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**A Web-based Survey to Assess Perceptions of Managed Care
Organization Representatives Regarding the Use of Co-pay Subsidy
Coupons for Prescription Drugs**

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by

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Thesis

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Dedication

To my husband Milind and son Sohum, Thank you for being my strength.

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Abstract

A Web-Based Survey to Assess Perceptions of Managed Care Organization Representatives Regarding the Use of Co-pay Subsidy Coupons for Prescription Drugs

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The University of Texas at Austin, 2012

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Pharmaceutical manufacturers' use of prescription brand-name drugs coupons and vouchers to subsidize patients' cost-sharing obligations such as co-pays has increased. The co-pays are used by managed care organizations (MCOs) to give their plan members an appreciation of drug costs as well as to offer incentives to use available equivalent generic alternatives due to lower co-pays. With higher tiered co-pays for brand-name drugs being offset by coupons, little is known about MCO representatives' perceptions about use of co-pay subsidy coupons for brand-name prescription drugs.

The objective of this study was to assess health plan managers and pharmacy benefit managers (PBMs) perceptions on the use of prescription drug co-pay subsidy coupons. An online survey instrument was used to collect data. A convenience sample of

834 MCO representatives was selected from the Academy of Managed Care Pharmacy (AMCP) membership directory. A total of 122 surveys were returned of which 105 were usable surveys, giving a response rate of 13.7%. A five-point, 11-item Likert scale ranging from 1 through 5, (1 = 'Strong Disagree' and 5 = 'Strongly Agree') was used to measure respondents' perceptions. Some items referred to coupons used to get co-pay discounts repeatedly over a year (i.e., long-term use coupons) while some items referred to coupons distributed for trial purposes (i.e., short-term use coupons). Of the 105 respondents, 42 (40%) "agreed," while 58 (55.2%) "strongly agreed" that co-pay subsidy coupons encouraged non-preferred brand-name drugs over preferred brand-name drugs. A total of 78 respondents (74.3%) reported that brand-name drug coupons undermined tiered formulary structure. Sixty respondents (57.1%) "strongly agreed" that short-term use coupons increased plan sponsor's costs and 72 respondents (68.6%) "agreed" that sponsor cost increased with long-term use coupons. A total of 42 (40%) reported to "strongly agree" that short-term use coupons should be eliminated whereas 49 (46.7%) respondents reported "strongly agreed" that long-term use coupons should be eliminated.

In summary, MCO representatives believe that brand-name drug utilization is increasing due to prescription drug incentives such as coupons which undermines their formulary controls and in turn, increases health care costs.

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Chapter One: Introduction and Literature Review

1.1 INTRODUCTION

Coupons are a widely used promotional tool that consumer goods manufacturers use to offer discounts on their products. Recently, some pharmaceutical companies have started promoting brand-name drugs using coupon offers. Since the vast majority of patients has insurance that covers prescription drugs, these coupon offers usually reduce or eliminate the patient's out-of-pocket costs (co-payments).¹ In other words, drug manufacturers that distribute drug coupons pay for the patient's portion of the prescription drug payment. Co-payments, commonly known as co-pays, typically are the cost sharing component for patients who are enrolled in a prescription drug benefit program. The remainder of prescription drug costs is paid by the patients' health plan or health insurance company.

Insurance companies structure co-payments to enhance patients' price-sensitivity toward brand-name drugs and to stimulate patients to use equivalent alternative therapies such as generic drugs. Eliminating or waiving co-pays by using coupons results in increased use of brand-name prescriptions drugs.² Furthermore, an increase in brand-name drug use disrupts the prescription drug control measures implemented by managed care organizations (MCOs) such as health plans and pharmacy benefit managers (PBMs) to control prescription drug costs. The purpose of this study is to examine MCOs' (health plans and PBMs) representatives' perceptions toward co-pay subsidy coupon offers.

The following sections provide an overview of types of coupons used by pharmaceutical companies, their distribution channels, redemption mechanisms, and description of the terms managed care organizations, plan sponsors, and PBMs. This will be followed by a literature review which describes the history of prescription drug coupons, how coupons have been increasingly used to provide co-pay subsidies, and the controversies resulting from their increasing use.

1.1.1 Types of Prescription Drug Coupons

Prescription drug coupons have been distributed by pharmaceutical companies in paper or plastic format. Recently, electronic coupons or vouchers programs have been implemented at pharmacies to provide discounts on prescription drugs at the point of sale.

1.1.1.1 Paper Coupons/Vouchers

Paper coupons/vouchers are the most commonly used coupon type that are distributed through newspapers, magazines, or downloaded from drug companies' websites.³ The advantage of prescription drug paper coupons is that if the pharmacy does not accept them, the patients can mail them directly to the manufacturers along with the receipt to receive a discount on their drug purchase.

1.1.1.2 Plastic Cards

Plastic cards are also called adjudicated debit cards, commonly known as the co-pay cards or loyalty cards.³ These cards are similar to ATM cards. Most prescription drug loyalty programs use an adjudicated debit card. It is generally distributed to the patient by physicians along with a prescription for the drug. These co-pay cards need to

be activated by calling a toll-free number assigned by the manufacturer prior to drug purchase. Once the adjudication process is completed, a plastic card can be used a number of times toward refilling prescriptions up to a defined limit set by drug companies. The advantage of using a plastic card is that the drug manufacturer can collect demographic information of card users. This information provides valuable leads in conducting market analyses.⁴ The Figure 1.1 presents an example of plastic card.

Figure 1.1 Plastic Card or Adjudicated Debit Card



Front of adjudicated-debit card, which includes a bank number

Source: Edmondson M. Coupons, Vouchers, and Adjudicated-Debit Cards: How Is a Brand Manager to Decide? *Pharmaceutical Executive*. March 8, 2008;28:38-40.

1.1.1.3 Electronic Coupons

Electronic coupons, also known as evouchers, are applied directly to patients' co-pays at the pharmacy counter. Electronic coupon programs are offered through various wholesaler companies. Pharmaceutical companies collaborate with wholesaler companies to offer discounts on their prescription drug products. For example, McKesson, a supplier of pharmacy management systems, offers eVoucher Rx™ solution through its RelayHealth service.⁵ The eVouchers provide immediate co-pay reduction for different brand drugs placed in higher formulary tiers. In order to take advantage of the electronic

coupons, the patient has to be enrolled in an evoucher program available at specific pharmacies. An advantage of this program is that a paper coupon or a co-pay card is not required to be presented by the patient to get the discount. The program automatically identifies any type of coupon, co-pay reduction, or incentives offered by pharmaceutical companies in the adjudication system.⁶ Figure 1.2 shows one instance in which eVoucher is linked to the adjudication process. The display screen shows initial claims response when the prescription for test drug is adjudicated at the pharmacy. A message box indicates the amount of discount offered to reduce patient's co-pay.

Figure 1.2 Display with eVoucher Information

<p>Rx 100307 Dr Kildare Mr Patient 11/06/06 TEST DRUG #100 As directed by physician. 0 Refs EDS 0 Exp 00/00</p>	<p>PATIENT MR =Sex:M (559)555-1212 1234 Main St DOB:05/05/55 Fresno, CA 93722 Age: 51 11/06/06 Attn- 14-Medco 34-eVoucher</p>												
<p>Paid Rx 100307</p> <table border="1"> <tr> <td>Cost \$</td> <td>100.00</td> <td></td> </tr> <tr> <td>+ Fee \$</td> <td>-50.00</td> <td>None</td> </tr> <tr> <td>-Copay \$</td> <td>50.00</td> <td></td> </tr> <tr> <td>Total \$</td> <td>None</td> <td>50.00</td> </tr> </table>	Cost \$	100.00		+ Fee \$	-50.00	None	-Copay \$	50.00		Total \$	None	50.00	<p>Claim Information Ref# 279150035EM00001</p> <p>Messages *eVoucher* The makers of [Drug Name] offer \$40.00 to reduce copay. Send COB for copay claim to BIN:012759, PCN: eVoucher, Cardholder ID:MRPAT196704051</p>
Cost \$	100.00												
+ Fee \$	-50.00	None											
-Copay \$	50.00												
Total \$	None	50.00											

Source: eVoucherRx. *Pacific Pharmacy Computers, Inc. Report*

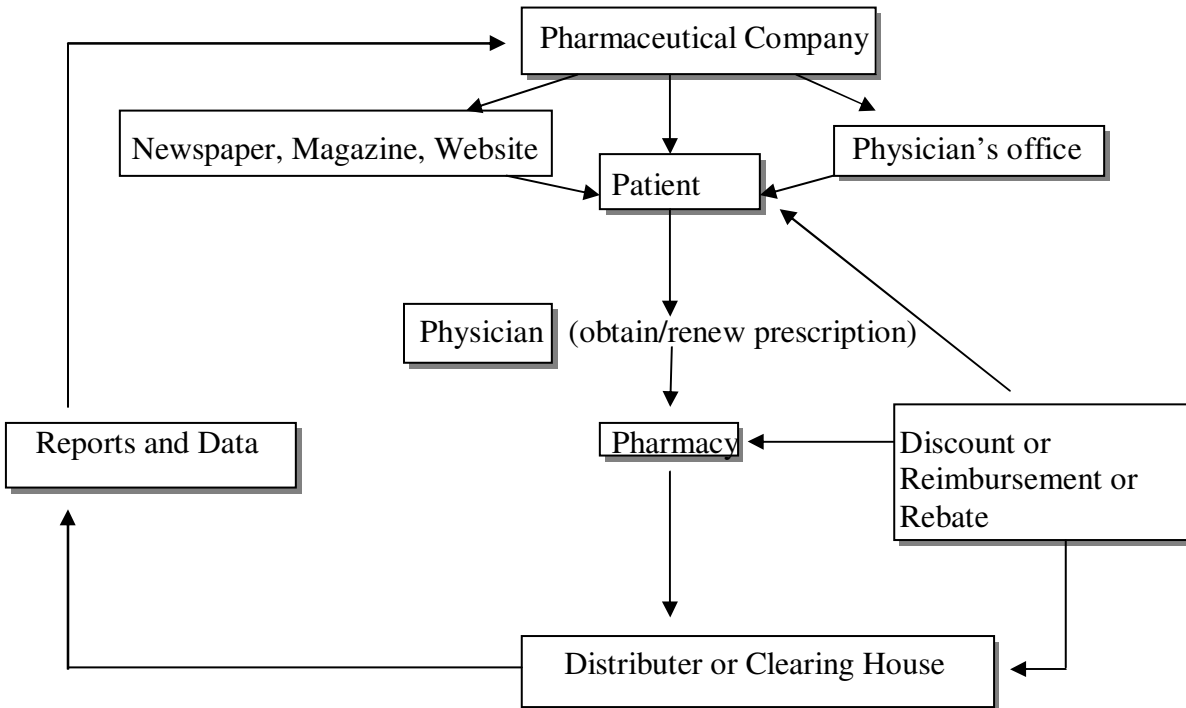
Available at: <http://www.goppc.com/support/Documents/061115%20eVoucher.pdf> Accessed June 16, 2011.

1.1.2 Redemption

Most paper coupons and co-pay card offers have to be redeemed by the patients at pharmacies. In cases where pharmacies do not accept drug coupons, they can be mailed to the drug manufacturer. For paper coupons, the pharmacist must submit claims and deduct discounts whereas for co-pay cards, the pharmacy receives immediate payment at the point of purchase when the card is swiped.⁷ Electronic vouchers on the other hand directly apply co-pay discounts on specific prescription products, i.e., they directly reduce patients' co-pays.

Pharmacies do not collect coupon data. Typically, de-identified coupon data are collected by coupon distributing agencies or clearing houses. The administrative costs associated with coupon, co-pay card, or electronic vouchers are paid by the pharmaceutical companies. Figure 1.3 presents the various distribution sources and the redemption process of prescription coupons and co-pay cards.

Figure 1.3 Distribution and Redemption of Prescription Drug Coupons and Co-pay Cards



Source: Adapted from: Smith SJ, Buta P. Clipping Coupons. *Pharmaceutical Executive*. April 1, 2004;24(4):86-92

1.1.3 MCOs and Plan Sponsors

In the United States, the majority of Americans are enrolled in some form of managed care organization (MCO). MCOs include health plans, PBMs, and insurance plans. Health plans are a specific type of MCOs that either finance or provide medical care to its enrolled members. Medical care is usually provided through their own facilities and staff or indirectly through contracted health care providers such as physicians, hospitals, and pharmacies.⁸ In order to provide prescription drug coverage to their members, MCOs share drug costs between plan sponsors and patients. Employers, unions, trust funds, or government agencies that provide health insurance are called plan sponsors.

Plan sponsors usually pay a fixed premium (i.e., a predetermined amount for drug insurance coverage for its members or employees) whereas the members pay a portion of drug costs through deductibles, co-payments, or co-insurance. Deductibles and co-payments are fixed-dollar amounts paid by members toward prescription drug costs. A deductible is an amount paid by members (100% of the initial portion) before the insurance coverage takes over whereas a co-payment is flat rate paid by members regardless of total costs. Co-insurance is a percentage of prescription drug cost paid by the members.

1.1.4 Benefit Designs and PBMs

Employers or plan sponsors contract with third party administrators such as health maintenance organizations (HMOs) or preferred provider organizations (PPOs) to administer the benefit plans. These entities usually employ benefit designs that are used to determine the level of payment.⁹ PBMs manage the prescription drug benefit portion of the plan.

Benefit design for prescription drugs provides members information about alternatives to expensive drugs. It also gives incentives to their members to choose equivalent alternatives over high cost prescription drugs. In addition, it includes how cost of the drug will be paid, type of benefit such as co-payments or co-insurance, and amount of patient cost sharing responsibilities. The benefit designs include special benefit requirements such as a drug formulary, the formulary tier structure, prior authorizations (physician applied pre-approval for non-covered prescription drugs), mandatory mail-

order, and other prescription drug restrictions. As discussed above, plan sponsors pay the health insurance costs of patients enrolled in health plans. Prescription drug coupons offered by pharmaceutical companies are used only for patients covered by private payers such as employers, commercial insurers, and self funded plans. Patients covered by public payers such as Medicare and Medicaid are not eligible to use such coupon offers.¹⁰⁻¹¹ Only patients enrolled in private insurance plan such as employer sponsored plans or through commercial insurers are eligible to use prescription coupons. As a result, private payers have criticized financial incentive programs such as prescription drug coupons that waive patients' share of prescription drug costs.

1.2 LITERATURE REVIEW

This section will cover the history of prescription drug coupons and the recent advancement of pharmaceutical companies in using coupons, vouchers, and co-pay cards (also known as loyalty card programs) for co-pay subsidies. In addition, this review will describe the controversies of brand-name prescription drug coupons.

1.2.1 History of Prescription Drug Coupons and Co-pay Cards

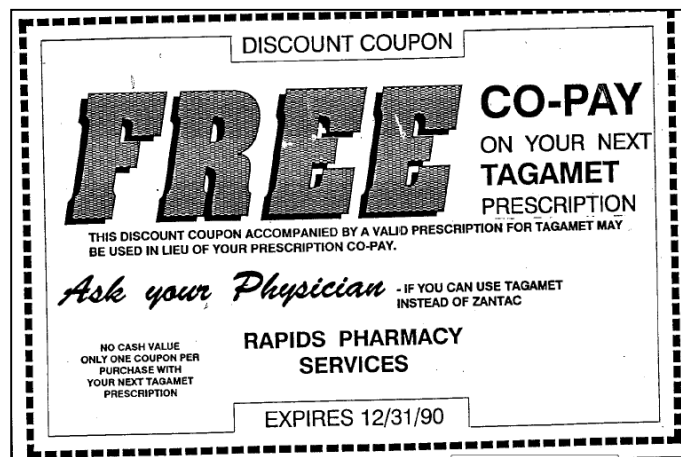
The history of drug coupons dates back to 1894, when a druggist named Asa Candler created coupons for Coca Cola[®]. At that time, it was used as a patent drug product having tonic and nerve stimulant properties.¹² Over the past century, coupons were extensively used for marketing consumer packaged goods; however, the earliest use of pharmaceutical coupons started in early 1980s.¹³

The first use of coupons for prescription drugs was initiated by Boots Pharmaceuticals in 1981. Boots Pharmaceuticals started promoting its generic ibuprofen called Rufen[®] using a \$1.50 rebate coupon. A similar coupon rebate program was used by the drug company Zenith for its drug tolazamide in 1986.¹⁴ Pharmaceutical coupons in the early 1980s were mainly used for promoting generic prescription drug products. A birth control pill called N.E.E 1/35m was promoted by Lexis laboratories using rebate discounts.¹⁵ The active ingredients of N.E.E 1/35m were ethinyl estradiol and norethindrone. The advertisements for N.E.E 1/35m were strategically placed in women's magazines such as Ms. Magazine, Cosmopolitan, Mademoiselle, Glamour, Shape,

Rolling Stone, and Self. Lexis offered rebate checks of \$10 and \$20 for six-month and twelve-month supplies.

In the 1990s, chain pharmacies started promoting prescription drugs using coupons. Thrift Drug's mail-order unit, Express Pharmacy Services, mailed its customers free co-pay discount coupons for the prescription drug Tagamet[®].¹⁶ The generic version of Tagamet[®] is cimetidine (see Figure 1.4). This coupon was part of a promotional campaign used to motivate consumers to use Tagamet[®] instead of Zantac[®] (ranitidine). According to an article by Spaulding and Joseph, the Tagamet[®] coupon was a way of attracting consumers by offering free co-payment and directing them to physicians for drug substitution.¹⁶

Figure 1.4 Free Co-pay Discount Coupon Offered on Tagamet[®]



Source : Spaulding CD, Joseph JW. Is Rx Couponing a Viable Direct-marketing Technique? *American Pharmacy (USA)*. January 1992;NS32(1):67-71.

Loyalty cards were first introduced in the early 1990s by Marion Merrell Dow for the drug Cardizem[®] (diltiazem). The drug promotion campaign was known as the

Cardizem Medication Plus Program.¹⁷ The loyalty card entitled patients to free prescriptions after a certain usage level. For example, existing card holders' refill records were maintained by pharmacies and after purchases of 540 tablets or more, patients could receive a free supply of 90 tablets. In addition, for new patients, prescribing physicians could provide an information package and voucher for a free 21-tablet supply of 60, 90, and 120 mg strengths. This program reimbursed pharmacists for filling the introductory prescription. The Cardizem card program was an attempt by Marion Merrell Dow to protect itself from future generic competition after losing its patent exclusivity.

Similar coupon programs were used for promoting brand-name drugs approaching patent expiration. For example, Schering Plough offered coupons for its anti-histaminic drug Claritin[®] (loratidine) in 2002. The drug manufacturer Novartis introduced \$5 discount coupons for Zocor[®] (simvastatin).¹⁸ Both drugs were nearing their patent expiration when coupons were introduced. Coupons were also used for launching new drug products in parallel to promoting existing products. Schering Plough launched Clarinex[®] (desloratidine) in 2002 using a seven-day free trial coupon which could be downloaded from the company website.¹⁹ In a similar program, Eli Lilly offered a free one-month supply of Prozac Weekly[®] using trial coupons while promoting its anti-depressant drug Prozac[®].²⁰

1.2.2 Co-pay Cards and Internet Offers

More recently, drug companies have ventured into another marketing strategy that involves subsidizing co-payments on prescription drugs. Co-payments are out-of-pocket

costs incurred by insured patients on prescription drugs. Drug companies are offering coupons, vouchers, or co-pay cards (also known as loyalty cards) to waive co-payments partly or completely on prescription drugs. Table 1.1 shows some of the discounts offered by leading pharmaceutical companies for their brand-name prescription drugs in 2009.²¹ Many of these discount offers were available on drug companies' websites.

Table 1.1 Brand-Name Drugs, Drug Manufacturer, and Co-Pay Description of the Leading Pharmaceutical Co-pay Coupons in 2009

Brand-name Drug	Drug Manufacturer	Co-Pay Description*
Lipitor [®] (atorvastatin calcium)	Pfizer	Co-pay card with \$10 to \$15 in discount for each refill
Humira [®] (adalimumab)	Abbott Laboratories	Co-pay card with \$5 as maximum co-payment throughout the year
Enbrel [®] (etanercept)	Amgen and Wyeth	Co-pay card with no co-payments for first six months and \$10 co-pay afterwards.
Nexium [®] (esomeprazole magnesium)	Astra Zeneca	Co-pay card (The Purple Plus [™] saving card) entitles patient with co-pay of \geq \$25 to pay a flat \$ 25 co-payment.
Lunesta [®] (eszopiclone)	Sepracor	Co-pay card offering no co-payments for first twelve months for patients with co-pay of \geq \$50 on prescription drug
AmbienCR [®] (zolpidem tartrate extended release)	Sanofi - Aventis	Co-pay card with \$20 as discount for up to first 5 refills

* the amount of discount in dollar value using co-pay cards used toward co-payments in a year

Source: (1) Rockoff J. Drug Makers criticized for co-pay subsidies. *The Wall Street Journal*. July 20, 2009 and (2) drug manufacturers' websites.

Weppner et al. gave a detailed account of direct-to-consumer offers for free and discounted prescription medicines on the internet.²² The author identified the 50 most prescribed brand-name prescription medications in 2007. Forty-six (92%) out of the 50 brand-name prescription medications had a manufacturer-sponsored website. Thirty brand-name medications (60%) had one or more prescription voucher offers for free samples or discounted medications on their websites. In total, there were 35 individual offers; 24 (69%) were for prescription drug discounts and 11 (31%) were vouchers for free samples.

Marketers have emphasized several advantages of using internet coupons over traditional pre-printed ones. Online coupons have lower or no distribution cost and it is easier to collect product usage information using bar codes printed on coupons.²³

1.2.3 Controversies of Prescription Drug Coupons

Health care costs, including pharmaceutical costs have continued to escalate for health insurance plans and pharmacy benefit managers. One method used by these managed organizations to control or contain the rising pharmaceutical costs is to pass some of the costs on to patients. Patient cost-sharing is usually in the form of deductibles, co-payments, or co-insurance costs.²⁴ Patient cost-sharing methods are prevalent for medical services such as physician office visits, hospitalizations, and a variety of out-patient procedures. Prescription drugs are no exception. Most patients today who have health insurance or are covered by a managed care organization, which also provides

coverage for pharmaceuticals, have to pay a co-payment or co-insurance for prescription drugs.

Health insurers, plans, and pharmacy benefit managers have implemented a variety of tiered co-payment benefits for prescription drugs. These co-payment or co-insurance costs are the patient's share of the prescription drug's costs. These are commonly referred to as "out-of-pocket cost" for the patient.²⁵ Co-payments are fixed-dollar amounts per prescription drug dispensed. In a 2010 survey of 372 employer commercial plans, 67% of the employer plans used fixed co-payments for prescription drugs.²⁶ Co-payments may range from \$1.00 per drug for public assistance programs such as Medicaid to over \$100.00 for specialty drugs for self-funded employer or commercial third-party drug plans.

Another form of patient cost sharing is when the patient pays a percentage of the drug cost. This is referred to as co-insurance. Based on the 2010-2011 Prescription Drug Benefit Cost and Plan Design Report sponsored by Takeda, the median co-insurance rate for generic drugs was 10.0% of the product cost, whereas for managed care organizations' preferred brand-name drugs, the median co-insurance cost was 25.0%.²⁷ In other words, the patient pays 25% of the total drug costs for preferred brand-name pharmaceuticals. The patient's co-insurance cost is subject to change due to prescription drug cost inflation. However, co-payment costs often vary by drug type or the tiered category of drugs.

The number of co-payment tiers varies by plan; some plans only have one tier while others may have five different tiers or categories of drugs.²⁸ For commercial plans, three tiers are the most common; these are generic drugs, preferred brand-name drugs (drugs listed on the firm's formulary) and non-preferred brand-name drugs. Normally, the lowest patient cost sharing or co-payment cost is for generic drugs; the reason is that generic drugs usually have the lowest drug ingredient cost for the health plan or PBM and these organizations want to provide an incentive for patients to use cheaper generic drugs. Preferred brand-name drugs usually have next highest co-payment costs. "Preferred drugs" are pharmaceutical products which have been approved by the plan and listed on the health care plan's or PBM's formulary. The next highest co-payment costs are for those drugs not listed on the plan's formulary and thus are referred to as non-preferred brand-name drug products. Non-formulary drugs are drugs not included on plan's drug list. Non-formulary brand-name drugs usually have a higher cost and thus are not preferred by the health plans or PBMs. The prescriber can request a non-formulary drug to be given to the patient, but the prescriber must provide sufficient reasoning that the patient requires the drug product; i.e., the prescriber must get prior authorization for the non-formulary drug.²⁹

Table 1.2 presents common tiered plan designs. Higher tier groups are non-preferred drugs (not included in plan's preferred list), specialty drugs (drugs manufactured through biologic processes to treat chronic, complex, or life-threatening

diseases), and lifestyle drugs (drugs that are not medically necessary but improve quality of life).³⁰

Prescription drug coupons are offered on brand-name drugs used to treat conditions such as asthma, heartburn, allergy, depression, and hypercholesterolaemia.³¹ Recently, coupons have been offered for lifestyle drugs such as those used to treat erectile dysfunction, weight-loss, insomnia, birth control, and some skin conditions like alopecia.³² These drugs are placed in higher tier groups (i.e., non-preferred brands). Because coupons or co-pay cards are used for non-preferred drugs, they subsidize or waive higher co-payments. This provides a financial incentive for patients to use non-preferred brand-name drugs over generic drugs. Table 1.3 presents the average retail co-payments in 2010 by drug categories for all U.S. employers.

Table 1.2 Common Tier Plan Designs

Tier designs	Two-tier	Three-tier	Four-tier	Five or more tier
First Tier	Generics	Generics	Generics	Generics
Second Tier	Brand	Preferred brand	Preferred brand	Preferred brand
Third Tier		Non-preferred brand	Non-preferred brand	Non-preferred brand
Fourth tier			Specialty	Specialty
Fifth or more				Lifestyle

Source: 2010-2011 *Prescription Drug Benefit Cost and Plan Design Report*, Sponsored by Takeda Pharmaceuticals North America, Inc., written by Pharmacy Benefit Management Institute, Scottsdale, AZ. 2010, p.17

Table 1.3 Average Retail Prescription Co-payments by Drug Category for All Employers (2010)

Drug Category	Average Copayment (in \$)
Generics	9.57
Preferred brands	26.31
Non-preferred brands	46.19
Brand drugs (Preferred & Non-preferred)	35.92
Lifestyle	40.47
Specialty	61.01

Source: 2010-2011 *Prescription Drug Benefit Cost and Plan Design Report*, Sponsored by Takeda Pharmaceuticals North America, Inc., written by Pharmacy Benefit Management Institute, Scottsdale, AZ. 2010, p.21

The increasing use of co-pay subsidy coupons, vouchers, or cards for promoting brand-name prescription drugs has been criticized by MCOs and PBMs. They complain that coupons circumvent prescription co-payments which leads to higher brand-name drug utilization.³³ As more patients use co-pay subsidy coupons for brand-name drugs, insurers pay higher ingredient costs. This may undermine the formulary structure and leads to higher brand-name drug utilization. Furthermore, research on prescription drug coupons has shown that the presence of coupons is associated with favorable consumer attitudes toward the advertisement and the brand.³⁴ In addition, coupons increase the likelihood of drug inquiry intention. The increasing use of co-pay subsidy coupons has led to growing concern among MCOs such as plans, PBMs, and insurers.³⁵

1.2.4 Pharmaceutical Companies' Perspective on Co-pay Subsidy Coupons

Pharmaceutical companies claim that the use of prescription drug coupons is a way to connect directly to consumers.³⁶ They consider delivering coupons or vouchers for prescription drugs more economical than delivering samples to physicians.³⁷ The

marketing costs for sampling in the U.S. amounts for over \$18 billion.³⁸ These include costs of using sales representatives, maintaining drug inventories at physicians' offices, and wastage incurred due to drug product expirations.³⁹ Coupons help reduce these expenses to drug manufacturers. Another advantage of prescription coupon programs is the increased patient affordability for brand-name prescription drugs due to lower co-payments.⁴⁰ Furthermore, pharmaceutical companies claim that patients enrolled in voucher programs show higher adherence and persistence rates.⁴¹

1.2.5 Strategies to Counteract Coupons

As mentioned earlier to control the increasing prescription drug costs, managed care organizations have implemented strategies that include increasing the difference in cost sharing amounts between generics and non-preferred drugs, using stricter formulary controls, applying limits on quantity dispensing, requiring prior authorizations, and using step therapy approaches that involve starting with the most cost-effective drugs (generics) and then progressing to more costly therapy.⁴²⁻⁴³ Recently, Blue Cross and Blue Shield (BCBS) of Michigan launched pilot program that used coupons to waive co-payments on generic drugs. This led to a 10% of plan members switching from brand-name drugs to generic drugs.⁴⁴ Critics of co-pay subsidy coupons believe that using similar strategies will help counteract brand-name prescription drug coupons.⁴⁵

1.2.6 Summary of Literature Review

Dollar-off coupons and free-sample vouchers were used for promoting generic drugs as well as brand-name drugs in the early 1980s. However, these accounted for a

very small portion of overall marketing efforts. During this time, the MCO plans covered prescription drugs using one common co-pay (i.e., a flat rate of \$2 or \$5 irrespective of whether it was a generic or a brand-name drug).⁴⁶ With increasing prescription drug costs, many managed care plans in the mid-1980s started offering benefit designs with tiered co-pay structures. The benefit designs provide incentives to plan member to use available generic drugs. The difference in generic and brand-name drugs copayments affects brand-name drug utilization which, in turn, results in pharmaceutical companies introducing brand drug promotions using co-pay subsidies. Co-pay subsidy coupons are widely offered for brand-name drugs with generic alternatives, competing drugs in similar therapeutic categories, and newly introduced brand drugs.⁴⁷ Many of these co-pay subsidy coupons are used for drugs used in chronic therapies, life-style drugs, and specialty drugs that require patients' on private insurance to pay higher co-payments.⁴⁸ Waived co-payments on such drugs may result in cost-shifting from patients to MCOs. This has led to criticism of brand-name drug coupon offers by some consumer groups and policy makers.⁴⁹

The purpose of this study is to determine the perceptions of representatives from different MCOs such as health plans and PBMs toward co-pay subsidy prescription drug coupons. This study determines if PBMs and health plan providers monitor increases in prescription drug coupons and additional costs incurred to their organization due to coupons. In addition, this study finds out if MCO representatives have discussions on ways to counteract coupons. Furthermore, this study will determine if health plans and

PBMs representatives believe that co-pay subsidy coupons increase both primary adherence and persistence. Previous studies have shown that higher co-payments affect both the rate at which new prescriptions are filled (primary adherence) as well as rate of refills (persistence).⁵⁰⁻⁵¹

The information gathered from this survey will provide baseline information to help improve communications between pharmaceutical companies and MCOs.

1.2.7 Objectives

The overall purpose of this study was to assess the perceptions of Managed Care Organization (MCO) representatives regarding the use of co-pay subsidy coupons for prescription drugs. For this study, a web-based survey was developed and implemented to assess perceptions of health plan managers and PBM representatives. These perception scores (dependent variable) were compared by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled (independent variables).

The specific study objectives were to compare health plan/PBM representatives' perceptions regarding whether:

1. Use of co-pay subsidy coupons encourages utilization of non-preferred brand-name drugs instead of preferred brand-name drugs by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled ;

2. Use of co-pay subsidy coupons increases drug costs to plan sponsor by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled;
3. Use of co-pay subsidy coupons improves patient adherence and persistence by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled; and
4. Co-pay subsidy coupons should be eliminated by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

All variables used in the study were derived from the items on the survey questionnaire. Objectives 2 and 4 measured MCO representatives' perception on both short-term and long-term use co-pay subsidy coupons. The short-term use coupons were defined as co-pay cards used for trial offers with usage limit as a requirement by manufacturers. For example, co-pay card used for dermatology drugs may have a discount limit of up to three uses. Long-term use coupons were defined as co-pay cards that could be used repeatedly for a year, (for example; co-pay card for cholesterol lowering drugs.) Objective 3 measured perception of MCO representatives toward co-pay coupons improving both primary adherence and persistence.

1.2.8 Hypotheses

Based on the study objectives, the hypotheses for the study were as follows:

H₀₁: There is no difference in the mean perception score of health plan/PBM representatives toward whether co-pay subsidy coupons encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

H₀₂: There is no difference in the mean perception score of health plan/PBM representatives regarding whether **short-term use** co-pay subsidy coupons increases drug costs to plan sponsor by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

H₀₃: There is no difference in the mean perception score of health plan/PBM representatives regarding whether **long-term use** co-pay subsidy coupons increases drug costs to plan sponsor by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled

H₀₄: There is no difference in the mean perception of health plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of first prescription being filled by the predominant managed organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

H₀₅: There is no difference in the mean perception of health plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of prescription refill by the

predominant managed organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

H₀₆: There is no difference in the mean perception of health plan /PBM representatives toward **short-term use** co-pay subsidy coupon elimination by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

H₀₇: There is no difference in the mean perception of health plan /PBM representatives toward **long-term use** co-pay subsidy coupon elimination by the predominant managed care organization, the position in the organization, pharmacy licensure, and number of beneficiaries enrolled.

Chapter Two: Methodology

This chapter describes the instrument, instrument development, study respondents, procedures used for survey administration, data collection, and analyses. The study was divided into two phases. The first phase involved development of the questionnaire, completion of IRB approval, selection of eligible survey respondents, and pretest of the questionnaire. The second phase involved administration of the survey, data collection, and data analysis.

2.1 PHASE ONE

2.1.1 Survey Instrument

A short survey questionnaire consisting of 28 items was designed for this study (see Appendix I). The survey questionnaire was separated into three sections and included closed-ended, open-ended, and partially closed-ended questions.

The closed-ended questions comprised of both ordered and unordered response choices. Closed-ended ordered responses were used to provide an entire range of possible answers (i.e., gradation of a single concept).⁵² The respondents choose their answer from the most appropriate scale. An example of closed-ended ordered response choices is ‘*strongly disagree*’ to ‘*strongly agree*’. In this questionnaire, items used to measure perceptions of ‘*health Plan/PBM representatives toward co-pay subsidy coupons*’ (all items in question 8), and ‘*organization’s total enrollment figure*’ (question 15) were examples of closed-ended questions with ordered response choices.

The closed-ended unordered responses do not provide a range or continuum.⁵³ The responses are a list of answer choices without a scale. An example of closed-ended unordered responses is choices that require ranking. In this study questionnaire, *'marketing approaches for distributing prescription drug co-pay subsidy coupons'* (question 2) was an example of closed-ended question with unordered response type. This item asked the respondents to rank the most widely used options using numbers 1 through 3. The partially closed-ended unordered responses provide a list of answer choices along with an option for the survey respondents to write his/her own answer choice. An example of a partially closed-ended unordered question was *'ways in which co-pay subsidy coupons could be discouraged'* (question 11). In this question, the answer choice *'other' (please specify)* gave respondents the option to create their own separate response.

Open-ended questions do not provide any response choices. The respondents have to formulate their answers; hence, they are considered difficult and may have several drawbacks. However, open-ended questions are used when researchers are interested in exploring a new topic, or when it is difficult to formulate response choices, or when it is necessary to estimate a certain number.⁵⁴ In this questionnaire, an open-ended question was used to estimate the percentage increase in non-preferred brand-name drugs (question 9).

Section One

The first section consisted of closed-ended questions. The closed-ended questions were used to collect the following information from the respondents:

1. Awareness about use of co-pay subsidy coupons (question 1);
2. Marketing approaches in distribution of co-pay subsidy coupons (question 2);
3. Belief regarding whether use of co-pay subsidy coupons had increased, decreased or stayed about the same in the previous year (question 3);
4. Opinion on the top 20 brand-name drugs that used co-pay subsidy coupons (question 4);
5. Whether respondent's organization monitored coupon use (questions 5 and 6);
and
6. Whether respondent's organization monitored organizational costs due to co-pay subsidy coupons (question 7).

The closed-ended question contained responses such as 'yes', 'no', and 'don't know'.

Section Two

The second section of the survey questionnaire comprised of an open-ended question, several closed-ended and partially closed-ended questions. The closed-ended questions with ordered responses are used to measure perceptions of respondents (all items in question 8). This question included 14 items. Each item consisted of a statement and a five-point scale called the Likert scale assigned to measure response on each of the statement. The scale for the items ranged from '*strongly disagree*' to '*strongly agree*'.

The respondents were asked to choose the most appropriate answer using this scale. The items measured respondents' perceptions toward impact of co-pay subsidy coupon on brand-name drugs (items 8a to 8g), patient adherence (items 8k, 8l), whether co-pay subsidy coupon undermined tiered formulary structure (item 8h), increased drug costs to plan sponsor (item 8i, 8j), and needed elimination (item 8m, 8n). Some items referred to short-term and long-term use co-pay subsidy coupons.

In the open-ended (question 9), all respondents were asked to estimate the *'percentage increase in utilization of non-preferred brand-name drug in past year'*. Question 10 comprised of a closed-ended question on whether the respondent's *'organization had discussion on ways in which co-pay coupon use could be discouraged'*. The response scale used for this question was 'yes', 'no', and 'don't know'. Question 11 comprised of a closed-ended question that asked the respondents to choose the ways in which co-pay subsidy coupons were discouraged. The response choices included *'increase difference in cost sharing between generics and non-formulary drugs'*, *'use a step therapy approach (defined as coverage of second-line therapy after trial with first-line therapy)'*, *'use adherence rewards for generics'*, 'don't know' and 'other'.

Section Three

The final section of the questionnaire asked respondents to provide information about their work setting. The variables included predominant managed care organization (question 12), pharmacy licensure (question 13), respondents' position in the organization (question 14), and number of beneficiaries enrolled (question 15). The variable

'predominant managed care organization' included categories of *'health plan'*, *'pharmacy benefits manager'* (PBM), and *'other'*. The variable *'pharmacy licensure'* was measured using a respondent's answer to the question *'Are you a licensed pharmacist?'*. The response scale was *'yes'* and *'no'*. The variable *'position within the organization'* included five categories of *'executive officer'* (president/vice president), *'program manager'* (clinical, pharmacy), *'director'* (clinical operations, formulary, pharmacy), *'pharmacist'* (staff, senior), and *'other'*. The variable *'number of beneficiaries'* included five categories from *'less than 1,000,000 lives'*, *'1,000,000 – 4,999,999 lives'*, *'5,000,000 – 9,999,999 lives'*, *'10 million lives or more'* and *'don't know'*. Question 16 of the questionnaire comprised of blank space for respondents to fill in additional comments or concerns.

2.1.2 Institutional Review Board Approval

Approval was obtained from the University of Texas at Austin Institutional Review Board (IRB). This study was in compliance with the policies and procedures required for any research with human subjects. The study (IRB Protocol # 2011-03-0048) was approved under the exempt category on March 21, 2011.

2.1.3 Sample Selection

The sample of respondents was selected from the Academy of Managed Care Pharmacy (AMCP) membership directory for the year 2010-2011. AMCP is a national professional association of pharmacists and health care professionals with nearly 6,000 members. AMCP members consisted of wide diversity of individuals such as university enrolled pharmacy students, academics, working executives belonging to the pharmaceutical industry, health plan employees, PBMs employees, and individuals working in other healthcare organizations. The directory comprised of alphabetical listings of AMCP members' names starting with last name first, position/title, name of the work organization, contact information that included organization address, telephone number, and email address. The subjects for this study were selected based on: (1) their employment in a MCO (i.e., a health plan or a PBM); (2) organization tax status (only non-government organizations were selected as prescription drug coupons are disallowed in government sponsored programs such as Medicare, Medicaid or state plans); and (3) their position within the selected organization. The following table summarizes selection of MCO representatives' for the study.

Table 2.1 Summary of MCO Representatives' Selection Based on their Position in the Organization.

Type of MCO	Examples ^b	Title in Organization ^c
Health Plan	Kaiser Permanente Blue Cross Blue Shield UnitedHealthcare Blue Shield Anthem BC/BS ^a Aetna Tufts Health Plan HighMark Health Net WellCare Humana Health Plans	Clinical Pharmacist Senior Clinical Pharmacist Staff Clinical Pharmacist Pharmacy Program Manager Clinical Program Manager Formulary Manager Director of Pharmacy Director of Clinical operations Formulary Director Vice-President, Clinical operations Vice-President, Formulary management
PBM ^a	Prescription Solutions MedImpact Healthcare Systems Medco Health Solutions CareMark Express-Scripts WellPoint	Vice-President, Pharmacy President, Clinical operations President, Formulary management President, Pharmacy

^a PBM – Pharmacy Benefit Managers, BC/BS – Blue Cross Blue Shield

^b Some examples of non-government health plan and PBMs selected based on selection criteria

^c Health Plan and PBM representatives selected based on their title/position in organization

The subjects were selected using convenience sampling which is a non-probability sampling technique. The sample was selected from the AMCP directory, a publically available membership list. The researchers selected the subjects alphabetically from this list. All AMCP members that met the inclusion criteria were selected.

A total of 834 members were selected from the AMCP directory.

2.1.4 Pretest

To pretest the questionnaire, a survey link was sent to small sample of four MCO representatives to assess the clarity and completeness of the questionnaire. In addition to getting responses, the primary purpose was to identify unclear or confusing items and to record the time needed for completion of the survey.

Based on the pretest, some of the items on the survey instrument were re-worded. For example, in the pretest questionnaire item, *'Do you believe that in the past year the number of co-pay subsidy coupons offered by pharmaceutical manufacturers have increased'* was changed to *'Do you believe that in the past year the number of co-pay subsidy coupons offered by pharmaceutical manufacturers has increased, decreased, or stayed about the same as in previous year'*.

Question 8, (item i) *'co-pay subsidy coupons increase drug costs to managed care firms'* was changed to *'co-pay subsidy coupons increase drug costs to plan sponsors'*. Items referring to short-term use and long-term use co-pay subsidy coupons were added in the survey instrument. For example items 8d, 8e, 8f, 8g, 8i, 8j, 8m, and 8n were included in the final survey instrument.

The item *'please estimate the increase in number of prescription drug co-pay subsidy coupons since last year'* was deleted as pretest respondents considered it to be a difficult question. From Question 11, *'please specify ways in which the use of co-pay subsidy coupons could be discouraged'* the answer choice *'eliminate coupons completely'* was deleted as the pretest respondents noted that it was beyond health plan/PBMs control to eliminate the use of coupon offers by their plan members. Various suggestions were integrated into the final survey instrument (See Appendix I). Respondents noted that the time to complete the questionnaire was 5 to 7 minutes.

2.2 PHASE TWO

The second phase involved administering the survey to selected subjects. Previous studies suggest that there has been a low response rate with MCO representatives.⁵⁵ Thus, the survey was administered to all 834 selected MCO representatives.

2.2.1 Administration of the Survey

This questionnaire was uploaded on SurveyMonkey™ which is an online survey tool that enables users to create, distribute, and collect results of online surveys. For the purpose of this study, a SSL (Secure Socket Layer) encryption plan was used for SurveyMonkey™. SSL encryption is in compliance with Health Insurance Portability and Accountability Act (HIPAA) regulations. It is mainly used for transferring secured private documents.

According to Dillman (2007), multiple contacts are essential in order to encourage high response rate.⁵⁶ Dillman suggests that there should be four or more contacts with respondents. This may include a pre-notice, the survey questionnaire, a Thank you/Reminder, and a replacement questionnaire. In addition, Dillman highlights the importance of a pre-notice and personalized email. A pre-notice should be sent out before sending the survey questionnaire which should include the purpose of the study and the upcoming survey questionnaire notification. The pre-notice must be short and succinct as email recipients could discard lengthy emails. Similarly, personalized emails could be used to increase response rate.⁵⁷ For this study, an invitation email and two reminder

emails were sent. A total of three contacts were made with the email recipients. A pre-notice was not sent in this survey.

The first email invitation was sent to the selected subjects in the week of July 12, 2011 at 12 p.m. (central time) via the researcher's residential internet connection. The email included the purpose of the study, a link to the survey and a brief explanation of voluntary participation, respondents' confidentiality, privacy, and anonymous data collection (see Appendix II). It also restated that clicking on the survey link was considered as the consent to participate. In addition, the invitation email included contact information of the IRB committee's chair person and the researchers involved in the study. The purpose of including contact information was to answer any queries from the respondents pertaining to the study. A signed cover letter with the exact same wordings as the email was included as an attachment to the invitation email (see Appendix II). In order to avoid disclosure of email addresses to everyone on the list, email was sent as blind carbon copy (bcc) to each email recipient.

The online questionnaire was designed to take no longer than 7 minutes to complete. The participants were asked to click on the URL that appeared as: <https://www.surveymonkey.com/s/RSRTPYT> on the email. The data were collected online and was password protected. Only the researchers involved in this study had access.

Two follow-up reminder emails were sent to all the eligible respondents between 12:00 and 12.30 p.m. Central time (see Appendices III and IV). These emails were sent

one week (July 18, 2011) and three weeks (August 1, 2011) after the initial invitation email. These emails covered all content of the invitation email in addition to thanking subjects who had already completed the survey. A signed reminder letter was attached with both these emails.

2.2.2 Data Collection

The data collection began on July 12, 2011 and ended on August 11, 2011, a one-month time period.

2.2.3 Data Analysis

All responses were collected on a spreadsheet which was extracted using Microsoft Excel[®]. The Excel[®] spreadsheet was later imported to the Predictive Analytics Software (PASW)[®] version 18.0 for analysis. The data were cleaned and descriptive analysis was performed on all variables.

2.2.3.1 Descriptive Analysis

Descriptive analysis (means, standard deviations, frequency distributions) were reported for all variables in the instrument. Means were reported for continuous data such as ‘perceptions regarding use of co-pay subsidy coupons have impact on brand-drug utilization, patient adherence, and costs (all items in question 8), and percentage increase in utilization of non-preferred drug since past year (question 9).

2.2.3.2 Independent Variables

Independent variables used were ‘predominant managed care organization’, ‘pharmacy licensure’, ‘position within the organization’, and ‘number of beneficiaries enrolled’.

The variable ‘*predominant managed care organization*’ was derived from question 12 (see Appendix I) of the survey questionnaire and was worded as ‘*Which of the following best describes predominant managed organization where you work?*’ It is defined as subject’s primary work setting (i.e., whether he/she worked for a health plan or a pharmacy benefit manager.) The subjects were divided into two groups based on their answer choice. The health plan manager group was coded as ‘1’ and the PBM group was coded as ‘2’.

The variable ‘*pharmacy licensure*’ refers to the subject holding licensure to practice pharmacy. The variable was obtained from question 13 of the questionnaire worded as ‘*Are you a licensed pharmacist?*’ The subjects were classified into two groups licensed pharmacists and others (i.e., subjects not holding pharmacy licensure) and the answer choices were coded as ‘1’ and ‘2’ respectively.

The variable ‘*position within the organization*’ refers to designation of the subject working in a health plan or a PBM setting. This variable was obtained from question 14 worded as ‘*Which of the following best describes your position in the organization where you are employed?*’ The answer choices of subjects were coded as follows ‘executive officer’ = 1, ‘program manager’ = 2, ‘director’ = 3, ‘pharmacist’ = 4, and ‘other’ = 5.

The variable '*number of beneficiaries enrolled*' was defined as total enrollment of subject's organization. This variable was obtained from question number 15 of the survey questionnaire. The subjects were asked to choose the approximate total enrollment of their organization. Based on their response, they were classified into five groups for data analysis: subjects having total enrollment of 'less than 1,000,000 lives' coded as 1; between '1,000,000 to 4,999,999 lives' coded as 2; enrollment between '5,000,000 to 9,999,999 lives' coded as 3, 'greater than or equal to 10 million lives' coded as 4, and don't know (i.e., subjects unaware of their total organization's enrollment) coded as 5.

2.2.2.3 Dependent Variables

Based on the study objectives, the dependent variables were perception scores of Health Plan/PBM representatives. The following table presents the dependent variables and the codes used in data analysis

Table 2.2 Dependent Variables, Items, and Codes

Dependent Variables ^a	Item	Codes ^b
Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	8c	Strongly Disagree = 1 Disagree = 2 Neutral = 3 Agree = 4 Strongly Agree = 5
Short-term use co-pay subsidy coupons increase drug cost to plan sponsor	8i	
Long-term use co-pay subsidy coupons increase drug cost to plan sponsor	8j	
Co-pay subsidy coupon use improve likelihood of first prescription being filled	8k	
Co-pay subsidy coupon use improve likelihood of refill	8l	
Short-term use co-pay subsidy coupons should be eliminated	8m	
Long-term use co-pay subsidy coupons should be eliminated	8n	

^a Perception scores of MCO respondents

^b Codes for Likert scale items. All items were scored using Likert scale.

2.2.3.4 Hypothesis Testing

All statistical analyses were performed using PASW[®] version 18. An a priori significance level of $p < 0.05$ was used for all the statistical tests. Table 2.3 summarizes the study hypotheses, variables, and statistical tests that were used.

Table 2.3 Summary of Hypotheses, Variables, and Statistical Tests

Hypothesis	Dependent Variable (DV) ^a	Independent Variables (IV) ^b	Statistical Tests
H ₀₁	Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	-Predominant Managed Care Organization (IV ₁) -Pharmacy Licensure (IV ₂) -Position (IV ₃) - Number of Beneficiaries Enrolled (IV ₄)	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA
H ₀₂	Short-term use co-pay subsidy coupons increase drug cost to plan sponsor	IV ₁ IV ₂ IV ₃ IV ₄	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA
H ₀₃	Long-term use co-pay subsidy coupons increase drug cost to plan sponsor	IV ₁ IV ₂ IV ₃ IV ₄	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA
H ₀₄	Co-pay subsidy coupon use improve likelihood of first prescription being filled	IV ₁ IV ₂ IV ₃ IV ₄	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA
H ₀₅	Co-pay subsidy coupon use improve likelihood of refill	IV ₁ IV ₂ IV ₃ IV ₄	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA
H ₀₆	Short-term use co-pay subsidy coupons should be eliminated	IV ₁ IV ₂ IV ₃ IV ₄	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA
H ₀₇	Long-term use co-pay subsidy coupons should be eliminated	IV ₁ IV ₂ IV ₃ IV ₄	Two sample T-test Two sample T-test One-way ANOVA One-way ANOVA

^aAll dependent variables are continuous, ^bAll independent variables are categorical

Chapter Three: Results

This chapter will describe the results of the descriptive analysis and the hypothesis testing.

3.1 ANALYSIS OF STUDY PROCEDURE

A total of 834 invitation emails were sent to the selected MCO representatives, of which 60 resulted in delivery failures. Thus, it is assumed that a total sample size of 774 received the survey. Four refused to participate; one indicated he/she worked for a Medicaid plan; and two respondents were from health plans of Massachusetts (MA) hence were not eligible to take the survey. Thus, these email addresses (bounced, refused to participate, and MA / Medicaid health plans) were deleted from the final list of members to which the survey was sent. Therefore, a total sample size was 767 was considered delivered after reminder emails. Two reminder emails were sent after the invitation email. Fifty-seven (7.43%) responses were received after the first invitation email, followed by 41 (5.34%) responses after the second reminder, and 24 (3.12%) responses after the third reminder email. A total of 122 responses were received for a response rate of 15.90 % (122/767) after the third email. Of the 122 survey respondents, 11 surveys were incomplete and 6 surveys were excluded from analysis based on the selection criteria. The excluded survey responses were from three independent health care consultants; one specialty pharmacist; one outcomes research manager, and one managed service organization (MSO) representative. Therefore, the number of usable responses was 105 for a response rate of 13.68 % (105/767).

3.2 DESCRIPTIVE ANALYSIS

3.2.1 Respondents' Characteristics

The characteristics of MCO respondents are presented in Table 3.1. Of the 105 respondents, 79 (75.2%) were health plan employees. A majority of MCO representatives, 100 (95.2%), were licensed pharmacists. In terms of current position in the organization, 56 (53.3%) were directors, 26 (24.8%) were program managers, 14 (13.3%) were pharmacists, and 9 (8.6%) were executive officers. A majority of MCO respondents, 50 (47.6%), had total enrollment of less than 1 million lives within their organization, 19 (18.1%) respondents reported organization enrollment between 1,000,000 and 4,999,999 whereas 9 (8.6%) respondents reported enrollment between 4,999,999 and 9,999,999 lives. Twenty five (23.8%) respondents indicated that their organization enrollment figure to be higher than 10 million lives.

Table 3.1 Characteristics of Respondents

Variable	Measure	N (%)	N (Total)
Predominant MCO ^b	Health Plan	79 (75.2)	105
	PBM ^b	26 (24.8)	
Pharmacy Licensure	Licensure	100 (95.2)	104 ^a
	No Licensure	4 (3.8)	
Current Position ^c	Executive Officer	9 (8.6)	105
	Program Manager	26 (24.8)	
	Director	56 (53.3)	
	Pharmacist	14 (13.3)	
Total Beneficiary Enrollment ^d	< 1,000,000 lives	50 (47.6)	105
	1,000,000 – 4,999,999 lives	19 (18.1)	
	5,000,000 – 9,999,999 lives	9 (8.6)	
	≥ 10 million lives	25 (23.8)	
	Don't Know	2 (1.9)	

Total number of respondents (N) = 105

^aOne respondent did not answer this item

^bMCO – Managed Care Organization, PBM - Pharmacy Benefit Manager

^cExecutive officers include President/Vice-President of Clinical Operations, Formulary or Pharmacy; Program Managers of Clinical Operations and Pharmacy; Director of Clinical Operations, Formulary or Pharmacy; and Senior/Staff Pharmacists of Clinical Operations and Pharmacy

^dNumber of beneficiaries enrolled by the MCO

3.2.2 Perceptions of MCO Representatives about Co-pay Subsidy Coupons

MCO respondents were asked about their perceptions toward prescription drug co-pay subsidy coupons. Table 3.2 presents the items and the descriptive statistics on respondents' perceptions about prescription drug co-pay subsidy coupons (question 8). Respondents were asked to rate the 14 items (question 8) using a five-point Likert scale. These items were scored 1 through 5 with 1 = 'Strong Disagree', 2 = 'Disagree', 3 = 'Neutral', 4 = 'Agree', and 5 = 'Strongly Agree'.

Of the 105 MCO respondents, 54 (51.4%) 'agreed' while 31 (29.5%) 'strongly agreed' that patients are more likely to shift from generic to brand-name drugs when they receive co-pay subsidy coupons (item 8a). The mean (\pm SD) perception score of the MCO respondents on this item was 4.01 (\pm 0.88). When asked whether co-pay subsidy coupons increase utilization of brand-name prescription drugs instead of generic drugs (item 8b), 48 (46.2%) 'agreed' whereas 51 (49.0%) 'strongly agreed.' The mean perception score on this item was 4.43 (\pm 0.62). Of the 105 respondents, a majority 58 (55.2%) 'strongly agreed' while 42 (40.0%) 'agreed' that co-pay subsidy coupons encouraged patients to use nonpreferred drugs (item 8c). The mean (\pm SD) perception score was 4.48 (\pm 0.68).

MCO respondents were asked whether a majority of patients who take advantage of short-term use co-pay subsidy coupons become regular users of brand-name drugs (item 8d). A large number of MCO respondents 48 (45.7%) 'agreed' while 18 (17.1%) 'disagreed', and 25 (23.8%) indicated 'neutral.' The mean (\pm SD) perception score for

this item was 3.51 (\pm 0.95). MCO respondents indicated that a majority of patients who take advantage of long-term use co-pay subsidy coupons become regular users of brand-name drugs (item 8e). Forty-eight (46.2%) respondents ‘agreed’ with this statement whereas 41 (39.4%) ‘strongly agreed.’ MCO respondents were asked whether short-term co-pay subsidy coupons build brand-loyalty toward brand-name prescription drugs (item 8f). Forty-seven (45.2%) ‘agreed’, 29 (27.9%) indicated ‘neutral’ while 14 (13.5 %) respondents ‘disagreed.’ The mean (\pm SD) perception score was 3.55 (\pm 0.91). For the item, ‘*long-term use co-pay subsidy coupons build brand-loyalty toward brand-name prescription drugs (item 8g)*’, 54 (51.4%) respondents ‘agreed’ while 37 (35.2%) ‘strongly agreed.’ The mean (\pm SD) perception score on this item was 4.17 (\pm 0.78).

A majority of MCO representatives 78 (74.3%) ‘agreed’ that co-pay subsidy coupons undermined the tiered formulary structure (item 8h). In general, a large proportion of MCO representatives ‘strongly agreed’ that both short-term use 60 (57.1%) and long-term use 72 (68.6%) co-pay subsidy coupons increased costs to plan sponsor (item 8i and 8j). The mean (\pm SD) perception scores on these items were 4.43 (\pm 0.76) and 4.58 (\pm 0.70) respectively.

When MCO respondents were asked about their perception toward co-pay subsidy coupons improving likelihood that patients will get first prescription filled (item k), there were mixed responses. Of the 104 respondents, 12 (11.5%) ‘disagreed’, 40 (38.5%) indicated ‘neutral’, 39 (37.5%) ‘agreed’, while 11 (10.6%) ‘strongly agreed.’ The mean (\pm SD) perception score on this item was 3.43 (\pm 0.90). For item 8l, ‘*Co-pay subsidy*

coupons improve the likelihood that patients will obtain refill prescriptions', 20 (19%) 'disagreed', 38 (36.2%) indicated 'neutral', 38 (36.2%) 'agreed', while only 7 (6.7%) 'strongly agreed.' The mean perception score on item 8l was 3.27 (\pm 0.91).

MCO representatives 'agreed' that both short-term use and long-term use co-pay subsidy coupons should be eliminated (items 8m and 8l). The mean (\pm SD) perception scores on these items were 3.96 (\pm 1.0); 4.11 (\pm 1.0) respectively. Forty-two (40.0%) 'strongly agreed' that short-term co-pay subsidy coupons should be eliminated while 49 (46.7%) 'strongly agreed' that long-term co-pay subsidy coupons should be eliminated.

Table 3.2 Frequencies and Descriptive Statistics of MCO Representatives' Perceptions about Co-pay Subsidy Coupons

Item (Question)	Scale Range ^a						
	SD	D	N	A	SA	Total	Mean
	1	2	3	4	5	N	(S.D)
	N	N	N	N	N	N	
	(%)	(%)	(%)	(%)	(%)	(%)	
Patients are more likely to shift from generic to brand-name drugs when they receive co-pay subsidy coupons (8a).	0	10 (9.5)	10 (9.5)	54 (51.4)	31 (29.5)	105 (100.0)	4.01 (0.88)
Co-pay subsidy coupons increase utilization of brand-name prescription drugs instead of generic drugs (8b).	0	1 (1.0)	4 (3.8)	48 (46.2)	51 (49.0)	104 ^b (100.0)	4.43 (0.62)
Co-pay subsidy coupons are likely to encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs (8c).	0	3 (2.9)	2 (1.9)	42 (40.0)	58 (55.2)	105 (100.0)	4.48 (0.68)
The majority of patients who take advantage of short-term use co-pay subsidy coupons become regular users of brand-name drugs (8d).	1 (1.0)	18 (17.1)	25 (23.8)	48 (45.7)	13 (12.4)	105 (100.0)	3.51 (0.95)
The majority of patients who take advantage of long-term use co-pay subsidy coupons become regular users of brand-name drugs (8e).	1 (1.0)	4 (3.8)	10 (9.6)	48 (46.2)	41 (39.4)	104 ^b (100.0)	4.19 (0.84)
Short-term use co-pay subsidy coupons build brand loyalty toward brand-name prescription drugs (8f).	1 (1.0)	14 (13.5)	29 (27.9)	47 (45.2)	13 (12.5)	104 ^b (100.0)	3.55 (0.91)
Long-term use co-pay subsidy coupons build brand loyalty toward brand-name prescription drugs (8g).	0	5 (4.8)	9 (8.6)	54 (51.4)	37 (35.2)	105 (100.0)	4.17 (0.78)

^aSD – Strongly Disagree, D – Disagree, N – Neutral, A – Agree, SA - Strongly Agree (coded 1 to 5)

^bFrequency with missing responses

Table 3.2 Frequencies and Descriptive Statistics of MCO Representatives' Perceptions about Co-pay Subsidy Coupons
(continued)

Item (Question)	Scale Range ^a						
	SD 1 N (%)	D 2 N (%)	N 3 N (%)	A 4 N (%)	SA 5 N (%)	Total N (%)	Mean (S.D)
Co-pay subsidy coupons undermine the tiered formulary structure (8h).	0	2 (1.9)	1 (1.0)	24 (22.9)	78 (74.3)	105 (100.0)	4.70 (0.59)
Short-term use co-pay subsidy coupons increase drug costs for plan sponsors (8i).	0	2 (1.9)	11 (10.5)	32 (30.5)	60 (57.1)	105 (100.0)	4.43 (0.76)
Long-term use co-pay subsidy coupons increase drug costs for plan sponsors (8j).	0	2 (1.9)	7 (6.7)	24 (22.9)	72 (68.6)	105 (100.0)	4.58 (0.70)
Co-pay subsidy coupons improve the likelihood that patients will get their first prescription filled (8k).	2 (1.9)	12 (11.5)	40 (38.5)	39 (37.5)	11 (10.6)	104 ^b (100.0)	3.43 (0.90)
Co-pay subsidy coupons improve the likelihood that patients will obtain refill prescriptions (8l).	2 (1.9)	20 (19.0)	38 (36.2)	38 (36.2)	7 (6.7)	105 (100.0)	3.27 (0.91)
Short-term use brand drug co-pay subsidy coupons should be eliminated (8m).	0	9 (8.6)	28 (26.7)	26 (24.8)	42 (40.0)	105 (100.0)	3.96 (1.00)
Long-term use brand drug co-pay subsidy coupons should be eliminated (8n).	0	10 (9.5)	17 (16.2)	29 (27.6)	49 (46.7)	105 (100.0)	4.11 (1.00)

^aSD – Strongly Disagree, D – Disagree, N – Neutral, A – Agree, SA - Strongly Agree (coded 1 to 5)

^b Frequency with missing responses

3.2.3 MCO Representatives' Beliefs Regarding Change in Number of Co-pay Subsidy Coupons

The MCO representatives were asked if they believed the number of co-pay subsidy coupons offered by pharmaceutical manufacturer increased, decreased, or stayed about the same as compared to previous year. Table 3.3 shows the frequency distribution of MCO representatives' responses about their belief on change in number of co-pay subsidy coupons. A total of 91 (86.7%) of the 105 believed that the number of co-pay subsidy coupons had increased as compared to the previous year, 13 (12.4%) indicated that it had stayed about the same, and 1 (1.0%) believed that it has decreased.

Table 3.3 Frequency Distribution of MCO Representatives' Belief Regarding Change in Number of Co-pay Subsidy Coupons

Change in number of co-pay subsidy coupons as compared to 2010 ^a	N ^b (%)
Increased	91 (86.7)
Decreased	1 (1.0)
Stayed about the same	13 (12.4)

^a Belief of respondents that in the number of co-pay subsidy coupons offered by pharmaceutical manufacturers have changed in past year compared to its previous year

^b Total number of respondents N=105

3.2.4 Opinion on Brand-name Drugs that Use Coupons for Promotion

The respondents were asked about their opinion on the number of top 20 brand-name prescription drugs that use coupons for promotion. Of the 105 respondents, 47 (44.8%) had an opinion that 10 or more of the top 20 brand-name drugs use coupon promotions.

Table 3.4 Responses to the Item, ‘In Your Opinion, Approximately How Many of the Top 20 Brand-Name Prescription Drugs Use Coupon Promotions?’

Number of brand-name prescription drugs using coupons^a	N^b (%)
None	0 (0.0)
1 to 3	9 (8.6)
4 to 6	21 (20.0)
7 to 9	16 (15.2)
10 or more	47 (44.8)
Don't know	12 (11.4)

^aRespondents' opinion on top 20 brand-name prescription drugs that use coupons for promotion

^bTotal number of respondents N=105.

3.2.5 Monitoring Co-pay Subsidy Coupons by MCO

MCO representatives were asked to indicate whether his or her organization monitored prescription drug coupons, or if their organization contracted other organization to monitor prescription drug coupons. Table 3.5 presents the frequency distribution of MCO representatives' coupon monitoring activities for prescription drugs. In addition, MCO representatives were asked to indicate if their organization monitored costs incurred due to use of prescription drug coupons. These results are also presented in Table 3.5.

Twenty four (22.9%) of the 105 MCO respondents indicated that they monitored coupon/vouchers for brand-name prescriptions, while 72 (68.6%) indicated they did not. A total of 95 (90.5%) of 105 respondents did not contract with another organization to monitor use of coupons for brand-name drugs. A total of 23 respondents (21.9%) reported that their organization monitored cost incurred due to coupon/voucher use.

Table 3.5 Frequency Distribution of Co-pay Subsidy Coupon Monitoring Activities of MCO Representatives

Variable	Response			Total N (%)
	Yes N (%)	No N (%)	Don't Know N (%)	
Organization monitored coupon/voucher use for brand-name prescription drugs	24 (22.9)	72 (68.6)	9 (8.6)	105 (100.0)
Organization contracted with another organization to monitor use of coupons for brand-name prescription drugs	1 (1.0)	95 (90.5)	9 (8.6)	105 (100.0)
Organization monitors costs incurred due to coupon/voucher use	23 (21.9)	71 (67.6)	11 (10.5)	105 (100.0)

3.2.6 Approaches for Distributing Prescription Drug Co-pay Subsidy Coupons

MCO respondents were asked to rank the most widely used marketing approach for distributing prescription drug coupons using numbers 1 through 3 with “1” being the most widely used marketing approach, “2” being the second most widely used approach, and “3” being the third most widely used marketing approach. There were seven answer choices: newspapers; magazine coupons; internet offers; direct mail to consumer; pharmacies; physicians; and other (question 2 of the questionnaire). Table 3.6 provides a description of widely used marketing approaches in distributing prescription drug co-pay subsidy coupons. Sixty-three (60.0%) out of 105 respondents indicated couponing through physician offices as the most widely used marketing approach, this was followed by internet offers (N=26, 24.8%) and the third most frequent response was magazine coupons (N=29, 27.6%). In terms of total mentions, 90 (85.7%) respondents indicated physicians among the first three widely used marketing options, followed by internet

offers 74 (70.5%), magazine coupon 60 (57.1%), pharmacies 38 (36.2%), direct-mail to consumer 31 (29.5%), and newspaper 23 (21.9%).

Table 3.6 Marketing Approaches for Distributing Prescription Drug Coupons

Marketing Option	Most Widely Used 1 N (%)	2nd Most Widely Used 2 N (%)	3rd Most Widely Used 3 N (%)	N^a (%)	Missing Responses (%)	Total N (%)
Physicians	63 (60.0)	20 (19.0)	7 (6.7)	90 (85.7)	15 (14.3)	105 (100.0)
Internet offers	29 (27.6)	26 (24.8)	19 (18.1)	74 (70.5)	31 (29.5)	105 (100.0)
Magazine coupons	6 (5.7)	25 (23.8)	29 (27.6)	60 (57.1)	45 (42.9)	105 (100.0)
Pharmacies	3 (2.9)	17 (16.2)	18 (17.1)	38 (36.2)	67 (63.8)	105 (100.0)
Direct-mail to consumer	1 (1.0)	10 (9.5)	20 (19.6)	31 (29.5)	74 (70.5)	105 (100.0)
Newspapers	3 (2.9)	8 (7.6)	12 (11.4)	23 (21.9)	82 (78.1)	105 (100.0)

^a Indicates total frequency of MCO respondents who ranked the marketing option as 1,2, and 3
1 – Most Widely Used; 2 – Second Most Widely Used; 3 – Third Most Widely Used.

3.2.7 Estimate of Percent Increase in Non-preferred Brand-name Drug Utilization

MCO respondents were asked to estimate the percentage increase in utilization of co-pay subsidy coupons. Table 3.7 presents MCO respondents' estimates. Seventy-nine (75.2 %) of the 105 MCO respondents reported "Don't Know."

Table 3.7 Estimate of Percent Increase in Non-preferred Brand-name Drug Utilization

Estimate on non-preferred brand-name drug utilization (in percentage)	N^a(%)
Don't Know	79 (75.2)
0	1 (1.0)
3	2 (1.9)
5	5 (4.8)
6	1 (1.0)
10	4 (3.8)
15	2 (1.9)
20	1 (1.0)
25	1 (1.0)
35	1 (1.0)
55	1 (1.0)
150	1 (1.0)
Total	99 (94.3)

^a Number of respondents = 99 ; System missing = 6

3.2.8 Ways to Discourage Co-pay Subsidy Coupons

MCO respondents were asked if during the past year their organization had discussion on ways to discourage co-pay subsidy coupons in the past year. Table 3.8 presents the results. Of the 104 respondents, 69 (66.3 %) reported that their organization had discussion on ways to discourage co-pay subsidy coupons in the past year. Four respondents reported 'don't know' indicating that they were not aware about their organization's discussions to discourage prescription drug coupon use.

Table 3.8 Responses to Item, ‘During the Past Year, Has Your Organization had Discussions about Ways in Which Co-pay Subsidy Coupons Could Be Discouraged?’

Discussions about ways in which co-pay subsidy coupons could be discouraged^a	N (%)
Yes	69 (66.3)
No	31 (29.8)
Don’t Know	4 (3.8)
Total	104 (100.0)

^aMCO respondents opinion on ways in which co-pay subsidy coupons

MCO respondents were asked to specify ways in which co-pay subsidy coupons could be discouraged. Table 3.9 presents the results. A total of 98 (93.3%) out of the 105 respondents answered the question. Since MCO respondents were asked to choose multiple responses, there were a total of 196 responses. Eighty-nine respondents (45.4%) indicated using step therapy approach, followed by 58 (29.6%) who reported that the difference in cost sharing between generics and non-formulary drugs should be increased, and 49 (25.0%) indicated using adherence rewards for generic drugs.

Table 3.9 Discussion on Ways to Discourage Co-pay Subsidy Coupons

Ways to discourage coupons	Responses N (%)
Increase difference in cost sharing between generics and non-formulary drugs	58 (29.6)
Using step therapy approach	89 (45.4)
Use adherence rewards	49 (25.0)
Don’t know	0 (0.0)
Total	196 (100.0)

In addition, MCO respondents were given an option to specify ways other than the one on the checklist. The following are some of the ways suggested by MCO respondents to discourage use of co-pay subsidy coupons:

1. Health plans should omit coverage for brand-name drugs that are promoted using co-pay subsidy coupons;
2. Use legal contracts with pharmacy networks to ban use of co-pay cards/vouchers/coupons for brand-name drugs;
3. Use co-insurance instead of co-payments on approved prescription drugs;
4. Health plans should provide incentives to use preferred brand-name drugs to their members;
5. Use mandatory mail-order pharmacy; and
6. Make a separate tier for drugs that are promoted by co-pay subsidy coupons.

3.3 HYPOTHESES TESTING

This study had seven hypotheses. The statistical tests that addressed each hypothesis were presented in Table 2.3. For each hypothesis, a dependent variable (perception score) was tested against three independent variables: the predominant managed care organization (IV₁), the position in the organization (IV₂), and number of beneficiaries enrolled (IV₄).

For each hypothesis, two statistical tests were used: two-sample T-test and two, one-way ANOVA. For pharmacy licensure (variable IV₃), there was inadequate number of respondents without pharmacy licensure to do the hypotheses testing. Hence in the following sections will describe three statistical tests (i.e., one two-sample T-test and two, one-way ANOVAs) per hypothesis.

3.3.1 Two-sample T- test

A two-sample T-test was used to compare the mean perception score of MCO respondents' (dependent variables) by the predominant managed care organization (IV₁). MCOs were categorized as either a health plan or a PBM. Table 3.10 provides the descriptive statistics (i.e., mean, and standard deviation), the t-statistic (t), degrees of freedom (df), and significance level. No statistical significant differences were found for the items controlling for type of managed care organization

Table 3.10 Two-Sample T-Test Comparison of Mean Perception Score between Health Plan and PBM Representatives

Dependent variables	Predominant MCO ^a				df	t	Sig.
	Health Plan (N = 79)		PBM ^b (N= 26)				
	Mean	SD	Mean	SD			
Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	4.49	0.68	4.42	0.70	103	0.457	0.649
Short-term use co-pay subsidy coupons increase drug cost to plan sponsors*	4.38	0.82	4.58	0.51	70.548	-1.458	0.149
Long-term use co-pay subsidy coupons increase drug cost to plan sponsors*	4.54	0.76	4.69	0.47	70.285	-1.173	0.245
Co-pay subsidy coupon use improve likelihood of first prescription being filled [#]	3.38	0.92	3.58	0.80	102	-0.942	0.348
Co-pay subsidy coupon use improve likelihood of refill	3.22	0.97	3.42	0.70	103	-1.008	0.316
Short-term use co-pay subsidy coupons should be eliminated	4.00	1.00	3.85	1.04	103	0.673	0.503
Long-term use co-pay subsidy coupons should be eliminated	4.13	1.00	4.08	1.01	103	0.218	0.791

Dependent variables were measured on 5-point Likert scale ranging 1 to 5 (1 = 'Strongly Disagree' and 5 = 'Strongly Agree')

^aMCO - Managed Care Organization

^bPBM - Pharmacy Benefit Manager

SD – Standard Deviation

*Equal variances not assumed

[#]Health Plan (N) = 78

Interpretation of Results:

The following section will present the hypothesis for the variable *predominant managed care organization* and interpretation of the results using two-sample T-tests.

Hypothesis 1: There is no difference in the mean perception score of Health Plan/PBM representatives toward whether co-pay subsidy coupons encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs by the predominant managed care organization.

T-test for Hypothesis 1

The t-test showed no significant difference in mean perception score between health plan (4.49, SD = 0.68) and PBM (4.42, SD = 0.70) representatives ($t = 0.457$; $df = 103$; $p = 0.649$) on whether co-pay subsidy coupons encouraged non-preferred brand-name drug utilization over preferred brand-name drugs.

Hypothesis 2: There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether **short-term use** co-pay subsidy coupons increase drug costs to plan sponsor by the predominant managed care organization.

T-test for Hypothesis 2

The T-test showed no significant difference in mean perception score between health plan (4.38, SD = 0.82) and PBM (4.58, SD = 0.51) representatives ($t = -1.458$; $df = 70.548$; $p = 0.149$) on whether short-term co-pay subsidy coupons increase costs to plan sponsor.

Hypothesis 3: There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether **long-term use** co-pay subsidy coupons increase drug costs to plan sponsor by the predominant managed care organization.

T-test for Hypothesis 3

The T-test showed no significant difference in mean perception score between health plan (4.54, SD = 0.76) and PBM (4.69, SD = 0.47) representatives ($t = -1.173$; $df = 70.285$; $p = 0.245$) on whether long-term co-pay subsidy coupons increases costs to plan sponsor.

Hypothesis 4: There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of first prescription being filled by the predominant managed organization.

T-test for Hypothesis 4

The T-test showed no significant difference in mean perception score between health plan (3.38, SD = 0.92) and PBM (3.58, SD = 0.80) representatives ($t = -0.942$; $df = 102$; $p = 0.348$) on whether short-term co-pay subsidy coupons improve likelihood of first prescription being filled.

Hypothesis 5: There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of prescription refill by the predominant managed organization.

T-test for Hypothesis 5

The T-test showed no significant difference in mean perception score between health plan (3.22, SD = 0.97) and PBM (3.42, SD = 0.70) representatives ($t = -1.008$; $df = 103$; $p = 0.316$) on whether long-term co-pay subsidy coupons improve likelihood of prescription refill.

Hypothesis 6: There is no difference in the mean perception of Health Plan/PBM representatives toward **short-term use** co-pay subsidy coupon elimination by the predominant managed care organization.

T-test for Hypothesis 6

The T-test showed no significant difference in mean perception score between health plan (4.00, SD = 1.00) and PBM (3.85, SD = 1.04) representatives ($t = 0.673$; $df = 103$; $p = 0.503$) on whether short-term co-pay subsidy coupons should be eliminated.

Hypothesis 7: There is no difference in the mean perception of Health Plan/PBM representatives toward **long-term use** co-pay subsidy coupon elimination by the predominant managed care organization.

T-test for Hypothesis 7

The T-test showed no significant difference in mean perception score between health plan (4.13, SD = 1.00) and PBM (4.08, SD = 1.01) representatives ($t = 0.218$; $df = 103$; $p = 0.791$) toward long-term co-pay subsidy coupon elimination.

3.3.2 One-way ANOVA

3.3.2.1 One-way ANOVA for Dependent Variables by Position in MCO

A one-way ANOVA was used to compare the dependent variables (i.e., the mean perception score of MCO respondents) controlling for respondent's position within the organization (IV₂). Table 3.11 provides the descriptive statistics (i.e., mean, and standard deviation) of all the four groups i.e., executive officer; program manager; director; and pharmacist. This is followed with Table 3.12 which tests the difference in the mean perception scores among four groups by ANOVA analyses. There were seven one-way ANOVA tests.

Table 3.11 Mean Perception Scores of Dependent Variables by Different Positions within the MCO

Dependent Variable	Position				Total
	Executive Officer N=9	Program Manager N=26	Director N=56	Pharmacist N=14	N=105
	Mean SD	Mean SD	Mean SD	Mean SD	Mean SD
Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	4.56 0.73	4.54 0.51	4.41 0.78	4.57 0.51	4.48 0.68
Short-term use co-pay subsidy coupons increase drug cost to plan sponsors	4.78 0.44	4.42 0.76	4.41 0.78	4.29 0.83	4.43 0.77
Long-term use co-pay subsidy coupons increase drug cost to plan sponsors	4.78 0.44	4.54 0.76	4.61 0.67	4.43 0.85	4.58 0.70
Co-pay subsidy coupon use improve likelihood of first prescription being filled	3.33 1.12	3.46 0.76	3.36 0.95	3.71 0.83	3.43 0.90
Co-pay subsidy coupon use improve likelihood of refill	3.33 1.00	3.46 0.70	3.09 0.98	3.57 0.85	3.27 0.91
Short-term use co-pay subsidy coupons should be eliminated	4.44 1.01	3.69 1.05	4.09 0.90	3.64 1.22	3.96 1.00
Long-term use co-pay subsidy coupons should be eliminated	4.33 1.12	3.81 1.17	4.29 0.85	3.86 1.09	4.11 1.00

Dependent variables were measured on 5-point Likert scale ranging 1 to 5 (1 = 'Strongly Disagree' and 5 = 'Strongly Agree')

Table 3.12 ANOVA for Dependent Variables by Different Positions within MCO

Variables		Sum of Squares	df	Mean Square	F	Sig.
Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	Between	0.525	3	0.175	0.371	0.774
	Within	47.666	101	0.472		
	Total	48.190	104			
Short-term use co-pay subsidy coupons increase drug cost to plan sponsor	Between	1.402	3	0.467	0.809	0.492
	Within	58.312	101	0.577		
	Total	59.714	104			
Long-term use co-pay subsidy coupons increase drug cost to plan sponsor	Between	0.759	3	0.253	0.503	0.681
	Within	50.803	101	0.503		
	Total	52.562	104			
Co-pay subsidy coupon use improve likelihood of first prescription being filled	Between	1.483	3	0.494	0.602	0.615
	Within	82.046	100	0.820		
	Total	83.529	103			
Co-pay subsidy coupon use improve likelihood of refill	Between	4.090	3	1.363	1.670	0.178
	Within	82.444	101	0.816		
	Total	86.533	104			
Short-term use co-pay subsidy coupons should be eliminated	Between	6.319	3	2.106	2.138	0.100
	Within	99.529	101	0.985		
	Total	105.858	104			
Long-term use co-pay subsidy coupons should be eliminated	Between	5.447	3	1.186	1.849	0.143
	Within	99.181	101	0.982		
	Total	104.629	104			

Interpretation of Results of One-way ANOVA

This section summarizes the hypothesis and results of one-way ANOVA analyses for each hypothesis. The independent variable is position within organization.

Hypothesis 1: There is no difference in the mean perception score of Health Plan/PBM representatives toward whether co-pay subsidy coupons encourage patients to use non-

preferred brand-name drugs instead of preferred brand-name drugs by the position in the organization.

One-way ANOVA for Hypothesis 1

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether co-pay subsidy coupons encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs) among executive officer (4.56 ± 0.73), program manager (4.54 ± 0.51), director (4.41 ± 0.78), and pharmacist (4.57 ± 0.51) groups; ($F = 0.371$; $df = 3, 101$; $p = 0.774$).

Hypothesis 2: There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether **short-term use** co-pay subsidy coupons increase drug costs to plan sponsor by the position in the organization.

One-way ANOVA for Hypothesis 2

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether short-term use co-pay subsidy coupons increase drug cost to plan sponsor) among executive officer (4.78 ± 0.44), program manager (4.42 ± 0.76), director (4.41 ± 0.78), and pharmacist (4.29 ± 0.83) groups; ($F = 0.809$; $df = 3,101$; $p = 0.492$).

Hypothesis 3: There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether **long-term use** co-pay subsidy coupons increase drug costs to plan sponsor by the position in the organization.

One-way ANOVA for Hypothesis 3

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether long-term use co-pay subsidy coupons increase drug cost to plan sponsor) among executive officer (4.78 ± 0.44), program manager (4.54 ± 0.76), director (4.61 ± 0.67), and pharmacist (4.43 ± 0.85) groups; ($F = 0.503$; $df = 3,101$; $p = 0.681$).

Hypothesis 4: There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of first prescription being filled by the position in the organization.

One-way ANOVA for Hypothesis 4

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether use of co-pay subsidy coupons improves likelihood of first prescription being filled) among executive officer (3.33 ± 1.12), program manager (3.46 ± 0.76), director (3.36 ± 0.95), and pharmacist (3.71 ± 0.83) groups; ($F = 0.602$; $df = 3,100$; $p = 0.615$).

Hypothesis 5: There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of prescription refill by the position in the organization.

One-way ANOVA for Hypothesis 5

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether use of co-pay subsidy coupons improves likelihood of prescription refill) among

executive officer (3.33 ± 1.00), program manager (3.46 ± 0.70), director (3.09 ± 0.98), and pharmacist (3.57 ± 0.85) groups; ($F = 1.670$; $df = 3,101$; $p = 0.178$).

Hypothesis 6: There is no difference in the mean perception of Health Plan/PBM representatives toward **short-term use** co-pay subsidy coupon elimination by the position in the organization.

One-way ANOVA for Hypothesis 6

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., short-term use co-pay subsidy coupons should be eliminated) among executive officer (4.44 ± 1.01), program manager (3.69 ± 1.05), director (4.09 ± 0.90), and pharmacist (3.64 ± 1.22) groups; ($F = 2.138$; $df = 3,101$; $p = 0.100$).

Hypothesis 7: There is no difference in the mean perception of Health Plan/PBM representatives toward **long-term use** co-pay subsidy coupon elimination by the position in the organization.

One-way ANOVA for Hypothesis 7

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., long-term co-pay subsidy coupons should be eliminated) among executive officer (4.33 ± 1.12), program manager (3.81 ± 1.17), director (4.29 ± 0.85), and pharmacist (3.86 ± 1.09) groups; ($F = 1.849$; $df = 3,101$; $p = 0.143$).

3.3.2.2 One-way ANOVA for Dependent Variables by Number of Beneficiaries Enrolled in MCO

Another **one-way ANOVA** was performed to compare the perception score by the independent variable number of beneficiaries enrolled (IV₄). Table 3.13 provides the descriptive statistics (i.e., mean, standard deviation) of the four groups (i.e., less than 1 million lives; 1,000,000 – 4,999,999; 5,000,000 – 9,999,999; and 10 million and above). This is followed with Table 3.14 which tests the difference in the mean perception scores among four groups by ANOVA analyses. There were seven one-way ANOVA tests.

Table 3.13 ANOVA Comparison of Mean Perception Score by Number of Beneficiaries Enrolled by MCO

Dependent Variable	Enrollment Status ^a				Total ^b
	< 1 million N=50	1,000,000 to 4,999,999 N=19	5,000,000 to 9,999,999 N=9	≥ 10 million N=25	N ^c =103
	Mean SD	Mean SD	Mean SD	Mean SD	Mean SD
Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	4.42 0.67	4.58 0.50	4.56 0.53	4.44 0.87	4.47 0.68
Short-term use co-pay subsidy coupons increase the drug cost to plan sponsors	4.50 0.76	4.32 0.88	4.44 0.73	4.40 0.65	4.44 0.75
Long-term use co-pay subsidy coupons increase the drug cost to plan sponsors	4.62 0.72	4.53 0.77	4.67 0.50	4.56 0.65	4.59 0.69
Co-pay subsidy coupon use improve likelihood of first prescription being filled [#]	3.40 0.88	3.44 0.86	3.67 1.22	3.36 0.86	3.42 0.89
Co-pay subsidy coupon use improve likelihood of refill	3.28 0.97	3.32 0.88	3.44 1.13	3.12 0.78	3.26 0.91
Short-term use co-pay subsidy coupons should be eliminated	3.98 1.02	4.16 0.83	3.89 1.17	3.92 1.03	3.99 0.99
Long-term use co-pay subsidy coupons should be eliminated	4.10 1.02	4.47 0.61	3.89 1.17	4.08 1.07	4.15 0.98

Dependent variables were measured on 5-point Likert scale ranging 1 to 5 (1 = 'Strongly Disagree' and 5 = 'Strongly Agree')

^aNumber of beneficiaries enrolled by the MCO

^bTotal Number of Respondents Combined

^cmissing responses – 2

For group with organization enrollment of 1,000,000 to 4,999,999 ; N=18

SD – Standard Deviation

Table 3.14 ANOVA Comparison of Dependent Variables by Number of Beneficiaries Enrolled by MCO

Variables		Sum of Squares	df	Mean Square	F	Sig.
Co-pay subsidy coupon use encourages non-preferred brand-name drug utilization instead of preferred brand-name drugs	Between	0.437	3	0.146	0.306	0.821
	Within	47.194	99	0.477		
	Total	47.631	102			
Short-term use co-pay subsidy coupons increase drug cost to plan sponsor	Between	0.512	3	0.171	0.298	0.827
	Within	56.827	99	0.574		
	Total	57.340	102			
Long-term use co-pay subsidy coupons increase drug cost to plan sponsors	Between	0.197	3	0.066	0.134	0.940
	Within	48.677	99	0.492		
	Total	48.874	102			
Co-pay subsidy coupon use improve likelihood of first prescription being filled [#]	Between	0.668	3	0.223	0.272	0.845
	Within	80.204	98	0.818		
	Total	80.873	101			
Co-pay subsidy coupon use improve likelihood of refill	Between	0.875	3	0.292	0.339	0.797
	Within	85.047	99	0.859		
	Total	85.922	102			
Short-term use co-pay subsidy coupons should be eliminated	Between	0.755	3	0.252	0.249	0.862
	Within	100.235	99	1.012		
	Total	100.990	102			
Long-term use co-pay subsidy coupons should be eliminated	Between	2.850	3	0.950	0.980	0.405
	Within	95.966	99	0.969		
	Total	98.816	102			

For group with enrollment 1,000,000 to 4,999,999 ; N=18

Interpretation of Results of One-way ANOVA

Each hypothesis and the results of the one-way ANOVA are summarized below:

Hypothesis 1: There is no difference in the mean perception score of Health Plan/PBM representatives toward whether co-pay subsidy coupons encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 1

A one-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether co-pay subsidy coupons encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs) among groups with number of beneficiaries enrolled less than 1 million (4.42 ± 0.67); 1,000,000 – 4,999,999 (4.58 ± 0.50); 5,000,000 – 9,999,999 (4.56 ± 0.53); and 10 million and above (4.44 ± 0.87) ($F=0.306$; $df= 3, 99$; $p = 0.821$).

Hypothesis 2: There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether **short-term use** co-pay subsidy coupons increase drug costs to plan sponsor by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 2

A one-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether short-term use co-pay subsidy coupons increase drug cost to plan sponsor) among groups with number of beneficiaries enrolled less than 1 million (4.50 ± 0.76); 1,000,000 – 4,999,999 (4.32 ± 0.88); 5,000,000 – 9,999,999 (4.44 ± 0.73); and 10 million and above (4.40 ± 0.65) ($F=0.298$; $df= 3, 99$; $p = 0.827$).

Hypothesis 3: There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether **long-term use** co-pay subsidy coupons increase drug costs to plan sponsor by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 3

A one-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether long-term use co-pay subsidy coupons increase drug cost to plan sponsor) among groups with number of beneficiaries enrolled less than 1 million (4.62 ± 0.72); 1,000,000 – 4,999,999 (4.53 ± 0.77); 5,000,000 – 9,999,999 (4.67 ± 0.50); and 10 million and above (4.56 ± 0.65) ($F=0.134$; $df= 3, 99$; $p = 0.940$).

Hypothesis 4: There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of first prescription being filled by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 4

A one-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether use of co-pay subsidy coupons improves likelihood of first prescription being filled) among groups with number of beneficiaries enrolled less than 1 million (3.40 ± 0.88); 1,000,000 – 4,999,999 (3.44 ± 0.86); 5,000,000 – 9,999,999 (3.67 ± 1.22); and 10 million and above (3.36 ± 0.86) ($F=0.272$; $df= 3, 98$; $p = 0.845$).

Hypothesis 5: There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of prescription refill by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 5

A one-way ANOVA showed no significant differences in mean (SD) perception score (i.e., whether use of co-pay subsidy coupons improves likelihood prescription refill) among groups with number of beneficiaries enrolled less than 1 million (3.28 ± 0.97); 1,000,000 – 4,999,999 (3.32 ± 0.88); 5,000,000 – 9,999,999 (3.44 ± 1.13); and 10 million and above (3.12 ± 0.78) ($F=0.339$; $df= 3, 99$; $p = 0.797$).

Hypothesis 6: There is no difference in the mean perception of Health Plan/PBM representatives toward **short-term use** co-pay subsidy coupon elimination by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 6

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., short-term use co-pay subsidy coupons should be eliminated) among groups with number of beneficiaries enrolled less than 1 million (3.98 ± 1.02); 1,000,000 – 4,999,999 (4.16 ± 0.83); 5,000,000 – 9,999,999 (3.89 ± 1.17); and 10 million and above (3.92 ± 1.03) ($F=0.249$; $df = 3, 99$; $p = 0.862$).

Hypothesis 7: There is no difference in the mean perception of Health Plan/PBM representatives toward **long-term use** co-pay subsidy coupon elimination by the number of beneficiaries enrolled.

One-way ANOVA for Hypothesis 7

One-way ANOVA showed no significant differences in mean (SD) perception score (i.e., long-term co-pay subsidy coupons should be eliminated) among groups with number of beneficiaries enrolled less than 1 million (4.10 ± 1.02); 1,000,000 – 4,999,999 (4.47 ± 0.61); 5,000,000 – 9,999,999 (3.89 ± 1.17); and 10 million and above (4.08 ± 1.07) ($F=0.980$; $df= 3, 99$; $p = 0.405$).

3.3.3 Summary of Results of Hypotheses Testing

The following table presents a summary of results of hypotheses testing.

Table 3.15 Summary of Results of Hypotheses Testing

Hypothesis	Results*
H ₀₁ : There is no difference in the mean perception score of Health Plan/PBM representatives toward whether co-pay subsidy coupons encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs by the predominant managed care organization, the position in the organization, and number of beneficiaries enrolled.	Not Rejected
H ₀₂ : There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether short-term use co-pay subsidy coupons increase drug costs to plan sponsor by the predominant managed care organization, the position in the organization, and number of beneficiaries enrolled.	Not Rejected
H ₀₃ : There is no difference in the mean perception score of Health Plan/PBM representatives regarding whether long-term use co-pay subsidy coupons increase drug costs to plan sponsor by the predominant managed care organization, the position in the organization, and number of beneficiaries enrolled.	Not Rejected
H ₀₄ : There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of first prescription being filled by the predominant managed organization, the position in the organization, and number of beneficiaries.	Not Rejected

* Analysis was not performed using independent variable 'pharmacy licensure'

Table 3.15 Summary of Results of Hypotheses Testing (continued)

Hypothesis	Results*
H ₀₅ : There is no difference in the mean perception of Health Plan/PBM representatives in regard to co-pay subsidy coupons improving likelihood of prescription refill by the predominant managed organization, the position in the organization, and number of beneficiaries enrolled.	Not Rejected
H ₀₆ : There is no difference in the mean perception of Health Plan/PBM representatives toward short-term use co-pay subsidy coupon elimination by the predominant managed care organization, the position in the organization, and number of beneficiaries enrolled.	Not Rejected
H ₀₇ : There is no difference in the mean perception of Health Plan/PBM representatives toward long-term use co-pay subsidy coupon elimination by the predominant managed care organization, the position in the organization, and number of beneficiaries.	Not Rejected

* Analysis was not performed using independent variable ‘pharmacy licensure’

Chapter Four: Discussion

This chapter provides a summary of the major findings of the study and will discuss the significance or implications of these findings with respect to the literature. In addition, the chapter will assess limitations of this study and give directions for future research.

4.1 REVIEW OF RESEARCH QUESTIONS

One of the many roles for MCOs is increasing value and use of pharmaceuticals by making drugs affordable, accessible and improving their use while maximizing positive patient outcomes. In order to achieve this goal, along with managing costs for plan sponsors, MCOs have implemented certain strategies. One of MCOs' several strategies is establishing drug formularies and promoting generic products. Most drug formularies have a preferred drug list and tiered cost structure with generic drugs placed at lowest tier. The objective is to make appropriate drugs accessible to all members, while allowing access of expensive medical alternatives for certain members.

In recent times, coupon/voucher offers have been used for: 1) launching new drugs; 2) brand-name drugs which are approaching patent expiration; 3) enhancing competition between two or more brand-name drugs; and 4) lifestyle drugs and specialty drugs. The coupon offers are widely seen in magazine ads, newspapers, or are offered at physician offices. In addition, internet search results direct an information seeker to a manufacturer-sponsored web homepage or to a drug coupons website that has an alphabetical listing of discounted prescription drugs. Such promotions are short-term for introducing products or may last for a year (long-term). An important component of brand-name drug coupon promotion is that it waives or subsidizes out-of-pocket costs (co-pays) of patients enrolled in health plans. The patient portion of the drug costs are

covered by drug companies promoting their product using coupon offers while the remainder of costs are covered by plan sponsors. While MCOs are offering incentives to their members to use affordable available generic drugs, pharmaceutical companies are increasing access to their brand-name drugs by offering co-pay subsidies. Little is known in the literature about the perceptions MCO representatives have toward brand-name drug coupon programs that subsidize their plan members' costs.

This study was conducted on a sample of MCO representatives (i.e., health plan managers and pharmacy benefit managers). The purpose was to determine the perceptions of MCO representatives toward co-pay subsidy coupons. Specific objectives were to determine their perceptions regarding: whether co-pay subsidy coupons led to increase in non-preferred brand-name drugs instead of preferred brand-name drugs; whether coupons improved patient adherence; whether short-term use and long-term use coupons increased plan sponsor costs; and if both these type of coupons should be eliminated. In addition, the objective of this study was to find out if MCOs monitored changes in coupon activity, monitored costs incurred to their organization due to coupons, and if they discussed ways to counteract coupon offers.

4.2 STUDY FINDINGS

MCO Characteristics

Of the 105 respondents who answered the survey, 79 (75.2%) were health plan managers and 26 (24.8%) were PBM representatives. A total of 95.2% of the respondents were licensed pharmacists. A total of 56 (53.3%) were directors of pharmacy, formulary or clinical operations. Slightly less than half (46.7%) of the respondents had beneficiary enrollment of less than 1 million.

All of the MCO respondents who answered the survey were aware of the use of co-pay subsidy for brand-name prescription drugs. According to MCO respondents, the most widely used marketing approaches for coupon distribution were through physician offices 90 (85.7%), followed by internet offers 74 (70.5%), and magazine coupons 60 (57.1%). A majority of MCO respondents, 91 (86.7%) believed that co-pay subsidy coupons offered by pharmaceutical manufacturers had increased in 2011 as compared to 2010. This finding was highlighted in the recent article published in the *Wall Street Journal* that notes there were 310 co-pay card programs in 2011 - a rise of 260% over the previous two years.⁵⁸ Forty seven (44.7%) respondents had an opinion that 10 or more of the top 20 brand-name drugs used coupons for promotion. This finding is consistent with the Weppner et al. study that notes more than 30 out of 50 most prescribed brand-name drugs have internet offers in term of coupons or vouchers.⁵⁹

Coupon Monitoring Activities

MCO respondents were asked if their organization monitored use of coupons/vouchers by their plan members. Seventy-two (68.6%) respondents answered 'No.' When asked if their organization contracted with another organization to monitor use of brand-name coupons/vouchers, 95 (90.5%) respondents answered 'No.' With respect to monitoring costs incurred to their organization due to coupons, 71 (67.6%) answered 'No' they did not monitor costs. This study found that a low proportion of MCOs monitored use (22.9%, N = 24) and costs (21.9%, N = 23) incurred due to coupons. These findings suggest that monitoring coupons may involve additional time

consuming effort on part of MCOs. Furthermore, data received from pharmacies may not track if co-pay was made by the patient or the drug manufacturer.

Perception Regarding Impact of Coupons on Brand-name Drug Utilization

MCO representatives perceived that the utilization of generic drugs was affected by co-pay subsidy coupons. Fifty-four (51.4%) respondents ‘agreed’ that patients were more likely to shift from generic to brand-name drugs on receiving co-pay subsidy coupons. Fifty-one (49%) respondents ‘strongly agreed’ that brand-name drug utilization increased instead of generic drugs. The hypotheses testing showed no significant difference in perception of MCO representatives toward whether co-pay subsidy coupons encouraged utilization of non-preferred brand-name drugs over preferred brand drugs by predominant MCO, position in the MCO, and number of beneficiaries enrolled. In this study, a majority of MCO respondents 58 (55.2%) ‘strongly agreed’ whereas 42 (40%) ‘agreed’ that co-pay subsidy coupons encouraged use of non-preferred brand-name drugs instead of preferred brand-name drugs. The literature suggests that MCOs use three or more tiers in drug formularies. These are incentive-based formularies that provide the lowest co-pays for generic drugs, followed by ‘select’ brand-name drugs called preferred brands and the top tiers consists of non-preferred drugs which have higher co-pays. Studies suggest that adding tiers for non-preferred drugs lowers costs paid by health plans.⁶⁰ A possible explanation for this is that plan members choose equivalent available generic drugs or preferred brands instead of costlier alternatives. However, with co-pay subsidy coupons waiving out-of-pocket costs on non-preferred or non-formulary brand-

name drugs for plan members, there is no incentive to choose generic or preferred brand-name drugs.

Perception toward Brand Loyalty and Costs of Co-pay Subsidy Coupons (Short-term use Versus Long-term use)

For the item, *'A majority of patients who take advantage of short-term use co-pay subsidy coupons become regular users of brand-name drugs.'* it is interesting to note that 48 (45.7%) 'agreed', 13 (12.4%) 'strongly agreed', while 18 (17.1%) 'disagreed' with the statement. Short-term use coupons are typically distributed for trial purposes with limited use. Previous studies in consumer research suggest that short-term coupon promotions draw deal-prone users who are less likely to continue using products.⁶¹ Similar findings were observed for the statement, *'Short-term use co-pay subsidy coupons build brand loyalty toward brand-name prescription drugs.'*; 47 (45.2%) 'agreed' while 14 (13.5%) 'disagreed'. These findings are not consistent with previous consumer behavior studies that suggest deal-prone consumers revert back to their original brands when deals are withdrawn, that is, short-term deal prone shoppers are not brand loyal.⁶¹⁻⁶² A possible explanation could be that unlike consumer products, even short-term coupon promotion for brand-name prescription drugs are very effective in getting patients to use drugs for a long time.

The findings for the statement, *'a majority of patients who take advantage of long-term use co-pay subsidy coupons become regular users of brand-name drug.'* were 41 (39.4%) respondents indicating 'strongly agreed', 48 (46.2%) 'agreed' while 10

(9.6%) respondents had 'neutral' perception and a mean perception score of 4.19 (0.84). With respect to long-term use coupons, 54 (51.4%) 'agreed' while 37 (35.2%) 'strongly agreed' that long-term use co-pay subsidy coupons build brand-loyalty. The mean perception score was 4.17 (0.77). Overall, MCO respondents perceived that patient using coupons for a long period of time as in case of co-pay cards that were offered for refills up to a year may become regular users and brand loyals.

MCO representatives perceived that both short-term use and long term use co-pay subsidy coupons increased drug cost to plan sponsors. Hypotheses testing showed no significant difference in mean perception score of MCO representatives toward whether short-term and long-term co-pay subsidy coupons increased drug cost to plan sponsors by predominant MCO, position in the MCO, and number of beneficiaries enrolled. Of the 105 MCO respondents, 60 (57.1%) respondents 'strongly agreed' that plan sponsor's cost increased due to short-term use coupons and 72 (68.6%) respondents 'strongly agreed' that plan sponsor's cost increased due to long-term use coupons. The mean perception scores on whether short-term use and long-term use co-pay subsidy coupons increased drug costs to plan sponsor were 4.43 (0.76) and 4.58 (0.70), respectively. A possible explanation for this finding could be that MCOs try to effectively utilize health care resources by making appropriate drugs available to plan members. However, in the face of escalating drug prices, use of co-pay subsidy coupon promotions directly affects their cost containment efforts. Evidence suggests that the increasing coupon promotions may

inflate the prescription drug costs.⁶³ As more patients use coupons that eliminate their co-pays, it is apparent that MCOs perceive co-pay subsidy coupons increase plan costs.

Perception Regarding Impact of Coupons on Adherence

Drug manufacturers claim that coupons for brand-name drugs are a part of patient-directed programs.⁶⁴ These discount programs enable patients to start a new drug or continue with an existing drug.⁶⁵ Co-pay subsidy coupons reduce the financial burden of patients by decreasing their out-of-pocket costs. Studies have reported that patient-directed programs such as LoyaltyScript show higher persistence rates among patients enrolled in the program.⁶⁶ In this study, an attempt was made to investigate if MCO respondents perceived that co-pay subsidy coupons increased primary adherence (i.e., rate at which patients filled first prescriptions) and persistence (i.e., rate of refill).⁶⁷

Hypotheses testing for MCO representatives' perception toward items, 'Co-pay subsidy coupons improve the likelihood that patients will get their first prescription filled,' and 'Co-pay subsidy coupons improve the likelihood of refill,' showed that there was no significant differences in the mean perception scores of MCO respondents by predominant MCO, position in the MCO, and number of beneficiaries enrolled. For the item, 'Co-pay subsidy coupons improve the likelihood that patients will get their first prescription filled,' the results show mixed responses with the frequency of responses almost tied with 40 (38.1%) MCO respondents indicating a 'neutral' response and 39 (37.1%) indicating 'agreed.' There were 12 (11.5%) respondents who 'disagreed' while 2 (1.9%) respondents 'strongly disagreed' (Table 3.2). The mean perception score was 3.43

(0.90). Previous studies suggest that an increase in prescription drug co-pays decreases medication adherence.⁶⁸⁻⁶⁹ Furthermore, drug coupons are incentives that are more likely to draw consumers toward filling prescriptions. Of the 105 respondents, 14 disagreed that co-pay subsidy coupons will encourage likelihood of first prescription fills. These findings contradict the results pertaining to earlier statements in this survey (i.e., when asked if patients using coupons become regular users or brand-loyals for long-term use coupons, greater proportion of MCO respondent agreed. The mean perceptions scores are 4.19 (0.84) and 4.17 (0.78), respectively. However, when asked if co-pay subsidy coupons improve likelihood that patients will obtain refill prescriptions, there is relatively less agreement among MCO respondents and a dip in the mean perception score to 3.27 (0.91). .

In the case of MCO respondents' perceptions toward co-pay subsidy coupons improving the likelihood of prescription refill, 20 (19.0%) 'disagreed' while the number of MCO respondents who indicated 'neutral' were 38 (36.2%), the same as those who 'agreed.' A mean perception score of 3.27 (0.91) was observed. With coupons distributed repeatedly for longer periods (long-term use coupons), it is expected that patients are more likely to use them repeatedly for refills. Of the 105 respondents, 60 respondents did not believe that coupons improve likelihood of prescription refills.

While increasing promotion of their prescription drugs by using co-pay subsidy coupons, pharmaceutical companies emphasize that waived co-payments will help overcome non-adherence (i.e., medication discontinuation) due to high drug costs. It is

documented that consumers are sensitive toward drug co-pay increases and that increasing co-pays affects adherence. Waived co-pays on prescription drugs through coupons provide an incentive for consumers to try new expensive drug alternatives. This is increasing costs for plan sponsors. While MCOs want to eliminate coupon promotion, they find this beyond their control. Hence, they may be inclined to report that coupons do not increase adherence or persistence.

Perception Regarding Impact of Coupons on Formulary Structure and Elimination of Coupon Offers

MCO respondents had a unanimous agreement that co-pay subsidy coupons were disrupting the tiered formulary structure. Of the 105 respondents who answered the survey, 78 (74.3%) respondents ‘strongly agreed’ that co-pay subsidy coupons undermined tiered formulary structure. This is because co-pay subsidy coupons are mostly available for non-preferred drugs. These non-preferred drugs are placed in higher cost tiers to provide an incentive to use generics and preferred brand-name drugs. When respondents were asked to estimate the percentage increase in utilization of non-preferred brand-name drugs due to co-pay subsidy coupons, 79 (75.2%) indicated ‘don’t know.’

In terms of co-pay subsidy coupon elimination, hypotheses testing showed that there were no significant differences in mean perception score of MCO representatives toward both short-term and long-term co-pay subsidy coupon elimination by predominant MCO, position in the MCO, and number of beneficiaries enrolled. Forty-two (40%) respondents ‘strongly agreed’ that short-term use coupons should be eliminated whereas

49 (46.7%) respondents ‘strongly agreed’ that long-term use coupons should be eliminated. The mean perception scores were 3.96 (1.00) toward short-term coupon elimination and 4.11 (1.00) toward long-term coupon elimination. In particular, MCO representatives were sensitive to co-pay subsidy coupon promotion with a majority perceiving that coupons should be banned. However, few respondents disagreed or had neutral opinions (Table 3.2) toward both short-term use and long-term use coupon elimination. A possible explanation could be that MCO representatives may welcome co-pay subsidy coupons for expensive specialty drugs that are used to treat complex medical conditions such as cancer, inflammatory condition, multiple sclerosis, and other complex disorders. An article in *Drug Benefit News* points out that although health plans should adopt strategies to counteract some prescription co-pay subsidy coupons, they should partner with pharmaceutical companies on costly treatments that use specialty drugs.⁷⁰

A majority (65.7%, N = 69) of respondents indicated that their organization discussed ways to discourage co-pay subsidy coupon use within past year. When MCO respondents were asked to specify ways in which coupons can be discouraged, a majority favored using a step therapy approach. In addition, respondents indicated that MCOs should omit coverage for drugs with coupons, start their own coupon incentive programs for generic and preferred drugs, or use mandatory mail-order service.

4.3 STUDY LIMITATIONS

Like any research project this study has limitations. This study cannot be generalized due to the fact that it used a convenience sample and the sample size was

relatively small. This study used a sample from the AMCP directory and thus, it may be possible that AMCP members may have different perspectives than the general MCO population.

The study assessed perceptions of MCO representatives toward co-pay subsidy coupons and perceptions may evolve or change with time. Hence, we are not assured that MCO representatives may have the same views today as they did when the study was conducted. Plus, as with all questionnaire studies, there may be differences in interpreting the items or questions.

The study response rate was low (i.e., 13.68%) and a non-response bias was not accounted for in this study. It is possible that non-respondent MCO representatives will have different perceptions toward co-pay subsidy coupons than those who did respond. It is possible that some organizations may prohibit access to survey links or prohibit their employees from participation in surveys due to corporate survey policies.

Finally, the survey was self administered (i.e., all the responses were self reported).

4.4 CONCLUSION

Overall, the findings of this study demonstrate that MCO representatives perceived co-pay subsidy coupons for brand-name prescription drugs do present a problem for managed care organizations. The results show that many MCO representatives perceived that co-pay subsidy coupons increased brand-name drug

utilization, undermined tiered formulary structure, and increased costs to plan sponsors. The results were not conclusive in regard to co-pay subsidy coupons improving patient adherence and persistence. MCO representatives considered short-term use coupons as less problematic than long-term use coupons. This could be because long-term use coupons may increase brand-loyalty and brand drug use. A majority of respondents agreed that co-pay subsidy coupons should be eliminated. These results are in line with the anticipated responses given that MCOs are bound to be sensitive toward coupons/vouchers that directly impact their cost containment strategies. It is “all about access;” as plan sponsors switch their plan members to tiered formularies that restrict access to expensive drugs, brand-name drug manufacturers are promoting their products to help patients get access to blockbuster moieties.

4.5 DIRECTIONS FOR FUTURE RESEARCH

This study uses MCOs’ perspectives on use of co-pay subsidy coupons. It would be interesting to investigate the consumers/plan members’ perspective toward co-pay subsidy coupon use. In addition, it would be interesting to assess consumers’ perceptions if health plans decide to ban coupon use or implement strategies to counteract coupons. Furthermore, the literature is lacking in studies that explore effects of coupon use on medication persistence. Another unexplored area from MCO’s perspective could be assessing the extent to which coupons/vouchers increase costs of prescription drugs.

Appendices

APPENDIX I

A Web-Based Survey to Assess the Perceptions of Managed Care Organization Representatives Regarding Use of Co-pay Subsidy Coupons for Brand-name Prescription Drugs

The purpose of this survey is to assess your perceptions about co-pay subsidy coupons or vouchers. Since you work for a health plan or a pharmacy benefit management firm, you have been identified as a candidate for our study.

Co-pay subsidy coupons and vouchers are offered by pharmaceutical manufacturers for certain brand-name prescription drugs. For the purpose of this survey, a co-pay subsidy coupon will be defined as a promotional financial incentive such as a coupon, voucher, or a co-pay card (also known as a loyalty card) that waives co-payment partially or completely on a brand-name prescription drug.

I. In this section, we would like to know about your experiences with co-pay subsidy coupons.

Please check the appropriate box that corresponds with your answer to the questions below.

1. Before you received this survey, were you aware that co-pay subsidy coupons are being offered by some pharmaceutical manufacturers?

Yes (*Please continue with question 2*)

No (*Please skip to Section III*)

2. Listed below are marketing approaches for distributing prescription drug co-pay subsidy coupons. *(In your opinion, please rank the three most widely used options using the numbers 1 through 3 with “1” being most widely used, “2” second most widely used, and “3” third most widely used.)*

_____ Newspapers

_____ Magazine coupons

_____ Internet offers

_____ Direct mail to consumer

_____ Pharmacies

_____ Physicians

_____ Other _____ *(Please specify and rank)*

3. Do you believe that in the past year the number of co-pay subsidy coupons offered by pharmaceutical manufacturers has increased, decreased, or stayed about the same as in the previous year?

Increased

Decreased

Stayed about the same

4. In your opinion, approximately how many of the top 20 brand-name prescription drugs use coupons for promotion?

None

1-3

4-6

7-9

10 or more

Don't know

5. Does your organization monitor coupon/voucher use for brand-name prescription drugs?

Yes

No

Don't know

6. Does your organization **contract with another organization** to monitor the use of coupons for brand-name prescription drugs?

Yes

No

Don't know

7. Does your organization monitor **costs to your organization** due to coupon/voucher use for brand-name prescription drugs?

Yes

No

Don't know

II. In this section, we would like to know your perceptions regarding whether the use of co-pay subsidy coupons has an impact on brand-name drug utilization, patient adherence, and costs.

Note: Some items refer to long-term or short-term use coupons.

Long-term use coupons are defined as co-pay cards that can be used repeatedly over a year to get co-pay discounts on refills. (For example, co-pay cards used for cholesterol lowering drugs).

Short-term use coupons are defined as co-pay cards that are distributed for trial offers and have a limit on usage (For example, co-pay cards used for dermatology products may be limited to 3 refills).

8. Please check the appropriate circle indicating your level of agreement with each of the following statements by choosing one of the following responses:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Patients are more likely to shift from generic to brand-name drugs when they receive co-pay subsidy coupons.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Co-pay subsidy coupons increase utilization of brand-name prescription drugs instead of generic drugs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Co-pay subsidy coupons are likely to encourage patients to use non-preferred brand-name drugs instead of preferred brand-name drugs.-	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. The majority of patients who take advantage of short-term use co-pay subsidy coupons become regular users of brand-name drugs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- e. The majority of patients who take advantage of **long-term use** co-pay subsidy coupons become regular users of brand-name drugs.
- f. **Short-term use** co-pay subsidy coupons build brand loyalty toward brand-name prescription drugs.
- g. **Long-term use** co-pay subsidy coupons build brand loyalty toward brand-name prescription drugs.
- h. Co-pay subsidy coupons undermine the tiered formulary structure.
- i. **Short-term use** co-pay subsidy coupons increase drug costs for plan sponsors.
- j. **Long-term use** co-pay subsidy coupons increase drug costs for plan sponsors.
- k. Co-pay subsidy coupons improve the likelihood that patients will get their first prescription filled.
- l. Co-pay subsidy coupons improve the likelihood that patients will obtain refill prescriptions.
- m. **Short-term use** brand drug co-pay subsidy coupons should be eliminated.

n. **Long-term use** brand drug
co-pay subsidy coupons should be eliminated.

9. Please estimate the percentage increase in utilization of non-preferred brand-name drugs for the past year due to co-pay subsidy coupons?

_____ %

Don't know

10. During the past year, has your organization had discussion about ways in which co-pay subsidy coupons could be discouraged?

Yes

No

Don't know

11. In your opinion, please specify the ways in which the use of co-pay subsidy coupons could be discouraged? (*Check all that apply*)

Increase difference in cost sharing between generics and non-formulary drugs

Use a step therapy approach (defined as coverage of second-line therapy after trial with first-line therapy)

Use adherence rewards for generics

Don't know

Other (*Please*

specify)_____

III. This section will help gather some information about you.

Please check the appropriate box that corresponds with your answer to the questions below.

12. Which of the following best describes the predominant managed care organization where you work?

Health Plan

Pharmacy Benefit Manager (PBM)

Other (*Please specify*) _____

13. Are you a licensed pharmacist?

Yes

No

14. Which of the following best describes your position within the organization where you are employed?

Executive Officer (President/Vice President)

Program Manager (Clinical, Pharmacy)

Director (Clinical Operations, Formulary, Pharmacy)

Pharmacist (Staff, Senior)

Other (*Please specify*) _____

15. What is your organization's approximate total enrollment? (i.e., *indicate the number of lives covered by your plans*)

- < 1,000,000 lives
- 1,000,000 – 4,999,999 lives
- 5,000,000 – 9,999,999 lives
- ≥ 10 million lives
- Don't know

16. Any additional comments or concerns

Thank you for taking the time to participate in this survey!

APPENDIX II



COLLEGE OF PHARMACY

THE UNIVERSITY OF TEXAS AT AUSTIN

Center for Pharmacoeconomic Studies • Austin, Texas 78712-0127

(512) 471-6892 • FAX (512) 471-8762

Dear Sir/Madam,

Pharmaceutical manufacturers have used coupons, vouchers, or co-pay cards also known as loyalty cards for promoting brand-name prescription drugs. These coupons or co-pay cards lower or waive patients' out-of-pocket costs (co-payments). In other words, drug manufacturer's pay for patient's portion of prescription drug cost. A co-payment is cost-sharing component of patients enrolled in health plan. Coupons or vouchers circumvent the higher co-payments implemented by managed care firms for expensive brand-name drugs. Until now, there is little documentation about the impact of such patient-directed prescription coupon incentives particularly for managed care organizations (MCOs).

We, at the University of Texas at Austin are in the process of conducting a research study to determine perceptions of MCO representatives regarding the use of prescription drug coupons or vouchers. Since you work for a health plan or a pharmacy benefit management firm, you have been identified as a candidate for this study. Your views are important as they will provide a solution to improve communication between managed care organizations and pharmaceutical companies.

We invite you to participate in this study by completing a short questionnaire. It will only take 5 to 7 minutes. Your participation in this study is voluntary. At the bottom of this email is a link to the questionnaire.

We hope that you will participate in the project by completing the questionnaire. All responses are anonymous and will be kept confidential. No identifying information such as your name or identification of your organization will be collected and responses will not be linked to you. The results of the study will be reported in aggregate form. Participation in the study poses little to no risk to you. The return of your completed survey will represent your consent to participate in this study. To participate in the study please click on the link at the bottom of this email. To reiterate, no email addresses or names will be collected.

If you have any questions about this project, you may contact us at (512)-471-5607 or email Poorva Nemlekar at poorva@mail.utexas.edu or Dr. Marvin Shepherd at marvshepherd@mail.utexas.edu

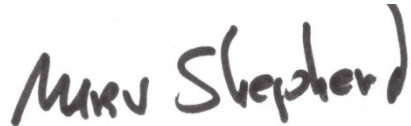
If you have questions or concerns about your rights as a research participant or complaints, please contact the University of Texas at Austin Institutional Review Board Chair Jody Jenson at irbchair@austin.utexas.edu or the Office of Research Support at orsc@uts.cc.utexas.edu.

Thank you for your help in advance. We greatly appreciate your time and efforts in taking this survey.

Please click on the following link or paste it on your web browser to take the survey:

<https://www.surveymonkey.com/s/RSRTPYT>

Sincerely,

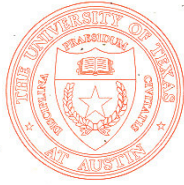


Marvin Shepherd, Ph.D.
Director
Center for Pharmacoeconomics Studies



Poorva Nemlekar, B.Pharm

APPENDIX III



COLLEGE OF PHARMACY

THE UNIVERSITY OF TEXAS AT AUSTIN

Center for Pharmacoeconomic Studies • Austin, Texas 78712-0127
(512) 471-6892 • FAX (512) 471-8762

Dear Sir/Madam,

Last week we sent you a request to participate in a survey study that is being conducted by researchers at the College of Pharmacy at the University of Austin at Texas. This study is being conducted to determine perceptions of Managed Care Organization (MCO) representatives toward the use of brand-name prescription drug coupons or vouchers.

Pharmaceutical manufacturers have used coupons, vouchers, or co-pay cards for promoting brand-name prescription drugs. Coupons or vouchers circumvent the higher co-payments of expensive brand-name drugs. Until now, there is little documentation about the impact of such patient-directed prescription coupon incentives particularly for managed care organizations (MCOs)

If you have already taken the survey, **Thank You**. If not, we ask you to provide your feedback. This survey questionnaire will only take 5 to 7 minutes for completion. Your participation in this study is voluntary. At the bottom of this email is a link to the questionnaire.

We hope that you will participate in the project by completing the questionnaire. All responses are anonymous and will be kept confidential. No identifying information such as your name or identification of your organization will be collected and responses will not be linked to you. The results of the study will be reported in aggregate form. Participation in the study poses little to no risk to you. The return of your completed survey will represent your consent to participate in this study. To participate in the study, please click on the link at the bottom of this email. To reiterate, no email addresses or names will be collected.

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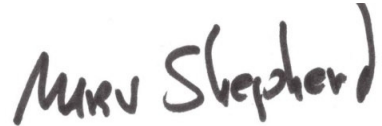
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<https://www.surveymonkey.com/s/RSRTPYT>

Thank you in advanced for your time and effort in completing the survey. Your help is greatly appreciated.

Sincerely,

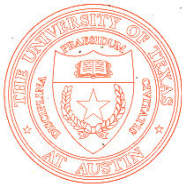
Handwritten signature of Marvin Shepherd in black ink.

Marvin Shepherd, Ph.D.
Director
Center for Pharmacoeconomics Studies

Handwritten signature of Poorva Nemlekar in black ink, with a horizontal line under the name.

Poorva Nemlekar, B.Pharm

APPENDIX IV



COLLEGE OF PHARMACY

THE UNIVERSITY OF TEXAS AT AUSTIN

Center for Pharmacoeconomic Studies • Austin, Texas 78712-0127
(512) 471-6892 • FAX (512) 471-8762

Dear Sir/Madam,

Approximately three weeks ago, we sent you a request to participate in a survey study that is being conducted by researchers at the College of Pharmacy at the University of Austin at Texas. This study is being conducted to determine perceptions of Managed Care Organization (MCO) representatives toward the use of brand-name prescription drug coupons or vouchers.

If you have already taken the survey, **Thank You**. If not, we ask you to provide your feedback. This survey questionnaire will only take 5 to 7 minutes for completion. Your participation in this study is voluntary. At the bottom of this email is a link to the questionnaire.

We hope that you will participate in the project by completing the questionnaire. All responses are anonymous and will be kept confidential. No identifying information such as your name or identification of your organization will be collected and responses will not be linked to you. The results of the study will be reported in aggregate form. Participation in the study poses little to no risk to you. The return of your completed survey will represent your consent to participate in this study. To participate in the study, please click on the link at the bottom of this email. To reiterate, no email addresses or names will be collected.

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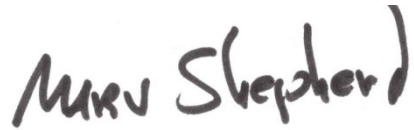
If you have questions or concerns about your rights as a research participant or complaints, please contact the University of Texas at Austin Institutional Review Board Chair Jody Jenson at irbchair@austin.utexas.edu or the Office of Research Support at orsc@uts.cc.utexas.edu.

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Sincerely,

Handwritten signature of Marvin Shepherd in black ink.

Marvin Shepherd, Ph.D.
Director
Center for Pharmacoeconomics Studies

Handwritten signature of Poorva Nemlekar in black ink, with a horizontal line under the name.

Poorva Nemlekar, B.Pharm

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Vita

Poorva Milind Nemlekar was born in Mumbai, India. She graduated with a Bachelors degree in Pharmacy from Bombay College of Pharmacy, Mumbai University in 2005. After graduation she worked with Cipla Ltd. Mumbai, as a clinical research sponsor coordinator. In June of 2008, she got admitted to the graduate program in Pharmacy Administration at the University of Texas at Austin. She is a member of the pharmacy honor society (Rho Chi). She served as a secretary of the student chapter of ISPOR (International Society for Pharmacoeconomics and Outcomes Research) at the University of Texas at Austin.

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