IMPACT OF PHARMACY REGULATION AND PAYMENT ON GENERIC DRUG USE IN THE MEDICAID PROGRAMS: 1991 TO 2008

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“The fear of the LORD is the beginning of knowledge .....”

ABSTRACT

The purpose of this study is to understand the effect of state generic substitution regulations on the generic prescribing and dispensing processes in the Medicaid program and describe the factors that influence dispensing and prescribing generic drugs.

The primary research objective for this study is to calculate estimate the rates of generic substitution (i.e., “Generic Prescribing Rate”, “Generic Dispensing Rate” and “Net Generic Rate”) in the Medicaid program between 1991 and 2008 and to determine and understand how state regulations influence the process of prescribing and dispensing generic drugs in the state Medicaid programs. The research performs at the Substitutable Market level and explains the significant differences observed.

The study design is a retrospective, cross-sectional time series study. Databases from the Centers for Medicare and Medicaid Service (CMS) and the “Medicaid State Drug Utilization Data” will be collected with four observations per year by state from 1991 to 2008. This data base was complemented with Medi-Span Master Drug Data Base ® (MDDB), Medi-Span Price-Check PC ®, National Association of Board of Pharmacy (NABP) publications and Medicaid Payment Data Base (MPDB).

The data set for this study was the entire population of drugs reimbursed by therapeutic class in 48 states (excluding Arizona & Tennessee) since 1991 to 2008 in the Medicaid program.

The descriptive analysis was performed nationwide and by state. However Fixed effects, two-stage least squares regression was utilized to analyze the regression models nationwide by therapeutic class.

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CHAPTER I: INTRODUCTION

1.1 INTRODUCTION

Prescription drugs in the outpatient setting are the most frequent form of health care provided in the U.S. For most of the nearly two decade period from 1990 to 2008, outpatient prescription drug expenditures in the United States grew substantially faster than the economy (as measured by the Gross Domestic Product (GDP)).[1] In the 1990 outpatient prescription drug expenditures were $40.3 billion which accounted for 5.6% of national health expenditures (NHE) and this outpatient drug spending was growing at an average annual rate of 12.8%.[1] In the year 2000, the outpatient drug spending had tripled compared with 1990 to $120.9 billion representing 8.8% of NHE and they were growing at an average annual rate of 11.6%.[1] By the year 2008, the outpatient drug spending had tripled compared with 2000 to $242.6 billion representing 10.1% of NHE and the average annual growth rate had slowed to 2.8%.[1] From 1990 to 2008, outpatient prescription drug spending increased 6-fold, while total national health expenditures grew a little more than 3-fold. In the same time period, 1990 to 2008, the total U.S. economy (as measured by the GDP) had expanded 1.6-fold. Clearly, outpatient prescription drug expenditures grew substantially faster than the GDP and the NHE from 1990 to 2008.

Many factors have influenced the growth in drug spending over time including growth in the number of persons covered, growth in the number of prescriptions, more new medicine approvals by the Food & Drug Administration (FDA), growth in brand name drug prices, drugs going off patent and facing competition from generics with lower prices, the substitution of lower cost generics for high-priced brand name drugs, and other factors.[1]

Medicaid is the federal and state health program for indigent and medically needy persons in the U.S. Medicaid covered 22.8 million enrollees in 1990, 34.2 million in 2000 and 47.2 million in 2008.[2] The number of persons covered by Medicaid more

than doubled between 1990 and 2008. Medicaid program expenditures for personal health care grew from $69.7 billion in 1990, to $186.9 billion in 2000, and then to $318.2 billion in 2008.[3] In the same time frame (1990 to 2008), Medicaid program drug expenditures also grew with spending of $5.1 billion in 1990, $19.8 billion in 2000, and $19.2 billion in 2008.

While the Medicaid drug spending appears to have leveled out between 2000 and 2008, this trend was affected by the implementation of the Medicare Part D program in 2006. At that time, the drug coverage for about 6 million to 8 million dual eligible (i.e., Medicaid-Medicare) enrollees was shifted from Medicaid to Medicare. These dual eligibles represented about 20% of all Medicaid enrollees and they used substantially more prescription drugs per capita than the remaining non-dual eligible Medicaid enrollees. By 2005, the Medicaid drug spending had grown to an all-time high of $36.4 billion, but when the dual eligibles were moved from Medicaid to Medicare Part D in 2006 the Medicaid drug spending dropped nearly 50% from $36.4 billion in 2005 to $19.1 billion in 2006.[4]

In summary, the Medicaid and Medicare programs are very important and large government-financed health care programs that represent substantial share of the national economy in the U.S. As of 2006, both programs cover outpatient prescription drugs as part of the health benefit program. The Medicaid program was the single largest outpatient drug program in the world from prior to 1990 up until 2005. When the Medicare Part D program began operation in 2006 by providing outpatient prescription drugs for covered elderly and disabled recipients, the Medicare Part D program became the largest outpatient drug program.

Outpatient prescription drug expenditures under Medicaid have grown faster than total Medicaid program spending over the past two decades. For example, between 1997 and 2000 the total Medicaid payments (including prescription drug, nursing facility, inpatient hospitals and others) grew by 7.7 % per year while in the same time frame Medicaid drug expenditures grew by an average annual rate of 18.1 % and accounted for more than one-half of the total Medicaid spending growth for this time period.[5] Since drug expenditures are a significant share of Medicaid expenditures

and they have been one of the fastest growing components of Medicaid, the states—the level of government that directly operates the Medicaid program—are searching for methods to help them control the growth of drug expenditures.

The Kaiser Family Foundation[6,7] conducted a survey of the states to identify strategies that states are using to manage the growing Medicaid drug expenditures. This Kaiser Family Foundation survey found that all states use some type of program to manage drug expenditures, and that two of these cost management programs appeared to be the most successful. Perhaps, the most common approach was to require or encourage prescribing and dispensing of generic medications when there is a generic equivalent available. Another common approach to managing drug spending was to affect utilization through "prior authorization" (PA) which is a policy of a state Medicaid program that requires a physician or pharmacist to obtain approval from the state, or a subcontractor, before prescribing or dispensing a certain drug product.

Setting of a maximum limit on the price of generic drugs has been used as a means to achieve cost containment for Medicaid. Abramson, et al.[8] studied the effect of this approach. They analyzed data the MAC (Maximum Allowable Cost) drug lists and the FUL (Federal Upper Limit) drug list for five states to determine the number of drugs included and the aggressiveness of the pricing limits. They concluded that MAC and FUL programs contribute to state Medicaid pharmacy savings by influencing pharmacies to dispense lower-priced generic drugs rather than higher-priced brand name drugs for off-patent medications.

Other researchers (i.e., Michael Fisher, Jerry Avorn, Sebastian Schnneweiss, and David Solomon) studied Medicaid programs that used prior authorization (PA) programs to influence the use of cyclooxygenase-2 inhibitors (COX-2s).[9] They examined data from 50 states and drug use from 1999 to 2000 for NSAIDs and COX2s. They found that prescriptions for COX2s drugs accounted for one-half of all NSAID doses covered by Medicaid. In the 22 states that implemented a PA program for COX2s, the proportion of NSAID doses dispensed as COX2s was reduced by

15% and the corresponding cost per NSAID prescription was reduced by $10.28 per prescription.

This research project examines the outpatient prescription drug expenditures for covered Medicaid beneficiaries from 1990 to 2008 and the role of generic substitution. The purpose of this study is to determine and understand the effect of state generic substitution regulations on the generic prescribing and dispensing processes in the Medicaid program and to describe the factors that influence the prescribing and dispensing of generic drugs.

1.2 BACKGROUND AND SIGNIFICANCE

The role of generic drug products in the U.S. prescription market has changed substantially over the past two or three decades. Numerous studies have been conducted to identify the role of generic drugs at specific points in time or across a short period of time, i.e., two to four years. A study using the 1989 National Ambulatory Medical Care Survey (NAMCS) data found that almost all physicians prescribe both brand and generic drugs for their patients. However, this analysis was not able explain which physicians were more likely to allow generic substitution even though physicians are thought to be the most important agent in the prescription decision.[10]

A study by Mott & Kreling (1997) examined whether the characteristics of therapeutic categories and the payment type had an effect on the generic substitution rate. They found that generic substitution occurred significantly more often for drugs used to treat acute rather than chronic conditions.[11]

Generic drug products were dispensed for 54% of all prescriptions in the Medicaid program in 1995 and that percentage declined to 51% by 1998 according to a study by the NIHCM Foundation (The National Institute for Health Care Management Research and Educational Foundation, 2002). If the generic share of all prescriptions was returned to 55% of Medicaid prescriptions, the study estimated that Medicaid

would save between $1 billion and $1.5 billion annually. A report by the PRIME Institute at the University of Minnesota also found that prescriptions for off-patent drugs as a proportion of all prescriptions in the Medicaid program declined between 1995 and 1998.[12]

Another assessment of the potential for generic substitution was conducted using the Medical Expenditure Panel Survey (MEPS-HC) data from 1997 to 2000. This study found that 56% of all outpatient prescriptions were for drugs that were available in both generic (non-innovator multi-source) and brand name (innovator multi-source) forms. However, the generic drug product was actually dispensed for only 61% of these prescriptions resulting in an overall net generic rate of about 37%. The study also estimated that if generic substitution had been used every time in this time period (i.e., 1997 to 2000), that there would have been annual savings of about $46 per person for people under 65 years of age and about $78 for people older than age 65.[13]

The economic impact from under-use of generic drugs was estimated in a study published in 2003. In this research, Michael Fisher and Jerry Avorn examined Medicaid data from 48 states and the District of Columbia from the year in 2000. They concluded that Medicaid prescription drug spending in 2000 could have been reduced by as much as $ 229 million if generic substitution had been used to its full potential.[14] The same researchers calculated the potential savings for both a state Medicaid program and a private insurance plan and estimated that 3.6% of the annual drug payments could be saved.[15] Others have noted that the savings opportunities were was expected to grow between the mid-2000s and 2012 due to the continued number of drug products going off patent or losing exclusivity status.

The potential for savings from generic substitution varies across therapeutic categories. Express Scripts has estimated the generic savings expected in six therapy classes.[16] They examined "the annual savings opportunity among commercially insured members across the 48 states and six therapy classes." The six therapeutic classes were selected from the top 10 therapeutic classes utilized most by insured consumers representing 41% of the market in 2003. Drugs in the

gastrointestinal agents class and anti-hyperlipidemic agents class had the greatest potential savings from generic substitution and therapeutic substitution. This study reports that generic substitution has substantial savings potential and that therapeutic substitution has even more significant cost savings potential.

A study by the Office of Inspector General (OIG) was published in 2006 and examined the rate of generic drug dispensing in State Medicaid programs during 2004.[17] This study used the Medicaid Drug Rebate (MDR) data set from fee-for-service prescription claims in that period. The findings showed that on average: (1) 41% of prescriptions were written for drugs that have no generic substitutes (single source drugs) while 59% were for drugs that have generic substitutes available; (2) for the prescriptions drugs with generic substitutes available, the generic was dispensed 89% of the time; and (3) 54% of all prescriptions were dispensed with a generic drug product (non-innovator multi-source drug).

In 2008, the changes in Medicaid prescription volume after the implementation of the Medicare Part D drug benefit were studied. There was a major shift of prescription drug spending from Medicaid to Medicare. The study found that across the 48 state Medicaid programs, drug expenditures dropped more than 45% from $38.5 billion in 2005 to $20.9 billion in 2006. The number of prescriptions dropped 49 percent from 543 million in 2005 to 278 million in 2006. In 2006, generic drugs were dispensed for about 60 percent of prescriptions paid for by the 48 State Medicaid programs. This average generic rate is more than four percentage points over the 55.5 percent average generic rate for these same states in 2005.[18]

In more recent years, dispensing of generic prescriptions has grown to reach more than 75% of all outpatient prescriptions that were managed by Express Scripts, Inc. in 2013.[19] Growth in the percent of prescriptions filled with a generic has been especially strong in the last decade (2004 to 2013) due, in large part, to patent and exclusivity expirations for many of the top selling branded products. For example, Zocor (simvastatin) and Lipitor (atorvastatin calcium) were among the world's top selling drugs when they lost their patents and exclusivity periods in 2006 and 2009, respectively.[20]

The terminology and measures to examine the role of generic drug products varies from study to study. Some studies use the same term such as generic fill rate, but define the measure differently. For example, one study labeled the percentage of all prescriptions (i.e., whether single-source, innovator multi-source or non-innovator multi-source) that were dispensed as a generic drug product (non-innovator multi-source drug) as the "generic fill rate".[21] Yet, another study, labeled this same measure as the "generic dispensing rate".[22] The definition of measures used in this study are presented in a later section, although it is worth noting that in this research the measure of the percentage of all prescriptions (single-source, innovator multi-source and non-innovator multi-source drugs) that were dispensed as a generic drug product (non-innovator multi-source drug) will be referred to as the "Net Generic Rate" or NGR.

This research study defines three specific measures for the role of generic drug products in prescribing and dispensing prescriptions. In addition, this study examines each of the three generic use measures across states and across time (i.e., from 1991 to 2008).

1.3 DEFINITIONS AND TERMINOLOGY

This section provides definitions for some of the key terms used in this research project. The key terms defined here are related to: (1) the drug product regulatory approval process and the patent and exclusivity status of drug products (such as Single Source, Innovator Multiple Source and Non-Innovator Multiple Source); (2) Generic Substitution including related terms such as Bioequivalents and Therapeutic Equivalents; and (3) index measures related to Generic Substitution including the Generic Prescribing Rate (GPR), the Generic Dispensing Rate (GDR) and the Net Generic Rate (NGR).

1.3.1. Drug Product Regulatory and Patent Status

When Congress first passed the law establishing the Medicaid Drug Rebate program[23], the legislation provided descriptive terms for grouping prescription drug products based upon the regulatory process by which they were approved as well as by their patent and exclusivity status. The three broad categories for grouping drug products are: (1) single source drugs, (2) innovator multiple source drugs, and (3) non-innovator multiple source drugs. While these groups were originally defined in the OBRA '90 statutes in the context of the Medicaid Drug Rebate Program, the terms have been used more broadly over time and have come to be applied generally to prescription drug products in the outpatient market.[24]

Single-Source (SS) Drug: A single-source drug is a drug product for which there are no other *therapeutic equivalents* on the market. Single-source drugs are drug products that are produced or distributed under an original new drug application (NDA) approved by the U.S. Food & Drug Administration (FDA), including drug products marketed by producers or distributors holding a cross-license to operate under an approved NDA.[25] Single source drugs are usually protected by a patent or some other form of exclusivity, but they may be, at times, the only drug product on the market for other reasons such as a very small market size. Usually a single source drug is identified as a brand name drug that has no generic equivalent (or therapeutic equivalent) drug products in the market. Thus, these drug products are referred to as a 'Single Source Brand'.

Innovator Multiple Source (IMS) Drug: An innovator multiple source drug is a drug product that was first authorized for marketing under an original NDA approved by the FDA, but which is now off-patent or has no exclusivity protection; and, it is a drug product for which there are more than one approved products with the same active ingredient(s), dosage form, route of administration, and strength on the market. An innovator multiple source drug product is still marketed by the original NDA holder or by their licensee. As long as there are one or more drug products with the same active ingredient(s), dosage form, route of administration, and strength on the market which have met the FDA's criteria for pharmaceutical equivalence, bioequivalence,

and therapeutic equivalence, the drug products produced and marketed by the original NDA holder, and their licensees, are considered *innovator multiple source* drugs. Generally, these products are referred to as 'Innovator Multiple Source' or as an 'Off-Patent Brand' that has generic equivalents in the market.

Non-Innovator Multiple Source (NMS) Drug: A non-innovator multiple source drug is a drug product that is marketed or sold by a manufacturer or labeler other than the original license (NDA) holder and which has the same active ingredient(s), dosage form, route of administration, and strength as an innovator multiple source drug on the market. Most often a non-innovator multiple source drug is manufactured and/or marketed by a firm whose drug product was approved by the FDA using an Abbreviated New Drug Application (ANDA). A non-innovator multiple source drug is considered to be a 'generic equivalent' to the innovator multiple source drug (i.e., the reference listed drug) if it has been demonstrated to have met the FDA's criteria for pharmaceutical equivalence, bioequivalence, and therapeutic equivalence, and the drug product is listed in the FDA Orange Book. Generally, these NMS drug products are referred to as 'Non-Innovator Multiple Source' or as an 'Off-Patent Generic'.

1.3.2. Generic Substitution and Related Terms

Easy and routine generic substitution (drug product selection by the pharmacist) is the product of the Hatch-Waxman Act structure, FDA regulations, and state drug product selection laws in our nation's states and territories. The availability and use of FDA-approved generic drug products that are easily and routinely substitutable for existing brand name drug products to which they are AB-rated, assures that effective price competition exists in the market for a given prescription drug product, and it further assures that patient-users will achieve equivalent efficacy and safety at a substantially decreased cost.

The substitution of generic drug products for a brand name prescription drug is a complex process that is influenced by both federal and state statutes and regulations. The federal laws primarily have jurisdiction over the regulation of drug products including market approval, designation of drug products as either

prescription only or over-the-counter status, definition of standards and terminology regarding which drugs can be considered as therapeutic equivalents, awarding of intellectual property rights such as patents and other forms of exclusivity, and other aspects of regulation related to drug product manufacturing, marketing and sales. The state laws primarily have jurisdiction over the regulation of the professions such as medicine and pharmacy and over the interface of professions with patients (i.e., consumers). State statutes and regulations address who can prescribe drug products, who can dispense drug products, and the circumstances under which a substitution may be made for the drug product originally prescribed. The state's authority in regulating prescription drug use also addresses the role of the consumer in requesting or prohibiting generic substitution.

Federal Statutes and Regulations. The role and function of the FDA Orange Book (officially known as "Approved Drug Products with Therapeutic Equivalence Evaluations") is important to the process of easy and routine AB-rated generic substitution. Generic drugs that have met standards for "therapeutic equivalence" based on FDA evaluations are, in all material respects, exact substitutes for their brand name counterparts, and are given the designation "AB" by the FDA. There are two components to the definition of "therapeutic equivalence": (1) "pharmaceutical equivalence" and (2) "bioequivalence." "Pharmaceutical equivalence" means that the generic drug is the same active ingredient (i.e., drug molecule), the same dosage form, and the same strength as the brand name counterpart. "Bioequivalence" refers to "products that display comparable bioavailability when studied under similar experimental conditions." A generic drug product and the reference listed drug product (originator drug product) shall be considered bioequivalent when "the rate and extent of absorption of the test drug do not show a significant difference from the rate and extent of absorption of the reference listed drug when administered at the same molar dose of the therapeutic ingredient under similar experimental conditions either in a single dose or multiple doses."[26]

The FDA assures that brand name versions of a drug product and the AB-rated generic versions of the same drug product are "therapeutically equivalent," which means that generics "can be substituted with the full expectation by the patient and

physician that they will have the same clinical effect and safety profile as the innovator drug."[27] The FDA has stated that a finding of bioequivalence means that any differences in therapeutic effect of the brand versus the generic drug that could possibly exist "should be no greater than one would expect if one lot of the innovator's product was substituted for another."[28] This means that the generic is considered by the FDA to have the same clinical effect and safety as the brand. Since there is no difference in clinical effect and safety between the FDA-approved brand and the corresponding FDA-approved, AB-rated generic drug products, these AB-rated generic equivalents are substitutable for the brand name product by pharmacists.

Federal statutes, regulations and rules regarding generic substitution depend upon several key terms that are defined very precisely. Among the key terms and definitions related to generic substitution are the following: 'pharmaceutical alternates', 'pharmaceutical equivalents', 'therapeutic equivalents', therapeutic alternates', 'bioavailability', 'bioequivalence', and 'therapeutic equivalence'. These key terms from the federal rules and regulations are defined below, as they are presented in the FDA Orange Book.

> **Pharmaceutical Alternates.** Drug products are considered to be pharmaceutical alternatives if they contain the same therapeutic moiety, but are different salts, esters, or complexes of that moiety, or are different dosage forms or strengths (e.g., tetracycline hydrochloride, 250mg capsules vs. tetracycline phosphate complex, 250mg capsules; quinidine sulfate, 200mg tablets vs. quinidine sulfate, 200mg capsules). Data are generally not available for FDA to make the determination of tablet to capsule bioequivalence. Different dosage forms and strengths within a product line by a single manufacturer are thus pharmaceutical alternatives, as are extended-release products when compared with immediate-release or standard-release formulations of the same active ingredient.[29]
>
> **Pharmaceutical Equivalents.** Drug products are considered to be pharmaceutical equivalents if they contain the same active ingredient(s), are of the same dosage form, route of administration and are identical in strength or concentration (e.g., chlordiazepoxide hydrochloride, 5mg capsules). Pharmaceutically equivalent drug products are formulated to contain the same amount of active ingredient in the same dosage form and to meet the same or compendia or other applicable standards (i.e., strength, quality, purity, and identity), but they may differ in characteristics such as shape,

scoring configuration, release mechanisms, packaging, excipients (including colors, flavors, preservatives), expiration time, and, within certain limits, labeling.[30]

Bioavailability. This term means the rate and extent to which the active ingredient or active moiety is absorbed from a drug product and becomes available at the site of action. For drug products that are not intended to be absorbed into the bloodstream, bioavailability may be assessed by measurements intended to reflect the rate and extent to which the active ingredient or active moiety becomes available at the site of action.[31]

Bioequivalent Drug Products. This term describes pharmaceutical equivalent or pharmaceutical alternative products that display comparable bioavailability when studied under similar experimental conditions. Section 505 (j)(8)(B) of the Act describes one set of conditions under which a test and reference listed drug (see Section 1.4) shall be considered bioequivalent: the rate and extent of absorption of the test drug do not show a significant difference from the rate and extent of absorption of the reference drug when administered at the same molar dose of the therapeutic ingredient under similar experimental conditions in either a single dose or multiple doses; or the extent of absorption of the test drug does not show a significant difference from the extent of absorption of the reference drug when administered at the same molar dose of the therapeutic ingredient under similar experimental conditions in either a single dose or multiple doses and the difference from the reference drug in the rate of absorption of the drug is intentional, is reflected in its proposed labeling, is not essential to the attainment of effective body drug concentrations on chronic use, and is considered medically insignificant for the drug. Where these above methods are not applicable (e.g., for drug products that are not intended to be absorbed into the bloodstream), other in vivo or in vitro test methods to demonstrate bioequivalence may be appropriate.

Bioequivalence may sometimes be demonstrated using an in vitro bioequivalence standard, especially when such an in vitro test has been correlated with human in vivo bioavailability data. In other situations, bioequivalence may sometimes be demonstrated through comparative clinical trials or pharmacodynamic studies.[32]

Therapeutic Equivalents: *Drug products are considered to be therapeutic equivalents only if they are pharmaceutical equivalents and if they can be expected to have the same clinical effect and safety profile when administered to patients under the conditions specified in the labeling* (emphasis added).

FDA classifies as therapeutically equivalent those products that meet the following general criteria: (1) they are approved as safe and effective; (2) they are pharmaceutical equivalents in that they (a) contain identical amounts of

> the same active drug ingredient in the same dosage form and route of administration, and (b) meet compendial or other applicable standards of strength, quality, purity, and identity; (3) they are bioequivalent in that: (a) they do not present a known or potential bioequivalence problem, and they meet an acceptable in vitro standard, or (b) if they do present such a known or potential problem, they are shown to meet an appropriate bioequivalence standard; (4) they are adequately labeled; (5) they are manufactured in compliance with Current Good Manufacturing Practice regulations. The concept of therapeutic equivalence, as used to develop the List, applies only to drug products containing the same active ingredient(s) and does not encompass a comparison of different therapeutic agents used for the same condition (e.g., propoxyphene hydrochloride vs. pentazocine hydrochloride for the treatment of pain). Any drug product in the List repackaged and/or distributed by other than the application holder is considered to be therapeutically equivalent to the application holder's drug product even if the application holder's drug product is single source or coded as non-equivalent (e.g., BN). Also, distributors or repackagers of an application holder's drug product are considered to have the same code as the application holder. Therapeutic equivalence determinations are not made for unapproved, off-label indications.
>
> FDA considers drug products to be therapeutically equivalent if they meet the criteria outlined above, even though they may differ in certain other characteristics such as shape, scoring configuration, release mechanisms, packaging, excipients (including colors, flavors, preservatives), expiration date/time and minor aspects of labeling (e.g., the presence of specific pharmacokinetic information) and storage conditions. When such differences are important in the care of a particular patient, it may be appropriate for the prescribing physician to require that a particular brand be dispensed as a medical necessity. With this limitation, however, *FDA believes that products classified as therapeutically equivalent can be substituted with the full expectation that the substituted product will produce the same clinical effect and safety profile as the prescribed product* (emphasis added).[33]

Therapeutic Equivalence: The term therapeutic equivalence has a very specific and precise meaning derived from the definition of “therapeutic equivalents” as defined in the FDA Orange Book and reported above. When two or more drug products are said to possess “therapeutic equivalence”, each of the drug products must meet the exact definition of “therapeutic equivalents” as defined in the FDA Orange Book. When drug products are therapeutic equivalents, one drug product can be substituted for another drug product and both drug products can be assumed to produce the same clinical effect and safety profile as the prescribed product. Drug

products are considered to be “therapeutically equivalent” only if they meet these criteria, that is, they contain the same active ingredients, dosage form, route of administration, strength, and bioavailability. Drug products that have been determined by the FDA to be “therapeutically equivalent” are assigned therapeutic equivalence codes starting with the letter ‘A ‘ such as ‘AB’ for oral solid drug products or ‘AT’ for topical drug products.[34]

State Statutes and Regulations.

All fifty states and the District of Columbia have enacted statutes or regulations permitting, encouraging, or, under certain circumstances, requiring pharmacists to substitute AB-rated generics for brand name drug equivalents. The general purpose of these statutes is to save people money, given that AB-rated generics are almost always expected to be much less expensive than brand name versions of the same drug product. State regulations regarding generic substitution often reference, or even quote directly from, the federal statutes, regulations and rules including the terms defined such as ‘pharmaceutical alternates’, ‘pharmaceutical equivalents’, ‘therapeutic equivalents’, therapeutic alternates’, ‘bioavailability’, ‘bioequivalence’, and ‘therapeutic equivalence’.

Although there is a general consistency in generic substitution laws across states, there are some important differences in how and when state laws allow generic substitution. Some states even permit what is referred to as pharmacists’ discretion when implementing generic substitution.[35] One professional reference source, known as the ***Pharmacist’s Letter***, identifies 20 states as having “discretion” to choose the drug product to be substituted. However, this pharmacist’s discretion is not unfettered discretion. Most states have statutes and/or regulations which specify criteria that must, or should, be considered in exercising this pharmacist’s discretion when substituting generic equivalent drug products.

Five of these states identified as having pharmacist’s discretion (i.e., Iowa, Nebraska, North Dakota, Ohio and Vermont) specify that in exercising professional judgment, pharmacists must insure that the product substituted has the same bioavailability or dissolution as the drug product prescribed. The language in Iowa for

example specifies that “[t]he pharmacist may exercise professional judgment in the economic interest of the patient by selecting a drug product with the same generic name and demonstrated bioavailability as the one prescribed for dispensing and sale to the patient.” While the pharmacist has discretion, that discretion must be based on demonstrated (emphasis added) bioavailability or dissolution. Demonstration of bioavailability would require the pharmacist to perform tests or rely upon another validated source for this information (such as the FDA Orange Book). Performance of bioavailability or dissolution tests is an expensive and time-consuming process which is not practical for most pharmacies to perform on their own. Consequently, the only practical way for a pharmacist to have assurance that equivalent bioavailability or dissolution exists for an alternative drug product is to refer to, and rely upon, the list of AB-rated drug products in the FDA Orange Book. In other words, to meet the threshold criteria specified in state statutes and regulations in these five states, for all practical purposes, the pharmacist has to rely upon the AB-ratings published in the FDA Orange Book. For example, pharmacists in these five states (i.e., Iowa, Nebraska, North Dakota, Ohio and Vermont) cannot (emphasis added) unilaterally substitute a generic delayed-release capsule for a standard release tablet product of the same molecule.

In yet another state (i.e., Oregon) listed among the 20 states with pharmacist’s discretion, the statutes and regulations specify that for drug products to be substituted the drug products must be “therapeutically equivalent” which in Oregon is defined to mean “drugs that are approved by the United States Food and Drug Administration for interstate distribution and the Food and Drug Administration has determined that the drugs will provide essentially the same efficacy and toxicity when administered to an individual in the same dosage regimen.” Although the FDA Orange Book is not named explicitly, for all practical purposes, a pharmacist would have to rely upon the AB-ratings published in the FDA Orange Book to meet this criterion for generic substitution. Another state (i.e., Washington), that was listed among pharmacist’s discretion states, has a similar requirement that drug products be “therapeutically equivalent” and the Washington statutes and regulations specifically indicate that the FDA Orange Book is a “board approved reference for a

positive formulary of therapeutically equivalent products". Pharmacists in these states (i.e., Oregon and Washington) cannot (emphasis added) unilaterally substitute a generic delayed-release capsule for a standard release tablet version of the same molecule.

In yet another state (i.e., Missouri) that was listed among states with pharmacist's discretion, the statutes and regulations specify "A pharmacist shall not substitute drug products that are rated as therapeutically inequivalent to other pharmaceutically equivalent products as listed in the latest edition or cumulative supplement of the "Approved Drug Products with Therapeutic Equivalence Evaluations" [also known as, the FDA Orange Book] published by the United States government, Department of Health and Human Services." In other words, through use of a negative formulary, Missouri references the FDA Orange Book in a manner that would prohibit substitution of drug products that are not AB-rated 'therapeutic equivalents'. By definition, AB-rated therapeutic equivalents must have, inter alia, the same strength and dosage form. Pharmacists in Missouri cannot (emphasis added) unilaterally substitute a generic delayed-release capsule for a tablet version of the same molecule.

For legal or practical reasons, as described above, 19 of the 20 states listed by the Pharmacist's Letter would not permit routine unilateral substitution of a generic delayed-release capsule for a tablet version of the same molecule.

The FDA Orange Book listing of "Approved Drug Products with Therapeutic Equivalence Evaluations" serves as an appropriate basis for a pharmacist to use for determination of which generic drug products may be considered as equivalent for purposes of substitution. In some states, the use of the FDA Orange Book is mandated as the basis for determining which drug products can be substituted. In most other states pharmacists are allowed discretion over which drug products can be substituted, based on specified criteria. In those states where the FDA Orange Book is not directly mandated, the FDA Orange Book is the most practical way to meet the criteria specified for allowing pharmacist discretion in selection of drug products for generic substitution.

As described elsewhere in this report, pharmacist discretion for generic substitution in many states is limited by a requirement that the originally prescribed drug product and the substituted generic drug product have the same active ingredient (i.e., drug molecule), the same dosage form, and the same strength. In other states, as described elsewhere in this report, pharmacist discretion for generic substitution is to be based on "demonstrated" or "documented" evidence of bioavailability or clinical safety and efficacy. Again, the FDA Orange Book is the most practical way to meet the criteria specified by state statutes and regulations for allowing pharmacist discretion in selection of drug products for generic substitution.

"Therapeutic equivalence", as defined and evaluated by the FDA (described elsewhere in this report and in more detail in the FDA Orange Book) is fundamentally different from the concept of "therapeutic interchange". "Therapeutic interchange" is defined by the Academy of Managed Care Pharmacy as "the practice of replacing, with the prescribing physician's approval, a prescription medication originally prescribed for a patient with a chemically different medication." In other words, "therapeutic interchange" requires contacting the physician for approval and involves using a drug product that has a different drug molecule, a different dosage form, a different strength, or other differences from the drug product originally prescribed. Substitution of AB-rated, equivalent generic drug products based on "therapeutic equivalence" and switching of different drug products based on "therapeutic interchange" are fundamentally different processes.

FDA publishes the Orange Book and monthly update supplements to meet certain obligations specified by the Hatch-Waxman Act and subsequent amendments. The Orange Book provides pharmacists and state boards of pharmacy with a reference list of (brand) drug products and the generic drugs products that FDA has determined to be "therapeutically equivalent", and thus "AB-rated." According to state pharmacy practice acts, these AB-rated equivalents are, therefore, easily and routinely substitutable for their corresponding brand name counterpart drug products.

Pharmacists typically dispense less-expensive, AB-related generic drugs in place of their brand name counterparts whenever possible, not only because of state statutes

and regulations, but also because such easy and routine pharmacy substitution benefits their patients (because AB-rated generics are less expensive than brand name counterpart) and sometimes benefits the pharmacy (for a similar reason).

Easy and routine pharmacy substitution of AB-rated generic drugs is essential to effective generic economic competition. If the state-regulated, easy and routine substitution of generics for brand name drugs by pharmacists is impaired – for instance, if a generic version of the brand name drug is not AB-rated to the brand name drug because the brand has been reformulated so that it is not pharmaceutically equivalent due to a dosage form or labeled strength change – the economic benefits of generic competition will not be realized by purchasers or patients, and the goals of Congress, the FDA, and state boards of pharmacy in connection with the Hatch-Waxman Act framework will be frustrated. This is, in part, because under the Hatch-Waxman Act framework, demand for generic drugs is, by design, a derivative of the demand for the corresponding brand name drug that was generated by the brand name drug company during the period when the brand name drug company enjoyed the government-granted patent and/or marketing exclusivity.

The use of generic drug products is primarily a result of the easy and routine substitution performed by pharmacists, using FDA certified AB-rated therapeutic equivalents according to the state drug product selection (generic substitution) statutes and regulations. In other words, the doctor prescribes the brand name drug and the pharmacist easily and routinely substitutes the AB-rated generic version according to the drug substitution rules and regulations. This process of easy and routine substitution of AB-rated generics by the pharmacist is the manner in which: (i) the Hatch-Waxman Act framework was intended to, and does, facilitate generic drug competition; (ii) robust conversion of the market for a given molecule from the brand name drug product to its AB-rated generic equivalents is achieved; and, (iii) price competition among generics affords substantial savings to drug purchasers and consumers.

The Hatch-Waxman Act framework encouraged generic drug manufacturers to develop and market AB-rated versions of brand name drug products that could be

approved and launched soon after the brand name drug exclusivity ends. These AB-rated generic versions were intended to be "therapeutically equivalent", and were expected to largely, if not wholly, replace the prescriptions written for the brand name drug product. The demand for the AB-rated generic versions was to be created through the easy and routine substitution process and lower generic prices, and not by differentiation based on heavy promotion. Consequently, heavy marketing of a generic drug product after generic entry would be a highly inefficient use of resources from a societal perspective.

1.3.3. Measures of Generic Substitution

Several key terms related to generic substitution will be used in a specific way in this research study. First, the term 'generic substitution' is defined. Then, three measures of generic substitution are defined: (1) the net generic rate; (2)

Generic Substitution: Generic substitution is the substitution of one drug product for another drug product only when both drug products have been shown to be therapeutically equivalent to the same reference listed drug product (RLD). Generic substitution may also include substitution of a therapeutically equivalent drug product for the reference listed drug product (i.e., the original brand name drug product approved for marketing). As discussed above, drug products that are 'therapeutic equivalents' and which can be treated as 'generic substitutes' must have the same drug molecule and salt, the same dosage form, the same strength, and the same route of administration and they are expected to produce the same clinical effect and safety profile as the prescribed product when administered under by the same route and with the same dosage regimen.[36]

Generic Prescribing Rate (GPR): Generic Prescribing Rate is defined as the number of innovator multi-source drug units and non-innovator multi-source drug units divided by the number of all drug units (i.e., single source, innovator multi-source and non-innovator multi-source) that were prescribed in a specific period of time. In essence the GPR is the percentage of all prescriptions where the drug

product prescribed was a generic drug product or could have been filled with a generic drug product. The formula is:

NGR = (IMS + NMS) / (SS + IMS + NMS).

Generic Dispensing Rate (GDR): Generic Dispensing Rate is defined as the number of non-innovator multi-source drug units (e.g., dollars, prescriptions, or daily doses) divided by the sum of the innovator multi-source drug units and the non-innovator multi-source drug units that were dispensed in a specific period of time. This rate determines how frequently a generic drug product is dispensed when a generic version of the drug product prescribed is in the market. This concept is sometimes described as the generic "penetration" or "efficacy" rate.[37] The formula is:

GDR = NMS / (IMS + NMS).

Net Generic Rate (NGR): Net Generic Rate is defined as the number of non-innovator multi-source drug units (e.g., dollars, prescriptions, or daily doses) divided by the number of all drug units (i.e., single source, innovator multi-source and non-innovator multi-source) that were dispensed in a specific period of time. The formula is:

NGR = NMS / (SS + IMS + NMS).

1.4 RESEARCH OBJECTIVES

The primary research objective for this study is to calculate estimate the rates of generic substitution (i.e., "**Generic Prescribing Rate**", "**Generic Dispensing Rate**" and "**Net Generic Rate**") in the Medicaid program between 1991 and 2008 and to determine and understand how state regulations influence the process of prescribing and dispensing generic drugs in the state Medicaid programs. Several specific research questions are addressed by this research project to accomplish the primary objective.

1.4.1 Research Question 1

What are the Generic Prescribing Rate (GPR) trends in the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008?

Objective 1. Calculate the Generic Prescribing Rate (GPR) for the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008.

1.4.2 Research Question 2

What are the Generic Dispensing Prescribing Rate (GDR) trends in the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008?

Objective 2. Calculate the Generic Prescribing Rate (GDR) for the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008.

1.4.3 Research Question 3

What are the Net Generic Rate (NGR) trends in the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008?

Objective 3. Calculate the Net Generic Rate (NGR) for the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008.

1.4.4 Research Question 4

What are the key regulatory and financial incentive policies and factors influencing the generic trends (Generic Prescribing Rate, Generic Dispensing Rate, and Net Generic Rate) for the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008?

Objective 4. Determine the key regulatory and financial incentive policies and factors influencing the Medicaid generic (Generic Prescribing Rate, Generic Dispensing Rate, and Net Generic Rate) for the Medicaid program for the United States as a whole, and by state, over time from 1991 to 2008.

1.5 DATA SOURCES AND RESEARCH METHODS

This study utilizes several databases to answer the research questions and objectives that were mentioned before. First, utilization and expenditures were obtained from the Centers for Medicaid and Medicare Services (CMS), the "Medicaid State Drug Utilization Data" database was collected from 1991 to 2008. Data on drug products and their characteristics was obtained from Medi-Span's Master Drug Data Base ® (MDDB) and Price-Check PC ®. Data related to the policy and regulatory environment in each state was drawn from the National Association of Boards of Pharmacy (NABP) ® data base and from the National Pharmaceutical Council's publications on Pharmaceutical Benefits Under State Medical Assistance Programs (from 1990 to 2007). Also, other sources were used to provide more details related to specific variables that were in the study and to better understand the market.

The frame of reference for this study was the U.S. Medicaid program with the data for all drug claims at the national drug code (NDC) level by quarter and state for the years from 1991 to 2008. The primary objective was to analyze the generic utilization rates and factors that influence them for the United States Medicaid program as a whole and over time. Similar analysis was done on a state by state basis. The analysis examined generic utilization rates across the States over time and tested to determine if the specific generic substitution regulations and policies influenced the performance with statistically significant differences. The unit of analysis in this study was a specific drug product at the NDC level for a specific state and for a specific time period by quarter and year.

First, descriptive analysis was performed to show the overall trends of the Generic Prescribing Rate, Generic Dispensing Rate, and Net Generic Rate. The descriptive analysis was conducted nationwide and by state. Then, specific analyses were done with one specific generic rate at a time as the primary dependent variable and with various financial policy and regulatory variables as explanatory factors. A fixed effect, two-way least squares regression was utilized to analyze specific models.

1.6 IMPLICATIONS OF THE STUDY

Appropriate utilization of lower-cost generic drug products is perhaps the single most effective cost containment tool for a prescription drug benefit. There is substantial evidence in the literature showing savings from generic substitution, but there is not much analysis of the various methods and policies that influence generic substitution. Therefore, the overall objective of this study is to evaluate the influence that specific financial policies and regulations may have on generic substitution. While this study focuses on generic substitution in state Medicaid drug programs, the findings will also be useful for private prescription drug benefit programs.

This study measures three specific generic rates: (1) Generic Prescribing Rate (GPR), (2) Generic Dispensing Rate (GDR), and (3) Net Generic Rate (NGR). The first two of these rates measure intermediate steps that reflect the actions of physician (i.e., GPR) and pharmacist (GDR). The overall impact is measured with the Net Generic Rate (NGR).

The framework for the generic rates calculated in this study was the number of generics as a percent of all drug products that are available as exact generic substitutes (i.e., drug products that are therapeutically equivalent, that is exact generic substitutes). This level can be referred to as the ‘generic substitute’ market level. One could also look at generics rates as a percent of all drug products for the same molecule (e.g., all drug products containing diltiazem in any dose form, strength, or salt form). This level is referred to as the “chemical entity’ market level. A third approach to examining generic rates would be to look at all drug products that could be used for the same therapeutic purpose (e.g., ulcer therapies). This level of analysis is referred to as the therapeutical market level.

1.7 SCOPE OF THE STUDY

The finding of this research should be understood and interpreted within the scope of the study as described here.

First, the data set for this study was the complete set of all drug products provided to beneficiaries of the Medicaid program for each state and quarter from 1991 to 2008. Since the data is only reported at a quarterly level (i.e., 3 month blocks) the entry of generics in the market could be at the beginning of a quarter or the middle of a quarter or at the end of a quarter. Therefore, the generic rate reported in the first quarter after generic entry could differ depending on the proportion of time in the quarter that the generic was actually on the market. This issue in subsequent quarters is not an issue.

Second, one of the limitations of the study is the effect that Direct-to-Consumer Advertising (DTCA) may produce on the process of prescribing. For example, DTCA may lead patients to ask for, and doctors to prescribe, a single-source brand name drug product when the doctor might otherwise have prescribed a drug that is generically available and that is at least as safe and as effective and is available at a lower price. If doctors prescribe fewer drug products that have possible generic substitutes the net generic rate (NGR) will be lower. The effect of DTCA was captured but was combined with other effects as well. Therefore, it was not possible to separate and to infer how much the DTCA influences this process.

Third, a given physician may have a preference for either brand name drug products or generic drug products that will affect his or her prescribing patterns. This study does not have an explicit measure of individual physician preferences, although the aggregate generic prescribing rate and the net generic rate calculated and reported in this study have such preferences inherent within the aggregate rates. Similarly, a given pharmacist may have various reasons for preferring to dispense a brand name drug product or a generic drug product when possible. This study does not have an explicit measure of individual pharmacist preferences, although the aggregate

generic dispensing rate and the net generic rate calculated and reported in this study have such preferences inherent within the aggregate rates.

Fourth, generic dispensing may have been affected by interruptions in the supply of generic drug products. In other words, a generic may have been approved for marketing, but for some reason the generic drug product may be in short supply or may not be in stock at the pharmacy when a prescription is dispensed. This study had no way of measuring this supply effect on the generic rates calculated and reported.

Finally, there are times when a specific drug product (i.e., a certain brand name drug product) may be medically necessary when compared to the generic version of a drug product. For example, if a patient is allergic to a certain color of dye (e.g., FDC Yellow #2) and that dye is in the generic versions but not the brand name version of the drug product, the physician may indicate that the brand is “medically necessary”. The data set used for this study did not have any patient specific data or prescribing records that could identify when the use of the brand name drug product was considered to be medically necessary. This effect on generic dispensing is thought to be so small, in general, that it should not substantially influence the generic rates observed. However, this effect was not explicitly measured in the data set used.

[1] Hartman M, Martin AB, Benson J, Catlin A and the National Health Expenditure Accounts Team, Notional Health Spending in 2011: Overall Growth Remains Low, But Some Payers and Services Show Signs of Acceleration. Health Affairs, 32 (1), 87-99, 2013.

[2] Centers for Medicare & Medicaid Services, National Health Expenditure Data, Table 22, Health Insurance Enrollment and Uninsured; Number of Enrollees and Annual Percent Change, Calendar Years 1987-2012, http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-eports/NationalHealthExpendData/Downloads/ tables.pdf.

[3] Centers for Medicare & Medicaid Services, National Health Expenditure Data, Table 3, National Health Expenditures; Levels and Annual Percent Change, by Source of Funds: Selected Calendar Years 1960-2012, http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ tables.pdf.

[4] Centers for Medicare & Medicaid Services, Data Analysis Brief Medicare-Medicaid Dual Enrollment from 2006 Through 2011, Prepared by Medicare-Medicaid Coordination Office, February 2013, Table 2. Yearly Trends of Medicare-Medicaid Enrollees and Medicare-only Enrollees, (Non-MMEs) in the Total Medicare Population by Age Group from 2006 through 2011. http://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/Dual_Enrollment_2006-2011_Final_Document.pdf.

[5] Scheinder A & Elam L. (2002). Medicaid: Purchasing Prescription Drugs. Policy Brief. Kaiser Commission on Medicaid and the Uninsured. January 2002.

[6] Schwalberg R., Bellamy H., Giffin M., Miller C. & Schreiber S. (2001). Medicaid outpatient prescription drug benefits: Findings from a national survey and selected case study highlights. The Kaiser Family Foundation. October 2001.Retrieved December 06, 2010, from http://www.kff.org/medicaid/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=14047

[7] Crowley JS, Ashner D, Elam L. Medicaid outpatient prescription drug benefits: Findings from a national survey, 2003. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 2003.

[8] Abramson RG, Harrington CA, Missmar R, Li SP, Mendelson DN. (2004) Generic drug cost containment in Medicaid: Lessons from five state MAC programs. Health Care Finance Rev. 2004; 25:25-34.

[9] Fischer MA, Avorn J. (2004). Potential savings from increased use of generic drugs in the elderly: What the experience of Medicaid and other insurance programs means for a Medicare drug benefit. Pharmacoepidemiology and Drug Safety.2004; 13:207-214. Retrieved December 06, 2010, from http://onlinelibrary.wiley.com/doi/10.1002/pds.872/pdf

[10] Hellerstein J, K. (1998). The importance of the physician in the generic versus trade-name prescription decision. RAND Journal of Economics, Spring 1998 Vol. 29 (1): 108-136.

[11] Mott, D. & Kreling, D. (1997). The influence of therapeutic category and insurance type on generic substitution of drug products. Journal of Research in Pharmaceutical Economics, 1997 Vol. 8(3):3-22.

[12] Schondelmeyer S.W. (2000), Patents, Intellectual Property, Innovation and Prescription Drugs: Do the Rules Benefit Consumer, Presentation made at a congressional briefing, (September 25, 2000).

[13] Haas JS, Phillips KA, Gerstenberger EP, Seger AC.(2005) Potential savings from substituting generic drugs for brand-name drugs: Medical expenditure panel survey, 1997-2000. Ann Intern Med. 2005; 142:891-897.

[14] Fischer MA, Avorn J. (2003). Economic consequences of underused of generic drugs: Evidence from Medicaid and implications for prescription drug benefit plans. Health Serv Res. 2003; 38:1051-1063.

[15] Fischer MA, Avorn J. (2004). Potential savings from increased use of generic drugs in the elderly: What the experience of Medicaid and other insurance programs means for a Medicare drug benefit. Pharmacoepidemiology and Drug Safety.2004; 13:207-214. Retrieved December 06, 2010, from http://onlinelibrary.wiley.com/doi/10.1002/pds.872/pdf

[16] Cox E., Behm A., Mager D. & Miller S. 2004 Generic Drug Usage Report. Express Scripts Research Study Findings.
http://www.express-scripts.com/ourcompany/news/outcomesresearch/onlinepublications/study/gdur.pdf

[17] Levinson D. (2006). Generic Drug Utilization in State Medicaid Programs. Department of Health and Human Services, Office of Inspector General (OIG). July 2006.Retrieved November 16 2010, from. http://oig.hhs.gov/oei/reports/oei-05-05-00360.pdf.

[18] Bruen B. K. & Miller L.M. (2008) Changes in Medicaid Prescription Volume and use in the wake of Medicare Part D implementation. Health Affair, January/February 2008.

[19] (Express Scripts Research Study Findings) Express Scripts Research Study Findings. Geographic Variation in Generic Fill Rate. Retrieved December 06, 2010, from http://www.reducedrugprices.org/av.asp?na=128

[20] Humphreys A. (2006). World's Best Selling Medicines. Med Ad News, June 2006.Vol. 25 (6). Retrieved August 20.2006, from
http://www.pharmalive.com/magazines/medad/view.cfm?articleID=3613.

[21] Gibson T.B., Ozminkowski R.J. & Goetzel R.Z., (2005), The Effects of Prescription Drug Cost Sharing: A Review of the Evidence, The American Journal of Managed Care Vol. 11, No. 11, November 2005.

[22] Greczyn R.J., Jr. (2003), Prescription Drugs and Medical Costs: Four Opportunities for Health Plans and Physicians to Make a Difference, NC Med J, Volume 64, Number 6, November/December 2003.

[23] The Medicaid Drug Rebate Program was established by Congress as part of the Omnibus Budget Reconciliation Act of 1990 (OBRA '90). The OBRA '90 law contained definitions for Single Source Drug, Innovator Multiple Source Drug, and Non-Innovator Multiple Source Drug.

[24] As defined in the OBRA '90 statutes enabling the Medicaid Drug Rebate Program the term ''single source drug'' means "a [Medicaid] covered outpatient drug which is produced or distributed under an original new drug application approved by the Food and Drug Administration, including a drug product marketed by any cross-licensed producers or distributors operating under the new drug application."

The term ''multiple source drug'', according to statutes, means "a [Medicaid} covered outpatient drug for which there is (sic) at least 1 other drug product which: (I) is rated as therapeutically equivalent (under the Food and Drug Administration's most recent publication of ''Approved Drug Products with Therapeutic Equivalence Evaluations''), (II) is pharmaceutically equivalent and bioequivalent, . . ., and (III) is sold or marketed in the State during the period."

Multiple source drugs are further characterized as either: (1) innovator multiple source drugs or (2) non-innovator multiple source drugs. The term ''innovator multiple source drug'' means a multiple source drug that was originally marketed under an original new drug application approved by the Food and Drug Administration. The term ''non-innovator multiple source drug'' means "a multiple source drug that is not an innovator multiple source drug." 42 U.S.C. §1396r-8(k)(7)

[25] The term ''single source drug'', according to statutes, "means a [Medicaid] covered outpatient drug which is produced or distributed under an original new drug application approved by the Food and Drug Administration, including a drug product marketed by any cross-licensed producers or distributors operating under the new drug application." 42 U.S.C. §1396r-8(k)(7). The term "single source drug", however, has come to be used in the market as a whole rather than just within Medicaid.

[26] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[27] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[28] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[29] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[30] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[31] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[32] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[33] U.S. Food & Drug Administration, ***Approved Drug Products with Therapeutic Equivalence Evaluations***, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

[34] Thomson Micromedex. Approved Drug Product and Legal Requirements. 27th Edition , 2007.

[35] Pharmacists' Letter

[36] James D. Henderson and Richard H. Esham (2001). Generic Substitution: Issues for Problematic Drugs. Southern Medical Journal. January 2001, Vol. 94 Issue 1: 16-21.

[37] Levinson D. (2006). Generic Drug Utilization in State Medicaid Programs. Department of Health and Human Services, Office of Inspector General (OIG). July 2006.Retrieved November 16 2010, from. http://oig.hhs.gov/oei/reports/oei-05-05-00360.pdf.

CHAPTER II: LITERATURE REVIEW

This chapter provides a brief overview of the events that happened in the last fifty years in the pharmaceutical industry.

2.1 INTRODUCTION

After World War II there was an enormous increase in the development of new and potent drug entities. For that reason, the U.S. government was very concerned about regulating what kinds of medications were provided to consumers.

In the early years of the 1900s the Food and Drug Act (1906) legislated that a drug needed to be properly labeled but it did not have to be safe. As a result, in 1938 the Food, Drug and Cosmetic Act was enacted and at this time, is was endorsed saying that drugs or cosmetics had to be tested for toxicity before marketing and in addition, enough information for its use needed to be on in the package and it made first mention of "use by instruction from physician only".

In 1952, the Durham-Humphrey Amendment was enacted and explicitly defined two specific categories for medications: prescription and over-the-counter (OTC). Prescriptions drugs can only be dispensed with direct medical supervision or health practitioner. OTC drugs can be purchased and used without a prescription. [1]

Subsequently, in 1962 Kefauver-Harris Amendments was authorized but it wasn't until 1962, in the wake of the Thalidomide situation (a drug given to pregnant women for morning sickness that caused severe birth defects), that amendments were added saying that a drug had to be effective for what it was intended and that approval had to be given before trials on humans could be conducted, in consequence creating the Food and Drug Administration (FDA). Investigation of existing drugs' effectiveness began in 1964 and by 1974, 6,133 drugs had been removed for ineffectiveness.[2]

Also, the market was very lucrative. From 1960 to 1982, the average return rate for the pharmaceutical industry was 18.5 percent and in the same period time the average annual return rate for all manufacturing in the United States was 12.1 percent. That produced a public policy explosion to decrease drug costs. [3]

Moreover, the standards to make medications during that period time were not very high. For that reason, companies were allowed to produce products with minimum requirements. The reputation of generic drugs was very low and companies that produced brand name drugs were in charge of promoting the value of drugs and so disqualified generics companies.

At the same time, the FDA had been responsible for monitoring the quality of drugs since 1931, but initially was just concerned about counterfeiting, misbranding, and fraud. After that, in 1938, the FDA changed roles and was more focused on the new drug approval process which proved that drugs were safe and effective and if they were not the FDA was allowed to prosecute the companies.

Finally, the issue of substitution of drugs was very important. Pharmacists were allowed to dispense any labeler's product as long as it matched the active ingredients requested on the physician's prescriptions until the 1950s. But with the problems mentioned before, the government was focused on improving the standards for the new medications and also controlling the substitution.

2.2 MARKET OVERVIEW

Commodities are goods or things of value with uniform quality, produced in large quantities by many different manufacturers. The items from each different producer are considered equivalent. A commodity has a demand but the product is without quantitative differentiation across the market and is exchangeable no matter who

produces it. One of the unique aspects of a commodity is that its price is determined as a function of its market. Essentially, goods that previously carried premium margins for market participants have become commodities, generic pharmaceuticals are such an example.

In a competitive market the purchaser will not pay more than the market clearing price of a particular good. That price is a function of the quantity demanded by purchaser, and the quantity supplied by producers, resulting in an economic equilibrium of price and quantity. Generic pharmaceuticals can be thought of as commodities in the sense that a knowledgeable purchaser (Pharmacist) sees no difference in quality across competing generics and bases the purchasing decision on price.

Elasticity is an essential concept in the theory of supply and demand that explains how supply and demand responds to a variety of factors, including price as well as other stochastic principles. Elasticity is defined as the ratio of the percent change in one variable to the percent change in another variable and it corresponds to the slope of the demand curve. An "elastic" good is one whose price elasticity of demand has a magnitude greater than one. Similarly, "unit elastic" and "inelastic" explain goods with price elasticity having a magnitude of one and less than one respectively.

A good or service is considered to be highly elastic if a slight change in price leads to a sharp change in the quantity demanded or supplied. Usually these kinds of products are available in the market and can be thought of as needs. On the other hand, an inelastic good or service is one in which changes in price witness only modest changes in the quantity demanded or supplied. These goods tend to be things that are more of a necessity to the consumer.

As the price of a good rises, consumers will usually demand a lower quantity of that good; they may consume less of that good, substitute it with another product, etc. The greater the extent to which demand falls as price rises, the greater the price elasticity of demand. Consequently, as the price of a good goes down, consumers will usually demand a greater quantity of that good: consuming more, dropping substitutes, etc. However, there may be some goods of which consumers cannot

consume less or for which adequate substitutes cannot be found. Prescription drugs are such goods, demand does not greatly decrease as the price rises, and elasticity of demand can be considered low, except when there is a generic substitution.

Generic drugs can be considered “perfect substitutes” for branded drugs; as a result these are commodities with mainly elastic price.

2.2.1 PRICE

Price and price structure have always been a complicated part of the pharmaceutical industry. The price has to be established high enough to finance the degree of product competition required to maintain market position. For pharmaceutical products that compete with each other, the price structure will normally reflect the price that can help to capture the market without driving customers to move to substitutes. For a new product, the price structure will usually reflect a price higher than those of potential substitutes. The higher price and the justification for why they are that expensive has always been a controversial issue.

Prices of specific drugs tend to stay at relatively high levels until market position is susceptible to competition - when the patent expires - and lower priced generic equivalents arrive to the market. In general, price competition is presented in pharmaceuticals when the drugs are older, standardized, and non-patented or patent-expired products. When entry does happen, prices tend to drop or go up, depending on the analytic approach of the company that is marketing the competitors (generics).

Also, legislation (patent, line extension and others) is an important external component of the price because even though it was created to produce market competition, it has generated a monopoly that companies have used to extend patents and create a market niche where the manufacturer does not have competition and can increase its revenue. In a study in 1984 researchers measured continued price rigidity, and they found that price rigidity was due to product-line

extensions that brand-name drug firms introduced for their patent-expiring brand-name drugs. [4]

Furthermore, in another study in 2006, researchers said that there are three important factors that can delay the optimization of savings from generic drug use. First, generic drugs are frequently late to the U.S. marketplace after the expiration of the patent or other Intellectual Property protection; second, generic prices can stay high because the Hatch-Waxman Act gives six months of exclusivity to the first generic product on the market; and finally, physicians can be slow to switch to generic versions of brand name pharmaceuticals, and payers formularies often do not require such substitution. [5]

During the period of 1950 to 1981, national costs for retail drugs and medical miscellaneous increased about 9.3 percent annually from $1.7 billion in 1950 to $3.7 billion in 1960, $8 billion in 1970, $19.3 billion in 1980 and $21.4 billion in 1981.[6]

In addition, between 1982 and 1992, the producer price index for prescription drugs rose at an annual average rate of 8.4 percent. At the same time the index for all commodities at wholesale increased by 1.6 percent and the price index for all medical care rose at a 7.4 percent rate. [7]

Another important attribute of the pharmaceutical industry has been its extraordinarily high reported profitability. Between 1960 and 1991, pharmaceuticals ranked first or second for 24 out of 32 years on Fortune magazine's annual tabulation of median after-tax profit returns on stockholders' equity for its 500 largest industrial corporations, classified into between 21 and 28 industry categories. [8]

Even with the entire arguments presented thus far, there was a considerable decline in the prices of pharmaceuticals from 1960 through 1968, and that was in contrast with the significant inflation in the prices of other medical care goods and services and in overall prices. During the period of 1960 to 1968, the medical care price index rose twice as fast as the consumer price index, in overload of 30 percent. All these were followed by a five year period of relative price stability for pharmaceuticals,

while inflation continued unabated in the medical care sector and in the overall economy. [9]

A study in 1992 shows that from 1981 through 1988 the manufacturer drug price index for all drugs increased at an average of 9.1percent in 1981 to 83.5 percent in 1988, and the retail drug price index increased at an annual average of 7.2 percent in 1981 to 62.6 percent in 1988. [10]

Finally, pharmaceutical manufacturers always argue that they work in a competitive environment. The total market for any specific drug is determined by the number of subjects that have the illnesses which that drug will be used to treat. A new product can have some market share only at the price of other products with similar therapeutic effects. Any product, even a well-established one, can find its position rapidly in the market but lose its position by a successful introduction of a new therapeutic advance. Price can be one of the factors that determine how much market share a product will have.

2.2.2 PROMOTION

The pharmaceutical industry is one of the most advertising-intensive industries in the world. As early as 1900 the pharmaceutical industry was doing drug promotion at all the market levels (physicians and patients). Their promotional techniques have ranged from simple advertising in newspapers to Direct to Consumer Advertising (DTCA) on TV. The argument of the industry is that consumers (physicians and patients) need explanations of the value of particular brands and brand-name products and to persuade them of their use. This behavior has been regarded by opponents as one of the components that contribute to the high drug prices.

Research has confirmed this argument, by showing that expenditures for advertising range from 15 percent in the United Kingdom to 22 percent in Italy, Germany, and the United States. [11]

The first drug advertisement ever recorded was in 1708 in Boston by Nicholas Boone who published a medicine patent in an American newspaper [12]. In 1962, the Kefauver-Harris drug amendments changed pharmaceutical advertising and represented the first time that a regulation was made for that purpose. That time they stated that advertisements must have four basic components: they cannot be false or confusing; they must describe a fair equilibrium of information about the risks and benefits of using the medication; they must include details that are of substance to the product's advertised uses; and finally, in general the publicity has to contain a brief review of the drug including each risk from the product approval labeling. [13]

Prior to the early 1980s, pharmaceutical companies promoted their prescription products exclusively to physicians, who were anticipated to proceed as educated mediators interpreting drug information for the patients. After 1981 drug promotion was open to the final consumers as advertising on TV, in magazines, and through massive communication media. A survey that was conducted in eighteen commercial magazines from 1989 to 1998 discovered a total of 320 different DTCAs representing 101 brands and 14 categories of medical conditions [14]

Opinions about DTCA are diverse. In 1997, a study conducted by US family physicians found that four fifths believed that DTCA was "not a good idea" since it increased expenditure and promoted confusing and unfair views of drugs [15]. Another survey of 1,500 patients regarded to DTCA promotion as useful with 62% saying that DTCA helped them discuss their health with physicians. However, 58% said that advertising makes medications look better than they are. [16]

Either way the influence of drug promotion by pharmaceutical firms may become even more important than drug manufacturing. An example of DTCA advertising's growth and its effect on drug sales was in a study released by the National Institute for Health Care Management Research and Education (NIHCM). They found that pharmaceutical companies spent $1.8 billion on DTC advertising in 1999, up 38.5 percent from the $1.3 billion spent in 1998 and 33 times the $55 million spent in 1991. Television ads accounted for $1.1 billion of the expenditure in 1998. [17]

The same institute conducted a study in 2001 where they found that retail prescription drug spending in the United States increased to approximately $131.9 billion in 2000, from $111.1 billion in 1999. The study found that sales of the 50 drugs most seriously advertised directly to consumers accounted for 40% of this increase. The approximately 9,850 other prescription medicines sold in the United States were responsible for the remaining 60% of the increase. The top 50 drugs represented $58.2 billion in 2000, approximately 44% of the total amount that Americans spent on all prescription drugs that year. [18]

Other ways that the pharmaceutical companies influence the industry are: support of conferences, symposium, and continuing education programs for physicians and pharmacists in the medical and pharmacy professions. Also the publication of the Physicians' Desk Reference (PDR), published by Medical Economics, represents a collection of paid marketing purchased by the major brand-name companies. The PDR includes materials approved by the FDA, and its advertisements closely resemble the approved package insert.

Finally, the influence of drug promotion is an effective resource to provide drug information to physicians and to influence their prescribing behavior. The failure of most physicians to prescribe generic products, and of most pharmacists to dispense them when they are available at significant cost savings to the consumer, is directly related to the promotional efforts of the drug industry.

2.2.3 PATENT

Patents are an intellectual property protection that was created to give incentives for innovation in general. Patents and other varieties of protection remove the competition to a product for a period of time. In this period the originator can frequently charge premium prices, which guarantee a big return on what might have been a significant investment in research and development in any area of the market. The period where the products in a pharmaceutical market are protected by

patents is a major barrier to entry of products from competing firms. The average effective patent life for major pharmaceuticals in 2005 was 11 years. [19]

One of the big challenges in the market is the time and the investment to bring a drug to the market, the average time to develop a drug is between 10 to 15 years. Of the 5,000 to 10,000 compounds that are tested, just five will go to clinical trials and, only one will eventually obtain FDA approval and only two of 10 marketed drugs ever generate revenues that are equivalent or exceed R&D costs. [20]

The creation of an original drug product generally requires considerable investment in research and development, which is regularly absent from the resources of most small firms. Also small firms lack the capital to develop any patents for which they are the owners and the intensive research and development efforts of the larger firms usually establish patent umbrellas over all second-best products related to the primary advance so the chances to see small companies with blockbuster drugs are minimal. A current study from the Tufts University Center for the Study of Drug Development say that the average cost of developing a medication is $1.3 billion in 2005 dollars, including the cost of failures and capital. [21]

Frequently patents are tradeoffs for consumers who can have easy access to the higher technology and better products, but this does not always happen because the high price limits the access to some privileged groups.

In the pharmaceutical market the government has created a series of laws that has significantly increased the life of the drug and for that reason innovation in this market has been growing very fast. Some of the improvements that help medications continue in the market are extending the original patent; reducing the time in clinical testing and regulatory review; and establishing “market exclusivity” to drugs under certain conditions. [22]

Previous to 1994, patents in the pharmaceutical industry were covered for a period of 17 years, giving the owner a legal monopoly over the production of a particular product or the employment of a particular production procedure. If the patent was not licensed for sale by any other firm, a patented drug represented an exclusive

chemical entity in that market. Now after the Uruguay Round Agreements (URAA) Act was passed patents last 20 years from the date of application.

Patent life does not necessarily correspond with commercial life of a product; for example: the drug “enalapril” in Canada was off-patent in 2007 and that is 28 years after the initial patent was approved. [23]

The period of patent protection left over at the time of a New Drug Application (NDA) approval by the FDA has declined significantly from 13.6 years in 1966 to 9.5 years in 1979 (Caves et.al., 1991); but after the Waxman-Hatch Act (1984) there was an improvement in re-establishing the patent life and, according to a study conducted in Duke University, in the early 1990s the average patent life of new compounds was 11.8 years. [24]

The reasons for these declines were because they decreased the time in patent-pending and that produced faster processing of the application by the Patent Office. They increased the time between patent filing and clinical testing and the increase in the time between the beginning of clinical testing and NDA approval, since of the increased the requirements for NDA approval. [25]

Finally, all the changes in the market that had been created with the intention to help the consumer have more supply and better access to medications and helped the industry with incentives for innovation.

2.3 SUBSTITUTION ISSUES

2.3.1 ANTI-SUBSTITUTION LAW

Between 1930 and 1950, the substitution practice of drug product selection was reasonably tolerated by pharmacists, physicians, and manufacturers. This was certainly appropriate in part due to the large percentage of prescriptions which were

compounded and the small proportion of drug preparations that were manufactured in final form.

However, opponents were of the view that substitution was dangerous and pervasive during the 1950s. There was no concrete proof at that time that substitution of inferior quality products was happening, or patients were experiencing any significant adverse reactions as a result of substitution.

Furthermore, with the end of World War II, there was an incredible increase in the development of new and potent drug entities; that produced a decrease in the amount of compounding done in pharmacies. Therefore, the pharmaceutical sales industry growth, especially among manufacturers of proprietary drug products increased.

This period was also the beginning of marketing prescription drugs with lower standards and producing counterfeit products because there was no legislation that was concerned with the safety and efficacy of medications. Since then, legislators have become worried about substitution and counterfeiting.

Therefore during the 1950s, U. S. "Anti-substitution" laws were enacted and that was a response to the drug "counterfeiting" problem. In 1951 the Durham-Humphrey Amendment to the FD&C Act promoted this initiative by creating a new class of prescription-only drugs that cannot be safely used without medical supervision and restricting their sale to prescription by licensed practitioners. [26]

The state laws were supported mainly by the Pharmaceutical Manufacturers Association (PMA), but other groups argued that these laws allowed drug manufacturers to increase their prices and profits under the pretense of protecting the consumer from drugs of questionable quality. Simultaneously, the American Pharmaceutical Association (APhA) also supported state anti-substitution laws to protect against legal responsibility in dispensing alleged counterfeit drugs.

In 1953, the New Jersey Board of Pharmacy was in the process of enforcing the anti-substitution law and discovered that the substitution rate was 22 per cent of total prescriptions written for drugs that were likely to be substituted. Additionally in 1954, a chain drug store executive estimated that the brand substitution cost of major firms was $50 million per year. [27]

In that period Senator Estes Kefauver and a group of his committee initiated different research to see how the market was working. They found significant differences between prices for brand name and generic drugs that were equivalent products, and concluded that prescribing and substitution of non-brand name drugs should be extended. The 1962 Kefauver-Harris amendments to the FD&C Act authorized the FDA to assure the effectiveness and safety of all drugs. This diminished the requirements of state anti-substitution laws which had been passed in answer to issues of drug efficacy and effectiveness. Other amendments required the FDA to establish generic names for products in order to make the public aware of the identity of trademark-named drug products.

The regulations were, and remain, a major instrument used by the federal government to assure drug quality by setting standards for facilities and conditions under which drugs are manufactured. It was not until 1970 that the FDA initiated the Abbreviated *New* Drug Application process which covered drug safety and efficacy, and facilitated the introduction of generically-equivalent drugs. [28]

2.3.2 THE HATCH-WAXMAN ACT

The Drug Price Competition and Patent Term Restoration Act of 1984, also known as the Hatch-Waxman Act, signed into law by President Reagan on September 24, 1984 (Soehnge, H. 2003), was created for two main reasons: to have generic medication available to the consumer with the lowest cost and to generate new incentives for research and development of products with pre-market approval by the government. [29]

Furthermore, the act established an abbreviated new drug application (ANDA) process for generic drugs marketing approval by the Food and Drug Administration (FDA) (21 U.S.C. § 355). This idea was supported by consumer groups which lobbied Congress to pass legislation that would simplify the approval procedure for generic drugs whose brand name equivalents were already in the market. Previous to that, they were required to repeat expensive human clinical trials for all NDAs for generic equivalents of post-1962 pioneer drugs. Manufacturers requests for generic equivalents of pioneer drugs approved prior to 1962 were excused from the clinical testing requirement. The abbreviated new drug application (ANDA) procedure made it possible for generic drugs to be approved by the FDA if they were shown to be the "bioequivalent" of an approved drug and it would eliminate the expense and delay of proving the safety and effectiveness of a generic drug in clinical tests on humans when a pioneer drug manufacturer had already proven such requirements. [30]

On the other hand, the industry protested that the seventeen year patent term for pioneer (first to develop, manufacture and market new) drugs patented prior to receiving FDA approval was effectively reduced by the time that it took the FDA to approve the product for the market. The companies argued that, the loss of effective life of the patent was harmful since it reduced the incentive to invest in research and development of new and novel drug products. For that reason a method was created to re-establish the patent life of products pending pre-marketing approval by the FDA. [31]

The Drug Price Competition and Patent Term Restoration Act consist of: Title I, created a generic drug approval method for pioneer drugs approved after 1962, by amending the Federal Food, Drug, and Cosmetic Act. Under these requirements, the FDA must approve the ANDA within 180 days from the time of filing if the applicant demonstrates that:

1) The conditions for prescribed, recommended, or suggested use for the new generic drug have been previously approved for a prior drug; [32]

2) The generic drug has the same active ingredient(s) as the prior approved drug; [33]

3) The generic drug uses the same route of administration, dosage form, and strength as the approved drug; [34]

4) The generic drug is the "bioequivalent" of an approved drug; [35]

5) The labeling proposed for the generic drug is the same as the labeling approved for the prior drug; [36]

Furthermore, the applicants must confirm that, either the generic drug is not patented, or, if it is or was patented, then the applicant has to verify: that the patent has expired, the date the patent will expire, or that the patent is invalid or will not be infringed. [37] Then if the generic drug is not patented or if the patent has expired, the approval is effective immediately.

Additionally, if the generic drug is patented, then the approval is effective on the patent's expiration date. When the applicant certifies that the patent is invalid or will not be infringed, the effective date of approval may be delayed 180 days and if the patent owner does not file an action for patent infringements.

Finally, Title II which implements the patent term restoration condition that provided twenty years patent term from the date on which the application for the patent was filed in the United States (The Uruguay Round Agreements Act, P.L. 103-465 was signed on December 8, 1994 but the effective date for the provisions was 6 months later, June 8, 1995) on certain products subject to pre-market approval, their method of use, or their method of manufacture. [38]

The inventors under this policy will be able to obtain a patent of *“any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof…..”* [39], therefore if the inventor provided that is a novel discover a patent will give to him and that will give its owner "*the right to exclude others from making, using, or selling the invention throughout the United States . . .*" for a term of twenty years. [40]

In addition, the products that qualify for patent term extensions include drug products, medical devices, food additives, and color additives subject to regulation under the Federal Food, Drug, and Cosmetic Act. [41]

Finally, the patent term remaining at the time of regulatory approval cannot be extended beyond fourteen years under the term extension provisions. [42]

2.4 PHYSICIANS PRESCRIBING BEHAVIOR

Understanding the phenomenon of physicians prescribing behavior has always been important and complicated. In general, physicians are under a lot of pressure. It also depends on what type of institution they practice in. There are hospitals and clinics that are related to universities or institutions that practice research (Mayo Clinic, John Hopkins and others). Recent information is more accessible in these kinds of institutions. In contrast, hospitals and clinics that are located in rural areas or do not have any association with educational institutions update their information through journals, newsletters, and pharmaceutical representatives.

Therefore, for the reasons that were mentioned before, the information that physicians receive is not always the same and is focused on clinical and therapeutic issues. The knowledge that physicians have about the cost of the medication is minimal. That is because they are more concentrated on the diagnosis of the disease and what drug works better than in the cost and access by the patient to the drug.

Many studies about physician knowledge of drug cost and prescribing behavior say that they are willing to learn about the cost of the medication, but the lack of accurate information concerning actual cost and insurance coverage limits them in that area. Physicians have greater exposure to drug representatives, and that has been associated with prescribing higher cost medications, especially among primary care physicians. [43]

In general, Americans consume lot medications per year and that is one of the reasons for the increase in drug expenditures. Therefore one of the gatekeepers in the market is physicians who are the first to have contact with a patient and they have the option to select the medication that patient needs. In that context the primary target for prescription drug marketing is doctors.

Many studies have documented that physicians are not familiar with prescription drug cost. One of the studies indicated that physicians consider drug cost in therapy decisions, but lack information and often make erroneous suppositions about the cost of medications prescribed. The study suggests that doctors could provide better cost-effective prescribing services and reduce costs if information about drug prices was readily available and if their medical education addressed drug cost. [44]

On average, the most common office visit is to a family physician, and family physicians write more than 30% of the prescriptions annually in the United States (Ernst et al., 2000). Rational cost-effective prescribing depends on accurate and timely information about the cost of medication, and in general, most of the physicians studied reported that they did not receive enough information concerning the cost of medications. They believed regular updates on medication costs would help to improve cost-effective prescribing.

A number of studies have established that the education of physicians concerning drug prices can modify prescribing behavior and decrease costs by improving selection of cost-effective therapies. In 1983, a randomized controlled trial study found that physicians that were offered personal education visits by clinical pharmacists reduced their prescribing of the target drugs by 14 per cent as compared with doctors that did not received this kind of education. That percentage had a substantial cost savings in the reimbursed for these drugs. [45]

Finally, other studies to determine if clinical pharmacist education will affect physicians prescribing behavior show that there were improvements in the knowledge of drug costs and therapy when doctors received direct education.[46] Some authors think that physicians prescribing habits are relatively insensitive to cost information. A study where doctors had medication cost information in a

computer showed that the provision of real-time computerized drug cost information did not affect overall prescription drug cost to the patient. [47]

2.5 PHARMACIST DISPENSING BEHAVIOR

The role of the pharmacist has changed since the 1950's. As mentioned, before 1950 pharmacists were allowed to dispense any drug, and the only condition was that it had to be the same chemical entity that the physician prescribed. After significant problems during that time with generic medication, the role of the pharmacist changed from a person that dispensed a medication to a health professional that advised and gave the patient the best option for his or her treatment.

Between 1960 and 1970 the campaign to substitute brand medications with generic drugs was very strong and pharmacists were not allowed to change what physicians prescribed. For that reason, the physicians' market power was high. At that time anti-substitution laws were passed by states where it became mandatory that pharmacists dispense the exact drug product that was prescribed by the physician specified with a brand name or generic name plus a specific manufacturer.[48] At that time physicians were allowed to use two methods to prevent substitution: one was the two-line method where physicians sign the prescription "brand medically necessary" or "substitution allow" and in the latter case if the physician signed the prescription, pharmacists were allowed to substitute the medication. The method was called "active substitution methods". [49]

Additionally, pharmacist education changed during the period before the law passed. Prior to that, it was focused on drug products, emphasizing chemistry, pharmaceutics, and the control and regulation of drug product delivery systems. However, because of the dramatically changing health care delivery system and the progressively changing role of pharmacists in the efficient and effective treatment of disease for the patient, education shifted to focus for practitioners in this area. [50]

A study conducted in 1982 revealed that 34 percent of pharmacists regularly substitute brand medication for generic when it is available. [51] That shows that anti-substitution laws had a big impact on the pharmacist profession because pharmacists were pushed to take on roles that they were not allowed to take before, related to practice, interrelationship with patients, and the cost of the pharmaceuticals.

Today, the gatekeeper in the health system is not just the physician. Now physicians are working together with the pharmacist to give the patient the best treatment but with even more efficacy and cost-effectiveness.

[1] Berger MS & Berger BA (2005). FDA Overview from emedicinehealth.com. Retrieved December 2, 2010, http://www.emedicinehealth.com/fda_overview/article_em.htm

[2] Berger MS & Berger BA (2005). FDA Overview from emedicinehealth.com. Retrieved December 2, 2010, http://www.emedicinehealth.com/fda_overview/article_em.htm

[3] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

[4] Hong SH; Shepherd MD; Scoones D & Wan TH (2005). Product-Line Extensions and Pricing Strategies of Brand-Name Drugs Facing Patent Expiration. Journal of Managed Care Pharmacy November/December 2005; 11; 9:746-54.

[5] Kesselheim AS., Fischer MA., & Avorn J (2006).Extensions Of Intellectual Property Rights and Delayed Adoption of Generic Drugs: Effects On Medicaid Spending. Health Affairs (2006) 25:6:1637–1647.

[6] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

[7] Scherer F. M. (1993). Pricing, Profits, and Technological Progress in the Pharmaceutical Industry. Journal of Economic Perspectives, Summer 1993; 7:3; 97-115

[8] Scherer F. M. (1993). Pricing, Profits, and Technological Progress in the Pharmaceutical Industry. Journal of Economic Perspectives, Summer 1993; 7:3; 97-115

[9] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

[10] Thomas J & Schondelmeyer S (1992). Price Indexes for Pharmaceuticals used by the Elderly. Health Care Financing Review, Fall 1992; 14:1: 91-106.

[11] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

[12] Wilkes MS., Bell RA., and Kravitz RL. (2000). Direct-To-Consumer Prescription Drug Advertising: Trends, Impact, And Implications. Health Affairs, 2000;19:2:110-128.

[13] Henney, JE (2000). Challenges in Regulating Direct-to-Consumer Advertising. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2242.

[14] Huang, AJ (2000). The rise of Direct-to-Consumer Advertising of Prescription drugs in the United States. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2240.

[15] Kravitz, RL (2000). Direct-to-Consumer Advertising of Prescription drugs: Implications for Patients-Physician relationship. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2244.

[16] Henney, JE (2000). Challenges in Regulating Direct-to-Consumer Advertising. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2242.

[17] National Institute for Health Care Management (2000). Prescription Drug and Mass Media Advertising. Washington September 2000.

[18] National Institute for Health Care Management (2001). Prescription Drug Expenditure in 2000: The Upward trend continues. Washington May 2001.

[19] Pharmaceutical Research and Manufacturers of America, Pharmaceutical Industry Profile 2008 (Washington, DC: PhRMA, March 2008).

[20] Pharmaceutical Research and Manufacturers of America, Pharmaceutical Industry Profile 2008 (Washington, DC: PhRMA, March 2008).

[21] Pharmaceutical Research and Manufacturers of America, Pharmaceutical Industry Profile 2008 (Washington, DC: PhRMA, March 2008).

[22] National Institute for Health Care Management Foundation (2000). Prescription Drugs and Intellectual Property Protection. August 2000

[23] Sibbald, B (2001). Drug patent protection: How long is long enough?. Canadian Medical Association Journal. May 1, 2001; 164 (9).

[24] National Institute for Health Care Management Foundation (2000). Prescription Drugs and Intellectual Property Protection. August 2000

[25] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

[26] Facchinetti NJ & Dickson WM (1982). Access to generic drugs in 1950s: The politics of a social problem. American Journal Public Health, 1982; 72: 468-475. Retrieved November 23, 2010, from http://ajph.aphapublications.org/cgi/reprint/72/5/468 .

[27] Facchinetti NJ & Dickson WM (1982). Access to generic drugs in 1950s: The politics of a social problem. American Journal Public Health, 1982; 72: 468-475. Retrieved November 23, 2010, from http://ajph.aphapublications.org/cgi/reprint/72/5/468 .

[28] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

[29] Lewis RA. (1992). The emerging effects of the Drug Price Competition and Patent Term Restoration Act of 1984. Journal of Contemporary Health Law & Policy. 8:361-78, 1992.

[30] Hassen, A S. (2004). A Summary of recent changes to the drug price competition and patent term restoration act of 1984.

[31] United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

[32] United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

[33] United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

[34] United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

[35] United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

[36] United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

[37] United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

[38] United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

[39] United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

[40] United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

[41] United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

[42] United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

[43] Reichert S, Simon T & Halm EA. (2000) Physicians' attitudes about prescribing and knowledge of the cost of common medications. Archives of Internal Medicine 2000; 160:2799-2803.

[44] Walzak D, Swindells S & Bhardwai A (1994) Primary care physicians and the cost of drugs: a study of prescribing practices based on recognition and information sources. The Journal of Clinical Pharmacology, 1994; 34:1159-1163.

[45] Avorn J. and Soumerai S. B. (1983) Improving drug-therapy decisions through educational outreach. A randomized controlled trial of academically based "detailing". The New England Journal of Medicine. 1983; 24:1457-1463.

[46] Sumpton JE, Frewen TC, and Rieder MJ (1992). The effect of physician education on knowledge of drug therapeutics and cost. The Annals of Pharmacotherapy 1992; 26:692-697.

[47] Ornstein SM.; MacFarlane LL; Jenkins RG; Pan Q; Wager KA. (1999). Medication Cost Information in a Computer-Based Patient Record System: Impact on Prescribing in a Family Medicine Clinical Practice Archives Family Medicine. 1999; 8:118-121.

[48] Ascione F, Kirking D, Gaither C & Welage L. (2001) Historical overview of generic medication policy. Journal of the American Pharmaceutical Association, 2001; 41: 4, 567-577.

[49] Hellerstein J, K. (1998). The importance of the physician in the generic versus trade-name prescription decision. RAND Journal of Economics, Spring 1998 Vol. 29 (1): 108-136.

[50] Graber DR, Bellack JP, Lancaster C, Musham C, Nappi Jean & O'Neil EH (1999). Curriculum topics in pharmacy education: Current and ideal emphasis.American Journal of Pharmaceutical Education, Vol. 63, summer 1999.

[51] Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

CHAPTER III: CONCEPTUAL FRAMEWORK AND RESEARCH METHODOLOGY

The following chapter describes the study in detail. First, the description of the market level of the analysis. Second, a conceptual framework is explained. Third, the regression models and hypotheses of the study are clarified. Fourth, a description of the data sources and the operationalization of the dependent and independent variables are described; and finally, econometric methods and models used to analyze the data are shown.

3.1 Market Level of Analysis

As mentioned before, this study could be conducted defining three market levels of analysis: the chemical entity; the therapeutic and the substitutable market level; but for the propose of this study, the analysis was at the substitutable market level, where we observed the effect of factors that encouraged the utilization of generics in the market.

3.1.1 Substitutable Market Level

For the purpose of this study, at the substitutable market level information on the specific dosage form, strength and route of administration of the drug product was included, presentations that were pharmaceutical equivalents by the FDA and defined in the Approved Drug Product (Orange Book). In this level of the study, generic substitution was measured when it was available. A drug product presentation was considered substitutable when it was in the same fourteen-digit Generic Product Identifier (GPI) code and the therapeutically equivalent (TE) code allowed for it.

Drug products are pharmaceutically equivalent according to the FDA or considered therapeutically equivalent (TE) when they can be substituted and will produce the same clinical effect and safety profile as the innovator product. Those medications are only therapeutically equivalent (TE) if they meet these criteria: contain the same active ingredient(s); dosage form; route of administration; strength and if they are assigned by the FDA the same therapeutic equivalence codes starting with the letter "A."

Therapeutic equivalence (TE) codes determine whether the FDA has evaluated a particular approved product as therapeutically equivalent to other pharmaceutically equivalent products and provide additional information on the basis of the FDA's evaluations. Examples of TE codes are: AA, AB, BC, etc.

A drug product is considered to be a therapeutically equivalent "A" rated only if a drug company's approved application contains enough scientific facts establishing through in vivo and/or in vitro studies, the bioequivalence of the product to a selected reference listed drug and those active ingredients or dosage forms for which no in vivo bioequivalence issue is known or suspected. Those products which the FDA does not estimate to be therapeutically equivalent are "B" rated.

The fourteen-digit Generic Product Identifier (GPI) code was used to group the drug product presentations of the same chemical entity. The table below shows how this code is defined by the Medi-Span.

Table 3.1.2 Generic Product Identifier (GPI) Structure defines by Medi-Span Master Drug Database (MDDB®) v2.0.

GPI-Subset	Representation	Type
12-xx-xx-xx-xx-xx-xx	Drug Group	*MISC. ENDOCRINE*
12-34-xx-xx-xx-xx-xx	Drug Class	*Posterior Pituitary**
12-34-56-xx-xx-xx-xx	Drug Subclass	*Vasopressin***
12-34-56-78-xx-xx-xx	Drug Name	Desmopressin
12-34-56-78-90-xx-xx	Drug Name	Acetate
12-34-56-78-90-12-xx	Dosage Form	Tablet
12-34-56-78-90-12-34	Strength	0.1MG

The Generic Product Identifier (GPI) is a code that categorizes drug products by a hierarchical therapeutic classification or pharmaceutically equivalent drug products. The 14-character GPI consists of a hierarchy of seven subsets. These subsets are structured and identified below:

a. Drug Group: The two-character Drug Group (first subset) classifies general drug products.

b. Drug Class: The four-character Drug Class (first and second subset) identifies specific therapeutic drug classes.

c. Drug Subclass: The six-character Drug Subclass (first through third subset) is used if further distinction is needed within a Drug Class.

d. Drug Name and Drug Name Extension: The eight-character Drug Name (first through fourth subset) designates basic drug moiety (when it exists as a product). Alternately, the ten-character Drug Name Extension (first through fifth subset) designates the specific drug salt, when applicable.

e. Dosage Form and Strength: The eleventh and twelfth characters (sixth subset) identify the drug product's dosage form. The thirteenth and fourteenth characters (seventh subset) differentiate various strengths and routes of administration.

3.1.2 Other Markets Level (Therapeutic and Chemical Entity)

The Therapeutic and Chemical Entity market levels were not included in this study but are left for future studies or analysis. We will provide some characteristics of them.

At the therapeutic market level the information included all the chemical entities that are available by class. That includes: single and multi-source medication that can be interchanged if they are available. At this level a 6 digit GPI code is a suggested variable to identify the cluster of drug product presentation within the class.

The chemical entity market level included information on the specific dosage form, strength, therapeutic equivalency code and route of administration by each molecule that is available. This level of the study measures if the therapeutic substitution was done or not. At this level an 8 or 10 digit GPI code is a recommended variable to identify the cluster of drug product presentations of the same chemical entity.

3.2 Empirical Model of Factors that Influence Market Levels

3.2.1 Conceptual Framework for the Substitution Level of Analysis

A typical industry or market is defined with many firms that have ease of entry and way out of the market. Commonly in that market, firms have the ability to differentiate their products and companies maximize profit and set the price and the quantities of production depending on the market's structure.

There are other markets like oligopolies (dominated by a small number of sellers) and monopolies (dominated by a one seller) where competitive firms are price setters and there are barriers to entry that make the access complicated for other companies or competitors, and that created market power to the firms.

In the pharmaceutical market, where medications have different stages during their life cycle, the market started as a monopoly, where you have one company supplying the medication (brand drugs) to an oligopoly market, where small number of companies produce a product (generic drugs). These products are nominated as "perfect substitutes" products (Welage, Kirking, Ascione & Gaither. 2001) [i] or "homogeneous products" and are considered commodities by any economics consideration.

Based on industry organization explained previously, where pharmaceutical companies compete, there are economics model that could explain the behavior of the industry; these models can be separated into the consumer perspective (demand side) and the manufacturer perspective (supply side).

Example of "manufacturer perspective" is the case of the Bertrand model [ii]; according to the Bertrand model, companies that produce the homogenous product compete in price until they reach the marginal cost (they don't set price below, otherwise they don't have any profit) and this is how they capture the market. Furthermore, we have the model that explains competition by knowing the quantity, that is the case of Stackelberg [iii] or Cournot [iv] competition. Both of them, basically explain these competitions as the game theory, where one of the firms or suppliers in the market is the one that makes the first move and the other competitors in the market follow until the other decides to make another move. These two types of models can explain some part of the system; they cannot capture the complete dynamic of the pharmaceutical market.

The theory of Market Segmentation [v] can be used to explain the pharmaceutical market; where we have many sub-sets (for example: class of drugs, therapeutics class, etc) where consumers with one or more characteristics demand similar drugs based on qualities of those goods, such as price.

The segmentation in the pharmaceutical market can be made in many different ways, e.g.: by types of disease, mechanics of action, type of patent protection (an example of that is Orphan drugs or medication for children), and others. But the common criterion is to create homogeneous segments that have common needs and can be reached by a market intervention.

While, there may be theoretically 'ideal' market segments, in fact, every organization engaged in a market will develop different ways to fragment the market, and create product differentiation strategies to exploit different segments. The market segmentation and corresponding product differentiation strategy can give a firm a temporary commercial advantage.

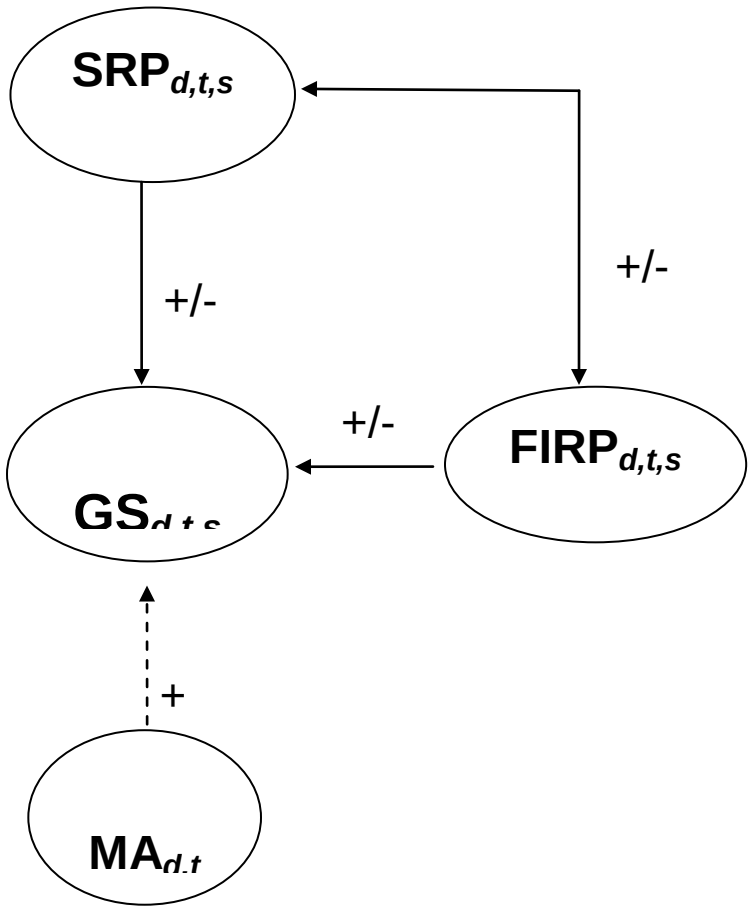
Market segmentation model could explain the separations of the market into generics and brand medications, but does not explain the structure and behavior of the pharmaceutical industry and how this segmentation is created. Therefore, other conditions in the pharmaceutical market in addition to price differences between generic and brand medications influence in the demand for generic drugs products.

3.2.2 Conceptual Model of Factors that Influence Generic Substitution at State and National Level

In a pharmaceutical market there are many exogenous and endogenous variables that will determine how a specific model will work. In our specific case, substitution regulation policy and financial incentives are the endogenous variables that will influence generic rate in all the study. Nevertheless, there are many exogenous variables that will not be accounted in this study, but can influence in a small way how things are in the pharmaceutical arena; variables like: Federal Policies that influence every state or state budget, inflation, or economic environment. To attempt to capture the influence of the exogenous variables, Time was including as a variable to capture some of the influence that federal policy.

The following is a conceptual model of the factors that influenced the generic reimbursement rate at the state and national Level.

Figure 3.2: Conceptual Generic Substitution Model:



GS $_{d,t,s}$ = Generic Substitution by drug product d at the time t by State s

SRP $_{d,t,s}$ = Substitution regulation Policy by drug product d at the time t by State s

FIRP $_{d,t,s}$ = Financial incentives regulation Policy by drug product d at the time t by State s

$MA_{d,t}$ = (Number of Generic Drugs/Total of Drugs) Market available by drug product d at the time t.

The process of generic substitution could have many factors that influence the decision; these influences can be in a positive or negative way. The following will explain these factors and where we will obtain them.

3.2.2.1 Substitution Regulation Policy

There are many regulations at state level that can make the substitution of a brand drug with a generic drug incredibly simple or exceptionally difficult. Most of these factors or regulations were extracted from National Association of Boards of Pharmacy (NABP) publications.

The following are the variables that influenced the generic rates, these were used to build the empirical model represented in Figure 3.2, to determine the factors that affect the generic rates at the market levels but does not mean that, there are not more factors that could or would influence the process of generic substitution.

All of the variables from National Association of Board of Pharmacy (NABP) were considered dichotomous with values 0 & 1, to making sure that each of the variables effects were detected in the analysis.

Generic Formulary (NABP)

A Generic Formulary was defined as a variable that reports the type of formulary that each state has, using the concept of Approved Drug Product book (also known as the Orange Book). States can have a positive formulary, that means that generics may (or in some cases must) be dispensed if the drug appears on the formulary, or negative formularies that prohibit generic interchange of drugs on the list or don't have a formulary. The variable was name as a Ph_Gf and separated in two: "Positive formulary" and "Non-Formulary". Both of them coded as a dichotomous variable.

Orange Book Formulary (NABP)

An Orange Book Formulary was defined as a variable that reports as a type of formulary (using the concept of Approved Drug Product book) that each state has. Those states authorize the pharmacist to substitute only drug products that are proved to be "therapeutically equivalent", AB rate by the Food and Drug Administration (FDA). The variable was name as a Ph_OB and separated in two: "Others List" and "Orange Book". Both of them code as dichotomous variable (as was mention before) with values from 0 to 1.

Discretion in generic substitution (permissive or mandatory) (NABP)

Permissive or mandatory was defined as a regulation that encourages or requires that pharmacists substitute a medication that was prescribed when certain criteria are met. The variable was name as a Ph_Pm and code as a dichotomous with values 0 for permissive & 1 for mandatory.

Method for Preventing Substitution (NABP)

A method for preventing substitution was defined as one of several different alternatives that prevents or reduces the opportunities to substitute generically a prescription written by a physician. The variable was name as a Ph_Ps and separated in three: "Check Box"; "Initial" and "Write the Words". All of them code as dichotomous variable (as was mention before) with values from 0 to 1.

Requirement to pass-on cost savings to the consumer (NABP)

A Saving Cost for Patients by transfer a portion or full of cost was defined as a regulation that obligates the pharmacist to pass on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug. The variable was name as a Ph_Cs and separated in two: "Portion of Cost" & "Full Saving". Both of them code as dichotomous variable (as was mention before) with values from 0 to 1.

Patient consent for generic substitution (NABP)

Patient consent was defined as the requirement that a patient's permission is necessary to substitute or that the patient has to be notified/informed of the substitution of his/her medication. The variable was name as a Ph_Pc and code as a dichotomous with yes and no answer but with values 0 & 1.

3.2.2.2 Financial Incentives Regulation Policy

One of the incentives that the exchange of brand drug for generic prescription has is financial. Pharmacists are able to maximize the profit of reimbursement if the substitution of the medications is possible. That is doable only if the state has a Maximum Allowed Cost (MAC) or Federal Upper Limit (FUL) program and the generic drug is included in that program. Also, in some states Medicaid has an incentive fee for generic substitution, and that is another economic incentive for substituting generic when the non-innovator multi-source drug is available and what the fee is by state.

The variables that are included in this section are:

Average Wholesaler Price (AWP) Discount

An Average Wholesaler Price Discount was defined as a variable that reports the percentage that will be reduced from the Estimated Acquisition Cost (EAC) that for most states is calculated by using the Average Wholesaler Price (AWP) for a drug, less a percentage discount. The AWP is the price assigned to the drug by its manufacturer and is compiled by the Red Book, First DataBank, and Medi-Span for use by the pharmaceutical community.

This discount also was separated by the different institutions or in different situations that are present in the market. The variables names are: amount basic discount (Awp_Discount_Basic), generic medication (Awp_Discount_Generic) & institutional, chain, low volume, independent (Awp_CHANNEL_Of_Distribution_A), this variable put together the different channels of distribution and code dichotomous with values

0 & 1, that represent the presence or absence of the groups involves. The other two variables: basic discount and discount generic were presented as a percentage (%).

Dispensing Fee ($)

A Dispensing Fee was defined as a variable that reports the amount of money ($) that was paid to the pharmacy by each prescription (Rx) by the different institutions or in different situations that are present in the market. The variables names are: amount per base rate (Df_Base_Rate), institutional (Df_Institutional), generic medication (Df_Generic), and unit dose (Df_Unit_Dose). All of variables were presented as a discount in $.

3.3 Study Hypotheses

The following are the hypotheses explaining generic rates in the study. It is important to understand that rates will be calculated when the result is greater than zero. Therefore any time that the numerator or denominator of the rate will be zero because one of the components of the formula is zero or the complete denominator or denominator is zero the rate will not be possible to be calculated.

I. The Medicaid Generic Rate (generic prescribing rate, generic dispensing rate, and net generic rate) at the substitutable market level by therapeutic category at state and time level is given by the following equation:

1. Generic Prescribing Rate (GPR)

GPR = (IMS + NMS) / (SS + IMS + NMS)

Where: SS = Single Source drugs / IMS = Innovator Multi-Source drugs / NMS = Non-innovator Multi-Source drugs

$$GPR_{d,t} = \int_{>0} f\ [\text{Substitution regulation Policy}_{d,t},\ \text{Financial incentives regulation Policy}_{d,t}\ ].$$

2. Generic Dispensing Rate (GDR)

GDR = NMS / (IMS + NMS)

Where: IMS = Innovator Multi-Source drugs / NMS = Non-innovator Multi-Source drugs

$$GDR_{d,t} = \int_{>0} f\ [\text{Substitution regulation Policy}_{d,t},\ \text{Financial incentives regulation Policy}_{d,t}\ ].$$

3. Net Generic Rate (NGR)

NGR = NMS / (SS + IMS + NMS)

Where: SS = Single Source drugs/ IMS = Innovator Multi-Source drugs / NMS = Non-innovator Multi-Source drugs

$$NGR_{d,t} = \int_{>0} f\ [\text{Substitution regulation Policy}_{d,t},\ \text{Financial incentives regulation Policy}_{d,t}\ ].$$

Hypothesis 1: The Medicaid Generic Rate (generic prescribing rate, generic dispensing rate, and net generic rate) at the substitutable market level by therapeutic class at state and time is influenced by:

$\boldsymbol{SRP_{d,t,}}$ = Substitution regulation Policy by drug product d at the time t by State

$\boldsymbol{FIRP_{d,t,}}$ = Financial incentives regulation Policy by drug product d at the time t by State

II. The National Medicaid Generic Rate (generic prescribing rate, generic dispensing rate, and net generic rate) at the substitutable market level by state and time is given by the following equation:

1. National Generic Prescribing Rate (GPR)

NGPR = (IMS + NMS) / (SS + IMS + NMS)

Where: SS = Single Source drugs / IMS = Innovator Multi-Source drugs / NMS = Non-innovator Multi-Source drugs

$$NGPR_{d,t,s} = \int_{>0} f\ [\text{Substitution regulation Policy}_{d,t,s},\ \text{Financial incentives regulation Policy}_{d,t,s}\ ].$$

2. National Generic Dispensing Rate (GDR)

NGDR = NMS / (IMS + NMS)

Where: IMS = Innovator Multi-Source drugs / NMS = Non-innovator Multi-Source drugs

$$NGDR_{d,t,s} = \int_{>0} f\ [\text{Substitution regulation Policy}_{d,t,s},\ \text{Financial incentives regulation Policy}_{d,t,s}\ ].$$

3. National Net Generic Rate (NGR)

NNGR = NMS / (SS + IMS + NMS)

Where: SS = Single Source drugs/ IMS = Innovator Multi-Source drugs / NMS = Non-innovator Multi-Source drugs

$$NNGR_{d,t,s} = \int_{>0} f\ [\text{Substitution regulation Policy}_{d,t,s},\ \text{Financial incentives regulation Policy}_{d,t,s}\ ].$$

Hypothesis 2: The National Medicaid Generic Rate (generic prescribing rate, generic dispensing rate, and net generic rate) at the substitutable market level by state and time is influenced by:

$\boldsymbol{SRP_{d,t,s}}$ = Substitution regulation Policy by drug product d at the time t by State s

$\boldsymbol{FIRP_{d,t,s}}$ = Financial incentives regulation Policy by drug product d at the time t by State s

3.4 Data Source and Sample Selection

The study uses a different dataset from the Centers for Medicaid and Medicare Service (CMS), the "Medicaid State Drug Utilization Data" database, Medi-Span Master Drug Data Base ® (MDDB), Medi-Span Comprehensive Price History ® database, National Association of Board of Pharmacy (NABP) ® data and Medicaid Payment database (MPDB) and publications from different sources (Pink Sheet; MedAdNews and Orange Book) to create more details to understand the dependent and independent variable behavior.

3.4.1 DATA SOURCES

a. Centers for Medicaid and Medicare Service (CMS) --- Medicaid State Drug Utilization Data.

The drug data from CMS provides drug expenditure and utilization data by quarters by year about Medicaid program from 1991 to 2008. This data was obtained from the Centers for Medicaid and Medicare Service (CMS) for all the medications that were used in that time.

Medicaid State Drug Utilization data measures drug products that were used by Medicaid recipients in a specific period of the time. The data is by quarter (Q1: January1st to March 31st; Q2: April 1st to June 30; Q3: July 1st to September 30; & Q4: October 1st to December 31st) by year, and the sample represents the United States divided by all the states; excluding Tennessee and Arizona.

Each state has information listed by National Drug Code (NDC), the name that the FDA gives to the product that was used, a total products that were reimbursed, by units and amount of money. The National Drug Code (NDC) is a list of drug products that is assigned an exclusive 11-digit, 3-section number that categorizes the labeler, product, and trade package size. A five-digit labeler code is allocated by the FDA and represents any company that produces (as well as repackers or relabelers), or distributes (under its own name) a drug product. The four-digit product code is given by the company and recognizes a particular strength, dosage form, and formulation for a specific company. Finally, the two-digit package code is given by the company and classifies package sizes and types.

b. Medi-Span: Master Drug Database (MDDB)®, Wolters Kluwer Health

Medi-Span Master Drug Data Base ® (MDDB) v2.0 is a data base that gives complete information about the drug product. The Medi-Span MDDB database was used in combination with Medicaid State Drug Utilization to obtain more detailed information on all the drug products that were available from 1991 to 2008.

The Medi-Span MDDB database has information available about all drug products by National Drug Codes (NDCs) with capacity to link old and new NDCs; and that is linked with product names, strengths, package types and package size, patent status, over-the-counter status, therapeutic equivalency codes, therapeutic classification codes, Generic Product Identifier (GPI)® codes, manufacturer and repackager information, and current and historical drug pricing.

The Medi-Span MDDB database has two files; both of them have the same variables. However, the first one has all the active NDC that were in the market up to

48 months of inactive products. The second one contains all the inactive NDC that were in the market since 1980 until 48 months before the active NDC.

A Generic Product Identifier (GPI) ® code is a classification by MediSpan that defines pharmaceutically equivalent drug products. Products having the same 14-character GPI are identical with respect to active ingredient(s), dosage form, route, and strength. The GPI does not consider identification of bioequivalence or therapeutic equivalency of drug products.

c. Medi-Span: Comprehensive Price History ®, Wolters Kluwer Health

Medi-Span's Comprehensive Price History gives historical information on the price of drug products at the NDC level connected with drug products information. This data set includes all prices in Medi-Span's Master Drug Data Base® for all National Drug Codes since the early 1980s. Medi-Span's Comprehensive Price History ® is basically a small part of the Master Drug Data Base.

d. National Association of Board of Pharmacy (NABP)

The National Association of Board of Pharmacy (NABP) Survey of Pharmacy Law is an overview of pharmacy law by state. The survey explains states' board organization, function, and requirements for pharmacist licensure in general. Additionally, it gives an overview of the laws that regulate the prescribing and dispensing of medications and professional standards. The Survey of Pharmacy Law, however, presents just a sample of the laws that regulate the profession of pharmacy.

NABP's Survey of Pharmacy Law provides a source for individuals who require an overview of the state laws, rules, and regulations that regulate pharmacy and its practice. The survey is separated by section with the following information: overview of the institution and the authority of the state boards of pharmacy; information about pharmacist and pharmacy licensing issues; information related to the prescribing and dispensing of drugs (facsimile and electronic transmission of prescriptions, prescribing and dispensing authority, drug product selection, and patient

requirements) and finally the last section gives demographic information about pharmacists and pharmacies.

For purposes of the study, NABP's Survey of Pharmacy Law books from 1991 to 2008 was used to obtain the information on states' regulation related to substitution and pharmacy and pharmacist legislation by state.

e. Medicaid Payment Data base (MPDB)

The Medicaid Payment Data base (MPDB) is an economic group of factors (or variables) that can affect or influence a pharmacist in the decision making of dispensing a medication, when drugs has generic available or not.

Medicaid Payment Data base (MPDB) was prepared by a consulting group for use in a lawsuit over manufacturer drug prices and their cost to Medicaid.

For purposes of the study, Medicaid Payment Data base (MPDB) was organized as a time series data from 1991 to 2008 and was used to obtain the information on states' financial incentives when the exchange of brand drug for generic prescription has happened.

f. FDA Approved Drug Product (Orange Book); Pink Sheet & MedAd News

The FDA Approval Drug Product (Orange Book) classifies drug products that were approved by the Food and Drug Administration (FDA) under the Federal Food, Drug, and Cosmetic Act (the Act) under the standards of safety and effectiveness. FDA Orange Books were used to obtain information about the definition of exclusivity and substitution.

Pink Sheet and MedAdNews are groups of magazines on the pharmaceutical market that give general details about new issues on the market (patent approved, patent litigations, generic approved, etc).

3.4.2 Sample Selection

The data for the study was the entire population of drugs from 1991 to 2008 that were paid for the Medicaid program. The research analyzed the data nationwide and by state. The purpose of this is to explain how the rates perform and it was possible to observe significant differences across time and in different markets.

3.4.3 Structure of the Dataset

The Medicaid state drug utilization data was connected with other datasets by variables that are focused on drug policy (i.e., variables that give information about state regulation) and drug product (i.e., variables that give information about drug product). That is the main difference between the two sets.

a. Medicaid State Drug Utilization data

The Medicaid state drug utilization data were obtained from the Centers for Medicaid and Medicare Service (CMS) webpage from 1991 to 2008. The data are organized by individual files by state per quarter and per year in .TXT format that were converted to Stata and Excel format. There is missing data during the period of time that the data was collected. The state of Arizona does not provide any report and the state of Tennessee does not have any record between 1995 and 1998 (four years).

The variables that the data provide are: NDC codes, the state abbreviation, a product name, and total products unit that was reimbursed by units by numbers of Rxs and by amount of money. Therefore, those are the variables that give us the starting point to connect with other ones.

b. Linking Medicaid State Drug Utilization data with Medi-Span: Master Drug Database (MDDB) ® & Comprehensive Price History ®, Wolters Kluwer Health

The Medicaid state drug utilization dataset did not include drug details; therefore the Medi-Span Master Drug Database (MDDB) ® and Comprehensive Price History ® are data bases that give in detail drug product information. The Medi-Span Master Drug Database (MDDB) ® also has two datasets; both with the same variables. The difference between them is that one has all National Drug Codes (NDC) that are active in the market and the other one has all NDC that there are not active in the market. The three data bases were connected with Medicaid state drug utilization data by the National Drug Code (NDC) variable. The NDC variables will connect with the variables in the other data to be able to do the analysis by market level (by market levels we have to be able to recognize the patent status of each drug and in detail, the dosage form, route, strength and the name of the company that is marketing the drug).

c. Linking the Medicaid Payment data base ® (MPDB) with National Association of Board of Pharmacy ® (NABP)

The Medicaid state drug utilization dataset did not include state drug policy regulation; therefore the National Association of Board of Pharmacy (NABP) ® and the Medicaid Payment data base (MPDB) ®, were the data bases that provided us with details about state regulation information.

Both databases (NABP ® & MPDB ®) were connected by the states' initial variable, and the states' initial variable was the connection with the dataset that contains each generic rate by state per quarter per year, to be able to create the models that determined the validity of the Generic Rates that is one of the primary goals of this project.

d. FDA Approved Drug Product (Orange Book); Pink Sheet & MedAd News.

FDA Approved Drug Product (Orange Book); Pink Sheet & MedAd News are complementary data that helped to understand the regulations in each state and details in the market. This complementary data were to be linked directly with any variables of any data mentioned before, but were supported with additional

information to have a better understanding of the factors that drive the drug substitution topic.

3.5 Procedure of Unit of Analysis and Variables

This section shows the process that was used for this study in the units of analysis, units of measurement, dependent variables, and independent variables at the substitutable market level.

3.5.1 Procedure of Unit of Analysis at the Substitutable Market Level

For the purpose of the study, a drug product presentation (i.e., a specific dosage form, strength, and route of administration) was considered substitutable when it had the same 14 GPI (in case of Multi-Source medication) code as the originator drug product presentation and the TEE code indicated that was the therapeutic equivalent.

The Multi-Source Code was the key variable that was used to determine the patent status of the NDC medications across the time of the study. The variable was obtained from the MDDB®v2.0 and identifies drug products as either single or multiple-source original drug products or a generic copy of the standard drug product. The definitions of this variable are:

Table 3.1.3 Patent Status Code defines by Medi-Span Master Drug Database (MDDB®) v2.0.

CODE	Description
N	Single-source drug product available from one manufacturer. The drug product is not generic, nor is it available as a generic.
M	Single-source, co-licensed Drug product that is co-licensed and not considered generic, nor is it available as a generic. The drug product is generally considered a single-source drug product despite multiple manufacturers.
O	Original drug product considered to be the industry standard. These drug products are available from multiple manufacturers.
Y	Drug product available from multiple manufacturers. Often, this is a copy of an original drug product valued as the standard.

Afterward, the calculation of the Generics rate was performed by merging Medicaid State Drug Utilization data with data from the Master Drug Database (MDDB) and Medi-Span Comprehensive Price history data. These datasets provide us with the variables that help create a dataset across the period 1991 until 2008 (per quarter) with the patent status by NDC with all the changes that happened in the life period of the drug over the 17 years.

However, even though Medicaid State Drug Utilization data was with panel structure; Master Drug Database (MDDB) and Medi-Span Comprehensive Price history data were not. Therefore, to be able to reach our goal, several adjustments were making. First, using 14 GPI code that helps to put together medications that were substitutable, was created a new code call 16 GPI, that basically was 14 GPI plus two more digit that represent Rx (01) and OTC (02).

Second, Master Drug Database (MDDB) has a Multi-Source Code that represent the patent status of each NDC code, but that code is cross-sectional (means that give the information for that specific NDC in the last two years, therefore for the purpose of our study and using enclosed literature, a panel data was re-created with a Multi-Source Code but capturing the status changes for each NDC, as a result, in the 18 years of study, were able to identified when NDC change from a Single Source drugs to a non-innovator multiple source (typical know a Generic medication).

Finally, other variable from Medi-Span Master Drug Database (MDDB®) that was used was Patent Status Code that variable defines each of the different status that an NDC can have and they were defines as: N, M O & Y (please see above for more details). Therefore, because each of the generic rates was defines with different nomenclature: SS: Single Source; IMS: Innovator Multisource & NMS: Non-Innovator Multisource. Codes were adjusted to be able to calculate in accurately way the Generic rates.

Finally, the unit of analysis at the substitutable market level was generic rate (Generic Prescribing Rate, Generic Dispensing Rate & Net Generic Rate) by state by quarter by year.

3.5.2 Variables at the Substitutable Market Level

a. Dependent Variable

At the substitutable market level of analysis the dependent variable was a generic rate. Therefore these are: (1) generic prescribing rate; (2) generic dispensing rate and (3) net generic rate. The dependent variable was calculated by state by quarter and by year. These rates were expressed in terms of percentage of prescriptions (Rxs) and the percentage of prescription expenditures ($).

b. Independent Variables

The independent variables across the substitutable market level that will be used to test our hypothesis and reach our goal to observe what influence generic rates are mentioned in sections 3.2.2 Substitution regulation Policy and 3.2.3 Financial incentives regulation Policy; therefore, will not be repeat again.

3.6 Econometric Analytic Methods

The data set that was used in the study is an unbalanced cross-sectional times series data. The data sets merge data across the time (time series data) with data observed at some point in time (cross sectional units), the cross sectional units present several points of information in time. The unbalanced panel data set used for the study has different time periods observed for the expenditures that Medicaid had consumed for different cross sections.

A typical data set can be described with a linear regression model; a multiple regression analysis is used to model a relationship between a dependent variable and multiple predictor variables. A typical multiple regression model can be as follows:

$$Y_i = a_0 + a_1 X_{i1} + a_2 X_{i2} + \ldots\ldots a_k X_{ik} + \varepsilon_i$$

Where Y_i is the dependent variable that answer in the i th trial, $X_{i1}, X_{i2,\ldots\ldots} X_{ik}$ are the independent variables that are the values of k predictor variables in the i th trial, and ε_i is a random error that represents the difference between the actual or the observed value of Y_i and the value of Y_i estimated by the k predictor variables.

In a panel data analysis one of the advantages is the flexibility of modeling differences in performance across the individuals, therefore the regression model is different from the linear regression model. For the purpose of this study, the regression model that describes our research has that form:

$$Y_{it} = x_{i1}\,\beta + z_i\,a + \varepsilon_{it} \quad i=1,\ldots\ldots n \text{ and } t=1,\ldots\ldots T$$

Where Y_{it} represents the dependent variable, x_{it} contains K independent variables, and ε_{it} is an error term. i represents the number of cross sectional units, and t represents the time periods the data was observed for the cross sections.

The majority of panel data has more cross sectional units than time periods. As a result, heterogeneity across cross-sectional units is the focus of panel data analysis. The heterogeneity is distinguished by $z_i\ a$ where z_i is a group of individual or specific variables, which may be observed or unobserved. Therefore, if z_i is observed for all individuals, then the model can be fitted by ordinary least squares (Greene, 2003). The techniques for dealing with heterogeneity in panel data are called fixed effects and random effects.

The fixed effects technique, $z_i\ a$ contains a group of specific constant terms in the regression model. The regression model, in this case is:

$$Y_{it} = x_{it}\beta + a_i + \varepsilon_{it} \quad \text{i=1,.....n and t=1,.....T}$$

Where a_i contains all the observable effects and specifies an estimable conditional mean and that indicates that the terms does not vary over time. (Greene, 2003)

Therefore, for purpose of this study is to be able to capture effects across units and in-groups of variables fixed effects technique was used.

Finally, all of the statistical analyses was conducted using SAS Version 9.2 ®.

[i] Welage, L, S., Kirking D. M., Ascione F. J., and Gaither C. A.. Understanding the Scientific Issues Embedded in the Generic Drug Approval Process. Journal of the American Pharmacists Association. posted: 02/06/2002; J Am Pharm Assoc. 2001;41(6) © 2001 American Pharmacists Association. Retrieved December 27, 2010, http://www.medscape.com/viewarticle/421495_1

[ii] Tremblay CH., Tremblay MJ., Tremblay VJ. A General Cournot-Bertrand Model with Homogeneous Goods, (2011). Theoretical Economics Letters. 2011; 1:38-40.

[iii] Sherali HD., Soyster AK., Murphy FH. Stackelberg-Nash-Cournot Equilibria: Characterizations and Computations. (1983). Operations Reseach. 1983; 31(2)253-276.

[iv] De Wolf D, Smeers Y. S Stochastic Version of Stackelberg-Nash-Cournot equilibrium Model, (1997). Management Science. 1997; 43(2)190-197.

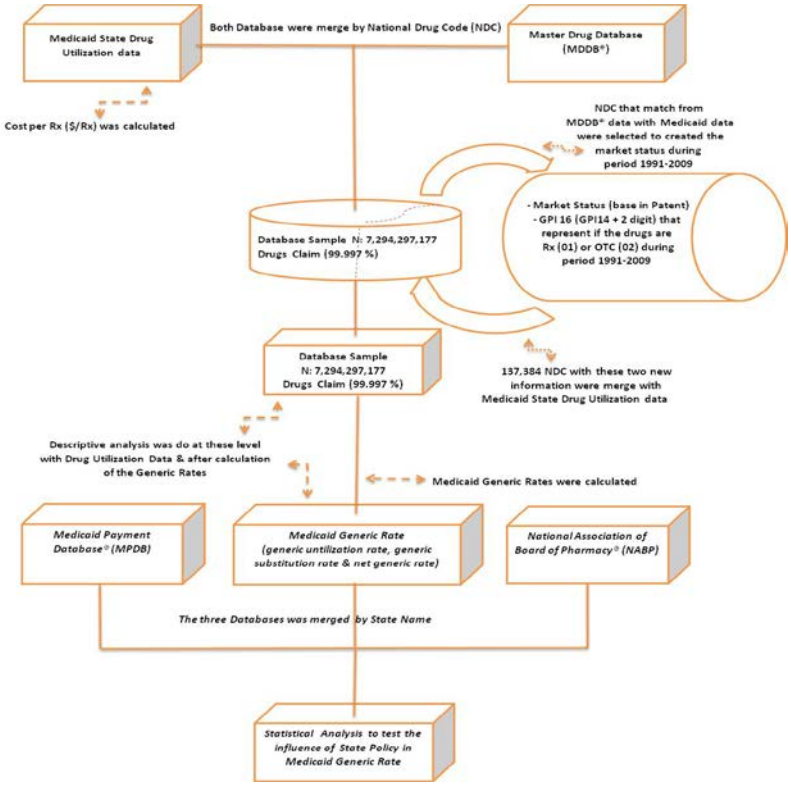
[v] Dickson PR. and Ginter JL. Market Segmentation, Product Differentiation, and Marketing Strategy (1987). Journal of Marketing, Vol. 51, No. 2 (Apr., 1987), pp. 1-10

CHAPTER IV: RESULTS

The results chapter is organized into three sections. In section 4.1 shows National Drug utilization data trends of the raw data with the descriptive analysis at the substitutable level. In section 4.2 shows the National Generic index trends at the substitutable level. Finally, in section 4.3 shows the Regression results at the substitutable market.

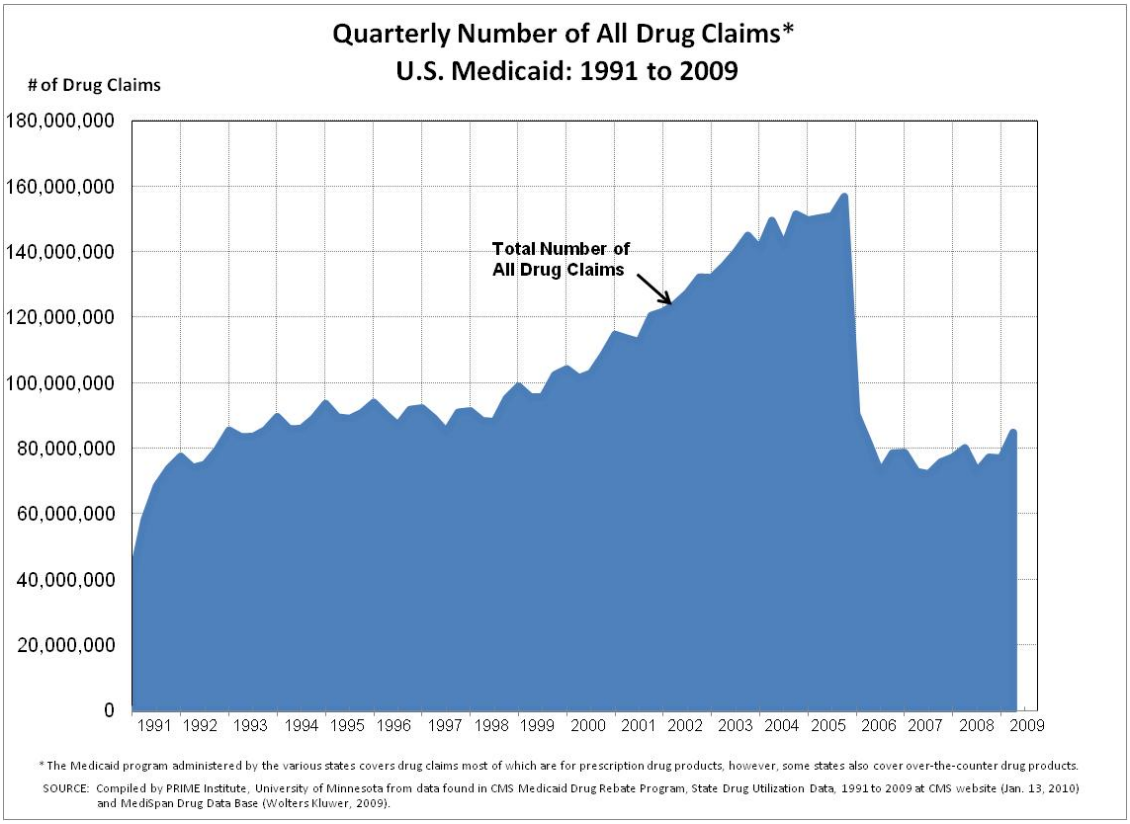
4.1 National Drug utilization data trends of the raw data with descriptive analysis at the substitutable level.

To understand how the results of this study were obtained, a flow diagram of the study was created, with a general explanation of how the databases are connecting and the main steps in this study.



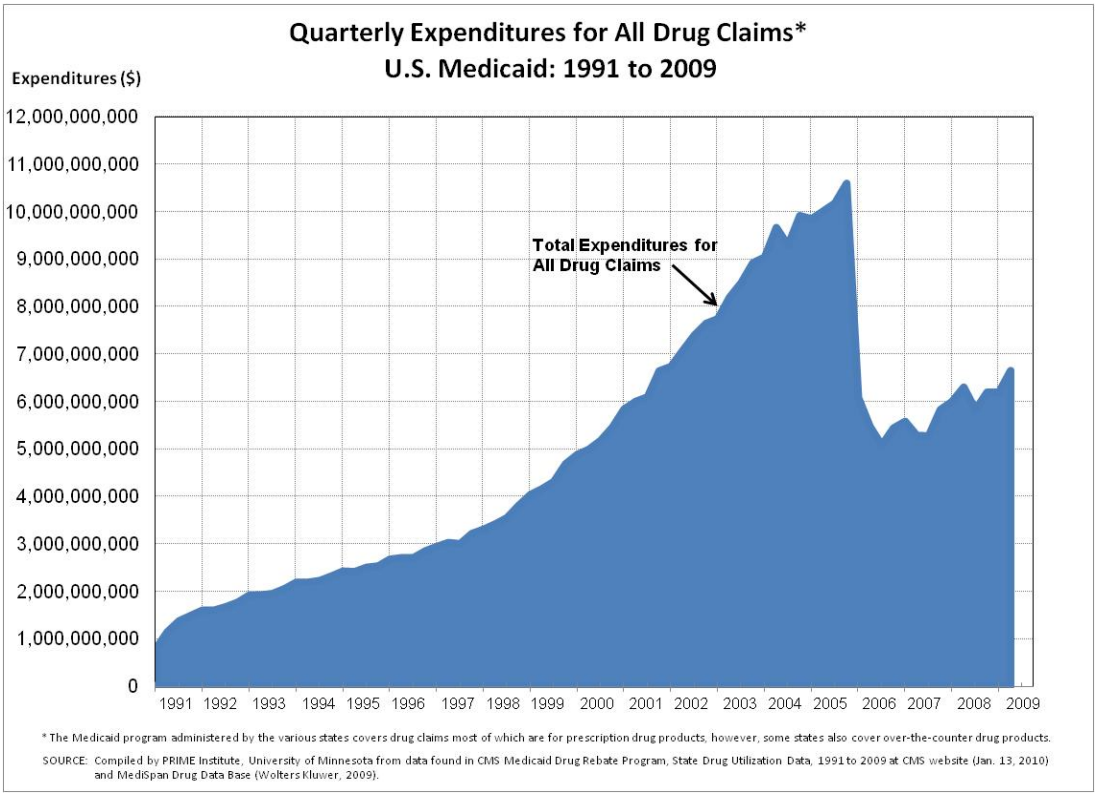
4.1.1 All Drug Claim utilization data trends.

During the time period that was analyzed (first quarter of 1991 until second quarter 2009) we see an increment in almost 100% on the population that Medicaid was covering and that also is what you observe in the numbers of claims (Rx) that were consumed, in the first quarter of 1991 almost 42 millions of Rx were consumed and until the fourth quarter of 2005 were 160 millions of Rx were consumed.



January 2006 was the beginning of the Medicare Part-D program. As seen, a significant decline in the use of prescription occurred. As Medicaid Part-D began over 7 million dual-eligible members moved from the Medicaid program to the Medicare program, producing a decline from 160 millions of Rx in the fourth quarter of 2005 to 93 million in the first quarter of 2006.

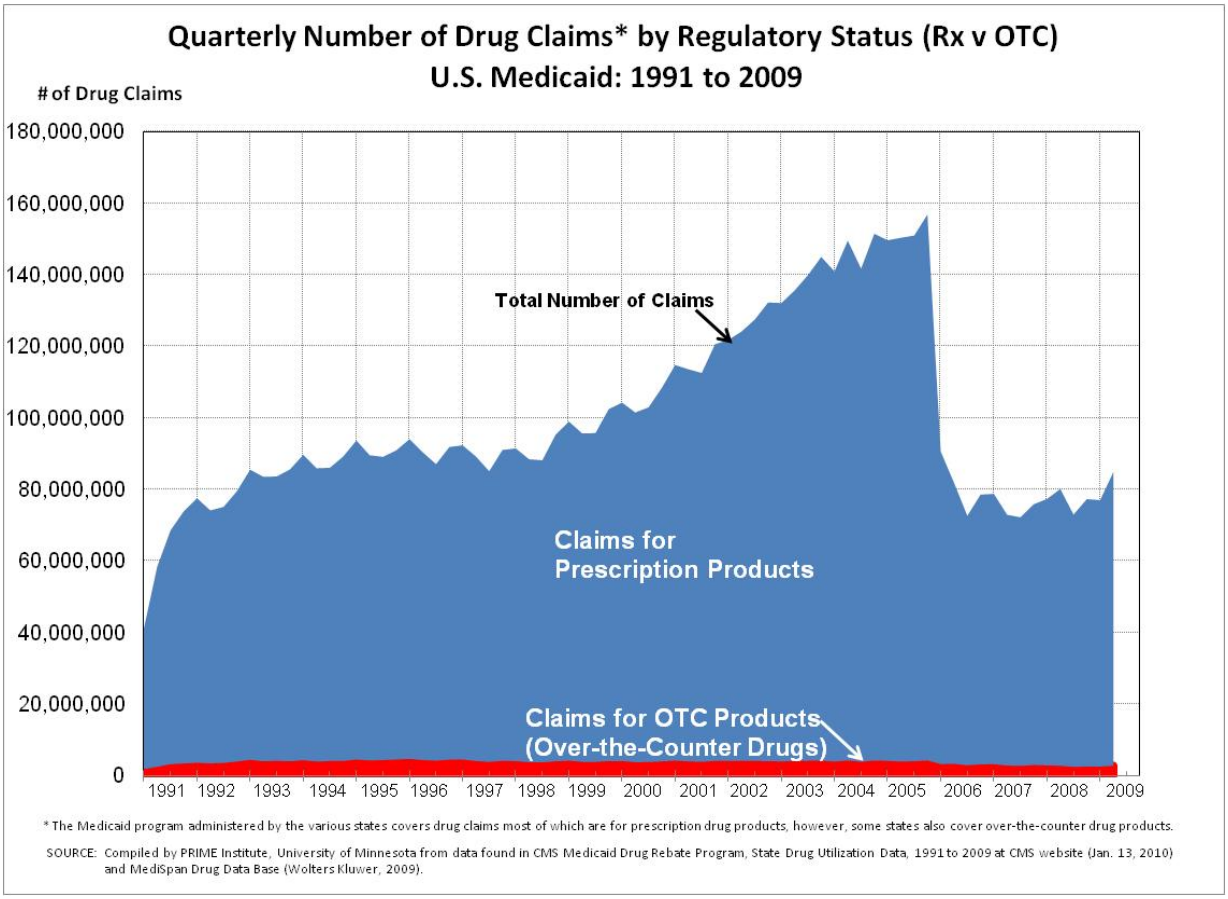
Also, we observe the same tendency in the amount of expenditure ($) that Medicaid program incurred in that period from $10,915,731,482 in the fourth quarter of 2005 to $6,299,469,907 in the first quarter of 2006.



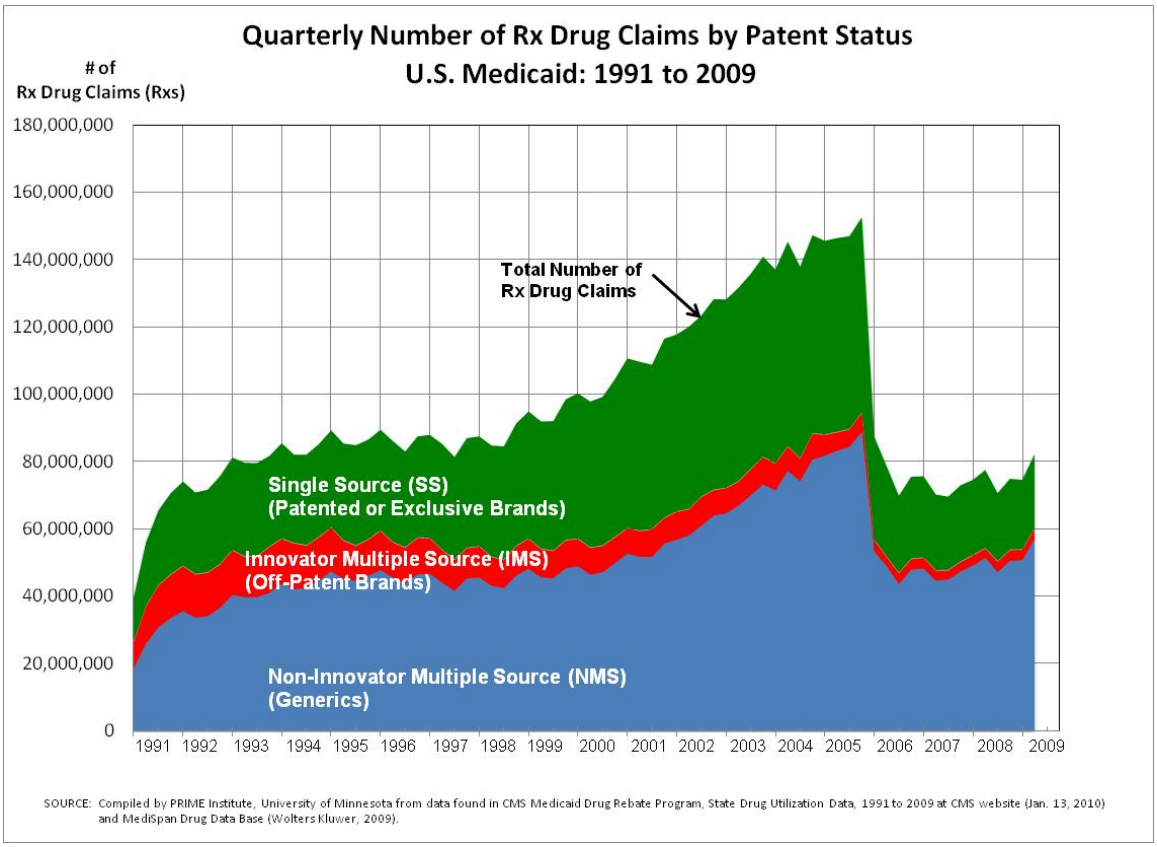
Furthermore, even thought the charts numbers of claims (Rx) and expenditure ($) has different slop the proportion at the beginning of 2006 is the same on both, was appreciated that the cost per claims (Rx) from the beginning of 1991 until the first two quarters of 2009 is clear the sustained and steady increase in this, started in almost $20 per claims (Rx) and in this 18 years increase almost $80 but claims (Rx).

During the process of creating the “analytic data set”, the start point was a set of 7,294,505,589 drugs claim, but was observed that the data had Rx claims; Over-the-Counter (OTC) claims and a group of drugs claims with unknown product information, therefore, after worked in all of them (group of drugs claims with unknown product information) and check

case by case, the “group of drugs claims with unknown product information” was reduce to 208,412 drugs claim. As a result, the final “analytic data set” was 7,294,297,177 drugs claim (that represent a 99.997% of the drugs claims used); where 7,021,539,129 were Rx claims and 272,758,049 OTC claims; below is the information mentioned before:



Consequently, after the “analytic data set” was define the drugs claims were able to be separated by patent status for the purpose of the study and see how the 18 years of drugs claims was behave.

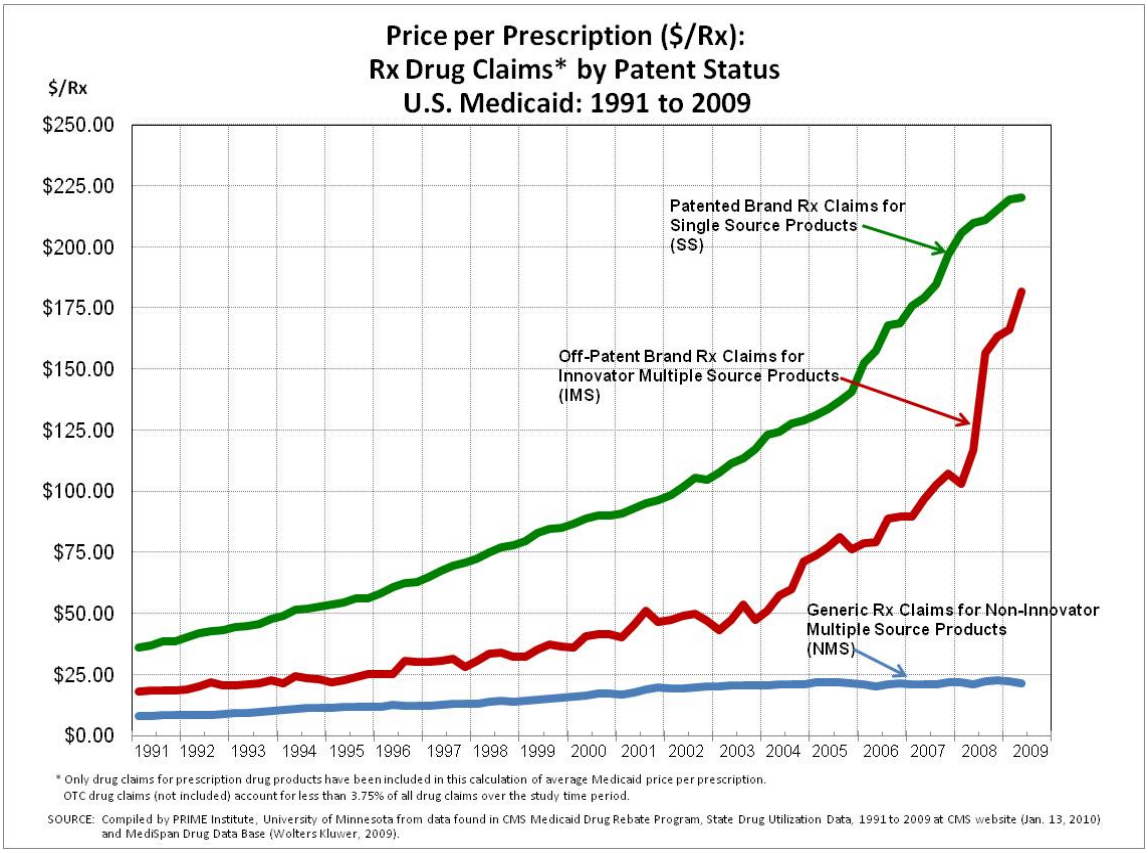


Now overall, in this 18 years the claims (Rx) price have increase in almost 300%, but if we separated the claims (Rx) by market status (Brand (SS); Off-Patent (IMS) & Generics (NMS)) we can observe how each of them have been increase across the period of time in different proportions.

Therefore, the Single Source (SS) Brand Rx price is the one that shows the biggest increase from $36.12 in 1991 to $ 220.56 in 2009, during the 18 years period that were analyzed, but the exponential growth was between the years 2005 – 2009 where the price increase from $140.76 to $ 220.56 that represent almost a 56% increase in 4 years and if we compared with that during 1991 until 2005 (14 years) the price of Rx increase 290% and compared with the 18 years that were analyzed where the price per Rx increase from $36.12 to $ 220.56 that represent almost 500% approximately.

Now, off-patent (IMS) brand Rx price shows the increase from $18.19 in 1991 to $181.98 in 2009, during the 18 years period that were analyzed, but the exponential growth was between the years 2005 – 2009 where the price increase from $76.20 to $181.98 that represent almost a 139% increase in 4 years and if we compared with that during 1991 until 2005 (14 years) the price of Rx increase 319% and compared with the 18 years that were analyzed where the price per Rx increase from $18.19 to $181.98 that represent almost 900% approximately.

Finally, Generic (NMS) Rx price shows the increase from $8.13 in 1991 to $21.47 in 2009, during the 18 years period that were analyzed that represent almost 164% approximately. More details in summary data were added in the appendix.



In general, we are able to see that in this 18 years of study, the incremental of cost and drug consumption have been substantial if we compare with cost of living and if you check each state. For more details in each state was add in the appendix.

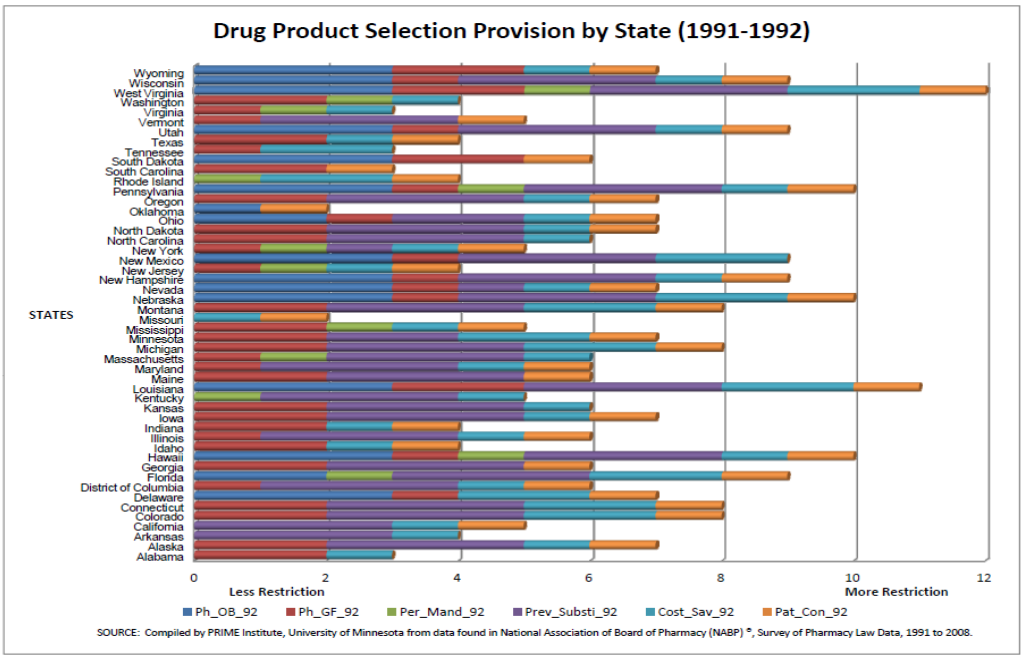
4.1.2 State Regulations

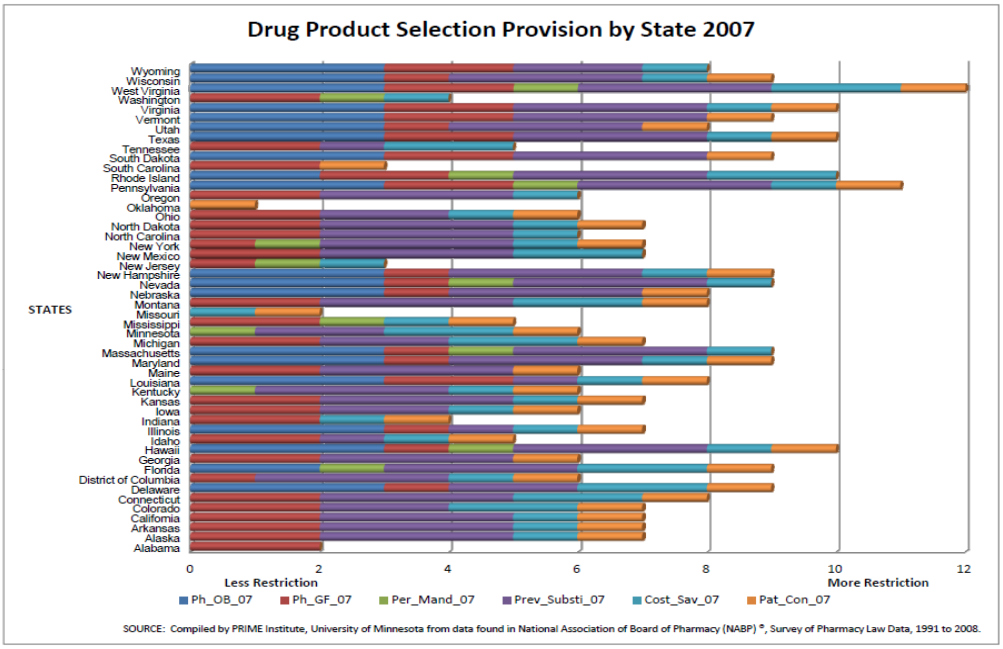
The National Association of Board of Pharmacy (NABP) Survey of Pharmacy Law was the source from which we obtained an overview of the laws that regulate the prescribing and dispensing of medications and professional standards, however, represents just some of the laws that regulate the profession of pharmacy. For the purposes of this study, the information used was from 1991 to 2008 to obtain regulation information related to substitution and pharmacy and pharmacist legislation by state.

The variables from “Survey of Pharmacy Law” were selected, re-coded and the result was six variables that represent the “Drug product selection”, these variables were: Generic formulary substitution (notation: Ph_GF); Orange Book or formulary base in Orange Book (notation: Ph_OB); Mandatory or Permissive (notation: Ph_Pm); How to prevent substitution (notation: Ph_Ps); Patient cost saving pass on (notation: Ph_ Cs); Patient Consent (notation: Ph_Pc).

Another important part, is to be aware of how the graph were created, the way that them can be observe are in two: One , is by the length of the bars that by each State will be different and the second, is by how many of different colors each State has. In the first case, the length of the bars will represent how much strong is the possibility to do the substitution between brand medication to the generic; in the second case, is how many laws or regulations each State is using to prevent or accept the substitution between brand drug to generic.

Therefore, during the time frame of the study (since 1991 until 2008) States have not change drastically or dramatically there substitution law. If we analyzed the graph drug product selection provision by year, are we able to observe that the changes are not significant across the years, That means that States have been using the same regulations to prevent the use of generics in this period & just few of them have been incorporated more regulations to increase the restriction. Here we have two examples of the beginning of the period and almost the end of the period.

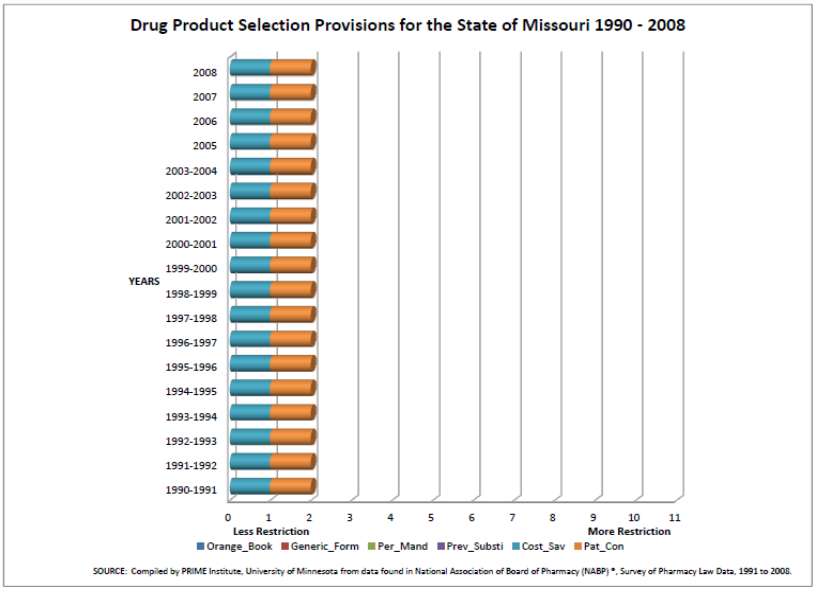


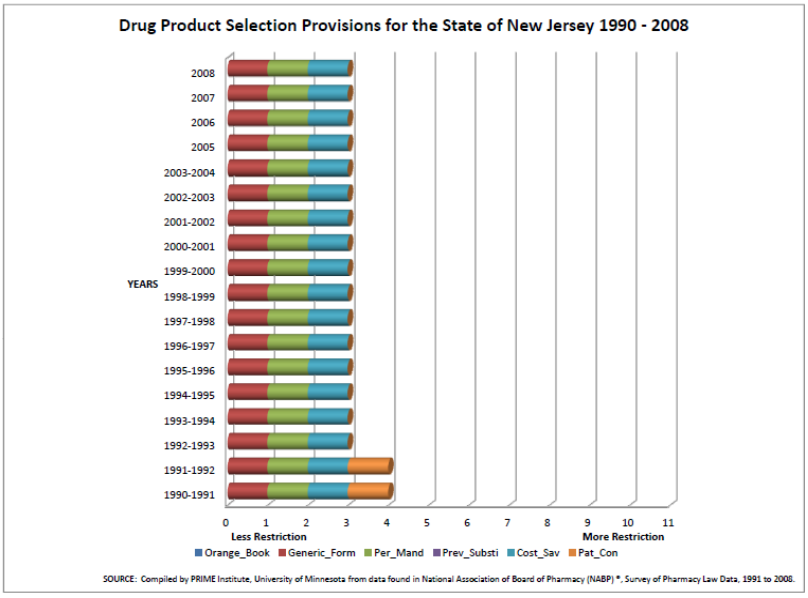


Now if we analyzed the same type of graph but by State the perception is different; we can separated these in four groups:

1. States that did not have much variability but also the length (that represent how restricted they could be) were not high;

These States are 7 (Washington, South Carolina, Oklahoma, New Jersey, Missouri, Indiana & Alabama); they represent a 14% of the total. (More details on each State see appendix)

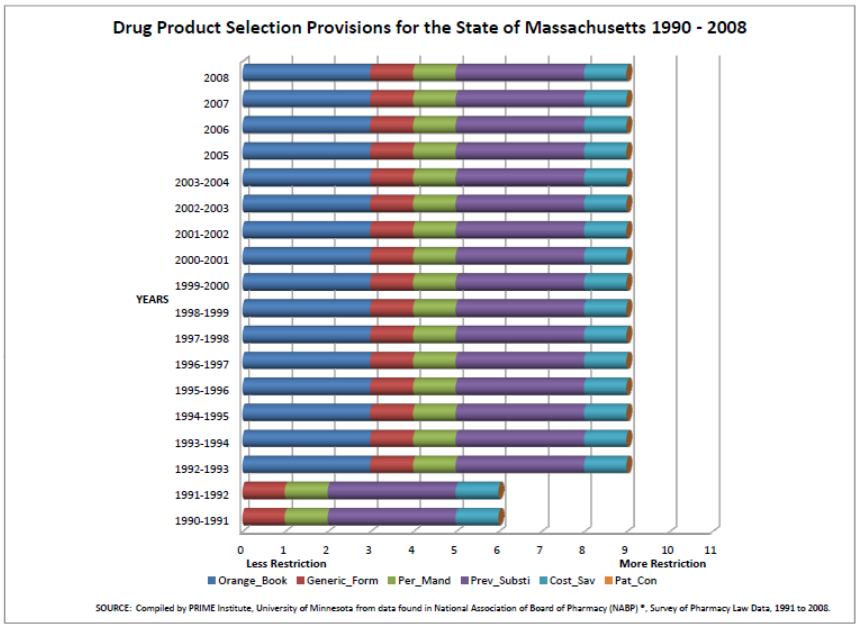


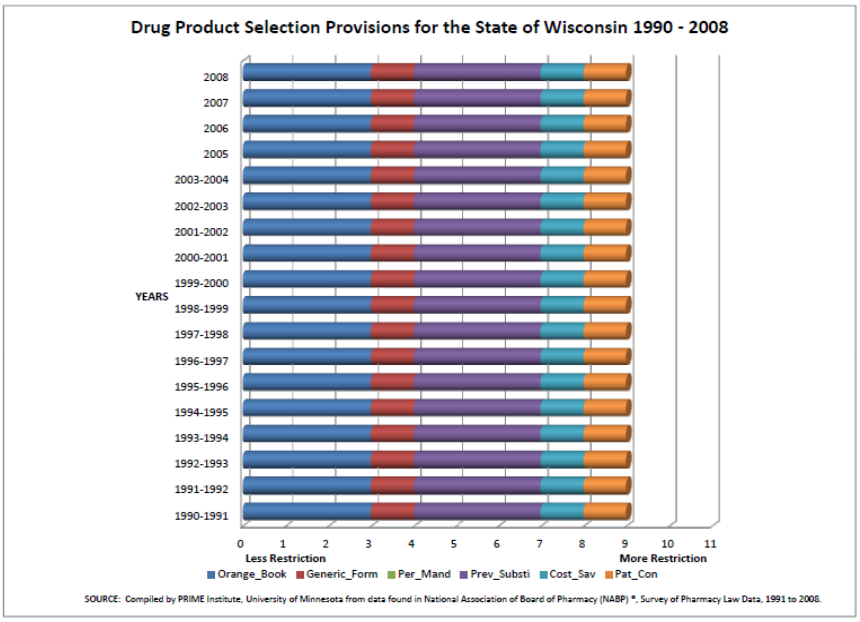


Most of the States in this group does not have more than 3 different laws related with the substitution brand medication with generics and the variability between each year is almost constant, but in all of them, the strength of the laws it is not higher than 4 (been 11 the max.).

2. States that did not have much variability but also the length (that represent how restricted they could be) were high.

These States are 8 (Florida, Massachusetts, Nebraska, New Hampshire, Pennsylvania, South Dakota, West Virginia & Wisconsin); they represent a 16% of the total. (More details on each State see appendix)



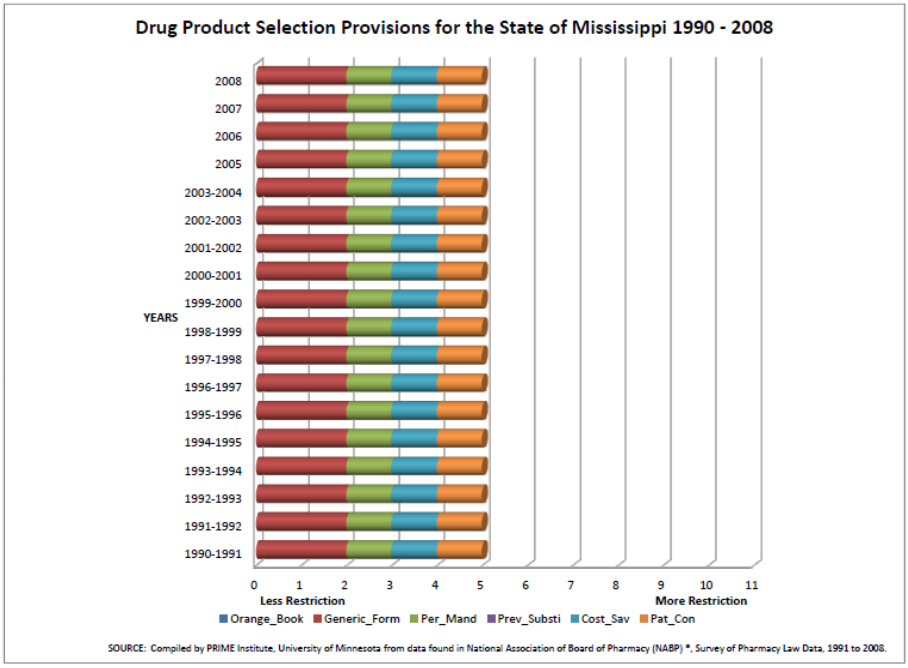


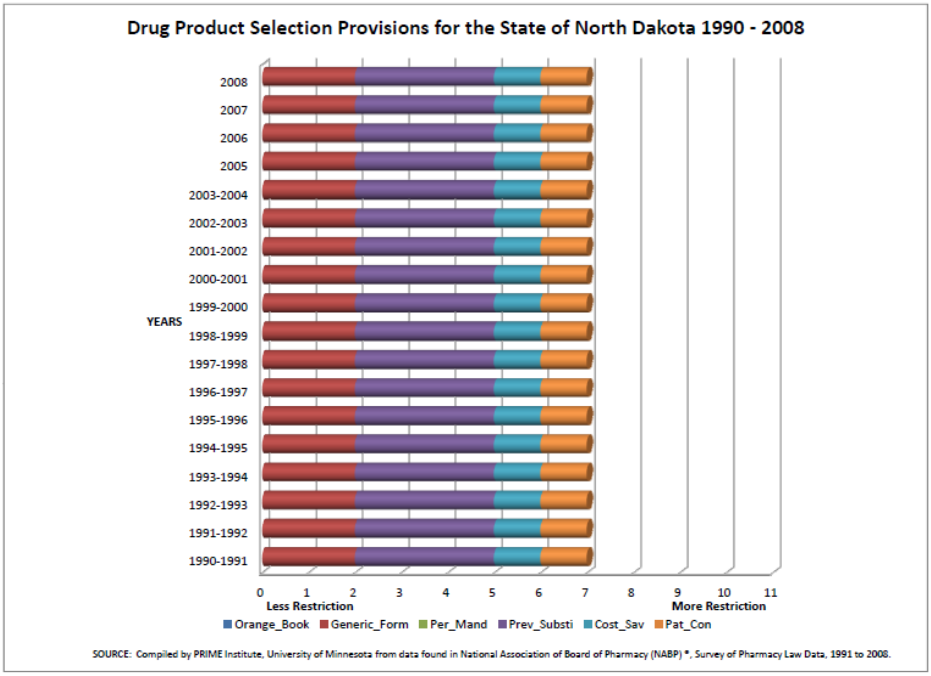
Most of the States in this group have between 4 and 6 different laws related with the substitution brand medication with generics and the variability between each year is almost constant, but in all of them, the strength of the laws it is high closer to 11 (most of them between 9 to 11) (been 11 the max.).

3. States that did not have much variability but also the length (that represent how restricted they could be) were intermediate;

These States are 12 (Alabama, Connecticut, District of Columbia, Georgia, Maine, Mississippi, Montana, Nevada, New York, North Carolina, North Dakota & Utah); They represent a 24% of the total. (more details on each State, see appendix)

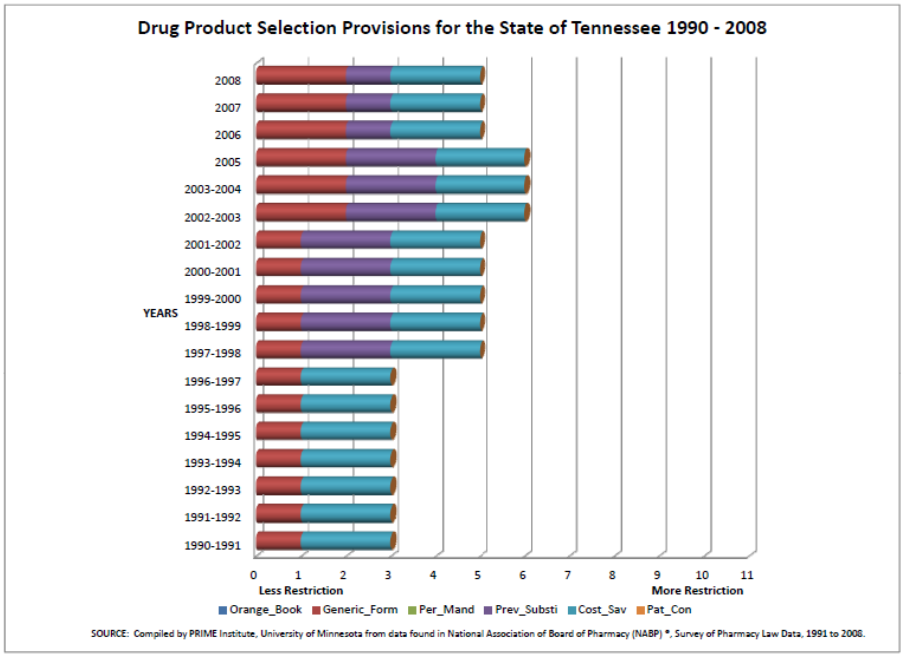
Most of the States in this group have between 3 and 5 different laws related with the substitution brand medication with generics and the variability between each year is almost constant, but in all of them, the strength of the laws it is between 6 to 8 (been 11 the max.).

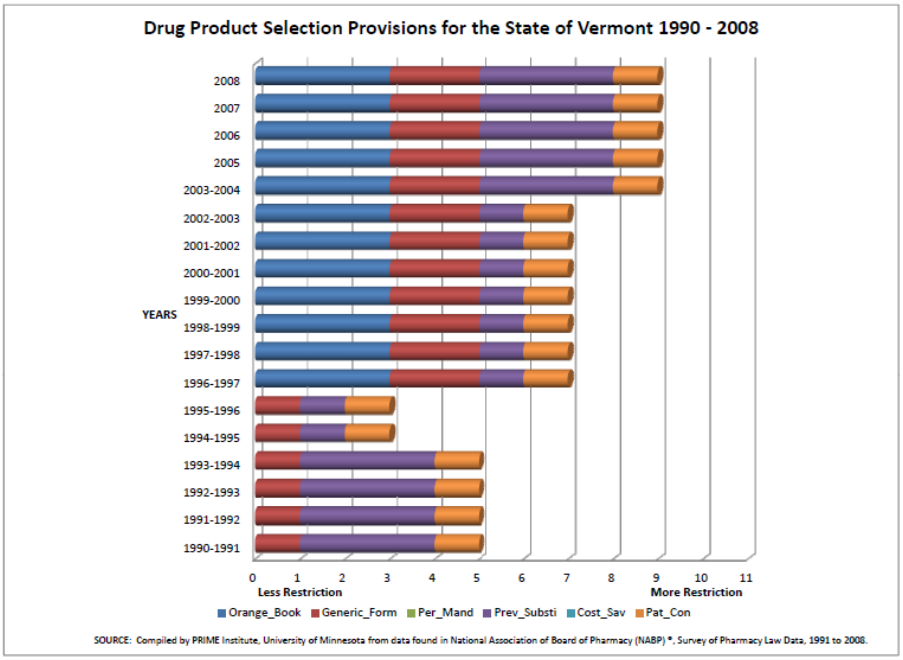

Drug Product Selection Provisions for the State of Mississippi 1990 - 2008
YEARS
2008
2007
2006
2005
2003-2004
2002-2003
2001-2002
2000-2001
1999-2000
1998-1999
1997-1998
1996-1997
1995-1996
1994-1995
1993-1994
1992-1993
1991-1992
1990-1991
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Orange_Book Generic_Form Per_Mand Prev_Substi Cost_Sav Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) *, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of North Dakota 1990 - 2008
YEARS
2008
2007
2006
2005
2003-2004
2002-2003
2001-2002
2000-2001
1999-2000
1998-1999
1997-1998
1996-1997
1995-1996
1994-1995
1993-1994
1992-1993
1991-1992
1990-1991
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Orange_Book Generic_Form Per_Mand Prev_Substi Cost_Sav Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) *, Survey of Pharmacy Law Data, 1991 to 2008.

4. States that had variability but also the length (that represent how restricted they could be) were high & low;

These States are 23 (Rhode Island, Texas, Wyoming, Virginia, Vermont, Tennessee, Oregon, Ohio , Minnesota, Michigan, Maryland, Louisiana, Kentucky, Kansas, Iowa, Illinois, Idaho, Hawaii, Delaware, Colorado, California & Arkansas); They represent a 46% of the total. (More details on each State see appendix)





In most of the States in this group the variability between year is very high, because most of them between the period that was study and contrary to the other groups they change the number of the laws that they have; the number of laws that the States have is between 2 and 6 different laws related with the substitution brand medication with generics. Finally, the variability between each year in this group is also high because has fluctuations, in all of them, the strength of the laws it is between 3 to 10 (been 11 the max.).

4.2 Generic rates trends at the substitutable level.

One of the main objective of this study, was create and calculate an instrument that has able to measure the consumption of generics medication, base on the market status of each of product across the time.

Consequently, three different rates were created:

1. Net Generic Rate (% of All Dispensed as Generic): Non-Innovator Multi-Source / (Single Source + Innovator Multi-Source + Non-Innovator Multi-Source).

2. Generic Prescribing Rate (% of Off-Patent Dispensed as a Generic): (Innovator Multi-Source + Non-Innovator Multi-Source) / (Single Source + Innovator Multi-Source + Non-Innovator Multi-Source).

3. Generic Dispensing Rate (% All Prescribed as Off-Patent): Non-Innovator Multi-Source / (Innovator Multi-Source + Non-Innovator Multi-Source).

These three instruments, were able to capture if a medication in a specific therapeutic class was a single source or off-patent or has generics alternatives, therefore could be substitute if the case was appropriate. Also, were measure by the number of prescriptions (Rx) that were used and by the amount of money reimbursed ($) in Medicaid program between 1991 until 2008,

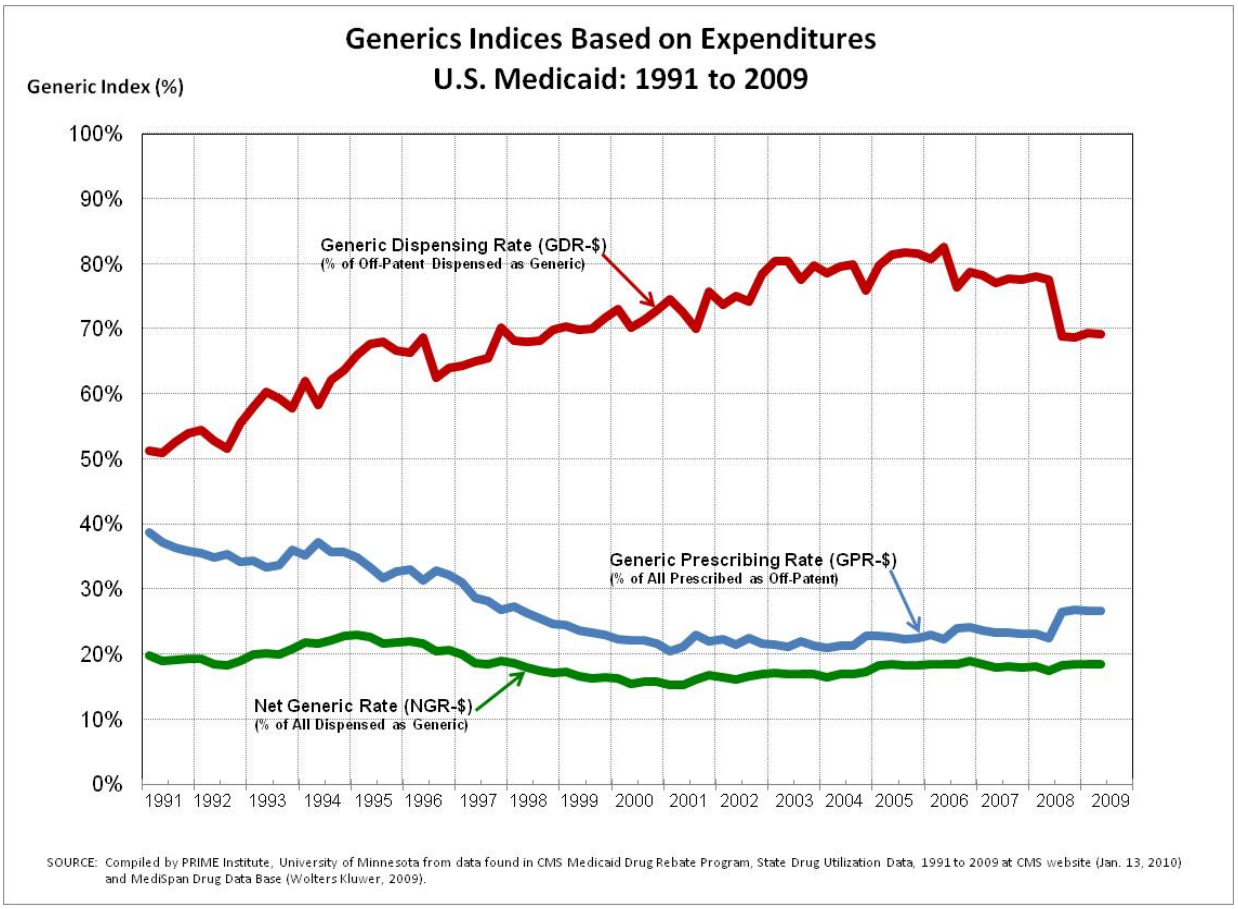
The sample that was used in this study was the complete population of drugs that Medicaid program reimbursement between 1991 until 2008; the population of drugs was a diverse group of eighteen different therapeutic Class where in almost all of them we found brand medications, generic medications and over-the-counter (OTC) medications; but for the purpose of this study over-the-counter (OTC) drugs will be included in the descriptive analysis but not in the statistical. The main reason that over-the-counter (OTC) drugs were excluded from the statistical analysis was because between 1991 until 2008 there were many federal changes (related to OTC regulation) and too much variability across states; therefore we were not able to capture that effect.

4.2.1 Generic rates based on Expenditures ($) at the substitutable level.

Nationwide we observed after *Generic Dispensing Rate (GDR) measure by reimbursement ($)* was calculate, the percentage of off-patent medication dispensing as a generic increased 36.81% in 18 years from 50.8% in 1991 to 69.5% in 2009; but the biggest percentage in these 18 years was in 2006 were the 82.6% of off-patent medication was dispensing as a generic, therefore in the first 15 years the increment was in 62.6%; then after the last 3 years, the percentage of off-patent medication that was dispensing as a generic decrease in 15.9%.

Now, after *Generic Prescribing Rate (GPR) measure by reimbursement ($)* was calculate, the percentage of all prescribed as off-patent medication decrease in 30.75% in 18 years from 38.7% in 1991 to 26.8% in 2009; but again, the biggest decreased in percentage in these 18 years was in 2001 were the 20.7% of all medications prescribed as off-patent medication; therefore in the first 10 years the decreased was in 46.51%, but after the last 8 years the percentage of all prescribed as off-patent medication increase again in 29.47%.

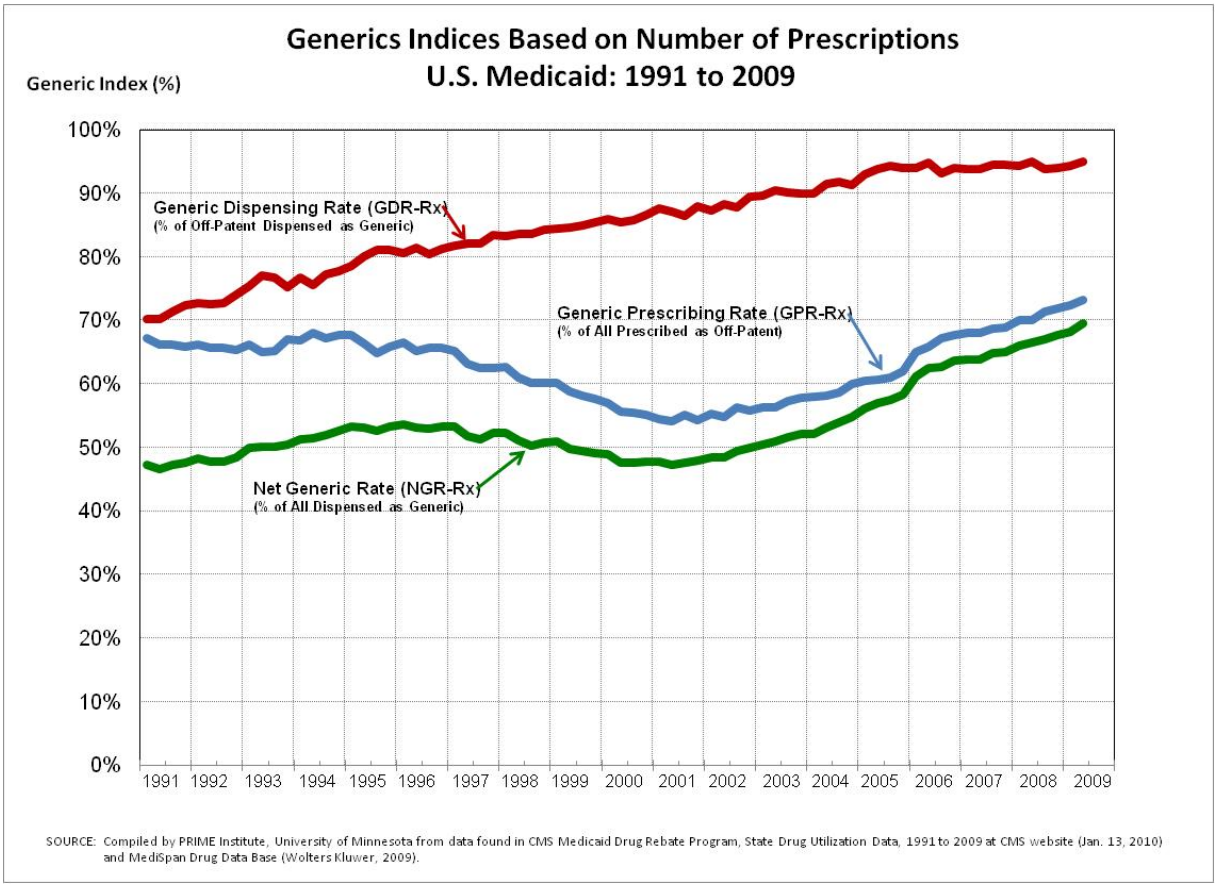
Finally, after *Net Generic Rate (NGR) measure by reimbursement ($)* was calculate, the percentage of all dispensed as generic medication decrease in 5.076% in 18 years from 19.7% in 1991 to 18.7% in 2009; but again, the biggest increased in percentage in these 18 years was in 1995 were the 23.1% of all dispensed as generic medication, therefore in the first 5 years the increased was in 17.26%, but after the last 14 years the percentage of all dispensed as generic decreased again in 19.048%.



4.2.2 Generic index based Prescription (Rx) at the substitutable level.

On a national scale, once *Generic Dispensing Rate (GDR) measure by prescription (Rx)* was calculate, the percentage of off-patent medication dispensing as a generic increased 37.43% in 18 years from 69.2% in 1991 to 95.1% in 2009; with a very smooth and almost constant slope. At the same time, when *Generic Prescribing Rate (GPR) by prescription (Rx)* was calculate, the percentage of all prescribed as off-patent medication increase in 9.84% in 18 years from 67.1% in 1991 to 73.7% in 2009; Now, during that period,

between 1998 until 2005 *Generic Prescribing Rate (GPR) by prescription (Rx)* decrease 9.45% from 1998 until 2001 and then increase 12.23% until 2005. Therefore, just in the last 4 years the percentage of all prescribed as off-patent medication increase again in 18.11%. Finally, *Net Generic Rate (NGR) measure by prescription (Rx)* was calculate and the percentage of all dispensed as generic medication increase in 51.08% in 18 years from 46.4% in 1991 to 70.1% in 2009; but again, during that period, between 1998 until 2005 *Net Generic Rate (NGR) measure by prescription (Rx)* decrease 8.99% from 1998 until 2001 and then increase 21.43% until 2005. Therefore, just in the last 4 years the percentage of all prescribed as off-patent medication increase again in 21.28%.



4.3 Regression results at the substitutable market.

One of objectives of this study was determine and calculate the impact of state regulation, related to generic substitution drugs. Therefore, a panel procedure call “the Two Way Fixed effects” was accomplished for the three different rates, nationally and by therapeutic class.

4.3.1 Regression analysis at the substitutable market level for Net Generic Rate (NGR); Generic Prescribing Rate (GPR) & Generic Dispensing Rate (GDR) for U.S. Medicaid by Prescription (Claims).

At the national level, nineteen regulations from two different data sources were analyzed by prescription (claims); to determine the effects of State regulation on the substitution process (Table.I). These two different data sources are survey pharmacy law (where was selected twelve regulations that physicians can use to prevent generic substitution) and Medicaid reimbursement (where was selected seven regulations that affect the discount price and the dispensing fee by type of medication).

As a result, overall regulations that have direct effect from Physicians in the process of prescribing and substituted a medication for the generic if that is available, has negative or none effects nationally across the time (Table.II), these effects are when all drugs are dispensed as a generic, when Off-Patent drugs are dispensed as a generic and when all drugs are prescribed as Off-Patent drugs.

The group of regulations that affect discount price and dispensing fee in a pharmacy have an effect in the process of dispensing and prescribing a medication; this is how, a percentage discount for Generic Rx and Dispensing Fee for Unit Dose Rx has a positive effects, as a result change in 1% AWP Discount or in $1 Dispensing Fee will increase the process of drug product selection. But also, some of these effects are negative, this is how, a percentage discount for Baseline Rx and dispensing Fee for Generic Rx has a negative effects in these two process; therefore a change in 1% AWP Discount or in $1 Dispensing Fee will decrease the process of drug product selection.

Table II. Net Generic Rate (NGR); Generic Prescribing Rate (GPR) & Generic Dispensing Rate (GDR) U.S. Medicaid measure by Prescription (Claims)

National Generic Rates by Prescriptions (RX)

Unit of Analysis: State & Time
Measure: Prescriptions (RX)
Dependent Variable: GPR , GDR & NGR
Data: Survey Pharmacy Law & Medicaid Reimbursement

	National					
	NGR_RX_USA		GPR_RX_USA		GDR_RX_USA	
Fit Statistics	Estimate		Estimate		Estimate	
R-Square	89.33%		91.66%		90.64%	
Variables Names	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**
Intersection	0.743	<.0001	0.768	<.0001	0.978	<.0001
Formulary Based on Positive List	-0.042	<.0001	-0.035	<.0001	-0.016	0.0031
No Formulary Specified as Basis	-0.034	<.0001	-0.024	<.0001	-0.022	<.0001
Based Only on Prescriber Permission	-0.044	<.0001	-0.034	<.0001	-0.024	0.0003
Formulary Based on Others list	0.004	0.5196	0.000	0.9426	0.008	0.1646
Formulary Based on Orange Book	-0.006	0.0416	-0.004	0.0559	-0.002	0.3574
Generic Substitution is Mandatory	-0.011	0.0071	-0.004	0.2022	-0.014	0.0003
Substitution Prevented by Check Box	-0.010	0.0183	-0.020	<.0001	0.011	0.005
Substitution Prevented by Initials of the Phrase	-0.005	0.2366	-0.015	<.0001	0.012	0.001
Substitution Prevented by Written Phrase	0.002	0.6402	-0.014	<.0001	0.020	<.0001
Pass On Part of Cost Savings	-0.017	0.0004	-0.014	<.0001	-0.004	0.3492
Pass On Full Cost Savings	-0.004	0.4399	-0.010	0.0251	0.004	0.4951
Patient Consent or Notification Required	-0.014	<.0001	-0.011	<.0001	-0.008	0.0007
Variables Names	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**
AWP % Discount for Baseline Rx	-0.300	<.0001	-0.256	<.0001	-0.085	0.0342
AWP % Discount for Generic Rx	0.133	<.0001	0.091	<.0001	0.067	<.0001
AWP % Discount by Channel Distribution	0.005	0.3316	0.014	0.0007	-0.010	0.0352
Dispensing Fee for Basic Rx	0.005	0.0121	0.006	<.0001	-0.002	0.3594
Dispensing Fee for Generic Rx	-0.008	<.0001	-0.005	0.0002	-0.006	0.0005
Dispensing Fee for Institutional Rx	0.000	0.4245	0.000	0.7289	0.001	0.1546
Dispensing Fee for Unit Dose Rx	0.003	<.0001	0.002	0.0036	0.002	0.0006

4.3.2 Regression analysis at the substitutable market level for Net Generic Rate (NGR); Generic Prescribing Rate (GPR) & Generic Dispensing Rate (GDR) for U.S. Medicaid by Expenditures ($).

At the national level, nineteen regulations from two different data sources were analyzed by expenditures ($); to determine the effects of State regulation on the substitution process (Table.I) As a result, overall regulations that have direct effect from Physicians in the process of prescribing and substituted a medication for the generic if that is available, has negative or none effects nationally across the time when all drugs are dispensed as a generic & when Off-Patent drugs are dispensed as a

generic (Table.III). When all drugs are prescribed as Off-Patent drugs few regulations have negative effects (Table.III).

Finally, Medicaid reimbursement regulations that affect discount price and dispensing fee in a pharmacy have an effect in the process of dispensing and prescribing a medication; this is how, an AWP percentage discount has negative and positive effects depending on the process of dispensing or prescribing (Table.III). But also, the effect of dispensing fee has negative and positive effects depending on the process of dispensing or prescribing (Table.III)

Table III. Net Generic Rate (NGR); Generic Prescribing Rate (GPR) & Generic Dispensing Rate (GDR) U.S. Medicaid measure by Expenditures ($)

National Generic Rates by Reimbursement ($)

Unit of Analysis: State & Time
Measure: Reimbursement ($)
Dependent Variable: GPR , GDR & NGR
Data: Survey Pharmacy Law & Medicaid Reimbursement

	National		
	NGR_$_USA	GPR_$_USA	GDR_$_USA
Fit Statistics	Estimate	Estimate	Estimate
R-Square	95.46%	96.08%	82.38%

Variables Names	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intersection	0.204	<.0001	0.257	<.0001	0.811	<.0001
Formulary Based on Positive List	-0.012	0.029	-0.011	0.0655	-0.004	0.7209
No Formulary Specified as Basis	-0.015	<.0001	-0.009	0.0254	-0.027	0.0006
Based Only on Prescriber Permission	0.040	<.0001	0.045	<.0001	0.012	0.3491
Formulary Based on Others list	0.022	<.0001	0.018	0.0016	0.044	<.0001
Formulary Based on Orange Book	-0.004	0.1312	-0.003	0.3533	-0.003	0.5085
Generic Substitution is Mandatory	-0.011	0.0041	-0.004	0.3672	-0.029	0.0001
Substitution Prevented by Check Box	-0.018	<.0001	-0.027	<.0001	0.000	0.9892
Substitution Prevented by Initials of the Phrase	-0.016	<.0001	-0.023	<.0001	-0.007	0.2957
Substitution Prevented by Written Phrase	-0.010	0.001	-0.025	<.0001	0.016	0.0059
Pass On Part of Cost Savings	-0.006	0.142	-0.003	0.5681	-0.019	0.0221
Pass On Full Cost Savings	-0.007	0.16	-0.005	0.4221	-0.015	0.1526
Patient Consent or Notification Required	-0.003	0.2162	0.000	0.9022	-0.007	0.1299

Variables Names	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AWP % Discount for Baseline Rx	-0.179	<.0001	-0.126	0.0029	-0.360	<.0001
AWP % Discount for Generic Rx	0.026	0.0609	-0.022	0.132	0.184	<.0001
AWP % Discount by Channel Distribution	0.028	<.0001	0.030	<.0001	0.024	0.0101
Dispensing Fee for Basic Rx	0.006	0.0023	0.007	0.0003	0.005	0.2014
Dispensing Fee for Generic Rx	-0.009	<.0001	-0.004	0.0091	-0.023	<.0001
Dispensing Fee for Institutional Rx	0.001	0.1646	0.001	0.0777	0.000	0.7265
Dispensing Fee for Unit Dose Rx	0.005	<.0001	0.003	<.0001	0.008	<.0001

CHAPTER V: DISCUSSIONS AND CONCLUSIONS

The main objective of the study was to understand how the regulations intended to influence Generic Substitution and affect and influence on drug product selection.

5.1 Net Generic Rate (NGR)

5.1.1 Net Generic Rate (NGR) measure by prescription (Rx)

First was analyzed the percentage of All drugs that were dispensed as a generic defined as a Net Generic rate (NGR). As a result, nationally, a positive formulary and non-formulary is significant in the process of drug product selection. However, both of them decrease the percentage of drugs that are dispensed as a generic if the states have them in their regulations when they are significant. A positive formulary is, a list of generic drug products from different manufacturers identifies as products that may be substituted for one another, and most states specify the Orange Book as the positive formulary; and a non-formulary means that the drugs are not included in a preferred medications list for pharmacists to be selected. After the seventeen therapeutic categories were analyze, a positive formulary regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic categories and in 5 of them not; and that the maximum decrease will be 15.21 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category and the minimum decrease will be 2.86 percentage points in “Analgesics & Anesthetics” therapeutic category.

A non-formulary regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic categories and in 4 of them not; that maximum decrease will be 11.33 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category and the

minimum decrease will be 1.34 percentage points in “Neuromuscular Drugs” therapeutic category.

Different Types of Formularies are not the only drug products selection list that states have or used to help to control the cost of prescription and the process of generic substitution; therefore, Others list was another of the regulations that was selected to be part of this study and is not significant when is measure by prescription (Rx). After the seventeen therapeutic categories were analyze, an “Others list” regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic category and in 7 of them not; and that the maximum decrease will be 5.81 percentage point in “Anti-Infective” therapeutic category and the increase will be 13.43 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category.

The used of the Approved Drug Product book, commonly known as the “Orange Book” in the state regulation is significant and decreases the processes of drug product selection when is measure by prescription (Rx). The Approved Drug Products book with Therapeutic Equivalence Evaluations (the List, commonly known as the Orange Book) identifies drug products approved on the basis of safety and effectiveness by the Food and Drug Administration (FDA) under the Federal Food, Drug, and Cosmetic Act (the Act). After the seventeen therapeutic categories were analyze, an Orange Book regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic categories and in 8 of them not; and that the maximum decrease will be 8.32 percentage point in “Biological” therapeutic category and the increase will be 1.92 percentage points in “Neuromuscular Drugs” therapeutic category.

Drug product selection law, vary significantly among states. Therefore, in states where pharmacists must substitute a less expensive generic drug, also called “mandatory” substitution regulation; is significant when measure by prescription (Rx) was, but decreases

the processes of drug product selection. In the same way, Patient Consent regulations, determines whether patients can influence the generic substitution process at the point of the pharmacy, and that decreases the processes of drug product selection or “generic substitution”. After the seventeen therapeutic categories were analyze, a “Permissive or Mandatory” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic categories and in 5 of them not; and that the maximum decrease will be 11.28 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 3.47 percentage points in “Nutritional Products” therapeutic category.

During the process of drug product selection, there are a lot of ways to prevent substitution in a prescription by physicians. One of them, is when a prescriber writes with words “Dispensing as Written”, “No substitution” or an equivalent notation that prevent a pharmacist substitute the prescription. Another instance is when prescribers write the initials for example: “DAW” or “NS”, etc. The final alternative; is when prescriber must check a box on a prescription where is labeled, like example: “Dispensing as Written” or “Generic equivalent Allowed". In our study, the three alternatives: the Check Box, Initials and Written in Words, influenced in a reduction of the product selection drug process, and in the case of the measure by prescription (Rx) just "Check Box" was significant.

After the seventeen therapeutic categories were analyze, a “Check Box” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic categories and in 5 of them not; and that the maximum decrease will be 5.87 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the minimum decrease will be 5.6345 percentage points in “Analgesics & Anesthetics” therapeutic category. Afterwards, “Initials” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 10.79 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the

increase will be 5.43 percentage point in “Genitourinary” therapeutic category. Finally, “Written in Words” regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic categories and in 7 of them not; and that the maximum decrease will be 4.11 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 5.11 percentage point in “Analgesics & Anesthetics” therapeutic category.

A cost savings pass-on was defined as a regulation that requires the pharmacist to pass-on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug. This regulation was separated in two: Patients Cost Saving by Portion of cost and Patients Cost Saving by Full saving, but only Patients Cost Saving by Portion of cost is significant and decreases the processes of drug product selection when is measure by prescription (Rx).

Subsequently, “Patients Cost Saving by Portion of cost” regulation showed that, measure by prescription (Rx) was significant in 7 therapeutic categories and in 10 of them not; and that the maximum decrease will be 5.25 percentage points in “Antineoplastics” therapeutic category and the increase will be 5.28 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category. Then, a “Patients Cost Saving by Full saving” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 7.58 percentage point in “Analgesics & Anesthetics” therapeutic category and the increase will be 11.08 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category.

Another regulation that was significant only when was measure by prescription (Rx) and decreases the processes of drug product selection was “Patient Consent”. Patient Consent was defined as the requirement that a patient’s permission is necessary to substitute or that the patient has to be notified/informed of the substitution of his/her medication. Then, after the seventeen therapeutic categories were analyze, a “Patient Consent” regulation

showed that, measure by prescription (Rx) was significant in 13 therapeutic categories and in 4 of them not; and that the maximum decrease will be 7.49 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 2.32 percentage points in “Nutritional Products” therapeutic category.

Furthermore, another regulation that affects the process of generic substitution in a pharmacy and could increasing or decreasing Pharmacy Profit is the Average Wholesale Price (AWP) discount. This discount is defined as an amount payable by pharmacies for the cost of a prescription expressed as a percentage off of Average Wholesale Price (AWP). Therefore, measure by prescription (Rx) in an “AWP Basic Discount”, the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive a lower payment, as result, would decrease the processes of drug product selection. In the other hand, in an “AWP Generic Discount”, the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive higher payment, as a result, would increase the processes of drug product selection. Then, after the seventeen therapeutic categories were analyze, an “AWP Basic Discount” regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic category and in 4 of them not; and that the maximum decrease will be 0.012 % in “Anti-Infective” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount and the increase will be 0.016 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount.

A “AWP Generic Discount” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 0.005 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount and the

increase will be 0.0029 % in “Hematological” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount.

Finally, a “AWP by Channel of Distribution” regulation showed that, measure by prescription (Rx) was significant in 14 therapeutic category and in 3 of them not; and that the maximum decrease will be 0.001 % in “Neuromuscular Drugs” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution and the increase will be 0.0014 % in “Biological” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution.

We have regulations that affect directly to the process of drug product selection by increasing or decreasing Pharmacy Profit. Is the case with, Dispensing Fee in pharmacy, which is an amount of money pay to a pharmacy for dispensed a prescription, as a result, the pharmacy receives a fixed payment (reimbursement) for the transaction. In this study, three type of the dispensing fee were significant measure by prescription (Rx): the base rate, unit dose and generic but the dispensing fee by institution was not significant. The first two, the base rate & unit dose shows that, they increase the processes of drug product selection but in the case of dispensing fee on generic if the state has in the regulation, will decrease generic substitution.

After the seventeen therapeutic categories were analyze, an “Dispensing Fee Base Rate” regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic category and in 4 of them not; and that the maximum decrease will be 4.57 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee and the increase will be 2.11 percentage point in “Respiratory” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee.

A “Dispensing Fee on Generic” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 2.57 percentage point in “Respiratory” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic and the increase will be 1.8089 percentage point in “Antineoplastics” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic.

Then, even thought “Institutional Dispensing Fee” was not significant nationally by therapeutic category was different, therefore after the seventeen therapeutic categories were analyze, an “Institutional Dispensing Fee” regulation showed that, measure by prescription (Rx) was significant in 7 therapeutic category and in 10 of them not; and that the maximum decrease will be 0.69 percentage point in “Miscellaneous Products” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee and the increase will be 0.76 percentage point in “Hematological” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee.

Finally, “Unit Dose Dispensing Fee” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 0.47 percentage point in “Central Nervous System” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee and the increase will be 1.88 percentage point in “Miscellaneous Products” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee.

5.1.2 Net Generic Rate (NGR) measure by Reimbursement ($)

Net Generic rate (NGR) measure by reimbursement ($) was defined and analyzed as a percentage of All drugs that were dispensed as a generic. As a result, nationally, a positive formulary and non-formulary is significant in the process of drug product selection; but, both of them decrease the percentage of drugs that are dispensed as a generic if the states have them in their regulations when they are significant. As be previous explained, a positive formulary is, a list of generic drug products from different manufacturers identifies as products that may be substituted for one another, and most states specify the Orange Book as the positive formulary; and a non-formulary means that the drugs are not included in a preferred medications list for pharmacists to be selected. After the seventeen therapeutic category were analyze, a positive formulary regulation showed that, measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 16.61 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 6.74 percentage point in “Antineoplastics” therapeutic category. In the same way, a non-formulary regulation showed that, measure by reimbursement ($) showed that, in 6 therapeutic category were significant and in 11 of them not; where the maximum decrease will be 11.68 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the minimum decrease will be 2.09 percentage point in “Hematological” therapeutic category.

Others list was another of the regulations that was selected to be part of this study and is significant and increase the process of drug product selection when was measure by reimbursement ($). After the seventeen therapeutic categories were analyze, an “Others list” regulation showed that, measure by reimbursement ($) showed that, in 11 therapeutic category were significant and in 6 of them not; where the maximum decrease will be 2.76

percentage point in “Anti-Infective” therapeutic category and the increase will be 8.27 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category.

The used of the Approved Drug Product book, commonly known as the “Orange Book” in the state regulation is not significant when was measure by reimbursement ($). An Orange Book regulation measure by reimbursement ($) showed that, in 4 therapeutic category were significant and in 13 of them not; where the maximum decrease will be 12.81 percentage point in “Biological” therapeutic category and a minimum decrease will be 3.17 percentage point in “Gastrointestinal” therapeutic category.

Drug product selection law, vary significantly among states. In states where pharmacists must substitute a less expensive generic drug, also called “mandatory” substitution regulation; is significant when was measure by reimbursement ($) but decreases the processes of drug product selection. Then, a “Permissive or Mandatory” regulation measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 9.71 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 4.51 percentage point in “Miscellaneous Products” therapeutic category.

On the other hand, during the process of drug product selection, there are a lot of ways to prevent substitution in a prescription by physicians. One of them, is when a prescriber writes with words “Dispensing as Written”, “No substitution” or an equivalent notation that prevent a pharmacist substitute the prescription. Another instance is when prescribers write the initials for example: “DAW” or “NS”, etc. The final alternative; is when prescriber must check a box on a prescription where is labeled, like example: “Dispensing as Written” or “Generic equivalent Allowed". These three alternatives: the Check Box, Initials and Written in Words, influenced in a reduction in product selection drug process and were significant when measured by the reimbursement ($).

After the seventeen therapeutic categories were analyze, a “Check Box” regulation measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 9.83 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 5.22 percentage point in “Genitourinary” therapeutic category. Afterwards, an “Initials” regulation measure by reimbursement ($) showed that, in 10 therapeutic category were significant and in 7 of them not; where the maximum decrease will be 7.31 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 5.89 percentage point in “Genitourinary” therapeutic category. Finally, “Written in Words” regulation measure by reimbursement ($) showed that, in 10 therapeutic category were significant and in 7 of them not; where the maximum decrease will be 6.46 percentage point in “Biological” therapeutic category and the increase will be 6.301 percentage point in “Genitourinary” therapeutic category.

A cost savings pass-on was defined as a regulation that requires the pharmacist to pass-on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug and was separated in two: Patients Cost Saving by Portion of cost and Patients Cost Saving by Full saving, but was not significant when was measure by reimbursement ($). But, after the seventeen therapeutic categories were analyze, an “Patients Cost Saving by Portion of cost” regulation measure by reimbursement ($) showed that, in 7 therapeutic category were significant and in 10 of them not; where the maximum decrease will be 4.82 percentage point in “Gastrointestinal” therapeutic category and the increase will be 10.09 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category. In the case of a “Patients Cost Saving by Full saving” regulation showed that, measure by reimbursement ($) showed that, in 10 therapeutic category were significant and in 7 of them not; where the maximum decrease will be 11.08 percentage point in “Anti-Infective” therapeutic category and

the increase will be 7.02 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category.

Patient Consent was a regulation that was not significant when measure by reimbursement ($) was. After the seventeen therapeutic categories were analyze, a “Patient Consent” regulation showed that, measure by reimbursement ($) in 10 therapeutic category were significant and in 7 of them not; where the maximum decrease will be 4.26 percentage point in “Biological” therapeutic category and the increase will be 2.81 percentage point in “Nutritional Products” therapeutic category.

Another regulation that affects the process of generic substitution in a pharmacy and could increasing or decreasing Pharmacy Profit is the Average Wholesale Price (AWP) discount. Therefore, the results shows that, measure by reimbursement ($) in an “AWP Basic Discount”, the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive a lower payment, as result, would decrease the processes of drug product selection. In the other hand, in an “AWP Generic Discount”, will not be significant, and in an “AWP by Channel of Distribution” the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive higher payment, as a result, would increase the processes of drug product selection

After the seventeen therapeutic categories were analyze, an “AWP Basic Discount” regulation showed that, measure by reimbursement ($)in 10 therapeutic category were significant and in 7 of them not; and that the maximum decrease will be 0.011 % in “Anti-Infective” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount and the increase will be 0.01 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount. After that, an “AWP Generic Discount” regulation measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them

not; and that the maximum decrease will be 0.004 % in “Stimulants/Anti-Obesity/Anorexia” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount and the increase will be 0.003 % in “Analgesics & Anesthetics” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount. Finally, an “AWP by Channel of Distribution” regulation measure by reimbursement ($) showed that, in 12 therapeutic category were significant and in 5 of them not; and that the maximum decrease will be 0.0005 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution and the increase will be 0.0012 % in “Biological” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution.

Finally, we have regulations that affect directly to the process of drug product selection by increasing or decreasing Pharmacy Profit. Is the case with, Dispensing Fee in pharmacy, which is an amount of money pay to a pharmacy for dispensed a prescription, as a result, the pharmacy receives a fixed payment (reimbursement) for the transaction. In this study, three type of the dispensing fee were significant measure by reimbursement ($): the base rate, unit dose and generic but the dispensing fee by institution was not significant. The first two, the base rate & unit dose shows that, they increase the processes of drug product selection but in the case of dispensing fee on generic if the state has in the regulation, will decrease generic substitution.

After the seventeen therapeutic categories were analyze, an “Dispensing Fee Base Rate” regulation showed that, measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; and that the maximum decrease will be 3.92 percentage point in “Nutritional Products” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee and the increase will be 1.78 percentage point in “Antineoplastics” therapeutic category if In the process of drug

product selection States that change in $1 the Basic Dispensing Fee. After that, an “Dispensing Fee on Generic” regulation measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; and that the maximum decrease will be 2.07 percentage point in “Respiratory” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic and the increase will be 1.68 percentage point in “Genitourinary” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic.

Then, even thought “Institutional Dispensing Fee” was not significant nationally by therapeutic category was different, therefore an “Institutional Dispensing Fee” regulation measure by reimbursement ($) showed that, in 6 therapeutic category were significant and in 11 of them not; and that the maximum decrease will be 0.47 percentage point in “Genitourinary” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee and the increase will be 0.94 percentage point in “Biological” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee.

Finally, an “Unit Dose Dispensing Fee” regulation showed that, measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; and that the minimum increase will be 0.38 percentage point in “Analgesics & Anesthetics” therapeutic category if In the process of drug product selection States that change in $1 the Unit dose Dispensing Fee and the maximum increase will be 2.29 percentage point in “Nutritional Products” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee.

5.2 Generic Prescribing Rate (GPR)

5.2.1 Generic Prescribing Rate (GPR) measure by Prescription (Rx)

The next rate calculated and analyzed was the percentage of all prescribed as off-patent drugs and was defining as a Generic Prescribing rate (GPR) measure by prescription (Rx). As a result, nationally, a positive formulary or non-formulary is significant in the process of drug product selection measure by prescription (Rx) but , they decrease the percentage of all prescribed as off-patent drugs if the state have them in their regulations.

After the seventeen therapeutic categories were analyze, a positive formulary regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic categories and in 4 of them not; and that the maximum decrease will be 14.60 percentage points in “Biological” therapeutic category and the increase will be 3.41 percentage points in “Stimulants/Anti-Obesity/Anorexia” therapeutic category. And a non-formulary regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; that maximum decrease will be 8.71 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 1.70 percentage point in “Nutritional Products” therapeutic category.

As we mentioned in the Net Generic Rate, formularies are not the only drug products selection list; therefore, Others list was another of the regulations that was selected to be part of this study but is not significant when is measure by prescription (Rx). Then After the seventeen therapeutic categories were analyze, an “Others list” regulation showed that, measure by prescription (Rx) was significant in 8 therapeutic category and in 9 of them not; and that the maximum decrease will be 5.45 percentage point in “Anti-Infective” therapeutic category and the increase will be 22.99 percentage point in “Biological” therapeutic category.

The used of the Approved Drug Product book, commonly known as the “Orange Book” in the state regulation is not significant when measure by is. After the seventeen therapeutic category were analyze, an Orange Book regulation measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 4.42 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category and the increase will be 6.11 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category.

Drug product selection law, vary significantly among states; as a result, in states where pharmacists must substitute a less expensive generic drug, also called “mandatory” substitution regulation; is not significant when was measure prescription (Rx). As a consequence, After the seventeen therapeutic categories were analyze, an “Permissive or Mandatory” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 3.75 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 5.44 percentage point in “Hematological” therapeutic category.

Furthermore, as was previously mentioned, there are ways to prevent substitution in a prescription by prescribers. One of them is when a prescriber written in words “Dispensing as Written”, “No substitution” or an equivalent message that prevent a pharmacist to substitute the prescription. Another example is when prescriber writes the Initials for example: “DAW” or “NS”. Finally, is when prescriber must check a box on a prescription where is labeled like for example: “Dispensing as Written” or “Generic equivalent Allowed". In our study once again, the three of the alternatives that were mention before, were significant: the Check Box, Initials & Written in Words but all of them result in decrease the processes of drug product selection when were measure by prescription (Rx).

After the seventeen therapeutic categories were analyze, a “Check Box” regulation showed that, measure by prescription (Rx) was significant in 11 therapeutic categories and in 6 of them not; and that the maximum decrease will be 14.89 percentage point in “Biological” therapeutic category and the increase will be 4.61 percentage points in “Analgesics & Anesthetics” therapeutic category. Afterwards, an “Initials” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 10.67 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 3.77 percentage point in “Gastrointestinal” therapeutic category. Finally, “Written in Words” regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic categories and in 7 of them not; and that the maximum decrease will be 9.77 percentage points in “Biological” therapeutic category and the increase will be 3.01 percentage points in “Analgesics & Anesthetics” therapeutic category.

A cost savings pass-on as was mention before was defined as a regulation that requires the pharmacist to pass-on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug and was separated in two: Patients Cost Saving by Portion of cost and Patients Cost Saving by Full saving, but both Patients Cost Saving are significant and decreases the processes of drug product selection when is measure by prescription (Rx). Then, after the seventeen therapeutic categories were analyze, an “Patients Cost Saving by Portion of cost” regulation showed that, measure by prescription (Rx) was significant in 6 therapeutic category and in 11 of them not; and that the maximum decrease will be 4.36 percentage point in “Nutritional Products” therapeutic category and the minimum decrease will be 1.99 percentage point in “Analgesics & Anesthetics” therapeutic category. And, a “Patients Cost Saving by Full saving” regulation showed that, measure by prescription (Rx) was significant in 8 therapeutic category and in 9 of them not; and that the maximum decrease will be 6.50 percentage point in “Analgesics & Anesthetics” therapeutic

category and the increase will be 15.52 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category.

Afterward, for the percentage of all prescribed as off-patent drugs, in states that determines whether patients can influence the generic substitution process at the point of the pharmacy, Patient Consent regulation was significant only when was measure by prescription (Rx) but decreases the processes of drug product selection or “generic substitution”. Then, after the seventeen therapeutic categories were analyze, a “Patient Consent” regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic categories and in 7 of them not; and that the maximum decrease will be 7.28 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 1.04 percentage points in “Neuromuscular Drugs” therapeutic category.

For the Generic Prescribing Rate, another regulation that affects Pharmacy Profit was the Average Wholesale Price discount. Therefore, measure by prescription (Rx) the three AWP discount are significant. In “AWP Basic Discount”, the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive a lower payment, as result, would decrease the processes of drug product selection. In the other hand, in “AWP Generic Discount” & “AWP by Channel of Distribution” the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive higher payment, as a result, would increase the processes of drug product selection.

After the seventeen therapeutic categories were analyze, “AWP Basic Discount” regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic category and in 7 of them not; and that the maximum decrease will be 0.011 % in “Anti-Infective” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount and the increase will be 0.014 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in

1% AWP Basic Discount. After that, "AWP Generic Discount" regulation showed that, measure by prescription (Rx) was significant in 11 therapeutic category and in 6 of them not; and that the maximum decrease will be 0.005 % in "Misc. Psychotherapeutic & Neurology" therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount and the increase will be 0.002 % in "Cardiovascular" therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount. Finally, "AWP by Channel of Distribution" regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 0.001 % in "Misc. Psychotherapeutic & Neurology" therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution and the increase will be 0.001 % in "Biological" therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution.

As was mentioned before, some regulations affect directly to the Pharmacy Profit. Is the case with, Dispensing Fee in pharmacy, which is an amount of money pay to a pharmacy for dispensed a prescription, as a result, the pharmacy receives a fixed payment (reimbursement) for the transaction. In the study, three type of the dispensing were significant measure by prescription (Rx): the base rate, unit dose and generic. The first two: the base rate & unit dose shows that, they increase the processes of drug product selection but in the case of dispensing fee on generic if the state has them in the regulation, the fee will decrease generic substitution.

Subsequently, a "Dispensing Fee Base Rate" regulation showed that, measure by prescription (Rx) was significant in 14 therapeutic category and in 3 of them not; and that the maximum decrease will be 3.81 percentage point in "Misc. Psychotherapeutic & Neurology" therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee and the increase will be 21.25 percentage point in "Biological"

therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee. After that, a “Dispensing Fee on Generic” regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic category and in 4 of them not; and that the maximum decrease will be 5.73 percentage point in “Biological” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic and the increase will be 1.71 percentage point in “Hematological” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic.

Then, even thought “Institutional Dispensing Fee” was not significant nationally by therapeutic category was different, therefore, an “Institutional Dispensing Fee” regulation showed that, measure by prescription (Rx) was significant in 6 therapeutic category and in 11 of them not; and that the maximum decrease will be 0.84 percentage point in “Genitourinary” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee and the increase will be 0.50 percentage point in “Gastrointestinal” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee.

Finally, after the seventeen therapeutic categories were analyze, an “Unit Dose Dispensing Fee” regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic category and in 4 of them not; and that the maximum decrease will be 0.18 percentage point in “Biological” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee and the increase will be 1.45 percentage point in “Miscellaneous Products” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee.

5.2.2 Generic Prescribing Rate (GPR) measure by Reimbursement ($)

Next rate calculated and analyzed was the percentage of all prescribed as off-patent drugs and was defining as a Generic Prescribing rate (GPR) measure by reimbursement ($) . As a result, nationally, positive formulary is not significant in the process of drug product selection measure by reimbursement ($) and non-formulary is significant measure by reimbursement ($) but decrease the percentage of all prescribed as off-patent drugs if the state have them in their regulations.

After the seventeen therapeutic category were analyze, even thought positive formulary was not significant nationally by therapeutic category was different, therefore, in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 10.23 percentage point in “Central Nervous System” therapeutic category and the increase will be 7.88 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category. Then, a non-formulary regulation measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; where the maximum decrease will be 7.857 percentage point in “Central Nervous System” therapeutic category and the increase will be 7.294 percentage point in “Nutritional Products” therapeutic category.

Other list was another of the regulations that was selected to be part of this study and is significant and increase the process of drug product selection when was measure by reimbursement ($). Then After the seventeen therapeutic categories were analyze, “Others list” regulation showed that, measure by reimbursement ($) showed that, in 11 therapeutic category were significant and in 6 of them not; where the maximum decrease will be 6.21 percentage point in “Analgesics & Anesthetics” therapeutic category and the increase will be 18.02 percentage point in “Biological” therapeutic category.

Also, the used of the Approved Drug Product book, commonly known as the “Orange Book” in the state regulation is not significant when is measure by reimbursement ($). But after the seventeen therapeutic category were analyze, Orange Book regulation measure by reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 4.42 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category and the increase will be 6.11 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category.

Drug product selection law, vary significantly among states; as a result, in states where pharmacists must substitute a less expensive generic drug, also called “mandatory” substitution regulation; is not significant when was measure by reimbursement ($). But, after the seventeen therapeutic categories were analyze, “Permissive or Mandatory” regulation measure by reimbursement ($) showed that, in 11 therapeutic category were significant and in 6 of them not; where the maximum decrease will be 4.89 percentage point in “Hematological” therapeutic category and the increase will be 9.05 percentage point in “Biological” therapeutic category.

As was previously mentioned, there are ways to prevent substitution in a prescription by prescribers. One of them is when a prescriber written in words “Dispensing as Written”, “No substitution” or an equivalent message that prevent a pharmacist to substitute the prescription. Another example is when prescriber writes the Initials for example: “DAW” or “NS”. Finally, is when prescriber must check a box on a prescription where is labeled like for example: “Dispensing as Written” or “Generic equivalent Allowed". In our study once again, the three of the alternatives that were mention before, were significant: the Check Box, Initials & Written in Words but all of them result in decrease the processes of drug product selection when were measure by reimbursement ($).

After the seventeen therapeutic categories were analyze, a “Check Box” regulation showed that, measure by reimbursement ($), in 11 therapeutic category were significant and in 6 of them not; where the maximum decrease will be 14.25 percentage point in “Biological” therapeutic category and the increase will be 4.76 percentage point in “Anti-Infective” therapeutic category. Afterwards, “Initials” regulation showed that, measure by reimbursement ($), in 12 therapeutic category were significant and in 5 of them not; where the maximum decrease will be 9.29 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 3.89 percentage point in “Anti-Infective” therapeutic category. Finally, “Written in Words” regulation showed that, measure by reimbursement ($), in 12 therapeutic category were significant and in 5 of them not; where the maximum decrease will be 10.93 percentage point in “Biological” therapeutic category and the increase will be 3.01 percentage point in “Anti-Infective” therapeutic category.

A cost savings pass-on as was mention before was defined as a regulation that requires the pharmacist to pass-on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug and was separated in two: Patients Cost Saving by Portion of cost and Patients Cost Saving by Full saving, but both Patients Cost Saving are not significant in the processes of drug product selection when is measure by reimbursement ($).

But even thought “Patients Cost Saving by Portion of cost” and “Patients Cost Saving by Full saving” were not significant nationally, by therapeutic category was different, subsequently, “Patients Cost Saving by Portion of cost” regulation showed that, measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; where the maximum decrease will be 6.41 percentage point in “Nutritional Products” therapeutic category and the increase will be 6.10 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category. Also is the case of, “Patients Cost

Saving by Full saving" regulation showed that, measure by reimbursement ($) showed that, in 10 therapeutic category were significant and in 7 of them not; where the maximum decrease will be 16.39 percentage point in "Biological" therapeutic category and the increase will be 9.45 percentage point in "Misc. Psychotherapeutic & Neurology" therapeutic category.

Then, for the percentage of all prescribed as off-patent drugs, in states that determines whether patients can influence the generic substitution process at the point of the pharmacy, Patient Consent regulation was not significant measure by reimbursement ($). But even thought "Patient Consent" was not significant nationally, by therapeutic category was different. Then, a "Patient Consent" regulation measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; where the maximum decrease will be 8.45 percentage point in "Biological" therapeutic category and the increase will be 4.90 percentage point in "Hematological" therapeutic category.

In the Generic Prescribing Rate (GPR), another regulation that affects Pharmacy Profit was the Average Wholesale Price discount. Therefore, the results show that, measure by reimbursement ($), the two AWP discount are significant. In "AWP Basic Discount", the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive a lower payment, as result, would decrease the processes of drug product selection. In the other hand, in "AWP by Channel of Distribution" the bigger discount that manufacturers offered to a pharmacy, the pharmacy would receive higher payment, as a result, would increase the processes of drug product selection.

Then, after the seventeen therapeutic categories were analyze, an "AWP Basic Discount" regulation showed that, measure by reimbursement ($) showed that, in 11 therapeutic category were significant and in 6 of them not; and that the maximum decrease will be 0.01 % in "Anti-Infective" therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount and the increase will be 0.01 % in "Misc.

Psychotherapeutic & Neurology" therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount. After that, "AWP Generic Discount" regulation showed that, measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; and that the maximum decrease will be 0.003 % in "Misc. Psychotherapeutic & Neurology" therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount and the increase will be 0.002 % in "Analgesics & Anesthetics" therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount. Then, "AWP by Channel of Distribution" regulation showed that, measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; and that the maximum decrease will be 0.001 % in "Misc. Psychotherapeutic & Neurology" therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution and the increase will be 0.001 % in "Respiratory" therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution.

Finally, some regulations affect directly to the Pharmacy Profit. Is the case with, Dispensing Fee in pharmacy, in the study, three type of the dispensing were significant measure by reimbursement ($): the base rate, unit dose and generic. The first two, the base rate & unit dose shows that, they increase the processes of drug product selection but in the case of dispensing fee on generic if the state has them in the regulation, the fee will decrease generic substitution.

After the seventeen therapeutic categories were analyze, an "Dispensing Fee Base Rate" regulation showed that, measure by reimbursement ($), in 10 therapeutic category were significant and in 7 of them not; and that the maximum decrease will be 4.16 percentage point in "Nutritional Products" therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee and the increase will be

3.85 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee.

After that, “Dispensing Fee on Generic” regulation showed that, measure by reimbursement ($), in 10 therapeutic category were significant and in 7 of them not; and that the maximum decrease will be 2.62 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic and the increase will be 2.87 percentage point in “Anti-Infective” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic.

Then, even thought “Institutional Dispensing Fee” was not significant nationally by therapeutic category was different, therefore, “Institutional Dispensing Fee” regulation showed that, measure by reimbursement ($), in 5 therapeutic category were significant and in 12 of them not; and that the maximum decrease will be 0.71 percentage point in “Genitourinary” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee and the increase will be 0.63 percentage point in “Analgesics & Anesthetics” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee.

Finally, “Unit Dose Dispensing Fee” regulation showed that, measure by Reimbursement ($) showed that, in 9 therapeutic category were significant and in 8 of them not; and that the maximum decrease will be 0.60 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category if In the process of drug product selection States that change in $1 the Unit dose Dispensing Fee and the increase will be 2.04 percentage point in “Nutritional Products” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee.

5.3 Generic Dispensing Rate (GDR)

5.3.1 Generic Dispensing Rate (GPR) measure by Prescription (Rx)

The last rate calculated and analyzed was the percentage of off-patent drugs dispensed as generic defined as a Generic Dispensing rate (GDR), as a result, a positive formulary and non-formulary is significant in the process of drug product selection but both of them decrease the percentage of all prescribed as off-patent drugs if the state have them in their regulations measure by prescription (Rx) and decrease the percentage of all prescribed as off-patent drugs if the state have them in their regulations.

After the seventeen therapeutic categories were analyze, a positive formulary regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic categories and in 7 of them not; and that the maximum decrease will be 8.80 percentage points in “Nutritional Products” therapeutic category and the increase will be 2.34 percentage points in “Anti-Infective” therapeutic category. And, a non-formulary regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; that maximum decrease will be 8.982 percentage point in “Nutritional Products” therapeutic category and the minimum decrease will be 1.261 percentage point in “Central Nervous System” therapeutic category.

As we mentioned before, formularies are not the only drug products selection list; therefore, Others list was another of the regulations that was selected to be part of this study but is not significant when is measure by prescription (Rx). But after the seventeen therapeutic categories were analyze, “Others list” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 4.28 percentage point in “Endocrine & Metabolic Drugs”

therapeutic category and the increase will be 16.13 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category.

Approved Drug Product book, commonly known as the “Orange Book” was other regulation included in the state regulation analysis and is not significant when measure by prescription (Rx); but after the seventeen therapeutic categories were analyze, Orange Book regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic categories and in 7 of them not; and that the maximum decrease will be 10.36 percentage points in “Biological” therapeutic category and the increase will be 2.34 percentage points in “Stimulants/Anti-Obesity/Anorexia” therapeutic category.

Then, for the percentage of off-patent drugs dispensed as generic in states where pharmacists must substitute a less expensive generic drug or “mandatory’ substitution; the regulation is significant but decreases the processes of drug product selection when was measure by prescription (Rx). As a consequence, a “Permissive or Mandatory” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic categories and in 8 of them not; and that the maximum decrease will be 13.97 percentage points in “Biological” therapeutic category and the increase will be 4.03 percentage points in “Neuromuscular Drugs” therapeutic category.

There are many ways to prevent substitution in a prescription by prescribers, one of them, is when prescriber written in words “Dispensing as Written”, “No substitution” or an equivalent notation that prevent a pharmacist to substitute the prescription. Another example is when prescriber writes the Initials ex: “DAW” or “NS” and the final alternative; is when prescriber must check a box on a prescription where is labeled like ex: “Dispensing as Written” or “Generic equivalent Allowed. In our study once again, the three of the alternatives that were mention before, were significant: the Check Box, Initials & Written in Words but all

of them result in increase the processes of drug product selection when were measure by prescription (Rx).

After the seventeen therapeutic categories were analyze, a “Check Box” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 4.58 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 6.01 percentage point in “Genitourinary” therapeutic category. Afterwards, “Initials” regulation showed that, measure by prescription (Rx) was significant in 11 therapeutic categories and in 6 of them not; and that the maximum decrease will be 8.49 percentage points in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 6.95 percentage points in “Nutritional Products” therapeutic category. Finally, “Written in Words” regulation showed that, measure by prescription (Rx) was significant in 13 therapeutic category and in 4 of them not; and that the maximum decrease will be 1.21 percentage point in “Central Nervous System” therapeutic category and the increase will be 6.99 percentage point in “Genitourinary” therapeutic category.

A cost savings pass-on as was mention before was defined as a regulation that requires the pharmacist to pass-on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug and was separated in two: Patients Cost Saving by Portion of cost and Patients Cost Saving by Full saving, both of them are not significant when were measure by prescription (Rx).

After the seventeen therapeutic categories were analyze, an “Patients Cost Saving by Portion of cost” regulation showed that, measure by prescription (Rx) was significant in 7 therapeutic category and in 10 of them not; and that the maximum decrease will be 9.64 percentage point in “Biological” therapeutic category and the increase will be 2.69 percentage point in “Nutritional Products” therapeutic category. Then, a “Patients Cost Saving by Full

saving" regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 15.64 percentage point in "Misc. Psychotherapeutic & Neurology" therapeutic category and the increase will be 9.43 percentage point in "Respiratory" therapeutic category.

Again, for the percentage of off-patent drugs dispensed as generic in states where pharmacists must substitute a less expensive generic drug; Patient Consent regulation determines whether patients can influence the generic substitution process at the point of the pharmacy, is significant but decreases the processes of generic substitution when was measure by prescription (Rx). Then, after the seventeen therapeutic categories were analyze, a "Patient Consent" regulation showed that, measure by prescription (Rx) was significant in 14 therapeutic categories and in 3 of them not; and that the maximum decrease will be 2.74 percentage points in "Hematological" therapeutic category and the increase will be 3.27 percentage points in "Misc. Psychotherapeutic & Neurology" therapeutic category.

Average Wholesale Price (AWP) discount is a regulation that affects Pharmacy Profit. This discount was defined in both previous rates Net Generic Rate (NGR) and Generic Prescribing Rate (GPR). Therefore, after was measure by prescriptions (Rx) the three different AWP discount shows that; in an "AWP Basic Discount" the bigger discount that manufacturers offer to a pharmacy, pharmacy will be receive lower payment therefore will decrease the processes of drug product selection. In the other hand, "AWP Generic Discount" the bigger discount that manufacturers offer to a pharmacy, pharmacy will receive more payment therefore will increase the processes of drug product selection; but in this case a third discount was significant, this was the "AWP Channel Distribution A" that included: Institutions, Independent Pharmacy, Pharmacy Chain, etc; and in this the bigger discount that manufacturers offer to a pharmacy, pharmacy will be receive lower payment therefore will decrease the processes of drug product selection.

After the seventeen therapeutic categories were analyze, an “AWP Basic Discount” regulation showed that, measure by prescription (Rx) was significant in 10 therapeutic category and in 7 of them not; and that the maximum decrease will be 0.01 % in “Endocrine & Metabolic Drugs” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount and the increase will be 0.01 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount. After that, an “AWP Generic Discount” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 0.01 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount and the increase will be 0.003 % in “Endocrine & Metabolic Drugs” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount. Then, an “AWP by Channel of Distribution” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 0.001 % in “Genitourinary” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution and the increase will be 0.001 % in “Biological” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution.

Finally, as was mentioned Dispensing Fee regulation affect directly to the Pharmacy Profit. And is define as, an amount of money pay to a pharmacy when dispensing a prescription, therefore, Pharmacy receive a fixed payment (reimbursement) for the transaction. In the study, for the case of Generic Dispensing Rate (GDR), two type of the dispensing fee were significant: the unit dose and generic. The dispensing fee on generic shows that decrease the processes of drug product selection but in the case of dispensing

fee on unit doses if the state has them in the regulation, the fee will increase generic substitution measure by prescription (Rx).

After the seventeen therapeutic categories were analyze, an “Dispensing Fee Base Rate” regulation showed that, measure by prescription (Rx) was significant in 12 therapeutic category and in 5 of them not; and that the maximum decrease will be 5.27 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee and the increase will be 1.48 percentage point in “Anti-Infective” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee.

A “Dispensing Fee on Generic” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 2.43 percentage point in “Respiratory” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic and the increase will be 1.60 percentage point in “Antineoplastics” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic.

Then, even thought “Institutional Dispensing Fee” was not significant nationally by therapeutic category was different, therefore after the seventeen therapeutic categories were analyze, an “Institutional Dispensing Fee” regulation showed that, measure by prescription (Rx) was significant in 4 therapeutic category and in 13 of them not; and that the maximum decrease will be 0.70 percentage point in “Miscellaneous Products” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee and the increase will be 0.99 percentage point in “Hematological” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee.

Finally, “Unit Dose Dispensing Fee” regulation showed that, measure by prescription (Rx) was significant in 9 therapeutic category and in 8 of them not; and that the maximum decrease will be 0.44 percentage point in “Anti-Infective” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee and the increase will be 1.86 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee.

5.3.2 Generic Dispensing Rate (GPR) measure by Reimbursement ($)

The final rate calculated and analyzed was the percentage of off-patent drugs dispensed as generic and was defined as a Generic Dispensing rate (GDR) measure by reimbursement ($), as a result, a positive formulary is not significant in the process of drug product selection and non-formulary is significant measure by reimbursement ($) but decrease the percentage of all prescribed as off-patent drugs if the state have them in their regulations. Then as a result, after the seventeen therapeutic category were analyze, a positive formulary regulation showed that, measure by reimbursement ($), in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 13.73 percentage point in “Hematological” therapeutic category and the increase will be 14.06 percentage point in “Biological” therapeutic category. Then, a non-formulary regulation showed that, measure by reimbursement ($) showed that, in 10 therapeutic category were significant and in 7 of them not; where the maximum decrease will be 17.28 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 7.85 percentage point in “Miscellaneous Products” therapeutic category.

As we mentioned before, Others list was another of the regulations that was selected to be part of this study and is significant and increase the process of drug product selection when was measure by reimbursement ($). Then After the seventeen therapeutic categories were analyze, an “Others list” regulation showed that, measure by reimbursement ($), in 10 therapeutic category were significant and in 7 of them not; where the maximum increase will be 20.65 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category and the minimum increase will be 3.84 percentage point in “Analgesics & Anesthetics” therapeutic category.

Approved Drug Product book, commonly known as the “Orange Book” was other regulation included in the state regulation analysis and is not significant when is measure by reimbursement ($). But after the seventeen therapeutic category were analyze, an Orange Book regulation showed that, measure by reimbursement ($), in 7 therapeutic category were significant and in 10 of them not; where the maximum decrease will be 18.96 percentage point in “Biological” therapeutic category and the increase will be 3.99 percentage point in “Stimulants/Anti-Obesity/Anorexia” therapeutic category.

Then, for the percentage of off-patent drugs dispensed as generic in states where pharmacists must substitute a less expensive generic drug or “mandatory’ substitution; the regulation is significant but decreases the processes of drug product selection when was measure by reimbursement ($). As a consequence, “Permissive or Mandatory” regulation showed that, measure by reimbursement ($), in 12 therapeutic category were significant and in 5 of them not; where the maximum decrease will be 18.49 percentage point in “Biological” therapeutic category and the increase will be 4.197 percentage point in “Genitourinary” therapeutic category.

In addition, there are a lot of ways to prevent substitution in a prescription by a prescribers, one of them, is when prescriber written in words “Dispensing as Written”, “No

substitution" or an equivalent notation that prevent a pharmacist to substitute the prescription. Another example is when prescriber writes the Initials ex: "DAW" or "NS" and the final alternative; is when prescriber must check a box on a prescription where is labeled like ex: "Dispensing as Written" or "Generic equivalent Allowed. In our study once again, the three of the alternatives that were mention (Check Box, Initials & Written in Words) measure by reimbursement ($) only "Written in Words" was significant increasing the processes of drug product selection.

After the seventeen therapeutic categories were analyze, a "Check Box" regulation showed that, measure by reimbursement ($), in 11 therapeutic category were significant and in 6 of them not; where the maximum decrease will be 12.30 percentage point in "Misc. Psychotherapeutic & Neurology" therapeutic category and the increase will be 13.65 percentage point in "Biological" therapeutic category. Afterwards, "Initials" regulation showed that, measure by reimbursement ($), in 8 therapeutic category were significant and in 9 of them not; where the maximum decrease will be 10.46 percentage point in "Misc. Psychotherapeutic & Neurology" therapeutic category and the increase will be 4.42 percentage point in "Genitourinary" therapeutic category. Finally, "Written in Words" regulation showed that, measure by reimbursement ($) showed that, in 8 therapeutic category were significant and in 9 of them not; where the maximum decrease will be 8.16 percentage point in "Hematological" therapeutic category and the increase will be 10.98 percentage point in "Genitourinary" therapeutic category.

A cost savings pass-on as was mention before was defined as a regulation that requires the pharmacist to pass-on to the consumer all or part of the cost savings from dispensing a non-innovator multi-source drug, the variable was separated in two: Patients Cost Saving by Portion of cost and Patients Cost Saving by Full saving, and Patients Cost

Saving by Portion of cost was significant when was measure by reimbursement ($) but decreases the processes of drug product selection

After the seventeen therapeutic categories were analyze, an “Patients Cost Saving by Portion of cost” regulation showed that, measure by reimbursement ($), in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 13.31 percentage point in “Biological” therapeutic category and the increase will be 4.61 percentage point in “Miscellaneous Products” therapeutic category. And, a “Patients Cost Saving by Full saving” regulation showed that, measure by reimbursement ($), in 7 therapeutic category were significant and in 10 of them not; where the maximum decrease will be 10.37 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category and the increase will be 7.96 percentage point in “Respiratory” therapeutic category.

Again, for the percentage of off-patent drugs dispensed as generic in states where pharmacists must substitute a less expensive generic drug; Patient Consent regulation determines whether patients can influence the generic substitution process at the point of the pharmacy, is not significant when was measure by reimbursement ($). Then, after the seventeen therapeutic categories were analyze, a “Patient Consent” regulation showed that, measure by reimbursement ($), in 9 therapeutic category were significant and in 8 of them not; where the maximum decrease will be 6.65 percentage point in “Biological” therapeutic category and the increase will be 5.03 percentage point in “Genitourinary” therapeutic category.

Additionally, Average Wholesale Price (AWP) discount is a regulation that affects Pharmacy Profit. This discount was defined in both previous rates Net Generic Rate (NGR) and Generic Prescribing Rate (GPR). Therefore, measure by reimbursement ($), the result shows that in an “AWP Basic Discount” the bigger discount that manufacturers offer to a pharmacy, pharmacy will be receive lower payment therefore will decrease the processes of

drug product selection. In the other hand, “AWP Generic Discount” the bigger discount that manufacturers offer to a pharmacy, pharmacy will receive more payment therefore will increase the processes of drug product selection; and in the case of “AWP Channel Distribution A” that included: Institutions, Independent Pharmacy, Pharmacy Chain, etc; the bigger discount that manufacturers offer to a pharmacy, pharmacy will be receive lower payment therefore will decrease the processes of drug product selection.

After the seventeen therapeutic categories were analyze, an “AWP Basic Discount” regulation showed that, measure by reimbursement ($) showed that, in 7 therapeutic category were significant and in 10 of them not; and that the maximum decrease will be 0.009 % in “Miscellaneous Products” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount and the increase will be 0.011 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Basic Discount. After that, “AWP Generic Discount” regulation showed that, measure by reimbursement ($) showed that, in 13 therapeutic category were significant and in 4 of them not; and that the maximum decrease will be 0.011 % in “Misc. Psychotherapeutic & Neurology” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount and the increase will be 0.004 % in “Endocrine & Metabolic Drugs” therapeutic category if in the process of drug product selection States change in 1% AWP Generic Discount.

Then, “AWP by Channel of Distribution” regulation showed that, measure by reimbursement ($) showed that, in 10 therapeutic category were significant and in 7 of them not; and that the maximum decrease will be 0.001 % in “Genitourinary” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution and the increase will be 0.002 % in “Miscellaneous Products” therapeutic category if in the process of drug product selection States change in 1% AWP by Channel of Distribution.

Finally, Dispensing Fee regulation affect directly to the Pharmacy Profit. And is define as, an amount of money pay to a pharmacy when dispensing a prescription, therefore, Pharmacy receive a fixed payment (reimbursement) for the transaction. In the study, for the case of Generic Dispensing Rate (GDR), two type of the dispensing fee were significant: the unit dose and generic. The dispensing fee on generic shows that, decrease the processes of drug product selection and in the case of dispensing fee on unit doses if the state has them in the regulation, the fee will increase generic substitution measure by reimbursement ($).

After the seventeen therapeutic categories were analyze, an “Dispensing Fee Base Rate” regulation showed that, measure by reimbursement ($), in 9 therapeutic category were significant and in 8 of them not; and that the maximum decrease will be 8.73 percentage point in “Misc. Psychotherapeutic & Neurology” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee and the increase will be 3.92 percentage point in “Hematological” therapeutic category if In the process of drug product selection States that change in $1 the Basic Dispensing Fee. After that, “Dispensing Fee on Generic” regulation showed that, measure by reimbursement ($), in 10 therapeutic category were significant and in 7 of them not; and that the maximum decrease will be 5.19 percentage point in “Hematological” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic and the increase will be 0.92 percentage point in “Topical Products” therapeutic category if In the process of drug product selection States that change in $1 the Dispensing Fee on Generic.

Then, even thought “Institutional Dispensing Fee” was not significant nationally by therapeutic category was different, therefore measure by reimbursement ($) showed that, in 5 therapeutic category were significant and in 12 of them not; and that the maximum decrease will be 1.11 percentage point in “Miscellaneous Products” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee

and the increase will be 1.41 percentage point in “Biological” therapeutic category if In the process of drug product selection States that change in $1 the Institutional Dispensing Fee.

Finally, a “Unit Dose Dispensing Fee” regulation showed that, measure by reimbursement ($) showed that, in 11 therapeutic category were significant and in 6 of them not; and that the minimum decrease will be 0.45 percentage point in “Central Nervous System” therapeutic category if In the process of drug product selection States that change in $1 the Unit dose Dispensing Fee and the maximum increase will be 3.40 percentage point in “Miscellaneous Products” therapeutic category if In the process of drug product selection States that change in $1 the Unit Dose Dispensing Fee.

5.4 Generic Rates variation across the States and U.S. Medicaid

Generics rates (Net Generic, Generic Prescribing and Generic Dispensing) were calculated in each States, excluding: Arizona and Tennessee. Given the size of the data set, the results were arranged in increasing magnitude, the minimum, 10th percentile, 25th percentile, the median, the mean, 75th percentile, 90th percentile and the maximum.

This is a summary of the data (a descriptive analysis), were none statistical analysis was made and were not control for regulations or any other factors. Therefore, percentiles were calculated (calculations were by quarter by year) and three points were randomly selected to show the behavior of the rates.

5.4.1 Net Generic rate (NGR)

Net Generic Rate (NGR) is the measure that indicates the percentage of all drugs dispensed as generic; therefore, across those three randomly selected points, it is possible to see a trend where, almost in all percentiles, the percentage of all drugs dispensed as a generic measure by prescriptions and reimbursement was almost the same, as well as the increment (Table.IV).

Exhibit 11 shows, that the distribution of all drugs dispensed as a generic measure by prescriptions in second quarter of 1991was in the order of the 40% in each percentiles as well as second quarter of 2000. In the second quarter of 2008 was an increment in the percentage of all drugs dispensed as a generic in the order of the 60% in each percentile. Likewise, the distribution of all drugs dispensed as a generic measure by reimbursement in each of the points was between 12% and 25% in each of percentile.

Table IV.

Net Generic rate (NGR)	Measured by Reimbursement ($)			Measured by Prescriptions (Rxs)		
	1991-2	2000-2	2008-2	1991-2	2000-2	2008-2
10th percentile	14.50%	13.40%	12.50%	40.70%	44.00%	62.10%
25th percentile	17.20%	14.30%	15.00%	42.00%	44.60%	64.60%
Median	18.90%	16.80%	18.30%	45.10%	47.60%	68.50%
75th percentile	20.80%	18.20%	21.70%	49.80%	49.90%	70.60%
90th percentile	24.10%	19.60%	24.70%	53.60%	52.00%	72.60%

5.4.2 Generic Prescribing rate (GPR)

Generic Prescribing Rate (GPR) indicates the percentage of Off-Patent drugs dispensed as a generic. As a result, across those three randomly selected points, again is possible to see a trend where, almost in all percentiles, the percentage of Off-Patent drugs dispensed as a generic measure by prescriptions and reimbursement was almost the same, as well as the increment (Table.V).

Exhibit 12 shows, that the distribution of Off-Patent drugs dispensed as a generic measure by prescriptions in second quarter of 1991was in the order of the 60% in each percentiles as well as second quarter of 2008. In the second quarter of 2000 was an increment in the percentage of Off-Patent drugs dispensed as a generic in the order of the 50% in each percentile.

Similarly, the distribution of Off-Patent drugs dispensed as a generic measure by reimbursement in each of the points was diverse, in second quarter of 1991was in the order of the 30% in each percentiles, in second quarter of 2000 was in the order of the 20% in each percentiles and in second quarter of 2008 was between 17% and 29% in each of percentile (Table.V).

Table V.

Generic Prescribing rate (GPR)	Measured by Reimbursement ($)			Measured by Prescriptions (Rxs)		
	1991-2	2000-2	2008-2	1991-2	2000-2	2008-2
10th percentile	32.70%	19.10%	17.30%	61.00%	51.60%	65.70%
25th percentile	34.90%	21.50%	19.30%	63.70%	54.40%	67.90%
Median	37.70%	23.20%	22.70%	66.50%	56.40%	71.50%
75th percentile	40.30%	25.20%	25.60%	67.90%	58.00%	73.30%
90th percentile	42.90%	26.50%	29.40%	72.90%	59.90%	75.40%

5.4.3 Generic Dispensing rate (GDR)

Generic Dispensing Rate (GDR) is the number of prescriptions filled with a generic as a percentage of all drugs Prescribed as Off-Patent. As a result, across those three randomly selected points, again is possible to see a trend where (Table.VI) the distribution of the number of prescriptions filled with a generic as a percentage of All drugs Prescribed as Off-Patent measure by prescriptions in second quarter of 1991was in the order of the 60% in each percentiles, in second quarter of 2000 was in the order of the 80% in each percentiles and In the second quarter of 2008 was in the order of the 90% in each percentile.

In the same way, the distribution of the number of prescriptions filled with a generic as a percentage of All drugs Prescribed as Off-Patent measure by reimbursement in each of the points was diverse, in second quarter of 1991was between 40% and 60% in each percentiles, in second quarter of 2000 was between 64% and 77% in each percentiles and in second quarter of 2008 was between 69% and 89% in each of percentile (Table.VI).

Table VI.

Generic Dispensing rate (GDR)	Measured by Reimbursement ($)			Measured by Prescriptions (Rxs)		
	1991-2	2000-2	2008-2	1991-2	2000-2	2008-2
10th percentile	41.60%	64.20%	69.30%	63.40%	81.50%	93.60%
25th percentile	46.70%	67.20%	76.80%	65.90%	82.80%	95.20%
Median	50.90%	70.90%	83.00%	69.90%	84.50%	96.00%
75th percentile	54.80%	73.50%	85.90%	72.90%	86.40%	96.90%
90th percentile	60.90%	77.10%	89.30%	76.20%	87.60%	97.50%

5.5 Limitations

This study considered factors and regulations that affect the process of drug product selection, but all the results and conclusion should be understand under the frame of these limitations.

The period of the study was 18 years from 1991 until 2008, but Medicaid State Drug Utilization Data from Center of Medicaid and Medicare Services (CMS) is reported by quarter by year, therefore, the rates were calculated base on market status, and every time that a drug change market status (lost patent protection and move from Single Source product to Innovator Multi-Source and Non-Innovator Multi-Source) therefore the error or variability will be between three month, where were not able to know the moment when medications change status.

Another factor is the availability of Innovator Multi-Source and Non-Innovator Multi-Source medications in each of the therapeutic categories that were use in the study. As was mentioned, to separate each therapeutic categories were used a 14 digit code, also know as a Generic Product Identifier (GPI) code, but because the data had Over-the-Counter (OTC) drugs, a 16 digit code was created (14 digit code + 2 that represent Rx or OTC); base on that, was able to determine what drugs were able to be substituted. However, some of these therapeutic categories were relatively new ex: Biological and in the same case the regulations to that specific category have not been 100% define; therefore the Generic Rate in each of the cases were low or cero because the absence of the generic alternative.

Other, factor to take in consideration is “physicians’ preferences”; in our data set we don’t have variables that were measure that factor or that indicates “physicians’ preferences”. What we have is the outcome of what physicians prescribed, therefore will be useful to measure or have a parameter that tells you that.

Finally, is important to situate on perspective the Population of the data that was study (The Medicaid population by state), the main reason of that is because, as a government program is important for them the cost, therefore, the incentive to used generic alternative if it is available in the market is very important, To help to reduce and control de cost or reimbursement.

5.6 Conclusions

The Generic Rates calculated and the empirical model in this study, were able to explain the dynamic in the last 18 years of the generic substitution in Medicaid program.

In the descriptive part, Generic rates successfully show how the use of generic medication was and how product substitution happens.

The sample of the data (the complete universe of drugs that were reimbursed in Medicaid program) was able to show how the cost per prescription ($/Rx) has increase substantially and since 2001 in exponential way in Single Source products and Innovator Multiple Source but at the same time, Non-Innovator Multiple Source Product – also known as Generic product – has increase in a very low proportion that the slope of the line is almost flat

Consequently, the percentage of all dispensed as generic – also known as Net Generic Rate (NGR) – have increased in the 18 years of the study with a little decline during the period of 1999 and recovered in 2004 and since that year was increasing. Then, the percentage of all prescribed as Off-patent – also known as Generic Prescribing Rate (GPR) – was stable in the first four year, then in 1997 decline a little more drastic than NGR but recovered in 2004 and since that year was increasing. Finally, the percentage of Off-Patent dispensed as Generic – also known as Generic Dispensing Rate (GDR) – Since 1991 until 2009 was increasing.

Moreover, after the nineteen regulations were testing to determine the effects of them in each of the generic rates (measure by prescriptions (Rx) and by reimbursement ($) the trend show that most of the impact that these regulations is reduce or decrease the use of generic medication rather than increase them.

Finally, others factors like: types of therapeutics categories, the lack of regulation for specific type of medications Ex: Biological, medications that were under patent protection in the compete period (18 years) because they were new in the market; show us that there so many changes in the market dynamic that when is control by state and time, every single time that, a study with this dimensions want to be done, has to be in consideration all these factor and more.

GLOSSARY

Single-Source (SS) Drug : A single-source drug is a product that is produced or distributed under an original new drug application (NDA) approved by the FDA, including a drug product marketed by cross-licensed producers or distributors operating under the new drug application and is under patent or exclusivity protection. Usually, a single source drug is identified as a brand name drug that has no generic equivalent in the market.

Innovator Multi-Source (IMS) Drug: An innovator multi-source drug is a product that was first authorized for marketing under an original NDA approved by the FDA, but is off-patent or has no exclusivity protection however is still marketed by the original manufacturer. Usually, these IMS products have one or more generic equivalents in the market. Generally, these products are referred to as off-patent brand name drugs that have generic equivalents in the market

Non-Innovator Multi-Source (NMS) Drug: A non-innovator multiple-source drug is a product that has the same standards as an innovator multi-source drug (bioequivalent and effectiveness) and identical composition but is marketed or sold by manufacturers or labelers other than the original manufacturer. It is a drug that is not under any patent or exclusivity protection and is identified as a generic drug.

Net Generic Rate (NGR): Net Generic Rate is defined as the ratio of the number of non-innovator multi-source drugs divided by all the drugs (single source, innovator multi-source and non-innovator multi-source) that were reimbursed by Medicaid program in each State in a specific period of time. The formula is: NMS / (SS + IMS + NMS).

Generic Dispensing Rate (GDR): Generic Dispensing Rate is defined as the ratio of the number of non-innovator multi-source drugs divided by just innovator multi-source and non-innovator multi-source drugs that were reimbursed by Medicaid program in each State in a specific period of time. This index determines how frequently a generic drug is dispensed when a generic version of a brand drug is in the market. Also sometimes mention as the generic “penetration” or “efficacy” rate (Levinson D. (2006). The formula is: NMS / (IMS + NMS).

Generic Prescribing Rate (GPR): Generic Prescribing Rate is defined as the ratio of the number of innovator multi-source and non-innovator multi-source drugs divided by all the drugs (single source, innovator multi-source and non-innovator multi-source) that were reimbursed by Medicaid program in each State in a specific period of time. Is the percentage of all prescriptions filled that were generics drugs (Levinson D. (2006). The formula is: (IMS + NMS) / (SS + IMS + NMS).

Generic Substitution: Generic substitution is defined as a process where a different drug product is dispensed than the drug product that was prescribed, but is considered therapeutically equivalent. Generic substitution is based on the concept of therapeutic equivalence that is the generic product will produce the exact equivalent clinical effects (both therapeutic and toxic) as the reference product when administered under the identical conditions in the same dosage in the same patient. When authorizing generic substitution the practitioner expects therapeutics equivalence between the generic product & the reference product therefore no dosage adjustment or additional monitoring should be required (above and beyond that which would normally occur with the reference product. (James D. Henderson and Richard H. Esham (2001).

Therapeutic Equivalence: Drug products can be substituted for other drugs if it will produce the same clinical effect and safety profile as the prescribed product. Drug products are considered to be therapeutically equivalent only if they meet these criteria: contain the same active ingredients; dosage form; route of administration; and strength; and the FDA assigned therapeutically equivalent codes starting with the letter "A ". (Thomson Micromedex, 27th Ed.)

Bioequivalent: The standard that a non-innovator multi-source drug has to match with the original reference listed drug in acceptable parameters for bioavailability, which is the extent and the rate at which the body absorbs the drug. The generic version must deliver the same amount of active ingredients into a patient's bloodstream and in the same time as the single-source drug. (Thomson Micromedex, 27th Ed.)

REFERENCE

1. Abramson RG, Harrington CA, Missmar R, Li SP, Mendelson DN. (2004) Generic drug cost containment in Medicaid: Lessons from five state MAC programs. Health Care Finance Rev. 2004; 25:25-34.

2. Ascione F, Kirking D, Gaither C & Welage L. (2001) Historical overview of generic medication policy. Journal of the American Pharmaceutical Association, 2001; 41: 4, 567-577.

3. Approved Drug Product and Legal Requirements. 27th Edition , 2007. Approved Drug Products with Therapeutic Equivalence Evaluations. 34th Edition , 2014. U.S. Department of Health and Human Services Food and Drug Administration Center for Drug Evaluation and Research Office of Medical Products and Tobacco Office of Generic Drugs.

4. Avorn J. and Soumerai S. B. (1983) Improving drug-therapy decisions through educational outreach. A randomized controlled trial of academically based "detailing". The New England Journal of Medicine. 1983; 24:1457-1463.

5. Berger MS & Berger BA (2005). FDA Overview from emedicinehealth.com. Retrieved December 2, 2010, http://www.emedicinehealth.com/fda_overview/article_em.htm

6. Bruen B.K. (2002). States Strive to Limit Medicaid Expenditures for Prescription drugs. The Kaiser Family Foundation. February 2002. Retrieved December 06, 2010, from http://www.kff.org/medicaid/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=14111

7. Bruen B. K. & Miller L.M. (2008) Changes in Medicaid Prescription Volume and use in the wake of Medicare Part D implementation. Health Affair, January/February 2008.

8. Caves RE, Whinston MD, Hurwitz MA, Pakes Al & Temin P (1991). Patent Expiration, Entry, and Competition in the U.S. Pharmaceutical Industry. Brookings Papers on Economic Activity. Microeconomics © 1991 The Brookings Institution.

9. Centers for Medicare & Medicaid Services, National Health Expenditure Data, Table 3, National Health Expenditures; Levels and Annual Percent Change, by Source of Funds: Selected Calendar Years 1960-2012,

http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ tables.pdf.

10. Centers for Medicare & Medicaid Services, National Health Expenditure Data, Table 22, Health Insurance Enrollment and Uninsured; Number of Enrollees and Annual Percent Change, Calendar Years 1987-2012, http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-eports/NationalHealthExpendData/Downloads/ tables.pdf

11. Centers for Medicare & Medicaid Services, Data Analysis Brief Medicare-Medicaid Dual Enrollment from 2006 Through 2011, Prepared by Medicare-Medicaid Coordination Office, February 2013, Table 2. Yearly Trends of Medicare-Medicaid Enrollees and Medicare-only Enrollees, (Non-MMEs) in the Total Medicare Population by Age Group from 2006 through 2011. http://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/Dual_Enrollment_2006-2011_Final_Document.pdf.

12. Cox E., Behm A., Mager D. & Miller S. 2004 Generic Drug Usage Report. Express Scripts Research Study Findings. http://www.express-scripts.com/ourcompany/news/outcomesresearch/onlinepublications/study/gdur.pdf

13. Christian-Herman J, Emons M, George D. (2004). Effects of generic-only drug coverage in a Medicare HMO. Health Aff (Millwood). 2004; Suppl Web Exclusives: W4-455-68.

14. Crowley JS, Ashner D, Elam L. Medicaid outpatient prescription drug benefits: Findings from a national survey, 2003. Menlo Park, CA: The Henry J. Kaiser Family Foundation; 2003.

15. De Wolf D, Smeers Y. S Stochastic Version of Stackelberg-Nash-Cournot equilibrium Model, (1997). Management Science. 1997; 43(2)190-197.

16. Dickson PR. and Ginter JL. Market Segmentation, Product Differentiation, and Marketing Strategy (1987). Journal of Marketing, Vol. 51, No. 2 (Apr., 1987), pp. 1-10.

17. Ernst ME.; Kelly MW.; Hoehns JD.; Swegle JM ; Buys LM.; Logemann CD.; Ford JK.; Kautzman HA.; Sorofman BA.; Pretorius RW. (2000). Prescription Medication Costs: A Study of Physician Familiarity. Archives Family Medicine. 2000; 9:1002-1007.

18. Express Scripts Research Study Findings. Geographic Variation in Generic Fill Rate. Retrieved December 06, 2010, from http://www.reducedrugprices.org/av.asp?na=128

19. Express Scripts (2004). Overall Drug Trend, Express Scripts Drug Trend Report 2004. Retrieved December 06, 2010, from http://www.express-scripts.com/research/studies/drugtrendreport/2004/trend.pdf

20. Facchinetti NJ & Dickson WM (1982). Access to generic drugs in 1950s: The politics of a social problem. American Journal Public Health, 1982; 72: 468-475. Retrieved November 23, 2010, from http://ajph.aphapublications.org/cgi/reprint/72/5/468 .

21. Fischer MA, Avorn J. (2004). Potential savings from increased use of generic drugs in the elderly: What the experience of Medicaid and other insurance programs means for a Medicare drug benefit. Pharmacoepidemiology and Drug Safety.2004; 13:207-214. Retrieved December 06, 2010, from http://onlinelibrary.wiley.com/doi/10.1002/pds.872/pdf

22. Fischer MA, Avorn J. (2003). Economic consequences of underused of generic drugs: Evidence from Medicaid and implications for prescription drug benefit plans. Health Serv Res. 2003; 38:1051-1063.

23. Fischer MA, Schneeweiss S, Avorn J, Solomon DH. (2004). Medicaid prior-authorization programs and the use of cyclooxygenase-2 inhibitors. N Engl J Med. 2004; 351:2187-2194.

24. Gencarelli DM (2005). One pill, many prices: Variation in prescription drug prices in selected government programs. NHPF Issue Brief. 2005 ;(807):1-20.

25. Gibson T.B., Ozminkowski R.J. & Goetzel R.Z., (2005), The Effects of Prescription Drug Cost Sharing: A Review of the Evidence, The American Journal of Managed Care Vol. 11, No. 11, November 2005.

26. Golberg, T., DeVito, C.A.,& Raskin, I.E. (1986) Generic Drug Laws: A Decade of Trial A Prescription for Progress. U.S. Department of Health and Human Services.

27. Graber DR, Bellack JP, Lancaster C, Musham C, Nappi Jean & O'Neil EH (1999). Curriculum topics in pharmacy education: Current and ideal emphasis.American Journal of Pharmaceutical Education, Vol. 63, summer 1999.

28. Greczyn R.J., Jr. (2003), Prescription Drugs and Medical Costs: Four Opportunities for Health Plans and Physicians to Make a Difference, NC Med J, Volume 64, Number 6, November/December 2003.

29. Greene, H. W. (2003). Econometric Analysis. Fifth edition. New Jersey: Prentice Hall publication.

30. Haas JS, Phillips KA, Gerstenberger EP, Seger AC.(2005) Potential savings from substituting generic drugs for brand-name drugs: Medical expenditure panel survey, 1997-2000. Ann Intern Med. 2005; 142:891-897.

31. Hartman M, Martin AB, Benson J, Catlin A and the National Health Expenditure Accounts Team, Notional Health Spending in 2011: Overall Growth Remains Low, But Some Payers and Services Show Signs of Acceleration. Health Affairs, 32 (1), 87-99, 2013.

32. Hassen, A S. (2004). A Summary of recent changes to the drug price competition and patent term restoration act of 1984.

33. HDMA FACTBOOK Industry Overview 2005-2006. (2005). FactBook: Industry Overview. (ISSN: 0-97791914-0-0). U.S., VA: Author.

34. Heffler S, Smith S, Keehan S, Clemens MK, Zezza M, Truffer C. (2004) Health spending projections through 2013. Health Aff (Millwood). 2004; Suppl Web Exclusives: W4-79-93.

35. Hellerstein J, K. (1998). The importance of the physician in the generic versus trade-name prescription decision. RAND Journal of Economics, Spring 1998 Vol. 29 (1): 108-136.

36. Henney, JE (2000). Challenges in Regulating Direct-to-Consumer Advertising. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2242.

37. Hong SH; Shepherd MD; Scoones D & Wan TH (2005). Product-Line Extensions and Pricing Strategies of Brand-Name Drugs Facing Patent Expiration. Journal of Managed Care Pharmacy November/December 2005; 11; 9:746-54.

38. Huang, AJ (2000). The rise of Direct-to-Consumer Advertising of Prescription drugs in the United States. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2240.

39. Humphreys A. (2006). World's Best Selling Medicines. Med Ad News, June 2006.Vol. 25 (6). Retrieved August 20.2006, from http://www.pharmalive.com/magazines/medad/view.cfm?articleID=3613.

40. James D. Henderson and Richard H. Esham (2001). Generic Substitution: Issues for Problematic Drugs. Southern Medical Journal. January 2001, Vol. 94 Issue 1: 16-21.

41. Kesselheim AS., Fischer MA., & Avorn J (2006).Extensions Of Intellectual Property Rights and Delayed Adoption of Generic Drugs: Effects On Medicaid Spending. Health Affairs (2006) 25:6:1637–1647.

42. Kravitz, RL (2000). Direct-to-Consumer Advertising of Prescription drugs: Implications for Patients-Physician relationship. Journal of American Medical Association (JAMA). November 1, 2000, 284;17:2244.

43. Levinson D. (2006). Generic Drug Utilization in State Medicaid Programs. Department of Health and Human Services, Office of Inspector General (OIG). July 2006.Retrieved November 16 2010, from. http://oig.hhs.gov/oei/reports/oei-05-05-00360.pdf.

44. Lewis RA. (1992). The emerging effects of the Drug Price Competition and Patent Term Restoration Act of 1984. Journal of Contemporary Health Law & Policy. 8:361-78, 1992.

45. Mott, D. & Krelling, D. (1997). The influence of therapeutic category and insurance type on generic substitution of drug products. Journal of Research in Pharmaceutical Economics, 1997 Vol. 8(3):3-22.

46. National Association of Chain Drug Stores. (2008). Industry Facts-at-a-Glance, June 23, 2008. Alexandria, VA: Author. Retrieved June 23, 2008, from. http://www.nacds.org/wmspage.cfm?parm1=507#top.

47. National Institute for Health Care Management Foundation (2000). Prescription Drugs and Intellectual Property Protection. August 2000

48. National Institute for Health Care Management (2000). Prescription Drug and Mass Media Advertising. Washington September 2000.

49. National Institute for Health Care Management (2001). Prescription Drug Expenditure in 2000: The Upward trend continues. Washington May 2001.

50. Ornstein SM.; MacFarlane LL; Jenkins RG; Pan Q; Wager KA. (1999). Medication Cost Information in a Computer-Based Patient Record System: Impact on Prescribing in a Family Medicine Clinical Practice Archives Family Medicine. 1999; 8:118-121.

51. Pharmaceutical Research and Manufacturers of America, Pharmaceutical Industry Profile 2008 (Washington, DC: PhRMA, March 2008).

52. Reichert S, Simon T & Halm EA. (2000) Physicians' attitudes about prescribing and knowledge of the cost of common medications. Archives of Internal Medicine 2000; 160:2799-2803.

53. Ryan, Jennifer (2006). Medicaid in 2006: A Trip Down the Yellow Brick Road?. National Health Policy Forum. March 29,2006; 810

54. Schwalberg R., Bellamy H., Giffin M., Miller C. & Schreiber S. (2001). Medicaid outpatient prescription drug benefits: Findings from a national survey and selected case study highlights. The Kaiser Family Foundation. October 2001.Retrieved December 06, 2010, from http://www.kff.org/medicaid/loader.cfm?url=/commonspot/security/getfile.cfm&PageID=14047

55. Scheinder A & Elam L. (2002). Medicaid: Purchasing Prescription Drugs. Policy Brief. Kaiser Commission on Medicaid and the Uninsured. January 2002.

56. Scherer F. M. (1993). Pricing, Profits, and Technological Progress in the Pharmaceutical Industry. Journal of Economic Perspectives, Summer 1993; 7:3; 97-115

57. Schondelmeyer S.W. (2000), Patents, Intellectual Property, Innovation and Prescription Drugs: Do the Rules Benefit Consumer, Presentation made at a congressional briefing, (September 25, 2000).

58. Sherali HD., Soyster AK., Murphy FH. Stackelberg-Nash-Cournot Equilibria: Characterizations and Computations. (1983). Operations Reseach. 1983; 31(2)253-276.

59. Sibbald, B (2001). Drug patent protection: How long is long enough?. Canadian Medical Association Journal. May 1, 2001; 164 (9).

60. Soehnge H. (2003). The Drug Price Competition and Patent Term Restoration Act of 1984: fine-tuning the balance between the interests of pioneer and generic drug manufacturers. Food & Drug Law Journal. 58(1):51-80.

61. Sumpton JE, Frewen TC, and Rieder MJ (1992). The effect of physician education on knowledge of drug therapeutics and cost. The Annals of Pharmacotherapy 1992; 26:692-697.

62. Thomson Micromedex. Approved Drug Product and Legal Requirements. 27th Edition , 2007.

63. The National Institute for Health Care Management Research and Educational Foundation (2002). A Primer: Generic Drugs, Patents and the

Pharmaceutical Marketplace. June 2002. Retrieved December 06, 2010, from http://nihcm.org/pdf/GenericsPrimer.pdf

64. Thomas J & Schondelmeyer S (1992). Price Indexes for Pharmaceuticals used by the Elderly. Health Care Financing Review, Fall 1992; 14:1: 91-106.

65. Tremblay CH., Tremblay MJ., Tremblay VJ. A General Cournot-Bertrand Model with Homogeneous Goods, (2011). Theoretical Economics Letters. 2011; 1:38-40.

66. U.S. Food & Drug Administration, *Approved Drug Products with Therapeutic Equivalence Evaluations*, also known as the 'FDA Orange Book', 34th edition, 2014, pp. vi-vii.

67. United State Code. Title 21 – Food and Drugs. Chapter 9, Subchapter V, Part A - Drugs and Devices, Sec. 355. New drugs. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl21/ch9/subchV/ptA/sec355.html

68. United State Code. Title 35 – Patents, Chapter 14, Sec. 156. Extension of patent term. Retrieved November 06, 2006, from http://www.washingtonwatchdog.org/documents/usc/ttl35/ptII/ch14/sec156.html

69. U.S. Department of Commerce. United States Patent and Trademark Office. Manual of Patent Examining Procedure. Eighth Edition, August 2001. Retrieved November 07, 2006, from http://www.uspto.gov/web/offices/pac/mpep/documents/front.htm

70. Walzak D, Swindells S & Bhardwai A (1994) Primary care physicians and the cost of drugs: a study of prescribing practices based on recognition and information sources. The Journal of Clinical Pharmacology, 1994; 34:1159-1163.

71. Wilkes MS., Bell RA., and Kravitz RL. (2000). Direct-To-Consumer Prescription Drug Advertising: Trends, Impact, And Implications. Health Affairs, 2000;19:2:110-128.

72. Welage, L, S., Kirking D. M., Ascione F. J., and Gaither C. A.. Understanding the Scientific Issues Embedded in the Generic Drug Approval Process. Journal of the American Pharmacists Association. posted: 02/06/2002; J Am Pharm Assoc. 2001;41(6) © 2001 American Pharmacists Association. Retrieved December 27, 2010, http://www.medscape.com/viewarticle/421495_1

Appendix 1
Supplementary Summary Figures of Medicaid Drug Utilization data set 1991 - 2009

Medicaid Drug Claims*: Q1 1991 to Q2 2009

	Expenditures ($)			% of Expenditures ($) by Patent Status		
	Rx Claims	OTC Claims	All Drug Claims	Rx Claims	OTC Claims	All Drug Claims
All Drug Claims	$ 355,855,935,514	$ 4,069,054,907	$ 359,924,990,420	98.9%	1.1%	100.0%
Drug Claims with Unknown Product Info	$ 8,921,029	$ 951,376	$ 9,872,405	90.4%	9.6%	100.0%
Usuable Drug Claims	$ 355,847,014,484	$ 4,068,103,531	$ 359,915,118,015	98.9%	1.1%	100.0%
% of Drug Claims Used	99.997%	99.977%	99.997%			

	Drug Claims (Prescriptions, Rxs)			% of Drug Claims (Prescriptions, Rxs)		
	Rx Claims	OTC Claims	All Drug Claims	Rx Claims	OTC Claims	All Drug Claims
All Drug Claims	7,021,655,279	272,850,310	7,294,505,589	96.3%	3.7%	100.0%
Drug Claims with Unknown Product Info	116,151	92,261	208,412	55.7%	44.3%	100.0%
Usuable Drug Claims	7,021,539,129	272,758,049	7,294,297,177	96.3%	3.7%	100.0%
% of Drug Claims Used	99.998%	99.966%	99.997%			

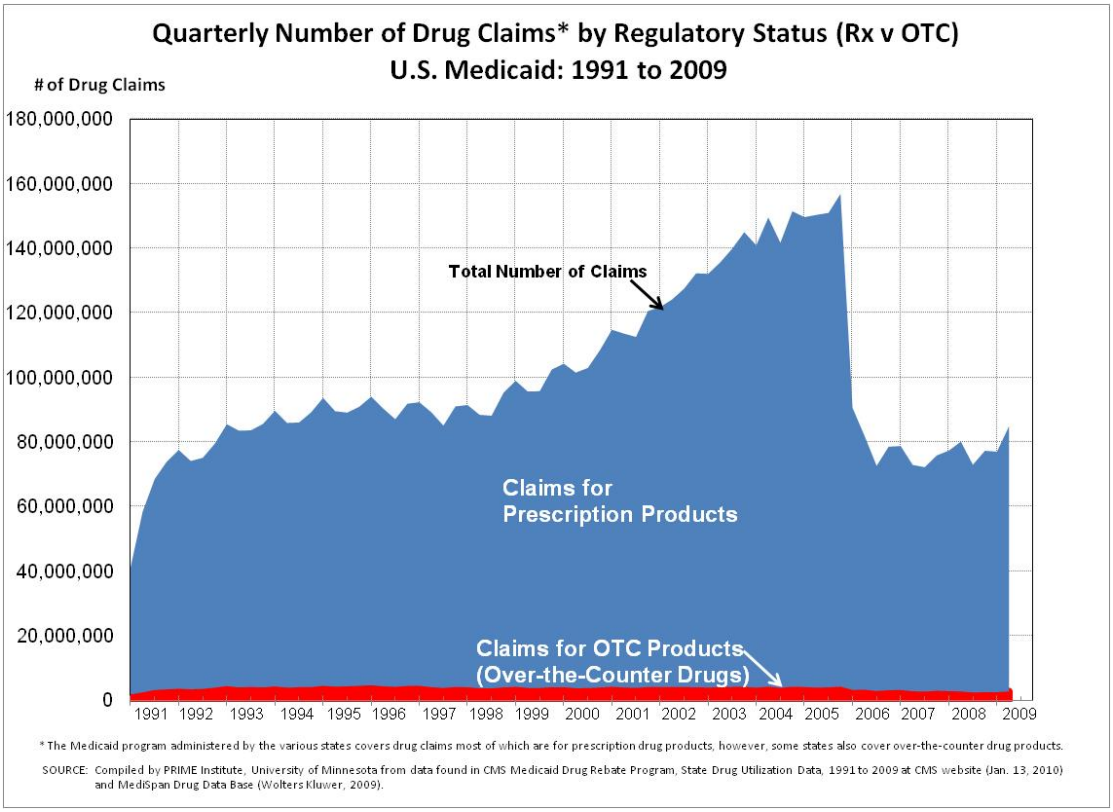
	Units			% of Units		
	Rx Claims	OTC Claims	All Drug Claims	Rx Claims	OTC Claims	All Drug Claims
All Drug Claims	471,839,151,449	58,487,642,444	530,326,793,893	89.0%	11.0%	100.0%
Drug Claims with Unknown Product Info	76,167,598	9,127,264	85,294,861	89.3%	10.7%	100.0%
Usuable Drug Claims	471,762,983,851	58,478,515,181	530,241,499,032	89.0%	11.0%	100.0%
% of Drug Claims Used	99.984%	99.984%	99.984%			

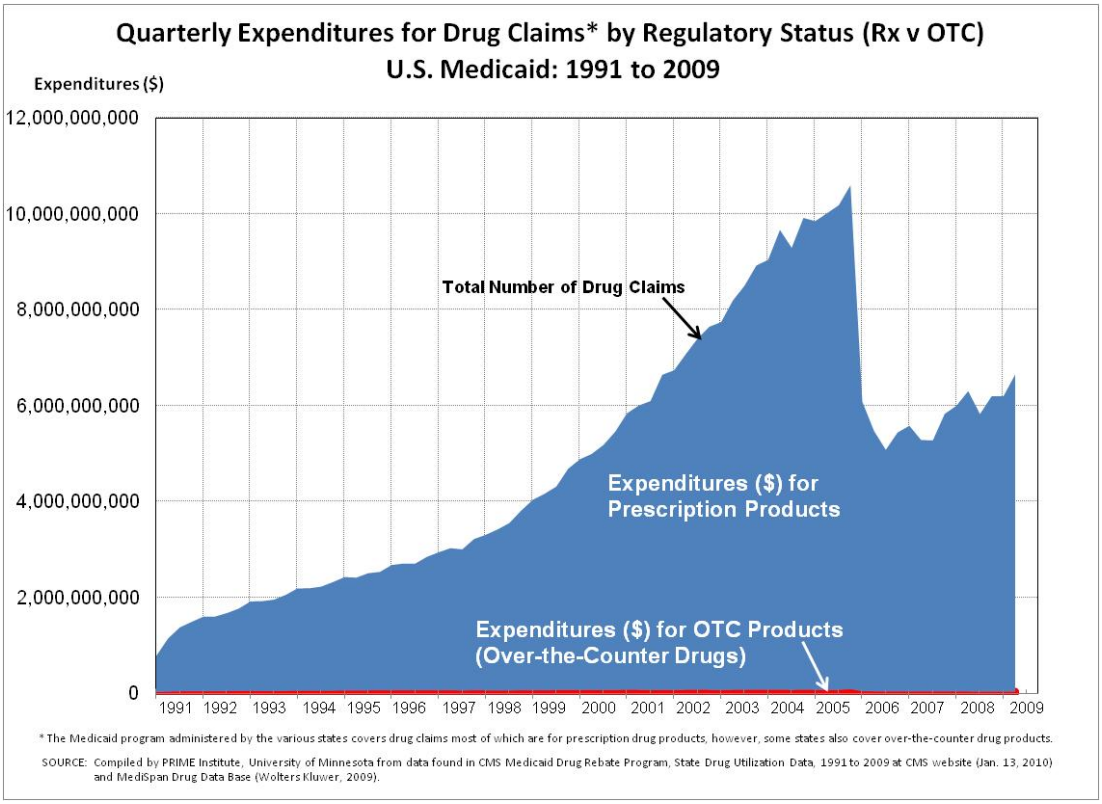
	Expenditures per Prescription ($/Rx)			Ratio to Avg Expenditures per Prescription ($/Rx)		
	Rx Claims	OTC Claims	All Drug Claims	Rx Claims	OTC Claims	All Drug Claims
All Drug Claims	$ 50.68	$ 14.91	$ 49.34	1.03	0.30	1.00
Drug Claims with Unknown Product Info	$ 76.81	$ 10.31	$ 47.37	1.62	0.22	1.00
Usuable Drug Claims	$ 50.68	$ 14.91	$ 49.34	1.03	0.30	1.00

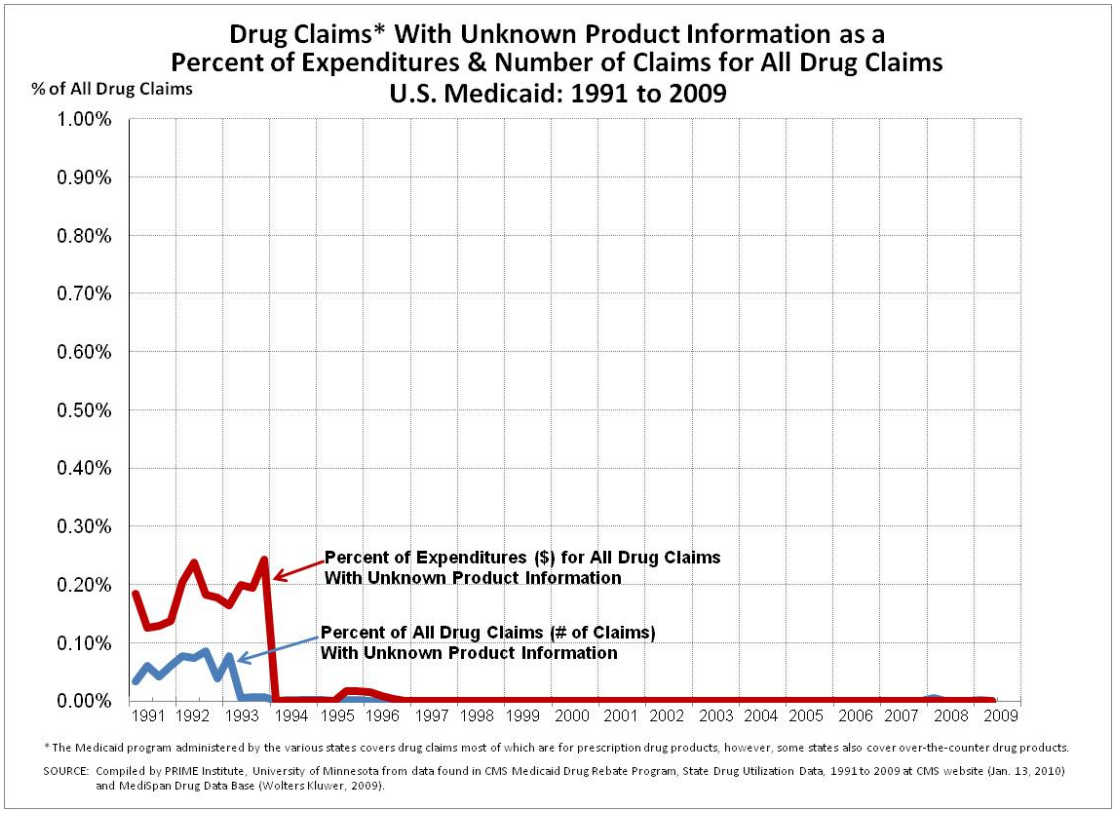
	Expenditures per Unit ($/Unit)			Ratio to Avg Expenditures per Unit ($/Unit)		
	Rx Claims	OTC Claims	All Drug Claims	Rx Claims	OTC Claims	All Drug Claims
All Drug Claims	$ 0.75	$ 0.07	$ 0.68	1.11	0.10	1.00
Drug Claims with Unknown Product Info	$ 0.12	$ 0.10	$ 0.12	1.01	0.90	1.00
Usuable Drug Claims	$ 0.75	$ 0.07	$ 0.68	1.11	0.10	1.00

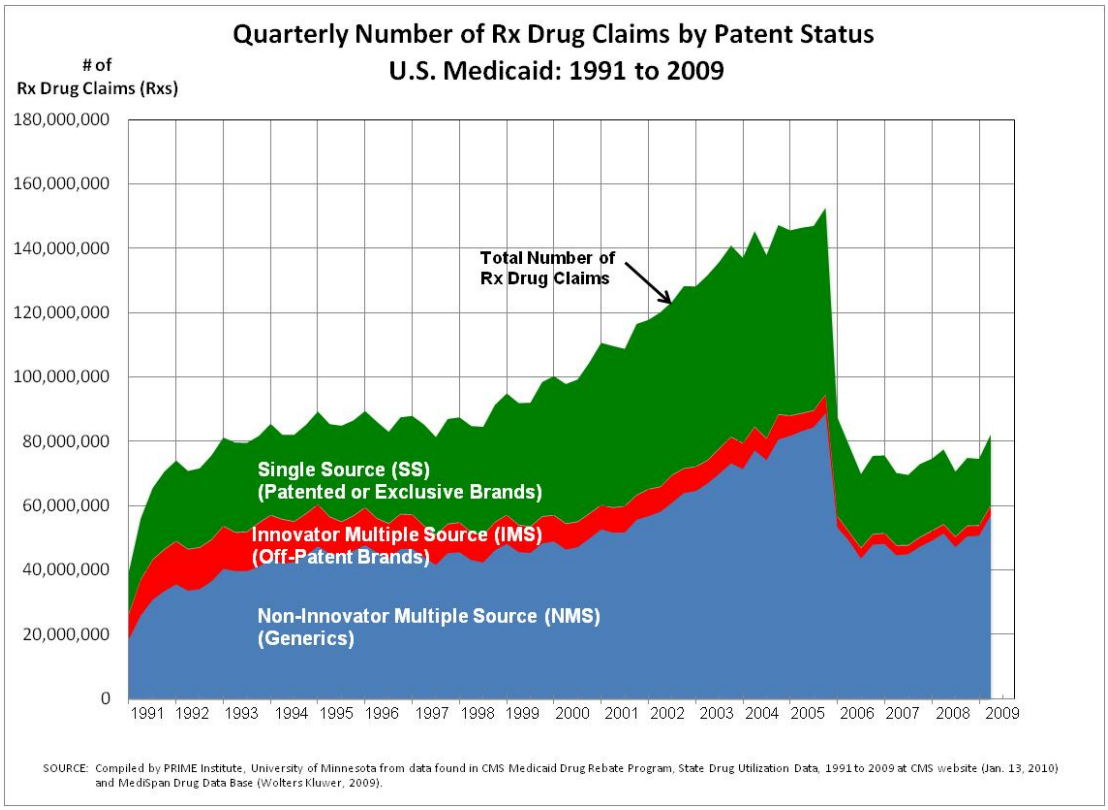
	Units per Prescription (Units/Rx)			Ratio to Avg Units per Prescription (Units/Rx)		
	Rx Claims	OTC Claims	All Drug Claims	Rx Claims	OTC Claims	All Drug Claims
All Drug Claims	67	214	73	0.92	2.95	1.00
Drug Claims with Unknown Product Info	656	99	409	1.60	0.24	1.00
Usuable Drug Claims	67	214	73	0.92	2.95	1.00

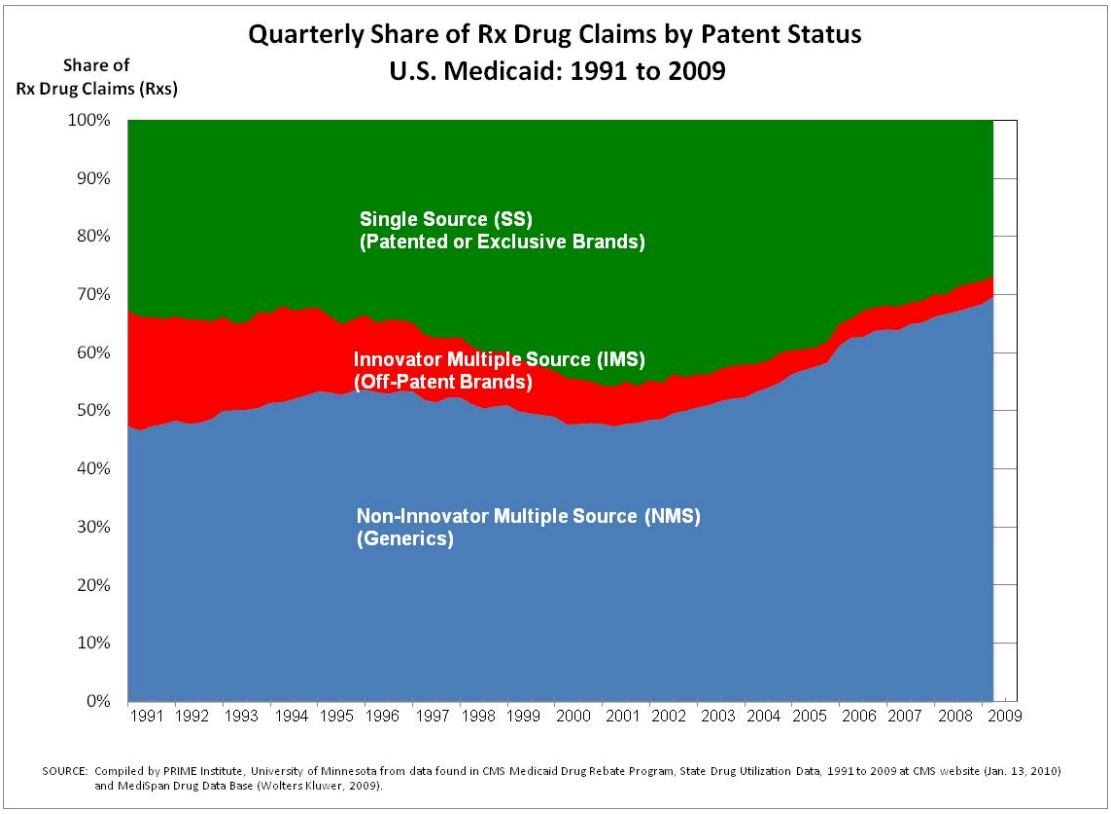
* The Medicaid program administered by the various states covers drug claims most of which are for prescription drug products, however, some states also cover over-the-counter drug products.

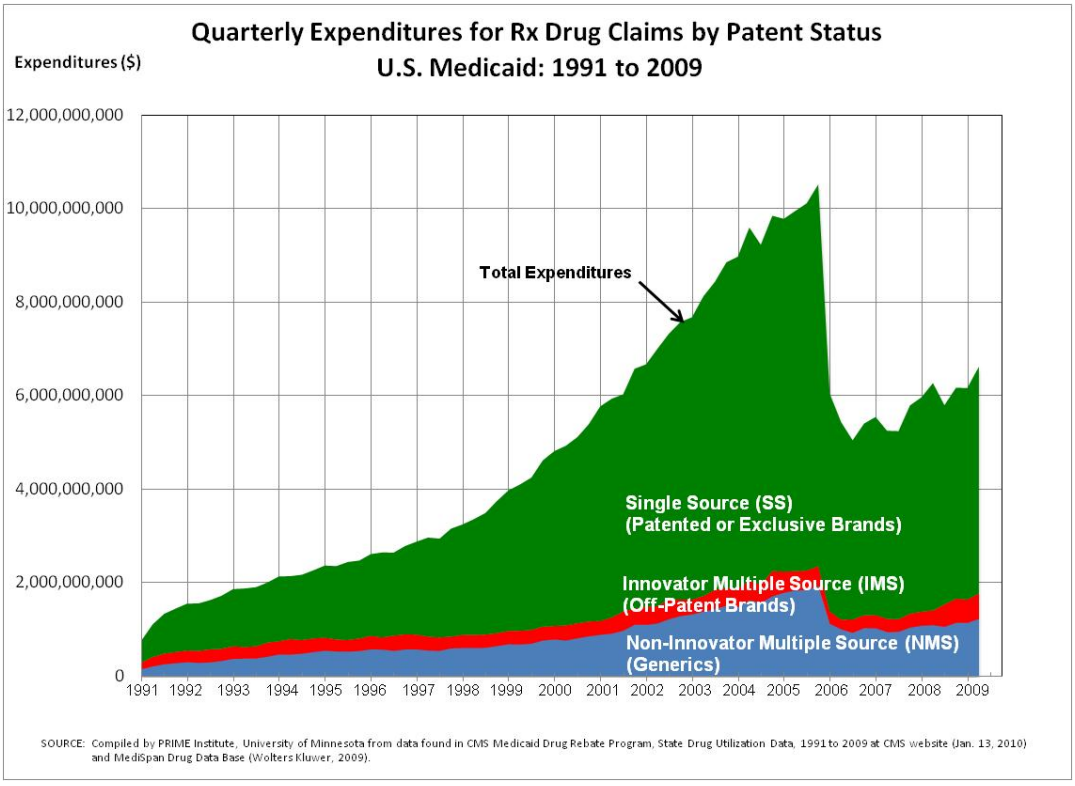

Quarterly Number of Drug Claims* by Regulatory Status (Rx v OTC)
U.S. Medicaid: 1991 to 2009
# of Drug Claims
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Total Number of Claims
Claims for
Prescription Products
Claims for OTC Products
(Over-the-Counter Drugs)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
* The Medicaid program administered by the various states covers drug claims most of which are for prescription drug products, however, some states also cover over-the-counter drug products.
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

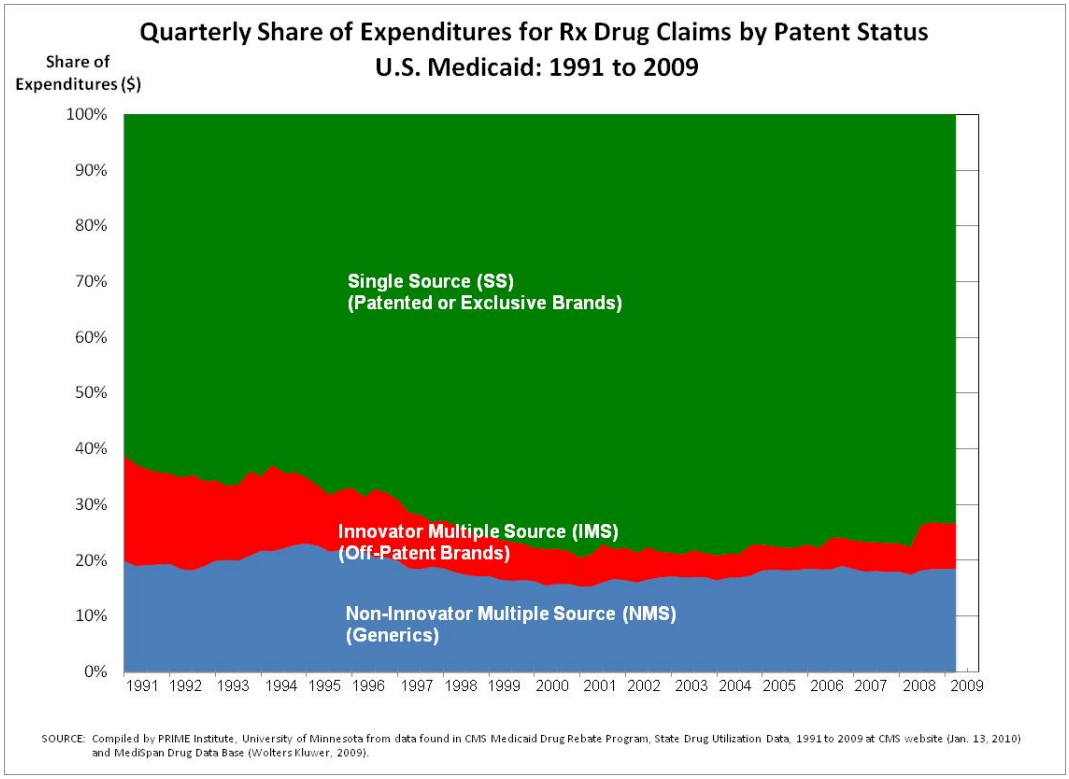

Quarterly Expenditures for Drug Claims* by Regulatory Status (Rx v OTC)
U.S. Medicaid: 1991 to 2009
Expenditures ($)
12,000,000,000
10,000,000,000
8,000,000,000
6,000,000,000
4,000,000,000
2,000,000,000
0
Total Number of Drug Claims
Expenditures ($) for
Prescription Products
Expenditures ($) for OTC Products
(Over-the-Counter Drugs)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
* The Medicaid program administered by the various states covers drug claims most of which are for prescription drug products, however, some states also cover over-the-counter drug products.
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).


Drug Claims* With Unknown Product Information as a
Percent of Expenditures & Number of Claims for All Drug Claims
U.S. Medicaid: 1991 to 2009
% of All Drug Claims
1.00%
0.90%
0.80%
0.70%
0.60%
0.50%
0.40%
0.30%
0.20%
0.10%
0.00%
Percent of Expenditures ($) for All Drug Claims
With Unknown Product Information
Percent of All Drug Claims (# of Claims)
With Unknown Product Information
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
* The Medicaid program administered by the various states covers drug claims most of which are for prescription drug products, however, some states also cover over-the-counter drug products.
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).


Quarterly Number of Rx Drug Claims by Patent Status
U.S. Medicaid: 1991 to 2009
of
Rx Drug Claims (Rxs)
180,000,000
160,000,000
140,000,000
120,000,000
100,000,000
80,000,000
60,000,000
40,000,000
20,000,000
0
Total Number of
Rx Drug Claims
Single Source (SS)
(Patented or Exclusive Brands)
Innovator Multiple Source (IMS)
(Off-Patent Brands)
Non-Innovator Multiple Source (NMS)
(Generics)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

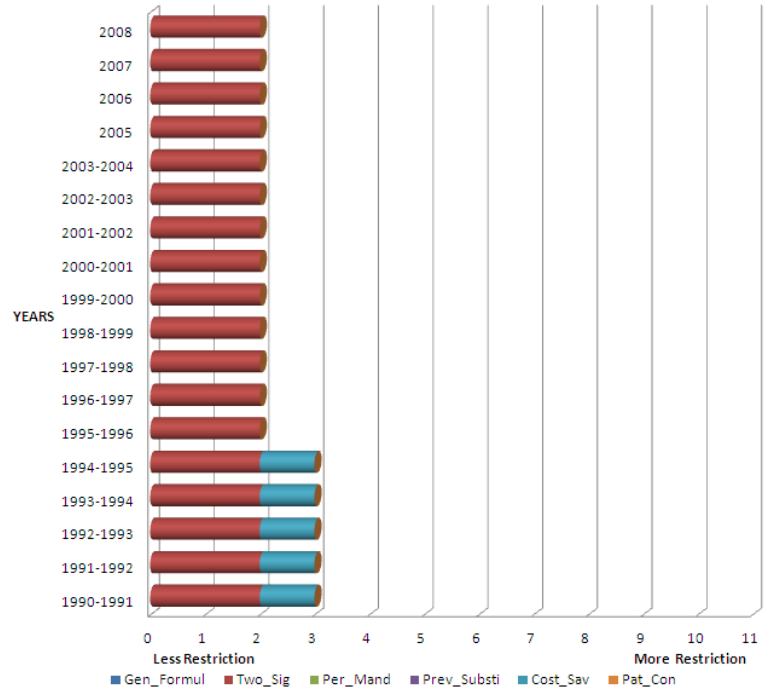

Quarterly Share of Rx Drug Claims by Patent Status
U.S. Medicaid: 1991 to 2009
Share of
Rx Drug Claims (Rxs)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Single Source (SS)
(Patented or Exclusive Brands)
Innovator Multiple Source (IMS)
(Off-Patent Brands)
Non-Innovator Multiple Source (NMS)
(Generics)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).


Quarterly Expenditures for Rx Drug Claims by Patent Status
U.S. Medicaid: 1991 to 2009
Expenditures ($)
12,000,000,000
10,000,000,000
8,000,000,000
6,000,000,000
4,000,000,000
2,000,000,000
0
Total Expenditures
Single Source (SS)
(Patented or Exclusive Brands)
Innovator Multiple Source (IMS)
(Off-Patent Brands)
Non-Innovator Multiple Source (NMS)
(Generics)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).


Quarterly Share of Expenditures for Rx Drug Claims by Patent Status
U.S. Medicaid: 1991 to 2009
Share of Expenditures ($)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Single Source (SS)
(Patented or Exclusive Brands)
Innovator Multiple Source (IMS)
(Off-Patent Brands)
Non-Innovator Multiple Source (NMS)
(Generics)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

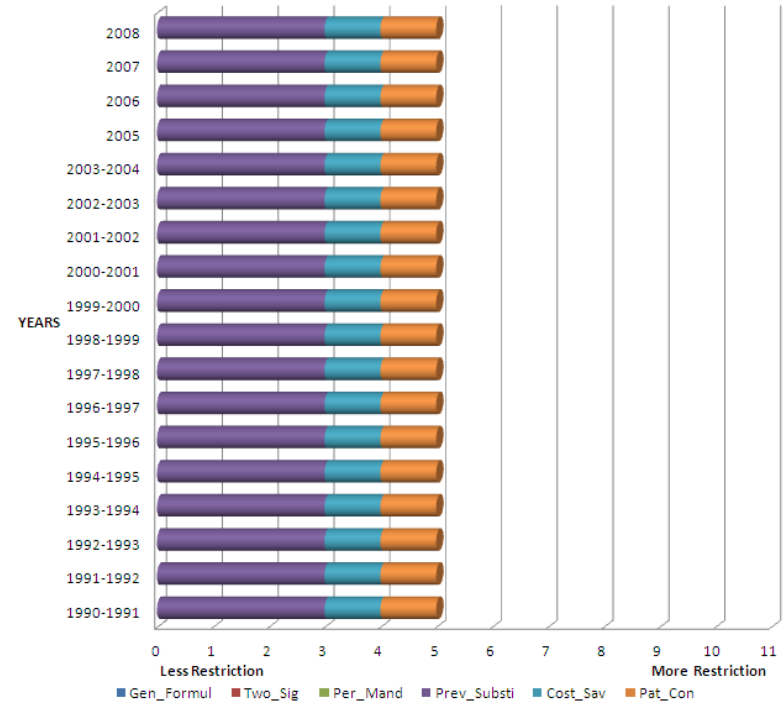
Appendix 2
Drug Product Selection Provisions by States from 1990 to 2008

Drug Product Selection Provisions for the State of Alabama 1990 - 2008

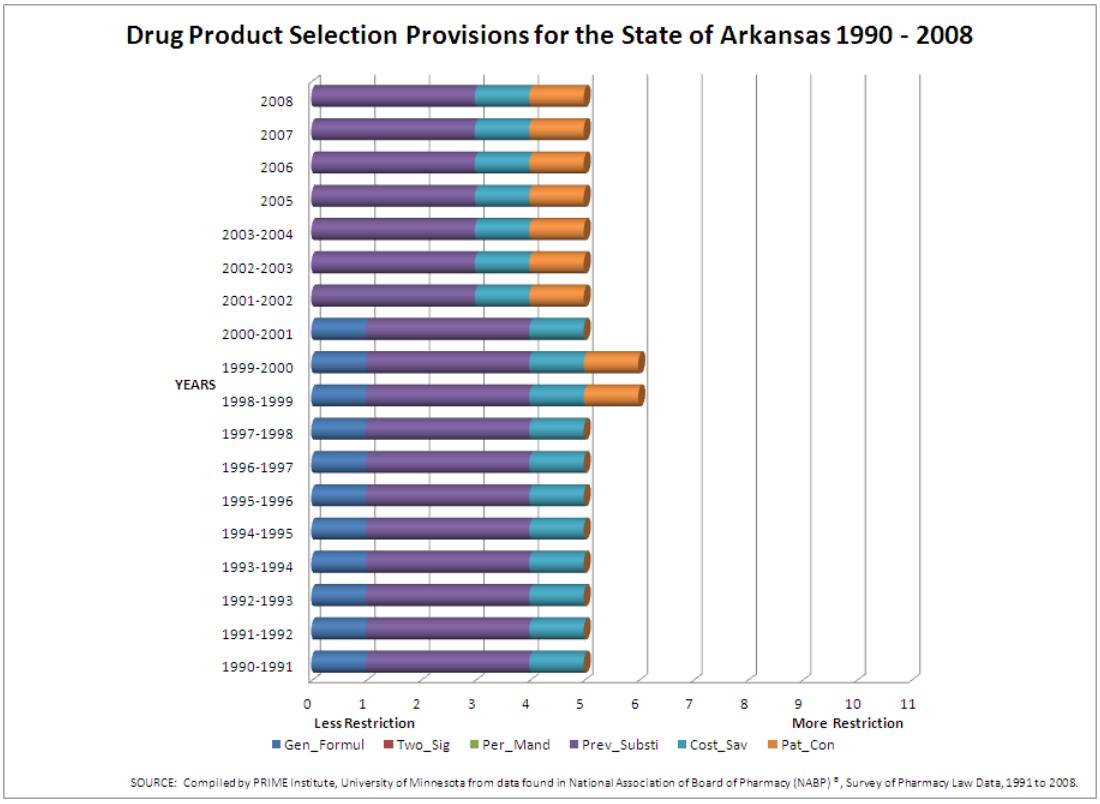


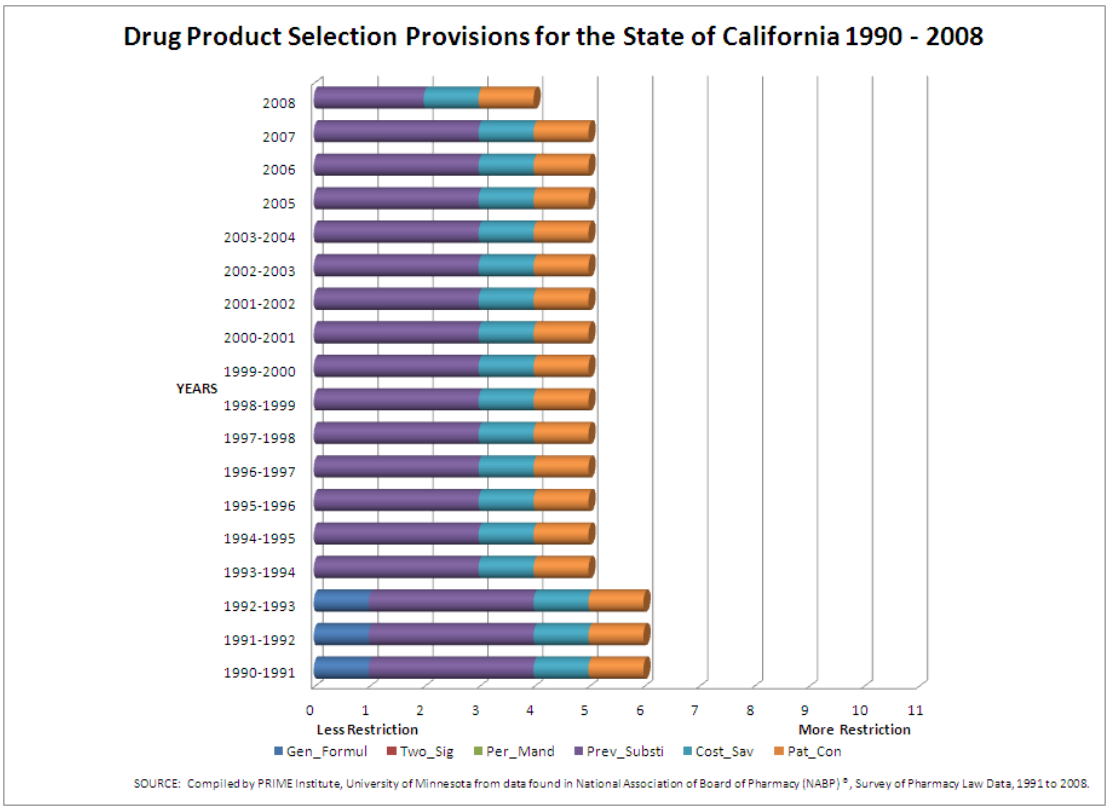
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Alaska 1990 - 2008



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Arkansas 1990 - 2008
2008
2007
2006
2005
2003-2004
2002-2003
2001-2002
2000-2001
1999-2000
1998-1999
1997-1998
1996-1997
1995-1996
1994-1995
1993-1994
1992-1993
1991-1992
1990-1991
YEARS
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Gen_Formul
Two_Sig
Per_Mand
Prev_Substi
Cost_Sav
Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of California 1990 - 2008
2008
2007
2006
2005
2003-2004
2002-2003
2001-2002
2000-2001
1999-2000
1998-1999
1997-1998
1996-1997
1995-1996
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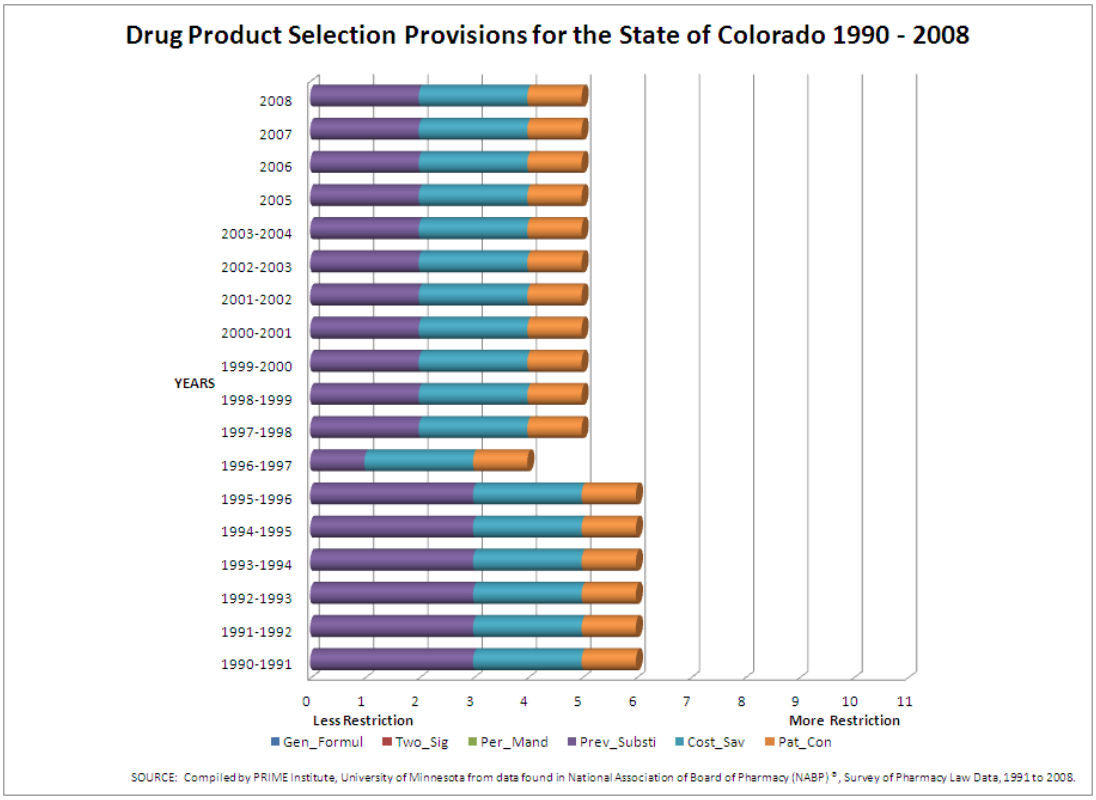
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Colorado 1990 - 2008
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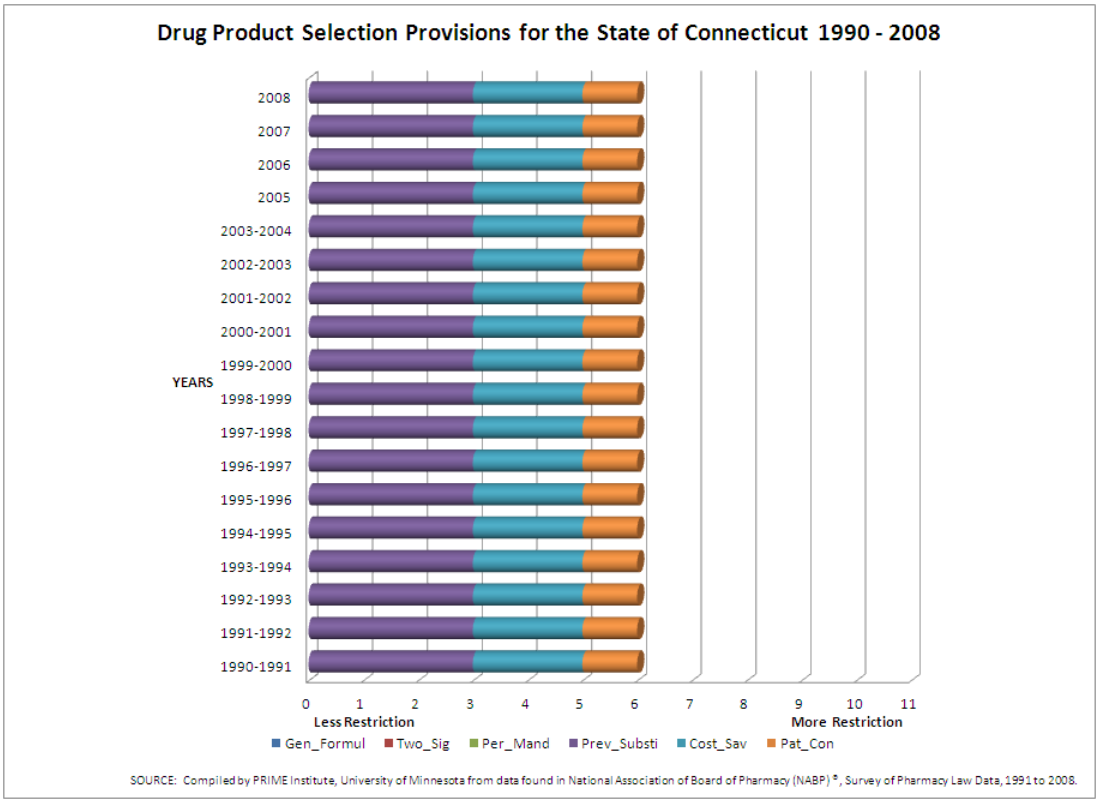
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Connecticut 1990 - 2008
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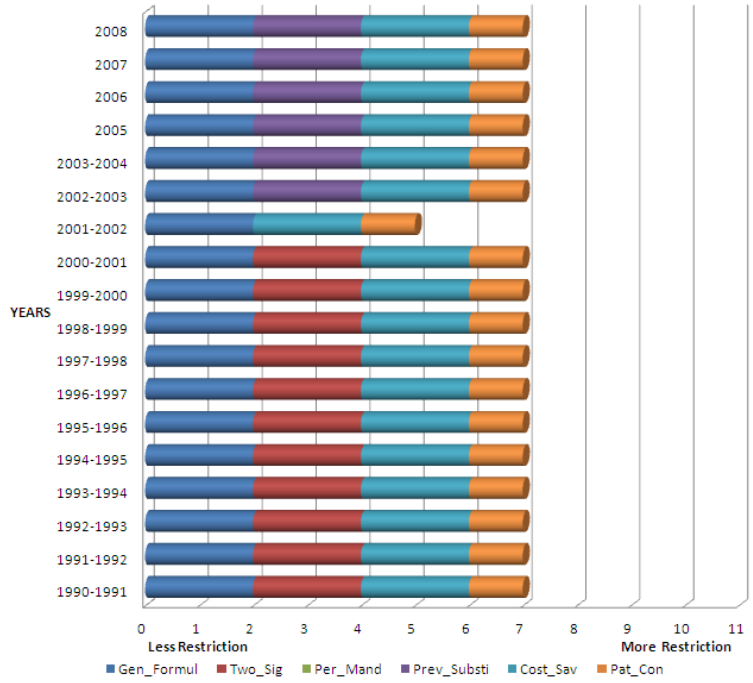
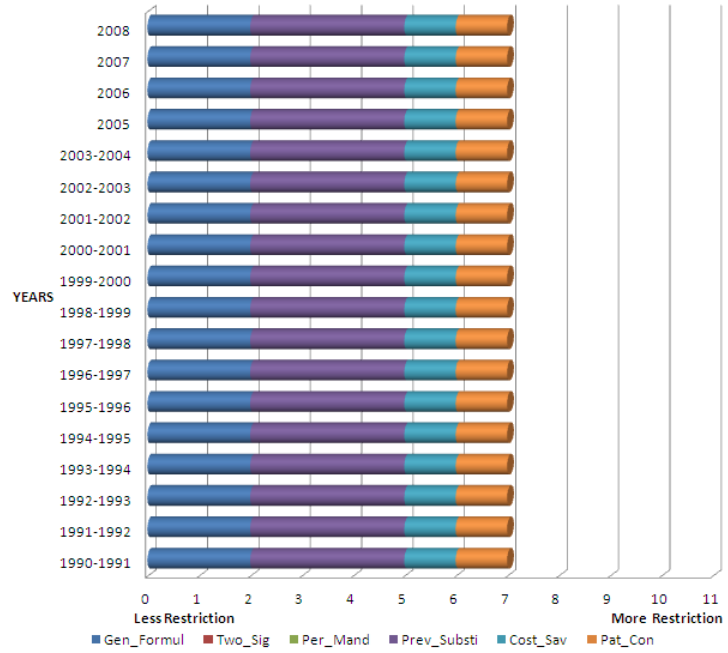
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Delaware 1990 - 2008

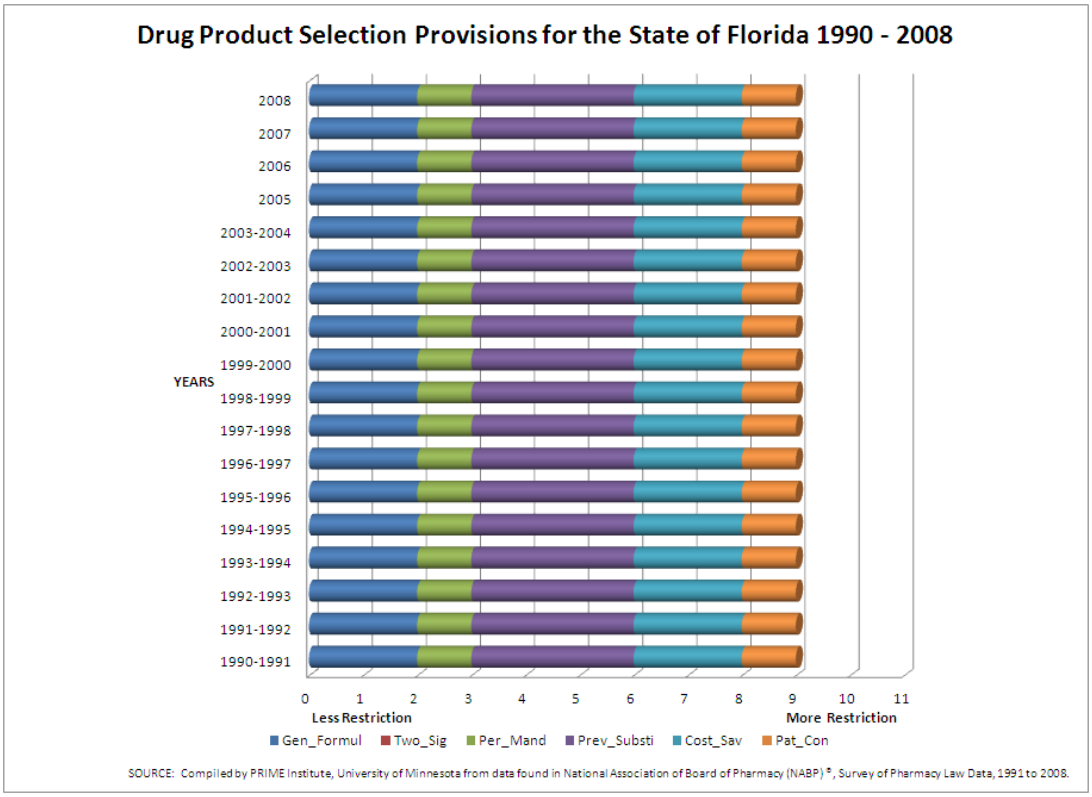


SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of District of Columbia 1990 - 2008



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Florida 1990 - 2008
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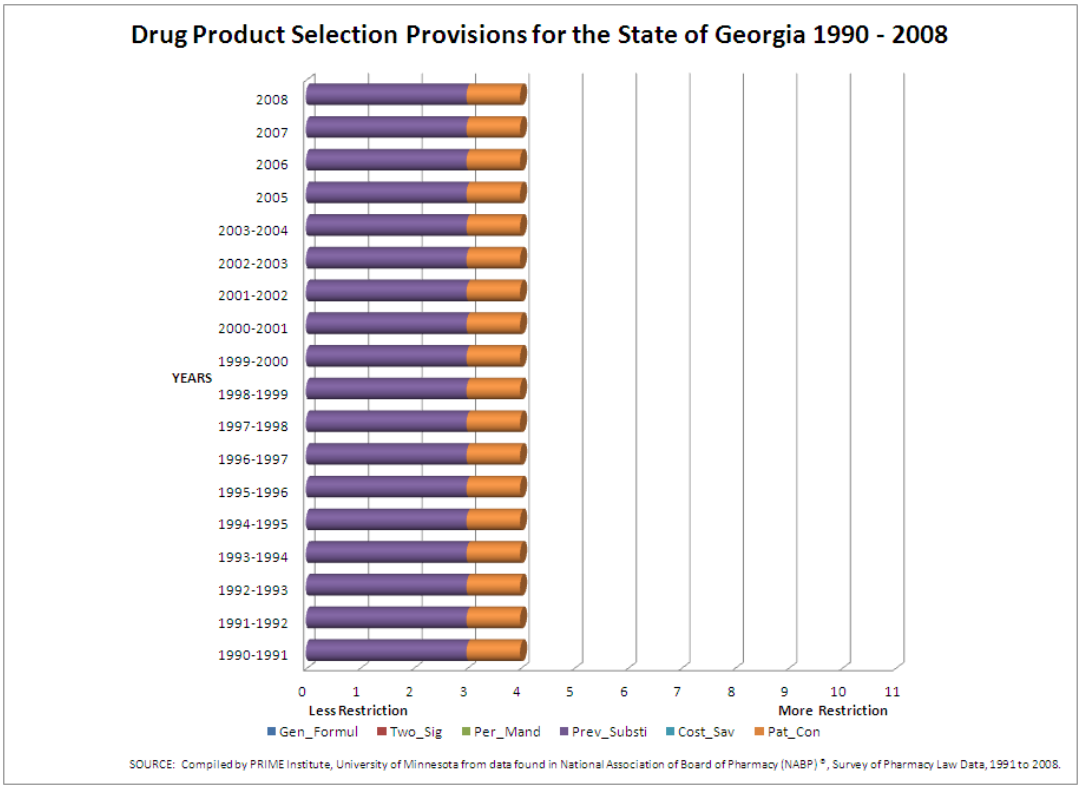
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Georgia 1990 - 2008
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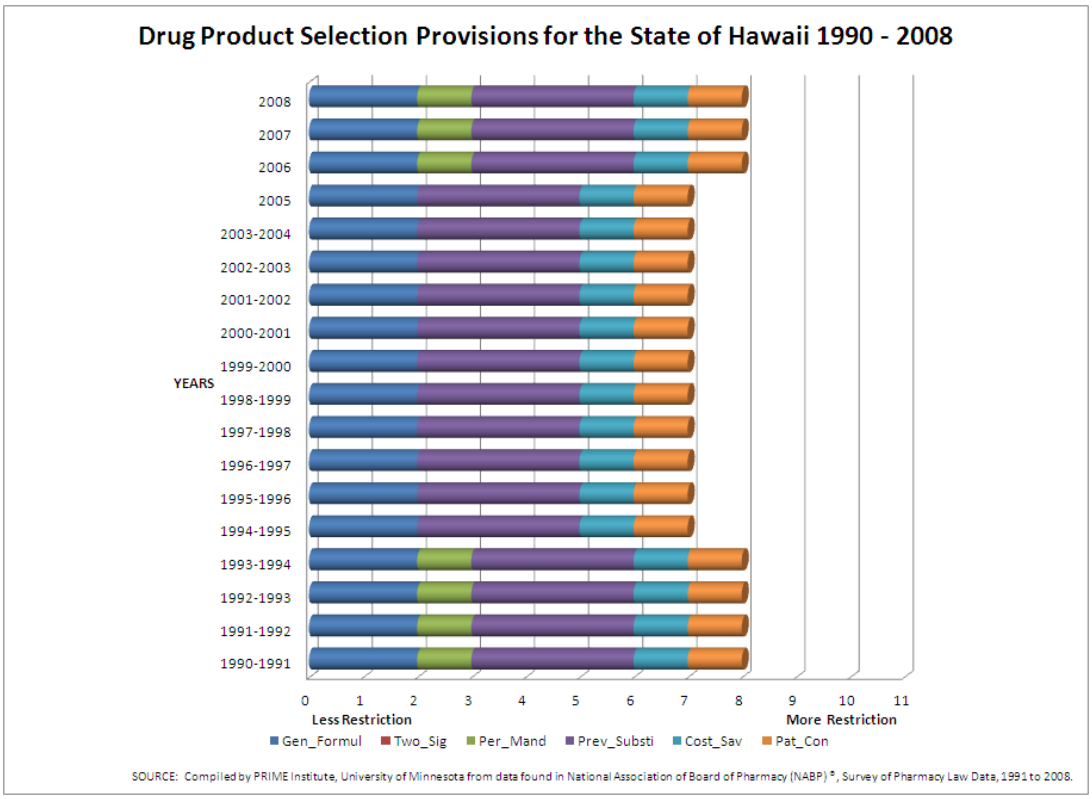
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Hawaii 1990 - 2008
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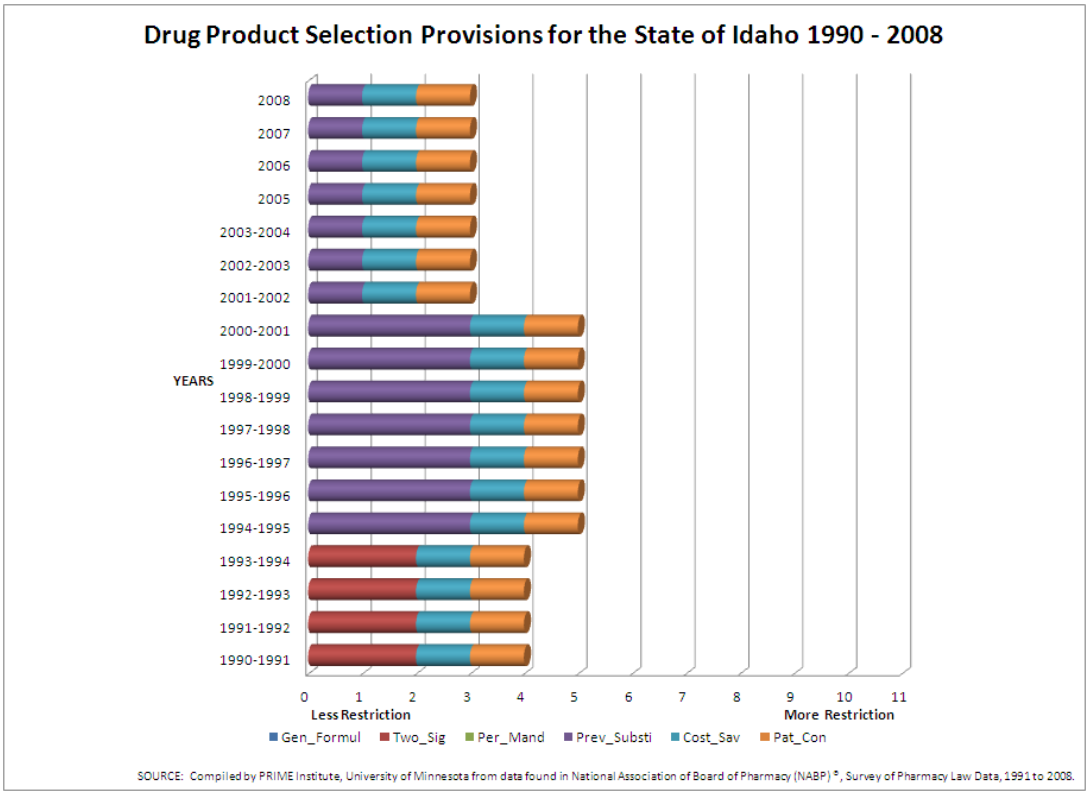
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.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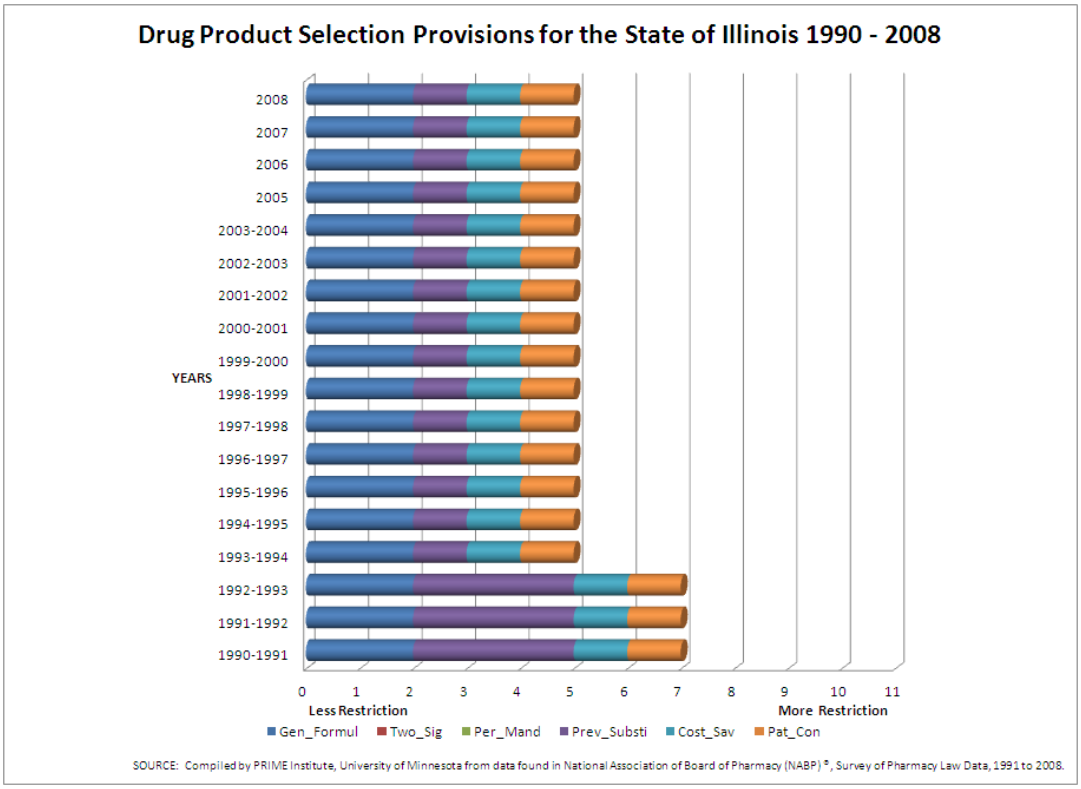
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Illinois 1990 - 2008
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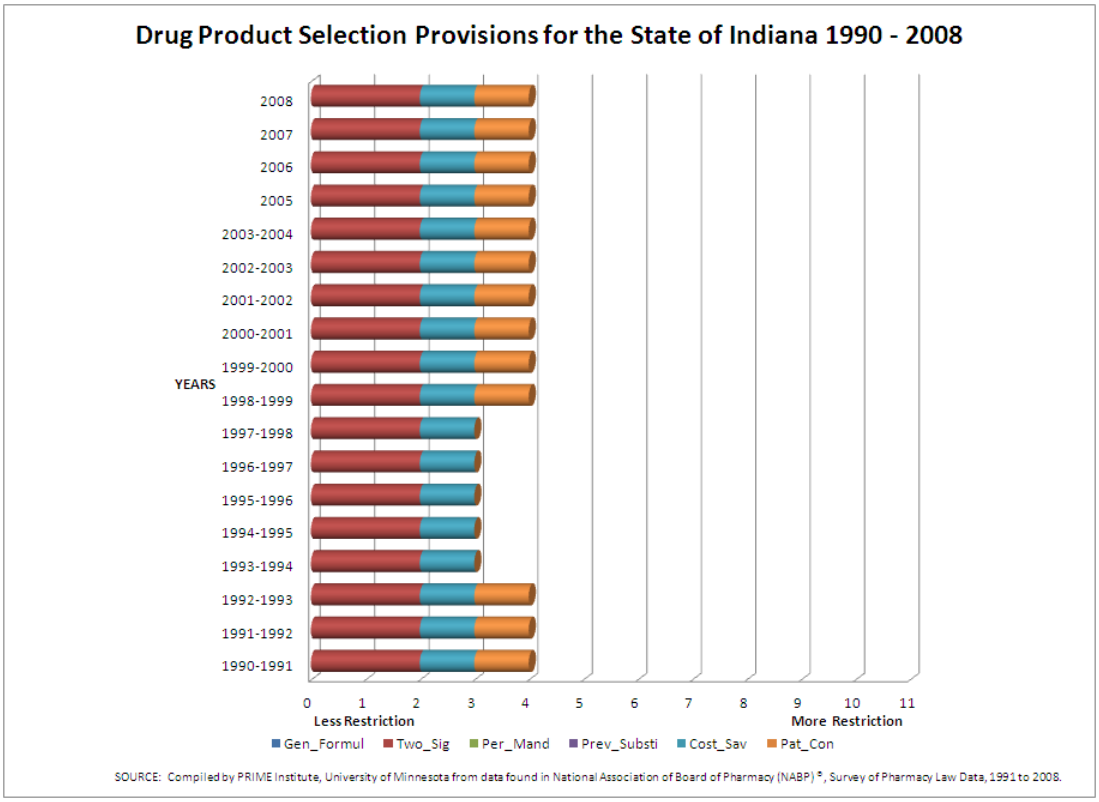
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Indiana 1990 - 2008
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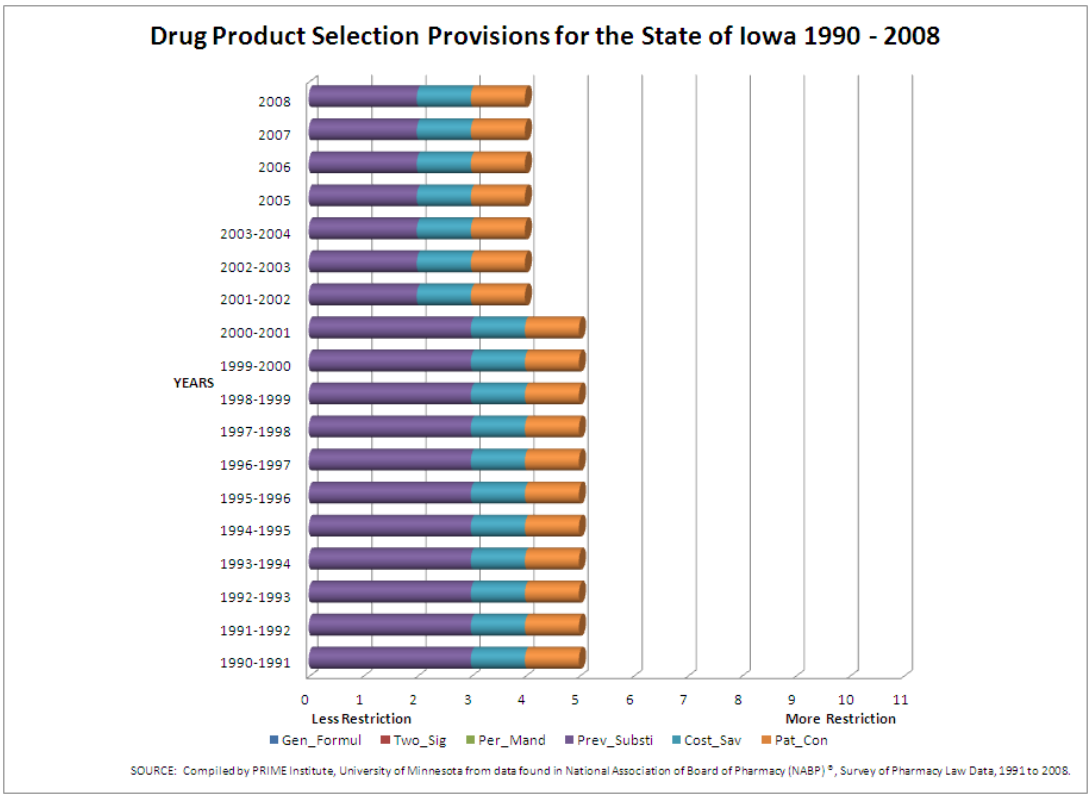
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.



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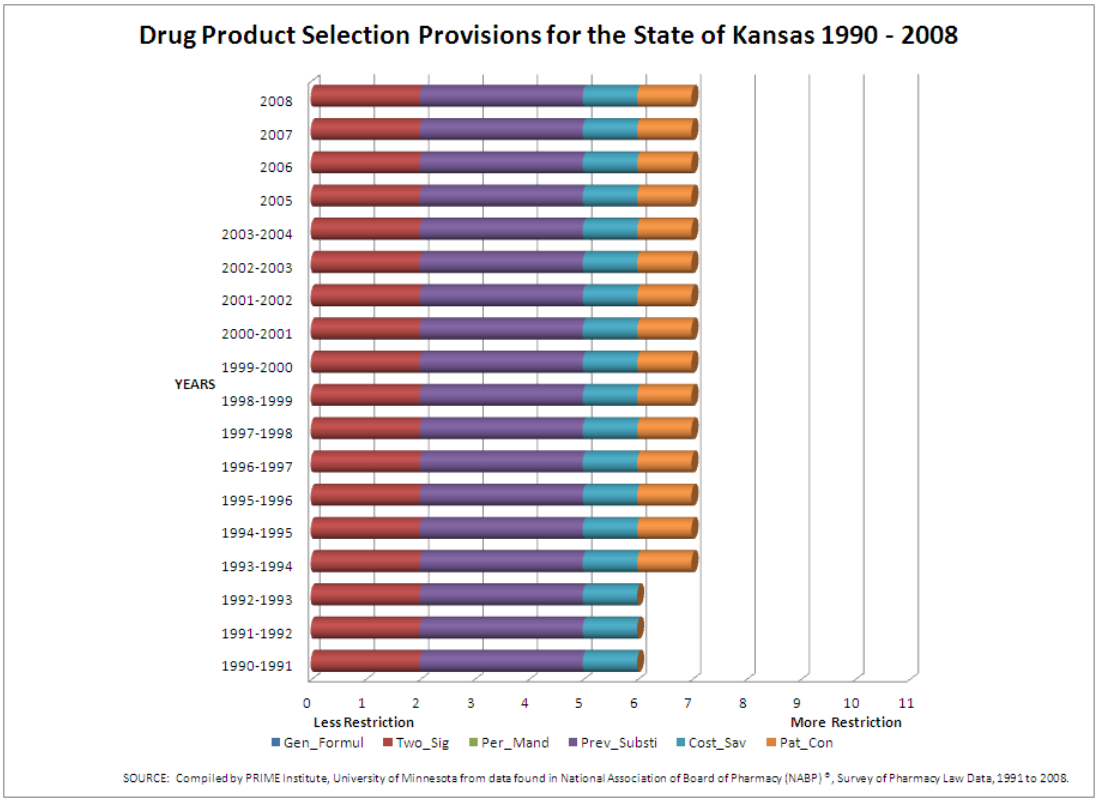
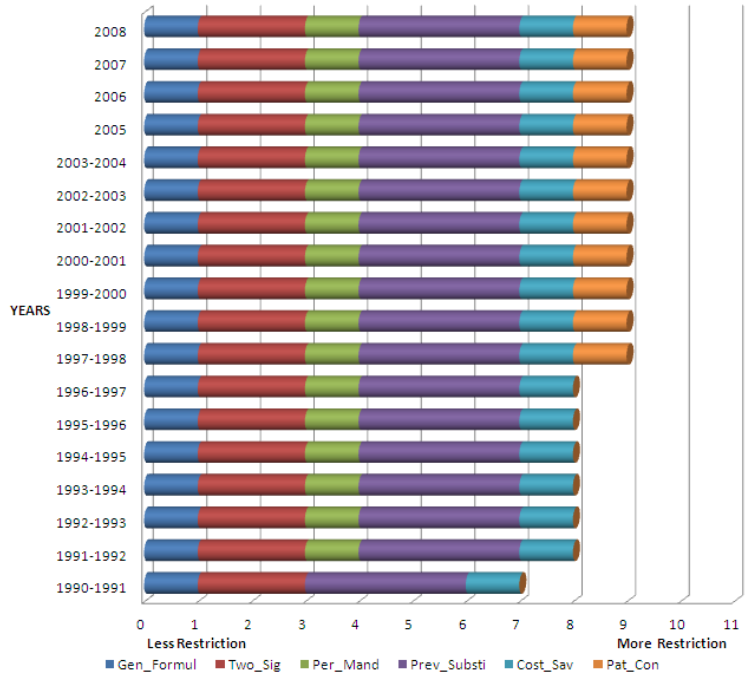


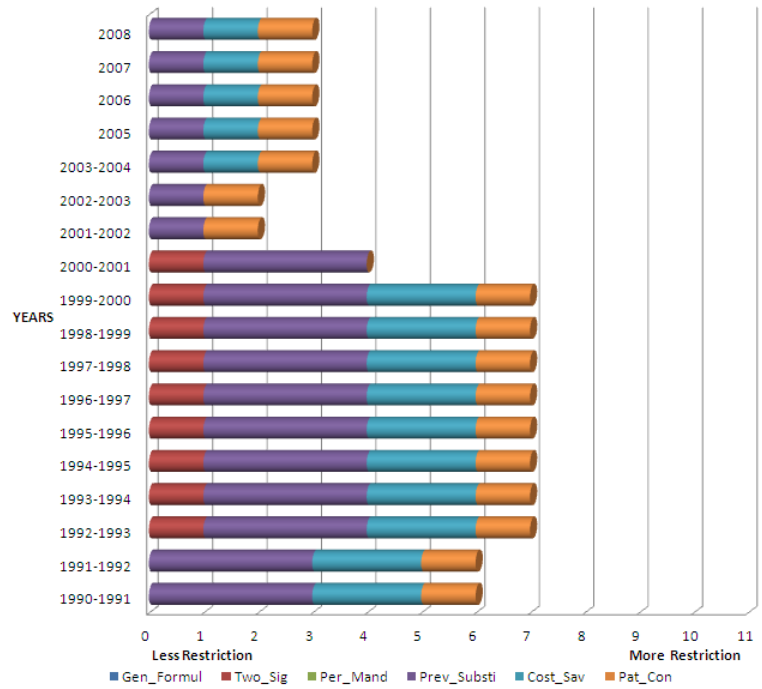
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Kentucky 1990 - 2008

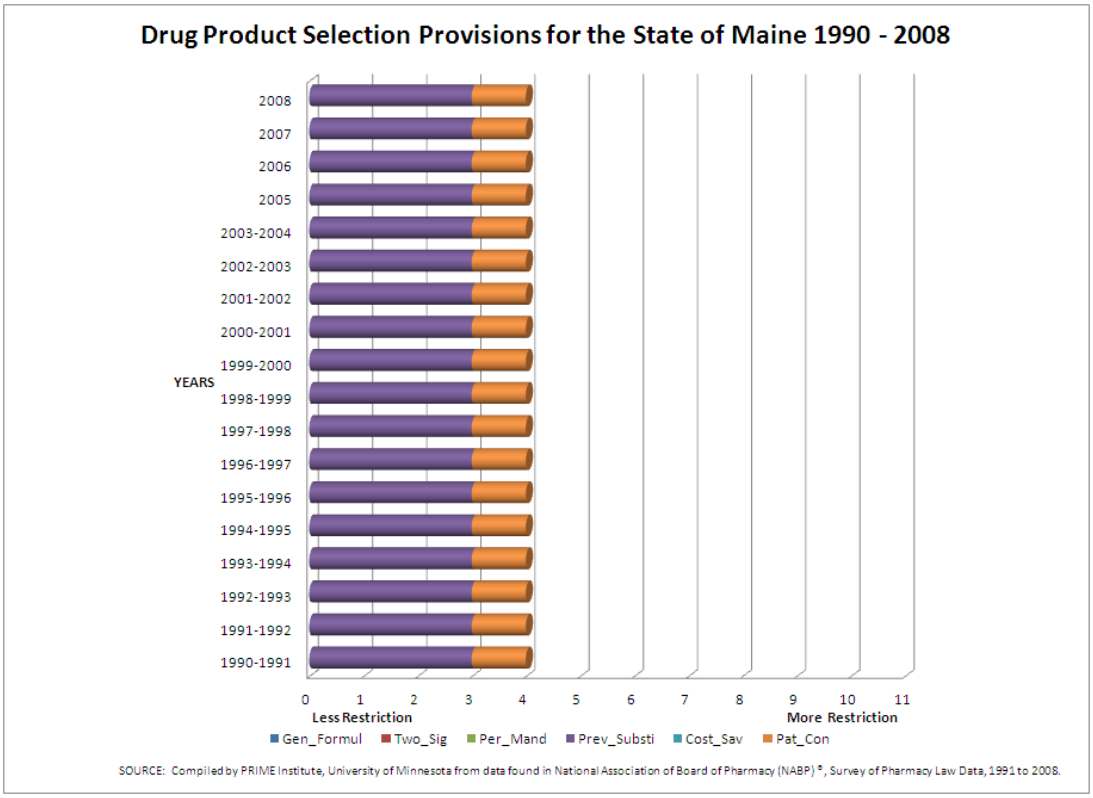


SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Louisiana 1990 - 2008



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Maine 1990 - 2008
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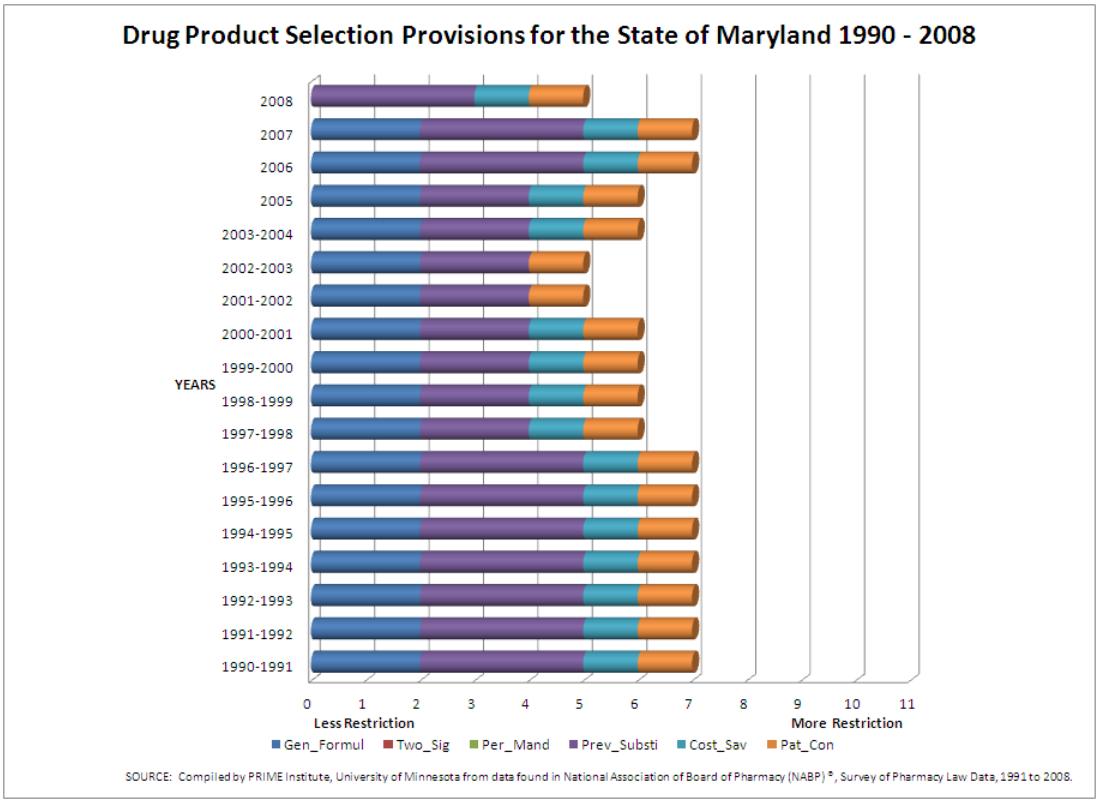
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Maryland 1990 - 2008
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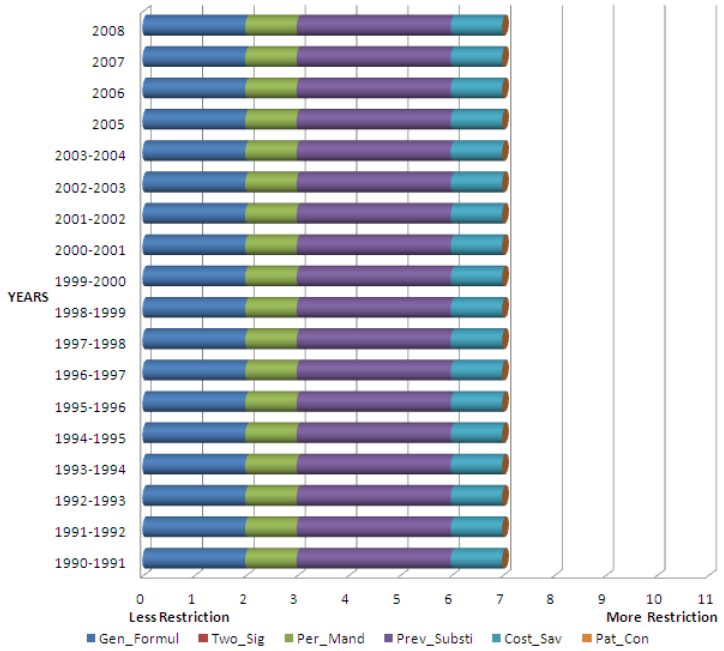
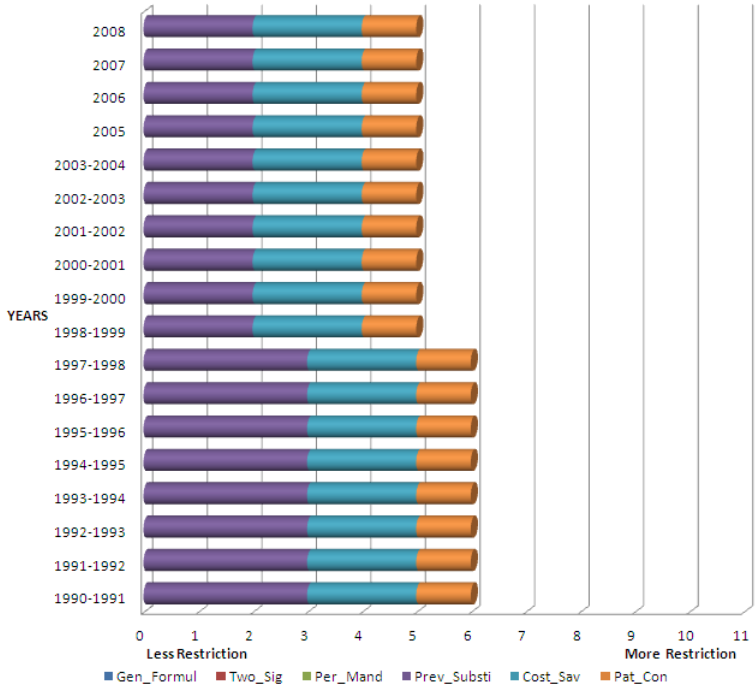
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Massachusetts 1990 - 2008

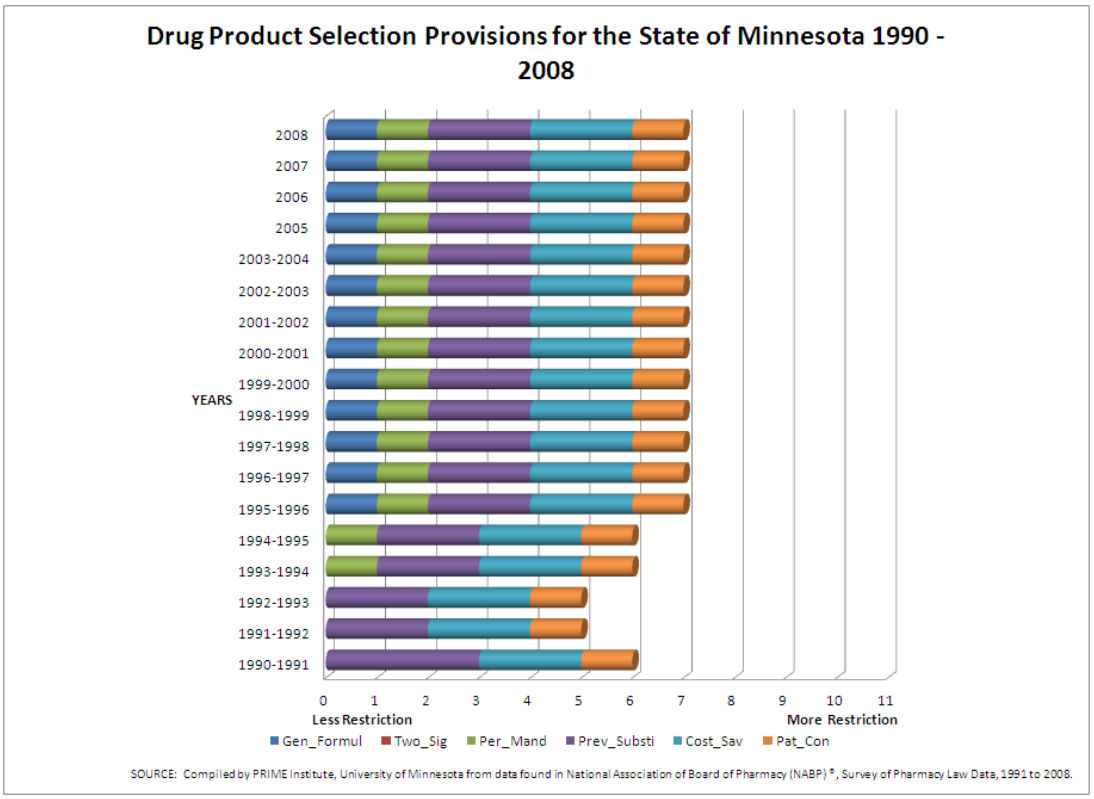


SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Michigan 1990 - 2008



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Minnesota 1990 - 2008
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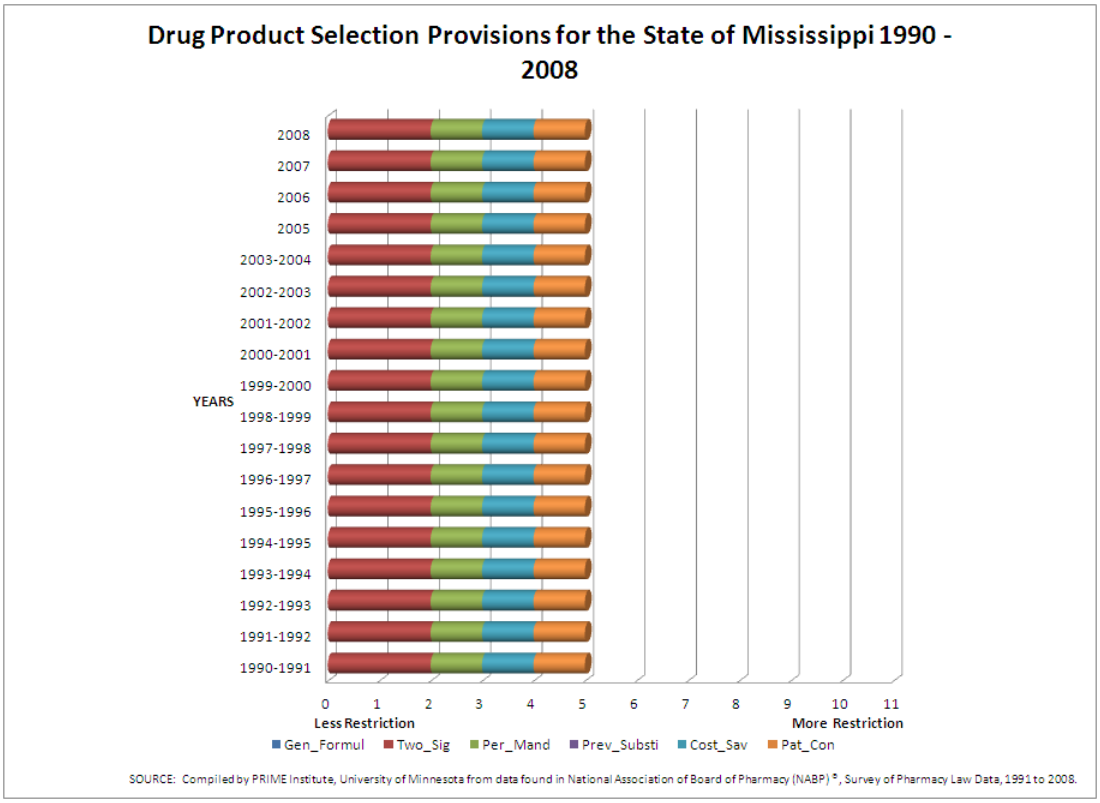
Drug Product Selection Provisions for the State of Mississippi 1990 - 2008
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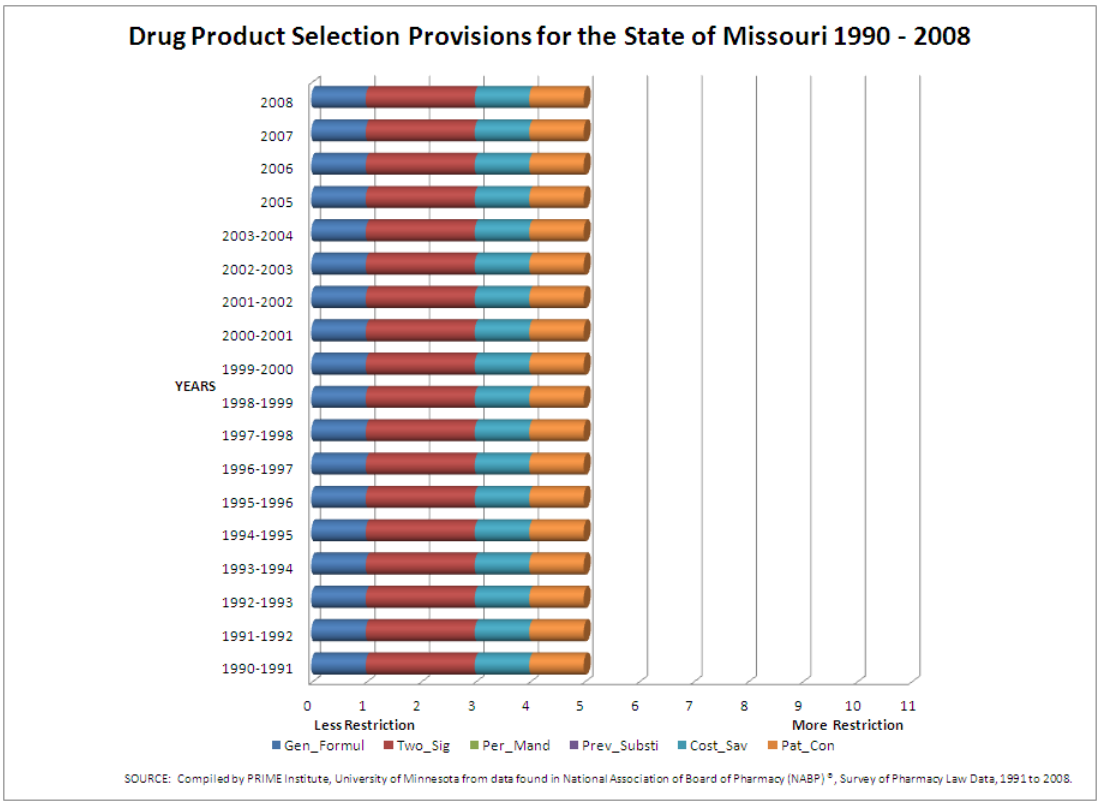
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Missouri 1990 - 2008
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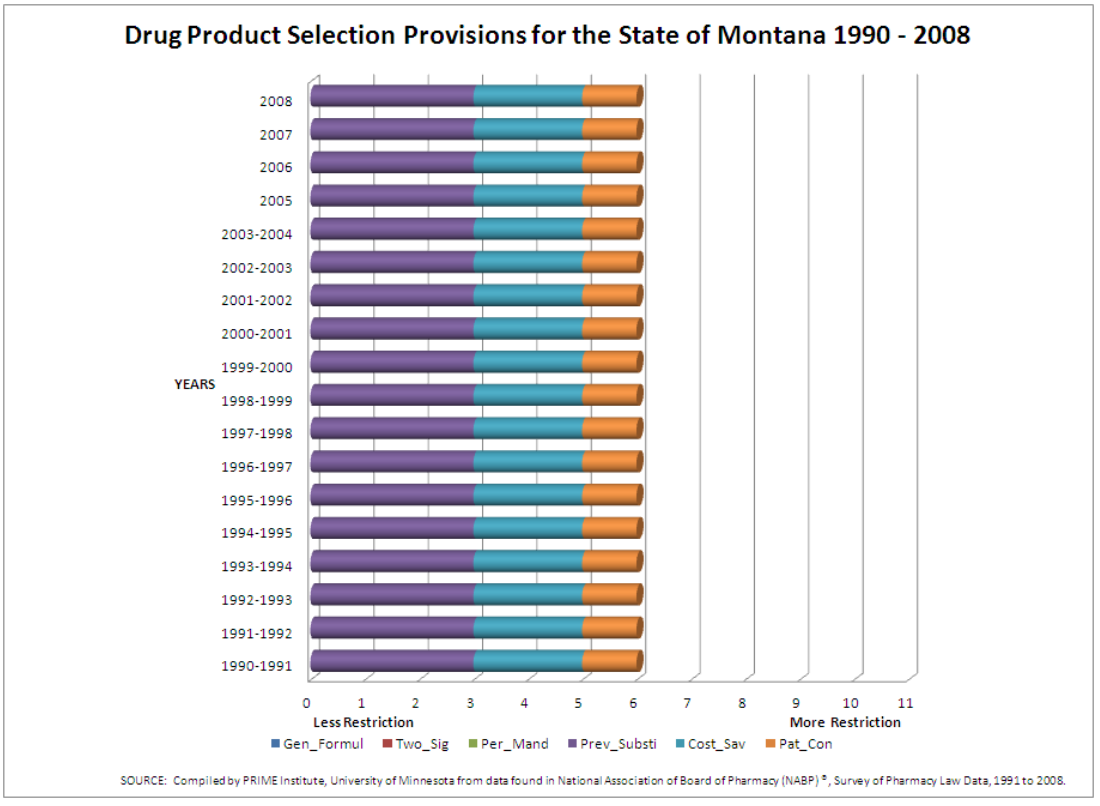
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Montana 1990 - 2008
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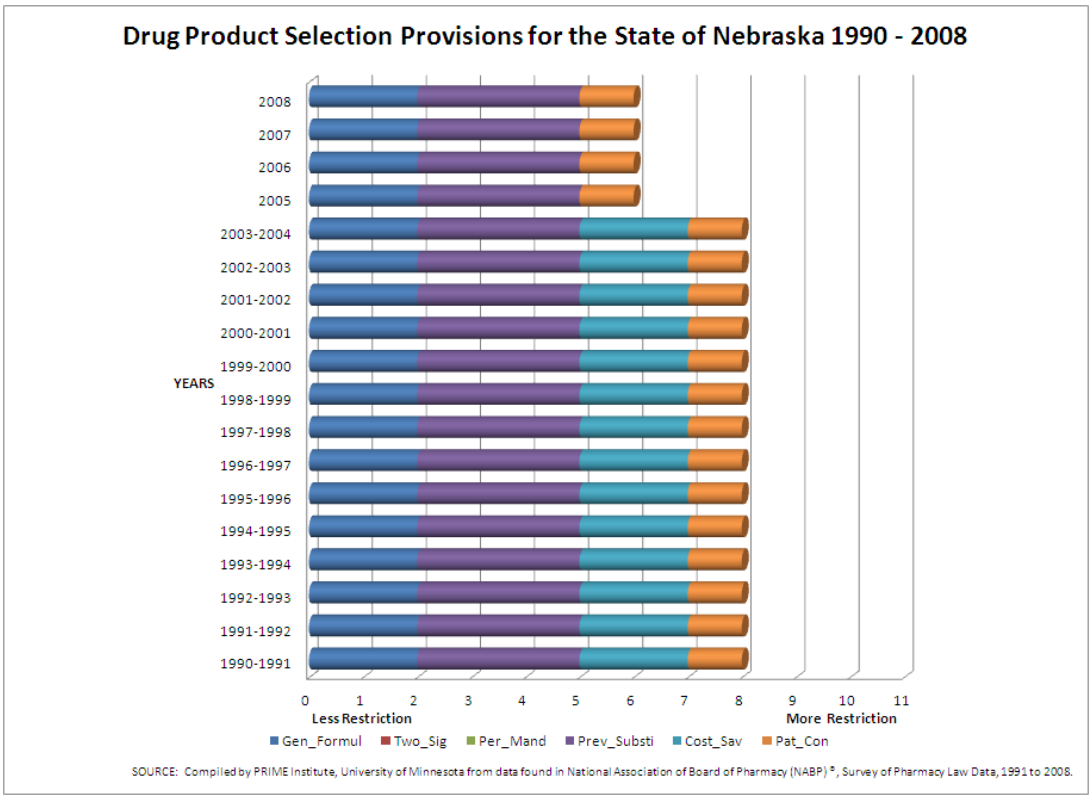
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Nebraska 1990 - 2008
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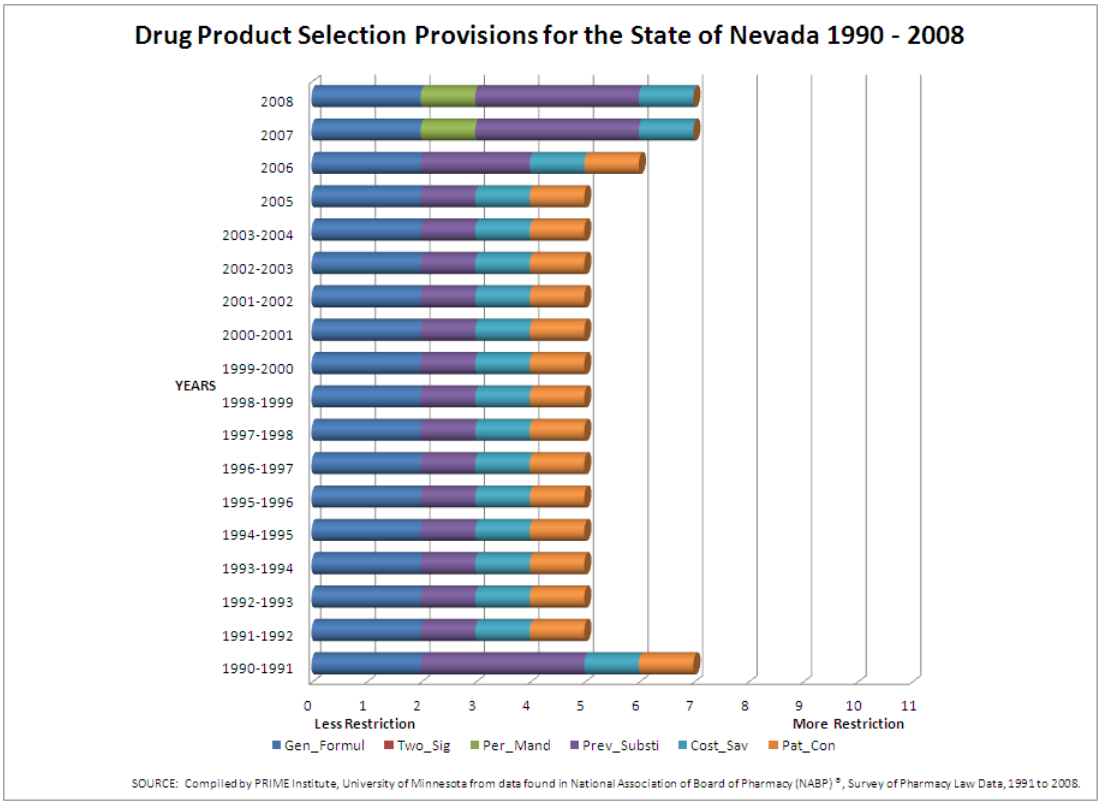
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Nevada 1990 - 2008
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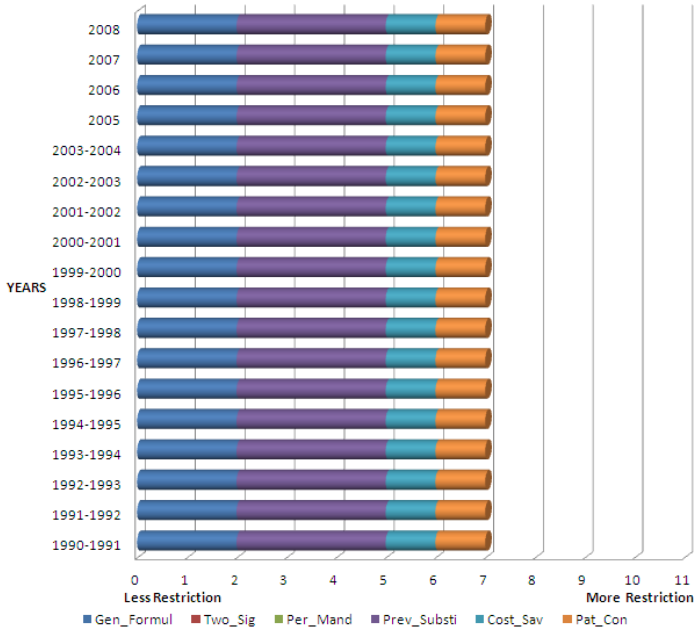
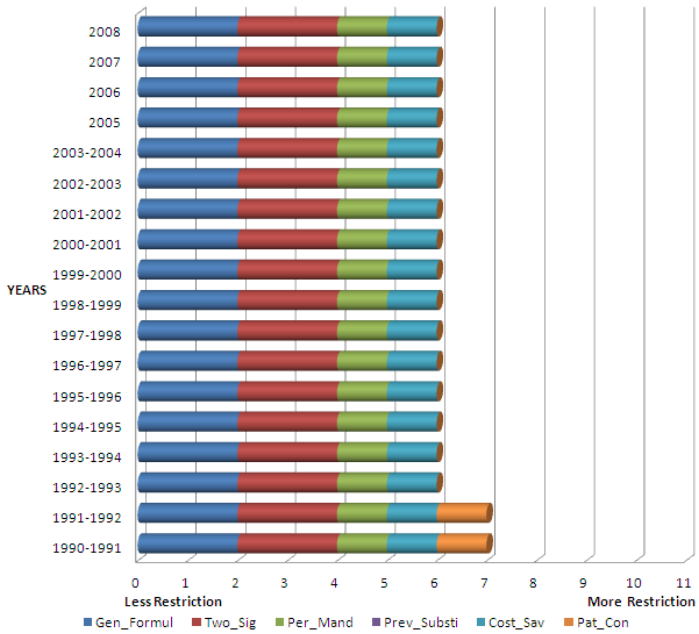
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of New Hampshire 1990 - 2008



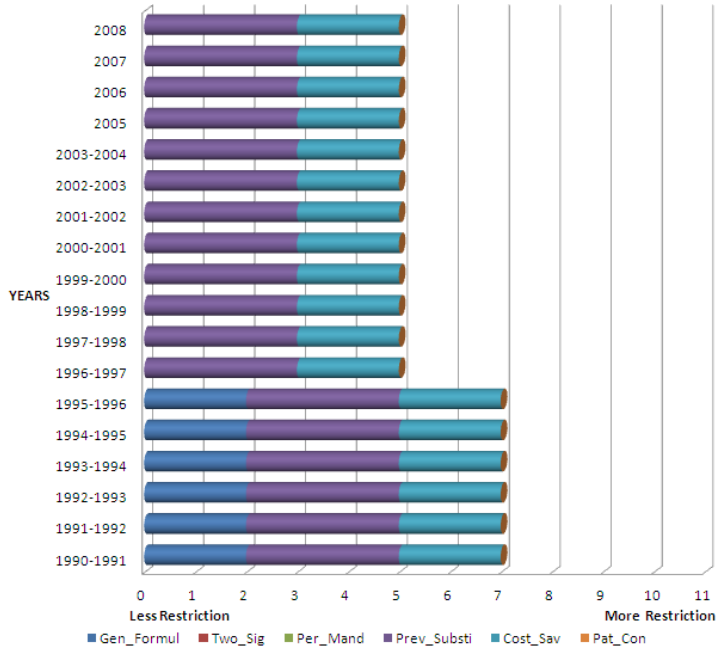
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of New Jersey 1990 - 2008



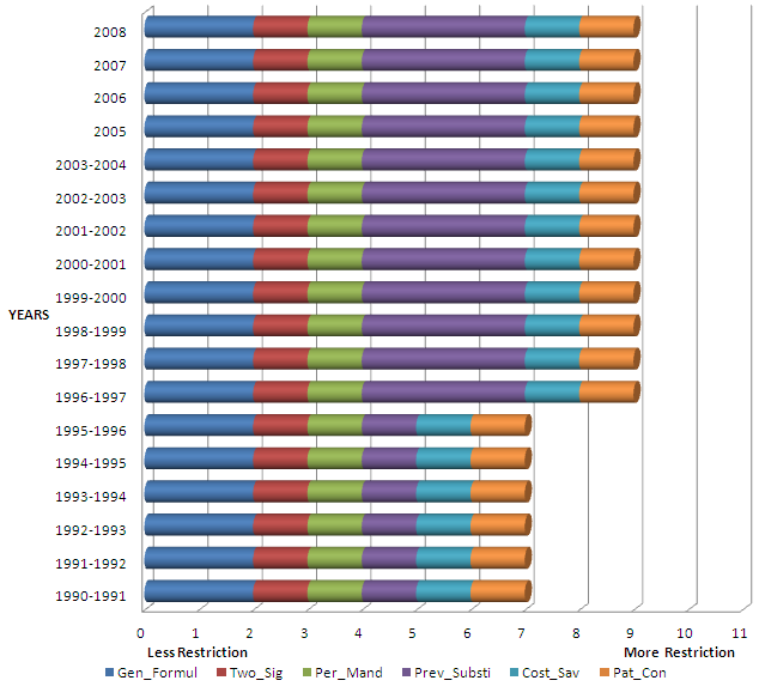
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of New Mexico 1990 - 2008



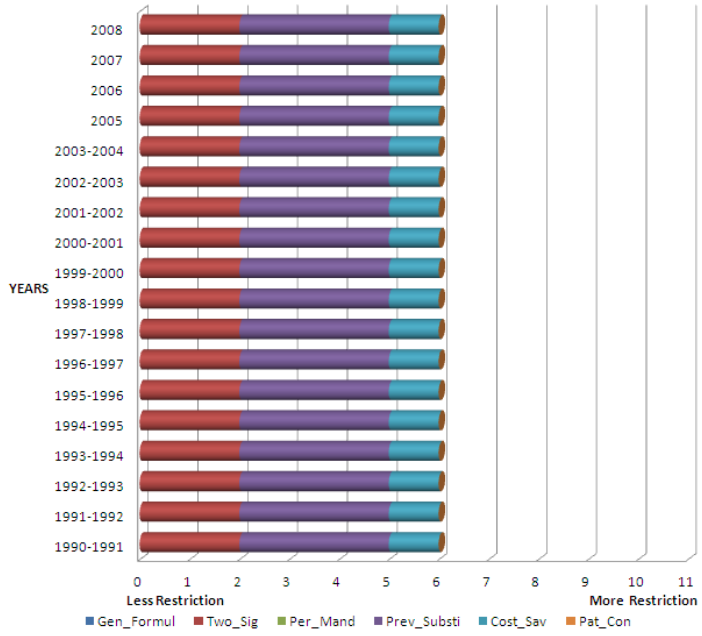
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of New York 1990 - 2008



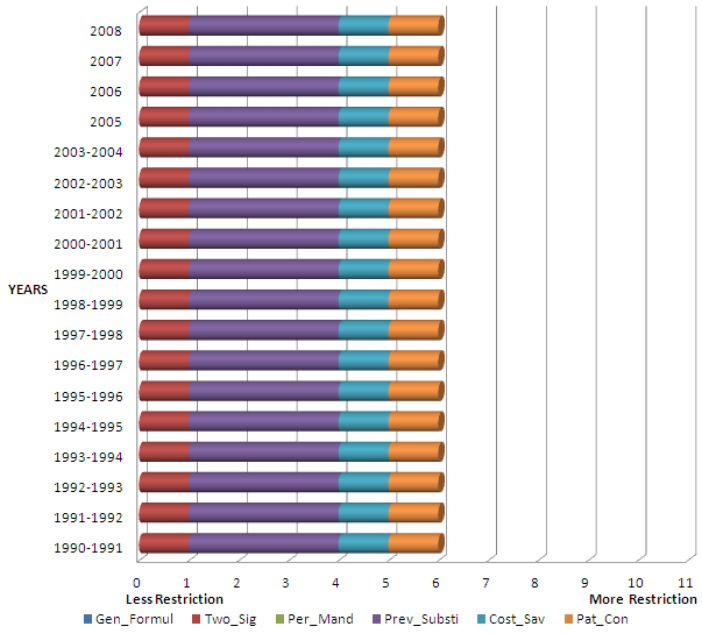
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of North Carolina 1990 - 2008



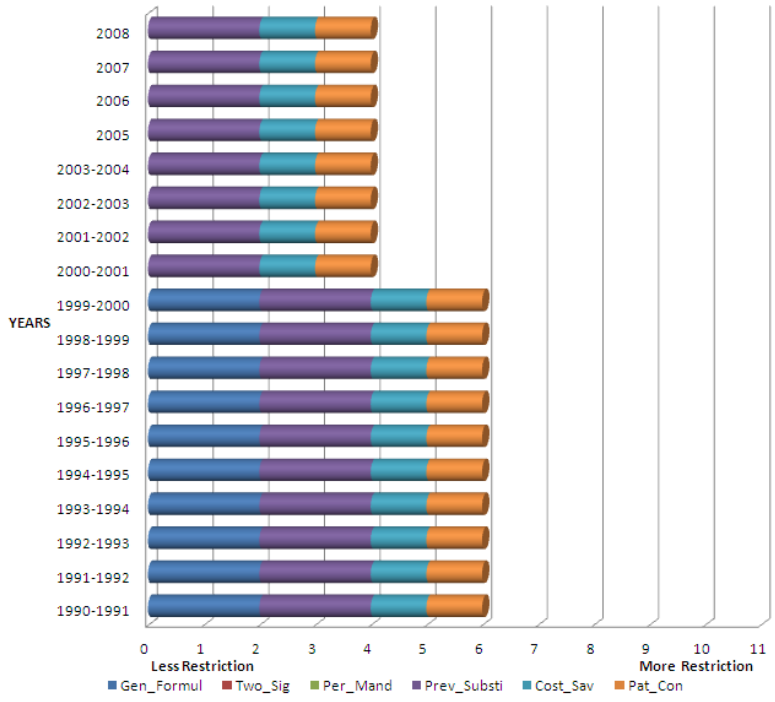
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [5], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of North Dakota 1990 - 2008



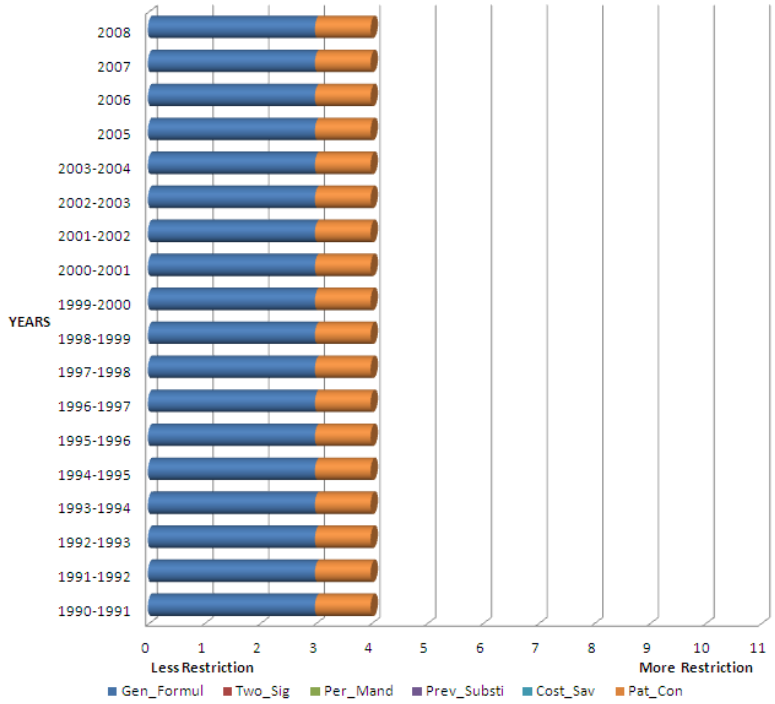
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [5], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Ohio 1990 - 2008



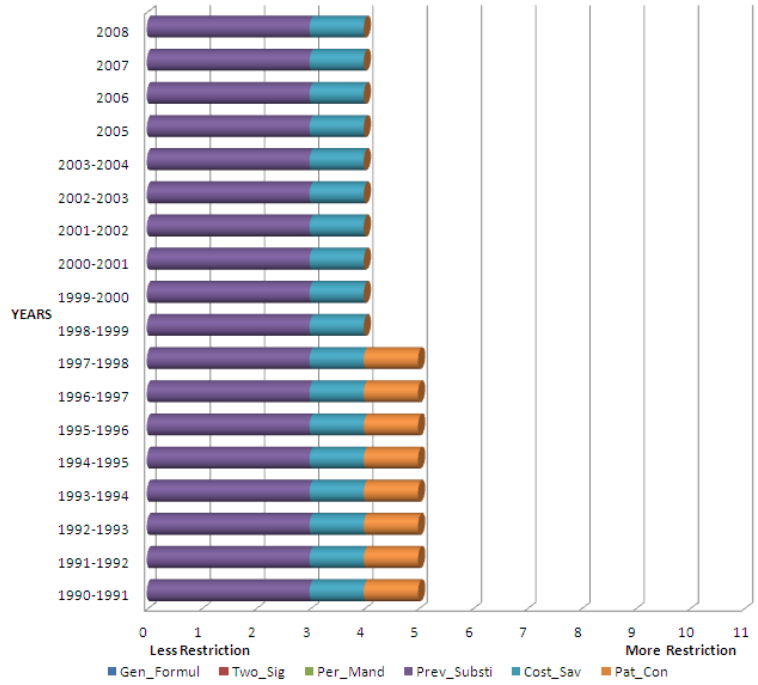
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [5], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Oklahoma 1990 - 2008



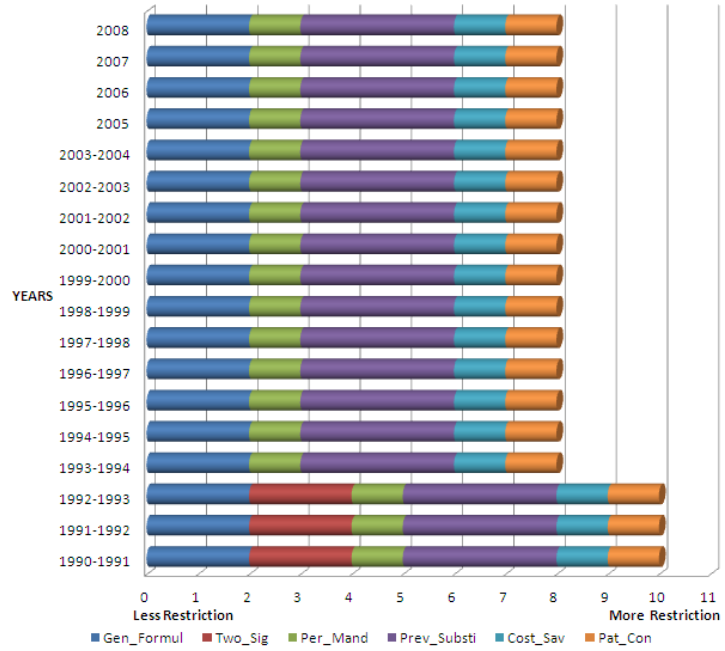
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [5], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Oregon 1990 - 2008



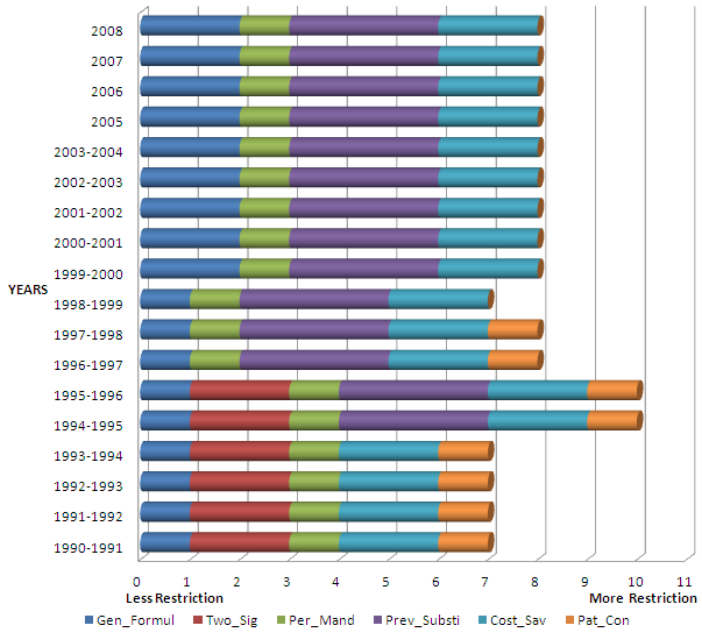
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Pennsylvania 1990 - 2008



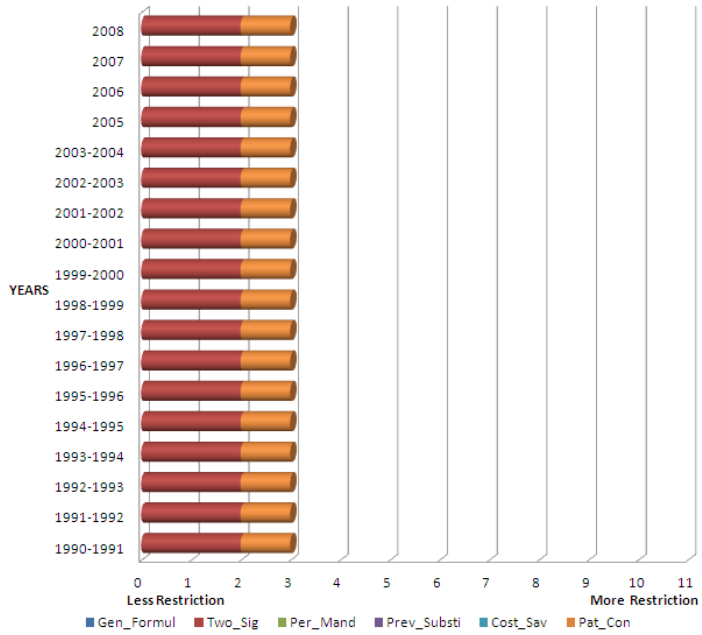
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Rhode Island 1990 - 2008



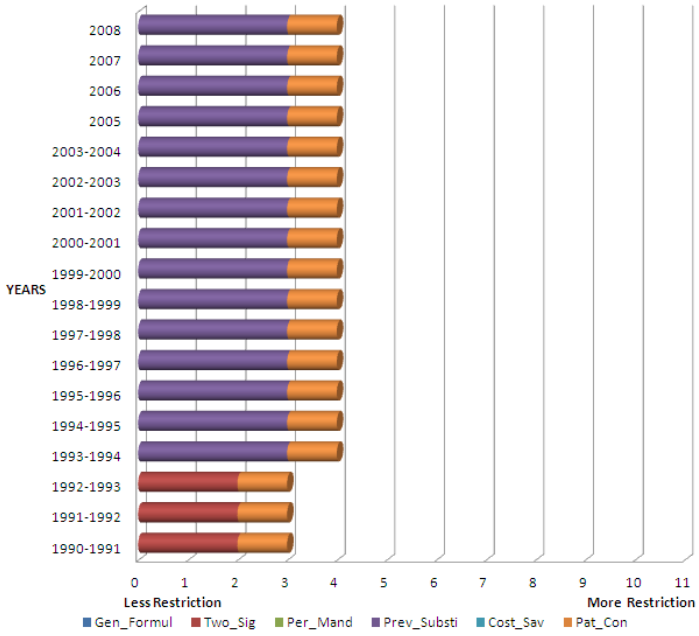
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of South Carolina 1990 - 2008



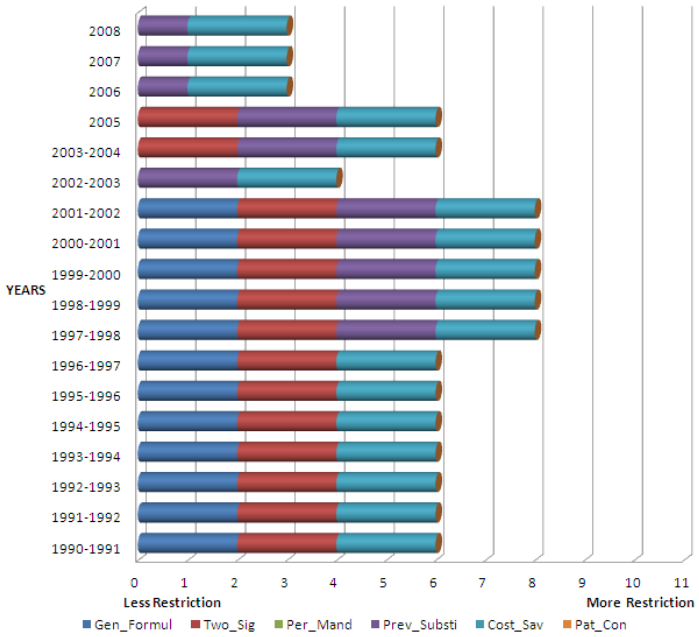
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of South Dakota 1990 - 2008

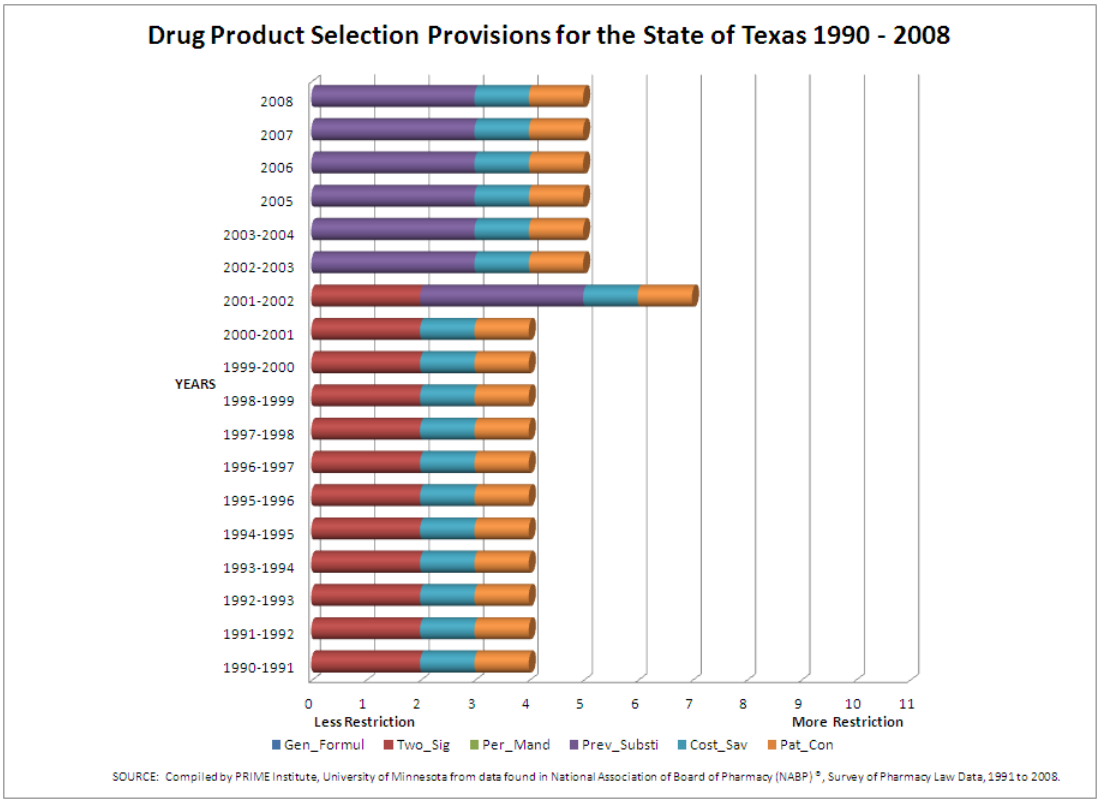


SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

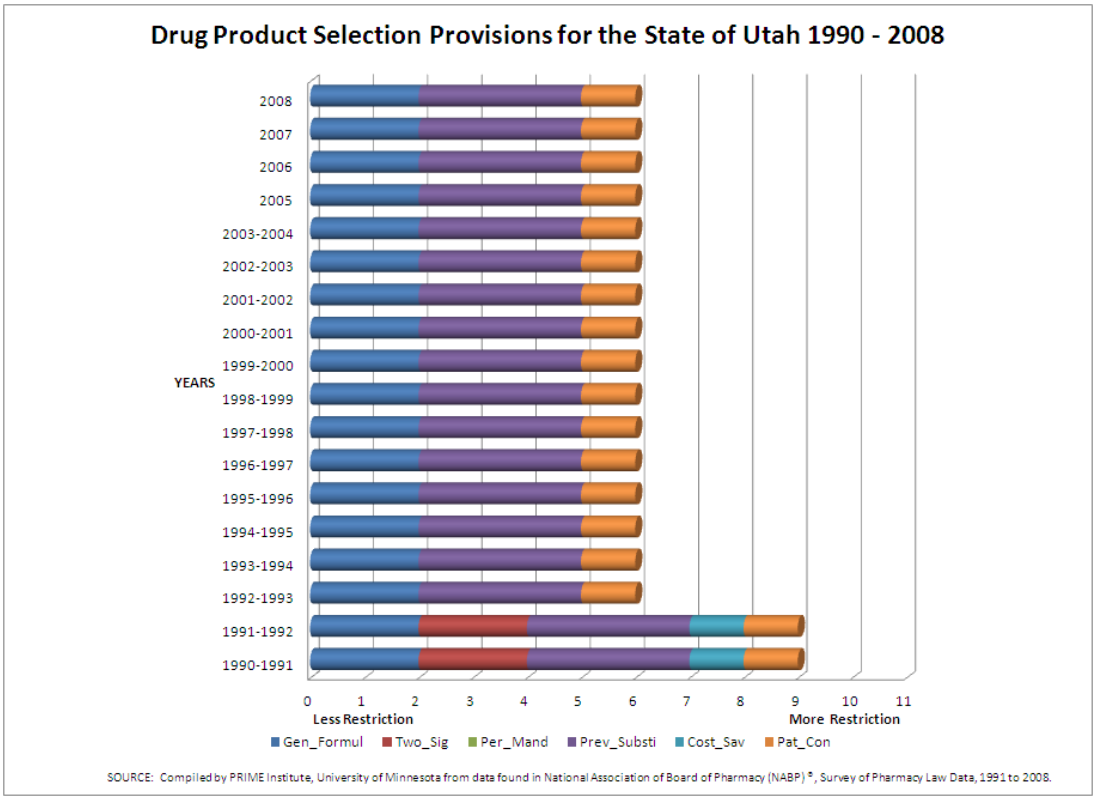
Drug Product Selection Provisions for the State of Tennessee 1990 - 2008



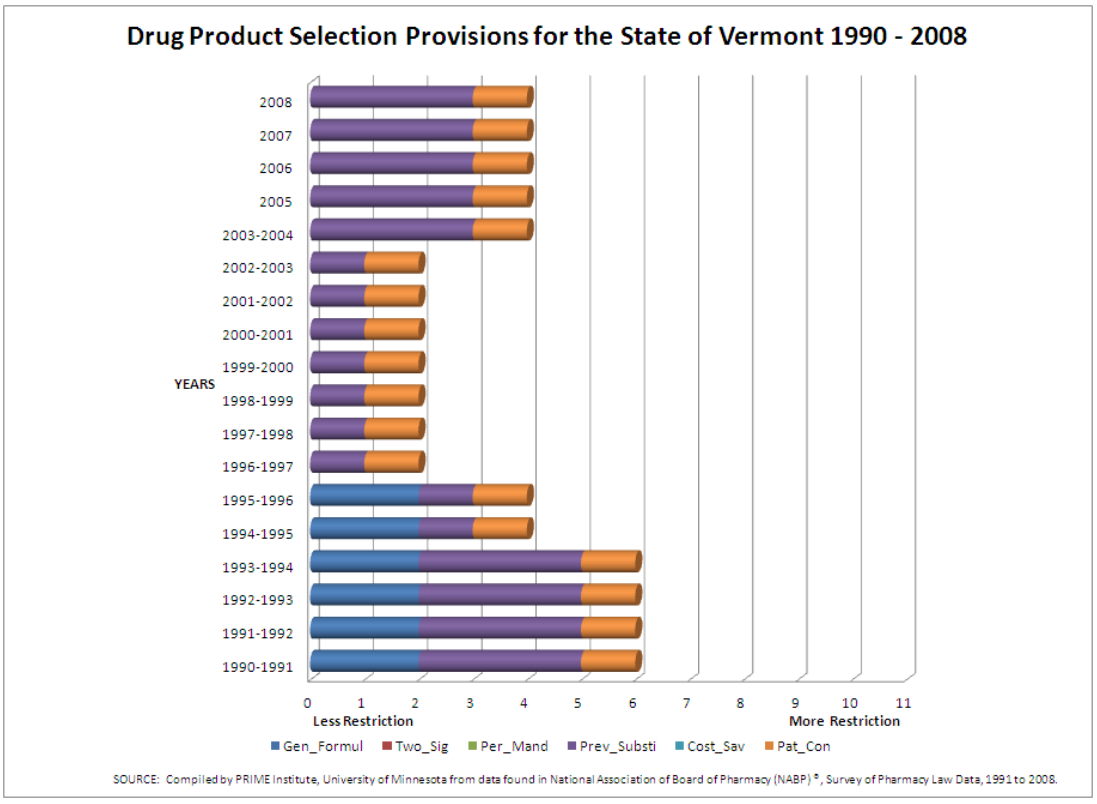
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Vermont 1990 - 2008
YEARS
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2003-2004
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1997-1998
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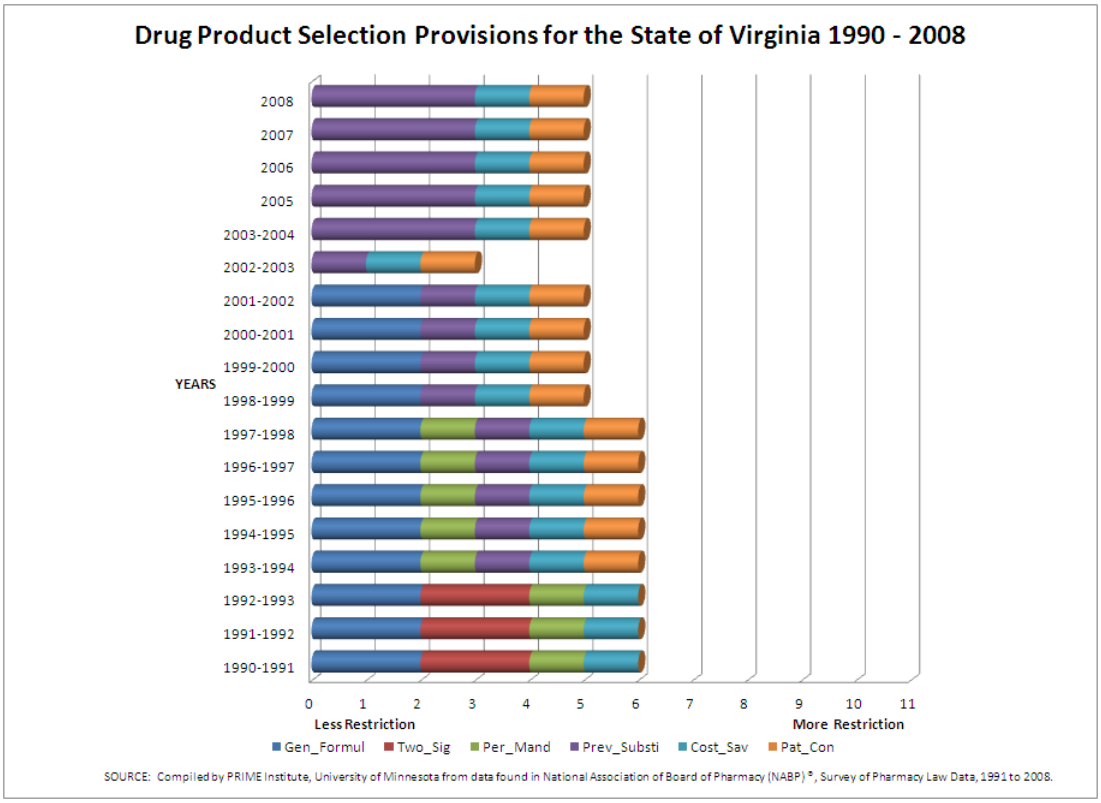
1991-1992
1990-1991
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Gen_Formul
Two_Sig
Per_Mand
Prev_Substi
Cost_Sav
Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Virginia 1990 - 2008
YEARS
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2006
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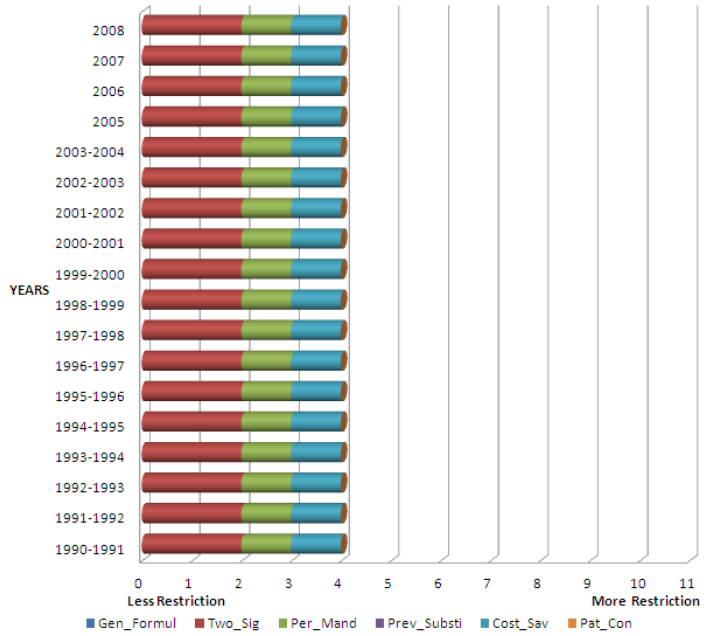
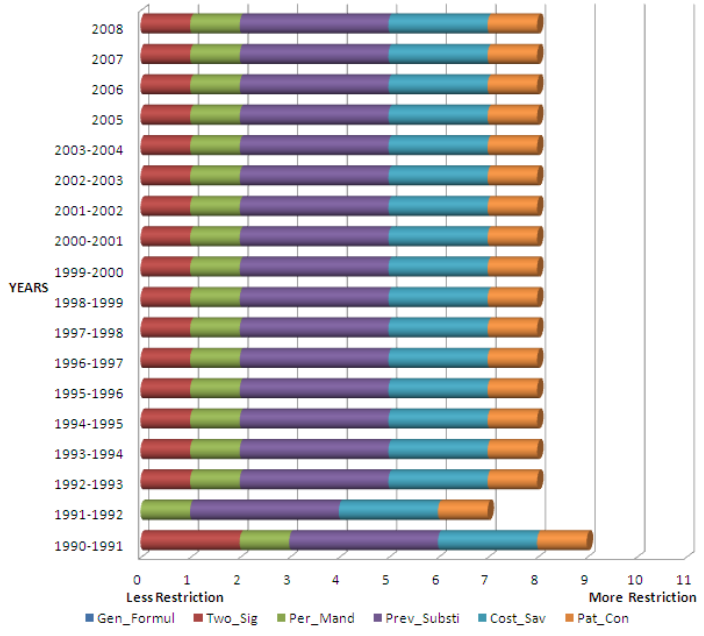
2003-2004
2002-2003
2001-2002
2000-2001
1999-2000
1998-1999
1997-1998
1996-1997
1995-1996
1994-1995
1993-1994
1992-1993
1991-1992
1990-1991
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Gen_Formul
Two_Sig
Per_Mand
Prev_Substi
Cost_Sav
Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of Washington 1990 - 2008

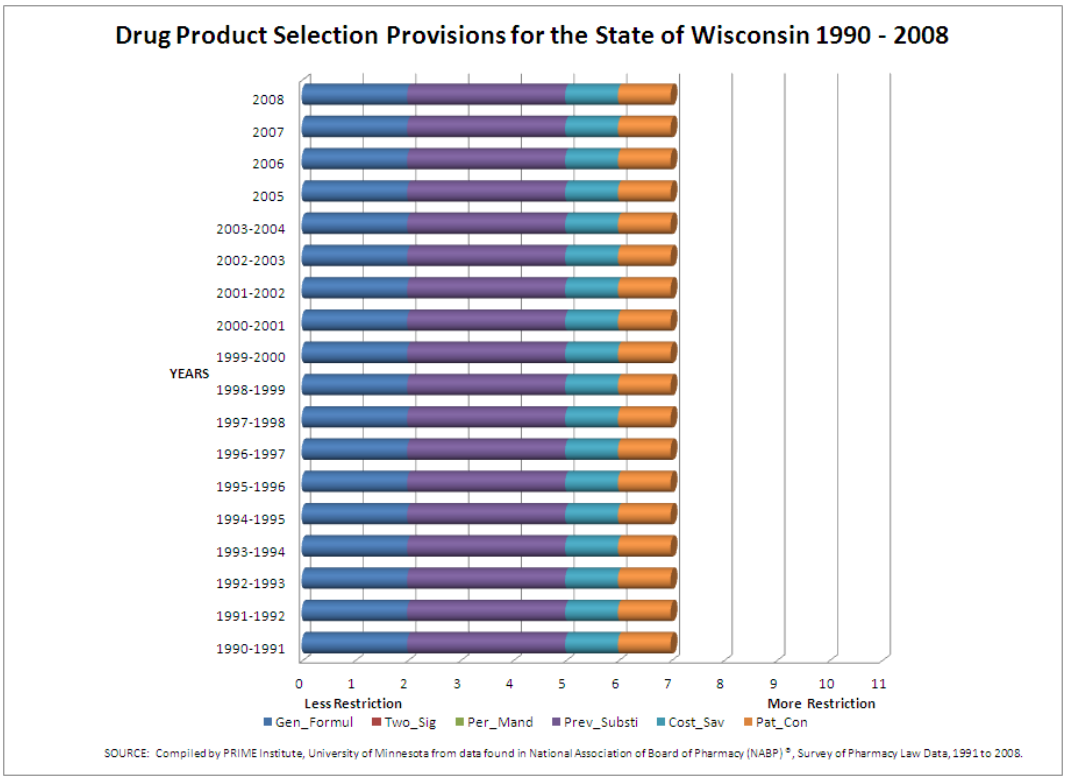


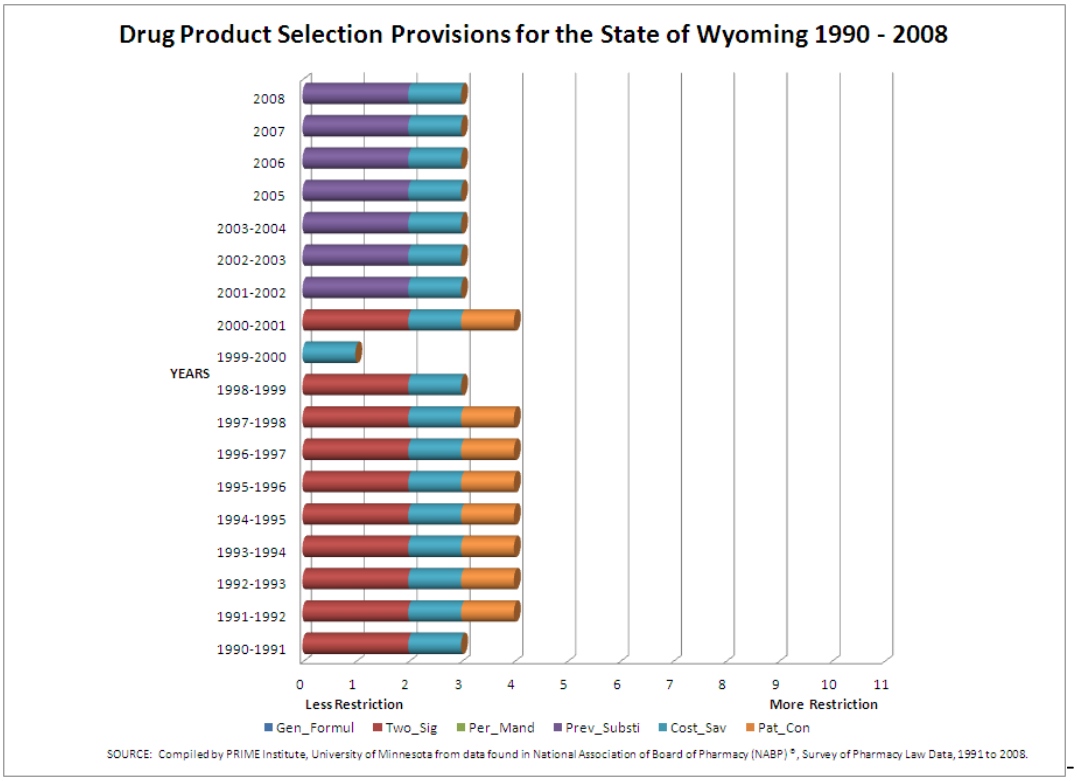
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.

Drug Product Selection Provisions for the State of West Virginia 1990 - 2008



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Wisconsin 1990 - 2008
YEARS
2008
2007
2006
2005
2003-2004
2002-2003
2001-2002
2000-2001
1999-2000
1998-1999
1997-1998
1996-1997
1995-1996
1994-1995
1993-1994
1992-1993
1991-1992
1990-1991
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Gen_Formul
Two_Sig
Per_Mand
Prev_Substi
Cost_Sav
Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provisions for the State of Wyoming 1990 - 2008
YEARS
2008
2007
2006
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2003-2004
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1998-1999
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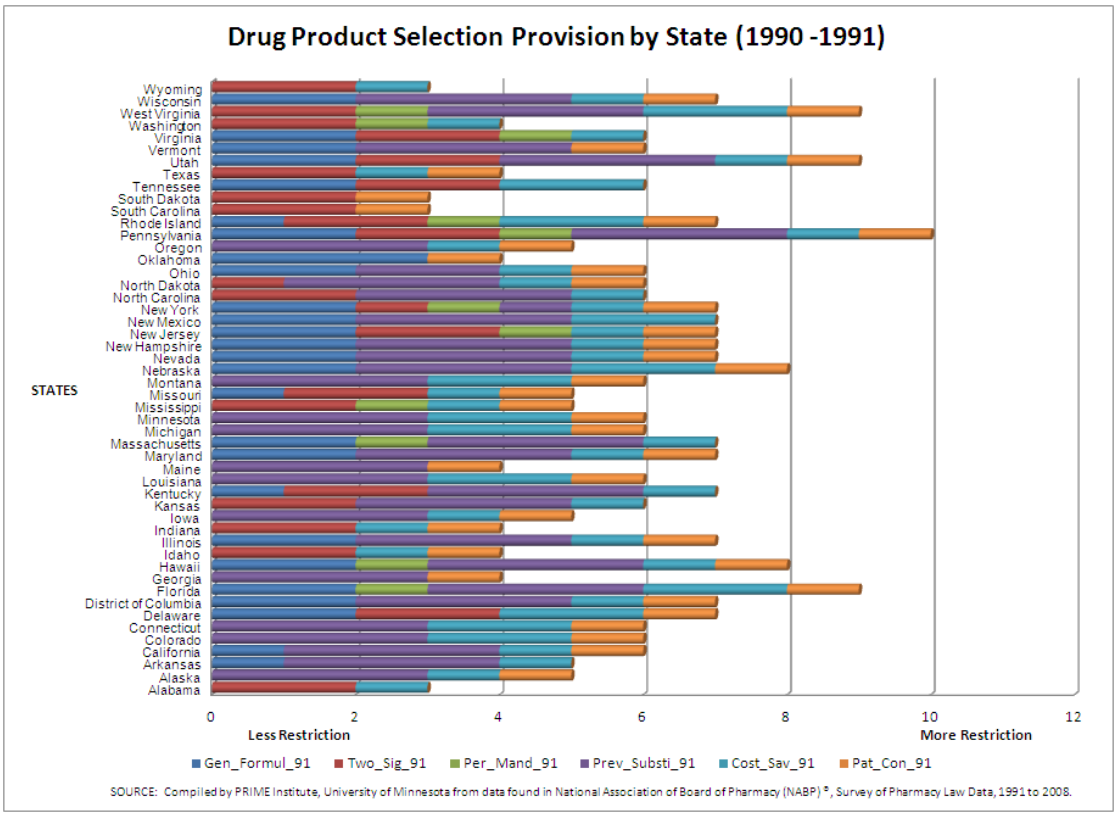
1990-1991
0 1 2 3 4 5 6 7 8 9 10 11
Less Restriction
More Restriction
Gen_Formul
Two_Sig
Per_Mand
Prev_Substi
Cost_Sav
Pat_Con
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

Appendix 3
Drug Product Selection Provisions by States Per Year (1990 - 2008)


Drug Product Selection Provision by State (1990 -1991)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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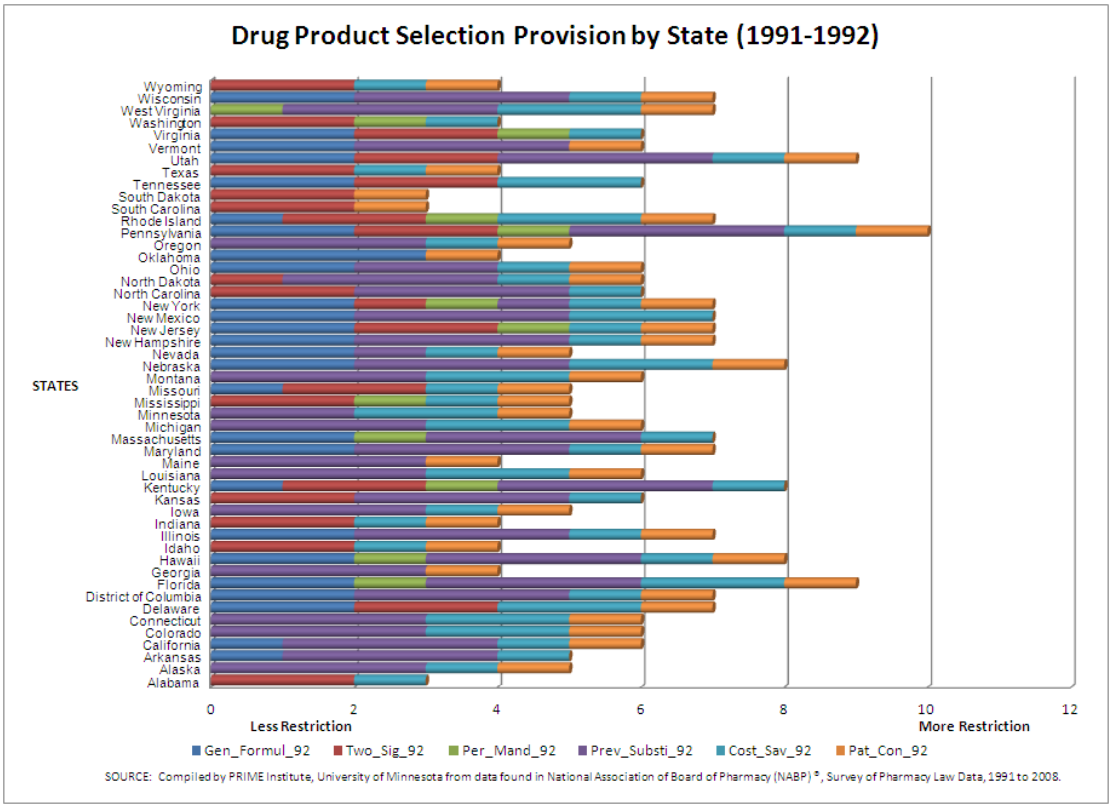
12
Less Restriction
More Restriction
Gen_Formul_91
Two_Sig_91
Per_Mand_91
Prev_Substi_91
Cost_Sav_91
Pat_Con_91
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1991-1992)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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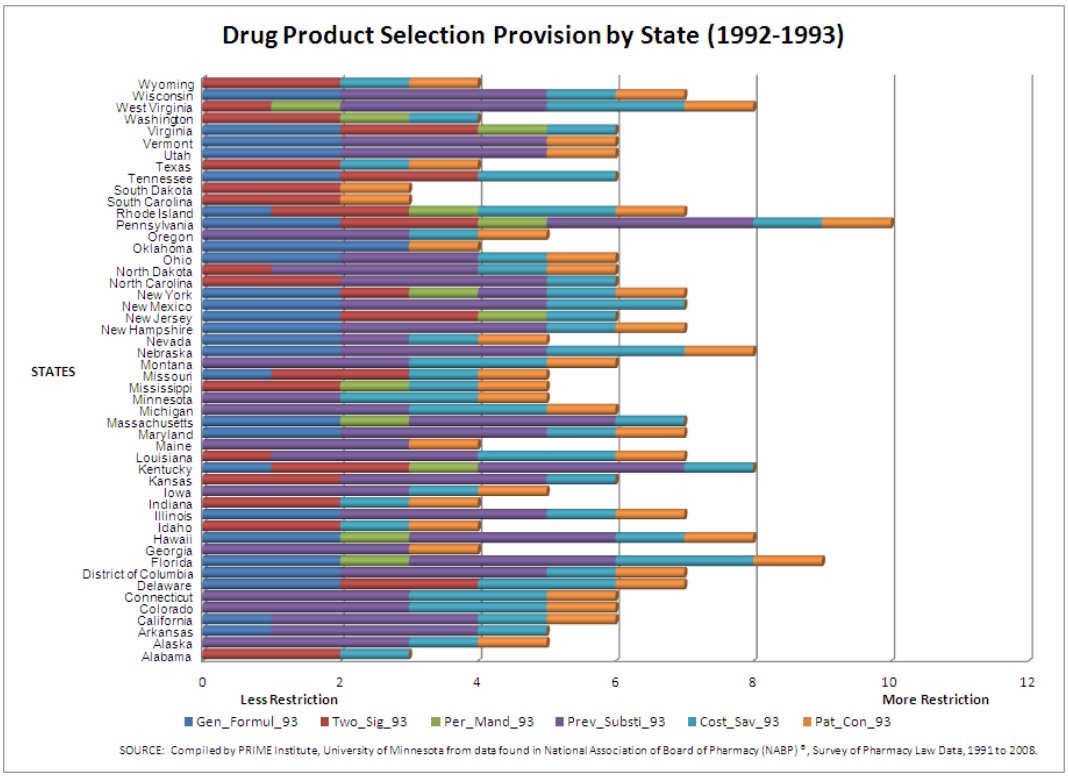
12
Less Restriction
More Restriction
Gen_Formul_92
Two_Sig_92
Per_Mand_92
Prev_Substi_92
Cost_Sav_92
Pat_Con_92
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1992-1993)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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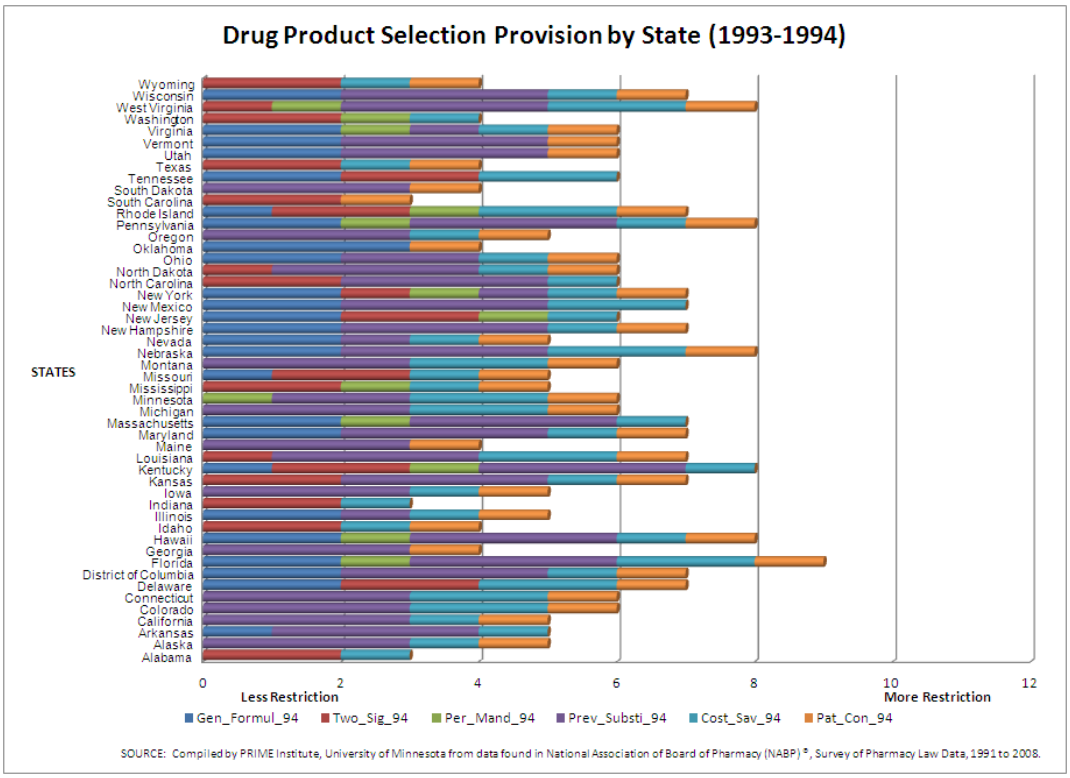
12
Less Restriction
More Restriction
Gen_Formul_93
Two_Sig_93
Per_Mand_93
Prev_Substi_93
Cost_Sav_93
Pat_Con_93
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1993-1994)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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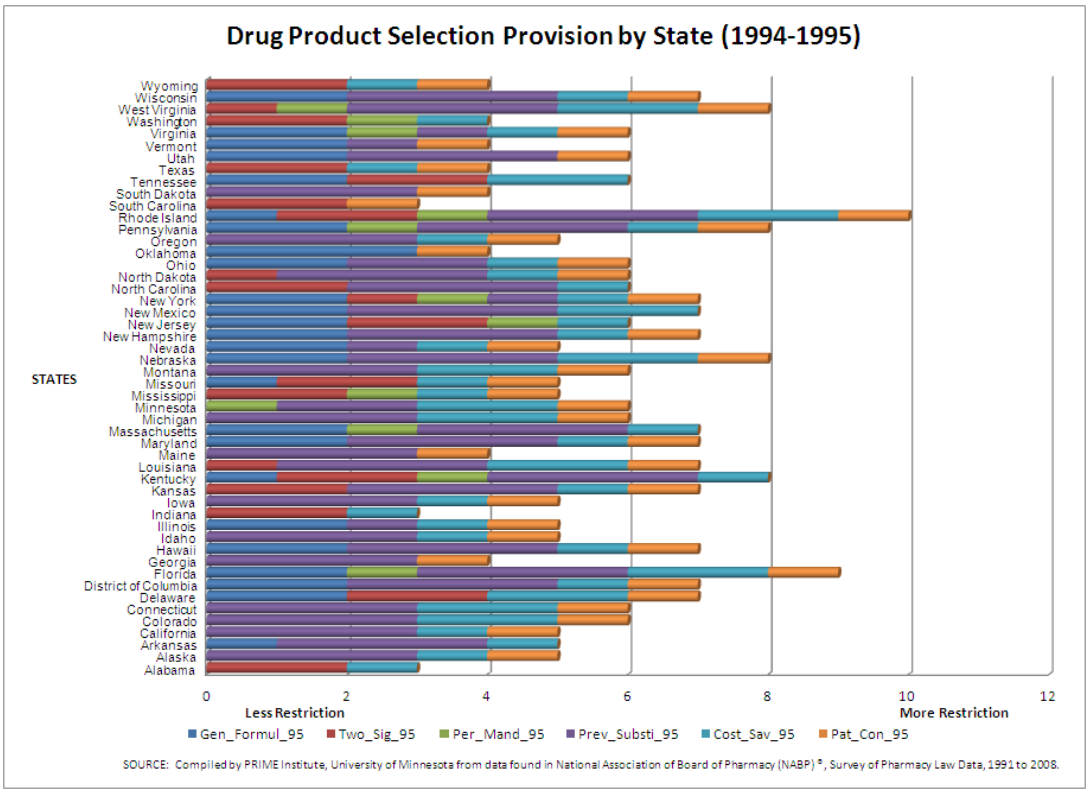
10
12
Less Restriction
More Restriction
Gen_Formul_94
Two_Sig_94
Per_Mand_94
Prev_Substi_94
Cost_Sav_94
Pat_Con_94
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1994-1995)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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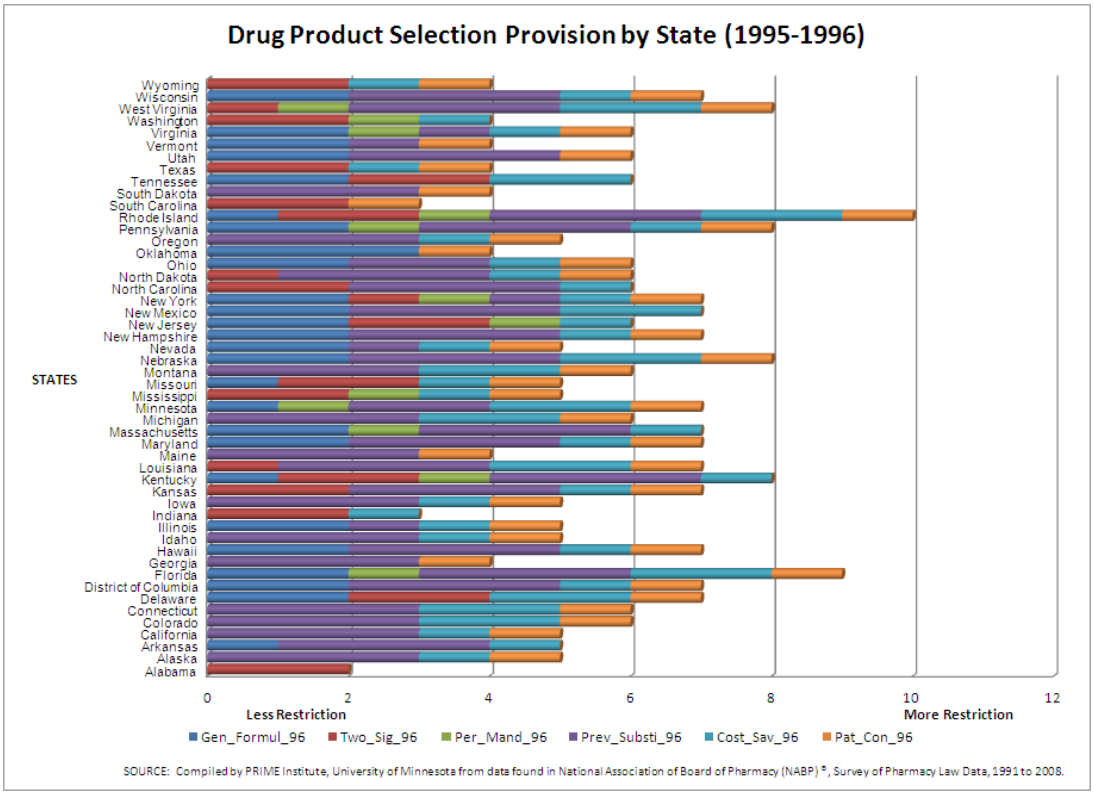
12
Less Restriction
More Restriction
Gen_Formul_95
Two_Sig_95
Per_Mand_95
Prev_Substi_95
Cost_Sav_95
Pat_Con_95
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1995-1996)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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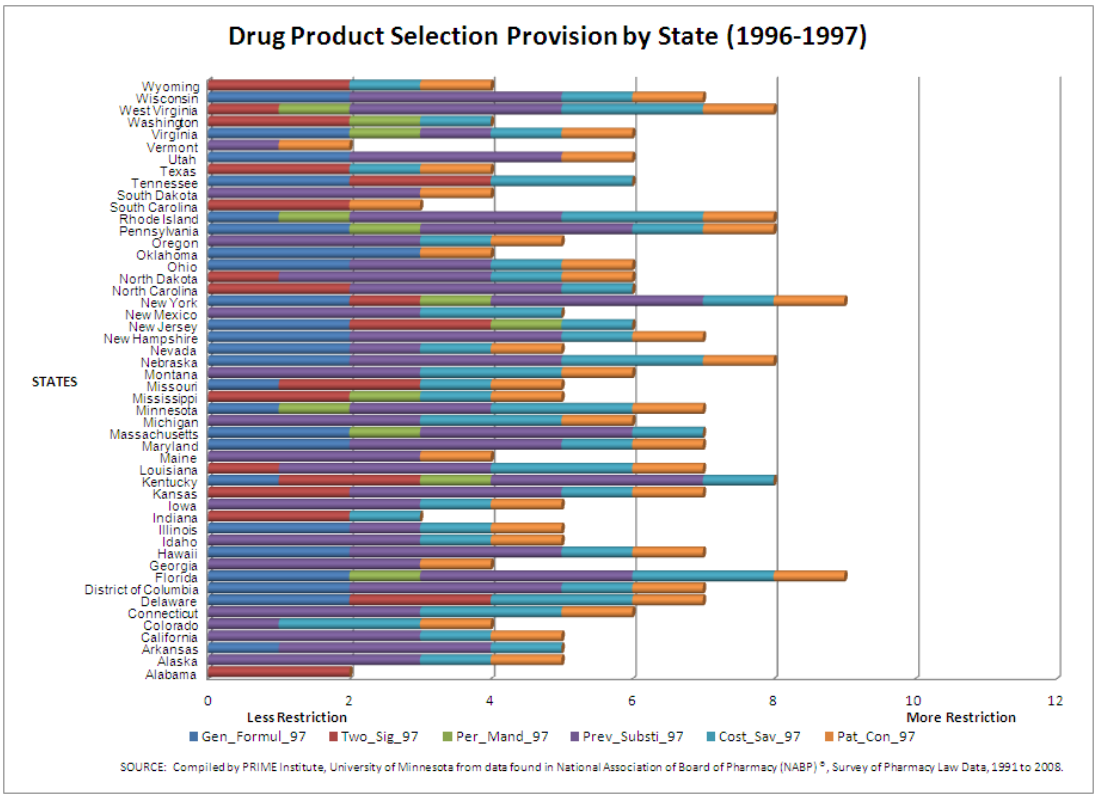
12
Less Restriction
More Restriction
Gen_Formul_96
Two_Sig_96
Per_Mand_96
Prev_Substi_96
Cost_Sav_96
Pat_Con_96
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1996-1997)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
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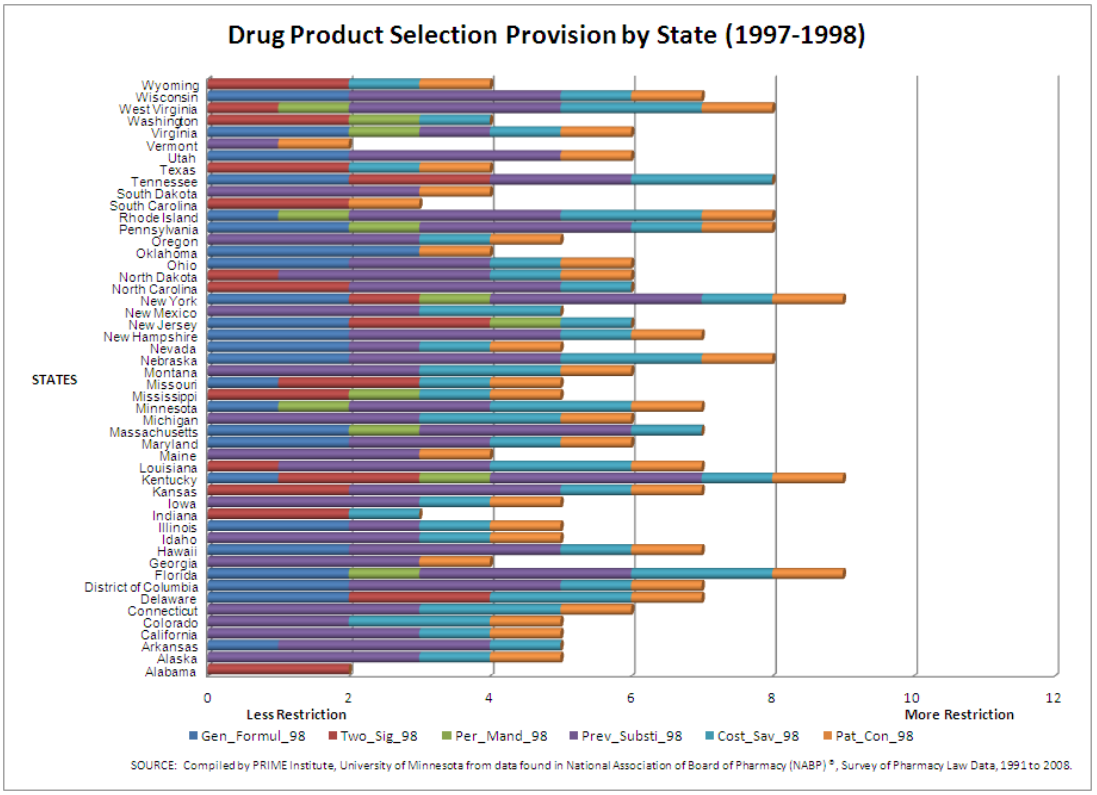
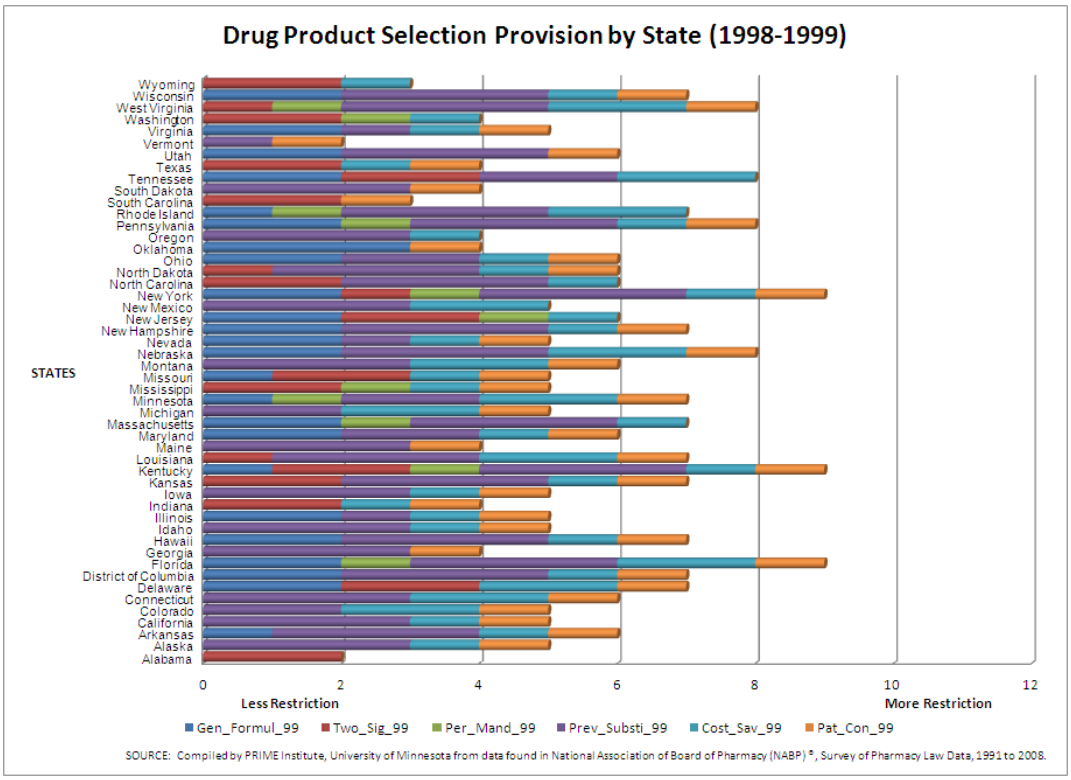
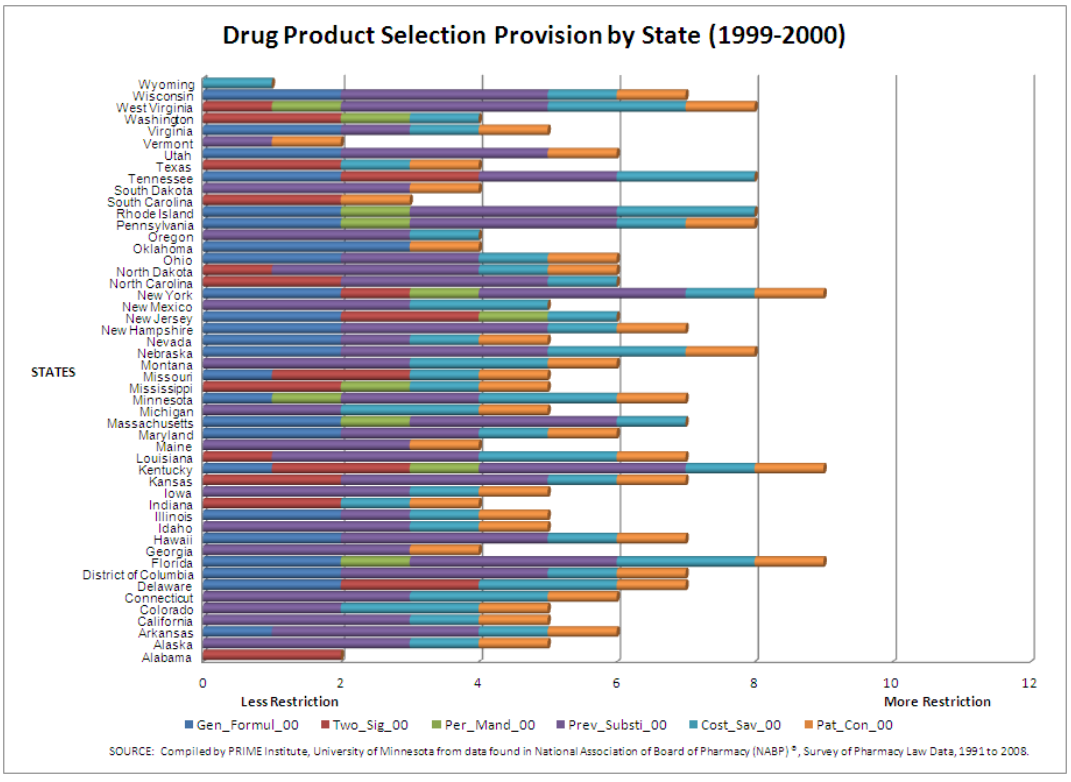
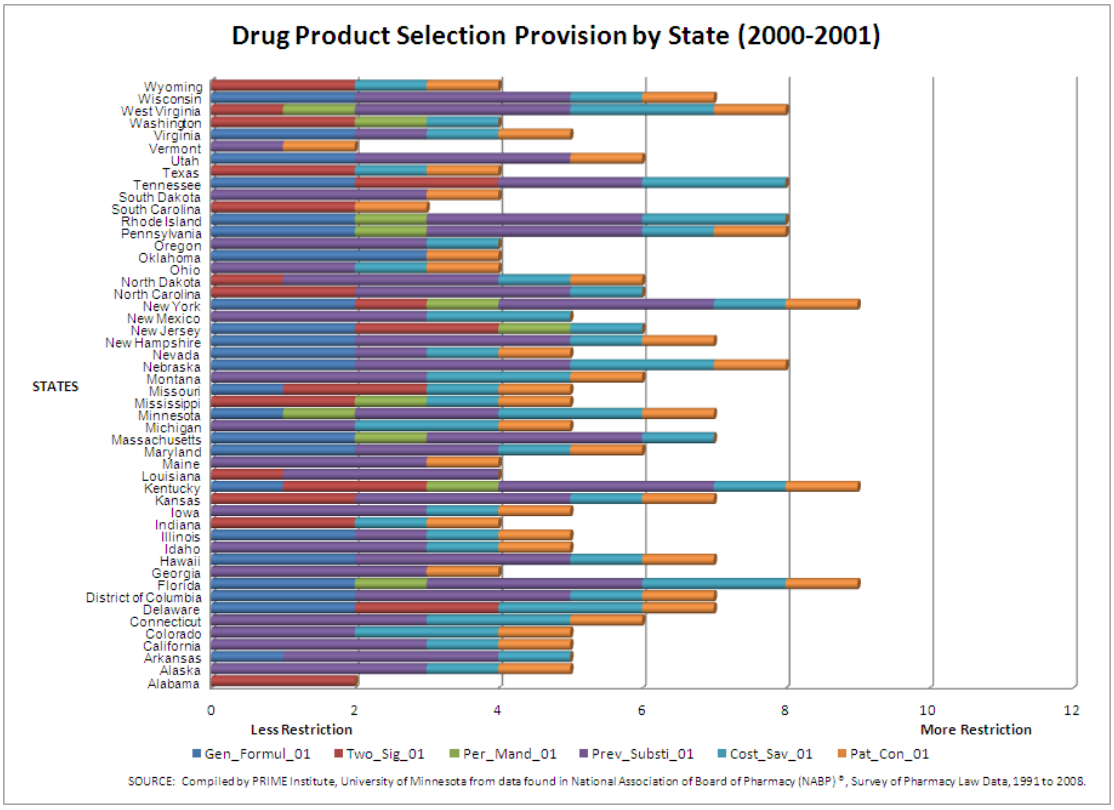
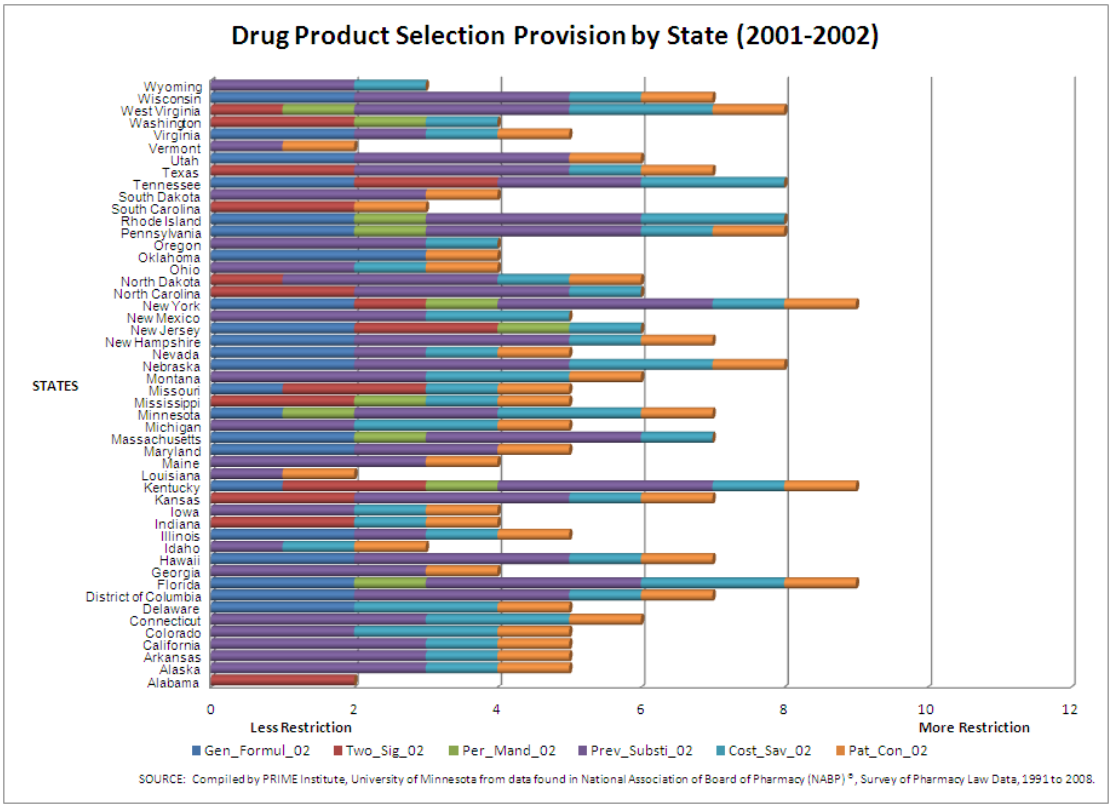
12
Less Restriction
More Restriction
Gen_Formul_97
Two_Sig_97
Per_Mand_97
Prev_Substi_97
Cost_Sav_97
Pat_Con_97
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

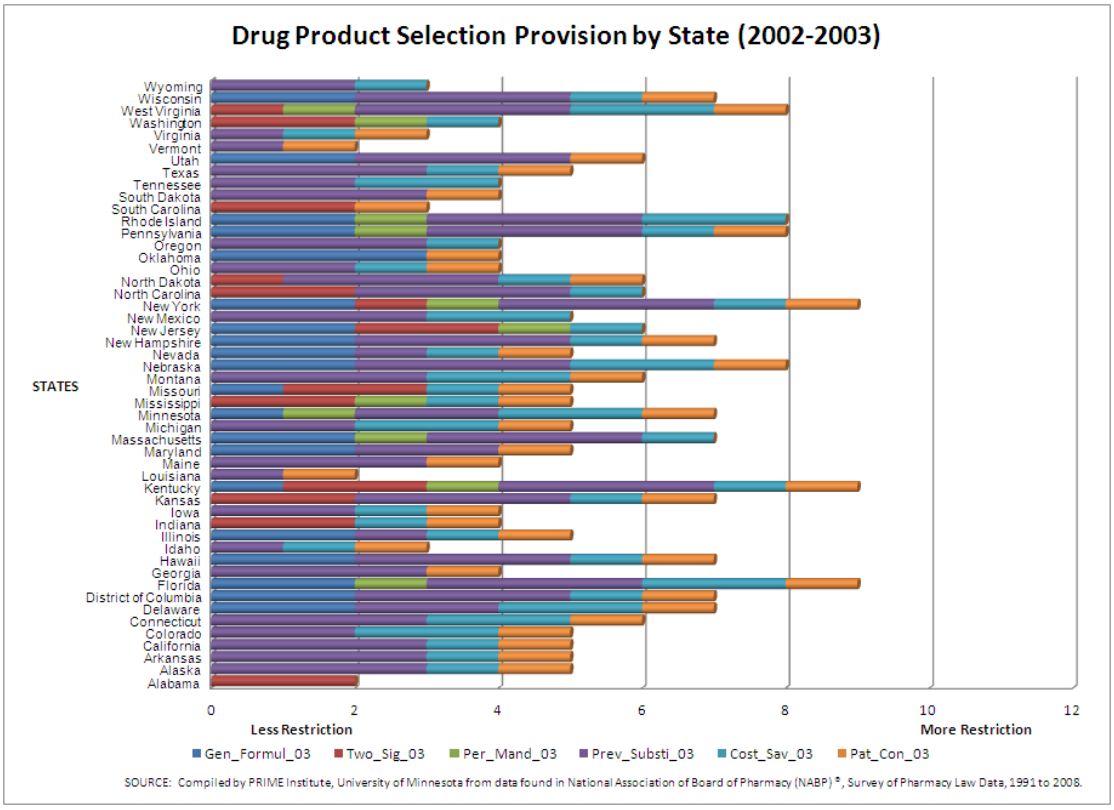

Drug Product Selection Provision by State (1997-1998)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
0
2
4
6
8
10
12
Less Restriction
More Restriction
Gen_Formul_98
Two_Sig_98
Per_Mand_98
Prev_Substi_98
Cost_Sav_98
Pat_Con_98
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (1998-1999)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
0
2
4
6
8
10
12
Less Restriction
More Restriction
Gen_Formul_99
Two_Sig_99
Per_Mand_99
Prev_Substi_99
Cost_Sav_99
Pat_Con_99
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

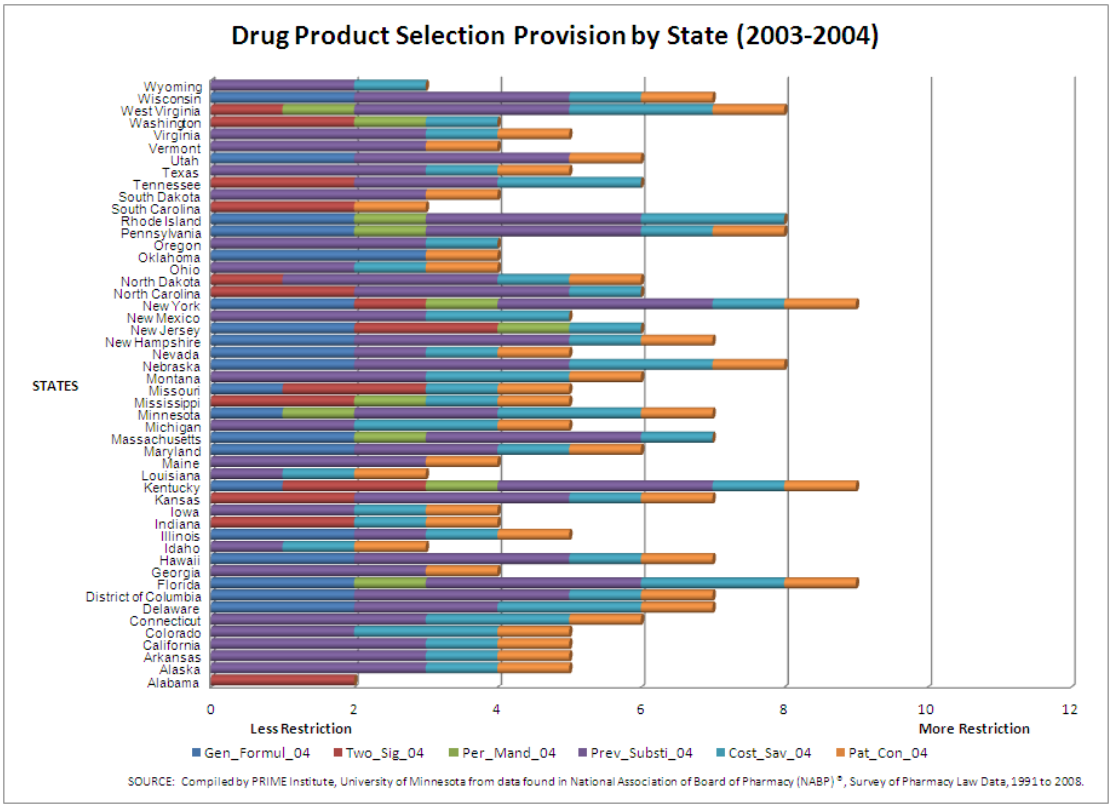

Drug Product Selection Provision by State (1999-2000)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
0
2
4
6
8
10
12
Less Restriction
More Restriction
Gen_Formul_00
Two_Sig_00
Per_Mand_00
Prev_Substi_00
Cost_Sav_00
Pat_Con_00
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.


Drug Product Selection Provision by State (2000-2001)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
0
2
4
6
8
10
12
Less Restriction
More Restriction
Gen_Formul_01
Two_Sig_01
Per_Mand_01
Prev_Substi_01
Cost_Sav_01
Pat_Con_01
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

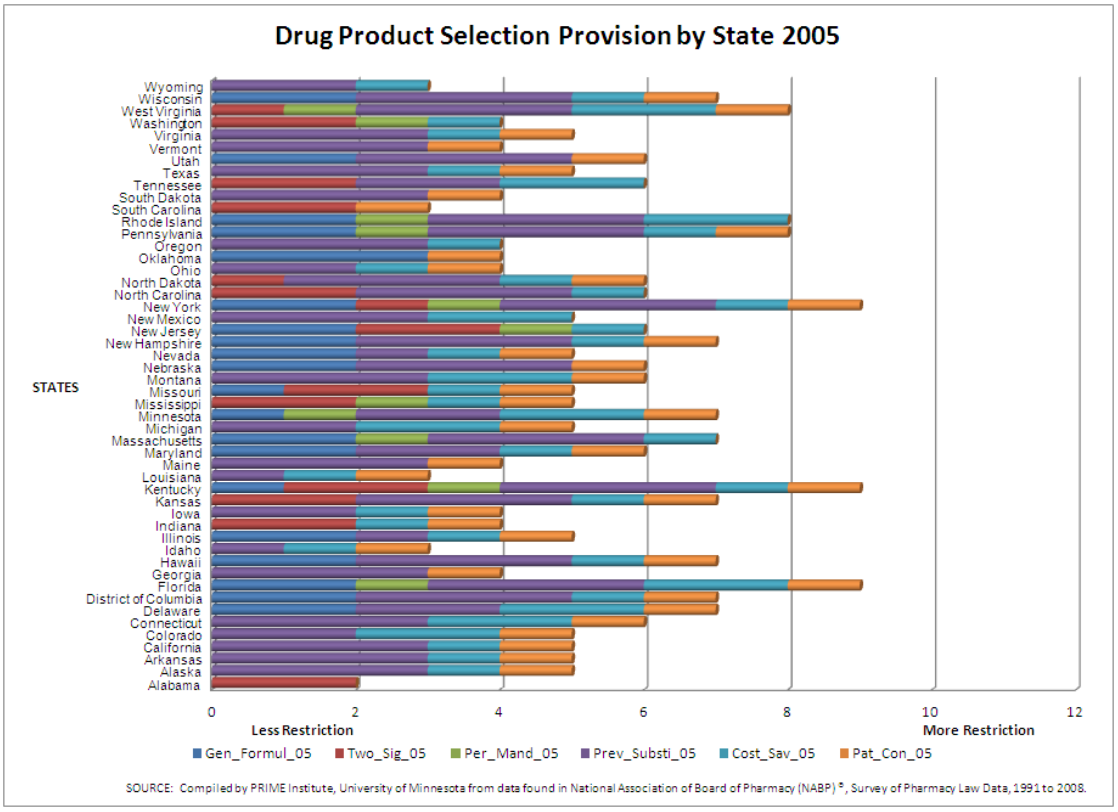

Drug Product Selection Provision by State (2001-2002)
STATES
Wyoming
Wisconsin
West Virginia
Washington
Virginia
Vermont
Utah
Texas
Tennessee
South Dakota
South Carolina
Rhode Island
Pennsylvania
Oregon
Oklahoma
Ohio
North Dakota
North Carolina
New York
New Mexico
New Jersey
New Hampshire
Nevada
Nebraska
Montana
Missouri
Mississippi
Minnesota
Michigan
Massachusetts
Maryland
Maine
Louisiana
Kentucky
Kansas
Iowa
Indiana
Illinois
Idaho
Hawaii
Georgia
Florida
District of Columbia
Delaware
Connecticut
Colorado
California
Arkansas
Alaska
Alabama
0
2
4
6
8
10
12
Less Restriction
More Restriction
Gen_Formul_02
Two_Sig_02
Per_Mand_02
Prev_Substi_02
Cost_Sav_02
Pat_Con_02
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.



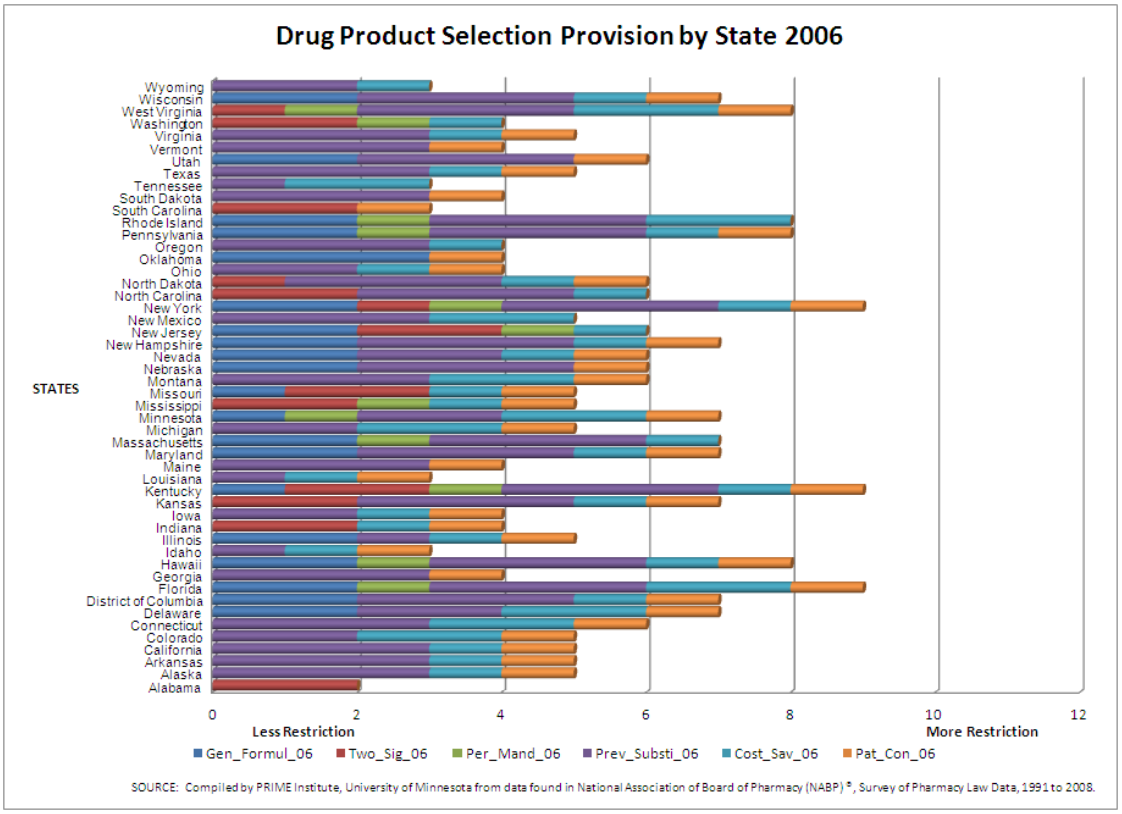
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.



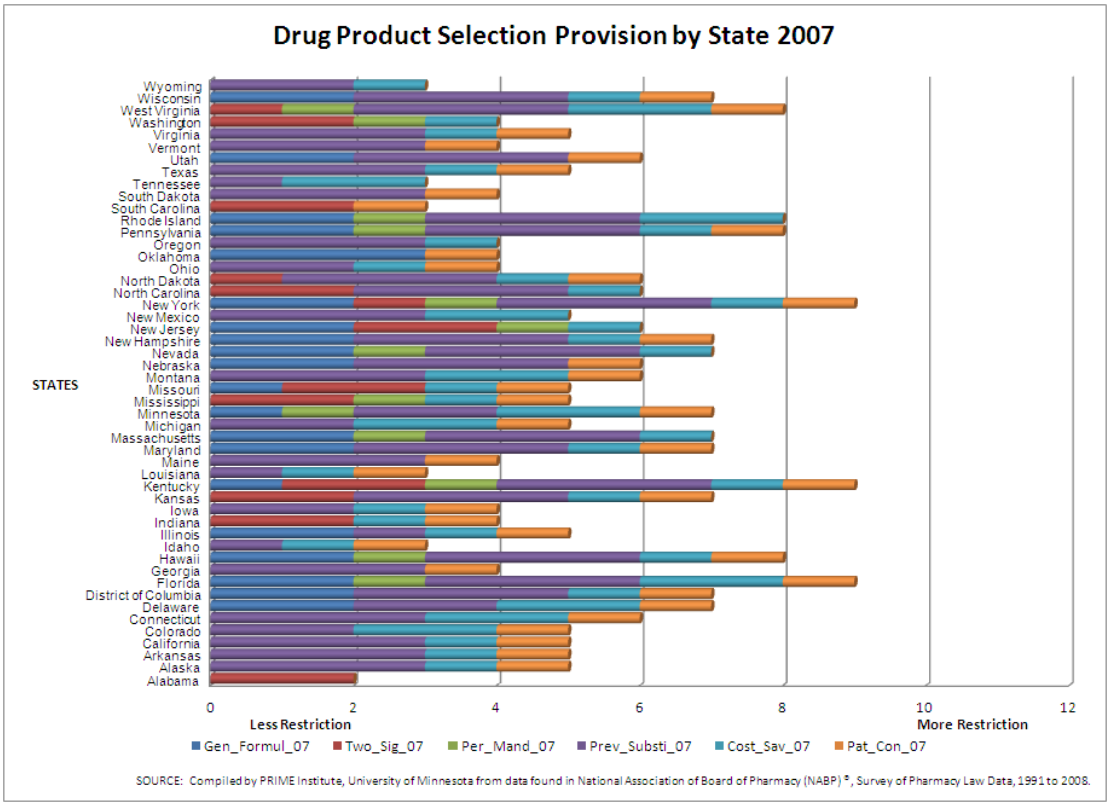
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.



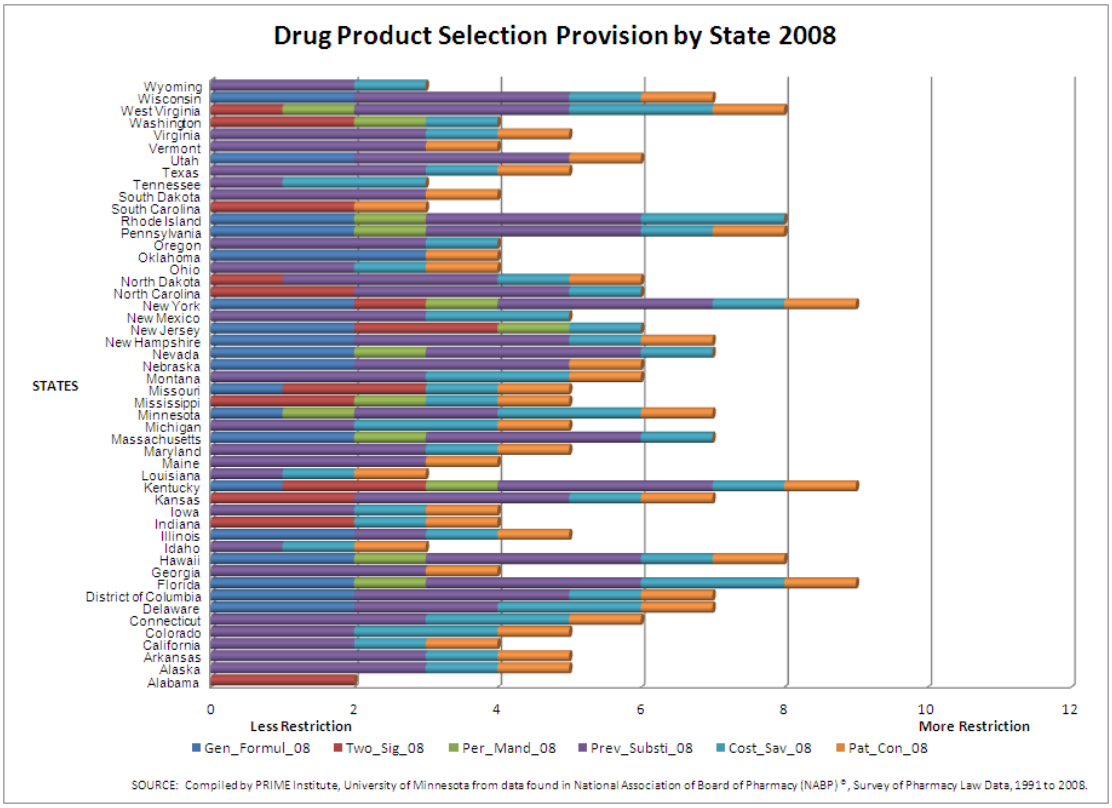
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) ®, Survey of Pharmacy Law Data, 1991 to 2008.

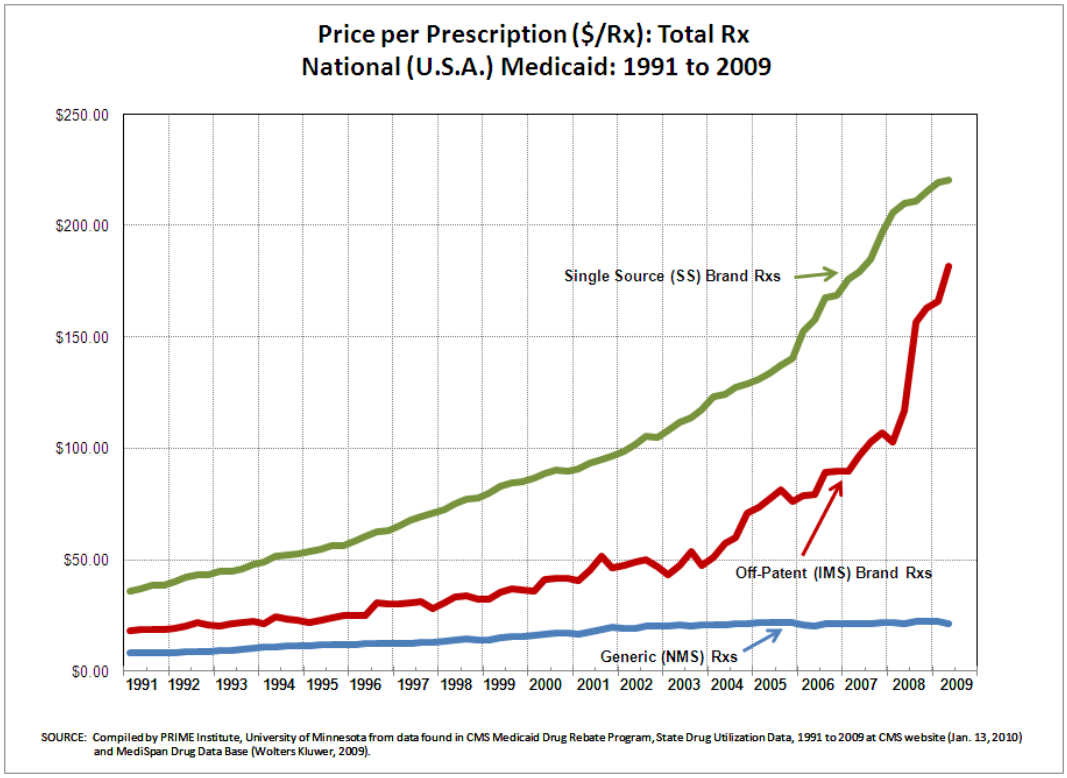


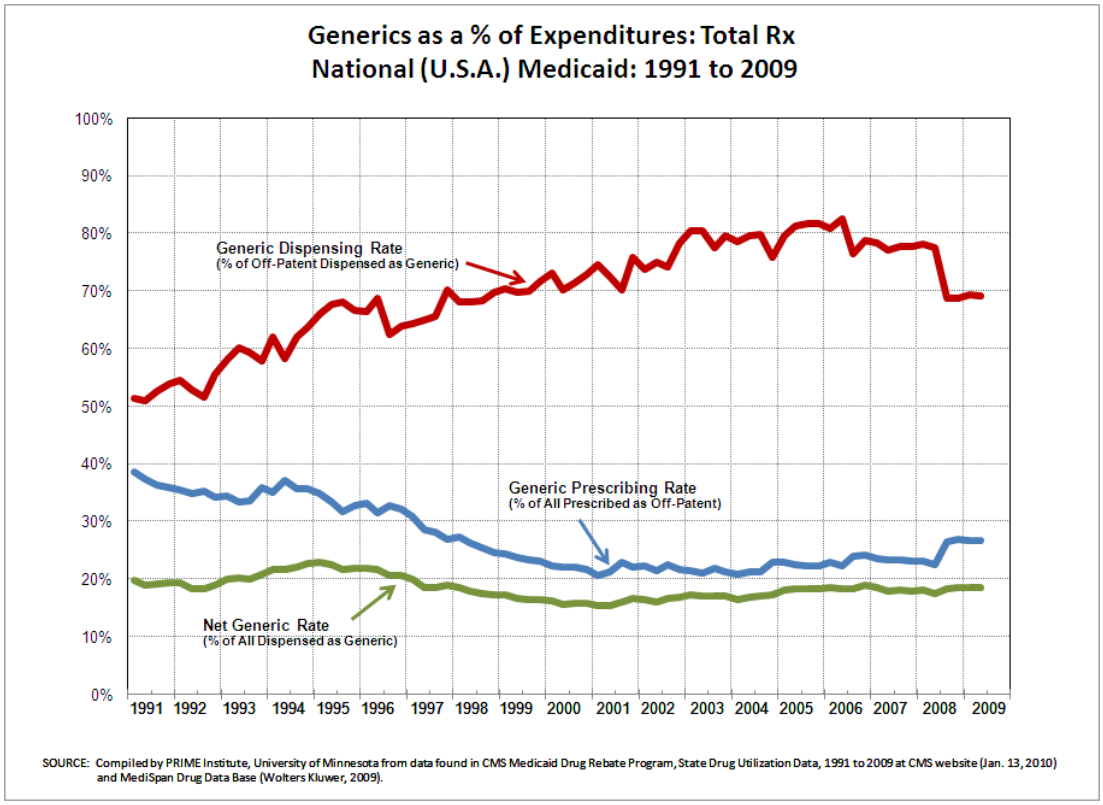
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.



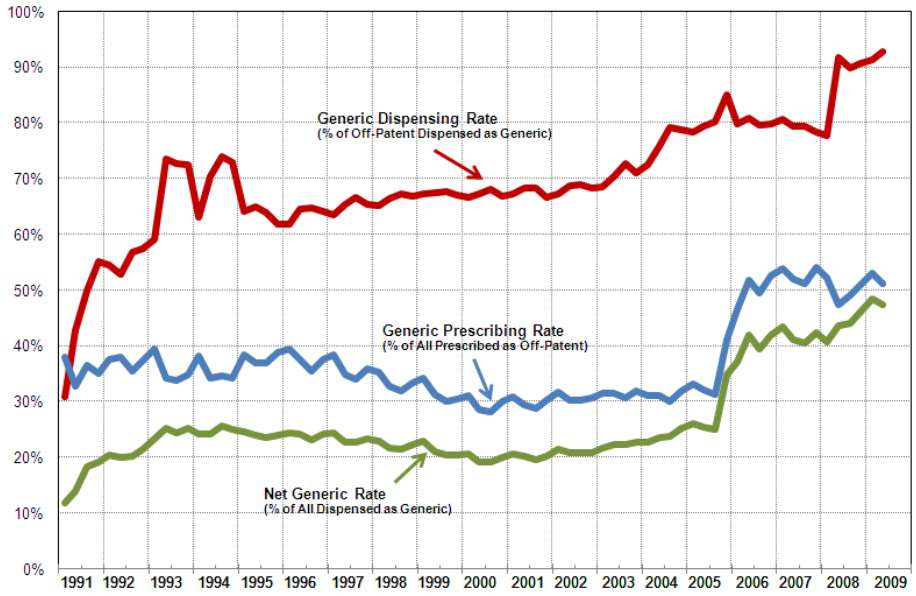
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in National Association of Board of Pharmacy (NABP) [8], Survey of Pharmacy Law Data, 1991 to 2008.

Appendix 4
Generics Rates at the Substitutable Market national and by State


Price per Prescription ($/Rx): Total Rx
National (U.S.A.) Medicaid: 1991 to 2009
$250.00
$200.00
$150.00
$100.00
$50.00
$0.00
Single Source (SS) Brand Rxs
Off-Patent (IMS) Brand Rxs
Generic (NMS) Rxs
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

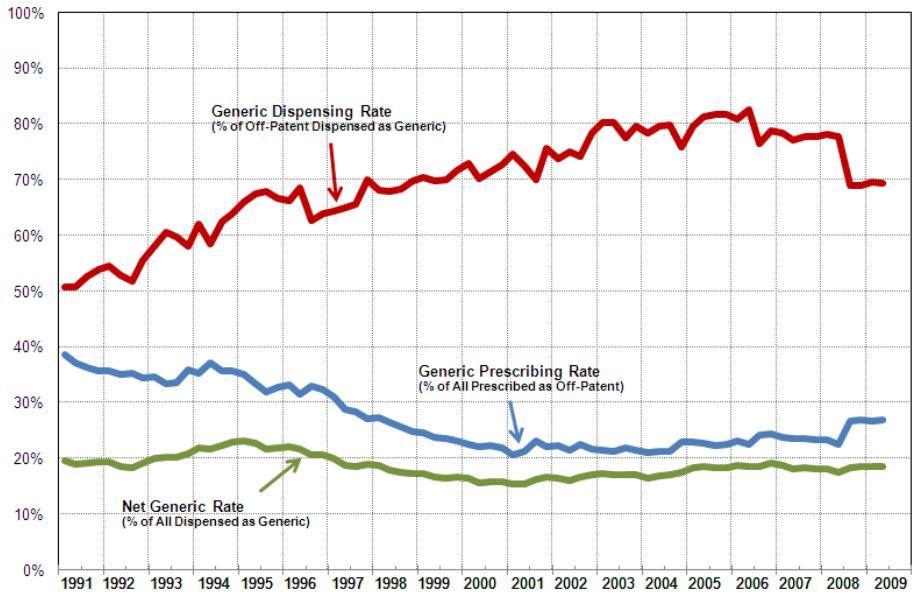

Generics as a % of Expenditures: Total Rx
National (U.S.A.) Medicaid: 1991 to 2009
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Generic Dispensing Rate
(% of Off-Patent Dispensed as Generic)
Generic Prescribing Rate
(% of All Prescribed as Off-Patent)
Net Generic Rate
(% of All Dispensed as Generic)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
National (U.S.A.) Medicaid: 1991 to 2009



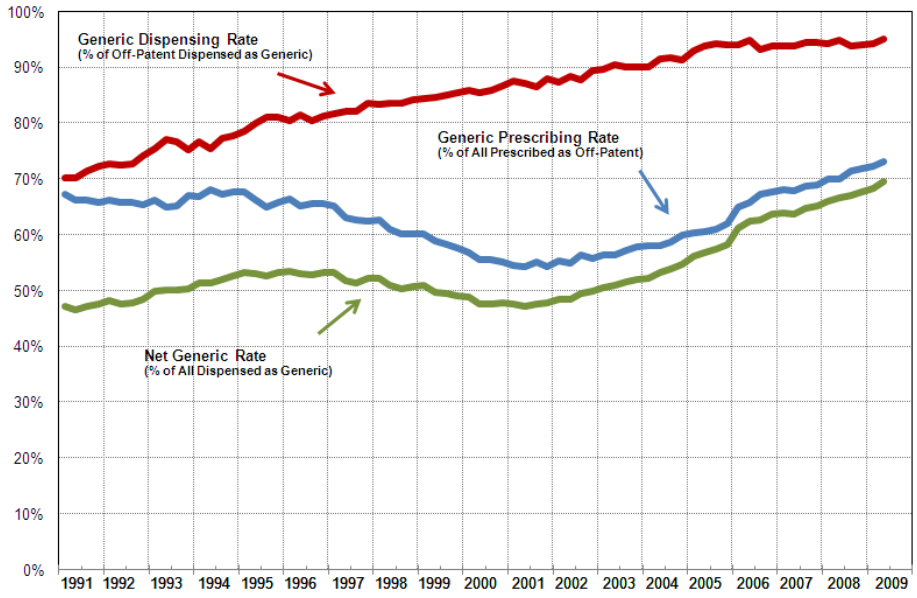
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
National (U.S.A.) Medicaid: 1991 to 2009



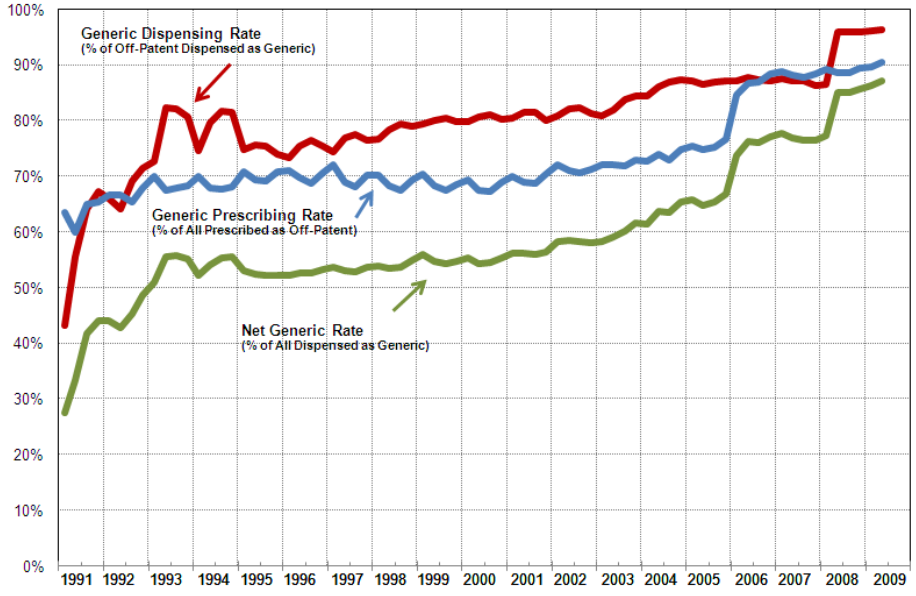
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Prescriptions: Total Rx
National (U.S.A.) Medicaid: 1991 to 2009



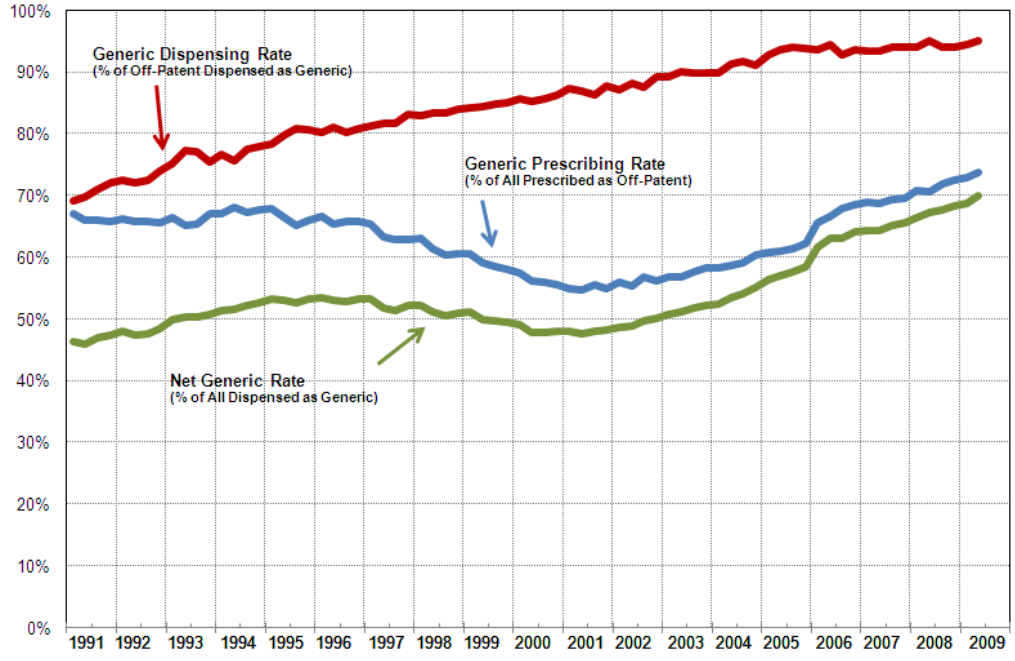
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Prescriptions: Total OTC
National (U.S.A.) Medicaid: 1991 to 2009



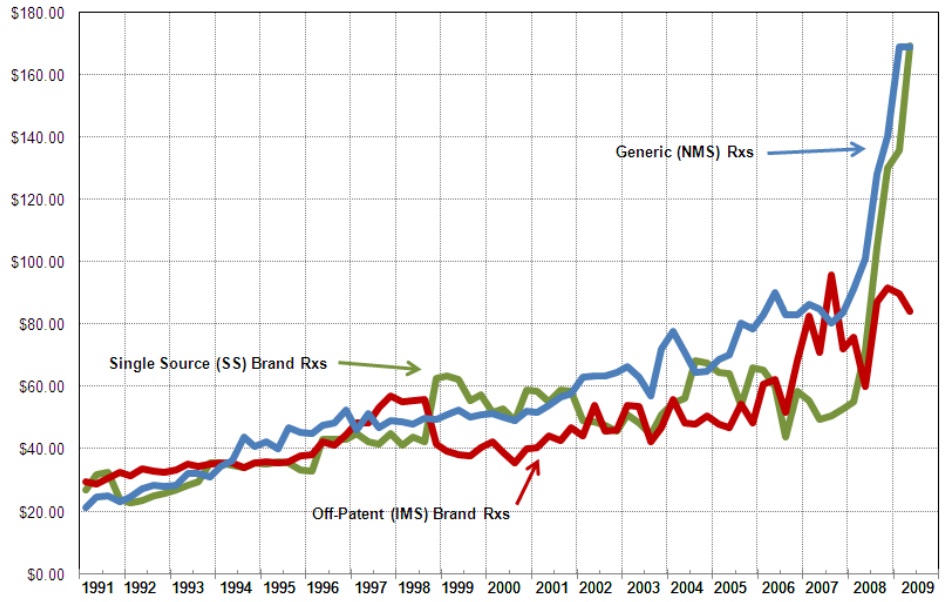
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Prescriptions: Total All National (U.S.A.) Medicaid: 1991 to 2009



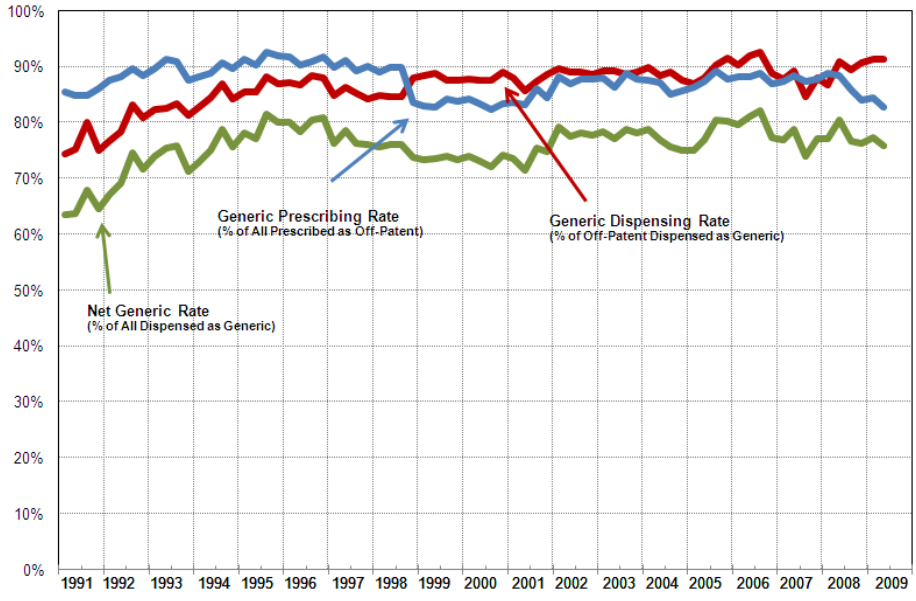
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Alaska Medicaid: 1991 to 2009



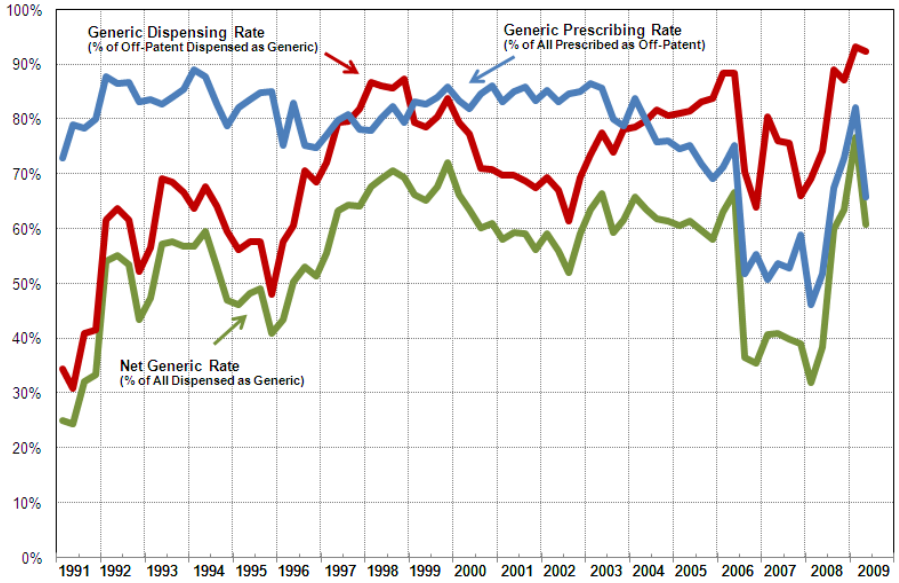
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Alaska Medicaid: 1991 to 2009



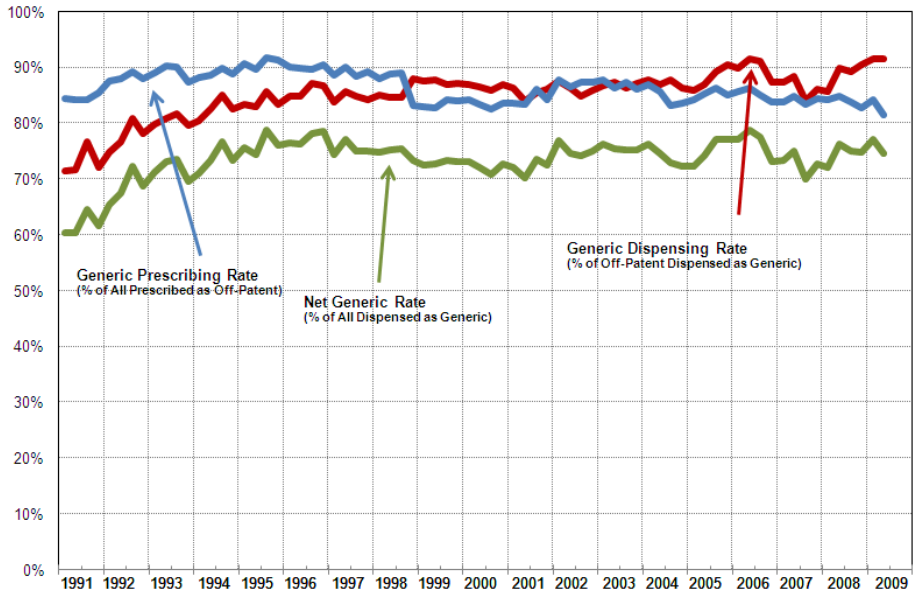
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Alaska Medicaid: 1991 to 2009



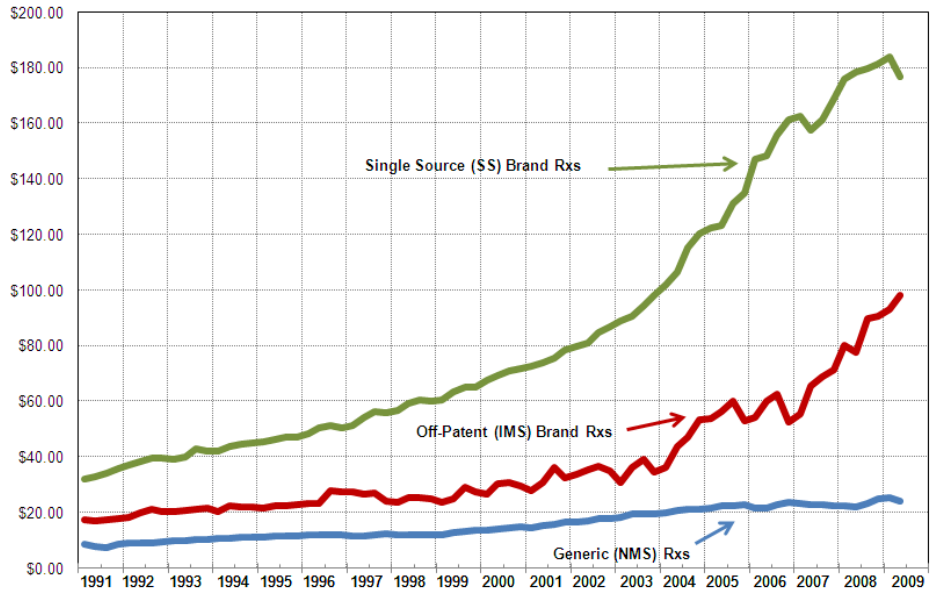
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Alaska Medicaid: 1991 to 2009



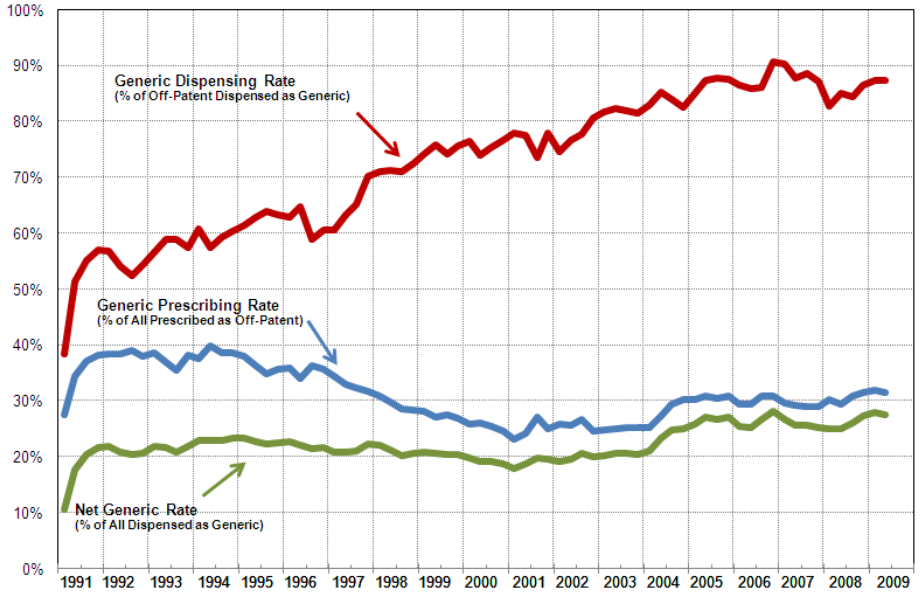
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Alabama Medicaid: 1991 to 2009



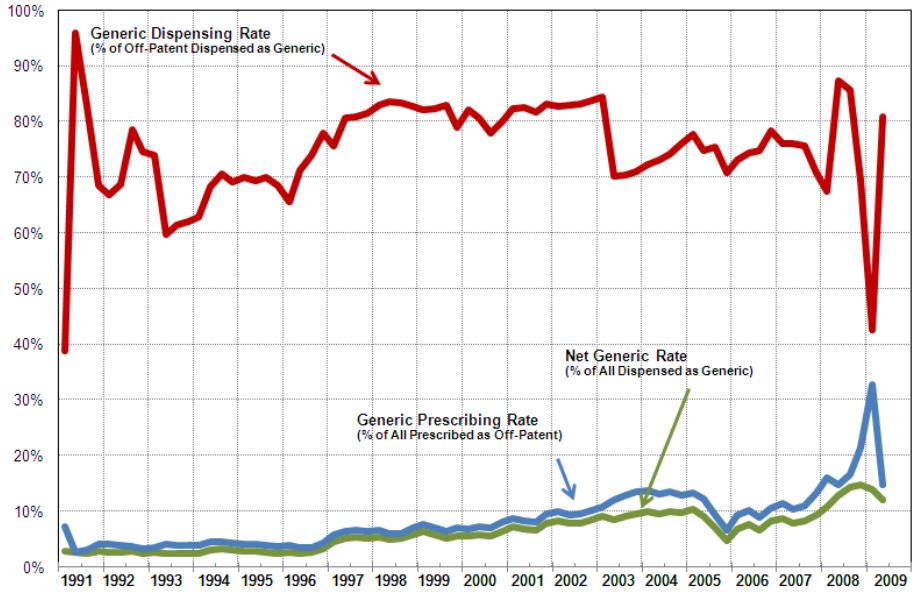
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Alabama Medicaid: 1991 to 2009



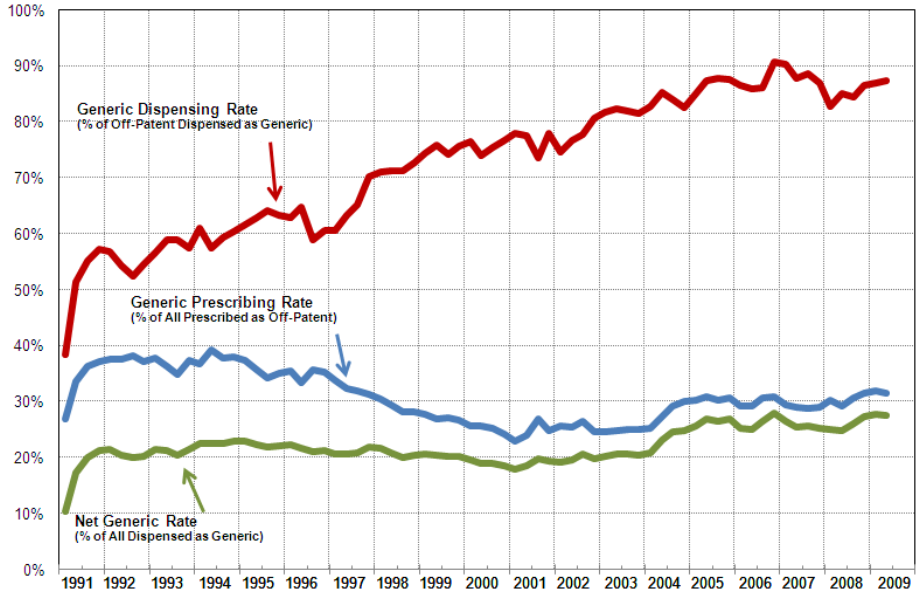
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Alabama Medicaid: 1991 to 2009



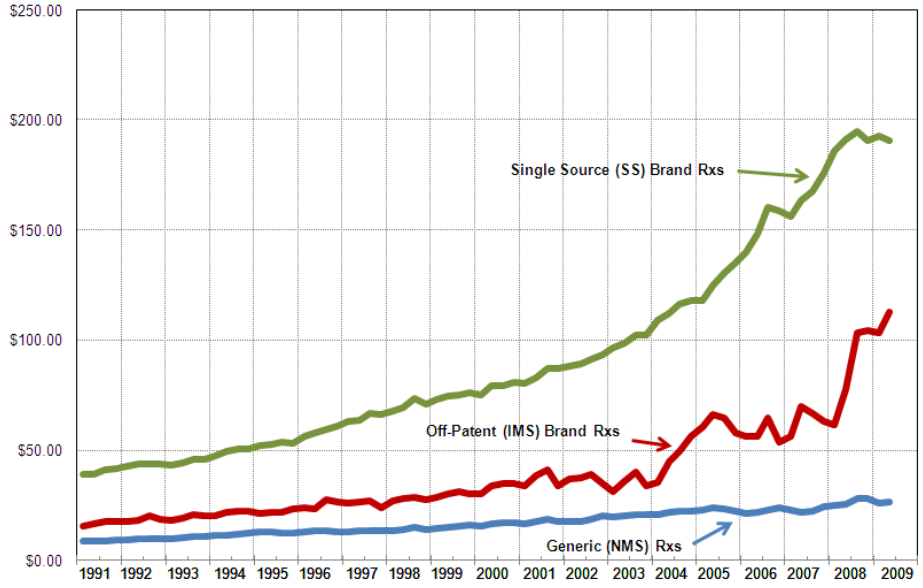
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Alabama Medicaid: 1991 to 2009



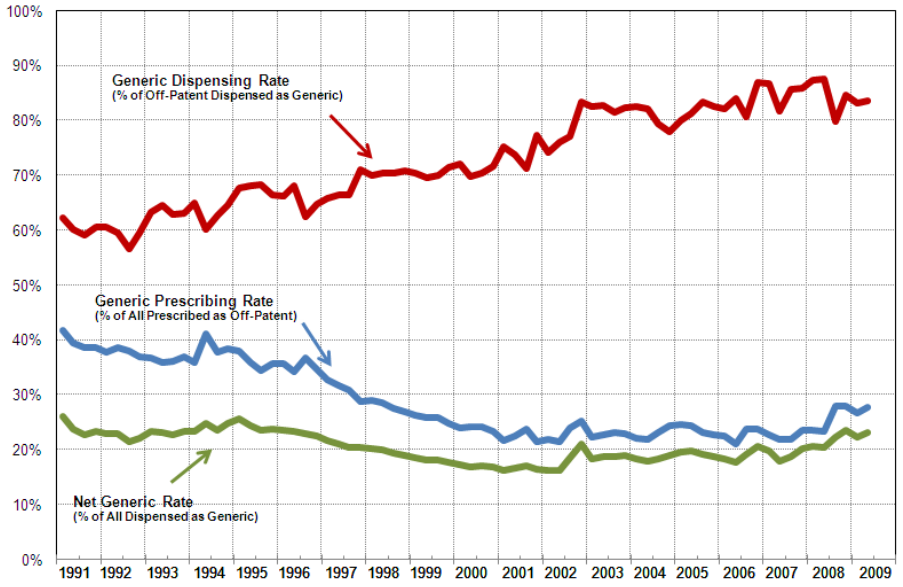
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Arkansas Medicaid: 1991 to 2009



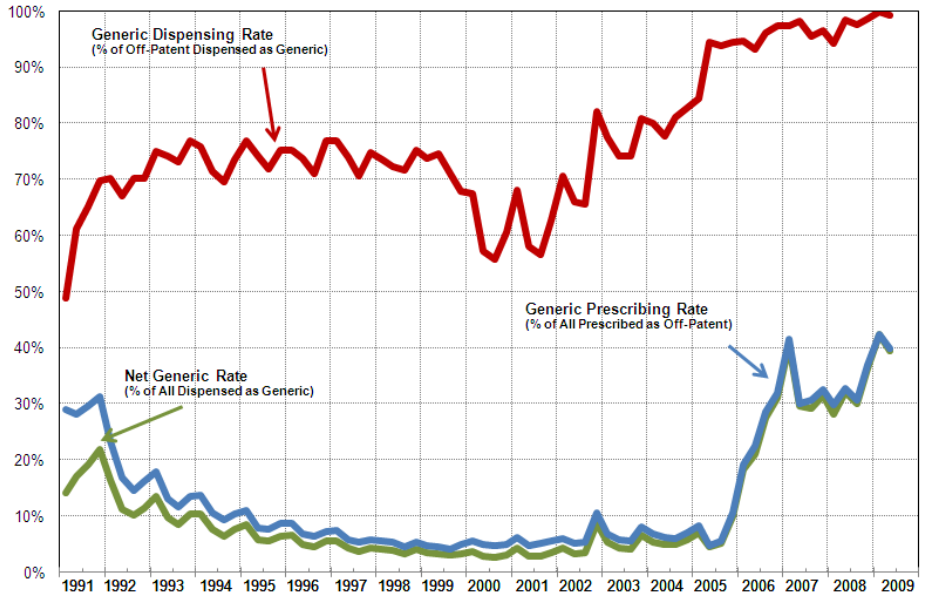
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Arkansas Medicaid: 1991 to 2009



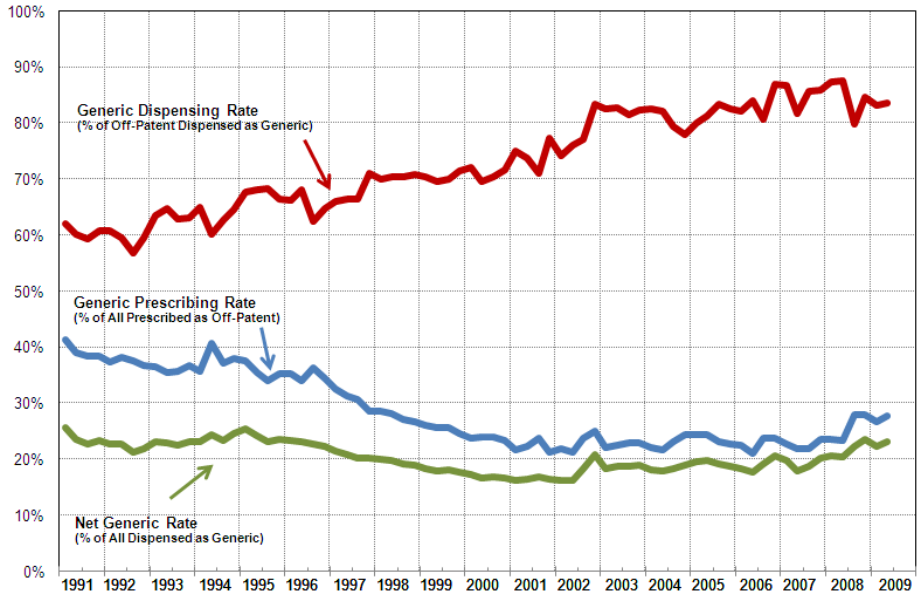
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Arkansas Medicaid: 1991 to 2009

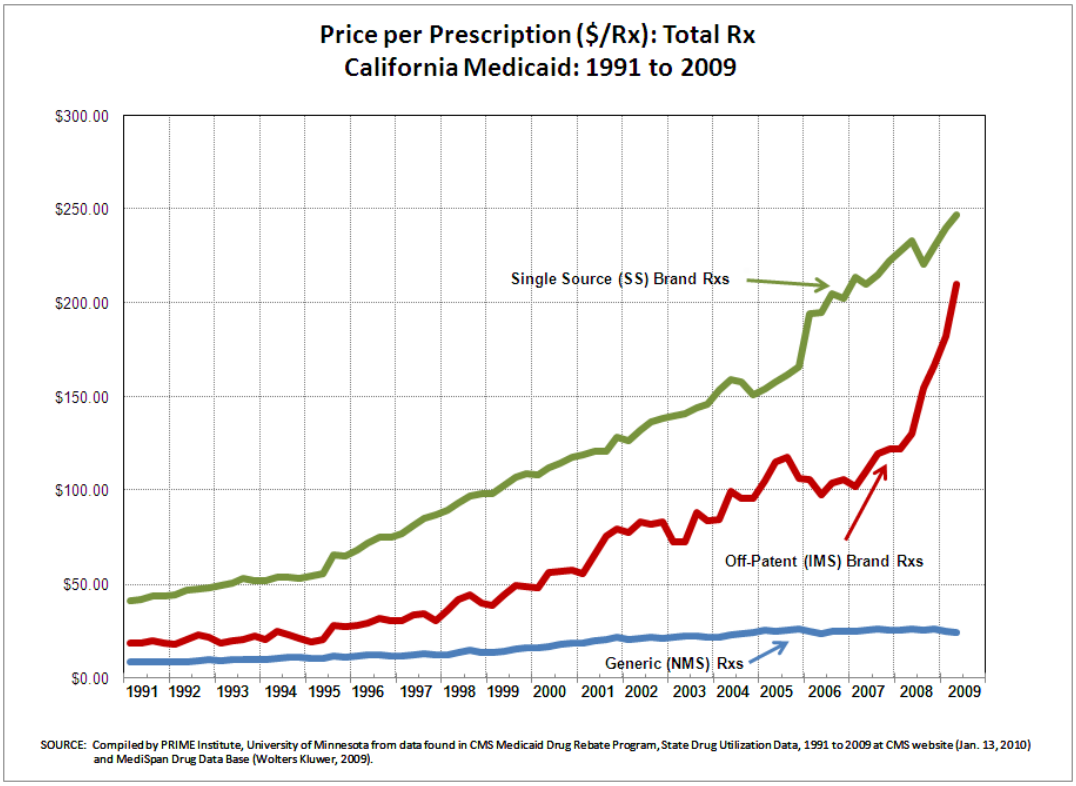


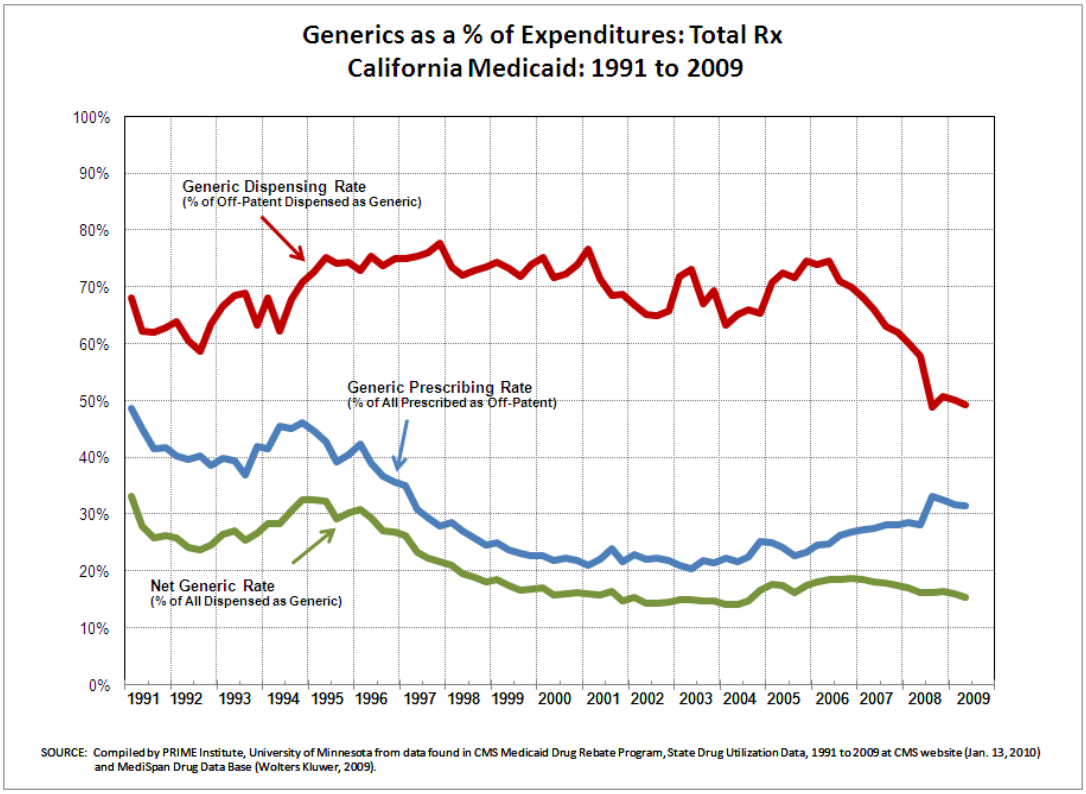
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Arkansas Medicaid: 1991 to 2009

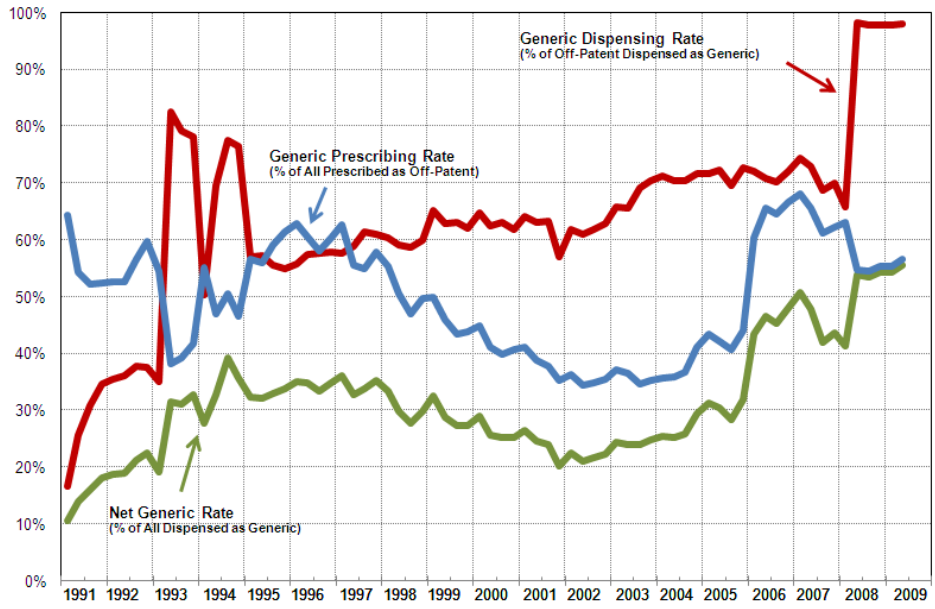


SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).


Price per Prescription ($/Rx): Total Rx
California Medicaid: 1991 to 2009
$300.00
$250.00
$200.00
$150.00
$100.00
$50.00
$0.00
Single Source (SS) Brand Rxs
Off-Patent (IMS) Brand Rxs
Generic (NMS) Rxs
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

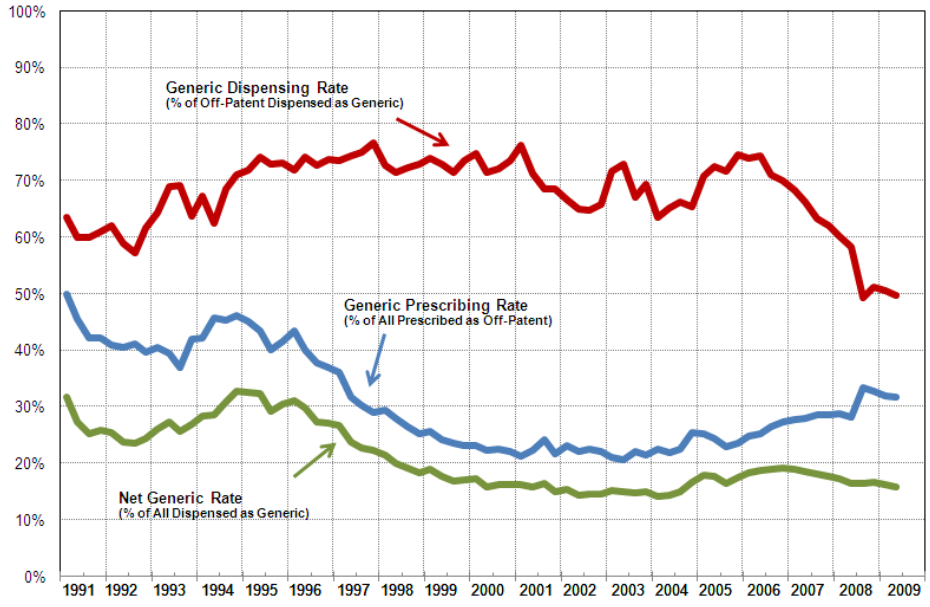

Generics as a % of Expenditures: Total Rx
California Medicaid: 1991 to 2009
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Generic Dispensing Rate
(% of Off-Patent Dispensed as Generic)
Generic Prescribing Rate
(% of All Prescribed as Off-Patent)
Net Generic Rate
(% of All Dispensed as Generic)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
California Medicaid: 1991 to 2009



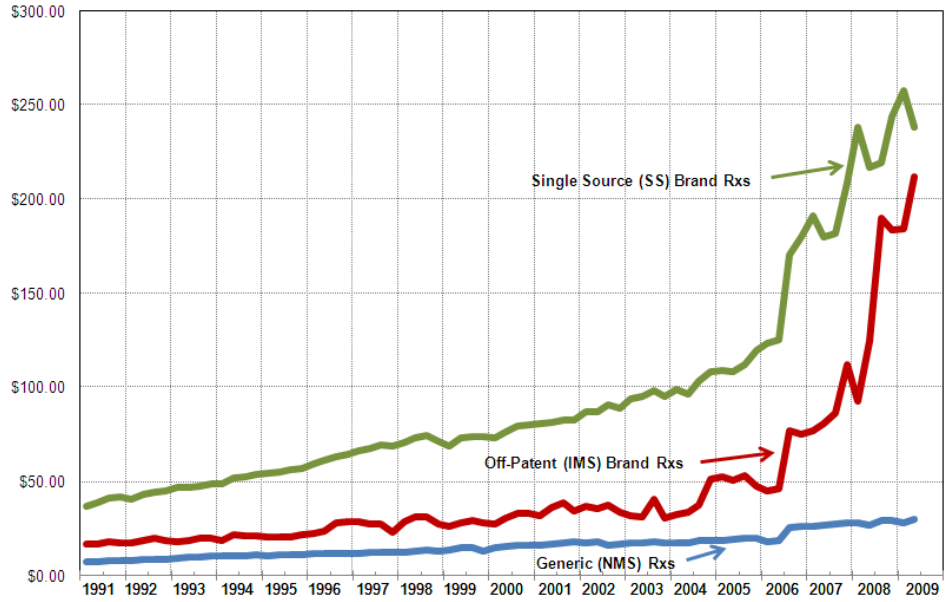
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
California Medicaid: 1991 to 2009



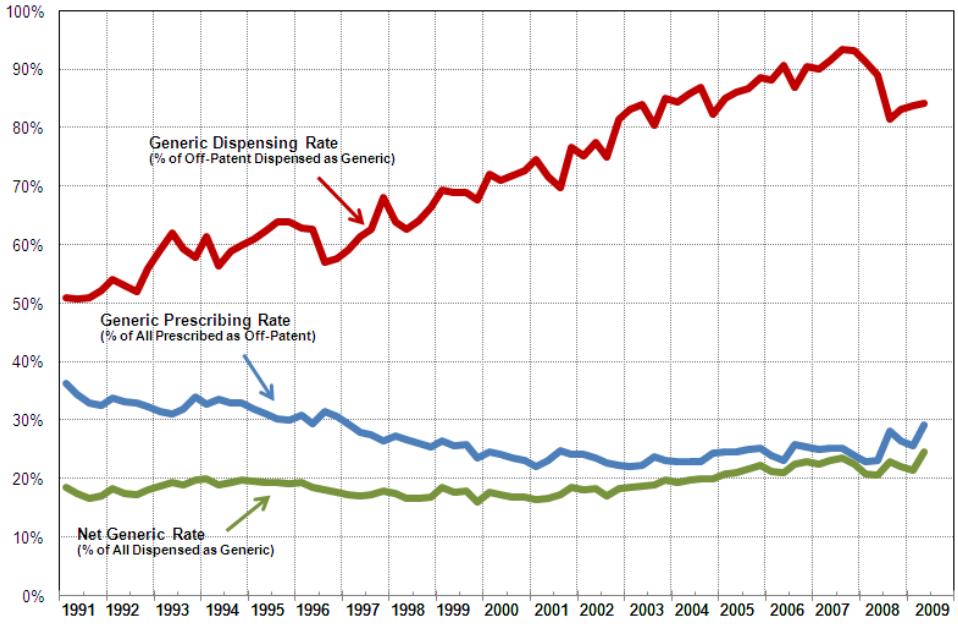
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Colorado Medicaid: 1991 to 2009



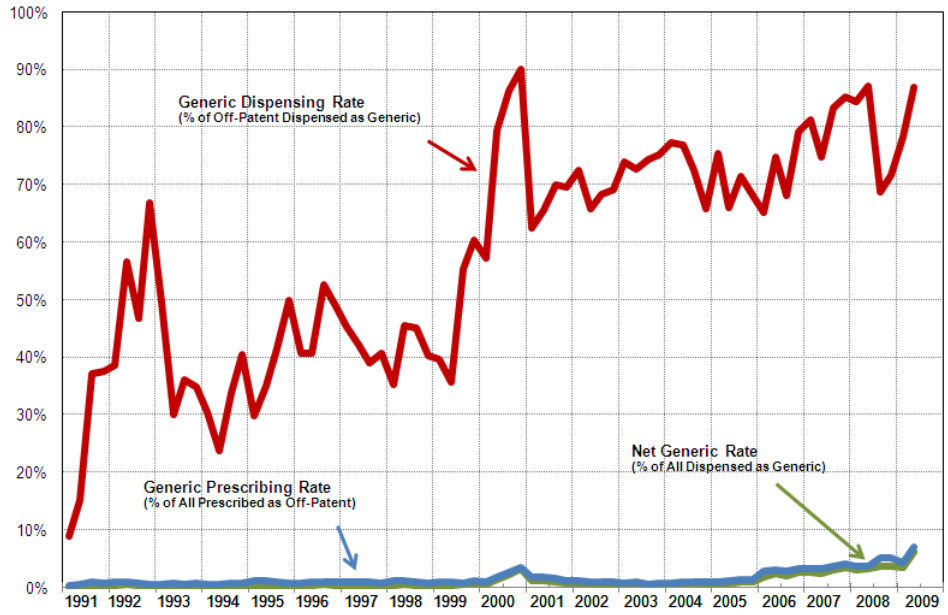
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Colorado Medicaid: 1991 to 2009



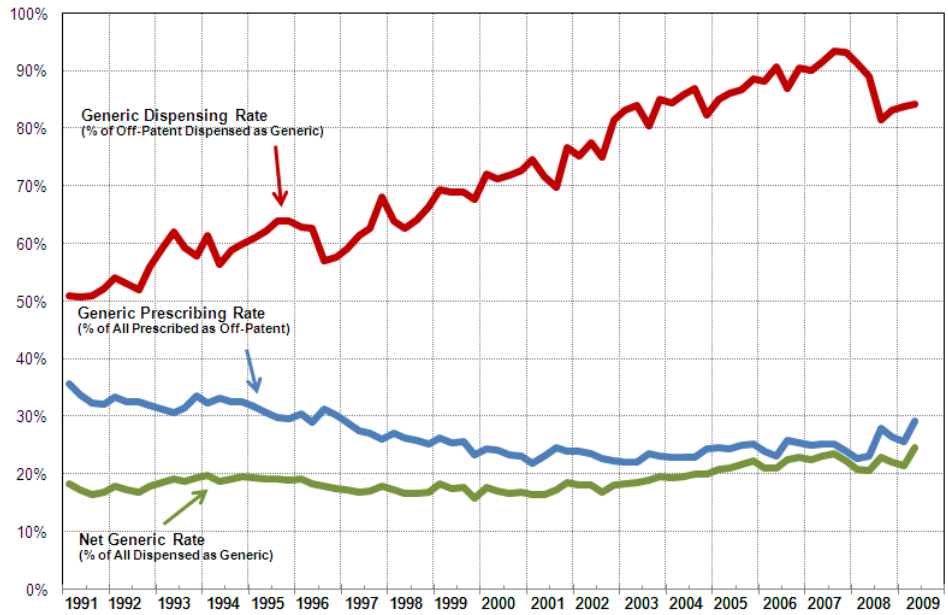
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Colorado Medicaid: 1991 to 2009



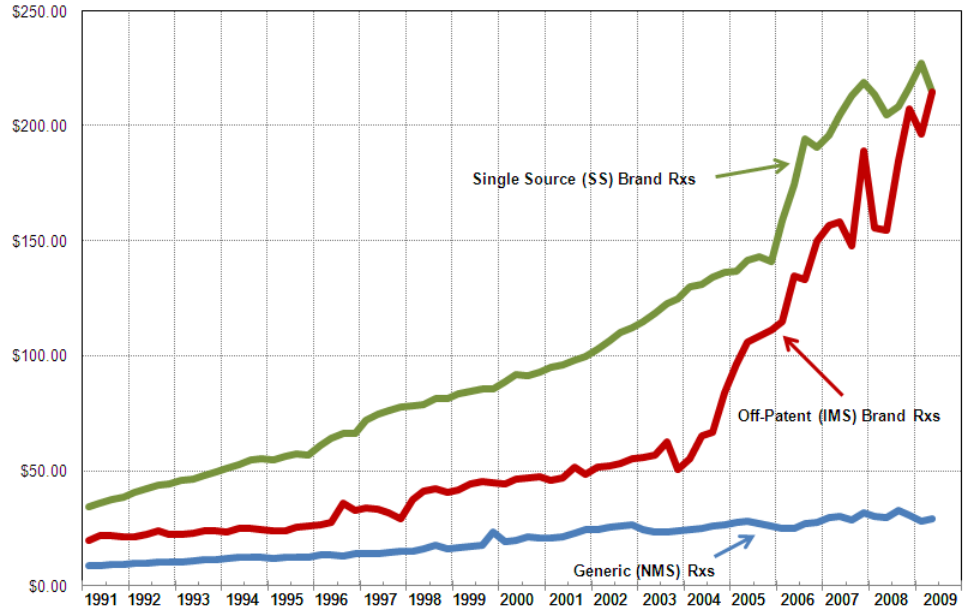
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Colorado Medicaid: 1991 to 2009



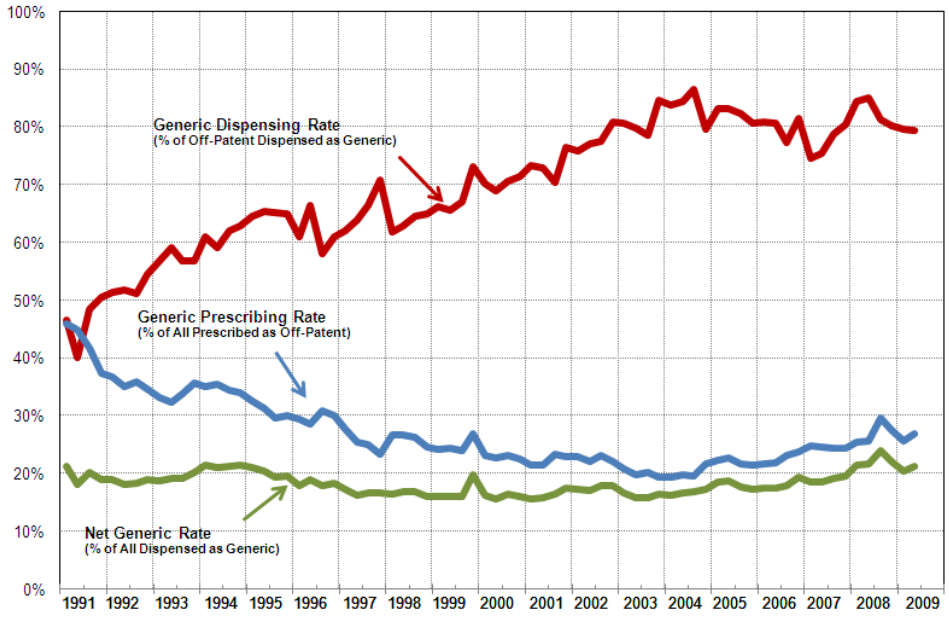
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Connecticut Medicaid: 1991 to 2009



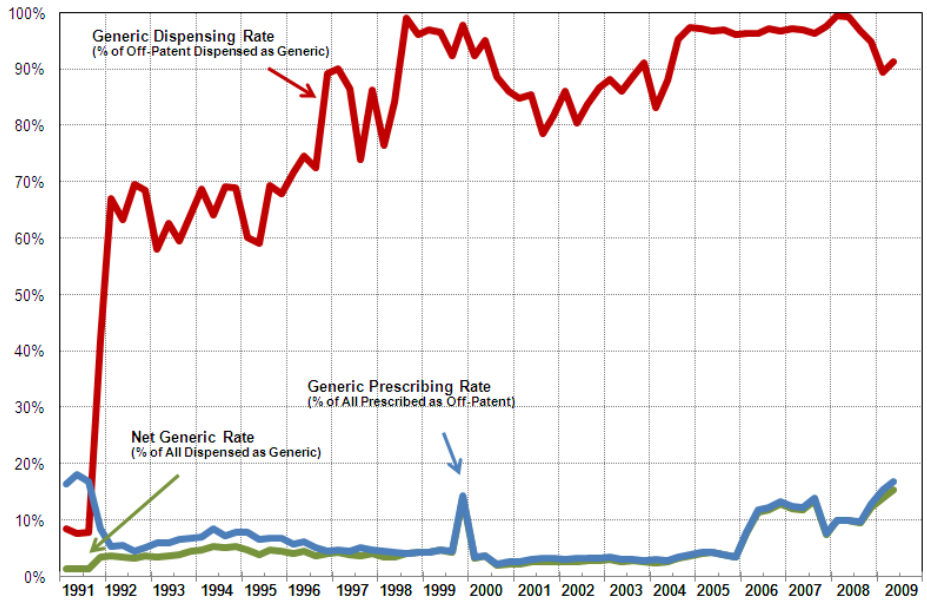
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Connecticut Medicaid: 1991 to 2009



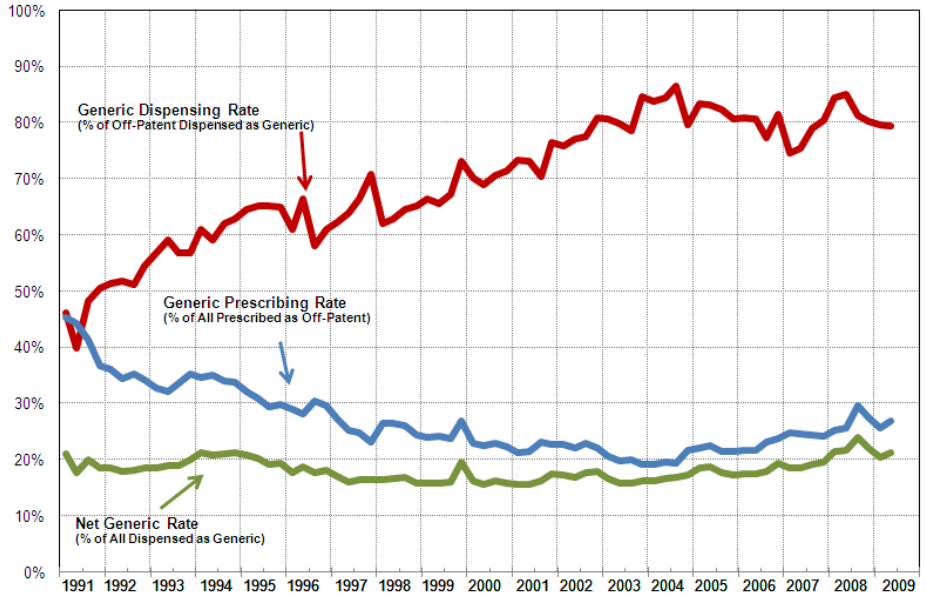
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Connecticut Medicaid: 1991 to 2009



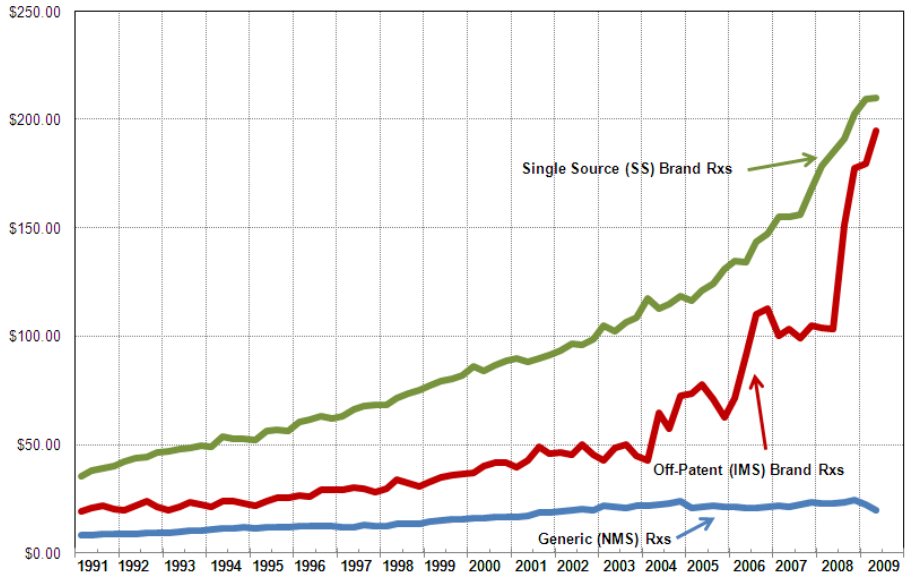
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Connecticut Medicaid: 1991 to 2009



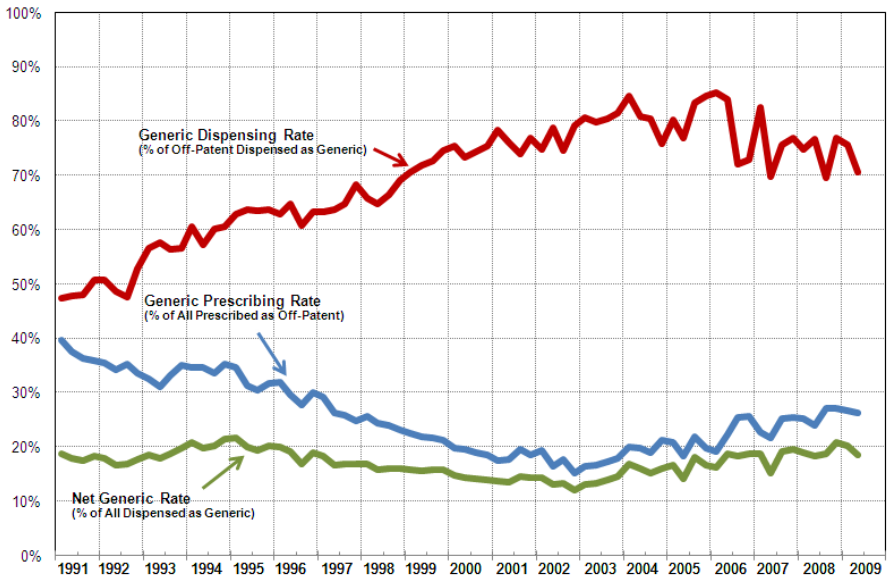
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Delaware Medicaid: 1991 to 2009



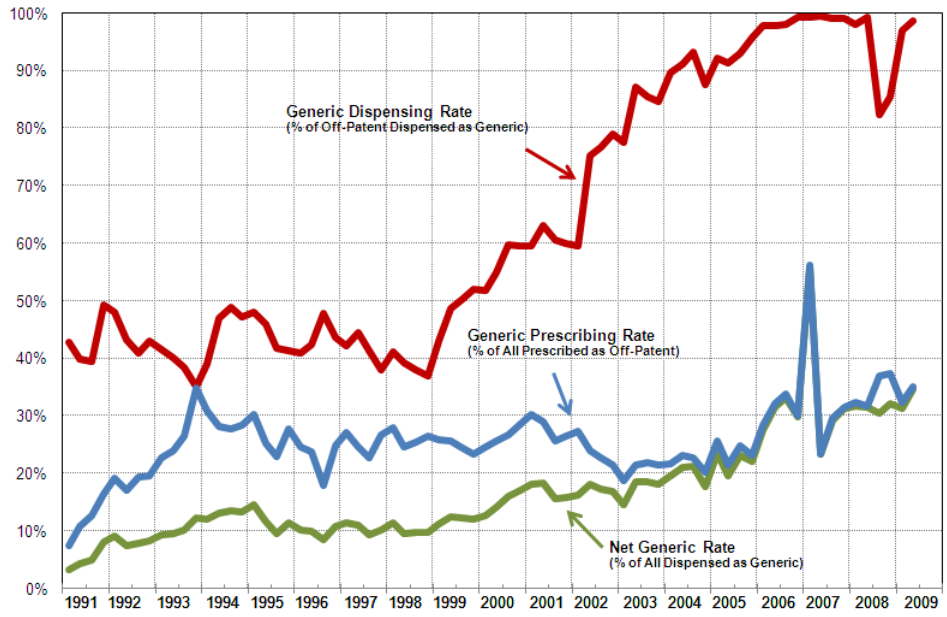
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Delaware Medicaid: 1991 to 2009



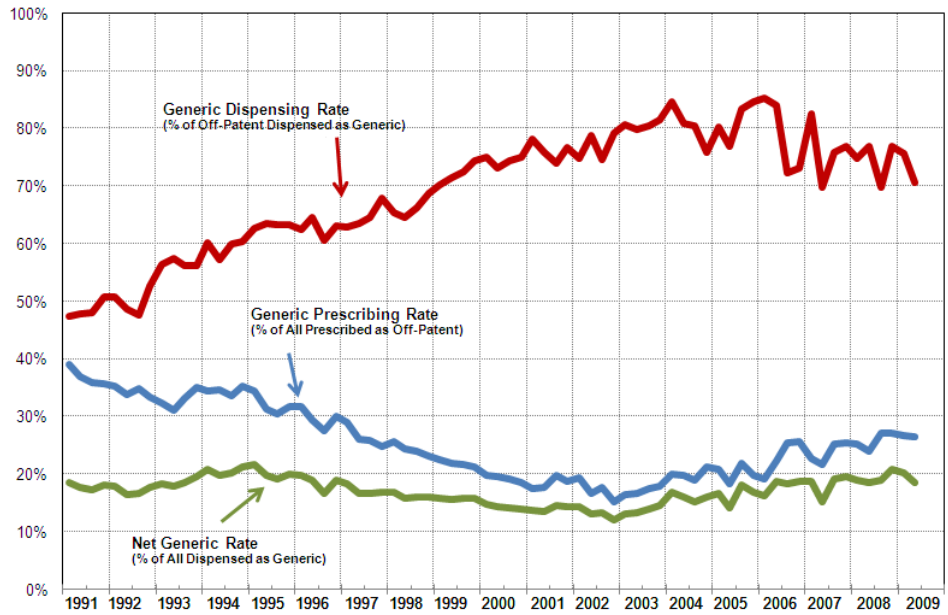
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Delaware Medicaid: 1991 to 2009



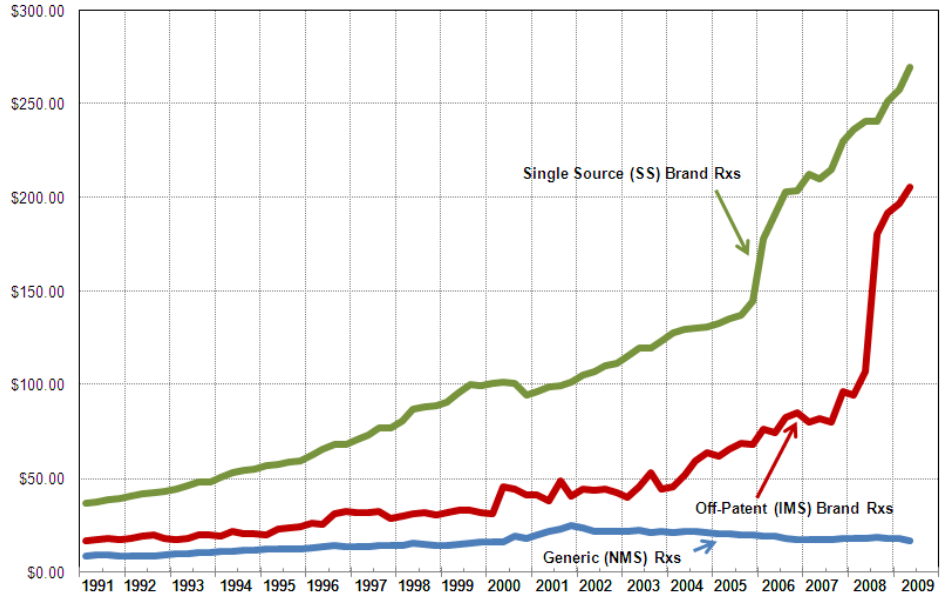
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Delaware Medicaid: 1991 to 2009



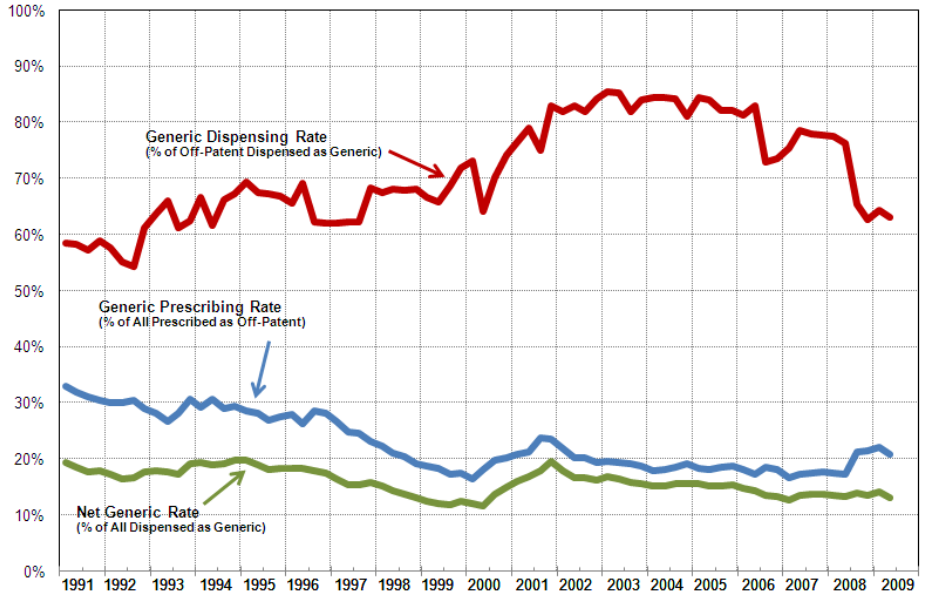
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Florida Medicaid: 1991 to 2009



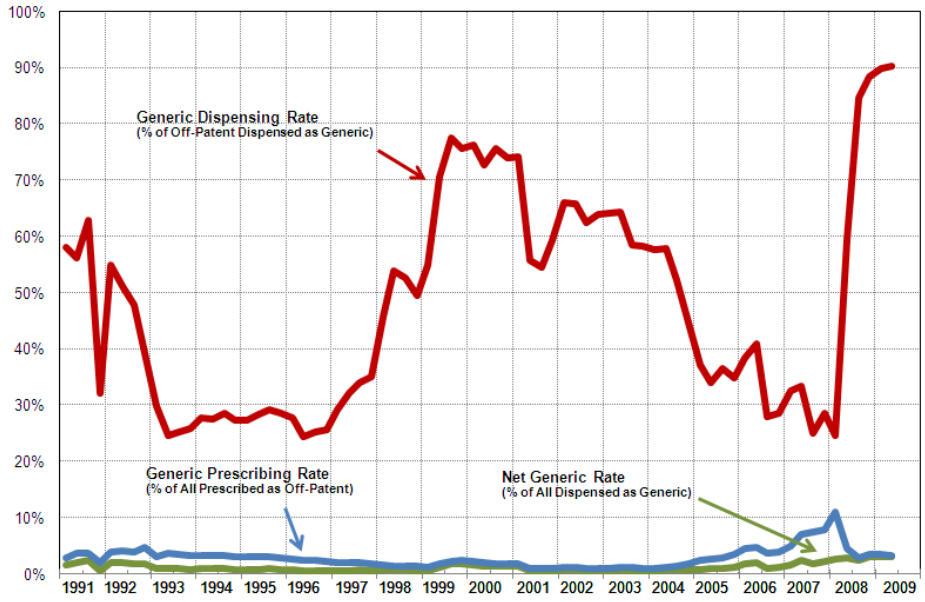
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Florida Medicaid: 1991 to 2009



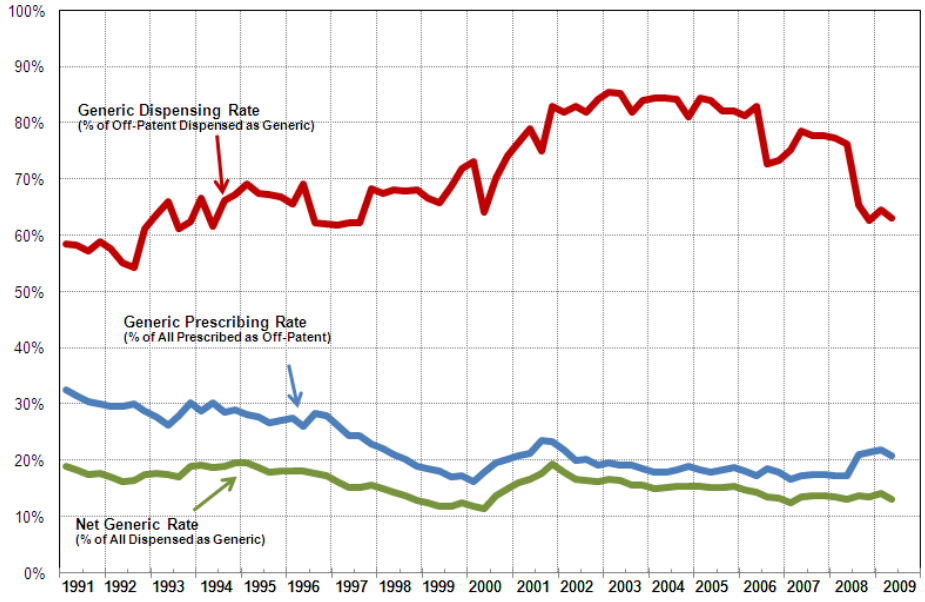
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Florida Medicaid: 1991 to 2009



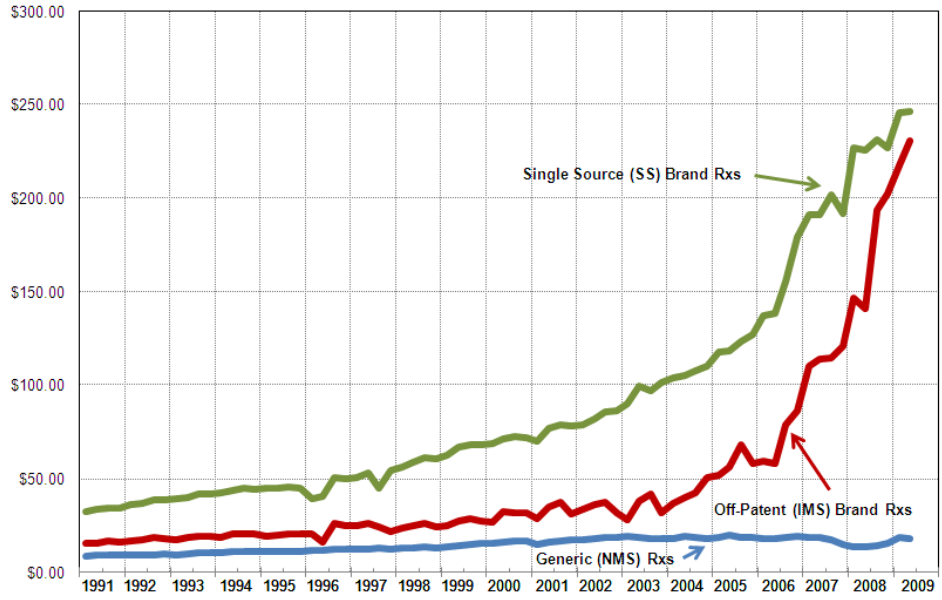
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Florida Medicaid: 1991 to 2009



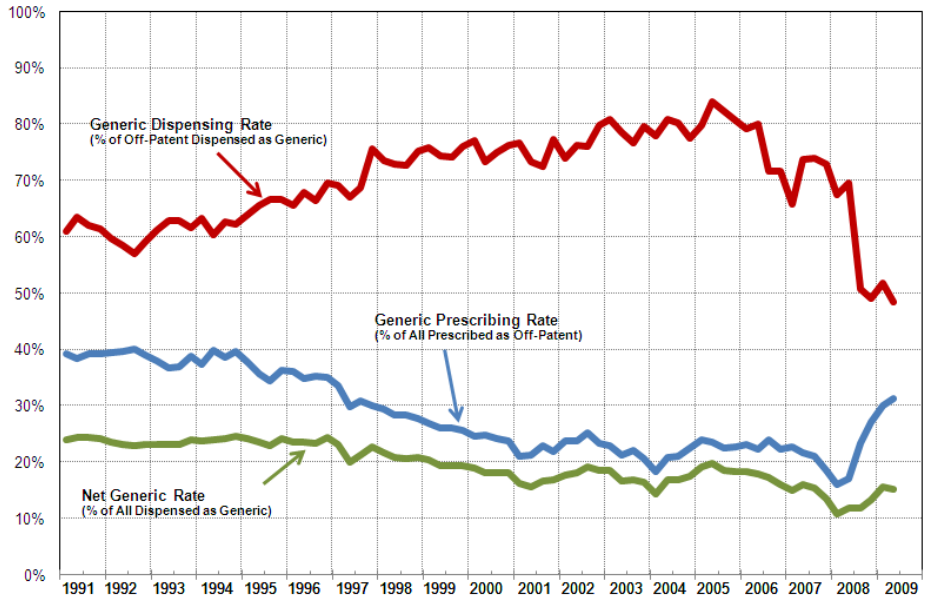
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Georgia Medicaid: 1991 to 2009



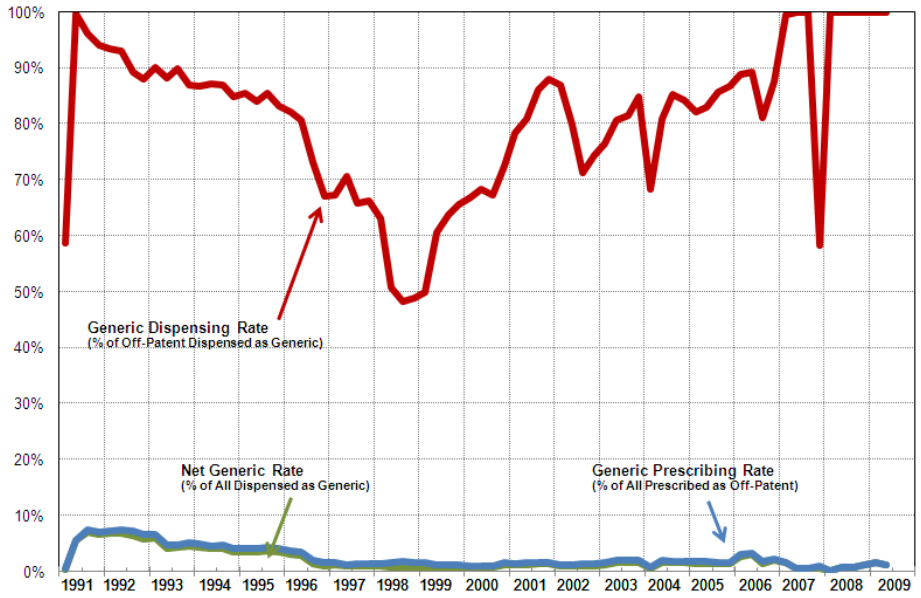
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Georgia Medicaid: 1991 to 2009



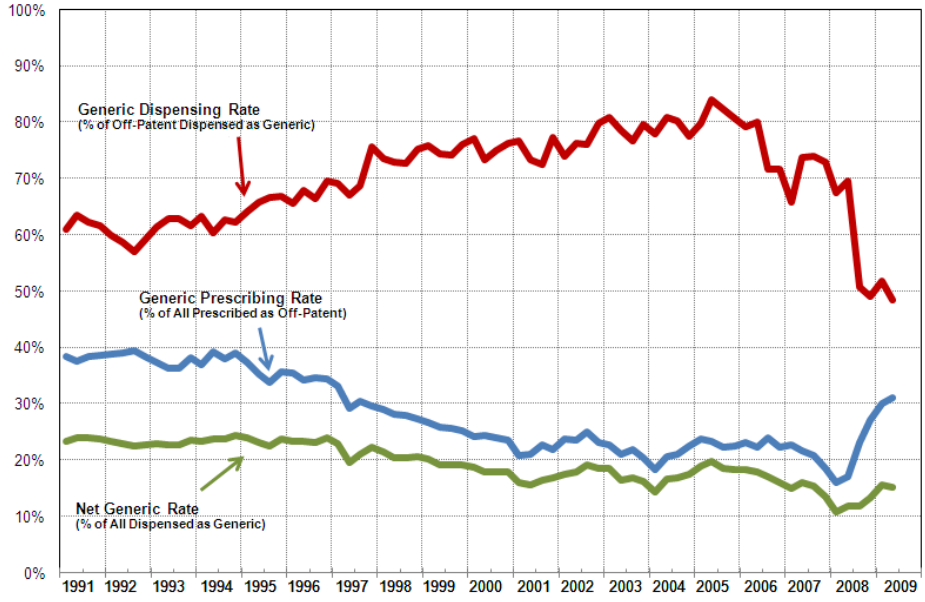
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Georgia Medicaid: 1991 to 2009



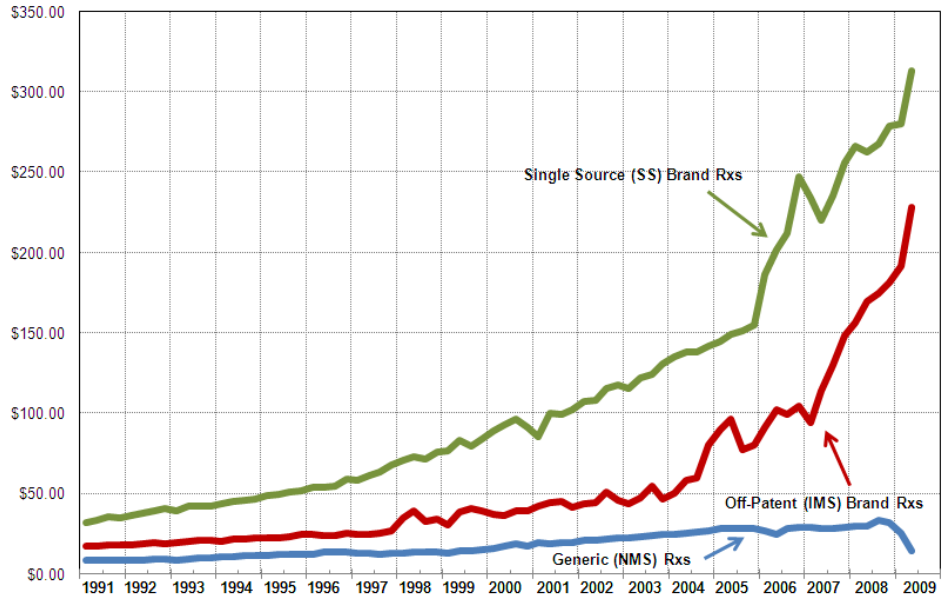
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Georgia Medicaid: 1991 to 2009



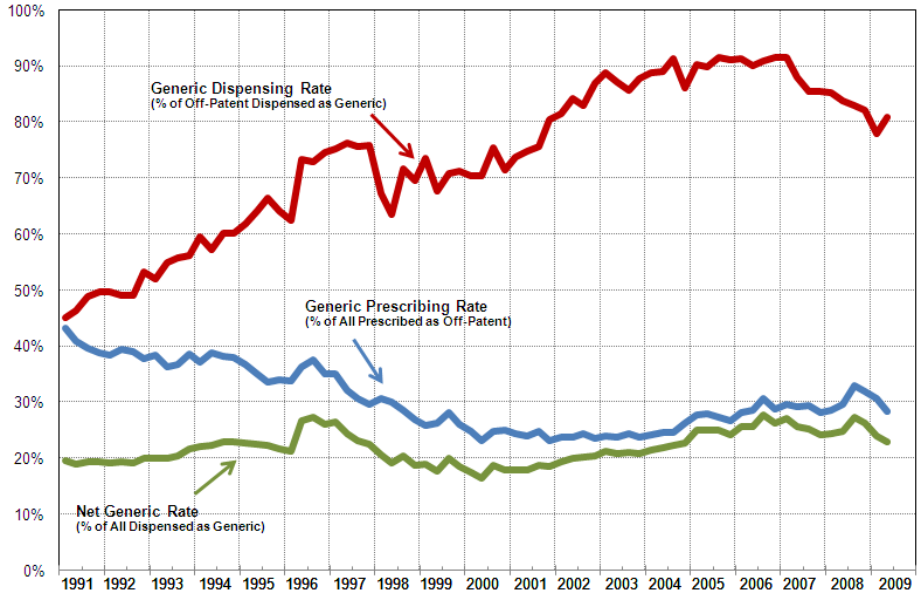
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Hawaii Medicaid: 1991 to 2009



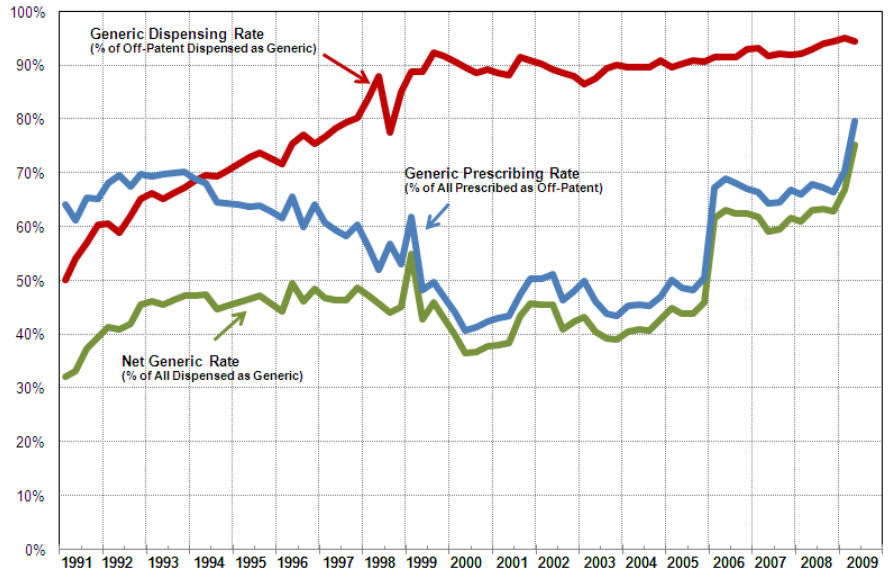
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Hawaii Medicaid: 1991 to 2009



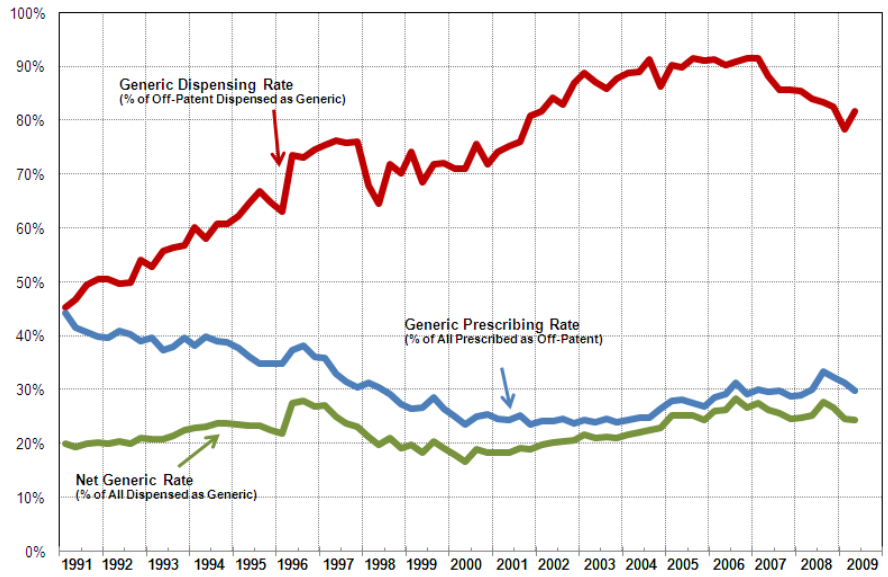
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Hawaii Medicaid: 1991 to 2009



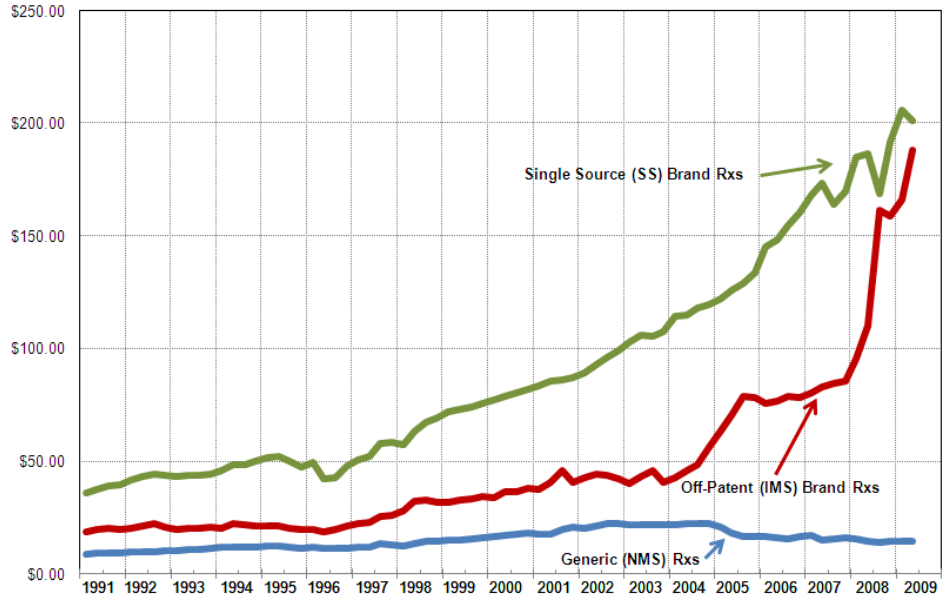
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Hawaii Medicaid: 1991 to 2009



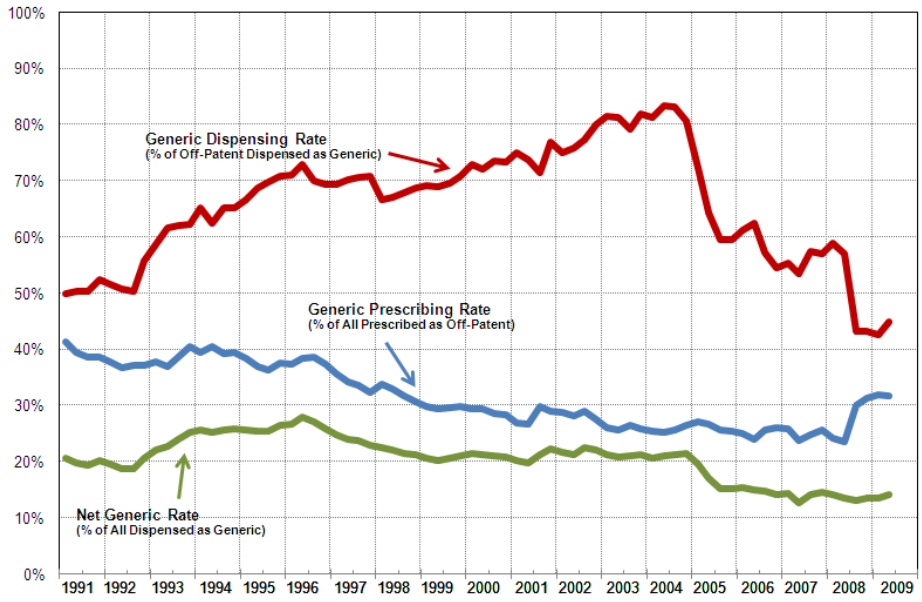
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Iowa Medicaid: 1991 to 2009



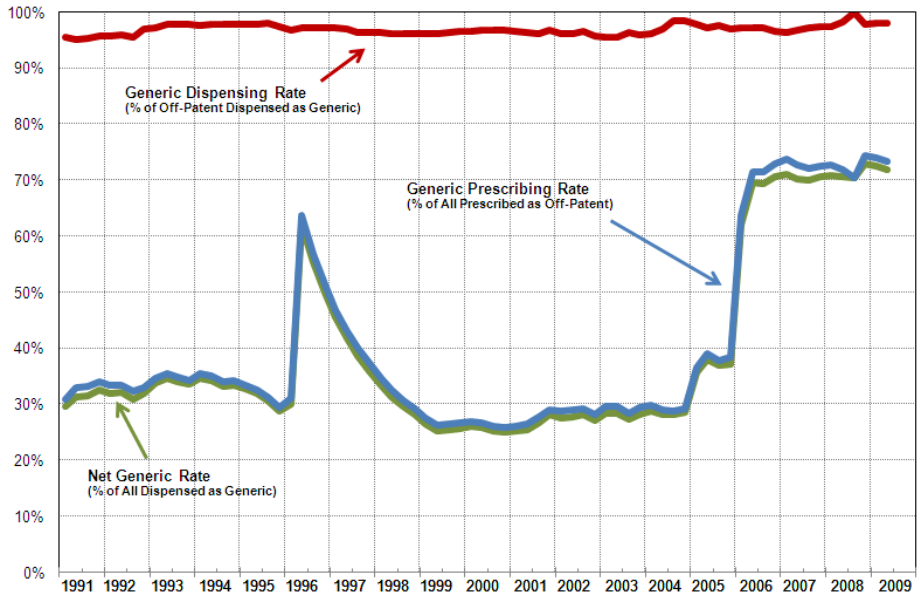
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Iowa Medicaid: 1991 to 2009



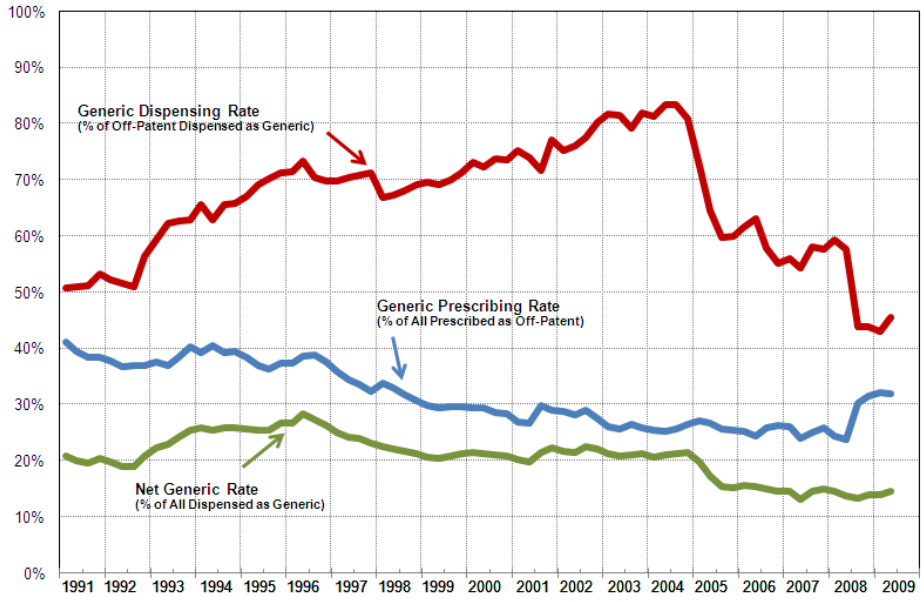
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Iowa Medicaid: 1991 to 2009



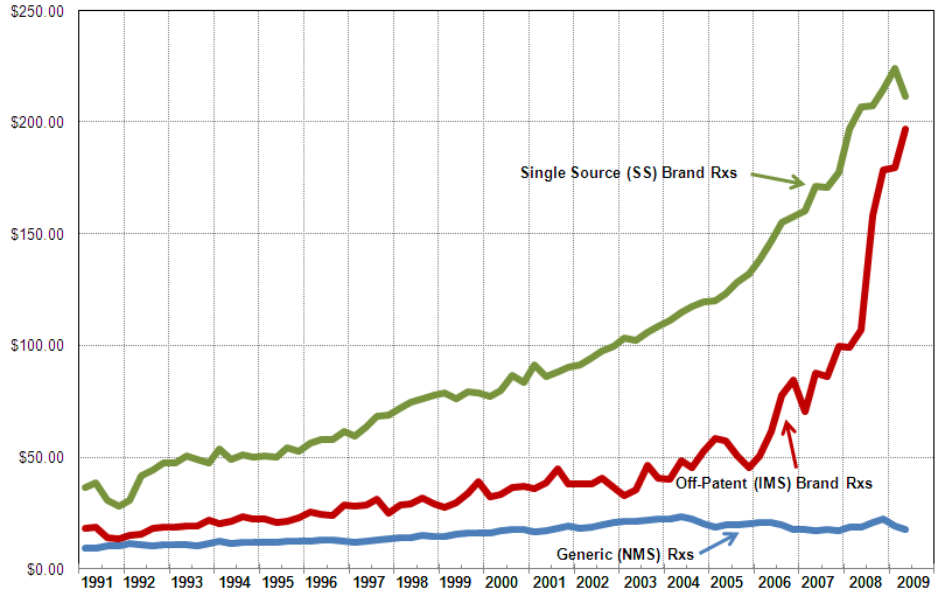
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Iowa Medicaid: 1991 to 2009



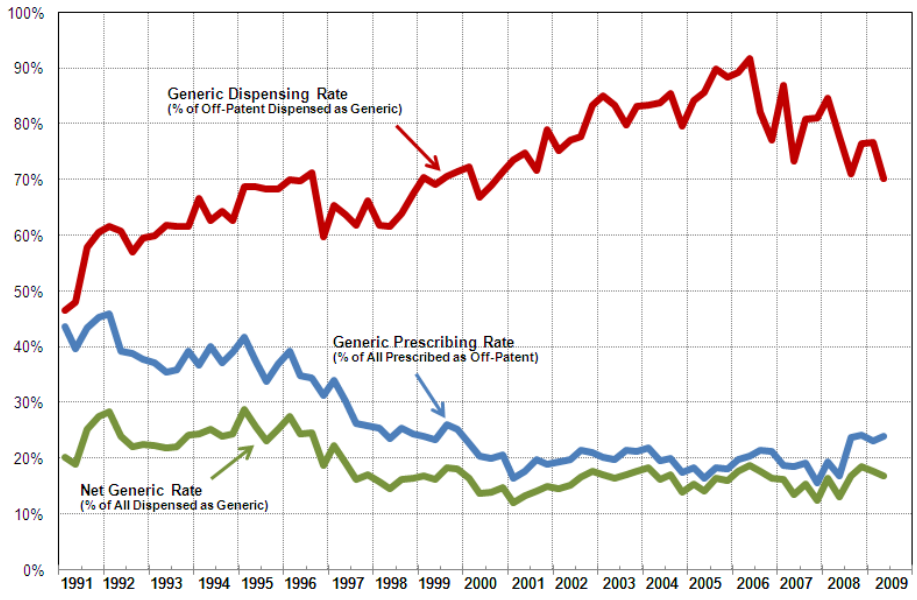
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Idaho Medicaid: 1991 to 2009



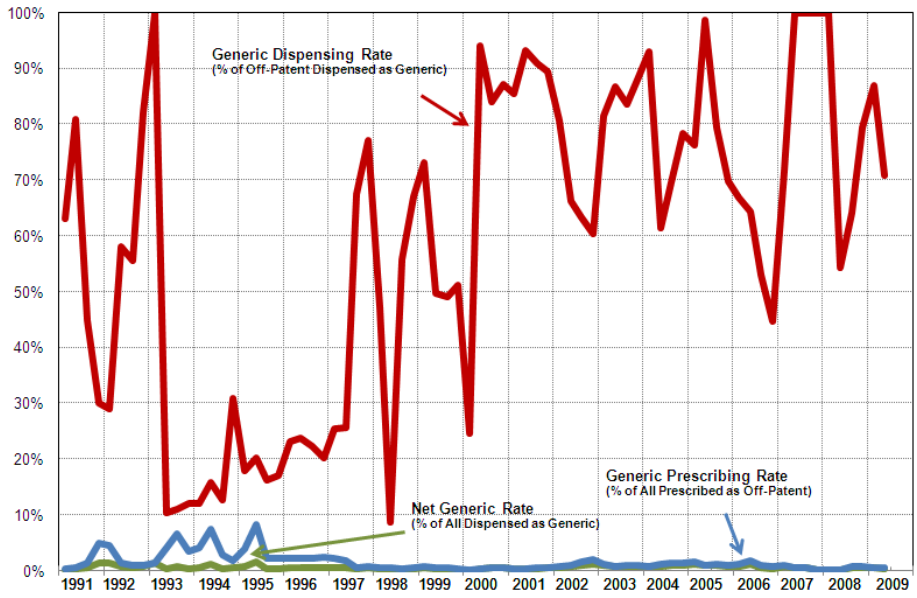
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Idaho Medicaid: 1991 to 2009



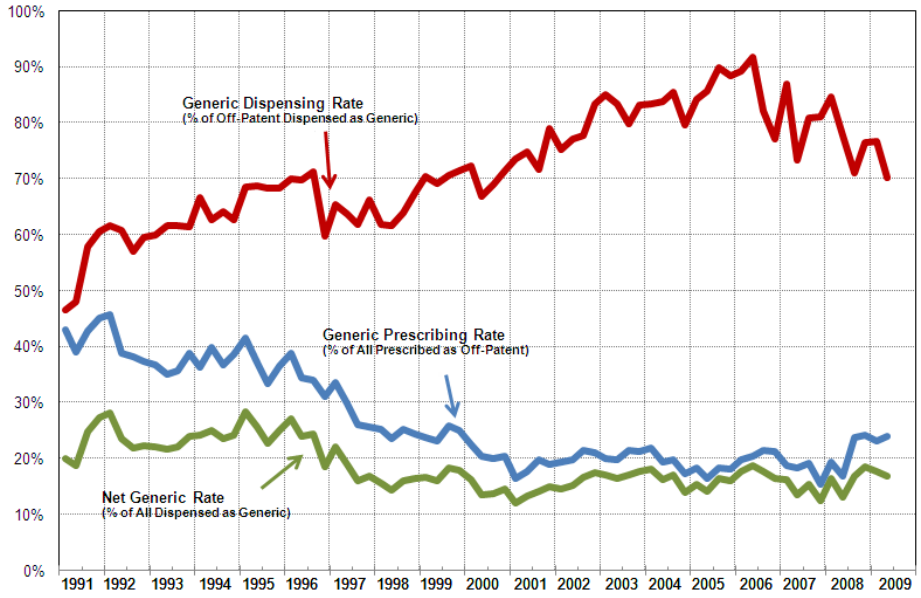
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Idaho Medicaid: 1991 to 2009



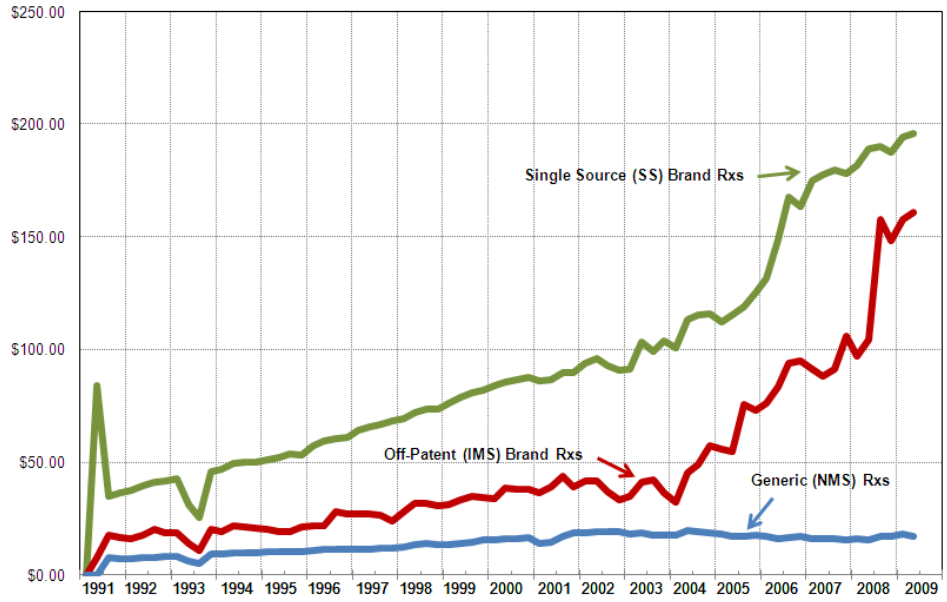
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Idaho Medicaid: 1991 to 2009



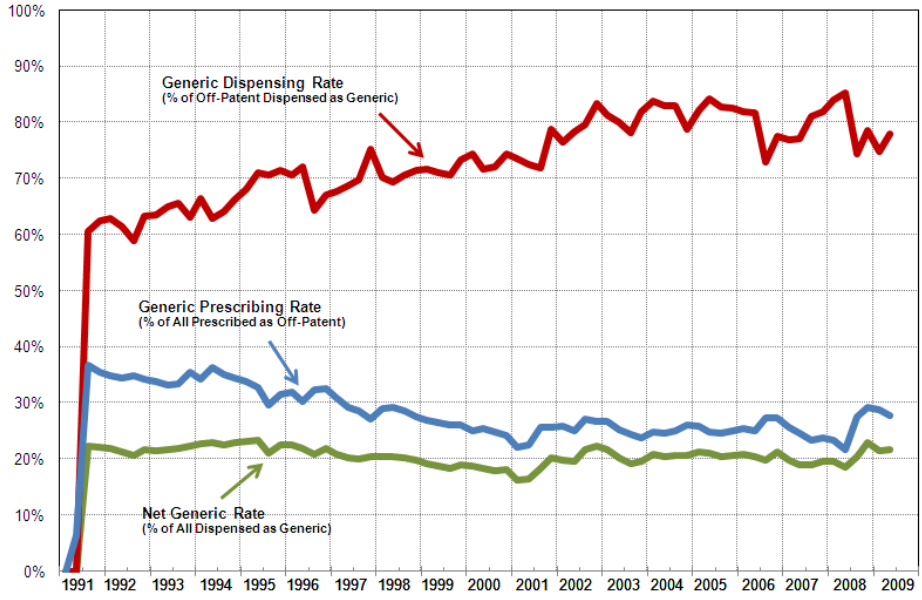
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Illinois Medicaid: 1991 to 2009



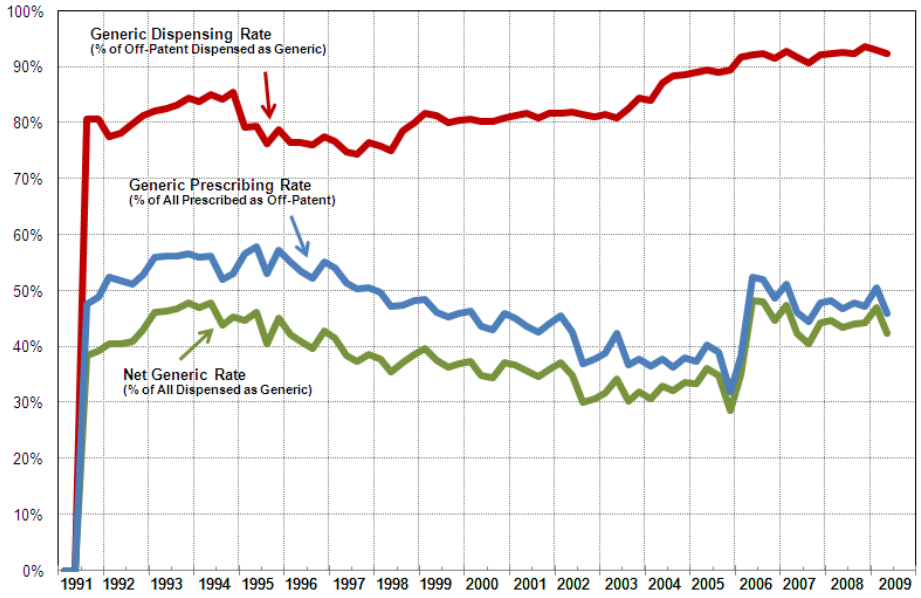
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Illinois Medicaid: 1991 to 2009



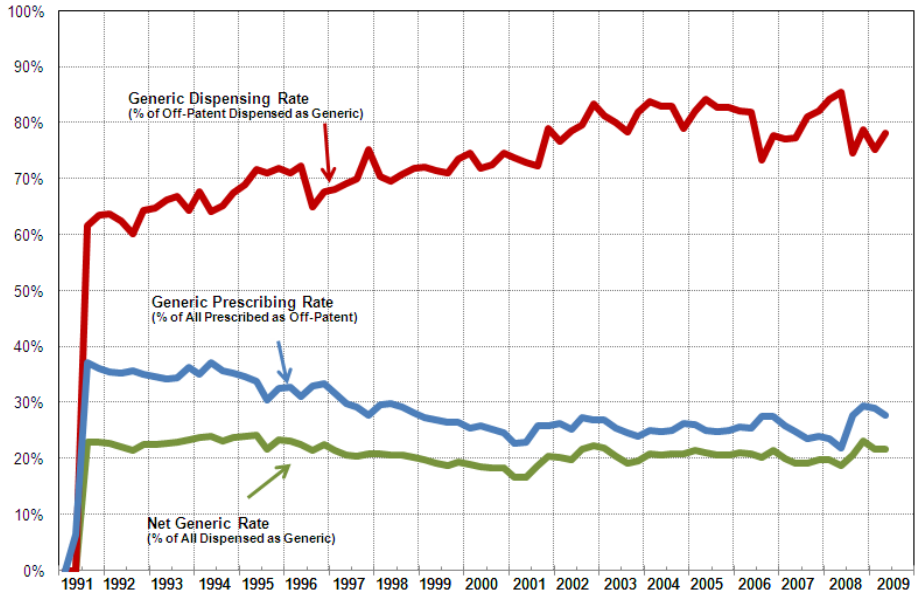
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Illinois Medicaid: 1991 to 2009



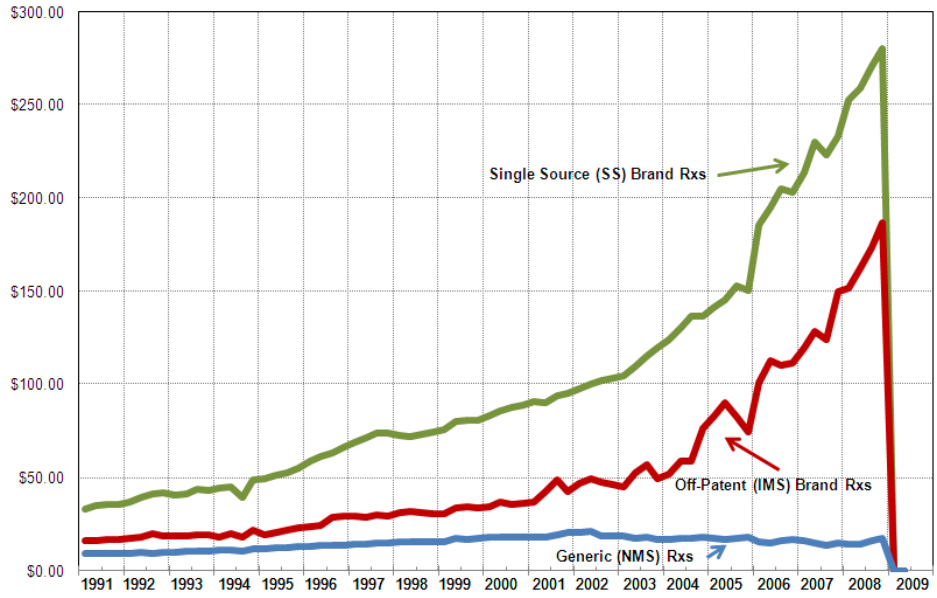
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Illinois Medicaid: 1991 to 2009



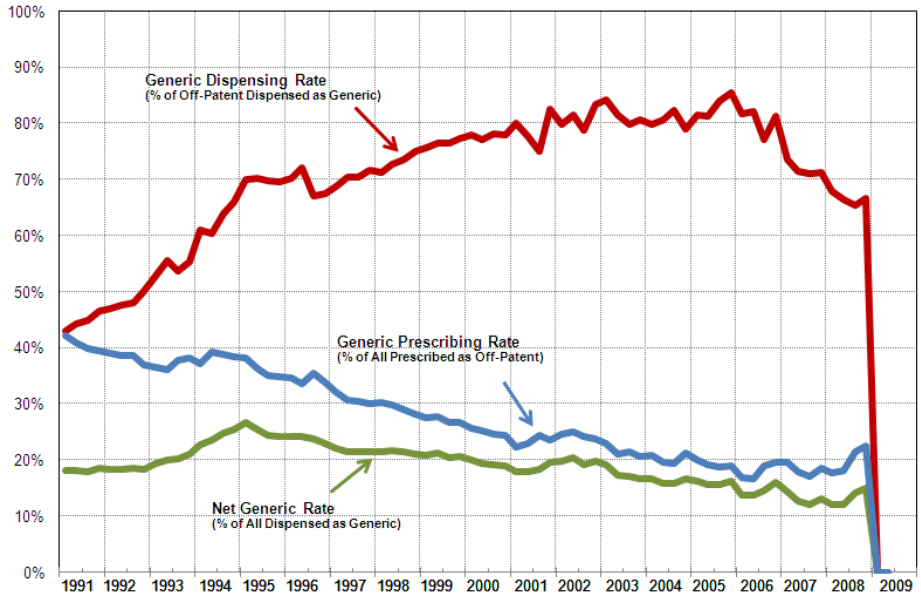
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Indiana Medicaid: 1991 to 2009



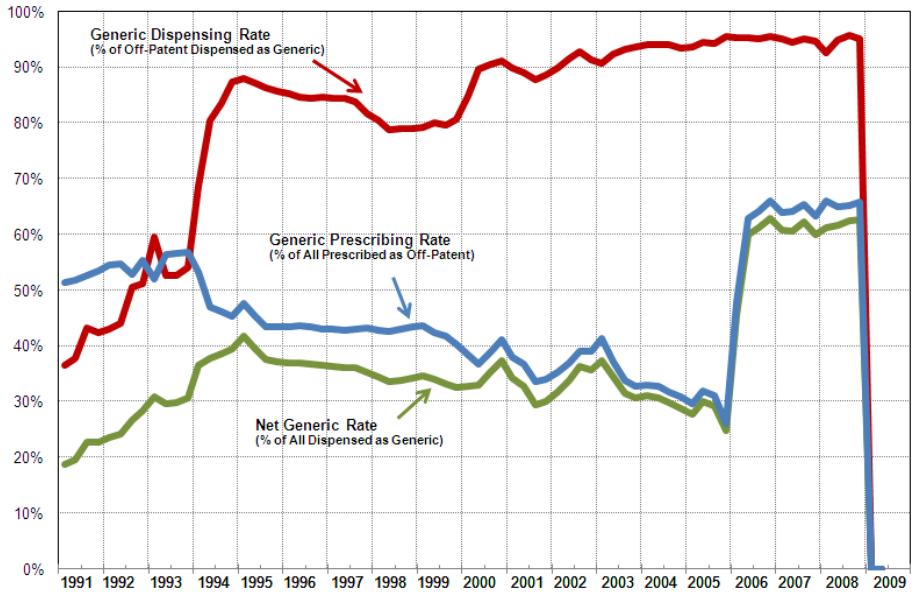
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Indiana Medicaid: 1991 to 2009



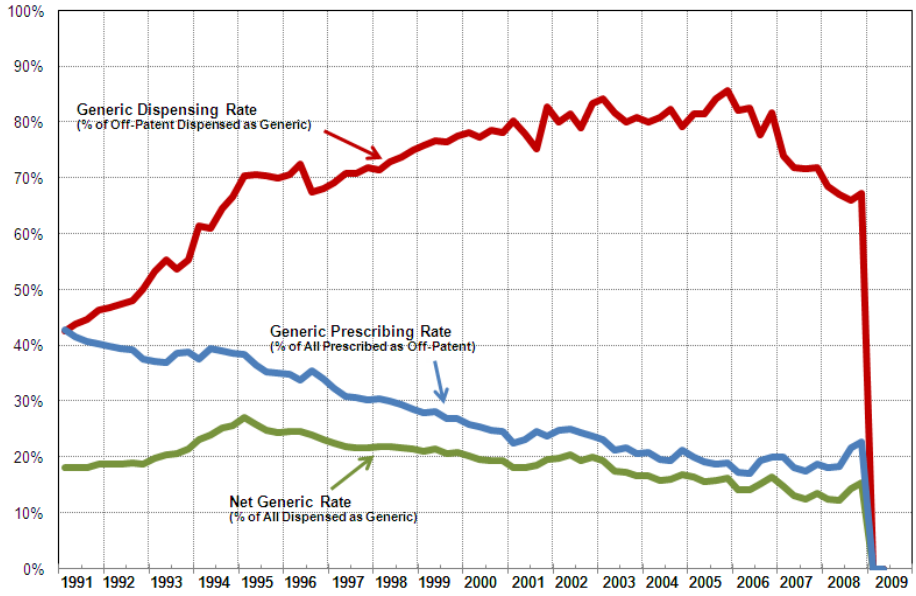
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Indiana Medicaid: 1991 to 2009



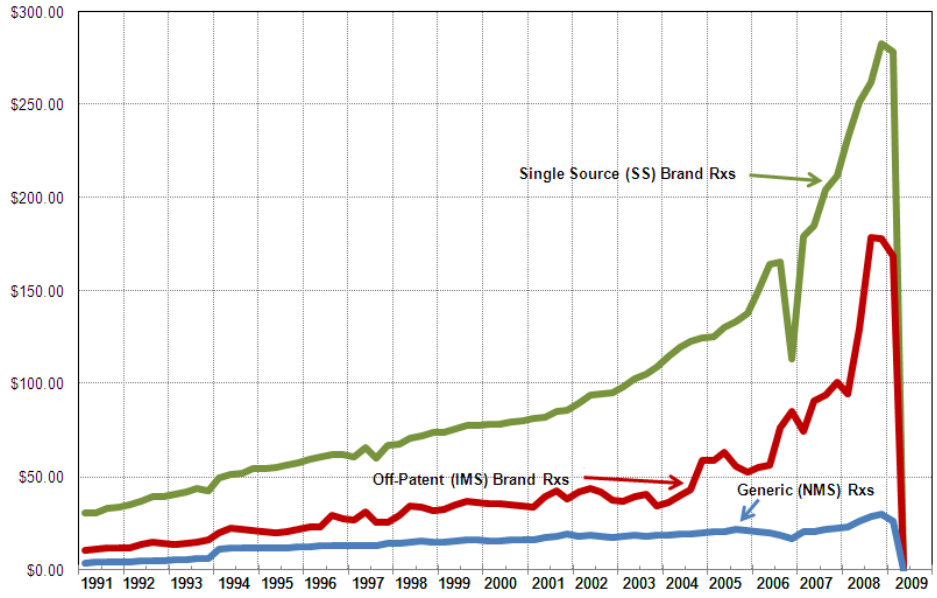
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Indiana Medicaid: 1991 to 2009



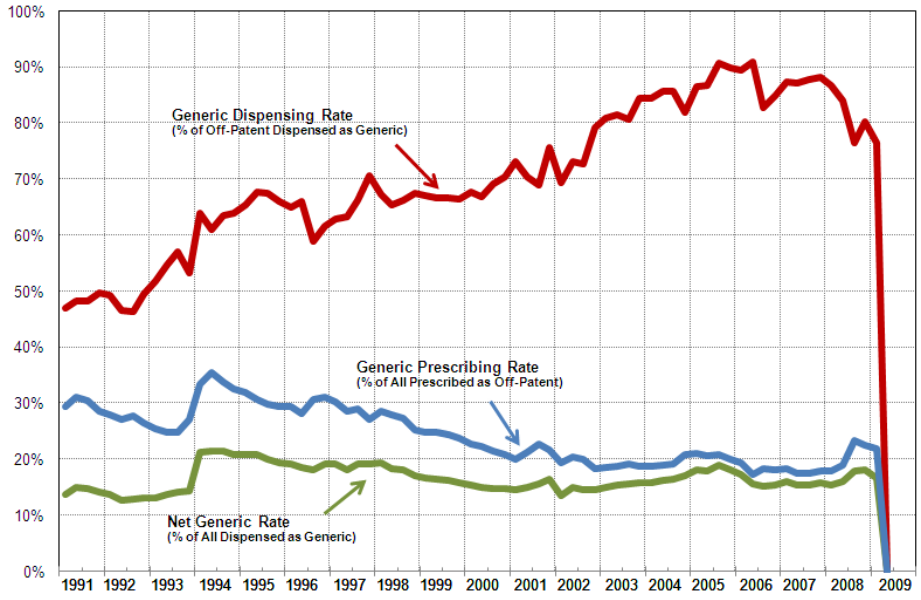
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Kansas Medicaid: 1991 to 2009



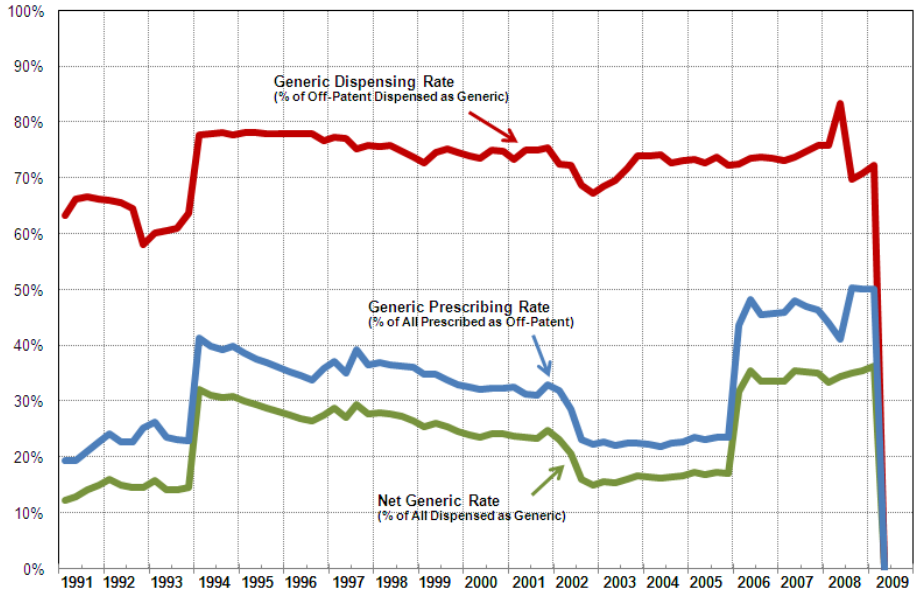
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Kansas Medicaid: 1991 to 2009



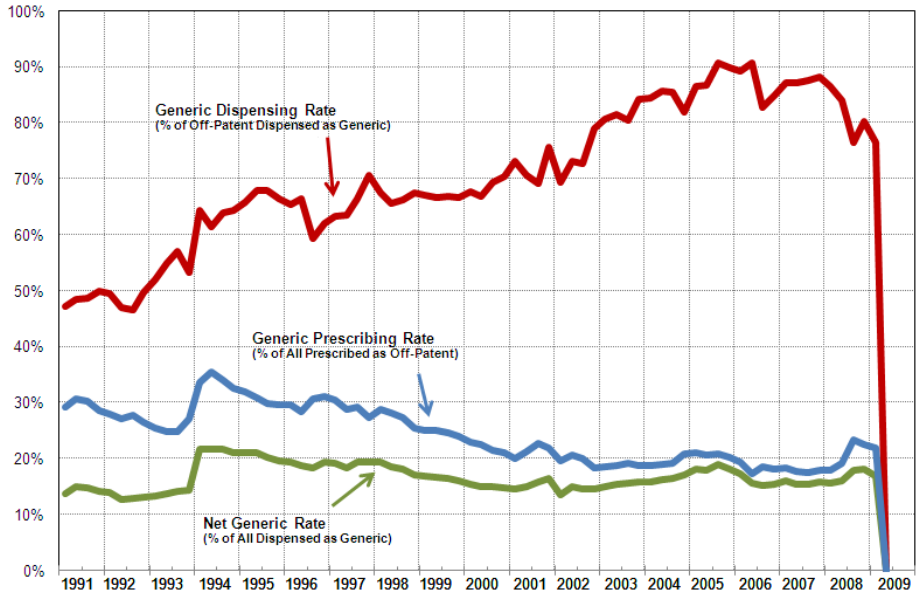
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Kansas Medicaid: 1991 to 2009



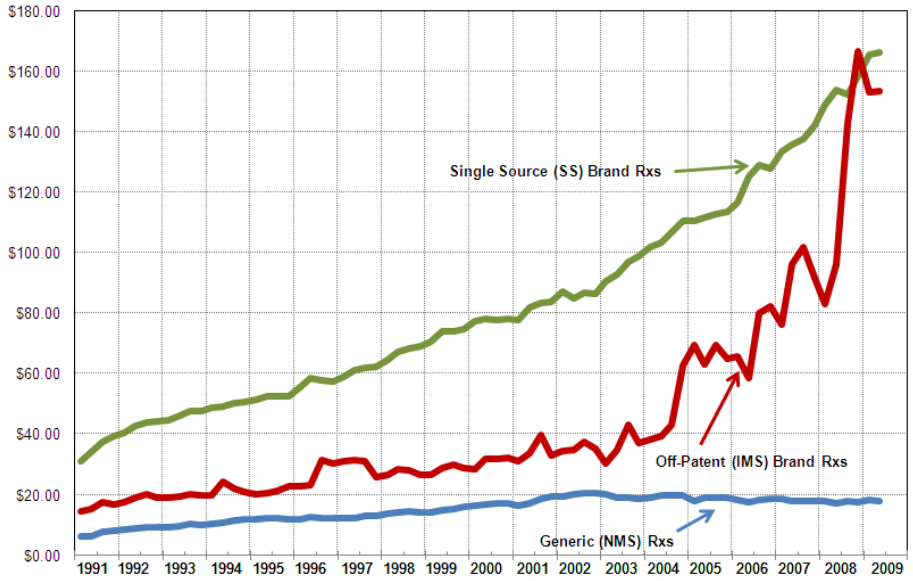
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Kansas Medicaid: 1991 to 2009



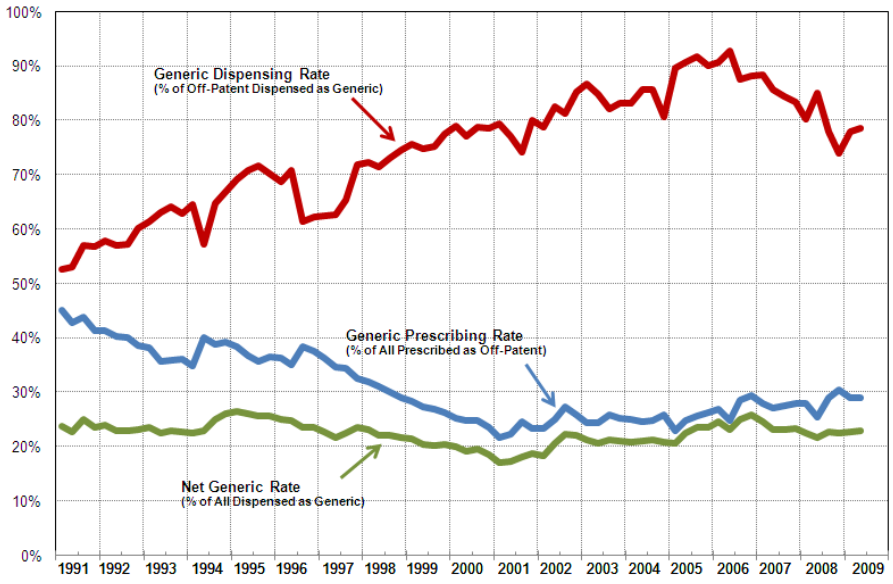
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Kentucky Medicaid: 1991 to 2009



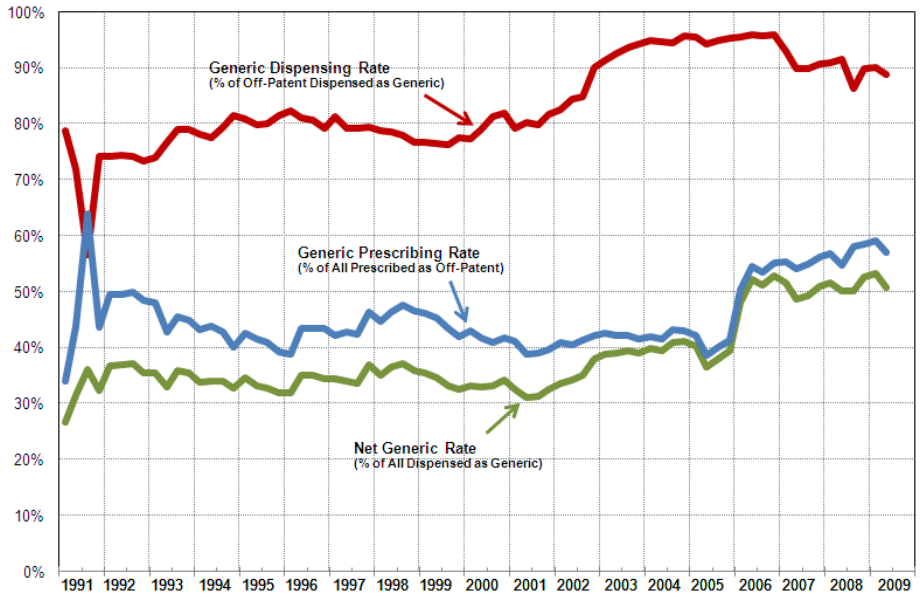
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Kentucky Medicaid: 1991 to 2009



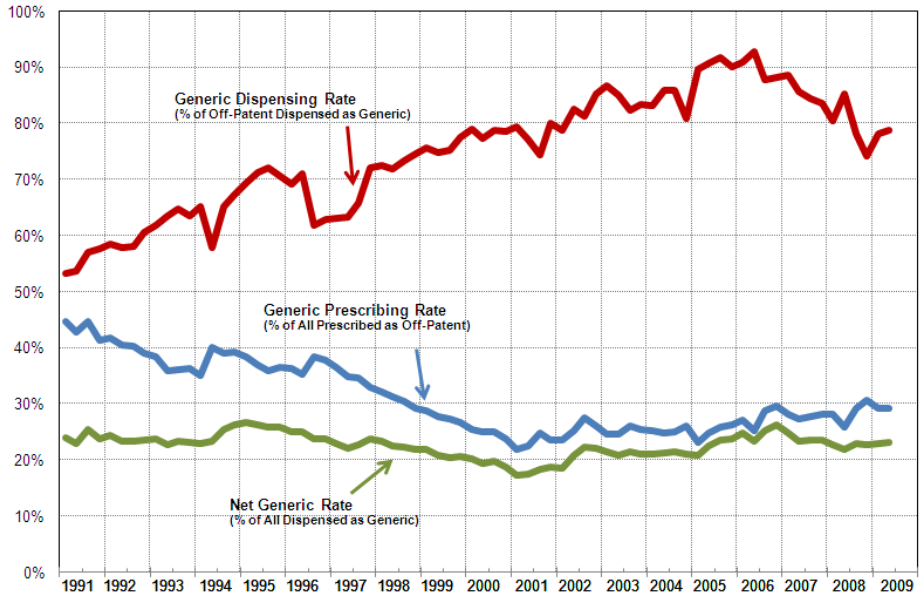
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Kentucky Medicaid: 1991 to 2009



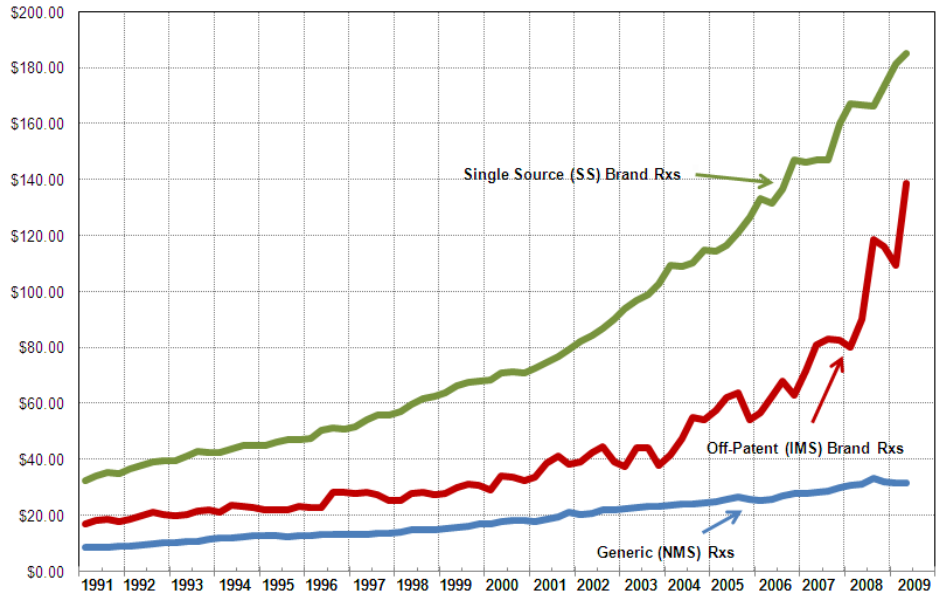
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Kentucky Medicaid: 1991 to 2009



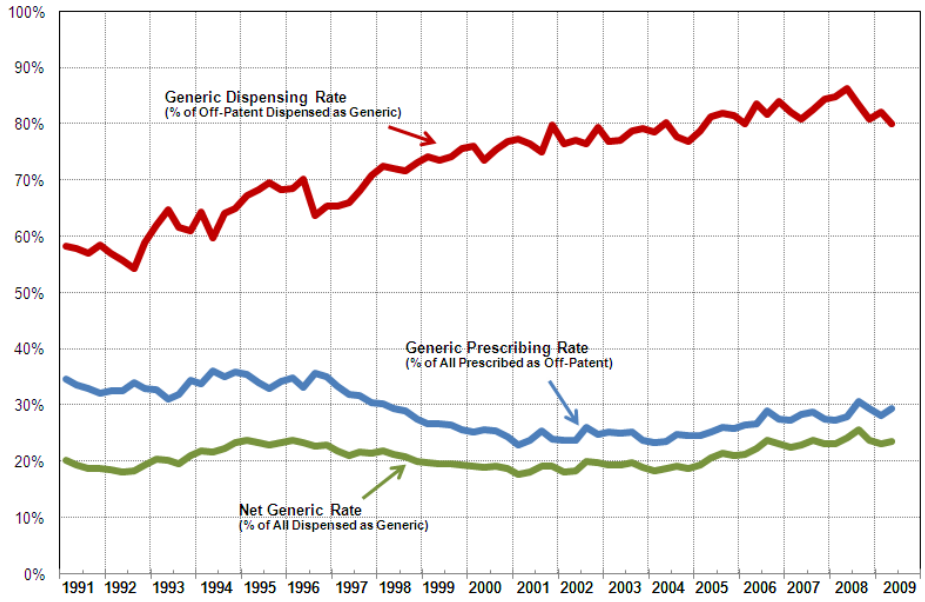
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Louisiana Medicaid: 1991 to 2009



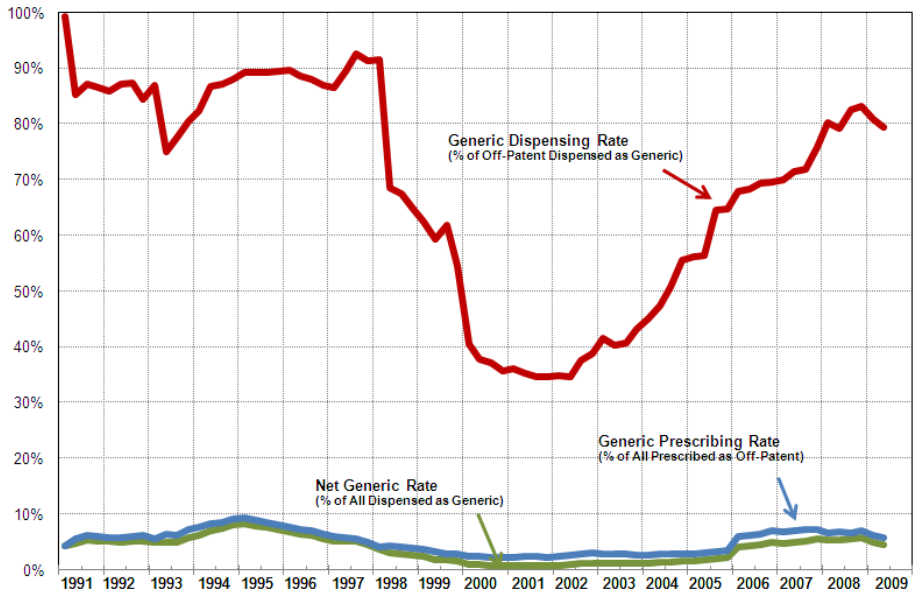
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Louisiana Medicaid: 1991 to 2009



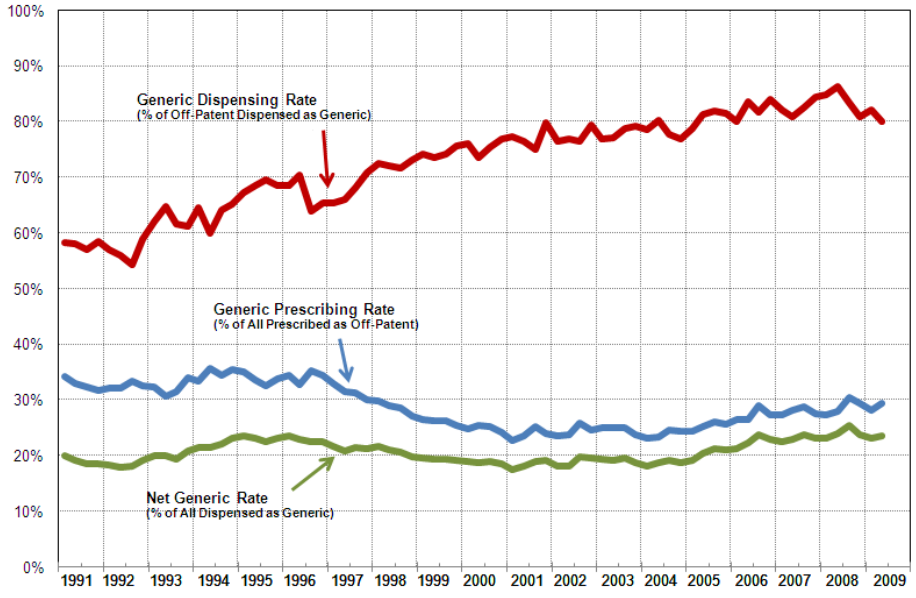
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Louisiana Medicaid: 1991 to 2009



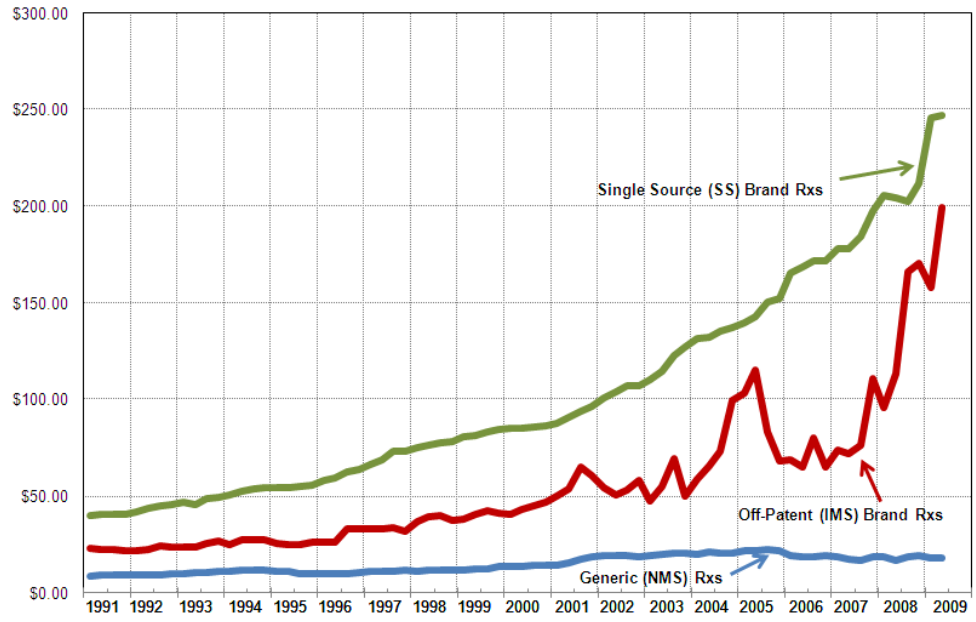
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Louisiana Medicaid: 1991 to 2009



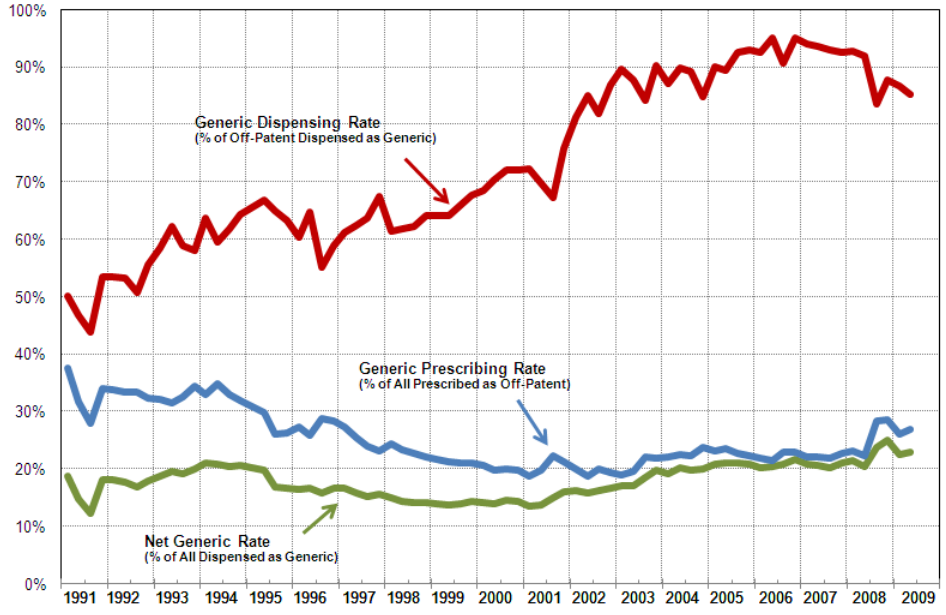
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Massachusetts Medicaid: 1991 to 2009



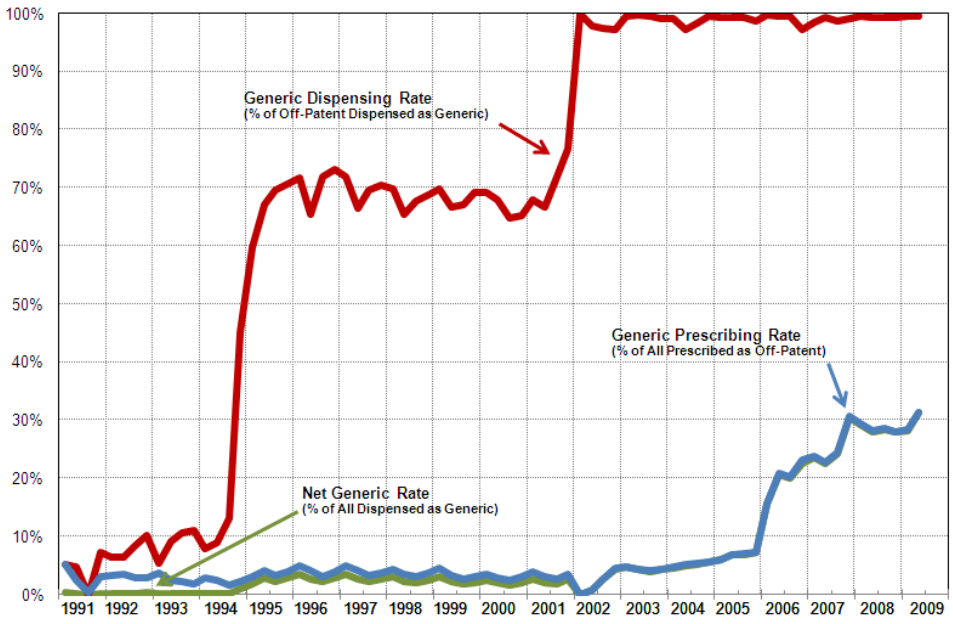
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Massachusetts Medicaid: 1991 to 2009



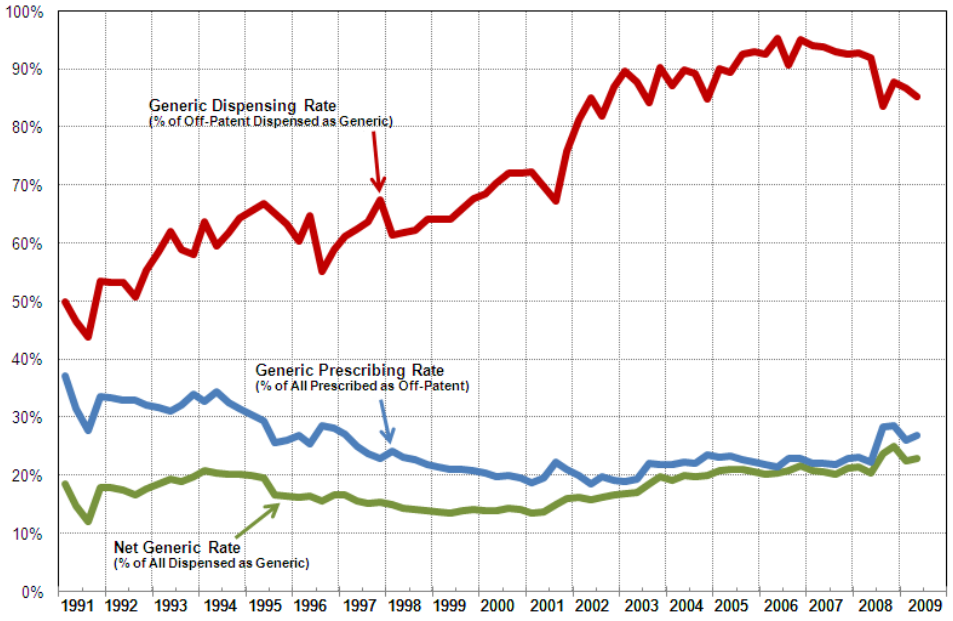
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Massachusetts Medicaid: 1991 to 2009



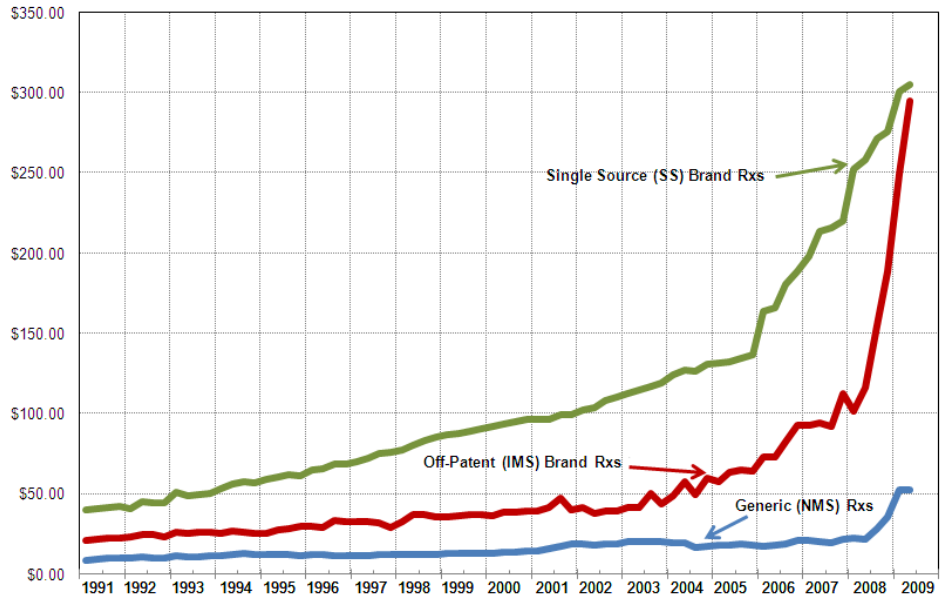
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Massachusetts Medicaid: 1991 to 2009



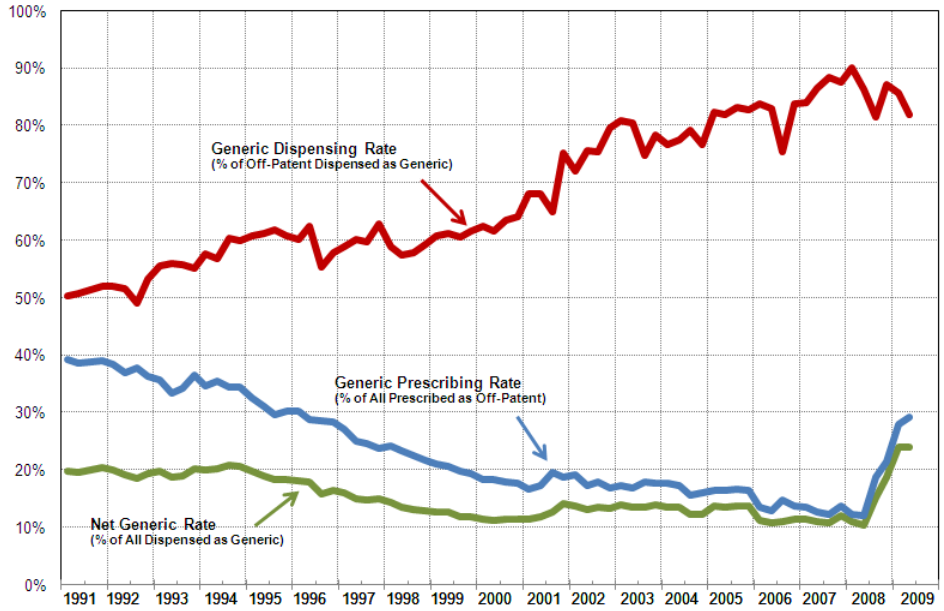
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Maryland Medicaid: 1991 to 2009



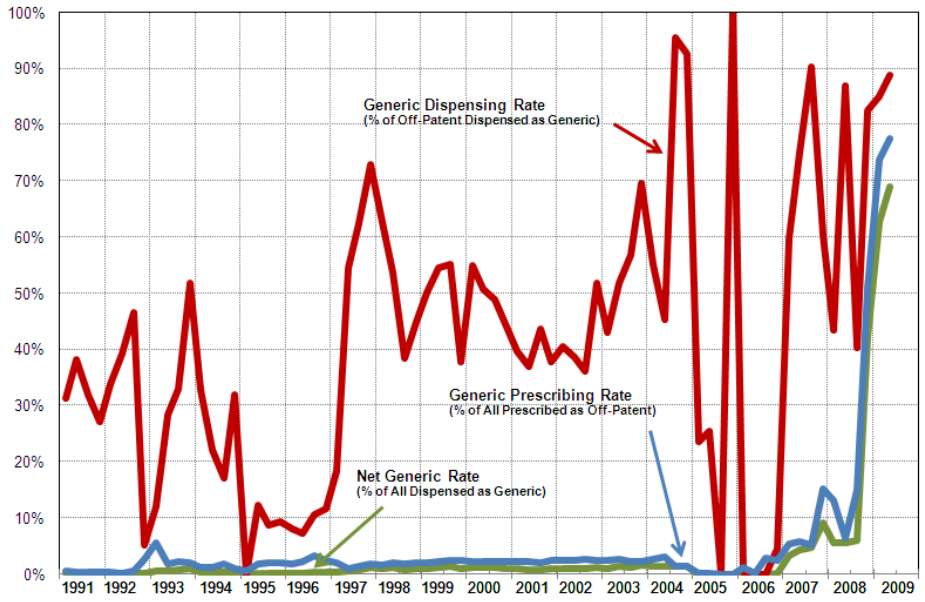
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Maryland Medicaid: 1991 to 2009



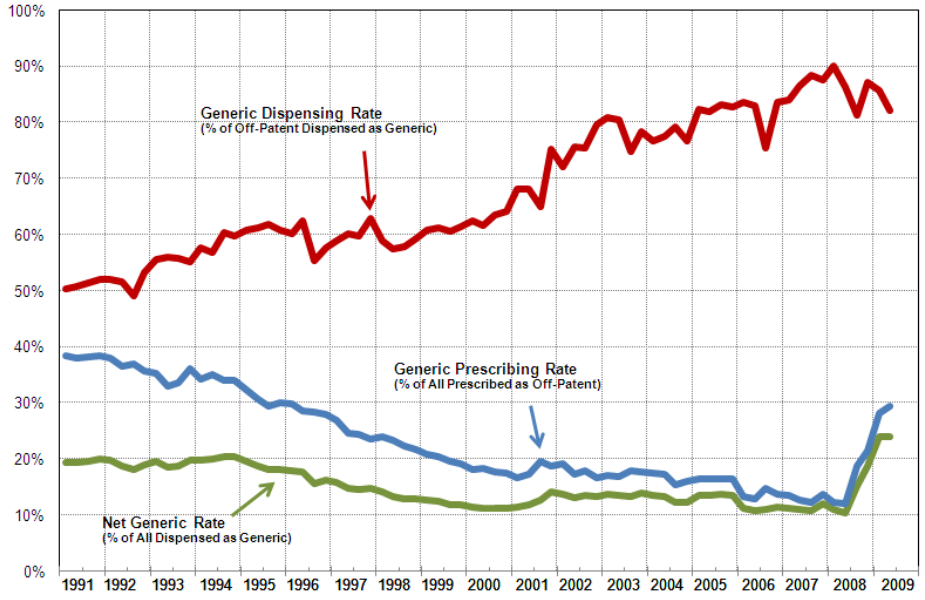
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Maryland Medicaid: 1991 to 2009



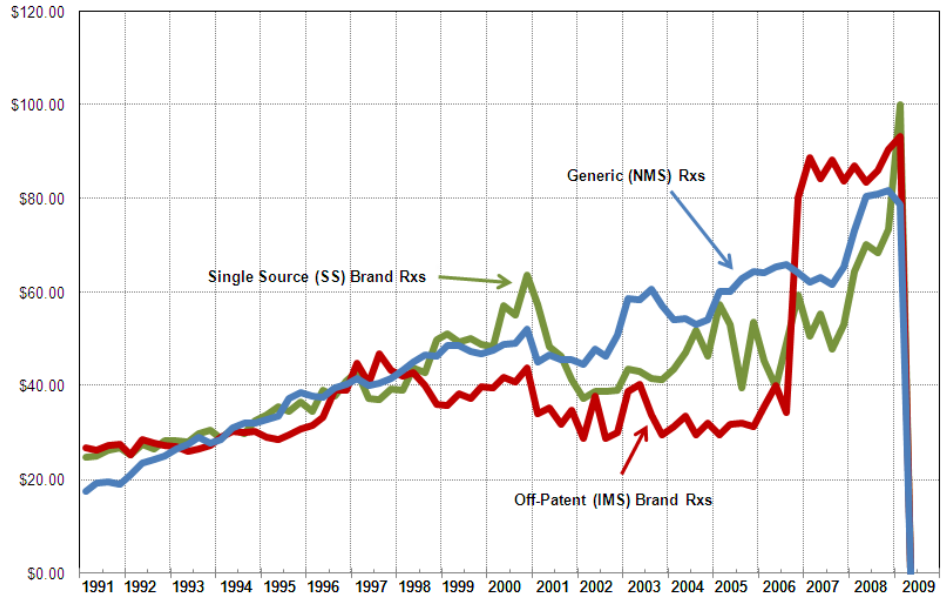
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Maryland Medicaid: 1991 to 2009



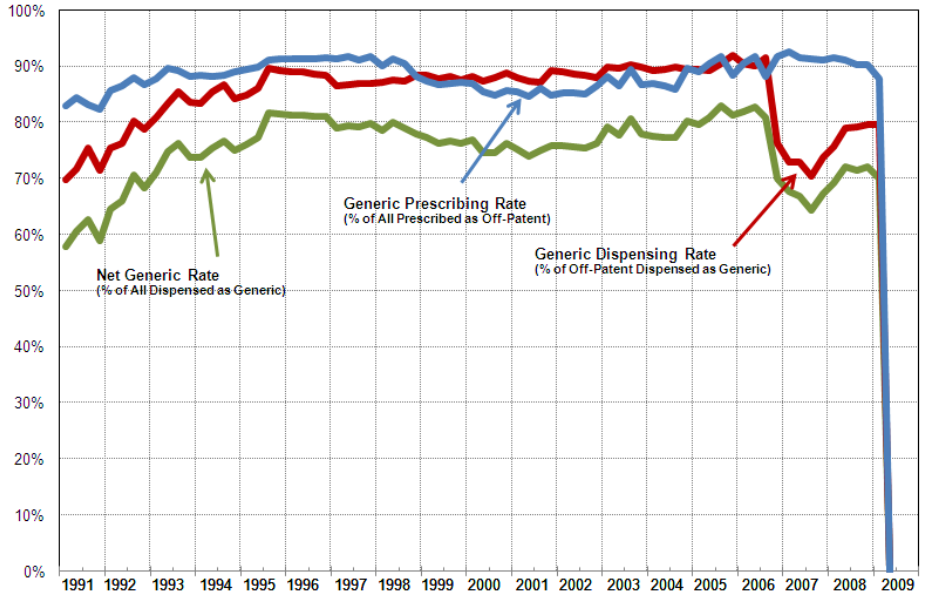
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Maine Medicaid: 1991 to 2009



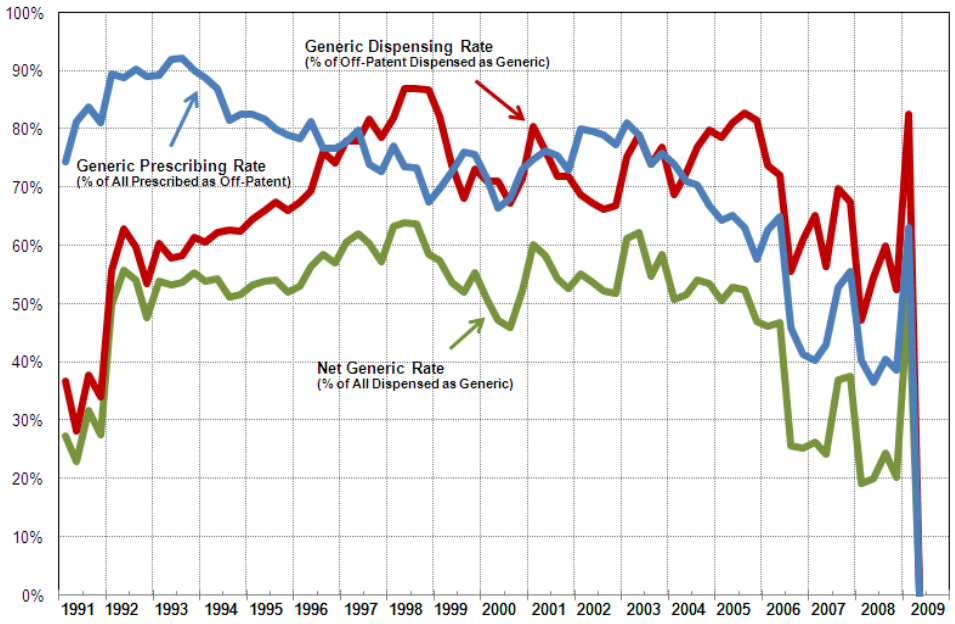
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Maine Medicaid: 1991 to 2009



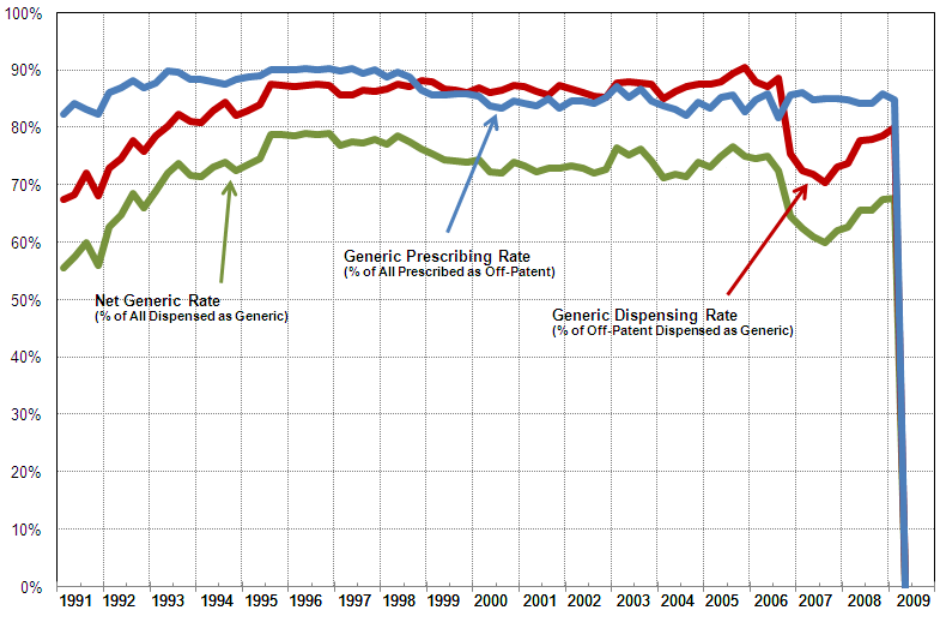
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Maine Medicaid: 1991 to 2009



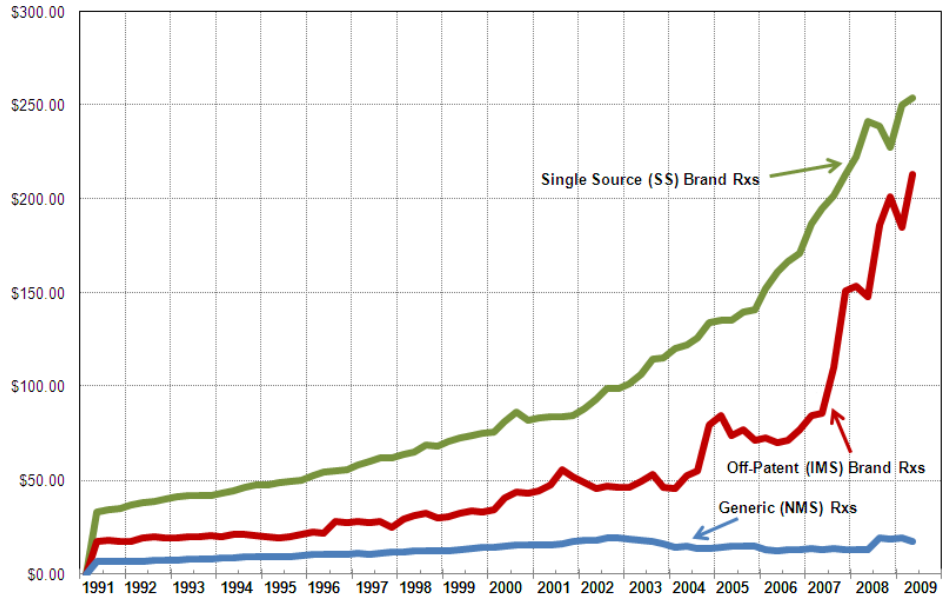
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Maine Medicaid: 1991 to 2009



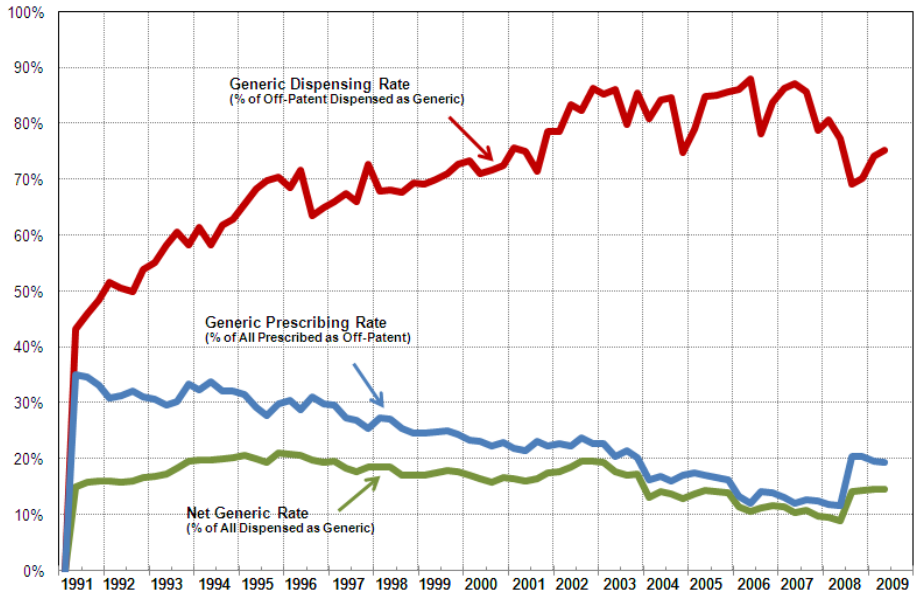
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Michigan Medicaid: 1991 to 2009



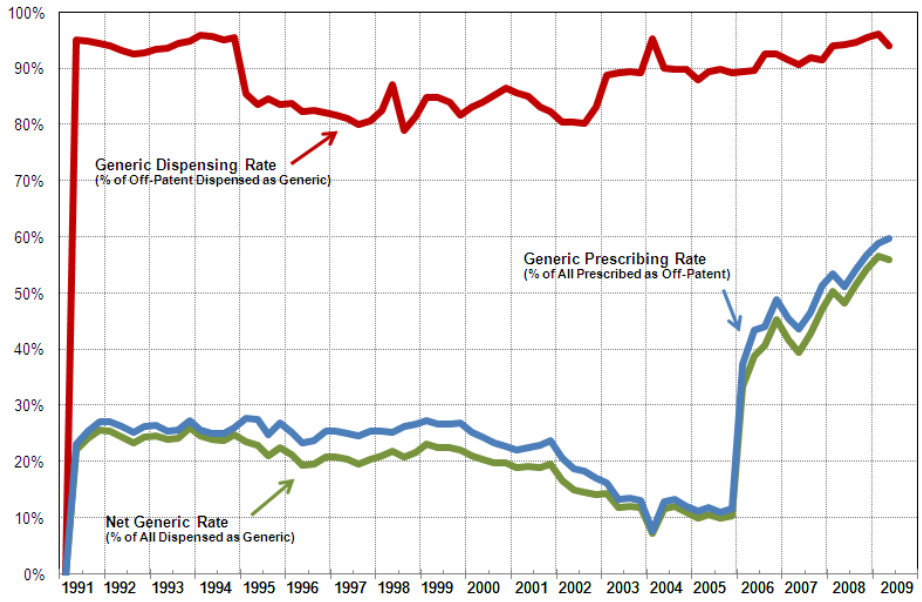
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Michigan Medicaid: 1991 to 2009



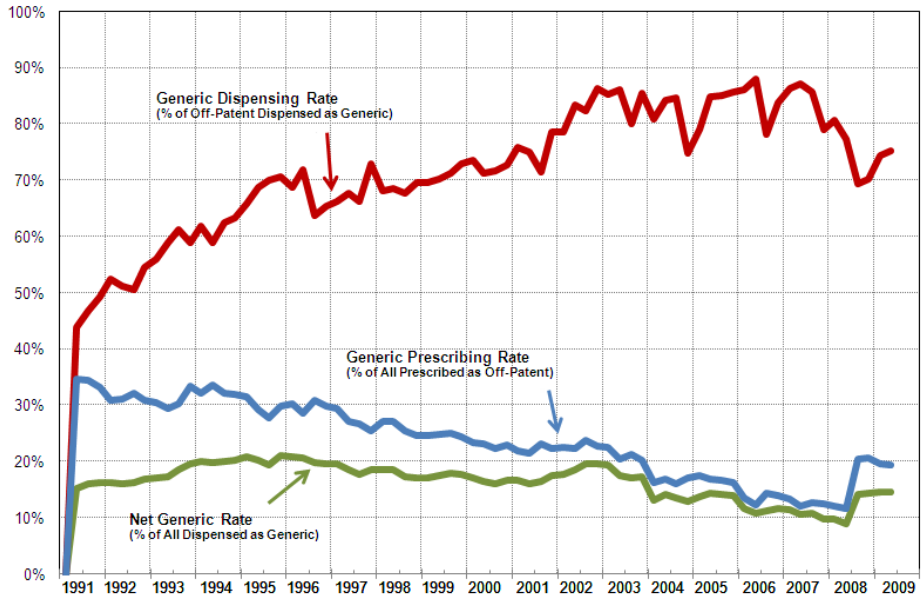
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Michigan Medicaid: 1991 to 2009



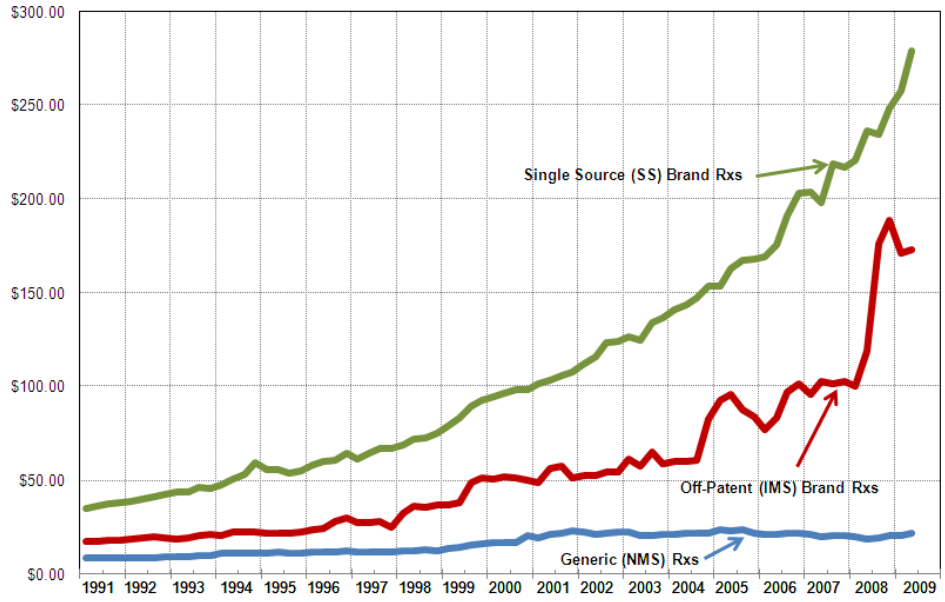
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Michigan Medicaid: 1991 to 2009



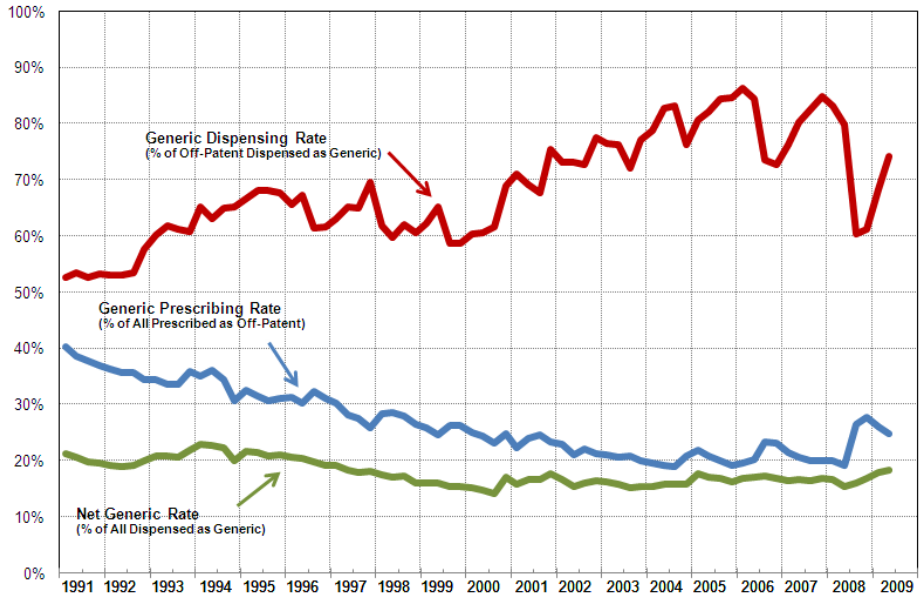
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Minnesota Medicaid: 1991 to 2009



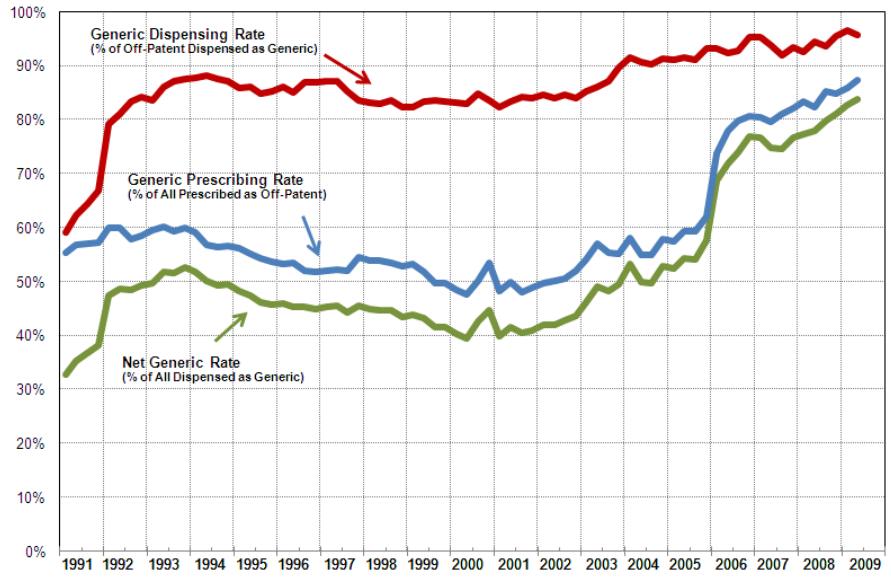
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Minnesota Medicaid: 1991 to 2009



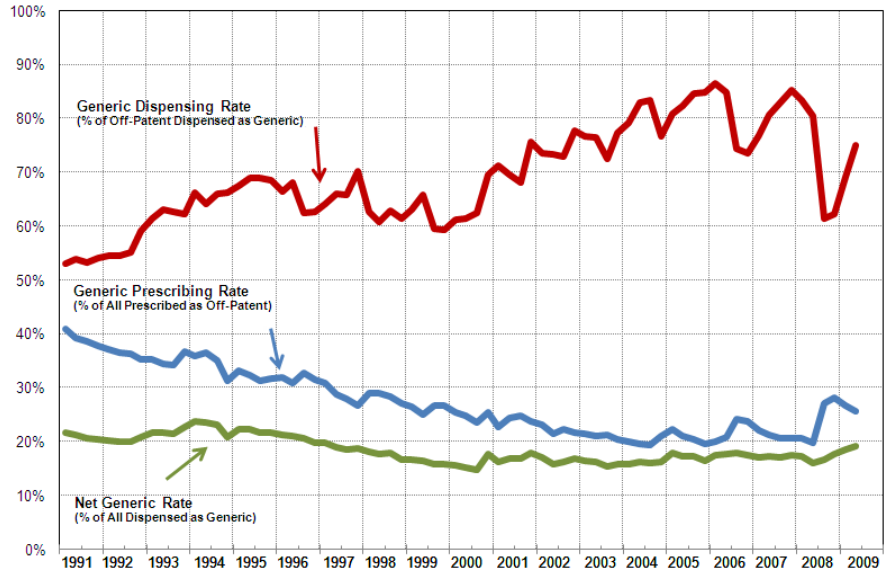
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Minnesota Medicaid: 1991 to 2009



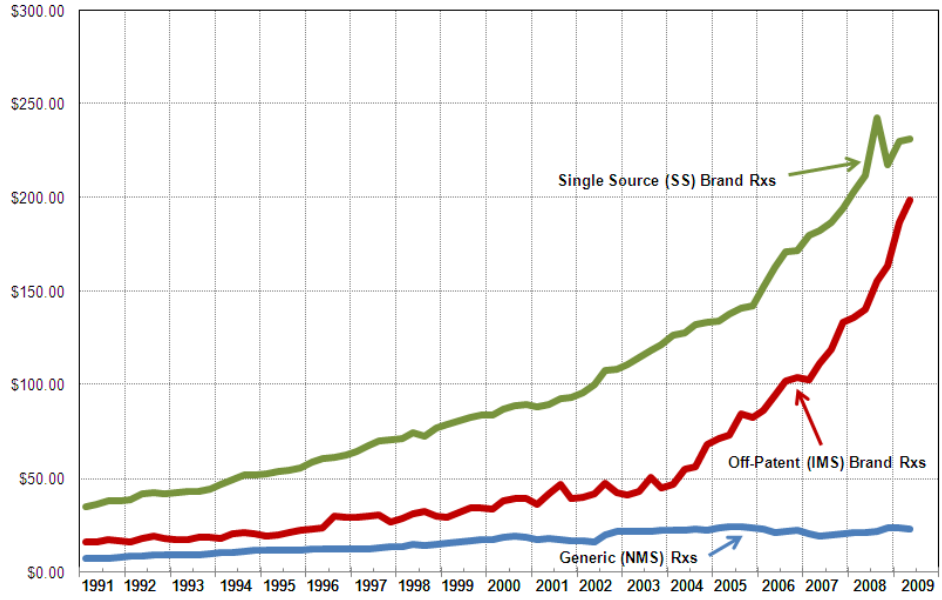
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Minnesota Medicaid: 1991 to 2009



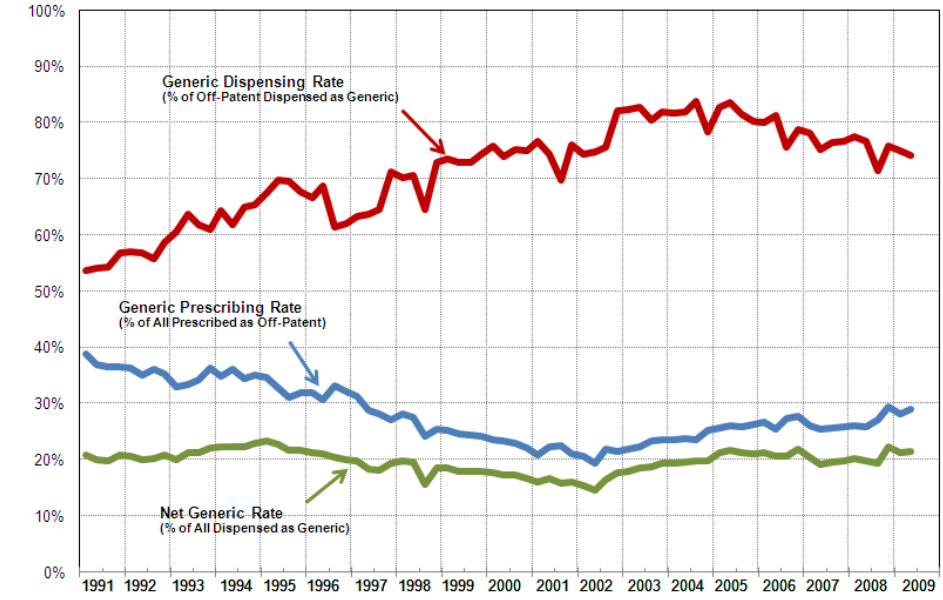
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Missouri Medicaid: 1991 to 2009



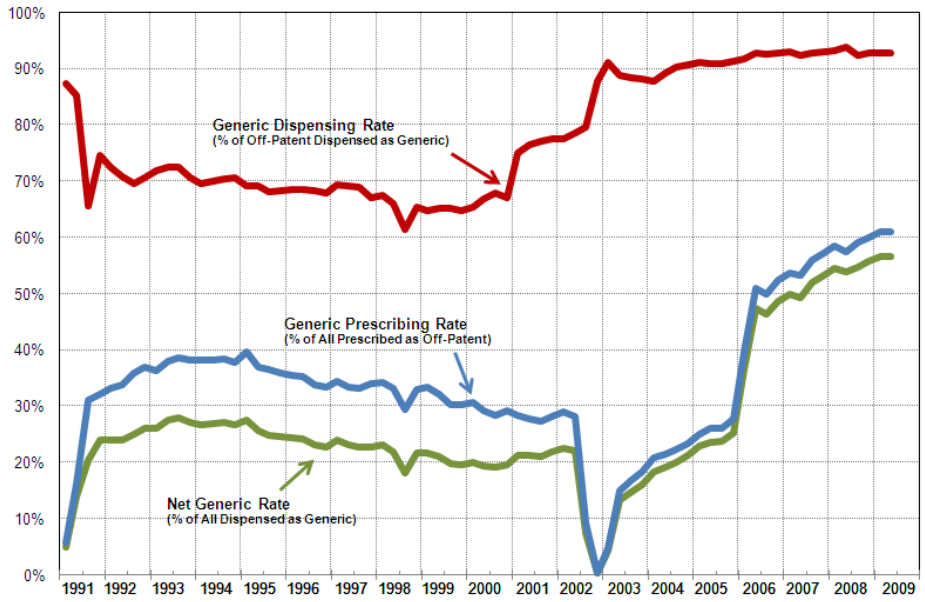
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Missouri Medicaid: 1991 to 2009



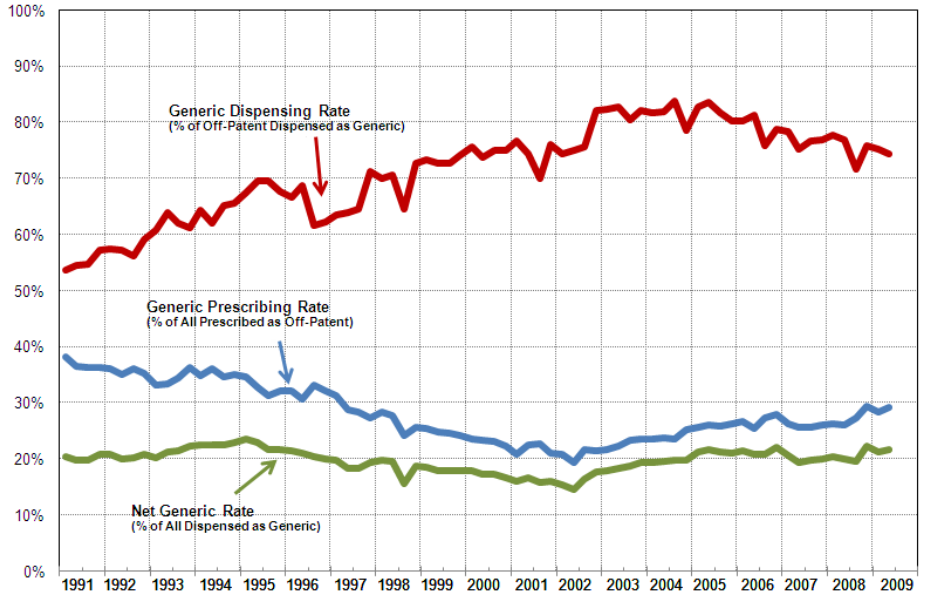
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Missouri Medicaid: 1991 to 2009



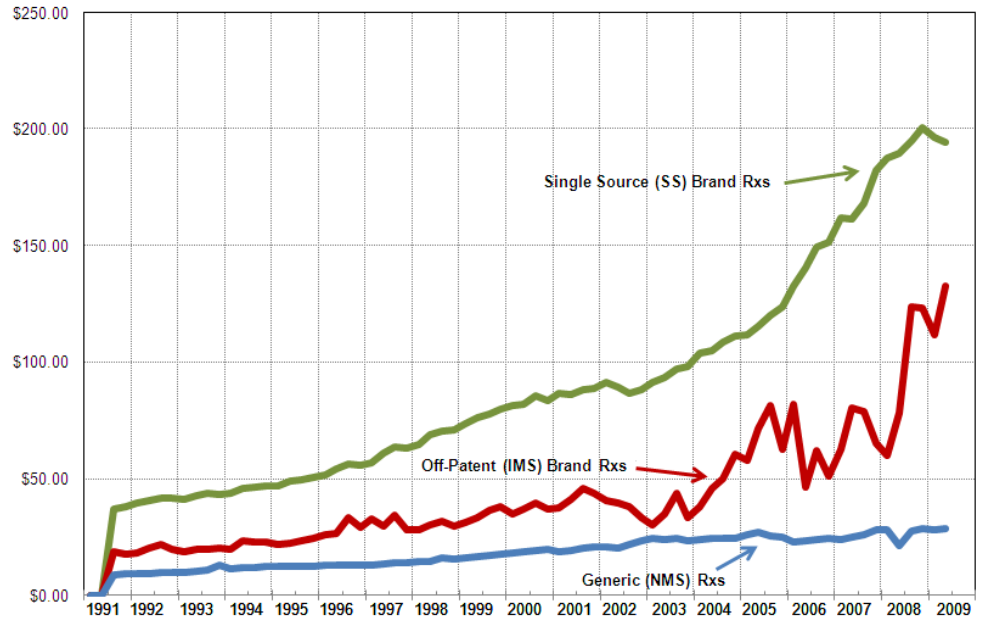
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Missouri Medicaid: 1991 to 2009



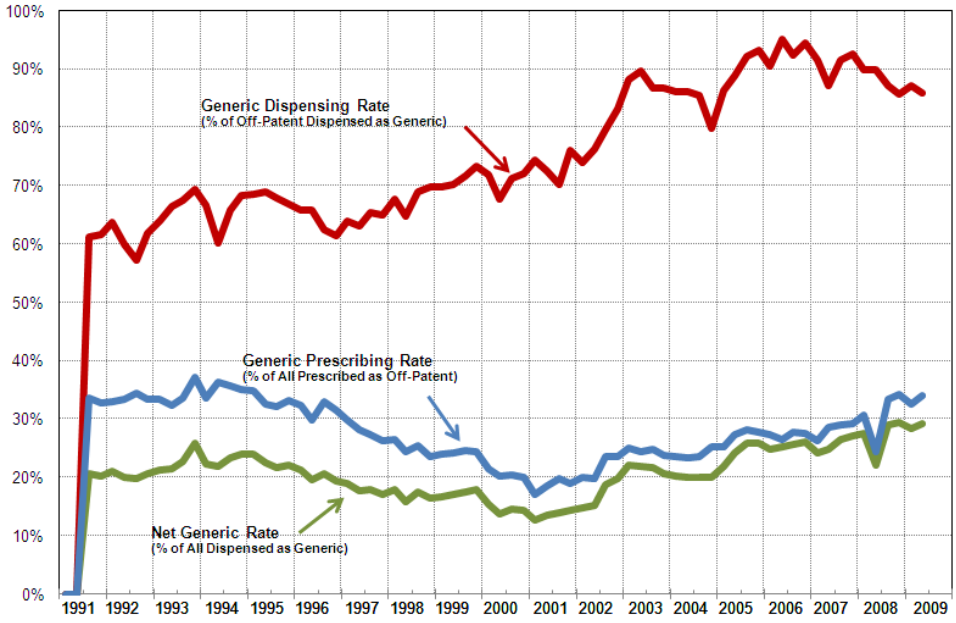
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Mississippi Medicaid: 1991 to 2009



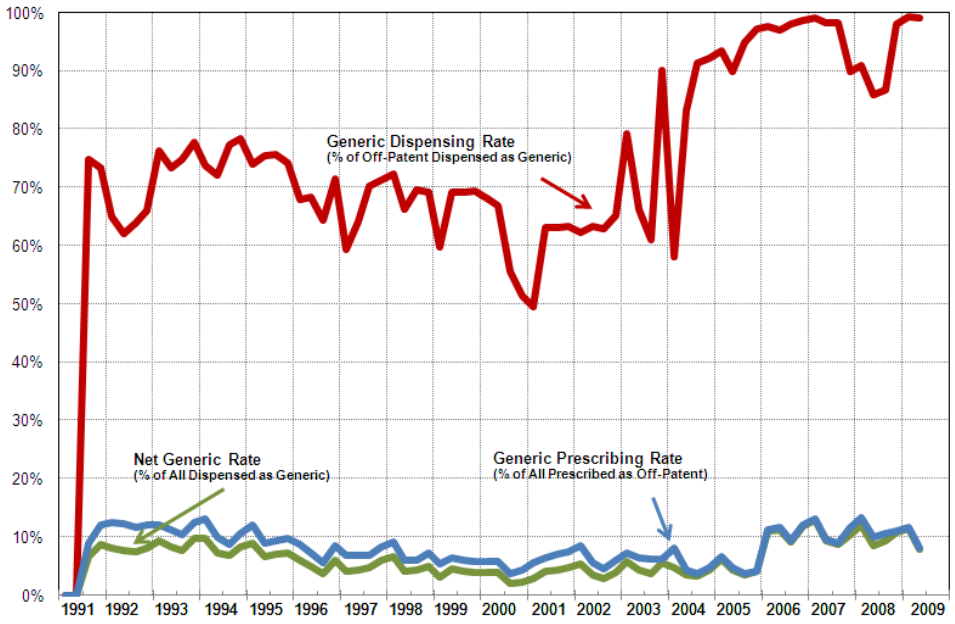
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Mississippi Medicaid: 1991 to 2009



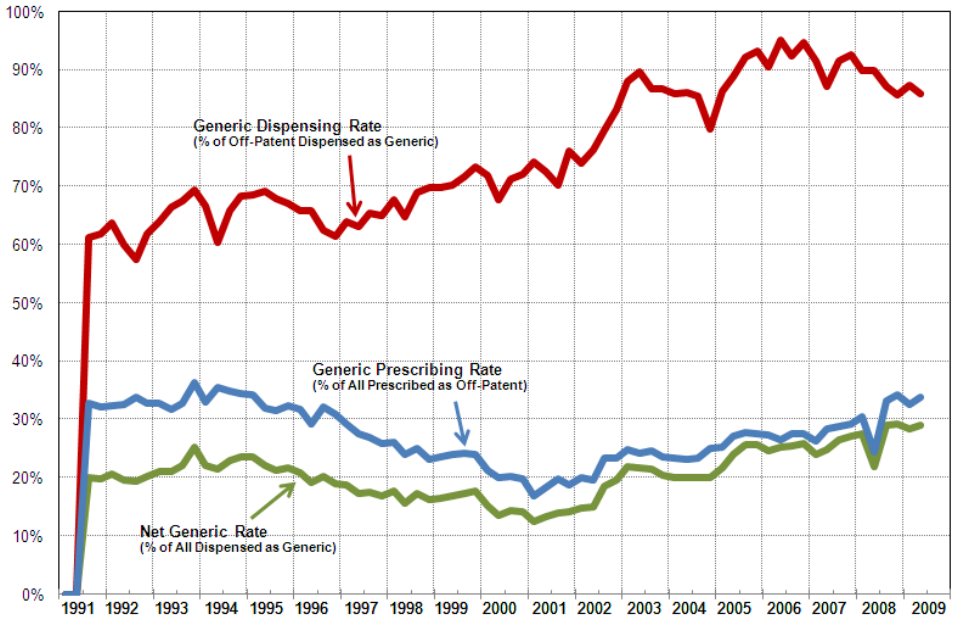
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Mississippi Medicaid: 1991 to 2009



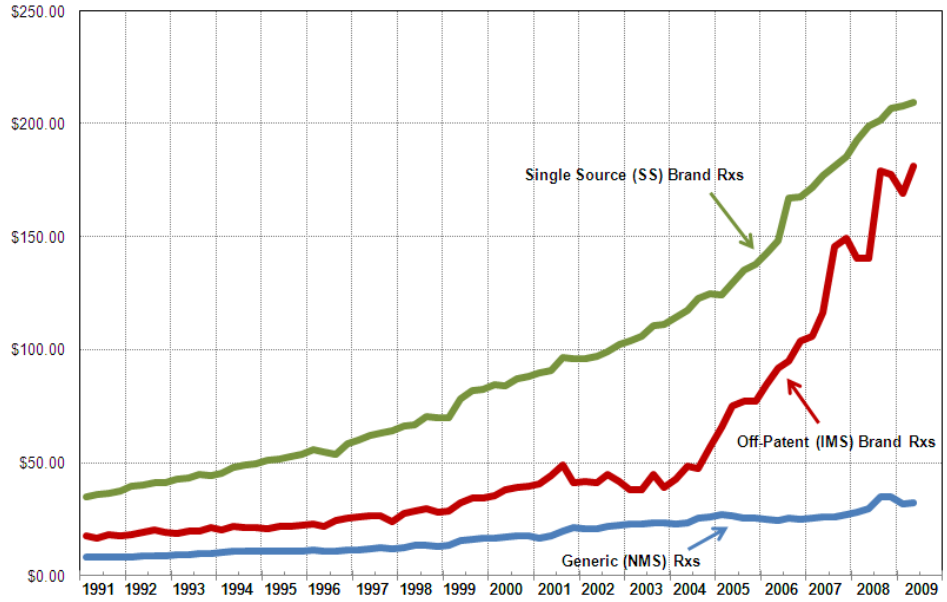
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Mississippi Medicaid: 1991 to 2009



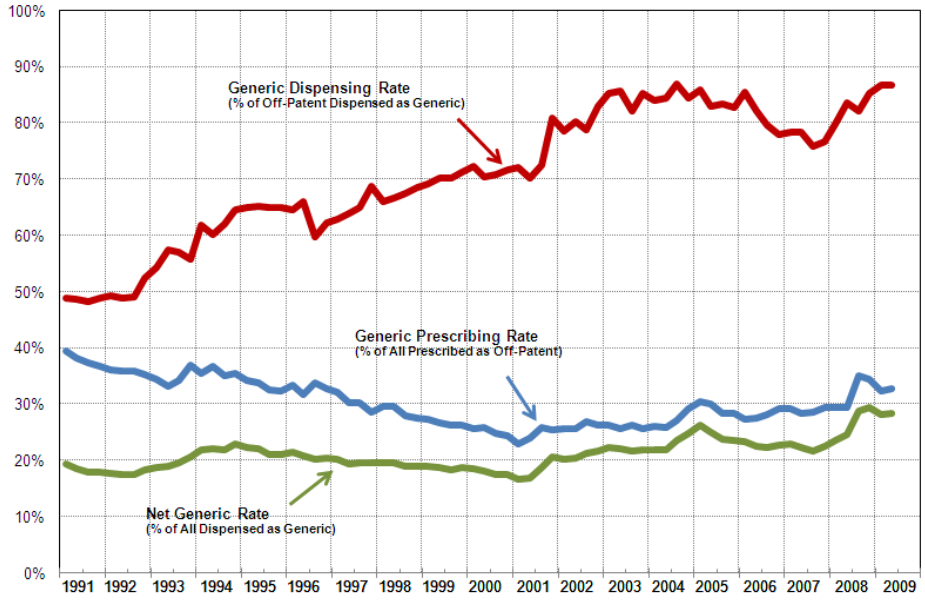
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Montana Medicaid: 1991 to 2009



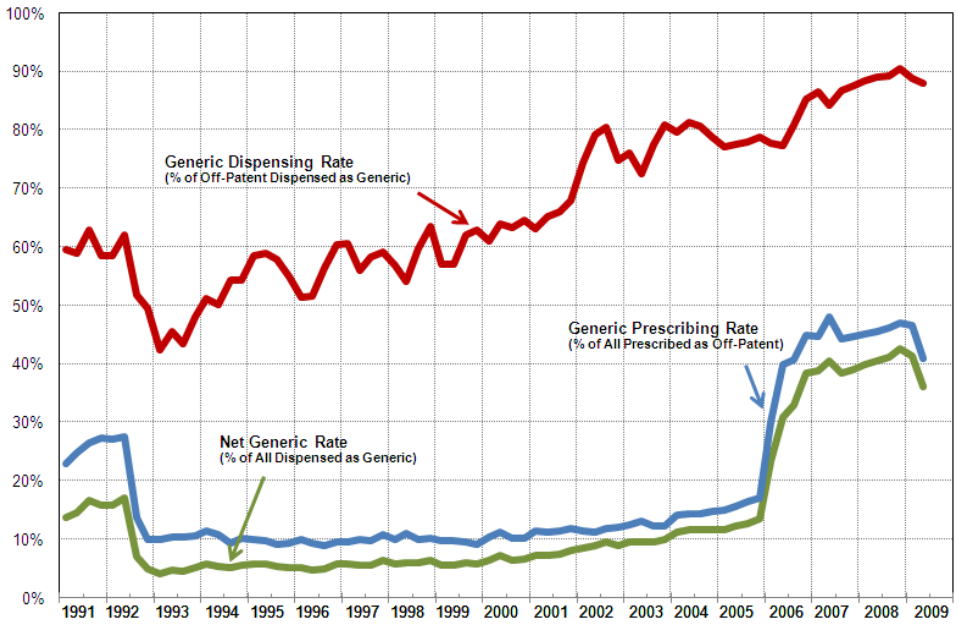
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Montana Medicaid: 1991 to 2009



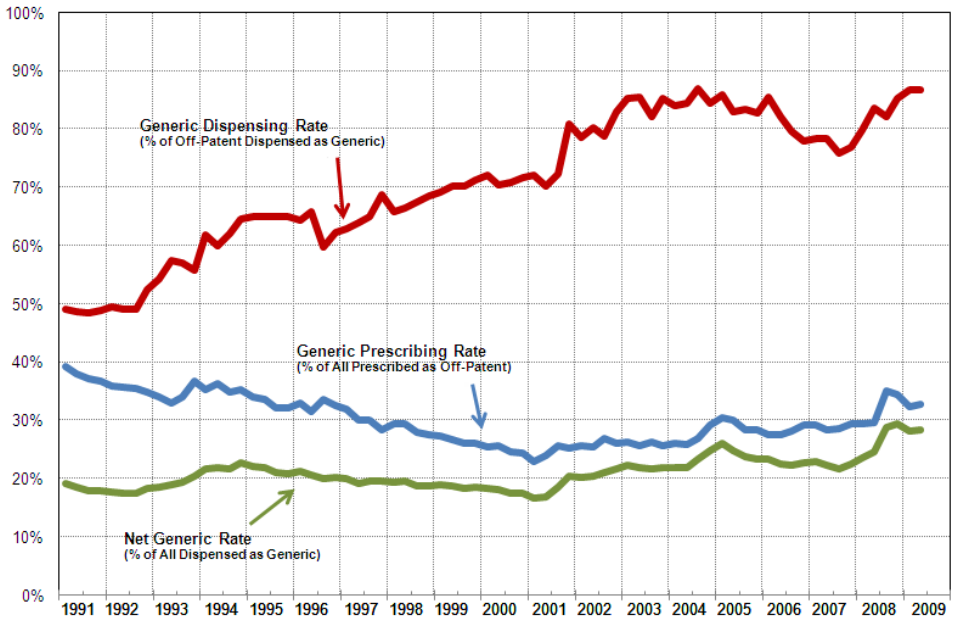
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Montana Medicaid: 1991 to 2009



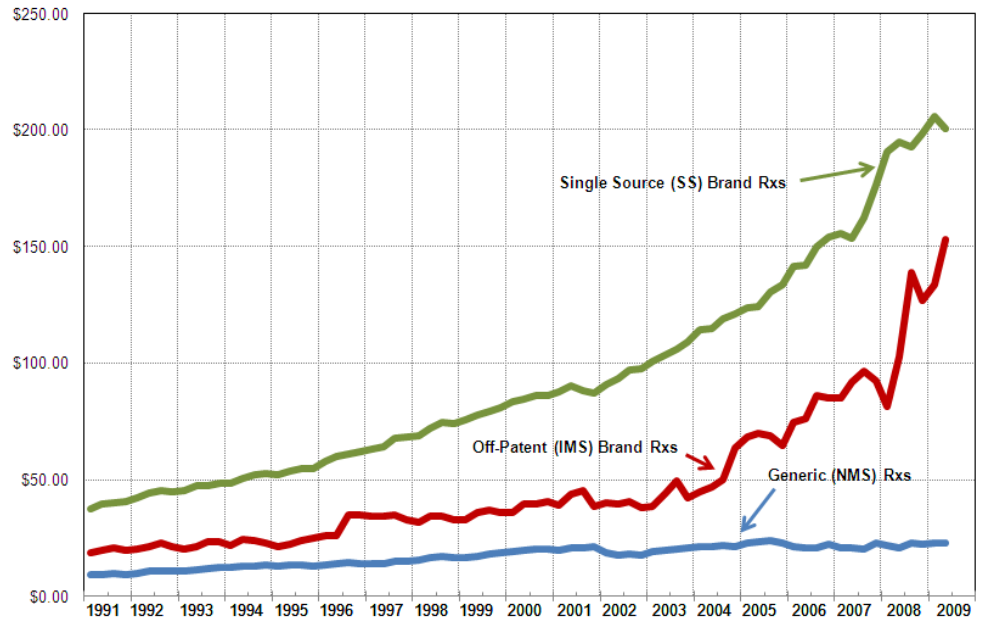
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Montana Medicaid: 1991 to 2009



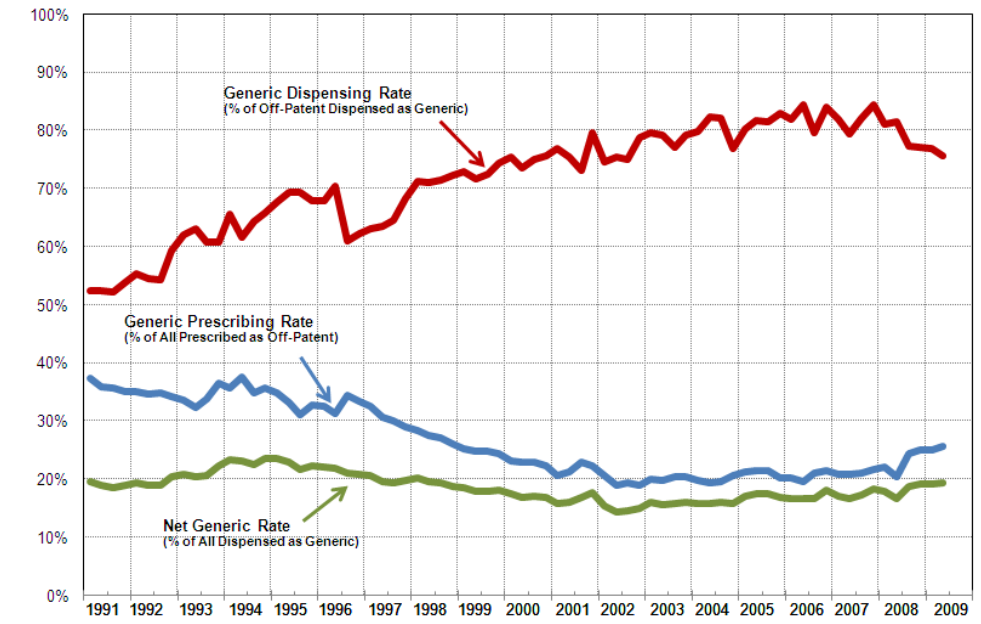
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
North Carolina Medicaid: 1991 to 2009



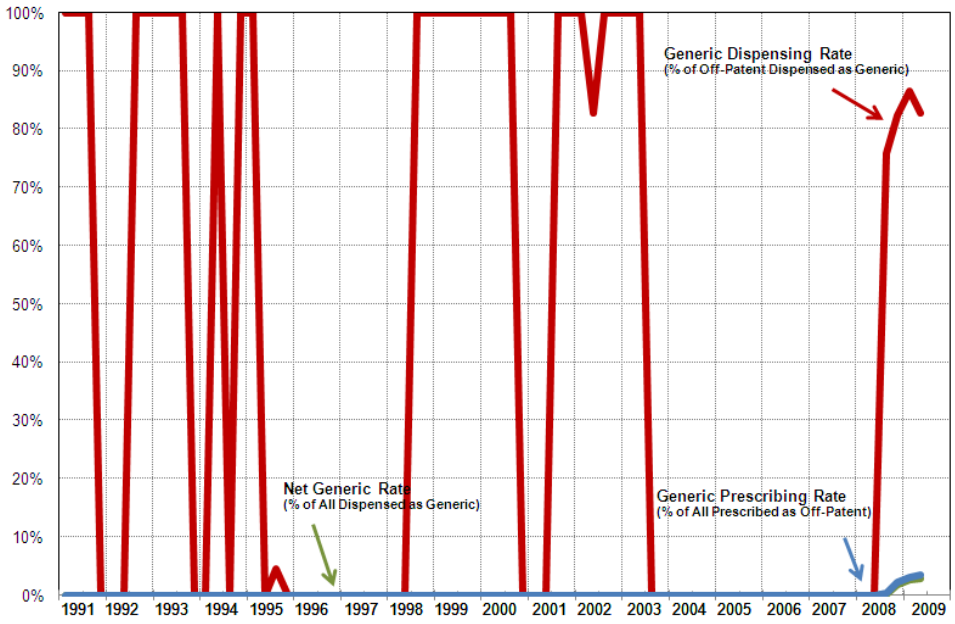
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
North Carolina Medicaid: 1991 to 2009



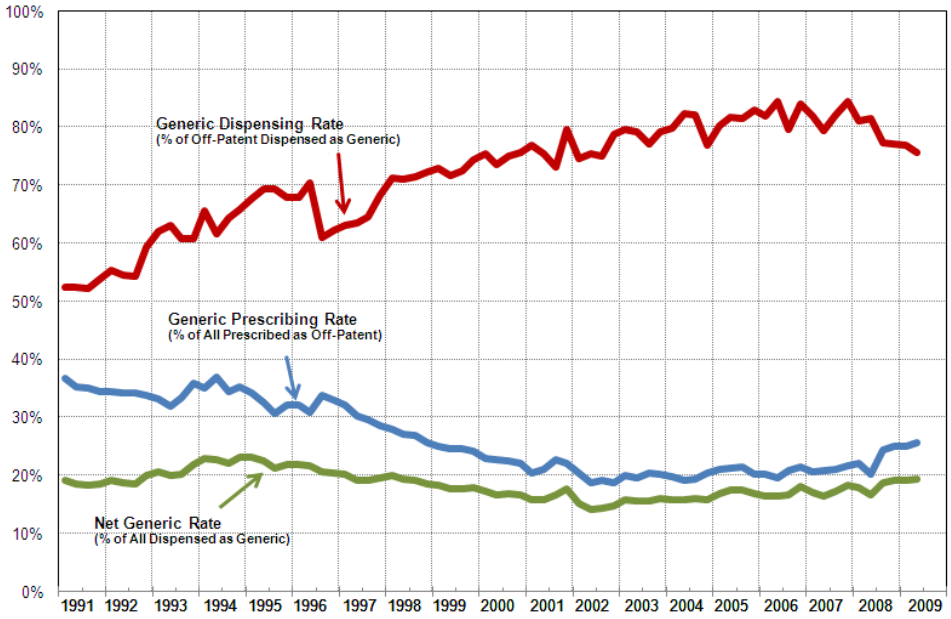
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
North Carolina Medicaid: 1991 to 2009



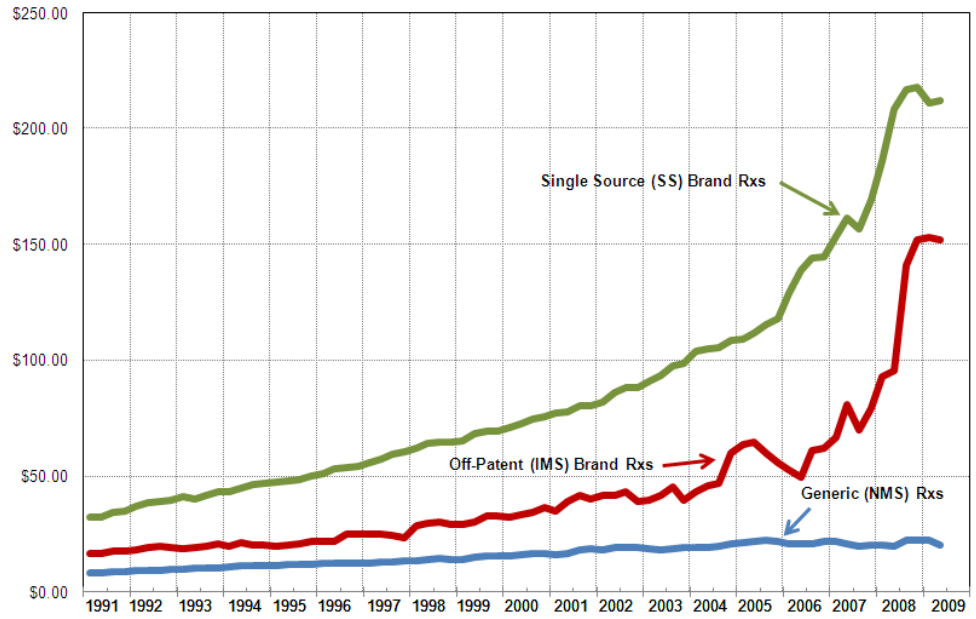
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
North Carolina Medicaid: 1991 to 2009



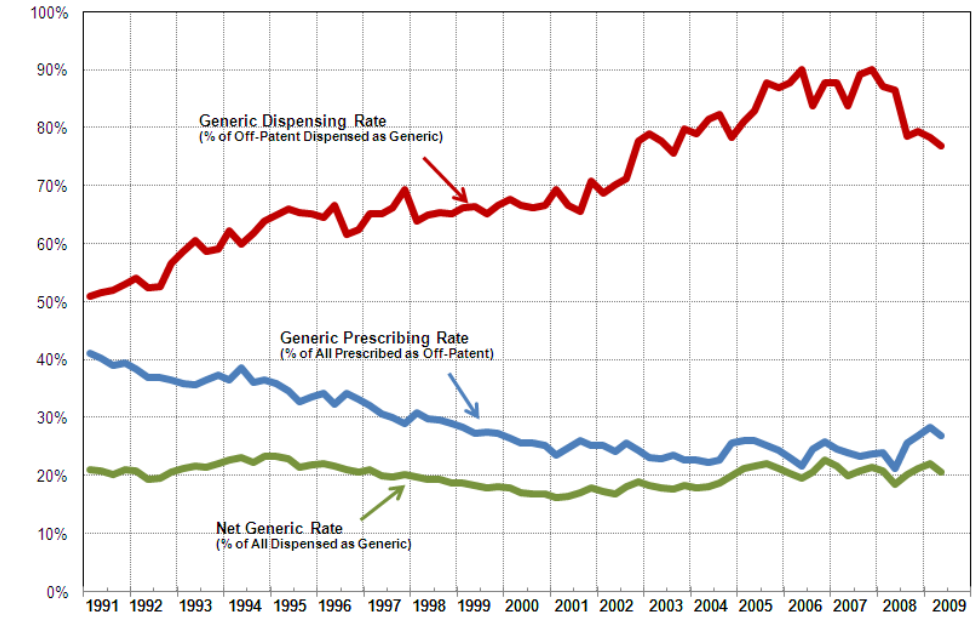
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
North Dakota Medicaid: 1991 to 2009



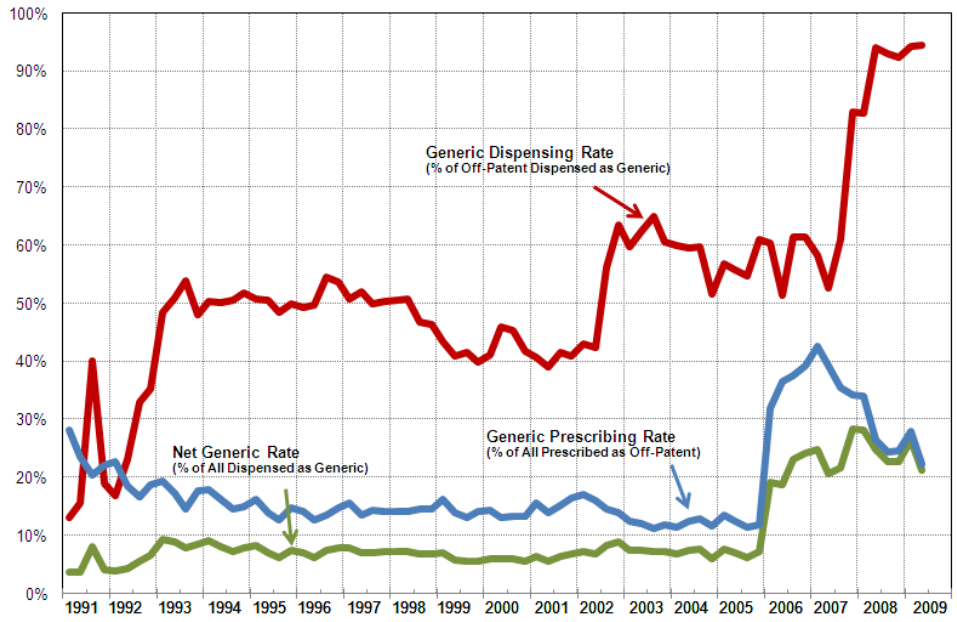
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
North Dakota Medicaid: 1991 to 2009



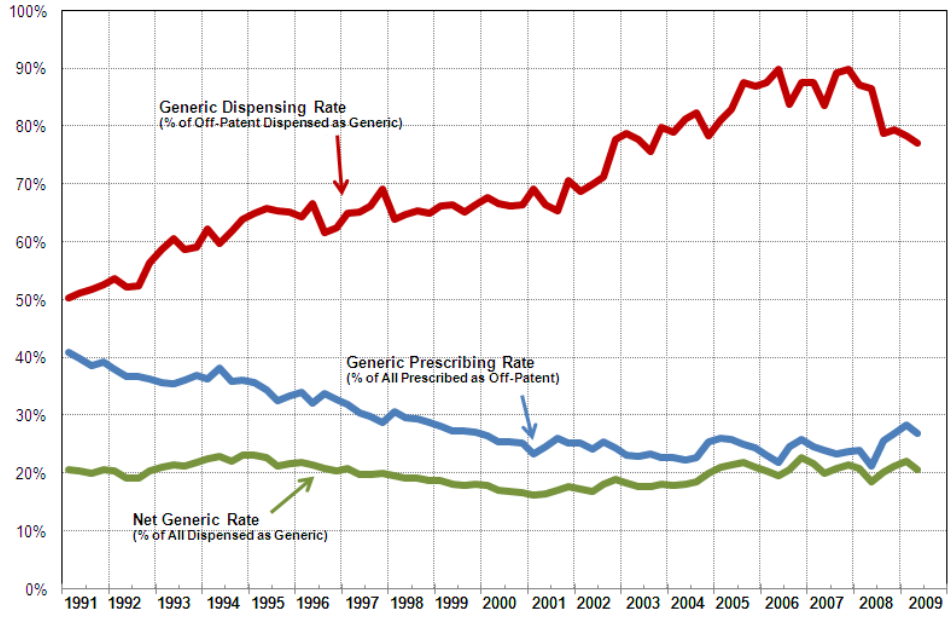
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
North Dakota Medicaid: 1991 to 2009



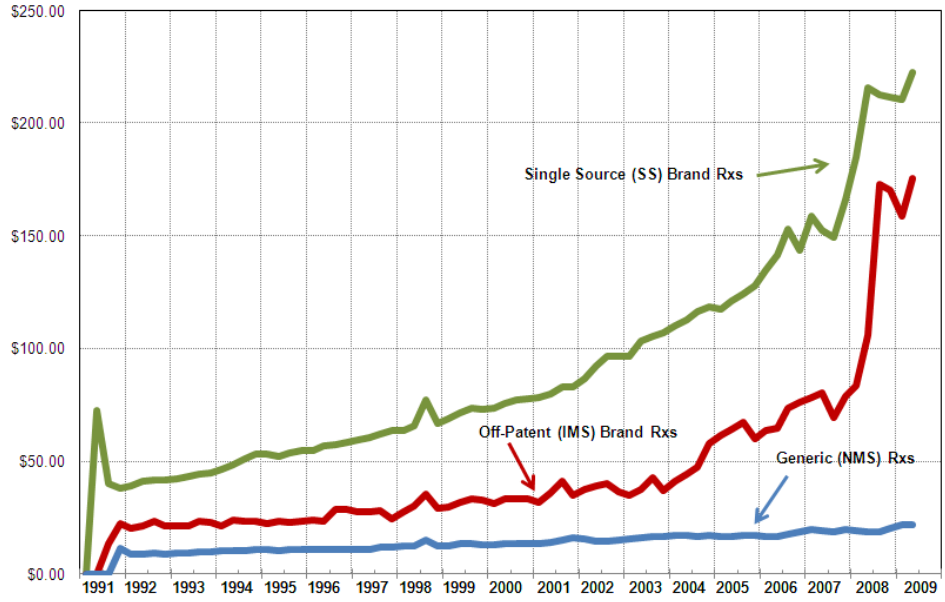
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
North Dakota Medicaid: 1991 to 2009



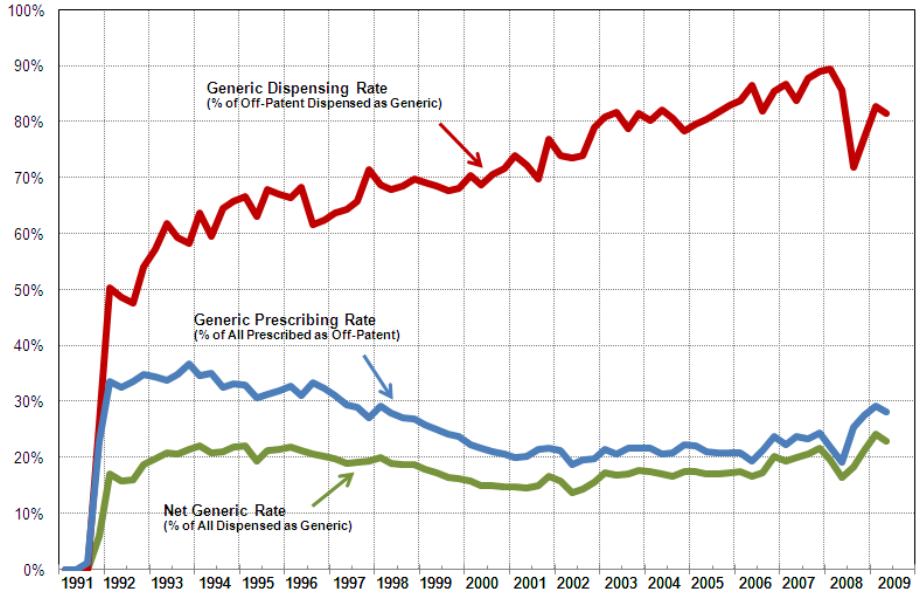
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Nebraska Medicaid: 1991 to 2009



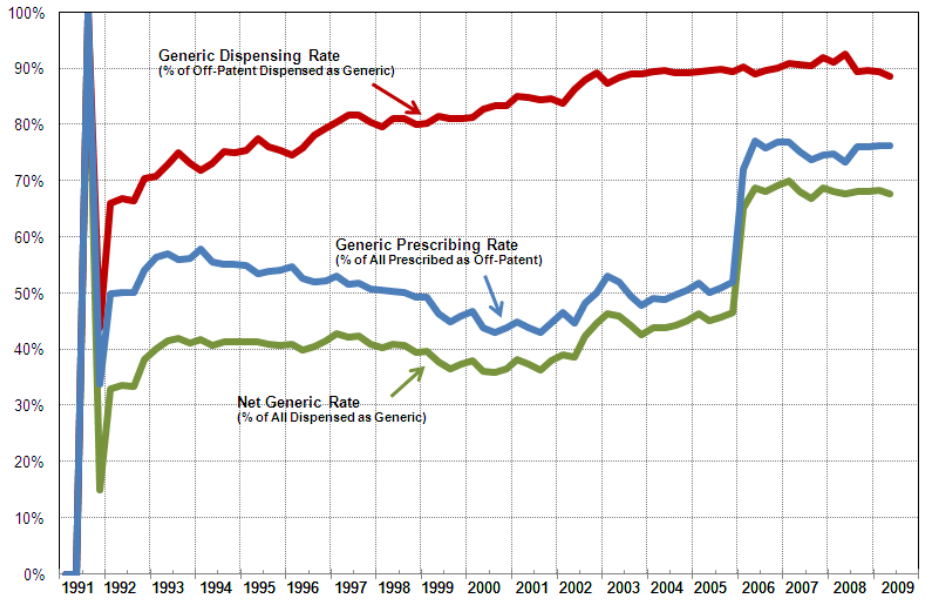
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Nebraska Medicaid: 1991 to 2009



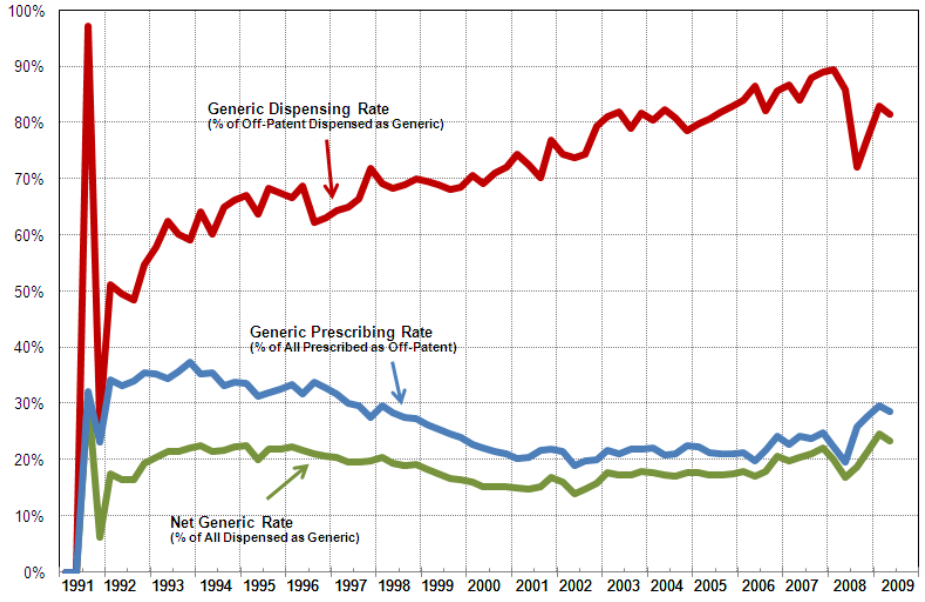
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Nebraska Medicaid: 1991 to 2009



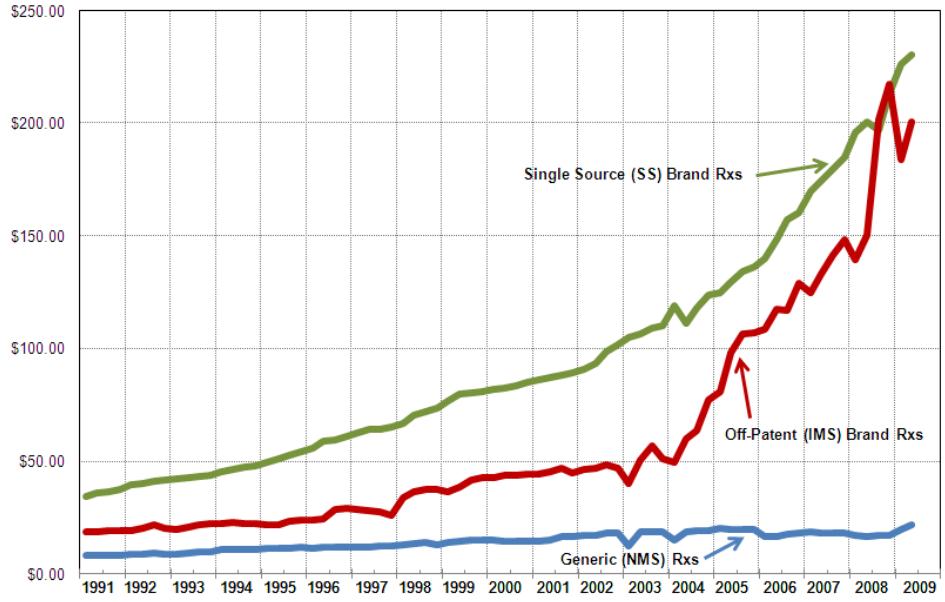
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Nebraska Medicaid: 1991 to 2009



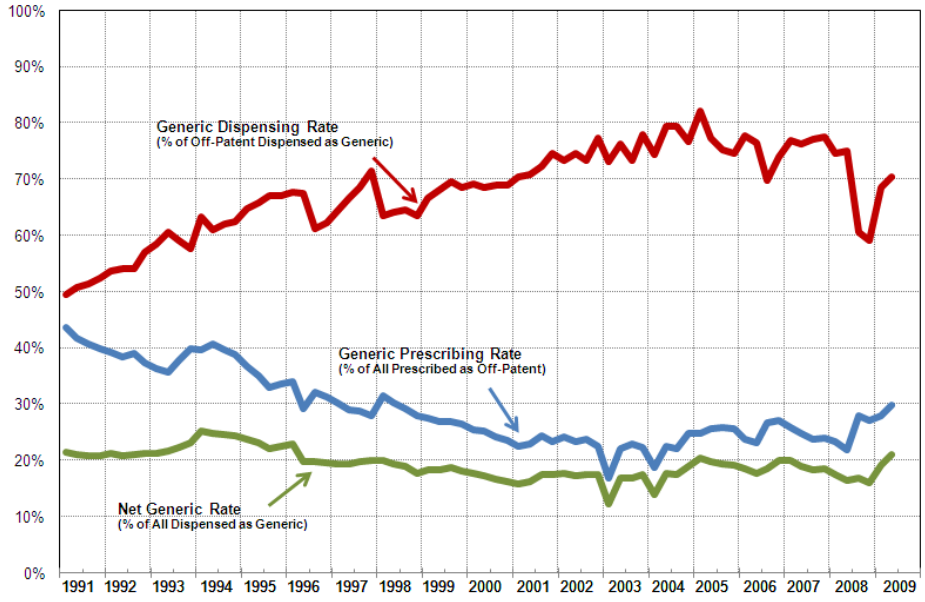
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
New Hampshire Medicaid: 1991 to 2009



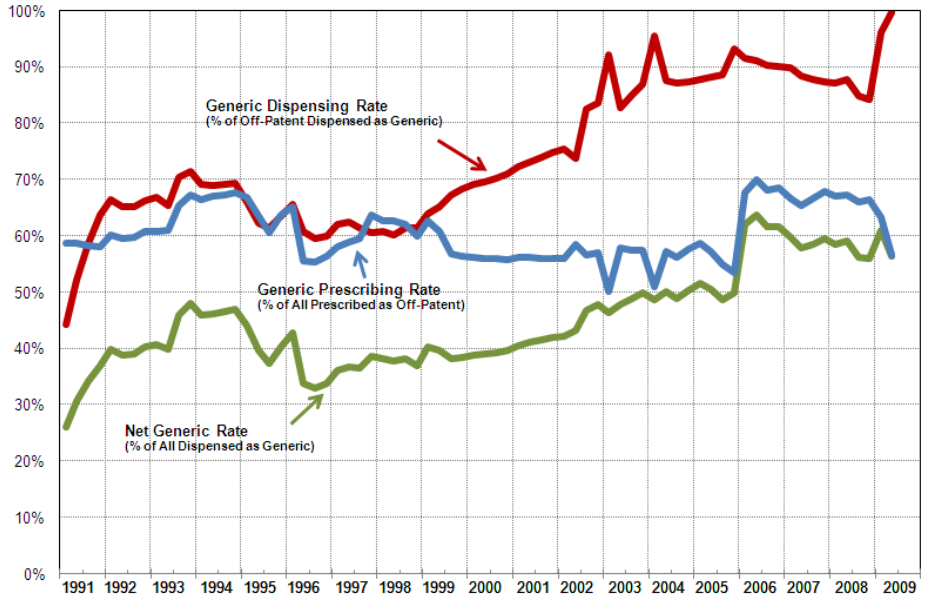
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
New Hampshire Medicaid: 1991 to 2009



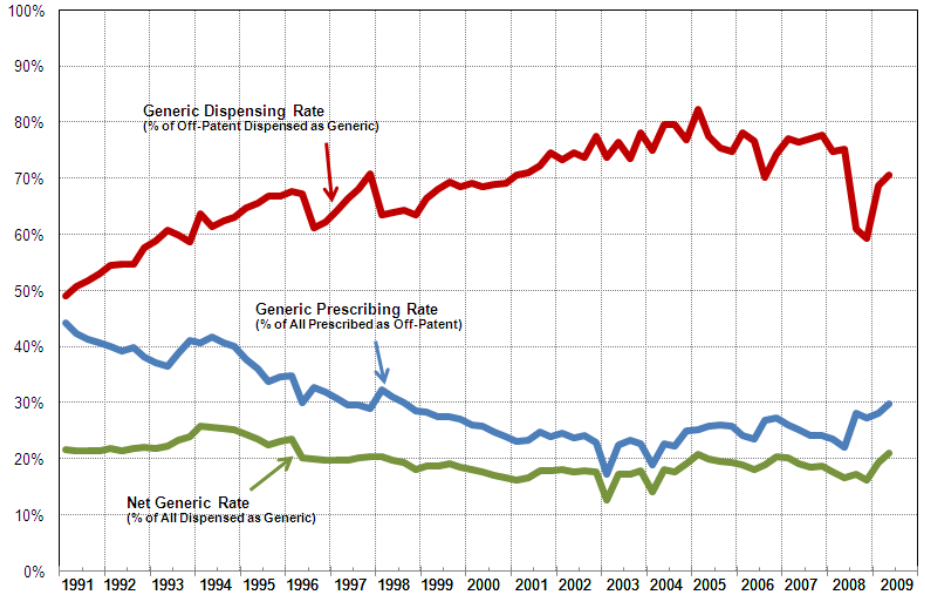
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
New Hampshire Medicaid: 1991 to 2009



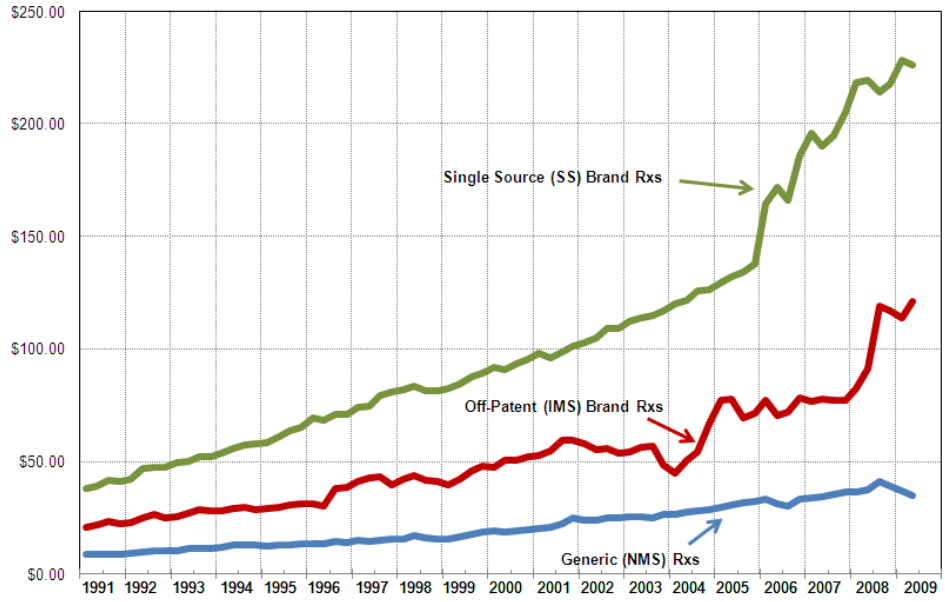
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
New Hampshire Medicaid: 1991 to 2009



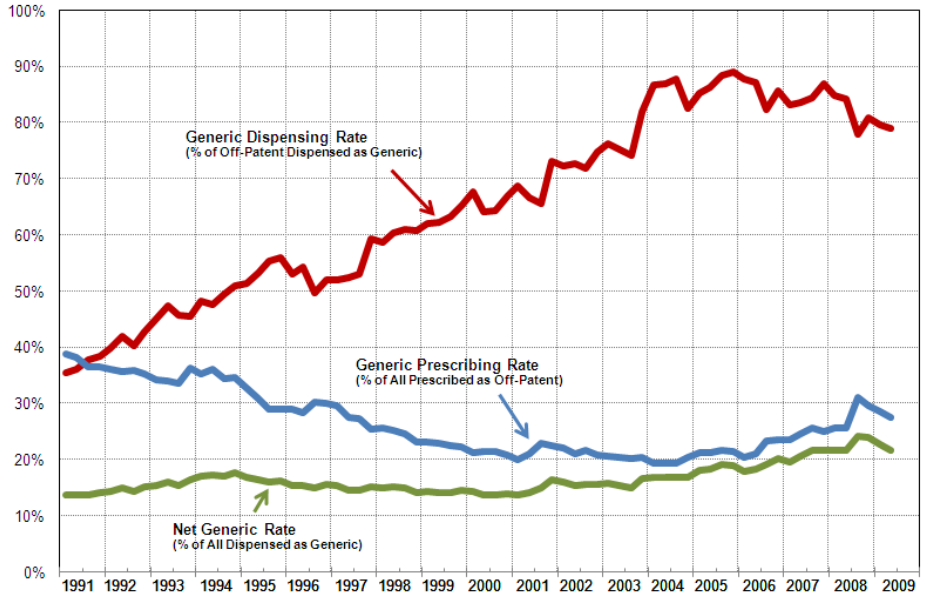
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
New Jersey Medicaid: 1991 to 2009



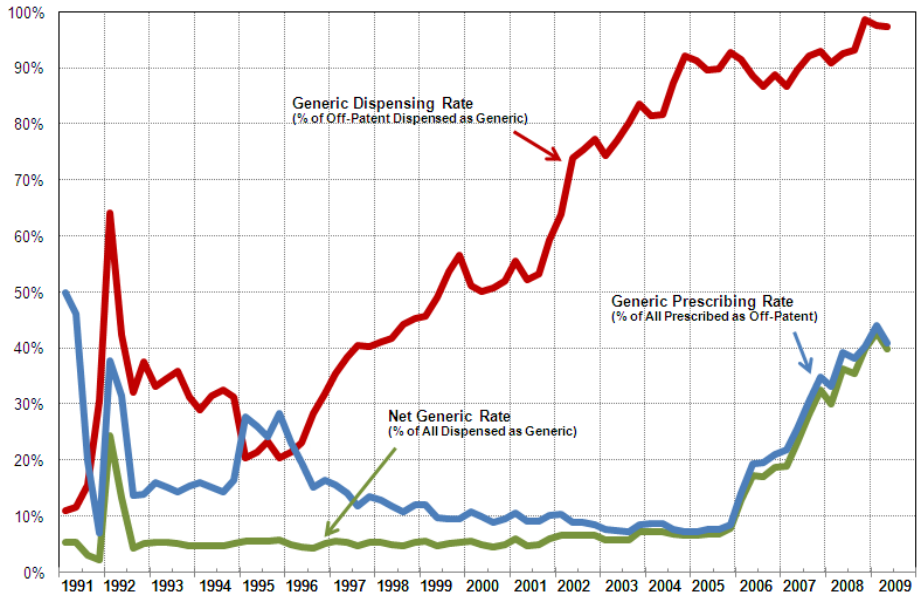
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
New Jersey Medicaid: 1991 to 2009



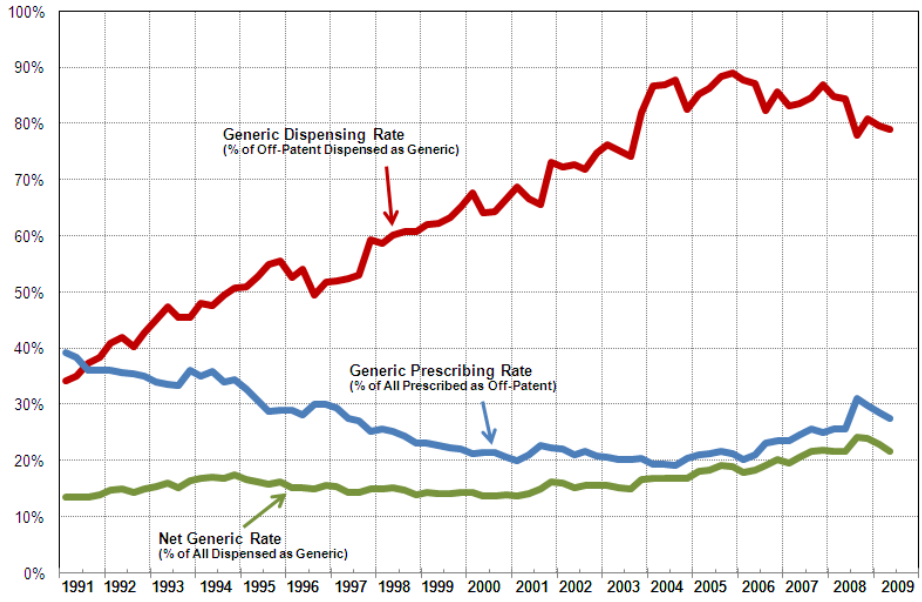
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
New Jersey Medicaid: 1991 to 2009



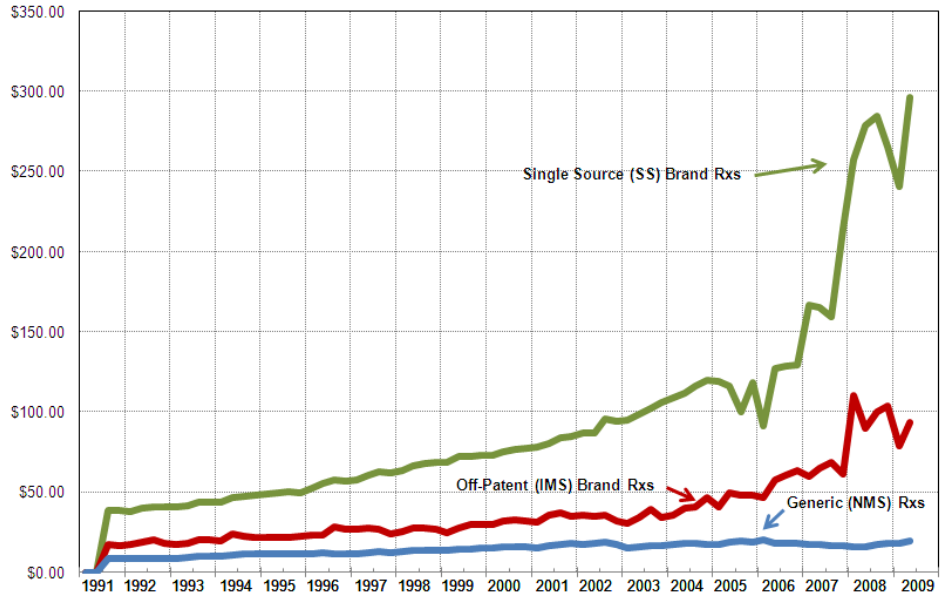
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
New Jersey Medicaid: 1991 to 2009



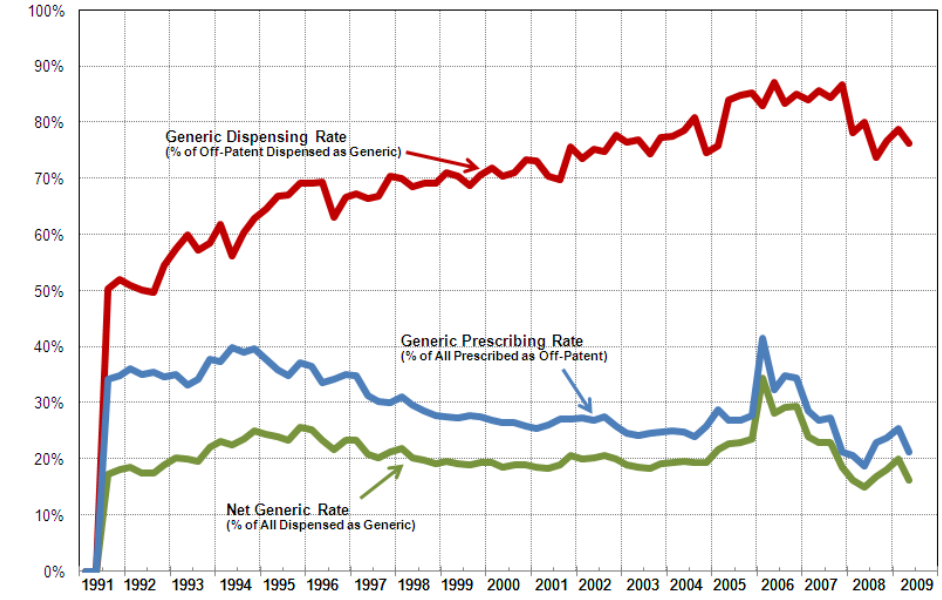
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
New Mexico Medicaid: 1991 to 2009



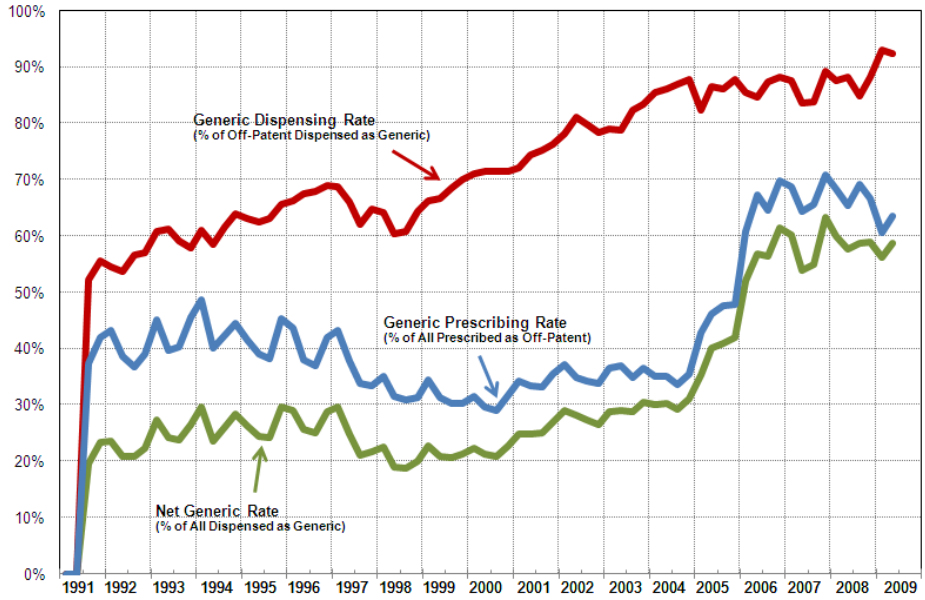
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
New Mexico Medicaid: 1991 to 2009



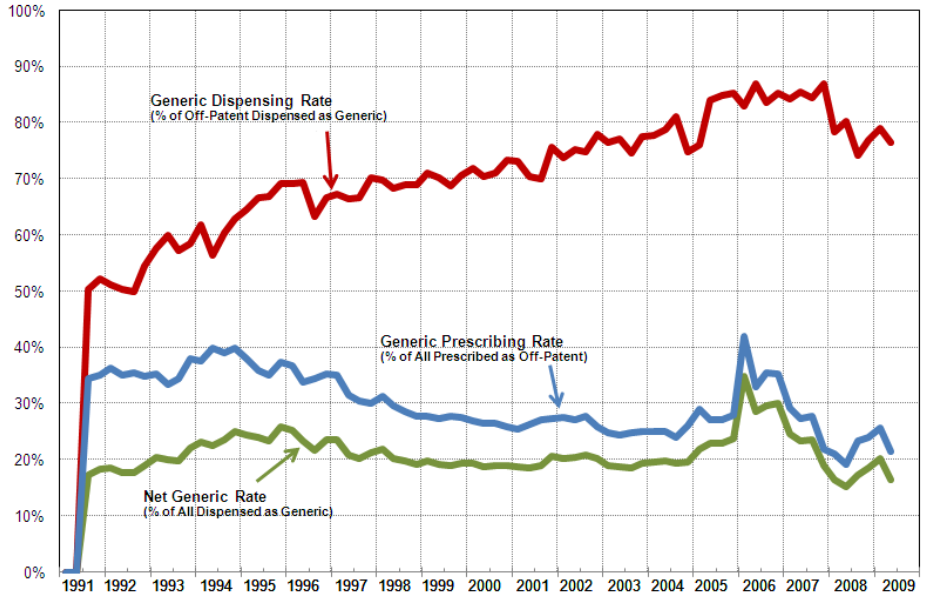
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
New Mexico Medicaid: 1991 to 2009



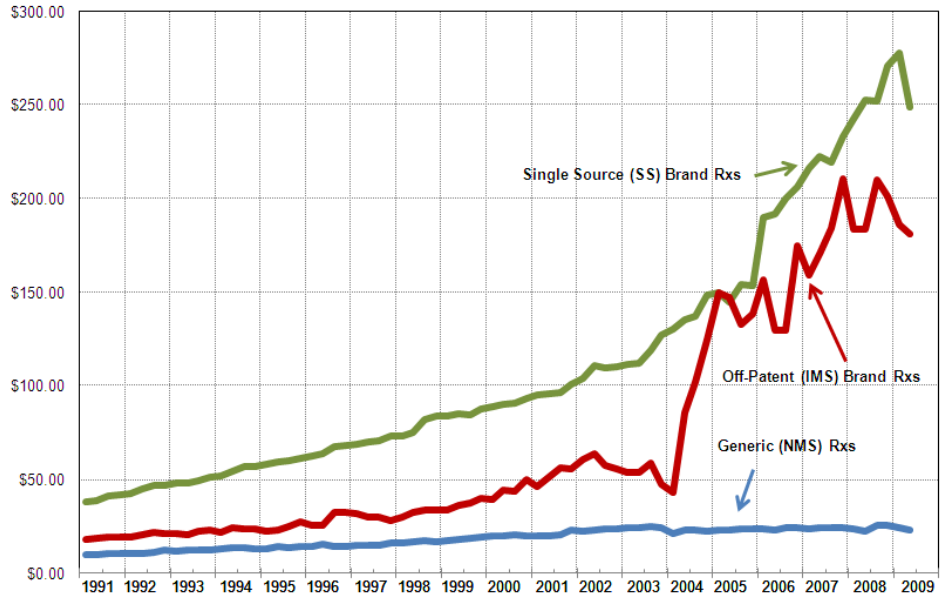
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
New Mexico Medicaid: 1991 to 2009



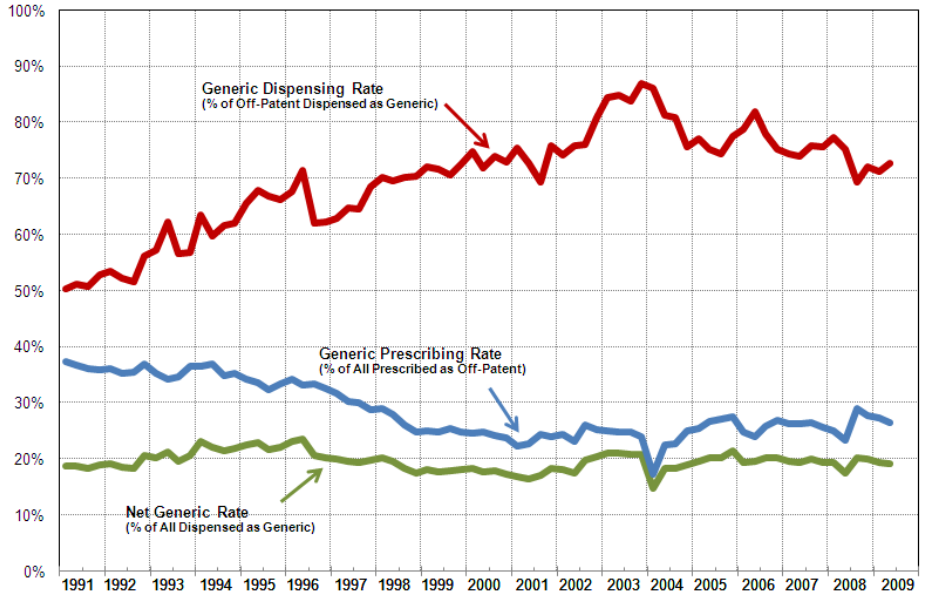
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Nevada Medicaid: 1991 to 2009



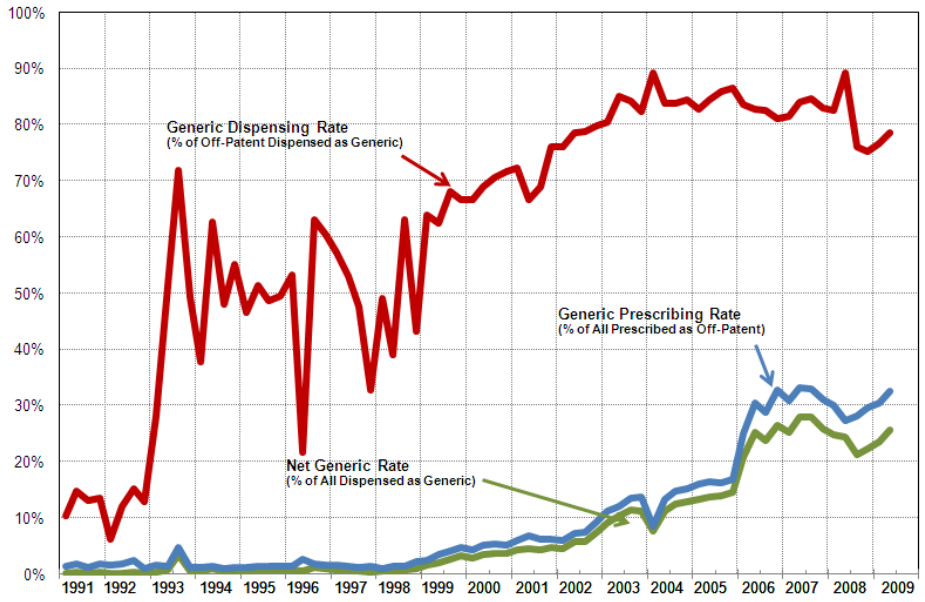
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Nevada Medicaid: 1991 to 2009



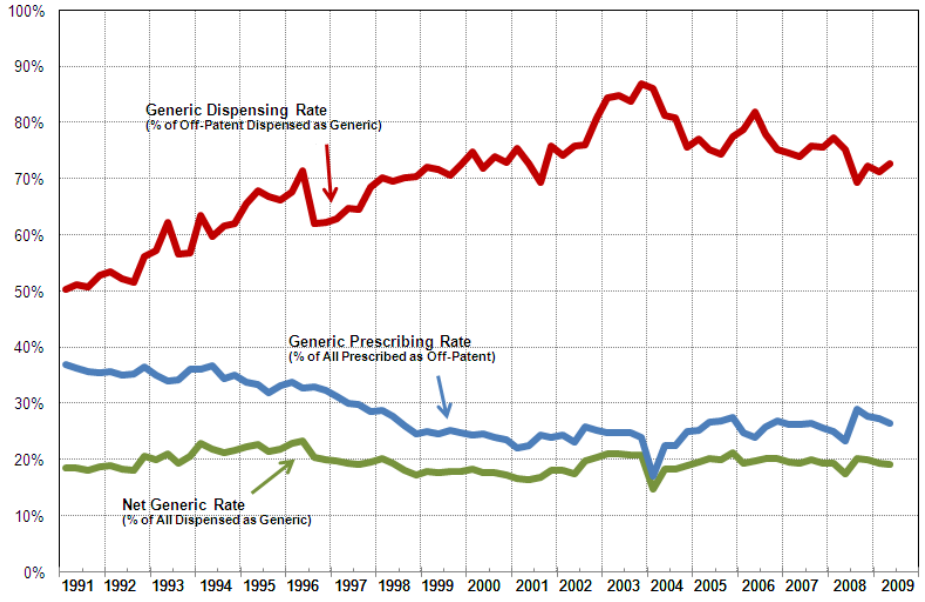
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Nevada Medicaid: 1991 to 2009



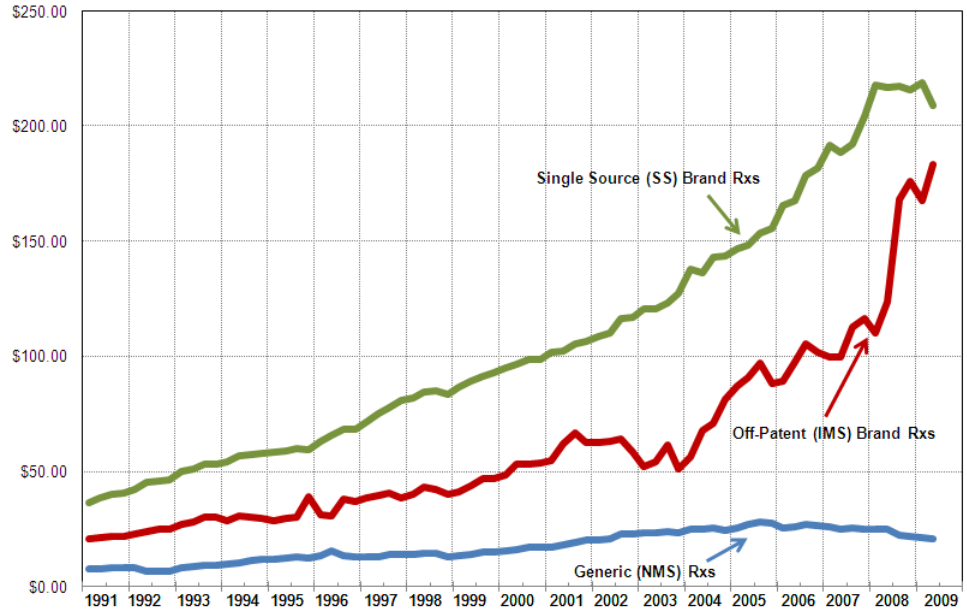
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Nevada Medicaid: 1991 to 2009



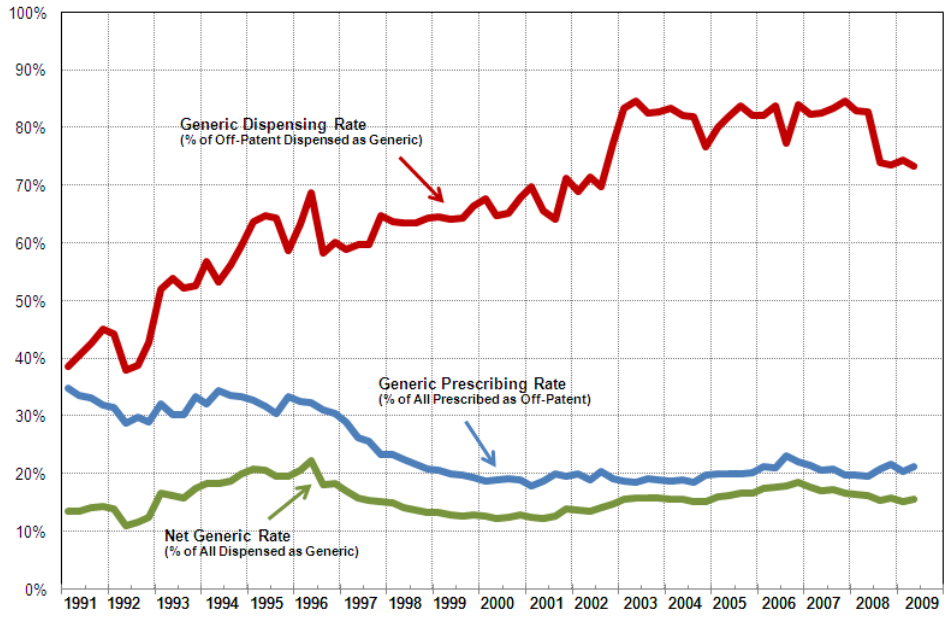
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
New York Medicaid: 1991 to 2009



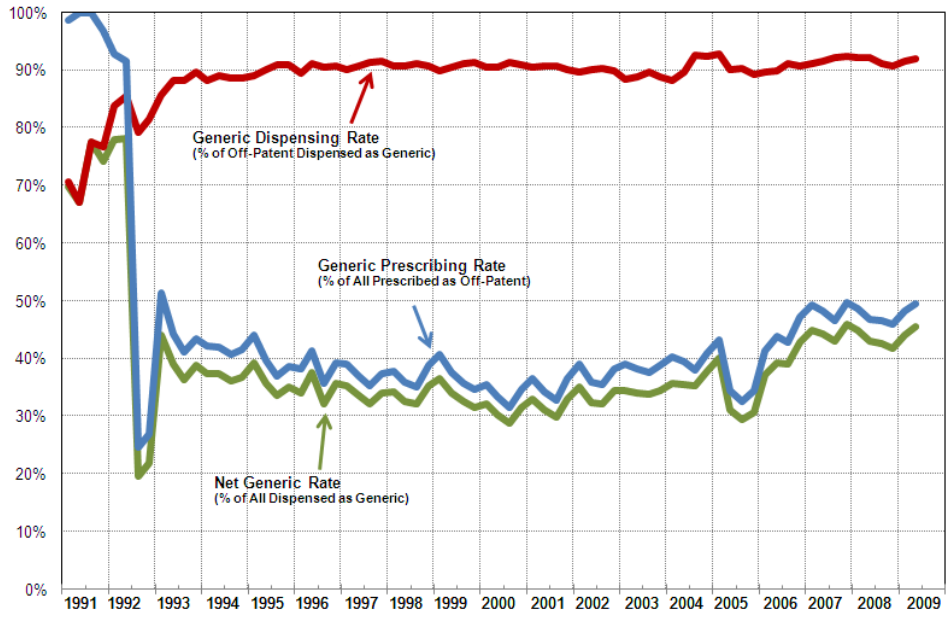
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
New York Medicaid: 1991 to 2009



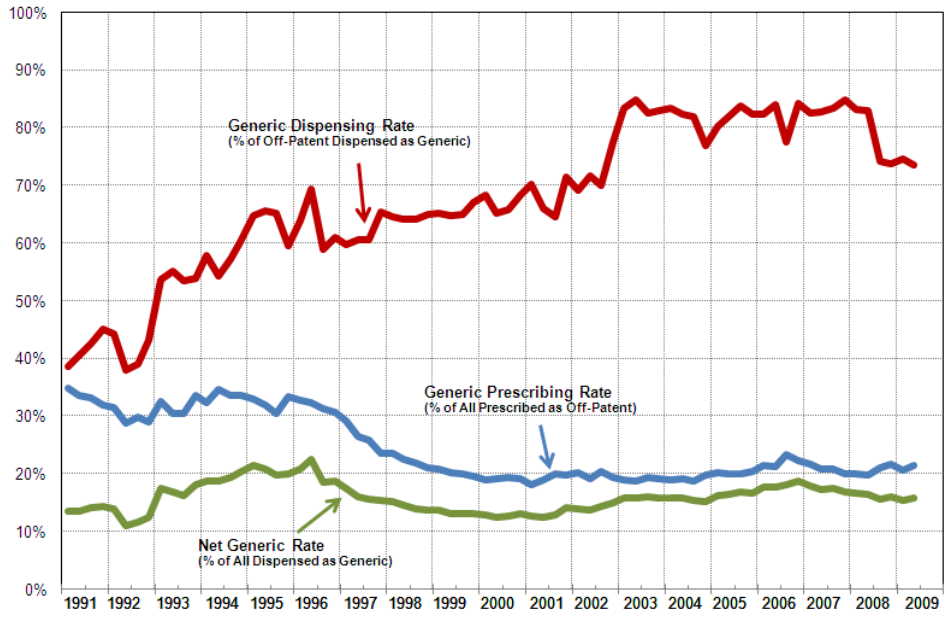
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
New York Medicaid: 1991 to 2009



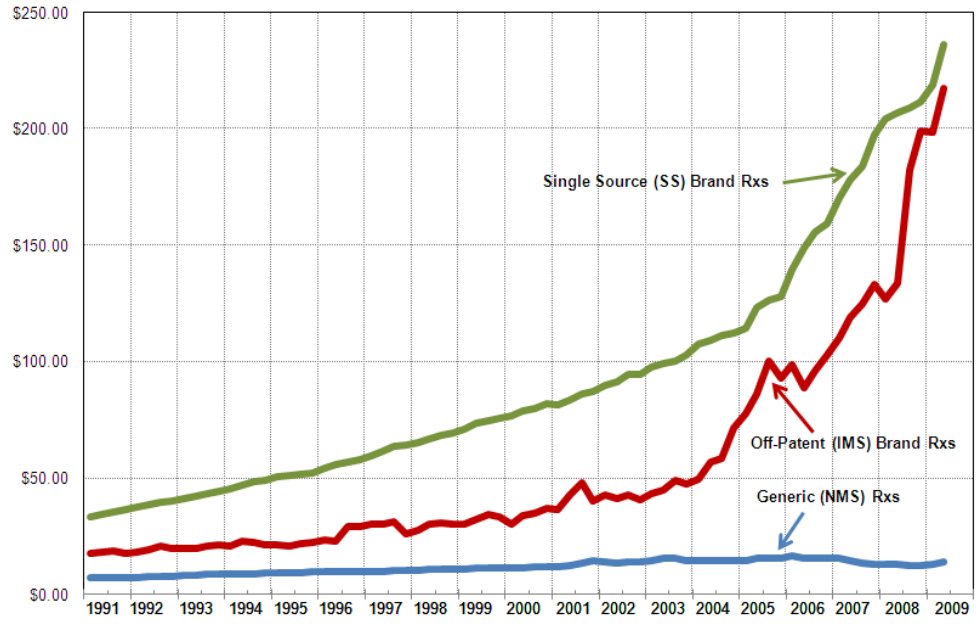
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
New York Medicaid: 1991 to 2009



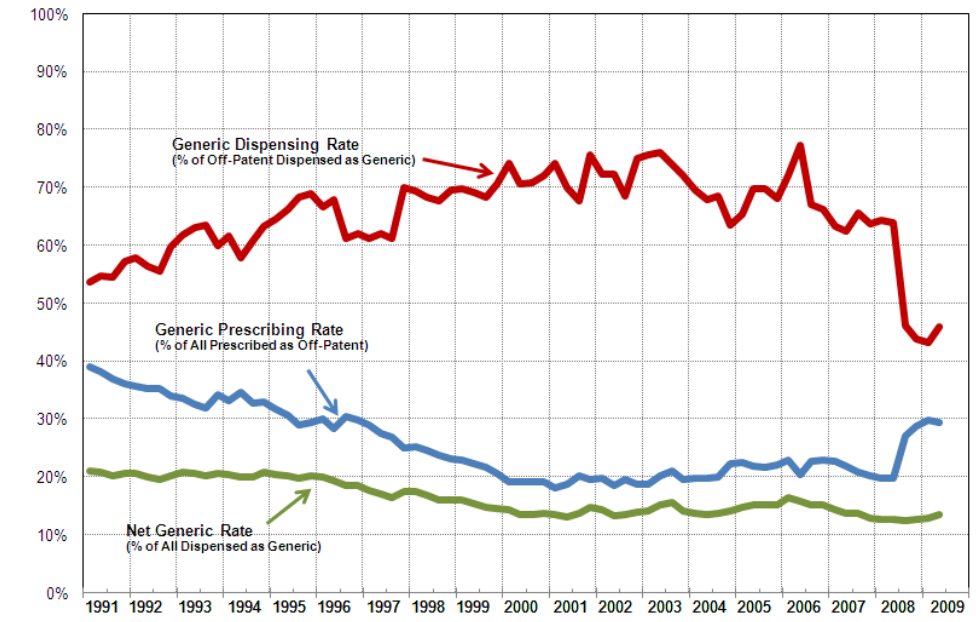
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Ohio Medicaid: 1991 to 2009



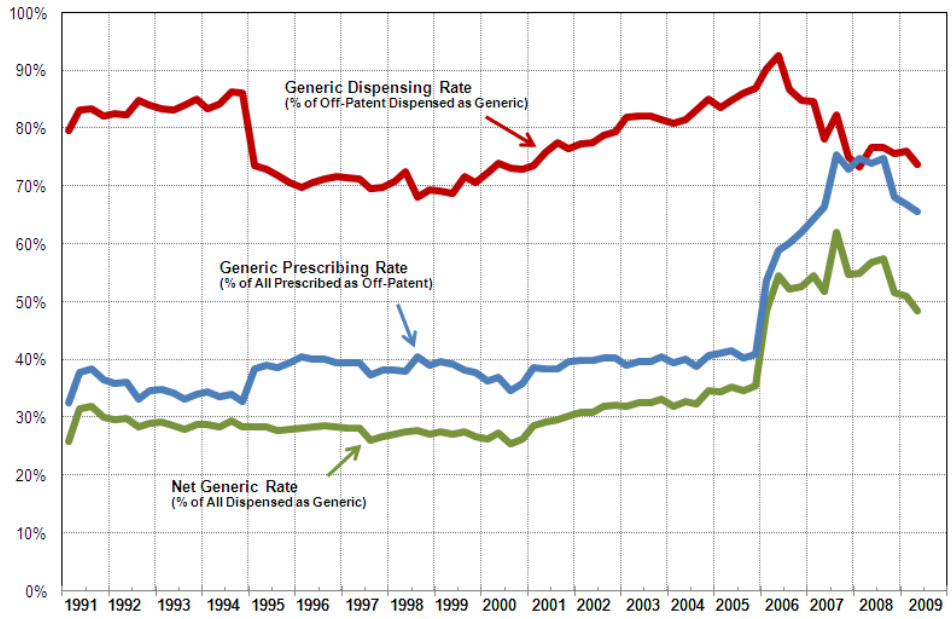
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Ohio Medicaid: 1991 to 2009



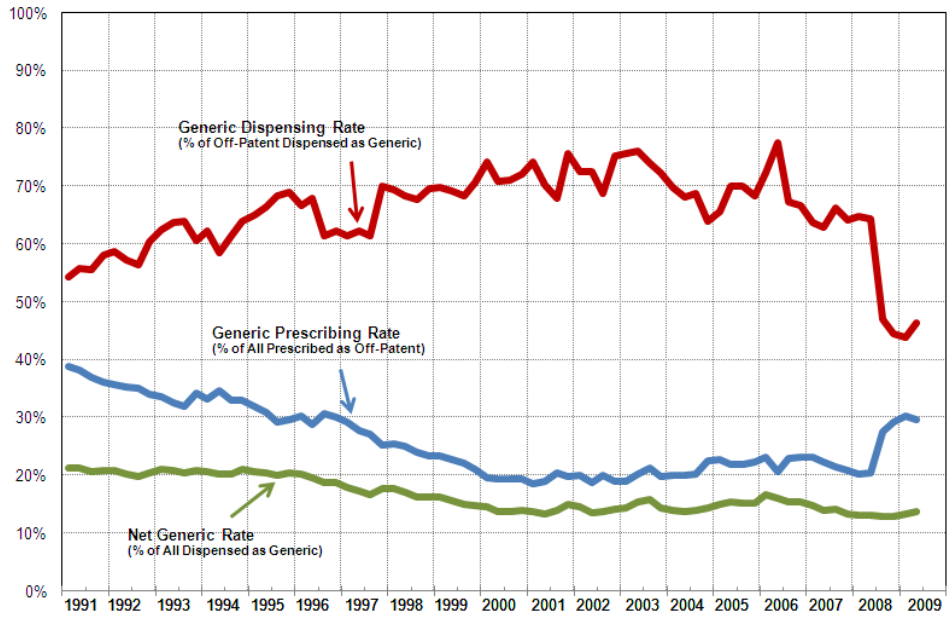
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Ohio Medicaid: 1991 to 2009



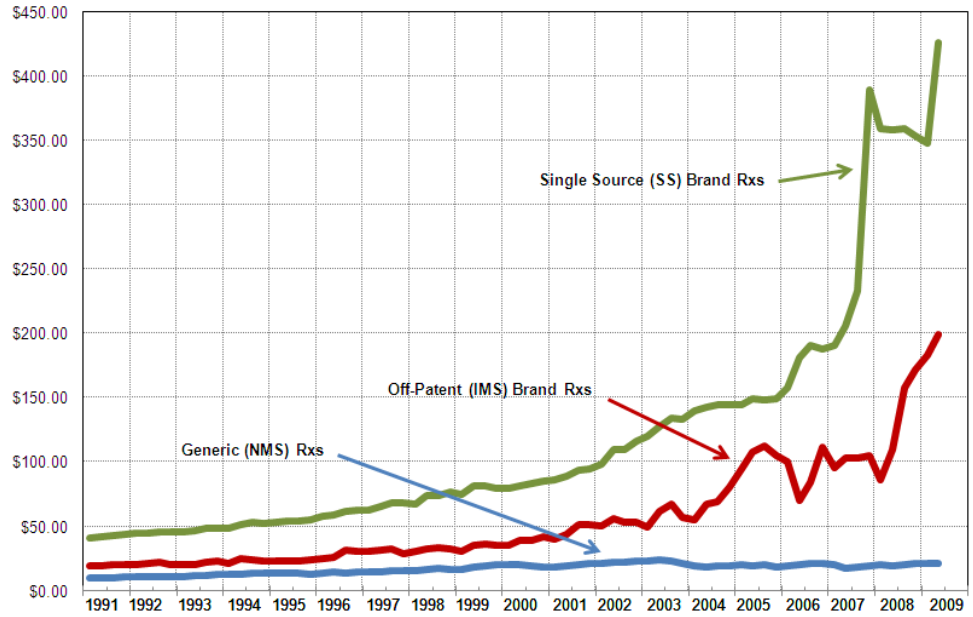
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Ohio Medicaid: 1991 to 2009



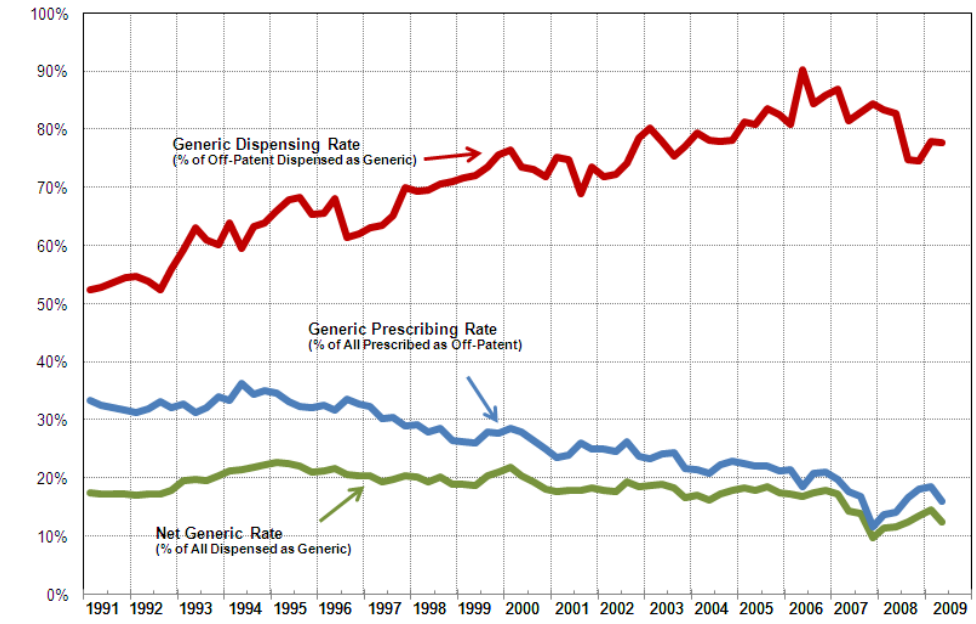
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Oklahoma Medicaid: 1991 to 2009



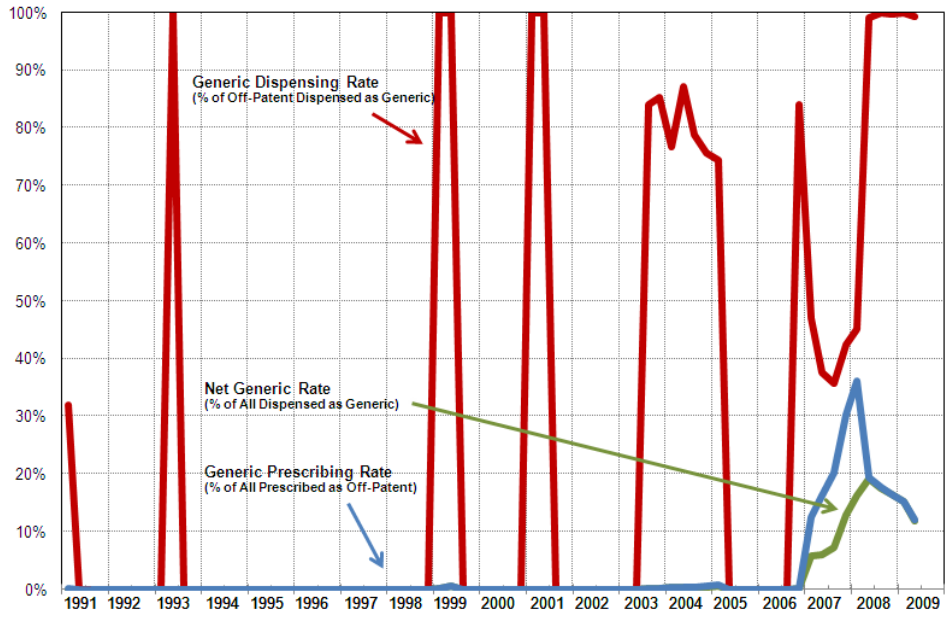
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Oklahoma Medicaid: 1991 to 2009



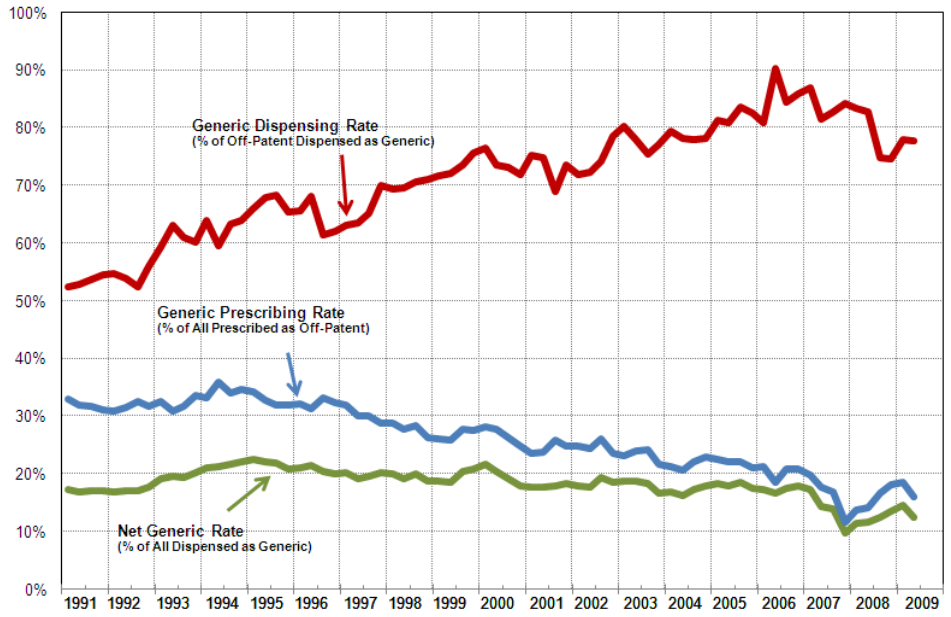
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Oklahoma Medicaid: 1991 to 2009



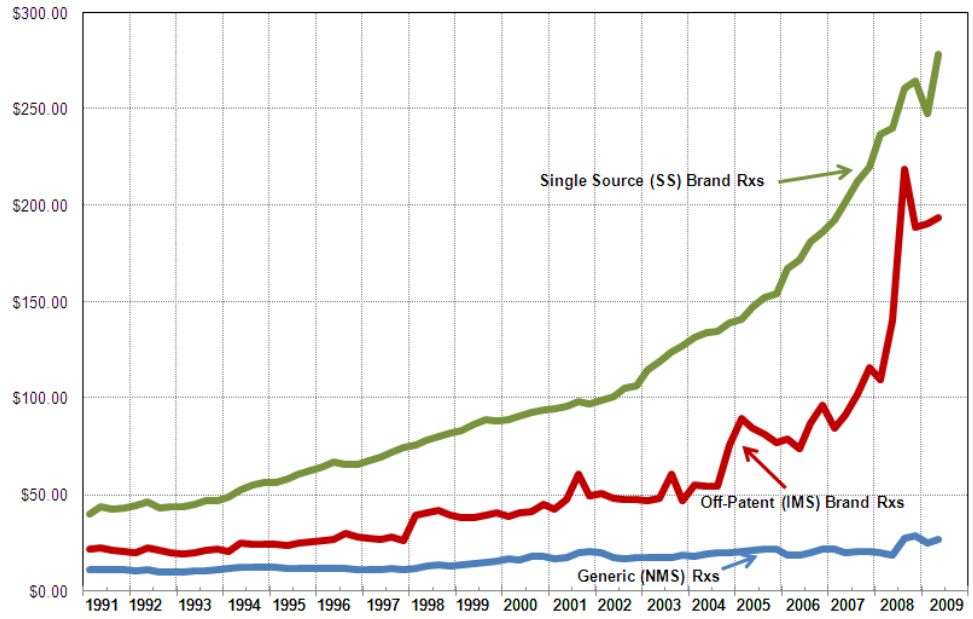
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Oklahoma Medicaid: 1991 to 2009



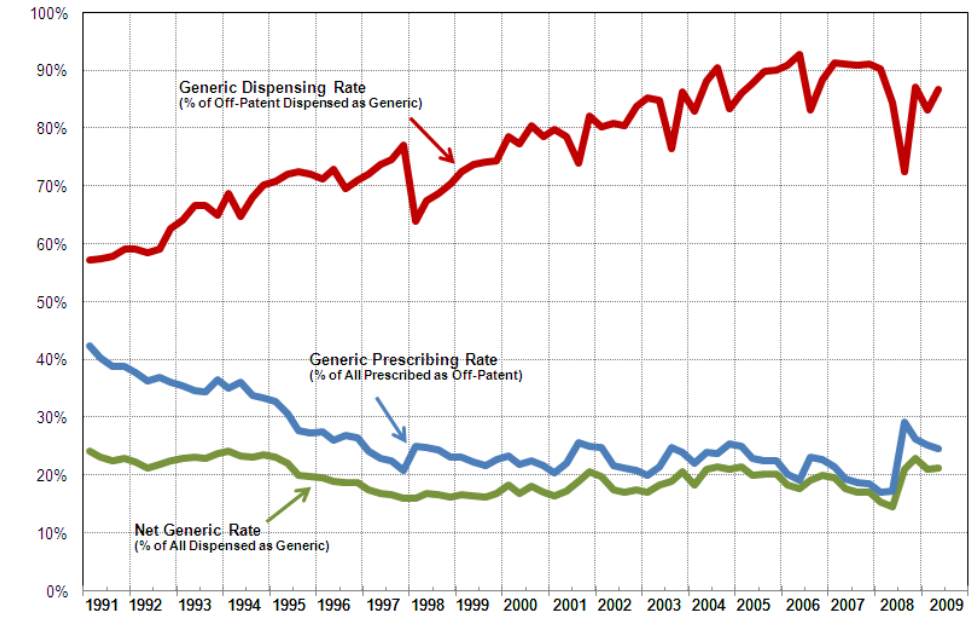
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Oregon Medicaid: 1991 to 2009



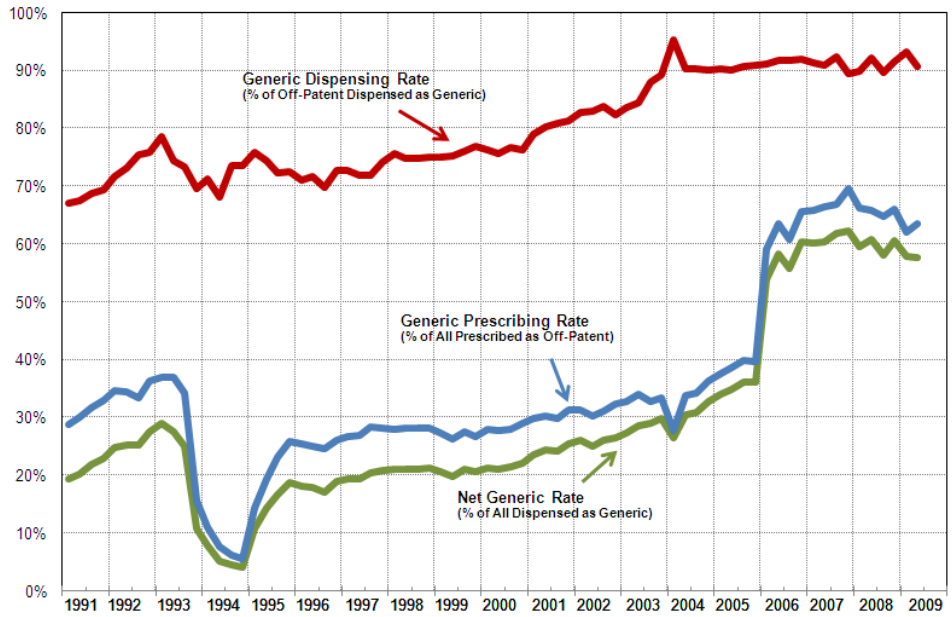
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Oregon Medicaid: 1991 to 2009



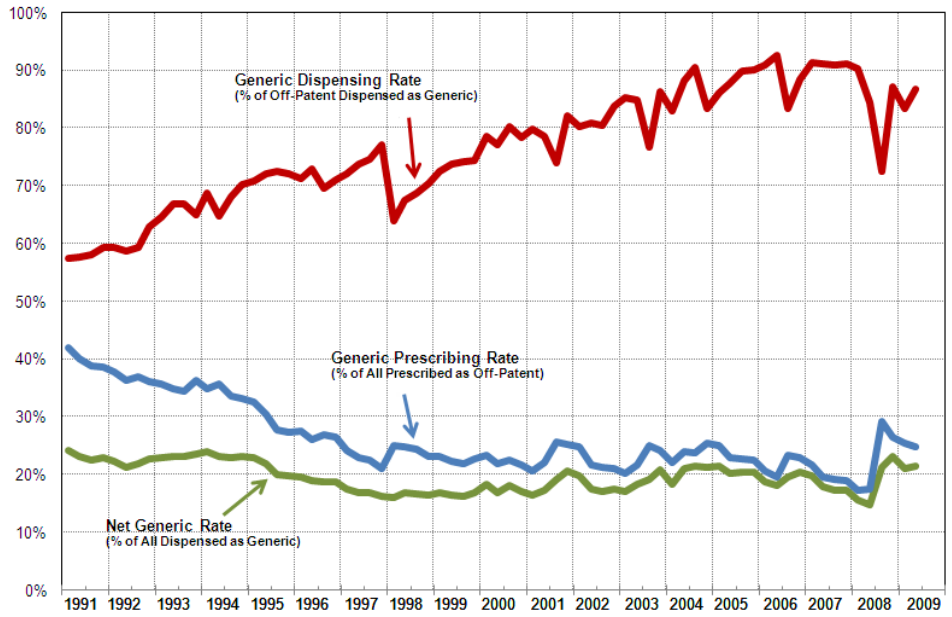
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Oregon Medicaid: 1991 to 2009



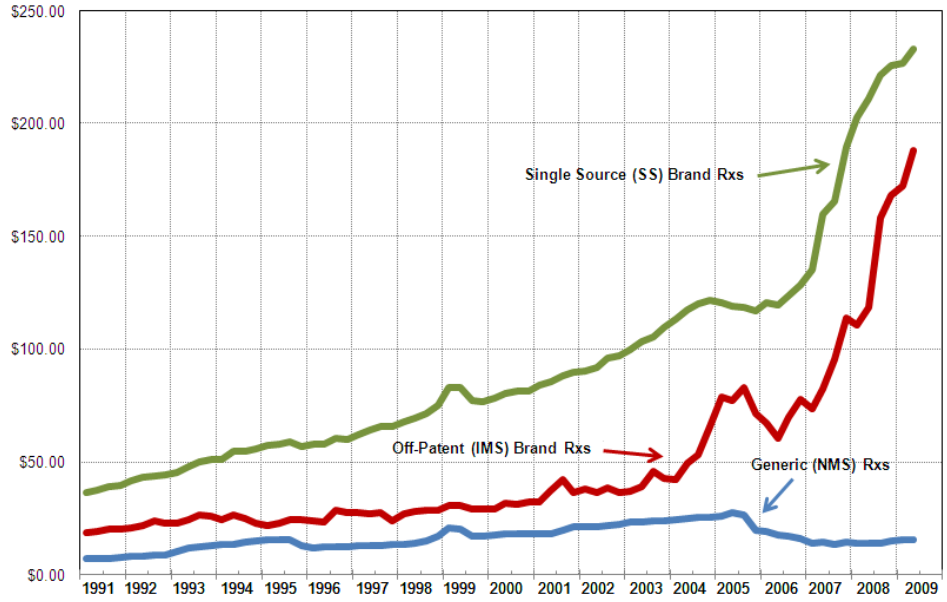
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Oregon Medicaid: 1991 to 2009



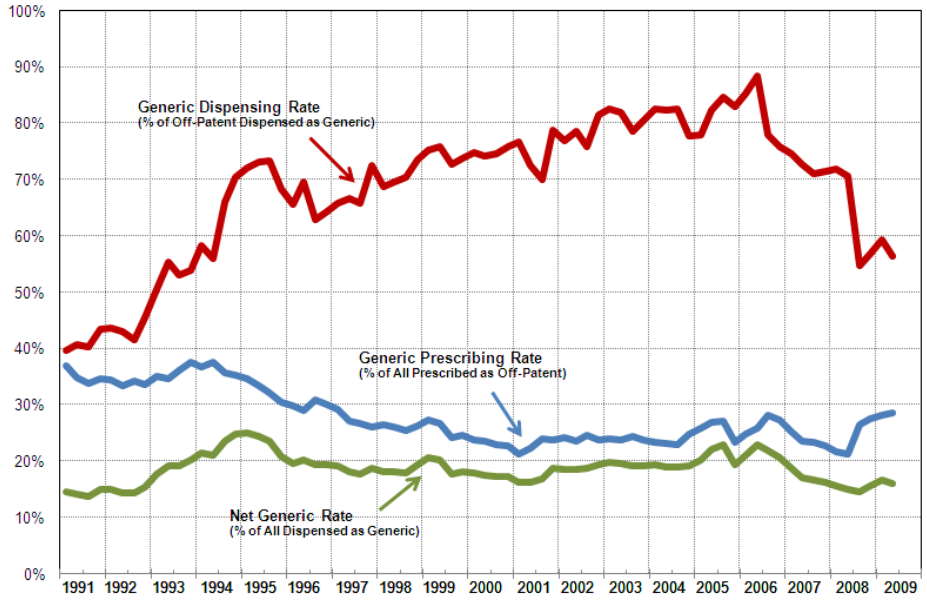
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Pennsylvania Medicaid: 1991 to 2009



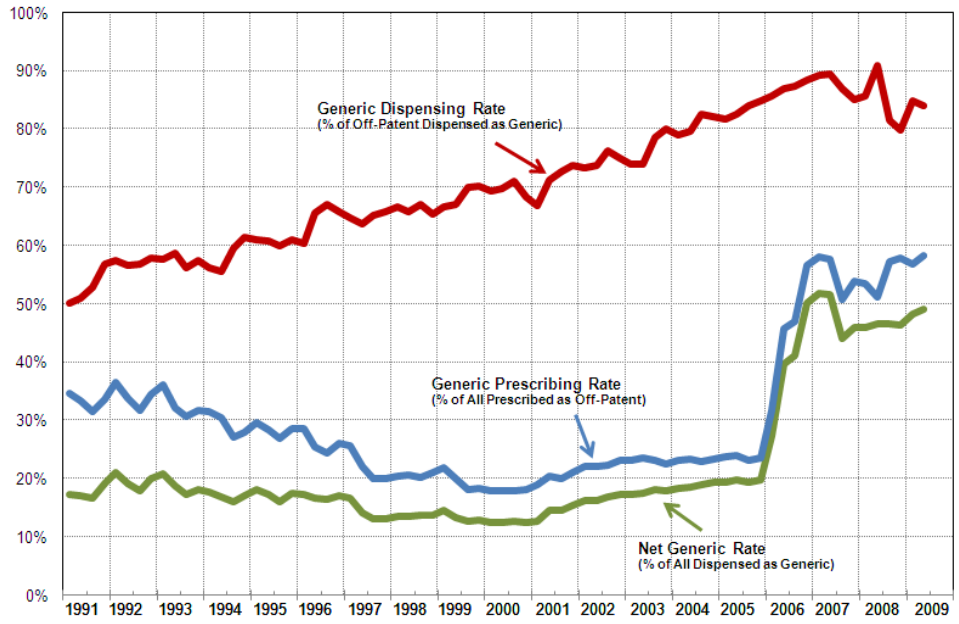
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Pennsylvania Medicaid: 1991 to 2009



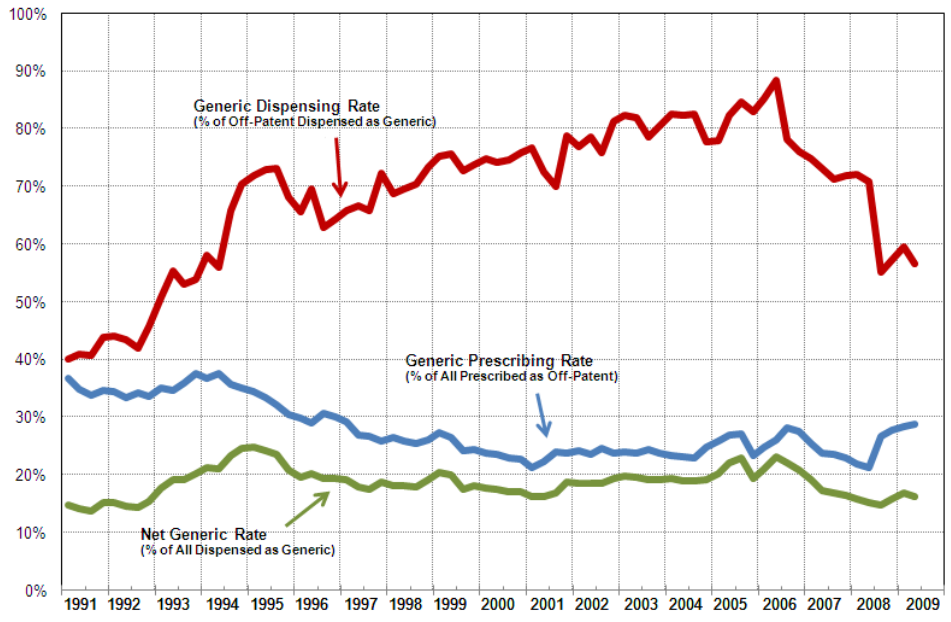
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Pennsylvania Medicaid: 1991 to 2009



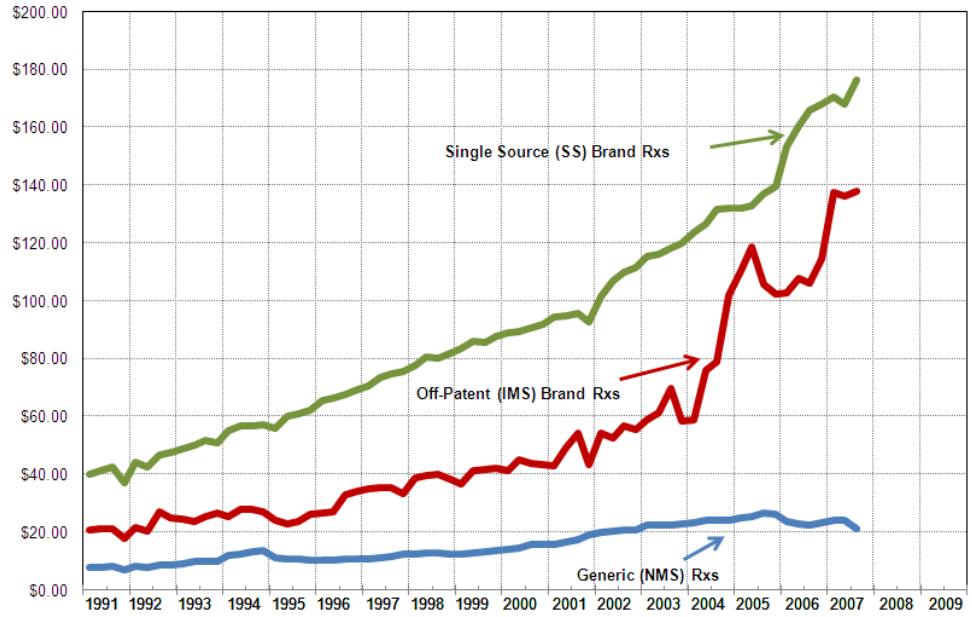
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Pennsylvania Medicaid: 1991 to 2009



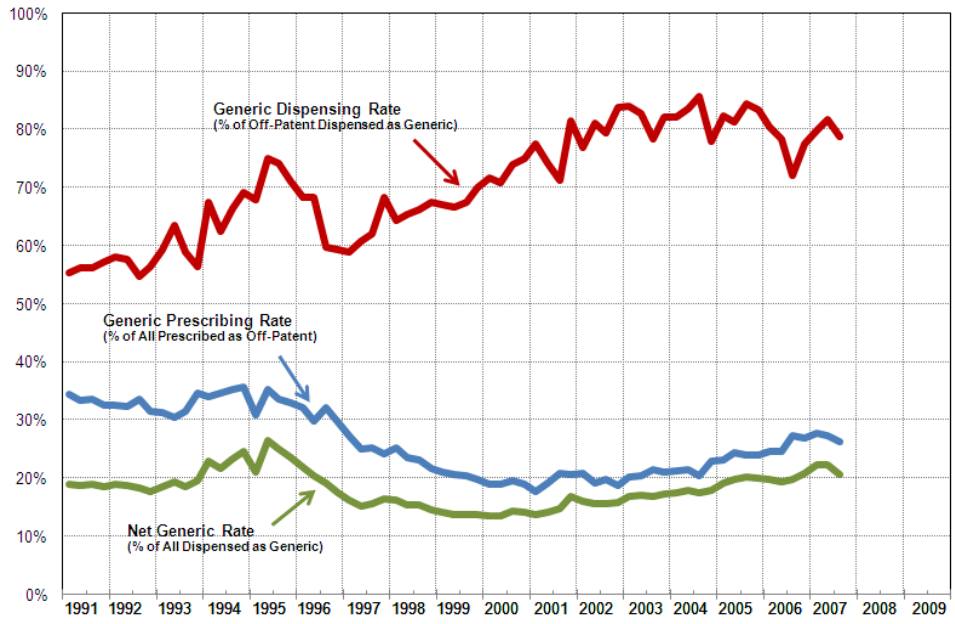
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Rhode Island Medicaid: 1991 to 2009



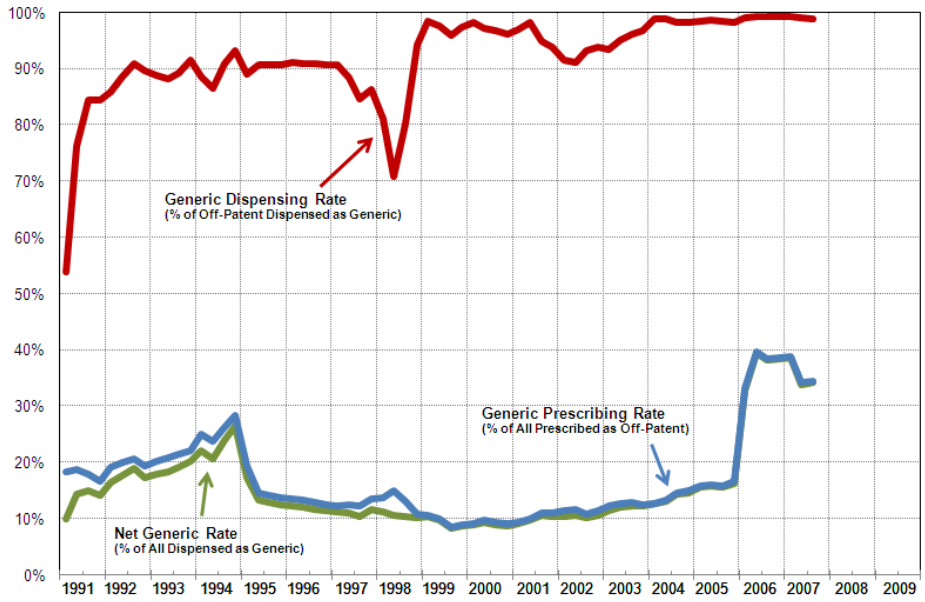
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Rhode Island Medicaid: 1991 to 2009



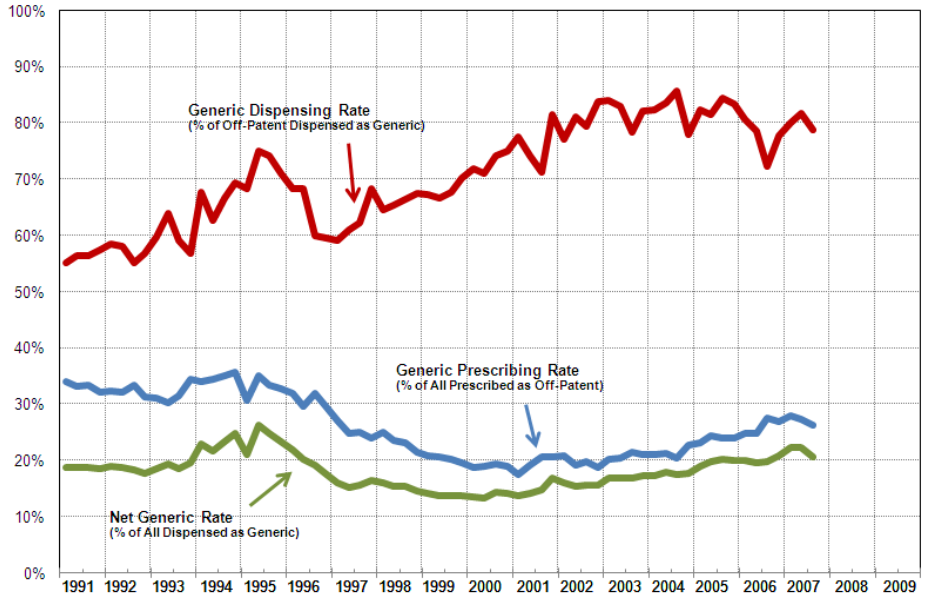
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Rhode Island Medicaid: 1991 to 2009



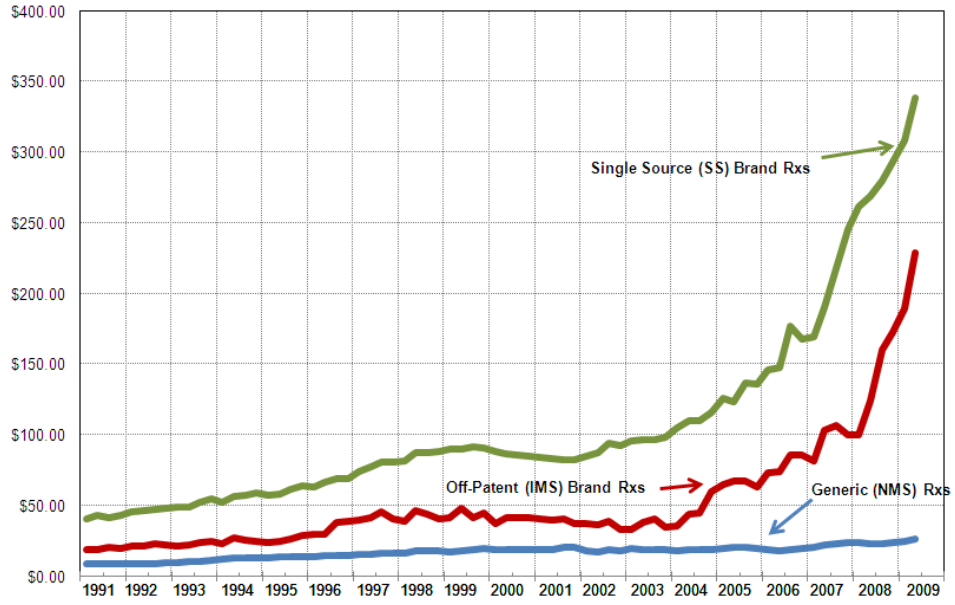
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Rhode Island Medicaid: 1991 to 2009



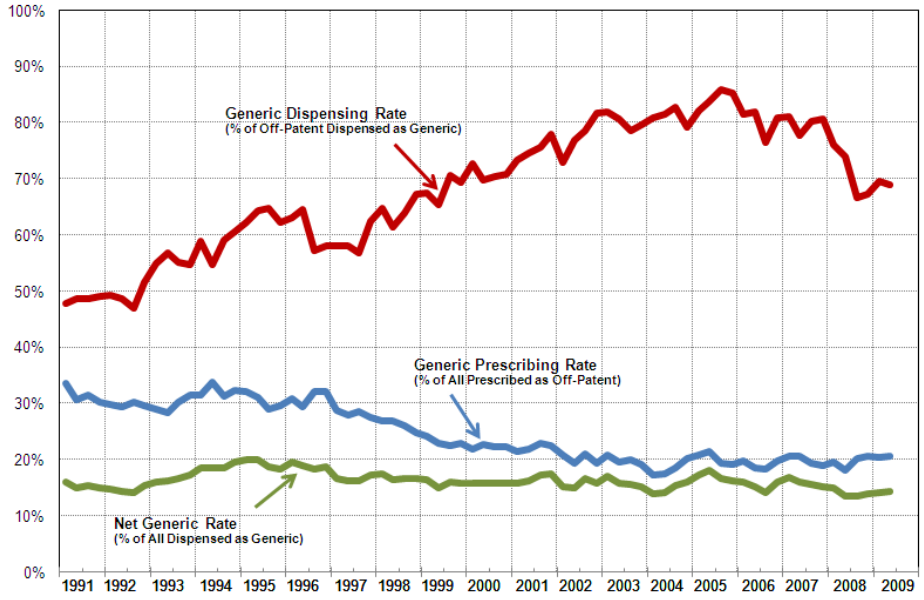
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
South Carolina Medicaid: 1991 to 2009



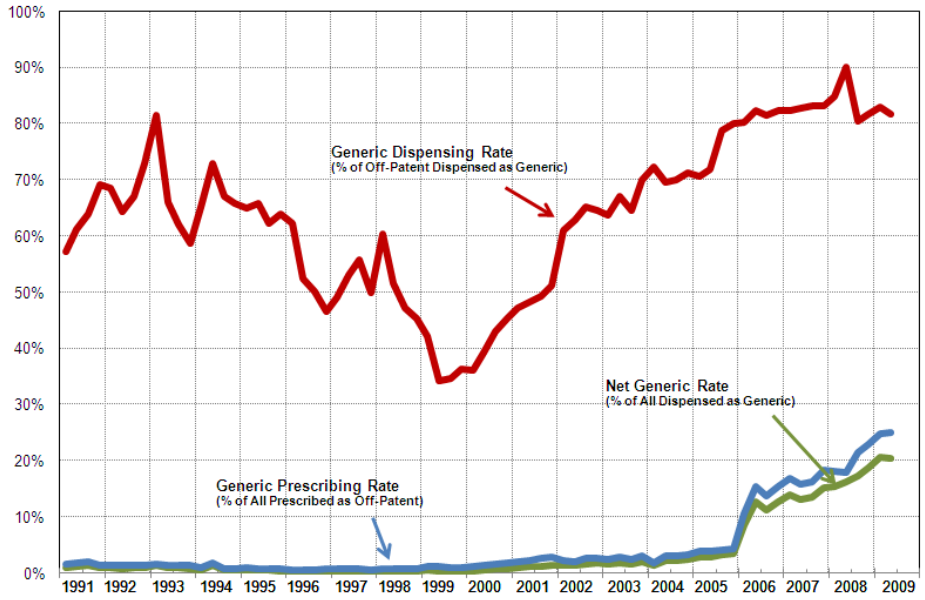
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
South Carolina Medicaid: 1991 to 2009



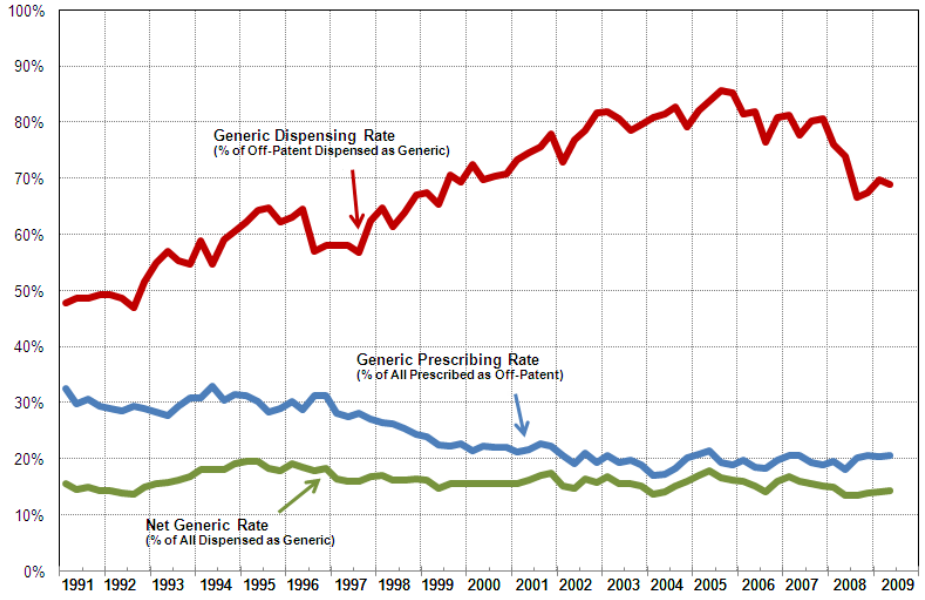
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
South Carolina Medicaid: 1991 to 2009



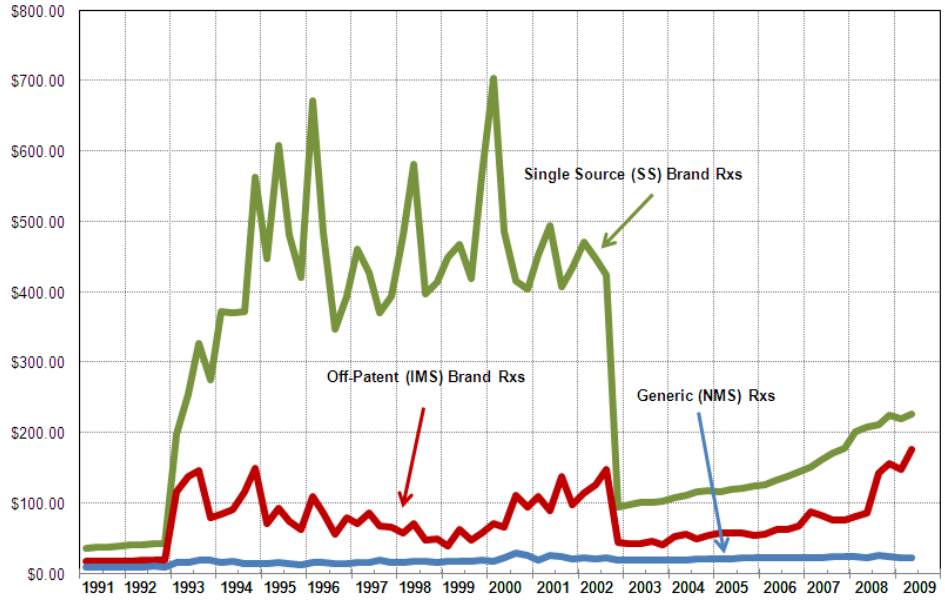
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
South Carolina Medicaid: 1991 to 2009



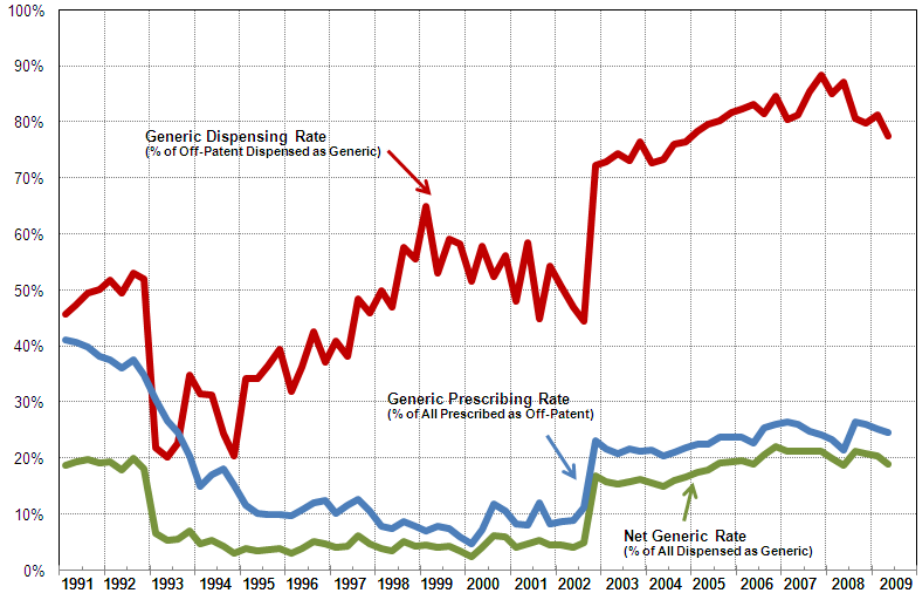
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
South Dakota Medicaid: 1991 to 2009



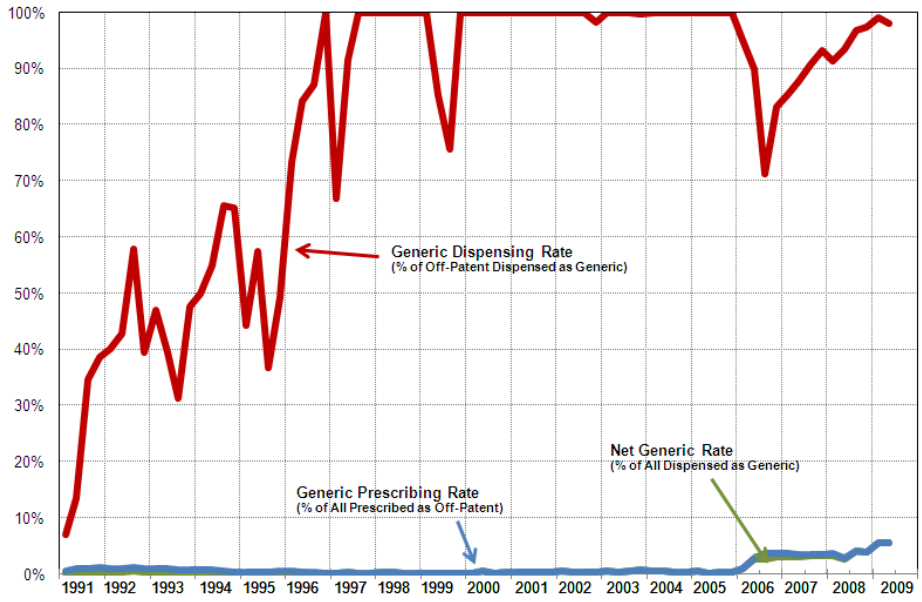
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
South Dakota Medicaid: 1991 to 2009



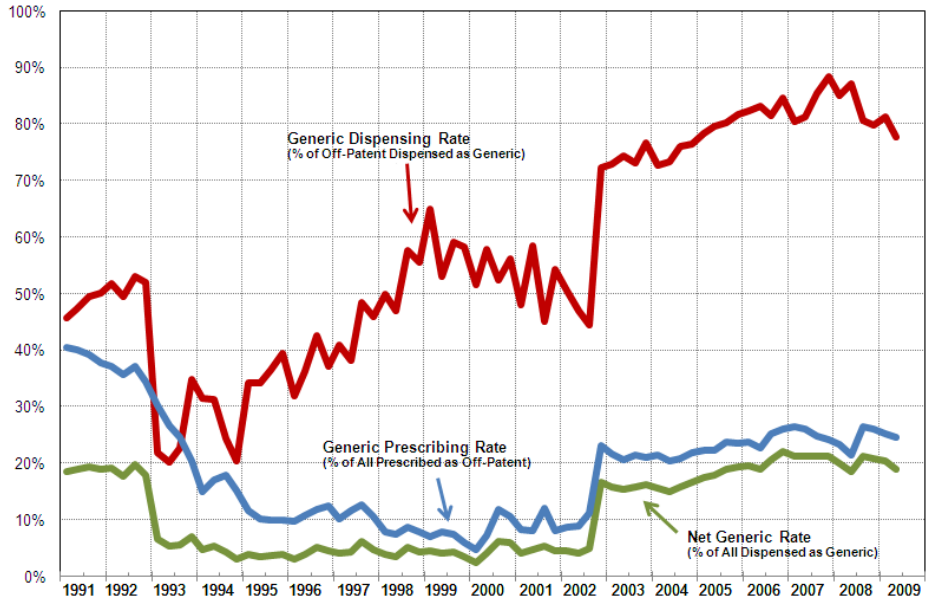
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
South Dakota Medicaid: 1991 to 2009



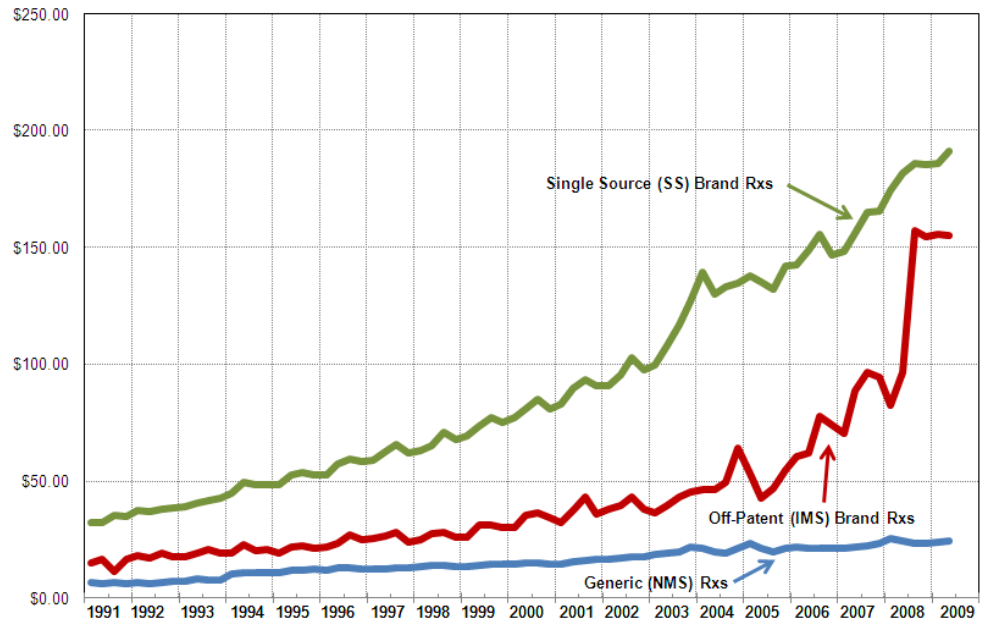
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
South Dakota Medicaid: 1991 to 2009



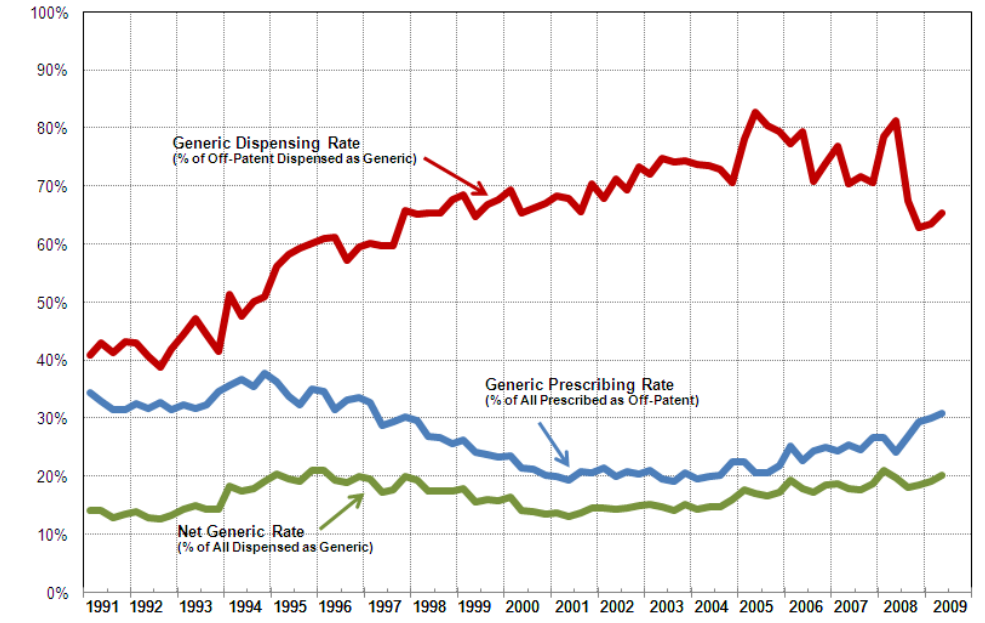
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Texas Medicaid: 1991 to 2009



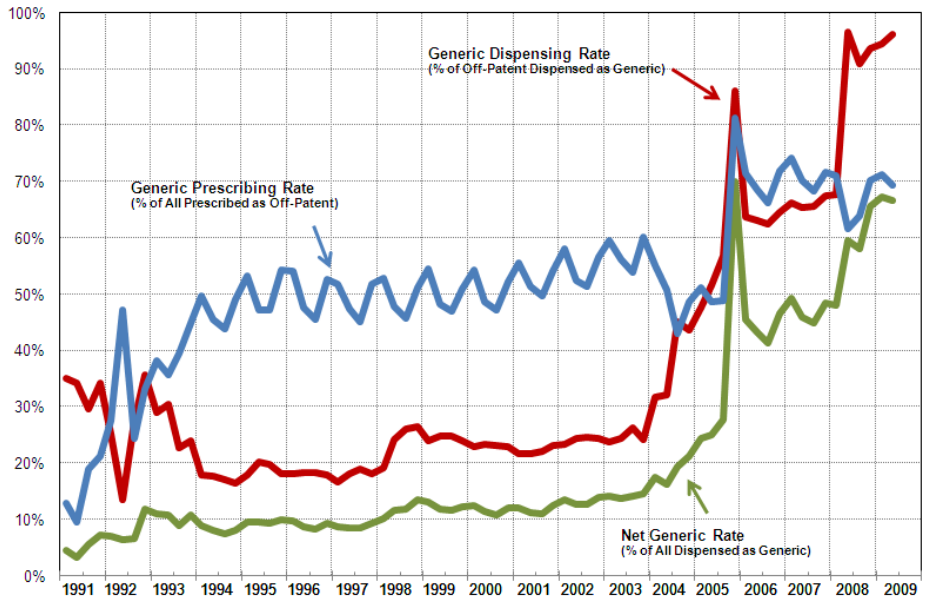
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Texas Medicaid: 1991 to 2009



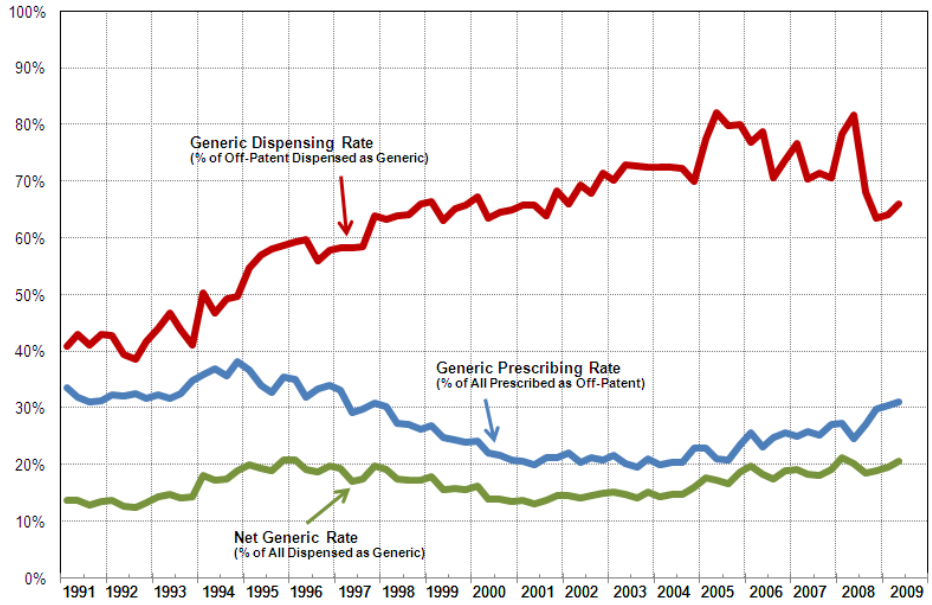
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Texas Medicaid: 1991 to 2009



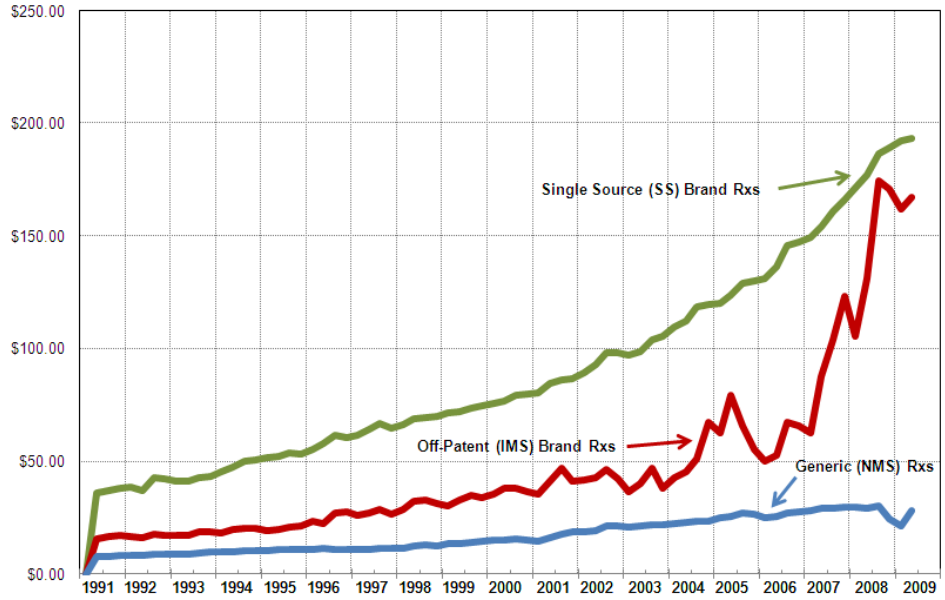
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Texas Medicaid: 1991 to 2009



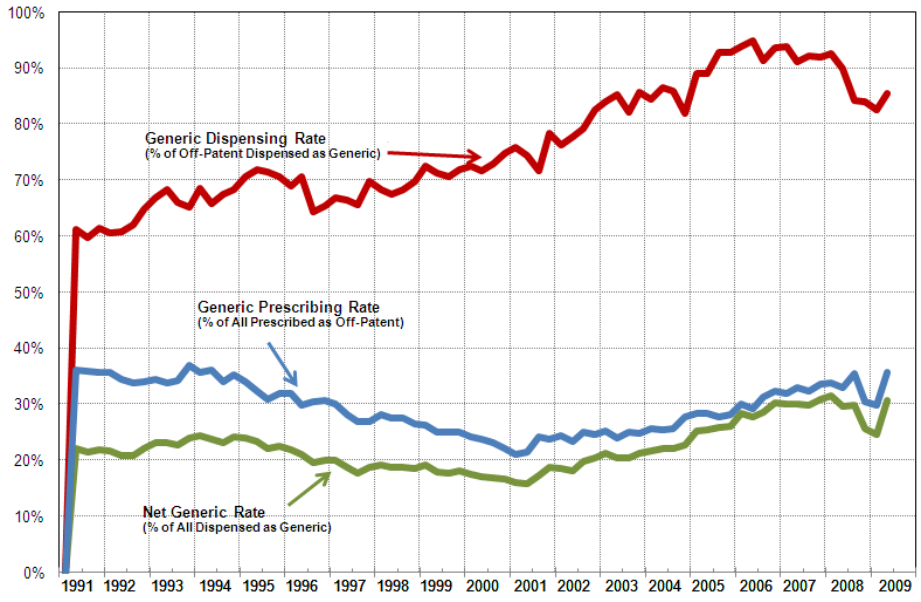
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Utah Medicaid: 1991 to 2009



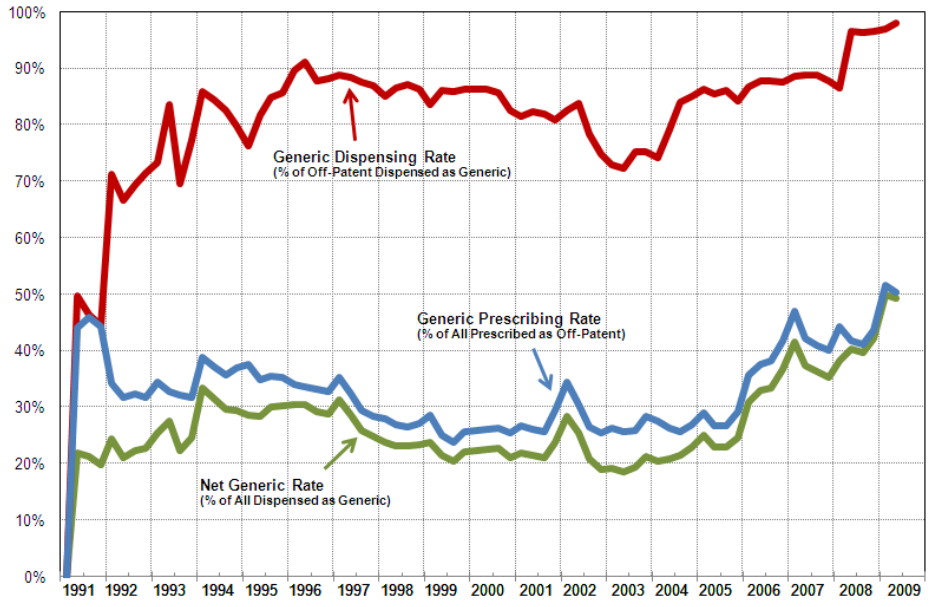
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Utah Medicaid: 1991 to 2009



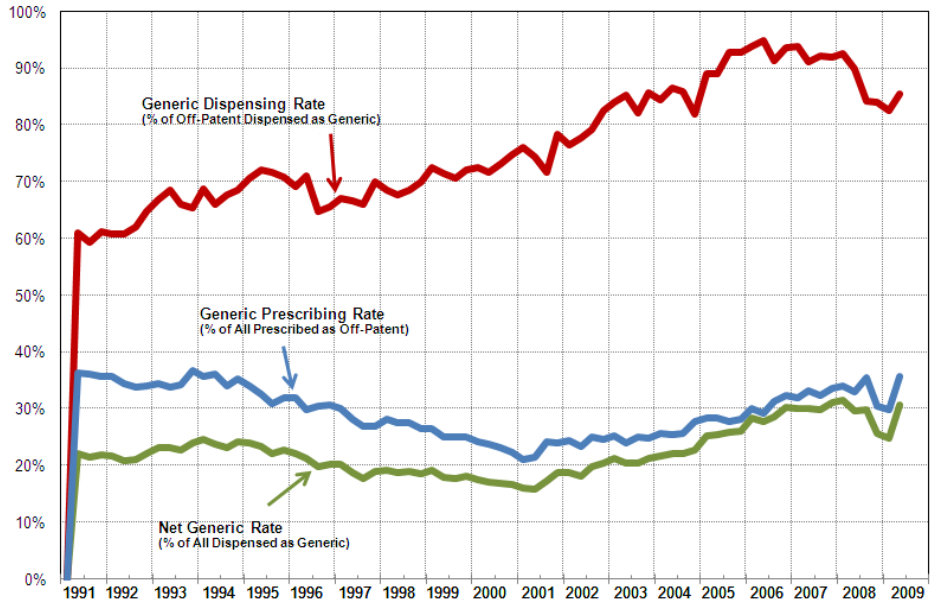
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Utah Medicaid: 1991 to 2009



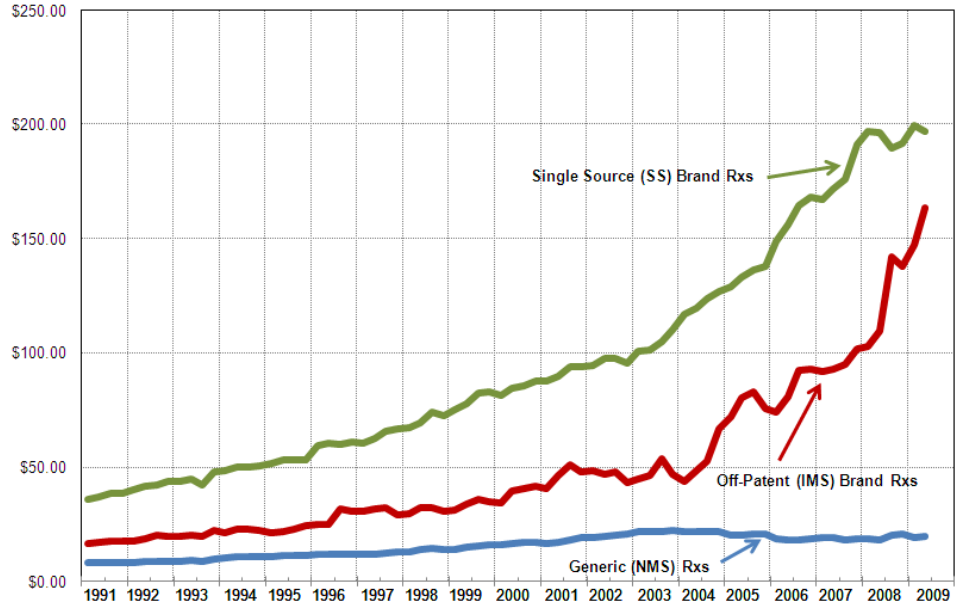
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Utah Medicaid: 1991 to 2009



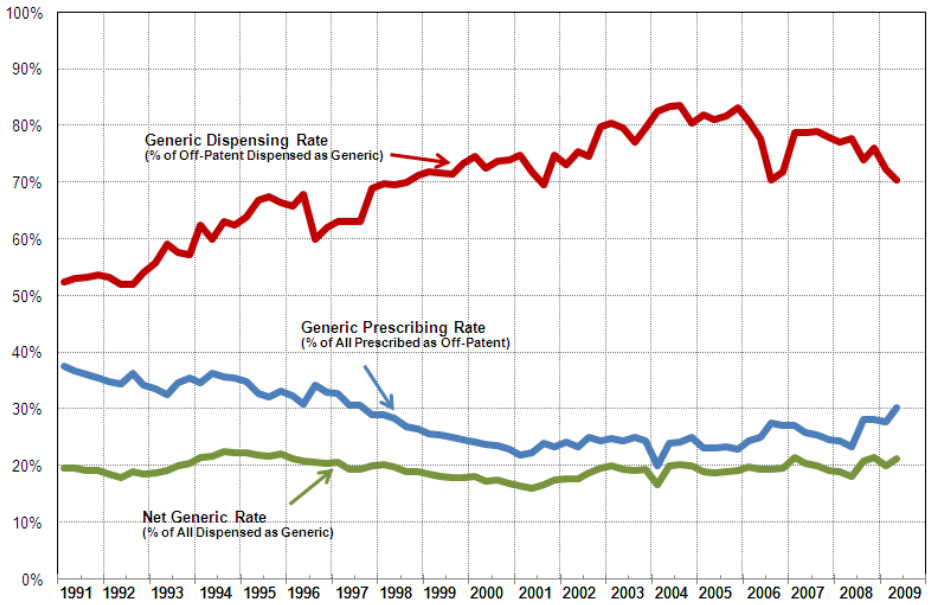
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Virginia Medicaid: 1991 to 2009



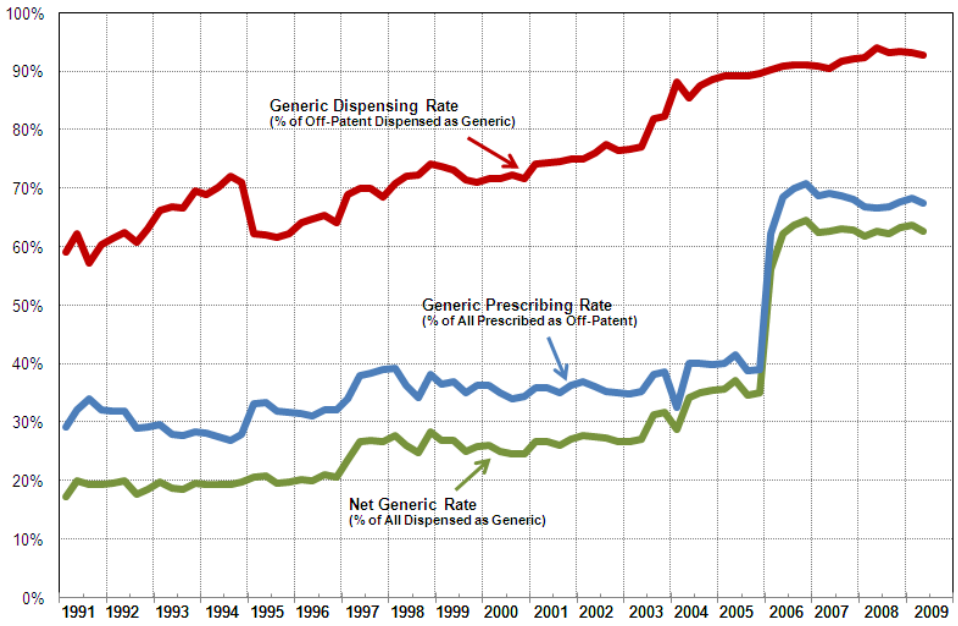
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Virginia Medicaid: 1991 to 2009



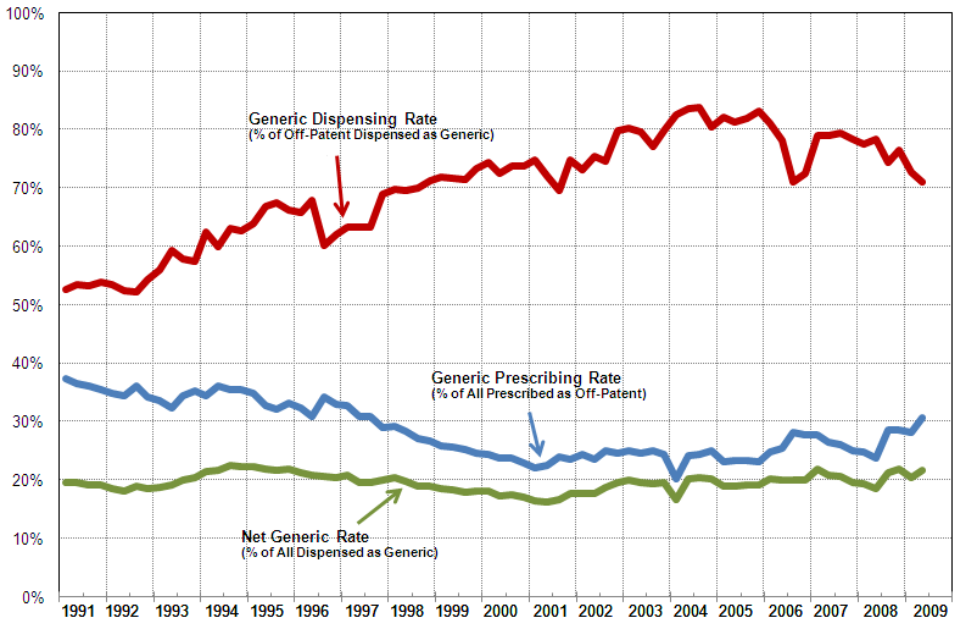
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Virginia Medicaid: 1991 to 2009



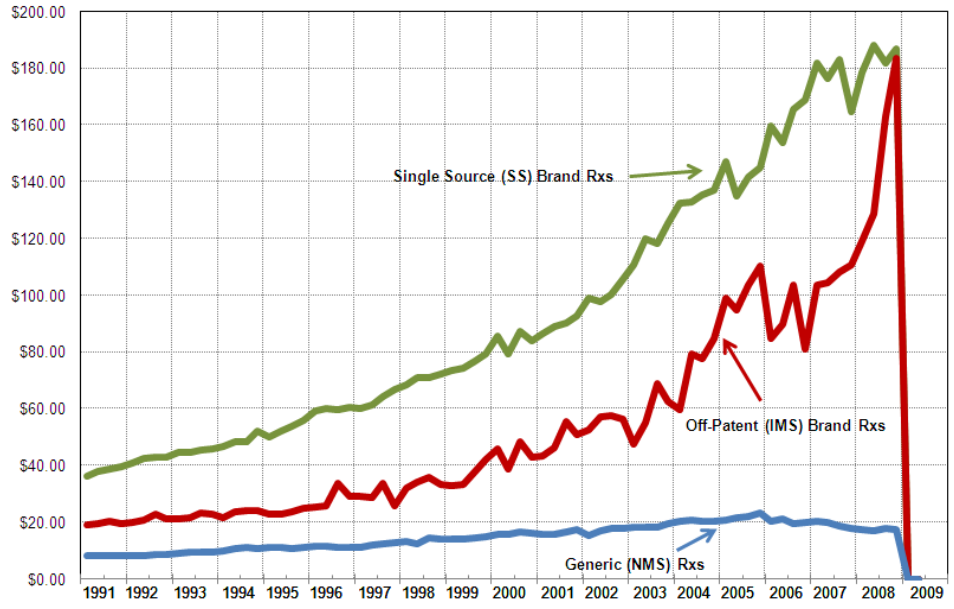
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Virginia Medicaid: 1991 to 2009



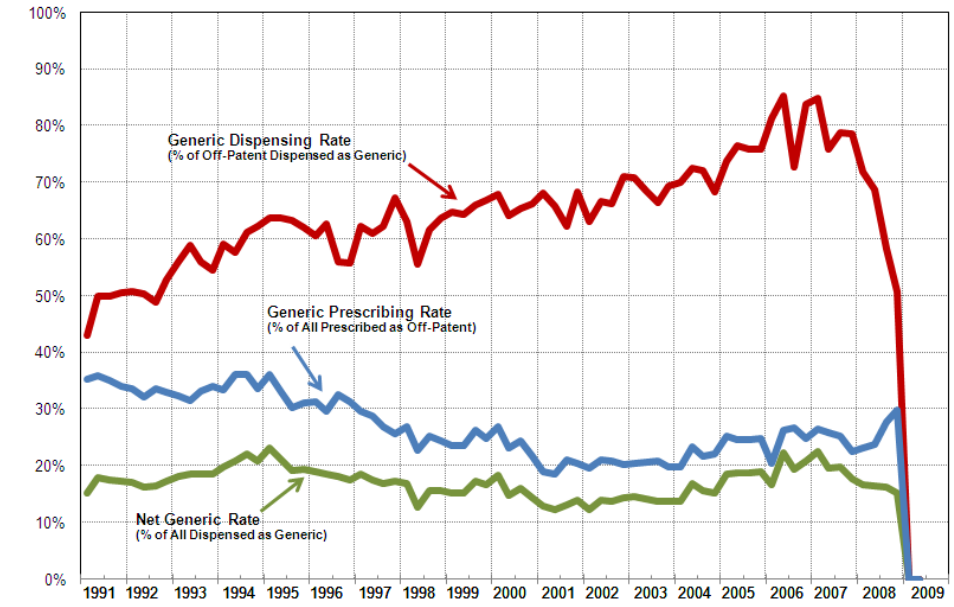
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Vermont Medicaid: 1991 to 2009



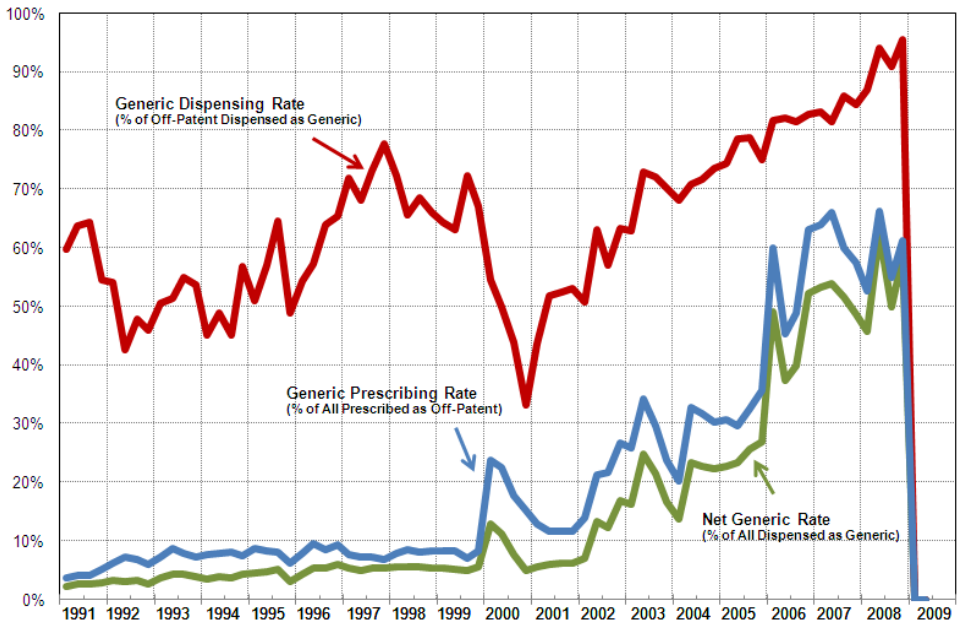
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Vermont Medicaid: 1991 to 2009



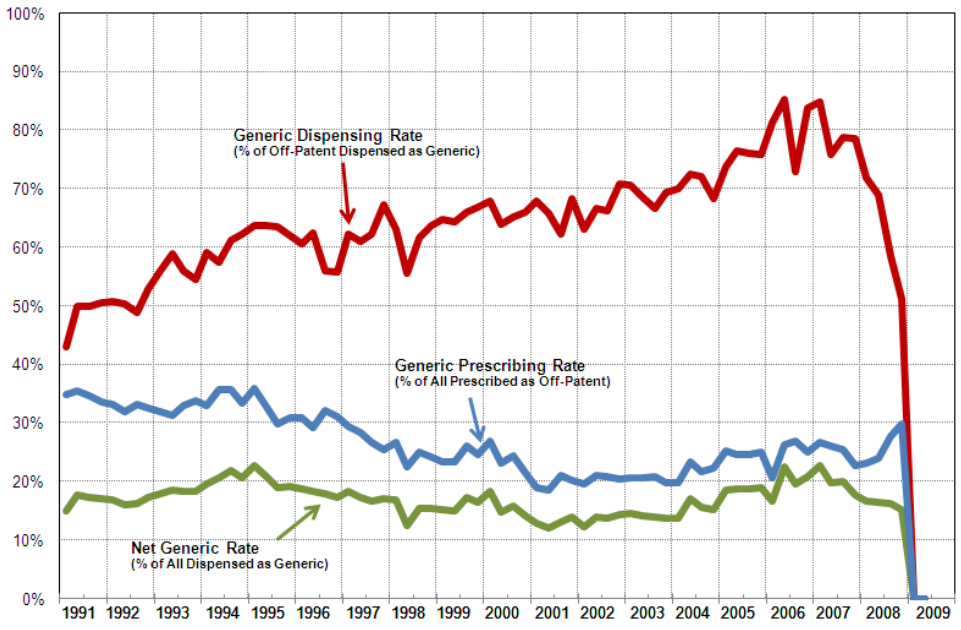
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Vermont Medicaid: 1991 to 2009



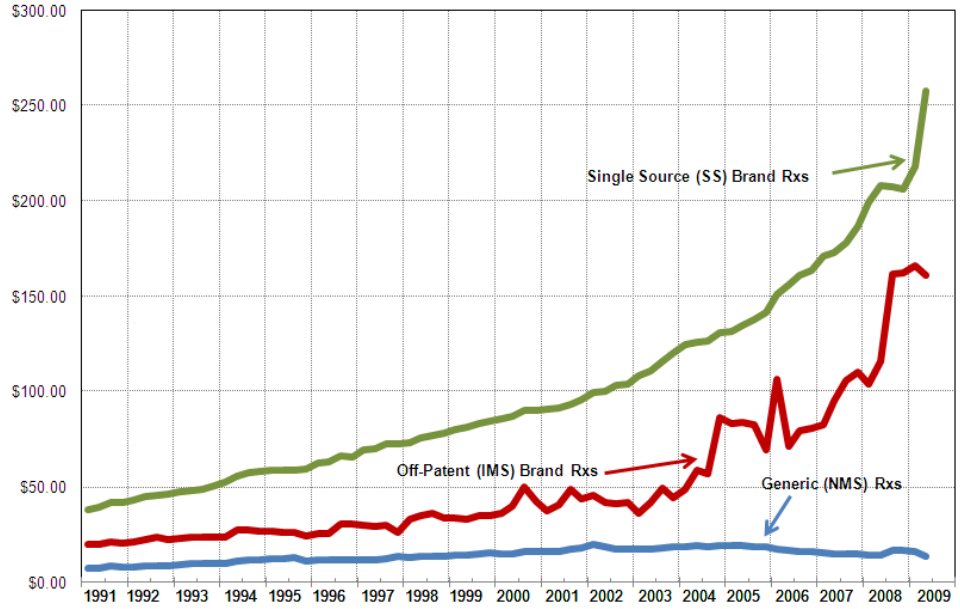
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Vermont Medicaid: 1991 to 2009



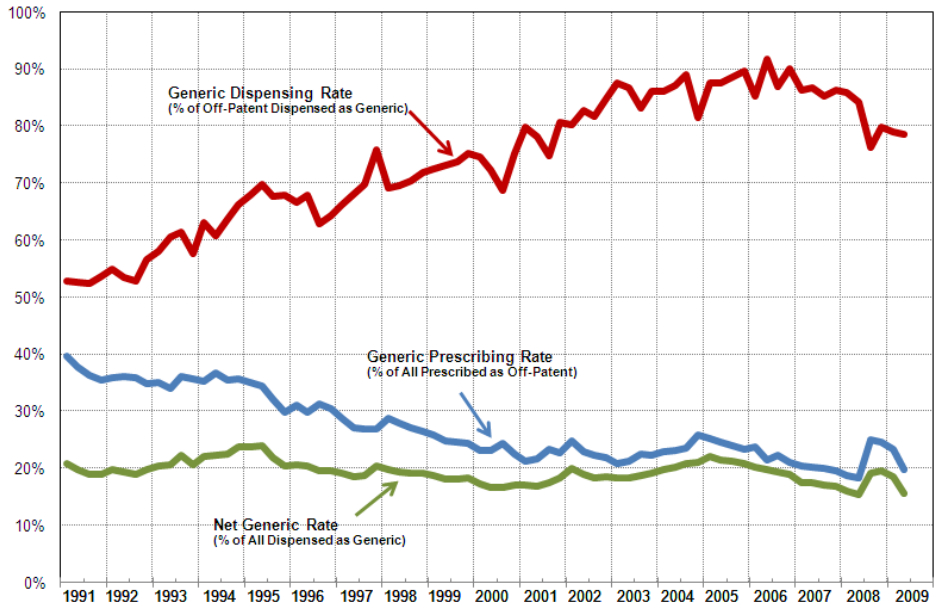
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Washington Medicaid: 1991 to 2009



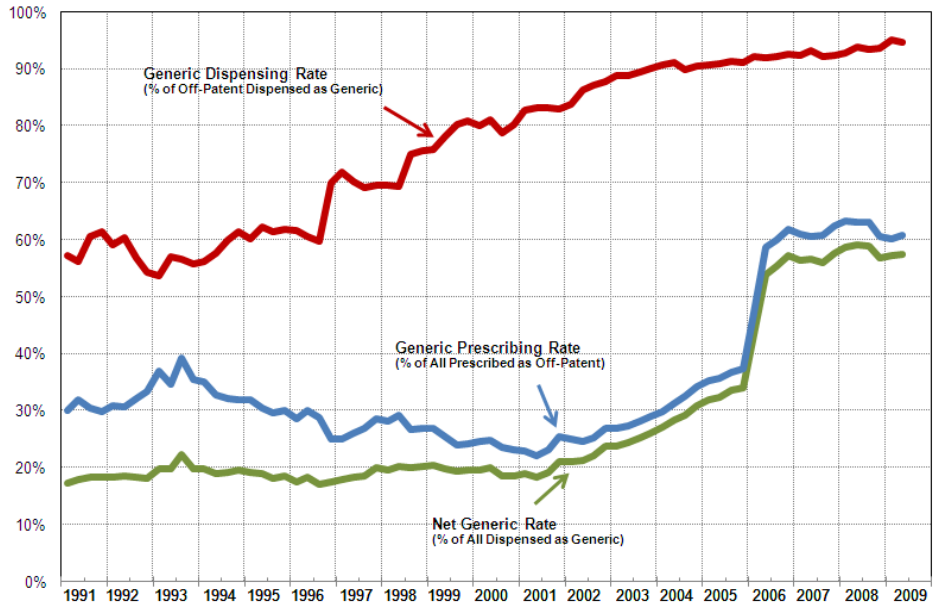
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Washington Medicaid: 1991 to 2009



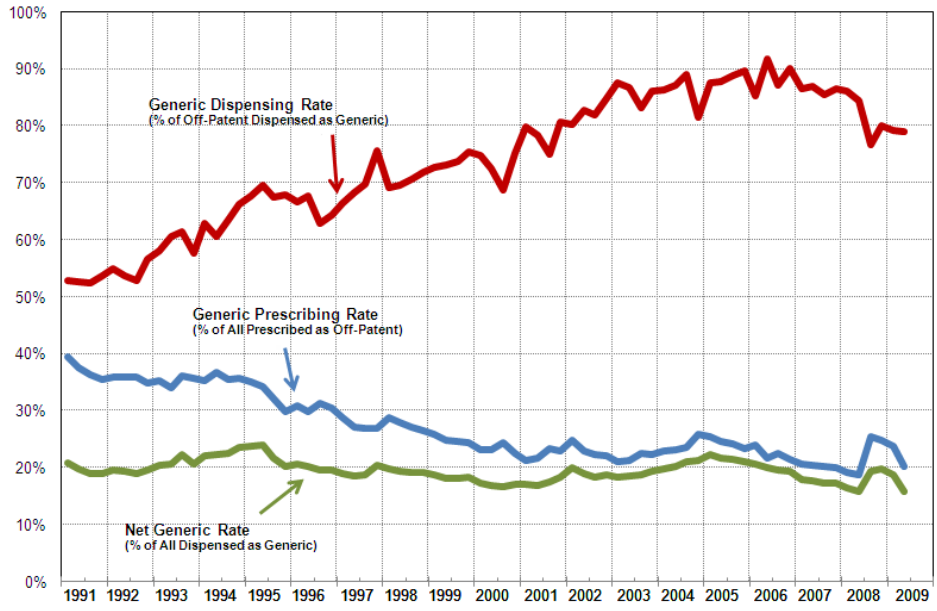
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Washington Medicaid: 1991 to 2009



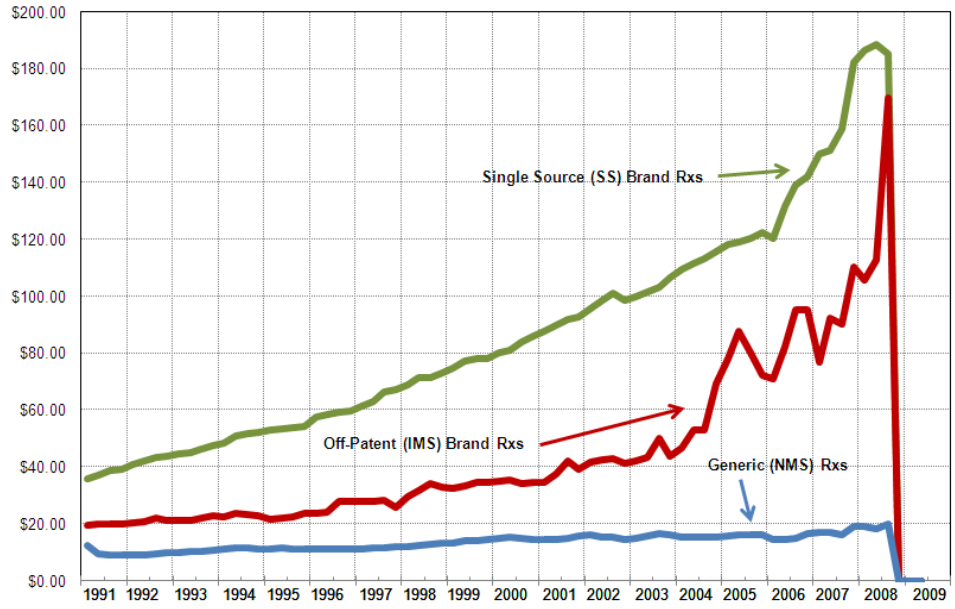
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Washington Medicaid: 1991 to 2009



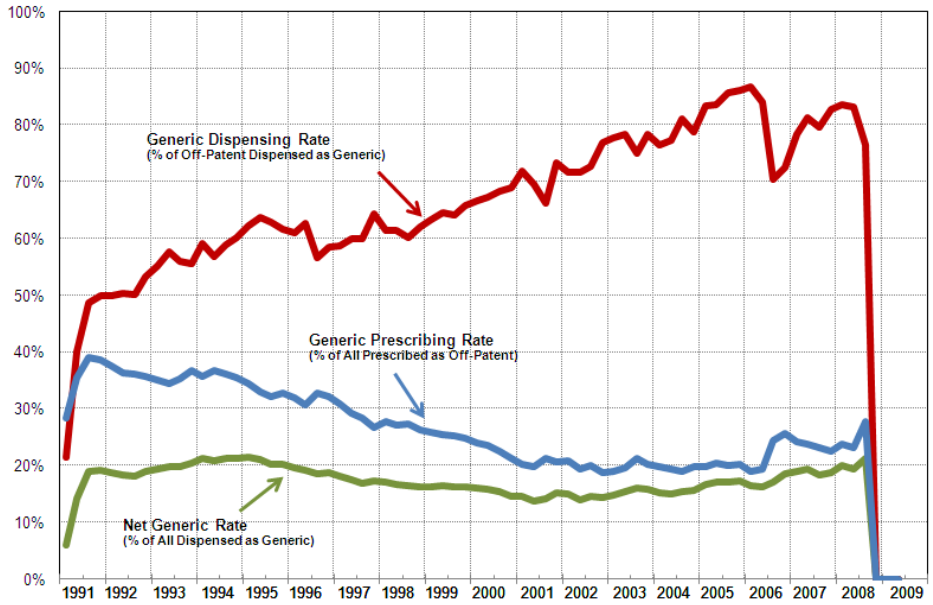
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Wisconsin Medicaid: 1991 to 2009



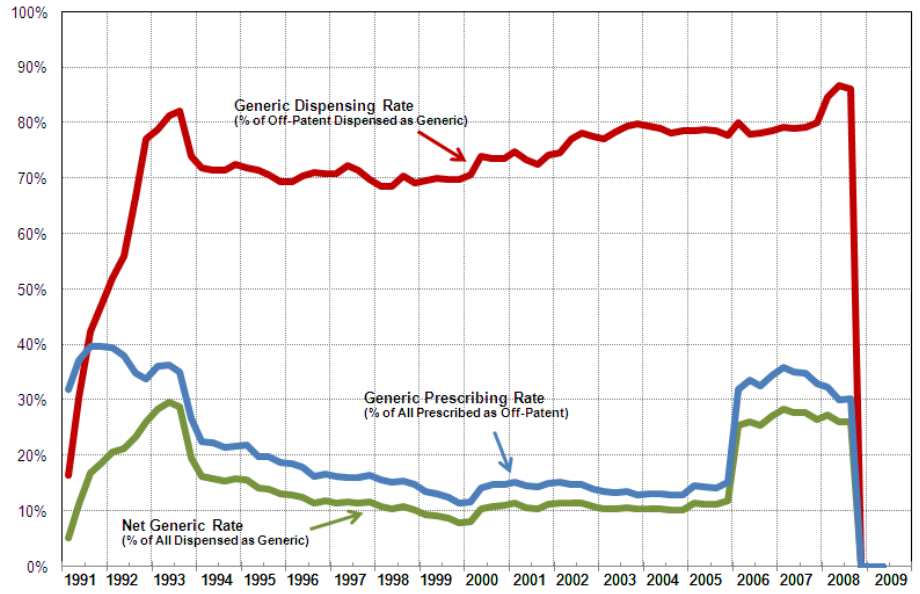
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Wisconsin Medicaid: 1991 to 2009



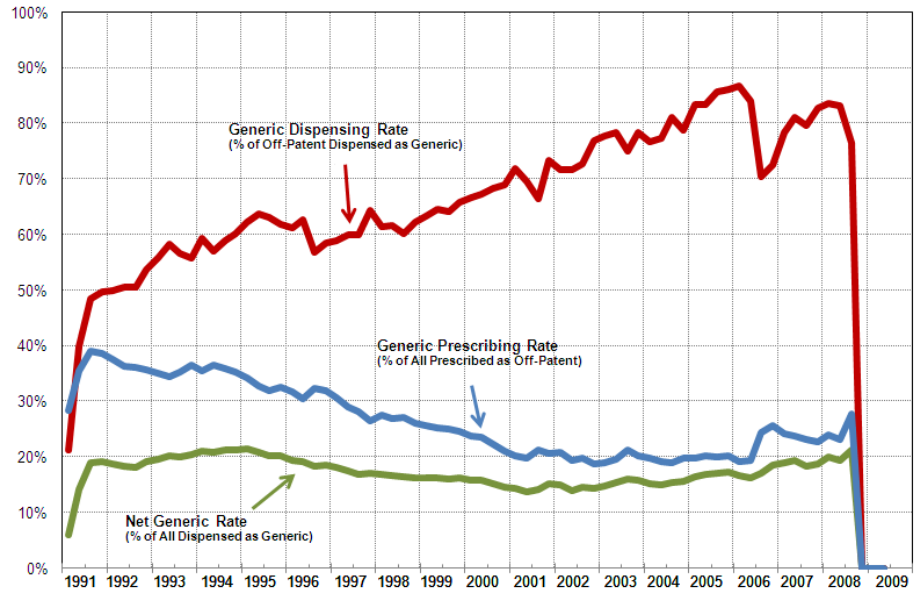
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Wisconsin Medicaid: 1991 to 2009



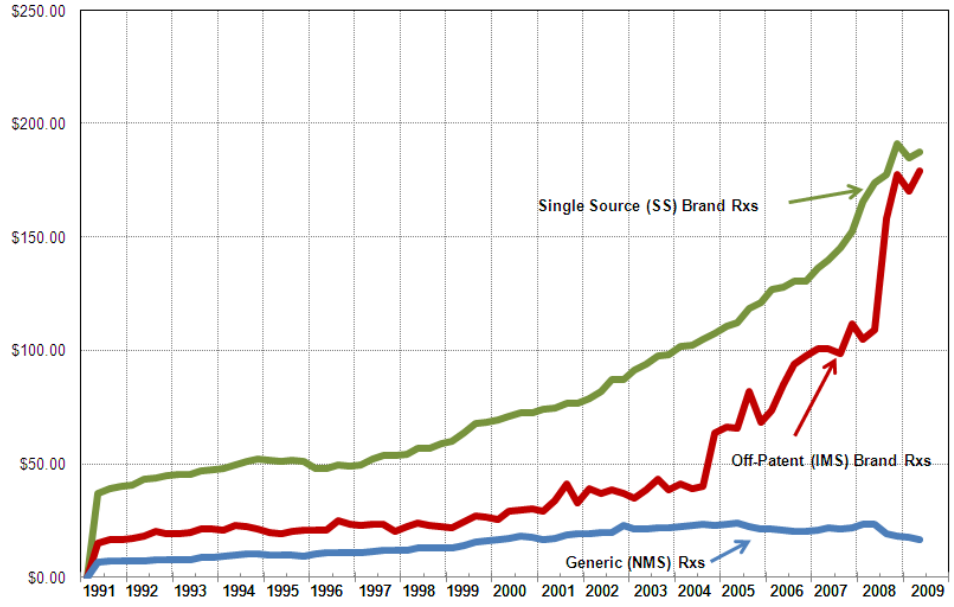
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Wisconsin Medicaid: 1991 to 2009



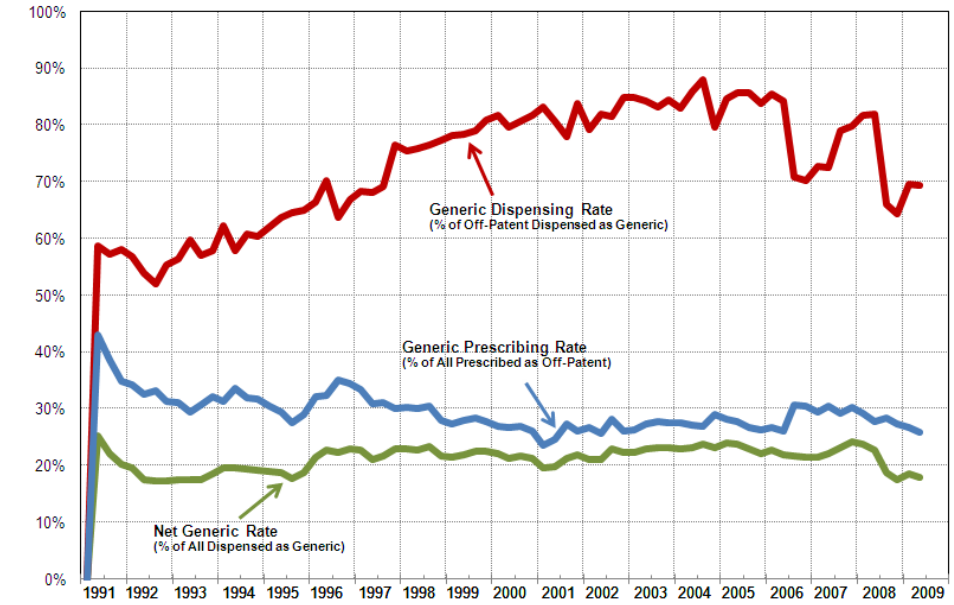
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
West Virginia Medicaid: 1991 to 2009



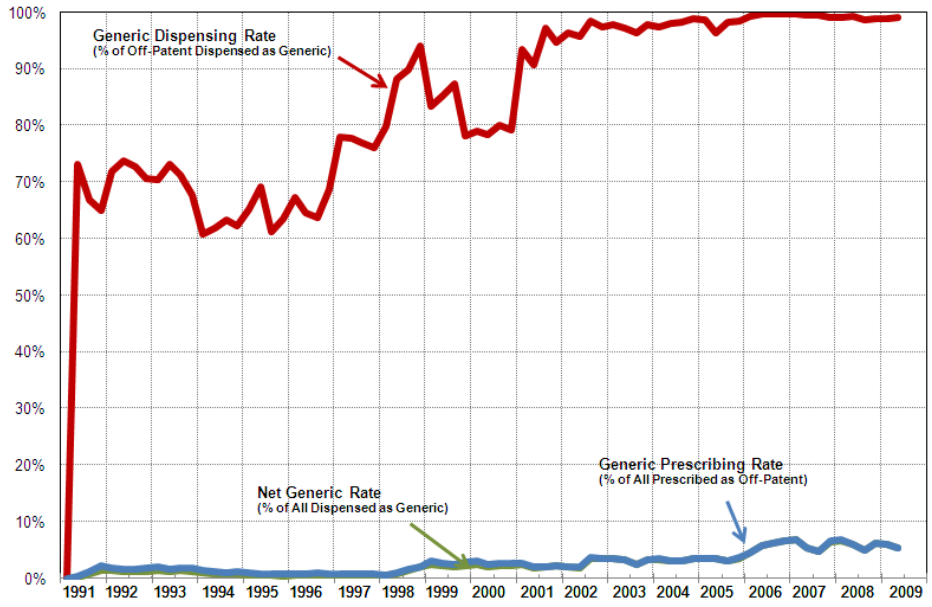
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
West Virginia Medicaid: 1991 to 2009



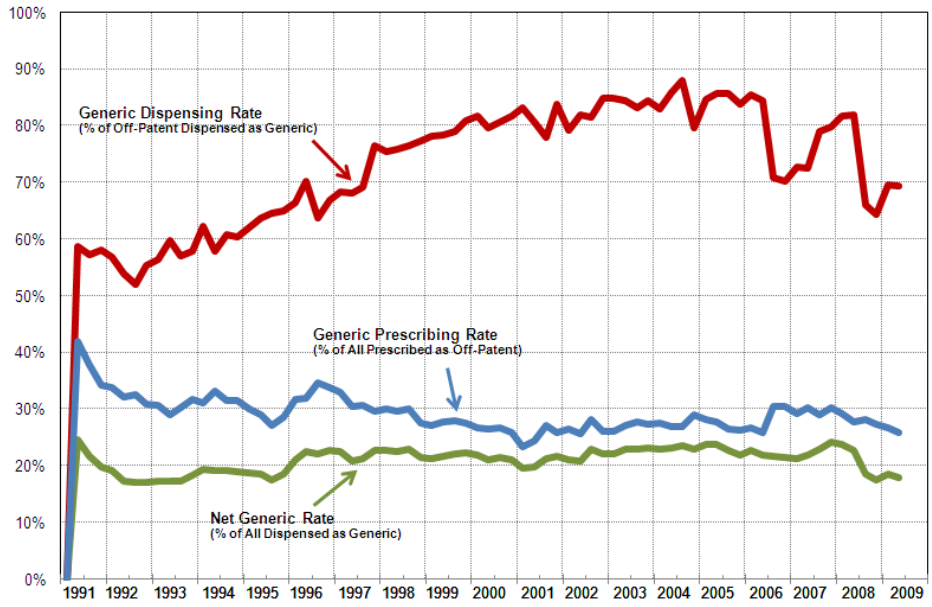
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
West Virginia Medicaid: 1991 to 2009



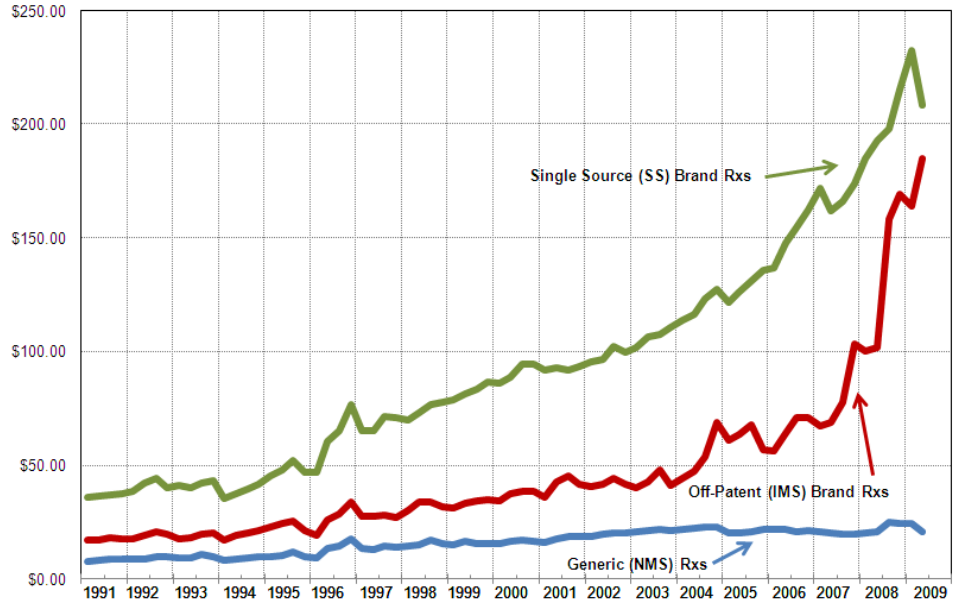
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
West Virginia Medicaid: 1991 to 2009



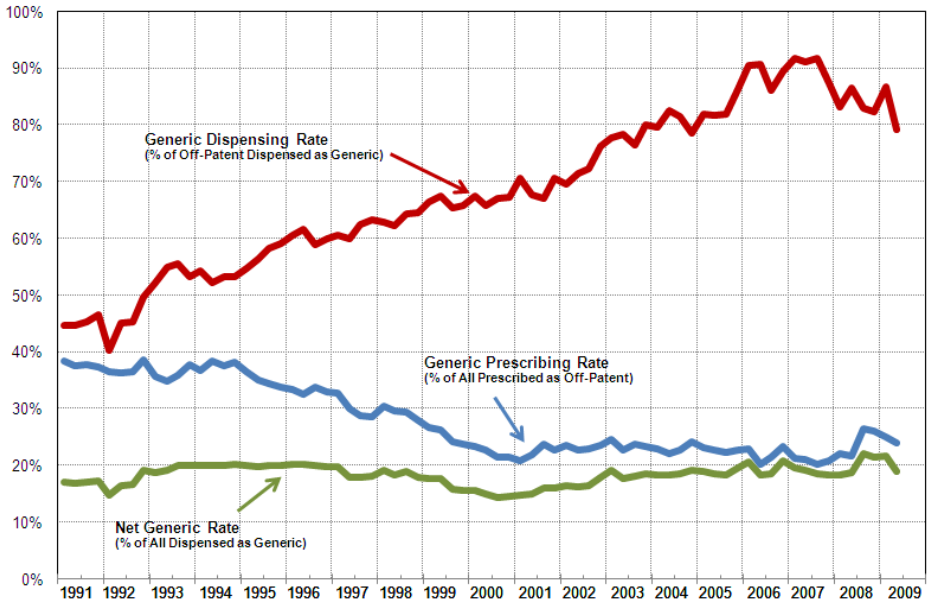
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Price per Prescription ($/Rx): Total Rx
Wyoming Medicaid: 1991 to 2009



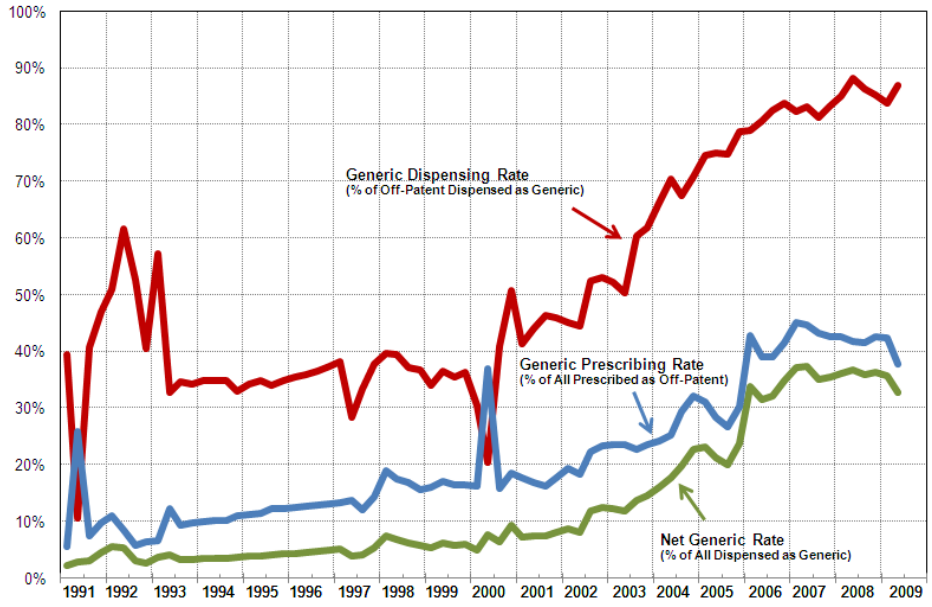
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total Rx
Wyoming Medicaid: 1991 to 2009



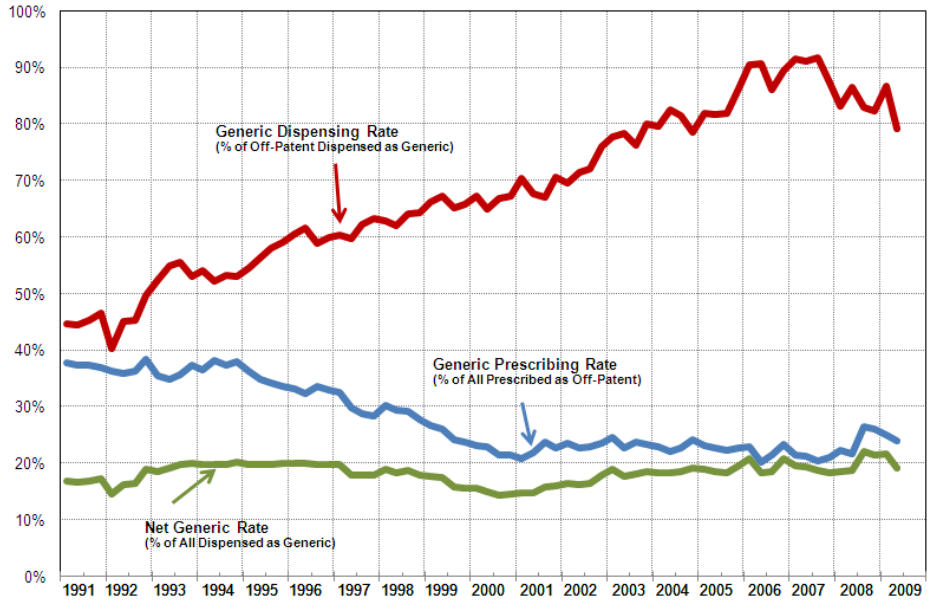
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
Wyoming Medicaid: 1991 to 2009

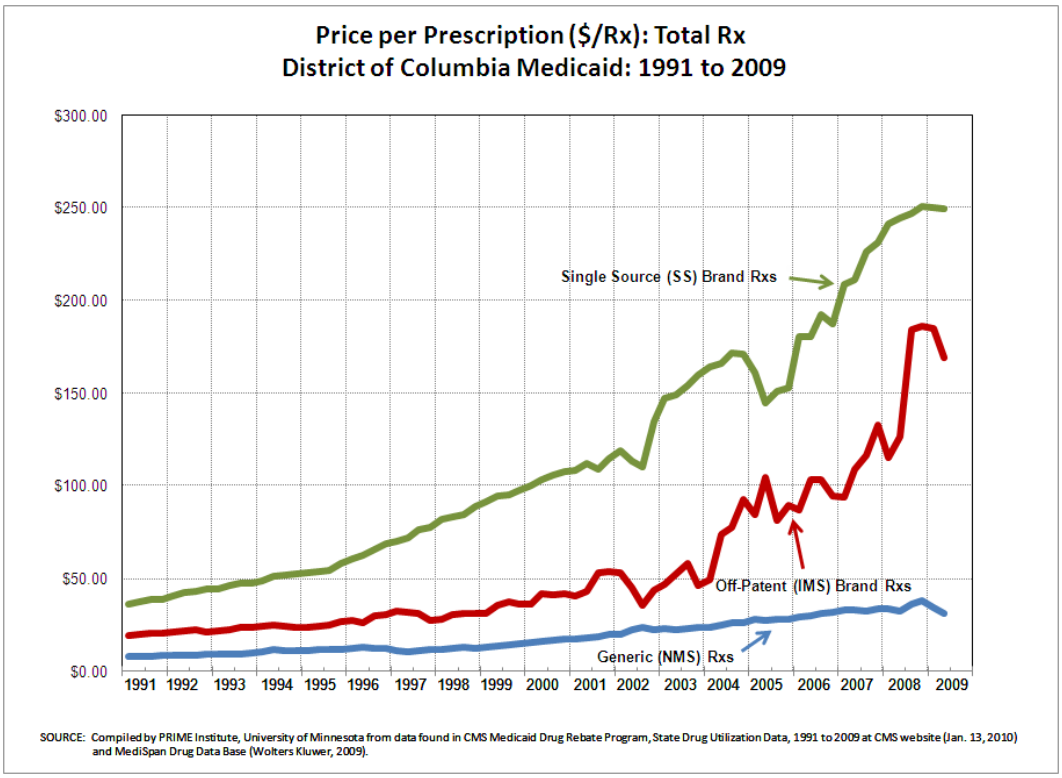


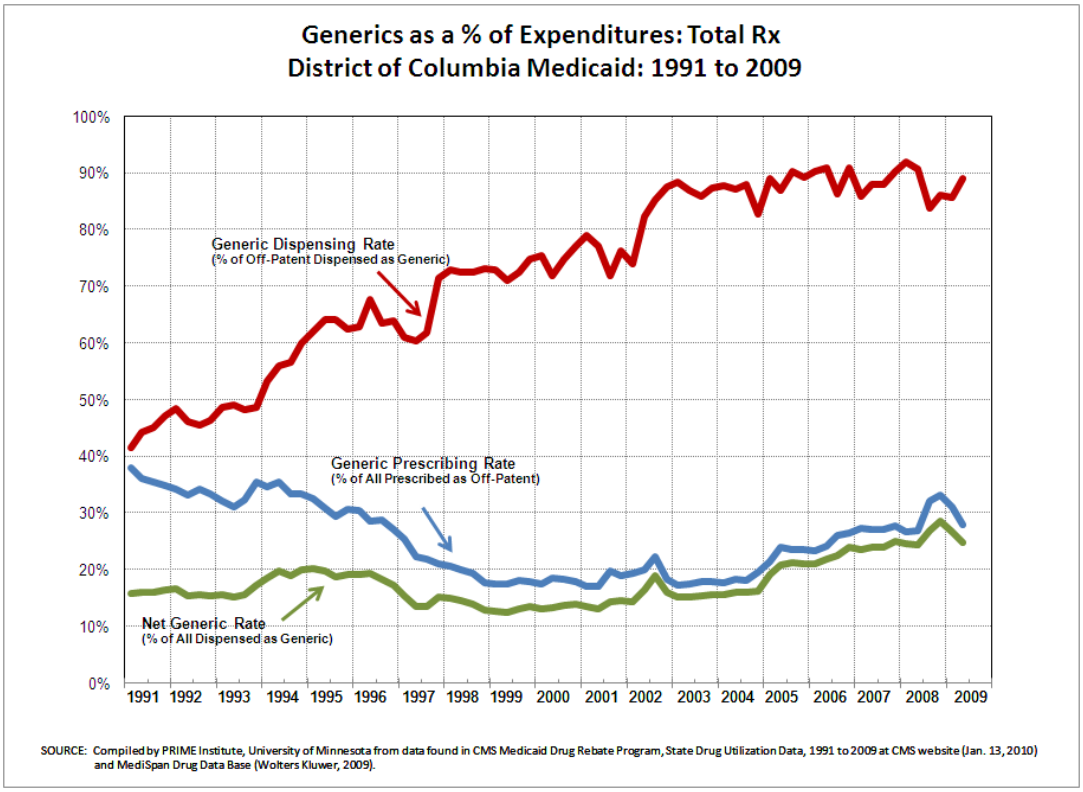
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
Wyoming Medicaid: 1991 to 2009

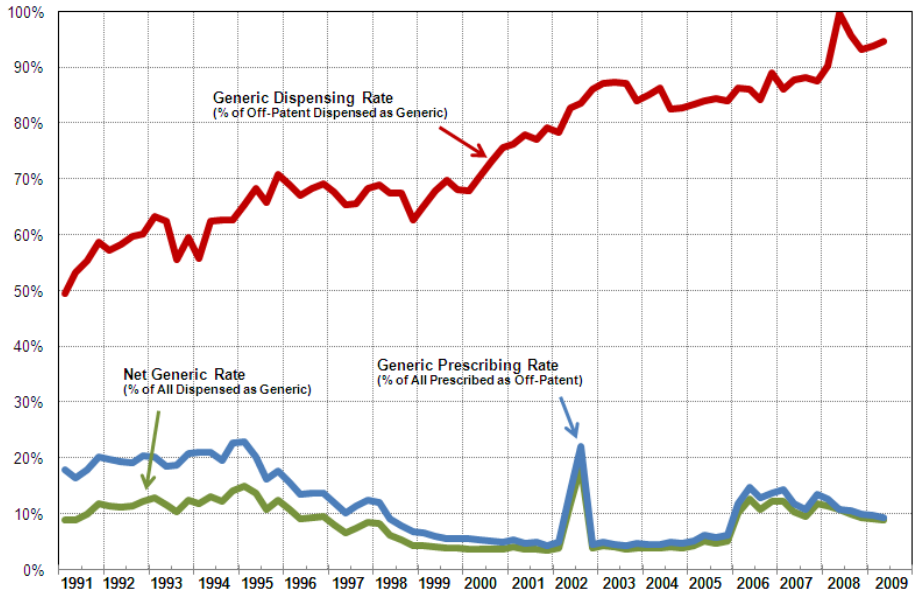


SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).


Price per Prescription ($/Rx): Total Rx
District of Columbia Medicaid: 1991 to 2009
$300.00
$250.00
$200.00
$150.00
$100.00
$50.00
$0.00
Single Source (SS) Brand Rxs
Off-Patent (IMS) Brand Rxs
Generic (NMS) Rxs
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

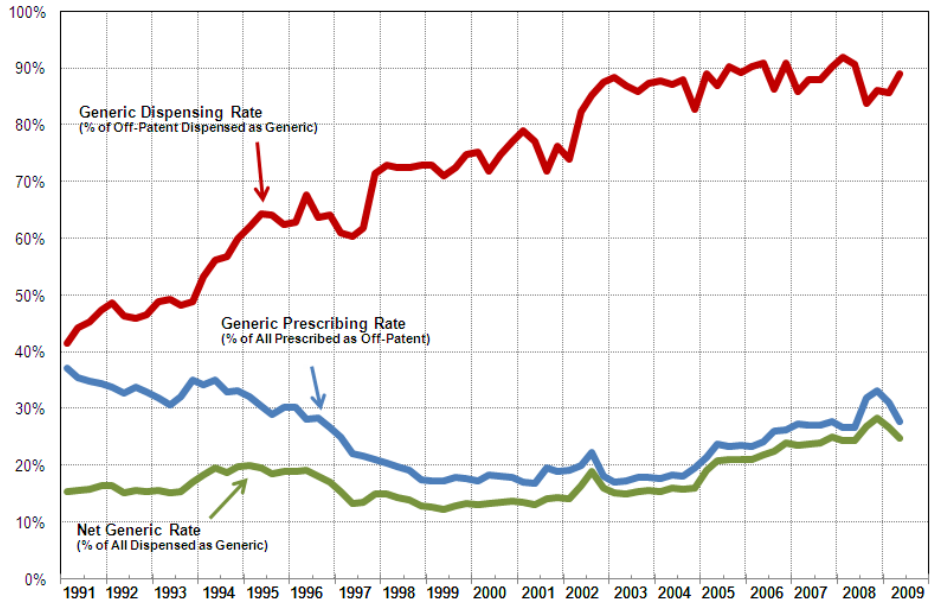

Generics as a % of Expenditures: Total Rx
District of Columbia Medicaid: 1991 to 2009
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Generic Dispensing Rate
(% of Off-Patent Dispensed as Generic)
Generic Prescribing Rate
(% of All Prescribed as Off-Patent)
Net Generic Rate
(% of All Dispensed as Generic)
1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total OTC
District of Columbia Medicaid: 1991 to 2009



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Generics as a % of Expenditures: Total All
District of Columbia Medicaid: 1991 to 2009



SOURCE: Compiled by PRIME Institute, University of Minnesota from data found in CMS Medicaid Drug Rebate Program, State Drug Utilization Data, 1991 to 2009 at CMS website (Jan. 13, 2010) and MediSpan Drug Data Base (Wolters Kluwer, 2009).

Appendix 5
Regression Results in the Substitutable Market

National Generic Rates
by Prescriptions (RX) & Reimbursement ($)

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	National											
	Prescriptions (RX)						Reimbursement ($)					
	NGR_RX_USA		GPR_RX_USA		GDR_RX_USA		NGR_AMO_USA		GPR_AMO_USA		GDR_AMO_USA	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8933**		**0.9166**		**0.9064**		**0.9546**		**0.9608**		**0.8238**	
SSE	2.6507		1.6455		2.2833		2.2403		2.5501		8.6881	
MSE	0.0008		0.0005		0.0007		0.0007		0.0008		0.0026	
DFE	3367		3367		3367		3367		3367		3367	
Root MSE	0.0281		0.0221		0.026		0.0258		0.0275		0.0508	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3367	
F Value	177.99	<.0001	258.33	<.0001	164.51	<.0001	435.97	<.0001	486.4	<.0001	93.17	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.742887	<.0001	0.767866	<.0001	0.97797	<.0001	0.204225	<.0001	0.257288	<.0001	0.811399	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.04213	<.0001	-0.03515	<.0001	-0.01607	0.0031	-0.01176	0.029	-0.01058	0.0655	-0.00379	0.7209
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.03421	<.0001	-0.02364	<.0001	-0.02177	<.0001	-0.01528	<.0001	-0.00934	0.0254	-0.02657	0.0006
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.04441	<.0001	-0.03428	<.0001	-0.02422	0.0003	0.039915	<.0001	0.045107	<.0001	0.012127	0.3491
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.003761	0.5196	-0.00033	0.9426	0.007534	0.1646	0.022071	<.0001	0.018141	0.0016	0.04429	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.00588	0.0416	-0.00435	0.0559	-0.00246	0.3574	-0.004	0.1312	-0.00263	0.3533	-0.00345	0.5085
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.01121	0.0071	-0.00418	0.2022	-0.014	0.0003	-0.01098	0.0041	-0.00368	0.3672	-0.02863	0.0001
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.00957	0.0183	-0.01964	<.0001	0.010575	0.005	-0.01756	<.0001	-0.0266	<.0001	0.000099	0.9892
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	-0.0045	0.2366	-0.01487	<.0001	0.01164	0.001	-0.01555	<.0001	-0.02319	<.0001	-0.0072	0.2957
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.00154	0.6402	-0.0137	<.0001	0.020126	<.0001	-0.01001	0.001	-0.02486	<.0001	0.016415	0.0059
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.01664	0.0004	-0.01449	<.0001	-0.00406	0.3492	-0.00631	0.142	-0.00262	0.5681	-0.01938	0.0221
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.00442	0.4399	-0.01011	0.0251	0.003626	0.4951	-0.0074	0.16	-0.00451	0.4221	-0.01483	0.1526
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.0136	<.0001	-0.01114	<.0001	-0.00815	0.0007	-0.00295	0.2162	0.000312	0.9022	-0.00711	0.1299

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.30038	<.0001	-0.25587	<.0001	-0.08501	0.0342	-0.17893	<.0001	-0.12617	0.0029	-0.36012	<.0001
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.132597	<.0001	0.090522	<.0001	0.067259	<.0001	0.025726	0.0609	-0.02206	0.132	0.1839	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.005018	0.3316	0.013808	0.0007	-0.0101	0.0352	0.028158	<.0001	0.030384	<.0001	0.024071	0.0101
DfBR	Dispensing Fee for Basic Rx		0.004946	0.0121	0.006298	<.0001	-0.00168	0.3594	0.005528	0.0023	0.007083	0.0003	0.004557	0.2014
DfGen	Dispensing Fee for Generic Rx		-0.00805	<.0001	-0.00514	0.0002	-0.00565	0.0005	-0.0087	<.0001	-0.00449	0.0091	-0.02349	<.0001
DfInst	Dispensing Fee for Institutional Rx		0.000462	0.4245	-0.00016	0.7289	0.000765	0.1546	0.000739	0.1646	0.001001	0.0777	0.000366	0.7265
DfUD	Dispensing Fee for Unit Dose Rx		0.002714	<.0001	0.001501	0.0036	0.002089	0.0006	0.004528	<.0001	0.002777	<.0001	0.007574	<.0001

NGR_RX (Net Generic Rate by RX) NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by R) (IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by R) NMS / (IMS + NMS)

NGR_AMO (Net Generic Rate by $) NMS / (SS + IMS + NMS)
GPR_AMO (Generic Prescribing Ra (IMS + NMS) / (SS + IMS + NMS)
GDR_AMO (Generic Dispensing Ra NMS / (IMS + NMS)

Anti-Infective Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Anti-Infective Agents

		Prescriptions (RX)						Reimbursement ($)					
Unit of Analysis:	**State & Time**	**NGRRXA**		**GPRRXA**		**GDRRXA**		**NGRAmountA**		**GPRAmountA**		**GDRAmountA**	
Measure:	**Prescriptions (RX) & Reimbursement ($)**												
Dependent Variable:	**GPR , GDR & NGR**												
Fit Statistics		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square		**0.8731**		**0.8932**		**0.8419**		**0.8551**		**0.876**		**0.777**	
SSE		8.4088		6.7637		4.5681		10.7472		11.3748		11.8773	
MSE		0.0025		0.002		0.0014		0.0032		0.0034		0.0035	
DFE		3367		3367		3367		3367		3367		3368	
Root MSE		0.05		0.0448		0.0368		0.0565		0.0581		0.0594	
F Test for No Fixed Effects		**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF		119		119		119		119		119		119	
Den DF		3367		3367		3367		3367		3367		3368	
F Value		156.95	<.0001	211.72	<.0001	103.61	<.0001	120.71	<.0001	149.52	<.0001	77.73	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.928493	<.0001	0.942102	<.0001	1.006032	<.0001	0.498076	<.0001	0.504311	<.0001	1.087033	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.001670	0.8724	-0.02413	0.0099	0.023376	0.0024	-0.02859	0.0153	-0.05135	<.0001	0.020589	0.0967
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.020600	0.0066	-0.02183	0.0013	-0.00845	0.1309	-0.04628	<.0001	-0.04967	<.0001	-0.03773	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.043580	0.0006	-0.03181	0.0054	-0.01998	0.0334	-0.05195	0.0003	-0.04554	0.0021	-0.02451	0.1056
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	-0.058090	<.0001	-0.05453	<.0001	-0.00398	0.6033	-0.02764	0.0188	-0.02808	0.0203	0.019107	0.1222
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.035040	<.0001	-0.02982	<.0001	-0.0102	0.0071	-0.03441	<.0001	-0.03246	<.0001	-0.01502	0.0139
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.033040	<.0001	-0.0205	0.002	-0.02732	<.0001	-0.04718	<.0001	-0.04558	<.0001	-0.02988	0.0007
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.023959	0.0009	0.023683	0.0003	0.000619	0.9073	0.043296	<.0001	0.047607	<.0001	-0.0097	0.2583
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.016921	0.0125	0.022306	0.0002	-0.00803	0.1078	0.022741	0.003	0.038934	<.0001	-0.04526	<.0001
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.014413	0.0141	0.008495	0.1065	0.008784	0.0423	0.026786	<.0001	0.030125	<.0001	5.01E-07	0.9999
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.015660	0.0601	-0.02533	0.0007	0.00913	0.1369	-0.03966	<.0001	-0.04389	<.0001	0.001405	0.8871
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.054610	<.0001	-0.04243	<.0001	-0.03178	<.0001	-0.11082	<.0001	-0.10855	<.0001	-0.04705	0.0001
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.011330	0.0142	-0.01395	0.0008	0.000251	0.9413	-0.0014	0.7886	0.000079	0.9882	-0.00404	0.4611

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-1.24027	<.0001	-1.08885	<.0001	-0.26517	<.0001	-1.10278	<.0001	-0.96346	<.0001	-0.58422	<.0001
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.14653	<.0001	0.138269	<.0001	0.007886	0.6874	0.038076	0.2053	0.002293	0.9409	0.130538	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.09968	<.0001	0.084901	<.0001	0.020164	0.003	0.100058	<.0001	0.089013	<.0001	0.041873	0.0001
DfBR	Dispensing Fee for Basic Rx		0.01842	<.0001	0.00684	0.0298	0.014794	<.0001	-0.00749	0.059	-0.02454	<.0001	0.019552	<.0001
DfGen	Dispensing Fee for Generic Rx		-0.01846	<.0001	-0.00631	0.0244	-0.01502	<.0001	0.009222	0.009	0.028654	<.0001	-0.03209	<.0001
DfInst	Dispensing Fee for Institutional Rx		-0.00083	0.42	-0.00084	0.3637	-0.0001	0.8928	-0.00177	0.1293	-0.00151	0.2069	-0.00119	0.333
DfUD	Dispensing Fee for Unit Dose Rx		-0.00031	0.7921	0.002595	0.0129	-0.00443	<.0001	0.002578	0.0501	0.002783	0.0398	0.002192	0.1129

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Biologicals Generic Rates
by Prescriptions (RX) & Reimbursement ($)

Biologicals

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXB		GPRRXB		GDRRXB		NGRAmountB		GPRAmountB		GDRAmountB	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.5951**		**0.6653**		**0.6083**		**0.5387**		**0.6301**		**0.5314**	
SSE	39.2801		70.247		66.1867		38.477		75.6038		89.2832	
MSE	0.0215		0.0385		0.0353		0.0211		0.0415		0.0477	
DFE	1825		1825		1877		1820		1820		1873	
Root MSE	0.1467		0.1962		0.1878		0.1454		0.2038		0.2183	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	1825		1825		1877		1820		1820		1873	
F Value	16.5	<.0001	22.8	<.0001	18.81	<.0001	13.15	<.0001	21.4	<.0001	13.75	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Intercept			0.148754	0.2047	0.311948	0.0468	0.253376	0.0901	0.097327	0.4067	0.197828	0.2289	0.093046	0.5791
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.061650	0.1624	-0.14602	0.0134	0.101018	0.0622	-0.01467	0.7374	-0.11875	0.0529	0.140594	0.0257
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.012420	0.6654	-0.07365	0.0553	0.058632	0.1105	-0.00282	0.9211	-0.06601	0.0983	0.083514	0.0507
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	0.118187	0.0096	0.188917	0.002	0.080422	0.1609	0.137134	0.0024	0.273125	<.0001	0.102464	0.1245
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.061809	0.1861	0.229914	0.0002	-0.07855	0.1768	0.011124	0.8102	0.180178	0.0056	-0.10685	0.1143
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.083220	0.0007	-0.03423	0.2954	-0.10358	0.0005	-0.12806	<.0001	-0.03249	0.3389	-0.18959	<.0001
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.078730	0.0085	0.0398	0.3193	-0.13973	0.0002	-0.04224	0.154	0.090469	0.0294	-0.18487	<.0001
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.041280	0.2357	-0.14886	0.0014	0.043144	0.3295	-0.0122	0.739	-0.14252	0.0055	0.136525	0.0123
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.005591	0.8903	-0.02497	0.6451	0.056196	0.2747	-0.02859	0.4973	-0.10071	0.0882	0.051511	0.4101
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.046100	0.1239	-0.09767	0.0148	0.008219	0.8288	-0.06463	0.0434	-0.1093	0.0148	1.87E-02	0.6933
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.032510	0.2745	-0.04271	0.283	-0.09641	0.0104	-0.03049	0.301	0.012301	0.766	-0.13311	0.0024
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.051450	0.2894	0.019423	0.7649	0.008389	0.8924	-0.03779	0.4323	-0.1639	0.0152	0.079333	0.2713
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	0.014724	0.4389	-0.03234	0.2037	-0.02561	0.2897	-0.04263	0.0241	-0.08452	0.0014	-0.06651	0.0183

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.59480	0.0986	-0.88507	0.0661	-0.37793	0.4104	-0.5851	0.1018	-0.58451	0.2435	-0.65126	0.2232
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	-0.11073	0.5256	-0.07207	0.7574	-0.07746	0.727	-0.14495	0.4024	0.005303	0.9826	-0.23263	0.3677
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.14402	0.0003	0.11854	0.0245	0.124894	0.0127	0.123147	0.0017	0.040624	0.4604	0.154068	0.0085
DfBR	Dispensing Fee for Basic Rx		-0.00112	0.9855	0.212458	0.0099	-0.03669	0.6385	-0.03096	0.6135	0.125976	0.1427	-0.02256	0.8048
DfGen	Dispensing Fee for Generic Rx		-0.02059	0.1203	-0.05726	0.0013	-0.02213	0.1894	0.010499	0.4243	-0.01779	0.3341	-0.00835	0.6706
DfInst	Dispensing Fee for Institutional Rx		0.00298	0.4316	0.007334	0.1475	0.006014	0.2138	0.009389	0.0124	0.003337	0.5258	0.014113	0.0122
DfUD	Dispensing Fee for Unit Dose Rx		0.00088	0.9879	-0.17777	0.023	0.020258	0.7846	0.012093	0.8353	-0.10636	0.1922	0.00656	0.9396

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Antineoplastics Generic Rates by Prescriptions (RX) & Reimbursement ($)

Antineoplastics

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXC		GPRRXC		GDRRXC		NGRAmountC		GPRAmountC		GDRAmountC	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.7521**		**0.7997**		**0.7201**		**0.5644**		**0.7556**		**0.5785**	
SSE	24.7331		20.5247		21.0079		27.2708		25.862		53.0365	
MSE	0.0075		0.0062		0.0063		0.0082		0.0078		0.016	
DFE	3310		3310		3310		3310		3310		3311	
Root MSE	0.0864		0.0787		0.0797		0.0908		0.0884		0.1266	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3310		3310		3310		3310		3310		3311	
F Value	64.27	<.0001	101.3	<.0001	49.38	<.0001	27.18	<.0001	63.48	<.0001	31.97	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.650711	<.0001	0.741773	<.0001	0.850746	<.0001	0.026926	0.445	0.119745	0.0005	0.515916	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.003820	0.833	-0.01037	0.5299	0.008349	0.6171	0.067424	0.0004	0.046934	0.0113	0.084201	0.0015
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.015870	0.2284	-0.03023	0.0118	0.014114	0.2451	0.014586	0.2918	0.000857	0.9493	0.035671	0.0645
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.011570	0.5996	0.021948	0.2746	-0.03812	0.0608	-0.06127	0.0082	-0.03608	0.1096	-0.02878	0.3727
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.006706	0.712	-0.0075	0.6503	0.007461	0.6559	-0.01677	0.3795	-0.03573	0.0545	0.034941	0.189
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.003020	0.7362	-0.00841	0.303	0.001674	0.8394	0.000432	0.9634	-0.00005	0.9953	-0.0058	0.6583
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	0.017199	0.1821	0.024377	0.0379	-0.01759	0.1388	-0.02164	0.1098	-0.01323	0.3156	-0.05035	0.0077
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.042055	0.0009	0.024562	0.0335	0.029963	0.0104	0.01389	0.2968	0.017125	0.1866	-0.03233	0.0816
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.000354	0.9771	-0.01498	0.1822	0.015145	0.1826	-0.03695	0.0043	-0.03647	0.0038	-0.03241	0.0726
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.035081	0.0007	0.018964	0.0448	0.033984	0.0004	0.002076	0.8488	0.00298	0.7787	-7.60E-03	0.6165
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.052520	0.0003	-0.03699	0.0049	-0.02545	0.0556	0.000974	0.9487	0.009191	0.5331	-0.00672	0.7502
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.045690	0.0097	-0.01152	0.4739	-0.04996	0.0022	0.00481	0.7954	0.020298	0.2611	-0.06067	0.019
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	0.015113	0.0615	0.000576	0.9376	0.018354	0.0138	0.016532	0.0515	0.008741	0.2902	0.003826	0.7464

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	0.41226	0.0021	0.396752	0.0011	0.100811	0.4136	0.066642	0.6352	0.090072	0.5103	0.386882	0.0483
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	-0.06332	0.1702	-0.14341	0.0007	0.065558	0.1234	-0.25868	<.0001	-0.25029	<.0001	-0.16819	0.0129
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.07065	<.0001	-0.05509	0.0002	-0.01501	0.3077	0.051104	0.0023	0.013112	0.4218	0.036671	0.1166
DfBR	Dispensing Fee for Basic Rx		-0.02541	<.0001	-0.01603	0.0043	-0.01128	0.0472	0.01782	0.0059	0.020562	0.0011	-0.02771	0.0022
DfGen	Dispensing Fee for Generic Rx		0.01809	0.0009	0.006909	0.1632	0.015977	0.0014	-0.01954	0.0006	-0.01809	0.0011	0.005818	0.4649
DfInst	Dispensing Fee for Institutional Rx		0.00095	0.596	0.001829	0.262	-0.0015	0.3643	-0.00212	0.2595	-0.00122	0.5034	-0.00172	0.5111
DfUD	Dispensing Fee for Unit Dose Rx		0.00934	<.0001	0.009946	<.0001	-0.00165	0.4103	0.002546	0.2638	0.002544	0.2516	0.005718	0.0719

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Endocrine & Metabolic Drugs Generic Rates by Prescriptions (RX) & Reimbursement ($)

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

Endocrine & Metabolic Drugs

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXD		GPRRXD		GDRRXD		NGRAmountD		GPRAmountD		GDRAmountD	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8736**		**0.8361**		**0.8771**		**0.8768**		**0.8539**		**0.8734**	
SSE	6.2985		5.0083		10.1029		6.1374		11.1621		15.6525	
MSE	0.0019		0.0015		0.003		0.0018		0.0033		0.0046	
DFE	3367		3367		3367		3367		3367		3368	
Root MSE	0.0433		0.0386		0.0548		0.0427		0.0576		0.0682	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3368	
F Value	144.37	<.0001	125.18	<.0001	141.6	<.0001	159.95	<.0001	128.01	<.0001	139.92	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.680602	<.0001	0.721656	<.0001	0.978627	<.0001	0.152928	<.0001	0.180933	<.0001	0.870452	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.035590	<.0001	-0.0259	0.0013	-0.03356	0.0033	-0.0038	0.67	-0.00808	0.5013	-0.00131	0.9269
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.028960	<.0001	-0.01685	0.004	-0.03096	0.0002	-0.00707	0.275	0.000476	0.9566	-0.03529	0.0007
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.026520	0.0162	-0.01108	0.2597	-0.02291	0.101	0.073711	<.0001	0.099532	<.0001	0.000286	0.9869
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	-0.028660	0.0015	0.000761	0.9244	-0.04279	0.0002	0.011452	0.1976	0.027281	0.0229	0.0239	0.0922
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.010500	0.0182	0.009863	0.0129	-0.02763	<.0001	-0.0053	0.2272	0.011761	0.0469	-0.02498	0.0004
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.007050	0.2716	-0.00576	0.3133	-0.01445	0.0751	-0.02969	<.0001	-0.02671	0.0018	-0.07266	<.0001
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.028308	<.0001	0.000649	0.9073	0.034791	<.0001	-0.00927	0.1329	-0.0483	<.0001	-0.00364	0.7118
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.013870	0.018	0.000657	0.9	0.012447	0.0936	-0.01075	0.0633	-0.034	<.0001	-0.01357	0.1417
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.014675	0.0039	0.001901	0.6746	0.013071	0.0422	-0.00797	0.1119	-0.0468	<.0001	8.01E-03	0.317
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	0.003700	0.6077	0.004813	0.454	0.012588	0.1679	0.008691	0.2219	0.018856	0.0494	0.004186	0.7125
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.003746	0.6713	-0.03274	<.0001	0.047201	<.0001	-0.02112	0.0154	-0.02591	0.0275	0.005599	0.6874
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.016390	<.0001	-0.01659	<.0001	-0.01106	0.0289	0.000653	0.8685	0.005407	0.3093	-0.00733	0.2441

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.45501	<.0001	0.105668	0.0755	-0.82565	<.0001	-0.17166	0.0091	0.169398	0.0563	-0.85992	<.0001
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.21339	<.0001	-0.00283	0.8902	0.302006	<.0001	0.046622	0.0402	-0.11388	0.0002	0.349859	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.01601	0.0445	-0.02436	0.0006	0.043365	<.0001	0.036616	<.0001	0.007489	0.4801	0.064056	<.0001
DfBR	Dispensing Fee for Basic Rx		-0.01630	<.0001	-0.00683	0.0117	-0.0189	<.0001	0.002105	0.4827	0.000382	0.9247	0.010805	0.0241
DfGen	Dispensing Fee for Generic Rx		0.00720	0.0078	0.007336	0.0024	0.004222	0.2175	-0.002	0.4542	0.006863	0.0566	-0.02291	<.0001
DfInst	Dispensing Fee for Institutional Rx		-0.00166	0.0631	-0.00434	<.0001	0.002084	0.0651	-0.00031	0.7264	-0.00173	0.1449	0.002536	0.0713
DfUD	Dispensing Fee for Unit Dose Rx		0.00186	0.0644	0.001454	0.1055	0.000956	0.4537	-0.00027	0.7836	-0.00154	0.2508	0.001607	0.3113

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Cardiovascular Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Cardiovascular Agents

		Prescriptions (RX)						Reimbursement ($)					
Unit of Analysis:	**State & Time**	**NGRRXE**		**GPRRXE**		**GDRRXE**		**NGRAmountE**		**GPRAmountE**		**GDRAmountE**	
Measure:	**Prescriptions (RX) & Reimbursement ($)**	**Fit Statistics**	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
Dependent Variable:	**GPR , GDR & NGR**												
		R-Square	**0.9065**		**0.8697**		**0.9264**		**0.9186**		**0.8967**		**0.871**	
		SSE	5.8515		3.9209		4.283		5.2299		6.0793		14.5274	
		MSE	0.0017		0.0012		0.0013		0.0016		0.0018		0.0043	
		DFE	3367		3367		3367		3367		3367		3368	
		Root MSE	0.0417		0.0341		0.0357		0.0394		0.0425		0.0657	
		F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
		Number DF	119		119		119		119		119		119	
		Den DF	3367		3367		3367		3367		3367		3368	
		F Value	170.12	<.0001	136.69	<.0001	224.6	<.0001	230.65	<.0001	180.96	<.0001	130	<.0001
Data Survery Pharmacy Law														
Name in the Analysis	**Description**	**Variables Values CODE**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**
Intercept			0.883932	<.0001	0.882834	<.0001	1.005681	<.0001	0.341341	<.0001	0.343385	<.0001	0.970011	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.058240	<.0001	-0.04556	<.0001	-0.01816	0.0148	0.001654	0.8406	-0.00765	0.3886	0.007965	0.5611
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.029910	<.0001	-0.01672	0.0013	-0.01906	0.0004	0.002314	0.6989	0.003708	0.5654	-0.00453	0.6496
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.090820	<.0001	-0.08477	<.0001	-0.0226	0.013	0.032613	0.0012	0.040495	0.0002	-0.01612	0.3357
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	-0.032710	0.0002	-0.03086	<.0001	-0.0125	0.0924	0.008808	0.283	0.017921	0.0428	0.014472	0.2898
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	0.003027	0.4799	0.004426	0.207	-0.00056	0.8782	0.003868	0.3396	0.003217	0.4614	0.009951	0.1404
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	0.022933	0.0002	0.021108	<.0001	-0.00199	0.7064	0.023837	<.0001	0.01656	0.0086	0.011832	0.2241
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.001500	0.8031	-0.01599	0.0012	0.01605	0.0019	-0.01426	0.0123	-0.03034	<.0001	0.01965	0.0384
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.013025	0.0212	0.003434	0.4577	0.013629	0.0048	-0.01572	0.0033	-0.01842	0.0014	0.00623	0.4838
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.013244	0.0068	-0.0028	0.4839	0.024491	<.0001	-0.00484	0.2954	-0.01806	0.0003	3.39E-02	<.0001
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.009230	0.1841	-0.00098	0.8632	-0.01214	0.0411	0.003929	0.5497	0.015263	0.0312	-0.0259	0.018
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.007222	0.396	0.001765	0.7999	-0.00125	0.8638	-0.00922	0.2516	-0.00743	0.3914	-0.02417	0.0714
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.015500	<.0001	-0.00601	0.0565	-0.01516	<.0001	-0.00465	0.2018	0.010165	0.0096	-0.01809	0.0029
Data Medicaid Reimbursment														
Name in the Analysis	**Description**	**Variables Values CODE**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.40174	<.0001	-0.40444	<.0001	-0.01083	0.8439	-0.23973	<.0001	-0.15276	0.0197	-0.15421	0.1276
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.18874	<.0001	0.150407	<.0001	0.057597	0.0024	0.093194	<.0001	0.033925	0.1335	0.206565	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.02541	0.0009	-0.00917	0.1447	-0.02893	<.0001	0.003803	0.6003	-0.00386	0.6215	-0.02242	0.0639
DfBR	Dispensing Fee for Basic Rx		0.00562	0.055	0.005984	0.0126	0.000254	0.9194	0.001819	0.511	0.001271	0.6702	0.002197	0.6337
DfGen	Dispensing Fee for Generic Rx		-0.01084	<.0001	-0.00649	0.0024	-0.00549	0.0139	-0.00783	0.0015	0.003072	0.2475	-0.02308	<.0001
DfInst	Dispensing Fee for Institutional Rx		0.00085	0.3259	0.001322	0.0603	-0.00037	0.6193	0.001058	0.193	0.001563	0.0746	0.000802	0.5537
DfUD	Dispensing Fee for Unit Dose Rx		0.00349	0.0003	0.002898	0.0003	0.000861	0.3	0.006252	<.0001	0.003939	<.0001	0.007375	<.0001

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Respiratory Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Respiratory Agents

Unit of Analysis:	**State & Time**
Measure:	**Prescriptions (RX) & Reimbursement ($)**
Dependent Variable:	**GPR , GDR & NGR**

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXF		GPRRXF		GDRRXF		NGRAmountF		GPRAmountF		GDRAmountF	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8056**		**0.8293**		**0.842**		**0.9066**		**0.9165**		**0.8404**	
SSE	8.8063		8.3081		6.3799		6.7494		7.7291		15.373	
MSE	0.0026		0.0025		0.0019		0.002		0.0023		0.0046	
DFE	3367		3367		3367		3367		3367		3368	
Root MSE	0.0511		0.0497		0.0435		0.0448		0.0479		0.0676	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3368	
F Value	100.4	<.0001	105.31	<.0001	99.2	<.0001	197.62	<.0001	194.64	<.0001	113.5	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Intercept			0.590432	<.0001	0.619881	<.0001	0.967933	<.0001	0.172289	<.0001	0.252723	<.0001	0.743406	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.051880	<.0001	-0.04271	<.0001	-0.03982	<.0001	-0.02782	0.0029	-0.02601	0.0093	-0.05752	<.0001
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.038020	<.0001	-0.04259	<.0001	-0.00655	0.3218	-0.03238	<.0001	-0.03511	<.0001	-0.03454	0.0008
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.013700	0.2934	-0.00774	0.5412	-0.03613	0.0011	0.031561	0.0057	0.044623	0.0003	-0.05115	0.003
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.043433	<.0001	0.0174	0.0924	0.066031	<.0001	0.03736	<.0001	0.01856	0.0628	0.091236	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	0.009970	0.0579	0.010244	0.0448	0.008654	0.0531	-0.0041	0.3731	-0.00389	0.4291	-0.00005	0.9941
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.025160	0.0009	-0.01108	0.1323	-0.01083	0.0932	-0.01738	0.0088	-0.00361	0.6106	0.003827	0.7023
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.043680	<.0001	-0.05517	<.0001	0.002335	0.7104	-0.03983	<.0001	-0.04682	<.0001	-0.03604	0.0002
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	-0.023060	0.0009	-0.04174	<.0001	0.028346	<.0001	-0.02815	<.0001	-0.04229	<.0001	0.009156	0.3172
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.025530	<.0001	-0.03828	<.0001	0.011507	0.0244	-0.02286	<.0001	-0.03599	<.0001	-4.68E-03	0.5548
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.021600	0.0113	-0.02108	0.0109	-0.00208	0.7741	0.005971	0.4235	0.009432	0.2375	-0.00753	0.5037
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.045718	<.0001	-0.00086	0.9323	0.094262	<.0001	0.022593	0.0135	-0.00008	0.9934	0.079555	<.0001
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.010050	0.0334	0.003782	0.4097	-0.02009	<.0001	-0.00176	0.6709	0.005429	0.2199	-0.01116	0.0738

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.17057	0.0305	-0.40473	<.0001	0.223148	0.0009	-0.25466	0.0002	-0.4707	<.0001	0.105028	0.3131
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.04631	0.0888	0.091257	0.0006	-0.01879	0.4172	0.006912	0.7717	0.033616	0.1873	0.146303	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.02907	0.002	0.053453	<.0001	-0.02277	0.0045	0.072562	<.0001	0.097709	<.0001	-0.03695	0.003
DfBR	Dispensing Fee for Basic Rx		0.02111	<.0001	0.018842	<.0001	0.008249	0.007	0.014552	<.0001	0.017418	<.0001	0.005241	0.2693
DfGen	Dispensing Fee for Generic Rx		-0.02574	<.0001	-0.01606	<.0001	-0.02425	<.0001	-0.02065	<.0001	-0.01683	<.0001	-0.02904	<.0001
DfInst	Dispensing Fee for Institutional Rx		0.00117	0.2675	-0.00106	0.2988	0.002876	0.0014	0.002786	0.0026	0.000431	0.6624	0.005618	<.0001
DfUD	Dispensing Fee for Unit Dose Rx		0.00020	0.8691	-0.00235	0.042	0.004569	<.0001	0.001564	0.1336	-0.00077	0.4873	0.009868	<.0001

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Gastrointestinal Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Gastrointestinal Agents

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXG		GPRRXG		GDRRXG		NGRAmountG		GPRAmountG		GDRAmountG	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.7617**		**0.7435**		**0.7929**		**0.7825**		**0.8482**		**0.7611**	
SSE	18.5022		17.5969		7.9331		13.2181		13.116		27.4121	
MSE	0.0055		0.0052		0.0024		0.0039		0.0039		0.0081	
DFE	3367		3367		3367		3367		3367		3368	
Root MSE	0.0741		0.0723		0.0485		0.0627		0.0624		0.0902	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3368	
F Value	73.1	<.0001	69.7	<.0001	86.88	<.0001	81.86	<.0001	125.75	<.0001	85.21	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.544099	<.0001	0.558727	<.0001	0.958219	<.0001	0.297905	<.0001	0.332801	<.0001	0.866949	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.00666	0.6669	-0.00337	0.8234	-0.01801	0.0755	-0.01116	0.3936	-0.02116	0.1044	-0.01073	0.5686
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.00479	0.6703	0.003053	0.7808	-0.02023	0.0061	-0.00972	0.3069	-0.01071	0.2585	-0.01855	0.1757
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.0438	0.0205	-0.05782	0.0017	0.008147	0.5103	0.040591	0.0111	0.005571	0.7262	0.122317	<.0001
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.018114	0.2404	0.009617	0.5228	0.020526	0.0423	0.037651	0.0039	0.031604	0.015	0.05291	0.0049
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.03083	<.0001	-0.02765	0.0002	-0.01404	0.0049	-0.03168	<.0001	-0.02951	<.0001	-0.04526	<.0001
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.03061	0.0053	-0.01952	0.0684	-0.01339	0.0627	-0.0425	<.0001	-0.04036	<.0001	-0.0195	0.1447
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.01552	0.1474	-0.01705	0.1026	0.012697	0.0703	-0.01696	0.061	-0.01777	0.0488	-0.0258	0.0478
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.033694	0.0008	0.03765	0.0001	0.012964	0.0488	-0.00452	0.5947	0.006532	0.4399	-0.00035	0.9768
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.00039	0.9639	-0.00787	0.3535	0.028217	<.0001	-0.00494	0.5021	-0.00558	0.4465	0.011313	0.2853
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.01433	0.2462	-0.01605	0.1828	0.003234	0.6893	-0.04837	<.0001	-0.05185	<.0001	-0.0314	0.0368
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.068634	<.0001	0.06871	<.0001	0.013246	0.1812	-0.03138	0.0142	-0.03154	0.0133	-0.02791	0.1296
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.03935	<.0001	-0.03131	<.0001	-0.02576	<.0001	-0.01065	0.0658	-0.00847	0.142	-0.02886	0.0005

Data Medicaid Reimbursmnet

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.68335	<.0001	-0.91559	<.0001	0.3659	<.0001	-0.13354	0.1668	-0.31332	0.0011	-0.00865	0.9504
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.04516	0.2523	0.048434	0.208	-0.00648	0.802	-0.03559	0.2857	-0.04676	0.1591	0.132296	0.0059
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.026835	0.0494	0.051524	0.0001	-0.03542	<.0001	-0.00625	0.5879	0.003943	0.7316	0.007047	0.6715
DfBR	Dispensing Fee for Basic Rx		0.016335	0.0017	0.018897	0.0002	-0.00809	0.0177	0.012299	0.0052	0.015544	0.0004	0.001318	0.8352
DfGen	Dispensing Fee for Generic Rx		-0.00228	0.6231	-0.00305	0.5001	0.003395	0.2631	-0.0062	0.1133	-0.00276	0.4785	-0.01835	0.0011
DfInst	Dispensing Fee for Institutional Rx		0.00352	0.0213	0.005034	0.0007	-0.00186	0.0626	0.000613	0.635	0.000939	0.4658	0.001491	0.423
DfUD	Dispensing Fee for Unit Dose Rx		0.000381	0.8254	-0.00157	0.3518	0.005148	<.0001	0.000267	0.8546	-0.00233	0.109	0.01106	<.0001

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Genitourinary Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Genitourinary Agents

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXH		GPRRXH		GDRRXH		NGRAmountH		GPRAmountH		GDRAmountH	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.7752**		**0.8379**		**0.7316**		**0.7342**		**0.8423**		**0.7195**	
SSE	14.5687		13.1347		20.2809		13.1924		16.0006		39.6956	
MSE	0.0043		0.0039		0.006		0.0039		0.0048		0.0118	
DFE	3363		3363		3363		3363		3363		3364	
Root MSE	0.0658		0.0625		0.0777		0.0626		0.069		0.1086	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3363		3363		3363		3363		3363		3364	
F Value	92.94	<.0001	133.03	<.0001	62.88	<.0001	73.06	<.0001	117.83	<.0001	64.17	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Intercept			0.772792	<.0001	0.728336	<.0001	1.080177	<.0001	0.331427	<.0001	0.281112	<.0001	1.080205	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.08365	<.0001	-0.05992	<.0001	-0.0415	0.0105	-0.06096	<.0001	-0.04682	0.0012	-0.02703	0.2332
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.04287	<.0001	-0.02397	0.0115	-0.03159	0.0074	-0.01247	0.1898	-0.00399	0.7032	-0.03054	0.0641
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.09397	<.0001	-0.06028	0.0002	-0.06067	0.0022	-0.00171	0.9147	0.038706	0.0278	-0.06437	0.0202
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.043102	0.0017	0.004993	0.7011	0.079939	<.0001	0.03802	0.0036	-0.00006	0.9967	0.146401	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.02769	<.0001	-0.03091	<.0001	0.002808	0.725	-0.03302	<.0001	-0.03437	<.0001	-0.01262	0.2582
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.01283	0.1883	-0.02337	0.0116	0.018408	0.1097	-0.00096	0.9175	-0.01964	0.0548	0.041987	0.0091
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.048407	<.0001	-0.00036	0.9682	0.060081	<.0001	0.052151	<.0001	-0.00861	0.3876	0.084164	<.0001
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.054337	<.0001	0.033117	<.0001	0.032473	0.002	0.058875	<.0001	0.025557	0.0063	0.044145	0.0027
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.047445	<.0001	-0.00209	0.7763	0.069888	<.0001	0.063008	<.0001	0.000547	0.9462	0.109803	<.0001
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.03493	0.0015	-0.00858	0.4103	-0.05029	0.0001	-0.01743	0.0951	0.018677	0.1043	-0.07414	<.0001
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.06863	<.0001	-0.05927	<.0001	-0.03949	0.0128	-0.09631	<.0001	-0.08191	<.0001	-0.09163	<.0001
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	0.007396	0.2238	-0.00936	0.105	0.030193	<.0001	0.017348	0.0027	-0.00405	0.5253	0.050309	<.0001

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.05356	0.5977	0.098344	0.3075	-0.09177	0.4435	-0.01138	0.9062	0.044235	0.6775	0.008229	0.9608
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.205225	<.0001	0.089371	0.0072	0.20272	<.0001	0.016106	0.6289	-0.106	0.0039	0.276698	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.07395	<.0001	-0.00708	0.5387	-0.10978	<.0001	-0.02416	0.0363	0.065789	<.0001	-0.13909	<.0001
DfBR	Dispensing Fee for Basic Rx		-0.00911	0.0488	-0.01579	0.0003	0.006397	0.2409	-0.02147	<.0001	-0.02705	<.0001	-0.00046	0.9523
DfGen	Dispensing Fee for Generic Rx		0.014035	0.0007	0.015609	<.0001	0.000689	0.8871	0.016836	<.0001	0.01964	<.0001	-0.00182	0.7887
DfInst	Dispensing Fee for Institutional Rx		-0.00658	<.0001	-0.00842	<.0001	0.001406	0.3801	-0.00465	0.0003	-0.00707	<.0001	0.002524	0.2599
DfUD	Dispensing Fee for Unit Dose Rx		0.000835	0.5859	0.001968	0.1762	-0.00012	0.9464	0.006681	<.0001	0.007333	<.0001	0.006122	0.0155

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Central Nervous System Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Central Nervous System Agents

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXI		GPRRXI		GDRRXI		NGRAmountI		GPRAmountI		GDRAmountI	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8685**		**0.9052**		**0.7547**		**0.9234**		**0.9361**		**0.6864**	
SSE	7.1657		6.3442		2.5317		6.9641		8.1811		25.626	
MSE	0.0021		0.0019		0.0008		0.0021		0.0024		0.0076	
DFE	3367		3367		3367		3367		3367		3368	
Root MSE	0.0461		0.0434		0.0274		0.0455		0.0493		0.0872	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3368	
F Value	161.42	<.0001	228.48	<.0001	64.5	<.0001	251.32	<.0001	302.17	<.0001	51.22	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.765279	<.0001	0.773875	<.0001	1.010627	<.0001	0.194797	<.0001	0.275153	<.0001	0.823006	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.05922	<.0001	-0.06557	<.0001	0.00402	0.4824	-0.05956	<.0001	-0.10231	<.0001	0.0457	0.0121
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.06314	<.0001	-0.05849	<.0001	-0.01261	0.0025	-0.06576	<.0001	-0.07857	<.0001	-0.01456	0.2716
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	0.01569	0.1823	0.004058	0.7139	0.019367	0.0056	0.05927	<.0001	0.030538	0.0151	0.092216	<.0001
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.045925	<.0001	0.040706	<.0001	0.012991	0.0229	0.054628	<.0001	0.072633	<.0001	0.031405	0.0837
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.00511	0.2815	-0.00806	0.0709	0.001466	0.603	-0.00418	0.3707	-0.00308	0.5431	-0.00453	0.6135
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.05023	<.0001	-0.03611	<.0001	-0.02502	<.0001	-0.02593	0.0001	-0.00795	0.2762	-0.05046	<.0001
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.0537	<.0001	-0.03756	<.0001	-0.02381	<.0001	-0.04229	<.0001	-0.02546	0.0004	-0.05303	<.0001
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	-0.05789	<.0001	-0.03937	<.0001	-0.03046	<.0001	-0.02699	<.0001	-0.00855	0.2006	-0.07352	<.0001
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.03958	<.0001	-0.03322	<.0001	-0.01212	0.0002	-0.02439	<.0001	-0.03002	<.0001	-0.01656	0.1059
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	0.011408	0.1379	0.007941	0.2723	-0.00237	0.6036	0.028292	0.0002	0.022495	0.0062	-0.02868	0.0485
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.044087	<.0001	0.040006	<.0001	0.002711	0.6281	0.04301	<.0001	0.039062	0.0001	0.017767	0.3183
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.04385	<.0001	-0.0396	<.0001	-0.00963	0.0001	-0.02561	<.0001	-0.02676	<.0001	-0.00113	0.888

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	0.060284	0.3965	0.000968	0.9885	0.070504	0.0953	0.125844	0.0726	0.261525	0.0006	-0.33078	0.0139
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.116872	<.0001	0.098666	<.0001	0.045507	0.0018	0.01289	0.5942	0.001144	0.9652	0.192935	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.003544	0.6766	-0.00564	0.4806	0.00678	0.1795	0.032873	<.0001	-0.01592	0.0796	0.069612	<.0001
DfBR	Dispensing Fee for Basic Rx		0.01495	<.0001	0.011483	0.0002	0.006904	0.0003	0.009963	0.0018	0.002925	0.3981	0.021758	0.0004
DfGen	Dispensing Fee for Generic Rx		-0.02135	<.0001	-0.01261	<.0001	-0.01542	<.0001	-0.01646	<.0001	-0.00439	0.1545	-0.04284	<.0001
DfInst	Dispensing Fee for Institutional Rx		0.001993	0.0363	0.001368	0.1264	0.000948	0.0938	-0.00001	0.9895	-0.00086	0.3975	0.003891	0.0306
DfUD	Dispensing Fee for Unit Dose Rx		-0.00469	<.0001	-0.00548	<.0001	0.000819	0.1993	0.001365	0.1973	0.000656	0.5673	0.004536	0.0256

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Stimulants/Anti-Obesity/Anorexia Generic Rates by Prescriptions (RX) & Reimbursement ($)

Stimulants/Anti-Obesity/Anorexia

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXJ		GPRRXJ		GDRRXJ		NGRAmountJ		GPRAmountJ		GDRAmountJ	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8544**		**0.9319**		**0.5685**		**0.8671**		**0.926**		**0.5203**	
SSE	27.8071		21.6963		29.0951		29.8642		28.2503		39.6796	
MSE	0.0083		0.0065		0.0087		0.0089		0.0084		0.0118	
DFE	3356		3356		3356		3356		3356		3357	
Root MSE	0.091		0.0804		0.0931		0.0943		0.0917		0.1087	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3356		3356		3356		3356		3356		3357	
F Value	94.35	<.0001	211.65	<.0001	27.21	<.0001	107.6	<.0001	196.18	<.0001	25.08	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.085454	0.0139	0.126111	<.0001	0.883729	<.0001	-0.09002	0.0124	-0.05403	0.1228	0.838582	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.00782	0.6812	0.034111	0.0426	-0.04019	0.0392	0.018733	0.3426	0.078792	<.0001	-0.04589	0.0437
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.03965	0.0041	0.019627	0.1079	-0.07655	<.0001	-0.02738	0.056	0.048682	0.0005	-0.1116	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.04751	0.0407	-0.02913	0.1555	-0.02498	0.2927	0.044907	0.062	0.071564	0.0022	-0.02824	0.3084
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.134341	<.0001	0.038118	0.0229	0.161299	<.0001	0.082667	<.0001	-0.00501	0.7933	0.206536	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.02323	0.0136	-0.04702	<.0001	0.023418	0.015	-0.01219	0.2111	-0.04415	<.0001	0.039849	0.0004
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.02442	0.0703	-0.00253	0.832	-0.02806	0.042	-0.01478	0.2903	0.004211	0.7568	-0.03508	0.0295
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.03368	0.0105	-0.04549	<.0001	-0.0047	0.7266	-0.00417	0.7599	-0.02391	0.0713	0.000631	0.9679
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	-0.05851	<.0001	-0.04935	<.0001	-0.01415	0.2621	-0.04229	0.0009	-0.04102	0.001	-0.01611	0.2743
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.02044	0.0559	-0.03951	<.0001	0.015361	0.1601	-0.00453	0.6827	-0.03005	0.0053	0.020356	0.1108
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	0.021266	0.1638	0.021223	0.1157	0.007314	0.6396	0.028206	0.0748	0.029867	0.0524	0.005183	0.7763
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.097159	<.0001	0.108124	<.0001	0.038287	0.0441	0.058721	0.0023	0.088376	<.0001	0.052764	0.0175
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.01541	0.0669	-0.0174	0.0192	0.005475	0.5244	-0.01241	0.1546	-0.01655	0.0508	0.016901	0.0924

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	0.478489	0.0007	-0.04098	0.7411	0.363948	0.0113	0.66589	<.0001	-0.04168	0.7684	0.314718	0.0606
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	-0.19555	<.0001	-0.04783	0.2637	-0.10813	0.0292	-0.35578	<.0001	-0.17118	0.0005	-0.14472	0.0124
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.00985	0.5573	0.034752	0.0191	-0.01603	0.3502	0.002303	0.8946	0.058694	0.0005	0.017177	0.3913
DfBR	Dispensing Fee for Basic Rx		0.015047	0.0187	0.036338	<.0001	-0.01376	0.0355	0.010975	0.0979	0.038494	<.0001	-0.01009	0.1866
DfGen	Dispensing Fee for Generic Rx		-0.00351	0.5371	-0.02766	<.0001	0.015411	0.0082	0.002236	0.7046	-0.02616	<.0001	0.007045	0.3001
DfInst	Dispensing Fee for Institutional Rx		0.003703	0.0487	0.004145	0.0125	-0.00046	0.8095	0.003293	0.0907	0.004616	0.0148	-0.00302	0.1779
DfUD	Dispensing Fee for Unit Dose Rx		-0.00396	0.0617	-0.00519	0.0056	0.001317	0.5435	-0.00383	0.081	-0.00602	0.0048	0.001702	0.5015

NGR_RX (Net Generic Rate by RX) NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX) (IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX) NMS / (IMS + NMS)

NGR_AMO (Net Generic Rate by $) NMS / (SS + IMS + NMS)
GPR_AMO (Generic Prescribing Rate (IMS + NMS) / (SS + IMS + NMS)
GDR_AMO (Generic Dispensing Rate NMS / (IMS + NMS)

Misc. Psychotherapeutic & Neurology Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Misc. Psychotherapeutic & Neurology Agents

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXK		GPRRXK		GDRRXK		NGRAmountK		GPRAmountK		GDRAmountK	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.846**		**0.8429**		**0.5332**		**0.7266**		**0.8134**		**0.3789**	
SSE	38.2068		45.8608		60.3343		37.7811		42.3059		102.7666	
MSE	0.012		0.0144		0.0189		0.0118		0.0132		0.0322	
DFE	3190		3190		3190		3193		3193		3194	
Root MSE	0.1094		0.1199		0.1375		0.1088		0.1151		0.1794	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3190		3190		3190		3193		3193		3194	
F Value	102.48	<.0001	97.88	<.0001	23.33	<.0001	53.46	<.0001	87.51	<.0001	12.69	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Intercept			0.376471	<.0001	0.396982	<.0001	1.037762	<.0001	0.113948	0.0083	0.19835	<.0001	1.067229	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.1521	<.0001	-0.14585	<.0001	0.041333	0.155	-0.16612	<.0001	-0.08195	0.0008	-0.11598	0.0022
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.11329	<.0001	-0.08707	<.0001	-0.0485	0.0231	-0.11676	<.0001	-0.04109	0.0215	-0.17278	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.01118	0.6895	-0.05763	0.0602	0.148377	<.0001	-0.05604	0.0439	-0.08232	0.0052	0.212109	<.0001
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.03328	0.1551	-0.00455	0.8591	0.016791	0.568	0.046245	0.0468	-0.00835	0.7345	0.08528	0.0262
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	0.008882	0.4323	0.051208	<.0001	-0.05832	<.0001	0.019128	0.0889	0.061105	<.0001	-0.085	<.0001
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.11276	<.0001	-0.03745	0.0459	-0.10234	<.0001	-0.09706	<.0001	-0.02743	0.1277	-0.16413	<.0001
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.05866	0.0004	-0.02429	0.1786	-0.04578	0.0271	-0.09826	<.0001	-0.04886	0.0048	-0.12304	<.0001
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	-0.1079	<.0001	-0.10666	<.0001	-0.08494	<.0001	-0.07311	<.0001	-0.09289	<.0001	-0.10456	<.0001
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.04109	0.0019	-0.06324	<.0001	0.015513	0.3512	-0.04749	0.0003	-0.06874	<.0001	-0.00311	0.8857
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	0.052766	0.005	0.036229	0.0783	-0.01339	0.5703	0.100899	<.0001	0.060964	0.002	-0.00227	0.9412
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.11075	<.0001	0.155164	<.0001	-0.15638	<.0001	0.070202	0.007	0.094459	0.0006	-0.10365	0.0158
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.07491	<.0001	-0.07278	<.0001	0.032655	0.0129	-0.03622	0.0005	-0.01975	0.0714	0.029479	0.0841

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	1.587182	<.0001	1.399577	<.0001	0.660574	0.0032	0.955111	<.0001	0.906724	<.0001	1.121546	0.0001
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	-0.52692	<.0001	-0.50154	<.0001	-0.77329	<.0001	-0.23006	0.0003	-0.25375	0.0002	-1.04988	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.06472	0.002	-0.08181	0.0004	0.05607	0.0329	-0.05105	0.014	-0.07687	0.0005	0.022818	0.5054
DfBR	Dispensing Fee for Basic Rx		-0.04574	<.0001	-0.03809	<.0001	-0.05268	<.0001	-0.02807	0.0006	-0.00304	0.7251	-0.08731	<.0001
DfGen	Dispensing Fee for Generic Rx		-0.01722	0.0153	-0.01149	0.1397	-0.00153	0.8634	-0.00165	0.8146	-0.02592	0.0005	0.011388	0.3277
DfInst	Dispensing Fee for Institutional Rx		0.002034	0.3724	0.000579	0.8168	-0.00265	0.355	-0.00211	0.3521	-0.00481	0.0451	0.00199	0.5944
DfUD	Dispensing Fee for Unit Dose Rx		0.015423	<.0001	0.007878	0.0204	0.018602	<.0001	0.009882	0.0013	0.005231	0.1086	0.024423	<.0001

NGR_RX (Net Generic Rate by RX) NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX) (IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX) NMS / (IMS + NMS)

NGR_AMO (Net Generic Rate by $) NMS / (SS + IMS + NMS)
GPR_AMO (Generic Prescribing Rate (IMS + NMS) / (SS + IMS + NMS)
GDR_AMO (Generic Dispensing Rate NMS / (IMS + NMS)

Analgesics & Anesthetics Generic Rates by Prescriptions (RX) & Reimbursement ($)

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Analgesics & Anesthetics											
	Prescriptions (RX)						Reimbursement ($)					
	NGRRXL		GPRRXL		GDRRXL		NGRAmountL		GPRAmountL		GDRAmountL	
Fit Statistics	Estimate		Estimate		Estimate		Estimate		Estimate		Estimate	
R-Square	**0.8338**		**0.8231**		**0.7863**		**0.8185**		**0.8517**		**0.6185**	
SSE	8.1217		6.1785		2.3787		15.7507		15.9008		19.0164	
MSE	0.0024		0.0018		0.0007		0.0047		0.0047		0.0056	
DFE	3367		3367		3367		3367		3367		3368	
Root MSE	0.0491		0.0428		0.0266		0.0684		0.0687		0.0751	
F Test for No Fixed Effects	Estimate	Pr > F	Estimate	Pr > F	Estimate	Pr > F	Estimate	Pr > F	Estimate	Pr > F	Estimate	Pr > F
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3368	
F Value	96.91	<.0001	101.3	<.0001	65.51	<.0001	99.11	<.0001	137.84	<.0001	33.6	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.953498	<.0001	0.958339	<.0001	0.998789	<.0001	0.494352	<.0001	0.622623	<.0001	0.758596	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.02861	0.0053	-0.0164	0.0666	-0.01969	0.0004	-0.01807	0.2055	-0.00739	0.6062	-0.02817	0.0725
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.03561	<.0001	-0.02264	0.0005	-0.02053	<.0001	-0.01878	0.0706	0.000319	0.9756	-0.03417	0.0028
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.0881	<.0001	-0.08392	<.0001	-0.01269	0.0611	-0.06725	0.0001	-0.04216	0.0162	-0.05448	0.0045
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	-0.05	<.0001	-0.04806	<.0001	-0.00401	0.4683	-0.02431	0.0877	-0.06208	<.0001	0.038351	0.0142
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.00914	0.0702	0.005817	0.1865	-0.0176	<.0001	0.00374	0.5947	0.019235	0.0065	-0.01447	0.0611
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.04052	<.0001	-0.01723	0.0067	-0.02971	<.0001	-0.00578	0.5683	0.02033	0.0459	-0.03381	0.0024
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.056345	<.0001	0.046061	<.0001	0.015974	<.0001	0.045236	<.0001	0.011859	0.2323	0.060895	<.0001
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.031011	<.0001	0.018656	0.0013	0.015294	<.0001	0.014118	0.1277	-0.01155	0.2147	0.042699	<.0001
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.051136	<.0001	0.030129	<.0001	0.029878	<.0001	0.032099	<.0001	-0.00378	0.6391	0.071807	<.0001
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.0319	<.0001	-0.01991	0.0053	-0.01537	0.0005	-0.04834	<.0001	-0.02066	0.0713	-0.04887	<.0001
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.07575	<.0001	-0.06496	<.0001	-0.02254	<.0001	-0.07215	<.0001	-0.07211	<.0001	-0.02869	0.0614
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.03077	<.0001	-0.02679	<.0001	-0.00894	0.0003	-0.03647	<.0001	-0.03404	<.0001	-0.01688	0.0151

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.18424	0.015	-0.10765	0.103	-0.04177	0.3079	-0.39286	0.0002	-0.21771	0.0399	-0.12387	0.2848
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.081509	0.0018	0.077222	0.0007	-0.00783	0.5798	0.295545	<.0001	0.148817	<.0001	0.269298	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.025904	0.0042	0.006402	0.4171	0.020438	<.0001	0.044421	0.0004	0.018176	0.151	0.038088	0.0059
DfBR	Dispensing Fee for Basic Rx		-0.00711	0.0392	-0.00483	0.1086	-0.00345	0.0644	-0.00743	0.1218	0.006675	0.1667	-0.01574	0.0029
DfGen	Dispensing Fee for Generic Rx		0.00465	0.1299	0.007278	0.0066	-0.00226	0.1746	-0.01174	0.0061	-0.01042	0.0153	-0.0094	0.0453
DfInst	Dispensing Fee for Institutional Rx		0.001678	0.0976	0.001618	0.0672	0.000253	0.6446	0.002869	0.042	0.006328	<.0001	-0.00222	0.1528
DfUD	Dispensing Fee for Unit Dose Rx		-0.00035	0.758	-0.00266	0.0077	0.002622	<.0001	0.003824	0.0163	-0.00358	0.0254	0.011109	<.0001

NGR_RX (Net Generic Rate by RX) NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX) (IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX) NMS / (IMS + NMS)

NGR_AMO (Net Generic Rate by $) NMS / (SS + IMS + NMS)
GPR_AMO (Generic Prescribing Rate (IMS + NMS) / (SS + IMS + NMS)
GDR_AMO (Generic Dispensing Rate NMS / (IMS + NMS)

Neuromuscular Drugs Generic Rates by Prescriptions (RX) & Reimbursement ($)

Neuromuscular Drugs

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXM		GPRRXM		GDRRXM		NGRAmountM		GPRAmountM		GDRAmountM	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8412**		**0.8587**		**0.9126**		**0.8714**		**0.92**		**0.8764**	
SSE	6.0527		4.4135		6.4934		8.1412		7.9625		15.2026	
MSE	0.0018		0.0013		0.0019		0.0024		0.0024		0.0045	
DFE	3366		3366		3366		3366		3366		3367	
Root MSE	0.0424		0.0362		0.0439		0.0492		0.0486		0.0672	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3366		3366		3366		3366		3366		3367	
F Value	107.43	<.0001	131.64	<.0001	177.75	<.0001	143.86	<.0001	228.83	<.0001	134.2	<.0001
Data Survery Pharmacy Law												
Name in the Analysis	**Description**	**Variables Values CODE**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**
Intercept			0.659239	<.0001	0.778401	<.0001	0.843662	<.0001	0.208603	<.0001	0.394019	<.0001	0.527698	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.04644	<.0001	-0.01935	0.0105	-0.04298	<.0001	0.001494	0.8843	0.023174	0.0225	-0.01973	0.1595
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.01342	0.0371	-0.00044	0.9364	-0.01829	0.0061	0.006548	0.3804	0.018671	0.0115	-0.00459	0.6526
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.02899	0.0074	-0.00628	0.4967	-0.02514	0.0248	0.047389	0.0002	0.051487	<.0001	0.015765	0.3575
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.052318	<.0001	0.045113	<.0001	0.01967	0.0315	0.023838	0.0199	0.038916	0.0001	-0.00495	0.7235
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	0.01915	<.0001	0.011351	0.0023	0.021831	<.0001	-0.00223	0.6593	0.001474	0.7681	0.009445	0.1714
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	0.032196	<.0001	0.016063	0.0028	0.040257	<.0001	0.018027	0.0134	0.021903	0.0024	0.037767	0.0002
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.0028	0.6482	-0.01122	0.032	0.021533	0.0007	-0.0178	0.0123	-0.00813	0.2475	0.010068	0.2996
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	-0.00677	0.2386	-0.03285	<.0001	0.035199	<.0001	-0.01343	0.044	-0.02374	0.0003	0.016465	0.0706
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.001977	0.6913	-0.02109	<.0001	0.033249	<.0001	-0.01168	0.0432	-0.01833	0.0013	0.021741	0.0059
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	0.002994	0.6718	-0.02027	0.0008	0.022609	0.002	0.022797	0.0054	0.001372	0.8655	0.033185	0.0031
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.01798	0.0378	0.012228	0.0981	0.011573	0.1967	0.00789	0.4319	0.00399	0.6877	0.010778	0.4319
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	0.020315	<.0001	0.01043	0.0018	0.014047	0.0005	0.019509	<.0001	0.011724	0.0091	0.026247	<.0001
Data Medicaid Reimbursment												
Name in the Analysis	**Description**	**Variables Values CODE**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**	**Estimate**	**Pr > |t**
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	0.287072	<.0001	0.2607	<.0001	0.144982	0.0323	0.336158	<.0001	0.333482	<.0001	0.313809	0.0025
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.006558	0.7713	-0.01807	0.3484	0.02811	0.2291	-0.02928	0.2633	-0.01902	0.4623	0.090079	0.0118
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.07384	<.0001	-0.03416	<.0001	-0.07133	<.0001	-0.00742	0.4125	0.010843	0.2262	-0.0596	<.0001
DfBR	Dispensing Fee for Basic Rx		-0.00261	0.3806	0.010071	<.0001	-0.01265	<.0001	0.001316	0.7033	0.010905	0.0014	-0.00635	0.1782
DfGen	Dispensing Fee for Generic Rx		-0.00061	0.8167	-0.00895	<.0001	0.006322	0.0213	-0.00746	0.0153	-0.00832	0.0063	-0.009	0.0321
DfInst	Dispensing Fee for Institutional Rx		-0.00106	0.2275	-0.0007	0.3492	-0.00137	0.1293	-0.00247	0.015	-0.00189	0.0598	-0.00463	0.0008
DfUD	Dispensing Fee for Unit Dose Rx		0.004592	<.0001	-0.00028	0.7426	0.006282	<.0001	0.008112	<.0001	0.002891	0.0107	0.012138	<.0001

NGR_RX (Net Generic Rate by RX) NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX) (IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX) NMS / (IMS + NMS)

NGR_AMO (Net Generic Rate by $) NMS / (SS + IMS + NMS)
GPR_AMO (Generic Prescribing Rate (IMS + NMS) / (SS + IMS + NMS)
GDR_AMO (Generic Dispensing Rate NMS / (IMS + NMS)

Nutritional Products Generic Rates by Prescriptions (RX) & Reimbursement ($)

Nutritional Products

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXN		GPRRXN		GDRRXN		NGRAmountN		GPRAmountN		GDRAmountN	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.8155**		**0.7387**		**0.8371**		**0.7867**		**0.7205**		**0.8176**	
SSE	16.0375		8.5056		9.6238		27.5393		21.2287		16.5929	
MSE	0.0048		0.0025		0.0029		0.0082		0.0063		0.0049	
DFE	3367		3367		3367		3367		3367		3368	
Root MSE	0.069		0.0503		0.0535		0.0904		0.0794		0.0702	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3367		3367		3367		3367		3367		3368	
F Value	79.14	<.0001	64.92	<.0001	95.55	<.0001	69.4	<.0001	64.14	<.0001	80.77	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Intercept			0.917896	<.0001	0.979173	<.0001	0.951683	<.0001	0.794196	<.0001	0.86382	<.0001	0.943193	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.08877	<.0001	-0.01724	0.1003	-0.08801	<.0001	-0.04388	0.0201	0.016793	0.3109	-0.09828	<.0001
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.0583	<.0001	0.016961	0.0263	-0.08982	<.0001	0.008501	0.5357	0.072945	<.0001	-0.08204	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	0.050283	0.0043	0.04523	0.0004	-0.00179	0.8958	0.139645	<.0001	0.106816	<.0001	0.044682	0.0126
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.023297	0.1049	-0.00188	0.8573	0.024511	0.0277	0.078073	<.0001	0.041416	0.0123	0.053829	0.0002
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	0.006534	0.3569	0.00593	0.251	0.001705	0.7563	-0.01538	0.098	-0.00619	0.448	-0.01396	0.053
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	0.034668	0.0007	0.034616	<.0001	0.011054	0.163	0.026139	0.0512	0.031722	0.007	0.011757	0.2583
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.030684	0.0021	-0.01068	0.1414	0.051459	<.0001	-0.01573	0.2287	-0.05372	<.0001	0.041725	<.0001
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.02922	0.0018	-0.03067	<.0001	0.069481	<.0001	-0.04255	0.0005	-0.0826	<.0001	0.039475	<.0001
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.025703	0.0015	-0.01797	0.0023	0.055176	<.0001	-0.03055	0.004	-0.06791	<.0001	0.044539	<.0001
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.01125	0.3281	-0.04358	<.0001	0.026904	0.0025	-0.02025	0.1791	-0.06413	<.0001	0.03476	0.003
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.015305	0.2773	-0.00581	0.5713	0.018942	0.0826	0.009247	0.6164	-0.01756	0.2785	0.01913	0.1818
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	0.023212	0.0003	-0.00476	0.3047	0.031509	<.0001	0.028113	0.0008	0.00537	0.4641	0.03233	<.0001

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.28854	0.0067	-0.2367	0.0023	-0.17538	0.0333	-0.14058	0.3132	-0.26756	0.0288	-0.09267	0.3916
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.094139	0.0104	0.047417	0.0763	0.057426	0.0436	0.017424	0.7173	0.046339	0.2727	-0.02017	0.5891
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.018515	0.1453	0.020361	0.0279	0.007255	0.4613	0.033053	0.0473	0.043084	0.0032	0.015815	0.2212
DfBR	Dispensing Fee for Basic Rx		-0.03927	<.0001	-0.02908	<.0001	-0.01943	<.0001	-0.03919	<.0001	-0.0416	<.0001	-0.01325	0.0072
DfGen	Dispensing Fee for Generic Rx		0.016041	0.0002	0.015253	<.0001	0.007264	0.0298	0.004906	0.3855	0.019656	<.0001	-0.00667	0.1282
DfInst	Dispensing Fee for Institutional Rx		0.002282	0.1089	-0.00062	0.5473	0.003134	0.0045	0.001454	0.4358	-0.00037	0.8192	0.002506	0.0835
DfUD	Dispensing Fee for Unit Dose Rx		0.01274	<.0001	0.010648	<.0001	0.00321	0.0099	0.022846	<.0001	0.020345	<.0001	0.006628	<.0001

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Hematological Agents Generic Rates by Prescriptions (RX) & Reimbursement ($)

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Hematological Agents											
	Prescriptions (RX)						Reimbursement ($)					
	NGRRXO		GPRRXO		GDRRXO		NGRAmountO		GPRAmountO		GDRAmountO	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.6259**		**0.7124**		**0.7246**		**0.8344**		**0.8209**		**0.6843**	
SSE	31.0826		11.464		30.8548		13.2858		19.5823		55.6933	
MSE	0.0092		0.0034		0.0092		0.004		0.0058		0.0166	
DFE	3362		3362		3362		3362		3362		3363	
Root MSE	0.0962		0.0584		0.0958		0.0629		0.0763		0.1287	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3362		3362		3362		3362		3362		3363	
F Value	33.39	<.0001	58.88	<.0001	53.8	<.0001	100.24	<.0001	88.54	<.0001	56.86	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
Intercept			0.742832	<.0001	0.900904	<.0001	0.801207	<.0001	0.132899	<.0001	0.154782	<.0001	0.595965	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.06041	0.0026	-0.05058	<.0001	-0.00172	0.9313	-0.05065	0.0001	0.018113	0.2555	-0.13732	<.0001
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.05383	0.0002	-0.02057	0.0203	-0.04039	0.0055	-0.02088	0.0287	0.008853	0.4447	-0.09125	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.00919	0.7077	-0.00331	0.8243	-0.04849	0.0472	0.004061	0.8	-0.0678	0.0005	0.342928	<.0001
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.001975	0.9214	0.013343	0.2724	-0.02558	0.1996	0.046859	0.0003	-0.01364	0.3907	0.160645	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.05296	<.0001	-0.02817	<.0001	-0.04536	<.0001	0.003799	0.5565	0.016919	0.031	-0.05096	0.0001
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	0.031426	0.0274	0.054378	<.0001	-0.01915	0.1773	-0.00006	0.9951	-0.04893	<.0001	-0.04716	0.0134
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.008683	0.532	-0.00778	0.3564	0.005008	0.7175	-0.03114	0.0006	-0.04494	<.0001	-0.09029	<.0001
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.052714	<.0001	0.016679	0.0351	0.045994	0.0004	-0.01418	0.0961	-0.0259	0.0123	-0.04562	0.0089
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	0.012035	0.2865	-0.0125	0.0683	0.0224	0.0465	-0.02556	0.0005	-0.02656	0.0031	-0.08164	<.0001
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.03167	0.0482	-0.01743	0.0733	-0.00451	0.7778	-0.021	0.0451	-0.01718	0.1767	-0.01897	0.3764
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	0.004721	0.8099	0.006845	0.5658	0.022005	0.2605	-0.01428	0.2658	0.030647	0.0492	0.01176	0.6544
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.0283	0.0015	-0.00536	0.3203	-0.02739	0.002	0.022937	<.0001	0.049013	<.0001	-0.03366	0.0046

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|	Estimate	Pr > |t|
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.17047	0.2504	0.181305	0.0442	-0.58452	<.0001	-0.02993	0.7575	0.249335	0.0342	-0.24547	0.2162
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.286269	<.0001	0.123222	<.0001	0.217845	<.0001	0.103819	0.0019	0.032054	0.4299	0.011774	0.8635
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.05363	0.0025	-0.02389	0.0264	-0.03376	0.0558	-0.01961	0.0905	0.01704	0.2256	-0.02891	0.2227
DfBR	Dispensing Fee for Basic Rx		-0.02645	<.0001	-0.0336	<.0001	0.002735	0.6844	-0.01564	0.0004	-0.04141	<.0001	0.039178	<.0001
DfGen	Dispensing Fee for Generic Rx		0.000204	0.9729	0.017143	<.0001	-0.01752	0.0035	0.007047	0.073	0.027191	<.0001	-0.05192	<.0001
DfInst	Dispensing Fee for Institutional Rx		0.007572	0.0001	0.002518	0.0366	0.00985	<.0001	0.003437	0.008	0.00602	0.0001	0.005053	0.057
DfUD	Dispensing Fee for Unit Dose Rx		0.009514	<.0001	0.008684	<.0001	0.002039	0.3607	0.007811	<.0001	0.01008	<.0001	0.005134	0.0867

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Topical Products Generic Rates by Prescriptions (RX) & Reimbursement ($)

Topical Products

		Prescriptions (RX)						Reimbursement ($)					
Unit of Analysis:	**State & Time**	**NGRRXP**		**GPRRXP**		**GDRRXP**		**NGRAmountP**		**GPRAmountP**		**GDRAmountP**	
Measure:	**Prescriptions (RX) & Reimbursement ($)**												
Dependent Variable:	**GPR , GDR & NGR**												
Fit Statistics		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square		**0.7688**		**0.8529**		**0.7508**		**0.745**		**0.9045**		**0.7484**	
SSE		10.4861		4.9648		7.383		11.1004		4.9653		16.8543	
MSE		0.0031		0.0015		0.0022		0.0033		0.0015		0.005	
DFE		3367		3367		3367		3367		3367		3368	
Root MSE		0.0558		0.0384		0.0468		0.0574		0.0384		0.0707	
F Test for No Fixed Effects		**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF		119		119		119		119		119		119	
Den DF		3367		3367		3367		3367		3367		3368	
F Value		58.63	<.0001	121.61	<.0001	47.78	<.0001	57.84	<.0001	186.14	<.0001	46.73	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.86705	<.0001	0.864939	<.0001	1.043825	<.0001	0.388745	<.0001	0.42985	<.0001	0.94365	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.07592	<.0001	-0.05576	<.0001	-0.03773	0.0001	-0.08503	<.0001	-0.06649	<.0001	-0.0623	<.0001
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.03397	<.0001	-0.02088	0.0003	-0.02502	0.0004	-0.03897	<.0001	-0.02693	<.0001	-0.04808	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	-0.00892	0.5305	0.0177	0.0707	-0.03337	0.0052	-0.00481	0.7423	0.024531	0.0123	-0.05007	0.0055
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.039949	0.0006	0.005251	0.5112	0.055703	<.0001	0.07237	<.0001	0.036732	<.0001	0.130708	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.00799	0.1637	-0.00233	0.5546	-0.01177	0.0145	0.003682	0.5327	0.005916	0.1339	-0.00818	0.2603
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	-0.01831	0.0268	-0.01267	0.026	-0.01737	0.0123	-0.01497	0.0785	-0.01631	0.0042	-0.02091	0.0461
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	-0.01766	0.0285	-0.02654	<.0001	0.000255	0.9699	-0.01243	0.1341	-0.01845	0.0009	-0.01295	0.2052
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.003492	0.6442	-0.01477	0.0045	0.016038	0.0115	-0.0062	0.4254	-0.02903	<.0001	0.02066	0.0312
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.01107	0.0912	-0.02656	<.0001	0.016113	0.0034	-0.00542	0.4215	-0.02478	<.0001	0.027839	0.0008
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.02129	0.0221	-0.00763	0.2332	-0.02126	0.0065	-0.00452	0.6367	0.00347	0.5876	-0.00829	0.482
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.02396	0.0355	-0.0072	0.3581	-0.03704	0.0001	-0.03047	0.0094	-0.01461	0.0623	-0.04237	0.0034
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.02188	<.0001	-0.01833	<.0001	-0.01168	0.007	-0.0111	0.0364	-0.01071	0.0026	-0.00469	0.4724

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.18359	0.0329	-0.20947	0.0004	0.084551	0.2414	-0.18835	0.0334	-0.17437	0.0032	0.098549	0.366
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.263809	<.0001	0.145991	<.0001	0.149849	<.0001	0.24927	<.0001	0.089119	<.0001	0.288083	<.0001
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	-0.03846	0.0002	0.003037	0.6676	-0.05851	<.0001	-0.03031	0.0042	0.009962	0.159	-0.06491	<.0001
DfBR	Dispensing Fee for Basic Rx		-0.00219	0.5771	0.002719	0.3133	-0.00897	0.0064	-0.01088	0.007	-0.00674	0.0125	-0.00784	0.1148
DfGen	Dispensing Fee for Generic Rx		-0.00606	0.0822	-0.01169	<.0001	0.005489	0.0608	0.004607	0.1993	-0.00363	0.1305	0.009166	0.0382
DfInst	Dispensing Fee for Institutional Rx		-0.00271	0.0188	-0.00331	<.0001	-0.00003	0.9793	-0.00127	0.2817	-0.00123	0.1218	-0.00044	0.7644
DfUD	Dispensing Fee for Unit Dose Rx		0.004673	0.0003	0.003046	0.0007	0.004402	<.0001	0.006278	<.0001	0.004818	<.0001	0.004587	0.0054

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Miscellaneous Products Generic Rates by Prescriptions (RX) & Reimbursement ($)

Miscellaneous Products

Unit of Analysis: State & Time
Measure: Prescriptions (RX) & Reimbursement ($)
Dependent Variable: GPR , GDR & NGR

	Prescriptions (RX)						Reimbursement ($)					
	NGRRXQ		GPRRXQ		GDRRXQ		NGRAmountQ		GPRAmountQ		GDRAmountQ	
Fit Statistics	**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**		**Estimate**	
R-Square	**0.781**		**0.8245**		**0.5644**		**0.7239**		**0.7683**		**0.62**	
SSE	21.8984		21.0192		24.6396		13.9803		18.1689		48.2026	
MSE	0.0067		0.0064		0.0075		0.0043		0.0056		0.0147	
DFE	3274		3274		3274		3273		3273		3274	
Root MSE	0.0818		0.0801		0.0868		0.0654		0.0745		0.1213	
F Test for No Fixed Effects	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**	**Estimate**	**Pr > F**
Number DF	119		119		119		119		119		119	
Den DF	3274		3274		3274		3273		3273		3274	
F Value	67.69	<.0001	97.75	<.0001	29.55	<.0001	62.17	<.0001	82.55	<.0001	38.85	<.0001

Data Survery Pharmacy Law

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
Intercept			0.408667	<.0001	0.461776	<.0001	0.829651	<.0001	0.07986	0.0018	0.15502	<.0001	0.462881	<.0001
PhGf_Positive_Form	Formulary Based on Positive List	Yes = 1 -- No = 0	-0.05198	0.0026	-0.08191	<.0001	-0.01933	0.2903	0.002894	0.8335	-0.01218	0.4378	-0.01566	0.5402
PhGf_No_Form	No Formulary Specified as Basis	Yes = 1 -- No = 0	-0.00165	0.8952	-0.00953	0.4373	0.000446	0.9732	0.01608	0.1083	0.004238	0.7104	0.078459	<.0001
PhOB_Presc_Permit	Based Only on Prescriber Permission	Yes = 1 -- No = 0	0.028096	0.1782	0.03994	0.0508	-0.02086	0.3461	0.046138	0.0057	0.061284	0.0013	-0.02645	0.3928
PhOB_Others_List	Formulary Based on Others list	Yes = 1 -- No = 0	0.02569	0.1328	0.047553	0.0045	0.027255	0.1328	-0.01061	0.4371	-0.0367	0.0185	0.117038	<.0001
PhOB_Orange_Book	Formulary Based on Orange Book	Yes = 1 -- No = 0	-0.03396	<.0001	-0.03587	<.0001	-0.00536	0.5487	-0.0092	0.1721	-0.0207	0.0071	0.017293	0.1667
PhPm	Generic Substitution is Mandatory	Permissive = 0 -- Mandatory = 1	0.013311	0.2743	0.046955	<.0001	-0.04313	0.0008	0.045136	<.0001	0.060664	<.0001	-0.0016	0.9295
PhPs_Check_Box	Substitution Prevented by Check Box	Yes = 1 -- No = 0	0.03097	0.0097	0.038012	0.0012	0.01207	0.3421	0.006928	0.4706	0.010609	0.3325	0.045719	0.0104
PhPs_Initials	Substitution Prevented by Initials of the Phrase	Yes = 1 -- No = 0	0.003658	0.7439	0.008857	0.4194	-0.00655	0.5811	-0.00937	0.2958	-0.01117	0.2743	0.019994	0.2293
PhPs_Written_Words	Substitution Prevented by Written Phrase	Yes = 1 -- No = 0	-0.00314	0.7474	-0.00062	0.9485	0.007968	0.4416	-0.00592	0.4492	-0.00426	0.6327	0.037537	0.0098
PhCs_Portion_of_cost	Pass On Part of Cost Savings	Yes = 1 -- No = 0	-0.0042	0.7731	0.003109	0.8277	0.009894	0.5224	0.014881	0.2016	0.028816	0.0301	0.046103	0.0331
PhCs_Full_saving	Pass On Full Cost Savings	Yes = 1 -- No = 0	-0.03677	0.0286	-0.02103	0.2013	-0.0191	0.2837	-0.00441	0.7426	0.013924	0.3628	-0.04515	0.07
PhPc	Patient Consent or Notification Required	Yes = 1 -- No = 0	-0.02789	0.0002	-0.02778	0.0002	-0.01921	0.0169	-0.02724	<.0001	-0.03024	<.0001	-0.02626	0.0195

Data Medicaid Reimbursment

Name in the Analysis	Description	Variables Values CODE	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t	Estimate	Pr > |t
AwpDisB	AWP % Discount for Baseline Rx	The value is a % of discount	-0.36671	0.004	-0.18217	0.1445	-0.55387	<.0001	-0.37102	0.0003	-0.19775	0.0885	-0.88004	<.0001
AwpDisG	AWP % Discount for Generic Rx	The value is a % of discount	0.105096	0.016	0.103606	0.0153	0.014137	0.7598	-0.02399	0.4911	-0.05407	0.1735	0.01194	0.8535
AWPCHDA	AWP % Discount by Channel Distribution	Yes presence = 1 -- No presence = 0	0.086036	<.0001	0.070203	<.0001	0.117833	<.0001	0.07056	<.0001	0.043552	0.0023	0.231565	<.0001
DfBR	Dispensing Fee for Basic Rx		-0.01212	0.0372	-0.00813	0.1535	-0.01463	0.0177	-0.00388	0.4033	0.001705	0.7476	-0.04824	<.0001
DfGen	Dispensing Fee for Generic Rx		0.000077	0.9881	-0.00321	0.5243	0.003876	0.4775	-0.00526	0.2006	-0.00834	0.0753	0.01219	0.1103
DfInst	Dispensing Fee for Institutional Rx		-0.00693	<.0001	-0.0031	0.061	-0.00697	0.0001	-0.00204	0.131	-0.00032	0.8377	-0.01111	<.0001
DfUD	Dispensing Fee for Unit Dose Rx		0.018834	<.0001	0.014519	<.0001	0.015831	<.0001	0.006177	0.0001	0.002503	0.1767	0.033987	<.0001

NGR_RX (Net Generic Rate by RX)	NMS / (SS + IMS + NMS)	NGR_AMO (Net Generic Rate by $)	NMS / (SS + IMS + NMS)
GPR_RX (Generic Prescribing Rate by RX)	(IMS + NMS) / (SS + IMS + NMS)	GPR_AMO (Generic Prescribing Rate by $)	(IMS + NMS) / (SS + IMS + NMS)
GDR_RX (Generic Dispensing Rate by RX)	NMS / (IMS + NMS)	GDR_AMO (Generic Dispensing Rate by $)	NMS / (IMS + NMS)

Appendix 6

Policy Variables
Substitution Regulation
and
Financial Incentives Regulation

SUBSTITUTION REGULATION

VARIABLE NAME	VARIABLE DESCRIPTION	DEFINITION
Positive Formulary	Formulary Based on Positive List	A list of specific drugs or drug products that can be substituted.
Non-Formulary	No Formulary Specified as Basis	A state does not define a specific list drugs or drug products that can be substituted.
Others List	Formulary Based on Other Lists	A state have a list other than the Orange Book, or a positive or negative formulary.
Orange Book	Formulary Based on Orange Book	A state reference the Orange Book as the basis for substitution.
How to Prevent Substitution by Check Box	Substitution Prevented by Check Box	A state where substitution may prevent when the prescriber checks a box on the prescription.
How to Prevent Substitution by Initials	Substitution Prevented by Initials of Phrase	A state where substitution may prevent when the prescriber writes the initial of a phrase such as DNS (Do Not Substitute), DAW (Dispense as Written), or BMN (Brand Medically Necessary) on the prescription.
How to Prevent Substitution by Writing Words	Substitution Prevented by Written Phrase	A state where substitution may prevented when the prescriber hand-writes a phrase such as "Do Not Substitute", "Dispense as Written", or "Brand Medically Necessary" on the prescription.
Patient Cost Saving by Portion of the Cost	Pass On Part of Cost Savings	A state where part of the cost savings from a generic must be passed on to the patient.
Patient Cost Saving by Full Saving	Pass on Full Cost Savings	A state where full cost savings from a generic must be passed on to the patient.
Prescriber Permission	Based Only on Prescriber Permission	A state where statute or regulation substitution can occur only if the prescriber gives permission to do so.
Permissive or Mandatory	Generic Substitution is Mandatory	A state where statute or regulation mandates generic substitution unless otherwise specified by the prescriber or the patient.
Patient Consent	Patient Consent or Notification Required	A state where patient consent or notification is required in order to substitute a generic.

SUBSTITUTION REGULATION (FINANCIAL INCENTIVES REGULATION)

VARIABLE NAME	VARIABLE DESCRIPTION	DEFINITION
Basic Discount AWP	AWP % Discount for Baseline Rx	Is the percentage by which AWP is discounted to pay pharmacy for the drug ingredient cost. [For example, if the AWP discount is 15%, then the pharmacy will get paid 0.85 x AWP for the drug ingredient cost of a prescription.] The mean discount off of AWP is 10.14% across State-Qtr-Year observations.
Discount Generic AWP	AWP % Discount for Generic Rx	Is the percentage by which AWP is discounted to pay pharmacy for the generic drug ingredient cost. [For example, if the AWP discount is 15%, then the pharmacy will get paid 0.85 x AWP for the drug ingredient cost of a generic prescription.] The mean discount off of AWP for generics is 11.99% across State-Qtr-Year observations.
AWP Channel Distribution A	AWP % Discount by Channel of Dist.	A State where the discount off of AWP differs across one or more channels of distribution (i.e., institutional (hospitals and long term care), chains, independents). About 93.8% of the State-Qtr-Year observations (3,309/3,528) have a discount off of AWP that differs for one or more channels of distribution.
Dispensing Fee Base Rate	Dispensing Fee for Basic Rx	The amount of the dispensing fee paid to the pharmacy for each basic prescription dispensed. The average dispensing fee for a basic prescription was $4.32 across all State-Qtr-Year observations.
Generic Dispensing Fee	Dispensing Fee for Generic Rx	The amount of the dispensing fee paid to the pharmacy for each generic prescription dispensed. The average dispensing fee for a generic prescription was $4.39 across all State-Qtr-Year observations.
Institutional Dispensing Fee	Dispensing Fee for Institutional Rx	The amount of the dispensing fee paid to an institutional pharmacy for each prescription dispensed. The average dispensing fee for an institutional prescription was $4.55 across all State-Qtr-Year observations. State-Qtr-Years where the institutional dispensing fee was higher had:
Unit Dose Dispensing Fee	Dispensing Fee for Unit Dose Rx	The amount of the dispensing fee paid to the pharmacy for each unit dose prescription dispensed. The average dispensing fee for a unit dose prescription was $4.63 across all State-Qtr-Year observations.