage for VHAP Pharmacy, VScript, and VScript Expanded, as well as private drug coverage among the nonenrollees. The differential effects of drug coverage on use and cost of medical services is assessed for several of the individual disease categories reported on the survey.

The analyses are based on a survey of 1,356 enrollees and 1,324 eligible but nonenrolled beneficiaries in Vermont. Beneficiaries who were dually eligible for full benefits under Medicaid, those enrolled in a Medicare managed care plan, and those less than 65 years of age were excluded from the sample frame. The enrollee sample was further divided into three equal strata, one for each of the state pharmacy assistance programs. The samples were drawn in late 2003 and the telephone interviews conducted over a three month period in the spring of 2004. The surveys asked about reasons for enrolling or not enrolling, prior and current medical supplemental and prescription drug coverage (including drug discount cards), drug use and spending prior to enrollment and over the previous 12-month period, and prior and current unmet drug needs. The surveys also asked respondents various questions about their overall health status and whether they had ever been diagnosed with, taken medications for, or skimped on the prescribed dosage for nine chronic conditions. Finally, the survey included questions about living and marital status, education, employment and income. The enrollee and nonenrollee survey questionnaires are included in *Appendix A* and *Appendix B*, respectively. Additional demographic characteristics were obtained from the Medicare denominator files.

1.5 Organization of the Report

The remainder of this report is organized as follows. Chapter 2 provides a description of Vermont's various pharmacy assistance programs for low income and disabled residents. Chapter 3 describes the survey methodology. Chapter 4 presents the findings on the determinants of enrollment. Chapter 5 presents the findings from the analysis of the impact of enrollment on drug use and costs. Chapter 6 describes the results from the assessment of the effect of drug coverage on the use and cost of non-drug medical services. The conclusions of the study and its policy implications for the Medicare drug benefit are summarized in Chapter 7.

CHAPTER 2 DESCRIPTION OF VERMONT'S LOW-INCOME PHARMACY ASSISTANCE PROGRAMS

2.1 Introduction

Vermont currently offers three pharmacy benefit programs to its low-income elderly and disabled residents. The first, called *VScript*, was started in 1989 as a state-funded program to offer low-income Medicare beneficiaries a 50 percent subsidy on maintenance prescription drugs. The second, called *VHAP Pharmacy*, was introduced seven years later under the state's 1115 Medicaid waiver.⁵ It employed both state and federal dollars to provide a more generous drug benefit package with less enrollee cost-sharing to seniors and disabled residents with slightly lower incomes than its *VScript* partner. In 1999 *VScript* became funded through the 1115 waiver as well and in 2000 the state-funded only portion of the pharmacy assistance program was extended to a higher income population. The expanded State program is referred to as *VScript Expanded*. The purpose of this chapter is to provide an overview of the history, objectives, eligibility requirements, benefits, cost sharing arrangements, and management of Vermont's *VHAP Pharmacy*, *VScript* and *VScript Expanded* drug assistance programs.

2.2 History and Objectives of Vermont Pharmacy Programs

The Vermont pharmacy assistance programs, like most state-administered drug assistance programs, were intended to help those most vulnerable to the absence of a federal drug benefit. This particularly applies to low-income Medicare beneficiaries who are not eligible for, cannot afford or choose not to purchase employer-sponsored retirement plans or Medicare supplemental (Medigap) plans, but who are not poor enough to qualify for Medicaid. The explicit objectives of the *VHAP Pharmacy*, *VScript* and *VScript Expanded* programs were to help defray the rising cost of prescription drugs to low-income elderly and disabled residents, to improve access to drugs that maintain their health, and to prevent unnecessary health problems due to inadequate access to prescription drugs. While all three State pharmacy assistance programs share the same goals, *VHAP Pharmacy* was introduced as a way of providing a more generous benefits package with less enrollee cost sharing to individuals with lower incomes. *VHAP Pharmacy* also provided a mechanism for accessing federal funding.

Enrollment figures for the three state pharmacy assistance programs are presented in the bottom row of *Table 2-1*. As of October 2003, there were a total of 8,404 individuals enrolled in *VHAP Pharmacy*, 3,055 in *VScript*, and 3,208 in *VScript Expanded*. One out of every six Medicare beneficiaries in Vermont receives assistance paying for prescription drug purchases from the state, not counting those who get drug coverage through Medicaid.⁶

⁵ Vermont's 1115 Medicaid waiver is called the Vermont Health Access Program (VHAP). The waiver was extended from January 1, 2001 through December 31, 2003. In early 2004, CMS notified the state of a further extension.

⁶ Adults with incomes below 150 percent of poverty who do not receive Medicare benefits may be eligible for full medical coverage, including drug coverage, under Vermont's *VHAP Uninsured Program*. Individuals who receive drug coverage under the *VHAP Uninsured Program* are not included in our study.

Table 2-1
Comparison of Vermont programs with pharmacy assistance, 2003

	<u>VScript</u>	<u>VHAP Pharmacy</u>	<u>VScript Expanded</u>
Year Started	1989	1996	2000
<i>Eligibility Requirements</i>			
Eligibility Bases	65+/Disabled	65+/Disabled	65+/Disabled
Income (% FPL)	175	150	225
Asset Limit	None	None	None
Existing Rx	No	No	No
Coverage Allowed			
Vermont Resident	Yes	Yes	Yes
Citizen/Resident Alien	Yes	Yes	Yes
Covered Drugs	Maintenance	All	Maintenance
Enrollee Cost Sharing	\$5 for generics \$10 for brand named (beneficiary pays a maximum of \$100 per quarter)	\$3 for generics \$6 for brand named (beneficiary pays a maximum of \$50 per quarter)	\$275 annual deductible 41% co-insurance (beneficiary pays a maximum of \$2,500 per year)
Source of Funds	State/Federal	State/Federal	State
Program Enrollees	3,055	8,404	3,208

NOTE: Total program enrollees as of October, 2003

SOURCE: "Effects of Medicaid Premiums on Program Enrollment- Preliminary Analysis," Vermont Joint Fiscal Office, April 8, 2004; "Evaluation of Savings Attributable to Medicaid Pharmaceutical Cost Containment," Vermont Joint Fiscal Office, February 2003.

2.3 Eligibility, Benefits and Enrollee Cost Sharing

2.3.1 Eligibility Requirements

Eligibility for VHAP Pharmacy, VScript and VScript Expanded is based on a range of criteria, including age, disability, income, residency, and private pharmacy coverage. (See *Table 2-1*.) Enrollees must be at least 65 years old or receiving disability benefits from Social Security (OASDI), Medicare or Railroad Retirement. Individuals must not be receiving any other

assistance for prescription drug expenses at the time of enrollment other than Medicare.⁷ At the time of application, individuals must also be native-born or naturalized US citizens or resident aliens lawfully admitted for permanent residence and living in Vermont. Individuals who meet these requirements but who do not otherwise qualify for Medicare benefits because of the two-year waiting period for disability recognition, citizenship or lack of prior waged employment nonetheless remain eligible for the state drug assistance programs.

VHAP Pharmacy, VScript and VScript Expanded have income (but not asset) requirements, which have been expanded over time. (See *Figure 2-1* for a graphic illustration of these income threshold changes.) VScript was initially available to individuals with incomes less than 175 percent of the federal poverty level (FPL).⁸ In January 1996, the state began offering the more generous VHAP Pharmacy benefits at a lower level of enrollee cost sharing to individuals with incomes up to 100 percent of FPL. In November 1996, the income threshold for VHAP Pharmacy was raised to 150 percent of FPL. When the income criterion for VHAP Pharmacy was increased, the qualifying VScript population was automatically absorbed into the more generous (and partially federally funded) program. In April 1999, the remaining VScript program for enrollees with incomes between 150 percent and 175 percent of poverty became funded under the state's 1115 waiver as well. Finally, in January 2000 the state raised the income threshold for the state-funded program to 225 percent of FPL and called the new program VScript Expanded.

2.3.2 Pharmacy Benefits

Given the reliance on state funds, the priority for the VScript and VScript Expanded programs has been on prescription drugs considered essential for maintaining the health of seniors and disabled people suffering from chronic conditions, such as hypertension, asthma and diabetes. Individuals who depended on prescription drugs to control their chronic conditions over a long period of time were considered most vulnerable to the lack of a Medicare drug benefit and, thus, most in need of a targeted public pharmacy assistance program. By targeting the chronically ill, the early initiative was also designed to have the greatest effect on reducing the use and cost of other medical services, including those expenses borne by the state's Medicaid program. Thus, under VScript and VScript Expanded, only maintenance drugs are covered. Maintenance drugs are defined as all medications for which a single 60-day supply is prescribed. The term maintenance drug excludes drugs primarily associated with treatment of an acute condition. Lists of drugs covered and excluded under VScript and VScript Expanded are maintained and periodically updated by the Department of Prevention, Assistance, Transition, and Health Access (PATH).⁹

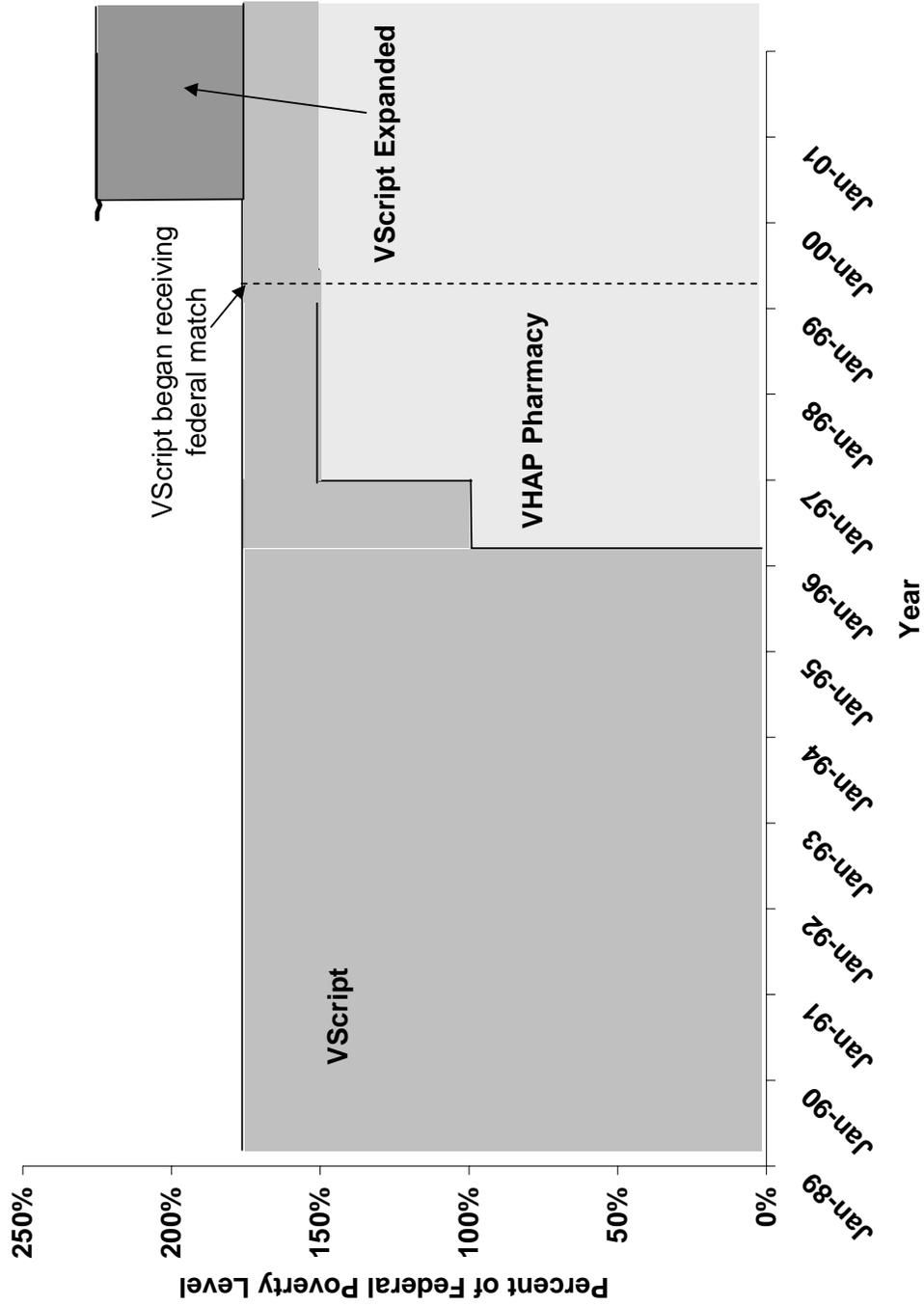
With the introduction of VHAP Pharmacy in 1996, Vermont was able to take advantage of federal matching funds under its 1115 Medicaid waiver for its beneficiaries. VHAP Pharmacy covers all prescription drugs, including contraception medications and devices, insulin supplies

⁷ People with a privately purchased Medicare supplemental pharmaceutical benefit can drop it without penalty and downgrade to a physician and hospital benefit only in order to be eligible for the state pharmacy assistance programs.

⁸ The federal poverty level in 2003 for an individual was \$8,980 and, for a married couple with or without children, \$12,120.

⁹ Enrollees must use a generic drug whenever available, unless a brand name drug is certified by the prescribing physician.

Figure 2-1
Income Thresholds for VHAP Pharmacy, VScript and VScript Expanded



and needles and syringes.¹⁰ Fertility, experimental drugs and non-prescription drugs are not covered. In April 1999, when VScript for individuals between 150 and 175 percent of FPL became part of VHAP Pharmacy, coverage remained restricted to maintenance prescription drugs, but cost sharing was reduced to the same level as VHAP Pharmacy. In January 2000, VScript Expanded with maintenance drug coverage was extended to all elderly and disabled residents with incomes between 175 and 225 percent of FPL.¹¹

Despite differences in pharmacy benefits between the VHAP Pharmacy program and the VScript and VScript Expanded programs, an analysis of the drug claims and survey data suggests that enrollees in both groups are equally likely to suffer from chronic disease and to use similar types and amounts of prescription drugs. The earlier analysis of pharmacy claims data presented in the first report to CMS found that the types of drugs most commonly purchased under both VHAP Pharmacy and VScript were used to treat the same set of chronic conditions, including stomach acids or ulcers, cholesterol, heart disease, diabetes and mental disorders (Gilman, *et al*, 2003). In fact, the eight top ranking prescription medications in terms of both number of users and total expenditures were the same for both VHAP Pharmacy and VScript. Similarities in self-reported chronic disease prevalence and drug use are evident in the current study as well. (See Chapters 4 and 5, respectively, for a description of these results.)

2.3.3 Enrollee Cost Sharing

VHAP Pharmacy, VScript and VScript Expanded all require enrollee cost sharing which underwent major changes between 1989 and 2004. (See *Table 2-2*.) Initially, VScript and VHAP Pharmacy relied on an enrollee co-insurance (i.e., enrollees were required to pay a percent of prescription costs). VScript imposed an 80 percent co-insurance payment and VHAP Pharmacy a 60 percent co-insurance payment.¹² In May 1996, the VHAP Pharmacy enrollee co-insurance payment was replaced by a two-tiered co-payment system (i.e., enrollees were required to pay a fixed amount per prescription, regardless of the cost). VHAP Pharmacy enrollees were required to pay \$1 for prescriptions that cost less than \$30 and \$2 for prescriptions that cost \$30 or higher. The dual co-payments were later applied to the VScript 150-175 percent FPL income group that became funded under the 1115 waiver in April 1999. However, prior to that, in July 1997, the VScript co-insurance was lowered to 50 percent. The 50 percent co-insurance remained in effect when VScript Expanded was initiated to include the 175-225 percent FPL income group in January 2000.

Further important changes to the cost sharing structure were instituted on October 1, 2001, establishing a three-tiered co-payment structure for VHAP Pharmacy and a two-tiered co-

¹⁰ Drugs that are to be used continuously for 30 days or more are prescribed and dispensed in amounts sufficient to allow the patient no fewer than 30 days and no more than 90 days at a time. Up to five refills per script within a given year are permitted. However, a drug can be re-prescribed by the physician as many times as necessary, thus, in effect, eliminating any cap on prescriptions covered.

¹¹ Coverage for VScript Expanded beneficiaries is limited to drugs dispensed by participating pharmacies that have signed a rebate agreement with the state's commissioner.

¹² Payment for prescribed drugs is made at the lower of the price for ingredients plus the dispensing fee or the usual and customary cost to the general public. For multiple source drugs (i.e., therapeutically equivalent or generic drugs) the price for ingredients is the lower of the CMS listed upper limit, the VHAP listed upper limit, or the Average Wholesale Price (AWP). For non-multiple source drugs (i.e., brand name or drugs other than multiple source), the price for ingredients is 90 percent of the AWP. Vermont state law requires generic substitution whenever possible.

payment structure for VScript. Co-payments under VHAP Pharmacy were established at \$1 for prescriptions below \$30, \$2 for prescriptions between \$30 and \$49.99, and \$3 for prescriptions \$50 or more. VScript co-payments were changed to \$2 for prescriptions below \$30 and \$4 for prescriptions \$30 or more. In addition, VScript Expanded coinsurance rates were lowered slightly to 41.25 percent, net of the pharmacy rebate. The cost sharing reforms under VHAP Pharmacy and VScript were intended to shift some of the increased drug spending back to the enrollee and to contain future cost growth.

Table 2-2
Changes in cost-sharing requirements of Vermont’s pharmacy assistance programs, 1989-2004

	Jan 89 – Jun 97	Jan 96 – Apr 96	May 96 – Sep 01	Jul 97 – Mar 99	Apr 99 – Sept 01	Jan 00 – Sep 01	Oct 01 – Dec 02	Jan 03 – Dec 03	Jan 04 – present
VScript	80% co-insurance			50% co-insurance	\$1 for drugs under \$30, \$2 for drugs \$30 or higher		\$2 drugs under \$30, \$4 drugs \$30 or more	\$5 for generics, \$10 brand name (maximum \$100 per quarter)	\$17 / month (no other cost sharing)
VHAP Pharmacy		60% co-insurance	\$1 for drugs under \$30, \$2 for drugs \$30 or higher				\$1 drugs under \$30, \$2 drugs \$30-\$49.99, \$3 prescriptions \$50 or more	\$3 for generics, \$6 for brand name (maximum \$50 per quarter)	\$13 / month (no other cost sharing)
VScript Expanded						50% co-insurance	41.25% co-insurance	\$275 annual deductible, 41% co-insurance (maximum \$2,500 per year)	\$35 / month (no other cost sharing)

SOURCE: “Evaluation of Savings Attributable to Medicaid Pharmaceutical Cost Containment,” Vermont Joint Fiscal Office, 2/2003; “Medicare Prescription Drug, Improvement, and Modernization Act of 2003 – Effects on Vermont,” Vermont Joint Fiscal Office, 2/11/04

Two-tiered co-payments with per-quarter maximums replaced the three-tiered co-payments for VHAP Pharmacy and the two-tiered co-payments for VScript in January 2003. These policy changes further increased the proportion of pharmaceutical costs that must be paid by the enrollee, and resulted in slower spending growth for some programs. VHAP Pharmacy co-payments were raised to \$3 for generic drugs and \$6 for brand named drugs, with a maximum out-of-pocket enrollee spending of \$50 per quarter. VScript co-payments were raised to \$5 for generic drugs and \$10 for brand named drugs, with a maximum of out-of-pocket enrollee spending of \$100 per quarter. A \$275 annual deductible and a maximum out-of-pocket enrollee spending of \$2,500 per year were incorporated into VScript Expanded, while maintaining the 41.25 percent co-insurance rate.

Finally, while not included in the time period covered under our evaluation, additional major cost sharing changes were implemented in January 2004. The two-tiered co-payments with maximums for VHAP Pharmacy and VScript were replaced with monthly premiums of \$13 and \$17, respectively. A \$35 monthly premium replaced the co-insurance and annual deductible required under VScript Expanded. The State decided to replace its existing reliance on co-payments and deductibles with monthly premiums because of concerns that VHAP Pharmacy, VScript and VScript Expanded enrollees were not meeting their full cost-sharing obligations (e.g., failure to pay), as well as a desire to slow the growth in program costs.¹³ Further, the previous cost-sharing schedule was found by the State to be regressive, with lower income residents spending a larger proportion of their income on pharmacy expenditures under the program. The premium cost-sharing model was adopted to protect access to pharmacy assistance for lower income individuals, while better aligning enrollee cost-sharing obligations with the ability to pay.

2.4 Administration and Funding of VScript and VHAP Pharmacy

VHAP Pharmacy, VScript and VScript Expanded are administered by the Office of Vermont Health Access which is part of PATH, as are all publicly-funded health insurance programs in Vermont. Applications for all pharmacy programs are mailed out with individuals' state income tax returns each year and can be returned to the Department of Taxes by June 15. Applications can also be submitted to the Vermont Health Access Eligibility Services Unit or a PATH district office at any time during the year. Eligibility decisions must be made within 30 days following the date the application. Eligibility is from the date of determination until the following June 30.¹⁴ Individuals are required to report any changes in their circumstances that may make them ineligible for VHAP Pharmacy within 10 days of the change.

State funds expended under VHAP Pharmacy, VScript and VScript Expanded are obtained from cigarette tax revenues.¹⁵ However, by including pharmacy assistance for low-income seniors and disabled who are not covered under traditional Medicaid in its 1115 demonstration waiver, Vermont was able to take advantage of the opportunity to tap federal matching dollars for expenditures under VHAP Pharmacy and, later, VScript. Out of the 31 states currently offering drug coverage for low-income elders and the disabled, Vermont was the first one to receive partial federal funding for its pharmacy assistance programs.¹⁶

2.5 Healthy Vermonters Drug Discount Card Program

In addition to the state-subsidized pharmacy assistance programs, Vermont initiated a new prescription drug discount card program for low-income residents in June 2002. The state-sponsored drug discount card, referred to as the *Healthy Vermonters Program*, replaced an earlier drug discount card program that had been approved and implemented under the state's

¹³ Additional cost-containment initiatives were implemented in 2004, including a preferred drug list with mandatory prior approval and a multi-state purchasing agreement providing supplemental rebates.

¹⁴ If an individual applies before June 30, the enrollee must reapply for eligibility after June 30 of the same year.

¹⁵ Unlike many other states with pharmacy assistance programs, tobacco settlement funds have not been appropriated for VHAP Pharmacy, VScript and VScript Expanded.

¹⁶ As of April 2004, 11 states have applied for and receive federal funding for their pharmacy benefit programs.

1115 waiver, but was later found to be unconstitutional by the federal courts.¹⁷ The new drug discount card program is no longer incorporated into Vermont's 1115 waiver, yet nonetheless provides eligible residents access to outpatient prescription drugs at discounted Medicaid prices without direct state subsidy. Individuals enrolled in VHAP Pharmacy, VScript or VScript Expanded are automatically enrolled into the Healthy Vermonters Program. Residents with incomes between 225 and 300 percent of the FPL are also eligible for Healthy Vermonters, while residents with incomes between 300 and 400 percent of the FPL are eligible if they are 65 years of age or older or disabled and receiving Medicare or social security benefits.

¹⁷ The Vermont legislature approved an earlier VHAP Pharmacy Discount Program as part of its 1115 demonstration waiver. The initiative was designed to provide access to pharmaceuticals for all adults with incomes below 300 percent of the federal poverty level at the negotiated Medicaid fee schedule less applicable rebates. The PDP was also intended to provide access to pharmaceuticals to all Medicare beneficiaries who lack other outpatient pharmacy coverage regardless of income. However, a federal appeals court, upholding a pharmaceutical industry challenge, ruled in June 2001 that CMS improperly approved Vermont's plan to extend reduced prescription drug prices through Medicaid to seniors and some non-elderly adults who would not otherwise qualify for traditional Medicaid assistance. As a result, the state was forced to cancel the pharmacy discount program until further appeal or modification.

CHAPTER 3 SURVEY METHODOLOGY

3.1 Introduction

The major purpose of the evaluation is to assess whether the Vermont demonstration promotes access to outpatient prescription medications and improvement in the health of the low-income elderly. To address this question, two groups of Medicare beneficiaries were selected: (1) those enrolled in the state pharmacy assistance programs and (2) those who meet or nearly meet the programs' income eligibility criteria, but who are not enrolled in either these programs or in Medicaid. The primary goals of the survey were to collect information on: (1) outpatient prescription drug coverage prior to enrollment in the pharmacy assistance programs; (2) differences in health status between those enrolled in the programs and those who are not enrolled; (3) differences in utilization of prescription drugs between those enrolled in the programs and those who are not enrolled; (4) access to prescription drugs among enrollees and non-enrollees; (5) awareness of the pharmacy assistance programs among those who are not enrolled; (6) reasons for enrolling or not enrolling in the programs; (7) adequacy of coverage among enrollees and non-enrollees; and (8) unmet drug needs among near eligible beneficiaries. Medicare claims for sampled beneficiaries were merged with the survey data in order to obtain information on Medicare spending and service utilization. These data were used to evaluate issues related to adverse selection, crowd out, adequacy of coverage, and unmet needs.

This chapter summarizes the methods Mathematica Policy Research, Inc. (MPR) used to conduct the survey, the processes used to select samples for the Vermont Pharmacy Survey, and the processes used to adjust the sampling weights to account for non-response.¹⁸ The sample was selected in two parts, treatment and control. The treatment sample was drawn from a database containing all Medicare beneficiaries in Vermont enrolled in one of three pharmacy assistance programs. The control sample was selected from Medicare beneficiaries in Vermont who are not enrolled in a pharmacy assistance program. The treatment sample was stratified by type of pharmacy assistance program (Vermont Health Access Plan (VHAP), VScript, and VScript Expanded). The control sample was selected from two strata defined by monthly Social Security benefits (benefits in 80th percentile or greater, benefits less than 80th percentile).

To be eligible to participate in the survey, sampled beneficiaries in the treatment group had to be enrolled in one of Vermont's pharmacy assistance programs at the time of the interview, and sampled beneficiaries in the control group could not be enrolled in one of Vermont's pharmacy assistance programs and had to have incomes below 300 percent of the federal poverty level.

Data were collected by telephone during a 12 week period (March 23 to June 13 2004) using Computer Assisted Telephone Interviewing (CATI) technology. In total 6,044 cases were released for interviewing. Of those 2,118 were treatment cases (706 VHAP cases, 704 Vscript cases, and 708 Vscript Expanded cases) and 3,926 were control cases (386 cases whose benefits were 80th percentile or greater and 3,540 cases whose benefits were less than the 80th percentile).

¹⁸ The research was funded by the Centers for Medicare and Medicaid Services (CMS) under Contract Number 500-95-0040.

To obtain telephone numbers for the sample MPR matched the sample to Social Security Administration (SSA) records and to a telematch service provided by Marketing Systems Group. Forty percent of the cases that were released to interviewing either had no telephone number or an incorrect telephone number. Locating specialists at MPR were able to locate a telephone number for 78 percent of these cases.

A total of 2,680 18-minute interviews were completed. Of the completed interviews 1,356 were treatment cases (VHAP: 470, Vscript: 477, and Vscript Expanded: 409) and 1,324 were control cases. The overall unweighted response rate was 74 percent and varied by group (treatment: 77 percent, control: 72 percent). The two major reasons for non-response were a refusal to participate (11 percent) and the inability to locate a telephone number (8 percent). Fourteen percent of the completed interviews were conducted by a proxy respondent. The sampling weights were adjusted for survey non-response and poststratified to population control totals.

3.2 Sample Design

The sample was selected in two parts, treatment and control. The treatment sample was drawn from a database containing all Medicare beneficiaries in Vermont enrolled in one of three pharmacy assistance programs. The control sample was selected from Medicare beneficiaries in Vermont who were not enrolled in a pharmacy assistance program. The sampling weights were adjusted for survey non-response and poststratified to population control totals.

3.2.1. Sample Selection

A stratified sample of 2,226 beneficiaries was selected from participants in the Vermont pharmacy assistance programs, and a stratified sample of 4,370 beneficiaries was selected from a control group composed of non-enrolled Medicare beneficiaries. The treatment sample was stratified by type of pharmacy assistance program. The control sample was selected from strata defined by monthly Social Security benefits (*Table 3-1*).

Table 3-1
Sampling strata

Strata	Description
1	Control—Benefits in 80 th percentile or greater
2	Control— Benefits less than the 80 th percentile
3	Treatment—Vermont Health Access Plan
4	Treatment— VScript
5	Treatment— VScript Expanded

The treatment sample was selected from the list of participants in one of the Vermont pharmacy assistance programs: VHAP, VScript, and VScript Expanded. Participants in a fourth program, Health Vermonters, were not eligible for the treatment sample because they only receive discounts on drug purchases, not pharmacy *per se*. Therefore, these beneficiaries were added to the control frame (described below). The sample frame for the treatment sample was

further restricted to beneficiaries who are 65-years-old or older and not deceased. Lastly, the frame was checked for duplicate entries, which were excluded. Next, a systematic sample was selected using Chromy's procedure and controlling for zip code, gender, and age. The sampling weight was computed as the inverse of the probability of selection. To obtain contact information, the Vermont pharmacy assistance file was matched to the Social Security Administration file.

The control sample was selected from Medicare beneficiaries in Vermont. To construct the sample frame, the Medicare file was first compared to the treatment frame, and beneficiaries who participated in one of the pharmacy programs were excluded. Next, beneficiaries who participated in the VP discount card program were added to the control frame. All beneficiaries were eligible for the control frame unless the beneficiary met one of the following:

- Participating in a Vermont pharmacy assistance program (except for VP discount card participants)
- Younger than 65-years-old
- Deceased
- Diagnosed end-stage renal disease
- Under hospice care
- Dually eligible for Medicaid

Beneficiaries that met any of these conditions were removed from the sample frame. Before sample selection, additional frame variables were created.

To further stratify the control sample frame, information on monthly social security benefits from the SSA file was used as a proxy measure of household income. The SSA file is composed of primary beneficiaries and auxiliary beneficiaries. For example, a husband who worked for pay is the primary beneficiary and his wife who worked at home is the auxiliary beneficiary. In order to stratify on social security benefits, the benefits paid to primary and the corresponding auxiliary beneficiaries was summed. However, some households were composed of two primary beneficiaries, such as when a husband and wife both worked for pay. In these cases, no information was available to link the records and sum the monthly benefit. Therefore, for individuals with no linked spouse, the social security benefit amount used for stratification was the individual's benefit amount. This stratification scheme may have slightly underrepresented wealthier households in the high benefits stratum. The control frame was divided into two strata based on the distribution of monthly social security benefits: beneficiaries in the 80th percentile or greater and beneficiaries less than the 80th percentile. Some records in the Medicare file could not be matched to the SSA file and therefore were missing the monthly social security benefit amount. Nearly all of the beneficiaries missing the monthly benefit were women. Therefore, for sampling purposes these beneficiaries were assigned to one of the strata by using a Bernoulli distribution where the parameter was equal to the distribution of monthly social security benefits for women with nonmissing monthly benefit.

In order to more precisely measure the impact of the pharmacy programs, it was important that the control sample was similar to the treatment sample on a socioeconomic status (SES) measure. In order to do so, the control sample had to be grouped into a small number of cells of similar beneficiaries. As the basis for constructing this SES variable, zip code was

selected. Vermont zip codes were divided into ten equal groups, called *zgroup*. Zip codes were ranked according to their percentage of resident population with income at or above 200 percent of the federal poverty level, and assigned to *zgroup* based on their percentile rankings. Federal poverty level information came from *CensusCD 2000 long form SF3: Region 1*, published by GeoLytics. A few Vermont zip codes in the sample frame were not included in the *CensusCD* and these zip codes were grouped together into an eleventh *zgroup*. Finally, there were some zip codes in the sample frame from outside of Vermont, and these were gathered into a twelfth *zgroup*. Therefore, the *zgroup* variable used for control sample selection had 12 categories.

A systematic sample with probability proportional to size controlling for zip code group, gender, and age was selected. The relative size of the zip code group (*zgroup*) as compared to the average size in the treatment frame was used for the measure of size. The measure of size, $MOS(i)$, for case i in zip code group j is defined as follows:

$$MOS_j(i) = \frac{\sum_{t=1}^3 z_j}{z_{cj}}$$

where z_j is the number of beneficiaries in the treatment frame in stratum t and zip code group j and z_{cj} is the number of beneficiaries in the control frame stratum c and zip code group j . Note that separate measures of size were calculated for the two control group strata. Lastly, sampling weight was calculated as the inverse of the probability of selection.

3.2.2 Second Stage Sample

The initial sample size selected was larger than the targeted size to account for the loss of sample due to ineligible and unlocatable beneficiaries. After this sample was drawn, the beneficiaries were grouped into waves for fielding purposes, where samples were released by waves until the target sample size was achieved. We recognized, however, that the waves were unintentionally constructed in such a way as to be correlated with characteristics of our initial sample resulting in some characteristics of the sample only present in certain waves. Therefore, not all “types” of beneficiaries in the sample had a chance to be interviewed. To correct for this imbalance in the sample, a second stage sample was drawn to ensure the representativeness of the sample for the study.

We considered all treatment and control cases previously released as selected with certainty for the second stage. The remaining treatment and control cases were divided into two groups, beneficiaries selected with certainty (**Table 3-2**) and beneficiaries with a chance of selection (**Table 3-3**). These two groups were defined by second stage strata composed of first-stage strata, geographic area, gender, and age. One hundred beneficiaries were selected with certainty for the second stage sample. To select the sample from the second group Chromy’s systematic sampling procedure was used, controlling for second stage strata, gender, and age. Two hundred and seventy beneficiaries were selected with equal probabilities of selection from both treatment and control cases. The total second stage sample contained 370 beneficiaries. Therefore, the final sample sizes for first and second stage samples were 2,118 treatment beneficiaries and 3,926 control beneficiaries. Lastly, the sampling weight FW was calculated as

the product of the inverse of the probability of selection for the first stage and the inverse of the probability of selection for the second stage.

Table 3-2
Second stage strata selected with certainty for second stage sample

First-Stage Strata	Geographic Area	Gender	Age
1-Control	Zgroup 2	Male and Female	—
1-Control	Zgroup 10	Male and Female	—
2-Control	Zgroup 2	Male and Female	—
2-Control	Zgroup 4	Female	78
2-Control	Zgroup 6	Male	68
3-Treatment	Zip code 05491	Female	—
5-Treatment	Zip code 05701	Female	79-84
5-Treatment	Zip code 05753	Male	80-84

Table 3-3
Second stage strata for subsampling in second stage sample

First-Stage Strata	Geographic area	Gender	Age
1-control	Zgroup 1	Male and Female	—
1-control	Zgroup 11	Male and Female	—
1-control	Zgroup 12	Male and Female	—
2-control	Zgroup 4	Female	65-77
2-control	Zgroup 5	Male and Female	—
2-control	Zgroup 6	Male	65-67
3-treatment	Zip code 05491	Male	—
3-treatment	Zip codes 05492, 05494, 05495, 05602, 05640, 05641, 05647, 05648, 05649, 05650, 05651, 05652, 05653	Male and Female	—
4-treatment	Zip codes 05251, 05255, 05257, 05261, 05262, 05301, 05302, 05342, 05343, 05344, 05345, 05346, 05350	Male and Female	—
5-treatment	Zip code 05701	Female	85-101
5-treatment	Zip code 05701	Male	—
5-treatment	Zip codes 05702, 05730, 05732, 05733, 05734, 05735, 05737, 05738, 05739, 05740, 05741, 05743, 05748	Male and Female	—
5-treatment	Zip code 05753	Female	—

3.3 Data Collection Procedures

The data collection was conducted at MPR's Columbia, Maryland survey operations center. A total of 2,680 interviews were conducted with an overall unweighted response rate of 74 percent. The average interview length was 18 minutes.

3.3.1 Interviewer Training

MPR trained twenty-six interviewers to administer the survey instrument. All of the interviewers trained had prior experience conducting telephone interviews. Study-specific training took twelve hours. Trainers explained the background and purpose of the study, reviewed the questionnaire, provided instructions for asking each question, and discussed methods for contacting respondents and gaining cooperation. In addition, we trained the interviewers on the challenges of interviewing an elderly population. Interviewers had ample time for role playing, practice interviewing, and administrative procedures. After the main session, interviewers finished their training by completing practice interviews with a supervisor.

3.3.2 Data Collection

Interviewing began on March 23, 2004 and continued for 12 weeks. Sampled beneficiaries were notified by mail one week before an initial call was made to reassure them about the survey's authenticity and purpose. The advance letter was on CMS letterhead and explained the purpose of the study, confidentiality of responses, and voluntary participation (*Figure 3-1*). The letter encouraged respondents to call Mathematica's toll-free number for further information and to participate in the study.

In total, 2,680 interviews were completed. Of these, 1,356 interviews were completed with beneficiaries in the treatment group and 1,324 interviews were completed with beneficiaries in the control group (*Table 3-4*). All interviews were conducted by telephone using MPR's Computer Assisted Telephone Interviewing System (CATI).

Fourteen percent of the completed interviews were conducted by a proxy respondent. A proxy is defined as a person who completed an interview on behalf of the sample member. The proxy was recruited when interviewers learned that sample members were unable to complete the interview themselves due to a physical or mental condition such as hearing impairment, or dementia. Interviewers also recruited proxies to complete the interview for sample members having language barriers. Eligible proxies included individuals familiar with the health care experiences of the sample member. They were often the spouses, children, or other relatives and friends of the sample member. The two most common reasons for using a proxy were hearing issues and the sampled beneficiary being too ill to complete the interview.

Figure 3-1
Advance Letter

Dear Medicare Beneficiary:

I am writing to ask for your help with an important new study, *The Vermont Pharmacy Survey*. The Study is sponsored by the Centers for Medicare and Medicaid Services (CMS), the government agency that runs the Medicare program. The purpose of the survey is learn if Medicare beneficiaries who live in Vermont have access to pharmacy programs. Your name was selected at random from a list of Medicare enrollees.

CMS has hired Mathematica Policy Research, a private national research firm to conduct the survey. We assure you that all information collected will be totally confidential and will not be reported in any way that identifies you personally. ***Your participation will not affect any Medicare benefits you receive now or are entitled to in the future. No one will try to sell you anything, or ask for a donation, or give your name to any other organization as part of this study. We are only collecting this information for research purposes and to improve program operations.***

In about one week, an interviewer from Mathematica will call you by telephone for the survey interview. This survey is voluntary but very important for ensuring that people on Medicare can get the care they need.

Please help us by responding to the interview when the telephone interviewer calls. The interview will only take between 5 and 15 minutes to complete. ***If you have any questions, or wish to set up an interview time, please call Val Taylor at Mathematica. The toll-free number is 1-888-633-8344. Val can be reached by e-mail at vtaylor@mathematica-mpr.com. You may also call Paul Boben at CMS. Paul's number is 410-786-6629 (not a toll-free call). Paul can be reached by e-mail at PBoben@cms.hhs.gov.***

If your telephone number is unlisted, it is especially important that you call us, because we will not be able to call you. If you can not participate in this study for health reasons, you may ask someone who knows about your health care to answer the questions on your behalf.

Thank you for your assistance.

Sincerely,

J. Ned Burford
CMS Privacy Officer

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0938-0906. The time required to complete this information is 5 to 15 minutes per response. If you have any comments concerning the accuracy of the time estimate(s) or suggestions for improving of the questionnaire, please write to: CMS, 7500 Security Boulevard, N2-14-266, Baltimore, Maryland 21244-1850.

Table 3-4
Completed interviews by week

Week Ending	Treatment				Control			TOTAL
	VHAP	VScript	VScript Expanded	All	SSA > 80 percent	SSA <= 80 percent	All	
March 29, 2004	7	60	43	110	0	0	0	110
April 5, 2004	212	156	120	488	17	16	33	521
April 12, 2004	37	37	46	120	21	214	235	355
April 19, 2004	6	10	7	23	2	250	252	275
April 26, 2004	10	14	15	39	5	101	106	145
May 3, 2004	28	42	31	101	13	61	74	175
May 10, 2004	58	38	48	144	4	30	34	178
May 17, 2004	23	25	23	71	3	100	103	174
May 24, 2004	47	54	46	147	7	109	116	263
May 31, 2004	31	33	22	86	7	107	114	200
June 7, 2004	0	1	0	1	0	26	26	27
June 14, 2004	8	1	6	15	27	171	198	213
June 16, 2004	3	6	2	11	4	29	33	44
TOTAL	470	477	409	1356	110	1214	1324	2680

Both qualitative and quantitative indicators of interviewer performance were used to monitor data quality. Quantitative indicators, such as productivity and refusal rates were assessed from reports generated by the CATI system. During the first week of the project, at least one completed interview was monitored for each telephone interviewer using MPR's central monitoring system. The system enables the supervisor to listen to interviews without the interviewer or the respondent being aware of it. The system also allows the supervisor to view the interviewer's CATI screen while the interview is in progress. Overall, approximately 5 percent of all interviews were monitored. For each monitored interview, the supervisor completed an on-line evaluation identifying specific errors. At the completion of the monitoring session, the supervisor reviewed any errors with the interviewer and made suggestions for improvement.

3.3.3 Obtaining Contact Information for Sample Members

The SSA file contained a telephone number for 55 percent of the cases. To obtain telephone numbers for the remaining cases, MPR used the telematch services from Marketing Systems Group (MSG). This search yielded telephone numbers for 63 percent of the cases, of which 40 percent did not have a prior telephone number. Therefore, at the start of data collection 80 percent of the cases had telephone numbers. In addition to the 20 percent of cases for which a telephone number was not initially located, 20 percent of the sample had an incorrect telephone number. MPR's locating department was able to locate a telephone number for 78 percent of these cases and determined that two percent of these sampled beneficiaries were deceased. The following resources were used to locate sample beneficiaries:

- **Directory Assistance.** The locating specialist asked the operator for the sampled respondent and others in the area with the same or similar last names.
- **Advance Letter mailed ADDRESS SERVICE REQUESTED.** The US Postal Service will return a letter with updated address information when it is available.
- **On-line data base of addresses.** On-line data bases were used to verify or update address information for sample beneficiaries. These data bases were also used to look up cases by address, also called reverse look-ups. Reverse look-ups sometimes yielded a telephone number that was listed to someone other than the sample beneficiary. If the locating specialist saw that the sample member lived at the address of record, the telephone number was considered unpublished.
- **Neighbors.** Reverse look-ups were used to obtain the names and telephone numbers of neighbors. Neighbors provided useful locating leads and took messages.

Our general approach to locating was to use the least expensive, automated sources first and progress to the more expensive locating for cases that were not found.

3.3.4 Survey Eligibility

Two thousand one hundred and eighteen (2,118) treatment cases were released for interviewing. Thirteen percent (281 cases) were ineligible for survey participation. There were three reasons for ineligibility: the sample member was no longer enrolled in the pharmacy assistance program (230 cases), the sample member was deceased (44 cases), and the sample member no longer resided in Vermont (7 cases).

Three thousand nine hundred and twenty six (3,926) control cases were released for interviewing. Thirty nine percent (1,523 cases) were ineligible for survey participation. The main reason for ineligibility was annual income greater than 300 percent of the federal poverty level (1,275 cases). The other reasons for ineligibility were the sample member had enrolled in one of the pharmacy assistance programs (146 cases), the sample member was deceased (77 cases), and the sample member no longer resided in Vermont (25 cases).

3.3.5 Response Rates and Reasons for Non-response

Response rates are often computed in two ways: weighted and unweighted. The unweighted response rate can be used for monitoring the field operations of the survey. The weighted response rate that uses the sampling base weights can be used to assess the quality of survey estimates and the bias due to non-response. The response rates were calculated as the product of the eligibility determination rate and the completion rate. Where the eligibility determination rate was the number of cases where eligibility was determined divided by all sampled cases, and the completion rate was the number of completed interviews divided by all eligible cases.

Overall, the unweighted response rate was 74 percent and the weighted response rate was 70 percent (**Table 3-5**). The response rates varied by group. For the treatment group, the unweighted response rate was 77 percent and the weighted response rate was 75 percent. For the

control group, the unweighted response rate was 72 percent and the weighted response rate was 70 percent. The two main reasons for non-response was a refusal to participate and a non-locatable telephone number. Eleven percent of the sample refused to participate in the study, and 8 percent of the sample did not have telephone numbers to be called by the end of the field period.

**Table 3-5
Response rates**

Group	Unweighted (percent)	Weighted (percent)
Treatment	77.3	75.2
VHAP	75.5	74.2
VScript	76.8	75.0
VScript Expanded	79.4	77.6
Control	71.8	69.5
Overall	73.6	70.4

All initial refusals that were not hostile or threatening were sent a second letter and then called by an interviewer who specialized in refusal conversion. Most initial refusals were soft. Refusal conversion specialists were able to interview 50 percent of those who were initially reluctant to participate.

3.4 Data Editing and Coding Open Ended Responses

A CATI data-editing instrument was programmed to check completed interviews for errors. The CATI program enforced questionnaire logic strictly. No case was certified as clean until all appropriate questions had been either answered or assigned an acceptable non-response value and until the data record for each case was completely consistent with the programmed logic. MPR reviewed the SAS frequencies and checked them for face validity and verified that there were no out-of-range responses or logical inconsistencies. A file that contained the text of "other, specify" responses was produced to facilitate coding. Responses were back coded in existing answer categories when appropriate and new answer categories were generated as necessary to code the "other, specify" responses.

3.5 Non-Response Adjustments

If people who fail to respond to a survey would have provided systematically different answers from those who do respond, then survey estimates obtained only from respondent data will be biased. Therefore, adjustments to the sampling weight *FW* were calculated to compensate for such bias. Weighting class adjustments were made by portioning the sample into groups, called *weighting classes*, and then adjusting the weights of respondents within each class so that they sum to the weight total for nonrespondents and respondents from that class. The weighting classes were defined on the basis of stratification and sorting variables: stratum, whether they were selected with certainty or not in the second stage, gender, and age. For the

control sample the socioeconomic status, zip code group, was also used. A response and eligibility indicator were also defined. *ELIGRESP* was defined as follows:

<i>ELIGRESP</i> =	1	Sampled beneficiary was eligible, respondent
	2	Sampled beneficiary was eligible, nonrespondent
	3	Sampled beneficiary was ineligible
	4	Eligibility status of the sampled beneficiary is unknown

Note that a value of 1, 2, and 3 implies eligibility status is known, and a value of 4 indicates eligibility status is unknown.

Non-response adjustment factors were calculated in two steps. First, we adjusted the sampling weights to account for sampled beneficiaries for whom eligibility status could not be determined. The eligibility determination adjustment factor $EAF_c(i)$ for case i in weighting class c is defined as follows:

$$EAF_c(i) = \frac{\sum_{i \in c} FW_c(i)}{\sum_{i \in c} \delta_{ed} FW_c(i)} \quad \text{if } ELIGRESP = 1, 2, 3$$

$$EAF_c(i) = 0 \quad \text{if } ELIGRESP = 4$$

where FW is the sampling weight. δ_{ed} is equal to 1 for beneficiaries where eligibility was determined and 0 otherwise.

Second, we adjusted for nonresponding beneficiaries known to be eligible, but who did not complete the interview. This adjustment is calculated only among cases known to be eligible. The $NAF_c(i)$ for case i in weighting class c is defined as follows:

$$NAF_c(i) = \frac{\sum_{i \in c} FW_c(i)}{\sum_{\substack{i \in c \\ ELIGRESP=(1,2)}} \delta_{nr}(i) FW_c(i)} \quad \text{if } ELIGRESP = 1$$

$$NAF_c(i) = 0 \quad \text{if } ELIGRESP = 2$$

$$NAF_c(i) = 1 \quad \text{if } ELIGRESP = 3$$

$$NAF_c(i) = 0 \quad \text{if } ELIGRESP = 4$$

where δ_{nr} is equal to 1 for cases that completed the interview and 0 otherwise. The adjustment factors EAF and NAF were then applied to the sampling weights to obtain the non-response adjusted weight $RW(i)$ for case i is as follows:

$$RW(i) = EAF(i) \times NAF(i) \times FW(i)$$

Note that the respondents and the ineligible beneficiaries will have non-zero non-response adjusted weight. The nonrespondents and the cases with unknown eligibility will have a zero non-response adjusted weight.

We also calculated poststratification adjustments to correct for sample variation in estimated population totals for analytic subgroups. Poststratification adjustments force the adjusted weight totals to population totals for the specified population groups that formed the *poststrata*. The poststrata were defined on the bases of key domains. For the treatment sample those key domains are pharmacy assistance program, gender, and age. For the treatment samples the poststratification adjustment factor $PAF_g(i)$ for case i in poststratum g is defined as:

$$PAF_g(i) = \frac{N_g}{\sum_{j \in g} RW_g(j)}$$

where the numerator N_g is the total number of beneficiaries in the population in poststratum g and the denominator is the sum of the non-response adjusted weights for all respondents and ineligible beneficiaries from poststratum g . The population counts N_g are obtained from the sample frame. Note that this adjustment assumes that beneficiaries on the sample frame are ineligible in the same proportion as found in the sample. The poststratified adjusted weight $PW(i)$ for case i is as follows:

$$PW(i) = PAF(i) \times RW(i)$$

For the control sample the key domain used to form poststrata is zip code group. For the control sample the poststratification adjustment factor $PAF_z(i)$ for case i in zip code group z is defined as:

$$PAF_z(i) = \frac{\sum_{t=1}^3 \sum_{j \in z} PW(j)}{\sum_{j \in z} RW(j)} \quad \text{if } ELIGRESP = 1$$

$$PAF_g(i) = 1 \quad \text{if } ELIGRESP = 3$$

$$PAF_g(i) = 0 \quad \text{if } ELIGRESP = 2, 4$$

where the numerator is the sum of the poststratified adjusted weights for all three treatment samples in zip code group z , and the denominator is the sum of the non-response adjusted

weights for the control sample in zip code group z . Note that this adjustment assumes that the poststratified weighted counts of responding beneficiaries in the treatment sample is the most accurate source of information on the distribution of zip code group. The poststratified adjusted weight $PW(i)$ for case i is as follows:

$$PW(i) = PAF(i) \times RW(i)$$

This final weight is the final analysis weight, which should be used in the analysis of the data set.

CHAPTER 4 ANALYSIS OF ENROLLMENT

4.1 Introduction

Medicare beneficiaries with incomes 100-200 percent of poverty are the most likely to lack outpatient prescription drug coverage (Poisal and Chulis, 2000; Poisal and Murray, 2001). People in this income category are typically too poor to purchase commercial drug policies, but not poor enough to qualify for drug benefits under Medicaid. Many states have chosen to implement a state pharmacy assistance program to fill the gap in prescription drug coverage for low-income elderly and disabled people. Currently, 31 states offer some type of state pharmacy assistance program, either through a direct subsidy for the purchase of prescription drugs or through a discount program, and an additional 8 states have authorized programs that are not yet in operation (<http://www.ncsl.org/programs/health/drugaid.htm>, accessed September 16, 2004). Although these programs provide an important benefit, a 2001 survey found that 20-38 percent of low-income seniors in 5 states with a pharmacy assistance program still lacked prescription drug coverage (Safran et al., 2002). Among the factors that may limit enrollment are welfare stigma, lack of awareness of the programs and their eligibility criteria, and burdensome application processes (GAO, 2000; Fox et al., 2002).

Some eligible individuals likely do not enroll because they already have prescription drug coverage. Although substantial numbers of low-income Medicare beneficiaries lack prescription drug insurance, the majority are covered (Poisal and Chulis, 2000; Poisal and Murray, 2001). A significant concern is that public insurance, such as pharmacy assistance programs, may simply replace private insurance and not expand overall coverage either because individuals drop their previous coverage or employers stop offering coverage. Indeed, the Medicare Modernization Act includes incentives to discourage employers from reducing drug coverage for retirees. If public coverage does crowd-out private insurance, then the impact of pharmacy assistance programs on access to prescription medications will be less than is implied by enrollment numbers. Furthermore, financial responsibility for this coverage will be shifted from private payers to public. However, even if crowd-out occurs, pharmacy assistance programs might still provide substantial financial relief for low-income populations if they no longer have to pay a premium for their coverage or face reduced copayments.

Previous research on crowd-out of private health insurance by Medicaid eligibility expansions has mainly attributed crowd-out to enrollees dropping their private insurance, but not to reduced offer rates by employers (Cutler and Gruber, 1996). Other studies have shown that crowd-out increases significantly with income (Dubay and Kenney, 1997; Rask and Rask, 2000). A simulation of alternate Medicare prescription drug benefit designs predicted that, depending on the generosity of the benefit and the subsidy level, one-third to two-fifths of enrolled beneficiaries would be people who had prior drug coverage and dropped it (Shea et al., 2003/2004).

Adverse selection is often a concern in the design of insurance programs. Previous studies have found that sicker people are more likely to purchase Medigap policies (Ettner, 1997; Long, 1994; Wolfe and Goddeeris, 1991) and to enroll in the Medicare Savings Programs (Haber

et al., 2003; Neumann et al., 1995).¹⁹ While adverse selection is typically viewed as a source of concern for the viability of insurance markets, for public programs it can be viewed as an indicator that the programs are reaching the populations with greatest need. Adverse selection can also have implications for the accuracy of cost estimates for insurance programs.

In order to assess the effectiveness of pharmacy assistance programs in expanding coverage of prescription drugs for low-income populations, it is important to understand who enrolls in these programs, as well as why some eligible people fail to enroll. This chapter uses data from a survey of enrollees in Vermont's pharmacy assistance program and a comparison sample of eligible nonenrollees to identify factors that drive enrollment in the program, including sociodemographic characteristics, health status, prescription drug utilization, and prior prescription drug coverage. Among the policy issues addressed by these analyses are the extent to which state pharmacy assistance programs are subject to adverse selection and whether this public coverage crowds-out private insurance coverage of prescription drugs. The following section describes the survey data and the analytic methods used. We then describe the results of our descriptive and multivariate analyses. The chapter concludes with a summary of our findings, focusing on adverse selection, crowd-out, and barriers to enrolling people in the program.

4.2 Data and Methods

4.2.1 Data and Sample

The analysis of program enrollment uses data from a survey of enrollees in Vermont's three pharmacy assistance programs and a comparison group of nonenrollees. With the exception of age and gender, which were derived from the Medicare Enrollment Data Base (EDB), all data used in these analyses are self-reported. As described in Chapter 3, the enrollee sample was drawn from a frame of all Medicare beneficiaries over age 64 who were enrolled in any of the state pharmacy assistance programs on October 31, 2003. An equal number of enrollees was sampled from each of Vermont's three pharmacy assistance programs to support comparisons across these groups, as well as separate comparisons of each group with nonenrollees.

The nonenrollee sample was drawn from a frame of all elderly Medicare beneficiaries residing in Vermont who were not enrolled in any of the pharmacy assistance programs, were not dually eligible, and were not enrolled in a Medicare managed care plan at any time during the previous year. Individuals with incomes under 300 percent of the federal poverty level (FPL) were eligible for the nonenrollee sample. A screener was used to identify nonenrollees who were eligible for the sample based on self-reported income. In order to increase the likelihood of contacting nonenrollees who would meet the income criterion for the sample, information on Social Security benefits provided by the Social Security Administration was used to identify a subgroup of likely eligible beneficiaries. These likely eligibles were oversampled.

¹⁹ The Medicare Savings Programs is the name used to refer to benefits provided to beneficiaries who are dually eligible for Medicare and some form of Medicaid. This includes beneficiaries who receive full Medicaid benefits, as well as those entitled only to assistance with Medicare cost-sharing payments.

Members of the nonenrollee sample with incomes over 225 percent FPL were excluded from most of the analyses reported in this chapter because their incomes exceed the eligibility criteria for Vermont’s pharmacy assistance programs. As a result, the sample included in the enrollment analyses is somewhat different from those used for the analyses of enrollment impacts on prescription drug use and on the use and cost of medical services (described in Chapters 5 and 6, respectively). However, nonenrollees with incomes over 225 percent FPL were included in analyses comparing people eligible for the pharmacy assistance programs with near-eligibles.

4.2.2 Methods

The enrollment analyses compare characteristics of individuals enrolled in Vermont’s pharmacy assistance program with those of eligible nonenrollees in order to understand factors that influence the decision to enroll in these programs. In addition, for enrollees, we examine how they learn about the program, reasons for enrolling, and whether enrollment in the pharmacy assistance programs crowds-out other forms of prescription drug coverage. For eligible nonenrollees, we look at reasons for not enrolling in the programs and interest in enrolling. As described previously, our survey involved a complex sample design. In order to adjust standard errors for this complex sample design, all analyses were conducted using the survey procedures in STATA. Statistical significance in all analyses is based on two-tailed hypothesis tests.

We conducted both descriptive and multivariate analyses. Depending on the variable, our descriptive analyses involved three types of comparisons:

- Comparisons of enrollees in all three pharmacy assistance programs combined with eligible nonenrollees;
- Separate comparisons of enrollees in each of the three programs with eligible nonenrollees.²⁰
- Comparisons of enrollees in the three programs with each other.

Additional descriptive statistics were calculated for nonenrollees only. We also conducted descriptive comparisons of nonenrollees with incomes 225-300 percent FPL, who slightly exceed program eligibility criteria, with a combined sample of enrollees and nonenrollees who are eligible for the programs.

Logistic regression was used to estimate the separate influence of various factors on the decision to enroll in Vermont’s pharmacy assistance programs. The basic model can be summarized as:

$$E_i = \alpha + X_i\beta_1 + H_i\beta_2 + C_i\beta_3 + U_i\beta_4 + \varepsilon_i$$

where $E_i = 1$ for program enrollees, 0 otherwise;

²⁰ Data were not available to identify which pharmacy assistance program nonenrollees would have qualified for. Therefore, enrollees in each of the programs are compared to all nonenrollees.

X_i = a vector of sociodemographic characteristics;

H_i = a vector of health status measures;

C_i = a vector of prescription drug coverage measures;

U_i = a vector of prescription drug utilization measures; and

ε_i = a random error term.

We report the odds ratio for each of the variables in our model. An odds ratio greater than 1 indicates that the variable increases the likelihood of enrolling in a pharmacy assistance program, while variables with an odds ratio less than one are associated with a decreased likelihood of program enrollment.

Sociodemographic characteristics in our model include: age (75-84 years of age and 85 years or older, with 65-74 the omitted category), gender (female), living arrangement (alone), education (high school only and some post-high school education, with less than high school the omitted category), and income (greater than 150 percent FPL). To the extent that age is a proxy for more complex health needs, we hypothesize that older beneficiaries are more likely to enroll than younger. We hypothesize that people living alone are less likely to enroll in the program because they are expected to have fewer supports and to receive less assistance in applying for benefits such as these. We expect that greater education will increase the likelihood of knowing about the programs and, therefore, the likelihood of enrolling. Increasing income is expected to be negatively associated with enrollment, both because higher income individuals are more likely to be able to pay for their out-of-pocket costs and because they are eligible for a less generous benefit. We do not have specific hypotheses about the impact of gender on the likelihood of enrolling.

Health status measures include: self-reported health status (good and fair or poor, with excellent or very good the omitted category) and a set of self-reported clinical conditions (hypertension; heart disease; emphysema, asthma, or chronic obstructive pulmonary disease; cancer or other malignancy; diabetes; arthritis; osteoporosis; depression; and stomach ulcer, heartburn, or reflux). Poorer health is expected to increase the likelihood of enrollment.

The model also includes several indicators of prescription drug utilization, including the number of different medications taken (1-4, 5-10, and 11 or more, with 0 the omitted category) and a set of indicators for the financial stress created by prescription drug utilization (skipping doses to make medication last longer, taking less than prescribed to make medication last longer, spending less on other basic needs to pay for medication, and needing help from family or friends to help pay for medications). For enrollees, these variables reflect experience during the year prior to enrolling in the pharmacy assistance program, while nonenrollee responses describe their experience during the year prior to the date the survey was administered. We hypothesize that individuals who use more prescription drugs and have greater financial stress as a result of

their prescription drug use will be more likely to enroll in the programs.²¹ Finally, we include two measures of prescription drug coverage: having insurance that covers prescription drugs and having a prescription drug discount card. We expect that individuals who already have a source of coverage will be less likely to enroll in the programs. The reference period for the drug coverage and drug utilization variables is the year prior to enrollment for the enrollee sample and the year prior to the survey for nonenrollees.

4.3 Results

4.3.1 Descriptive Results

Sociodemographic Characteristics

Table 4-1 compares the sociodemographic characteristics of enrollees and nonenrollees, for all enrollees combined as well as for enrollees in each of the programs separately. In addition, we compare enrollees in the three pharmacy assistance programs.

Enrollees are significantly older than nonenrollees, with a mean age of 77.2 years compared to 75.7 for nonenrollees. Nearly one-fifth of enrollees are 85 years or older while only 11 percent of nonenrollees are in this age group. This finding holds for all three enrollee groups, although among the enrollees, VHAP Pharmacy has the oldest population. Enrollees are significantly more likely to be female than nonenrollees (69 percent compared to 61 percent) and this pattern holds for all three enrollee groups. VHAP Pharmacy has significantly more females than both VScript and VScript Expanded.

Enrollees overall are substantially less likely to be married and more likely to be widowed than nonenrollees; however, when each program is analyzed separately, the difference between enrollees and nonenrollees is only significant for VHAP Pharmacy. Consistent with their marital status, enrollees are more likely than nonenrollees to live alone, but this finding is again driven by the VHAP Pharmacy program. Although enrollees overall and nonenrollees do not differ in where they live, VHAP Pharmacy enrollees are less likely than nonenrollees and enrollees in VScript and VScript Expanded to live in their own house or apartment and more likely to live in a relative's home.

The education level of enrollees is substantially lower than that of nonenrollees. Over 40 percent of enrollees did not graduate from high school, compared to 28 percent of nonenrollees. In contrast, nearly 30 percent of nonenrollees had some college education, but less than 20 percent of enrollees. Lower education levels hold for all three pharmacy assistance programs, but VScript Expanded enrollees have more education than those in VHAP Pharmacy or VScript. Only a small percentage of both the enrollee and nonenrollee samples are working, but enrollees are significantly less likely to work (6 percent vs. 10 percent). VHAP Pharmacy and VScript enrollees are significantly less likely than those in VScript Expanded to work.

²¹ We also estimated models including variables for out-of-pocket expenses. These variables were never significant. Because they were missing for 12 percent of the observations in our sample, we dropped these variables from the final model.

Table 4-1
Self-reported sociodemographic characteristics of pharmacy assistance program enrollees and eligible nonenrollees

	Enrollees				Eligible nonenrollees (N=879)
	All (N=1,346)	VHAP Pharmacy (N=461)	VScript (N=476)	VScript Expanded (N=409)	
Age (%)					
65-74	39.2	37.1	40.7	43.9	45.0
75-84	42.4	43.2	42.2	40.3	43.8
85+	18.3	19.6	17.1	15.8	11.3
Age (mean)	77.2	77.5	76.7	76.5	75.7
Female (%)	69.2	71.0	65.3	68.3	60.7
Marital status (%)					
Married/civil union	42.0	34.3	53.8	52.1	55.8
Widowed	45.0	50.0	37.2	38.9	33.8
Divorced	7.4	8.9	4.6	6.1	6.2
Separated	0.6	0.8	0.4	0.2	0.3
Never married	4.9	6.0	4.0	2.7	3.9
Live alone (%)	42.0	47.0	35.6	34.0	32.3
Living situation (%)					
Nursing home	0.0	0.0	0.0	0.2	0.2
Group home	1.8	2.4	1.1	0.5	1.1
Assisted living facility	3.3	3.2	4.3	2.5	2.4
With relative in their home	8.5	10.6	5.2	5.8	5.5
Apartment or house that you own or rent	86.4	83.8	89.4	91.0	90.7
Other	0.0	0.0	0.0	0.0	0.2

(continued)

Table 4-1 (continued)
Self-reported sociodemographic characteristics of pharmacy assistance program enrollees and eligible nonenrollees

	Enrollees				Eligible nonenrollees (N=879)
	All (N=1,346) ***	VHAP Pharmacy (N=461) ***,##	VScript (N=476) ***,###	VScript Expanded (N=409) **	
Education (%)					
Less than high school	41.5	43.5	44.3	32.2	28.1
High school only	40.6	39.2	38.5	47.3	42.6
Some post-high school	17.9	17.3	17.1	20.5	29.3
Employment status (%)					
Not working	93.6	93.7	95.6	91.3	89.6
Part-time	5.4	5.7	3.8	6.4	7.3
Full-time	0.9	0.6	0.6	2.3	3.2
Income (%)					
<151% FPL	67.8	86.2	52.7	29.1	34.0
>150% FPL	32.2	13.8	47.3	70.9	66.0

NOTES:

Significance based on two-tailed hypothesis test.

*** Significant different from non-enrollees at 0.01 level.

** Significant different from non-enrollees at 0.05 level.

* Significant different from non-enrollees at 0.10 level.

*** Significant different from VScript enrollees at 0.01 level.

*** Significant different from VScript enrollees at 0.05 level.

*** Significant different from VScript enrollees at 0.10 level.

*** Significant different from VScript Expanded enrollees at 0.01 level.

*** Significant different from VScript Expanded enrollees at 0.05 level.

*** Significant different from VScript Expanded enrollees at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. Age and gender are obtained from the Enrollment Data Base. All other variables are self-reported data from the survey.

PROGRAM: snv01r h07r snv05r

Enrollees are substantially poorer than nonenrollees. While two-thirds of enrollees have an income 150 percent FPL or lower, the opposite is true for nonenrollees. This suggests that enrollment penetration is greatest among the lowest income populations, who presumably have the greatest need for assistance. Consistent with the income eligibility criteria for each of the programs, VHAP Pharmacy enrollees have the lowest incomes while VScript Expanded have the highest incomes.²²

Health Status

Based on several different indicators, enrollees are in poorer health than nonenrollees (*Table 4-2*). They are substantially more likely to report themselves as being in fair or poor health (39 percent compared to 29 percent), and less likely to say they are in excellent or very good health (26 percent compared to 35 percent). Similarly, they are more likely to say they are in worse health compared to others their own age and less likely to say they are in better health. They are also more likely to report that they have specific clinical conditions that are likely to require treatment with prescription medications, including hypertension; heart disease; diabetes; arthritis; osteoporosis; depression; and stomach ulcers, heartburn or reflux. Enrollees are both less likely to say their health is the same as it was a year ago, and more likely to say it is either better or worse. Interestingly, despite the sociodemographic differences, there are generally no differences in health status between enrollees in the three programs. To the extent there are differences, there is no clear pattern across programs. While VScript and VScript Expanded might have been expected to enroll a sicker population because they target drugs for chronic conditions, previous analyses showed little difference between programs in the types of drugs purchased (Gilman, et al., 2003).

Prescription Drug Utilization

Enrollees were asked a series of questions about their prescription drug utilization during the year prior to enrolling in the pharmacy assistance programs, while nonenrollees were asked comparable questions about the year prior to the survey. More than two-thirds of enrollees had been in the pharmacy assistance for two or more years. Therefore, it is possible that their recall of utilization is less accurate than that of nonenrollees. Secular changes in patterns of prescription drug utilization could also influence differences between enrollees and nonenrollees.²³ *Table 4-3* displays the responses to the questions. We only report differences from nonenrollees for enrollees overall because there were generally no differences between enrollees in the different programs.

²² It is likely that there is error in reporting of income. Individuals with incomes at or below 150 percent FPL are eligible for VHAP, but 53 percent of VScript enrollees and 29 percent of VScript Expanded enrollees report incomes this low. In addition, 14 percent of VHAP enrollees report incomes greater than 150 percent FPL, which would disqualify them for VHAP. Although reporting of income appears problematic, differences in the distribution of reported income across programs is consistent with eligibility criteria (i.e., VHAP has the highest percentage of enrollees with incomes 150 percent FPL or lower, while VScript Expanded has the lowest percentage).

²³ We compared self-reported utilization for enrollees based on their length of enrollment in the pharmacy assistance program. We found few differences between different enrollee cohorts. However, beneficiaries who had been enrolled five or more years were less likely to report out-of-pocket expenditures over \$50 and less likely to say they needed help paying for medications.

Table 4-2
Self-reported health status of pharmacy assistance program enrollees
and eligible nonenrollees

	Enrollees				Eligible nonenrollees (N=879)
	All (N=1,346)	VHAP Pharmacy (N=461)	VScript (N=476)	VScript Expanded (N=409)	
Self-reported health status (%)	***	***	***	**	
Excellent/very good	25.6	26.2	22.9	27.1	34.7
Good	35.0	34.9	35.3	35.1	36.4
Fair/poor	39.4	38.9	41.8	37.9	28.9
Health compared to 1 year ago (%)	***	**	*	*	
Better	14.0	14.6	13.2	13.0	10.6
Same	63.9	63.5	64.6	64.6	71.8
Worse	22.1	21.9	22.2	22.5	17.6
Health compared to most your age (%)	***	***	***	***	
Better	43.5	43.5	44.1	42.6	54.0
Same	44.7	44.7	44.1	45.3	39.0
Worse	11.9	11.8	11.8	12.1	7.0
Clinical conditions (% with)					
Hypertension	67.0	67.5 ^{***}	66.1 ^{***}	66.4 ^{***}	56.1
Heart disease	41.1	38.1 ^{**, € € €}	48.4 ^{***, #}	42.1 ^{***}	31.4
Emphysema, asthma or COPD	16.8	16.3	18.7	16.2	15.1
Cancer or other malignancy	18.7	18.4	18.6	19.6	17.8
Diabetes	22.8 ^{***}	24.1 ^{***}	21.1 ^{**}	20.9 ^{**}	15.9
Arthritis	64.3 ^{***}	64.6 ^{***}	63.9 ^{***}	64.0 ^{***}	53.0
Osteoporosis	22.4 ^{**}	21.7	20.8 [#]	26.5 ^{***}	17.9
Depression	22.0 ^{**}	21.3	23.4 ^{**}	22.5 [*]	17.4
Stomach ulcer, heartburn, reflux	32.7 ^{**}	30.5	36.7 ^{***}	34.9 ^{**}	27.1

NOTES:

Significance based on two-tailed hypothesis test.

*** Significantly different from nonenrollees at 0.01 level.

** Significantly different from nonenrollees at 0.05 level.

* Significantly different from nonenrollees at 0.10 level.

€ € € Significantly different from VScript enrollees at 0.01 level.

€ € Significantly different from VScript enrollees at 0.05 level.

€ Significantly different from VScript enrollees at 0.10 level.

Significantly different from VScript Expanded enrollees at 0.01 level.

Significantly different from VScript Expanded enrollees at 0.05 level.

Significantly different from VScript Expanded enrollees at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: snv01r h07r

Table 4-3
Self-reported prescription drug utilization of pharmacy assistance program
enrollees and eligible nonenrollees¹

	Enrollees ²	Eligible nonenrollees
	(N=1,346)	(N=879)
Had prescriptions filled or refilled (%)	84.0	84.3
Number of different medications ³ (%)	***	
Less than five	57.3	56.4
5-10	38.9	33.3
11-20	2.9	6.2
More than 20	0.9	4.2
Monthly out-of-pocket costs (%)	***	
\$0	18.7	16.6
\$1-49	26.2	35.0
\$50-199	36.3	32.5
\$200-399	15.3	11.1
More than \$400	3.5	4.9
Did not fill prescription because could not afford it (%)	21.6***	6.8
Skipped doses to make medication last longer (%)	17.9***	11.0
Took less than prescribed to make medication last longer (%)	16.6***	9.3
Spent less on food, heat, other basic needs to pay for medication (%)	26.4***	8.9
Family or friend helped pay for medication (%)	11.9***	3.8

NOTES:

Significance based on two-tailed hypothesis test.

¹ For enrollees, utilization is year prior to enrollment in pharmacy assistance program. For nonenrollees, utilization is year prior to survey

² Responses for VHAP Pharmacy, VScript and VScript Expanded enrollees are not shown separately because there were generally no differences between programs.

³ For those with some prescription drug use.

*** Significantly different at 0.01 level.

** Significantly different at 0.05 level.

* Significantly different at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: snv01r snv09r

Most survey respondents had at least one prescription filled or refilled during a 12 month period (84 percent) and there was no difference between enrollees and nonenrollees.²⁴ Contrary to expectations, nonenrollees were more likely to use large numbers of different medications (11 or more). On the other hand, the cost of prescription drugs posed a greater financial burden for enrollees. Enrollees were somewhat more likely to have monthly out-of-pocket costs for prescription drugs in excess of \$50 (55 percent compared to 49 percent for nonenrollees).²⁵ Over 20 percent said that, during the year prior to enrolling, they did not fill a prescription because they could not afford it. In contrast, only 7 percent of nonenrollees report not being able to fill a prescription. More than one-quarter of enrollees cut back on basic needs such as food and heat in order to pay for their medications, compared to 9 percent of nonenrollees. Enrollees were three times more likely than nonenrollees to have needed help from their families or friends to pay for their medications. There were also more likely to take actions to stretch their medications, either skipping doses or taking less than prescribed.

Not surprisingly, having prescription drug coverage has a significant impact on utilization and the financial burden of paying for drugs. Compared to those without prior drug coverage, enrollees who had drug coverage before enrolling were more likely to have at least one prescription filled or refilled, but less likely to have out-of-pocket expenses over \$50 (results not shown). They were also less likely to say they had not filled a prescription due to cost, had taken less than prescribed to stretch their medications, had cut back on basic needs to pay for medications, and needed help paying for medications.

Crowd-out

One of the concerns about programs such as Vermont's pharmacy assistance programs is that people will drop other forms of prescription drug coverage in order to receive publicly-subsidized services. Only 20 percent of enrollees had any type of prescription drug coverage during the year prior to enrolling in Vermont's pharmacy assistance program (*Table 4-4*), whereas 63 percent of nonenrollees had coverage at the time of the survey. Nonenrollees were also more likely to have a prescription drug discount card at the time of the survey (28 percent vs. 19 percent of enrollees in the year prior to enrolling). Among those with prescription drug coverage, the most common types for both groups were employer, union or retiree coverage (36 percent for enrollees and 38 percent for nonenrollees) and individually purchased Medigap plans (28 percent enrollees and 38 percent nonenrollees). Approximately 14 percent of those with coverage in both groups received coverage through the Veteran's Administration (VA) and 13 percent of enrollees with coverage had been eligible for Medicaid (compared to 2 percent of nonenrollees). Both enrollees and nonenrollees had been covered for a long period of time, most commonly 5 years or more (results not shown). Among those with coverage, relatively few enrollees and nonenrollees had more than one type of prescription drug coverage (13 percent and 16 percent, respectively).

²⁴ Among enrollees in the different programs, VScript Expanded enrollees were the most likely to have had at least one prescription and they were significantly more likely than nonenrollees to have a prescription (results not shown).

²⁵ VScript Expanded enrollees were more likely than VHAP and VScript enrollees to have out-of-pocket expenses over \$50 per month; VScript enrollees had higher out-of-pocket expenses than VHAP enrollees. This differences from nonenrollees found for enrollees overall held for VScript and VScript Expanded enrollees, but not VHAP enrollees.

Table 4-4
Self-reported prescription drug coverage of pharmacy assistance program
enrollees and eligible nonenrollees¹

	Enrollees ² (N=1,346)	Eligible nonenrollees (N=879)
Had prescription drug coverage (%)	19.8 ***	63.1
<u>Type of coverage³</u>		
Medigap (%)	27.7 **	38.4
Employer, union, or retiree health coverage (%)	35.7	38.4
VA benefits (%)	13.5	13.9
Tricare (%)	0.9 **	2.9
Medicaid (%)	13.3 ***	2.2
Medicare+Choice (%)	2.9	1.3
Had multiple types of prescription drug coverage ³ (%)	13.4	16.2
Had prescription drug discount card (%)	19.2***	28.1

NOTES:

Significance based on two-tailed hypothesis test.

¹ For enrollees, drug coverage is year prior to enrollment in pharmacy assistance program. For nonenrollees, drug coverage is at time of survey

² Responses for VHAP Pharmacy, VScript, and VScript Expanded are not shown separately because there were generally no differences between programs.

³ For those with prescription drug coverage.

*** Significantly different at 0.01 level.

** Significantly different at 0.05 level.

* Significantly different at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: snv01r snv09r

There were largely no significant differences in prior prescription drug coverage between the enrollees in the three programs (results not shown). However, VScript Expanded enrollees were more likely than VHAP Pharmacy and VScript enrollees to have had a prescription drug card in the year prior to enrolling. We found some differences in prior drug coverage among enrollees based on the length of time they had been enrolled in the program. More recent enrollees who had been in the program less than two years were more likely to report that they had prescription drug coverage during the year prior to enrolling. They were also more likely to have had a drug discount card.

Enrollees were asked a series of questions to ascertain whether they still have prescription drug coverage outside of the pharmacy assistance program and, if not, the reason they no longer have coverage. Most enrollees that previously had private coverage currently have coverage only through the pharmacy assistance program (*Table 4-5*). For example, only 10 percent of those who had this coverage in the past retained their employer, union or retiree coverage. Just over one-third kept their Medigap coverage.²⁶ Among those with who no longer have their prior coverage, almost three-quarters enrolled immediately in the pharmacy assistance program and experienced no break in coverage.

Most people who no longer had Medigap coverage, dropped it voluntarily (90 percent) and about half of these dropped it to join the pharmacy assistance program. Although the pharmacy assistance program crowded-out private coverage for a high percentage of enrollees who had Medigap coverage, only about 5 percent of enrollees had Medigap coverage prior to enrolling. As a result, the magnitude of crowd-out is small. In contrast, only 30 percent voluntarily dropped their employment-based coverage and just over a quarter of these dropped their coverage to join the pharmacy assistance program. Among those who dropped their coverage for reasons other than enrolling in the pharmacy assistance program, by far the most common reason was the cost of their premiums.

Enrolling in the Pharmacy Assistance Program

Enrollment in the pharmacy assistance programs is quite stable. Over half of the enrollees had been enrolled 2-5 years and 17 percent were enrolled five or more years (*Table 4-6*). As discussed previously, only 20 percent of enrollees had prescription drug coverage during the year prior to enrolling in the pharmacy assistance program. Indeed, 60 percent had never had prescription drug coverage at any time. VHAP Pharmacy enrollees were substantially less likely than VScript or VScript Expanded enrollees to have had coverage in the past.

²⁶ People with other forms of prescription drug coverage are not permitted to enroll in the pharmacy assistance program. Therefore, it appears that there was some confusion in responding to these questions. However, given the small numbers of enrollees that had prescription drug coverage prior to enrolling, the actual number of respondents who apparently incorrectly reported that they retained their coverage is small. For example, 20 people reported that they still had a Medigap policy and 10 reported that they still had employer, union or retiree coverage.

Table 4-5
Effect of enrollment in pharmacy assistance program
on self-reported other prescription drug coverage by type of coverage¹

<u>Medigap</u>	
No longer have coverage ² (%)	64.9
No longer have coverage because beneficiary dropped coverage ³ (%)	89.2
Dropped because enrolled in pharmacy assistance program ⁴ (%)	52.6
Reason dropped, if not because enrolled in pharmacy assistance program: ⁵	
Cost of prescriptions/copays (%)	15.5
Cost of premiums (%)	72.5
Prescription drug was not covered (%)	0.0
Too many drug restrictions/no brand name drugs (%)	0.0
Other (%)	14.7
 <u>Employer/union/retiree</u>	
No longer have coverage ² (%)	89.7
No longer have coverage because beneficiary dropped coverage ³ (%)	29.7
Dropped because enrolled in pharmacy assistance program ⁴ (%)	26.4
Reason dropped, if not because enrolled in pharmacy assistance program: ⁵	
Cost of prescriptions/copays (%)	22.3
Cost of premiums (%)	63.5
Prescription drug was not covered (%)	0.0
Too many drug restrictions/no brand name drugs (%)	0.0
Other (%)	2.8
 Immediately enrolled in pharmacy assistance program when coverage ended (%)	 73.4

NOTES:

- ¹ Responses for VHAP Pharmacy, VScript, and VScript Expanded are not shown separately because there were generally no differences between programs.
- ² Denominator is those that had coverage.
- ³ Denominator is those that had coverage but no longer have it.
- ⁴ Denominator is those that had coverage but no longer have it because they dropped it.
- ⁵ Denominator is those that had coverage and dropped it for reasons other than enrolling in the pharmacy assistance programs. Respondents could answer yes to more than one reason.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: h12 snv07

Table 4-6
Self-reported enrollment in pharmacy assistance programs

	All Enrollees (N=1,346)	VHAP Pharmacy (N=461)	VScript (N=476)	VScript Expanded (N=409)
<u>Length of time enrolled (%)</u>		ε, ###	###	
Less than one year	13.4	11.8	10.4	19.4
At least one year, less than 2	17.8	16.8	14.1	21.8
At least 2 years, less than 5	51.6	48.5	57.2	50.8
Five or more years	17.2	22.9	18.3	8.0
<u>Time without drug coverage before enrolling (%)</u>		εεε, ##		
Less than one year	4.0	4.2	3.1	4.5
At least one year, less than two	5.1	4.6	5.2	6.5
At least two years, less than five	9.4	8.7	9.1	12.2
Five years or more	21.8	17.2	29.7	26.8
Never had drug coverage	59.6	65.3	53.0	50.0
<u>Reason for enrolling¹</u>				
Didn't have drug coverage (%)	84.5	84.1	85.6	81.6
Lost your drug coverage (%)	14.4	11.5 ^{##}	14.6	16.9
Couldn't afford drug coverage (%)	78.2	77.3	80.0	76.8
Spouse was enrolled (%)	20.8	19.1	22.7 ^{###}	16.8
Needed prescription drugs because of a new condition or change in treatment for an existing condition (%)	61.8	61.4	61.7	57.6
Wanted the protection of drug coverage in the future (%)	90.7	90.0	92.3 ^{###}	86.5
Other (%)	6.9	6.0 [#]	7.1	9.5

NOTES:

Significance based on two-tailed hypothesis test.

εεε Significantly different from VScript enrollees at 0.01 level.

εε Significantly different from VScript enrollees at 0.05 level.

ε Significantly different from VScript enrollees at 0.10 level.

Significantly different from VScript Expanded enrollees at 0.01 level.

Significantly different from VScript Expanded enrollees at 0.05 level.

Significantly different from VScript Expanded enrollees at 0.10 level.

¹ Respondents could answer yes to more than one reason.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM:snv01 snv05 snv07

Not surprisingly, then, over 80 percent of enrollees said they enrolled in the program because they did not have drug coverage. Nearly 80 percent enrolled because they could not afford other drug coverage. For about 60 percent of enrollees, the decision to join the program was precipitated by a specific medical need, either the diagnosis of a new condition or a change in treatment for an existing condition. However, over 90 percent said they wanted the protection of drug coverage in the future. There were generally few differences across programs in the reasons for enrolling.

Enrollees were asked how they learned about Vermont's pharmacy assistance program (*Table 4-7*). By far the most common ways were through information included in the state tax package and personal contacts with friends, neighbors, or relatives (mentioned by 26 percent each). About 10 percent of respondents said they had received information through a medical provider or through a mailing. Information in the state tax package and personal contacts were the most common sources of information for enrollees in all three programs. However, consistent with their lower income, VHAP Pharmacy enrollees were more likely to receive information from medical assistance program workers or medical case workers.

Reasons for Not Enrolling

Although most nonenrollees are simply not aware of the pharmacy assistance program, 43 percent have heard about them (*Table 4-8*). The vast majority of those who had heard about the program (84 percent) had never applied for coverage. Of those who had not applied, the most common reasons were that the individual already had prescription drug coverage (43 percent) or did not think she was eligible (24 percent). Of the 26 percent who had applied in the past, about half had never enrolled, mainly because they were not eligible. Of those that had been enrolled in the past, 70 percent were no longer enrolled because their income increased and they lost eligibility. About 10 percent disenrolled because of the cost-sharing payments.²⁷

Unlike other public assistance programs, the pharmacy assistance programs appear to have widespread acceptance among the potentially eligible population. Only one-third of nonenrollees indicated that they would not apply for the program if they were eligible. Among those who would not apply, the main reason was that they already had prescription drug coverage (63 percent). Almost one-third felt they do not need drug coverage, either because they do not need prescription drugs (14 percent) or because they can afford to pay for their medications (17 percent). Only 4 percent cited the stigma of being on public assistance and 1 percent viewed the paperwork as a barrier.

²⁷ Vermont began charging premiums for its pharmacy assistance programs in early 2004. Although enrollment fell following the introduction of premiums, particularly in VScript Expanded, tabulations by the State of Vermont indicate that it increased shortly thereafter (PATH, 2004). Disenrollees were substantially less likely than those who remained enrolled to have a chronic condition (identified based on prescription drug claims) and nearly half had not filled any prescriptions through the programs during 2003. A survey of disenrollees found that 39-45 percent (depending on the program) dropped their coverage because of the premium cost; however, more than one-quarter had other insurance available to them (PATH, 2004).

**Table 4-7
How enrollees learn about the pharmacy assistance program¹**

	All enrollees (N=1,346)	VHAP Pharmacy (N=461)	VScript (N=476)	VScript Expanded (N=409)
Information in state tax package (%)	25.8	19.6 ^{€€€}	31.9 ^{##}	24.5
Radio/tv/newspaper (%)	5.6	3.9	6.1	6.1
Poster or billboard (%)	0.7	0.2	1.3	0.3
Friend/neighbor/relative (%)	26.4	25.8	25.3	29.4
Church, community group, or senior center (%)	4.9	7.4 ^{###}	5.3 [#]	2.7
Medicare or Medicaid assistance program worker (%)	7.3	10.7 ^{€€€,###}	5.0	5.2
Doctor's office, clinic or hospital (%)	9.2	9.1	8.4	8.4
Pharmacist (%)	6.8	6.3 [#]	5.8	10.3
Medical case worker or social service program (%)	4.2	6.9 ^{€€,##}	3.0	3.0
Mailing (%)	9.6	13.1	8.8	8.9
Insurance company (%)	3.8	1.4 ^{€€,##}	3.8	5.4
Other (%)	2.5	1.5	2.3	3.2

NOTES:

Significance based on two-tailed hypothesis test.

^{€€€} Significantly different from VScript enrollees at 0.01 level.

^{€€} Significantly different from VScript enrollees at 0.05 level.

[€] Significantly different from VScript enrollees at 0.10 level.

^{###} Significantly different from VScript Expanded enrollees at 0.01 level.

^{##} Significantly different from VScript Expanded enrollees at 0.05 level.

[#] Significantly different from VScript Expanded enrollees at 0.10 level.

¹ Respondents could answer yes to more than one information source.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.
PROGRAM: SHVA04SR

Table 4-8
Interest in pharmacy assistance programs among eligible nonenrollees

Have heard about the program (%)	42.6
Of those who have heard, never applied (%)	84.2
Reason never applied: ¹	
Didn't think eligible for program (%)	23.9
Didn't want to complete paperwork (%)	0.8
Didn't want to be on public assistance (%)	1.9
Didn't need prescription drugs (%)	15.6
Already had drug coverage (%)	42.9
Can afford prescription drugs on own (%)	13.9
Not necessary/not interested/hasn't bothered (%)	3.1
Other (%)	2.8
Of those who applied, were never enrolled (%)	51.2
Reason never enrolled: (%)	
Wasn't eligible	63.4
Got drug coverage from another source	15.6
Other	21.0
Of those who were enrolled, reason no longer enrolled: (%)	
Income increased	68.9
Got drug coverage on my own	9.4
Didn't like the fees	10.5
Forgot to re-apply	3.8
Problem getting pharmacy to serve me	3.8
Other	3.5
Would not apply for program if eligible (%)	32.8
Reason would not apply: ¹	
Don't want to complete paperwork (%)	1.1
Don't want to be on public assistance (%)	3.8
Don't need prescription drugs (%)	14.2
Already have drug coverage (%)	62.8
Can afford drugs/not worth it (%)	16.5
Other (%)	5.6

NOTES: ¹ Respondents could answer yes to more than one reason.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: SHVA04SR

4.3.2 Regression Results

Results from the logistic regression for the probability of enrolling in the prescription drug program are shown in *Table 4-9*. As expected, older individuals are more likely to enroll than younger ones; the odds of enrolling are more than 60 percent greater for a person age 85 and over, compared to one under the age of 74. Also as predicted, people with incomes over 150 percent FPL have only one-quarter the odds of enrolling compared to those with lower incomes. Surprisingly, the likelihood of enrolling decreases with greater education, and the odds of enrolling for people with some post-high school education is only about half that of people who did not graduate from high school. Although we expected that people with more education would be more aware of the program and better able to negotiate the application process, level of education may capture unmeasured health status differences. In addition, more educated people may be better able to find alternative ways of meeting their prescription drug needs. People who live alone are more likely to enroll, although this result is only significant at $p < .10$. Although this result was unexpected, it may be that people who live alone have fewer alternative resources to help them obtain prescription drugs and, therefore, greater need for the assistance offered by these programs. Gender did not have a significant effect on the probability of enrolling.

The multivariate results confirm the descriptive findings that pharmacy assistance programs are subject to adverse selection and sicker individuals are more likely to enroll in these programs. The odds of enrolling are 75 percent greater for individuals who consider themselves to be in fair or poor health compared to those who rate their health as excellent or very good. In addition, the odds of enrolling are 70 percent greater for people who report that they have hypertension. Having heart disease and arthritis also increase the likelihood of enrolling, but these results are only marginally significant.²⁸

On the other hand, as we found in the descriptive analyses, greater utilization of prescription drugs does not increase the likelihood of enrolling.²⁹ Compared to people who do not use any medications, those who use 11 or more medications during the year have only one-fifth the odds of enrolling. Although this was not our initial hypothesis, it may be that people who have high levels of prescription drug utilization have found ways to access needed medications, while low levels of utilization indicate unmet needs.³⁰ Indeed, people for whom purchasing prescription drugs poses a significant financial burden are substantially more likely to enroll. Those who report that they have to forgo other basic needs to pay for their prescriptions have three times greater odds of enrolling, while needing assistance from family or friends to pay

²⁸ Health status is reported at the time of the survey. To the extent that having access to prescription drugs improves health status, current health status may be endogenous to program enrollment. However, the expected direction of the bias caused by this endogeneity indicates that our finding that people in poorer health are more likely to enroll is, if anything, understated. Furthermore, this finding holds for most of the clinical conditions included in our survey. Because these conditions are chronic, they should be less subject to this endogeneity.

²⁹ Recall that utilization for enrollees is reported for the year prior to enrolling and, therefore, is not subject to endogeneity.

³⁰ Because of the long recall period for many enrollees, utilization may not be reported accurately. If enrollees tend to under-report their utilization, this would bias the results toward a negative relationship between increasing utilization and the probability of enrolling. However, as described earlier, we did not find significant differences in self-reported pre-enrollment prescription drug utilization between long-term enrollees, who have lengthy recall periods, and recent enrollees whose recall period is more similar to nonenrollees.

Table 4-9
Factors predicting enrollment in pharmacy assistance program

	Odds Ratio	Std. Errors
<u>Age</u>		
75-84	1.323 *	(.194)
85+	1.639 **	(.366)
Female	1.125	(.181)
Lives alone	1.369 *	(.226)
<u>Education</u>		
High school only	0.863	(.153)
Some post-high school	0.562 ***	(.117)
Income > 150% FPL	0.281 ***	(.040)
<u>Health status</u>		
Good	1.224	(.237)
Fair/poor	1.748 ***	(.366)
<u>Clinical conditions</u>		
Hypertension	1.711 ***	(.281)
Heart disease	1.356 *	(.237)
Emphysema, asthma or COPD	1.056	(.237)
Cancer or other malignancy	1.012	(.216)
Diabetes	1.237	(.244)
Arthritis	1.311 *	(.214)
Osteoporosis	0.934	(.186)
Depression	1.126	(.227)
Stomach ulcer, heartburn, reflux	1.153	(.210)
<u>Number of different medications¹</u>		
1-4	1.070	(.275)
5-10	0.817	(.242)
11+	0.185 ***	(.093)
Skipped doses to make medication last longer ¹	0.780	(.215)
Took less than prescribed to make medication last longer ¹	1.312	(.381)
Spent less on food, heat, other basic needs to pay for medication ¹	3.001 ***	(.701)
Family or friend helped pay for medication ¹	2.282 **	(.763)
Prescription drug coverage ²	0.150 ***	(.024)
Prescription drug discount card ²	0.758	(.130)
Sample size	1,571	

NOTES:

Significance based on two-tailed hypothesis test.

¹ Response refers to year prior to enrollment in pharmacy assistance program for enrollees and year prior to survey for nonenrollees.

² For enrollees, response is year prior to enrollment in pharmacy assistance program. For nonenrollees, response is at time of survey.

Standard errors in parentheses.

*** Significantly different at 0.01 level.

** Significantly different at 0.05 level.

* Significantly different at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. Age and gender are obtained from the Enrollment Data Base. All other variables are self-reported data from the survey.

PROGRAM: snv11

for drugs more than doubles the odds of enrolling. However, unlike the descriptive results, people who report skipping doses or taking less than the prescribed amount to make their medication last longer were not more likely to enroll.

People with alternate ways of paying for prescription drugs are much less likely to enroll in Vermont's pharmacy assistance program. The odds that a person with another source of prescription drug coverage would enroll in the pharmacy assistance programs are only 15 percent of the odds for a person with no drug coverage. Having a prescription drug discount card also decreases the odds of enrolling, but this result is not statistically significant.

We also ran the multivariate model, comparing enrollees in each of the three programs separately to nonenrollees (results not shown). Findings from the multivariate model predicting enrollment in the VHAP Pharmacy program were comparable to findings for the overall enrollee population, although the effects were often stronger and more highly significant in the model restricted to VHAP Pharmacy enrollees. However, having heart disease and arthritis, which were marginally significant in the model including all enrollees, were no longer significant in the VHAP Pharmacy model. The results of the model for the VScript program were also similar to the overall model, but several variables became insignificant (being age 85 and over, living alone, having post-high school education, and needing help from friends or family paying for prescription drugs). On the other hand, having a prescription had a marginally significant ($p < .10$) negative effect on the probability of enrolling and having heart disease had a larger, more significant ($p < .01$) positive effect on enrollment. There were few significant variables in the model predicting enrollment in VScript Expanded, with the exception of having prescription drug coverage (which reduced the likelihood of enrolling) and cutting back on basic needs to pay for medications (which increased the likelihood of enrolling).

4.3.3 Comparison of Eligible and Near-eligible Populations

Although the eligibility criteria for Vermont's pharmacy assistance program are relatively generous, individuals in higher income groups may still face barriers to accessing needed prescription drugs and the cost of drugs may still pose a substantial burden for them. However, it is possible that needs for prescription drugs and drug coverage change with increasing income. In order to understand the implications of expanding eligibility to somewhat higher income populations, we compared individuals who meet the eligibility criteria for Vermont's pharmacy assistance programs with those whose incomes slightly exceed the eligibility criteria. For these comparisons, individuals in the eligible group include enrollees and nonenrollees with incomes 225 percent FPL and below. The near-eligible group includes nonenrollees with incomes 226-300 percent FPL.

As shown in *Table 4-10*, the demographic characteristics of the eligible and near-eligible populations differ substantially. Near-eligibles are younger, less likely to be female, more likely to be married, less likely to live alone, and more likely to live in their own home. They are substantially more educated and more likely to be employed on a full-time or part-time basis. Near-eligibles also report that they are in better health (*Table 4-11*). They are more likely than eligibles to say that they are in excellent or very good health and they are more likely to describe themselves as being in better health than others their own age. However, there were fewer differences in the likelihood of having certain clinical conditions. Near-eligibles were less likely

Table 4-10
**Self-reported sociodemographic characteristics of pharmacy assistance
program eligibles and near-eligibles**

	Eligibles (N=1,822)	Near -eligibles (N=445)
Age (%)		**
65-74	45.0	52.3
75-84	41.1	37.9
85+	14.0	9.8
Age (mean)	76.1	74.8 ***
Female (%)	63.3	54.3 ***
Marital Status (%)		***
Married/civil union	47.7	61.1
Widowed	40.0	27.7
Divorced	7.2	6.4
Separated	0.5	0.0
Never married	4.6	4.8
Live Alone (%)	37.1	25.8 ***
Living situation (%)		***
Nursing home	0.1	0.2
Group home	1.3	0.9
Assisted living facility	3.0	1.1
With relative in their home	7.3	2.6
Apartment or house that you own or rent	88.1	95.2
Other	0.1	0.0
Education (%)		***
Less than high school	34.7	15.3
High school only	41.3	44.4
Some post-high school	24.0	40.3
Employment Status (%)		***
Not working	90.9	83.1
Part-time	6.9	12.0
Full-time	2.2	4.9

NOTES:

Significance based on two-tailed hypothesis test.

*** Significantly different from eligibles at 0.01 level.

** Significantly different from eligibles at 0.05 level.

* Significantly different from eligibles at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. Age and gender are obtained from the Enrollment Data Base. All other variables are self-reported data from the survey.

PROGRAM: snv22 snv24

Table 4-11
Self-reported health status of pharmacy assistance program
eligibles and near eligibles

	Eligibles (N=1,822)	Near-eligibles (N=445)
Self-reported health status (%)		***
Excellent/very good	31.1	40.0
Good	35.3	36.3
Fair/poor	33.6	23.7
Health compared to 1 year ago (%)		
Better	11.9	9.9
Same	69.0	73.1
Worse	19.1	17.0
Health compared to most your age (%)		**
Better	51.3	60.0
Same	40.2	33.1
Worse	8.5	6.9
Clinical conditions (% with)		
Hypertension	59.1	59.4
Heart disease	36.1	31.6
Emphysema, asthma or COPD	16.5	13.8
Cancer or other malignancy	18.6	24.5 **
Diabetes	18.5	15.8
Arthritis	58.3	52.5 *
Osteoporosis	20.6	16.4
Depression	20.1	12.9 ***
Stomach ulcer, heartburn, reflux	29.8	26.2

NOTES:

Significance based on two-tailed hypothesis test.

*** Significantly different from eligibles at 0.01 level.

** Significantly different from eligibles at 0.05 level.

* Significantly different from eligibles at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: snv22

to report that they have depression and less likely to have arthritis (although the latter difference is only significant at $p < .10$). On the other hand, near-eligibles were significantly more likely to report that they have cancer.

Near-eligibles have greater use of prescription drugs than eligible individuals (*Table 4-12*). They are more likely to have had a prescription filled during a 12-month period, although there is no difference in the number of different medications used.³¹ There is not a consistent pattern for monthly out-of-pocket costs. Near eligibles are less likely to have no out-of-pocket costs, but also less likely to have very high out-of-pocket expenses (\$200 or more per month). Obtaining prescription drugs posed less financial stress for near-eligibles. They were substantially less likely to not fill a prescription because they could not afford it, less likely to skip doses or take less than prescribed to make medications last longer, less likely to cut back on other basic needs to pay for medications, and less likely to need help paying for medications.

The near-eligible population is far more likely to have alternatives to public programs for obtaining prescription drug coverage.³² While less than half of the eligible population had some type of prescription drug coverage, nearly two-thirds of the near-eligible population had coverage (*Table 4-13*). For those with prescription drug coverage, there were generally few significant differences between the eligible and near-eligible populations in the type of coverage. Near-eligibles were also more likely to have a drug discount card.

4.4 Conclusions

Our findings indicate that Vermont's pharmacy assistance programs enroll the most vulnerable individuals among the populations eligible for coverage. Enrollees are older, less educated, lower income, and more likely to live alone than eligible nonenrollees. Sicker individuals, based on both self-reported general health status and having certain chronic conditions, are more likely to enroll in the program. People for whom purchasing prescription drugs creates the greatest financial stress are also more likely to enroll. Although people who used fewer medications prior to enrolling are more likely to enroll, in light of their poorer health status, this lower level of use may indicate greater unmet need. Indeed, for 60 percent of enrollees, the decision to enroll was driven by a medical need. However, future security provided by prescription drug coverage was an important factor for nearly all enrollees. In addition to enrolling those eligible individuals with the greatest need for public prescription drug coverage, Vermont's program is targeted to the population with greatest need. Compared to people whose incomes slightly exceed the eligibility criteria for the pharmacy assistance program, eligible individuals are more likely to come from vulnerable sociodemographic groups, are in poorer health, face greater financial stress from purchasing prescription medications, and are less likely to have an alternative to public drug coverage.

³¹ As in Table 4-3, utilization for enrollees is reported for the year prior to enrollment in the pharmacy assistance program. Utilization for eligible and near-eligible nonenrollees is reported for the year prior to the survey.

³² Drug coverage for enrollees is reported for the year prior to enrolling in the pharmacy assistance program, while coverage for eligible and near-eligible nonenrollees is reported at the time of the survey.

Table 4-12
Self-reported prescription drug utilization of pharmacy assistance program
eligibles and near eligibles¹

	Eligibles (N=1,822)	Near-eligibles (N=445)
Had prescriptions filled or refilled (%)	84.3	89.3 **
Number of different medications ² (%)		
Less than five	56.6	60.8
5-10	35.3	34.8
11-20	5.5	3.0
More than 20	2.6	1.4
Monthly out-of-pocket costs (%)		*
\$0	16.7	11.0
\$1-49	31.6	35.7
\$50-199	34.1	38.5
\$200-399	13.0	11.6
More than \$400	4.7	3.3
Did not fill prescription because could not afford it (%)	13.3	4.3 ***
Skipped doses to make medication last longer (%)	14.8	5.9 ***
Took less than prescribed to make medication last longer (%)	13.0	7.3 ***
Spent less on food, heat, other basic needs to pay for medication (%)	16.5	2.8 ***
Family or friend helped pay for medication (%)	7.4	1.1 ***

NOTES:

Significance based on two-tailed hypothesis test.

*** Significantly different from eligibles at 0.01 level.

** Significantly different from eligibles at 0.05 level.

* Significantly different from eligibles at 0.10 level.

¹ For enrolled eligibles, utilization is year prior to enrollment. For non-enrolled eligibles and near-eligibles, utilization is year prior to survey.

² For those with some prescription drug use.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: snv22

Table 4-13
Self-reported prescription drug coverage of pharmacy assistance program
eligibles and near eligibles¹

	Eligibles (N=1,822)	Near- eligibles (N=445)
Had prescription drug coverage (%)	45.9	65.0 ***
<u>Type of coverage²</u>		
Medigap (%)	36.9	37.5
Employer, union, or retiree health coverage (%)	37.2	44.1
VA benefits (%)	13.1	13.0
Tricare (%)	2.1	6.5 ***
Medicaid (%)	3.5	0.3 ***
Medicare+Choice (%)	1.3	1.4
Had multiple types of prescription drug coverage ² (%)	15.5	17.3
Had prescription drug discount card (%)	25.2	30.4 *

NOTES:

Significance based on two-tailed hypothesis test.

*** Significantly different from eligibles at 0.01 level.

** Significantly different from eligibles at 0.05 level.

* Significantly different from eligibles at 0.10 level.

¹ For enrolled eligibles, utilization is year prior to enrollment. For non-enrolled eligibles and near-eligibles, utilization is year prior to survey.

² For those with some prescription drug coverage.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. All variables are self-reported data from the survey.

PROGRAM: snv22 snv24

We do not find evidence that crowd-out is a problem in Vermont's programs. Over four-fifths of enrollees said they joined the program because they did not have prescription drug coverage and nearly as many said they could not afford other forms of coverage. The results of our multivariate analyses showed that the odds of enrolling for a person with prescription drug coverage was only 15 percent that of a person without coverage.

If we assume that the pharmacy assistance programs crowded-out private insurance coverage for people who voluntarily dropped their coverage to join the pharmacy assistance program, the pharmacy assistance program can be considered to have crowded-out private insurance for about 30 percent of those with Medigap coverage and 7 percent of those with employment-based coverage. When we take into account the relatively small proportion of enrollees that had these types of coverage prior to enrolling, the potential crowd-out is even smaller, less than 2 percent and 1 percent, respectively. Pharmacy assistance programs such as Vermont's may also lead to crowd-out if they encourage employers to eliminate retiree and other sources of employment-based coverage. Nearly two-thirds of enrollees with employment-based coverage lost their prescription drug coverage involuntarily. Although the survey does not provide information on the reason for losing this coverage, it is plausible that employer crowd-out may have been a contributing factor. However, at most this would affect 4 percent of enrollees.

Enrolling eligible low-income populations in public assistance programs can be challenging. For example, previous studies have shown that many potentially eligible beneficiaries do not enroll in the Medicare Savings Programs (Haber et al., 2003; Moon et al., 1998; Actuarial Research Corporation, 2002), mainly because they are not aware that the programs exist. Indeed, nearly 80 percent of the population eligible for, but not enrolled in, the Medicare Savings Programs had never heard of them (Haber et al., 2003). Although lack of awareness is a barrier to enrolling people in Vermont's pharmacy assistance programs, nearly half of eligible nonenrollees were familiar with the program. Our findings indicate that a large portion of eligible nonenrollees either already have coverage or do not feel they need coverage. Additional common barriers to enrolling low-income populations, such as burdensome application procedures and welfare stigma, do not appear to be significant factors in the pharmacy assistance programs.

CHAPTER 5 ANALYSIS OF DRUG COSTS AND UTILIZATION

5.1 Introduction

Insurance plays an important role in ensuring access to services. While Medicare provides insurance coverage for most medical needs, it has only recently added a prescription drug benefit. The one exception has been in managed care plans where beneficiaries usually receive more generous benefits than in the traditional Medicare, including prescription drug coverage. However, even these benefits have been eroding since 2000 (Gold and Achman, 2001). Many beneficiaries have drug benefits through supplemental insurance policies, but these plans typically only cover a portion of the costs (National Bipartisan Commission, 1999). Lower income seniors may be able to access state pharmacy assistance programs to fill some of the gap in prescription drug coverage (Commonwealth, 2004). As of August 2003, 29 states offered some type of state pharmacy assistance program, either through a direct subsidy for the purchase of prescription drugs or through a discount program, and an additional 9 states authorized programs that are not yet in operation (National Council of State Legislatures, 2003). Among beneficiaries without prescription drug coverage, about 10 percent have a drug discount card (Eppig and Poisal, 2003).

Past research has shown that insurance coverage for drugs increases the demand for drugs (Coulson, et al., 1995) and access to more drugs. As expected, those with coverage pay less each year for their drugs and purchase more medications (Davis et al. 1999). Conversely, Soumerai et al., noted in past studies that higher out of pocket costs are associated with fewer prescriptions being filled (1987). Drug costs can be extremely burdensome, especially for the near-poor (incomes between \$10,000 and \$20,000) who don't qualify for Medicaid prescription drug coverage. Among them, nearly one in eight beneficiaries spent at least 10 percent of their income on out-of-pocket drug expenses in 1999 (Shea, Stuart, and Briesacher, 2003). And this population is likely to have higher prescription needs. More than 90 percent of the near-poor filled at least one prescription in 1999, and on average, they filled 25 prescriptions per year (Ibid). Many have chronic conditions and past research has shown that elderly populations with chronic conditions are likely to stretch their daily medications by taking them every other day or ever third day (American Heart Association, 1992).

State pharmacy assistance programs are intended to increase access to drugs and reduce unmet need in some of the most vulnerable populations. This chapter analyzes the impact of Vermont's three pharmacy assistance programs in increasing access to prescription drugs and reducing unmet need for their near-poor elderly populations. The data are from a survey of enrollees in Vermont's pharmacy assistance program and a comparison sample of eligible nonenrollees. The survey was designed to identify factors that explain differences in the number of prescriptions filled each year, out-of-pocket costs, and different responses to unmet demand, such as skipping or taking reduced dosages, or foregoing other necessities such as food or heat. Explanatory factors include sociodemographic characteristics, health status, medical conditions, insurance coverage, prescription drug utilization, and individual behavior changes in the prior 12 months. Among the policy issues addressed by these analyses are the extent to which pharmacy assistance programs provide coverage to populations who would otherwise ignore medical directives and possibly exacerbate chronic illness conditions. The following section describes the

survey data and the analytic methods used. We then describe the results of our descriptive and multivariate analyses. The chapter concludes with a summary of our findings, focusing on the effects of a state pharmacy assistance program on increasing access to prescription medication and reducing unmet need.

5.2 Data and Methods

5.2.1 Data and Sample

The analysis of drug utilization and unmet need uses data from a survey of enrollees in Vermont's three pharmacy assistance programs and a comparison group of nonenrollees. As described in Chapter 3, the enrollee sample was drawn from a frame of all Medicare beneficiaries over age 64 who were enrolled in any of the 3 state pharmacy assistance programs on October 31, 2003. An equal number of enrollees was sampled from each of Vermont's three pharmacy assistance programs to support comparisons across these groups, as well as separate comparisons of each group with nonenrollees.

The nonenrollee sample was drawn from a frame of all elderly Medicare beneficiaries residing in Vermont who were not enrolled in any of the pharmacy assistance programs, were not dually eligible, and were not enrolled in a Medicare managed care plan at any time during the previous year. Individuals with incomes under 300 percent of the federal poverty level (FPL) were eligible for the nonenrollee sample. A screener was used to identify nonenrollees for the sample based on self-reported income. In order to increase the likelihood of contacting nonenrollees who would meet the income criterion for the sample, information on Social Security benefits provided by the Social Security Administration was used to identify a subgroup of likely eligible beneficiaries. These likely eligibles were oversampled.³³

5.2.2 Methods

The drug utilization and unmet need analyses compare characteristics of individuals enrolled in Vermont's pharmacy assistance program with those of eligible nonenrollees in order to understand factors associated with higher drug utilization or unmet needs. As described previously, our survey involved a complex sample design. In order to adjust standard errors for this complex sample design, all analyses were conducted using the survey procedures in STATA.

We conducted both descriptive and multivariate analyses. Depending on the variable, our descriptive analyses involved three types of comparisons:

- Comparisons of enrollees in all three pharmacy assistance programs combined with eligible nonenrollees;

³³ This analysis includes beneficiaries in the non-enrollee group who have incomes between 225 percent -300 percent FPL. These near-eligibles were included in the sampling framework to increase the number of nonenrollees eligible for the survey. While they could not be included in enrollment analysis because they did not have the opportunity (ie, did not qualify) for the benefit, their expected expenses and responses are similar to those who do qualify but did not enroll. Hence they were included in these analyses but not the enrollment analyses.

- Separate comparisons of enrollees in each of the three programs with nonenrollees.³⁴
- Comparisons of non-enrollees with other prescription drug coverage to nonenrollees without additional coverage.

Multivariate regression methods were used to estimate the separate influence of various factors on drug utilization levels, monthly out-of-pocket costs, and unmet need responses, including skipping drugs or taking lower doses or not filling prescriptions because of high costs. The dependent variables were binary indicators (over/up to 20 prescriptions/year, out-of-pocket costs greater/less than \$200/month, skipped, reduced, or unfilled prescription dosages).³⁵

The basic regression models can be summarized as:

$$Y_i = \alpha + X_i\beta_1 + H_i\beta_2 + C_i\beta_3 + U_i\beta_4 + N_i\beta_5 + \varepsilon_i$$

where $Y_i = 1$ for respondents:

- a) with over 20 prescriptions filled per year; or
- b) with out-of-pocket costs equal or greater than \$200/month; or
- c) who skipped drugs or took less than prescribed; or
- d) who did not fill the prescription because of cost, respectively

0 otherwise;

X_i = a vector of sociodemographic characteristics;

H_i = a vector of health status measures;

C_i = a vector of insurance coverage measures;

and

ε_i = a random error term.

We report the odds ratio for each of the variables in our logistic regression models. An odds ratio greater than 1 indicates that the variable increases the likelihood of having more than 20 prescriptions filled per year, (or out of pocket costs greater than \$200 per month, skipping drugs/taking less than prescribed, or not filling a prescription because of cost) while variables

³⁴ Data were not available to identify which pharmacy assistance program nonenrollees would have qualified for. Therefore, enrollees in each of the programs are compared to all nonenrollees.

³⁵ The survey asked two sets of questions for both counts of the number of drugs taken and out-of-pocket costs. One was an absolute count and the second offered the response in a range of the counts. In the enrollment group, 78 percent left the continuous variable blank but responded to the categorical variable so the categorical variables were used in the models to maintain the larger sample size on these questions.

with an odds ratio less than one are associated with a decreased likelihood of having more than 20 prescriptions filled per year, (or out of pocket costs greater than \$200 per month, skipping drugs/taking less or not filling them).

Sociodemographic characteristics in our model include: age (75-84 years of age and 85 years or older, with 65-74 the omitted category), gender (female), living arrangement (alone), education (high school only and some post-high school education, with less than high school the omitted category), and income (greater than 150 percent FPL). Health status measures include: self-reported health status (good and fair or poor, with excellent or very good the omitted category) and a set of self-reported clinical conditions (hypertension; heart disease; emphysema, asthma, or chronic obstructive pulmonary disease; cancer or other malignancy; diabetes; arthritis; osteoporosis; depression; and stomach ulcer, heartburn, or reflux).

Several measures of insurance coverage are also included. Having any supplemental medical insurance in the past 12 months, or drug coverage through other benefits, or a discount drug card all represent additional insurance coverage that may increase access to prescription, and therefore, increase the number of prescriptions filled per year, lower monthly out-of-pocket costs, and reduce unmet need responses, such as skipping or reducing dosages or not filling prescriptions because of cost.

5.3 Results

5.3.1 Descriptive Results

Sociodemographic Characteristics

Table 5-1 compares the sociodemographic characteristics of enrollees and nonenrollees, and for all enrollees combined.³⁶ Enrollees are significantly older than nonenrollees, more likely to be female, live alone, and have lower education levels than nonenrollees. Enrollees are also substantially poorer than nonenrollees with two-thirds of the enrollees having an income of 150 percent of the FPL or less, compared to only 20 percent of the nonenrollees being in this group.

Health Status

Enrollees tend to have poorer health than nonenrollees. They are substantially more likely to report themselves as being in fair or poor health and less likely to say they are in excellent or very good health. They are also more likely to report that they have specific medical conditions such as hypertension; heart disease; diabetes; arthritis; osteoporosis; depression; and stomach ulcers, heartburn or reflux (*Table 5-2*). The two groups show no significant differences in the proportion having pulmonary conditions, such as emphysema, asthma, or COPD or in cancers or other malignancies. Among those with a condition, enrollees are also more likely to report they are taking a prescription for heart disease or for stomach ulcers/heartburn/reflux and two to three times less likely to report prescriptions as unaffordable, particularly for arthritis, osteoporosis, and depression.

³⁶ Comparisons between insurance programs were presented in section 4.

Table 5-1
Demographics of Pharmacy Assistance Program Enrollees and Eligible Non-Enrollees

	Enrollee (N=1,346)	Non-Enrollee (N=1,324)	All (N=2,670)
Age		***	
65-74	39.2	47.5	45.4
75-84	42.4	41.8	41.9
85+	18.3	10.8	12.7
Age (mean)	77.2	75.4 ***	75.9
Female	69.2	58.5 ***	61.3
Live alone	42.0	30.0 ***	33.2
Highest level of school completed		***	
Less than high school	41.5	23.6	28.3
High school/GED	40.6	43.2	42.6
Some college	17.9	33.1	29.2
Annual income (yours and spouse)		***	
<150%	67.8	20.2	33.1
151-225%	29.0	39.2	36.5
226-300%	3.2	40.6	30.5
Self-reported health status		***	
Excellent/very good	25.6	36.5	33.7
Good	35.0	36.4	36.0
Fair/poor	39.4	27.1	30.3

NOTES:

*** Significantly different from enrollees at 0.01 level.

** Significantly different from enrollees at 0.05 level.

* Significantly different from enrollees at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. Age and gender are obtained from the Enrollment Data Base. All other variables are self-reported data from the survey.

PROGRAM: snv01 h07 snv05

Table 5-2
Self-Reported Medical Conditions of Pharmacy Assistance Program Enrollees and Eligible Non-Enrollees

	Diagnosed with		Taking a prescription for			Prescription unaffordable			
	Enrollee (N=1,346)	Non- Enrollee (N=1,324)	All (N=2,670)	Enrollee	Non- Enrollee	All	Enrollee	Non- Enrollee	All
<u>Self-reported medical conditions</u>									
Have hypertension/high blood pressure	67.0	57.3 ***	59.8	92.4	90.9	91.3	2.1	2.4	2.3
Have heart disease/heart condition	41.1	31.5 ***	34.0	79.6	72.7 **	74.9	1.9	2.7	2.5
Have emphysema/asthma/COPD	16.8	14.6	15.2	74.7	77.7	76.8	3.5	4.4	4.2
Have cancer/malignancy	18.7	20.1	19.8	26.2	23.3	24.0	0.5	0.6	0.6
Have diabetes/high blood sugar	22.8	15.9 ***	17.7	78.2	80.6	79.8	1.5	2.0	1.8
Have arthritis	64.3	52.8 ***	55.8	43.7	39.0	40.4	1.4	3.1 **	2.6
Have osteoporosis/fragile soft bones	22.4	17.3 ***	18.7	57.3	55.9	56.3	2.0	6.3 **	5.0
Have depression	22.0	15.8 ***	17.4	72.7	75.7	74.7	2.3	6.7 *	5.4
Have stomach ulcers/heartburn/reflux	32.7	26.8 ***	28.3	71.8	61.5 **	64.6	4.4	3.9	4.1

NOTES:

*** Significantly different from enrollees at 0.01 level.

** Significantly different from enrollees at 0.05 level.

* Significantly different from enrollees at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004.

PROGRAM: snv01 snv10

Insurance Coverage

Enrollees were less likely to have supplemental medical insurance (*Table 5-3*) in addition to Medicare coverage (60 percent of enrollees compared to 79 percent of nonenrollees). In addition, nonenrollees were asked if they had supplemental drug coverage through a Medigap policy, an employer, Veteran’s benefits, Tricare, Medicaid, or an HMO. Almost 64 percent of the nonenrollees had other drug coverage. In addition, about 21 percent had a drug discount card.

Table 5-3
Self-reported insurance coverage of pharmacy assistance program enrollees and eligible non-enrollees

	Enrollee (N=1,346) (%)	Non-Enrollee (N=1,324) (%)		All (N=2,670) (%)
Any supplemental medical insurance	59.8	78.6	***	73.8
Number with other drug coverage	19.8	63.7	***	52.5
Number with discount card	17.4	21.4	***	20.4

NOTES:

- *** Significantly different from enrollees at 0.01 level.
- ** Significantly different from enrollees at 0.05 level.
- * Significantly different from enrollees at 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004.

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Prescription Drug Utilization and Costs

Enrollees and non-enrollees were asked a series of questions about their prescription drug utilization during the 12 months prior to the survey. Differences between enrollees and nonenrollees are reported. We also report differences within the nonenrollee groups between those who had some drug coverage and those who did not have additional coverage (*Table 5-4*).³⁷ Disaggregating those who are not enrolled in the state pharmacy program but have other coverage from those who have no other coverage allows us to refine our analysis of the impact of having prescription drug coverage. We hypothesize that those who have other drug coverage will be similar to those with state pharmacy assistance coverage.

³⁷ No distinctions are made among the 3 pharmacy assistance programs within the enrollee groups because of few significant differences between programs.

Table 5-4
Self-reported prescription use/costs of pharmacy assistance program enrollees and eligible non-enrollees

	Enrollee		Nonenrollee		All
	(N=1,346)	Total Nonenrollees (N=1,324)	With Coverage (N=948)	Without Coverage (N=370)	
Self-reported number of prescriptions filled or refilled		***		***	
zero	4.8	14.2	10.2	24.6	11.8
1-10	17.7	22.3	22.4	22.0	21.1
11-20	12.5	22.0	24.5	15.7	19.6
more than 20	64.9	41.6	42.9	37.6	47.5
Self-reported monthly out-of-pocket costs for medications		***		***	
zero	4.9	14.6	8.6	29.6	12.1
\$1-49	74.9	35.2	54.7	23.8	45.4
\$50-199	14.9	34.6	25.9	29.1	29.5
\$200-399	3.1	11.3	6.9	14.2	9.2
or \$400 or more	2.3	4.4	3.9	3.3	3.8

NOTES:

1 Due to small sample size unable to calculate t-test between enrollees with and without other coverage.

*** Significantly different from enrollees at 0.01 level.

** Significantly different from enrollees at 0.05 level.

* Significantly different from enrollees at 0.10 level.

*** Significantly different from nonenrollees with other coverage at the 0.01 level.

** Significantly different from nonenrollees with other coverage at the 0.05 level.

* Significantly different from nonenrollees with other coverage at the 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004.

PROGRAM: snv17 snv18

Most survey respondents had at least one prescription filled or refilled during a 12 month period (88 percent). However, enrollees were more likely than nonenrollees to have 20 or more prescriptions filled each year (65 percent compared to 42 percent). Still, about 45 percent of the nonenrollees buy 1-20 prescriptions per year. Within the nonenrollee populations, those with 11-20 prescriptions per year are more likely to have some other drug coverage (25 percent compared to 16 percent).

Enrollment in the pharmacy assistance program also appears to be associated with having moderate out-of-pocket costs. Enrollees tended to have some monthly costs; only 4.9 percent had no costs while almost three times that number (14.6 percent) of the nonenrollees had none. However, enrollees appear to have lower average monthly costs than nonenrollees. Almost three-quarters of all enrollees had monthly out-of-pocket costs for prescription drugs between \$1-\$49 whereas half the nonenrollees' had costs exceeding \$49/month. This suggests prescription coverage is reducing the individual financial burden and increasing access to drugs.

Insurance coverage also was associated with lower monthly out-of-pocket costs in the nonenrollee group. Nonenrollees with some drug coverage were over twice as likely to have average monthly costs between \$1-49/month (55 percent) compared to only 24 percent of the nonenrollees without other drug coverage.

Unmet Need

Respondents were also asked whether they altered their drug dosages, purchase of other necessities, or had trouble getting prescriptions for various reasons during the 12 months prior to the survey (*Table 5-5*). Enrollees were more likely to spend less on food, heat or other basic needs to pay for theirs or their spouse's medications, much more likely to receive free samples from their doctors (40 percent compared to 3 percent) or to fill their prescriptions at a clinic or hospital. This suggests enrollees may be either higher drug users or have better ties into the medical system. There were no significant differences in behavior between the nonenrollees with and without drug coverage.

Enrollees were also more likely to have had trouble in the past 12 months getting a particular type of medication (8.2 percent compared to 5.2 percent) or getting a preferred brand name. Similarly, nonenrollees with coverage were also more likely to have had past trouble getting a preferred brand name. This may be a reflection of adverse selection with those having higher needs enrolling in benefit programs. Interestingly, enrollees were also less likely than nonenrollees to have trouble paying their co-payment fees during the past 12 months (1.4 percent versus 3.5 percent). This suggests insurance coverage reduced some of the financial burden.

5.3.2 Regression Results

Several sets of models are presented in *Tables 5-6* and *5-7* that investigate the relationships between insurance coverage and:

- a) the number of prescriptions filled per year (models 1 and 2),
- b) the probability of having monthly out-of-pocket costs of \$200 or more (models 3-4),

Table 5-5
Self-reported unmet needs of pharmacy assistance program enrollees and eligible non-enrollees

	Enrollee		Nonenrollee		All
	(N=1,346)	Total Nonenrollees (N=1,324)	With Coverage (N=948)	Without Coverage (N=370)	
In last 12 months, did you ever...					(N=2,670)
Skip doses to make medication last longer	8.6	9.3	9.3	9.2	9.1
Take less than prescribed to make medication last longer	7.9	8.6	8.7	7.9	8.4
Spend less on food, heat, other basic needs to pay for medications	10.3	6.8 ***	6.9	6.1	7.7
Borrow money from family/friends to pay for medications	3.3	2.9	2.8	2.8	3.0
Receive free samples of med from doctor	39.6	2.9 ***	2.8	2.8	12.3
Fill medications for free at clinic or hospital	4.5	2.9 *	2.8	2.8	3.3
Spend less on food, heat, other basic needs to pay for spouse's medications	5.3	2.9 *	2.8	2.8	3.4
In past 12 months, any trouble...					
Getting particular type of med	8.2	5.2 **	5.7	4.0	6.0
Getting preferred brand name	7.7	5.0 *	6.2	1.8 †††	5.7
Getting prescription refilled	4.4	3.5	3.8	2.9	3.8
Paying your drug co-payment fees	1.4	3.5 **	3.3	2.9	2.8
Finding pharmacist to fill prescription	0.6	0.7	0.7	0.7	0.7

NOTES:

1 Due to small sample size unable to calculate t-test between enrollees with and without other coverage.

*** Significantly different from enrollees at 0.01 level.

** Significantly different from enrollees at 0.05 level.

* Significantly different from enrollees at 0.10 level.

††† Significantly different from nonenrollees with other coverage at the 0.01 level.

†† Significantly different from nonenrollees with other coverage at the 0.05 level.

† Significantly different from nonenrollees with other coverage at the 0.10 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004.

PROGRAM: snv17 snv18

**Table 5-6
Number of Prescriptions Filled Per Month**

	Over 20 prescriptions per year		\$200+ Monthly Out of Pocket Costs	
	Model 1	Model 2	Model 3	Model 4
<u>Demographics</u>				
Age 75-84	1.375 (0.636)	1.373 (0.639)	1.141 (0.241)	1.143 (0.241)
Age 85+	6.073 *** (3.067)	6.116 *** (3.113)	1.379 (0.431)	1.399 (0.439)
Female	0.729 (0.343)	0.730 (0.344)	1.338 (0.284)	1.341 (0.285)
Live Alone	1.197 (0.491)	1.211 (0.495)	0.939 (0.198)	0.945 (0.200)
High School	2.396 * (1.120)	2.356 * (1.100)	0.950 (0.224)	0.952 (0.225)
Post High School	0.226 (0.231)	0.221 (0.227)	0.759 (0.199)	0.762 (0.199)
Income 150% FPL +	0.608 (0.272)	0.604 (0.297)	1.178 (0.278)	1.059 (0.248)
<u>Health Status</u>				
Good	1.885 (1.330)	1.849 (1.304)	1.403 (0.343)	1.399 (0.342)
Fair/Poor	3.233 (2.495)	3.211 (2.472)	2.116 *** (0.580)	2.117 *** (0.581)
<u>Insurance</u>				
Any Supplemental	0.588 (0.268)	0.594 (0.272)	1.228 (0.300)	1.215 (0.298)
Drug Coverage	1.195 (0.535)	1.208 (0.545)	0.511 *** (0.108)	0.514 *** (0.108)
Drug Card	1.437 (0.842)	1.426 (0.844)	1.359 (0.281)	1.352 (0.280)
<u>Medical Conditions</u>				
Hypertension	1.612 (0.738)	1.613 (0.739)	1.253 (0.251)	1.256 (0.252)
Heart Disease	1.044 (0.413)	1.051 (0.421)	1.457 ** (0.297)	1.461 * (0.299)
Emphysema, Asthma, COPD	4.130 *** (1.920)	4.170 *** (1.927)	1.350 (0.324)	1.362 (0.329)
Cancer	0.987 (0.537)	0.982 (0.539)	0.710 (0.166)	0.718 (0.169)
Diabetes	0.768 (0.367)	0.764 (0.363)	2.034 *** (0.441)	2.042 *** (0.445)
Arthritis	0.596 (0.225)	0.592 (0.224)	1.166 (0.229)	1.163 (0.228)
Osteoporosis	1.818 (0.748)	1.814 (0.750)	1.112 (0.280)	1.109 (0.281)
Depression	1.826 (0.828)	1.815 (0.820)	1.186 (0.321)	1.183 (0.322)
Stomach Ulcers/Reflux	0.709 (0.293)	0.717 (0.293)	1.105 (0.235)	1.102 (0.235)
Enrollee	1.907 (0.851)		0.182 *** (0.042)	
VHAP Pharmacy		1.965 (1.050)		0.106 *** (0.038)
VScript		1.345 (0.716)		0.159 *** (0.047)
VScript Expanded		2.400 (1.333)		0.424 *** (0.100)

Reported scores are Relative Risk Ratios (standard errors).

* Significantly different from enrollees at 0.10 level; ** Significantly different from enrollees at 0.05 level; *** Significantly different from enrollees at 0.01 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. Age and gender are obtained from the Enrollment Data Base. All other variables are self-reported data from the survey.

Table 5-7
Out of Pocket Costs and Unmet Needs for P.A.P.E & NE

	Skip drugs or take less than prescribed		Not Fill Because of Cost	
	Model 5	Model 6	Model 7	Model 8
<u>Demographics</u>				
Age 75-84	0.597 ** (0.129) ***	0.596 ** (0.129) ***	0.462 ** (0.163)	0.460 ** (0.163)
Age 85+	0.259 (0.095)	0.261 (0.096)	0.182 *** (0.118)	0.187 *** (0.120)
Female	0.912 (0.211)	0.913 (0.211)	2.782 *** (0.893)	2.783 *** (0.890)
Live Alone	1.053 (0.230)	1.056 (0.232)	0.414 *** (0.132)	0.414 *** (0.133)
High School	0.740 (0.179)	0.742 (0.180)	0.746 (0.241)	0.748 (0.243)
Post High School	0.906 (0.249)	0.914 (0.252)	0.824 (0.277)	0.827 (0.280)
Income 150% FPL +	0.941 (0.206)	0.855 (0.189)	0.829 (0.263)	0.754 (0.235)
<u>Health Status</u>				
Good	1.113 (0.286)	1.110 (0.285)	1.290 (0.477)	1.290 (0.476)
Fair/Poor	1.578 (0.497)	1.592 (0.502)	1.799 (0.755)	1.819 (0.764)
<u>Insurance</u>				
Any Supplemental	0.688 * (0.156)	0.679 * (0.153)	0.713 (0.191)	0.696 (0.185)
Drug Coverage	0.640 ** (0.137)	0.639 ** (0.137)	0.522 ** (0.165)	0.522 ** (0.165)
Drug Card	1.819 *** (0.409)	1.817 *** (0.410)	2.236 *** (0.652)	2.236 *** (0.653)
\$200/Mo. Out of Pocket Drug Costs	2.177 *** (0.543)	2.135 *** (0.536)	1.525 (0.575)	1.496 (0.566)
<u>Medical Conditions</u>				
Hypertension	1.709 ** (0.364)	1.725 ** (0.368)	1.697 * (0.492)	1.716 * (0.495)
Heart Disease	0.830 (0.187)	0.820 (0.184)	0.893 (0.271)	0.879 (0.270)
Emphysema, Asthma, COPD	1.745 ** (0.460)	1.761 ** (0.467)	1.275 (0.464)	1.294 (0.474)
Cancer	0.822 (0.208)	0.828 (0.210)	1.081 (0.390)	1.079 (0.392)
Diabetes	0.865 (0.208)	0.871 (0.211)	0.632 (0.249)	0.630 (0.251)
Arthritis	1.276 (0.278)	1.276 (0.277)	0.917 (0.335)	0.919 (0.336)
Osteoporosis	1.648 ** (0.380)	1.646 ** (0.379)	1.173 (0.410)	1.177 (0.413)
Depression	1.273 (0.309)	1.269 (0.309)	1.983 * (0.724)	1.978 * (0.731)
Stomach Ulcers/Reflux	1.969 *** (0.406)	1.974 *** (0.408)	1.686 (0.546)	1.687 (0.549)
Enrollee	0.518 *** (0.117)		0.380 *** (0.125)	
VHAP Pharmacy		0.351 *** (0.109)		0.237 *** (0.109)
VScript		0.648 (0.172)		0.456 ** (0.174)
VScript Expanded		0.804 (0.185)		0.659 (0.216)

Reported scores are Relative Risk Ratios (standard errors).

* Significantly different from enrollees at 0.10 level; ** Significantly different from enrollees at 0.05 level; *** Significantly different from enrollees at 0.01 level.

SOURCE: Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees, 2004. Age and gender are obtained from the Enrollment Data Base. All other variables are self-reported data from the survey.

- c) the probability of skipping drugs or taking less than prescribed (models 5 and 6), and
- d) the probability of not filling a prescription because of cost (models 7 and 8).

Two sets of models are presented for each dependent variable; the first predicts differences between enrollees and nonenrollees while the second model compares each of the 3 pharmacy assistance programs to no enrollment in the state programs. Models 1-4 explain differences in the probability of having higher prescription or out-of-pocket costs, including variations by medical conditions. Models 5-8 identify the types of populations making choices about unmet need and deciding to reduce or forego prescriptions.

Number of Prescriptions Filled Per Month

Results from the first two logistic regression models (1 and 2) compare the effects of insurance coverage for those who have up to 20 prescriptions filled each year to those with 21 or more prescriptions filled each year. Both models suggest that insurance coverage is not significantly associated with having higher numbers of prescriptions filled per year. While those with insurance coverage appear to be 91 percent more likely to have higher use levels, these differences are not statistically significant.

The models are useful however, for identifying the types of beneficiaries who have higher yearly utilization levels. The oldest old (85 years or older) are over 6 times more likely to fill more than 20 prescriptions/year than the 65-74 year old population. Those with a high school education are 240 percent more likely to have higher use than those with less than a high school education. And those with respiratory ailments, such as emphysema, asthma, or COPD are over 4 times more likely to have the higher prescription use levels.

Monthly Out-of-Pocket Costs

Insurance coverage is associated with significantly lower monthly out-of-pocket costs (models 3 and 4) and the effects differ across the three state pharmacy assistance programs. Enrollees are, on average, 82 percent less likely to have out-of-pocket costs of \$200/month or more, all else equal. However, VHAP Pharmacy enrollees are 90 percent less likely to be in that group, while VScript enrollees are 85 percent less likely and VScript Expanded enrollees are only 58 percent less likely than nonenrollees to have monthly out-of-pocket costs of \$200 or more. Further, those who have other drug coverage are 49 percent less likely to have the higher monthly out-of-pocket costs.

As expected, monthly costs vary across beneficiaries with different health status and medical conditions. Those identifying their health status as fair or poor are over twice as likely as those identifying their health status as excellent to have the higher monthly costs. And these costs are significantly higher for those with heart conditions or diabetes, two chronic medical conditions.

Skip Drugs or Take Fewer Than Prescribed

Having insurance coverage is significantly related with a lower likelihood of skipping drugs or taking fewer than prescribed. State pharmacy assistance enrollees are 49 percent less

likely to have answered yes to these questions. Disaggregating the insurance groups shows that most of this difference is due to VHAP Pharmacy enrollment. These enrollees have 65 percent lower probability of going without prescriptions than nonenrollees, all else equal. Having supplemental medical insurance, other prescription drug coverage, or a prescription drug card are all associated with a reduced probability of going without drugs or taking fewer than prescribed.

Not Fill Prescriptions Because of Cost

As expected, enrollment in one of the state pharmacy assistance programs is associated with a lower probability of not filling a prescription item because of cost. State pharmacy assistance enrollees are 62 percent less likely to not fill a prescription compared to nonenrollees. Again, this is largely due to enrollment in VHAP Pharmacy (77 percent less likely) or VScript (55 percent less likely than nonenrollees).

Having other prescription drug coverage or a prescription drug card is also associated with a lower likelihood of not filling a prescription because of cost.

Unmet Need

Models 5-8 each represented types of unmet need where beneficiaries were foregoing the prescribed amounts of drugs, either reducing the amount taken or not purchasing some items. While insurance coverage clearly reduced the probability of these events occurring, it is also interesting to note, that all else equal, certain populations were more likely to forego prescription items.

Younger elderly beneficiaries (64-75 years old) were significantly more likely than older populations to skip, reduce, or forego purchasing drugs because of cost. The probability also varied by health conditions. Those having been diagnosed with hypertension were 69-72 percent more likely to not fill an item because of cost or take reduced prescription levels compared to beneficiaries with other conditions. Those with respiratory conditions, such as emphysema, asthma, or COPD; bone conditions, such as osteoporosis, or stomach ulcers and reflux were also significantly more likely to skip drugs or take fewer than prescribed although they were not more likely to identify cost as the reason.

5.4 Conclusions

Our findings indicate that Vermont's pharmacy assistance programs are assisting those with higher yearly prescription needs and are associated with lower monthly out of pocket costs. The VHAP Pharmacy enrollees are also less likely to be skipping medications, reducing their dosages, or not filling prescriptions because of costs.

In general those with higher prescription use are older, in worse health status, have more medical conditions, and are taking drugs for those conditions. They also have unmet needs, such as taking fewer drugs than prescribed or foregoing other goods to buy their drugs. Those with higher out-of-pocket costs are similar to those with higher drug use but they also are more likely to have other drug coverage.

As expected, those with higher out-of-pocket costs are more likely to skip dosages or take fewer items than prescribed compared to those with lower out-of-pocket costs. Those foregoing prescriptions or taking less than prescribed are also the most vulnerable populations.

These findings are important because they identify the beneficial effects of drug coverage in helping beneficiaries purchase the drugs prescribed for them. More importantly, they illustrate the types of factors affecting how a beneficiary will respond to high out-of-pocket costs need and the factors that predict when a beneficiary would be in this position. The impact of these decisions on exacerbating other health conditions and causing more serious outcomes becomes a critical issue for Medicare. These results suggest certain segments of the beneficiary population are most at risk for being in this position. This state pharmacy assistance program, and to some degree, other forms of drug coverage, appear to be effective in reducing these risks.

CHAPTER 6

IMPACT OF ENROLLMENT ON USE AND COST OF MEDICAL SERVICES

6.1 Introduction

One of the main arguments for adding the prescription drug benefit to the Medicare program in the United States is that timely and reliable access to outpatient prescription drugs may reduce the number of preventable hospitalizations for certain acute and chronic diseases such as hypertension, heart disease, diabetes, and stomach ulcers. In addition to improving beneficiary outcomes, the outpatient prescription drug benefit may also result in lower Medicare expenditures for other types of provider-based care. On the other hand, the Medicare outpatient prescription drug benefit may lead to an increased use of medical services and higher expenditures if drug and non-drug medical services (e.g., physician office visits for monitoring of medications or prescription refills) are complementary or if prescription therapies lead to greater adverse reactions or medical complications.

Few efforts have been made to date to analyze the impact of prescription drug coverage for seniors on such factors as utilization of non-drug medical services and the overall cost of health care. Lichtenberg used data from the Medical Expenditure Panel Survey to show that replacing older drugs with more recently FDA-approved medications reduces Medicare non-drug medical expenses, most notably hospital expenditures (Lichtenberg, 2001). Similarly, Soumerai and others examined payment restrictions imposed by New Hampshire Medicaid on drugs for acute mental illness and found that imposition of a three-prescription drug cap resulted in an increased number of clinic visits, emergency room encounters and partial hospitalizations, and higher Medicaid payments (Soumerai, et al., 1994; Soumerai, et al., 1991). Subsequent elimination of the prescription limits caused the use of most services to return to baseline levels. Comparable results were obtained from a study of higher cost sharing for 'essential' drugs among the elderly in Canada (Tamblyn, et al., 2001).

Two more recent unpublished studies use a nationally representative sample of Medicare beneficiaries and focus directly on the relationship between drug coverage or use on non-drug medical spending. Yang and Norton (2004) use MCBS panel data to show that an increase in outpatient prescription drug use leads to minor, but significant offsets in Medicare inpatient spending. Furukawa (2004), employing the same data, found that after controlling for selection Medicare beneficiaries with private drug coverage had significantly lower non-drug spending than those without drug coverage, although the savings offset varied by source of coverage and type of service.

The problem with most existing studies is that either they rely on very restrictive samples identified by a specific type of drug or medical condition (such as acute mental illness) or they consider only a single cost containment intervention (such as copayment tiers or prescription caps). In addition, they often focus on the effects of drug use or compliance, rather than drug coverage *per se*. As a result, the existing literature offers few lessons for understanding the potential offsetting savings effect of *drug coverage* more generally, as opposed to the cost effectiveness of a specific type or class of drug therapies. In fact, the Congressional Budget Office decided not to include a savings offset in its cost projections for the Medicare drug benefit proposals, citing in part the lack of generalizable evidence (Congressional Budget Office, 2003).

This study attempts to fill that gap by deriving generalizable estimates of the impact of outpatient drug coverage on Medicare expenditures. It builds upon an earlier evaluation of the Vermont pharmacy assistance programs based solely on claims data. In that study, Gilman and colleagues (2003) found little evidence of a Medicare offsetting effect for any type of service (Gilman, Gage and Mitchell, 2003). The prior study, however, was likely biased principally by unobserved differences in health status between the enrollee and nonenrollee samples and by the lack of information on drug coverage among the control group. This study uses information collected in a statewide survey of enrollees and eligible but nonenrolled beneficiaries to fill those gaps in critical beneficiary characteristics and to address some of the potential biases inherent in the earlier evaluation.

In the current study, we employ a cross-sectional analysis of program enrollees and eligible but nonenrolled beneficiaries in 2003. The impact of outpatient drug coverage on Medicare expenditures is evaluated by comparing annualized expenditures for Medicare-covered medical services among pharmacy assistance program enrollees in calendar year 2003 with annualized medical expenditures for low-income residents who were eligible for but not enrolled in the program over the same period of time. Through the use of the enrollee and nonenrollee surveys, we control for differences in demographic, socioeconomic, and health status characteristics between the two groups. We also control for supplemental medical and drug insurance status, as well as for ownership of a drug discount card. The difference in annualized expenditures by type of medical service between participants and non-participants thus measures the marginal impact of drug coverage on Medicare payments. However, despite the incorporation of the additional information available from the surveys, potential unobservable differences in health status between enrollees and nonenrollees may still lead to selection bias.

6.2 Data and Methods

6.2.1 Data and Sample

The offset analysis relies on four sources of data. Information on beneficiaries' demographic, socioeconomic and health status characteristics came from the enrollee and eligible or near-eligible nonenrollee surveys. Information on medical service use and expenditures came from the 2003 Medicare claims files, including the inpatient, outpatient and Part B Standard Analytic Files. Details on pharmacy assistance program enrollment came from the state Medicaid eligibility files. The state eligibility files provide a complete record of all dates of enrollment by type of program, including VHAP Pharmacy, VScript and VScript Expanded, and were also used to identify the enrollee frame. The Medicare Enrollment Denominator File (EDB) was used for selected beneficiary characteristics such as gender, age and dual eligibility. The EDB was also used for identifying the survey nonenrollee frame.

As stated in Chapter 3, the enrollee sample was drawn from a frame of all Medicare beneficiaries over the age of 64 who were enrolled any of the state pharmacy assistance programs on October 31, 2003. The enrollee sample was divided into three balanced strata, one for each of the three pharmacy assistance programs. The purpose of stratifying the enrollee sample was to allow us to make within group comparisons based on the benefits and copayment requirements of each program. The nonenrollee sample was drawn from a frame of all elderly Medicare beneficiaries who were resident of Vermont and not enrolled in any of the state

pharmacy assistance programs. A screener was used to identify nonenrollees based on self-reported income. Information on individuals' social security benefits provided by the Social Security Administration was used to identify a subgroup of likely eligible beneficiaries. The non-elderly were excluded from both sample frames.³⁸

6.2.2 Methods

The estimation strategy is based on a cross-sectional model in which the impact of drug coverage is measured as the difference in average Medicare expenditures among a representative sample of enrollees in VHAP Pharmacy, VScript and VScript Expanded and a representative sample of Medicare beneficiaries who are eligible for but not enrolled in any of the state's pharmacy assistance programs. Changes in Medicare expenditures are decomposed into changes in the probability of using medical services and changes in the amount of Medicare payment conditional on using those services. The later effect represents the 'intensity' of service use among claimants. Expenditures are further disaggregated by type of medical service: inpatient, outpatient and professional services.

The basic expenditure model used in this study can be summarized as follows:

$$Y_i = \alpha_i + X_i\beta_1 + E_i\beta_2 + \varepsilon_i$$

where Y_i = annualized total expenditures for beneficiary i ;

α_i = the intercept term;

X_i = a set of beneficiary-level characteristics;

E_i = an enrollment dummy that takes the value of one for all program enrollees and zero otherwise; and

ε_i = a random error term.

The basic model regresses annualized total expenditures from all sources including Medicare, third party payers and beneficiary copayments, on a set of beneficiary characteristics plus an enrollment dummy that takes the value of one for all beneficiaries enrolled in one of the three state pharmacy assistance programs and zero for all eligible but nonenrolled beneficiaries.

³⁸ The nonenrollee sample inadvertently included a few beneficiaries who were subsequently found to be entitled to full benefits under Medicaid. The dually eligible beneficiaries were excluded from our analysis. Further, the enrollee sample included a small number of elderly program enrollees who subsequently could not be identified on the Medicare EDB file. Since the Medicare offset analysis is based in part on Medicare claims data, program enrollees who could not be identified on the EDB were excluded from the analysis in Chapter 6. However, since claims data were not used in either the enrollment analysis or the drug use analysis, the non-identifiable program enrollees were included in the analyses presented in Chapters 4 and 5. Finally, the Chapter 6 analysis includes the 255-300 percent of poverty nonenrollee stratum. The near-eligible nonenrollee stratum was determined to be sufficiently similar to the eligible nonenrollee group to warrant using the additional observations to increase the sample size of the drug and offset analyses.

A positive sign on the enrollment coefficient signifies that drug coverage and service use are complements; a negative sign indicates that outpatient prescription drugs are a substitute for medical services. Total payments are chosen for this model to capture the full effect on drug coverage on use and cost of medical services.

Medicare beneficiaries are likely to enroll in state pharmacy assistance programs precisely because they experience an acute episode or suffer from chronic illnesses with extensive and persistent health care needs. In the absence of the drug benefit, program enrollees are likely to use more services and have higher health care costs than nonenrollees. To control for potential biases caused by adverse selection into the state pharmacy assistance programs, we include several health status measures, as well as a set of demographic and socioeconomic characteristics that are likely correlated with health status and, in turn, medical service use and expenditures. These include age (65-74 years of age, 75-84 years of age, and 85 years or older); gender (female); residency status (if a beneficiary lives alone); education (less than high school, high school only, and some post-high school); and income (less than 151 percent of poverty and between 151-300 percent of poverty). Older and female beneficiaries typically have higher health care needs than younger and male beneficiaries. Beneficiaries with higher education and income levels are also more likely to access health care services on a regular basis. In contrast, beneficiaries who live alone may be more independent and in better health (or may be less mobile) than beneficiaries who live with others and, thus, less likely to require health care services.

We also include self-reported health status (excellent/very good, good, and fair/poor), as well as a set of self-reported clinical conditions (hypertension; health disease; emphysema, asthma or chronic obstructive pulmonary disease; cancer or other malignancy; diabetes or high blood sugar; arthritis; osteoporosis; depression; and stomach ulcer, heartburn or reflux). Further, we include a set of indicators for the number of prescriptions filled during the previous 12-month period (none, 1-10, 11-20 and more than 20) as an additional proxy for health status.³⁹

The model may also produce biased results if the enrollee and nonenrollee samples have differential rates of supplemental medical insurance or if the nonenrollee sample has drug coverage or a drug discount card. (As reported earlier, all program enrollees are automatically assigned a drug discount card under the Healthy Vermonters program.) Supplemental medical insurance through a privately purchased Medigap policy or employer retiree benefits is likely to lead to higher use of outpatient and physician service use in particular. Higher rates of supplemental medical coverage among nonenrollees may lead to an overestimation of the program effects. In contrast, if drug coverage or a drug discount card creates similar Medicare offsets among the control group, the state program effects will be underestimated. (If drug coverage is a complement with medical services, the positive effect of enrollment on expenditures will also be underestimated.) To control for the confounding effect of supplemental medical and non-state drug coverage, we include an indicator variable that takes the value of one if a beneficiary has self-reported supplemental medical insurance coverage and zero otherwise and another indicator variable that takes the value one if a nonenrollee reports having drug coverage and zero otherwise. In addition, we include a similar indicator variable for

³⁹ Drug use is likely to be endogenous to enrollment. To test the impact of drug use on our results, we ran the models without the drug use variables and found it had little effect on the enrollment coefficients.

nonenrollees who report that they possess a drug discount card. This, in effect, creates a secondary “treatment” group of nonenrollees with drug coverage or a drug discount card.⁴⁰ As a result, the program effects as identified through the enrollment indicator variable will, thus, measure the difference in service use and expenditures between program enrollees and nonenrollees who have neither supplemental medical insurance nor a drug discount card.

The model is estimated on logged Medicare payments to account for the skewness of the expenditure data toward expensive outliers for those with a claim. However, because of the non-trivial proportion of beneficiaries without a claim, particularly within individual service categories, the results were estimated using a two-part model (Duan, Manning, Morris, and Newhouse, 1983). The two-part model estimates the probability of any expenditure and the level of non-zero expenditures among Medicare claimants separately. The probability model is estimated using logistic regression and the conditional logged expenditure model is estimated using ordinary least squares regression. A set of group- and service-specific smearing factors based on individual residuals are used to retransform the results back into the original dollar scale (Duan, 1983; Newhouse, et al., 1993). The standard errors from the two-part model are estimated using bootstrapped techniques.

The model is estimated on total expenditures for inpatient, hospital outpatient and physician services separately to capture potential differences in the substitution of drug for non-drug care across the individual service categories. Inpatient expenditures are based on facility payments for services provided in a hospital, skilled nursing facility, or long-term care hospital setting. Outpatient expenditures are based on facility payments for services administered in a hospital outpatient department or a freestanding ambulatory care clinic. Physician expenditures include all payments for professional services provided in any setting, including a physician’s office. One would expect that acute care services generally provided in inpatient and, to a lesser degree, outpatient facilities are more likely to be substitutes for drugs, while services oriented toward disease prevention and monitoring typically provided in a physician’s office are more likely to be complementary with drug therapies. For summary purposes, we also estimate the models on total expenditures measured over all service categories.

The model is also estimated using three program-specific enrollment indicator variables to test the differential impact of benefit design on medical service use and costs. The more generous the benefit in terms of either covered drugs or enrollee copayments, the greater the likelihood of using prescription medications and adhering to treatments, and thus the greater the likelihood of realizing any offset effects. Since VHAP Pharmacy covers all drugs, while VScript and VScript Expanded cover maintenance prescriptions only, we should expect to see a greater offset effect among those in the waiver-sponsored program. Similarly, the offset effects should be lowest among those enrolled in the VScript Expanded program who are required to pay 41.25 percent of the cost of each script plus meet a \$275 annual deductible with a \$2,500 annual out-of-pocket maximum, compared with the \$3 - \$10 per script copayment (depending on whether

⁴⁰ The drug coverage and drug card indicator variables are coded zero for enrollees since their effects are measured by the “enrollment” variable.

the drug is generic or brand named) with no deductible and a \$200 - \$400 quarterly out-of-pocket maximum required under VHAP Pharmacy and VScript participants.⁴¹

The marginal effect of program enrollment on annual total Medicare expenditures will vary according to how long an individual was entitled to Part A and B benefits in 2003. To control for differences in length of Medicare enrollment, observations are weighted by the proportion of the year a person is alive and entitled to both Part A and B benefits. The marginal effects will also vary by duration of program enrollment and, thus, access to and use of prescription drugs. Since the vast majority of the enrollee sample was enrolled for the full 12 months of 2003, no adjustments were made for partial year enrollment. Nor were any adjustments made for length of enrollment in the state pharmacy assistance programs historically.⁴²

6.3 Results

6.3.1 Descriptive Statistics

The distribution of the enrollee and nonenrollee samples by principal demographic, socioeconomic, health status, and insurance coverage attributes is presented in *Table 6-1*. Two-tailed chi-square tests were used to assess the statistical significance of observed sample differences. The enrollee and nonenrollee samples consist of 1,310 and 1,295 beneficiaries, respectively.⁴³ According to the results, program enrollees are more likely to be very old (85 years or older), female and living alone. They are also less likely to have graduated from high school or have some post-high school education. The income distribution, however, is biased because the frame for the nonenrollee sample included individuals with incomes up to 300 percent of poverty, while the frame for enrollees was capped at 225 percent of poverty.

In addition, beneficiaries who choose to enroll in the state pharmacy assistance programs have lower self-reported health status (fair/poor) and are more likely to suffer from chronic conditions such as hypertension, heart and lung disease, diabetes, arthritis, osteoporosis, mental depression and stomach ulcers. They are also more likely to use prescription medications and, among those who do, to fill more prescriptions per year. Less than five percent of the enrollee sample had no prescriptions filled in 2003, compared with 14 percent of the nonenrollee group. Moreover, over two-thirds of enrollees have 20 or more prescriptions filled during the previous 12 months, compared with only 42 percent among the nonenrollee group.

Finally, beneficiaries enrolled in the state pharmacy assistance programs were less likely to have supplemental coverage for non-drug medical services. Sixty percent of the enrollee sample reported having supplemental medical coverage, compared with nearly 80 percent of the nonenrollee group. Over two-thirds of the nonenrollee group also reported having prescription drug coverage and almost one-third reported having a prescription drug discount card. By

⁴¹ All forms of enrollee cost sharing were replaced with a three tier monthly premium in January 2004. See Table 2-2 for details.

⁴² Expenditures were, however, annualized by the proportion of the year than an individual is entitled to Part A and B under Medicare.

⁴³ The number of observations vary slightly with those used in Chapter 5 because of the exclusion of enrollees who we could not subsequently identified on the EDB.

Table 6-1
Self-Reported Sociodemographic and Health Status Characteristics of Pharmacy Assistance Program Enrollees versus Nonenrollees

	Enrollees (N= 1,310)		Nonenrollees (N=1,295)	P-value
Age (%)		***		<0.0001
Between 65 - 74 years	39.4		46.9	
Between 75 - 84 years	42.2		42.2	
More than 84 years	18.4		10.9	
Female (%)	68.9	***	59.2	<0.0001
Living Alone (%)	42.1	***	30.3	<0.0001
Education (%)		***		<0.0001
Less than high school	41.2		23.6	
High school only	41.0		43.1	
Some post-high school	17.8		33.3	
Income		***		<0.0001
Less than 151% FPL	68.1		20.4	
Between 151 - 300% of FPL	31.9		79.6	
Self Reported Health Status (%)		***		<0.0001
Excellent/Very Good	25.9		36.4	
Good	35.0		36.6	
Fair/Poor	39.2		27.1	
Clinical Conditions (%)				
Hypertension or high blood pressure	66.7	***	57.5	<0.0001
Heart disease or condition	40.7	***	31.5	<0.0001
Emphysema, asthma or COPD	17.0	***	14.5	<0.0001
Cancer or other malignancy	19.0	***	20.0	<0.0226
Diabetes or high blood sugar	23.0	***	15.8	<0.0001
Arthritis	64.1	***	53.1	<0.0001
Osteoporosis	22.4	***	17.6	<0.0001
Depression	22.1	***	15.9	<0.0001

(continued)

Table 6-1 (continued)
Self-Reported Sociodemographic and Health Status Characteristics of Pharmacy Assistance Program Enrollees versus Nonenrollees

	Enrollees		Nonenrollees	P-value
Stomach ulcer, heartburn or reflux	32.9	***	26.8	<0.0001
Insurance Status (%)				
Supplemental Medical Coverage	60.0	***	79.0	<0.0001
Other Drug Coverage	n/a		63.5	n/a
Drug Discount Card	n/a		28.9	n/a

NOTES:

Information on beneficiary age and gender was obtained from Medicare Enrollment Database. All other statistics are based on self-reported survey data.

Group differences in income are biased by inclusion of 225-300 percent FPL income group in non-enrollee sample.

While enrollees are not allowed to have other drug coverage, a small proportion report having a second source of drug coverage through entitlement programs like the VA.

All enrollees are eligible for the Healthy Vermonters drug discount card program that entitles them to Medicaid prices on prescriptions.

P-values reflect chi-square 2-tail test for differences in distribution of enrolled versus nonenrolled samples.

Proportions may not add up to 100 due to rounding.

****' indicates statistical significance at the 1% level, ***' at the 5% level and **' at the 10% level using 2-tailed chi-square test.

SOURCE: RTI analysis of 2004 Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees. Age and gender are obtained from Enrollment Database. All other variables are self-reported data from the survey.

Computer output: p2vt07a

definition, all enrollees had both state-subsidized drug coverage and a state-sponsored drug card entitling them to the Medicaid drug discount with no additional state subsidy. Differences in the distribution of the enrollee and nonenrollee samples across all of the reported characteristics were highly significant.

A similar set of descriptive statistics for Medicare-covered service utilization and expenditures for each of the sample groups and service categories is also presented in *Table 6-2*. The descriptive results show that program enrollees are more likely to use medical services, particularly outpatient and professional services, than their nonenrolled counterparts. Nearly 91 percent of the enrollee sample had an outpatient encounter and 95 percent had a visit with a physician or another type of professional health care provider in 2003, compared with 85 and 93 percents, respectively, for the nonenrolled sample. The two groups were equally likely to have a hospitalization. Only the observed differences in the proportion of each group using outpatient and professional service use were statistically significant.

Surprisingly, none of the observed differences in annualized expenditures, whether measured over claimants only or the full sample, was statistically significant. When measured over claimants only, both enrollees and nonenrollees used roughly \$12,500 in inpatient services, \$1,200 in outpatient services, and \$1,500 in professional services on average in 2003. When measured over the full samples, the two groups used roughly \$2000 in inpatient services, \$1,000 in outpatient services, and \$1,500 in professional services on average. Program enrollees incurred on average \$4,653 in annualized payments for all medical services in 2003, compared with \$4,427 among the nonenrollee group. The minor difference, however, was not significant.

6.3.2 Regression Results

Results from First-Part Logistic and Conditional Expenditure Models

The results of the first-part logistic and conditional OLS regressions by type of service are presented in *Table 6-3*. The results from the conditional expenditure model are expressed in log dollars. The standard errors are presented below each of the estimated coefficients. Two-tailed t-tests were performed to determine whether the estimated odds ratios are statistically different from one and the conditional log expenditure coefficients are statistically different from zero. The R^2 value and sample size for each model and service category are presented in the bottom two rows. The probability and conditional log expenditure models generally explain between 10 and 15 percent of the variation in conditional payments.

The results reveal that the odds of using medical services tend to be positively correlated with age and being female. The very elderly (aged 85 and above) are twice as likely to be hospitalized and over three times as likely to see a doctor compared with their younger counterparts. Similarly, women are nearly 60 percent more likely to use outpatient services and over twice as likely to use professional services as men. The probability of using physician services is also significant and positively correlated with income. Beneficiaries in the 151-300 percent of poverty category are 60 percent more likely to use professional services than their lower income counterparts. While the odds of using services also tend to be positively associated with living alone, education and income, none of the relationships is statistically significant. Differences in the intensity of resource use once services have been accessed across

Table 6-2
Unadjusted Service Use Rate and Mean Expenditures Enrollees versus Nonenrollees

	Enrollees (N= 1,310)		Nonenrollees (N=1,295)	P-value
Probability of using services (%)				
Inpatient services	16.0		15.7	<0.5420
Outpatient services	90.8	***	84.7	<0.0001
Professional services	95.3	***	93.0	<0.0001
Any services	97.3	***	94.4	<0.0001
Expenditures averaged over claimants only (\$)				
Inpatient services	12,529		12,784	<0.8372
Outpatient services	1,236		1,230	<0.9575
Professional services	1,604		1,479	<0.2580
Any services	4,785		4,689	<0.8129
Expenditures averaged over full sample (\$)				
Inpatient services	2,002		2,010	<0.9778
Outpatient services	1,122		1,042	<0.4305
Professional services	1,529		1,375	<0.1464
Any services	4,653		4,427	<0.5648

NOTES:

‘***’ indicates statistical significance at the 1% level, ‘**’ at the 5% level and ‘*’ at the 10% level using 2-tailed chi-square test for categorical variables and 2-tailed t-test for continuous variables.

SOURCE: RTI analysis of 2003 Medicare inpatient, outpatient and Part B claims.

Computer output: p2vt07a

Table 6-3 (continued)
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services:
First Stage Logistic and Conditional OLS Results based on Self-Reported Survey Data

	Inpatient Services		Outpatient Services		Professional Services		All Services	
	Probability of Any Expenditures	Level of (Logged) Expenditures						
Arthritis	1.415* (0.268)	0.009 (0.144)	2.324*** (0.428)	0.175*** (0.086)	1.785 (0.434)	0.436*** (0.090)	1.744** (0.487)	0.436*** (0.095)
Osteoporosis or fragile or soft bones	0.912 (0.180)	-0.054 (0.132)	2.987*** (0.902)	0.032 (0.091)	2.848** (1.330)	0.113 (0.100)	3.315*** (1.959)	0.130 (0.095)
Depression	0.903 (0.189)	0.122 (0.146)	0.721 (0.197)	0.088 (0.109)	0.763 (0.295)	0.120 (0.104)	0.679 (0.316)	0.091 (0.434)
Stomach ulcer, heartburn or reflux	1.029 (0.191)	-0.058 (0.152)	1.853*** (0.417)	0.306*** (0.094)	1.846* (0.640)	0.070 (0.084)	3.996*** (1.755)	0.130 (0.096)
Health Care Coverage	1.078 (0.206)	-0.053 (0.126)	1.645* (0.319)	0.128 (0.090)	2.236*** (0.590)	0.122 (0.081)	2.478*** (0.743)	0.167* (0.102)
Drug coverage (nonenrollees)	1.136 (0.250)	0.005 (0.154)	1.385 (0.304)	0.224*** (0.107)	0.999 (0.305)	0.147 (0.104)	0.911 (0.318)	0.231* (0.122)
Drug discount card (nonenrollees)	0.785 (0.172)	0.129 (0.172)	1.245 (0.262)	0.137 (0.113)	1.154 (0.347)	0.140 (0.098)	1.236 (0.431)	0.107 (0.114)
Program Enrollee	0.818 (0.191)	-0.008 (0.155)	1.863 (0.440)	0.060 (0.011)	1.425 (0.479)	0.155 (0.103)	2.048* (0.819)	-0.087 (0.129)
R ²	-	0.062	-	0.1008	-	0.1240	-	0.134
Sample Size	2,329	38	2,329	2,062	2,329	2,195	2,329	2,231

NOTES:

Results from probability model are presented as odds ratios.

Inpatient includes facility payments for services provided in a hospital, SNF and LTC hospital setting. Outpatient includes facility payments for services provided in a hospital department and freestanding ambulatory clinics. Physician includes professional payments for services provided in any setting, including a physician office.

Omitted observations are 65-74 year, male, not living alone, less than high school education, with income below 150 percent of poverty, in excellent or very good health status, and no prescription drug use.

*** indicates significance at 1% level; ** at 5% level; * at 10% level using 2-tailed t-test.

SOURCE:

RTI analysis of 2004 Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees. Age and gender are obtained from the Medicare Enrollment Database. Service use and expenditures are obtained from 2003 Medicare claims. All other variables are self-reported data from the survey.

Computer output: streg20b

the age, gender, living alone, education and income categories are generally less significant. However, the intensity of physician services is significant and positively correlated with age and education.

The findings further indicate that self-reported health status is correlated with the odds of using inpatient services, as well as the intensity of outpatient and professional services. Beneficiaries who report being in poor, fair or good health are roughly twice as likely to be hospitalized as those who report being in very good or excellent health. Once beneficiaries have accessed services, those who report being in poor, fair or good health have significantly higher expenditures for outpatient and professional services than their healthier counterparts as well. A similar pattern of higher use rates and higher expenditures conditional upon using services holds true for most of the individual medical conditions as well, although the significance of the results varies depending on the number of beneficiaries who report having the disease. Beneficiaries with heart disease, lung disease or arthritis are more likely to use inpatient services, and those who suffer from arthritis, osteoporosis and stomach ailments have a higher likelihood of using outpatient services. Each of these five chronic conditions, together with hypertension and cancer, is also associated with a greater likelihood of having a visit with a physician or other professional service provider. Moreover, while having a medical condition has no apparent impact on marginal inpatient expenditures, the effect on outpatient and professional expenditures conditional on accessing care is generally positive and significant.

The impact of health insurance for medical services (among enrollees and nonenrollees) and outpatient prescription medications (among nonenrollees only) on the use and cost of services is presented at the bottom of Table 6-3. Beneficiaries who have supplemental medical insurance are over 60 percent more likely to use outpatient services and over twice as likely to use professional services as those who do not have additional coverage. They are also more likely to incur higher costs once they access outpatient and professional care, although the results are not significant. Supplemental insurance has no significant impact on inpatient service use and costs, services which are more likely to be covered under Medicare. Nonenrollees with a privately purchased or retiree drug benefit also exhibit higher rates of service use and expenditures. The relationships, however, are largely insignificant, with the exception of the intensity of outpatient services. Among those who used outpatient services, nonenrollees with drug coverage have higher costs than nonenrollees without drug coverage. The complementarity in drugs and outpatient services is consistent with results for program enrollees presented below. Ownership of a drug discount card has no significant effect on the use and cost of Medicare services.

Most central to our analysis is the enrollment variable which shows the impact of participation in one of the three state pharmacy assistance programs on medical service use and costs relative to nonenrollees without drug coverage. The first-part results suggest that program enrollment has little observable impact on individual service use and costs. However, the negative association between drugs and inpatient services suggests that these two types of care may be substitutes. In contrast, the positive association between drug coverage and the use of ambulatory services suggests that drugs and outpatient or physician services are complements. Yet, none of these relationships is statistically significant. However, when aggregated over all types of services, drug coverage is associated with a marginally significant doubling of the probability of using any Medicare-covered service, suggesting that the potential

complementarities with ambulatory services may dominate the potential substitutability with inpatient services.

The results from the first-part models estimated with separate program-specific effects are presented in *Table 6-4*. The program effects, appearing at the bottom of the table, generally reinforce the results from the preceding analysis with a single enrollment variable. Drug coverage leads to lower rates of hospitalization. But the results are not significant. In contrast, drug coverage leads to higher rates of outpatient and profession service use. Moreover, the complementarities between drug coverage and the use of ambulatory services are stronger and more significant for enrollees in VScript and VScript Expanded. Enrollees in VScript Expanded were nearly three times more likely to use outpatient services than nonenrollees without drug coverage. Enrollees in both VScript and VScript Expanded were twice as likely to use physician services as well. They were also likely to have a higher intensity of service use than nonenrollees with drug coverage. These findings lend support to the contention that prescription drugs and ambulatory services provided in either an outpatient facility or a physician office are complementarities, particularly among beneficiaries who suffer from chronic conditions whose maintenance medications may require regular monitoring and new scripts provided by a physician, but may also lead to adverse side effects.

Again, when aggregated over all services, drug coverage more than doubles the odds of using any Medicare-covered service among VScript and VScript Expanded enrollees. This overall effect, which is statistically significant at the five percent level, further suggests that complementarities between drugs and ambulatory services may more than offset any potential savings realized on the inpatient side. The finding also suggests that the complementarities between pharmaceuticals and outpatient services may be particularly strong among beneficiaries with chronic conditions.

Results from Second-Part Model by Type of Program and Condition

The results from the two-part estimation technique by type of program are presented in *Table 6-5*. The coefficients represent the combined first-part logistic and conditional OLS results and measure the marginal effect of each of the explanatory variables on medical expenditures taking into account both the probability of using services and the intensity of service use among claimants. The two-part results are retransformed to their original dollar value using sample- and service-level smearing factors to account for heteroscedasticity among the error terms. The bootstrapped standard errors are presented in parentheses under each of the estimated coefficients.

The two-part results for the total enrollment and program-specific effects are summarized in *Table 6-6*. The enrollment effects are further disaggregated by type of service. The results show that, when service use rates and intensity are taken together, overall program enrollment is associated with a \$348 reduction in expenditures for inpatient services, a \$132 increase in outpatient expenditures, and a \$263 increase in expenditures for professional services. While only the positive association with professional services is statistically significant at the ten percent level when measured over all program enrollees, the pattern generally holds true for each individual program as well. Enrollment in VScript Expanded is associated with a statistically significant \$264 increase in expenditures for outpatient services and a \$527 increase in

Table 6-4
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services:
First Stage Logistic and Conditional OLS Results by Program Enrollment based on Self-Reported Survey Data

	Inpatient Services		Outpatient Services		Professional Services		All Services	
	Probability of Any Expenditures	Level of (Logged) Expenditures	Probability of Any Expenditures	Level of (Logged) Expenditures	Probability of Any Expenditures	Level of (Logged) Expenditures	Probability of Any Expenditures	Level of (Logged) Expenditures
Intercept	-	9.033 (0.313)	-	5.371 (0.164)	-	5.547 (0.139)	-	5.956 (0.171)
Age								
75-84 years	1.248 (0.230)	0.226 (0.144)	1.518** (0.302)	0.011 (0.086)	1.167 (0.297)	0.247*** (0.083)	1.670 (0.488)	0.198** (0.093)
>84 years	2.072*** (0.471)	-0.054 (0.133)	1.104 (0.361)	-0.308 (0.124)	3.613** (2.341)	0.122 (0.149)	4.849* (4.169)	0.083 (0.182)
Female	0.885 (0.162)	0.061 (0.131)	1.539** (0.320)	0.045 (0.938)	2.406*** (0.727)	-0.086 (0.091)	2.095** (0.774)	-0.018 (0.089)
Living Alone	1.205 (0.215)	-0.125 (0.121)	1.041 (0.204)	-0.156* (0.089)	1.052 (0.295)	-0.083 (0.081)	0.813 (0.270)	0.010 (0.089)
Education								
High school only	1.176 (0.240)	-0.158 (0.132)	1.036 (0.226)	0.049 (0.099)	1.196 (0.346)	0.159 (0.098)	1.308 (0.434)	0.146 (0.119)
Some post-high school	1.130 (0.245)	0.174 (0.151)	1.830*** (0.451)	-0.076 (0.107)	1.259 (0.430)	0.208** (0.103)	1.884 (0.768)	0.140 (0.127)
Income	1.073 (0.214)	0.024 (0.132)	0.840 (0.158)	0.094 (0.088)	1.575* (0.393)	0.013 (0.083)	1.382 (0.394)	0.030 (0.095)
Health Status								
Good	1.936*** (0.427)	0.025 (0.160)	1.251 (0.261)	0.163* (0.092)	1.141 (0.292)	0.196** (0.094)	0.974 (0.288)	0.380*** (0.097)
Fair/Poor	2.307*** (0.585)	0.153 (0.173)	1.156 (0.290)	0.402*** (0.111)	1.604 (0.608)	0.364*** (0.102)	1.449 (0.609)	0.514*** (0.128)
Clinical Condition								
Hypertension or high blood pressure	1.172 (0.189)	-0.072 (0.111)	1.351 (0.250)	-0.069 (0.082)	2.360*** (0.567)	-0.070 (0.079)	2.338*** (0.655)	-0.014 (0.091)
Heart disease or condition	1.617*** (0.275)	0.143 (0.131)	1.314 (0.282)	0.254*** (0.087)	2.677*** (0.775)	0.185** (0.088)	2.051** (0.651)	0.373*** (0.104)
Emphysema, asthma or COPD	1.511** (0.303)	-0.143 (0.133)	1.847** (0.514)	-0.041 (0.115)	3.671*** (1.767)	0.011 (0.103)	4.271*** (2.582)	0.170 (0.110)
Cancer or other malignancy	1.074 (0.210)	0.088 (0.128)	1.481 (0.376)	0.460*** (0.111)	2.104** (0.707)	0.381*** (0.112)	1.836* (0.689)	0.435*** (0.128)

(Continued)

Table 6-4 (continued)
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services:
First Stage Logistic and Conditional OLS Results by Program Enrollment based on Self-Reported Survey Data

	Inpatient Services		Outpatient Services		Professional Services		All Services	
	Probability of Any Expenditures	Level of (Logged) Expenditures	Probability of Any Expenditures	Level of (Logged) Expenditures	Probability of Any Expenditures	Level of (Logged) Expenditures	Probability of Any Expenditures	Level of (Logged) Expenditures
Diabetes or high blood sugar	1.177 (0.232)	-0.087 (0.144)	1.584* (0.422)	0.232 (0.097)	1.327 (0.423)	0.266*** (0.092)	1.520 (0.558)	0.274*** (0.109)
Arthritis	1.418* (0.268)	0.010 (0.145)	2.320*** (0.428)	0.175** (0.086)	1.774*** (0.430)	0.438*** (0.090)	0.739** (0.485)	0.438*** (0.095)
Osteoporosis or fragile or soft bones	0.909 (0.180)	-0.060 (0.133)	2.987*** (0.906)	0.030 (0.092)	2.828** (1.321)	0.111 (0.100)	3.306** (1.956)	0.127 (0.095)
Depression	0.900 (0.189)	0.119 (0.147)	0.720 (0.198)	0.087 (0.109)	0.766 (0.298)	0.118 (0.104)	0.682 (0.319)	0.089 (0.116)
Stomach ulcer, heartburn or reflux	1.025 (0.190)	-0.060 (0.152)	1.849*** (0.417)	0.305*** (0.094)	1.841* (0.633)	0.067 (0.084)	3.982*** (1.749)	0.128 (0.096)
Health Care Coverage	1.069 (0.205)	-0.548 (0.127)	1.630*** (0.317)	0.127 (0.090)	2.218*** (0.589)	0.114 (0.081)	2.469*** (0.743)	0.159 (0.102)
Drug coverage (nonenrollees)	1.141 (0.251)	0.004 (0.154)	1.390 (0.305)	0.225** (0.107)	1.002 (0.305)	0.149 (0.104)	0.913 (0.318)	0.233** (0.122)
Drug discount card (nonenrollees)	0.786 (0.172)	0.132 (0.172)	1.129 (0.263)	0.137 (0.136)	1.157 (0.347)	0.141 (0.098)	1.237 (0.430)	0.108 (0.114)
Program Enrollee	0.703 (0.197)	0.055 (0.192)	1.517 (0.435)	0.037 (0.136)	1.199 (0.485)	0.037 (0.122)	1.842 (0.896)	-0.038 (0.154)
VScript	0.927 (0.234)	0.039 (0.173)	2.206** (0.737)	0.027 (0.119)	1.980* (0.732)	0.271* (0.110)	2.504** (0.882)	0.196 (0.136)
VScript Expanded	0.983 (0.234)	-0.167 (0.160)	2.921*** (0.838)	0.139 (0.126)	2.054* (0.840)	0.291*** (0.106)	2.551** (1.248)	0.254 (0.129)
R ²	-	0.065	-	0.101	-	0.1262	-	0.136
Sample Size	2,329	382	2,329	2,062	2,329	2,195	2,329	2,231

NOTES:

Results from probability model are presented as odds ratios.

Inpatient includes facility payments for services provided in a hospital, SNF and LTC hospital setting. Outpatient includes facility payments for services provided in a hospital department and freestanding ambulatory clinics. Physician includes professional payments for services provided in any setting, including a physician office.

Omitted observations are 65-74 year, male, not living alone, less than high school education, with income below 150 percent of poverty, in excellent or very good health status, and no prescription drug use.

*** indicates significance at 1% level; ** at 5% level; and * at 10% level using 2-tailed t-test.

SOURCE: RTI analysis of 2004 Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees. Age and gender are obtained from the Medicare Enrollment Database. Service use and expenditures are obtained from 2003 Medicare claims. All other variables are self-reported data from the survey.

Computer output: streg20b

Table 6-5
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services Results from Two-Part Model based on Self-Reported Survey Data

		Inpatient Services		Outpatient Services		Professional Services		All Services	
Age	75-84 years	880 ***		57		383 ***		1,055 ***	
		343		68		87		318	
	>84 years	1,271 ***		-299		240 *		526	
		534		97		158		608	
Female		-77		98		-76		11	
		336		83		98		366	
Living Alone		48		-168		-131		-19	
		345		75		86		342	
Education	High school only	-62		61		255 ***		785 **	
		329		87		104		385	
	Some post-high school	263		-22		341 ***		803 **	
		440		100		126		452	
Income	Between 151-300% of FPL	194		100 *		96		364	
		282		73		82		318	
Health Status	Good	1,261 ***		213 **		313 ***		2,031 ***	
		511		93		103		433	
	Fair/Poor	1,978 ***		496 ***		607 ***		2,826 ***	
		561		114		122		507	
Clinical Condition	Hypertension or high blood pressure	111		-44		-56		33	
		293		79		85		327	
	Heart disease or condition	1,199 ***		323 ***		339 ***		2,024 ***	
		332		82		94		372	
	Emphysema, asthma or COPD	397		12		69		1,026 **	
		414		103		114		467	
	Cancer or other malignancy	320		634 ***		670 ***		2,487 ***	
		356		124		135		541	
	Diabetes or high blood sugar	71		330 ***		441 ***		1,514 ***	
		341		107		114		435	
	Arthritis	599 **		287 ***		647 ***		2,097 ***	
		292		72		77		301	
	Osteoporosis or Fragile or soft bones	-266		132 *		225 **		789 **	
		345		97		116		420	

Continued

Table 6-5 (continued)
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services Results from Two-Part Model based on Self-Reported Survey Data

		Inpatient Services	Outpatient Services		Professio nal Services	All Services
	Depression	91 <i>380</i>	59 <i>89</i>		167 * <i>104</i>	406 <i>383</i>
	Stomach ulcer, heartburn or reflux	-77 <i>333</i>	431 *** <i>90</i>		139 * <i>93</i>	797 ** <i>356</i>
Health Care Coverage	Supplemental medical coverage	15 <i>331</i>	194 *** <i>76</i>		229 *** <i>78</i>	915 *** <i>316</i>
	Drug coverage (nonenrollees)	227 <i>482</i>	286 ** <i>123</i>		219 ** <i>133</i>	1,132 ** <i>538</i>
	Drug discount card (nonenrollees)	-136 <i>509</i>	173 * <i>129</i>		226 ** <i>131</i>	575 <i>538</i>
Program Enrollee		-348 <i>442</i>	132 <i>113</i>		263 ** <i>114</i>	525 <i>464</i>

NOTES:

Inpatient includes facility payments for services provided in a hospital, SNF and LTC hospital setting. Outpatient includes facility payments for services provided in a hospital department and freestanding ambulatory clinics. Physician includes professional payments for services provided in any setting, including a physician office.

Omitted observations are 65-74 year, male, not living alone, less than high school education, with income below 150 percent of poverty, in excellent or very good health status, and no prescription drug use.

Bootstrapped standard errors with 500 repetitions are shown in parentheses.

***' indicates statistical significance at the 1% level, '**' at the 5% level and '*' at the 10% level using one-tailed t-test.

SOURCE: RTI analysis of 2003 Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees. Age and gender are obtained from Medicare Enrollment Data Base. Service use and expenditures are obtained from 2003 Medicare claims. All other variables are self-reported data from the survey.

Output: streg20 & streg20c

Table 6-6
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services:
Results from Two-Part Model by Program Enrollment based on Self-Reported Survey Data

	Incremental Expenditures on Medicare-Covered Services			
	Inpatient Services	Outpatient Services	Professional Services	All Services
All Pharmacy Assistance Program Enrollees	-348 (443)	132 (113)	263* (114)	525 (464)
By Program-Specific Enrollment:				
VHAP Pharmacy enrollees	-462 (566)	85 (157)	65 (149)	-121 (619)
VScript enrollees	-47 (512)	103 (146)	486** (157)	1,132* (611)
VScript Expanded enrollees	-365 (474)	264* (165)	527*** (164)	1,485** (668)

NOTES:

Estimates reflect differences in expenditures relative to nonenrollees after adjusting for sociodemographic and health status characteristics.

Bootstrapped standard errors are shown in parentheses.

*** indicates statistical significance at the 1% level, ** at the 5% level and * at the 10% level using 1-tailed t-test.

SOURCE: RTI analysis of 2004 Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees. Age and gender are obtained from the Medicare Enrollment Database. Service use and expenditures are obtained from 2003 Medicare claims. All other variables are self-reported data from the survey.

Computer output: streg20a and streg20b

expenditures for professional services. Enrollment in VScript is also associated with a statistically significant \$486 increase in expenditures for professional services. Finally, total expenditures measured over all services exhibited a \$1,132 increase among VScript enrollees and a \$1,485 increase among VScript enrollees.

Similar results from the two-part model for three selected conditions with sufficient sample sizes to provide robust estimates are presented in *Table 6-7*. The enrollment effects across all conditions are repeated at the top of the table for comparative purposes. Again, the results show a negative correlation between enrollment and expenditures for inpatient services across two of the three conditions and a positive correlation between enrollment and expenditures for both outpatient and professional services for all three conditions. However, only the lower inpatient expenditures for enrollees with hypertension (\$907) and the higher professional payments associated with hypertension (\$207) and heart disease (\$432) are statistically significant. Enrollment in the state pharmacy assistance programs is associated with an increase in expenditures for all services for elderly beneficiaries with heart disease. As a result of the consistent and positive effect for each service, enrollees with heart disease experienced a statistically significant \$1,266 annual increase in total medical expenditures.

Table 6-7
Impact of Enrollment in Pharmacy Assistance Programs on Expenditures for Medicare-Covered Services:
Results from Two-Part Model for Selected Conditions based on Self-Reported Survey Data

	Incremental Expenditures on Medicare-Covered Services			
	Inpatient Services	Outpatient Services	Professional Services	All Services
All Conditions	-348 (443)	132 (113)	263* (114)	525 (464)
By Disease-Specific Conditions:				
Hypertension or high blood pressure	-907* (679)	22 (135)	207* (155)	238 (538)
Arthritis	-726 (680)	91 (152)	71 (149)	-344 (578)
Heart disease or condition	86 (976)	185 (193)	432* (249)	1,266* (972)

NOTES:

Estimates reflect differences in expenditures relative to nonenrollees after adjusting for sociodemographic and health status characteristics.

Bootstrapped standard errors are shown in parentheses.

*** indicates statistical significance at the 1% level, ** at the 5% level and * at the 10% level using 1-tailed t-test.

SOURCE: RTI analysis of 2004 Survey of Vermont Pharmacy Assistance Program Enrollees and Nonenrollees. Age and gender are obtained from the Medicare Enrollment Database. Service use and expenditures are obtained from 2003 Medicare claims. All other variables are self-reported data from the survey.

Computer output: streg20a and streg20b

6.4 Conclusions

The results of the medical spending offset analysis provides further support to the view expressed in other recent studies that consistent and timely access to outpatient prescription drugs may serve as a substitute for acute inpatient services and a complement for professional and, to a lesser extent, outpatient services. Enrollment in Vermont’s state pharmacy assistance programs was associated with a 17 percent reduction in annual expenditures for inpatient services, although the offset at the overall and individual program levels was statistically insignificant. Enrollment in the state pharmacy assistance programs was also associated with a statistically significant 19 percent increase in annual expenditures for professional services. The largest and most statistically significant increase in payments for professional services was exhibited by enrollees in VScript and VScript Expanded. Annual payments for professional services increased 38 percent for VScript enrollees and 36 percent for VScript Expanded participants. While access to prescription drugs may help prevent avoidable hospitalizations, they also often require regular monitoring of treatment regimes and potential side effects by a physician or other professional provider. The complementarities between drug therapy and professional services are particularly strong among elderly beneficiaries with chronic conditions.

CHAPTER 7

CONCLUSIONS AND IMPLICATIONS FOR THE MEDICARE DRUG BENEFIT

Our analysis of survey data for a sample of people enrolled in Vermont's pharmacy assistance program and a comparison sample of eligible nonenrollees provides important insights regarding who is most likely to enroll in the Medicare Part D program and the program's potential for serving people with the greatest needs. The findings from these analyses only apply to low-income, aged Medicare beneficiaries who are not dually eligible for Medicaid and, therefore, are not generalizable to the entire Medicare population. However, the low-income population covered by Vermont's pharmacy assistance program is the group most likely to lack prescription drug coverage and to have difficulty paying for medications. As such, they are a key target of the Medicare Part D program. Furthermore, a program adopted by a single state, particularly a small one such as Vermont, does not have the potential of a program like Medicare Part D to exert profound influences on the health care market. Nonetheless, the experience in Vermont may provide some important lessons for Medicare as it moves toward implementing the Part D benefit.

7.1 Implications for Enrollment

In Vermont the most vulnerable individuals are the most likely to enroll in the pharmacy assistance program. Compared to people who are eligible for, but not enrolled in the program, enrollees are more likely to be age 85 or older, have less education, have lower incomes, and live alone. The program experiences adverse selection in enrollment. People who have poorer self-reported health status or have a number of chronic conditions that can be treated with prescription medications are more likely to enroll. There were no differences in health status between enrollees in the three programs, despite the fact that VScript and VScript Expanded target drugs for chronic conditions. Enrollees also had greater unmet need for prescription drugs before they joined the program. In spite of their poorer health status, enrollees took fewer medications prior to enrolling than nonenrollees. They were more likely to forgo filling a prescription because they could not afford it or cut back on the quantity taken in order to stretch their medications. The burden of paying for prescription medications also created greater financial stress for enrollees before they enrolled in the pharmacy assistance program and they were more likely to cut back on necessities or require assistance in paying for their drugs.

The Vermont pharmacy assistance program serves those individuals within the eligible population that have the greatest need and that can most benefit from publicly-provided prescription drug coverage. The enrolled population is in poor health and likely expensive to serve. Although it is a voluntary program, it is not clear whether the Part D program will be subject to the same adverse selection. Because Congress was cognizant of the potential adverse selection in Part D, the Medicare Modernization Act requires a penalty for late enrollment in Part D to discourage individuals from delaying enrollment until they become ill and have high prescription drug needs. The late enrollment penalty, with some modification, applies to low-income populations.

Like other public assistance programs, lack of awareness is a barrier to enrolling people in the pharmacy assistance program. Unlike many other public assistance programs, Vermont's

pharmacy assistance program appears to have widespread acceptance among the potentially eligible population and two-thirds said they would apply if they were eligible. Most people who would not apply either already have coverage or do not feel they need it. Burdensome application procedures and welfare stigma are not significant deterrents to applying.

Enrolling potentially eligible beneficiaries in public programs that require an active decision to apply can be daunting. CMS and the states have faced significant challenges in enrolling low-income Medicare beneficiaries in the Medicare Savings Programs, although enrollment rates have been growing over time. Vermont's experience provides encouraging evidence that low-income people who can benefit most from Part D will be successfully enrolled. Prescription drug coverage is more easily understood and more salient to beneficiaries than many other types of public assistance. While only 20 percent of people who were eligible for, but not enrolled in, the Medicare Savings Program had heard of them (Haber et al., 2003), 43 percent of eligible nonenrollees knew about Vermont's pharmacy assistance program. Indeed, several states have capitalized on their success at enrolling low income populations in pharmacy assistance program by using them as a vehicle for marketing the Medicare Savings Programs (Hoover et al., 2002). It is likely that Part D will be well-publicized and awareness will be even greater than that of state pharmacy assistance programs, particularly since it is part of Medicare and not viewed as a "welfare" program.

However, some features of Part D may make it more challenging to enroll potentially eligible, low-income beneficiaries. First, the complexity of selecting a plan may pose a barrier for some people. Furthermore, people with incomes over 135 percent FPL will face more complex and higher cost-sharing requirements under Part D compared to Vermont's program. The Part D prescription drug plan formularies could potentially be more restrictive than those offered through Vermont's pharmacy assistance programs, particularly when it comes to covering specific drugs used by an individual. Although VScript and VScript Expanded coverage is limited to drugs for chronic conditions, in practice these limitations do not have an important impact on drug utilization patterns and there are few differences between these programs and VHAP Pharmacy in the types of drugs purchased (Gilman et al., 2003). However, Part D includes a number of provisions intended to protect beneficiaries from restrictive formularies, including a "safe harbor" for plans that design formularies in compliance with model guidelines that are being developed by US Pharmacopeia with public comment and input. CMS will also review plan formularies for coverage and discrimination in formulary design. In addition, exception and appeal procedures are available to beneficiaries if a drug is not covered by a plan's formulary.

7.2 Implications for Use and Costs of Prescription Drugs

The results from the drug use and cost analyses also have important implications for the new Medicare Part D benefit. The analyses show that while there is no statistically significant association between enrolling in one of the state pharmacy assistance plans and having high yearly prescription use, enrollment is associated with lower out of pocket costs. Enrollees are 82 percent less likely than nonenrollees to have out of pocket costs of 200+/year. This effect differs across the 3 pharmacy assistance programs with VHAP Pharmacy enrollees being 90 percent less likely than nonenrollees to have those high costs, VScript enrollees 85 percent less likely, and VSE only 48 percent less likely than nonenrollees.

Enrollees are also less likely to have unmet needs than nonenrollees. In the past 12 months, enrollees are 48 percent less likely than nonenrollees to have skipped drugs or taken fewer than prescribed, although this is mostly attributable to VHAP Pharmacy enrollments who are 65 percent less likely than nonenrollees to answer yes to either of these questions. Similarly, enrollees are 62 percent less likely to not fill a prescription item because of cost. Again, this effect is greatest for VHAP Pharmacy enrollees who are 77 percent less likely to not fill a prescription because of cost. However, VScript enrollees also are less likely to have unmet need, with the enrollees being 55 percent less likely to not fill a script.

We also found that high use, high out-of-pocket costs and unmet need varied by the various health conditions. Those with respiratory conditions, such as asthma and COPD were four times more likely to have over 20 prescriptions filled per year than beneficiaries with other health conditions. Those with heart disease and diabetes were 45 percent and 200 percent more likely to have the higher out of pocket costs of \$200/month or more compared to people without those conditions. Further, patients with hypertension conditions were 70 percent more likely to either skip a drug, take fewer, or not fill a prescription because of cost. Patients with respiratory diseases or stomach acid conditions were 76 percent and 96 percent more likely to skip a drug or take less than prescribed. And those with depression were almost twice as likely (198 percent) as others to not fill a drug because of high costs. Each of these conditions are chronic conditions. Having unmet needs or not taking prescriptions to control these diseases may have implications for other health issues, such as a higher likelihood of being admitted for a preventable hospitalization.

Some of these drug costs are very expensive, especially for lower income individuals. For example, the average cost for Prozac which is used to treat depression was \$3.45 per pill in 1999 (Gage et al., 2002). Understanding the relationship between the higher costs of certain medications used by chronic populations and the potential costs for Medicare of unmet need is critical to estimating the potential offset effects of the new Part D benefit. This analysis shows the types of conditions that are associated with higher individual costs and the potential impact of these costs on individual health and future Medicare costs.

7.3 Implications for Use and Costs of Medical Services

Results from an earlier claims-based analysis of Vermont's pharmacy assistance program on the use and costs of medical services were inconclusive. The study failed to reveal any significant positive or negative effects of drug coverage on the use and costs of inpatient or outpatient services. The previous study, however, used a group of controls whose higher incomes made them ineligible for the state programs. The study also lacked important information on the supplemental medical and drug insurance status of the control population. Finally, because the initial evaluation included a large number of new enrollees, the results were strongly influenced by a 'precipitating illness' effect and a subsequent regression to the mean, causing the offsetting effects, particularly for inpatient services, to be overestimated

The updated study presented in this report benefits from a sample of eligible and near-eligible but nonenrolled beneficiaries as controls and a much richer set of self-reported survey information on beneficiary health status, insurance status, education, income and living status, as well as a profile of their existing chronic diseases. While the results likely remain biased by

unobserved differences in health status between enrollees and nonenrollees, we are nonetheless able to control for a greater range of factors than was previously possible using only claims data. Moreover, selection bias should cause any offsetting effects to be underestimated so the results can be interpreted as a lower bound measure.

The results of the medical expenditure analysis provides additional support to the views expressed in other recent studies (Lichtenberg, 2003; Yang, 2003) that consistent and timely access to outpatient prescription drugs among Medicare beneficiaries may serve as a substitute for acute inpatient services. Enrollment in Vermont's state pharmacy assistance programs was associated with a 27 percent reduction in annual expenditures for inpatient services, although the offset at the overall program level was statistically insignificant at the 10 percent level. The results further suggest that drug coverage among the elderly may be a complement to outpatient services, particularly those administered in a physician's office. Enrollment in the state pharmacy assistance programs was also associated with an 18 percent increase in annual expenditures for professional services and this result was significant at the five percent level. While access to prescription medications may help prevent avoidable hospitalizations, they may also require regular monitoring of drug treatment regimes and carry potential side effects that require the services of a physician or other professional health care provider.

Both the offsetting and complementarity effects appear strongest among beneficiaries who suffer from particular chronic conditions. Enrollment in VScript Expanded, a program whose benefits are limited to maintenance medications for chronic conditions, was associated with a statistically significant 36 percent reduction in annual expenditures for inpatient services. This suggests that, despite the higher cost sharing required under VScript Expanded, medical offsets may be more likely among beneficiaries who suffer from chronic conditions requiring consistent and timely use of outpatient medications. Enrollees in VScript and VScript Expanded also experienced the largest and most statistically significant increase in payments for ambulatory services. Annual payments for professional services increased 26 percent for VScript enrollees and 18 percent for VScript Expanded participants, suggesting that complementarities between drug coverage and physician services may be more pronounced for beneficiaries who suffer from chronic diseases as well.

In fact, the enhanced effects of drug coverage on medical service use and costs among beneficiaries with chronic conditions are further evidenced when the models were estimated over subgroups with specific diseases. Enrollment in a state pharmacy assistance program was correlated with lower inpatient spending for people with any of the three conditions we examined in this study: hypertension, arthritis or heart disease. However, none of the inpatient offsets for the disease-specific analyzes was statistically significant. In contrast, annual expenditures for professional services increased 19 percent for enrollees with hypertension and 24 percent for those with a heart condition. Both of these complementarities with services covered under Part B were statistically significant at the ten percent level.

Given these opposing relationships, the net effect of drug coverage on medical spending is difficult to ascertain and depends on the magnitude and sign of the individual service-level effects. The only total effect that was statistically significant was for beneficiaries who reported having arthritis. For people with arthritis, drug coverage was associated with lower medical

spending for inpatient, outpatient and professional services. The net effect was a statistically significant 23 percent reduction in annual medical expenditures.

The results from this limited study of low income non-dually eligible beneficiaries in Vermont suggest that the implementation of the Medicare Part D drug benefit may help to lower Medicare spending under Part A. At the same time, the Medicare drug benefit may lead to higher spending under Part B. The medical spending effects (both Part A offsets and Part B complements) of a Medicare drug benefit are likely to be most pronounced among selected populations, particularly those suffering from chronic conditions requiring the regular use of effective maintenance medications. However, the net effect of a Medicare drug benefit on total Part A and B spending is difficult to determine and is likely to be small when measured over all enrollees. Moreover, the net effects are likely to vary depending on the specific condition being treated and the effectiveness of the specific drug being used. Substantial total savings may, in fact, be realized among beneficiaries with certain chronic conditions where outpatient prescription medication is particularly effective for avoiding further illness and preventing unnecessary medical service use. It may, thus, be useful to consider these condition- and drug-specific factors when Part D and Medicare Advantage plans are developing their drug formularies and cost sharing rules.

7.4 Future of Vermont's State Pharmacy Assistance Programs under Medicare Part D

In just over one year, comprehensive outpatient prescription drug coverage will become available for the first time under Medicare. Medicare beneficiaries who are currently entitled to full benefits under Medicaid, including drug benefits, will automatically be enrolled under Part D and states will be required to reimburse the federal government a declining amount in proportion to their share of drug costs under Medicaid. Enrollment for beneficiaries currently participating in Vermont's pharmacy assistance programs, however, is optional. Participants may choose to sign up with a private risk bearing organization that offers pharmacy coverage as part of a comprehensive Medicare plan (known as a *Medicare Advantage* plan), if available, or with entities that offer drug coverage as a standalone package (known as a *Medicare Part D* plan). If an insufficient number of risk-bearing plans offer drug coverage in the state, the federal government will contract with a fallback plan. These fallback plans will act only in an administrative capacity and will not assume financial risk.

A comparison of the cost sharing obligations under Part D versus the state pharmacy assistance programs as currently legislated is presented in **Table 7-1**. Drug coverage under Part D will be partially subsidized for beneficiaries with incomes up to 150 percent of poverty.⁴⁴ Beneficiaries with incomes up to 135 percent of poverty will pay a \$2 copayment for generic or preferred multisource drugs and a \$5 copayment for all other prescription medications, up to a maximum total spending amount of \$5,100, at which point the copayments disappear and drug costs are fully subsidized. The monthly premium for these beneficiaries is also waived. Enrollees with incomes between 135 and 150 percent of poverty will pay a sliding scale premium based on their income, plus a \$50 annual deductible and a 15 percent coinsurance up to

⁴⁴ The Part D subsidies also have asset requirements. For those with incomes below 135 percent of poverty, asset requirements are \$6,000 for individuals and \$9,000 for couples. For those with incomes between 135 and 150 percent of poverty, assets must be below \$10,000 per individual and \$20,000 per couples.

\$5,100 in total out-of-pocket drug spending. After that, they will pay the \$2 or \$5 copayment depending on the type of drug. Enrollees with incomes above 150 percent of poverty will pay an estimated average monthly premium of \$35 and a \$250 annual deductible.⁴⁵ They will also pay the full 25 percent coinsurance on expenditures between the deductible and \$2,250, a 100 percent coinsurance on expenditures between \$2,250 and \$5,100, and a 5 percent coinsurance on expenditures above that amount.

The impact of Part D on enrollees in the Vermont pharmacy assistance programs is difficult to assess *a priori* and will ultimately depend on how the state responds to the new Medicare drug benefit. The state's response, in turn, depends on how the new drug benefit impacts the state's budget. Many enrollees with incomes below 150 percent of poverty who are currently covered and paid for in part by the state under VHAP Pharmacy will very likely take advantage of the full or partial subsidies offered under Part D. Even some of the VScript and VScript Expanded enrollees may choose to take advantage of the inclusion of medications with less than a 60-day supply under Medicare and sign up for the Part D benefit. The transfer of enrollees from the state plan to a federal plan may therefore reduce state expenditures. Vermont may then decide to use some of these newly realized savings to offer either a supplemental benefit directly through an authorized plan or by having their own supplemental benefits wrap around the Medicare benefit. Moreover, expenditures made by the state on behalf of Part D enrollees will ultimately count toward the enrollees' out-of-pocket limit of \$3,600, at which point the catastrophic coverage is triggered.

In sum, Part D creates both opportunities and challenges for states to continue ensuring that drug coverage remains available to their near-poor residents, particularly those with incomes above 135 percent of poverty who do not qualify for the full subsidy under Part D. Grant funds of \$125 million will be available to assist states in coordinating the transition between state programs and Part D and to help educate low income beneficiaries currently enrolled in state pharmacy assistance plans about the new Medicare drug benefit.

7.5 Areas for Future Research

While states can continue to offer assistance programs or otherwise supplement the Part D benefit once it is implemented, some states may elect to eliminate this coverage or substantially change it. It will be important to understand the impact of Part D implementation on the design of state pharmacy assistance programs, who enrolls, and the costs of these programs. Do states eliminate their pharmacy assistance programs and, if so, why? Do states that continue offering such programs change the benefit to wrap-around Part D or do they continue to offer independent programs? For those that wrap-around, how do state programs coordinate with Part D plans? Does enrollment in state programs decline following implementation of Part D? Do sicker individuals or those with higher prescription drug utilization remain enrolled in the state plan or are they more likely to leave? How do total and per enrollee program costs change following the implementation of Part D?

⁴⁵ The actuarially fair premium is currently estimated at \$35 per month, but will ultimately be determined by the individual plans.

**Table 7-1
Comparison of Medicare Part D and Vermont State Pharmacy Assistance Drug Benefits**

Vermont State Pharmacy Assistance				Medicare Part D	
Income	Program	Premium	Other Cost Sharing	Premium	Other Cost Sharing
0-135% FPL	VHAP Rx	\$13/mo.	None	None	\$2 generic or preferred multisource Rx or \$5 any other Rx copay up to \$5,100, then no copayments
135-150% FPL	VHAP Rx	\$13/mo.	None	\$0-\$35/mo. sliding scale	\$50 deductible 15% coinsurance to \$5,100, then \$2/\$5 copay
150-175% FPL	VScript	\$17/mo.	None	\$35/mo.	\$250 deductible 25% coinsurance to \$2,250, then no benefits to \$5,100, then 5% coinsurance
175-225% FPL	VScript Exp.	\$35/mo.	None	\$35/mo.	\$250 deductible 25% coinsurance to \$2,250, then no benefits to \$5,100, then 5% coinsurance

NOTE: Actuarially fair monthly premium is currently estimated at \$35, but will ultimately be determined by the individual plans.

Moreover, low-income populations previously covered by state pharmacy assistance programs, particularly those with incomes over 135 percent of poverty who do not qualify for low-income subsidies, may face higher cost-sharing if they enroll in Part D or they may have to change their medications due to formulary requirements. Following are some critical questions that should be answered in order to understand the impact of Part D on low-income individuals previously eligible for state coverage. What is rate of enrollment in Part D among low-income populations previously eligible for state coverage? Do out-of-pocket costs change following implementation of Part D for people previously eligible for coverage through a state program? Do patterns of utilization change? Do individuals change drugs (either within a therapeutic class or between brand-name and generic) after they enroll in Part D? Are there changes in access to prescription drugs and unmet need for low-income individuals who enroll in Part D plans?

Moreover, additional research will be needed to investigate the impact of Part D on unmet prescription drug needs, on out-of-pocket spending, on use and cost of prescription medications, and on use and cost of non-drug medical services. It will be equally important to assess the differential impacts of Part D for at-risk populations for whom access to prescription medications has been a challenge or those who suffer from conditions for which reliable, consistent and timely access to therapeutic treatments is critical for maintaining health and independence.

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