Determinants of Dispensing Location in the TRICARE Senior PharmacyProgram

Jesse D. Malkin
Geoffrey Joyce
Jennifer Pace
Thomas Croghan

Prepared for the Office of the Secretary of Defense

NATIONAL DEFENSE RESEARCH INSTITUTE and
RAND HEALTH

The research described in this report was sponsored by the Office of the Secretary of Defense (OSD). The research was conducted jointly by the Center for Military Health Policy Research, a RAND Health program, and the Forces and Resources Policy Center, a RAND National Defense Research Institute (NDRI) program. NDRI is a federally funded research and development center supported by the OSD, the Joint Staff, the unified commands, and the defense agencies under Contract DASW01-C-01-0004.

Library of Congress Cataloging-in-Publication Data

Determinants of dispensing location in the TRICARE senior pharmacy program / Jesse Malkin ... [et al.].
p. cm.
"MG-237."
Includes bibliographical references.
ISBN 0-8330-3689-0 (pbk.)
1. Medicine, Military—United States—Costs. 2. Drugs—United States—Cost control. 3. Older veterans—Medical care—United States—Costs. 4. Retired military personnel—Medical care—United States—Costs. 5. Military dependents—Medical care—United States—Costs. 6. United States—Armed Forces—Medical care—Costs. 7. Managed care plans (Medical care)—United States. I. Malkin, Jesse D., 1969–

UH423.D48 2004
362.17'82'086970973—dc22

2004021436

Published 2005 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516
RAND URL: http://www.rand.org/
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Preface

The military health system (MHS) has approximately 8.6 million eligible beneficiaries. These beneficiaries include active-duty military personnel and their family members, retired military personnel and their family members, and surviving family members of deceased military personnel. Like the private health care sector, the MHS has experienced a rapid growth in pharmaceutical expenditures. Recent growth is partly attributable to the TRICARE Senior Pharmacy (TSRx) program started in April 2001, which expanded civilian pharmacy coverage for elderly MHS beneficiaries (those aged 65 and up).

For the Department of Defense (DoD), the acquisition costs of prescription drugs depend on the dispensing location chosen by beneficiaries: drugs dispensed through military treatment facilities and the TRICARE Mail Order Pharmacy (TMOP) generally cost DoD less than those dispensed through retail pharmacies. In principle, therefore, DoD can reduce its pharmacy acquisition costs by shifting prescribing from retail pharmacies to military treatment facility (MTF) pharmacies and/or the TMOP. To support the development of policy options that can improve DoD's ability to manage acquisition costs of the TSRx program, our study provides information about where TSRx beneficiaries receive their medications, and what factors influence where they choose to obtain their medications.

The current report presents the results of the second phase of a two-phase study of TRICARE pharmacy cost issues that the RAND Corporation carried out for DoD. A separate report completed last year, "Pharmacy Costs and Use in the TRICARE Senior Pharmacy Program: Insights for Benefit Design from the Private Sector," exam-

ined the impact of adding a third tier to the TRICARE formulary, as TRICARE Management Activity (TMA) proposed in the *Federal Register.* The report's primary intended audience is the sponsoring office. However, this research should also interest defense health policymakers and those in pharmacy benefits management in both the private and public health care sectors.

Both reports were sponsored by the Assistant Secretary of Defense for Health Affairs and carried out jointly by RAND Health's Center for Military Health Policy Research and the Forces and Resources Policy Center of the National Defense Research Institute. The latter is a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the unified commands, and the defense agencies. Comments are welcome and may be addressed to Geoffrey Joyce (gjoyce@rand.org). For more information on RAND's Forces and Resources Policy Center, contact the Director, Susan Everingham. She can be reached by email at susan_everingham@rand.org; by phone at 310-393-0411, extension 7654; or by mail at RAND Corporation, 1776 Main Street, Santa Monica, CA 90401. Terri Tanielian and Susan Hosek are Codirectors of the RAND Center for Military Health Policy Research. They may be reached by email at territ@rand.org or susan_hosek@rand.org; by phone at 703-413-1100, extension 5404 or extension 7255; or by mail at RAND Corporation, 1200 S. Hayes Street, Arlington VA 22202. More information about RAND is available at http://www.rand.org.

Contents

Figures

Tables

Summary

The MHS serves approximately 8.6 million eligible beneficiaries, including active-duty military personnel and their family members (dependents), retired military personnel and their dependents, and surviving dependents of deceased military personnel. TRICARE, the program that administers health care for the DoD, includes a pharmacy benefit that provides coverage for virtually all U.S. Food and Drug Administration (FDA)-approved prescription medications.[1] Prior to fiscal year (FY) 2001, elderly military retirees and their dependents who wished to use their military benefits to fill a prescription could do so only at a MTF outpatient pharmacy. However, some drugs that were frequently prescribed by civilian providers were not always available at MTFs because of formulary restrictions.[2] As of FY 2001, DoD introduced a new program for elderly military retirees and their dependents, entitled TRICARE Senior Rx (TSRx). TSRx beneficiaries can now fill their prescriptions at any of four points of service: (1) outpatient pharmacies at MTFs; (2) the TRICARE Mail Order Pharmacy (TMOP),[3] currently administered by Express Scripts Inc.; (3) retail pharmacies

[1] Exceptions are medications to treat cosmetic conditions resulting from the normal aging process, medications whose sole use is to stimulate hair growth, medications for investigational use, medications for obesity and/or weight reduction, medications for smoking cessation, and some prescription vitamins.

[2] The term "formulary restriction" is used in the health services literature to refer to the practice of choosing to provide some brands of a particular class of drugs and not to provide others.

[3] The TRICARE Mail Order Pharmacy was formerly known as the National Mail Order Pharmacy (NMOP). The TMOP is suitable for ongoing prescriptions (that is, prescriptions used to treat chronic conditions).

contracted by regional TRICARE contractors (referred to as "network" pharmacies); and (4) non-network retail pharmacies.

The TMOP dispenses drugs for chronic conditions. Although it cannot dispense a few drugs, such as atorvastatin, without proof of medical necessity,[4] the overwhelming majority of drugs for chronic conditions are available. Retail pharmacies have completely open formularies: TRICARE reimburses them for all prescriptions except those specifically excluded from TRICARE coverage.

The location at which a TSRx beneficiary chooses to obtain a prescription drug affects the cost of that drug to the beneficiary. Elderly beneficiaries pay no co-payment for pharmacy items (either generic or name-brand) obtained from a MTF. The co-payment for items obtained through the TMOP and network retail pharmacies is $3.00 for a generic drug (up to a 90-day supply is available through the TMOP) and $9.00 for a name-brand drug. Non-network retail pharmacies charge a higher co-pay. The FY 2000 National Defense Authorization Act proposes establishing a Uniform Formulary, which will add a third tier for non-preferred brands (with a co-pay of $22.00) to the current two-tier structure and will require TMOP to have an open formulary.

The location at which a TSRx beneficiary chooses to obtain a prescription drug also affects the acquisition cost (defined here as the estimated ingredient cost of the drug to DoD, ignoring dispensing fees, co-payments, and sales taxes). Drugs dispensed through MTFs and the TMOP are purchased at prices negotiated by the Defense Supply Center in Philadelphia (DSCP) and the Department of Veterans Affairs. By contrast, drugs dispensed through TRICARE retail network pharmacies are reimbursed at rates negotiated by TRICARE managed care support contractors. The retail prices typically are considerably higher than those negotiated by the DSCP and the Veterans' Administration

[4] Medical necessity is determined on an individual basis, based on a review of information provided by the beneficiary's provider. According to the DoD Pharmacoeconomic Center's (PEC's) Web site, "reasons why a specific medication may be considered medically necessary include, but are not limited to: (1) an allergic reaction to the preferred or contracted medication, (2) a side effect or adverse reaction to the preferred or contracted medication, or (3) failure to achieve the desired effect with the preferred or contracted medication." In contrast, prior authorization requirements are designed to ensure that certain drugs are used by targeted beneficiaries for whom the drugs are most cost-effective and safe.

(VA). In principle, therefore, DoD could reduce its pharmacy acquisition costs by shifting prescription workload from retail pharmacies to MTFs and/or the TMOP.

The purpose of the present study was to gather information about where TSRx beneficiaries receive their medications and what factors influence these choices, and to provide a basis for developing policy options that can improve DoD's ability to manage the costs of the TSRx program. Specifically, the study sought to answer the following questions:

- What were the most-frequently dispensed and highest-cost drugs and drug classes at each of the three dispensing locations in FY 2002?
- To what extent did ingredient costs differ by dispensing location?
- How did use of each dispensing location change over the course of the year?
- How did beneficiaries' proximity to MTFs influence their use of MTF pharmacies, the TMOP, and retail pharmacies?
- Were MTF formulary restrictions associated with higher rates of retail dispensing?
- Do the patterns observed for TSRx beneficiaries also hold for 45- to 64-year-old, non–active-duty MHS beneficiaries (most of whom will be TSRx beneficiaries in the future)?

Approach

The study focused on prescriptions filled in FY 2002 by TRICARE beneficiaries aged 65 and over as well as those, ages 45 to 64, who were not active duty. The sample of TSRx beneficiaries consisted of 1.8 million eligibles, to whom 54 million prescriptions were dispensed.

A data set was assembled by linking TRICARE pharmacy claims data from the Pharmacy Data Transaction System (PDTS) to information about military beneficiaries and the MTFs closest to their residential ZIP codes. PDTS captures all pharmacy claims from MTF

outpatient pharmacies, the TMOP, and in-network retail pharmacies, including prescription drugs and certain medical supplies, but does not capture the small proportion of prescriptions (fewer than 1 percent of the total in FY 2002) dispensed from non-network retail pharmacies and paper claims. Beneficiary-level data came from the Defense Enrollment Eligibility Reporting System (DEERS) Point-in-Time Extracts (PITEs). A list of MTF pharmacies and their locations was obtained from the Medical Expense and Performance Reporting System (MEPRS) and was supplemented by conducting an online search.

TSRx utilization by drug class and type of dispensing location was analyzed as numbers of 30-day equivalent prescriptions. The effect of MTF proximity was examined by calculating the mean numbers of MTF, TMOP, and retail pharmacy prescriptions obtained by beneficiaries living close (within 20 miles of) to an MTF, at an intermediate distance (21 to 40 miles) from an MTF, or at a considerable distance (more than 40 miles) from the nearest MTF. The association between local MTF formulary restrictions and choice of dispensing location was examined by looking at use patterns of beneficiaries who received drugs that are generally not available from MTFs. We hypothesized that use of such drugs would be associated with increased use of retail pharmacies for drugs other than the one in question. For example, we hypothesized that beneficiaries receiving astorvastatin (brand name Lipitor) would be more likely than those not receiving atorvastatin to use retail pharmacies for drugs other than atorvastatin.

Findings and Limitations

Our analysis of the TSRx program, which focused on describing utilization patterns by dispensing location, and on assessing the impact of MTF proximity and local MTF formulary restrictions on TSRx use, provided four major findings:

First, although a majority of TSRx prescriptions in FY02 were dispensed from MTF pharmacies, a majority of TSRx estimated ingredient costs were attributable to drugs dispensed from retail pharmacies. Moreover, with respect to the proportion of prescriptions dispensed

from each dispensing location, there was a steady trend throughout FY02 toward greater use of retail pharmacies and less use of MTFs.

Second, as expected, we found that estimated ingredient costs of high-cost, widely-dispensed drugs were significantly higher for drugs dispensed from retail pharmacies than for drugs dispensed through MTFs and the TMOP, suggesting that—holding utilization constant—DoD's estimated ingredient costs could be reduced if dispensing shifted from retail pharmacies to dispensing locations where federal pricing is the basis of DoD's ingredient cost (that is, MTFs and the TMOP).

Third, geographic proximity to MTFs was strongly associated with TSRx use and utilization patterns. Specifically, beneficiaries who lived near MTFs were more likely to use the TSRx program, more likely to use MTF pharmacies, less likely to use the TMOP, and less likely to use retail pharmacies than were beneficiaries living far from MTFs. In addition, proximity to a MTF was associated with increased volume of MTF prescriptions, reduced volume of TMOP prescriptions, and reduced volume of retail pharmacy prescriptions. These findings are consistent with decades of previous research showing that use of a medical service tends to increase with a corresponding decrease in distance between the beneficiary and the provider of the service.

Fourth, within two major therapeutic classes—antihyperlipidemics and gastrointestinals—the availability of a drug at a MTF was associated with increased use of the MTF and reduced use of retail pharmacies to fill other prescriptions. Consider, for example, simvastatin (brand name Zocor), the preferred antihyperlipidemic, and atorvastatin, a widely used antihyperlipidemic that was not available from MTFs except in cases of medical necessity. Our analysis shows that simvastatin users obtained 28 percent of their non-simvastatin prescriptions from retail pharmacies, whereas atorvastatin users received 63 percent of their non-atorvastatin prescriptions from retail pharmacies.

These findings are relevant for the DoD Pharmacy & Therapeutics (P&T) Committee, which is responsible for determining the contents of the Basic Core Formulary (BCF) as well as the TMOP formulary; and for local MTF P&T Committees, which determine MTF formularies and manage special requests for non-formulary drugs.

Several factors may limit the strength, applicability, or validity of the study findings:

- The variable we used in our cost analyses—estimated ingredient cost—contains some portion of the dispensing fee for prescriptions dispensed from retail pharmacies. At least some of the discrepancy in ingredient costs between retail pharmacies and the other dispensing locations is attributable to this measurement error.
- It was not possible to control for a number of potentially important confounding factors, such as the marital status, race, and supplemental insurance coverage of beneficiaries as well as characteristics of the nearest MTF (such as average wait time).
- The study did not consider the type of provider (MTF versus non-MTF) used by the beneficiary, a factor that is likely to have a substantial effect on the dispensing location selected by the beneficiary. MTF providers presumably are more familiar with and attentive to the MTF and TMOP formularies than providers in the non-MTF community.
- Proximity to the nearest MTF was calculated assuming that visits originated from the beneficiary's residence (rather than a location that the beneficiary might regularly visit, for example). In addition, the software we used calculated distance "as the crow flies" as opposed to the more relevant metric of travel time.
- Whereas the pharmacy and enrollment data appeared to be complete, a small number of problems were observed, such as implausibly high costs for some pharmacy claims and items dispensed from ZIP codes that did not, according to MEPRS records, contain a MTF pharmacy.

Next Steps

The results of this study can serve as a baseline for future reforms. It will be instructive, for example, to assess how the trends identified in

this report will change if the co-payment for non-formulary drugs is raised (as DoD has proposed). In addition, our findings suggest the desirability for a prospective survey to identify the determinants of dispensing locations in the TSRx program, for example, the extent to which co-payments, geographic proximity, and hours of operation play a role in beneficiaries' decision to use or not use MTF pharmacies.

Acknowledgments

We are grateful for the support that we received throughout this project from our Project Officer at the TMA, CDR Thomas Mihara. We are also indebted to COL William Davies, DoD Pharmacy Program Director, and the staffers at the Pharmacoeconomic Committee, who responded to a number of questions during the course of the project and provided extensive comments on a first draft. We also appreciate the time and energy that several TMA contractors devoted to the project: Wendy Funk of Kennell and Associates Inc. and Chaya Merrill and Bill Pierce of STI Consulting Inc. We are grateful to Ross Anthony and Terri Tanielian of the RAND Center for Military Health Policy Research and Susan Everingham of the RAND National Defense Research Institute for their support and feedback, both in helping to secure funding for this work, but also in ensuring its completion. We thank Jeanne Ringel of RAND, Debi Reissman of Rxperts Inc., and LTC (Ret) Mark Perry, all of whom provided very helpful comments on a first draft. We also thank Sydne Newberry and Karen Matsuoka of RAND for their help writing and editing the report, and Esmeralda Williams of RAND for formatting the report.

Abbreviations

ACE	angiotensin-converting–enzyme
AWP	average wholesale price
BCF	Basic Core Formulary
BRAC	Base Relocation and Alignment Closures
DAPA	Distribution and Pricing Agreement
DDS	Dependent Data Suffix
DEERS	Defense Enrollment Eligibility Reporting System
DoD	Department of Defense
DSCP	Defense Supply Center Philadelphia
FDA	U.S. Food and Drug Administration
FY	fiscal year
H2	histamine-2
IIA	Independence of Irrelevant Alternatives
MCSC	managed care support contractor
MEPRS	Medical Expense and Performance Reporting System
MHS	military health system
MTF	military treatment facility
NDAA	National Defense Authorization Act
NDC	National Drug Code
NMOP	National Mail Order Pharmacy (now TMOP)
NSAID	non-steroidal, anti-inflammatory drug
P&T	Pharmacy & Therapeutics
PEC	Pharmacoeconomic Center
PDTS	Pharmacy Data Transaction System
PITE	Point-in-Time Extract

TMA	TRICARE Management Activity
TMOP	TRICARE Mail Order Pharmacy
TSRx	TRICARE Senior Pharmacy program
VA	Veterans' Administration

CHAPTER ONE

Introduction

The military health system (MHS) serves approximately 8.6 million eligible beneficiaries, including active-duty military personnel and their family members (dependents), retired military personnel and their dependents, and surviving dependents of deceased military personnel. Military health care is administered by the TRICARE program, the military's regionally managed health care program, which assumes the dual challenges of maintaining medical combat readiness while ensuring the health of all active-duty personnel, military retirees, and dependents.

The TRICARE program includes a pharmacy benefit that covers virtually all classes of U.S. Food and Drug Administration (FDA)-approved prescription medications.[1] TRICARE beneficiaries can fill their prescriptions at any of four points of service: (1) military treatment facility (MTF) outpatient pharmacies; (2) the TRICARE Mail Order Pharmacy (TMOP)[2] program, currently administered by Express Scripts Inc.;[3] (3) retail "network" pharmacies contracted by regional TRICARE managed care support contractors (MCSCs); and (4) non-network retail pharmacies. MTFs are sometimes referred to

[1] Exceptions are medications to treat cosmetic conditions resulting from the normal aging process, medications whose sole use is to stimulate hair growth, medications for investigational use, medications for obesity and/or weight reduction, medications for smoking cessation, and some prescription vitamins, i.e., items not covered by TRICARE.

[2] The TRICARE Mail Order Pharmacy was formerly known as the National Mail Order Pharmacy (NMOP). The TMOP dispenses medications for chronic conditions only. Drugs used to treat acute conditions, such as antibiotics, generally are not available through the TMOP.

[3] Drugs purchased by Express Scripts under Department of Defense (DoD) contracts are handled separately from drugs purchased under non-DoD contracts. This approach is sometimes referred to as a "dual inventory" accounting system.

as the Direct Care System. The MTF pharmacies have closed formularies that differ by facility (although each is required to carry a core formulary of items). The TMOP offers most drugs but, like the MTFs, cannot dispense particular drugs without proof of medical necessity. By contrast, retail pharmacies have completely open formularies, meaning TRICARE will reimburse for virtually all FDA-approved medications, except those specifically not covered by TRICARE.

The DoD Pharmacoeconomic Center (PEC) estimates that in fiscal year (FY) 2002, the cost to DoD for outpatient pharmacy items[4] for all MHS beneficiaries (that is, both active-duty and retired personnel as well as their dependents and survivors) was approximately $3.0 billion (Remund, 2003). The growth rate in military pharmacy spending is shown in Table 1.1. The acceleration in aggregate DoD pharmacy costs in 2001–2002 appears to be at least partly attributable to the introduction of the TRICARE Senior Pharmacy (TSRx) program in April 2001, which expanded access to prescription drugs for the Uniform Services Medicare population by nearly 1.5 million beneficiaries (Davies, 2003a).

Table 1.1
Growth in DoD Pharmacy Spending

FY	DoD
1996	7%
1997	15%
1998	13%
1999	17%
2000	22%
2001	28%
2002	47%

SOURCE: Remund, 2003.

[4] "Outpatient pharmacy items" refers primarily to patient-administered medications and medical supplies such as diabetes test strips and glucometers. Medications administered by a physician, either in a hospital or clinic, usually are not included in outpatient pharmacy databases.

The TSRx Program

In the late 1990s, Congress became increasingly concerned about the quality of DoD's pharmacy benefit for elderly military retirees and their dependent family members, who were restricted to filling their medication prescriptions at MTF pharmacies. Beneficiaries complained that some of their prescribed medications were not available at MTF pharmacies because of formulary restrictions. In response, Congress authorized the TSRx program in the FY 2001 National Defense Authorization Act (NDAA). This program expanded the locations where elderly military retirees, their dependents, and surviving dependents of deceased military personnel could fill their prescriptions. These beneficiaries now have a choice of locations where they can obtain prescription medications under their TRICARE benefit. They can fill their prescriptions for chronic medications through the TMOP (if they are being treated for a chronic condition). In addition they can fill prescriptions for both chronic and acute conditions at retail (civilian) pharmacies—both stand-alone outlets, such as CVS and Rite-Aid, and those within stores, like Wal-Mart and Safeway—as well as at MTFs. All uniformed services beneficiaries who turned 65 before April 1, 2001, are automatically eligible to use the TSRx benefit. Those who turned 65 on or after April 1, 2001, must be enrolled in Medicare Part B to qualify for the TSRx benefit. Beneficiaries under the age of 65 are not eligible for the TSRx benefit, even if they are covered by Medicare.

As was the case before TSRx was implemented, elderly military retirees and dependents pay no co-payment for pharmacy items obtained from an MTF. When a TSRx beneficiary uses the TMOP to obtain a medication for a chronic condition (medications for acute conditions are not available through the TMOP), generic items carry a $3.00 co-payment per prescription for up to a 90-day supply, and name-brand items carry a $9.00 co-payment per prescription for up to a 90-day supply (shipping and handling are free unless expedited shipping is requested). Items obtained from in-network retail pharmacies carry a $3.00 co-payment per prescription for up to a 30-day supply of a generic item and a $9.00 co-payment per prescription for up to a 30-day supply of a name-brand item. Items obtained from non-network

retail pharmacies carry a co-payment of $9.00 or 20 percent of the allowable charge, whichever is greater (see Table 1.2). The overwhelming majority of drug store chains are in-network: thus, most seniors pay a maximum co-payment of $9.00 per prescription.

As noted above, the implementation of the TSRx program was followed by a substantial increase in DoD pharmacy expenditures. This increase was particularly dramatic within the retail sector. In FY 2000, the last full fiscal year before the TSRx program was implemented, DoD spent $455 million on retail prescriptions (almost entirely on non-elderly military beneficiaries; elderly military beneficiaries were for the most part excluded from the retail benefit[5]). Just two years later, in FY 2002, spending on retail prescriptions was $1.28 billion—nearly triple the amount spent in FY 2000. By comparison, spending on MTF prescriptions increased by just one-third during the same two-year period (Remund, 2003).

The DoD Formulary System

Although TSRx enrollees can obtain TRICARE-covered drugs through all four dispensing locations described above, not all TRICARE-covered medications are readily available at each dispensing location. On April

Table 1.2
Current Co-Payment Structure

	Generics	Brand Name
MTF	$0.00	$0.00
TMOP (up to a 90-day supply)	$3.00	$9.00
In-network retail (up to a 30-day supply)	$3.00	$9.00
Non-network retail	$9.00 or 20% of total cost (whichever is greater). Existing deductibles apply.	

[5] Prior to TSRx, the retail benefit was available to all military beneficiaries (active duty, dependents, retirees) under the age of 65 but only those over 65 eligible through BRAC (Base Relocation and Alignment Closures). The TSRx benefit extended this benefit to all military beneficiaries over the age of 65.

27, 1998, the DoD established the Basic Core Formulary (BCF) to assure standard availability across MTFs for specific medications within therapeutic categories. The goal of the BCF was to meet the primary care needs of military beneficiaries, while also achieving significant cost savings within some therapeutic classes by selecting preferred products within those classes (that is, requiring drug makers with similar products to compete against one another on price). The BCF is maintained by the DoD Pharmacy & Therapeutics (P&T) Committee, which reviews formulary contents quarterly. During FY 2002, most drug classes were "open": no restrictions were placed on which brands MTFs could offer. However, two therapeutic classes were "closed": 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibitors (cholesterol-lowering agents, also known as "statins") and nonsedating antihistamines. For these two classes, DoD attempted to limit costs systemwide by mandating use of one or more preferred brands, a practice sometimes referred to as "committed-use" contracting. This policy requires manufacturers with similar products to compete on price for the right to have their product included in the BCF. A similar approach is used by many private payers. DoD estimates that the committed-use contract for antihyperlipidemics has saved nearly $100 million to date (Davies, 2003c).

To supplement the BCF, local MTFs can add drugs to create site-specific formularies. All MTF formularies must include preferred brands within closed therapeutic classes (e.g., simvastatin), and no MTF formulary may include nonpreferred brands within those classes (e.g., atorvastatin). Beyond the limitations established by the BCF, local MTF P&T committees have complete latitude about which TRICARE-covered drugs to include or exclude from their formularies. However, it should be noted that the MTF commander has an incentive to limit the MTF formulary to some extent in order to relieve MTF budget pressure.[6] It should also be noted that it is possible

[6] Each MTF commander has to keep his or her MTF operating within a budget established by his or her superiors. Two of the largest components of the budget are civilian payroll and the pharmacy. If the commander increases the budget for pharmacy, he or she typically must reduce the allocation for civilian payroll. Reducing the budget for civilian payroll often is more difficult than reducing the stock level on the pharmacy shelves (Perry, 2003).

for beneficiaries to obtain drugs not on MTF formularies. According to Tanielian and colleagues (2003), MTFs sometimes dispense drugs that are not on their formularies through non-formulary waivers, also known as special drug requests. Restrictions regarding such special requests vary from one MTF to another, but often they are onerous.[7] Prescriptions written by non-MTF prescribers for medications not on the MTF formulary cannot be filled at MTF pharmacies.

The TMOP formulary—which differs from the BCF—is also determined by the DoD P&T Committee. It covers most FDA-approved medications for chronic conditions, but, unlike the BCF, does not include medications to treat acute conditions such as an infection. TMOP provides non-formulary medications only if the provider demonstrates to the satisfaction of the mail order contractor (Express Scripts Inc.) that such medications are medically necessary.[8] A small number of additional medications, including COX-2 inhibitors and Viagra (sildenafil), can be dispensed through the TMOP only if the prescription request meets the prior authorization criteria established by the DoD P&T Committee.[9] Network retail pharmacies have open formularies: they can provide TRICARE beneficiaries with all FDA-approved prescription medications (generics and name-brands) except

[7] Some MTF physicians are reluctant to go to the trouble of completing additional paperwork to request non-formulary drugs, opting instead to instruct their patient to take a handwritten prescription for a non-formulary drug to a retail pharmacy (Perry, 2003).

[8] Medical necessity is determined based on a review of information provided by the beneficiary's provider. According to the DoD PEC's Web site, "reasons why a specific medication may be considered medically necessary include, but are not limited to: (1) an allergic reaction to the preferred or contracted medication, (2) a side effect or adverse reaction to the preferred or contracted medication, or (3) failure to achieve the desired effect with the preferred or contracted medication." Evidence of medical necessity is obtained from the provider who prescribed the medication.

[9] Prior authorization requirements are designed to ensure that certain drugs are used by targeted beneficiaries for whom the drugs are most cost-effective and safe. For example, the TMOP does not provide sildenafil to women, men under 18 years of age, patients receiving any form of nitrate therapy, patients with psychogenic erectile dysfunction, or patients with primary erectile dysfunction (i.e., history of inability to ever achieve an erection). Coverage is, however, provided for beneficiaries with organic erectile dysfunction (e.g., diabetes-related, vascular-related, or drug-induced organic dysfunction), organic erectile dysfunction that is a component of erectile dysfunction (e.g., mixed organic and psychogenic erectile dysfunction), or drug-induced erectile dysfunction where the causative drug cannot be altered or discontinued.

those explicitly excluded by TRICARE (e.g., cosmetic drugs), and offer all name-brand products for the same co-payment ($9.00 per prescription). However, MCSCs, which contract with network retail pharmacies, may require prior authorization for certain medications.

Under the FY 2000 NDAA (P.L. 106–65, Section 791, enacted October 5, 1999), which established Uniform Formulary parameters, the structure of the DoD pharmacy benefit will be changed. According to DoD's proposed rule (*Federal Register*, April 12, 2002) the current two-tier co-payment structure will be replaced by a three-tier structure, under which the proposed co-payment for non-formulary, name-brand (third tier) medications obtained at retail pharmacies will be $22.00 (see Table 1.3). The proposed rule also stipulates that non-formulary agents be made available from the TMOP (in the current system, non-formulary drugs are available from retail pharmacies but are available through the TMOP only with proof of medical necessity). In other words, non-preferred drugs in the statin and nonsedating antihistamine class would be available from the TMOP without proof of medical necessity. TRICARE Management Activity (TMA), the agency that oversees TRICARE, anticipates that only a limited number of items will be deemed non-formulary (Davies, 2003b); thus, beneficiaries will continue to pay no more than $9.00 per prescription for most name-brand products.

Table 1.3
Proposed Co-Payment Structures

	Tier 1 (generic)	Tier 2 (preferred brands)	Tier 3 (non-preferred brands)
MTF	$0.00	$0.00	$0.00
TMOP (up to a 90-day supply)	$3.00	$9.00	$22.00
In-network retail (up to a 30-day supply)	$3.00	$9.00	$22.00
Non-network retail	$9.00 or 20% of total cost (whichever is greater). Existing deductibles apply.		$22.00 or 20% of total cost (whichever is greater). Existing deductibles apply.

Note: Proposed rule published in the *Federal Register* on April 12, 2002.

Prices Paid by DoD for Outpatient Pharmacy Items

Pharmacy items dispensed through MTFs and the TMOP are purchased at prices negotiated by the Defense Supply Center Philadelphia (DSCP) and the Department of Veterans' Affairs (VA) National Acquisition Center. By contrast, network retail pharmacies that dispense to TRICARE beneficiaries are reimbursed at prices negotiated by TRICARE MCSCs. The retail prices typically are higher than those negotiated by the DSCP or VA. According to the Congressional Research Service, DoD has estimated that prices negotiated by DSCP usually are 24 percent to 70 percent below average wholesale price (AWP) (Yacker, 1999). By contrast, retail prices negotiated by TRICARE MCSCs are often closer to AWP.

Our Aim

In principle, DoD could reduce its pharmacy acquisition costs by shifting prescribing from retail pharmacies to the direct-care system (that is, MTF pharmacies and the TMOP). Yet little research has been done to assess the determinants of TRICARE beneficiaries' choice of dispensing location. Thus, DoD has limited information upon which to base policy decisions designed to shift prescribing from one dispensing location to another.

To improve knowledge about these issues, RAND performed a study analyzing determinants of dispensing location in the TSRx program using DoD data from FY 2002, the first complete fiscal year of the program's operation. Specific research questions were as follows:

- What were the most-frequently dispensed and highest-cost drugs and drug classes at each of the three dispensing locations?
- To what extent did estimated ingredient costs differ by dispensing location?
- How did use of each dispensing location change over the course of the year?

- How did beneficiaries' proximity to MTFs influence their use of MTF pharmacies, the TMOP, and retail pharmacies?
- To what extent were MTF formulary restrictions associated with higher rates of retail dispensing for non-targeted drugs (i.e., drugs other than the one being limited via formulary restrictions)?
- Do the patterns observed for TSRx beneficiaries also hold for 45- to 64-year-old non–active-duty MHS beneficiaries (most of whom will be TSRx beneficiaries in the future)?

The remainder of this report attempts to answer these questions. Chapter Two describes our data sources and methods. Chapter Three describes TSRx utilization, including the highest-cost drugs and drug classes by dispensing location, the most-frequently prescribed drugs and drug classes by dispensing location, and time trends in dispensing patterns. Chapter Four presents the results of analyses designed to gauge the effect of MTF proximity on use. Chapter Five presents the results of analyses designed to gauge the association between MTF formulary restrictions and beneficiaries' choice of dispensing location. Chapter Six presents conclusions and policy implications.

CHAPTER TWO

Data Sources and Methods

To gain insights about the determinants of TSRx beneficiaries' choice of dispensing location, we performed a quantitative analysis of DoD data. In this chapter, we describe our data sources and the methods we used to analyze the data.

Data Sources

We assembled a data set linking TRICARE pharmacy claims to information about MHS beneficiaries. The data were made available by TMA, using a set of specifications provided by RAND.

Claim-level FY 2002 pharmacy files came from the Pharmacy Data Transaction System (PDTS), a database system that electronically transmits encrypted prescription data between pharmacies and a central data repository. PDTS captures all pharmacy claims from the direct-care system and network retail pharmacies, including those for prescription drugs and certain medical supplies, but does not capture the small proportion of prescriptions (fewer than 0.3 percent of the total in FY 2002) dispensed from non-network retail pharmacies. PDTS captures the name of each drug or medical supply dispensed, its National Drug Code (NDC), its therapeutic class, the number of days supplied, the number of units dispensed, the dispensing location (MTF, mail, or network retail), generic status (name-brand without generic equivalents, name-brand with generic equivalents, or generic), and the ZIP code of the pharmacy from which the medication was dispensed.

The PDTS also contains several variables that relate to the cost of prescriptions: their estimated ingredient cost, the beneficiary's co-payment, the pharmacist's dispensing fee, and the "net amount paid," which is derived by adding the estimated ingredient cost, dispensing fee, and sales tax, and subtracting the beneficiary's co-payment. For prescriptions dispensed from MTFs, ingredient cost is an approximation based on the regional Distribution and Pricing Agreements (DAPA) price with manufacturers and distributors of the drug.[1] For prescriptions dispensed from retail outlets, ingredient cost is the price negotiated by the Pharmacy Benefit Manager subcontracted by the MCSCs (commonly referred to as a negotiated discount price) as part of their network agreements. Ingredient cost is not simply the price of the drug but also covers part of the pharmacies' cost of dispensing.

The dispensing fee at MTFs was always entered into the PDTS as zero. Assuming that the cost of dispensing at MTFs exceeds zero, the "net amount paid" variable understates the actual economic cost of drugs dispensed from MTFs. For this reason, we decided to base our cost analyses on the estimated ingredient cost variable rather than the net amount paid variable. However, the ingredient cost variable also contains measurement error: The ingredient cost submitted by retail pharmacies includes part of the cost of dispensing. Therefore, our comparison of ingredient costs by dispensing location overstates the ingredient cost of items dispensed from retail pharmacies. The degree of overstatement is likely to be small in the case of name-brand drugs, for which the ingredient cost typically is much higher than the dispensing fee, but may be substantial in the case of generics. This limitation must be borne in mind when considering the results of our cost analyses.

Each PDTS record contains an encrypted sponsor social security number and the Defense Enrollment Eligibility Reporting System (DEERS) Dependent Data Suffix (DDS), which describes the relationship of the beneficiary to the sponsor (e.g., sponsor, first spouse, second spouse, or third spouse). Except for a very small number of sponsors who

[1] The DAPA price is usually the price established by Section 603 of the Veterans Health Care Act of 1992 or the negotiated price. If the product is a brand name that has generic equivalents, the ingredient cost field in PDTS is based on the regional DAPA price of the lowest-cost generic equivalent.

do not have unique social security numbers, these two variables allow identification of unique beneficiaries, permitting linking of records at the level of the individual, across claims and files.

Beneficiary-level FY 2002 data from the DEERS Point-in-Time Extract (PITE) include each beneficiary's date of birth, sex, ZIP code of residence, relationship to the sponsor (i.e., insured or dependent), and eligibility for each month in FY 2002. The files RAND received from TMA contain information about all the MHS beneficiaries aged 45 and up who were not on active duty (including pre–Medicare-age retirees and their dependents), although at TMA's request we focused on the TSRx-eligible population (beneficiaries aged 65 and up).

We also obtained a list of MTF pharmacies from the Medical Expense and Performance Reporting System (MEPRS). In comparing the MEPRS list to the PDTS data, we observed a number of ZIP codes in which PDTS recorded large numbers of MTF-dispensed drugs but for which there was no corresponding MTF in MEPRS. Therefore, we supplemented the MEPRS list with a list containing a small number of additional MTF pharmacies identified through Internet searches and telephone calls.

Study Sample

The study sample for the primary analysis consisted of 1,756,691 beneficiaries aged 65 and older who were eligible for TRICARE for at least one month during FY 2002 and to whom 53,672,011 prescriptions were dispensed. We limited our analysis to prescriptions dispensed in FY 2002 through MTFs, the TMOP, and in-network retail pharmacies.[2]

We excluded 150,419 prescriptions dispensed from non-network retail pharmacies, because detailed prescription-level information, such as the product name and NDC, were unavailable for these items. In addition, a small number of non-network retail pharmacy claims were

[2] In the multivariate regression analyses, we excluded people who were not enrolled all year, who were not living in the same ZIP code for at least six months, and who were missing a primary residence ZIP code (since we could not calculate the distance to the nearest MTF if the ZIP code was missing). In effect, this decision resulted in the exclusion of all beneficiaries who reside overseas, none of whom had ZIP codes. The only exceptions were residents of Puerto Rico and the Virgin Islands, who have ZIP codes and were therefore included in the regressions (assuming they met all the other inclusion criteria).

not included in our file. Such claims are processed by TMA only after the beneficiary has submitted a claim via mail.

Data Cleaning

DoD's PDTS was created primarily to improve the safety of prescription medications dispensed to TRICARE beneficiaries. PDTS automatically compares each beneficiary's prescription to all previous MTF, TMOP, and network retail pharmacy prescriptions dispensed to the same beneficiary. The PDTS is the first MHS data system to centralize such information and make it available to TRICARE providers.

The PDTS is a cutting-edge database that captures virtually all prescriptions dispensed through the TRICARE program. However, we did observe problems with particular variables and devoted considerable attention to rectifying these problems. In a small number of cases, we trimmed, recoded, or otherwise transformed pharmacy claims to compensate for extreme outliers. Specifically, the following steps were taken:

- *Claims deletion.* We deleted pharmacy claims with the fill location code of "C,"[3] (N = 70,778), claims for which the beneficiary's co-payment or pharmacist's dispensing fee was negative (N = 29), and claims for which the amount paid by the government was negative, as long as the reason wasn't because the co-payment exceeded the cost of the drug (N = 65). Typically, those claims for which the amount paid by the government was negative consist of adjudicated claims.
- *Claims recoding.* We recoded the estimated ingredient cost variable for 156,919 MTF prescriptions with implausibly high values (e.g., $98,000 for a single prescription). For these claims, we imputed costs based on the estimated ingredient cost of the same drug-dose combination dispensed through the TMOP and retail pharmacies. The aggregate cost of these claims was $112,288,335 prior to imputation and $3,658,717 after.

[3] More than 99.8 percent of pharmacy claims had fill location of MTF, TMOP, or retail pharmacy. The claims marked with "C" do not correspond to any of the three fill locations. These drugs appear to be those that are not generally issued over the counter to outpatients and are likely to be administered by a physician in an office setting.

- *MEPRS list modification.* We modified the MEPRS list of MTFs in several ways. We deleted MTFs that had zero total pharmacy costs in FY 2001. As mentioned above, we also supplemented the MEPRS list with 15 additional MTFs, identified using a three-step process. We used the PDTS database to identify ZIP codes in which a large number of prescriptions were dispensed but that, according to the MEPRS file, did not contain MTFs. We searched the Internet for MTFs in those ZIP codes. If an MTF was listed, we contacted that MTF by telephone to confirm its existence, ZIP code, and the presence of an outpatient pharmacy. Most of the MTFs identified through our Internet searches and phone calls belonged to ZIP codes for which the PDTS recorded at least 5,000 prescriptions for FY 2002. If 5,000 or more prescriptions were filled in a particular ZIP code in FY 2002 and we could not locate an MTF in that ZIP code, we created a "pseudo-MTF" for that ZIP code. For example, if ZIP code 96538 had more than 5,000 prescriptions but we were unable to identify an MTF in that ZIP code, we created a new MTF called "MTF 96538." This approach resulted in the creation of 33 pseudo-MTFs. If fewer than 5,000 prescriptions were dispensed in a ZIP code for which no MTF existed, we assumed no MTF existed in that ZIP code.
- *DEERS PITE files.* We deleted a small proportion of observations in the DEERS PITE file: Anyone in a household where the sponsor's social security number was not unique (there were 750 social security numbers that were not unique); anyone who died before October 1, 2001 (N = 607,342); anyone whose age was listed as 100 or older and who was listed as the child of a sponsor, because his or her date of birth was probably off by 100 years (N = 1); anyone who had multiple death dates, unless the different dates were in the same month and year (N = 122); and anyone whose death date was after October 1, 2001, but had eligibility records only for months following his or her death (e.g., beneficiaries who died in July but had records only for September through December) (N = 2,638). Also, we changed age to "missing" if age was over 110 (N = 110).

The raw PDTS file contained 53,672,011 prescriptions dispensed to TSRx beneficiaries. Implementing the above exclusions left 53,353,955

PDTS prescriptions. Thus, we excluded 318,056 PDTS prescriptions in addition to the 150,419 prescriptions that were dispensed from non-network pharmacies—fewer than one percent of the total.

Analytic Methods

We performed a number of analyses designed to identify influences on choice of dispensing location within the TSRx program. We were interested in answering a range of questions, including the effect of beneficiaries' geographic proximity to an MTF on TSRx use and on utilization of the different dispensing locations; and the impact of MTF formulary restrictions on use of the different dispensing locations. We also sought answers to related questions, such as which drugs and therapeutic classes were dispensed from the three types of dispensing locations (MTF, TMOP, retail); how use of the different dispensing locations changed during the course of FY 2002; and the extent to which estimated ingredient costs varied across dispensing locations. In this section, we describe the analyses we used to address these questions.

Description of TSRx Utilization Patterns

We compiled lists of the most frequently dispensed therapeutic classes and drugs by dispensing location, based on the number of 30-day equivalent prescriptions dispensed. (The therapeutic classes used in our analyses were defined the same way as in the PDTS database.) We then ranked drug classes and drugs by estimated ingredient cost. To assess the association between dispensing location and estimated ingredient cost, we calculated the mean cost per tablet for a number of high-cost, widely dispensed drugs. We analyzed monthly prescription data collected between October 2001 and September 2002 to examine changes in dispensing patterns over time by location. We performed these analyses for TSRx beneficiaries and 45- to 64-year-old non–active-duty MHS beneficiaries.

Effect of MTF Proximity

One of our key research questions concerned the effect of MTF geographic proximity on choice of dispensing location. For example, we

hypothesized that people living near an MTF would be more likely to use the MTF and less likely to use the TMOP or a retail pharmacy than people who lived at a greater distance from an MTF.

Virtually all Americans live within five miles of a civilian pharmacy (National Association of Chain Drugstores, 2002), but there is considerable variability in Americans' proximity to MTFs. We hypothesized that proximity to an MTF pharmacy would increase the likelihood of using the TSRx program. Among TSRx users, we hypothesized that proximity to an MTF pharmacy would increase the likelihood of using an MTF pharmacy, and reduce the likelihood of using the TMOP or a retail pharmacy. Among MTF users, we hypothesized that proximity to an MTF would be associated with higher MTF use (i.e., a larger proportion of the total prescriptions filled would be filled at an MTF. Among TMOP users, we hypothesized that proximity to an MTF would be associated with lower TMOP use (i.e., a smaller proportion of total prescriptions filled). Finally, we hypothesized that among retail pharmacy users (defined as TSRx users who obtained one or more prescriptions from a retail pharmacy), proximity to an MTF would be associated with less retail use (i.e., a smaller proportion of total prescriptions filled at the retail pharmacy and greater proportion of prescriptions filled at an MTF).

We derived an estimate of distance using "The Great Circle Distance Formula"—a formula that calculates the distance in miles between two pairs of latitude and longitude values specified in radians. This method has several shortcomings. One is that distance is measured "as the crow flies" rather than in terms of travel distance or travel time, which are more relevant metrics. Another limitation of this approach is that it does not distinguish between different locations within a single ZIP code. For example, if a beneficiary lives within the same ZIP code as an MTF pharmacy, then the distance to the MTF pharmacy is said to be zero even though the actual distance from the resident's home to the MTF is greater than zero.

We tested our hypotheses in two ways. First, we computed unadjusted means of prescriptions dispensed by proximity to MTFs. Specifically, we calculated the mean number of MTF, TMOP, and retail prescriptions for TSRx beneficiaries within the following subgroups:

- beneficiaries living within 20 miles of two MTFs
- beneficiaries living within 20 miles of the closest MTF, and within 21 to 40 miles of a second MTF
- beneficiaries living within 20 miles of the closest MTF but more than 40 miles from the second-closest MTF
- beneficiaries living 21 to 40 miles from the closest MTF and 21 to 40 miles from the second-closest MTF
- beneficiaries living 21 to 40 miles from the closest MTF and more than 40 miles from the second-closest MTF
- beneficiaries living more than 40 miles (far) from any MTF.

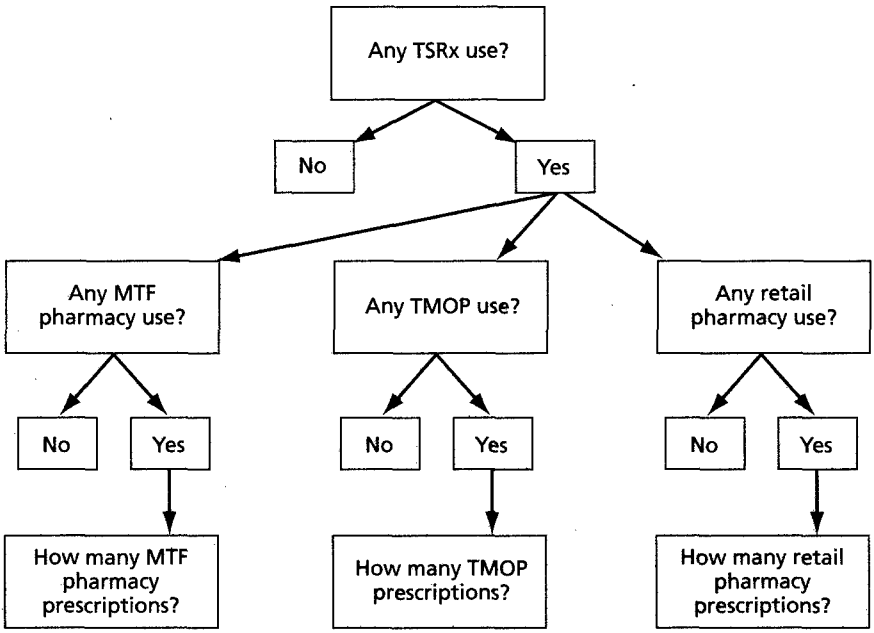
The reason we incorporated information about the distance to the second-closest MTF is that the closest MTF's formulary may not include the drug the beneficiary has been prescribed. In that case, the beneficiary might go to another nearby MTF whose formulary does cover the drug that has been prescribed for the beneficiary. The reason we used the 20-mile and 40-mile breakpoints is that these correspond to geographic regions used by DoD for administrative purposes.

Second, we estimated three sets of regression models—one for each type of dispensing location—to examine what factors influence where TSRx beneficiaries obtain their medications and their overall use of prescriptions drugs. Our statistical analyses used a three-part model for each of the dispensing locations. The first part of the model, which included the entire study sample, used logistic regression to estimate the probability that a TSRx eligible had at least one pharmacy claim, regardless of dispensing location. The second part of the model, which included only users of prescription drugs (those with at least one claim), used logistic regression to estimate the probability that a TSRx member filled at least one prescription at a specific dispensing location (i.e., separate models for MTF, TMOP, and retail). The third part of the model used negative binomial regressions to estimate the number of 30-day equivalent prescriptions dispensed at each location, conditional on having used an MTF, TMOP, or retail pharmacy, respectively. The structures of the three models are illustrated in Figure 2.1.[4]

[4] We did not combine the three parts of the model to simulate the effect of distance on pharmacy use at each dispensing location. Rather, we used the parameter estimates from each part

The explanatory variables of primary interest were the distances between the beneficiary's primary residence and the closest and second-closest MTFs. We controlled for demographic variables that might confound the relationship between MTF proximity and pharmacy use: dichotomous variables for sex (male versus female), age (65 to 74 versus 75 to 84 versus 85 and up), relationship to sponsor (sponsor versus dependent), urban primary residence (urban versus suburban and rural),[5] and the TRICARE geographic region of the beneficiary's primary residence, which corresponds to difference MCSCs. These explanatory variables are listed in Table 2.1. Other variables of potential relevance,

Figure 2.1
Structure of Multivariate Models



RAND *MG237-2.1*

of the model separately to predict probabilities and average pharmacy use conditional on having used that dispensing location. That is, we predicted conditional, not unconditional, use.

[5] "Urban" is defined as counties that fall within metropolitan areas.

such as the beneficiary's marital status and race, characteristics of the provider, characteristics of the closest and second-closest MTFs (for example, hours of operation and wait time), and the presence of supplemental insurance coverage either were not available in the data or were not reliably coded.

When estimating these models, we excluded a small proportion of beneficiaries who did not have a primary residence during FY 2002. (We defined primary residence as residence in a single ZIP code for at least six months out of the year.) We also excluded a small group of beneficiaries who were missing data on any of the explanatory variables.

Another three percent of the enrollees were not eligible for TSRx for the entire year. We adjusted the number of prescriptions they filled based on the number of months of TSRx eligibility: If a beneficiary had 11 months of TSRx eligibility, for example, we increased that beneficiary's number of prescriptions and costs by 9.1 percent (12/11 = 1.091). In a sensitivity analysis, we re-estimated the models without the partial-year enrollees.

To assist with interpretation of the results, we simulated the effect, on predicted outcomes, of moving every beneficiary from living within 20 miles of two MTFs to a residence more than 40 miles from any MTF.

Impact of MTF Formulary Restrictions

Not all TRICARE-covered medications are readily available at each dispensing location. For example, one of the most widely prescribed drugs in the United States, the cholesterol-lowering drug atorvastatin, is not on any MTF formulary (antihyperlipidemics are one of two closed classes in the TRICARE pharmacy program). The closure of the antihyperlipidemic class, an example of a committed-use contract, forced statin manufacturers to compete on price for the right to have their product listed on the BCF. DoD estimates that this policy has generated nearly $100 million in savings (Davies, 2003a). At the same time, it is possible that some beneficiaries who ordinarily would have filled prescriptions at MTFs or used the TMOP instead filled them at a retail outlet because the antihyperlipidemic they were prescribed was not available from their local MTF. If so, this would likely offset some

Table 2.1
Explanatory Variables

Sex
Male
Female (reference group)
Age
65 to 74
75 to 84
85 and up
Beneficiary Relationship to Sponsor
Sponsor
Dependent (reference group)
Urbanicity of Primary Residence
Urban
Not urban (reference group)
Distance Between Primary Residence and Closest MTF, In Miles
20 miles or less
21 to 40 miles
More than 40 miles (reference group)
Distance Between Primary Residence and Second-Closest MTF, in Miles
20 miles or less
21 to 40 miles
More than 40 miles (reference group)
TRICARE Region
Gulf South
Hawaii
Heartland
Mid Atlantic
Northeast
Northwest
Southeast
Southern California
Southwest
Central
Alaska, Western Pacific, Puerto Rico / U.S. Virgin Islands, Golden Gate (reference group)

of the savings generated by the antihyperlipidemic restrictions, since drugs dispensed from retail outlets generally are more costly to DoD than drugs dispensed through the direct care system.

We analyzed one aspect of this issue: the spillover effects of formulary restrictions (i.e., the effects of formulary restrictions on drugs that are not the target of the restrictions). In these analyses, we focused on six sentinel drugs within two top therapeutic classes—the antihyperlipidemics simvastatin, atorvastatin, and pravastatin; and the gastrointestinals esomeprazole, lansoprazole (Prevacid), and rabeprazole (Aciphex). We selected these drugs because they are examples of drugs for which MTFs had either relatively stringent restrictions (atorvastatin, pravastatin, esomeprazole, lansoprazole) or relatively few or no restrictions (simvastatin, rabeprazole).

Specifically, among beneficiaries who received each of these drugs, we calculated the rates of MTF pharmacy, TMOP, and retail dispensing for all drugs other than the drug in question. For example, among TSRx beneficiaries who received simvastatin, we calculated rates of MTF pharmacy, TMOP, and retail pharmacy use for all drugs other than simvastatin. For atorvastatin recipients, we calculated rates of MTF pharmacy, TMOP, and retail pharmacy use for all drugs other than atorvastatin. By comparing dispensing rates across the different drugs, we could see whether beneficiaries receiving drugs that were tightly restricted within the direct care system had a greater-than-average tendency to use retail pharmacies for their other drugs.

CHAPTER THREE

TSRx Utilization

In this chapter, we present our findings regarding the most frequently dispensed therapeutic classes and drugs by dispensing location, based on the number of 30-day equivalent prescriptions dispensed. We also provide ranks of drug classes and drugs by estimated ingredient cost. To assess the association between dispensing location and estimated ingredient cost, we calculated the mean cost per tablet for a number of high-cost, widely dispensed drugs.

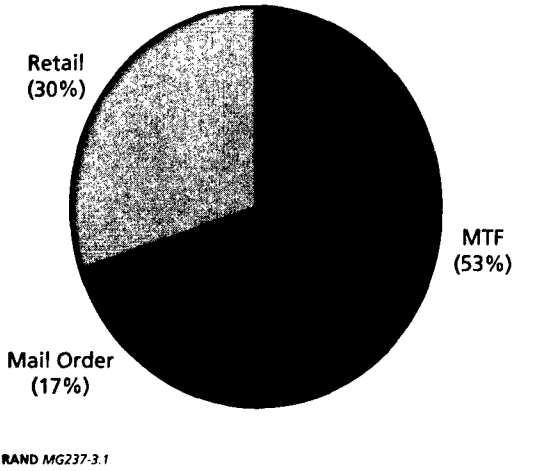
A total of 53.7 million 30-day equivalent prescriptions were dispensed to TSRx beneficiaries in FY 2002. Of those prescriptions, 28.4 million (53.0 percent of the total) were dispensed from MTFs; 8.9 million (16.6 percent) were dispensed from the TMOP; and 16.3 million (30.4 percent) were dispensed from in-network retail pharmacies (Figure 3.1).[1]

The number of 30-day equivalent prescriptions dispensed to TSRx beneficiaries in FY 2002 for each of the costliest 25 therapeutic classes is presented in Table 3.1. In addition, Table 3.1 reports the utilization rankings (defined in terms of volume of prescriptions dispensed) for each of the three dispensing locations.

The rankings are similar across different dispensing locations for most therapeutic classes. Cardiac drugs, for example, were the most frequently prescribed therapeutic class at all three dispensing locations. Antihyperlipidemic drugs were the second-most frequently prescribed class at all three dispensing locations.

[1] The mean number of different drugs received by TSRx users was 27.8 and by all TSRx eligibles was 19.6.

Figure 3.1
Number of 30-Day Equivalent Prescriptions by Dispensing Location (TSRx Only)



However, the rankings differed by dispensing location for several drug classes, most notably opiate agonists and benzodiazepines. These drugs were more likely to be dispensed through retail pharmacies.

All drug classes dispensed through the TMOP were also dispensed through MTFs and retail pharmacies. However, MTFs and retail pharmacies each dispensed drug classes that were not dispensed from the other two sites. Specifically, the following therapeutic drug classes were dispensed to TSRx beneficiaries through retail pharmacies only: antitussives, expectorants, mucolytic agents; sclerosing agents; and tuberculosis agents. Therapeutic classes dispensed to TSRx beneficiaries through MTFs only are listed in Table 3.2.

Utilization information for the 25 most widely dispensed drugs in FY 2002 is presented in Table 3.3. Unlike the drug class rankings, which were fairly consistent across different dispensing locations, individual drug utilization varied considerably by dispensing location. Several of the drugs most frequently dispensed by retail pharmacies were rarely dispensed through the direct-care system. Atorvastatin was the most frequently prescribed drug to TSRx beneficiaries at retail pharmacies but ranked only 121st at MTFs and 13th at the TMOP. The painkiller hydrocodone with acetaminophen was the second-most

Table 3.1
Most-Frequently Dispensed Therapeutic Classes (TSRx Only)

Therapeutic Class (as Defined by The PDTS)	Total Number of 30-day equivalent Scripts	Rank by Dispensing Location Number of Prescriptions Dispensed		
		MTFs	Mail	Retail
Cardiac drugs	10,059,819	1	1	1
Antihyperlipidemic agents	4,164,829	2	2	2
Diuretics	3,143,133	3	6	5
NSAIDs/COX-2s	2,924,880	4	5	7
Misc. GI drugs	2,796,610	5	4	3
Unclassified	2,317,423	9	3	6
Estrogens	2,071,586	6	7	11
Hypotensive agents	1,881,729	8	8	10
Thyroid agents	1,845,252	7	9	9
Antidepressants	1,678,281	10	10	8
Opiate agonists	1,226,845	19	25	4
Replacement preparations	1,210,037	11	16	17
Antihistamines	1,154,167	14	12	14
Misc. antidiabetic agents	1,141,932	12	11	18
Sulfonylureas	1,009,756	13	14	21
Anti-inflammatory agents	989,709	15	17	13
Sympathomimetic agents	903,192	16	15	16
Vasodilating agents	873,324	17	13	15
Benzodiazepines	802,185	22	23	12
Misc. EENT drugs	700,342	18	18	23
Anticoagulants	672,644	20	20	22
Adrenals	663,632	21	22	19
Genitourinary muscle relaxants	401,872	32	19	26
Anxiolytics, sedatives, and hypnotics	350,372	35	32	25

Note: COX-2: Cyclooxygenase-2; EENT: eye ear nose throat; NSAIDs: nonsteroidal anti-inflammatory drugs.

Table 3.2
Drug Classes Dispensed to TSRx Beneficiaries Through MTFs Only

Antacids and absorbents
Antiflatulents
Antiheparin agents
Basic oils and other solvents
Basic powders and demulcents
Blood derivatives
Chloramphenicol
Contact lens solution
Detergents
Diagnostic agents
Disinfectants (for nondermatologic use)
Emetics
Emollients, demulcents, and protectants
Gallbladder function agents
Kidney function agents
Lipotropic agents
Liver function agents
Mouthwashes and gargles
Myasthenia gravis drugs
Pituitary function agents
Thrombolytic agents
Thyroid function agents
Vitamin A
Vitamin C
Vitamin E

commonly dispensed drug to TSRx beneficiaries by retail pharmacies, but ranked 157th at MTFs and 149th at the TMOP.

Other drugs were far more commonly dispensed from MTFs than from retail pharmacies. The angiotensin-converting–enzyme (ACE) inhibitor Zestril (lisinopril), which is on the BCF, was the second-most commonly dispensed drug to TSRx beneficiaries at MTFs but ranked only 17th at retail pharmacies. The gastrointestinal Aciphex (rabepra-

Table 3.3
Drugs Most Frequently Dispensed to TSRx Beneficiaries

Brand Name	Active Ingredient	Total Number of 30-day Equivalent Scripts	Rank by Dispensing Location Number of Prescriptions Dispensed		
			MTFs	Mail Order	Retail
Zocor	simvastatin	2,795,672	1	1	5
Premarin	conjugated estrogens	1,535,631	3	3	4
Zestril	lisinopril	1,480,276	2	6	17
Synthroid	synthroid	1,380,516	4	9	8
Atenolol	atenolol	1,283,070	5	5	6
Norvasc	amlodipine	955,357	9	7	9
Hydrochlorothiazide	hydrochlorothiazide	950,848	8	12	11
Furosemide	furosemide	909,070	11	11	3
Aciphex	rabeprazole	800,026	6	39	74
Fosamax	alendronate	718,311	14	8	12
Aspirin*	aspirin	672,894	7	—	—
Celebrex	celcoxib	667,753	22	4	7
Prilosec	omeprazole	651,098	31	2	10
Lipitor	atorvastatin	628,219	121	13	1
Triamterene w/ hydrochlorothiazide	triamterene w/ hydrochlorothiazide	628,168	16	16	15
Glucophage	metformin	607,210	10	32	56
Vioxx	rofecoxib	525,203	28	10	13
Lopressor	metoprolol tartrate	502,233	18	23	24
Tiazac	diltiazem	479,371	13	33	95
Lanoxin	lanoxin	478,054	12	122	49
Ranitidine	ranitidine	458,077	17	27	46
Coumadin	warfarin	440,039	15	85	54
Allegra	fexofenadine	430,811	19	26	41
Plavix	clopidogrel	404,286	29	22	21
Potassium chloride	potassium chloride	390,080	26	18	29
Hydrocodone w/ acetaminophen	hydrocodone w/ acetaminophen	334,075	157	149	2

*Aspirin, an over-the-counter medication, is not covered through the TMOP or retail outlets.

zole)[2] ranked 6th at MTFs but 74th at civilian pharmacies. Aspirin, an over-the-counter medicine, was the seventh most frequently dispensed drug to TSRx beneficiaries at MTFs, but is not covered under the TRICARE benefit if obtained from the TMOP or retail outlets.

Estimated Ingredient Costs

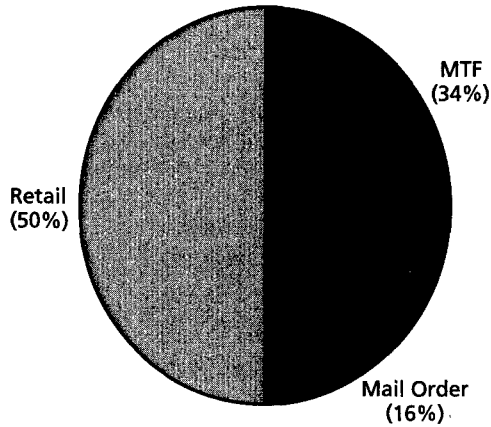
The total estimated ingredient cost of pharmacy items dispensed to TSRx beneficiaries in FY 2002 was $1.43 billion, or $26.64 per 30-day equivalent prescription. The breakdown of estimated ingredient cost by dispensing location (Figure 3.2) is quite different from the breakdown of utilization. Retail pharmacies accounted for only 30 percent of prescription volume but more than half of estimated ingredient costs. This difference reflects the above-average estimated ingredient cost of retail prescriptions—$44.25 per 30-day equivalent prescription[3] compared to $25.23 for mail-order prescriptions and $16.98 for MTF prescriptions.

The difference in the average estimated ingredient costs among dispensing locations is explained by two factors: (1) differences in the mix of drugs dispensed at each location, and (2) differences in prices paid by DoD for the same drug dispensed from various locations. Table 3.3 demonstrates the importance of drug mix in this calculation. Aspirin, which costs pennies per day of treatment, is the seventh most dispensed drug by MTFs, while celecoxib, which can cost several dollars per day of treatment, is the seventh most frequently prescribed drug at retail pharmacies. Even if there were no difference in the mix of drugs, the average estimated ingredient cost at MTFs and the TMOP would still be lower than the average estimated ingredient cost at retail pharmacies because, as we show later in this chapter, estimated ingredi-

[2] Many MTFs included rabeprazole on their local formularies because they received a substantial price concession on it (Davies, 2003a).

[3] DoD's average estimated ingredient cost for retail prescriptions, $44.25 per 30-day equivalent, appears to be lower than the average retail price of all retail prescriptions in the United States ($45.79 in 2000, according to the Generic Pharmaceutical Association; see <http://www.gphaonline.org/pdf/average-price.pdf>).

Figure 3.2
Aggregate Estimated Ingredient Cost by Dispensing Location (TSRx only)



RAND *MG237-3.2*

ent costs are lower for a given drug if it is dispensed from MTFs or the TMOP than if it is dispensed from a retail pharmacy.

The highest-cost therapeutic classes, ranked in descending order of total estimated ingredient cost, are shown in Table 3.4. Consistent with the prescription-level data, cardiovascular drugs, gastrointestinal agents, nonsteroidal anti-inflammatory drugs, antidepressants, and antidiabetic agents dominate the overall list as well as the three lists stratified by dispensing location. These therapeutic classes also are among the highest-cost classes in the civilian sector (National Institute for Health Care Management, 2002).

The 25 highest-cost drugs, ranked in descending order of total estimated ingredient cost, are shown in Table 3.5. As in the civilian sector, antihyperlipidemics, gastrointestinals, COX-2 inhibitors, and antihypertensives are well represented, and as expected, there are no generic products listed. Drugs for mental health conditions appear to be less widely used in the TSRx program than in the civilian sector. For example, the atypical antipsychotic Zyprexa (olanzapine), which is one of the 10 best-selling drugs in the world (in terms of total dollar sales), was only the 50th costliest drug in the TSRx program.

Another finding is that several of the highest-cost drugs in the retail pharmacies—for example, atorvastatin, lansoprazole, esome-

Table 3.4
25 Highest-Cost Therapeutic Classes (TSRx Only)

Therapeutic Class (as Defined by the PDTS)	Aggregate Acquisition Cost (in Dollars)	Rank by Dispensing Location and Estimated Ingredient Cost		
		MTF	Mail	Retail
Antihyperlipidemic agents	169,162,754	1	5	2
Cardiac drugs	165,003,983	2	1	3
Miscellaneous gi drugs	133,834,380	5	2	1
Unclassified agents	121,888,130	3	3	4
NSAIDS/COX-2 inhibitors	94,600,919	6	4	5
Antidepressants	58,229,918	7	7	6
Misc. Antidiabetic agents	56,530,277	4	6	8
Sympathomimetic agents	42,603,998	8	8	11
Antihistamine drugs	37,584,872	10	9	10
Antineoplastic agents	35,527,618	14	10	9
Opiate agonists	31,210,837	20	25	7
Estrogens	29,433,878	9	14	18
Hypotensive agents	29,035,016	12	15	13
Anti-inflammatory agents	27,212,332	11	21	14
Misc. EENT drugs	22,930,622	15	18	21
Misc. anticonvulsants	21,608,094	18	16	16
Parasympathomimetic (cholinergic agents)	20,317,223	27	12	15
Adrenals	19,189,149	13	22	28
Hematopoietic agents	18,992,303	16	23	23
Genitourinary smooth muscle relaxants	18,808,450	23	11	17
Quinolones	18,443,039	33	48	12
Vasodilating agents	18,199,264	21	13	20
Misc. Anxiolytics, sedatives, and hypnotics	13,777,151	24	29	19
Anticoagulants	13,437,680	19	36	25
Anti-Parkinson and anti-migraine agents	13,093,624	28	20	24
Tranquilizers	13,042,939	34	24	22

Table 3.5
25 Highest-Cost Drugs in the TSRx Program

Brand Name	Active Ingredient(s)	Estimated Ingredient Cost (in Dollars)	Rank by Dispensing Location and Estimated Ingredient Cost		
			MTF	Mail	Retail
Zocor	simvastatin	102,514,714	1	3	3
Prilosec	omeprazole	62,097,832	4	1	2
Celebrex	celcoxib	47,916,991	5	2	4
Fosamax	alendronate	40,128,099	2	5	10
Lipitor	atorvastatin	37,531,384	48	9	1
Vioxx	rofecoxib	29,904,020	9	4	8
Plavix	clopidogrel	29,058,195	7	6	7
Norvasc	amlodipine	28,650,196	6	7	11
Glucophage	metformin	20,703,311	3	44	44
Prevacid	lansoprazole	19,607,359	83	46	5
Advair Diskus	salmeterol/fluticasone	17,607,646	18	11	14
Premarin	conjugated estrogens	17,225,865	8	24	25
Neurontin	gabapentin	16,688,487	22	14	12
Avandia	rosiglitazone maleate	16,400,366	12	13	28
Zestril	lisinopril	16,288,247	10	21	27
Nexium	esomeprazole	15,618,271	298	59	6
Zoloft	sertraline	15,521,430	13	18	24
Aciphex	rabeprazole	14,170,681	14	109	21
Pravachol	pravastatin	13,683,079	144	47	9
Paxil	paroxetine	13,560,179	25	23	22
Actos	pioglitazone	13,559,833	47	8	18
Aricept	donepezil	13,236,354	43	15	13
Allegra	fexofenadine	12,470,708	19	34	30
Claritin	loratadine	12,085,861	72	12	15
Flonase	fluticasone	10,886,118	11	76	74

prazole, and pravastatin—are not among the costliest drugs within the direct-care system. This discrepancy presumably is due to administrative restrictions imposed by MTFs and the TMOP. Atorvastatin and pravastatin, for example, can be dispensed from an MTF or through the mail only if the prescriber provides evidence of medical necessity. The TMOP imposes a prior authorization requirement on esomeprazole.

We confirmed that estimated ingredient costs are higher for certain widely used drugs dispensed from retail pharmacies than for the same drugs dispensed from MTFs or the mail order program (Table 3.6). For example, the estimated ingredient cost of simvastatin 20 mg tablets is six times higher if dispensed from a retail pharmacy than if dispensed from the TMOP.[4]

Time Trends

The total number of prescriptions filled by retail pharmacies and the TMOP increased steadily throughout FY 2002. By contrast, the number of prescriptions filled at MTFs declined slightly during the course of the year (Figure 3.3).

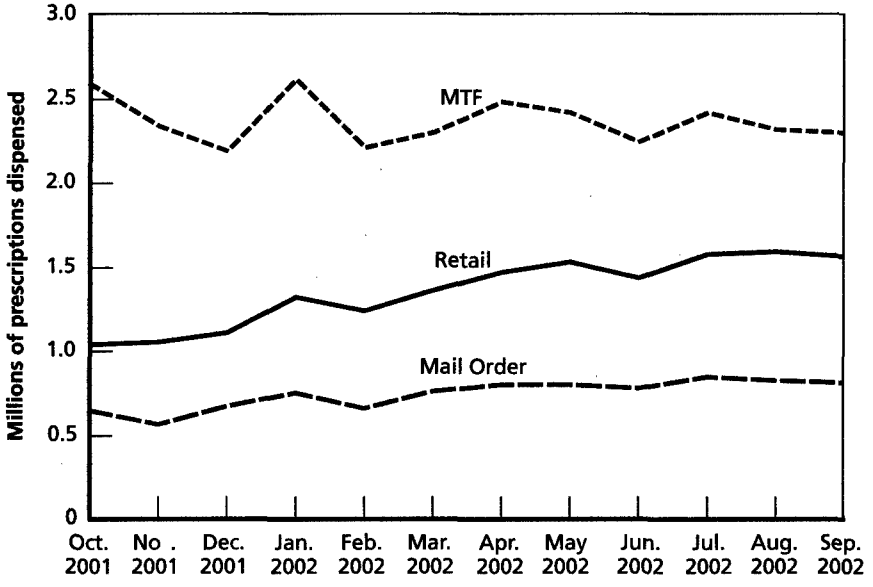
Comparing the first and last months of the FY—October 2001 and September 2002—we see that the proportion of drugs dispensed from retail pharmacies and the TMOP increased considerably, whereas the proportion of drugs dispensed from MTFs declined (Figure 3.4).

Table 3.6
Mean Estimated Ingredient Cost Per Tablet of Eight High-Cost Drugs, by Dispensing Location

			Mean Estimated Ingredient Cost Per Tablet (in Dollars)		
Brand Name	Active Ingredient	Dose (mg)	MTF	Mail	Retail
Zocor	simvastatin	20	0.95	0.61	3.66
Prilosec	omeprazole	20	2.45	2.15	3.85
Celebrex	celecoxib	100	1.10	0.92	1.38
Lipitor	atorvastatin	10	1.17	0.77	1.91
Fosamax	alendronate	10	1.15	1.23	2.01
Vioxx	rofecoxib	25	1.48	1.54	2.33
Plavix	clopidogrel	75	1.87	1.93	3.27
Norvasc	amlodipine	5	0.70	0.73	1.22

[4] It should be noted, however, that the mean estimated ingredient costs of simvastatin reported in Table 3.6 do not align with published contract prices. PEC staff blame the discrepancy on a data integrity problem caused by MTFs using the NDC number of a noncontracted discontinued package size for simvastatin (LTC Donald W. DeGroff, April 30, 2003, email).

Figure 3.3
30-Day Equivalent Prescriptions Dispensed to TSRx Beneficiaries



AND *MG237-3.3*

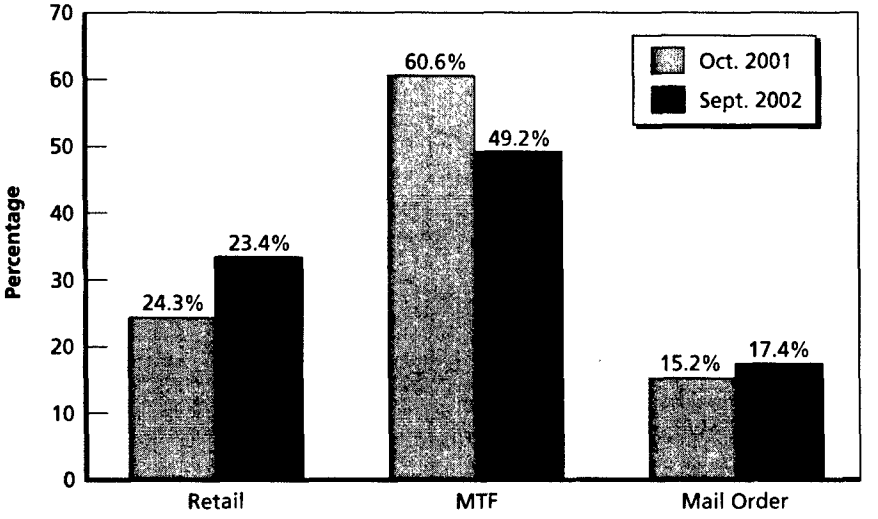
The general pattern observed in the aggregate time-trend analysis was observed for all of the top therapeutic drug classes with the exception of estrogens. That is to say, the proportion of prescriptions for these drug classes filled at retail pharmacies and by TMOP increased, while the proportion filled at MTFs steadily decreased. Similar patterns were observed for most high-cost drugs.

The aggregate, class-level, and drug-level analyses also exhibited a seasonal effect, with the greatest changes in dispensing levels occurring between December and January for MTFs, during November and December for the TMOP, and between December and January for retail pharmacies.

Assessment of Utilization for 45- to 64-Year-Olds

As discussed in Chapter Two, one of the objectives of this study was to identify similarities and differences between TSRx users and 45- to 64-

Figure 3.4
Changes in Mix of Dispensing Locations: October 2001 versus September 2002 (TSRx Only)



AND *MG237-3.4*

year-old non–active-duty TRICARE pharmacy users. To that end, we have listed the drugs most frequently dispensed to 45- to 65-year-old beneficiaries, ranked by prescription volume and estimated ingredient cost (see Appendix A). In general, these results are very similar to those presented above for the TSRx beneficiaries, with two notable differences.

First, the TMOP is used more widely among TSRx beneficiaries than among 45- to 64-year-olds, presumably because older beneficiaries are more likely to be treated for chronic conditions. About 17 percent of 30-day equivalent prescriptions dispensed to TSRx beneficiaries were dispensed through the TMOP, compared to just 8 percent in the 45- to 64-year-old cohort. This pattern is similar to that observed in the private sector (Reissman, 2003).

Second, estrogens were more widely used among the younger cohort, as one would expect. Among TSRx beneficiaries, estrogens were the seventh most widely dispensed drug class; among the 45- to 64-year-olds, estrogens ranked second.

Summary

In this chapter, we provided our findings for the most frequently dispensed therapeutic classes and drugs, by dispensing location, based on the number of 30-day equivalent prescriptions dispensed. We then ranked drug classes and drugs by estimated ingredient cost. To assess the association between dispensing location and estimated ingredient cost, we calculated the mean cost per tablet for a number of high-cost, widely dispensed drugs. We then analyzed monthly prescription data collected between October 2001 and September 2002 to examine changes in dispensing patterns over time, by location.

Although the majority of TSRx prescriptions in FY 2002 were dispensed from MTF pharmacies, the majority of TSRx estimated ingredient costs went to drugs dispensed from retail pharmacies. Moreover, there was a steady trend throughout FY 2002 toward greater use of retail pharmacies and less use of MTFs. As expected, estimated ingredient costs for high-cost, widely-dispensed drugs were significantly higher for drugs dispensed from retail pharmacies than for drugs dispensed through MTFs and the TMOP, suggesting that DoD-estimated ingredient costs could be reduced if dispensing shifted from retail pharmacies to MTFs or the TMOP.

The trends observed among 45- to 64-year-old non–active-duty TRICARE beneficiaries were similar to those observed in the TSRx population.

CHAPTER FOUR

Association Between MTF Geographic Proximity and Choice of Dispensing Location

In this chapter, we present the results of analyses designed to assess the impact of MTF geographic proximity on TSRx usage patterns. First, we present unadjusted means of prescriptions dispensed by proximity to MTFs. We then present the results of three sets of regression models—one for each dispensing location—that examine what factors influence where TSRx beneficiaries obtain their medications and their overall use of the TSRx benefit.

Descriptive Statistics

The demographic and geographic characteristics of TSRx users and eligible nonusers are reported in Table 4.1. Approximately 70 percent of TSRx eligibles used the TSRx program at some point during FY 2002. Women were more likely than men to be users of the TSRx benefit. The average distance from the closest MTF was 34 miles for users of the benefit and 42 miles for nonusers.

Each of the TRICARE regions listed in Table 4.1 contracts with a different managed care support contractor. A disproportionate number of users lived in the Gulf South and Southeast regions, whereas a disproportionate number of nonusers resided in the Northeast.

During FY 2002, 59 percent of TSRx users used an MTF pharmacy, 24 percent used the TMOP, and 67 percent used a retail pharmacy. The overlap among MTF users, TMOP users, and retail pharmacy users was considerable: 52 percent of MTF users also used a retail pharmacy, and 14 percent of MTF users also used the TMOP. Only 17 percent

Table 4.1
Selected Characteristics of TSRx Users and Nonusers

	TSRx Users (N = 1,145,432)		TSRx-Eligible Nonusers (N = 484,197)	
	Number	Percent	Number	Percent
Sex				
Male	546,976	47.75%	276,616	57.13%
Female	598,164	52.22%	206,326	42.61%
Missing	292	0.03%	1,255	0.26%
Age (mean; SD)	73.05	6.28	73.28	6.81
64 to 74	741,558	64.74%	309,415	63.90%
75 to 84	356,880	31.16%	145,446	30.04%
85 and up	46,993	4.10%	29,318	6.05%
Missing	1	0.00%	18	0.00%
Beneficiary Relationship to Sponsor				
Sponsor	551,974	48.19%	280,590	57.95%
Dependent	593,458	51.81%	203,607	42.05%
Missing	0	0.00%	0	0.00%
Urbanicity of Primary Residence				
Urban	775,341	67.69%	336,413	69.48%
Not urban	354,719	30.97%	133,561	27.58%
Missing	15,372	1.34%	14,223	2.94%
Distance Between Primary Residence and Closest MTF, in Miles (Mean; SD)	**33.93**	**44.02**	**41.82**	**47.92**
20 miles or less	618,167	53.97%	216,913	44.80%
21 to 40 miles	166,611	14.55%	85,243	17.61%
More than 40 miles	351,162	30.66%	177,562	36.67%
Missing	9,492	0.83%	4,479	0.93%
Distance Between Primary Residence and Second-Closest MTF, in Miles (Mean; SD)	**58.04**	**58.77**	**64.50**	**58.33**
20 miles or less	379,080	33.09%	116,983	24.16%
21 to 40 miles	165,748	14.47%	87,954	18.16%
More than 40 miles	591,112	51.61%	274,781	56.75%
Missing	9,492	0.83%	4,479	0.93%

Table 4.1 (Continued)

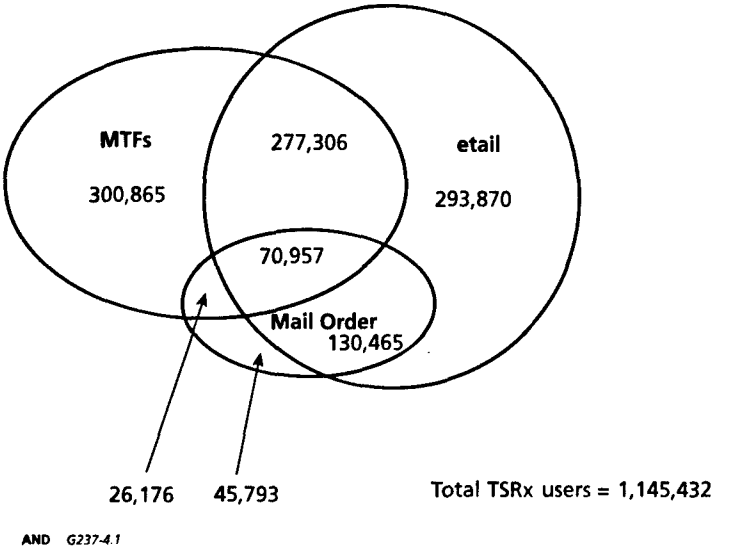
	TSRx Users (N = 1,145,432)		TSRx-Eligible Nonusers (N = 484,197)	
TRICARE Region	**Number**	**Percent**	**Number**	
Alaska	2,608	0.23%	1,348	0.28%
Golden Gate	52,244	4.56%	34,985	7.23%
Gulf South	108,495	9.47%	30,149	6.23%
Hawaii	9,312	0.81%	4,195	0.87%
Heartland	87,049	7.60%	51,002	10.53%
Mid Atlantic	87,324	7.62%	23,036	4.76%
Northeast	145,326	12.69%	92,659	19.14%
Northwest	52,352	4.57%	27,705	5.72%
Puerto Rico/Virgin Islands	1,941	0.17%	7,534	1.56%
Southeast	191,607	16.73%	52,879	10.92%
Southern California	77,739	6.79%	37,553	7.76%
Southwest	156,133	13.63%	54,731	11.30%
Central	168,908	14.75%	60,540	12.50%
WESTPAC	824	0.07%	224	0.05%
Missing	3,570	0.31%	5,657	1.17%
Number of 30-Day Equivalent Prescriptions (mean; SD)	46.79	36.29	0.00	0.00
Estimated Ingredient Costs, in Dollars (mean; SD)	1,247.57	1,545.93	0.00	0.00

Note: Users defined as TSRx beneficiaries ages 65 and over who used the TSRx program at least once during FY 2002. Of the total, 127,062 people were excluded from the table because they had no primary residence (a ZIP code in which the beneficiary lived for at least 6 of the 12 months in FY 2002).

Of the total, 34,164 TSRx users (3.0 percent) were eligible for TSRx for 6 to 11 months. To compensate for their shorter period of enrollment, we multiplied these beneficiaries' utilization and costs by 12/X, where X was the number of months of enrollment.

of TMOP users relied exclusively on the TMOP. That is, 83 percent of beneficiaries who used the TMOP also used an MTF pharmacy, a retail pharmacy, or both (Figure 4.1). Beneficiaries age 85 and over and women were slightly more likely to use retail pharmacies than their younger male counterparts. Beneficiaries who relied exclusively on MTF pharmacies were slightly younger and more likely to be male than beneficiaries who

Figure 4.1
Dispensing Locations Selected by TSRx Users



relied exclusively on the TMOP or retail pharmacies. Also, beneficiaries who relied exclusively on MTFs tended to live much closer to an MTF pharmacy (15.8 miles, on average) than other beneficiaries (40.4 miles, on average).

Descriptive statistics about the relationship between proximity to MTFs and the rate of use of the three dispensing locations are shown in Table 4.2. For the most part, the closer a beneficiary lived to an MTF, the more likely that he or she used an MTF. Similarly, the likelihood of using the TMOP or a retail pharmacy increased as distance to an MTF rose. Contrary to our expectations, beneficiaries in the third category (within 20 miles of MTF, more than 40 miles from second-closest MTF) had higher MTF use than beneficiaries in the second category (within 20 miles of one MTF, 21 to 40 miles of a second MTF). We are unable to explain this finding.

Descriptive statistics about the number of prescriptions at each dispensing location are presented in Table 4.3. The table shows a strong positive association among TSRx users between proximity to an MTF and MTF utilization, and it shows a strong inverse association between

Table 4.2
Proximity to MTFs and Likelihood of Use at Each Dispensing Location

Geographic Proximity of Beneficiary to MTFs	MTF Pharmacy Use		TMOP Use		Retail Pharmacy Use	
	Number	Percent	Number	Percent	Number	Percent
Within 20 miles of two MTFs (N = 379,080)	320,422	84.53	50,312	13.27	187,157	49.37
Within 20 miles of one MTF, 21–40 miles of a second MTF (N = 84,933)	50,736	59.74	20,670	24.34	56,499	66.52
Within 20 miles of one MTF, more than 40 miles from second-closest MTF (N= 154,154)	111,990	72.65	30,977	20.09	102,293	66.36
21 to 40 miles from closest MTF 21 to 40 miles from second-closest MTF (N = 80,815)	43,434	53.74	21,846	27.03	58,857	72.83
21 to 40 miles from one MTF, more than 40 miles from second-closest MTF (N = 85,796)	41,548	48.43	25,664	29.91	66,594	77.62
More than 40 miles from closest MTF (N = 360,654)	107,174	29.72	123,922	34.36	301,198	83.51

Note: Sample includes all TSRx users, except those with no primary residence during FY 2002. Differences across subgroups were significant (Chi-square test; p = 0.001).

proximity to an MTF and TMOP utilization. A moderately strong inverse association was observed between proximity to an MTF and utilization of retail pharmacies, with beneficiaries living more than 40 miles from an MTF filling more than twice as many prescriptions at retail pharmacies as people living within 20 miles of two MTFs. It should be noted, however, that MTFs cover over-the-counter medications, which could skew the comparison.

We repeated the analysis in Table 4.3 for the following subgroups: male beneficiaries, female beneficiaries, beneficiaries under the age of 75, beneficiaries between the ages of 75 and 84, beneficiaries over the age of 84, beneficiaries living in urban areas, beneficiaries living in rural areas, beneficiaries who are sponsors, and beneficiaries who are dependents. In every case, the results were similar to those shown in Table 4.3.

Table 4.3
Proximity to MTFs and Average Number of Prescriptions at Each Dispensing Location

Geographic Proximity of Beneficiary to MTFs	MTF Scripts		TMOP Scripts		Retail Scripts	
	Mean	SD	Mean	SD	Mean	SD
Within 20 miles of two MTFs (N = 379,080)	38.68	37.20	3.26	12.18	8.51	17.40
Within 20 miles of one MTF, 21 to 40 miles of a second MTF (N = 84,933)	24.07	32.36	7.74	19.46	14.31	22.56
Within 20 miles of one MTF, more than 40 miles from second-closest MTF (N = 154,154)	29.30	32.81	5.63	16.33	12.62	20.37
21 to 40 miles from closest MTF; 21 to 40 miles from second-closest MTF (N = 80,815)	20.97	30.81	8.76	20.40	15.71	22.74
21 to 40 miles from one MTF, more than 40 miles from second-closest MTF (N = 85,796)	17.97	28.36	10.03	21.88	16.89	23.15
More than 40 miles from closest MTF (N = 360,654)	10.73	23.75	12.77	24.73	20.04	25.28

NOTE: Sample includes all TSRx users, except those with no primary residence during FY 2002. Differences across subgroups were significant (ANOVA test; p = 0.001).

Multivariate Analyses

As discussed in Chapter Two, we estimated multivariate regression models to examine the independent association of geographic proximity with utilization of the different dispensing locations. These results are presented below. Because of the large analytic sample, many of the explanatory variables were statistically significant, so it is important to interpret the results in the context of their relevance to TSRx policy.

Our statistical analyses used a three-part model for each of the dispensing locations. The first part of the model, which included the entire study sample, used logistic regression to estimate the probability

that a TSRx member had at least one pharmacy claim, regardless of dispensing location. The second part of the model, which included only users of prescription drugs, used logistic regression to estimate the probability that a TSRx member filled at least one prescription at a specific dispensing location (i.e., separate models for MTF, TMOP, and retail). The third part of the model used negative binomial regressions to estimate the number of 30-day equivalent prescriptions dispensed at each location, conditional on having used an MTF, TMOP, or retail pharmacy, respectively.

TSRx Use

Proximity to MTFs was associated with an increased likelihood of using the TSRx program (Table 4.4). For example, our simulations show that TSRx beneficiaries who lived within 20 miles of two MTFs were 14 percentage points more likely to use the TSRx program (78.1 percent versus 64.1 percent) than those who lived more than 40 miles from either of the two closest MTFs. Other factors associated with use of the TSRx benefit include age, urbanicity, and dependent status. Beneficiaries age 75 to 84 were slightly more likely to use the TSRx benefit than those age 65 to 74, whereas those age 85 and over were less likely to use the benefit. Dependents and those living in rural areas

Table 4.4
Use of the TSRx Benefit

	Any TSRx Use		
	OR	95%	CI
Male	0.97	0.93	1.01
Age 75 to 84	1.05	1.04	1.05
Age 85 and up	0.69	0.68	0.70
Sponsor	0.70	0.67	0.73
Urban	0.73	0.73	0.74
Less than 20 miles to closest MTF	1.44	1.42	1.46
21 to 40 miles to closest MTF	1.20	1.18	1.21
Less than 20 miles to second-closest MTF	1.43	1.41	1.44
21 to 40 miles to second-closest MTF	0.99	0.97	1.00

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

were more likely to use the benefit than the sponsors and those living in urban areas, respectively.

MTF Use

Among TSRx users, proximity to MTFs was associated with a dramatic increase in the likelihood of using an MTF (Table 4.5) and a modest increase in the number of prescriptions filled at MTFs. TSRx users who lived within 20 miles of two MTFs were more than three times as likely to use an MTF pharmacy as TSRx users who lived more than 40 miles from an MTF (85.8 percent versus 25.9 percent). MTF users who lived within 20 miles of two MTFs averaged 46.7 MTF prescriptions in FY 2002, compared to 34.9 MTF prescriptions among MTF users who did not live within 40 miles of an MTF. These results were virtually the same when we excluded a small portion of enrollees with only 6 to 11 months of TSRx eligibility. Although TSRx users in the 75 to 84 age group were less likely than younger TSRx users to use MTFs, MTF users aged 75 to 84 obtained more prescriptions through MTFs than MTF users in the 65 to 74 age group.

Table 4.5
MTF Use

	Any MTF Use			Number of MTF Scripts		
	OR	95%	CI	Coeff.	z	p-value
Male	1.57	1.49	1.67	–0.054	–3.61	≤0.001
Age 75 to 84	0.73	0.73	0.74	0.029	12.35	≤0.001
Age 85 and up	0.45	0.44	0.46	–0.013	–2.25	0.025
Sponsor	0.70	0.66	0.74	–0.047	–3.14	0.002
Urban	0.73	0.72	0.74	–0.035	–13.17	≤0.001
Less than 20 miles to closest MTF	6.68	6.59	6.77	0.136	36.35	≤0.001
21 to 40 miles to closest MTF	3.27	3.22	3.32	0.071	15.85	≤0.001
Less than 20 miles to second-closest MTF	2.87	2.83	2.91	0.156	51.37	≤0.001
21 to 40 miles to second-closest MTF	0.97	0.95	0.98	0.026	7.03	≤0.001

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

TMOP Use

The results of the TMOP analysis are shown in Table 4.6. Among TSRx users, proximity to MTFs was associated with a reduced likelihood of using the TMOP. TSRx users who lived within 20 miles of two MTFs were roughly three times less likely to use the TMOP than TSRx users who lived more than 40 miles from an MTF (12.5 percent versus 37.0 percent).

Beneficiaries in the 75 to 84 age group were slightly less likely—and those 85 and older slightly more likely—to obtain drugs through the TMOP, than those 65 to 74 years of age. Those living in urban areas were more likely to use this mail-order program than those living in rural areas.

TMOP users who lived within 20 miles of two MTFs averaged 23.9 TMOP prescriptions, whereas TMOP users who lived more than 40 miles from an MTF pharmacy averaged 38.0 TMOP prescriptions—a difference of 63 percent. These results were virtually unchanged when we excluded a small portion of enrollees with 6 to 11 months of TSRx eligibility. The oldest beneficiaries, those aged 85 and up, were least likely to use the TMOP. However, when we limited the

Table 4.6
TMOP Use

	Any TMOP Use			Number of TMOP Scripts		
	OR	95%	CI	Coeff.	z	p-value
Male	1.01	0.95	1.08	–0.137	–6.25	≤0.001
Age 75 to 84	1.02	1.01	1.03	0.104	29.44	≤0.001
Age 85 and up	0.86	0.84	0.88	0.171	19.68	≤0.001
Sponsor	0.99	0.93	1.05	–0.012	–0.53	0.597
Urban	1.27	1.26	1.28	0.050	13.21	≤0.001
Less than 20 miles to closest MTF	0.47	0.47	0.48	–0.273	–52.38	≤0.001
21 to 40 miles to closest MTF	0.66	0.65	0.67	–0.165	–30.92	≤0.001
Less than 20 miles to second-closest MTF	0.51	0.50	0.51	–0.189	–31.16	≤0.001
21 to 40 miles to second-closest MTF	0.98	0.96	0.99	0.020	3.49	≤0.001

Note: Regional dummy variables were included in the regression equations but are not shown in the table

analysis to those beneficiaries who used the TMOP, the oldest beneficiaries received the most TMOP prescriptions. Those living in urban areas obtained more prescriptions through the TMOP than did those living in rural areas.

In a sensitivity analysis, we repeated the TMOP analyses controlling for four chronic conditions: depression (1 if the beneficiary received an antidepressant in FY 2002, 0 otherwise); gastrointestinal conditions (1 if the beneficiary received a gastrointestinal drug in FY 2002, 0 otherwise); cardiac conditions (1 if the beneficiary received a cardiac drug in FY 2002, 0 otherwise); and hyperlipidemia (1 if the beneficiary received an antihyperlipidemic in FY 2002, 0 otherwise). These results were very similar to those presented in Table 4.6 (see Table 4.7). As expected, the presence of a chronic condition is associated with a significantly increased likelihood of use and volume of use of the TMOP.

Table 4.7
TMOP Use, Controlling for Four Chronic Conditions

	Any TMOP Use			Number of TMOP Scripts		
	OR	95%	CI	Coeff.	z	p-value
Male	0.98	0.92	1.04	–0.173	–8.47	≤0.001
Age 75 to 84	1.03	1.02	1.04	0.098	29.71	≤0.001
Age 85 and up	0.91	0.89	0.93	0.191	23.40	≤0.001
Sponsor	1.01	0.96	1.08	0.017	0.83	0.405
Urban	1.27	1.26	1.29	0.052	14.51	≤0.001
Less than 20 miles to closest MTF	0.46	0.45	0.47	–0.274	–56.27	≤0.001
21 to 40 miles to closest MTF	0.65	0.64	0.66	–0.166	–33.14	≤0.001
Less than 20 miles to second-closest MTF	0.49	0.49	0.50	–0.193	–33.93	≤0.001
21 to 40 miles to second-closest MTF	0.97	0.96	0.99	0.019	3.54	≤0.001
Hyperlipidemia	1.48	1.46	1.49	0.254	81.56	≤0.001
Cardiac condition	1.24	1.23	1.25	0.459	141.58	≤0.001
Depression	1.07	1.06	1.09	0.292	76.23	≤0.001
GI condition	1.28	1.27	1.29	0.242	75.49	≤0.001

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

Retail Pharmacy Use

The results of the retail pharmacy analysis are shown in Table 4.8. TSRx users who lived within 20 miles of two MTFs were 26 percentage points less likely to use a retail pharmacy than TSRx users who lived more than 40 miles from an MTF (49.4 percent versus 85.7 percent). TSRx users age 65 to 74 were less likely to use retail pharmacies than either older age category. Dependents and those living in urban areas were slightly less likely to use retail pharmacies than sponsor beneficiaries and those living in rural areas.

Retail pharmacy users who lived within 20 miles of two MTFs averaged 17.0 retail pharmacy prescriptions, whereas retail users who lived more than 40 miles from an MTF pharmacy averaged 24.0 retail prescriptions. Again, the results were essentially the same when we excluded a small portion of TSRx users with only 6 to 11 months of TSRx eligibility. Retail pharmacy users ages 75 to 84 and 85 and older were more likely to use retail pharmacies and filled more prescriptions at retail pharmacies than those 65 to 74.

To view the results of the three-part models in a slightly different way, we predicted (i.e., simulated) the average number of prescriptions at each of the three dispensing locations for two subgroups of beneficiaries: those who live within 20 miles of two MTFs and those who live more than 40 miles from any MTF. We found that beneficiaries who live near at least two MTFs averaged a total of 40.1 prescriptions, of which 78.1 percent were obtained from MTFs. Among beneficiaries who live far away from MTFs, the average number of prescriptions was 27.8, among which only 20.9 percent were from MTFs. Thus, living near MTFs was associated with an increase in the number of total TSRx prescriptions as well as an increase in the proportion of prescriptions obtained from MTFs.

Analysis of Utilization by 45- to 64-Year-Olds

The demographic and geographic characteristics of non–active-duty 45- to 64-year-old TRICARE pharmacy users and eligible nonusers are reported in Table 4.8. About 53 percent of these TRICARE-eligible, non–active-duty beneficiaries filled a prescription through the TRICARE program at some point during FY 2002, compared to a use

Table 4.8
Retail Pharmacy Use

	Any Retail Use			Number of Retail Scripts		
	OR	95%	CI	Coeff.	z	p-value
Male	0.73	0.69	0.77	–0.294	–18.90	≤0.001
Age 75 to 84	1.41	1.39	1.42	0.203	79.01	≤0.001
Age 85 and up	1.57	1.54	1.61	0.410	70.04	≤0.001
Sponsor	1.07	1.01	1.13	–0.010	-0.67	0.505
Urban	0.99	0.98	1.00	–0.008	–3.01	0.003
Less than 20 miles to closest MTF	0.36	0.35	0.36	–0.229	–61.05	≤0.001
21 to 40 miles to closest MTF	0.55	0.54	0.56	–0.136	–33.40	≤0.001
Less than 20 miles to second-closest MTF	0.48	0.47	0.48	–0.117	–28.74	≤0.001
21 to 40 miles to second-closest MTF	0.95	0.94	0.97	0.062	15.22	≤0.001

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

rate of 70 percent among the TSRx-eligible beneficiaries. (When partial-year enrollees were excluded, the use rate remained at 53 percent.)

Use of Dispensing Locations

During FY 2002, 69.5 percent of 45- to 64-year-old TRICARE pharmacy users used an MTF pharmacy, 10.1 percent used the TMOP, and 45.1 percent used a retail pharmacy. Overlap existed among MTF users, TMOP users, and retail pharmacy users, but this overlap was less than in the TSRx population. Of all MTF users in this age group, 24.8 percent also used a retail pharmacy and 4.9 percent of MTF users also used the TMOP (Figure 4.2). The comparable figures for the TSRx program were 51.6 percent and 14.4 percent, respectively.

The rate of use by MTF proximity is shown in Table 4.9. As in the TSRx population, MTF proximity had a strong association with MTF use and a strong inverse association with TMOP/retail use.

Descriptive statistics about the relationship between proximity to MTFs and the number of prescriptions at each dispensing location are presented in Table 4.10. MTF proximity was correlated with MTF

Table 4.9
Selected Characteristics of 45- to 65-Year-Old TRICARE Pharmacy Users and Nonusers

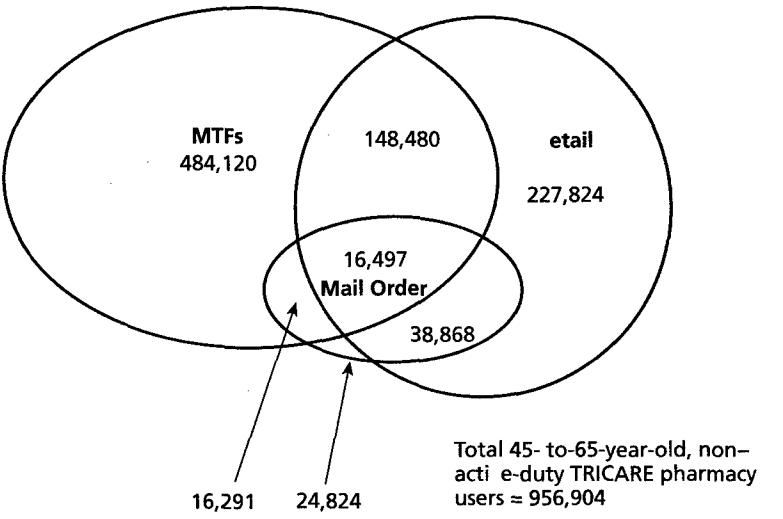
	TRICARE users (N = 956,904)		TRICARE Nonusers (N = 859,722)	
	Number	**Percent**	**Number**	**Percent**
Sex				
Male	414,438	43.31%	479,351	55.76%
Female	542,417	56.68%	378,790	44.06%
Missing	49	0.01%	1,581	0.18%
Age (mean; SD)	54.91	5.74	54.19	5.70
45 to 54	474,070	49.54%	476,460	55.42%
55 to 64	482,654	50.44%	383,136	44.57%
Missing	0	0.00%	0	0.00%
Relationship to Sponsor				
Sponsor	426,652	44.59%	491,621	57.18%
Dependent	530,252	55.41%	368,101	42.82%
Missing	0	0.00%	0	0.00%
Urban Residence				
Urban	639,969	66.88%	581,305	67.62%
Not urban	290,627	30.37%	254,096	29.56%
Missing	26,308	2.75%	24,321	2.83 %
Distance Between Primary Residence and Closest MTF, in Miles (Mean; SD)	27.55	49.83	40.50	51.88
20 miles or less	623,498	65.16%	418,370	48.66%
21 to 40 miles	109,590	11.45%	128,817	14.98%
More than 40 miles	206,814	21.61%	299,553	34.84%
Missing	17,002	1.78%	12,982	1.51%
Distance Between Primary Residence and Second-Closest MTF, in Miles (Mean; SD)	51.18	67.65	63.43	64.08
20 miles or less	411,157	42.97%	249,021	28.97%
21 to 40 miles	127,198	13.29%	136,797	15.91%
More than 40 miles	401,547	41.96%	460,922	53.61%
Missing	17,002	1.78%	12,982	1.51%

Table 4.9 (Continued)

	TRICARE users (N = 956,904)		TRICARE Nonusers (N = 859,722)	
TRICARE Region	**Number**	**Percent**	**Number**	**Percent**
Alaska	6,003	0.63%	4,622	0.54%
Golden Gate	27,895	2.92%	36,101	4.20%
Gulf South	97,603	10.20%	62,915	7.32%
Hawaii	7,741	0.81%	6,268	0.73%
Heartland	74,671	7.80%	97,920	11.39%
Mid Atlantic	93,737	9.80%	61,288	7.13%
Northeast	103,052	10.77%	150,909	17.55%
Northwest	42,657	4.46%	47,364	5.51%
Puerto Rico / Virgin Islands	1,069	0.11%	4,987	0.58%
Southeast	155,922	16.29%	102,287	11.90%
Southern California	57,717	6.03%	46,602	5.42%
Southwest	132,303	13.82%	100,593	11.70%
Central	143,456	14.99%	122,748	14.28%
WESTPAC	1,794	0.19%	874	0.10%
Missing	11,284	1.18%	14,244	1.66%
Number of 30-Day Equivalent Prescriptions (Mean; SD)	32.81	32.77	0.00	0.00
Estimated Ingredient Costs, in Dollars (Mean; SD)	907.60	1547.40	0.00	0.00

Note: Users defined as TRICARE beneficiaries aged 45 to 64 who used the TRICARE pharmacy program at least once during FY 2002. A total of 77,731 beneficiaries were excluded from the table because they had no primary residence (a ZIP code in which the beneficiary resided for at least 6 of the 12 months in FY 2002).
A total of 18,943 TSRx users (2.0 percent of the total) were eligible for TSRx for 6 to 11 months. To compensate for their shorter period of enrollment, we multiplied these beneficiaries' utilization and costs by 12/X, where X was the number of months of enrollment.

Figure 4.2
45- to 64-Year-Old TRICARE Pharmacy Users



AND *MG237-4.2*

use and was inversely correlated with TMOP use and retail use. The strength of these correlations was even greater than in the TSRx population.

Multivariate Analyses for 45-to-64-Year-Olds

The results of multivariate models for any pharmacy use, MTF pharmacy use, TMOP use, and retail pharmacy use for 45- to 64-year-olds are shown in Tables 4.11, 4.12, 4.13, and 4.14, respectively. As with the TSRx population, MTF proximity was positively associated with TRICARE pharmacy use, MTF use, and the number of MTF prescriptions, and MTF proximity was inversely associated with TMOP use, retail use, the number of TMOP prescriptions, and the number of retail prescriptions for the younger population. Specifically, living within 20 miles of two MTFs increased the probability of using the TRICARE pharmacy benefit by 26 percentage points relative to living more than 40 miles from an MTF (64.7 percent versus 38.2 percent). Among TRICARE pharmacy users, living within 20 miles of two MTFs (compared with more than 40 miles from the closest MTF) raised the probability of any

Table 4.10
Proximity to MTFs and Rate of Use of Each Dispensing Location, 45- to 64-Year-Olds

Geographic Proximity of Beneficiary to MTFs	MTF Pharmacy Use		TMOP Use		Retail Pharmacy Used	
	Number	Percent	Number	Percent	Number	Percent
Within 20 miles of two MTFs (N = 411,157)	367,972	89.50	18,859	4.59	112,249	27.30
Within 20 miles of one MTF, 21 to 40 miles of a second MTF (N = 69,151)	49,210	71.16	6,727	9.73	31,155	45.05
Within 20 miles of one MTF, more than 40 miles from second-closest MTF (N = 143,190)	115,487	80.65	10,986	7.67	59,647	41.66
21 to 40 miles from closest MTF; 21 to 40 miles from second-closest MTF (N = 58,047)	34,215	58.94	6,950	11.97	32,940	56.75
21 to 40 miles from one MTF, more than 40 miles from second-closest MTF (N = 51,543)	26,472	51.36	8,595	16.68	33,096	64.21
More than 40 miles from closest MTF (N = 223,816)	72,032	32.18	44,363	19.82	162,582	72.64

Note: Sample includes all non–active-duty TRICARE pharmacy users aged 45 to 64, except those with no primary residence during FY 2002. Differences across subgroups were significant (Chi-square test; p = 0.001).

MTF use by more than threefold (90.2 percent versus 23.8 percent), reduced the probability of TMOP use fivefold (4.6 percent versus 20.8 percent), and reduced the probability of using a retail pharmacy about threefold (27.2 percent versus 78.8 percent).

MTF users who lived within 20 miles of two MTFs averaged 32.5 MTF prescriptions, compared to 27.4 prescriptions among MTF users who lived more than 40 miles from an MTF. TMOP users who lived within 20 miles of two MTFs averaged 18.4 TMOP prescriptions, compared to 31.1 TMOP prescriptions among TMOP users who lived more than 40 miles from an MTF. Finally, retail pharmacy users who lived within 20 miles of two MTFs averaged 15.1 prescriptions, compared to 22.6 prescriptions among retail pharmacy users who lived more than 40 miles from an MTF.

Table 4.11
Proximity to MTFs and Average Number of Prescriptions at Each Dispensing Location, 45- to 64-Year-Olds

Geographic Proximity of Beneficiary to MTFs	MTF Pharmacy Scripts		TMOP Scripts		Retail Pharmacy Scripts	
	Mean	SD	Mean	SD	Mean	SD
Within 20 miles of two MTFs (N = 411,157)	27.75	31.05	0.86	5.94	4.15	13.11
Within 20 miles of one MTF, 21 to 40 miles of a second MTF (N = 69,151)	20.85	28.07	2.42	10.70	8.37	18.48
Within 20 miles of one MTF, more than 40 miles from second-closest MTF (N = 143,190)	24.37	28.89	1.79	9.00	6.78	16.49
21 to 40 miles from closest MTF; 21 to 40 miles from second-closest MTF (N = 58,047)	18.59	28.98	3.25	12.60	11.23	21.01
21 to 40 miles from one MTF, more than 40 miles from second-closest MTF (N = 51,543)	15.72	26.39	4.73	15.18	13.10	22.44
More than 40 miles from closest MTF (N = 223,816)	9.61	22.22	6.38	18.13	16.93	25.32

Note: Sample includes all non–active-duty TRICARE users aged 45 to 64, except those with no primary residence during FY 2002. An ANOVA test showed that differences across subgroups were significant (p = 0.001).

Summary

In this chapter, we reported descriptive statistics showing the relationship between dispensing patterns and proximity to an MTF pharmacy. We then estimated three sets of regression models—one for each dispensing location—to examine what factors influence where TSRx beneficiaries obtain their medications and their overall use of prescriptions drugs. We found that proximity to MTF pharmacies plays a key role in explaining TSRx use and utilization patterns. Specifically, beneficiaries who lived near MTFs were more likely to use the TSRx program, more likely to use MTFs, less likely to use the TMOP, and less likely to use retail pharmacies than beneficiaries living far away from MTFs. In addition, proximity

Table 4.12
Probability of TRICARE Pharmacy Use Among 45- to 64-Year-Olds

	Any TRICARE Use		
	OR	95%	CI
Male	0.73	0.71	0.74
Age 55 to 64	1.37	1.37	1.38
Sponsor	0.80	0.78	0.81
Urban	0.69	0.68	0.69
Less than 20 miles to closest MTF	2.11	2.09	2.13
Between 21 and 40 miles to closest MTF	1.46	1.44	1.48
Less than 20 miles to second closest MTF	1.49	1.48	1.51
Between 21 and 40 miles to second closest MTF	0.96	0.95	0.97

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

Table 4.13.
MTF Use Among 45- to 64-Year-Olds

	Any MTF Pharmacy Use			Number of MTF Pharmacy Scripts		
	OR	95%	CI	Coeff	z	p-value
Male	0.93	0.90	0.96	–0.145	–18.87	≤0.001
Age 55 to 64	1.25	1.24	1.26	0.387	159.72	≤0.001
Sponsor	1.04	1.00	1.07	–0.135	–17.73	≤0.001
Urban	0.68	0.67	0.68	–0.062	–21.12	≤0.001
Less than 20 miles to closest MTF	11.5	11.36	11.74	0.081	16.16	≤0.001
Between 21 and 40 miles to closest MTF	4.23	4.15	4.30	0.078	12.43	≤0.001
Less than 20 miles to second-closest MTF	2.71	2.67	2.76	0.088	26.29	≤0.001
Between 21 and 40 miles to second-closest MTF	0.94	0.92	0.95	0.014	3.10	0.002

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

Table 4.14
TMOP Use Among 45- to 64-Year-Olds

	Any TMOP use			Number of TMOP Scripts		
	OR	95%	CI	Coeff.	z	p-value
Male	0.92	0.88	0.97	–0.090	–4.17	≤0.001
Age 55 to 64	1.78	1.76	1.81	0.188	31.00	≤0.001
Sponsor	0.93	0.88	0.97	–0.150	–6.98	≤0.001
Urban	1.10	1.08	1.12	0.017	2.58	0.010
Less than 20 miles to closest MTF	0.35	0.35	0.36	–0.294	–32.23	≤0.001
Between 21 and 40 miles to closest MTF	0.61	0.60	0.63	–0.163	-17.03	≤0.001
Less than 20 miles to second-closest MTF	0.51	0.50	0.52	–0.232	-22.28	≤0.001
Between 21 and 40 miles to second-closest MTF	0.95	0.93	0.97	0.006	0.57	0.569

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

Table 4.15
Retail Use Among 45- to 64-Year-Olds

	Any Retail Use			Number of Retail Scripts		
	OR	95%	CI	Coeff.	z	p-value
Male	0.90	0.88	0.93	–0.185	–16.31	≤0.001
Age 55 to 64	0.92	0.91	0.93	0.229	68.37	≤0.001
Sponsor	0.89	0.86	0.91	–0.267	–23.65	≤0.001
Urban	1.14	1.13	1.15	0.011	2.73	0.006
Less than 20 miles to closest MTF	0.20	0.19	0.20	–0.309	–59.41	≤0.001
Between 21 and 40 miles to closest MTF	0.39	0.39	0.40	–0.171	–29.16	≤0.001
Less than 20 miles to second-closest MTF	0.50	0.49	0.51	–0.090	–16.23	≤0.001
Between 21 and 40 miles to second-closest MTF	1.01	1.00	1.03	0.065	11.23	≤0.001

Note: Regional dummy variables were included in the regression equations but are not shown in the table.

to an MTF was associated with increased volume of MTF prescriptions, reduced volume of TMOP prescriptions, and reduced volume of retail pharmacy prescriptions. We observed similar patterns among 45- to 65-year-old non–active-duty MHS beneficiaries.

In our simulations, we first assigned every beneficiary to the "within 20 miles of two MTFs" category, then predicted the percentage with TSRx use; next, we assigned each beneficiary to the "more than 40 miles from any MTF" category and predicted again the proportion of eligibles with TSRx use. The same general approach was used throughout this section.

CHAPTER FIVE

Association Between MTF Formulary Restrictions and Retail Use

This chapter describes the results of our analysis of the relationship between local MTF formulary restrictions and MTF pharmacy, TMOP, and retail pharmacy utilization.

We hypothesized that formulary restrictions may be associated with the dispensing location selected for other drugs. To assess this issue, we examined two top therapeutic classes: antihyperlipidemics and gastrointestinals (39.0 percent of TSRx users received an antihyperlipidemic, while 30.2 percent received a gastrointestinal agent). Within these two classes, we focused on six sentinel drugs within two top therapeutic classes: the antihyperlipidemics simvastatin, atorvastatin, and pravastatin; and the gastrointestinal agents esomeprazole, Prevacid (lansoprazole), and Aciphex (rabeprazole). We selected these drugs because they are examples of drugs for which the direct care system either had relatively stringent restrictions (atorvastatin, pravastatin, esomeprazole, and lansoprazole) or had relatively few restrictions (simvastatin and rabeprazole).

Among beneficiaries who received each of these drugs we calculated the rates of MTF pharmacy, TMOP, and retail dispensing for all drugs other than the drug in question. By comparing dispensing rates across the different drugs, we could see whether beneficiaries receiving drugs that were tightly restricted within the direct care system had a greater-than-average tendency to use retail pharmacies for their other drugs.

We found that TSRx beneficiaries who received simvastatin, the preferred antihyperlipidemic, filled 61 percent of their nonsimvastatin prescriptions (i.e., all drugs other than simvastatin) at MTFs and 28 per-

cent at retail pharmacies. By contrast, TSRx beneficiaries who received atorvastatin, one of the off-formulary antihyperlipidemic drugs, filled 25 percent of their nonatorvastatin prescriptions (i.e., all drugs other than atorvastatin) through MTFs and filled 63 percent of their non-atorvastatin prescriptions through retail pharmacies. TSRx users who, during FY 2002, received pravastatin, another non-formulary, antihyperlipidemic drug, filled 24 percent of their nonpravastatin prescriptions through MTFs and 64 percent through retail pharmacies. Similar patterns were observed for the gastrointestinal agents (see Table 5.1). [1]

Table 5.1
Spillover Effects

	Antihyperlipidemics		
	Percent of nonsimvastatin prescriptions dispensed to simvastatin users (N = 9,449,661)	**Percent of nonatorvastatin prescriptions dispensed to atorvastatin users (N = 2,745,486)**	**Percent of nonpravastatin prescriptions dispensed to pravastatin users (N = 904,551)**
MTF	60.22	24.54	24.34
Mail Order	11.61	12.59	12.13
Retail	28.17	62.87	63.53
	Gastrointestinal Agents		
	Percent of nonesomeprazole prescriptions dispensed to esomeprazole users (N = 1,259,185)	**Percent of nonlansoprazole prescriptions dispensed to lansoprazole users (N = 1,666,196)**	**Percent of non-rabeprazole prescriptions dispensed to rabeprazole users (N = 4,583,249)**
MTF	26.12	26.72	73.18
Mail Order	9.05	9.89	4.60
Retail	64.83	63.39	22.22

[1] When we excluded beneficiaries who received more than one of the three antihyperlipidemics or more than one of the three gastrointestinal agents, the differences in dispensing rates were even larger. For atorvastatin users, for example, the percentage of nonatorvastatin prescriptions dispensed from retail pharmacies increased to 69 percent.

Summary

In this chapter, we performed analyses to assess whether local MTF formulary restrictions were associated with higher rates of MTF dispensing and lower rates of TMOP and retail dispensing. We found that formulary restrictions were associated with increased retail dispensing of other drugs. It is possible that beneficiaries who were seen by MTF physicians were simply more likely to receive prescriptions for BCF drugs and to use MTF pharmacies than beneficiaries seen by civilian network physicians. Yet, it is also possible that formulary effects had spillover effects, that is, beneficiaries who received prescriptions for non-BCF drugs were prompted to pick up all of their prescriptions from retail outlets.

CHAPTER SIX

Conclusions and Policy Implications

Our analysis of the TSRx program, which focused on describing utilization patterns by dispensing location and on assessing the effect of MTF proximity and MTF formulary restrictions on TSRx use, provided four major findings:

- Although a majority of TSRx prescriptions in FY 2002 were dispensed from MTF pharmacies, a majority of TSRx pharmacy estimated ingredient costs were attributable to spending on drugs dispensed from retail pharmacies. Moreover, a steady trend was seen throughout FY 2002 toward proportionately greater use of retail pharmacies and proportionately less use of MTFs. The patterns observed among 45- to 64-year-old non–active-duty TRICARE beneficiaries were similar to those observed among TSRx beneficiaries.
- As expected, we found that estimated ingredient costs for high-cost, widely dispensed drugs were significantly higher for drugs dispensed from retail pharmacies than for drugs dispensed through the direct-care system, suggesting that DoD pharmacy estimated ingredient costs could be reduced if dispensing shifted from retail pharmacies to MTFs or the TMOP—even if product utilization patterns remained the same.
- Geographic proximity to MTFs plays a key role in explaining TSRx use and utilization patterns. Specifically, beneficiaries who lived near MTFs were more likely to use the TSRx program, more likely to use MTF pharmacies, less likely to use the TMOP, and less likely to use retail pharmacies than beneficiaries living far from

MTFs. In addition, proximity to an MTF was associated with increased volume of MTF-dispensed prescriptions, reduced volume of TMOP prescriptions, and reduced volume of retail pharmacy prescriptions. These findings are consistent with decades of previous research showing that use of a medical service tends to decrease with a corresponding increase in distance between the beneficiary and the provider of service (see, e.g., Shannon, Skinner, and Bashshur, 1973; Weiss, Greenlick, and Jones, 1970; Cohen and Lee, 1985; Shannon, Bashshur, and Lovett, 1986).

- Within two major therapeutic classes—antihyperlipidemics and gastrointestinal agents—the availability of a drug at an MTF was associated with increased use of the MTF for other drugs. For example, beneficiaries who obtained simvastatin, DoD's preferred antihyperlipidemic, filled 60 percent of their nonsimvastatin prescriptions at MTFs. By contrast, users of atorvastatin, a nonpreferred antihyperlipidemic, filled fewer than 25 percent of their nonatorvastatin prescriptions at MTFs. Users of pravastatin, another nonpreferred antihyperlipidemic, filled fewer than 25 percent of their nonpravastatin prescriptions at MTFs. To some extent, this finding may reflect the tendency of people who see MTF doctors (most of whom presumably tend to prescribe formulary drugs) to fill their prescriptions at MTF pharmacies. Alternatively, it may reflect the likelihood that beneficiaries who see MTF physicians will receive prescriptions for BCF drugs and will also use MTF pharmacies.

These findings are relevant for the DoD Pharmacy and Therapeutics Committee, which is responsible for determining the contents of the BCF as well as the TMOP formulary, and local MTF P&T Committees, which determine MTF formularies and manage special requests for non-formulary drugs.

Study Limitations

In interpreting our results, several study limitations must be borne in mind:

- The variable we used in our cost analyses—estimated ingredient cost—contains some portion of the dispensing fee for prescriptions dispensed from retail pharmacies. At least some of the discrepancy in ingredient costs between retail pharmacies and the other dispensing locations is attributable to this measurement error.
- As noted in Chapter Two, we were unable to control for many potential confounders, including the beneficiary's marital status, race, supplemental insurance coverage, and characteristics of nearby MTFs (such as average wait time). To the extent that these missing variables are correlated with both dispensing location and the covariates, the failure to control for these factors results in omitted variables bias.
- We had no information on the types of providers seen (MTF versus civilian network), which is likely to have a substantial impact on dispensing location. MTF providers presumably are more familiar with and attentive to the MTF and TMOP formularies than network providers.
- The variables used to measure MTF proximity all arise from the assumption that visits originate from a beneficiary's residence. The notion that some visits to MTF pharmacies originated from places other than the beneficiary's residence should be considered. For example, if a beneficiary lives far from an MTF but regularly visits friends or relatives who live near an MTF or shops regularly at a commissary at the same location as the MTF, then our proximity variable would understate true proximity to the MTF. In addition, our measurement of the proximity variable is based on absolute distance ("as the crow flies") rather than the more relevant metric of travel time (or travel distance).
- The validity of our analysis depends on the completeness and quality of the DoD data we were given. Our data allowed us to capture essentially 100 percent of MTF, TMOP, and in-network retail prescriptions, something that would not have been possible prior to the creation of the PDTS. However, we did observe several problems, such as pharmacy claims with implausibly high costs; MTF-dispensed prescriptions from ZIP codes that, according to MEPRS, did not contain an MTF pharmacy; and discrepancies between the average estimated ingredient cost of MTF-

dispensed simvastatin and published contract prices. In addition, we were not able to account for the pooling of prescriptions by TSRx beneficiaries.[1]

Policy Implications

A key question DoD must address is why so many TSRx beneficiaries receive their drugs from retail pharmacies when they could obtain the drugs at a lower cost through MTFs or the TMOP, and what, if anything, DoD can do to encourage these beneficiaries to obtain their drugs through MTFs or the TMOP.

Beneficiaries make decisions about which dispensing location to use based on several factors, including knowledge of alternatives, convenience and amenities, availability of prescribed drugs, price of prescribed drugs, and the location of providers. Here we discuss each factor in turn.

- *Knowledge of alternatives.* In theory, one reason why TSRx beneficiaries might fill their prescriptions at retail outlets is that they do not know that other dispensing locations may offer the same drugs with lower co-payments. DoD has undertaken a major effort to educate beneficiaries about the overall system and the co-payments at each dispensing location (Davies, 2003c). Despite these efforts, many beneficiaries continue to use retail outlets, even for drugs that are widely available through the direct care system or the TMOP. The extent to which beneficiaries are knowledgeable about the co-payments at various dispensing locations is not known and is beyond the scope of this study.
- *Convenience and amenities.* Our results indicate that geography is a key determinant of dispensing location. Virtually all TSRx

[1] Prior to the advent of TSRx, it was not uncommon for retirees in remote locations to pool their prescriptions and IDs, and give them to one person who traveled to the nearest MTF on behalf of the group. This person dropped off the prescriptions and IDs at the MTF pharmacy, returned the following day to pick up thousands of dollars worth of drugs, and then return home. It is unknown whether this phenomenon still takes place or is as common as it once was reported to be (Perry, 2003).

beneficiaries live within five miles of a retail pharmacy, but only about half live within 20 miles of an MTF pharmacy. In addition to geography, other factors might make retail pharmacies more convenient than MTFs: retail pharmacies offer a wide range of products in addition to prescription drugs, which MTF pharmacies generally do not; they often have more convenient hours of operation than MTFs, which typically are open only during normal business hours; and they have easier access during emergencies, such as during the aftermath of the September 11, 2001, terrorist attacks.

- *Availability of prescribed drugs.* A number of high-cost, widely used drugs are more easily obtained from retail pharmacies than through the direct care system. For example, atorvastatin can be obtained from retail pharmacies without proof of medical necessity or prior authorization, but is not listed on any MTF formulary and cannot be obtained from the TMOP without proof of medical necessity. We found that beneficiaries who receive drugs that are not on their local MTF formulary appear to be more likely to use retail pharmacies for their other drugs.
- *Price.* All other things being equal, we expect well-informed beneficiaries to select the dispensing location with the lowest co-payment. However, all other things are not equal and many beneficiaries would rather pay a modest $9.00 co-payment at a retail pharmacy than obtain their drugs at lower cost through the direct care system.
- *Providers.* As we mentioned above, we speculate that beneficiaries who are seen by MTF providers are more likely to be prescribed MTF formulary drugs than are beneficiaries seen by network providers. If so, beneficiaries seen by network providers would be more likely to fill their prescriptions at retail pharmacies, where non-formulary drugs are more easily obtained.

What can DoD do to steer beneficiaries toward the TMOP and direct care system? One possible approach is to increase education of beneficiaries. This approach might be appropriate if, for example, a large number of beneficiaries were ignorant of the advantages (to them)

of using the direct care system or TMOP rather than retail pharmacies. Since DoD has already undertaken an aggressive educational effort (Davies, 2003c), increasing resources devoted to education may not be cost-effective.

Second, since location is a key determinant of beneficiaries' choice of pharmacy, DoD should explore ways of bringing MTFs closer to beneficiaries. This effort could entail constructing new MTF pharmacies at MTFs that do not currently have a pharmacy or offering free or nominal-fee delivery of prescriptions from the MTF site. For certain drugs—for example, simvastatin—the cost of delivering the drug to the beneficiary's doorstep might be less than the savings derived by filling prescriptions through MTFs rather than retail pharmacies.

Third, DoD has considerable latitude to influence the availability of drugs at different dispensing locations. The proposed Uniform Formulary, for example, would allow the TMOP to dispense non-formulary drugs without requiring proof of medical necessity or prior authorization. Unfortunately, as we noted in our earlier report (Joyce, Malkin, and Pace, 2003), allowing the TMOP to dispense non-formulary drugs will undermine efforts to steer beneficiaries toward formulary drugs. Whether the cost-reducing effect of greater TMOP use exceeds the cost-increasing effect of making non-formulary drugs more widely available depends on a variety of factors (i.e., the extent to which retail use is shifted to the TMOP, the differential between TMOP estimated ingredient costs and retail pharmacy estimated ingredient costs, and the likelihood that increased use of non-formulary drugs will increase prices paid for formulary drugs within the same therapeutic classes). Another way to increase MTF use is to streamline the process by which non-formulary drugs can be dispensed from MTFs. Currently, the process can be rather onerous, and some physicians—preferring not to have to deal with time-consuming paperwork—simply advise their patients to take their prescriptions for non-formulary drugs to a retail pharmacy (Perry, 2003).

Fourth, DoD could steer beneficiaries toward the TMOP by allowing non-formulary drugs to be dispensed from the TMOP, as TMA has proposed, but at the same time no longer covering such drugs if they are dispensed from retail pharmacies. Such a policy appears to be

permissible under the NDAA, which requires only that non-formulary agents be available from at least one dispensing location. A move such as this would eliminate retail dispensing of non-formulary agents. While this change in policy would create inconvenience for some beneficiaries and to some extent would undermine the purpose of the TSRx program, which is to expand access, we would expect it to have little adverse effect on health outcomes except among beneficiaries who are incapable of using the TMOP, provided that all the drugs moved off the formulary are used to treat chronic conditions.[2]

Fifth, DoD can reform its prior authorization policies. Currently, some prior authorization requirements appear to encourage beneficiaries to use retail pharmacies. For example, prior authorization is required to obtain COX-2 inhibitors from the TMOP, whereas these drugs are available from retail pharmacies without prior authorization. According to the proposed Uniform Formulary, "selected pharmaceutical agents may be subject to prior authorization or utilization review requirements to assure medical necessity, clinical appropriateness and/or cost effectiveness" (*Federal Register,* 2002). Previous studies suggest that prior authorization requirements have enormous potential to influence prescription drug utilization patterns and expenditures. For example, Tennessee Medicaid's expenditures for non-steroidal, anti-inflammatory drugs (NSAIDs) declined by 53 percent following implementation of prior authorization and fail-first requirements for brand name NSAIDs (Smalley et al., 1995). The findings of Kotzan and colleagues, who examined expenditures for both NSAIDs and histamine-2 (H2) receptor antagonists, were similar (Kotzan et al., 1993a; Kotzan et al., 1993b). If prior authorization requirements were imposed solely on products dispensed from retail pharmacies, retail dispensing would likely decrease, whereas dispensing from MTFs and the TMOP would likely increase. Admittedly, such a requirement would be inconvenient for some beneficiaries (i.e., those who have difficulty using the mail-order pharmacy) and arguably would undermine the purpose of the TSRx program. However, such a move might be cost-effective (since a drug dispensed from the retail sector has

[2] The TMOP is a viable option for all medications for chronic conditions but is not an acceptable option for drugs used to treat acute conditions.

a higher ingredient cost than the same drug dispensed from the direct care system) and would likely have little adverse impact on health outcomes (provided that non-formulary drugs are made available through the TMOP and that only medications for chronic illnesses are moved off the formulary).

Sixth, DoD can influence dispensing patterns by the co-payments it sets for drugs dispensed from the various dispensing locations. Section 701 of the NDAA for FY 2000 (Public Law 106-65), codified at Title 10, United States Code, Section 1074g, states that non-formulary drugs must be made available to TSRx beneficiaries through at least one dispensing location and that cost sharing for non-formulary agents must be consistent with common industry practice and not in excess of 25 percent for retirees and their dependents. TMA estimates that the average prescription cost and dispensing fee for potential non-formulary agents will, in the aggregate, be in excess of $110 per prescription (*Federal Register,* 2002). If that estimate is correct, it appears that the statutory language in NDAA would allow a co-payment for non-formulary agents that is somewhat higher than that proposed by TMA. Raising TSRx cost sharing on non-formulary drugs to the maximum level allowed by the law (that is, 25 percent coinsurance) not only would increase beneficiaries' financial incentive to use formulary (preferred) drugs, but also would increase their incentive to use MTFs and the TMOP rather than retail pharmacies, because the savings in terms of reduced co-payments would be larger. However, the NDAA requires that the co-payment not exceed 20 percent for family members of active-duty personnel. Combining a 25 percent coinsurance rate for retirees with a 20 percent coinsurance rate for family members of active-duty personnel would increase the complexity of the system, which is not desirable.

Finally, since some beneficiaries will continue to rely on retail outlets regardless of DoD's policies, it is worth exploring ways to apply federal pricing to retail pharmacies. One possibility is to implement a system of rebates, as many private insurers do. We understand that such an approach is currently under consideration by the DoD (Davies, 2003c).

Because we had limited data about providers, we largely ignored their role in prescribing. Assuming providers play a direct role in pre-

scribing medications and an indirect role in dispensing location (i.e., by deciding whether to prescribe a formulary drug), what can DoD do to influence provider prescribing behavior and pharmacy choice? It is increasingly common for pharmacy benefits managers to pay pharmacies more for dispensing a generic than a name-brand drug. The DoD may be able to take some steps, such as counter-detailing,[3] that would encourage MTF providers to prescribe formulary drugs rather than non-formulary drugs.

Next Steps

This study can serve as a baseline for future reforms. It will be instructive to see, for example, how the trends identified in this report change if the co-payment for non-formulary drugs is raised or if major changes are made to the BCF. In addition, our study suggests new directions for research on the determinants of dispensing location in the TSRx program. For example, are beneficiaries who receive simvastatin from retail pharmacies aware that they can get the same drug for a lower co-payment through the TMOP? To what extent do wait time and hours of operation play a role in beneficiaries' decision to use or not use MTF pharmacies? Although a plethora of retrospective pharmacy claims data are now available, we believe that gathering prospective data (e.g., survey data) is the most promising avenue for answering such questions.

[3] Physician counter-detailing, a strategy that has been discussed for at least two decades, appears to be gaining momentum in the private sector. BlueCross/BlueShield of Florida sends letters to doctors who are low prescribers of generics. Other plans are preparing to distribute generic drug samples to contracted physicians, just as brand-name manufacturers do. In the public sector, some Medicaid programs have recently hired physicians and pharmacists to visit doctors' offices and encourage them to prescribe generics.

APPENDIX A

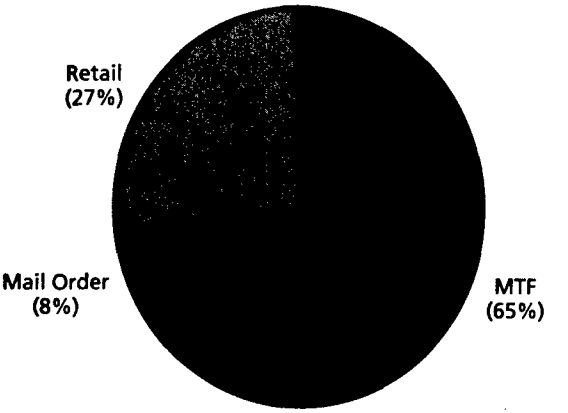
Top Drugs Dispensed to 45- to 65-Year-Old, Non–Active-Duty Beneficiaries

A total of 31.5 million 30-day equivalent prescriptions were dispensed to 45- to 64-year-old, non–active-duty TRICARE beneficiaries in FY 2002. 20.5 million of these prescriptions (65.0 percent of the total) were dispensed from MTFs, 2.6 million (8.4 percent) were dispensed from the TMOP, and 8.4 million (26.6 percent) were dispensed from in-network retail pharmacies (Figure A.1). The most frequently dispensed therapeutic classes and drugs are shown in Tables A.1 and A.2, respectively.

Estimated Ingredient Costs

The total estimated ingredient cost of pharmacy items dispensed to 45- to 64-year-old, non–active-duty TRICARE beneficiaries in FY 2002 was $871 million, or $27.65 per 30-day equivalent prescription. The breakdown of estimated ingredient cost by dispensing location (Figure A.2) is quite different from the breakdown of utilization. Retail pharmacies accounted for only 26.6 percent of prescription volume, but nearly half of estimated ingredient costs. That difference reflects the above-average acquisition cost of retail prescriptions—$49.23 per 30-day equivalent prescription, compared to $30.35 per mail-order prescription and $18.46 per MTF prescription. The most costly drug classes and drugs are listed in Tables A.3 and A.4, respectively.

Figure A.1
Number of 30-Day Equivalent Prescriptions by Dispensing Location



NOTE: 45- to 64-year-old, non–active-duty TRICARE beneficiaries only.

Table A.1
Most-Frequently Dispensed Therapeutic Classes

Therapeutic Class	Total Number of 30-Day Equivalent Script	Rank by Dispensing Location and Number of Prescriptions Dispensed		
		MTFs	Mail Order	Retail
Cardiac drugs	4,660,895	1	1	1
Estrogens	2,295,915	2	3	2
Antihyperlipidemic agents	2,200,142	4	2	3
Nsaids and cox-2 inhibitors	1,997,965	3	6	7
Miscellaneous gi drugs	1,728,891	6	4	6
Antidepressants	1,608,590	7	5	4
Diuretics	1,484,518	5	9	9
Antihistamine drugs	1,248,957	8	7	8
Thyroid agents	1,055,773	9	10	10
Opiate agonists	889,665	16	27	5
Misc. Antidiabetic agents	821,064	10	11	15
Unclassified therapeutic agents	768,913	14	8	12
Hypotensive agents	749,819	11	12	13
Anti-inflammatory agents	701,812	12	13	14
Sulfonylureas	553,865	15	14	21
Replacement preparations	548,129	13	20	28
Sympathomimetic (adrenergic) agents	501,976	17	15	16
Benzodiazepines	450,609	20	24	11
Progestins	345,768	18	18	27
Adrenals	337,056	19	22	20
Vasodilating agents	295,436	23	16	26
Skeletal muscle relaxants	278,362	29	26	17
Diabetes mellitus	259,215	21	23	32
Miscellaneous anticonvulsants	258,911	31	17	22

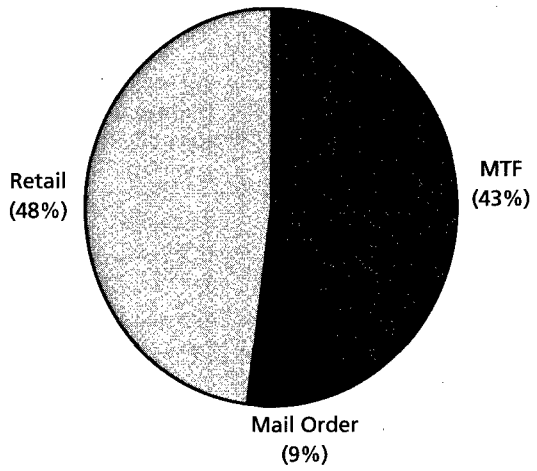
Note: 45- to 64-year-old, non–active-duty TRICARE beneficiaries only.

Table A.2
Most-Frequently Dispensed Drugs

Brand Name	Active Ingredient	Total Number Of 30-Day Equivalent Scripts	Rank By Dispensing Location Number of Prescriptions Dispensed		
			MTFs	Mail Order	Retail
Zocor	Simvastatin	1,452,497	1	1	4
Premarin	conjugated estrogens	1,446,045	2	2	2
Zestril	Lisinopril	918,748	3	4	18
Synthroid	Synthroid	843,771	4	9	6
Atenolol	Atenolol	692,166	6	10	8
Aciphex	Rabeprazole	636,418	5	50	61
Hydrochlorothiazide	Hydrochlorothiazide	585,248	7	15	12
Glucophage	Metformin	498,338	8	23	38
Allegra	Fexofenadine	492,403	10	14	13
Norvasc	Amlodipine	446,489	11	13	14
Prempro	conjugated estrogens/ medroxprerone	426,341	12	7	9
Aspirin	aspirin	421,113	9	N/A	3,111
Zyrtec	Cetirizine	362,238	13	19	23
Prilosec	Omeprazole	360,367	31	3	5
Triamterene / Hydrochlorothiazide	triamterene w/ hydrochlorothiazide	354,713	14	17	17
Lipitor	Atorvastatin	347,373	70	12	1
Celebrex	Celecoxib	335,477	19	5	7
Vioxx	Rofecoxib	297,885	22	11	10
Flonase	fluticasone proprionate	285,472	15	32	51
Zoloft	Sertraline	284,345	18	20	20
Ranitidine	ranitidine	269,635	16	31	47
Furosemide	Furosemide	235,377	23	26	27
Hydrocodone / Acetaminophen	hydrocodone w/ acetaminophen	225,599	130	168	3
Paxil	Paroxetine	212,973	30	29	25
Provera	Medroxyterone	206,109	17	256	431

Note: Drugs dispensed to 45- to 64-Year-Old, non–active-duty TRICARE beneficiaries only.

Figure A.2
Aggregate Estimated Ingredient Cost by Dispensing Location



RAND *MG237-A.2*

NOTE: 45- to 64-year-old, non–active-duty TRICARE beneficiaries only,

Table A.3
25 Highest-Cost Therapeutic Classes

Therapeutic Class (as defined by PDTS)	Aggregate Estimated Ingredient Cost (in dollars)	Rank By Dispensing Location Estimated Ingredient Cost		
		MTF	Mail Order	Retail
Antihyperlipidemic agents	92,950,287	1	5	2
Misc. gi drugs	78,014,532	8	2	1
Cardiac drugs	73,022,356	2	4	4
Antidepressants	67,719,032	3	6	3
Unclassified therapeutic agents	58,090,030	4	1	6
NSAIDS and COX-2 inhibitors	53,852,624	7	3	5
Miscellaneous antidiabetic agents	40,457,502	5	7	9
Antihistamine drugs	39,770,099	9	8	8
Estrogens	38,563,436	6	9	10
Opiate agonists	27,032,010	17	21	7
Misc. anticonvulsants	20,621,255	12	10	11
Anti-inflammatory agents	20,392,076	10	17	13
Sympathomimetic (adrenergic) agents	19,445,080	11	11	12
Anti-parkinson and anti-migraine agents	13,773,527	16	13	16
Hypotensive agents	12,639,921	15	19	19
Antineoplastic agents	12,469,515	18	14	18
Diabetes mellitus	11,402,766	13	15	27
Tranquilizers	10,259,040	29	16	15
Misc. anxiolytics, sedatives & hypnotics	10,218,776	23	25	17
Adrenals	9,587,726	14	26	32
Quinolones	9,143,176	33	57	14
Antivirals	8,692,767	22	23	20
Hematopoietic agents	8,108,731	19	29	24
Vasodilating agents	8,064,370	21	12	30
Antifungal antibiotics	6,885,095	20	31	33

Note: Drugs dispensed to 45- to 64-year-old, non–active-duty TRICARE beneficiaries only.

Table A.4.
25 Highest-Cost Drugs

Brand Name	Active Ingredient(s)	Total Estimated Ingredient Cost (in dollars)	Rank by Dispensing Location, Estimated Ingredient Cost		
			MTF	Mail	Retail
Zocor	simvastatin	57,030,441	1	3	3
Prilosec	omeprazole	37,351,643	4	1	1
Celebrex	celcoxib	25,817,389	3	2	4
Lipitor	atorvastatin	22,083,543	29	12	2
Glucophage	metformin	17,566,239	2	33	37
Vioxx	rofecoxib	17,433,863	13	4	7
Premarin	conjugated estrogens	16,753,377	6	19	11
Prempro	conjugated estrogens/ medroxyprogesterone	15,663,949	5	9	28
Zoloft	sertraline	14,461,639	11	14	13
Allegra	fexofenadine	13,858,377	10	23	15
Norvasc	amlodipine	13,353,663	8	16	20
Neurontin	gabapentin	12,342,647	19	11	10
Fosamax	alendronate sodium	12,301,928	9	15	33
Zyrtec	cetirizine	12,197,675	12	25	23
Prevacid	lansoprazole	12,019,428	69	39	5
Paxil	paroxetine	11,872,170	17	20	12
Avandia	rosiglitazone maleate	11,470,293	14	10	25
Claritin	loratadine	11,161,371	52	5	8
Flonase	fluticasone proprionate	11,059,146	7	58	44
Aciphex	rabeprazole	10,134,835	15	135	22
Advair Diskus	fluticasone proprionate and salmeterol	8,860,277	20	21	27
Zestril	lisinopril	8,830,888	16	42	39
Wellbutrin	bupropion hcl	8,774,926	24	22	21
Imitrex	sumatriptan	8,774,909	21	28	24
OxyContin	oxycodone hcl controlled-release	8,522,691	55	144	9

Note: Drugs dispensed to 45-to 64-year-old, non-active-duty TRICARE beneficiaries only.

References

Cohen, M. A., and H. L. K. Lee, "The Determinants of Spatial Distribution of Hospital Utilization in a Region," *Medical Care,* Vol. 23, No. 1, 1985, pp. 27–38.

Davies, W., 2003a. Personal communication with Jesse Malkin, February 2004, email.

———, 2003b. Statement made during TRICARE Conference presentation, January 28, 2003.

———, 2003c. Personal communication with Jesse Malkin, September 2003, telephone.

DeGroff, Donald W. Personal communication with Jesse Malkin, April 30, 2003, email.

Federal Register, April 12, 2002. Vol. 67, No. 71, Office of the Federal Register, National Archives and Records Administration.

Joyce, G., J. Malkin, and J. Pace, *Pharmacy Use and Costs in the TRICARE Senior Pharmacy Program: Insights for Benefit Design from the Private Sector.* Santa Monica, Calif.: RAND Corporation, MR-179-0-OSD, 2003.

Kotzan, J. A., C. A. Jankel, J. A. McMillan, A. L. Foster, and S. Myers, "Initial impact of a Medicaid prior-authorization program for NSAID prescriptions." *Journal of Research in Pharmaceutical Economics,* Vol. 5, 1993a, pp. 43–58.

Kotzan, J. A., J. A. McMillan, C. A. Jankel, and A. L. Foster, "Initial impact of a Medicaid maintenance dose program for H2 antagonist prescriptions," *Journal of Research in Pharmaceutical Economics,* Vol. 5, 1993b, pp. 25–41.

National Association of Chain Drug Stores, *The Chain Pharmacy Industry Profile,* Arlington, Va., 2002.

National Institute for Health Care Management, *Prescription Drug Trends in 2001: Another Year of Escalating Costs,* Washington, D.C., 2002.

Perry, M. Personal communication with Jesse Malkin, September 2003, email.

Reissman, D. Personal communication. August 2003, telephone.

Remund, COL Daniel, "Pharmacy Utilization in the Military Health System," TRICARE Conference, January 28, 2003.

Shannon, G. W., J. L. Skinner, and R. L. Bashshur, "Time and distance: the journey for medical care." *International Journal of Health Services,* Vol. 3, No. 2, 1973, pp. 237–244.

Shannon, G. W., R. L. Bashshur, and J. E. Lovett, "Distance and the use of mental health services." *Milbank Q.,* Vol. 64, No. 2, 1986, pp. 302–330.

Smalley, W. E., M. R. Griffin, R. L. Fought, L. Sullivan, and W. A. Ray, "Effect of a prior-authorization requirement on the use of nonsteroidal anti-inflammatory drugs by Medicaid patients," *New England Journal of Medicine,* Vol. 332, No. 24, 1995, pp. 1,612–1,617.

Tanielian, T., K. Harris, A. Suárez, R. Labor, M. Bradley, S. Atkinson, and P. Glassman, *Impact of a Uniform Formulary on Military Health System Prescribers: Baseline Survey Results,* Santa Monica, Calif.: RAND Corporation, MR-1615-OSD, 2003.

Weiss, J. E., M. R. Greenlick, and J. F. Jones, "Determinants of Medical Care Utilization: The Impact of Spatial Factors," *Medical Care,* Vol. 8, No. 6, 1970, pp. 456–462.

Yacker, H. G., "Outpatient prescription drugs: acquisition and reimbursement policies under selected federal programs," Congressional Research Service, Library of Congress, Washington, D.C., August 9, 1999.