FINAL REPORT OF THE
VIRGINIA DEPARTMENT OF MEDICAL ASSISTANCE SERVICES

AN EXAMINATION OF PHARMACY BENEFIT MANAGER PRACTICES AND THERAPEUTIC INTERCHANGE FOR CITIZENS IN THE COMMONWEALTH OF VIRGINIA

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 4

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COMMONWEALTH of VIRGINIA

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August 10, 1999

TO: The General Assembly of Virginia

The report contained herein is provided pursuant to House Joint Resolution 574, passed by the 1997 General Assembly. I submitted an interim report on January 11, 1999. This final report provides additional information regarding the impact of pharmacy benefit manager firms (PBMs) on the Commonwealth's citizens and upon the health care market in Virginia.

Both reports also contain detailed information on the PBM practice of therapeutic interchange. This is in response to the Task Force Studying the Practice of Therapeutic Interchange pursuant to House Joint Resolution 630, passed by the 1997 General Assembly.

The cost incurred by DMAS in preparing both reports was $228,000 in direct costs associated with interagency agreements and $18,225 in DMAS staff time. Because these reports had no direct connection to Medicaid, only state funds were used.

The interim report included two separate studies.

In the first study, the Mercatus Center at George Mason University estimated the incidence in Virginia of one type of therapeutic interchange based on pharmacy benefit manager claims data, analyzed the impact of formularies on therapeutic interchange and reported on the pharmacy benefit management vendors used by major health insurers in Virginia.

In a second study, the School of Pharmacy at Virginia Commonwealth University performed a literature review and summary description of the pharmacy benefit management industry. This study included an annotated bibliography on pharmacy benefit management. The literature review also was supplemented by interviews with selected pharmacists, physicians, PBM employees, employers and patients.

The final report includes two additional studies.

The School of Pharmacy at Virginia Commonwealth University surveyed citizens of Virginia to determine the impact of pharmacy benefit management practices. The primary focus of the survey was on the PBM practice of therapeutic interchange. The survey also covered general questions regarding the frequency of health insurance coverage for prescription drugs and the satisfaction with this coverage, the frequency of pharmacy benefit management practices and general experiences with prescriptions. Satisfaction with prescription drug coverage was tested for correlation with therapeutic interchange, other PBM practices, general prescription experience and demographic factors to learn what factors affect satisfaction with prescription drug coverage. Demographic factors and prescription experiences that increase the risk of a therapeutic interchange were also analyzed.

The Mercatus Center at George Mason University surveyed pharmacists and physicians to determine the incidence of therapeutic interchange, the reasons that therapeutic interchange is initiated, the annual incidence of patient complaints and the perceptions of physicians and pharmacists on whether therapeutic interchange improves or worsens clinical outcomes, as well as other related indicators. The study also evaluated the consistency of therapeutic interchange estimates between the different studies.

The literature search, which was part of the interim report, concluded that there was little reliable research into the practices of pharmacy benefit managers. The other studies in the interim and final reports represent a comprehensive, scientific research effort into the practices of pharmacy benefit managers with specific emphasis on the practice of therapeutic interchange.

Some general conclusions about the PBM practice of therapeutic interchange are:

- the incidence of therapeutic interchange is low (about 3 percent of all prescriptions written by physicians)
- the patient complaint rate is low (about 4 percent of patients with a therapeutic interchange complain to their physician)
- satisfaction with prescription drug coverage is high, but it is lower for those who have experienced a therapeutic interchange (only 85% of those who experienced a therapeutic interchange are very or somewhat satisfied with their prescription drug coverage compared to 95% of all survey respondents with prescription drug coverage).

The General Assembly should find this information helpful as part of its consideration of drug switching, which the 1999 General Assembly asked the Joint Commission on Health Care to look at as part of HJR 734.

Respectfully submitted,

Dennis G. Smith

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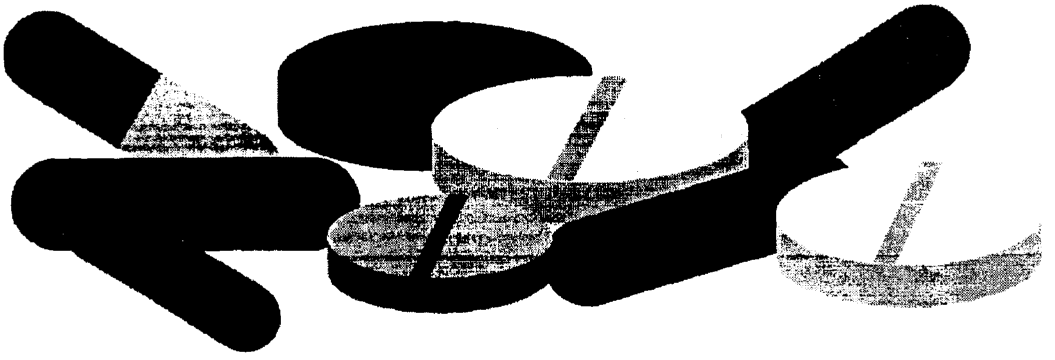
An Examination of Pharmacy Benefit Manager Practices and Therapeutic Interchange for Citizens in the Commonwealth of Virginia



STUDIES PRESENTED BY THE COMMONWEALTH OF VIRGINIA'S DEPARTMENT OF MEDICAL ASSISTANCE SERVICES TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA

PURSUANT TO H.J.R. 574 (1997)

Final Report
August 1999

EXECUTIVE SUMMARY

The studies included in the interim (January 11, 1999) and final reports were commissioned by the Virginia Department of Medical Assistance (DMAS) as authorized by the Commonwealth's General Assembly per HJR 574 (1997). HJR 574 authorized DMAS to: (1) examine practices of pharmacy benefit manager firms (PBMs) on the Commonwealth's citizens, and (2) determine the affect of such practices on the Commonwealth's citizens and the overall healthcare market. In light of the interest of the Special Task Force Studying the Practice of Therapeutic Interchange (HJR 630 (1997)), the Department also examined in depth the PBM practice of therapeutic interchange. The Department commissioned two studies by the VCU School of Pharmacy and two studies by the George Mason University Mercatus Center. The VCU Literature Review (interim report) outlined the purpose and history of PBMs and identified emerging issues in the management of pharmacy benefits. This report concluded that there was little reliable research into the practices of pharmacy benefit managers. As a result, the Department commissioned three scientific studies of PBM practices in the Commonwealth with specific emphasis on the practice of therapeutic interchange. The first study, Mercatus PBM Study (interim report), estimates the annual incidence of therapeutic interchange in the Commonwealth of Virginia by analyzing PBM pharmacy claims data. The Mercatus PBM Study also identifies health insurers in Virginia and how they are organized to manage their pharmacy benefit. The VCU Citizen Survey (final report) examines the impact of pharmacy benefit management practices through a survey of citizens. Satisfaction with prescription drug coverage was tested for correlation with therapeutic interchange, other PBM practices, general prescription experience and demographic factors to learn what factors affect satisfaction with prescription drug coverage. Demographic factors and prescription experiences that increase the risk of a therapeutic interchange were also analyzed. The Mercatus Physician/Pharmacist Survey (final report) estimates the incidence of therapeutic interchange, the reasons that therapeutic interchange is initiated, the annual incidence of patient complaints and the perceptions of physicians and pharmacists on whether therapeutic interchange improves or worsens clinical outcomes, as well as other related indicators. The study also evaluates the consistency of therapeutic interchange estimates between the different studies. The question and answers that follow summarize the most important findings from the studies.

Pharmacy Benefit Coverage in Virginia

1. What percent of Virginians had pharmacy coverage in 1998?

- About 83 percent, or 5.6 million, of all Virginians were estimated to have pharmacy coverage at any given time during the past year (VCU Citizen Survey & Mercatus PBM Study). There are an estimated 6.8 million Virginia residents (U.S. Bureau of the Census Estimate, July 1, 1998).

2. What percent of Virginians with pharmacy coverage used their pharmacy benefit during the past year?

- About 3.6 million, or roughly two-thirds, of all Virginians with pharmacy coverage are estimated to have used their pharmacy benefit during the past year (Mercatus PBM Study).

Prescription Drug Experience in Virginia

3. How many prescriptions were written by physicians or filled by retail pharmacists in Virginia during 1998?

- An estimated 65 million prescriptions were written by physicians and 58 million prescriptions were filled by retail pharmacists in Virginia during 1998. The difference between the two estimates is likely due to prescriptions filled in mail-order pharmacies or due to prescriptions written by physicians but not presented to be filled (Mercatus Physician/Pharmacist Survey).

4. How often do Virginians with prescription drug coverage fill prescriptions and how many drugs do they take on a regular basis?

- Virginians with prescription drug coverage visited a local pharmacy to fill a prescription 2.15 times on average during the prior three months. This average includes three out of ten respondents (29.3%) who did not visit a pharmacy in the last three months (VCU Citizen Survey).

- Only ten percent of Virginians with prescription drug coverage received a prescription through the mail in the prior three months (VCU Citizen Survey).

- Virginians with prescription drug coverage take an average of 1.5 different prescription drugs on a regular basis. This average includes 44 percent of respondents who take no prescription drugs on a regular basis (VCU Citizen Survey).

Pharmacy Benefit Management Practices in Virginia

5. What are the most common pharmacy benefit management practices in Virginia?

- The most frequently reported restriction on prescription drug coverage was higher copayments for brand name drugs. Half of respondents reported this restriction. The least frequently reported restriction on prescription drug coverage was doctor required to use drug list. Only 19 percent of respondents reported this restriction. Almost three out of ten respondents report limits on refills (29%) or limits on pharmacies (28%) and almost one out of four report a requirement to use generic drugs (24%) (VCU Citizen Survey).

- Only five percent of respondents with prescription drug coverage report four or five PBM restrictions. Two-thirds report 1-3 restrictions and 27 percent report no restrictions (VCU Citizen Survey).

- Many respondents were unaware of pharmacy benefit management practices used in their prescription drug coverage. This was particularly true of the restriction on doctors required to use drug list, of which almost three out of ten (29%) of respondents with prescription drug coverage did not respond or did not know (VCU Citizen Survey).

- Approximately three out of ten respondents with prescription drug coverage experienced a generic substitution in the last 12 months (VCU Citizen Survey).

Health Insurers & Pharmacy Benefit Management in Virginia

6. Which Virginia health insurers hire PBMs to administer their pharmacy benefit management programs and which PBMs do they use?

- The left column in the following table lists health plans in alphabetical order. The right column lists the PBM vendor used by each health plan (Mercatus PBM Study).

Health Insurers Contracting Out to PBM Vendors	
Health Insurer	***PBM Vendor***
BC&BS of the National Capital Area	Merck-Medco Managed Care
Capital Care, Inc.	PCS
Carilion	MedImpact
Cigna Health Corporation	PCS (indemnity)
George Washington University Health Plan	Advanced Paradigm
M.D. IPA & Optimum Choice, Inc.	Diversified Pharmaceutical Services
HealthKeepers, Inc.	Merck-Medco Managed Care
John Deere/Heritage National Health Plan	Argus Health Systems, Inc.
NYLCare Health Plans	Express Scripts, Inc.
OPTIMA Health Plan	Argus Health Systems, Inc.
PARTNERS Nat. Health Plans of NC, Inc.	Diversified Pharmaceutical Services
Peninsula Health Care, Inc.	Merck-Medco Managed Care
Piedmont Community Health Plan	Express Scripts, Inc.
Physicians Health Plan, Inc.	Merck-Medco Managed Care
Priority Health Care, Inc.	Merck-Medco Managed Care
Qual Choice, Inc.	National Prescription Administrators
Sentara Health Plans, Inc. (SHP)	Argus Health Systems, Inc.
Trigon	Merck-Medco Managed Care
Southern Health Services, Inc.	Express Scripts, Inc.
United HealthCare of Virginia, Inc.	Diversified Pharmaceutical Services

7. Which Virginia health insurers use subsidiary PBMs for administering their pharmacy benefit management programs?

- The following table lists health insurers that have subsidiary PBMs for administering their pharmacy benefit management programs (Mercatus PBM Study).

Health Insurers Using Subsidiary PBMs
Aetna U.S. Healthcare, Inc.
Cigna Health Corporation (mail order)

8. Which Virginia licensed health insurers administer their pharmacy benefit management programs in-house?

- The following table lists health insurers that administer their pharmacy benefit management programs in-house (Mercatus PBM Study).

Health Insurers Managing PBM Activities In-House
Cigna Health Corporation (indemnity and PPO)
INOVA Community Health Plan
Kaiser Foundation Health Plan of the Mid-Atlantic States, Inc.
Prudential Health Care—Mid-Atlantic

9. Which PBMs serve the most Virginians?

- Approximately 30 percent of Virginians with prescription drug coverage report that Merck-Medco is their PBM. This reflects the dominant market position of Trigon in the Virginia health insurance market. Other PBMs with significant market share in Virginia are Diversified Pharmaceutical Services (5.7%), Aetna (5.6%), Express Scripts (4.9%) and Argus (4.3%). About 30 percent of the respondents either did not know, did not answer the questions or gave a response which could not be associated with a PBM (VCU Citizen Survey).

How does Therapeutic Interchange Occur in Virginia

10. What are the different ways a therapeutic interchange can be initiated?

- There are five ways a therapeutic interchange can be initiated, based on the broad definition adopted by the Task Force Studying the Practice of Therapeutic Interchange. The five ways are *formulary exclusion, formulary inclusion, patient initiated, PBM financial incentive* and *manufacturer financial incentive* therapeutic interchanges. *Formulary exclusion* describes interchanges made because the originally prescribed drug is not covered on the pharmacy plan formulary. *Formulary inclusion* describes interchanges made because the originally prescribed drug is not a preferred drug on the pharmacy plan formulary. *Patient initiated* are interchanges made upon request of the patient and can also be formulary exclusion or inclusion types of interchanges. *PBM financial incentive* describes interchanges the pharmacy initiates as a result of financial incentives the PBM gives the pharmacy. This type of interchange would frequently overlap with formulary inclusion therapeutic interchange. *Manufacturer financial incentive* describes interchanges the pharmacy initiates as a result of financial incentives the pharmaceutical company has contracted to pay. PBM and Manufacturer financial incentives can reinforce each other or work against each other (Mercatus PBM Study and Pharmacist/Physician Survey).

11. What are the most common reasons cited by pharmacists for initiation of therapeutic interchanges?

- The most common reason reported by pharmacists for initiation of a therapeutic interchange is because the originally prescribed drug is not included on the health plan drug formulary (formulary exclusion) (35%). Other reasons include incentives to change from the originally prescribed drug to health plan preferred drugs (formulary inclusion) (27%), manufacturer financial incentives to the retail pharmacy (26%), pharmacy benefit manager financial incentives to the retail pharmacy (22%), and patient initiated (11%). These reasons for initiation of a therapeutic interchange may overlap with each other (Mercatus Pharmacist/Physician Survey).

12. Who initiates contacts with physicians for a therapeutic interchange?

- Retail pharmacists make less than half the contacts (42%) physicians receive for a therapeutic interchange. Health plans make 37 percent of the contacts and patients make 21 percent of the contacts to physicians for therapeutic interchanges (Mercatus Pharmacist/Physician Survey).

13. What are the classes of drugs for which therapeutic interchanges are most often approved?

- The most frequently attempted and approved formulary inclusion therapeutic interchanges are for anti-hypertensive drugs and non-steroidal anti-inflammatory drugs. These two drug classes

account for more than half of the pharmacy attempts and almost half of the successful therapeutic interchanges (Mercatus PBM Study).

14. What percentage of therapeutic interchange attempts are approved?

- Physicians report therapeutic interchange approvals on about one-third of contacts from pharmacists, health plans and patients (Mercatus Physician/Pharmacist Survey).

- Pharmacists report therapeutic interchange approvals on about three-quarter of physician contacts for all kinds of therapeutic interchanges (Mercatus Physician/Pharmacist Survey)

- Based on pharmacy claims data, about one-fourth of formulary inclusion therapeutic interchange attempts are approved by physicians (Mercatus PBM Study).

How often does Therapeutic Interchange Occur in Virginia

15. How many therapeutic interchanges were approved by physicians or filled by retail pharmacists in Virginia during 1998?

- An estimated 1.8 million therapeutic interchanges were approved by physicians and 440,000 were filled in retail pharmacies in Virginia during 1998. The difference between the two estimates may be partially explained by higher therapeutic interchange incidence rates for mail-order pharmacies, which would not be filled in retail pharmacies. Another potential reason for the difference is that prescribers could have changed the prescription before presentation at a retail pharmacy in cases of patient-initiated or health plan initiated therapeutic interchanges. Also not all prescriptions are filled (Mercatus Physician/Pharmacist Survey).

16. What percent of Virginians have experienced an approved therapeutic interchange during the past year?

- An estimated 3.1 percent of Virginians (211,000) report having experienced an approved therapeutic interchange initiated by an insurance company within the last 12 months (VCU Citizen Survey). This estimate was considered consistent with above estimates because the definition used was not as broad, the respondents who experienced a therapeutic interchange reported an average of two to three, one quarter to one-half of respondents may not have been aware that they were experiencing a therapeutic interchange (Mercatus Physician/Pharmacist Survey), possible recall bias and the low statistical reliability of the point estimate.

- An estimated 0.4 percent of Virginians have had an approved *formulary inclusion* therapeutic interchange within the last 12 months based on PBM claims data (Mercatus PBM Study).

Probability of a Therapeutic Interchange

17. What factors increase the risk of a therapeutic interchange?

- Respondents reporting a therapeutic interchange reported more PBM restrictions (2.05 restrictions) than those not reporting a therapeutic interchange (1.28 restrictions) (VCU Citizen Survey).

- Respondents reporting a therapeutic interchange reported twice as many visits to a local pharmacy as those without a therapeutic interchange (VCU citizen survey).

Outcomes Related to Therapeutic Interchange

18. Do physicians and pharmacists believe the practice of therapeutic interchange improves, makes no difference, or worsens clinical outcomes of patients?

- A majority of physicians (59%) believe the practice of therapeutic interchange worsens clinical outcomes while only 38 percent of pharmacists believe that therapeutic interchange worsens clinical outcomes (Mercatus Physician/Pharmacist Survey).

- Primary care physicians (54%) are less likely than specialty care physicians (64%) to believe that the practice of therapeutic interchange worsens clinical outcomes (Mercatus Physician/Pharmacist Survey).

19.What is the therapeutic interchange complaint rate by patients to physicians and pharmacists?

- Physicians receive complaints from about 4 percent of patients. Pharmacists receive complaints from about 1.7 percent of patients. This suggests that 96 to 98 percent of patients are sufficiently satisfied with the practice of therapeutic interchange that they do not complain to physicians or pharmacists (Mercatus Physcian/Pharmacist Survey).

20. Do patients report negative outcomes of a therapeutic interchange?

- Eighteen out of 58 respondents who reported a therapeutic interchange had a negative experience (they were not satisfied with the new drug or it did not work as well as the previous drug). Because of the small number of respondents, these results are not definitive (VCU Citizen Survey).

Perceptions of Physicians and Pharmacists on Workload and Responsibilities

21. What is the prescription incidence rate for therapeutic interchanges approved by physicians or filled by retail pharmacists in Virginia during 1998?

- The estimated prescription incidence rate of therapeutic interchanges approved by physicians is 3 percent. The estimated prescription incidence rate of therapeutic interchanges filled by pharmacists is 0.75 percent for all types of therapeutic interchange (Mercatus Physician/Pharmacist Survey).

22. Who usually decides the alternative drug when a therapeutic interchange is attempted?

- Almost 70 percent of physicians report they personally evaluate each therapeutic interchange request and that they are familiar with the alternative drug recommended for a therapeutic interchange. Pharmacists report that in almost 60 percent of therapeutic interchange approvals they are required to research or prompt the prescriber for an alternative drug (Mercatus Physician/Pharmacist Survey).

23. Do pharmacists or physicians spend more time on therapeutic interchange transactions?

- Pharmacists are more likely than physicians to spend more time on therapeutic interchange transactions (Mercatus Physician/Pharmacist Survey).

- About half of all physicians report that they normally spend less than a minute discussing each therapeutic interchange. Over 90% of physicians report they spend 5 minutes or less discussing each therapeutic interchange (Mercatus Physician/Pharmacist Survey).

- Almost 60% of pharmacists report they normally spend 1 to 5 minutes for each therapeutic interchange transaction. About 25% of pharmacists report they normally spend 6 to 10 minutes for each therapeutic interchange transaction (Mercatus Physician/Pharmacist Survey).

Satisfaction with Prescription Drug Coverage in Virginia

24. What percent of Virginians with pharmacy coverage are satisfied with their prescription drug coverage?

- Ninety-five percent of all respondents with prescription drug coverage report being very or somewhat satisfied with their prescription drug coverage (VCU Citizen Survey).

25. What factors influence satisfaction with prescription drug coverage?

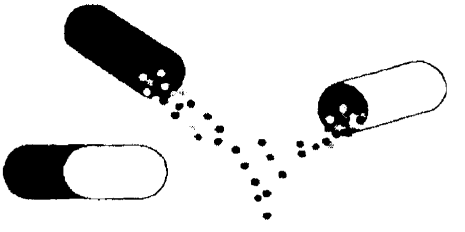
- With one exception, survey respondents who report a PBM restriction on their prescription drug coverage are less satisfied than other respondents with prescription drug coverage. The only exception is for a restriction to use only certain pharmacies (VCU Citizen Survey).

- The more PBM restrictions that respondents report, the less likely the respondent reports satisfaction with prescription drug coverage. Only 84 percent of respondents with 4-5 PBM restrictions were very or somewhat satisfied with prescription drug coverage compared to 98 percent of respondents with no restrictions and 94 percent of respondents with 1-3 restrictions (VCU Citizen Survey).

- The more visits to a local pharmacy reported in the last three months to fill a prescription, the less likely the respondent reports satisfaction with prescription drug coverage (VCU Citizen Survey).

- Respondents who experienced a therapeutic interchange are less satisfied with their prescription drug coverage than those who did not experience a therapeutic interchange. Only 85 percent of respondents who experienced a therapeutic interchange are very or somewhat satisfied with their prescription drug coverage compared to 95 percent of all respondents (VCU Citizen Survey).

Study to Determine the Impact of the PBM Practice of Therapeutic Interchange on Citizens of the Commonwealth of Virginia



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This report is based on the results of a study conducted by the School of Pharmacy at Virginia Commonwealth University. The study was conducted pursuant to an Interagency Agreement between the Department of Medical Assistance Services and the School of Pharmacy. The study was conducted under the direction of DMAS.

As stated in the Interagency Agreement between the Virginia Department of Medical Assistance Services (DMAS) and the Virginia Commonwealth University School of Pharmacy (VCU), the purpose of this survey is to determine the impact of practices of pharmacy benefit manager firms (PBMs) on the Commonwealth's citizens. While it is commonly known that these firms engage in a variety of practices in managing the pharmacy benefit often included in many health care plans, very little is known about the extent of these practices, the particular circumstances surrounding them, and their impact on the citizens of the Commonwealth of Virginia.

The purpose of this inquiry is to allow us to begin to identify important and salient features of the practices of PBMs, especially the practice of therapeutic interchange, in the Commonwealth. A telephone survey of Virginia households employing the survey technique of "Random Digit Dialing (RDD)" was used to accomplish this goal. This approach was chosen in light of the time constraints that have been imposed for the completion of this project, and in light of the resources that have been allocated.

This report consists of four sections: Executive Summary, Findings, Analysis of Satisfaction with Prescription Drug Coverage, and Appendices. An overview of the survey methodology (including limitations) and the questionnaire can be found in the appendices.

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EXECUTIVE SUMMARY

It is believed that Pharmacy Benefit Management (PBM) firms use a variety of techniques to restrict the use of the prescription drug benefit that is often included in health insurance coverage. Very little is known about how these restrictions and limitations on coverage for prescription drugs affect an insured's reported satisfaction with such coverage. This inquiry attempted to identify important and salient features of the practices of PBMs, especially the practice of therapeutic interchange, and how these practices affect satisfaction with insurance coverage for prescription drugs.

A synopsis of the findings and results from analyses of the data collected in this study are presented below. The first section of this Executive Summary consists of **findings** *related to insurance coverage, details of prescription drug coverage, visits to local pharmacies to have prescriptions filled or refilled, experiences related to prescription drugs in general (including generic substitution)* and, finally, findings *related to experiences with therapeutic interchange.*

In the second section, **an analysis of satisfaction with prescription drug coverage is presented.** Factors significantly affecting satisfaction with prescription drug coverage have been grouped into three categories: *respondent characteristics, restrictions on coverage for prescription drugs,* and *generic substitution and therapeutic interchange.*

FINDINGS

Insurance Coverage for Prescription Drugs (N=2,029)

- 72.5% of persons residing in single-person households (N=451) and 86% of persons residing in multiple-person households (N=1,353) reported having insurance coverage for prescription drugs.
- Only 5.2% of respondents reported being somewhat or very unsatisfied with their prescription drug coverage (N=1,685).

Details of Prescription Drug Coverage (N=1,685)

- 50.4% of respondents (N=1,685) with insurance coverage for prescription drugs reported that their insurance company required them to pay a higher co-payment for brand name drugs.
- 29.1% reported limits on refills or quantities dispensed, 27.7% reported that they could only use certain pharmacies, 23.9% reported being required to use generic drugs, and 18.7% reported that their doctor was required to prescribe from a list provided by their insurance companies.
- 27.2% reported no restrictions on their insurance coverage for prescription drugs, 67.6% reported 1-3 restrictions, and 5.2% reported 4-5 restrictions.
- Merck-Medco (PAID) was the most frequently mentioned PBM handling prescription drug coverage (N=518, 30.7%).

- 33.6% of respondents reported having a separate card verifying their insurance coverage for prescription drugs, 95 respondents reported not knowing whether their insurance company had issued them a separate card or not (5.6%).

Visits to Local Pharmacies to have Prescription Filled or Refilled (N=1,685)

- 29.9% of the respondents reported that they had not visited a local pharmacy during the 3-month period preceding the interview to have a prescription filled or refilled.
- 53% reported 1-3 visits, and 16% reported more than 3 visits.
- 89% of the respondents reported that they had not received any prescription medications in the mail in the 3-month period preceding the interview.
- 7% of the respondents reported having received a prescription in the mail 1-2 times in the 3-month period preceding the interview and less than one percent reported having received a prescription in the mail 5 or more times.

Experiences Related to Prescription Drugs (N=1,685)

- Respondents reported taking an average of 1.5 different prescriptions medications on a regular basis.
- 44% reported not taking any prescription medications on a regular basis (N=730) and 47% reported taking 1-4 prescription medications on a regular basis.
- Only 7% of respondents reported having been told that a prescription drug was not covered by their insurance plan in the 12-month period preceding the interview.

- Respondents were given the following definition of *generic substitution*:

  > A generic substitution occurs when the Pharmacist gives you the same drug that your physician prescribed but is usually less expensive.

  514 respondents (31.4%) reported that they had experienced a generic substitution in the 12-month period preceding the interview, based on this definition.

- In multiple-person households only 19% reported that any member of the household had experienced a generic substitution in the 12-month period preceding the interview.

- 33.8% of respondents reporting a generic substitution within the 12-month period preceding the interview reported having only one experience. 31% reported having 2-3 experiences, and 141 (31.2%) reported 4 or more experiences.

- Of the 30 brand name, single source drug mentions recorded by interviewers, 22 were in therapeutic categories for which therapeutic interchange could occur. This suggests the possibility that some of the generic substitutions were in fact therapeutic interchanges.

Therapeutic Interchange (N=63)

- For the purposes of this inquiry, therapeutic interchange was defined as follows:

  > A therapeutic interchange occurs when you get a DIFFERENT drug that is expected to work the same as the drug originally prescribed.

3.8% of the respondents reported having experienced a therapeutic interchange during the 12-month period preceding the interview.

- 70.5% of the respondents reported having experienced 1-2 therapeutic interchanges during the 12-month period, 23% report 3-6 interchanges, and only 6.5% reported 7 or more.

- 88.9% of the respondents reported that their last experience with a therapeutic interchange had occurred in a local pharmacy, and 11.1% reported that it had occurred with a prescription that they had received in the mail.

- 70.9% of the respondents reported that their pharmacist had advised them of the interchange, 21.8% reported that their physician had advised them, and 7.3% reported that they had been advised of the interchange by their insurance company.

- The two most frequently mentioned explanations given by respondents for not receiving the drug originally prescribed by their physician were "Drug not on list given to doctor" (41.9%) and "Saves money" (27.9%).

- Regarding their actions after being notified that their insurance company was requiring a therapeutic interchange, 69.6% of the respondents reported that they accepted the different drug, and 10.7% reported that they paid the full price for the original drug out of their own pocket.

- 85.4% of the respondents reported that their wait time for the therapeutic interchange was about the same as usual.

- 62.7% of the respondents reported that the drug involved in their last therapeutic interchange was a new drug that they had never taken before, and 37.3% reported that it was a drug they were already taking.

- In their view, 35.3% of the respondents who reported experiencing a therapeutic interchange involving a drug that they were already taking (N=22) stated that the new drug did not work as well as the original drug. 47.1% stated that the new drug worked about the same.

- 70.7% of the respondents experiencing a therapeutic interchange involving a new drug (N=41) reported that they were satisfied with the new drug, while 29.3% reported that they were not satisfied with the new drug.

Demographics (N=2,029)

- Respondents ranged in age from one year to 98 years. 67.2% reported being 18-54 years of age, 13.5% reported being 55-64 years of age, and 17% reported being 65 years of age or older.

- 79.5% of the respondents were White, 15.5% were Black, and 5% were Asian/Pacific Islander or Other.

- 3% of the respondents reported being of Hispanic origin.

- 29.8% of the respondents reported having a high school diploma or a GED certificate, and 21.5% reported having some college.

- 49% of the respondents reported that their 1997 before taxes household income was above $35,000. 30.2% reported that it was above $50,000, and 16.4% reported that it was above $70,000.

- 17% of the respondents reported that their 1997 before taxes household income was below $20,000.

ANALYSIS OF SATISFACTION WITH PRESCRIPTION DRUG COVERAGE

- Respondents appear to be satisfied with their prescription drug coverage, even when they had experienced a therapeutic interchange.

- 94.8% of the respondents reported that they were very or somewhat satisfied with their prescription drug coverage, compared to 85% of those who reported at least one therapeutic interchange within the 12-month period preceding the interview.

Respondent Characteristics

- Males were slightly more likely to report that they were somewhat satisfied with their prescription drug coverage than females (26.34% versus 23.12%, N=1,614). A higher percentage of females reported that they were somewhat unsatisfied with their coverage (3.87% versus 1.83%), but a larger percentage of males reported being very unsatisfied with their coverage (2.68% versus 1.88%).

- There is a statistically significant association between the number of times respondents reported visiting a local pharmacy to have a prescription filled or refilled during the 3-month period preceding the interview, and their satisfaction with their prescription drug coverage.

- Respondents who reported no visits to a local pharmacy to have a prescription filled or refilled during the 3-month period were more likely to report that they were very satisfied (72.77%) or somewhat satisfied (25.22%) with their coverage, compared to respondents reporting 1-3 visits (69.07% and 24.74%, respectively), or more than 3 visits (68.73% and 23.94%, respectively).

Restrictions on Coverage for Prescription Drugs

- The requirement to pay a higher co-payment for brand name drugs was significantly associated with respondents' satisfaction with their prescription drug coverage.

- Nearly 31% of respondents who reported that their insurance coverage for prescription drugs required them to pay a higher co-payment for brand name drugs reported that they were somewhat satisfied with their coverage, compared to 16.57% of those whose coverage did not require them to do so.

- 3.77% of the respondents who reported that they were required to pay a higher co-payment for brand name drugs reported that they were very unsatisfied with their coverage, compared to .84% of respondents who did not report such a restriction.

- The imposition of limits on refills or quantities of prescription drugs that can be dispensed at one time, is significantly associated with respondents' reported satisfaction with insurance coverage for prescription drugs.

- Only 62% of respondents who reported the imposition of limits on refills or the quantities of prescription drugs that can be dispensed at one time reported being very satisfied with their coverage, compared to 74.81% of those who did not report such restrictions.

- Respondents who reported that they were required to use generic versus brand name drugs were less likely to report being very satisfied with their coverage, compared to those not reporting this restriction (60% versus 74%).

- Respondents who reported that they were required to use generic versus brand name drugs were twice as likely to report that they were very unsatisfied with their coverage (3.29% versus 1.57%).

- Respondents who reported that their doctor was required to prescribe from a list provided by their insurance company were 1.2 times less likely to report that they were very satisfied with their coverage (60.27% versus 74%), and 4 times more likely to report being very unsatisfied with their coverage (5.48% versus 1.37%).

Generic Substitution and Therapeutic Interchange

- A statistically significant association ($p < .001$) was found between being told that a prescription drug was not covered by the respondents' prescription drug plan and satisfaction with the plan, for all respondents reporting such coverage (N=1,593).

- A statistically significant association ($p < .005$) was also found between being told that a prescription drug was not covered by a respondent's prescription drug plan and satisfaction with the plan for those respondents reporting a therapeutic interchange (N=59).

- Respondents who stated that they had been told that a prescription drug was not covered by their prescription drug plan within the 12-month period preceding the interview were 1.4 times less likely to report that they were very satisfied with their coverage (50%), compared to respondents who reported that they had not been told that a prescription drug was not covered (71.94%).

- A statistically significant association was found between experiencing a generic substitution and reported satisfaction with prescription drug coverage.

- Respondents who reported having had a generic substitution during the 12-month period preceding the interview were 1.12 times less likely to state that they were very satisfied with their prescription drug coverage (64.89% versus 72.60%), and nearly twice as likely to state that they were very unsatisfied with their coverage (3.16% versus 1.79%), compared to those who did not report a generic substitution during the 12-month period.

- Respondents who reported that they had experienced both a generic substitution and a therapeutic interchange were 1.2 times less likely to state that they were very or somewhat satisfied with their prescription drug coverage (80.56%), compared to those who reported having experienced neither a generic substitution nor a therapeutic interchange (95.91%).

- Compared to those who had not experienced a generic substitution or a therapeutic interchange, respondents who had experienced both were 4.8 times more likely to report that they were somewhat or very unsatisfied with their coverage (19.45% versus 4.09%).

- Respondents who reported either a generic substitution (5.77%) or a therapeutic interchange (8.70%) were 3.4 times and 2.2 times less likely to report that they were somewhat or very unsatisfied with their prescription drug coverage; compared to those who reported having experienced both (19.45%).

- Experiencing both a generic substitution and a therapeutic interchange decreased the likelihood that a respondent would report being very satisfied with their prescription drug coverage by 30%, and increased the likelihood that the respondent would report being somewhat unsatisfied with their prescription drug coverage by 32%.

FINDINGS

Insurance Coverage for Prescription Drugs

Interviewers first determined if anyone in the household had health insurance coverage for prescription drugs at the time of the interview. In single-person households (N=451), 327 persons (72.5%) reported health insurance coverage for prescription drugs.

Table 1 Insurance Coverage for Prescription Drugs in Multiple-person HH (N=1,578)

Number in HH	Frequency	Percent
0	220	14.0
1-4	1,211	77.0
5 or more	142	9.0
DK/RF*	5	

* DK=Don't Know, RF=Refused

In multiple-person households (N=1,578), no one was reported to have insurance coverage for prescription drugs in 220 households (14%). In over three-quarters of the multiple-person households included in the survey, the number of household members that were reported to have insurance coverage for prescription drugs was between one and four. In four of the multiple-person households, respondents reported not knowing if anyone in the household had coverage for prescription drugs, and in one instance the

respondent refused to give this information (see Table 1).

In summary, 73% (N=327) of respondents in single-person telephone households, and 86% of respondents in multiple-person telephone households in the Commonwealth of Virginia (N=1,353), reported having insurance coverage for prescription drugs at the time of the interview. 1,680 persons residing in singe and multiple-person telephone households in the Commonwealth of Virginia were reported to have insurance coverage for prescription drugs at the time of this inquiry (83%). Questions about experiences with prescription drugs were only asked of respondents residing in single or multiple-person telephone households who reported that at least one member of the household had insurance coverage for prescription drugs, or they didn't know or refused. All results are reported as for the respondents even, if questions were answered for the respondent by a proxy.

Satisfaction with Prescription Coverage

Table 2 Satisfaction with Prescription Drug Coverage (N=1,685)

Response	Frequency	Percent
Very Satisfied	1,134	70.3
Somewhat Satisfied	396	24.5
Somewhat Unsatisfied	48	3.0
Very Unsatisfied	36	2.2
DK/RF	71	

When asked about their level of satisfaction with their prescription drug coverage,

70% of the respondents reported that they were very satisfied, and 24% reported that they were somewhat satisfied. Five percent of persons in telephone households with insurance coverage for prescription drugs reported that they were somewhat or very unsatisfied with their prescription drug coverage (see Table 2).

Restrictions Imposed by Insurance Companies

Respondents were asked a series of five questions regarding restrictions on prescription drug coverage. These questions sought to determine the frequency of some of the most common pharmacy benefit management practices in Virginia (see Table 3). Percentages were computed only for respondents giving an answer to the question.

Half of the respondents reported higher co-payments for brand drugs. This was the most frequently mentioned restriction. The least frequently mentioned restriction was doctor required to use drug list (formulary). Only 18.7% of respondents reported this restriction. Slightly more than one quarter of the respondents reported limits on refills/quantities dispensed (29%) or requirement to use certain pharmacies (28%), and nearly one quarter reported a requirement to use generic drugs (24%).

In summary, 68% of the respondents in telephone household with insurance coverage for prescription drugs reported 1-3 restrictions on their insurance coverage (N=1,135). Twenty-seven percent reported that their insurance company does not impose restrictions on their coverage (N=456). Only five percent of respondents reported that their insurance company imposes 4-5 restrictions (see Table 4).

The questions focused on respondents' "awareness" of restrictions. A significant number of respondents were unaware of many of the features in their prescription drug coverage. More than one-quarter (N=482) were unaware if doctors are required to prescribe from a drug list. The restriction with the lowest number of respondents who did

not know or refused to answer the question was the restriction to only use certain pharmacies (N=88). Most respondents were aware of the requirement to use generic drugs (only 127 reported don't know or refused).

Table 3 Restrictions Imposed by Companies Handling Prescription Drug Coverage (N=1,685)

Restriction	Yes (%)	No (%)	DK/RF
Higher Co-payments for Brand	741 (50.4)	730 (49.6)	214
Limits on Refills/Quantities	432 (29.1)	1,050 (70.9)	203
Can Use Only Certain Pharmacies	443 (27.7)	1,154 (72.3)	88
Required to Use Generic Drugs	372 (23.9)	1,186 (76.1)	127
Doctor Required to Use Drug List	225 (18.7)	978 (81.3)	482

Table 4 Summary of Restrictions on Prescription Drug Coverage (N=1,679)

Number	Frequency	Percent
0	456	27.2
1-3	1,135	67.6
4 -5	88	5.2

Insurance Companies/HMOs Mentioned by Respondents

Respondents were asked to name both the "company that handles your prescription drug coverage" (PBM) and their health insurance company or HMO. Table 5 was developed by coding and correlating answers for the two questions and using information about which PBMs are used by insurance companies and HMOs in Virginia.[1] Three out of ten respondents with prescription drug coverage report using Merck-Medco (PAID) or an insurance company that uses Merck-Medco. This is primarily due to the dominant market position of Trigon and Trigon-affiliated insurance companies and HMOs, which contract with Merck-Medco. Aetna's PBM subsidiary, Diversified Pharmaceutical Services, and Express Scripts each have about 5% of the market. Insurance companies or HMOs using in-house PBMs also represent about 5% of the market. PCS, one of the three largest PBMs in the country, has a relatively small market share in Virginia, only1.4%.

There were a large number of "other" responses (17.9%) for which we cannot identify the PBM arrangement used. A large number of respondents did not know or refused to answer both questions (12.8%).

Separate Insurance Card for Prescription Drug Coverage

One important aspect of the daily operations of insurance companies and HMOs is the identification of persons covered by a particular plan. Most companies provide an electronic means for determining the identification of their insured and the adjudication

[1] See information developed as part of the interim report by the Mercatus Center, "An Estimate of the Annual Incidence of Therapeutic Interchange in the Commonwealth of Virginia During 1998," December 1998, p. 12-13.

of health insurance claims. In this sample of Virginia citizens residing in telephone households with insurance coverage for prescription drugs, two out of three reported that they did not have a separate card verifying their entitlement to the prescription drug coverage under their health insurance plan. Ninety-five respondents said that they did not know if they had a separate card for their prescription drug coverage, and one refused to answer this question (see Table 6).

Table 5 Companies (PBMs) Handling Prescription Drug Coverage (N=1,685)

Company	Frequency	Percent
Merck-Medco (PAID)	518	30.7
Diversified Pharmaceutical Services	96	5.7
Aetna's PBM Subsidiary	94	5.6
Express Scripts	83	4.9
Argus Health Systems	72	4.3
Kaiser (in house)	57	3.4
National Prescription Administrators	41	2.4
Medicaid (no PBM)	38	2.3
Cigna (PCS or in house)	33	2.0
Prudential (in house)	28	1.7
PCS	23	1.4
Caremark	23	1.4
PharmaCare Management Services (CVS)	17	1.0
Rx Prime	11	0.7
Advanced Paradigm	8	0.5
International Pharmacy Management	7	0.4
Inova (in house)	7	0.4
Eagle (Rite Aid)	6	0.4
MedImpact	5	0.3
Other	303	18.0
DK/RF	215	12.8

Prescription Medications Taken on Regular Basis

Respondents were asked to state the number of different prescription medications that they take on a regular basis (see Table 7). Forty-four percent of the respondents reported that they were not taking any prescription medications on a regular basis (N=738). Forty-seven percent reported taking between one and four prescription medications on a regular basis (N=789), seven percent reported taking between five and nine, and less than two percent reported taking 10 or more prescription medications on a regular basis (N=28).

Table 6 Separate Drug Card Issued by Insurance Company (N=1,685)

Status	Frequency	Percent
Separate Card Issued by Insurance Company to Indicate Coverage for Prescription Drugs	534	33.6
Prescription Drug Coverage Indicated on Single Card Issued by Insurance Company	1,055	66.4
DK/RF	96	

Table 7 Prescription Medications Taken on a Regular Basis (N=1,685)

Number	Frequency	Percent
0	738	44.3
1-4	789	47.3
5-9	111	6.7
10 or More	28	1.7
DK/RF	19	

In summary, the typical respondent in telephone households in Virginia with insurance coverage for prescription drugs reported taking an average of 1.5 different prescription medications on a regular basis. Nine out of ten respondents reported taking four or less different prescription medications on a regular basis.

Visits to Local Pharmacy to have Prescription Filled/Refilled

Respondents were asked to state the number of times they had visited a local pharmacy during the 3-month period preceding the date of the interview to have a prescription filled or refilled (see Table 8). Over half of the respondents (N=896) reported that they had visited a local pharmacy between one and three times during the 3-month

Table 8 Visits to Local Pharmacy to have Prescription Filled or Refilled (N=1,685)

Number	Frequency	Percent
0	493	29.3
1-3	896	53.2
More than 3	261	15.5
DK/RF	35	

period to have a prescription filled or refilled. Thirty percent of the respondents reported that they had not visited a local pharmacy at all to have a prescription filled or refilled during the 3-month period preceding the date of the interview (N=493).

Sixteen percent of the respondents (N=261) reported that they had made more than three visits to a local pharmacy to have a prescription filled or refilled during the 3-month period preceding the interview. One percent reported having made 13 or more visits. On the average, respondents who reported that they had visited a local pharmacy to have a prescription filled or refilled reported having made 2.15 visits.

Prescriptions Received in the Mail in Past Three Months

Another common cost saving practice among insurance companies and PBMs is the use of mail order pharmacies. Insurance companies often require persons covered by their policies to use these mail order pharmacies for maintenance medications. These are medications taken for chronic diseases such as hypertension. Although the company may not require an individual to use these pharmacies, they often encourage their use by

limiting the number of refills at local pharmacies during a specified period of time, by

Table 9 Number of Times Respondent Received Prescription Medicine in the Mail (N=1,685)

Number	Frequency	Percent
0	1,505	89.7
1-2	125	7.5
3-4	37	2.2
5 or More	10	0.6
DK/RF	8	

requiring a higher co-payment when a maintenance medication is obtained from a local pharmacy, or by limiting the quantity of a maintenance medication that can be dispensed over a certain period of time.

Mail order pharmacies may be less expensive and many insurance companies will allow up to a three-month supply of a medication to be dispensed at one time. Like therapeutic interchange, there is not very much empirical evidence concerning the extent to which these pharmacies are used by insurance companies and HMOs to curb rising health care costs associated with prescription medications.

The overwhelming majority of respondents in this survey had not received a prescription in the mail during the 3-month period preceding the interview (N=1,505). Eight percent of the respondents reported that they had received a prescription in the mail 1-2 times during the 3-month period of time preceding the interview (N=125). Less than one percent of the respondents stated that they had received a prescription medication in the mail five or more times in the 3-month period preceding the interview.

In summary, individuals residing in telephone households in the Commonwealth of Virginia, who report coverage for prescription drugs, do not appear to use mail order pharmacies to a significant degree (see Table 9).

Drug Switching Experiences in Past 12 Months

Persons with insurance coverage for prescription drugs may be told by the pharmacist that the particular drug that their health care provider has selected is not covered by the patient's insurance plan. The general term used to describe those instances in which a patient may not receive the drug prescribed by their physicians is *drug switching*. *Generic substitution* and *therapeutic interchange* are two examples of drug switching.

Respondents were asked "if there was an occasion in the past 12 months when they were told that a prescription medicine was not covered by their health insurance plan, but that they could switch to an alternative drug?" Respondents were asked this general question to get them in a frame of mind for more specific questions related to therapeutic interchange. Respondents were asked to answer this question based on the 12-month period immediately preceding the interview.

We would have expected the number of respondents to this question to equal or exceed the number of respondents who experienced either a generic substitution or therapeutic interchange. Respondents seemed to better understand the more specific questions about generic substitution and therapeutic interchange than they did the general question about drug switching. This question on drug switching, however, may have prepared them to respond more appropriately to the more detailed questions later on.

Table 10 Respondent Told Prescription Drug Not Covered by Insurance Plan (N=1,685)

Response	Number	Percent
Yes	116	7.0
No	1,544	93.0
DK/RF	25	

Only 7% of the respondents indicated that they had been told that a prescription drug was not covered by their insurance plan in the 12-month period prior to the interview (see Table 10). We assume that respondents had a prescription in hand and were attempting to have it filled when they were told this fact by the pharmacist. It is not clear from this information alone whether this was an instance of generic substitution or therapeutic interchange.

Generic Substitution within the Past 12 months

Insurance companies often require doctors and other prescribers to substitute generic equivalents of brand name drugs as a cost saving measure. This practice has been in place for quite some time and is widely used in the health care insurance arena. As a follow-up to the previous question about drug switching in general, respondents were asked to indicate whether or not they had experienced a generic substitution within the past 12 months (see Table 11). For the purposes of this study, interviewers were instructed to provide respondents with the following definition of generic substitution:

A generic substitution occurs when the Pharmacist gives you the SAME drug that your physician prescribed but is usually less expensive.

Table 11 Generic Substitution within the Past 12 Months (N=1,685)

Number	Frequency	Percent
Yes	514	30.5
No	1,123	66.6
DK/RF	48	

When asked whether this had happened to them within the past 12 months, over 500 respondents responded affirmatively (31.4%). Two-thirds of the respondents stated that they had not experienced a generic substitution in the past 12 months. We expected to find that generic substitution was a relatively common practice.

There were 285 separate drug mentions for the generic substitution question. Of these, 29 were general (such as antibiotic or pain medicine) rather than drug specific. Another 17 were unidentifiable by the researchers. This left a total of 239 specific and identifiable mentions. Of this group, 30 were brand name products for which generic substitutes are not available. This suggests that a small, but significant, number of the identified generic substitutions may not have actually been generic substitutions.

Of the 30 brand name, single source mentions, 22 were in therapeutic categories for which therapeutic interchange could occur. This suggests the possibility that some of the generic substitutions were in fact therapeutic interchanges. No clear conclusion can be drawn since 36 respondents experienced both a generic substitution and a

therapeutic interchange. Respondents could mention up to five drugs and may have mentioned drugs from both a generic substitution and a therapeutic interchange.

Table 12 Number of Experiences with Generic Substitution (N=514)

Number	Frequency	Percent
1	153	29.8
2-3	158	30.7
4 or more	141	27.4
DK/RF	62	

For those respondents who experienced a generic substitution within the past 12 months (N=514), three in ten reported having had a single experience in the past 12 months (33.8%). Slightly more than one-third of the respondents reported having 2-3 experiences within the past 12 months, and 141 reported having had four or more experiences within the past 12 months (31.2%, see Table 12). In multiple-person households, only 19% reported that any member of the household had had an experience with generic substitution within the 12- month period preceding the interview (N=309, see Table 13).

Therapeutic Interchange within the Past 12 Months

The main purpose of this inquiry was to determine how the PBM practice of therapeutic interchange affects citizens within the Commonwealth. Therapeutic

Interchange is thought to be a

Table 13 Generic Substitution in Multiple-Person Households (N= 1,685)

Response	Frequency	Percent
Yes	309	18.3
No	1,314	78.0
DK/RF	62	

common and frequently used cost saving measure of PBMs. However, little is known about the actual extent to which this PBM practice is used. Some have argued that it occurs infrequently. Proponents say that it is a safe, effective means of controlling spiraling prescription drug costs. Opponents say that the practice is detrimental to the health of consumers and that its widespread use is cause for concern. Opponents also believe that the practice is an inconvenience for the patient, the pharmacist, and the physician (or other health care provider with prescriptive authority).

For the purposes of this inquiry, therapeutic interchange was defined as follows:

> A therapeutic interchange occurs when you get a DIFFERENT drug that is expected to work the same as the drug originally prescribed.

When asked whether they had experienced a therapeutic interchange, only 63 of the respondents reported that they had indeed experienced a therapeutic interchange within the past 12 months (see Table 14). This number represents 3.8% of all respondents with

health insurance coverage for prescription drugs (N=1,685), and 3.1% of all 2,029 survey respondents.

Table 14 Therapeutic Interchange within the Past 12 Months (N=1,685)

Response	Frequency	Percent
Yes	63	3.8
No	1,574	96.2
DK/RF	48	

Table 15 reports the frequency of therapeutic interchange among persons who reported coverage of prescription drugs and who also reported having experienced an interchange in the 12-month period of time preceding the interview. Seventy-one percent of the respondents who reported a therapeutic interchange in the 12-month period preceding the interview reported between one and two interchanges (N=43). Only seven percent reported seven or more interchanges during the 12-month period. In multiple-person households, only 2.9% reported a therapeutic interchange for any member of the household during the 12-month period preceding the interview (N=48, see Table 16).

There were 36 separate drug mentions for the therapeutic interchange question. Of these, 11 were general (such as antibiotic or pain medicine) rather than drug specific. One was unidentifiable by the researchers. This left a total of 24 specific and identifiable mentions. All were in therapeutic classes for which therapeutic interchange could occur.

These results seem to suggest that therapeutic interchange may not be as

Table 15 Number of Therapeutic Interchanges within the Past 12 Months (N=63)

Number	Frequency	Percent
1 - 2	43	70.5
3-6	14	23.0
7 or More	4	6.6
DK/RF	2	

Table 16 Therapeutic Interchanges in Multiple-person Households (N=1,685)

Response	Frequency	Percent
Yes	48	2.9
No	1,587	97.1
DK/RF	50	

widespread a practice of insurance companies and HMOs in Virginia as some have argued. The percentage of respondents in Virginia telephone households that experienced a therapeutic interchange during the 12-month period preceding the interview (3.8%) is remarkably smaller than the percentage that experienced a generic substitution (31.4%). Respondents were eight times more likely to experience a generic substitution than a therapeutic interchange.

It is very important to note here that reports of generic substitution and therapeutic

interchange are from the perspective of the patient/consumer. Respondents have given responses based on their understanding of these two types of drug switching provided during the telephone interview.

Details of a Therapeutic Interchange

Some of the questions the study hoped to answer were how therapeutic interchange occurs, when it occurs, why it occurs, how disputes are resolved and the impact on clinical outcomes. Respondents who had experienced a therapeutic interchange therefore were asked a series of questions about the details of a therapeutic interchange. Results are reported in the following subsections. Due to the small number of respondents who experienced a therapeutic interchange, however, the results are not definitive.

Venue of Last Experience with Therapeutic Interchange

Table 17 provides a summary for the question relating to the site of the respondent's last experience with therapeutic interchange within the past 12 months. As the table reveals, 56 respondents indicated that the interchange had occurred at a local pharmacy and seven reported that it had occurred with a mail order prescription.

Table 17 Site of Last Therapeutic Interchange (N=63)

Site	Frequency	Percent
Local Pharmacy	56	88.9
Mail Order	7	11.1

Notification of Last Therapeutic Interchange

As Table 18 reveals, 39 respondents reported that they had experienced a therapeutic interchange in the last 12 months indicated that they had been notified by the pharmacist (71%), four stated that their insurance company had notified them, and 12 reported that they were notified by their physician.

Table 18 Notification of Last Therapeutic Interchange (N=63)

Who	Frequency	Percent
Pharmacist	39	70.9
Insurance Company	4	7.3
Physician	12	21.8
DK/RF	8	

Explanation Provided for Last Therapeutic Interchange

Respondents were asked additional questions relating to their last therapeutic interchange experience within the 12-month period of time preceding the date of the interview. Respondents were asked this questions: "Were you given an explanation for not receiving the drug originally prescribed by your physician?" If the respondent

indicated that they had received an explanation for not receiving the drug originally prescribed by their physician, they were then asked to state, in their own words, the explanation provided.

Interviewers were instructed not to prompt the respondent but to categorize their responses using a pre-determined list. Interviewers could record up to five open-ended responses to this question for each respondent. Table 19 contains a summary of the respondents' responses. Some of the responses that were not categorized were subsequently coded by staff in the Department of Medical Assistance Services.

Forty-two percent of the respondents told interviewers that the explanation they were given for the therapeutic interchange was that the drug originally prescribed was not on the list given to the doctor (N=18). Twelve of the respondents told interviewers that the explanation that they were given at the time of the therapeutic interchange was that the alternative drug saves money. One respondent told interviewers that they did not understand the explanation that they were given. Two of the respondents said that the explanation that they were given was that the therapeutic interchange was being required due to a recent change in the insurance company's policy.

Actions Following Notification of Last Therapeutic Interchange

After being asked whether or not they had been notified about a therapeutic interchange the last time it had occurred in the past 12 months, who provided the notification, and the explanation they had received, respondents were then asked to tell the interviewer, in their own words, what they did after they were notified. As in the case of the explanation they were given for not receiving the drug originally prescribed, interviewers were instructed to allow respondents to tell them in their own words what they did and to record the respondent's statements using pre-determined categories.

It was felt that this approach would yield the most accurate results while at the same time facilitating the analysis of the findings.

Interviewers again asked the respondents to "think back to the last time in the past 12 months that they had experienced a therapeutic interchange." The interviewers also repeated the definition of therapeutic interchange used in this inquiry to ensure that the respondent understood that this question was still referring to the last experience the respondent had with therapeutic interchange in the last 12 months.

Seven out of ten respondents stated that they accepted the therapeutic interchange (see Table 20). Five respondents (8.9%) complained or discussed it with their doctor, but it is not clear whether they accepted the therapeutic interchange. The other respondents clearly did not accept the therapeutic interchange. One out of ten respondents (10.7%) paid the total price of original drug out of their own pocket, four respondents (7.1%) got approval from insurance company for original drug and two respondents (3.6%) did not receive any medication.

If one considered the responses "paid total price out of own pocket", "never got any medication," and "complained/discussed with doctor" as negative outcomes, then 23.2% of respondents had a negative outcome. However, even fewer than 63 respondents had a completed therapeutic interchange since 4 respondents finally got insurance company approval for the original drug.

Wait for Prescription to Be Filled

Respondents who experienced a therapeutic interchange were then asked to tell the interviewer whether they had to wait longer than usual to get their medicine. One charge by opponents of this practice is that it inconveniences the patient, the pharmacist,

Table 19 Explanations Given for not Receiving the Drug Originally Prescribed (N=47)

Explanation	Number	Percent
Drug not on list given to doctor	18	41.9
Saves money	12	27.9
Medical reasons	4	9.3
Other Explanations	3	7.0
A recent change in company policy	2	4.6
Other drug just as effective	2	4.6
Not in stock	2	4.6
Didn't understand explanation given	1	2.3
DK/RF	4	

Table 20 Actions After Notification of Last Therapeutic Interchange (N=56)

Action	Number	Percent
Accepted different Drug	39	69.6
Paid total price of original drug out of own pocket	6	10.7
Paid higher co-payment to get original drug	0	-
Never got any medication	2	3.6
Got approval from insurance company for original drug	4	7.1
Other Action	5	8.9

and the physician. Fifty-five of the 63 respondents who experienced a therapeutic interchange responded to this question (Table 21).

Table 21 Perception about Wait Time for Therapeutic Interchange (N=63)

Response	Frequency	Percent
Little longer than usual	4	7.3
Lot longer than usual	4	7.3
Same as usual	47	85.5
DK/RF	8	

An examination of the respondents' responses in Table 21 reveals that their last experience with therapeutic interchange did not result in a longer wait to get their medicine, in their view. In fact, 86% of these respondents stated that their wait was "the same as usual." Four stated that they waited "a little longer," and only four stated that they waited "a lot longer."

Report on Status of the Original Drug

Referring to their last experience with therapeutic interchange, respondents were asked to tell the interviewer whether, the drug originally prescribed was a new drug or one that was already being taken. Respondents' responses to this question can be found in Table 22 below.

Thirty-seven of the respondents told interviewers that the drug originally prescribed in their last experience with therapeutic interchange was a new drug that they had never

taken before. Twenty-two respondents stated that the original drug involved in their last experience with therapeutic interchange was a drug that they were already taking. Based on these findings, it appears that, according to the patients themselves, when they did have an experience with therapeutic interchange, the original drug prescribed by their physician or other health care provider is more likely to be a new drug than one they were already taking.

Table 22 Status of Drug Originally Prescribed (N=63)

Status	Frequency	Percent
Already being taken	22	37.3
New, never taken before	37	62.7
DK/RF	4	

Respondent's Perception about New Drug

We wanted to determine whether the outcome of the therapeutic interchange was positive or negative from the point of view of the respondents. Respondents who had been switched from a drug they were already taking were asked how well the new drug worked compared to the original drug (see Table 23). Eleven respondents said that the new drug worked the same or better than the original drug and six said it did not work as well. Respondents who had been switched before even taking the original drug, and respondents who didn't answer the original question, were asked if they were satisfied with the results of the new drug (see Table 24). Twenty-nine respondents indicated that

they were satisfied with the new drug and 12 said they were not.

If the "positive" outcomes from the two questions are combined, approximately seven out of ten (69.0%) respondents had a positive outcome. These conclusions are the perception of the respondents and are not based on a clinical evaluation.

The eighteen respondents who had negative outcomes ("did not work as well" from Table 23, or were not satisfied from Table 24) were asked what they did. Their verbatim responses are recorded in Table 25. These responses are consistent with responses in Table 19.

The verbatim responses in Table 25 reveal that, for these fifteen respondents, their actions centered around further contact with their physician or health care provider. "Doctor" appears in nine of the responses. This suggests that the respondent did not simply accept what they were told

Table 23 Respondent's Perception about How Well the Alternative Drug Worked (N=22)

Response	Frequency	Percent
Worked better	3	17.6
Worked about the same	8	47.1
Did not work as well	6	35.3
DK/RF	5	

Table 24 Satisfaction with New Drug (N=41)

Response	Frequency	Percent
Yes	29	70.7
No	12	29.3

when the therapeutic interchange occurred. However, we have no way of determining the temporal sequence of events following the therapeutic interchange. It is interesting to note that two of the respondents reported that they got the original medication either from their doctor or after the doctor got approval from the insurance company. Additional

Table 25 Actions After Receiving Alternative Drug: Verbatim Responses* (N=18)**

Told doctor and he gave the original med
Went to a totally different medication
Told my doctor
Discussed with doctor
Didn't work as fast
Went back to MD
Told the doctor
Complained
Went back to the physician and he had to get the original one approved
Because it's less ex, it might not work as well
Put one in and it didn't feel better
Had to go back and get something different because the drug didn't work
Called doctor and told reaction that she gets
Doctor wrote letter
I stopped taking it and advised my doctor

* No frequency distribution was computed due to variability of responses
** DK/RF = 3

contact with the doctor is implied in two of the responses.

One respondent reported that they stopped taking the alternative medication and advised their doctor of that fact. One respondent simply indicated that "I complained" but it is not clear to whom they complained or if anything happened as a result of their complaint. Five of the responses involved some comment that appears to be based on the action of the drug in the respondent's body ("didn't work as fast," "...the drug didn't work," "called doctor and told reaction..."). One respondent appears to have reached a subjective conclusion about the alternative drug based on the fact that it is less expensive ("because it's less ex...").

Demographic Profile of Respondents

Gender

Interviewers recorded the sex of respondents by observation except in the case of proxies. In those instances in which the interview was completed by a proxy for the selected household member, interviewers asked the proxy for the gender of the selected household member for whom they were answering.

Females comprised 57% of the total sample (N=1,157) and males comprised 43% (N=872). Because preliminary results revealed that females were over represented in the sample, a special effort was made to include more males in the sample. The selection criteria were modified slightly near the end of the field period for the survey to increase the representation of males in the sample.

Age

The age of selected household members ranged from one year to 98 or more years of age (see Table D-1). Sixty-seven percent of the respondents were between 18 and 54 years of age (N=1,332), 14% were 55-64, 9% were 65-74 years of age, and 8% were 75 years of age or older. Two percent of the respondents were under 18 years of age.

Table D-1 Age Cohorts (N=2,029)

Cohort	Frequency	Percent
1 - 17	40	2.0
18 - 54	1,332	67.3
55 - 64	268	13.5
65 - 74	180	9.1
75 and above	160	8.1
Refused	49	

Race/Hispanic Origin

Eighty percent of the respondents reported that they were White (N=1,582), 309 stated that they were Black or African American, 41 stated that they were Asian/Pacific Islanders, and 58 stated that they were of some other race or ethnicity (see Table D-2).

Table D-2 Race (N=2,029)

Race	Frequency	Percent
White	1,582	79.5
Black or African American	309	15.5
Asian/Pacific Islander	41	2.1
Other	58	2.9
DK/RF	39	

Five respondents stated that they did not know their race or ethnicity, and 34 respondents refused to answer this question. In a separate question regarding ethnic origin regardless of race, only three percent of the respondents stated that they were of Hispanic origin (N=51).

Education

Thirteen percent of the respondents reported having less than a high school education (N=253, see Table D-3). Thirty percent of the respondents reported having completed high school or to have earned an equivalency diploma (N=591), 425 reported having some college or an Associate's of Arts degree, 416 stated that they had earned undergraduate degrees, 77 reported having completed some graduate education, and 218 reported having a graduate or professional degree.

Table D-3 Level of Education (N=2,029)

Highest Grade Level Completed	Frequency	Percent
Less than High School	253	12.8
High School Diploma/GED	591	29.8
Some College/AA Degree	425	21.5
College Graduate (BA, BS, etc.)	416	21.0
Some Graduate	77	3.9
Graduate/Professional Degree	218	11.0
DK/RF	49	

Income

Nearly 50% of the respondents reported that their total household income before taxes in 1997 was above $35,000. Only 82 of the respondents (4%) reported their total household income before taxes in 1997 was less than $10,000. Thirty percent of the respondents reported that their before taxes 1997 total household income was above $50,000 and 16% reported it to be above $70,000.

Table D-4 1997 Before Taxes Total Household Income (N=2,029)*

Income Level	Frequency	Percent
< $10,000	82	4.0
< $20,000	264	13.0
> $35,000	995	49.0
> $50,000	612	30.2
> $70,000	333	16.4
DK/RF	304	

* Percentages exceed 100 because of overlapping, nonexclusive categories

ANALYSIS OF SATISFACTION WITH PRESCRIPTION DRUG COVERAGE

The purpose of this inquiry was to determine the incidence of the PBM practice of therapeutic interchange in the Commonwealth of Virginia and to determine its impact on the Commonwealth's citizens. For those respondents who reported having insurance coverage for prescription drugs, additional questions were asked about pharmacy benefit management practices and prescription drug experiences.

In order to measure the impact of therapeutic interchange and other PBM practices on the citizens of the Commonwealth, respondents were asked about their satisfaction with their prescription drug coverage. This analysis of the results centers around the basic issue of satisfaction with prescription drug coverage and seeks to discover important respondent attributes that help us to understand the phenomenon of satisfaction with prescription drug coverage. In addition, this analysis reviews factors that may increase the likelihood of therapeutic interchange.

Contingency Tables and the Chi-square Test

In each of the tables below a cross-tabulation of a specific *independent variable* (e.g., age, number of prescription medications taken on a regular basis, gender, etc.) is performed with the *dependent variable* **"satisfaction with prescription drug coverage."** The ***Chi-square test statistic*** (X^2) allows us to evaluate the null hypothesis that changes in levels of satisfaction with prescription drug coverage are not associated with changes in the levels of the independent variable, and determine whether or not to reject or accept it. A significant Chi-square statistic ($p < .05$) indicates that there is sufficient evidence to **reject** the null hypothesis and conclude that a contingency exists between the dependent variable and the independent variable. A contingency means that there is some degree of statistical association between the two variables, such that changes in

the levels of the dependent variable are significantly associated with changes in the levels of the independent variable. Furthermore, the percentages reported in the contingency table are equivalent to probabilities. Thus, when a contingency exists, we are able to interpret the percentages as probabilities, or the *likelihood of occurrence*.

All of the tables used in this analysis represent a simple *two-way* cross-tabulation of one independent variable with "satisfaction with prescription drug coverage," the dependent variable. Generally speaking, each cell in the contingency table should have an expected cell count of at least five observations. When this is not the case, the Chi-square test may not be the appropriate test for statistical association. A note is added to those tables wherein this requirement is not met so that the reader will be aware of the fact that the reported results should be accepted with caution. No other statistical tests of association were performed in those instances. The Statistical Analysis System (SAS) was used to compute all Chi-square statistics.

Satisfaction with Prescription Drug Coverage

Overall, respondents appear to be very satisfied with their prescription drug coverage. Seventy percent of all respondents reported that they were very satisfied with their prescription drug coverage. A quarter of all respondents reported that they were somewhat satisfied with their prescription drug coverage. Only 5% of all respondents reported that they were either somewhat or very unsatisfied with their prescription drug coverage.

Respondents who reported having experienced at least one therapeutic interchange during the 12-month period preceding the interview were less satisfied with their prescription drug coverage, compared to all respondents. Only 57% of respondents experiencing a therapeutic interchange reported that they were very satisfied with their

prescription drug coverage (compared to 70% of all respondents). Twenty-eight percent of respondents reporting having experienced a therapeutic interchange reported that they were somewhat satisfied with their prescription drug coverage. Ten percent reported that they were somewhat unsatisfied with their prescription drug coverage (compared to 3% of all respondents) and 5% reported that they were very unsatisfied with their coverage (compared to 2.2% for all respondents).

In summary, respondents appear to be satisfied with their prescription drug coverage, even when they had experienced a therapeutic interchange. Ninety-five percent of all respondents, and 85% of respondents reporting that they had experienced a therapeutic interchange, stated that they were either very or somewhat satisfied with the prescription drug coverage offered by their health insurance plans.

Table A-1 Percent of Respondents Satisfied with Prescription Drug Coverage

Respondents	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied
All	70.3	24.5	3.0	2.2
T. I.	56.7	28.3	10.00	5.00

Respondent Characteristics

Gender

Males were slightly more likely to report that they were somewhat satisfied with their prescription drug coverage than females, for all respondents (26.34% versus 23.12%,

see Table A-2). A higher percentage of females reported that they were somewhat unsatisfied with their coverage than males (3.87% versus 1.83%), but a larger percentage of males reported being very unsatisfied with their coverage than females (2.68% versus 1.88%).

Table A-2 Percent Satisfied with Prescription Drug Coverage by Gender

Gender	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
Males	69.15	26.34	1.83	2.68	710
Females	71.13	23.12	3.87	1.88	904
Total	70.26	24.54	2.97	2.23	1,614

$X^2 = 8.596$, 3 d. f. ($p < 0.035$)

Age

The Chi-square test for independence between age cohort and level of satisfaction with prescription drug coverage was significant for respondents reporting a therapeutic interchange, but not for all respondents (see Table A-3). Older respondents who had an experience of therapeutic interchange were less satisfied with their prescription drug coverage than younger respondents who had an experience with therapeutic interchange. However, these results should be accepted with caution because a high percentage of the cells had expected counts less than 5.

Race/Ethnicity

Insofar as race and ethnic identity and respondents' satisfaction with their prescription drug coverage are concerned, no statistically significant association was found. Of those respondents reporting at least one experience with therapeutic interchange, none of them identified themselves as being Asian/Pacific Islander.

Income

Predetermined categories for total household income before taxes (1997) were used to record respondents' income. The following overlapping (nonexclusive) categories were used: **< $10,000, < $20,000, > $35,000, > $50,000, and > $70,000.**

Table A-3 Percent with Therapeutic Interchange Satisfied, by Age Cohort

Age Cohort	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
1 - 17	50.00	50.00	0	0	2
18 - 54	61.36	27.27	6.82	4.55	44
55 - 64	40.00	20.00	40.00	0	5
65 - 74	50.00	50.00	0	0	6
> 74	0	0	0	100	1
TOTALS	56.90	29.31	8.62	5.17	58

$X^2 = 27.456$, 12 d. f. ($p < 0.007$)

Note: 90% of the cells in the contingency table had expected counts less than 5.

Respondent choices for the first two categories were: "Yes, Less than", "No", and "Exactly." For the category > $35,000, respondent choices were "Above," "Below," and "Exactly." In the latter two categories, respondent choices were "Yes, Greater than," No," and "Exactly." Separate Chi-square tests for association between satisfaction with prescription drug coverage and each of the five income categories for all respondents and for respondents experiencing a therapeutic interchange were performed.

No statistically significant association between income and satisfaction with prescription drug coverage was found except in the case of respondents experiencing a therapeutic interchange and 1997 total household income before taxes greater than $50,000 (see Table A-4). Respondents who answered "No" to this questions (total 1997 household income before taxes was less than $50,000) were less likely to state that they were very satisfied with their insurance coverage for prescription drugs, compared to those who stated that their total household income was greater than $50,000 (54.55% versus 63.16%). Twenty-seven percent of the respondents who answered "No" reported that they were somewhat satisfied with their prescription drug coverage, compared to 31.58% of those who answered that their total household income was greater than $50,000.

We must use caution when interpreting the results pertaining to income category and respondents' reported satisfaction with their insurance coverage for prescription drugs because persons with low incomes (e.g., at or near poverty) may be eligible for Medicaid, or some other special programs, that may not impose the same types of restrictions regarding prescription drugs. The Medicaid program in the Commonwealth of Virginia, for example, uses an "open" formulary, even though it requires generic substitution when available. Consequently, we might expect Virginia Medicaid recipients to be very satisfied with their coverage based on just this fact alone. It is important to note

that respondents were not specifically asked whether or not they were covered by Medicaid during the interview.

In summary, although the total number of respondents in Table A-4 is small, it appears that respondents whose total household income was greater than $50,000, and who had experienced a therapeutic interchange, were more satisfied with their prescription drug coverage than those respondents who had experienced a therapeutic interchange and who reported their total 1997 household income before taxes to be less than $50,000.

Visits to Local Pharmacy

Analysis of the results revealed that there is a statistically significant association between the number of times a respondent visited a local pharmacy to have a prescription filled or refilled, and their reported satisfaction with their prescription drug coverage. Respondents who reported no visits to a local pharmacy to have a prescription filled or refilled during the three month period of time preceding the interview were more likely to report that they were very satisfied (72.77%) or somewhat satisfied (25.22%) with their prescription drug coverage, compared to respondents reporting 1-3 visits (69.07% and 24.74%, respectively) or more than three visits (68.73% and

Table A-4 Percent with Therapeutic Interchange Satisfied, by Total HH Income

Category	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
Yes, Greater than $50,000	63.16	31.58	0	5.26	19
No, Not Greater than $50,000	54.55	27.27	9.09	9.09	11
Exactly $50,000	0	0	100	0	1
Total	58.06	29.03	6.45	6.45	31

$X^2 = 16.167$, 6 d. f. ($p < 0.013$)

Note: 75% of the cells in the contingency table had expected counts less than 5.

23.94%, respectively; see Table A-5). Respondents reporting more than three visits were three times more likely to report being very unsatisfied with their coverage than respondents reporting no visits (1.12%) and 1.2 times more likely to report being very unsatisfied than those reporting 1-3 visits (2.52%).

On the average, respondents reported two visits to a local pharmacy to have a prescription filled or refilled during the three month period preceding the interview. Those respondents who reported having a therapeutic interchange, on the average, reported twice as many visits as those without a therapeutic interchange. This difference was statistically significant ($p < .0001$).

These results clearly reveal that making multiple trips to the pharmacy is associated with a greater likelihood of reporting dissatisfaction with prescription drug coverage. A test to determine if there is a statistically significant association between the

number of times respondents reported visiting a local pharmacy to have a prescription filled or refilled during the three months preceding the interview, and a limit on the number of refills or quantities dispensed, revealed that indeed there

Table A-5 Percent Satisfied, by Number of Visits to Local Pharmacy

Number of Visits	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
0	72.77	25.22	0.89	1.12	448
1 - 3	69.07	24.74	3.67	2.52	873
More than 3	68.73	23.94	4.25	3.09	259
Total	70.06	24.75	2.97	2.22	1,580

$X^2 = 13.805$, 6 d. f. ($p < 0.032$)

is an association ($X^2=21.113$, 2 d.f. ($P < 0.001$). This finding is consistent with Table A-5. Respondents who made more trips to a local pharmacy during the three month period preceding the interview were more likely to report being less satisfied with their prescription drug coverage, and more likely to report being somewhat satisfied or very unsatisfied.

Number of Different Prescription Medications

Respondents were asked to report how many different prescription medications

they were taking on a regular basis at the time of the interview. The likelihood of experiencing a therapeutic interchange might be expected to increase as the number of prescription medications increases. In order to determine whether or not the number of prescription medications taken on a regular basis has an impact on satisfaction with insurance coverage for prescription drugs, a categorical variable was created. The value of this variable was set to zero for those respondents reporting that they were not taking any prescription medications on a regular basis, and one for those reporting that they take one or more prescription medicines on a regular basis.

The mean number of prescriptions taken by persons reporting a therapeutic interchange was 2.23, compared to 1.53 for those not reporting a therapeutic interchange. Although respondents reporting a therapeutic interchange reported taking, on the average, .70 more prescription medications on a regular basis than those not reporting a therapeutic interchange, this difference was not statistically significant.

No statistically significant association was found between number of prescription medications taken on a regular basis and respondents' reported satisfaction with their prescription drug coverage.

Restrictions on Coverage for Prescription Drugs

Higher Co-payment for Brand Name Drugs

The requirement to pay a higher co-payment for brand name drugs was significantly associated with respondents' satisfaction with their prescription drug coverage. Nearly 31% of all respondents reporting that their insurance coverage for prescription drugs required them to pay a higher co-payment for brand name drugs

reported that they were somewhat satisfied with their prescription drug coverage, compared to 16.57% for all respondents who reported that their prescription drug plan did not require a higher co-payment for name brand drugs (See Table A-6). Only 0.84% of all respondents not required to pay a higher co-payment for brand name drugs reported that they were very unsatisfied with their coverage, compared to 3.77% of all respondents reporting that they were required to pay a higher co-payment.

Limits on Refills or Quantities Dispensed

One popular practice among PBMs and insurance companies providing coverage for prescription drugs is to limit the number of refills or the quantity of prescription drugs that can be

Table A-6 Requirement to Pay Higher Co-payment for Brand Name Drugs

Required	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
No	80.90	16.57	1.69	0.84	712
Yes	60.95	30.82	4.46	3.77	717
Total	70.89	23.72	3.08	2.31	1,429

$X^2 = 72.806$, 3 d. f. ($p < 0.001$)

dispensed at one time or in a period of time. As with all such restrictions, the purpose is to control health care costs. A statistically significant association was found between this

restriction and respondents' reported satisfaction with their prescription drug coverage for all respondents. Only 62% of all respondents who reported that their insurance coverage for prescription drugs imposed limits on the number of refills or quantities dispensed reported being very satisfied with their coverage, compared to 75% of all respondents who reported no such limits. Higher percentages of all respondents who reported limits on refills or quantities dispensed reported being somewhat satisfied (29.36%), somewhat unsatisfied (3.82%), and very unsatisfied (4.77%) with their prescription drug coverage, compared to respondents who reported no such limits (21.69%, 2.14%, and 1.36%; respectively).

Requirement to Use Generic versus Brand Name Drugs

Respondents were asked whether or not their insurance company required them to use generic versus brand name drugs as a requirement of their coverage for prescription drugs. A test to determine if there was an association between the

Table A-7 Percent Satisfied, by Limits on Refills or Quantities Dispensed

Limits	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
No	74.81	21.69	2.14	1.36	1,028
Yes	62.05	29.36	3.82	4.77	419
Total	71.11	23.91	2.63	2.35	1,447

$X^2 = 32.055$, 3 d. f. ($p < 0.001$)

requirement to use generic versus brand name drugs, and respondents' reported

satisfaction with their coverage, revealed a statistically significant to use generic versus brand name drugs, and respondents' reported satisfaction with their coverage, revealed a statistically significant association for all respondents (see Table A-8), but not for those who reported a therapeutic interchange. For respondents who indicated that their prescription drug plan required them to use generic versus brand name drugs, 60% reported that they were very satisfied with their coverage, compared to 74% of respondents who stated that their plan did not require them to use a generic. One-third of the respondents reporting that they are required to use a generic drug reported being somewhat satisfied with their coverage, compared to 22% of those reporting that they are not required to use generic drugs. Four percent of respondents required to use generics reported being somewhat unsatisfied with their coverage, and three percent reported being very unsatisfied, compared to 2.5% and 1.6% of those not required to use generics; respectively.

Table A-8 Requirement to Use Generic versus Brand Name Drugs

Required	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
No	73.95	22.22	2.45	1.57	1,143
Yes	60.00	32.60	4.11	3.29	365
Total	70.42	24.73	2.85	1.99	1,508

$X^2 = 26.236$, 3 d. f. ($p < 0.001$)

Requirement for Physician to Prescribe from Formulary List

For all respondents, a higher percentage of those who reported that their doctors were required to prescribe drugs from a formulary list supplied by the insurance company or PBM reported being somewhat satisfied (30.59%), somewhat unsatisfied (3.65%), or very unsatisfied (5.48%) with their coverage for prescription drugs than those who reported that their doctor was not required to prescribe from a list (22.32%, 2.32%, and 1.37%; respectively). A statistically significant association was found for all respondents (see Table A-9), but not for those reporting a therapeutic interchange.

Table A-9 Physician Required to Prescribe from Formulary List

Required	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
No	74.00	22.32	2.32	1.37	950
Yes	60.27	30.59	3.65	5.48	219
Totals	71.43	23.87	2.57	2.14	1,169

$X^2 = 25.109$, 3 d. f. ($p < 0.001$)

Restriction to Use Only Certain Pharmacies

Another frequently used means of controlling health care costs is the imposition of a restriction on pharmacies insured persons can use to get their prescription medications. When used, insurance companies and PBMs will often provide their customers with a list of names of pharmacies to be used in obtaining their prescription

medications. No statistically significant association between this restriction and respondents' reported satisfaction with their prescription drug coverage was found.

We have already noted that respondents' reported satisfaction with their prescription drug coverage was statistically, significantly associated with the requirement that respondents pay a higher co-payment for brand name drugs, limits on refills or quantities dispensed, the requirement that generics be used instead of brand name drugs, and the requirement that physicians prescribe from a formulary list. The only PBM restriction not found to be associated with satisfaction with prescription drug coverage was the restriction to use certain pharmacies.

A mean of 1.28 restrictions was reported on prescription drug coverage for all respondents, compared to a mean of 2.05 restrictions for respondents reporting a therapeutic interchange. This difference was statistically significant ($p < .0001$). It appears that, for respondents reporting a therapeutic interchange, the interchange may be only one of several restrictions to which they may be subjected when seeking to get a prescription filled or refilled. It also appears that when PBMs use restrictions on coverage for prescription drugs as a means of controlling health care costs, it is not uncommon for them to impose more than one restriction at a time.

In an attempt to get a composite picture of the impact of PBM restrictions on respondents' satisfaction with their coverage, an *index of restrictions* was created, based on a scale ranging from zero (no restrictions) to five (all restrictions reported). This index consisted of three distinct levels: No Restrictions, 1-3 Restrictions, and 4-5 Restrictions.

An examination of the results reveals that, for all respondents, there is a statistically significant association between restrictions on prescription drug coverage and respondents' satisfaction with the coverage (see Table A-10). Eighty percent of respondents reporting no restrictions on their coverage for prescription drugs stated that they were very satisfied with their coverage, compared to 69% of those reporting 1-3

restrictions and 42% of those reporting 4-5 restrictions. Only one percent of respondents reporting no restrictions stated that they were very unsatisfied with their coverage, compared to 2% of those reporting 1-3 restrictions and 7% of those reporting 4-5 restrictions.

Table A-10 Satisfaction and Number of Restrictions on Coverage

Restrictions	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
None	80.00	17.91	1.16	0.93	430
1 - 3	68.70	25.36	3.56	2.37	1,096
4 - 5	42.05	46.59	4.55	6.82	88
Total	70.26	24.54	2.97	2.23	1,614

$X^2 = 60.003$, 6 d. f. ($p < 0.001$)

In summary, these results clearly indicate that as the number of restrictions on prescription coverage increases, overall satisfaction with the coverage decreases significantly. Respondents reporting 1-3 restrictions on their coverage were 1.2 times less likely to report that they were very satisfied with their coverage, compared to respondents who reported no restrictions on their coverage. Those reporting 4-5 restrictions were 1.9 times less likely to report that they were very satisfied.

As the number of restrictions increased, those reporting 1-3 restrictions were 3 times more likely to report that they were somewhat unsatisfied with their coverage, compared to respondents reporting no restrictions. Respondents reporting 4-5 restrictions

were 4 times more likely to state that they were somewhat unsatisfied, compared to those reporting no restrictions. Respondents reporting 1-3 restrictions were 2.5 times more likely to state that they were very unsatisfied with their coverage than those reporting no restrictions (0.93% versus 2%). Respondents reporting 4-5 restrictions were seven times more likely to state that they were very unsatisfied with their coverage than those reporting no restrictions (0.93% versus 6.8%).

Generic Substitution and Therapeutic Interchange

Prescribed Drug Not Covered

All respondents who reported having prescription drug coverage were asked if they had ever been told that a prescribed drug was not covered by their plan. This question was asked of all respondents, whether or not they reported having experienced a generic substitution or a therapeutic interchange. We might expect that, if a respondent reported that they had ever been told that a prescription drug was not covered by their plan, they might be less likely to report being very or somewhat satisfied with their prescription drug coverage.

Half of all respondents who reported having been told that a prescription drug was not covered by their plan reported that they were very satisfied with their coverage, compared to 72%

of those who had not ever been told that a drug was not covered by their plan (See Table A-11). Thirty-six percent of all respondents reported being somewhat satisfied with their plan when they had been told that a drug was not covered, compared to 24% of those who had not been told this. Only 1.7% of all respondents who reported that they had not been told that a particular drug was not covered reported that they were very unsatisfied with their plan, compared to 7% of those who had been told that a drug was not covered.

Similar findings were noted for respondents reporting that they had experienced a therapeutic interchange as well. Thirty-five percent of respondents reporting that they had experienced a therapeutic interchange, and that they had been told that a prescription drug was not covered by their plan, reported that they were very satisfied with their plan, compared to 80% of those who had not been told that their plan would

Table A-11 Respondent Told Prescription Drug Not Covered

Told Drug Not Covered	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
No					
All	71.94	23.80	2.57	1.69	1,479
T. I.	80.00	10.00	6.67	3.33	30
Yes					
All	50.00	35.96	7.02	7.02	114
T. I.	34.48	44.83	13.79	6.90	29
Total					
All	70.37	24.67	2.89	2.07	1,593
T. I.	57.63	27.12	10.17	5.08	59

$X^2_{All} = 35.342$, 3 d. f. ($p < 0.001$)
Note: 25% of the cells in the contingency table had expected counts less than 5.

$X^2_{TI} = 13.001$, 3 d. f. ($p < 0.005$)
Note: 50% of the cells in the contingency table had expected counts less than 5.

not cover a prescribed drug. Only 10% of respondents reporting a therapeutic interchange, and who also reported that they had not been told that a particular drug was covered by their plan, reported being somewhat unsatisfied with their coverage, compared to 45% of those who had been told this fact. Nearly 7% of respondents who reported experiencing a therapeutic interchange and being told that a prescription drug was not covered by their plan reported being very unsatisfied with their plan, compared to 3% who had not been told this fact.

In summary, being told that a prescription drug was not covered by respondents' prescription drug plans increased the likelihood of respondents reporting less satisfaction with their plans. It appears that even if respondents reported a therapeutic interchange, they were more likely to report being very satisfied or somewhat satisfied with the their coverage if they were not also told that a particular drug was not covered.

This may mean that, insofar as their satisfaction with their prescription drug coverage is concerned, respondents can better handle being told that a therapeutic interchange is required, than they can handle being told that a particular drug is not covered by their prescription drug plan. While these two statements appear to be equivalent on the surface, they may not be in the minds of respondents who are asked to make judgements about their prescription drug plan, and to tell how satisfied they are with the plan.

Generic Substitution

Analysis of the results reveals that, for all respondents, there is a statistically significant association between having experienced a generic substitution and satisfaction with prescription drug coverage. Respondents who reported that they had experienced a generic substitution were more likely to report being somewhat satisfied (28.01%), somewhat unsatisfied (3.94%), or very unsatisfied (3.16%) with their prescription drug

coverage, compared to those reporting that they had not experienced a generic substitution (23.26%, 2.35%, and 1.79%; respectively). No statistically significant association between having experienced a generic substitution and satisfaction with prescription drug coverage was found for those respondents who reported having experienced a therapeutic interchange. As we might expect, a respondent's level of satisfaction with their prescription drug coverage appears to be affected by whether or not they had experienced a generic substitution (presumably against their will, or contrary to the desire of their doctor).

Table A-12 Satisfaction and Experience with Generic Substitution

G. S. Status	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
Yes	64.89	28.01	3.94	3.16	507
No	72.60	23.26	2.35	1.79	1,062
Total	70.11	24.79	2.87	2.23	1,569

$X^2 = 11.932$, 3 d. f. ($p < 0.008$)

Generic Substitution AND Therapeutic Interchange

Results of a test to determine if there was a statistically significant association between having experienced both a generic substitution and a therapeutic interchange, and satisfaction with coverage for prescription drugs, was also significant for all respondents (see Table A-13).

Overall, respondents who experienced both a generic substitution and a therapeutic interchange were more likely to report being somewhat satisfied (30.56%), somewhat unsatisfied (13.89%), or very unsatisfied (5.56%) with their prescription drug

coverage, compared to those who reported neither a generic substitution nor a therapeutic interchange (23.17%, 2.34%, and 1.75%; respectively).

In summary, experiencing both a generic substitution and a therapeutic interchange decreased the likelihood that a respondent would report being very satisfied with their prescription drug coverage by 30%, and increased the likelihood that the respondent would report being somewhat unsatisfied with their prescription drug coverage by 32%. Compared to respondents who reported neither a generic substitution nor a therapeutic interchange, respondents who experienced both were

Table A-13 Experience with Generic Substitution AND Therapeutic Interchange

G. S. & T. I.	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
Neither	72.74	23.17	2.34	1.75	1,027
G. S. Only	66.30	27.94	3.33	2.44	451
T. I. Only	69.57	21.74	4.35	4.35	23
Both	50.00	30.56	13.89	5.56	36
Total	70.27	24.72	2.93	2.08	1,537

$X^2 = 27.334$, 9 d. f. ($p < 0.001$)
Note: 25% of the cells in the contingency table had expected counts less than 5

seven times more likely to report being somewhat unsatisfied with their prescription drug coverage, and three times more likely to report being very unsatisfied with their coverage (13.89% versus 2.34%, and 5.56% versus 1.75%; respectively). Even when they experienced either a generic substitution or a therapeutic interchange, or both, respondents reported being more satisfied than unsatisfied with their prescription drug

coverage.

Therapeutic Interchange

Respondents reporting a therapeutic interchange were 1.25 times less likely to report that they were very satisfied with their prescription drug coverage, and 15% less likely to report being somewhat satisfied (56.67% versus 70.89% and 24.47% versus 28.33%; respectively), compared to respondents not reporting a therapeutic interchange (see Table A-14).

Table A-14 Satisfaction and Therapeutic Interchange

Therapeutic Interchange	Very Satisfied	Somewhat Satisfied	Somewhat Unsatisfied	Very Unsatisfied	Number
No	70.89	24.47	2.72	1.92	1,508
Yes	56.67	28.33	10.00	5.00	60
Total	70.34	24.62	3.00	2.04	1,568

$X^2 = 14.892$, 3 d. f. ($p < 0.002$)

Note: 25% of the cells in the contingency table had expected cell counts less than 5.

One in ten respondents reporting a therapeutic interchange stated that they were somewhat unsatisfied with their coverage (10%), compared to only 2.72% of the respondents not reporting a therapeutic interchange. Respondents who reported a therapeutic interchange were nearly three times more likely to report that they were very unsatisfied with their coverage, compared to those who had not experienced an interchange (5% versus 1.92%). Although the exact reasons may vary, and are unknown

here, it appears that the requirement that a therapeutic interchange be made by insurance companies providing prescription drug coverage increases the likelihood that respondents will report some degree of dissatisfaction with their coverage.

APPENDICES

A: Survey Methods & Sample Selection

Random Digit Dialing

Virginia households with telephones were selected using a technique known as *Random Digit Dialing* (RDD). Once a household was selected using RDD, qualified members of that household were identified to answer a series of questions related to PBM practices. A more in-depth discussion of the selection procedure can be found below.

Survey Sampling, Inc. (SSI) estimates that as many as 30% of telephone households are not published in a telephone directory. They suggest the trend may be increasing. RDD is the preferred method of conducting telephone surveys because it increases the chances of including these unlisted households. There may be considerable and important differences between telephone households that are published compared to those that are not. Samples drawn from only directory-listed numbers may be biased and not representative of the population under measurement. Methods have been developed to eliminate business numbers, fax and computer numbers, and household second lines. For these reasons, RDD has been chosen for this inquiry because it reaches 95% of telephone households in the Commonwealth of Virginia. Results of this survey can be generalized to the whole state.

Other advantages of RDD include easily obtained samples that can be provided in electronic format, effortless interface with Computer Assisted Telephone Interviewing (CATI) and dialing systems, more efficient sampling procedures, and better control over the sample while in the field. Cost savings accrue as a result of reduced labor needs and shorter time in the field. It is possible to generate RDD samples in accordance with any number of requirements precipitated by the goals of the inquiry. SSI concludes that "(T)he principal elements of a good random digit sample are: representation, inclusion of unlisted (also known as ex-directory) telephone households, and sample efficiency."

This inquiry employed a 10-call design. This means that each randomly dialed

household was called up to 10 times before a final disposition was reached. More than 2,000 telephone household in the Commonwealth of Virginia were included in the survey. The average length of the telephone interview was 9-10 minutes. The percentage of telephone households that were reached using RDD within each area code were approximately equal. The most calls were made to area code 504, and the fewest calls to area code 703. During the interview, respondents were asked to complete a questionnaire approved by DMAS that solicited information pertinent to PBM practices in the Commonwealth of Virginia (See Appendix B).

Once a telephone household was reached by RDD, a screening process was then used to determine if the person who answered the phone was at least 18 years of age or older. If the person answering the telephone was the only one in the household with insurance coverage for prescription drugs, then that individual was the qualified household member for the interview. If the person answering the telephone was not the only person in the household with insurance coverage for prescription drugs, then the interviewer asked for the member of the household with insurance coverage for prescription drugs who had the most recent birthday. The interviewer asked for a proxy to answer the questions in those instances when the target individual in the household was under 18 years of age, unable to speak on the telephone, or unwilling to do so.

Proxies answered the interviewer's questions in 94 instances. A total of 97 potential proxies were identified, but three refused to serve as a proxy for the interview. All results are reported as for the respondents, even if questions were answered by the proxy.

After the interviews had begun, the selection criteria were modified so that more males could be included in the survey. Early results had indicated that females were disproportionately represented in the sample. One possible reason for this could have been the fact that women are more likely to attend to matters in the household pertaining to health insurance, they may have been home more than males when the calls were

made, and they may have been more willing to respond to the questions. In the end, 57% of the sample was female and 43% was male. The interviewer only asked for the gender of the household member in those instances where a proxy was used. In the other instances the interviewer determined the sex of the respondent by observation. A total of 1,157 females and 872 males were included in the survey.

Once a telephone household was selected, interviewers used a series of screening questions to determine who in the household was 18 years of age or older with health insurance coverage for prescription drugs. General information was sought about the respondent's insurance coverage for prescription drugs. Respondents were asked about their satisfaction with their insurance coverage for prescription drugs, the name of the company that handled their prescription drug coverage, the name of their insurance company or HMO, and their experience with drug switching.

The focus of this inquiry was the respondent's experience with therapeutic interchange within the 12-month period of time preceding the interview. Respondents were asked specific questions about the last time that they had experienced a therapeutic interchange within this 12-month period. To ensure that respondents could distinguish between *generic substitution* and *therapeutic interchange*, interviewers provided definitions of each of these and repeated these definitions during the interviews.

Sample Selection and Interview Process

Technical support in the design of the questionnaire, and in completing the interviews, was provided by the Survey and Evaluation Research Laboratory (SERL) at VCU. The SERL contracted with Schulman, Ronca & Bucuvalas, Inc. (SRBI) of New York to provide additional assistance and technical support. SRBI actually drew the sample of telephone households for the survey and conducted the interviews (after being trained by staff from the SERL). After an initial field test, the questionnaire was approved by

DMAS and the telephone interviews were begun. Telephone interviews were conducted from November 19, 1998 through December 6, 1998. A total of 2,029 interviews were completed.

Randomly generated telephone numbers for each area code in Virginia were dialed automatically using SRBI's CATI system. This method assured that all areas of the Commonwealth would be included in the survey. Use of CATI technology made it possible for interviewers to schedule call backs as needed, easily refer back to information recorded from each phone call, and provided a practical facility for recording and storing information collected through the telephone interviews. After the completion of the telephone interviews, SRBI provided a data set of the results to the School of Pharmacy for analysis.

Sample Size

Prior to this inquiry, very little was known about the number of Virginians that had experienced an instance of therapeutic interchange. It has been estimated that 49 to 94 percent of persons covered by health insurance have some form of prescription drug coverage (see HJR 630 Task Force Report and Appendices, as well as Facilitator's Findings on Number of Virginians Covered by Health Insurance; DMAS 1997). However, of those who have health insurance, and who also have coverage for their prescription drugs, it was not known how many of them had experienced a therapeutic interchange.

It seemed reasonable to assume that the likelihood of a therapeutic interchange would increase if a person had coverage for prescription drugs, and had received a prescription from his/her physician. Other factors that may influence the likelihood of experiencing a therapeutic interchange include practices of the PBM managing this benefit, having a chronic condition requiring maintenance medications, and the presence of co-morbid conditions. This inquiry was not intended to be an exhaustive exploration

of the phenomenon of therapeutic interchange in the Commonwealth of Virginia. Rather, it was an attempt to begin to understand this phenomenon, and salient factors and features of it.

In order to determine the sample size that would yield valid results at a predetermined level of statistical significance, information about the population of interest was needed. A priori knowledge about the population proportion of persons whose prescription drug benefit was managed by a PBM, and who had experienced a therapeutic interchange, was quintessential to the determination of a suitable sample size. This information was not available. Based on anecdotal information and estimates from a number of sources, we assumed that the population proportion of persons who had experienced a therapeutic interchange was somewhere between .10 and .20.

We contacted Dr. T. J. Eller of the Virginia Commonwealth University Research and Evaluation Laboratory for assistance in performing an a priori power analysis to determine a suitable sample size. She determined that, if the population proportion of Virginia households that had experienced a therapeutic interchange was .15, then a sample size of 1,926 would be required.

In summary, our sample size of 2,029 Virginia telephone households is adequate to yield statistically valid results if the true population proportion of persons residing in Virginia telephone households who had experienced a therapeutic interchange within the 12-month period preceding the interview was at least .15. If the true proportion was less than .15, our sample size is not adequate for yielding statistically discernible results, except to indicate that the incidence was very low.

In light of the fact that the proportion of telephone households in our sample wherein respondents believed that they had experienced a therapeutic interchange within the 12-month period preceding the interview was **.03**, we must interpret the findings from this inquiry with reservations. Thus, the size of the sample used in this inquiry is one of the limitations of the inquiry.

Limitations

As with any inquiry involving the selection of a random sample of a larger population, there are circumstances that may affect the degree to which findings may be generalized to the larger population. These circumstances are in effect *limitations* of the inquiry. In the present case, four such limitations have been identified: sample size, household effect, familiarity with and understanding of *generic substitution* and *therapeutic interchange*, and memory recall. We have already discussed the limitation related to sample size. The other three limitations are discussed below.

Household Effect

The sampling unit for this survey was telephone households in the Commonwealth of Virginia. Respondents, therefore, came from these households. Their demographic profile is more consistent with that of telephone households in Virginia, than with the general population of Virginia. Respondents in a household were randomly selected to ensure a representative sample of respondents residing in Virginia telephone households. Females and older persons were more represented in the sample than in the general population of Virginia.

- Fifty-seven percent of the respondents in this study were female. Fifty-one percent of Virginia's general population was female in 1990.

- Only 10.7% of Virginia's general population was 65 or older in 1990. Seventeen percent of the respondents in this study were 65 or older.

Older people and females tend to make more visits to health care providers

annually, and, consequently, may be more likely to receive prescription medicines, compared to the general population. In light of these facts, older people and females may be more at-risk for experiencing a therapeutic interchange. Age and gender, however, are not the only factors that affect health seeking behavior, and subsequently, the likelihood of receiving a prescription for medication. Health status, psychosocial factors (e.g., health care beliefs), and perceptions about the availability, accessibility, and acceptability of health care services are also important determinants of health seeking behavior and, in turn, may also affect the likelihood that a respondent might receive a prescription, and experience a therapeutic interchange.

The fact that the proportion of females and older persons in our sample was greater than their respective proportions in the larger population suggests a *household effect* in our sample. This household effect is the second limitation of our study because it could cause an inflation of the estimate of the incidence of therapeutic interchange.

Respondents' Understanding of Terms

Respondents' understanding of, and familiarity with, the terms *generic substitution* and *therapeutic interchange* is the third limitation of this inquiry. We assumed that the general public was not aware of the terms generic substitution and therapeutic interchange. DMAS supplied the definitions of these terms that were used in the interviews. Respondents were also given a simple example of therapeutic interchange.

In addition to providing the respondents with definitions of generic substitution and therapeutic interchange, the order in which questions were asked was also used to increase respondent's understanding. They were first asked questions about drug switching in general, generic substitution, and finally therapeutic interchange. We were particularly concerned that respondents might confuse therapeutic interchange with the

more common practice of generic substitution. Therefore, we asked respondents about their experience with generic substitution before we asked them about therapeutic interchange.

We also asked respondents to identify the drugs that were involved in their last experiences with generic substitution and therapeutic interchange in the 12-month period preceding the interview. Respondents were asked to provide the names, separately, of up to five drugs in each case. This gave us the ability to check on the validity of the answers given. Despite the above efforts, there may still have been some misunderstanding and/or under reporting of experiences with generic substitution and therapeutic interchange due to respondents' unfamiliarity with or lack of understanding of these terms.

Memory Recall

Respondent's ability to recall and provide information from past events is a critical factor affecting the validity of data collected through survey research. *Memory recall*, the term used to describe this phenomenon, is the fourth limitation of our study. If respondents are not able to remember past events, or specific details from them, this creates a problem for researchers because their inability to do so limits the degree to which responses can be used to answer research questions. The problem of memory recall is exacerbated by longer periods of recall.

We asked respondents to recall general prescription experiences over a three-month period, a relatively short period. When we asked respondents about their experiences with drug switching, generic substitution and therapeutic interchange, we asked for them to recall these experiences over a twelve-month period. A shorter recall period may have been better, but, in light of the nature and expected low frequency of these events, especially therapeutic interchange, we believed that this was an acceptable

time period. Furthermore, we felt that if these events occurred infrequently, respondents would be more likely to recall them because they were "exceptions to the rule" when getting a prescription filled or refilled. We acknowledge the possibility of an under reporting of therapeutic interchange by respondents, as a result of memory recall.

B: Questionnaire

STUDY# 7768:

Assessing the Impact of the PBM Practice of Therapeutic Interchange on Citizens in the Commonwealth of Virginia: A Study Conducted by the Department of Medical Assistance Services

[Programmer note: where possible, make DK and RF codes 8 and 9]

INTRODUCTION:

Hello, my name is **[name]**, and I am calling on behalf of the Virginia Department of Medical Assistance Services. We are conducting a study about health care in Virginia. May I speak to the person most responsible for health care decisions in your household.

S1. To begin, how many people 18 or older, including yourself, live in household?

S2. How many people under 18 live in this household?

If S1+S2=1 ask S3a. Otherwise ask S3b.

S3a.. Do you have insurance coverage for prescription drugs?

Yes	**SKIP TO Q2**
No	**SKIP TO Q29**
(VOL) Don't Know	**SKIP TO Q29**
(VOL) Refused	**SKIP TO Q29**

S3b. How many people in this household have insurance coverage for prescription drugs?

IF S3b=0 SKIP TO Q29

IF S3b=1 ask S4a. Otherwise ask S4b.

S4a.. May I speak to that person?

Qualified respondent is on the phone	**SKIP TO Q2**
Transferring to qualified respondent	**SKIP TO NEW RESP**

INTRO

CB for qualified respondent	**SKIP TO CB NAME**
Refused to transfer	**SKIP TO P1**
Qualified respondent refused	**SKIP TO P1**
Qualified respondent unable to speak on phone	**SKIP TO P1**
Qualified respondent is under 18	**SKIP TO P1**

S4b. From among the people who have insurance coverage for prescription drugs, may I speak to the person who had the most recent birthday?

Qualified respondent is on the phone	**SKIP TO Q2**
Transferring to qualified respondent	**SKIP TO NEW RESP**

INTRO

CB for qualified respondent	**SKIP TO CB NAME**
Refused to transfer	**SKIP TO P1**
Qualified respondent refused	**SKIP TO P1**

Qualified respondent unable to speak on phone **SKIP TO P1**

Qualified respondent is under 18 **SKIP TO P1**

P1. Would you be willing to answer some questions for them?

Yes, continue **SKIP TO Q2**

No, REFUSED **THANK AND END**

Dummy for Non-Proxy/Proxy

Dummy for You/They

Dummy for You/Them

Dummy for Your/Their

CB NAME So I know who to ask for when I callback, may I have their first name or middle initial?

GO TO NEW RESP CB INTRO

NEW RESPONDENT INTRO:

Hello, my name is **[name]**, I am calling on behalf of the Virginia Department of Medical Assistance Services. We are conducting a study about health care in Virginia.

NEW RESPONDENT CB INTRO:

Hello, my name is **[name]**, and may I speak to [name or initials].
I am calling on behalf of the Virginia Department of Medical Assistance Services. We are conducting a study about health care in Virginia.

1. The following questions are about your prescription drug coverage.

   How satisfied are (you/they) with (your/their) prescription drug coverage? Would you say:

Very Satisfied

Somewhat Satisfied

Somewhat Unsatisfied, or

Very Unsatisfied

(VOL) Don't Know

(VOL) Refused

2a. Can (you/they) use any pharmacy or are (you/they) required to use only certain ones?

Can use any pharmacy

Required to use certain pharmacies

(VOL) Don't Know

(VOL) Refused

2b. Are (you/they) required to use generic drugs rather than brand name drugs

Yes, required to use generic drugs

No, can use brand name drugs

(VOL) Don't Know

(VOL) Refused

2c. Do (you/they) have to pay higher co-payments for brand name drugs?

Yes

No
(VOL) Don't Know

(VOL) Refused

2d. Are there drug lists that (your/their) doctor must use?

[**IF NEEDED**: Drug lists are lists of drugs that your insurance company creates to indicate which drugs they will cover and which ones they won't cover]

Yes

No

(VOL) Don't Know

(VOL) Refused

2e. Are there limitations on refills or quantities that may be dispensed?

Yes

No

(VOL) Don't Know

(VOL) Refused

3. Do you have a separate drug card or does (your/their) health insurance card indicate a separate drug management company?

Separate drug card from health care /More than one card

Health insurance card indicates a separate drug management company/One card

(VOL) Don't Know

(VOL) Refused

4. And do you happen to know the name of the company that handles your prescription drug coverage? (tack-up)

Advanced Paradigm

Aetna Pharmacy Management

Argus Health Systems

Caremark

Diversified Pharmaceutical Services

Eagle Managed Care (Rite Aid)

Express Scripts

First Health

Heritage Information Systems

International Pharmacy Management

National Prescription Services

PAID (Merck-Medco)

PCS

PharmaCare Management Services (CVS)

Rx Prime

WHP Health Initiatives Inc. (Walgreens)

97 Other (Specify)

98 (VOL) Don't Know

99 (VOL) Refused

5. What is the name of your health insurance company or HMO?(tack-up)

Aetna U.S. Health care

Capital Care

Carilion Health Plans

GWU Health Plan

HealthKeepers

INOVA

John Deere Health Care/Heritage National Health Plan

Kaiser

MDIPA and OCI (Optimum Choice)

National Capital Health Plan

NYLCare Health Plans

OPTIMA Health Plan (Sentara)

PARTNERS National Health Plans of NC

Peninsula

Priority

Prudential Health Care

QualChoice of Virginia

Sentara Health Plans

Southern

United Health care of Virginia

Virginia Chartered Health Plan

97 Other (Specify)

98 (VOL) Don't Know

99 (VOL) Refused

6. How many different prescription medications do (you/they) take on a regular basis?

___ ___ (range=0 to 97, 97=97 or more)

98 (VOL) Don't Know

99 (VOL) Refused

7. How many times have (you/they) visited a local pharmacy in the past 3 months to have a prescription filled?

___ ___ times(range=0 to 97, 97=97 or more)

98 (VOL) Don't Know

99 (VOL) Refused

8. How many times in the past 3 months have (you/they) received a prescription medication in the mail?

___ ___ times(range=0 to 97, 97=97 or more)

98 (VOL) Don't Know

99 (VOL) Refused

9. Has there been an occasion in the past 12 months when (you/they) were told that a prescription medicine was not covered by (your/their) health insurance plan, but that (you/they) could switch to an alternative drug

Yes

No

(VOL) Don't Know

(VOL) Refused

One kind of drug switching is called a GENERIC SUBSTITUTION. A generic substitution occurs when the Pharmacist gives you the SAME drug that your physician prescribed but is usually less expensive.

10a. Has this happened to (you/them) in the past 12 months?

[GENERIC SUBSTITUTION: A generic substitution occurs when the Pharmacist gives you the SAME drug that your physician prescribed but is usually less expensive.]

Yes

No

(VOL) Don't Know

(VOL) Refused

10b. Has this happened to any (**IF Q10a=YES, ADD:** other) member of your household in the past 12 months?

[GENERIC SUBSTITUTION: A generic substitution occurs when the Pharmacist gives you the SAME drug that your physician prescribed but is usually less expensive.]

Yes

No

(VOL) Don't Know

(VOL) Refused

IF Q10a=YES THEN CONTINUE, ELSE SKIP TO THE TEXT BEFORE Q13

11. How many times in the past 12 months have (you/they) experienced a generic substitution?

___ ___(range=1 to 97, 97=97 or more)

98 (VOL) Don't Know

99 (VOL) Refused

12. What are the names of the drugs that (you/they) received from a generic substitution (you can read the names from the drug bottle or spell the name). [Probe: Any Others]

[**IF RESPONDENT CANNOT REMEMBER THE NAME OF THE DRUG**: Would it be

possible for you to look at the bottle?]

_____ _____

_____ _____

(VOL) Don't Know

(VOL) Refused

Another kind of drug switching by insurance companies is called THERAPEUTIC INTERCHANGE. A therapeutic interchange occurs when you get a DIFFERENT drug, that is expected to work the same as the drug originally prescribed. FOR EXAMPLE: Your physician writes a prescription for Bayer aspirin but the pharmacist, with your physician's approval, gave you Advil instead.

13a. Has this happened to (you/them) in the past 12 months?

[THERAPEUTIC INTERCHANGE: A therapeutic interchange occurs when you get a DIFFERENT drug, that is expected to work the same as the drug originally prescribed.]

Yes

No

(VOL) Don't Know

(VOL) Refused

13b. Has this happened to any (**IF Q13a=YES, ADD:** other) member of your household in the past 12 months?

[THERAPEUTIC INTERCHANGE: A therapeutic interchange occurs when you get a DIFFERENT drug, that is expected to work the same as the drug originally prescribed.]

Yes

No

(VOL) Don't Know

(VOL) Refused

IF Q13a=YES THEN CONTINUE, ELSE SKIP TO Q28

14. How many times in the past 12 months have (you/they) experienced a therapeutic interchange?

___ ___(range=1 to 97, 97=97 or more)

98 (VOL) Don't Know

99 (VOL) Refused

15. What are the names of the drugs that (you/they) received from a therapeutic (you can read the names from the drug bottle or spell the name). [**Probe**: Any Others]

[**IF RESPONDENT CANNOT REMEMBER THE NAME OF THE DRUG**: Would it be possible for you to look at the bottle?]

_____ _____

_____ _____

16. Thinking back to the last time that this happened, was the prescription being filled in a local pharmacy or by mail order?

In a local pharmacy

By Mail Order

(VOL) Don't Know

(VOL) Refused

17. Thinking back to the last time that this happened, were (you/they):

Notified by the Pharmacist

Notified by the Insurance Company ,or

Notified by the Physician

(VOL) Don't Know

(VOL) Refused

18. Thinking back to the last time (you/they) experienced a therapeutic interchange, were (you/they) given an explanation for not receiving the drug originally prescribed by their physician?

Yes	
No	**SKIP TO Q20**
(VOL) Don't Know	**SKIP TO Q20**
(VOL) Refused	**SKIP TO Q20**

19. What was the explanation? **[DO NOT READ]**

Drug was not on the list given to the doctor

A recent change in the company's policy

Saves money

Didn't understand explanation

Other, (specify)

(VOL) Don't Know

(VOL) Refused

20. Thinking back to the last time that (you/they) were advised that the Insurance Company was requiring a therapeutic interchange, what did (you/they) do?(Remember: A therapeutic interchange is a switch to a DIFFERENT drug than the one originally prescribed by the physician)?

[DO NOT READ LIST]

(You/they) accepted the DIFFERENT drug **GO TO Q #22**

(You/they) paid the total cost of the medication originally prescribed out of (your/their) own pocket **GO TO Q #23**

(You/they) paid a higher co-pay to get the drug originally prescribed **GO TO Q #23**

(You/they) never got any medication **GO TO Q #23**

(You/they) got approval from the Insurance Company for the drug originally prescribed **GO TO Q #21**

Other, (specify)

(VOL) Don't Know

(VOL) Refused

21. Did (you/they) have to wait longer than usual for the prescription to be filled?

(INTERVIEWER: IF THEY REPORT A LONGER WAIT THAN USUAL, PROBE: "Was it a little longer than usual or a lot longer than usual?")

Yes, waited a little longer than usual

Yes, waited a lot longer than usual

No, wait was same as usual

(VOL) Don't Know

(VOL) Refused

22. Thinking back to the last time (you/they) experienced a therapeutic interchange, was the drug originally prescribed,

Already being taken	**GO TO Q #24**
OR	
was it new and had never been taken before?	**GO TO Q #25**
(VOL) Don't Know	**GO TO Q #25**
(VOL) Refused	**GO TO Q #25**

23. How well did the new drug work compared to the original drug?

Better	**GO TO Q #28**
About the same, or	**GO TO Q #28**
Not as well	**GO TO Q #26**
(VOL) Don't Know	**GO TO Q #28**
(VOL) Refused	**GO TO Q #29**

24. Were you satisfied with the drug received?

Yes	**GO TO Q #28**
No	**GO TO Q #26**
(VOL) Don't Know	**GO TO Q #28**
(VOL) Refused	**GO TO Q #28**

25. What did (you/they) do?

_____

(VOL) Don't Know

(VOL) Refused

DEMOGRAPHIC INFORMATION FOR THE RESPONDENT

26. **ENTER SEX OF THE RESPONDENT (ASK ONLY IF PROXY)**

Are they male or Female?

Male

Female

27. What was (your/their) age as of (your/their)last birthday?

___ ___(range=1 to 97, 97=97 or more)

98 (VOL) Don't Know

99 (VOL) Refused

28. Are (you/they) of Hispanic or Spanish origin?

Yes

No

(VOL) Don't Know

(VOL) Refused

29. Are (you/they) white, black, Asian, or of some other racial background?

White

Black, African American

Asian/Pacific Islander

Other (Please Specify)

(VOL) Don't Know

(VOL) Refused

30. What is the highest grade of school or year of college (you/they) have completed?

Less than high school graduate

High School Graduate/GED

Some College, Associate Degree, Community College

College Graduate, BA, BS, Bachelors

Some graduate school

Graduate or Professional Degree

(VOL) Don't Know

(VOL) Refused

>inc1< Was your total household income in 1997, before taxes, above or below $35,000?

Above $35,000 **[goto inc4]**

Below $35,000 **[goto inc2]**

(VOL) Exactly $35,000 **[goto end]**

(VOL) Don't Know **[goto end]**

(VOL) Refused **[goto end]**

>inc2< Was it less than $20,000?

Yes, below $20,000 **[goto inc3]**

No **[goto end]**

(VOL) Exactly $20,000 **[goto end]**

(VOL) Don't Know **[goto end]**

(VOL) Refused **[goto end]**

>inc3< Was it less than $10,000?

Yes, below $10,000 **[goto end]**

No **[goto end]**

(VOL) Exactly $10,000 **[goto end]**

(VOL) Don't Know **[goto end]**

(VOL) Refused **[goto end]**

>inc4< Was it above $50,000?

Yes, above $50,000 **[goto inc5]**

No **[goto end]**

(VOL) Exactly $50,000 **[goto end]**

(VOL) Don't Know **[goto end]**

(VOL) Refused **[goto end]**

>inc5< Was it above $70,000?

Yes, above $70,000 **[goto end]**

No **[goto end]**

(VOL) Exactly $70,000 **[goto end]**

(VOL) Don't Know **[goto end]**

(VOL) Refused **[goto end]**

Thank you very much for helping us with this important study.

Physician and Retail Pharmacist Perceptions of the Practice of Therapeutic Interchange in the Commonwealth of Virginia

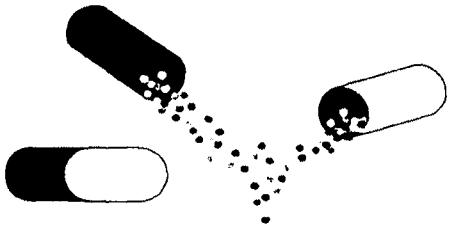

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TABLE OF CONTENTS

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INTRODUCTION

In 1997, the Virginia General Assembly passed House Joint Resolution (HJR) 574 (1997). HJR 574 requested the Virginia Department of Medical Assistance (DMAS) to:

1) examine practices of pharmacy benefit manager firms (PBMs) on the Commonwealth's citizens, and
2) determine the effect of such practices on the Commonwealth's citizens and the overall healthcare market.

One of the PBM practices of interest to the Virginia General Assembly is therapeutic interchange. The PBM practice of therapeutic interchange is one pharmacy management technique used by health insurers to reduce health care costs and premiums in order to provide lower priced health plans for cost conscious employers.

The Special Task Force Studying the Practice of Therapeutic Interchange (HJR 630 (1997) adopted a broad definition of therapeutic interchange. The definition is as follows: "*Therapeutic interchange is the dispensing of a drug, by any person authorized by law to dispense drugs, that is a chemically dissimilar alternative for the drug initially prescribed. The alternative drug is expected to have the same clinical results and similar safety profile, when administered to patients in therapeutically equivalent doses as the drug initially prescribed, and is dispensed with the approval of the person who prescribed the initial drug, or their lawful designee.*"

Previous studies have provided estimates of the annual incidence of therapeutic interchange for citizens of Virginia. These estimates of citizen incidence range from 0.4 percent to 3.1 percent during 1998. The differences in estimates are likely due to different

operational definitions of therapeutic interchange used for each study. The Mercatus Center PBM study used a narrow definition of therapeutic interchange.[1] The VCU Citizen Survey used a broader definition of therapeutic interchange.[2]

Purpose of the Study

This study reports the results from surveys of physicians and pharmacists on the topic of therapeutic interchange. This study was commissioned by DMAS in an effort to provide the Virginia General Assembly with further information on:

1) the annual prescription incidence of therapeutic interchange,

2) the reasons that therapeutic interchange is initiated,

3) the annual incidence of patient complaints about therapeutic interchange, and

4) the perceptions of physicians and pharmacists on whether therapeutic interchange improves or worsens clinical outcomes, as well as other related indicators.

Report Outline

We organize the report into four chapters:

- The Introduction summarizes the purpose of the research.

- The Results chapter presents the information obtained from our statewide survey of physicians and pharmacists in Virginia. We determine several estimates of interest to policy makers on the subject of therapeutic interchange. The results also include survey information on the perceptions of physicians and pharmacists with regard to therapeutic

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[1] *An Estimate of the Annual Incidence of Therapeutic Interchange in the Commonwealth of Virginia During 1998*, Mercatus Center, December 1998. This study measured the incidence of therapeutic interchange of the "formulary inclusion" type. This type of therapeutic interchange only occurs when both the originally prescribed drug and the preferred drug to be interchanged are included on the pharmacy plan formulary. In addition, a formulary inclusion therapeutic interchange is generally initiated as a result of pharmacy benefit management activities.

[2] Michael Pyles, Norman Carroll and David Holdford, *Study to Determine the Impact of the PBM Practice of Therapeutic Interchange on Citizens of the Commonwealth of Virginia*, Virginia Commonwealth University, May 1999. This study focused on therapeutic interchanges initiated by insurance companies, but would not have included all therapeutic interchanges initiated by patients or as a result of manufacturer financial incentives.

interchange. This chapter includes a summary of statistical tests for correlation and significance.

- The Methods chapter describes the sampling methods used to obtain the raw data and estimating techniques used to provide information on the therapeutic interchange process in Virginia.

- The Conclusion chapter highlights the most significant findings and analyses developed from the surveys.

The report also includes four appendices:

- Appendix A provides copies of the surveys that were mailed to physicians and pharmacists.
- Appendix B provides frequency tables for all questions asked on the pharmacist survey.
- Appendix C provides frequency tables for all questions asked on the physician survey.
- Appendix D provides bivariate correlation matrices for questions asked of physicians and pharmacists.

As stated earlier, in addition to incidence estimates on the practice of therapeutic interchange and patient complaints, this research report provides information about perceptions of physicians and pharmacists with regard to therapeutic interchange. The estimates and perceptions are provided in the following Results chapter.

RESULTS

Introduction

The survey results are presented in the following five sections. Within each section, summary estimates and findings are presented in narrative and visual forms. Detailed calculations of how the estimates were derived are provided in the Methods chapter.

Section 1 presents estimates of the prescription drug incidence rate and annual number of therapeutic interchanges in Virginia. Section 2 provides estimates of the share of approved therapeutic interchanges by how they are initiated. Section 3 provides estimates of the annual number and prescription incidence rate of complaints made by patients of who have had an approved therapeutic interchange. Section 4 summarizes the perceptions of physicians and pharmacists on pharmaceutical and overall health cost savings, clinical outcomes and workload responsibilities due to therapeutic interchange. Section 5 uses statistical methods to determine bivariate correlation coefficients and measures of statistical significance for all questions. Further analysis is provided for questions of interest demonstrating strong correlation and statistical significance.

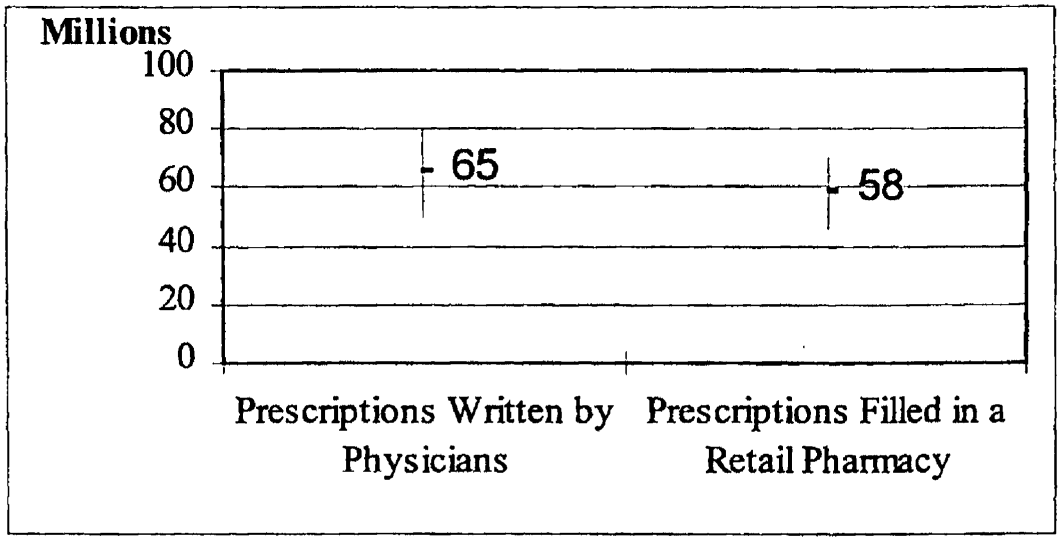
Section 1: Therapeutic Interchange Physician Prescription Drug Approval and Pharmacist Fill Rates

Estimated Volume of Prescriptions Written by Physicians and Filled by Retail Pharmacists During 1998

Physicians wrote an estimated 65 million prescriptions during 1998. This estimate is the mid-point of the range of 50 million and 80 million and based on information provided from the survey of physicians in Virginia. An estimated 58 million prescriptions were filled in

Virginia's retail pharmacies during 1998. This estimate of prescriptions filled is the mid-point of the range of 46 million and 70 million and based on information provided from the survey of pharmacists in Virginia. The point estimate was supplemented by other sources.[3] Figure 1 provides a graphical representation of these data.

Figure 1: Estimated Volume of Prescriptions Written by Physicians and Filled by Retail Pharmacists in Virginia During 1998



The lines in Figure 1 represent the estimated range of the volume of prescriptions written by physicians and filled by retail pharmacists in Virginia during 1998. The tick mark in the middle is the mid-point of the range of values. The number of prescriptions is expressed in millions.

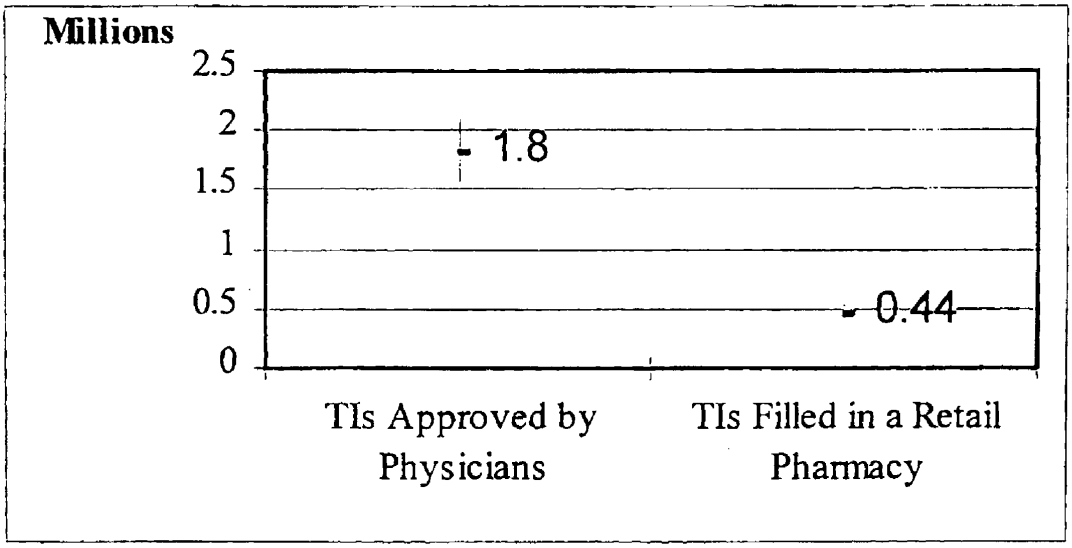
Estimated Number of Approved Therapeutic Interchanges and Prescriptions Written in 1998

An estimated 1.8 million therapeutic interchanges were approved by physicians in the Commonwealth of Virginia during 1998 as determined from the information provided in the

[3] Sources other than the pharmacist survey were used to benchmark the point estimate for prescriptions filled in a retail pharmacy. Further details are provided in the Methods chapter.

Virginia physician survey. This is a mid-point estimate ranging from 1.55 million to 2.1 million and based on information provided from the physician survey. We also estimate that about 440,000 therapeutic interchanges were filled in Virginia's retail pharmacies during 1998. This is a mid-point estimate in a range of 380,000 to 500,000 based on data provided from the pharmacist survey. Figure 2 provides a graphical representation of this information.

Figure 2: Estimated Volume of Therapeutic Interchanges Approved by Physicians and Filled by Retail Pharmacists in Virginia During 1998



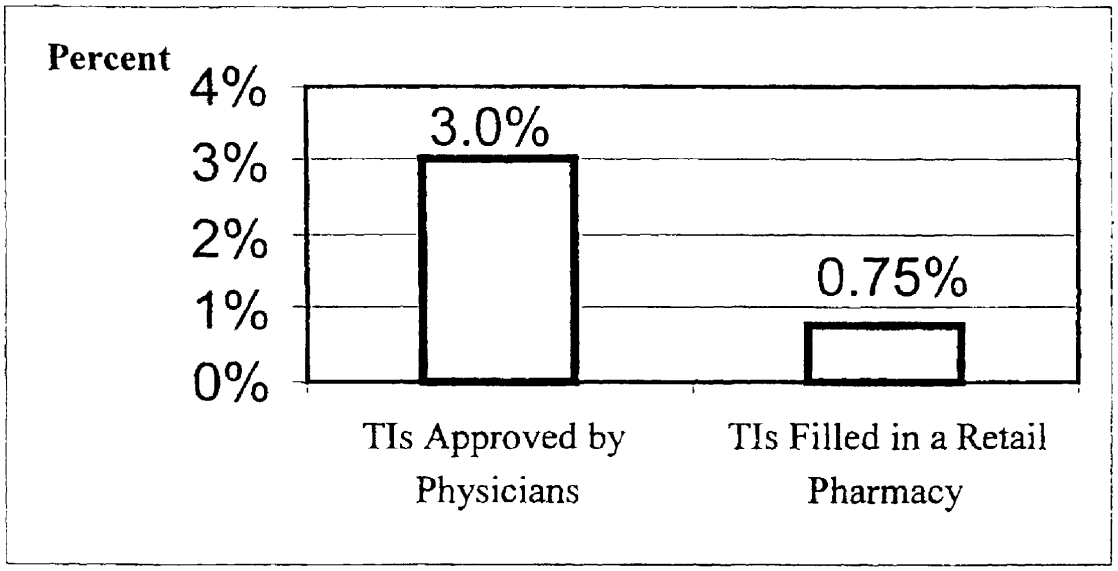
Similar to Figure 1, the lines in Figure 2 represent the estimated range of the volume of therapeutic interchanges approved by physicians and filled by retail pharmacists in Virginia during 1998. The tick mark in the middle is the mid-point range of values. The number of prescriptions is expressed in millions.

The Physician Therapeutic Interchange Approval Rate

The therapeutic interchange physician approval rate is estimated to be 3.0 percent of all prescriptions written by physicians based on data obtained from the physician survey. The therapeutic interchange physician approval rate is estimated to be 0.75 percent of all

prescriptions presented to retail pharmacists based on data obtained from the pharmacist survey. The approval rate Figure 3 provides a graphical representation of these data.

Figure 3: Estimated Rate of Therapeutic Interchanges Approved by Physicians and Filled by Retail Pharmacists in Virginia During 1998



Analysis of Prescription Volume, Therapeutic Interchange Volume and Rate Differences

There are notable differences between information provided in the physician and pharmacist surveys. The first notable difference occurs between the estimated volume of prescriptions written by physicians and the number of prescriptions filled in retail pharmacies. The second notable difference is between the volume of therapeutic interchanges approved by physicians and filled by pharmacists. Table 1 presents these estimates and illustrates the differences of interest.

Table 1: Annual Volume and Incidence Rate Estimates of Prescription Drugs and Therapeutic Interchange in the Commonwealth of Virginia During 1998		
	Physicians	*Retail Pharmacists*
Estimated Annual Volume of Prescriptions (written/filled)	65 million	58 million
Estimated Annual Number of Therapeutic Interchanges	1.8 million	0.44 million
Estimated Annual Therapeutic Interchange Prescription Incidence Rate	3.0 percent	0.75 percent

Notable Difference #1: There are at least two possible explanations for the difference between the estimated volume of prescriptions written by physicians and the number of prescriptions filled in retail pharmacies. The first possible explanation is the likelihood that a large percentage of prescriptions written are filled by mail-order pharmacies rather than retail pharmacies. One national survey indicates mail-order pharmacies accounted for about 4.3 percent of prescription drug volume in 1997 and is projected to account for 9.7 percent of all prescription drug volume by 1999.[4] A national industry-wide survey indicates that mail-order pharmacies accounted for 6 percent of total prescription drug volume in 1996 across all health models.[5]

If growth trends expected in HMO mail-order pharmacies have also occurred in other health plan models, we expect the overall national mail-order pharmacy volume share to be around 10 percent. We also expect national trends regarding market share of mail-order pharmacies to be similar to the experience of Virginia. According to the VCU Citizen Survey, about 10 percent of prescriptions are filled through mail order.[6] The difference between the estimated volume of prescriptions written by physicians and the number of prescriptions filled in retail pharmacies is roughly 10 percent.

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[4] *Novartis Pharmacy Benefit Report: 1998 Trends & Forecasts.* Produced by Emron, Totowa, NJ, An IMS Company.
[5] Namovicz-Peat S. Ed. *HMO & PBM Strategies for Pharmacy Benefits* AIS, Inc. Washington DC. 1998.
[6] Pyles, M.A.; Carroll, N.; and Holdford, D.: *Study to Determine the Impact of the PBM Practice of Therapeutic Interchange on Citizens of the Commonwealth of Virginia*, Virginia Commonwealth University, May 1999.

A second possible explanation for the difference between the two estimates is that patients may not always fill prescriptions written by physicians. We did not identify any statewide or national studies that provide estimates of how many prescriptions are written by physicians and not presented by patients to be filled by pharmacists.

Notable Difference #2: A second notable difference is the inconsistency between estimates of the volume and rates of therapeutic interchanges approved by physicians and the volume and rates of approved therapeutic interchanges filled by retail pharmacists.[7] There are several potential explanations.

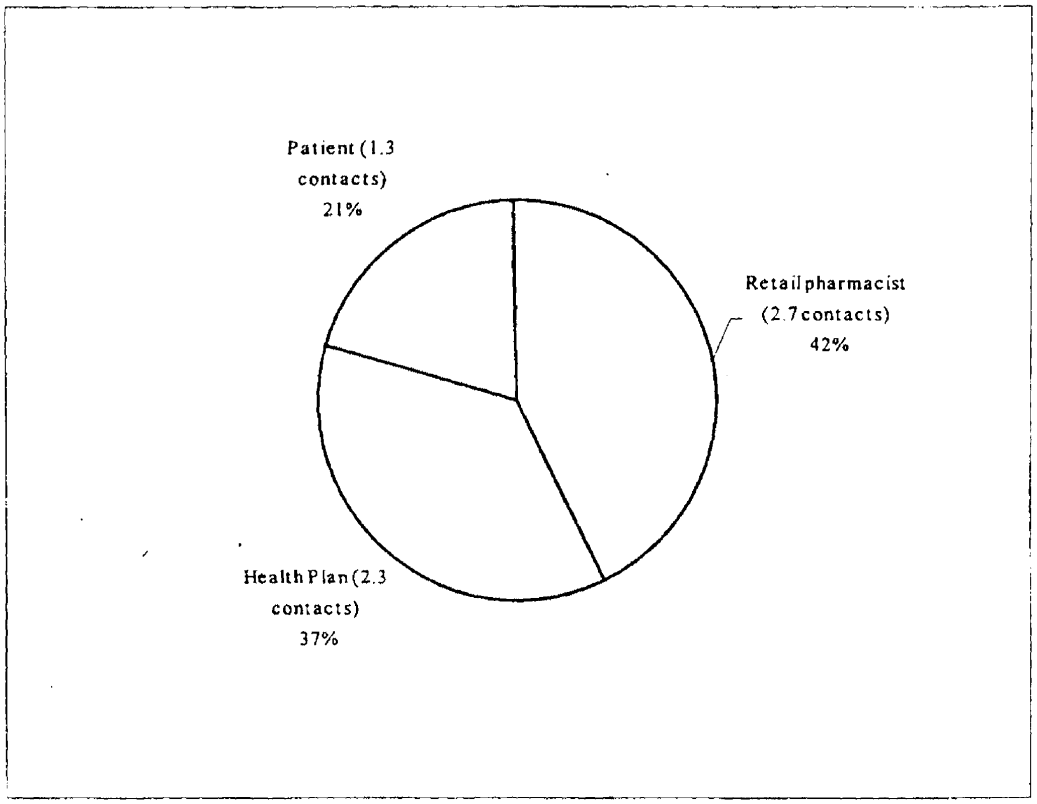
We offer four possible explanations. The first possible explanation may be that rates of therapeutic interchange for mail-order pharmacies are considerably higher than retail pharmacy rates. This might account for some of the differences between the physician survey therapeutic interchange rates (3.0 percent) and the pharmacist survey rates (0.7 percent). Calculations indicate that therapeutic interchange rates between 20 and 25 percent would be necessary for the relatively small mail-order share of market volume (estimated to be about 10 percent in 1998) to move the overall therapeutic interchange volume and rates up to estimates provided by the physician survey.

Physicians were asked in question 1, "*During the past 7 days, about how many times has your office been contacted by retail pharmacists and asked to consider a therapeutic interchange for your outpatients?* " They were also asked in question 2, "*During the past 7 days, about how many times has your office been contacted by health plans and asked to*

[7] The estimated annual therapeutic incidence rate is dependent on two factors. The first factor is the estimated annual volume of prescriptions written by physicians and filled by pharmacists. The second factor is the estimated annual number of therapeutic interchanges approved by physicians and filled by pharmacists. The lower therapeutic interchange incidence rate for pharmacists is a result of these two factors. The base volume of prescriptions is roughly equivalent for both the physician and pharmacist estimate. The number of therapeutic interchanges differs by a magnitude of four (1.8 million divided by 0.44 million). This dynamic accounts for the large difference between the two rates.

consider a therapeutic interchange for your outpatients?" The ratio of contacts from retail pharmacists to health plans is equal to about 1.2. This tells us that about 9 out of every 20 non-patient contacts to encourage a therapeutic interchange come from health plans. This high a ratio of health plan contacts suggests that the retail pharmacy focus of this study is not capturing all the therapeutic interchange activity in the Commonwealth of Virginia. Figure 4 illustrates the estimated number and percent of physician contacts by source.

Figure 4: Estimated Number and Percent of Weekly Therapeutic Interchange Contacts Received by Physicians in Virginia During 1998



Higher therapeutic interchange volume and rates of mail-order pharmacies could be due to consumer preferences for lower prices offered or advertised by mail-order pharmacies, especially for patients with chronic medical conditions. One industry-wide survey states that "*Some of the most common mail-order prescriptions are for calcium channel blockers,*

estrogen products, ACE inhibitors, and cholesterol reducers."[8] These prescription drugs fall into the more common drug therapy classes (anti-hypertensives, anti-lipemic, and estrogen-based contraceptives) identified as opportunities for therapeutic interchange.[9] Additionally, health plans may use financial incentives such as higher co-payments for drugs filled using mail-order pharmacy services rather than retail pharmacy services. Given this information, it seems reasonable that mail-order pharmacies would have higher rates of therapeutic interchange as a percent of prescription drug volume than retail pharmacies.

A second potential explanation might be that patient initiated therapeutic interchanges may be occurring due to direct-to-consumer (DTC) advertising by pharmaceutical manufacturers. In such a case, the physician may change prescriptions with no record of a "therapeutic interchange" being registered by either the pharmacy benefit manager or the retail pharmacist. The Novartis report has a key finding that DTC advertising prompts 32.7% of consumers to seek information about the drug of interest with their pharmacist, 25.2% to seek information from a physician, and 22.8% to purchase the product.

Physicians were asked in question 3, "*During the past 7 days, how many times have you been contacted by patients to consider a therapeutic interchange?* " The estimated weekly number of patient contacts asking physicians to consider a therapeutic interchange is about 1.3. If about one-quarter of these contacts are prompted by DTC advertising, physicians may receive about 0.3, or 5 percent of all patient contacts in Virginia due to DTC advertising.[10]

DTC advertising has grown dramatically from $164 million in 1993 to $500 million in 1996 and $1 billion in 1997, due in part to liberalizing changes in FDA regulation of

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[8] Namovicz-Peat S. Ed. *HMO & PBM Strategies for Pharmacy Benefits* AIS, Inc. Washington DC. 1998.
[9] *An Estimate of the Annual Incidence of Therapeutic Interchange in the Commonwealth of Virginia During 1998.* Mercatus Center, December 1998.
[10] Note: Physicians are estimated to receive about 6.3 contacts per week from all sources requesting a therapeutic interchange of which 1.3 contacts are estimated to come from patients. One-quarter of 1.3 is about 0.3 and 0.3 divided by 6.3 is equal to about 5 percent of all physician contacts.

prescription drug advertising.[11] The ExpressScript's Drug Trend Report states that the use of DTC advertising has been successful over the years. "*This strategy [DTC] has been highly successful . . . resulting in more prescriptions being written . . .It has also made the task of cost control even more difficult.*"[12]

A third possible explanation between physician and pharmacist differences in therapeutic interchange volume and rates is that health plans or manufacturers may persuade physicians to change their prescribing patterns before a subsequent prescription is written for patients with chronic conditions who require ongoing refills of medication. This type of transaction could be considered a therapeutic interchange by physicians and would not involve retail pharmacists or mail order pharmacies. In addition, this type of therapeutic interchange would not fall under the definition adopted by the Task Force Studying the Practice of Therapeutic Interchange.

A fourth possible explanation may have to do with limitations of the pharmacist questionnaire. The pharmacist questionnaire was designed to communicate a broad definition of therapeutic interchange. The definition of therapeutic interchange adopted by the Special Task Force Studying the Practice of Therapeutic Interchange was provided at the beginning of the survey and the first three questions were to help identify the primary ways a therapeutic interchange might be initiated (formulary exclusion, preferred drug, and patient initiated). Despite the intent of the survey design to encourage the use of a broad definition of therapeutic interchange, the pharmacists may have used a narrower definition than expected.

In summary, there appear to be at least four reasonable explanations for the differences between the estimated statewide volume of prescriptions written by physicians and the volume of prescriptions filled in retail pharmacies. Other explanations could account for a portion of

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[11] Namovicz-Peat S. Ed. *HMO & PBM Strategies for Pharmacy Benefits* AIS, Inc. Washington DC. 1998. p. 176.
[12] Express Scripts-Value Rx, 1997 Drug Trend Report. June 1998. p. 24.

the difference. However, we are fairly comfortable that the explanations for the differences have been identified. We are less certain on the degree to which differences in therapeutic interchange volume and rates between the physician and pharmacist surveys can be assigned to the four possible explanations.

Section 2: Estimate of the Share of Therapeutic Interchange by Reason for Initiation

We asked five questions regarding the reason for a therapeutic interchange being initiated. Virginia pharmacists were asked three non-financial incentive questions about what percent of times a therapeutic interchange is initiated. The first reason is a case when the original drug is not on the formulary. This case is referred to as a "formulary exclusion" therapeutic interchange. The second reason is a case when the original drug is on the formulary but is not a preferred drug. This case is referred to as a "formulary inclusion" therapeutic interchange. The third reason is a case when the patient requests a different drug. The first two reasons are mutually exclusive with each other. The third reason could occur due to either reason one or two.

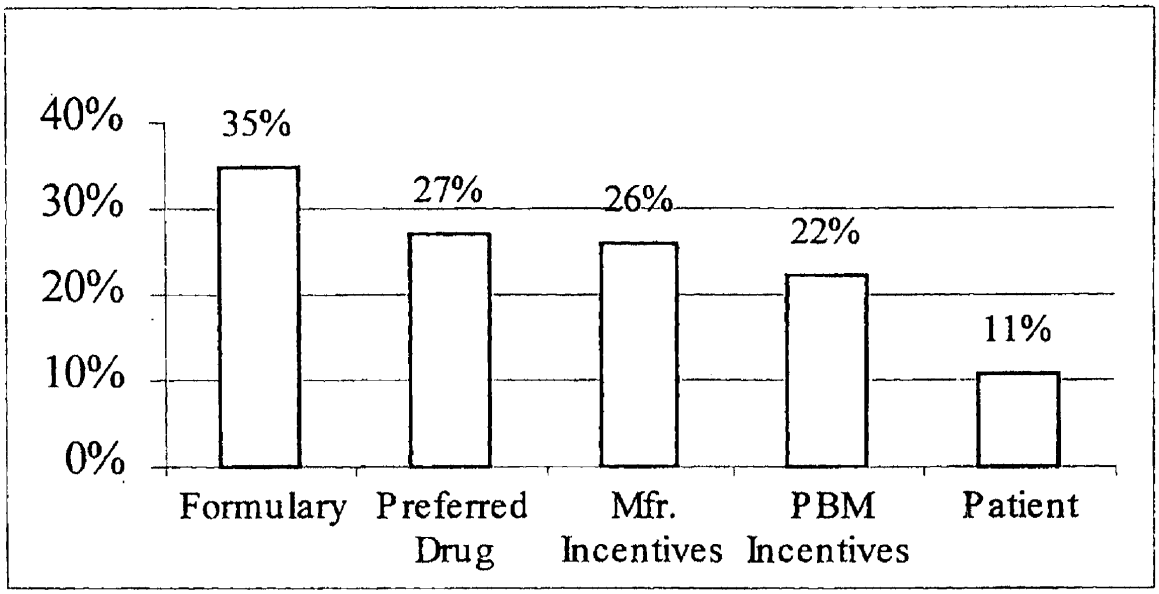
We also asked pharmacists two financial-incentive related questions about the percent of therapeutic interchanges that occur because pharmaceutical manufacturers and pharmacy benefit management companies provide financial incentives to retail pharmacies. These two incentives may or may not be mutually exclusive. Financial incentives for retail pharmacies are involved in at least 26% and are involved at most for 48% of all therapeutic interchanges filled by retail pharmacists.

The information from the pharmacist survey show that exclusion from the drug formulary (35%) is the most common reason cited for a therapeutic interchange to occur. The next most common reason for a therapeutic interchange to occur are that the original drug is not a preferred product offered by a health plan's drug formulary (27%), and manufacturer financial incentives (26%). PBM financial incentives (22%) are the next most common reason

for a therapeutic interchange. The least common reason for a therapeutic interchange to occur reported by pharmacists was the case when a patient requests a different drug (11%).

These percentages exceed 100 percent. There is reasonably some overlap between at least three of the five reasons for a therapeutic interchange. For example, a patient may request a therapeutic interchange after finding out that the prescribed drug is not on his/her health plan drug formulary. Figure 5 provides the mid-point of the range by percent of cases pharmacists reported for all five potential reasons for initiation of a therapeutic interchange.

Figure 5: Estimated Share of Therapeutic Interchanges by Reason of Initiation in Virginia During 1998[13]



[13] Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 11.4 percent for the formulary question; 14.6 percent for the preferred drug question; 16.1 percent for the manufacturer incentives question; 15.9 percent for the PBM incentives question, and 22.4 percent for the patient initiated question.

Analysis

Formulary exclusion of the originally prescribed drug was the most common reason for initiating a therapeutic interchange in Virginia during 1998. Pharmacist responses suggest that roughly 1 out of 3 cases of therapeutic interchange are initiated because the originally prescribed drug is not included on the formulary. The least likely reason for therapeutic interchange is the case when the patient initiates the interchange. However, there is a dynamic interplay between these two extremes. Patients, because of their general lack of knowledge about the specific therapeutic and adverse effects of prescription drugs, are unlikely to request a therapeutic interchange unless they are financially at-risk or receive consumer information from media sources. Many patients are likely to request a therapeutic interchange if they are required to pay the price of a drug not included on a formulary or if they are at risk for a relatively higher co-pay for a non-preferred drug included on a health plan formulary. [14] As a result, patient requests for therapeutic interchange are likely to overlap with formulary exclusion initiated changes and formulary inclusion (preferred drug) initiated changes. There may be instances where the pharmacist assumes that the patient would request a therapeutic interchange, so the pharmacist initiates it without asking the patient.

Therapeutic interchanges initiated due to manufacturer financial incentives to pharmacies (26%) are slightly more likely to occur than those initiated due to PBM financial incentives (22%) according to responses from the pharmacist survey. If these are cumulative, financial incentives would be the single most important reason, as much as 48%, for therapeutic interchange. Most likely there is some overlap, however. This overlap of manufacturer and PBM financial incentives could conflict with one another, potentially encouraging pharmacists to choose alternative drugs based on which financial incentive is in the best economic interest of the pharmacy.

[14] Note: Interchanges initiated due to health plans providing alerts for preferred drugs will be referred to as formulary inclusion therapeutic interchanges. See *An Estimate of the Annual Incidence of Therapeutic Interchange in the Commonwealth of Virginia During 1998*. Mercatus Center, December 1998.

Since PBM financial incentives are unlikely to be associated with therapeutic interchanges initiated due to formulary exclusion, a large share of therapeutic interchanges initiated due to formulary inclusion (preferred drug) must offer financial incentives to pharmacies. A simple mathematical analysis of the formulary inclusion (preferred drug) initiated share (27%) and the PBM incentives initiated share (22%) of therapeutic interchanges suggests that roughly 80 percent of formulary inclusion (preferred drug) initiated therapeutic interchanges involve financial incentives to pharmacies (22 divided by 27 equals about 80 percent).[15]

Section 3: Patient Satisfaction with Therapeutic Interchange

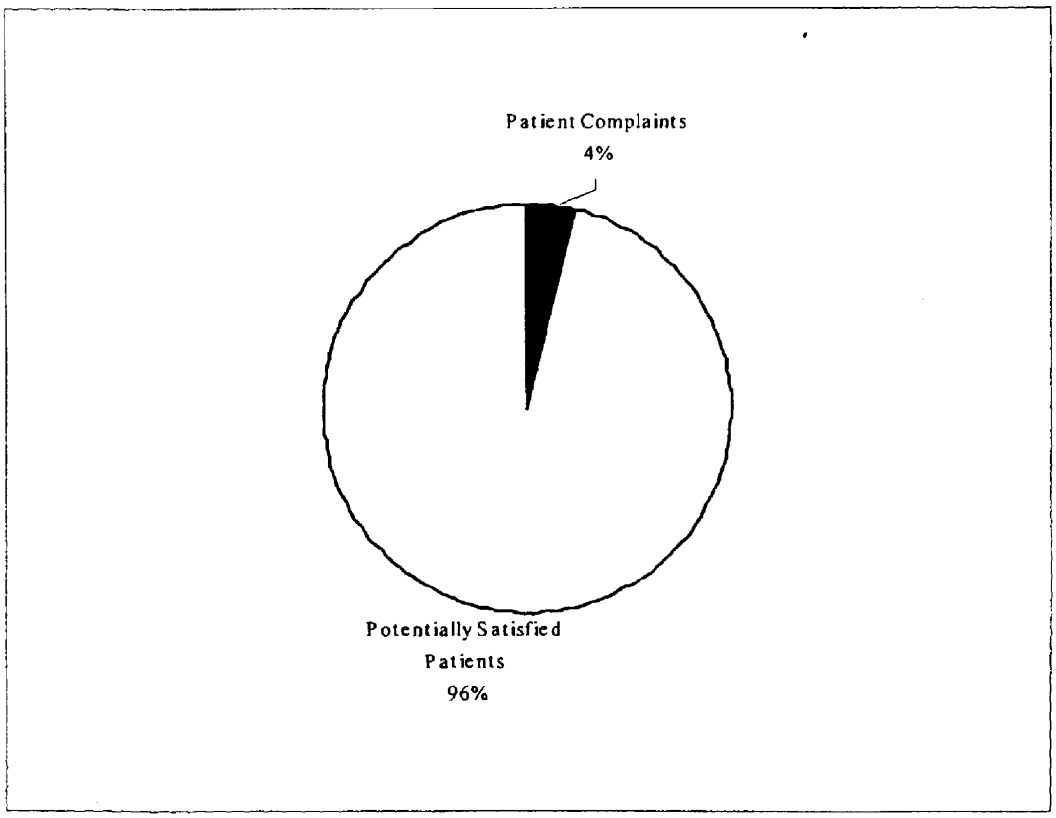
Virginia physicians and pharmacists were both asked: "*During the past year, about how many complaints--if any--about adverse side effect or ineffectiveness have you, personally, received from patients who had a therapeutic interchange?*" Estimates of complaints from patients show some notable results. The first notable result is that individual pharmacies and physicians were likely to receive the same number of complaints from patients during 1998. The mid-point of the range of patient complaints indicate each physician and pharmacy had an average of 4.5 complaints during the past year. However, because there are so many more physicians (16,400) than pharmacies (1,619) and pharmacists (5,180), the statewide estimate of patient complaints provided by patients to physicians is ten times greater than that for pharmacies and three times greater than that for pharmacists.

The estimated number of complaints about side effects or ineffectiveness by patients who experienced a therapeutic interchange using the physician survey data is about 70,000 using the mid-point of the range. Figure 6 shows an estimate of patient complaints received by

[15] PBM financial incentives to pharmacies would not be related to formulary exclusion types of therapeutic interchanges because no financial incentive is needed for prescription drugs to convince patients to choose alternative drugs that are not covered by a health plan formulary.

physicians as a percent of the total number of patients experiencing a therapeutic interchange as reported in the physician survey.[16]

Figure 6: Estimated Rate of Complaints to Physicians by Patients Experiencing Therapeutic Interchange in Virginia During 1998[17]



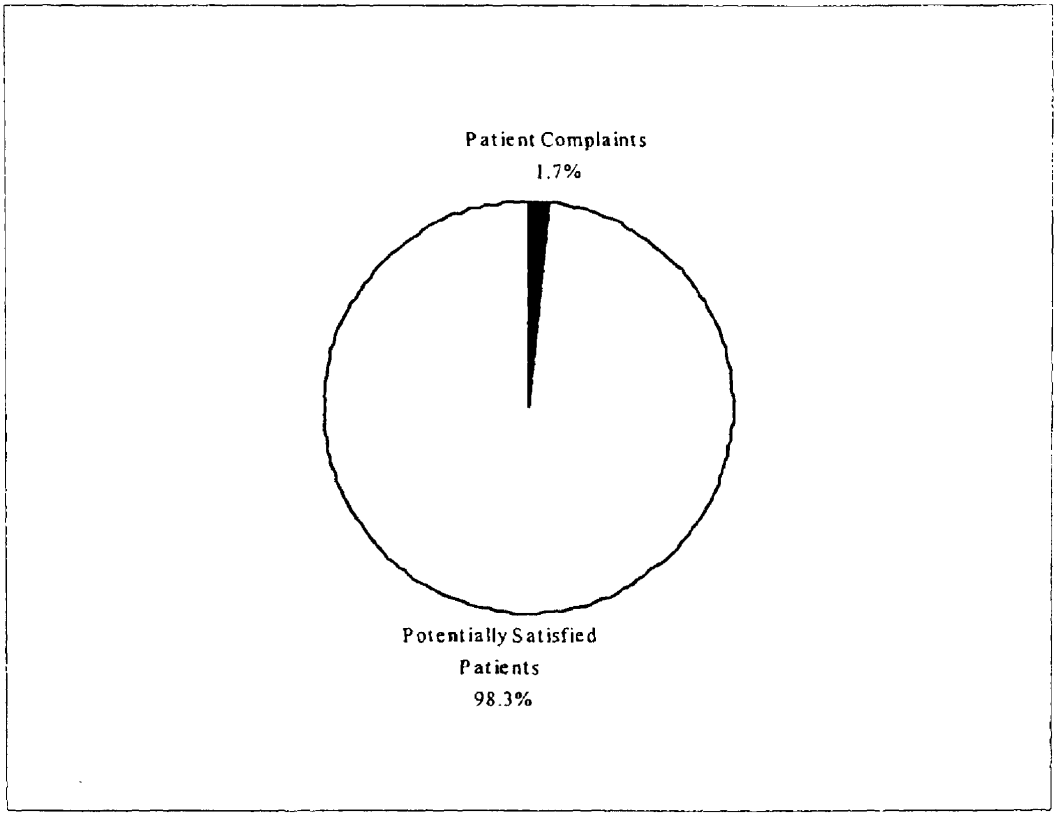
Patient complaints for those experiencing a therapeutic interchange as reported to pharmacists are much lower than for physicians. The estimated number of complaints received by retail pharmacies about side effects or ineffectiveness by patients who experienced a therapeutic interchange using the pharmacist survey data is about 7,000. The patient complaint rate as reported by pharmacists is 1.7%. Figure 7 illustrates the estimate of patient complaints

[16] Note: The denominator for this calculation is the estimated number of approved therapeutic interchanges written by physicians in Virginia during 1998.

[17] This question provides valid responses from a random selection of 704 physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 8.20 percent for physicians.

received by pharmacies as a percent of the total number of patients experiencing a therapeutic interchange as reported in the pharmacist survey.[18]

Figure 7: Estimated Rate of Complaints to Pharmacists by Patients Experiencing Therapeutic Interchange in Virginia During 1998[19]



Analysis

For both the physician and pharmacist complaint rates, it should be noted that patient complaints are only one quantitative measure of patient satisfaction that may not reflect the actual satisfaction of patients with therapeutic interchange. Patients who do not complain may not be satisfied with therapeutic interchange, but refrain, for some reason, from sharing dissatisfaction with their physician or pharmacist. However, the low rate of patient complaints

[18] Note: The denominator for this calculation is the estimated number of approved therapeutic interchanges in Virginia during 1998.

to physicians and pharmacists suggests that patients appear to be generally satisfied with therapeutic interchange.

Section 4: Perceptions of Physicians and Pharmacists on Therapeutic Interchange

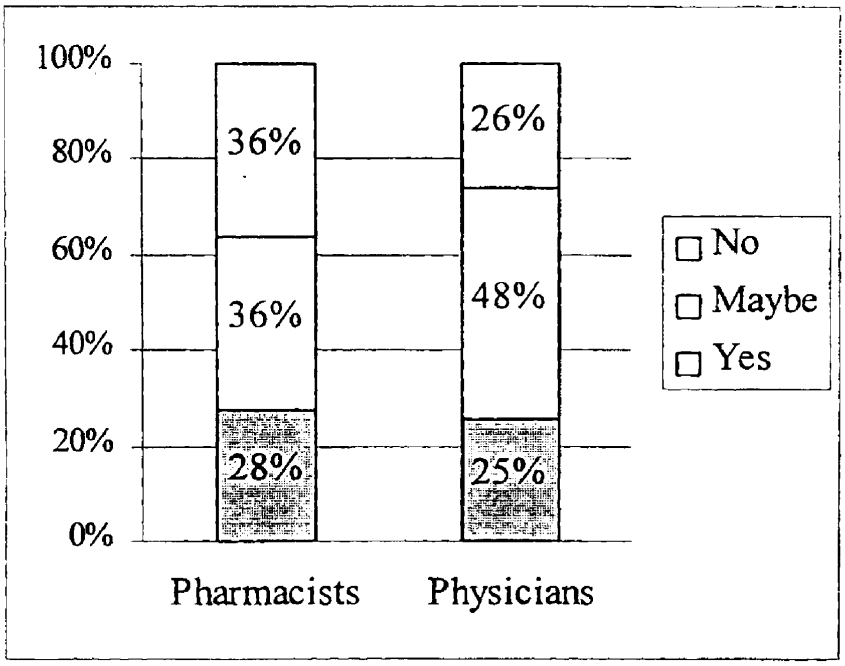
Pharmacy Cost Savings Perceptions

Physicians and pharmacists were asked: "*Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?*" The leading trend was found among physicians who were more likely to answer "maybe" (48%) than "yes" (26%) or "no" (25%) to this question. Pharmacists were just as likely to answer "no" (36%) as "maybe" (36%) and least likely to answer "yes" (28%). A comparison of the differences between professions show that physicians (48%) were more likely than pharmacists (36%) to answer "maybe" to this question. Pharmacists (36%) were more likely to answer "no" to the question of pharmaceutical savings than physicians (26%). Figure 8 illustrates the differences between physicians and pharmacists on this question.[20]

[19] This question provides valid responses from a random selection of 362 pharmacists. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 10.5 percent for the question.

[20] The Pearson's chi square has a significance value of less than 0.0005. This means that if there were no relationship between profession (pharmacists and physicians) and belief in therapeutic interchange helping to control pharmaceutical costs, the probability of obtaining discrepancies as large or larger as we see in our sample would be less than 0.05 percentage points. It is very unlikely that this large a sample difference between pharmacists and physicians would be obtained if there were no differences between the populations.

Figure 8: Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?[21]



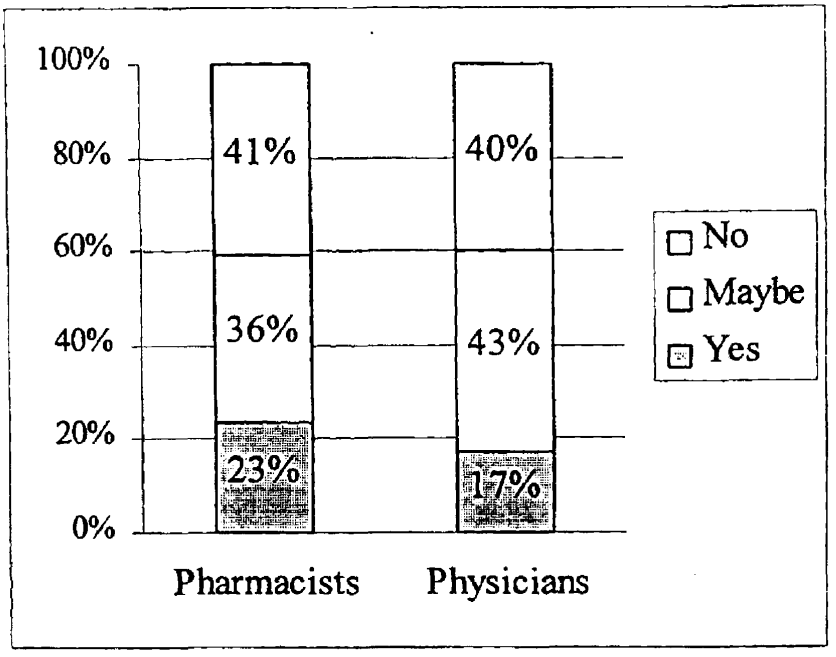
Health Cost Savings Perceptions

Physicians and pharmacists were also asked: "*Do you think the practice of therapeutic interchange can help to control health costs?*" Pharmacists (41%) and physicians (40%) are just as likely to believe that therapeutic interchange does not help to control health costs. The most interesting item regarding these responses is the shift in negative opinion from the question of pharmaceutical savings to health savings on the part of physicians. Physicians are more certain that therapeutic interchange does not help to control health costs (40%) than pharmaceutical costs (26%). Figure 9 illustrates the differences between physicians and pharmacists on this question.[22]

[21] This question provides valid responses from a random selection of 362 pharmacists and 689 physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 7.3 percent for pharmacists and plus or minus 5.0 percent for physicians.

[22] The Pearson's chi square has a significance value of less than 0.017. If there were no relation between profession (pharmacists and physicians) and belief in therapeutic interchange helping to control overall health costs, the probability of obtaining discrepancies as large or larger as we see in our sample would be less than 1.7 percent. It is very unlikely that this large a sample difference between pharmacists and physicians would be obtained if there were no differences in the population.

Figure 9: Do you think the practice of therapeutic interchange can help to control health costs?[23]



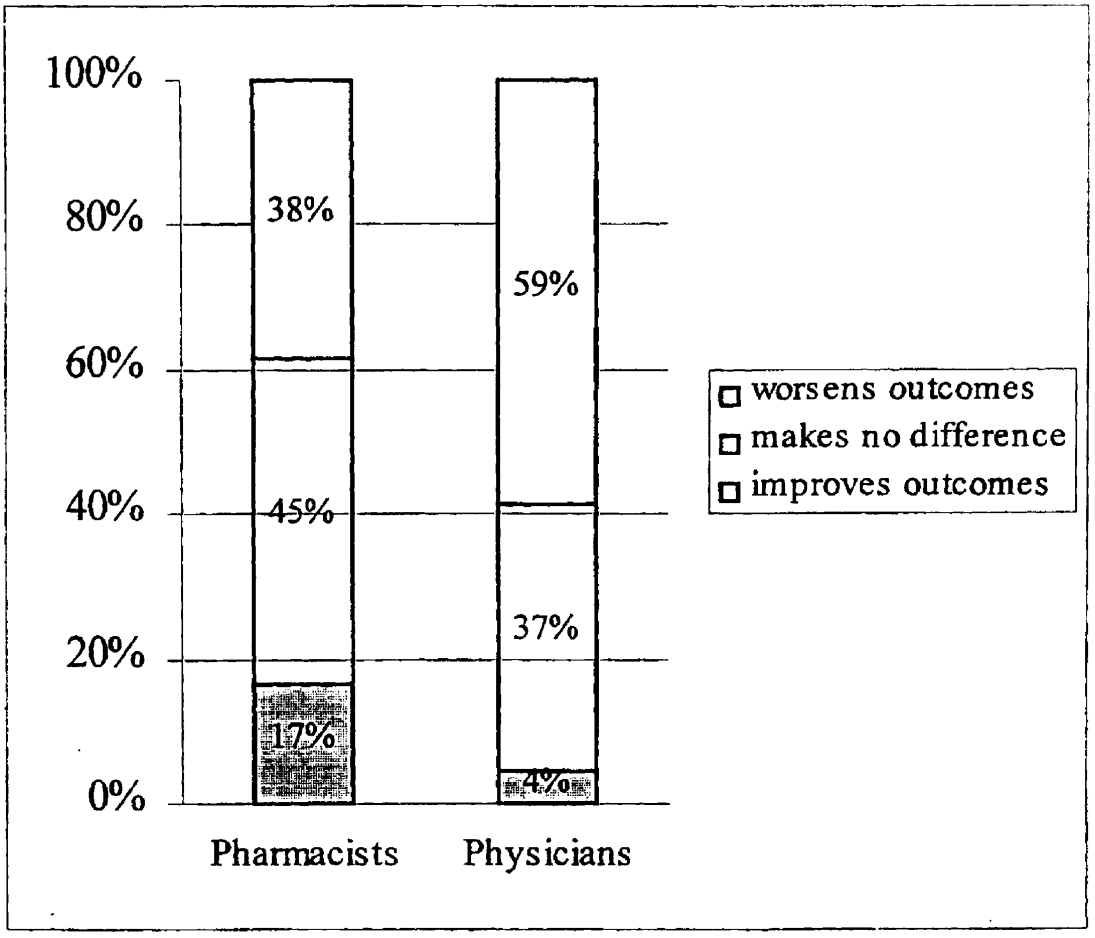
Clinical Outcomes Perceptions

Physicians and pharmacists were asked: "*Do you think the practice of therapeutic interchange: **definitely improves, slightly improves, slightly worsens, definitely worsens, or makes no difference** in clinical outcomes?*" A majority of physicians (59%) believe that therapeutic interchange worsens clinical outcomes while only 38 percent of pharmacists believe it worsens clinical outcomes. About 45 percent of pharmacists and 37 percent of physicians believe therapeutic interchange makes no difference in clinical outcomes. However, pharmacists (17%) are more likely to believe that therapeutic interchange improves clinical outcomes than are physicians (4%).

[23] This question provides valid responses from a random selection of 363 pharmacists and 742 physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 6.8 percent for pharmacists and plus or minus 4.1 percent for physicians.

Figure 10 illustrates the differences between physicians and pharmacists on the clinical outcomes question. [24] [25]

Figure 10: Do you think the practice of therapeutic interchange: <u>definitely improves, slightly improves, slightly worsens, definitely worsens, or makes no difference</u> in clinical outcomes?[26]



[24] Note that responses indicating a belief that therapeutic interchange improves clinical outcomes were combined into one group and that responses indicating a belief that therapeutic interchange worsens clinical outcomes were combined into one group. See frequency tables in Appendices B and C for further detail on the responses.

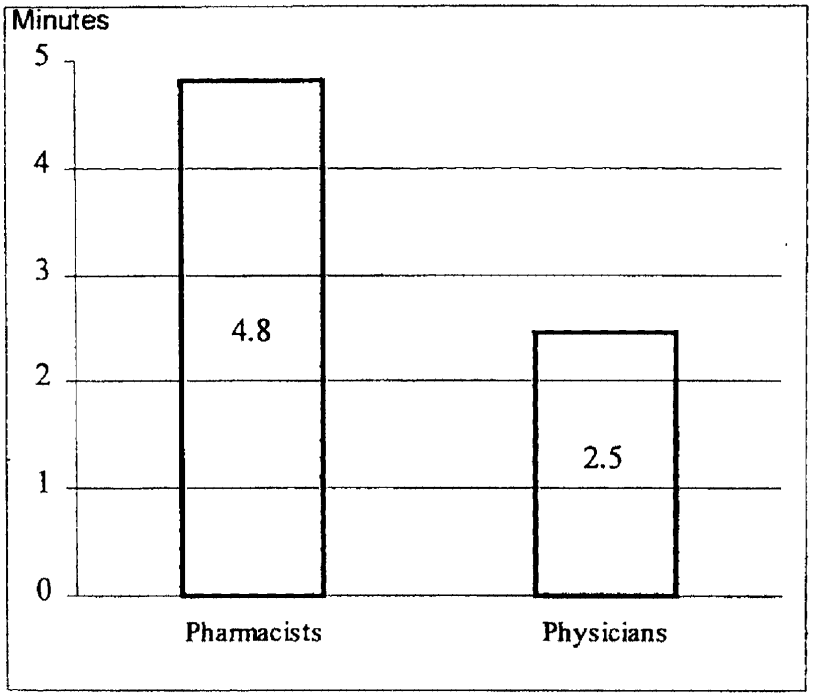
[25] The Pearson's chi square has a significance value of less than 0.0005. This means that if there were no relationship between profession (pharmacists and physicians) and perception of whether therapeutic interchange improves or worsens clinical outcomes, the probability of obtaining discrepancies as large or larger as we see in our sample would be less than 0.05 percentage points. It is very unlikely that this large a sample difference between pharmacists and physicians would be obtained if there were no differences in the population.

[26] This question provides valid responses from a random selection of 363 pharmacists and 714 physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 4.7 percent for pharmacists and plus or minus 2.2 percent for physicians.

Workload and Responsibility Perceptions

Physicians appear to spend considerably less time on therapeutic interchange transactions than do pharmacists. The average number of minutes spent by physicians on therapeutic interchange as reported in the questionnaire is 2.5. The average number of minutes spent by pharmacists on therapeutic interchange as reported in the questionnaire is 4.8. Figure 11 illustrates the difference between the estimated average number of minutes that physicians and pharmacists spend discussing therapeutic interchange.

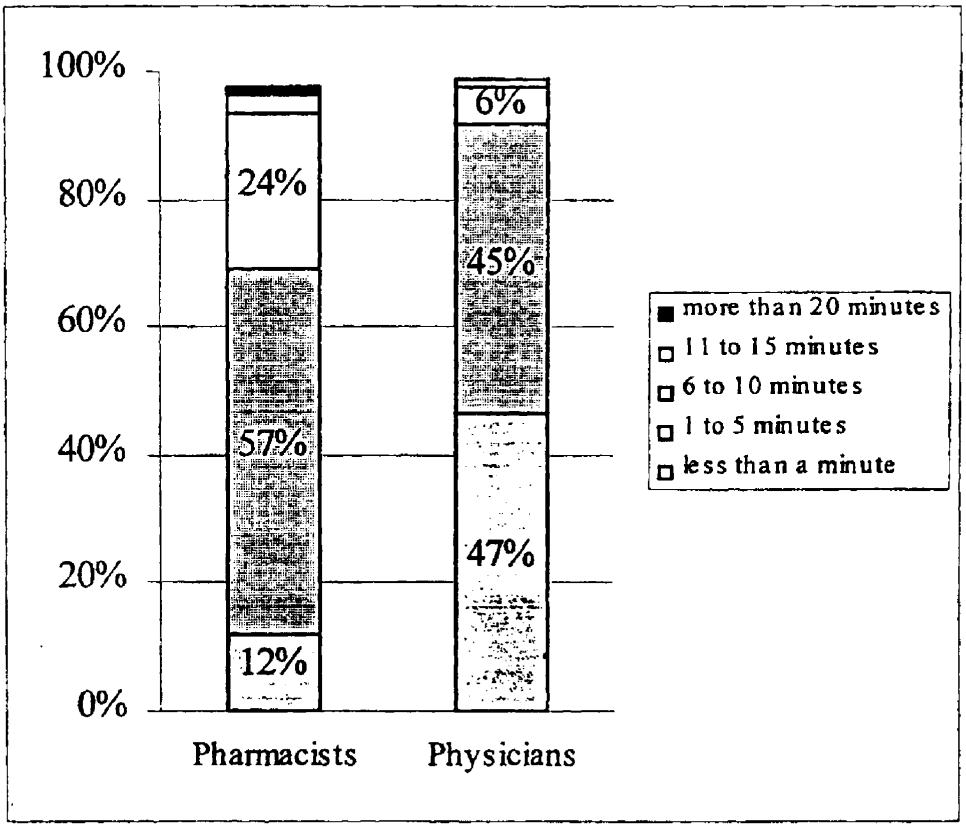
Figure 11: Estimated Average Number of Minutes Spent Discussing Each Therapeutic Interchange by Pharmacist and Physician in Virginia During 1998



The authors believe the physician average may be lower than the estimate reported above based on the broad range of values possible in 1 to 5 minute range and the relative weighting of ranges on either side of the 1 to 5 minute range. About 45 percent of physicians spend 5 minutes or less discussing therapeutic interchanges with 46.5 percent spending under one minute and 6.0 percent spending 6 to 10 minutes. The difference in relative intensity of

these border ranges suggests that the actual responses considered by physicians for the 1 to 5 minute range may have been skewed at the lower end of the range. Figure 12 shows the distribution of responses by range for the therapeutic interchange workload as measured by minutes.

Figure 12: How many minutes do you normally spend discussing each therapeutic interchange? [27]

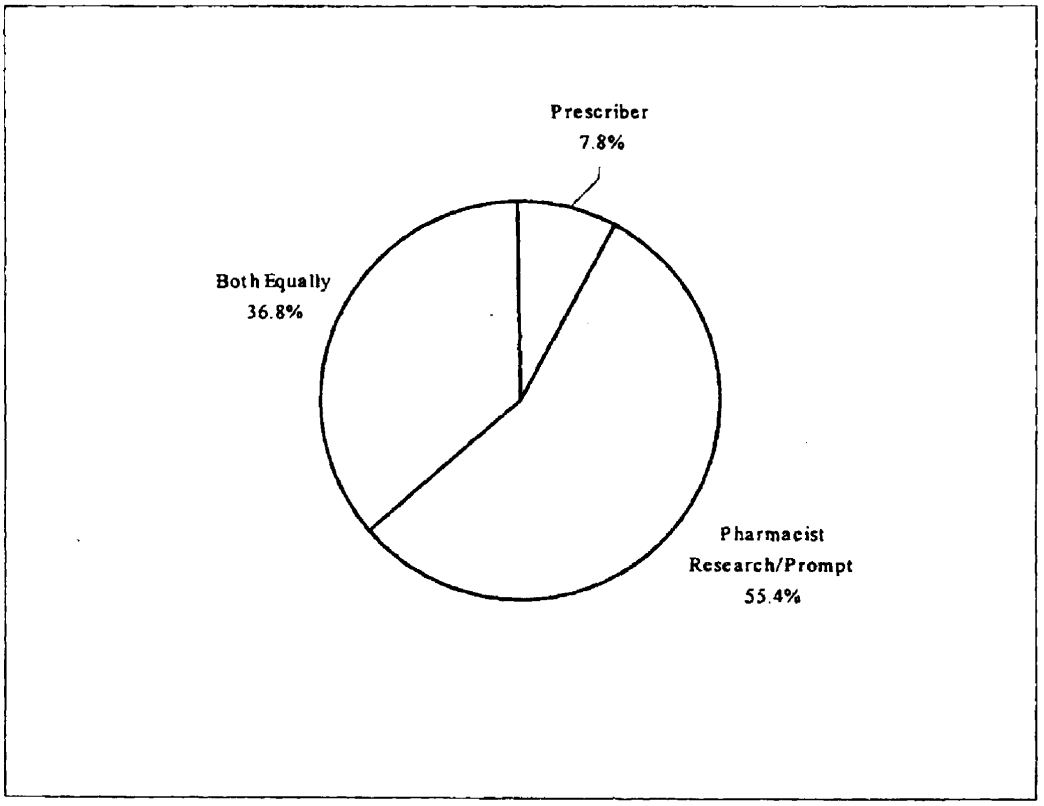


We also asked pharmacists whether the prescriber usually makes the suggestion for the alternative drug, or do they have to research or prompt the prescriber. Pharmacist responses clearly indicated they perceive themselves as having a significant role in providing information to assist the prescriber to make an informed decision during the therapeutic interchange

[27] This question provides valid responses from a random selection of 373 pharmacists and 705 physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 6.9 percent for pharmacists and plus or minus 7.6 percent for physicians.

transaction. Only 7.8 percent of pharmacists believe they usually rely on the prescriber to suggest an alternative drug during a therapeutic interchange transaction. Just over 55 percent believe they usually have to research or prompt the prescriber. Almost 37 percent of pharmacists believe both situations occur about equally. Figure 13 summarizes this information.

Figure 13: Does the prescriber usually make the suggestion for the alternative drug, or do you have to research or prompt him/her?[28]

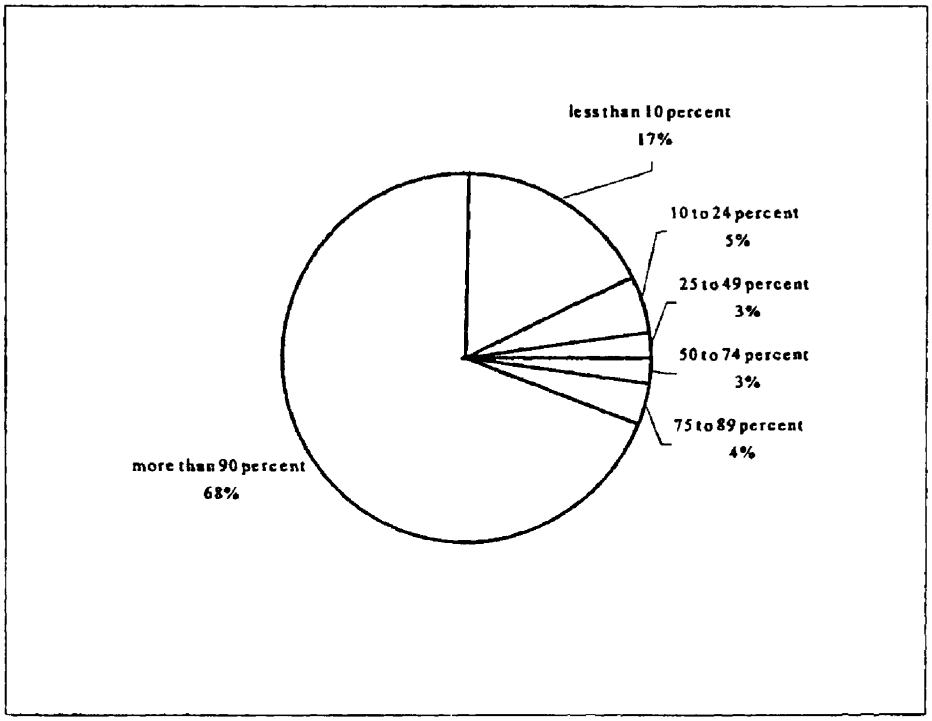


Physicians were asked how often they personally evaluate each therapeutic interchange request. Almost 70 percent of physicians reported they evaluate each therapeutic interchange

[28] This question provides 370 valid responses from a random selection of pharmacists and yields a plus or minus 4.1 percent sample error range at the 95 percent confidence level.

request more than 90 percent of the time but almost 20 percent do not personally evaluate requests. Figure 14 summarizes this information.

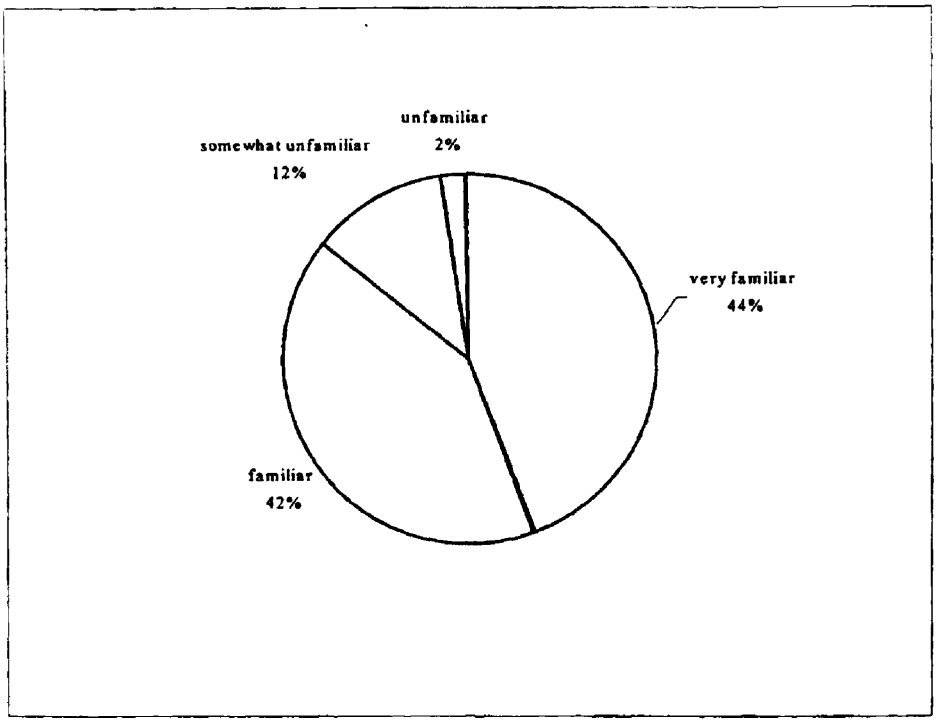
Figure 14: How often do you personally evaluate each therapeutic interchange request?[29]



Physicians were also asked how familiar they were with drugs recommended for therapeutic interchange. About 86 percent of physicians reported they were very familiar or familiar with drugs recommended for therapeutic interchange. The remaining 14 percent of physicians reported that they were somewhat unfamiliar or unfamiliar with drugs recommended for therapeutic interchange. Figure 15 summarizes this information.

[29] This question provides 706 valid responses from a random selection of pharmacists and yields a plus or minus 4.0 percent sample error range at the 95 percent confidence level.

Figure 15: In general, do you find that you are very familiar, familiar, somewhat familiar, or unfamiliar with drugs recommended for therapeutic interchange?[30]



Analysis

Concern has been expressed with the adequacy of evaluation each therapeutic interchange receives from physicians and how familiar they are with the alternative drugs recommended for a therapeutic interchange. Almost 70 percent of physicians report that they personally evaluate each therapeutic interchange request and 70 percent of physicians report being familiar with the alternative drug recommended for a therapeutic interchange. In contrast, pharmacists report that in almost 60 percent of therapeutic interchange approvals they are required to research or prompt the prescriber for an alternative drug. These differences in perception appear to be at odds with one another. However, it may be that physicians initially

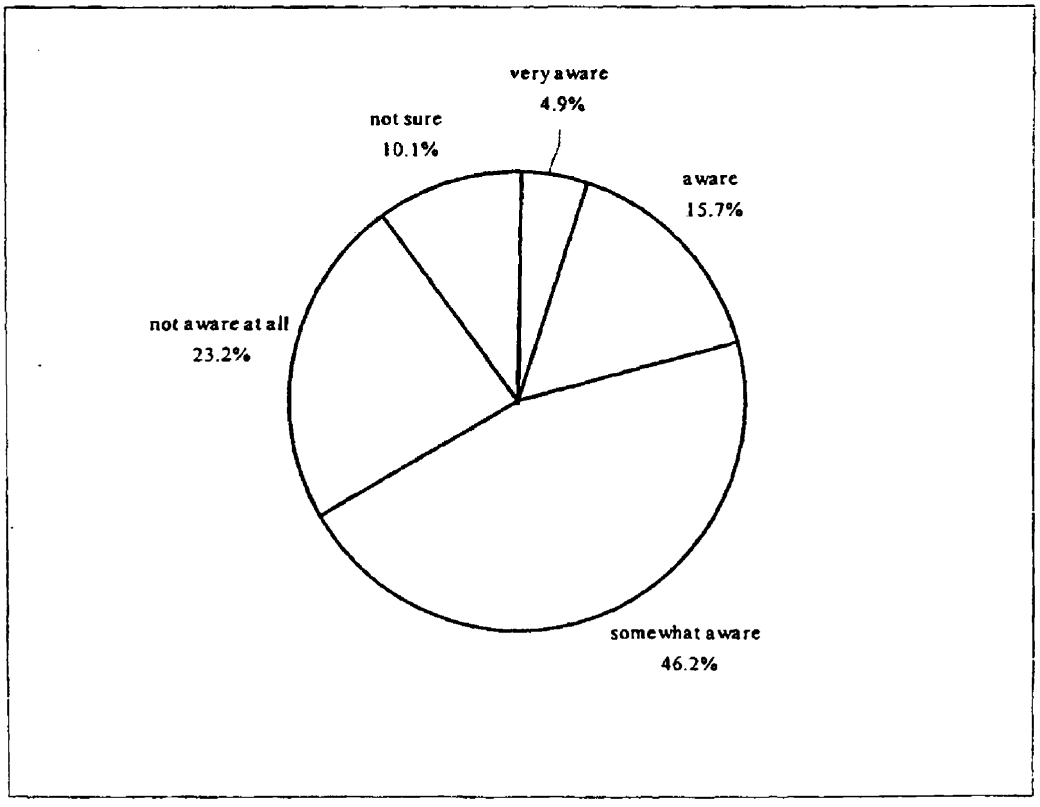
[30] This question provides 724 valid responses from a random selection of pharmacists and yields a plus or minus 6.8 percent sample error range at the 95 percent confidence level.

take a passive role and rely on pharmacists to prompt or research rather than make a suggestion themselves, but physicians still review the suggestion and are familiar with the drug suggested.

Patient Awareness Perceptions

Physicians were asked: "*How aware would you say your patients are regarding the practice of therapeutic interchange?*" Almost two-thirds of physicians responded that patients were at least somewhat aware of the practice of therapeutic interchange. Figure 16 provides the responses given by physicians on this question.

Figure 16: How aware would you say your patients are regarding the practice of therapeutic interchange?[31]

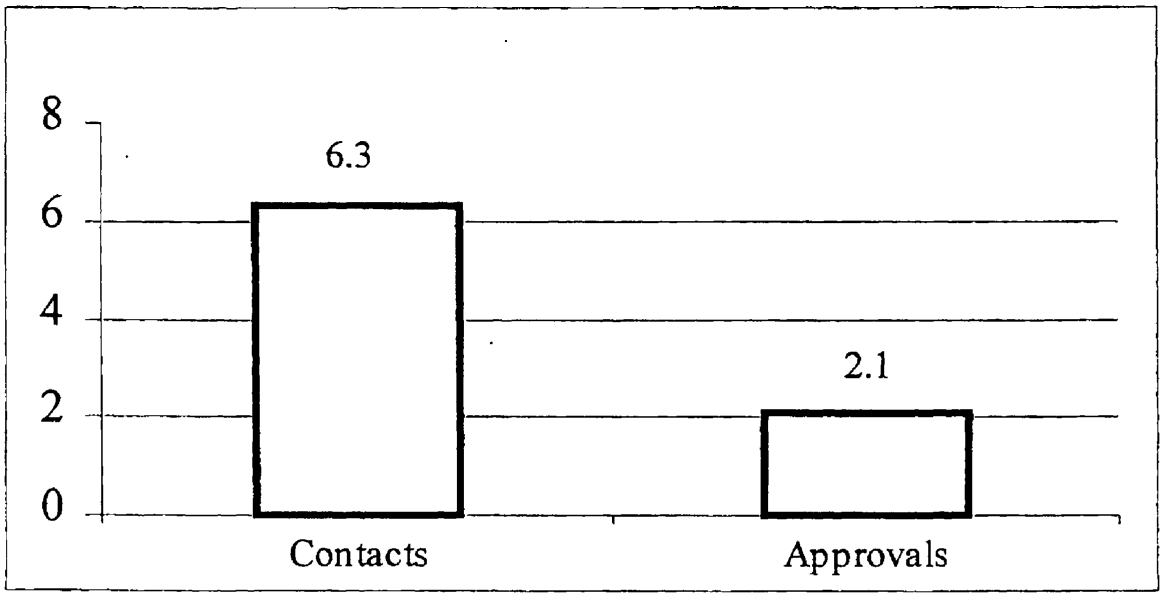


[31] This question provides 689 valid responses from a random selection of physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 3.2 percent for physicians.

Physician Perceptions of Therapeutic Interchange Contacts and Approvals

Physicians were asked three questions relating to the number of times they were contacted during the past seven days by retail pharmacists, health plans, and patients. Estimates based on the physician responses show that they average about 2.7 contacts from retail pharmacists, 2.3 contacts from health plans, and 1.3 contacts from patients for a total of 6.3 contacts per week. Physicians were also asked how many therapeutic interchanges they approved during the past seven days. We estimate that physicians approve 2.1 therapeutic interchanges per week. These estimates translate into an average therapeutic interchange rate of 33 percent, assuming the contacts requesting a therapeutic interchange represent mutually exclusive contacts.[32] Figure 17 provides the estimates based on responses provided by physicians from the questionnaire.

Figure 17: Estimated Number of Weekly Therapeutic Interchange Contacts and Approvals by Physicians in Virginia During 1998

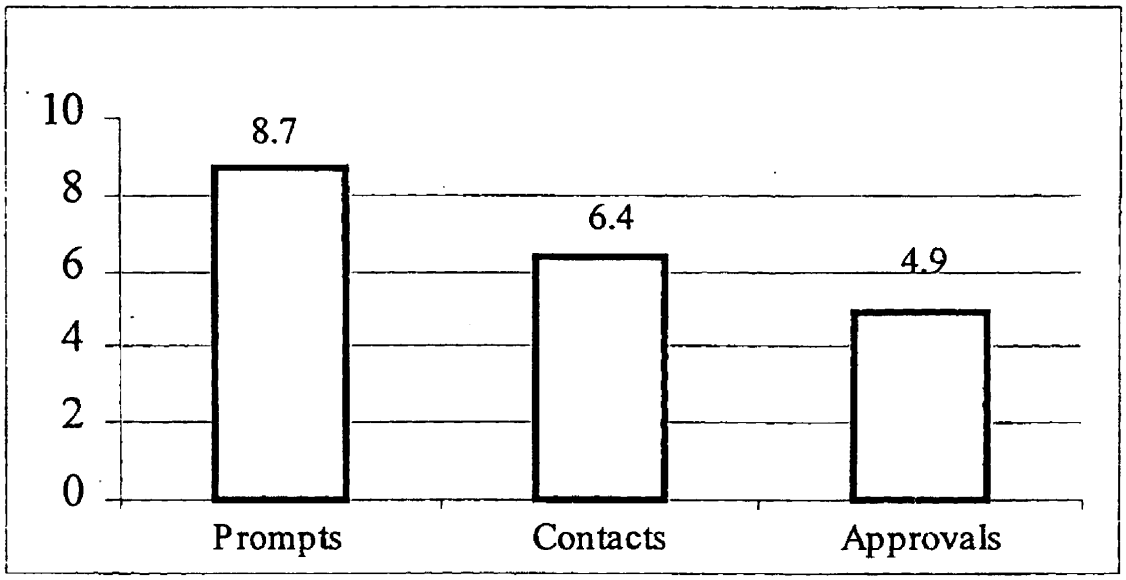


[32] This 33 estimate is of the same order of magnitude as the 27 percent therapeutic interchange approval rate provided in *An Estimate of the Annual Incidence of Therapeutic Interchange in the Commonwealth of Virginia During 1998.* Mercatus Center, December 1998.

Pharmacist Perceptions of Therapeutic Interchange Contacts and Approvals

Pharmacists were asked three questions relating to the number of times they were prompted/alerted to contact prescribers to discuss a therapeutic interchange, the number of times they did contact prescribers to discuss a therapeutic interchange, and the number of approved therapeutic interchange during the past seven days. Estimates based on the pharmacist responses show that they average about 8.7 prompts/alerts, 6.4 contacts, and 4.9 approved therapeutic interchanges per week. These estimates represent an average therapeutic interchange rate per contact of 75 percent. Figure 18 provides the estimates based on responses provided by pharmacists from the questionnaire.

Figure 18: Estimated Number of Weekly Therapeutic Interchange Prompts, Contacts and Prescriber Approvals in Virginia During 1998

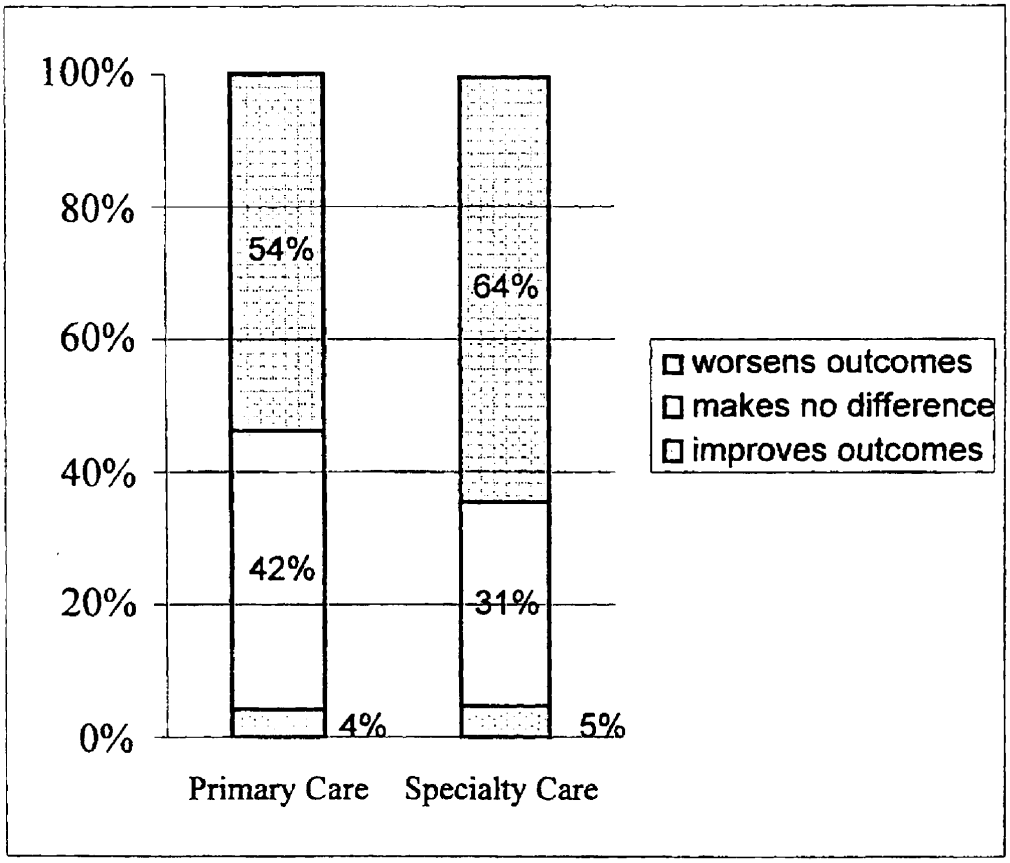


Differences Between Primary Care Physicians and Specialty Care Physicians

We analyzed differences on key variables (cost and clinical outcomes) between primary care physicians and specialty care physicians. The differences between these two groups were not statistically significant at the 0.05 level for all but one key variable. Primary care

physicians differed considerably from specialty care physicians on the question of whether therapeutic interchange improves or worsen clinical outcomes. About 46 percent of primary care physicians believe therapeutic interchange improves or makes no difference in clinical outcomes. About 35 percent of specialty care physicians believe therapeutic interchange improves or makes no difference in clinical outcomes. Figure 19 illustrates the results.[33]

Figure 19: Differences Between Primary Care Physicians and Specialty Care Physicians on Therapeutic Interchange Improving or Worsening Clinical Outcomes in Virginia During 1998[34]



[33] The Pearson's chi square has a significance value of 0.043. This means that if there was no relationship between profession (pharmacists and physicians) and perception of whether therapeutic interchange improves or worsens clinical outcomes, the probability of obtaining discrepancies as large or larger as we see in our sample would be no greater than 4.3 percent. It is unlikely that this large a sample difference between primary care physicians and specialty care physicians would be obtained if there were no differences in the population.

[34] This question provides valid responses from a random selection of 327 primary care and 360 specialty care physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 3.4 percent for primary care physicians and by plus or minus 3.2 percent for specialty care physicians.

Differences Between Chain and Independent Pharmacies on Financial Incentives

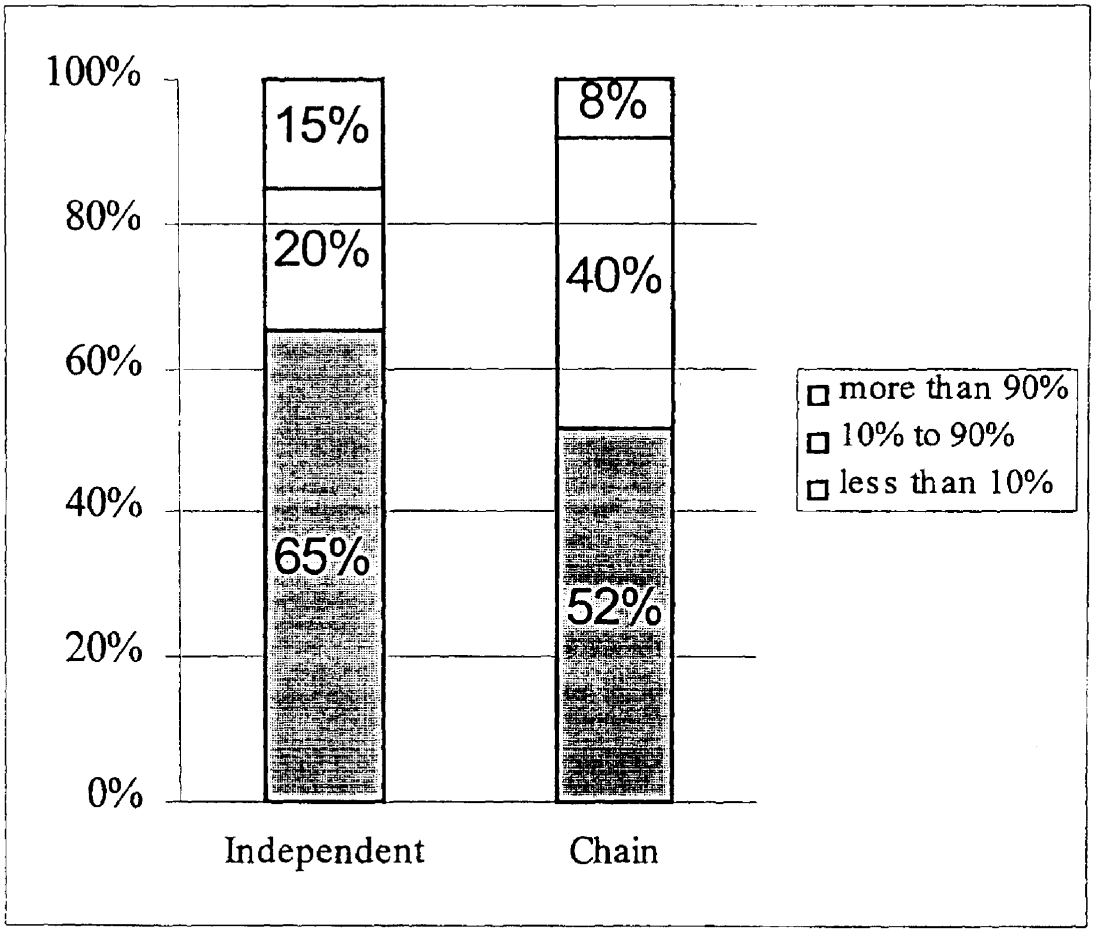
We analyzed differences on variables of interest (percent of approved therapeutic interchanges occurring as a result of manufacturers and PBM financial incentives) between chain pharmacies (47.9% of the sample) and independent pharmacies (49.6% of the sample). The differences between these two groups were not statistically significant at the 0.05 Pearson chi square level for manufacturers financial incentives but they were close at 0.057. The differences between chain and independent pharmacies were statistically significant at 0.009 on the question of what percent of therapeutic interchanges occur as a result of PBM financial incentives. The results for manufacturer incentives are similar, but less extreme, than the results for PBM incentives. The following discussion will focus on the relationship between chain and independent pharmacies and PBM incentives.

The data show that independent pharmacies are more likely than chain pharmacies to be at either extreme on the question of what percentage of therapeutic interchanges occur as a result of PBM incentives. About 65 percent of independent pharmacies and 52 percent of chain pharmacies reported that less than 10% of therapeutic interchanges are due to PBM financial incentives. Twenty percent of independent pharmacies and 40 percent of chain pharmacies reported that 10% to 90% of therapeutic interchanges occur as a result of PBM financial incentives. Fifteen percent of independent pharmacies and 8 percent of chain pharmacies reported that more than 90% of therapeutic interchanges occur as a result of PBM financial incentives. Figure 20 illustrates the relationships.[35]

[34] This question provides valid responses from a random selection of 327 primary care and 360 specialty care physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 3.4 percent for primary care physicians and by plus or minus 3.2 percent for specialty care physicians.

[35] The Pearson's chi square has a significance value of 0.009. This means that if there was no relationship between profession (pharmacists and physicians) and perception of whether therapeutic interchange improves or worsens clinical outcomes, the probability of obtaining discrepancies as large or larger as we see in our sample would be no greater than 0.9

Figure 20: What percent of approved therapeutic interchanges occur as a result of PBM incentives? [36]



Section 5: Statistical Correlation and Tests of Significance

We provide statistical analysis of all questions using bivariate correlation matrices in this section. In addition, we will compare differences in perceptions between two groups on

percent. It is very unlikely that this large a sample difference between primary care physicians and specialty care physicians would be obtained if there were no differences in the population.

[36] This question provides valid responses from a random selection of 327 primary care and 360 specialty care physicians. Chances are 95 in 100 that the real population response lies in the range defined by plus or minus 3.4 percent for primary care physicians and by plus or minus 3.2 percent for specialty care physicians.

cost and clinical outcome perceptions using statistical significance. The first set of groups we will compare are pharmacists and physicians. The second set of groups we will compare are primary care physicians and specialty care physicians.

Bivariate Correlation Matrix Analysis

Bivariate correlation matrix analysis is a statistical technique used for identifying two items of interest between two ordinal or interval variables. The first item of interest is whether or not two variables demonstrate a positive or inverse relationship. This is referred to as the correlation coefficient. The second item of interest is whether there exists a statistically significant relationship between the two variables based on statistical probability theory.

We examined three sets of bivariate correlation matrices to test for statistical relationships between all questions within each of the pharmacist and physician surveys. All three test matrices had similar, though slightly different, statistical methods. The three sets of test matrices, in order of increasingly conservative assumptions, included Pearson's correlation, Spearman's rho, and Kendall's tau b statistical tests. As expected, all three tests provided similar results that differed in the degree of intensity of correlation. We used the conventional standard, correlation coefficients greater than 0.3 at the 0.05 level of significance, for reporting significant correlations. We also chose to report the results from the most liberal test in order to capture more relationships in the following analysis (See Appendix D).

Physicians. Significant physician variable correlation fell into four groups of questions. The first group of correlated questions included numbers 1, 2, 3, 4, 13, 16, 17, and 18. The common factor in this group of questions was the volume of outpatients seen by the physician. Physicians who saw a higher volume of outpatients wrote more prescriptions, were more likely to be contacted by health plans and retail pharmacists to discuss a therapeutic interchange, approve more therapeutic interchanges, and receive more complaints about therapeutic interchange. Physicians who saw a lower volume of outpatients wrote fewer prescriptions,

were less likely to be contacted by health plans and retail pharmacists to discuss a therapeutic interchange, approve fewer therapeutic interchanges, and receive fewer complaints about therapeutic interchange.

The second group of correlated variables included those identified in question number 19. This question asked what share of a physician's outpatients fell into different categories. Physicians who were more likely to see female outpatients were less likely to see male outpatients. Another example is that physicians who were more likely to see children outpatients were less likely to see elderly outpatients. These correlations were among the strongest of the physician variables.

The third group of correlated variables included questions number 8, 9, and 10. These questions asked whether the physicians thought therapeutic interchange helped to control pharmaceutical and overall health costs and whether it improved or worsened clinical outcomes. Physicians more likely to believe that therapeutic interchange helps to control pharmaceutical costs were also more likely to believe that it helped to control overall health costs and that it made no difference or improved clinical outcomes for outpatients. The inverse was also more likely. Physicians less likely to believe that therapeutic interchange helps to control pharmaceutical costs were also less likely to believe that it helped to control overall health costs and that it worsened clinical outcomes for outpatients.

The fourth group of correlated variables included questions number 14, 17, and 18. These questions asked what specialty the physicians practiced, how many outpatients they saw, and how many prescriptions they wrote. Primary care physicians were more likely to see more outpatients and write more prescriptions than specialty care physicians.

Pharmacists. Significant pharmacist variable correlation fell into five groups of questions. The first group of correlated questions included numbers 1, 2, 5, 6, 7, 11, 12, and

13. The common factor in this group of questions was the volume of therapeutic interchanges attempted, approved and filled by pharmacists. Pharmacists who saw a higher volume of therapeutic interchanges reported higher shares of formulary exclusion, formulary inclusion (preferred drug), higher shares of manufacturer and PBM financial incentives to the pharmacy, and higher numbers of complaints about therapeutic interchange. Almost all of these variables exhibited correlation coefficients great than 0.3 with one another.

The second group of correlated variables included those in questions number 14, 15, and 16. These questions asked whether the pharmacist thought therapeutic interchange helped to control pharmaceutical and overall health costs and whether it improved or worsened clinical outcomes. Pharmacists more likely to believe that therapeutic interchange helps to control pharmaceutical costs were also more likely to believe that it helped to control overall health costs and that it made no difference or improved clinical outcomes for outpatients. The inverse was also more likely. Pharmacists less likely to believe that therapeutic interchange helps to control pharmaceutical costs were also less likely to believe that it helped to control overall health costs and that it worsened clinical outcomes for outpatients.

The third group of correlated variables includes questions number 16 and 17. Question 16 asked whether the pharmacist thought therapeutic interchange improved, made no difference, or worsened clinical outcomes. Question 17 asked how many complaints pharmacists received that were associated with a therapeutic interchange. Pharmacists who are more likely to receive more complaints are also more likely to perceive therapeutic interchange as worsening clinical outcomes. In other words, pharmacists who receive more complaints tend to view therapeutic interchange as worsening clinical outcomes. This could help explain why pharmacists, who have lower therapeutic interchange complaint rates (1.7%), have a more positive view with regard to the effect of therapeutic interchange on clinical outcomes than physicians who have a higher therapeutic interchange complaint rate (4.0%). The physician correlation coefficient is 0.193 for these two questions. The pharmacist correlation coefficient

is 0.371 for these two questions. Pharmacists may more favorably judge the clinical outcome effects of therapeutic interchange based on outpatient complaints than do physicians.

The fourth group of correlated variables includes questions number 18,19, 20 and 21. These questions have to do with whether the pharmacy was a chain or independent, whether the respondent was an owner or employee, and the number of hours and days a pharmacist reported their pharmacy being open during the week. Independent pharmacies and respondents who were owners were more likely to work in pharmacies that are open fewer days during the week and more likely to be open fewer hours during the week.

METHODS

There were 3,043 questionnaires mailed to physicians. Questionnaires sent to primary care physicians were mailed on December 17 and those sent to specialist physicians were sent on December 28, 1998. There were 1,308 questionnaires mailed to pharmacists on December 17. Over 2,896 mail questionnaires were delivered to physicians and 1,264 questionnaires were delivered to pharmacists.

The purpose of the questionnaires was to solicit physician and pharmacist experiences and professional opinions with regard to therapeutic interchange. Respondents were asked specific questions such as the number of times they had approved or filled a therapeutic interchange during the past 7 days and how many complaints about therapeutic interchange they had within the most recent 12-month period. The first three questions asked pharmacists to estimate the percentage of therapeutic interchanges that normally occur due to formulary exclusion, formulary inclusion (preferred drug interchanges), and patient initiated interchanges. This was done to ensure that pharmacist respondents could consider all three types of interchanges when answering the questions that followed. A definition of therapeutic interchange was also provided in a box at the top of both the physician and pharmacist questionnaire.

The Mercatus research team developed the survey with final approval by the Virginia Department of Medical Assistance Services (DMAS). Technical support for this project was provided by Dennis & Company Research, a commercial opinion and survey research firm in Minnesota. Dennis & Company Research acquired random samples of Virginia-based primary

care physicians, specialist physicians, and pharmacies from Survey Sampling, Inc. (SSI). Data were key punched by Action Data, Inc. in Silver Spring, Maryland.

The findings and results presented in this report are based on an analysis of these data by Mercatus Center at George Mason University. Conclusions and recommendations contained in this report have been drawn by the Mercatus Center and do not reflect the opinions or perspectives of DMAS, Dennis & Company Research, SSI, Inc., or Action Data, Inc..

Survey Instrument Development

The questionnaires used for the physician and pharmacist surveys were developed and administered by the Mercatus Center research team. Copies of the questionnaires are included in Appendix A of this report. The physician questionnaire included 21 questions and the pharmacist questionnaire included 24 questions. After the first draft of the questionnaire was completed, it was circulated for comment to research experts at the Commonwealth of Virginia's Department of Medical Assistance Services and questionnaire design experts at Dennis & Company Research, a commercial opinion and survey research firm in Minnesota. Almost all comments received from both organizations were incorporated into the questionnaires. The second draft questionnaires were pre-tested with physicians and pharmacists. Feedback from both pre-tests raised concerns about response rate due to excessive length of the second draft questionnaire. Several low priority questions were deleted in order to shorten the questionnaires and improve the response rate.

Separate questionnaires were mailed to pharmacists and physicians using Department of Medical Assistance Services (DMAS) envelopes and letterhead. Cover letters were signed by the Director of DMAS asking for pharmacist and physician assistance in understanding the process and practice of therapeutic interchange. We believe the leadership of DMAS' was critical to the successful response rates received for both the pharmacists and physicians.

Sample Selection

Pharmacists

We obtained a list of 1308 pharmacies in the Commonwealth of Virginia. This size sample was estimated to represent about 80 percent of the 1619 pharmacies registered in Virginia. There were 46 surveys returned undeliverable for a sample size of 1,262. The letter of introduction and survey were addressed to the pharmacist-in-charge to insure a standardized sample. The sample used for this study was purchased from Survey Sampling, Inc. (SSI), after seeking sample lists from three separate vendors. SSI provided the largest sample sizes of all three vendors. The sample of pharmacists is reflective of all retail pharmacies listed in the most recent edition of the yellow pages.

Physicians

Surveys were sent to an estimated 3,043 physicians out of a total licensed in-state population of 16,400. There were 147 surveys returned undeliverable for a total sample size of 2,896. The letter of introduction and survey were addressed to the individual physician. The sample used for this study was purchased from Survey Sampling, Inc. (SSI), after seeking sample lists from three separate vendors. SSI provided the largest sample sizes of all three vendors. The sample list was from the SSI medical database, and allows for multiple records per location. Each record includes the name, address, and telephone number and comes from a cross-referenced list compiled from:

- White and yellow pages listings
- Trade journals
- Professionals association memberships
- Professional directories

We used disproportionate sampling techniques to ensure sufficient numbers of cases from each group (primary care and specialist physicians) for purposes of analysis. This was necessary because primary care physicians were estimated to comprise 30% of the population

of interest. Even though primary care physicians comprise a smaller share of the physician population, based on interviews with physicians prior to mailing the survey, we correctly expected them to have a higher relative volume of outpatient visits and prescriptions than specialist physicians.[37] Disproportionate sampling provides a higher chance of selection than otherwise possible and provided sampling margins of error equal to or less than +/- 5% for each group. Questionnaires were mailed to 1,375 primary care physicians out of an estimated active population of 6,500. There were 66 questionnaires returned undeliverable for a total sample size of 1,309 primary care physicians. Questionnaires were also mailed to 1,668 specialist physicians out of an estimated active population of 9,900. There were 92 questionnaires returned undeliverable for a total sample size of 1,576 specialist physicians.

Response Rate

Pharmacists

The response rate assumption of 30 percent was consistent with mail survey response rates for non-physician professionals. The expected number of responses was 392 for the pharmacist questionnaire, yielding an expected sampling margin of error no greater than +/- 4.7 percent. Achieving a +/- 3.0 percent margin of error would have required 468 more responses for a total of 860.[38]

We received 380 responses on a delivered sample of 1,264 questionnaires for a 30.1 percent response rate. This response rate met our expectations and allows for a sampling margin of error no greater than +/- 4.8 percent.

[37] Primary care physicians reported an average of 110 prescriptions written per week and specialist care physicians reported an average of 62 prescriptions per week.

[38] This estimate uses the standard error formula for an infinite population multiplied by the sample multiplier for a finite population. The finite population multiplier must be used for this survey because the expected number of responses is a significant proportion of the populations of interest. Arkin, H. and Colton, R. *Statistical Methods*, Barnes and Noble, 1970: p. 149.

Physicians

The response rate assumption of 17 percent was consistent with the 17 percent response rate for a therapeutic interchange related mail survey of physicians in New York City during 1996.[39] The expected total number of responses was 517 for the physician questionnaire yielding a sampling margin of error no greater than +/- 4.1 percent. Achieving a +/- 3.0 percent margin of error would have required 383 more responses for a total of 900.

We received 767 responses on a delivered sample of 2,885 questionnaires for a 26.5 percent response rate. This response rate exceeded our expectations and allows for an overall sampling margin of error no greater than +/- 3.3 percent.

Reliability of Responses

Pharmacists Responses on Prescriptions Filled Volume

National estimates of the average HMO prescriptions per member per year from PBM and industry-wide sources show a range between 6.7 to 7.0 in 1996 and 7.3 to 7.7 in 1997.[40] It is reasonable that the average number of prescriptions per member per year (PMPY) in Virginia will be in the 1997 range plus a growth factor for 1998 that is similar to the growth in PMPY from 1996 to 1997 nationally. These adjustments provide a Virginia per capita estimate of 8.6 prescriptions per Virginia citizen.[41]

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[39] Green, M. *Compromising Your Drug of Choice: How HMOs are Dictating Your Next Prescription.* Public Advocate for the City of New York. December 1996.

[40] Express Scripts-Value Rx, 1997 Drug Trend Report. June 1998. p. 4.
Namovicz-Peat S. Ed. *HMO & PBM Strategies for Pharmacy Benefits* AIS, Inc. Washington DC. 1998. p. 3.
Novartis Pharmacy Benefit Report: 1998 Trends & Forecasts. Produced by Emron, Totowa, NJ, An IMS Company. p. 14. Note: There appears to be a typographic error in the *Novartis* manuscript. The manuscript says "*The Trends and Forecasts HMO sample averaged total drug expenditures of $171.56 PMPY for an annual Rx volume of 77.2/1000 members.*" The total drug expenditure estimate appears to be consistent with 7.7 prescriptions per person per year.

[41] This is consistent with the finding that Virginians visit the local pharmacy to fill a drug prescription an average of 2.15 times during the most recent three-month period. This translates into 8.6 visits to the local pharmacy to fill a drug prescription. Pyles, M.A.; Carroll, N.; and Holdford, D.: *Study to Determine the Impact of the PBM Practice of Therapeutic Interchange on Citizens of the Commonwealth of Virginia*, Virginia Commonwealth University, May 1999.

The mid-point of the range of responses provided by Virginia pharmacists multiplied by the number of licensed pharmacists in Virginia living in the Commonwealth (5,180 as of June 1998) provide a Virginia estimate of almost 26 prescriptions per Virginia resident.[42] Assuming a more reasonable estimate of active retail pharmacists (80 percent or 4,144) still provides an estimate of about 21 prescriptions per Virginia resident. This estimate is almost three times greater than the national average health maintenance organization PMPY number of prescriptions. A technical study completed on prescription drug use and expenditures for Minnesota's low-income senior citizens (who are actuarially high users of prescription drugs) estimated that their annual per capita count was about 16 prescription drugs.[43] We have to assume 1,725 pharmacists, 83% who work 40 or more hours per week, in order to reach an average of 8.6 prescriptions per Virginia resident in 1998. This assumption is relatively closer to the number of registered pharmacies in the Commonwealth of Virginia (1,619) than it is to licensed pharmacists (5,180) with Virginia addresses during June 1998. Clearly, retail prescription drug volume based on the pharmacist survey does not match national benchmarks. As a result, we used 1,725 as our unit for calculating the estimated volume of prescriptions and number of therapeutic interchanges. The average number of retail prescriptions per Virginia resident assumption is 8.6 per year.

Potential for Recall Bias

There was concern for the accuracy of self-reported data by survey respondents. The concern was that respondents will have faulty recall of the number of therapeutic interchanges or the duration of time taken to complete the communication necessary to conduct the therapeutic interchange. This is known as recall bias. One example of recall bias is a study of self-reported estimates of prescription drug spending by senior citizens. The most comprehensive study to determine the degree of underreporting of drug spending was

[42] The Virginia Board of Pharmacy estimates there were 1,619 registered pharmacies, 7,562 licensed pharmacists of which 5,180 had Virginia addresses in June 1998.

[43] Nystrom, S. and Muse, D. "*Prescription Drug Coverage and Expenditures for Low-Income Senior Citizens in Minnesota*" February 1997.

conducted by Project Hope under the direction of Mark Berk. [44] This study concluded that self-reported estimates of prescription drug spending were approximately 34 percent lower than actual spending for senior citizens.

Mercatus Center researchers developed and implemented techniques to minimize recall bias. First, we asked for information from the past seven days. The Berk study findings were based on a six-month recall period. Improved accuracy in recalling a task for survey purposes is associated with how recently the task has been performed. [45]

Two components of the questionnaire designed to reduce recall bias: 1) topic introduction in the cover letter and on the questionnaire; and 2) appropriate question ordering. Respondents were informed at the beginning of the questionnaire that the survey questions focus on their experiences with and views on therapeutic interchange. Informing respondents early about the focus of the survey provides an incentive to respond and activates the memory to provide more accurate responses. The respective questions were ordered to maximize recollections by respondents. The ordering of the questions was also designed to provide more accurate responses.

Potential for Response Bias Based on Intensity of Experience

There was also concern for response bias based on intensity of experience and strong feelings on the issue of therapeutic interchange. The Mercatus Center research team was concerned that respondents having the most experience with therapeutic interchange would have strong feelings on the issue. A greater share of those with strong feelings might be expected to respond to the survey than those who do not have strong feelings on the practice of

[44] Berk, M.; Schur, C.; and Mohr, P. *Using Survey Data to Estimate Prescription Drug Costs.* Health Affairs, 9(3): 146-156.

[45] Nystrom, S. and Muse, D. *Prescription Drug Coverage and Expenditures for Low-income Senior Citizens in Minnesota.* February 1997: 10-13.

therapeutic interchange. Responses by those with greater experience could overstate the prevalence and incidence rates regarding the practice of therapeutic interchange in Virginia.

There are techniques to minimize response bias including the use of a telephone survey or follow-up telephone interviews for subjects not responding to the mail survey. These strategies were considered and rejected based on resource and time constraints. However, telephone survey techniques introduce other problems such as interviewer bias and error.

The best strategy for reducing response bias in a mail survey, especially with a finite population of subjects, is to improve response rates. Special care in the length and design of the survey was taken to improve response rates above normal response rates. In addition, the survey data has been cross-referenced with other data provided in two earlier studies.[46]

Other Bias

The pharmacist survey had a typographical error in question 5. The range for 10 to 15 alerts/prompts for a therapeutic interchange during the past 7 days was missing. Some respondents created their own range and checked it. It appears as if most respondents ignored the missing range and placed a check in the ranges immediately above or below the missing range. Fortunately, this question is not critical for determining incidence rates or measuring opinions of pharmacists on therapeutic interchange.

Estimating Procedures

Mid-point of the Range

The mid-point of the range method of estimation requires the creation of weighting tables constructed from unweighted tables for each of the questions. Unweighted tables are created

[46] *An Estimate of the Annual Incidence of Therapeutic Interchange in the Commonwealth of Virginia During 1998.* Mercatus Center, December 1998; and Pyles, M.A.; Carroll, N.; and Holdford, D.: *Study to Determine the Impact of the PBM Practice of Therapeutic Interchange on Citizens of the Commonwealth of Virginia*, Virginia Commonwealth University, May 1999.

from the frequency tables showing the low and high values of the range category and the distribution of responses for each question. Figure 20 illustrates the method used to determine the mid-point of the range estimates for this study.

Figure 21: Illustration of Mid-point of the Range Calculation

What percent of approved therapeutic interchanges occur because the drug is not included on the formulary?

	Low Value	Response Distribution	Weighted Share
LOW	0%	41.5%	0.0%
	10%	20.2%	2.0%
	26%	6.9%	1.8%
	51%	6.6%	3.4%
	76%	11.2%	8.5%
	91%	13.6%	12.4%
	WEIGHTED AVERAGE FLOOR=		28.1%

MID-POINT = 34.7%

	High Value	Response Distribution	Weighted Share
HIGH	10%	41.5%	4.2%
	25%	20.2%	5.1%
	50%	6.9%	3.5%
	75%	6.6%	5.0%
	90%	11.2%	10.1%
	100%	13.6%	13.6%
	WEIGHTED AVERAGE CEILING=		41.3%

The first set of numbers shows the weighted average of the lower limits for each response category. The second set of numbers shows the weighted average of the higher limits for each response category. Column one represents the possible values for selection. For example, the lowest number available in the first range of possible responses was zero, the lowest number available in the second range of possible responses was 10%;,the lowest number available in the third range of possible responses was 26%, and so on until the lowest number available in the sixth and final range of possible responses is reached at 91%. The second column represents the distribution of responses for the question. Note that the distribution of responses will always be identical for each set of calculations. The responses are static from one set of calculations to the next set of calculations for each question of interest. The third column is the product of columns one and two. The products in the third column are then added together to derive an estimate for the weighted average floor and weighted average ceiling estimate. The

weighted average floor and weighted average ceilings are then added together and divided by two to derive a mid-point estimate of the weighted averages. Professional judgement was used for establishing a reasonable upper limit for questions with a final open-ended response.

Estimate Calculations and Related Assumptions

The ranges are used to determine the low and high limits of the range and the mid-point to derive almost all estimates including:

- The estimated volume of prescriptions written by physicians and filled by retail pharmacists in Virginia during 1998,
- The estimated volume of therapeutic interchanges approved by physicians and filled by retail pharmacists in Virginia during 1998,
- The estimated rate of therapeutic interchange approved by physicians and filled by retail pharmacists in Virginia during 1998,
- The estimated share of therapeutic interchange by reason of initiation in Virginia during 1998,
- The estimated number of complaints by patients experiencing therapeutic interchanges approved by physicians in Virginia during 1998, and
- The estimated rate of complaints by patients experiencing therapeutic interchanges filled by retail pharmacists in Virginia during 1998.

In addition to calculating the mid-point of the range, additional assumptions were used to determine different estimates. The following is a description of the assumptions used to derive estimates listed above.

The estimated volume of prescriptions written by physicians and filled by retail pharmacists in Virginia during 1998. Calibrating the model to accommodate the assumption of 8.6 prescriptions filled per Virginia citizen to derive the estimate of annual volume of prescriptions filled by pharmacists.

The physician estimate was derived by multiplying the mid-point of the range of the weekly number of prescriptions written per physician by 52 weeks. This calculation provided the annual per physician estimate of prescription drugs which was then multiplied by the estimated number of physicians in Virginia. [47] The physician estimate was also broken out into a primary care physician group and a specialist physician group. The primary care physician group consisted of general practice, family practice, internists, and pediatricians. The specialist physician group consisted of all other physicians. The Virginia Board of Medicine provided a rough estimate of the number of primary care and specialist physicians practicing medicine in Virginia. The estimated share of primary care physicians is 30 percent. The estimated number of prescriptions written was then proportionately weighted to reflect this assumption.

The estimated volume of therapeutic interchanges approved by physicians and filled by retail pharmacists in Virginia during 1998. This estimate used the same method and assumptions cited in the previous estimate, except that the weighted averages used were based on the question asking the respondents to indicate the number of therapeutic interchanges approved by physicians during the past week.

The estimated rate of therapeutic interchange approved by physicians and filled by retail pharmacists in Virginia during 1998. This rate was calculated by dividing the estimated number of therapeutic interchanges by the estimated total annual volume of prescriptions written by physicians and filled by retail pharmacists, respectively. The 3.0 percent therapeutic interchange rate represents a weighted mid-point of the range of 2.0 percent to 5.0 percent.

The therapeutic interchange physician approval rate is estimated to be 0.75 percent of all prescriptions submitted by patients to retail pharmacies. The 0.75 percent therapeutic

[47] The Virginia Board of Medicine records about 16,400 active licensed in-state physicians as of October 1998.

interchange rate represents a weighted mid-point of the range of 0.5 percent to 1.1 percent. The therapeutic interchange approval rate estimate is a linear derivation based on the range of responses for the number of therapeutic interchanges approved and the number of prescriptions written received from the physician survey. The ranges are dependent on the dynamic interplay of both variables and the rate estimate therefore is not a mid-point of the range derived from the minimum and maximum values.

The estimated share of therapeutic interchange by reason of initiation in Virginia during 1998. The estimates for each of the five ways a therapeutic interchange might be initiated was completed using the mid-point of the range method identified in Figure 12 earlier in this chapter.

The estimated rate of complaints by patients experiencing therapeutic interchanges approved by physicians in Virginia during 1998. The estimated rate of complaints is based on the mid-point of range of therapeutic interchange related complaints received by physicians during 1998 and divided by the estimated number of approved therapeutic interchanges during the past year.

The estimated rate of complaints by patients experiencing therapeutic interchanges filled by pharmacists in Virginia during 1998. The estimated rate of complaints is based on the mid-point of the range of therapeutic interchange related complaints received by pharmacists during 1998 and divided by the estimated number of approved therapeutic interchanges during the past year.

Limitations

We believe the results of this survey and the estimates provided to be realistic representations of the practice of therapeutic interchange. The strongest measure of integrity

for this study is that the estimates appear to be consistent with other studies on the practice of therapeutic interchange. The sample sizes appear large enough to have produced valid results and the surveys appear to have produced reliable responses. However, there are at least four potential limitations that bear consideration.

In any research, there are several tradeoffs to consider. One of the important tradeoffs we had to address was that between increased response rate and greater precision in the responses for the purpose of estimating several variables. In order to improve the response rates by making the questionnaires easier to fill out, we asked respondents to record their experience and perceptions into range-based categories using closed-ended questions. Providing ranges of categories for respondents to record their responses limited the precision that we might have otherwise had with open-ended questions. However, there are several advantages in addition to increased response rate. These advantages include:

1) the respondents answers are easier to interpret. Open-ended questions could have solicited a range estimate of their experience (say 5 to 10 therapeutic interchanges) which would be difficult to interpret into a database.
2) Answers are more likely to be legible. Open-ended questions can often be illegible. This would reduce the reliability of the responses and reduce the number of valid cases used for analysis
3) Closed-ended questions are easier to code, making the results of the survey less costly and more timely.

There are two uncertainties with regard to pharmacist survey responses. The first uncertainty is whether the responses provided represented the experience of the pharmacy or the pharmacist. Strong efforts were made to word questions and design the questionnaire so that the pharmacist provided quantitative estimates based on their personal experience. However, it is fortunate that other studies have been conducted to assist us in applying a

"reasonableness test" to the responses received. These other studies give us considerable confidence that the pharmacists were reporting the experience of the entire pharmacy rather than their personal experience. This conclusion is also supported by the fact that surveys were addressed to pharmacies rather than pharmacists and that the pharmacy's "pharmacist –in-charge" was asked to respond.

The second uncertainty is whether pharmacist questionnaire respondents used the intended broad operational definition of therapeutic interchange or a more narrow definition than requested. The survey was designed to include a broad definition by providing the definition in the front of the questionnaire and by prompting them to think broadly when answering the first three questions. We believe, because of the care taken in the design of the questionnaire, that the pharmacist respondents did use the intended broad operational definition of therapeutic interchange.

It is difficult to generalize about Virginia's therapeutic interchange practices in the future because the pharmacy benefit management market is dynamic. For example, one national industry-wide survey of HMOs projected an increase in per member per year prescription drug volume of 18 percent from 1997 to 1999. Increased prescription drug utilization and rising pharmaceutical costs suggest that the practice of therapeutic interchange may continue to increase. Therapeutic interchange techniques are likely to be continually refined and changed as new drugs are approved by the U.S. Food and Drug Administration, as knowledge about cost- and clinical-effectiveness of therapeutic drugs increases, and as computerized systems become more sophisticated. [48]

[48] Drug Benefit Trends, *Drug Information Services in the Managed Care Setting*. 9(8):28-30,36-40, 1997.

CONCLUSIONS

Therapeutic interchange appears to not have been a common practice in Virginia during 1998. Estimates of annual prescription incidence rates for therapeutic interchange from this study range from 0.75 percent to 3 percent in Virginia during the past year.

The prescription incidence rate from the pharmacist survey appears to be consistent with the Mercatus Center PBM study of the per subscriber incidence of therapeutic interchange in Virginia. The estimated patient incidence rate reported by PBMs for formulary inclusion (preferred drug) therapeutic interchange was 0.4 percent and can be shown to be consistent with the estimated retail pharmacist survey prescription incidence rate of 0.75 percent.

The VCU citizen survey reported that 70.5 percent of Virginia residents who had a therapeutic interchange during the past year had 1 to 2 therapeutic interchanges. The survey also reported that 23 percent of Virginia citizens who had a therapeutic interchange during the past year had 3 to 6 therapeutic interchanges and 6.5 percent had seven or more therapeutic interchanges. This suggests that the average citizen who experienced therapeutic interchange had between 2 and 3 interchanges during the past year. In addition, the Mercatus Center PBM study focused only on formulary inclusion therapeutic interchange. This estimate includes both formulary exclusion and inclusion (preferred drug). The per capita Virginia and prescription therapeutic interchange incidence rate estimates can be shown to be roughly consistent after consideration of these factors.

There appears to be consistency of incidence rates between the physician survey and the VCU citizen survey even though the superficial similarity in rates may be misleading.

According to the VCU citizen survey, 3.8 percent of respondents with prescription drug coverage experienced a therapeutic interchange in 1998. This is equivalent to 3.1 percent of the total population. While the rate may be somewhat high because of disproportionate sampling, [49] the rate seems superficially similar to the 3 percent rate reported by physicians. However, the 3.1 percent citizen incidence rate estimate represents about 200,000 Virginians, whereas the physician survey estimates the therapeutic interchange rate by prescription and represents up to 1.8 million interchanges. This ninefold difference still may be roughly consistent after consideration of the following five potential explanations for the differences.

The first potential explanation for the difference is the low statistical confidence researchers have in small cell sizes within large sample sizes. The low proportion and count of respondents reporting that they experienced a therapeutic interchange during the past year in the VCU citizen survey sample creates considerable uncertainty in the therapeutic interchange population incidence. It is difficult to project population incidence with sufficient certainty based on such small cell size counts reported in the sample.

The second potential explanation for the differences is identical to the previous comparison of estimates related to results from the VCU citizen survey on the average number of therapeutic interchanges among Virginians who experienced a therapeutic interchange. Virginians who had experienced a therapeutic interchange during the past year reported to have averaged between 2 and 3 interchanges. This means that the estimated 200,000 Virginians reporting having experienced a therapeutic interchange have had from 400,000 to 600,000 therapeutic interchanges during the past year.

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[49] The VCU survey sample is disproportionate and the 3.1 incidence rate estimate is unadjusted for the Commonwealth of Virginia population as reported by the U.S. Bureau of the Census. The identified over-sampling includes senior citizens, females, and Virginians with health insurance plans that include pharmacy benefits.

A third potential explanation for the differences is that physicians report that 23 percent of patients are "not aware at all" of therapeutic interchange and 46 percent are only "somewhat aware" of therapeutic interchange. Adjusting for this factor suggests that from one-quarter to one-half of respondents may not have been aware they were experiencing a therapeutic interchange and therefore were not able to report their experience. This raises the possible range of the volume of therapeutic interchanges to roughly 500,000 to 1,200,000.

The fourth potential explanation for the differences may include recall bias on the part of respondents to the VCU citizen survey, as they were asked to recall any therapeutic interchanges over the past 12 months. Based on other pharmaceutical survey research, recall bias could have been a factor in the difference. However, therapeutic interchange is not a common practice and may be more likely to be remembered by Virginians who are aware of an interchange. Absent evidence regarding recall bias on therapeutic interchange, it is difficult to estimate its impact. It should be noted that the 12-month recall period was necessary due to the expected low incidence of citizens who experienced at least one therapeutic interchange in the recent past. Shorter recall periods could have reduced the number of respondents who had experienced a therapeutic interchange and created greater uncertainty in the estimate than the 12-month recall period.

Finally, the definition of therapeutic interchange used in the citizen survey was less expansive than the definition used in the physician survey. The citizen survey focused on therapeutic interchanges initiated by insurance companies.

The above discussion shows that it is difficult to estimate exactly how much of the difference between this study and the VCU citizen survey can be accounted for by each of the explanations. However, the above potential explanations demonstrate reasonable consistency between the two estimates.

The roughly consistent differences between the two sets of surveys (Mercatus Center pharmacist survey and PBM survey compared to the Mercatus Center physician survey and VCU citizen survey) suggest that mail-order pharmacies may have a higher incidence rate of therapeutic interchange than retail pharmacies. Industry-wide research indicates that the most common mail-order prescriptions are for drugs that fall into the more common drug therapy classes previously identified as common opportunities for therapeutic interchange. These data suggest that mail-order pharmacies would have higher rates of therapeutic interchange as a percent of prescription drug volume than retail pharmacies. Prescriptions could also have been interchanged by the prescriber before being presented to a retail pharmacy in cases of patient-initiated and health plan-initiated interchanges.

The most common reason for initiation of a therapeutic interchange is, according to Virginia's pharmacists, because the originally prescribed drug is not included on the health plan formulary. The range of responses provided by Virginia's pharmacists suggests about 1 in 3 of all therapeutic interchanges are a result of formulary exclusion of the originally prescribed drug. Formulary exclusion therapeutic interchanges can reasonably be expected to overlap with patient initiated interchanges as price sensitive consumers are confronted with the price difference between drugs covered and those not covered by the formulary. Manufacturer and PBM financial incentives are unlikely to overlap with formulary exclusion therapeutic interchanges.

Almost all patients appear to be satisfied with their experience of therapeutic interchange. Complaints to physicians are estimated to occur for roughly 4 percent of physician approved therapeutic interchanges. Complaints to pharmacists are estimated to occur for roughly 1.7 percent of physician approved therapeutic interchanges filled at retail pharmacies.

Physician and pharmacist perceptions tend to be mixed and uncertain on whether the practice of therapeutic interchange helps to control pharmaceutical costs. Physicians were more likely to answer "maybe" (48%) than "yes" (26%) or "no" (25%) to this question. Pharmacist perceptions tend to be slightly more negative than physicians on whether the practice of therapeutic interchange can help to control pharmaceutical costs. Pharmacists were just as likely to answer "no" (36%) as "maybe" (36%) and least likely to answer "yes" (28%) on the question of whether therapeutic interchange can help to control pharmaceutical costs.

Physicians and pharmacists are less likely to believe that therapeutic interchange helps to control overall health care costs than they are likely to believe that it controls pharmaceutical costs, but there is still much uncertainty. Physicians are more certain that therapeutic interchange does not help to control health costs (40%) compared to their "no" responses on whether therapeutic interchange can help to control pharmaceutical costs (26%). However, the largest share of physicians (43%) answered "maybe" to the question of whether therapeutic interchange can help to control overall health costs. Pharmacists are slightly more certain that therapeutic interchange does not help to control health costs (41%) compared to their "no" responses on whether therapeutic interchange can help to control pharmaceutical costs (36%). A larger share of pharmacists (41%) believe that therapeutic interchange does not help to control health costs than pharmacists (23%) who believe therapeutic interchange can help to control health costs. However, a large share of pharmacists (36%) answered "maybe" to the question of whether therapeutic interchange can help to control overall health costs.

Physicians and pharmacists differ on whether therapeutic interchange improves or worsens clinical outcomes. A majority of physicians (59%) believe the practice of therapeutic interchange worsens clinical outcomes, but only 38 percent of pharmacists believe therapeutic interchange worsens clinical outcomes. Primary care physicians are less likely than specialty care physicians to believe that the practice of therapeutic interchange worsens clinical outcomes. About 54 percent of primary care physicians believe that the practice of therapeutic

interchange worsens clinical outcomes. About 64 percent of specialty care physicians believe that the practice of therapeutic interchange worsens clinical outcomes.

Physicians tend to spend less time on therapeutic interchange transactions than retail pharmacists. An estimated 90 percent of physicians spend 5 minutes or less on each therapeutic interchange transaction with 50 percent spending less than a minute. An estimated 70 percent of pharmacists spend 5 minutes or less on each therapeutic interchange with only10 percent spending less than a minute. These responses tend to suggest pharmacist complaints about therapeutic interchange may be more likely to focus on workload issues than for physicians.

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APPENDICES

APPENDIX A

Virginia Pharmacist Questionnaire on the Practice of Therapeutic Interchange

PURPOSE: The purpose of this research is to learn more about pharmacists' experience with and views on therapeutic interchange of prescription drugs. This survey should be completed by the ***Pharmacist-in-Charge***.

DEFINITION: **Therapeutic interchange is the dispensing of a drug, by any person authorized by law to dispense drugs, that is a chemically dissimilar alternative for the drug initially prescribed. The alternative drug is expected to have the same clinical results and similar safety profile, when administered to patients in therapeutically equivalent doses as the drug initially prescribed, and is dispensed with the approval of the person who prescribed the initial drug, or their lawful designee. Therapeutic interchange includes the use of alternative drugs for initially prescribed drugs: 1) not included on a formulary, 2) that are not preferred drugs on a formulary, and 3) that are requested by patients.**

PLEASE HELP US: This questionnaire is part of a statewide survey of pharmacists on the practice of therapeutic interchange. Please answer all the questions. In most cases, all you have to do is place an X in the circle next to your response. Please note that the answers to this survey should reflect ***your specific experiences*** and not the experience of the entire pharmacy.

1. What percent of *approved* therapeutic interchanges occur because the originally prescribed drug is not included on the pharmacy plan formulary?

   ± less than 10% ± 26 to 50% ± 76 to 90%
   ± 10 to 25% ± 51 to 75% ± more than 90%

2. What percent of *approved* therapeutic interchanges occur because the originally prescribed drug is not a preferred drug on the pharmacy plan formulary?

   ± less than 10% ± 26 to 50% ± 76 to 90%
   ± 10 to 25% ± 51 to 75% ± more than 90%

3. What percent of *approved* therapeutic interchanges occur because the patient requests a different drug?

   ± less than 10% ± 26 to 50% ± 76 to 90%
   ± 10 to 25% ± 51 to 75% ± more than 90%

4. During the past 7 days, *about* how many prescriptions did you, personally, fill?

   ±less than 401 prescriptions ±701 - 900 prescriptions ±1,101 - 1,400 prescriptions
   ±401 - 700 prescriptions ±901 - 1,100 prescriptions ±more than 1,400 prescriptions

5. During the past 7 days, *about* how many times <u>have you, personally, been prompted or alerted</u> to contact a prescriber to approve a therapeutic interchange for a patient?

± Zero times ± 6 to 9 times ± 21 to 25 times
± 1 to 5 times ± 16 to 20 times ± more than 25 times

6. During the past 7 days, *about* how many times <u>have you, personally, contacted</u> a prescriber's office and asked them to consider therapeutic interchange for a patient?

± Zero times ± 10 to 15 times ± 26 to 35 times
± 1 to 9 times ± 16 to 25 times ± more than 35 times

7. During the past 7 days, *about* how many therapeutic interchanges you personally attempted were **<u>approved</u>** by the prescriber?

± Zero ± 4 to 5 ± 8 to 10 ± 16 to 20
± 1 to 3 ± 6 to 7 ± 11 to 15 ± more than 20

8. How many minutes do <u>you</u> normally spend discussing with the prescriber's office **each** therapeutic interchange?

± less than a minute ± 6 to 10 minutes ± 16 to 20 minutes
± 1 to 5 minutes ± 11 to 15 minutes ± more than 20 minutes

9. Does the prescriber usually make the suggestion for the alternative drug, or do you have to research or prompt him/her for the selection?

± Prescriber usually suggests
± I usually have to research or prompt the prescriber
± Both occur about equally

10. In instances when the prescriber relies on your research or prompt, how often do you feel you have sufficient information about the patient to make an appropriate suggestion?

± Always ± Usually ± Sometimes ± Never

11. What percent of *approved* therapeutic interchanges occur as a <u>result of direct manufacturer incentives</u>?

± less than 10% ± 26 to 50% ± 76 to 90%
± 10 to 25% ± 51 to 75% ± more than 90%

12. What percent of *approved* therapeutic interchanges occur as a result of direct pharmacy benefit management company incentives?

± less than 10% ± 26 to 50% ± 76 to 90%
± 10 to 25% ± 51 to 75% ± more than 90%

13. For what percentage of therapeutic interchange attempts do you actually talk to the prescriber?

± less than 10% ± 26 to 50% ± 76 to 90%
± 10 to 25% ± 51 to 75% ± more than 90%

14. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?

± Yes ± No ± Maybe

15. Do you think the practice of therapeutic interchange can help to control overall health care costs?

± Yes ± No ± Maybe

16. Do you think the practice of therapeutic interchange:

± Definitely improves clinical outcomes.
± Slightly improves clinical outcomes.
± Slightly worsens clinical outcomes.
± Definitely worsens clinical outcomes.
± Makes no difference in clinical outcomes.

17. During the past year, about how many complaints--if any--about adverse side effect or ineffectiveness have you, personally, received from patients who had a therapeutic interchange?

± Zero ± 3 to 4 ± 7 to 8 ± 11 to 15
± 1 to 2 ± 5 to 6 ± 9 to 10 ± more than 15

18. Are you the owner of this pharmacy or an employee of the pharmacy?

± Owner ± Employee ± Other (PLEASE SPECIFY)_____

19. Is this pharmacy an independent store or part of a chain store?

± Independent ± Chain ± Other (PLEASE SPECIFY)_____

20. How many days a week is the pharmacy open?

± 5 days a week or less ± 6 days a week ± 7 days a week

21. How many hours a day is the pharmacy open during the week?

± 10 hours or less ± 11-14 hours ± more than 14 hours

22. During the past 7 days, about how many hours did you work as a dispensing pharmacist?

± less than 10 hours ± 10 to 20 hours ± 21 to 39 hours ± 40 hours or more

23. In what area of Virginia do you work?

± Richmond area ± Northern Virginia area ± Other area
± Norfolk/Tidewater area ± Roanoke area

24. Please write in any additional comments you have on the subject of therapeutic interchange.

_____

_____

_____

_____

_____

THANK YOU FOR YOUR TIME AND FOR SHARING YOUR VIEWS.

PLEASE PLACE THIS QUESTIONNAIRE IN THE SELF-ADDRESSED STAMPED ENVELOPE AND PUT IT IN THE MAIL TODAY OR MAIL TO:

Mercatus Center
George Mason University
4084 University Drive, Suite 208
Fairfax, Virginia 22030-6815

OR FAX THE COMPLETED QUESTIONNAIRE TO: **703/934-1578**

Virginia Physician Questionnaire on the Practice of Therapeutic Interchange

PURPOSE: The purpose of this research is to learn more about physicians' experience with and views on therapeutic interchange of prescription drugs for their ***outpatient practice only***. This survey should be completed personally by the physician to whom it is addressed.

DEFINITION: **Therapeutic interchange is the dispensing of a drug, by any person authorized by law to dispense drugs, that is a chemically dissimilar alternative for the drug initially prescribed. The alternative drug is expected to have the same clinical results and similar safety profile, when administered to patients in therapeutically equivalent doses as the drug initially prescribed, and is dispensed with the approval of the person who prescribed the initial drug, or their lawful designee. Therapeutic interchange includes the use of alternative drugs for initially prescribed drugs: 1) not included on a formulary, 2) that are not preferred drugs on a formulary, and 3) that are requested by patients.**

PLEASE HELP US: This questionnaire is part of a statewide survey of physicians on the practice of therapeutic interchange. Please answer all the questions. In most cases, all you have to do is place an X in the circle next to your response.

1. During the past 7 days, *about* how many times has your office been contacted by retail pharmacists and asked to consider a therapeutic interchange for your outpatients?

   ± Zero times ± 3 to 4 times ± 7 to 8 times ± 11 to 15 times
   ± 1 to 2 times ± 5 to 6 times ± 9 to 10 times ± more than 15 times

2. During the past 7 days, *about* how many times has your office been contacted by health plans and asked to consider a therapeutic interchange for your outpatients?

   ± Zero times ± 3 to 4 times ± 7 to 8 times ± 11 to 15 times
   ± 1 to 2 times ± 5 to 6 times ± 9 to 10 times ± more than 15 times

3. During the past 7 days, *about* how many times has your office been contacted by patients and asked to consider a therapeutic interchange?

   ± Zero times ± 3 to 4 times ± 7 to 8 times ± 11 to 15 times
   ± 1 to 2 times ± 5 to 6 times ± 9 to 10 times ± more than 15 times

4. During the past 7 days, *about* how many times have you **approved** a therapeutic interchange for one of your outpatients?

   ± Zero times ± 3 to 4 times ± 7 to 8 times ± 11 to 15 times
   ± 1 to 2 times ± 5 to 6 times ± 9 to 10 times ± more than 15 times

5. How many minutes do you *normally* spend discussing with retail pharmacies **each** therapeutic interchange?

± less than a minute ± 6 to 10 minutes ± 16 to 20 minutes
± 1 to 5 minutes ± 11 to 15 minutes ± more than 20 minutes

6. How often do you personally evaluate each therapeutic interchange request:

± less than 10% ± 25% to 49% ± 75% to 89%
± 10% to 24% ± 50% to 74% ± more than 90%

7. How aware would you say your patients are regarding the practice of therapeutic interchange?

± Very aware ± Aware ± Somewhat aware ± Not aware at all ± Not sure

8. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?

± Yes ± No ± Maybe

9. Do you think the practice of therapeutic interchange can help to control overall health care costs?

± Yes ± No ± Maybe

10. Do you think the practice of therapeutic interchange:

± Definitely improves clinical outcomes
± Slightly improves clinical outcomes
± Slightly worsens clinical outcomes
± Definitely worsens clinical outcomes
± Makes no difference in clinical outcomes

11. Have you ever rejected a health plan contract because of the therapeutic interchange practices and policies?

± Yes ± No

12. In general, do you find that you are:

± very familiar with drugs recommended as a therapeutic interchange
± familiar with drugs recommended as a therapeutic interchange
± somewhat unfamiliar with drugs recommended as a therapeutic interchange
± unfamiliar with drugs recommended as a therapeutic interchange

13. During the past year, about how many complaints--if any--about adverse side effect or ineffectiveness have you received from outpatients who received a therapeutic interchange?

± Zero ± 3 to 4 ± 7 to 8 ± 11 to 15
± 1 to 2 ± 5 to 6 ± 9 to 10 ± more than 15

14. What is your primary specialty?

± General practice ± Internal medicine ± Pediatrics
± Family practice ± Obstetrics/gynecology ± Specialty (SPECIFY)_____

15. What percentage of time in your practice is spent on outpatient care?

± less than 10% ± 25% to 49% ± 75% to 90%
± 10% to 24% ± 50% to 74% ± more than 90%

16. During the past 7 days, how many hours did you spend on direct outpatient care activities? Please include only time spent at your office-based practice.

± less than 15 hours ± 20 to 24 hours ± 30 to 34 hours ± 40 to 44 hours
± 15 to 19 hours ± 25 to 29 hours ± 35 to 39 hours ± more than 44 hours

17. During the past 7 days, how many outpatients did you see?

± less than 75 outpatients ± 125 to 149 outpatients ± 175 to 199 outpatients
± 75 to 124 outpatients ± 150 to 174 outpatients ± more than 200 outpatients

18. During the past 7 days, how many outpatient drug prescriptions did you write?

± less than 50 prescriptions ± 75 to 99 prescriptions ± 125 to 150 prescriptions
± 50 to 74 prescriptions ± 100 to 124 prescriptions ± more than 150

19. What percentage of your outpatients would you say are:

Children	_____%	Middle Aged	_____%
Young Adults	_____%	Elderly	_____%

Men	_____%	Women	_____%

20. In what area of Virginia do you work?

± Richmond area ± Northern Virginia area ± Other area
± Norfolk/Tidewater area ± Roanoke area

21. Please write in any additional comments you have on the subject of therapeutic interchange.

_____

_____

_____

_____

_____

THANK YOU FOR YOUR TIME AND FOR SHARING YOUR VIEWS.

PLEASE PLACE THIS QUESTIONNAIRE IN THE SELF-ADDRESSED STAMPED ENVELOPE AND PUT IT IN THE MAIL TODAY OR MAIL TO:

Mercatus Center
George Mason University
4084 University Drive, Suite 208
Fairfax, Virginia 22030-6815

OR FAX THE COMPLETED QUESTIONNAIRE TO: **703/934-1578**

APPENDIX B

Frequencies

1. What percent of approved therapeutic interchanges occur because the drug is not include on the formulary?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	156	41.1	41.5	41.5
	10% to 25%	76	20.0	20.2	61.7
	26% to 50%	26	6.8	6.9	68.6
	51% to 75%	25	6.6	6.6	75.3
	76% to 90%	42	11.1	11.2	86.4
	more than 90%	51	13.4	13.6	100.0
	Total	376	98.9	100.0	
Missing	No Response	4	1.1		
	Total	4	1.1		
Total		380	100.0		

2. What percent of approved therapeutic interchanges occur because the drug is not a preferred drug on the formulary?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	201	52.9	53.6	53.6
	10% to 25%	83	21.8	22.1	75.7
	26% to 50%	37	9.7	9.9	85.6
	51% to 75%	14	3.7	3.7	89.3
	76% to 90%	14	3.7	3.7	93.1
	more than 90%	26	6.8	6.9	100.0
	Total	375	98.7	100.0	
Missing	No Response	5	1.3		
	Total	5	1.3		
Total		380	100.0		

3. What percent of approved therapeutic interchanges occur because the patient requests a different drug?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	299	78.7	79.5	79.5
	10% to 25%	40	10.5	10.6	90.2
	26% to 50%	25	6.6	6.6	96.8
	51% to 75%	7	1.8	1.9	98.7
	76% to 90%	4	1.1	1.1	99.7
	more than 90%	1	.3	.3	100.0
	Total	376	98.9	100.0	
Missing	No Response	4	1.1		
	Total	4	1.1		
Total		380	100.0		

4. During the past 7 days, how many prescriptions did you fill?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 401	75	19.7	19.7	19.7
	401 to 700	146	38.4	38.4	58.2
	701 to 900	93	24.5	24.5	82.6
	901 to 1,100	26	6.8	6.8	89.5
	1,101 to 1,400	27	7.1	7.1	96.6
	more than 1,400	13	3.4	3.4	100.0
	Total	380	100.0	100.0	
Total		380	100.0		

5. During the past 7 days, how many times have you been prompted or alerted to contact a prescriber to approve a TI?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	58	15.3	15.4	15.4
	1 to 5	157	41.3	41.8	57.2
	6 to 9	69	18.2	18.4	75.5
	10 to 15	11	2.9	2.9	78.5
	16 to 20	33	8.7	8.8	87.2
	21 to 25	18	4.7	4.8	92.0
	more than 25	30	7.9	8.0	100.0
	Total	376	98.9	100.0	
Missing	No Response	4	1.1		
	Total	4	1.1		
Total		380	100.0		

6. During the past 7 days, how many times have you contacted a prescriber and asked them to consider a TI for a patient?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	87	22.9	23.1	23.1
	1 to 9	219	57.6	58.2	81.4
	10 to 15	32	8.4	8.5	89.9
	16 to 25	28	7.4	7.4	97.3
	26 to 35	5	1.3	1.3	98.7
	more than 35	5	1.3	1.3	100.0
	Total	376	98.9	100.0	
Missing	No Response	4	1.1		
	Total	4	1.1		
Total		380	100.0		

7. During the past 7 days, how many therapeutic interchanges were approved by the prescriber?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	88	23.2	23.5	23.5
	1 to 3	121	31.8	32.4	55.9
	4 to 5	48	12.6	12.8	68.7
	6 to 7	32	8.4	8.6	77.3
	8 to 10	33	8.7	8.8	86.1
	11 to 15	24	6.3	6.4	92.5
	16 to 20	19	5.0	5.1	97.6
	more than 20	9	2.4	2.4	100.0
	Total	374	98.4	100.0	
Missing	No Response	6	1.6		
	Total	6	1.6		
Total		380	100.0		

8. How many minutes do you normally spend discussing with the prescriber each therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than a minute	44	11.6	11.8	11.8
	1 to 5	214	56.3	57.4	69.2
	6 to 10	90	23.7	24.1	93.3
	11 to 15	12	3.2	3.2	96.5
	16 to 20	9	2.4	2.4	98.9
	more than 20	4	1.1	1.1	100.0
	Total	373	98.2	100.0	
Missing	No Response	7	1.8		
	Total	7	1.8		
Total		380	100.0		

9. Does the prescriber usually make the suggestion for the alternative drug, or do you have to research or prompt him/her?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	prescriber usually suggests	29	7.6	7.8	7.8
	I usually have to research or prompt the prescriber	205	53.9	55.4	63.2
	both occur about equally	136	35.8	36.8	100.0
	Total	370	97.4	100.0	
Missing	No Response	10	2.6		
	Total	10	2.6		
Total		380	100.0		

10. How often do you feel you have sufficient information about the patient to make an appropriate suggestion?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	always	35	9.2	9.4	9.4
	usually	192	50.5	51.6	61.0
	sometimes	114	30.0	30.6	91.7
	never	31	8.2	8.3	100.0
	Total	372	97.9	100.0	
Missing	No Response	8	2.1		
	Total	8	2.1		
Total		380	100.0		

11. What percent of approved therapeutic interchanges occur as a result of direct manufacturer incentives?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	219	57.6	60.7	60.7
	10% to 25%	37	9.7	10.2	70.9
	26% to 50%	27	7.1	7.5	78.4
	51% to 75%	18	4.7	5.0	83.4
	76% to 90%	18	4.7	5.0	88.4
	more than 90%	42	11.1	11.6	100.0
	Total	361	95.0	100.0	
Missing	No Response	19	5.0		
	Total	19	5.0		
Total		380	100.0		

12. What percent of approved therapeutic interchanges occur as a result of pbm incentives?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	205	53.9	58.2	58.2
	10% to 25%	39	10.3	11.1	69.3
	26% to 50%	29	7.6	8.2	77.6
	51% to 75%	10	2.6	2.8	80.4
	76% to 90%	27	7.1	7.7	88.1
	more than 90%	42	11.1	11.9	100.0
	Total	352	92.6	100.0	
Missing	No Response	28	7.4		
	Total	28	7.4		
Total		380	100.0		

13. For what percentage of therapeutic interchange attempts do you actually talk to the prescriber?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	223	58.7	62.1	62.1
	10% to 25%	54	14.2	15.0	77.2
	26% to 50%	30	7.9	8.4	85.5
	51% to 75%	15	3.9	4.2	89.7
	76% to 90%	10	2.6	2.8	92.5
	more than 90%	27	7.1	7.5	100.0
	Total	359	94.5	100.0	
Missing	No Response	21	5.5		
	Total	21	5.5		
Total		380	100.0		

14. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	100	26.3	27.5	27.5
	no	131	26.3	36.1	63.6
	maybe	132	34.7	36.4	100.0
	Total	363	95.5	100.0	
Missing	No Response	17	4.5		
	Total	17	4.5		
Total		380	100.0		

15. Do you think the practice of therapeutic interchange can help to control overall health costs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	85	22.4	23.4	23.4
	no	149	39.2	40.9	64.3
	maybe	130	34.2	35.7	100.0
	Total	364	95.8	100.0	
Missing	No Response	16	4.2		
	Total	16	4.2		
Total		380	100.0		

16. Do you think the practice of therapeutic interchange .... clinical outcomes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	definitely improves	19	5.0	5.2	5.2
	slightly improves	41	10.8	11.3	16.5
	slightly worsens	95	25.0	26.2	42.7
	definitely worsens	44	11.6	12.1	54.8
	makes no difference	164	43.2	45.2	100.0
	Total	363	95.5	100.0	
Missing	No Response	17	4.5		
	Total	17	4.5		
Total		380	100.0		

17. During the past year, about how many complaints-if any-about adverse side effect or ineffectiveness have you received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	zero	97	25.5	26.8	26.8
	1 to 2	80	21.1	22.1	48.9
	3 to 4	60	15.8	16.6	65.5
	5 to 6	29	7.6	8.0	73.5
	7 to 8	21	5.5	5.8	79.3
	9 to 10	29	7.6	8.0	87.3
	11 to 15	11	2.9	3.0	90.3
	more than 15	35	9.2	9.7	100.0
	Total	362	95.3	100.0	
Missing	No Response	18	4.7		
	Total	18	4.7		
Total		380	100.0		

18. Are you the owner of this pharmacy or an employee of the pharmacy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	owner	143	37.6	39.5	39.5
	employee	213	56.1	58.8	98.3
	other	6	1.6	1.7	100.0
	Total	362	95.3	100.0	
Missing	No Response	18	4.7		
	Total	18	4.7		
Total		380	100.0		

19. Is this pharmacy an independent store or a chain store?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	independent	180	47.4	49.6	49.6
	chain	174	45.8	47.9	97.5
	other	9	2.4	2.5	100.0
	Total	363	95.5	100.0	
Missing	No Response	17	4.5		
	Total	17	4.5		
Total		380	100.0		

20. How many days a week is the pharmacy open?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 days or less	20	5.3	5.5	5.5
	6 days	156	41.1	43.0	48.5
	7 days	187	49.2	51.5	100.0
	Total	363	95.5	100.0	
Missing	No Response	17	4.5		
	Total	17	4.5		
Total		380	100.0		

21. How many hours a day is the pharmacy open during the week?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10 hours or less	159	41.8	43.0	43.0
	11 to 14 hours	184	48.4	49.7	92.7
	more than 14	27	7.1	7.3	100.0
	Total	370	97.4	100.0	
Missing	No Response	10	2.6		
	Total	10	2.6		
Total		380	100.0		

22. During the past 7 days, how many hours did you work as a dispensing pharmacist?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10	4	1.1	1.1	1.1
	10 to 20	7	1.8	1.9	3.0
	21 to 39	52	13.7	14.0	17.0
	40 or more	308	81.1	83.0	100.0
	Total	371	97.6	100.0	
Missing	No Response	9	2.4		
	Total	9	2.4		
Total		380	100.0		

23. In what area of Virginia do you work?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Richmond	70	18.4	18.9	18.9
	Norfolk/Tidewater	64	16.8	17.3	36.1
	Northern Virginia	57	15.0	15.4	51.5
	Roanoke	45	11.8	12.1	63.6
	Other	135	35.5	36.4	100.0
	Total	371	97.6	100.0	
Missing	No Response	9	2.4		
	Total	9	2.4		
Total		380	100.0		

APPENDIX C

Frequencies

1. During past 7 days, how many times have you been contacted by retail pharmacists to consider a therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	zero times	333	43.4	44.2	44.2
	1 to 2 times	186	24.3	24.7	68.9
	3 to 4 times	106	13.8	14.1	83.0
	5 to 6 times	36	4.7	4.8	87.8
	7 to 8 times	27	3.5	3.6	91.4
	9 to 10 times	20	2.6	2.7	94.0
	11 to 15 times	16	2.1	2.1	96.1
	more than 15 times	29	3.8	3.9	100.0
	Total	753	98.2	100.0	
Missing	No Response	14	1.8		
	Total	14	1.8		
Total		767	100.0		

2. During past 7 days, how many times have you been contacted by health plans to consider a therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	zero times	335	43.7	44.6	44.6
	1 to 2 times	218	28.4	29.0	73.6
	3 to 4 times	88	11.5	11.7	85.4
	5 to 6 times	40	5.2	5.3	90.7
	7 to 8 times	23	3.0	3.1	93.7
	9 to 10 times	20	2.6	2.7	96.4
	11 to 15 times	12	1.6	1.6	98.0
	more than 15 times	15	2.0	2.0	100.0
	Total	751	97.9	100.0	
Missing	No Response	16	2.1		
	Total	16	2.1		
Total		767	100.0		

3. During past 7 days, how many times have you been contacted by patients to consider a therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	zero times	434	56.6	57.6	57.6
	1 to 2 times	209	27.2	27.8	85.4
	3 to 4 times	68	8.9	9.0	94.4
	5 to 6 times	15	2.0	2.0	96.4
	7 to 8 times	10	1.3	1.3	97.7
	9 to 10 times	6	.8	.8	98.5
	11 to 15 times	5	.7	.7	99.2
	more than 15 times	6	.8	.8	100.0
	Total	753	98.2	100.0	
Missing	No Response	14	1.8		
	Total	14	1.8		
Total		767	100.0		

4. During past 7 days, how many times have you approved a therapeutic interchange for one of your outpatients?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	zero times	289	37.7	38.4	38.4
	1 to 2 times	269	35.1	35.8	74.2
	3 to 4 times	95	12.4	12.6	86.8
	5 to 6 times	28	3.7	3.7	90.6
	7 to 8 times	22	2.9	2.9	93.5
	9 to 10 times	19	2.5	2.5	96.0
	11 to 15 times	16	2.1	2.1	98.1
	more than 15 times	14	1.8	1.9	100.0
	Total	752	98.0	100.0	
Missing	No Response	15	2.0		
	Total	15	2.0		
Total		767	100.0		

5. How many minutes do you normally spend discussing with retail pharmacists each therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than a minute	328	42.8	46.5	46.5
	1 to 5 minutes	319	41.6	45.2	91.8
	6 to 10 minutes	42	5.5	6.0	97.7
	11 to 15 minutes	7	.9	1.0	98.7
	16 to 20 minutes	7	.9	1.0	99.7
	more than 20 minutes	2	.3	.3	100.0
	Total	705	91.9	100.0	
Missing	No Response	62	8.1		
	Total	62	8.1		
Total		767	100.0		

6. How often do you personally evaluate each therapeutic interchange request:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	123	16.0	17.4	17.4
	10% to 24%	35	4.6	5.0	22.4
	25% to 49%	19	2.5	2.7	25.1
	50% to 74%	18	2.3	2.5	27.6
	75% to 89%	25	3.3	3.5	31.2
	more than 90%	486	63.4	68.8	100.0
	Total	706	92.0	100.0	
Missing	No Response	61	8.0		
	Total	61	8.0		
Total		767	100.0		

7. How aware would you say your patients are regarding the practice of therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very aware	36	4.7	4.9	4.9
	aware	116	15.1	15.7	20.5
	somewhat aware	342	44.6	46.2	66.7
	not aware at all	172	22.4	23.2	89.9
	not sure	75	9.8	10.1	100.0
	Total	741	96.6	100.0	
Missing	No Response	26	3.4		
	Total	26	3.4		
Total		767	100.0		

8. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	189	24.6	25.5	25.5
	no	194	25.3	26.1	51.6
	maybe	359	46.8	48.4	100.0
	Total	742	96.7	100.0	
Missing	No Response	25	3.3		
	Total	25	3.3		
Total		767	100.0		

9. Do you think the practice of therapeutic interchange can help to control overall health costs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	127	16.6	17.1	17.1
	no	296	38.6	39.9	57.1
	maybe	318	41.5	42.9	100.0
	Total	741	96.6	100.0	
Missing	No Response	26	3.4		
	Total	26	3.4		
Total		767	100.0		

10. Do you think the practice of therapeutic interchange . . . . clinical outcomes?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	definitely improves	6	.8	.8	.8
	slightly improves	26	3.4	3.6	4.5
	slightly worsens	286	37.3	40.1	44.5
	definitely worsens	133	17.3	18.6	63.2
	makes no difference	263	34.3	36.8	100.0
	Total	714	93.1	100.0	
Missing	No Response	53	6.9		
	Total	53	6.9		
Total		767	100.0		

11. Have you ever rejected a health plan contract because of the therapeutic interchange practices and policies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	112	14.6	15.4	15.4
	no	613	79.9	84.6	100.0
	Total	725	94.5	100.0	
Missing	No Response	42	5.5		
	Total	42	5.5		
Total		767	100.0		

12. In general, do you find that you are . . . with drugs recommended for therapeutic interchange?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very familiar	319	41.6	44.1	44.1
	familiar	302	39.4	41.7	85.8
	somewhat unfamiliar	86	11.2	11.9	97.7
	unfamiliar	17	2.2	2.3	100.0
	Total	724	94.4	100.0	
Missing	No Response	43	5.6		
	Total	43	5.6		
Total		767	100.0		

13. During the past year, about how many complaints-if any-about adverse side effect or ineffectiveness have you received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	zero	218	28.4	31.0	31.0
	1 to 2	120	15.6	17.0	48.0
	3 to 4	122	15.9	17.3	65.3
	5 to 6	60	7.8	8.5	73.9
	7 to 8	42	5.5	6.0	79.8
	9 to 10	46	6.0	6.5	86.4
	11 to 15	27	3.5	3.8	90.2
	more than 15	69	9.0	9.8	100.0
	Total	704	91.8	100.0	
Missing	No Response	63	8.2		
	Total	63	8.2		
Total		767	100.0		

14. What is your primary specialty?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	general practice	57	7.4	7.9	7.9
	family practice	205	26.7	28.4	36.3
	internal medicine	47	6.1	6.5	42.8
	obstetrics/gynecology	36	4.7	5.0	47.8
	pediatrics	40	5.2	5.5	53.3
	other	337	43.9	46.7	100.0
	Total	722	94.1	100.0	
Missing	No Response	45	5.9		
	Total	45	5.9		
Total		767	100.0		

15. What percentage of time in your practice is spent on outpatient care?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 10%	16	2.1	2.2	2.2
	10% to 24%	22	2.9	3.0	5.2
	25% to 49%	39	5.1	5.4	10.6
	50% to 74%	100	13.0	13.8	24.4
	75% to 90%	160	20.9	22.1	46.5
	more than 90%	387	50.5	53.5	100.0
	Total	724	94.4	100.0	
Missing	No Response	43	5.6		
	Total	43	5.6		
Total		767	100.0		

16. During the past 7 days, how many hours did you spend on direct outpatient care activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 15 hours	62	8.1	8.6	8.6
	15 to 19 hours	23	3.0	3.2	11.8
	20 to 24 hours	45	5.9	6.3	18.1
	25 to 29 hours	50	6.5	7.0	25.1
	30 to 34 hours	74	9.6	10.3	35.4
	35 to 39 hours	95	12.4	13.2	48.6
	40 to 44 hours	167	21.8	23.3	71.9
	more than 44 hours	202	26.3	28.1	100.0
	Total	718	93.6	100.0	
Missing	No Response	49	6.4		
	Total	49	6.4		
Total		767	100.0		

17. During the past 7 days, how many outpatients did you see?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 75	227	29.6	31.7	31.7
	75 to 124	257	33.5	35.8	67.5
	125 to 149	126	16.4	17.6	85.1
	150 to 174	53	6.9	7.4	92.5
	175 to 199	23	3.0	3.2	95.7
	more than 200	31	4.0	4.3	100.0
	Total	717	93.5	100.0	
Missing	No Response	50	6.5		
	Total	50	6.5		
Total		767	100.0		

18. During the past 7 days, how many outpatient prescriptions did you write?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 50	223	29.1	31.2	31.2
	50 to 74	131	17.1	18.3	49.5
	75 to 99	93	12.1	13.0	62.5
	100 to 124	77	10.0	10.8	73.3
	125 to 150	74	9.6	10.3	83.6
	more than 150	117	15.3	16.4	100.0
	Total	715	93.2	100.0	
Missing	No Response	52	6.8		
	Total	52	6.8		
Total		767	100.0		

19a. What percentage of outpatients are children?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	2.9	4.6	4.6
	1	14	1.8	2.9	7.5
	2	2	.3	.4	7.9
	3	5	.7	1.0	9.0
	4	68	8.9	14.2	23.2
	5	1	.1	.2	23.4
	10	123	16.0	25.7	49.2
	12	1	.1	.2	49.4
	15	42	5.5	8.8	58.2
	18	1	.1	.2	58.4
	20	67	8.7	14.0	72.4
	22	1	.1	.2	72.6
	25	25	3.3	5.2	77.8
	30	22	2.9	4.6	82.4
	33	1	.1	.2	82.6
	35	5	.7	1.0	83.7
	40	7	.9	1.5	85.1
	45	5	.7	1.0	86.2
	46	1	.1	.2	86.4
	50	6	.8	1.3	87.7
	60	5	.7	1.0	88.7
	65	1	.1	.2	88.9
	70	2	.3	.4	89.3
	80	5	.7	1.0	90.4
	82	1	.1	.2	90.6
	85	1	.1	.2	90.8
	90	11	1.4	2.3	93.1
	94	1	.1	.2	93.3
	95	3	.4	.6	93.9
	99	3	.4	.6	94.6
	100	26	3.4	5.4	100.0
	Total	478	62.3	100.0	
Missing	No Response	289	37.7		
	Total	289	37.7		
Total		767	100.0		

19b. What percentage of outpatients are young adults

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	5	.7	.8	.8
	1	5	.7	.8	1.6
	2	2	.3	.3	1.9
	3	3	.4	.5	2.3
	4	62	8.1	9.7	12.0
	6	1	.1	.2	12.2
	7	3	.4	.5	12.6
	8	4	.5	.6	13.3
	10	124	16.2	19.3	32.6
	15	60	7.8	9.4	42.0
	18	1	.1	.2	42.1
	19	2	.3	.3	42.4
	20	145	18.9	22.6	65.1
	24	1	.1	.2	65.2
	25	75	9.8	11.7	76.9
	28	1	.1	.2	77.1
	30	63	8.2	9.8	86.9
	32	1	.1	.2	87.1
	33	2	.3	.3	87.4
	34	1	.1	.2	87.5
	35	14	1.8	2.2	89.7
	40	24	3.1	3.7	93.4
	45	8	1.0	1.2	94.7
	50	21	2.7	3.3	98.0
	55	1	.1	.2	98.1
	60	2	.3	.3	98.4
	70	1	.1	.2	98.6
	71	1	.1	.2	98.8
	75	2	.3	.3	99.1
	80	1	.1	.2	99.2
	85	2	.3	.3	99.5
	90	1	.1	.2	99.7
	100	2	.3	.3	100.0
	Total	641	83.6	100.0	
Missing	No Response	126	16.4		
	Total	126	16.4		
Total		767	100.0		

19c. What percentage of outpatients are middle aged?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	.3	.3	.3
	4	4	.5	.6	.9
	10	19	2.5	2.9	3.8
	13	1	.1	.2	4.0
	15	20	2.6	3.1	7.0
	18	2	.3	.3	7.3
	20	59	7.7	9.0	16.3
	25	61	8.0	9.3	25.6
	29	1	.1	.2	25.8
	30	136	17.7	20.8	46.6
	33	4	.5	.6	47.2
	34	3	.4	.5	47.6
	35	45	5.9	6.9	54.5
	36	1	.1	.2	54.7
	38	1	.1	.2	54.8
	39	2	.3	.3	55.1
	40	116	15.1	17.7	72.8
	45	23	3.0	3.5	76.3
	48	1	.1	.2	76.5
	50	70	9.1	10.7	87.2
	52	2	.3	.3	87.5
	55	4	.5	.6	88.1
	56	1	.1	.2	88.2
	60	30	3.9	4.6	92.8
	64	1	.1	.2	93.0
	65	7	.9	1.1	94.0
	68	1	.1	.2	94.2
	70	11	1.4	1.7	95.9
	75	5	.7	.8	96.6
	78	1	.1	.2	96.8
	80	16	2.1	2.4	99.2
	90	2	.3	.3	99.5
	100	3	.4	.5	100.0
	Total	655	85.4	100.0	
Missing	No Response	112	14.6		
	Total	112	14.6		
Total		767	100.0		

19d. What percentage of outpatients are elderly?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.3	.3	.3
	1	3	.4	.5	.8
	4	22	2.9	3.5	4.3
	7	1	.1	.2	4.4
	8	1	.1	.2	4.6
	10	63	8.2	10.0	14.6
	12	1	.1	.2	14.7
	13	1	.1	.2	14.9
	15	36	4.7	5.7	20.6
	19	1	.1	.2	20.8
	20	74	9.6	11.7	32.5
	24	1	.1	.2	32.6
	25	55	7.2	8.7	41.4
	27	1	.1	.2	41.5
	30	71	9.3	11.3	52.8
	33	2	.3	.3	53.1
	34	1	.1	.2	53.2
	35	27	3.5	4.3	57.5
	40	75	9.8	11.9	69.4
	45	12	1.6	1.9	71.3
	50	74	9.6	11.7	83.0
	55	6	.8	1.0	84.0
	58	1	.1	.2	84.2
	60	46	6.0	7.3	91.4
	61	1	.1	.2	91.6
	64	1	.1	.2	91.8
	65	6	.8	1.0	92.7
	67	1	.1	.2	92.9
	70	17	2.2	2.7	95.6
	75	13	1.7	2.1	97.6
	80	10	1.3	1.6	99.2
	86	1	.1	.2	99.4
	90	3	.4	.5	99.8
	100	1	.1	.2	100.0
	Total	631	82.3	100.0	
Missing	No Response	136	17.7		
	Total	136	17.7		
Total		767	100.0		

19e. What percentage of outpatients are men?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	.3	.3	.3
	10	5	.7	.8	1.1
	15	1	.1	.2	1.2
	20	11	1.4	1.7	2.9
	25	14	1.8	2.2	5.1
	30	46	6.0	7.1	12.2
	32	2	.3	.3	12.5
	33	5	.7	.8	13.3
	35	45	5.9	7.0	20.2
	40	189	24.6	29.2	49.5
	43	1	.1	.2	49.6
	44	1	.1	.2	49.8
	45	61	8.0	9.4	59.2
	48	5	.7	.8	60.0
	50	218	28.4	33.7	93.7
	52	1	.1	.2	93.8
	55	6	.8	.9	94.7
	60	22	2.9	3.4	98.1
	65	2	.3	.3	98.5
	70	3	.4	.5	98.9
	75	2	.3	.3	99.2
	85	1	.1	.2	99.4
	90	2	.3	.3	99.7
	100	2	.3	.3	100.0
	Total	647	84.4	100.0	
Missing	No Response	120	15.6		
	Total	120	15.6		
Total		767	100.0		

19f. What percentage of outpatients are women?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10	2	.3	.3	.3
	15	1	.1	.1	.4
	20	1	.1	.1	.6
	25	3	.4	.4	1.0
	30	4	.5	.6	1.6
	35	2	.3	.3	1.9
	40	22	2.9	3.2	5.1
	45	6	.8	.9	6.0
	48	1	.1	.1	6.1
	50	218	28.4	31.9	38.1
	52	5	.7	.7	38.8
	55	60	7.8	8.8	47.6
	56	1	.1	.1	47.7
	57	1	.1	.1	47.9
	60	188	24.5	27.5	75.4
	65	45	5.9	6.6	82.0
	66	3	.4	.4	82.4
	67	2	.3	.3	82.7
	68	2	.3	.3	83.0
	70	44	5.7	6.4	89.5
	75	14	1.8	2.0	91.5
	80	11	1.4	1.6	93.1
	85	2	.3	.3	93.4
	90	5	.7	.7	94.1
	99	2	.3	.3	94.4
	100	38	5.0	5.6	100.0
	Total	683	89.0	100.0	
Missing	No Response	84	11.0		
	Total	84	11.0		
Total		767	100.0		

20. In what area of Virginia do you work?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Richmond	133	17.3	18.5	18.5
	Norfolk/Tidewater	151	19.7	21.0	39.5
	Northern Virginia	189	24.6	26.3	65.8
	Roanoke	65	8.5	9.0	74.8
	Other	181	23.6	25.2	100.0
	Total	719	93.7	100.0	
Missing	No Response	48	6.3		
	Total	48	6.3		
Total		767	100.0		

APPENDIX D

Physicians Bivariate Correlation Matrix-Pearson Correlation

Correlations

		1. During past 7 days, how many times have you been contacted by retail pharmacists to consider a therapeutic interchange	2. During past 7 days, how many times have you been contacted by health plans to consider a therapeutic interchange	3. During past 7 days, how many times have you been contacted by patients to consider a therapeutic interchange	4. During past 7 days, how many times have you approved a therapeutic interchange for one of your outpatients?	5. How many minutes do you normally spend discussing with retail pharmacists each therapeutic interchange?	6. How often do you personally evaluate each therapeutic interchange request	7. How aware would you say your patients are regarding the practice of therapeutic interchange?	8. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?	9. Do you think the practice of therapeutic interchange can help to control overall health costs?	10. Do you think the practice of therapeutic interchange ... . clinical outcomes?	11. Have you ever rejected a health plan contract because of the therapeutic interchange practices and policies?	12. In general, do you find that you are ... with drugs recommended for therapeutic interchange.	13. During the past year, about how many complaints-if any-about adverse side effects or ineffectiveness have you received?	15. What percentage of time in your practice is spent on outpatient care?	16. During the past 7 days, how many hours did you spend on direct outpatient care activities?	17. During the past 7 days, how many outpatients did you see?	18. During the past 7 days, how many outpatient prescriptions did you write?	19b. What percentage of outpatients are young adults	19c. What percentage of outpatients are children?	19d What percentage of outpatients are elderly?	19e. What percentage of outpatients are middle aged?	19e. What percentage of outpatients are men?	19f. What percentage of outpatients are women?
Pearson Correlation	1. During past 7 days, how many times have you been contacted by retail pharmacists to consider a therapeutic interchange	1.000	.391**	.412**	.338**	.112**	.112**	-.097*	.034	.075*	.105**	-.078*	-.108**	.472**	.124**	.339**	.291**	.330**	.003	-.071	-.044	-.069	-.033	.057
	2. During past 7 days, how many times have you been contacted by health plans to consider a therapeutic interchange	.391**	1.000	.293**	.431**	.056	.106**	-.079*	.109**	.125**	.141**	-.090*	-.160**	.442**	.121**	.364**	.234**	.344**	-.040	-.164**	-.009	-.019	-.103*	.068
	3. During past 7 days, how many times have you been contacted by patients to consider a therapeutic interchange	.412**	.293**	1.000	.347**	.082*	.099	-.190**	-.027	-.030	-.040	.009	-.034	.331**	.056	.127**	.173**	.181**	.040	-.080	-.038	-.010	.003	.003
	4. During past 7 days, how many times have you approved a therapeutic interchange for one of your outpatients?	.338**	.431**	.347**	1.000	.077*	.062	-.132**	-.101**	-.074*	-.113**	.009	-.090**	.375**	.122**	.181**	.270**	.316**	-.006	-.067	-.002	-.062	-.009	.010
	5. How many minutes do you normally spend discussing with retail pharmacists each therapeutic interchange?	.112**	.056	.082*	.077*	1.000	.097*	-.064	.033	.007	.002	-.122**	.024	.304**	.005	-.036	-.037	.056	-.016	.046	.007	-.036	-.033	.016
	6. How often do you personally evaluate each therapeutic interchange request	.112**	.106**	.099	.062	.097*	1.000	-.047	.041	.111**	.132**	-.029	-.250**	.165**	.161**	.154**	.082*	.142**	-.029	-.055	-.034	.007	-.089*	.023
	7. How aware would you say your patients are regarding the practice of therapeutic interchange?	-.097*	-.079*	-.190**	-.132**	-.064	-.047	1.000	.121**	.139**	.083*	.056	.100**	-.163**	-.010	.000	-.025	-.081*	.083*	.042	-.019	-.076	-.055	.051
	8. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?	.034	.109**	-.027	-.101**	.033	.041	.121**	1.000	.752**	.290**	-.088**	.037	.073	.057	.043	.018	-.002	.095*	.034	-.005	-.010	-.029	.083*
	9. Do you think the practice of therapeutic interchange can help to control overall health costs?	.075*	.125**	-.030	-.074*	.007	.110**	.139**	.752**	1.000	.347**	-.059	.034	.116**	.077*	.088*	.022	.011	.106**	-.034	-.061	.040	-.049	.113**
	10. Do you think the practice of therapeutic interchange .... clinical outcomes?	.105**	.145**	-.040	-.113**	.002	.132**	.083*	.290**	.347**	1.000	-.121**	-.086*	.193**	.017	.067	.009	.023	.018	.012	-.096*	.021	-.031	-.004
	11. Have you ever rejected a health plan contract because of the therapeutic interchange practices and policies?	-.078*	-.090*	.009	.009	-.122**	-.029	.056	-.088**	-.059	-.121**	1.000	.022	-.124**	-.094*	-.033	-.039	-.033	-.055	.091	.100*	-.077	.078	-.080*
	12. In general, do you find that you are ... with drugs recommended for therapeutic interchange.	-.108**	-.160**	-.034	-.090*	.024	-.250**	.100*	.037	.034	-.086*	.022	1.000	-.137**	-.103*	-.137**	-.161**	-.150**	.044	.071	-.028	-.003	.120*	-.027
	13. During the past year, about how many complaints-if any-about adverse side effects or ineffectiveness have you received?	.472**	.442**	.331**	.375**	.304**	.165**	-.163**	.073	.116**	.193**	-.124**	-.117**	1.000	.116**	.197**	.302**	.279**	-.034	-.156**	-.007	-.078*	-.089*	.069*
	15. What percentage of time in your practice is spent on outpatient care?	.124**	.121**	.056	.122**	.005	.161**	-.010	.057	.077*	.017	-.094*	-.103**	.116**	1.000	.364**	.320**	.412**	-.004	.019	-.151**	-.018	-.170*	.044
	16. During the past 7 days, how many hours did you spend on direct outpatient care activities?	.339**	.364**	.127**	.181**	-.036	.154**	.000	.043	.088*	.067	-.033	-.137**	.197**	.364**	1.000	.510**	.495**	-.056	-.057	-.125**	-.054	-.128*	.039
	17. During the past 7 days, how many outpatients did you see?	.291**	.234**	.173**	.270**	-.037	.082*	-.025	.018	.022	.009	-.039	-.161**	.302**	.320**	.510**	1.000	.561**	-.037	-.028	-.068	-.160*	-.064	.000
	18. During the past 7 days, how many outpatient prescriptions did you write?	.330**	.344**	.181**	.316**	.056	.142**	-.081*	-.002	.011	.023	-.033	-.150**	.279**	.412**	.495**	.561**	1.000	-.016	-.119**	-.108**	-.109*	-.194*	.085*
	19b. What percentage of outpatients are young adults	.003	-.040	.040	-.006	-.016	-.029	.083*	.095*	.106**	.018	-.055	.044	-.034	-.004	-.056	-.037	-.016	1.000	-.100*	-.328**	-.134*	-.064	.245**
	19c. What percentage of outpatients are children?	-.071	-.164**	-.080	-.067	.046	-.055	.042	.034	-.036	.053	.091	.073	-.156**	.019	-.057	-.028	-.119**	-.100*	1.000	-.428**	-.426*	.275*	-.251**
	19d. What percentage of outpatients are elderly?	-.044	-.009	-.038	-.002	.007	-.034	-.019	-.005	-.061	-.096*	.100*	-.028	-.007	-.151*	-.121**	-.068	-.108**	-.328**	-.428**	1.000	-.440*	.160*	-.306**
	19e. What percentage of outpatients are middle aged?	-.069	-.019	-.010	-.062	-.036	.007	-.070	-.010	.040	.021	-.077	-.003	-.078*	-.058	-.054	-.160**	-.109**	-.174*	-.426**	-.440*	1.000	-.076	.194**
	19e. What percentage of outpatients are men?	-.033	-.103*	.003	-.009	-.033	-.089*	-.051	-.028	-.049	-.031	.078	.130*	-.089*	-.178*	-.128**	-.064	-.194**	-.064	.275**	.160*	-.076	1.000	-.962**
	19f. What percentage of outpatients are women?	.057	.068	.003	.030	.016	.023	.051	.083*	.113**	-.004	-.080*	-.027	.069*	.044	.039	.000	.085*	.245**	-.251**	-.306**	.194*	-.962**	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Pharmacists Bivariate Correlation Matrix-Pearson Correlation

Correlations

		1. What percent of approved therapeutic interchanges occur because the drug is not included on the formulary?	2. What percent of approved therapeutic interchanges occur because the drug is not a preferred drug on the formulary?	3. What percent of approved therapeutic interchanges occur because the patient requests a different drug?	4. During the past 7 days, how many prescriptions did you fill?	5. During the past 7 days, how many times have you been prompted or alerted to contact a prescriber to approve a TI?	6. During the past 7 days, how many times have you contacted a prescriber and asked them to consider a TI for a patient?	7. During the past 7 days, how many therapeutic interchanges were approved by the prescriber?	8. How many minutes do you normally spend discussing with the prescriber each therapeutic interchange?	9. Does the prescriber usually make the suggestion for the alternative drug, or do you have to research or prompt him/her?	10. How often do you feel you have sufficient information about the patient to make an appropriate suggestion?	11. What percent of approved therapeutic interchanges occur as a result of direct manufacturer incentives?	12. What percent of approved therapeutic interchanges occur as a result of PBM incentives?	13. For what percentage of therapeutic interchange attempts do you actually talk to the prescriber?	14. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?	15. Do you think the practice of therapeutic interchange can help to control overall health costs?	16. Do you think the practice of therapeutic interchange . . . clinical outcomes?	17. During the past year, about how many complaints-if any-about adverse side effect or ineffectiveness have you received?	20. How many days a week is the pharmacy open?	21. How many hours a day is the pharmacy open during the week?	22. During the past 7 days, how many hours did you work as a dispensing pharmacist?
Pearson Correlation	1. What percent of approved therapeutic interchanges occur because the drug is not included on the formulary?	1.000	.465**	-.005	.053	.364**	.331**	.376**	.159**	.058	.166**	.195**	.164**	.087	-.057	-.047	.227**	.192**	.092	.066	.069
	2. What percent of approved therapeutic interchanges occur because the drug is not a preferred drug on the formulary?	.465**	1.000	.111**	.150**	.334**	.198**	.213**	.175**	.087	.171**	.268**	.308**	.095	.087	.090	.194**	.205**	.094	.014	.074
	3. What percent of approved therapeutic interchanges occur because the patient requests a different drug?	-.005	.111**	1.000	.037	.083	.064	.031	-.033	.004	-.131**	-.005	-.049	.145**	-.039	-.040	.010	.063	-.021	-.085	.040
	4. During the past 7 days, how many prescriptions did you fill?	.053	.150**	.037	1.000	.377**	.204**	.266**	.076	.071	.022	.111**	.173**	.057	.033	-.014	.038	.155**	.020	.071	.196**
	5. During the past 7 days, how many times have you been prompted or alerted to contact a prescriber to approve a TI?	.364**	.234**	.083	.377**	1.000	.484**	.462**	.156**	.067	.129**	.309**	.243**	-.020	.079	.063	.204**	.353**	.211**	.161**	.156**
	6. During the past 7 days, how many times have you contacted a prescriber and asked them to consider a TI for a patient?	.331**	.198**	.064	.204**	.484**	1.000	.423**	.197**	-.011	.050	.173**	.139**	.046	-.096	-.092	.147**	.197**	.170**	.197**	.121**
	7. During the past 7 days, how many therapeutic interchanges were approved by the prescriber?	.376**	.213**	.031	.266**	.462**	.423**	1.000	.151**	.005	.063	.305**	.143**	.040	-.107**	-.123**	.139**	.347**	.152**	.155**	.141**
	8. How many minutes do you normally spend discussing with the prescriber each therapeutic interchange?	.159**	.175**	-.033	.076	.156**	.197**	.151**	1.000	.101	.079	.196**	.097	.041	.096	.147**	.174**	.277**	.058	.086	.110**
	9. Does the prescriber usually make the suggestion for the alternative drug, or do you have to research or prompt him/her?	.058	.087	.004	.071	.067	-.011	.005	.101	1.000	.015	.121**	.108**	.037	-.009	-.032	.036	.027	-.013	.002	.015
	10. How often do you feel you have sufficient information about the patient to make an appropriate suggestion?	.166**	.171**	-.131**	.022	.129**	.050	.063	.079	.015	1.000	.230**	.162**	-.121**	.129**	.180**	.132**	.051	.104	.072	.040
	11. What percent of approved therapeutic interchanges occur as a result of direct manufacturer incentives?	.195**	.268**	-.005	.111**	.309**	.173**	.305**	.196**	.121**	.230**	1.000	.446**	-.023	.089	.083	.293**	.199**	.010	.143**	-.001
	12. What percent of approved therapeutic interchanges occur as a result of PBM incentives?	.164**	.308**	-.049	.173**	.243**	.139**	.143**	.097	.108**	.162**	.446**	1.000	.035	.101**	.148**	.254**	.175**	.106**	.133**	.061
	13. For what percentage of therapeutic interchange attempts do you actually talk to the prescriber?	.087	.095	.145**	.057	-.020	.046	.040	.041	.037	-.121**	-.023	.035	1.000	-.137**	-.086	.065	-.007	-.046	-.087	.008
	14. Do you think the practice of therapeutic interchange can help to control pharmaceutical costs?	-.057	.087	-.039	.033	.079	-.096	-.107**	.096	-.009	.129**	.089	.101**	-.137**	1.000	.798**	.390**	.231**	-.074	-.095	.086
	15. Do you think the practice of therapeutic interchange can help to control overall health costs?	-.047	.090	-.040	-.014	.063	-.097	-.123**	.147**	-.032	.180**	.083	.148**	-.086	.798**	1.000	.422**	.187**	-.029	-.103	.079
	16. Do you think the practice of therapeutic interchange . . . . clinical outcomes?	.227**	.194**	.010	.038	.204**	.147**	.139**	.174**	.036	.132**	.293**	.254**	.065	.390**	.422**	1.000	.371**	-.008	.040	.193**
	17. During the past year, about how many complaints-if any-about adverse side effect or ineffectiveness have you received	.192**	.205**	.063	.155**	.353**	.197**	.347**	.277**	.027	.051	.199**	.101**	-.007	.231**	.187**	.371**	1.000	-.005	.030	.102
	20. How many days a week is the pharmacy open?	.092	.094	-.021	.020	.211**	.170**	.152**	.058	-.013	.104	.010	.106**	-.046	-.074	-.029	-.008	-.005	1.000	.634**	.042
	21. How many hours a day is the pharmacy open during the week?	.066	.014	-.085	.071	.161**	.197**	.155**	.086	.002	.072	.143**	.133**	-.087	-.095	-.103	.040	.030	.634**	1.000	.068
	22. During the past 7 days, how many hours did you work as a dispensing pharmacist?	.069	.074	.040	.196**	.156**	.121**	.141**	.110**	.015	.040	-.001	.061	.008	.086	.079	.193**	.102	.042	.068	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).