



WORKERS COMPENSATION PRESCRIPTION DRUG STUDY: 2011 UPDATE

Workers compensation medical costs per claim average more than \$6,000 and soar to nearly \$25,000 for lost-time claims. This update examines workers compensation prescription drug (Rx) use, a medical expense that makes up 19% of all workers compensation (WC) medical costs.

KEY FINDINGS

- The indicated Rx share of total medical is 19%; this is slightly higher than the estimate given in our 2010 update [1]
- OxyContin® climbs from the number 3 WC drug in Service Year 2008 to number 1 in Service Year 2009
- Hydrocodone-Acetaminophen drops from the top WC drug in Service Year 2008 to number 3 in Service Year 2009
- Recent overall cost increases are driven more by utilization increases than by price increases
- Physician dispensing continues to increase in Service Year 2009 in almost every state
- Increased physician dispensing is associated with increased drug costs per claim
- Per-claim Rx costs vary significantly by state

This report first looks at the countrywide share of WC medical costs due to prescription drugs and the impact of price and utilization changes on those costs. We then look at physician dispensing. Finally, we look at costs by state and some drivers of those costs.

HISTORICAL BACKGROUND

NCCI has been releasing studies on the use of prescription drugs in workers compensation, a significant driver of WC medical costs, for many years. Our 2003 installment showed that utilization (as opposed to price) increases were the driving force behind total per-claim WC Rx cost increases. Several drugs, such as Actiq®, Mobic®, and OxyContin® have shown significant changes in market share over the course of these prior studies. In 2010, NCCI identified a sudden and significant growth in the share of WC drugs dispensed by physicians. For further historical details, please see our previous six studies—available for download at ncci.com.

STUDY DATA

The data used in this study is for medical services provided between 1996 and 2009 on both lost-time and medical-only claims that occurred between 1994 and 2009, evaluated* as of July 1, 2010. “Prescription drug,” as used in this study, is defined as a drug identified with a National Drug Code (NDC) or a carrier-specialized drug code.

Drug costs that are bundled with other services and included in codes such as Hospital Revenue Codes, Healthcare Common Procedure Code System (HCPCS), or Current Procedural Terminology (CPT) were not included in this study.

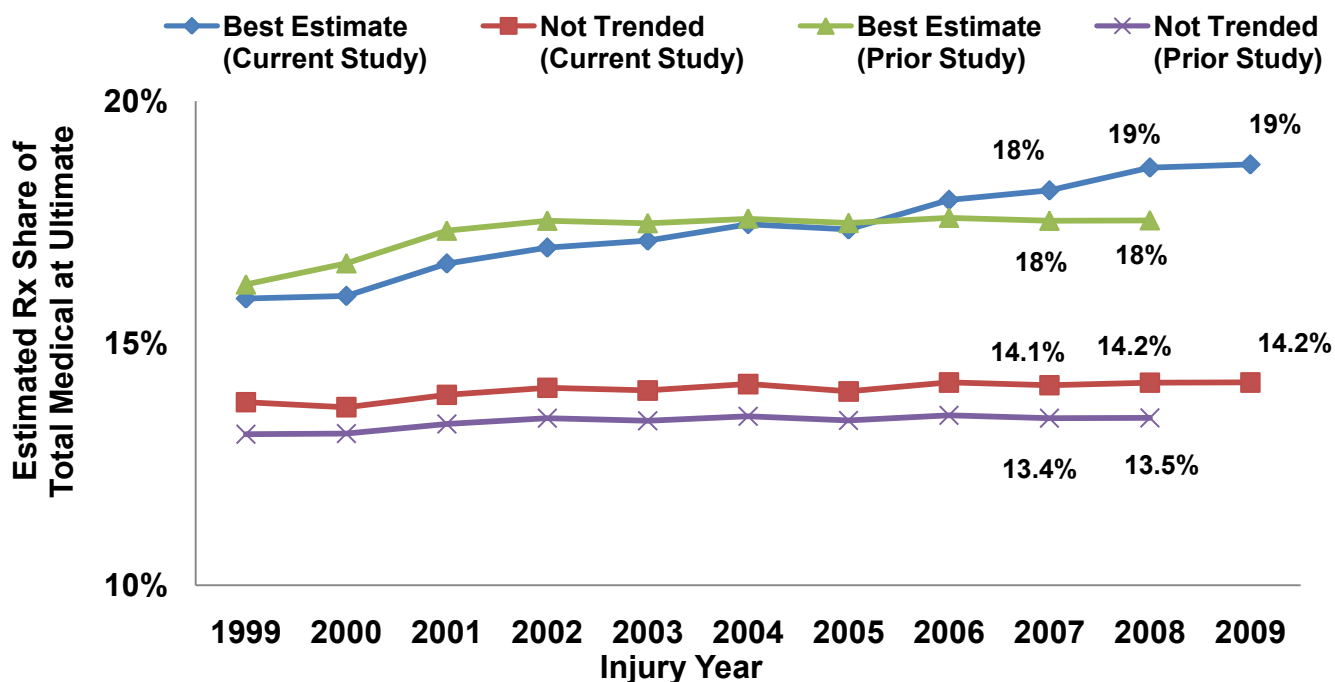
* In order for transactions to be present in our data, they must be reported and entered into carriers’ systems. For instance, if a claimant received a service on December 29, 2001, it’s possible that the carrier did not have this transaction entered into their system until January 12, 2002. As such, historical data is ever-changing, and we must examine it “evaluated as of” a certain date.

RX SHARE OF TOTAL MEDICAL

We begin with the updated estimate of the Rx share of total medical costs. Exhibit 1 displays two estimates of this share:

- The first estimate, our best estimate, accounts for anticipated trends. At 19% for Injury Year* 2009, this estimate is slightly higher than in our prior study [1].
- The second estimate, which does not consider future trends, serves as a reference for the first. The indicated value under this scenario is also higher than in our prior study.

The Indicated Rx Share of Total Medical Is Slightly Elevated From the Last Study



Source: Derived from sample data provided by carriers

Aggregation of states where NCCI provides ratemaking services, excl. WV, plus CA, DE, MA, MI, MN, NJ, NY, PA, and WI
 Prior Study: "Workers Compensation Prescription Drug Study—2010 Update" available at ncci.com

Exhibit 1

* WC looks at costs by injury year (the year of injury) because insurance coverage continues (potentially for many years) following the date of injury in WC. This "long-tail" feature of WC is distinct from most other lines of insurance coverage, which are usually confined to the 12-month policy year for which premium is charged. As a result, other types of insurance coverage are much more sensitive to short-term increases in costs, while WC is subject to substantial long-term cost pressures.

The "long-tail" nature of WC is critical and underscores the need for further research. Substantial quantities of medical services are routinely delivered for many years following the occurrence of a WC claim. As a result, estimates of the annual costs and reserves on serious claims must fully account for the compounding effect of medical inflation. For example, at an annual medical cost inflation of 10%, the annual cost of a fixed regimen of medical treatment will be nearly double the first year's cost in the eighth year following the claim.

The methodology behind the two estimates rests on the observed and projected incremental shares^{*} shown in Exhibits 2 and 3 and on an estimated payout pattern.

The observed and projected incremental Rx shares for Relative Service Years[†] 1 through 9 are shown in Exhibit 2. As observed in prior studies, incremental Rx shares generally display two distinct patterns:

1. The shares increase as claims age. The later relative service years have systematically higher Rx shares of total medical than the earlier relative service years. Rx costs for 1- to 2-year-old claims comprise only around 3% of total medical costs, but Rx costs on claims more than 11 years old make up more than 40% of all medical costs in these periods.
2. For more recent injury years, the Rx share of total medical costs is greater than for older injury years, as evidenced by the general upward trend of each line.

The shares observed in Service Year 2009 for Relative Service Years 4 through 9 are distinctly higher than in previous service years. Subsequent exhibits suggest that increases in physician dispensing might be contributing to this growth.

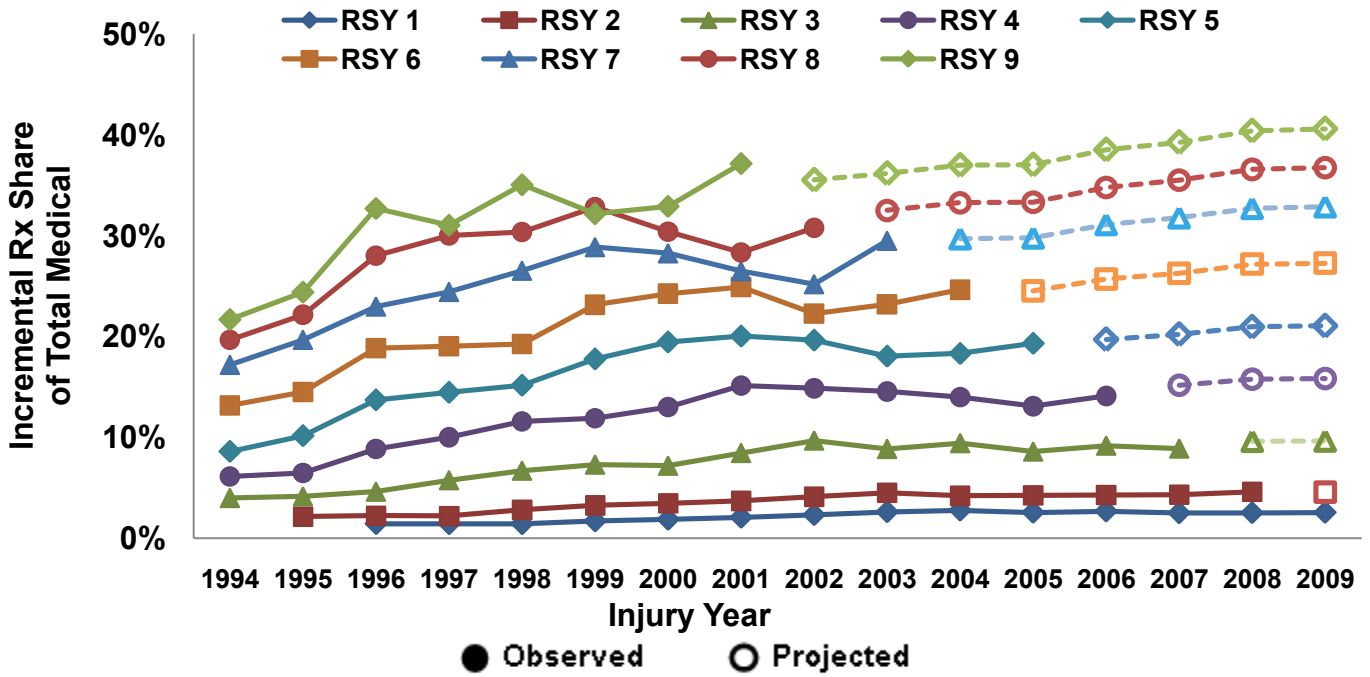
The projections are based on a statistical model that gives consideration to trends by service year,[‡] relative service year, and injury year. Details are given in Appendix 1.

* The incremental Rx share of total medical costs is defined as WC Rx costs within (and only within) a given relative service year and service year combination divided by WC medical costs within (and only within) the same relative service year and service year combination.

† The first relative service year consists of all services in the calendar year of the injury. The second relative service year consists of all of the services provided in the calendar year following the year of injury, and so on. For example, if an injury occurs in November 1999, any treatments and prescriptions filled in 1999 are part of the first relative service year, and any treatments in 2000 would be in the second relative service year. Treatments in 2001 would be part of the third relative service year, and so on.

‡ A service year consists of all services in a calendar year aggregated across applicable (and available) injury years. For instance, if the data consists of all injuries that occurred in 1994 through 2007 (or injury years 1994 through 2007), then Service Year 2000 would consist of all payments made in the year 2000 for those injuries that occurred in the years 1994 through 2000.

Service Year 2009 Shows an Increase in the Incremental Rx Share of Medical Costs



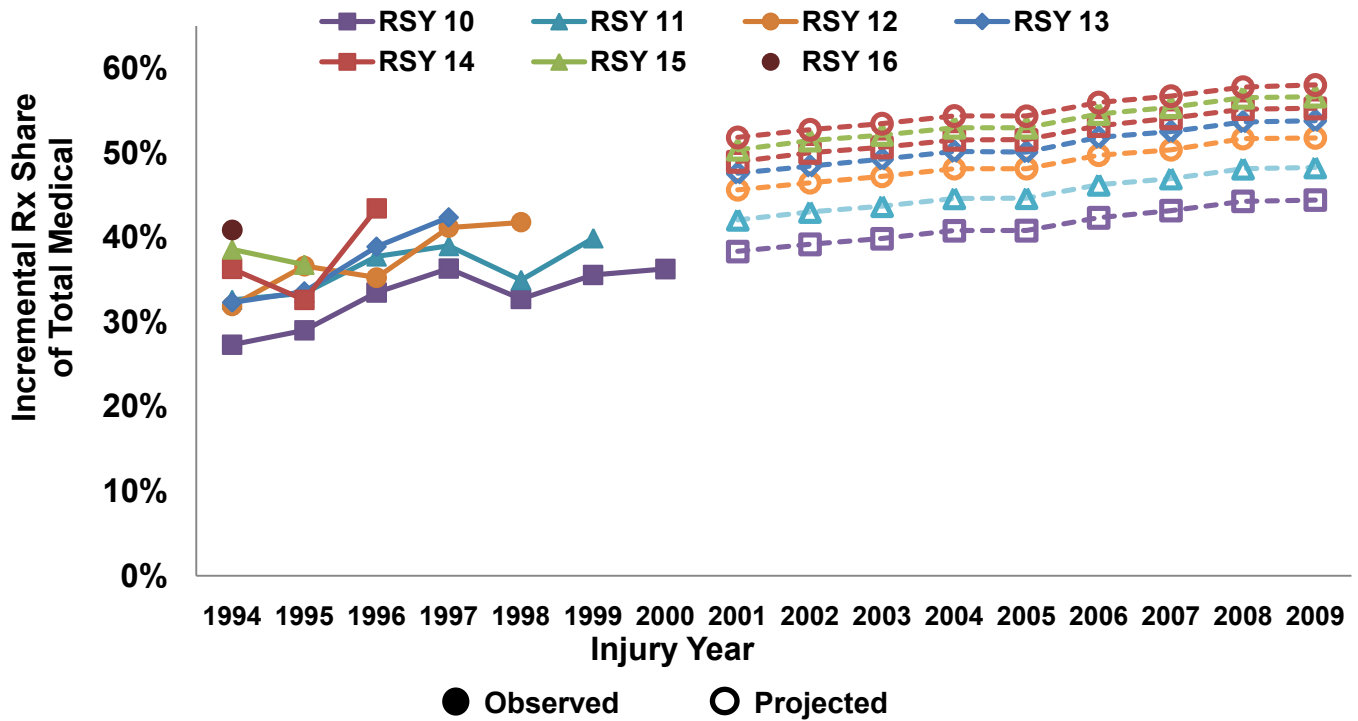
Source: Derived from sample data provided by carriers

Aggregation of states where NCCI provides ratemaking services, excl. WV, plus CA, DE, MA, MI, MN, NJ, NY, PA, and WI

Exhibit 2

The observed and projected incremental Rx shares for Relative Service Years 10 to 16 are shown in Exhibit 3. As noted in previous updates, these older relative service years do not demonstrate as clear a pattern as the earlier relative service years. Rather, incremental Rx shares in these older relative service years start to converge on a single value and become almost indistinguishable from one another. The smaller differences between the projections for successive relative service years reflect this.

Older Relative Service Years Continue to Converge



Source: Derived from sample data provided by carriers

Aggregation of states where NCCI provides ratemaking services, excl. WV, plus CA, DE, MA, MI, MN, NJ, NY, PA, and WI

Exhibit 3

CHANGES IN PRESCRIBING PATTERNS

Exhibit 4 lists the top 50 drugs, ranked by dollars paid, for Service Year 2009 along with their historical rankings. Many movements in these rankings tightly coincide with FDA approval dates.

As mentioned in our previous update [1], the rise of OxyContin[®] and the fall of its generic, Oxycodone HCL, are a result of the reinstatement of the patent on the brand name drug. Because brand name drugs generally go off patent—and not the other way around—such a trend is atypical.

Celebrex[®] ranks as the number 5 WC drug in 2009. Vioxx[®] and Bextra[®] were taken off the market in September 2004 and April 2005, respectively, leaving Celebrex[®] as the only one of the big three COX-2 inhibitors remaining on the market.

In 2007, NCCI noted that Mobic[®], which some countries other than the United States classify as a COX-2 inhibitor [3], seemed to be replacing some of the share left after the removal of Vioxx[®] and Bextra[®] from the market [2]. NCCI also noted that the generic version of Mobic[®]—Meloxicam—had recently received FDA approval. Mobic[®] has now dropped out of our top 50 list and Meloxicam rose from the number 15 drug in 2007 to the number 9 drug in 2009. At the same time, Celebrex[®] fell from the number 3 drug in 2007 to the number 5 drug in 2009.

Flector[®], a patch that one places on the skin to relieve the acute pain of minor strains, sprains, and bruises, received FDA approval in early 2007. Flector[®] had ranked lower than 1000 in 2007, but it is the number 14 drug in 2009.

Amrix[®], which also received FDA approval in early 2007, is marketed as “the only once-a-day treatment for the relief of muscle spasm throughout the day” [4]. Amrix[®] was the number 266 drug in 2007, but has moved up to number 23 in 2009.

The decline of Topamax[®], used to treat migraines, coincides with the rise of its generic equivalent, Topiramate. This generic equivalent received recent FDA approval at the end of Q1 2009.

Dendracin, Neurodendraxin[®]—used in the treatment of muscle pain—has grown from the number 344 drug in 2007 to number 40 in 2009. The three active ingredients in this cream are Capsaicin, Menthol, and Methyl Salicylate [5]. Physicians dispense over 97% of all WC Dendracin, Neurodendraxin[®] scripts. Typical WC costs are \$225 for a 120 ml (4.1 oz) bottle.

Appendix 2 gives short descriptions of the top 15 drugs.

Top 50 Drugs for Service Year 2009

Paid Share Service Year 2009	Drug Name	Rank by Service Year		
		2009	2008	2007
6.1%	OXYCONTIN®	1	3	8
5.2%	LIDODERM®	2	2	2
5.1%	HYDROCODONE-ACETAMINOPHEN	3	1	1
4.4%	LYRICA®	4	4	4
3.7%	CELEBREX®	5	5	3
3.4%	GABAPENTIN	6	6	5
2.8%	SKELAXIN®	7	7	7
2.7%	CYMBALTA®	8	8	13
2.3%	MELOXICAM	9	11	15
2.3%	CYCLOBENZAPRINE HCL	10	9	9
2.1%	TRAMADOL HCL	11	10	10
2.0%	OMEPRAZOLE	12	15	18
1.8%	FENTANYL	13	12	14
1.5%	FLECTOR®	14	28	>1000
1.4%	OXYCODONE HCL	15	13	6
1.4%	ULTRAM® ER	16	17	23
1.3%	OXYCODONE HCL-ACETAMINOPHEN	17	19	21
1.3%	CARISOPRODOL	18	16	12
1.3%	NAPROXEN	19	14	11
1.2%	KADIAN®	20	23	24
1.1%	ZOLPIDEM TARTRATE	21	18	30
1.1%	OPANA® ER	22	31	57
1.1%	AMRIX®	23	47	266
1.1%	TIZANIDINE HCL	24	22	20
1.1%	AMBIEN CR®	25	26	27
1.0%	PERCOCET®	26	27	25
0.9%	IBUPROFEN	27	21	16
0.9%	NAPROXEN SODIUM	28	24	26
0.8%	OXYCODONE-ACETAMINOPHEN	29	30	32
0.8%	ACTIQ®	30	25	17
0.8%	ENDOCET®	31	40	40
0.7%	AVINZA®	32	32	34
0.7%	LUNESTA®	33	34	41
0.7%	DURAGESIC®	34	29	19
0.7%	NEXIUM®	35	37	37
0.7%	LOVENOX®	36	38	43
0.6%	FENTANYL CITRATE	37	35	28
0.6%	MORPHINE SULFATE	38	41	42
0.6%	EFFEXOR XR®	39	33	36
0.6%	DENDRACIN, NEURODENDRAXIN®	40	76	344
0.6%	TOPIRAMATE	41	-	-
0.6%	TOPAMAX®	42	20	22
0.6%	DICLOFENAC SODIUM	43	44	44
0.5%	PROPOXYPHENE NAP-ACETAMINOPHEN	44	36	33
0.5%	ETODOLAC	45	43	38
0.5%	NABUMETONE	46	42	35
0.5%	PROVIGIL®	47	45	46
0.5%	LEXAPRO®	48	48	45
0.5%	ZANAFLEX®	49	53	58
0.5%	SEROQUEL®	50	52	51

Exhibit 4

PRICE AND UTILIZATION

Per-claim Rx costs grew by 12% in Service Year 2009. Exhibit 5 separates this growth into price and utilization components.

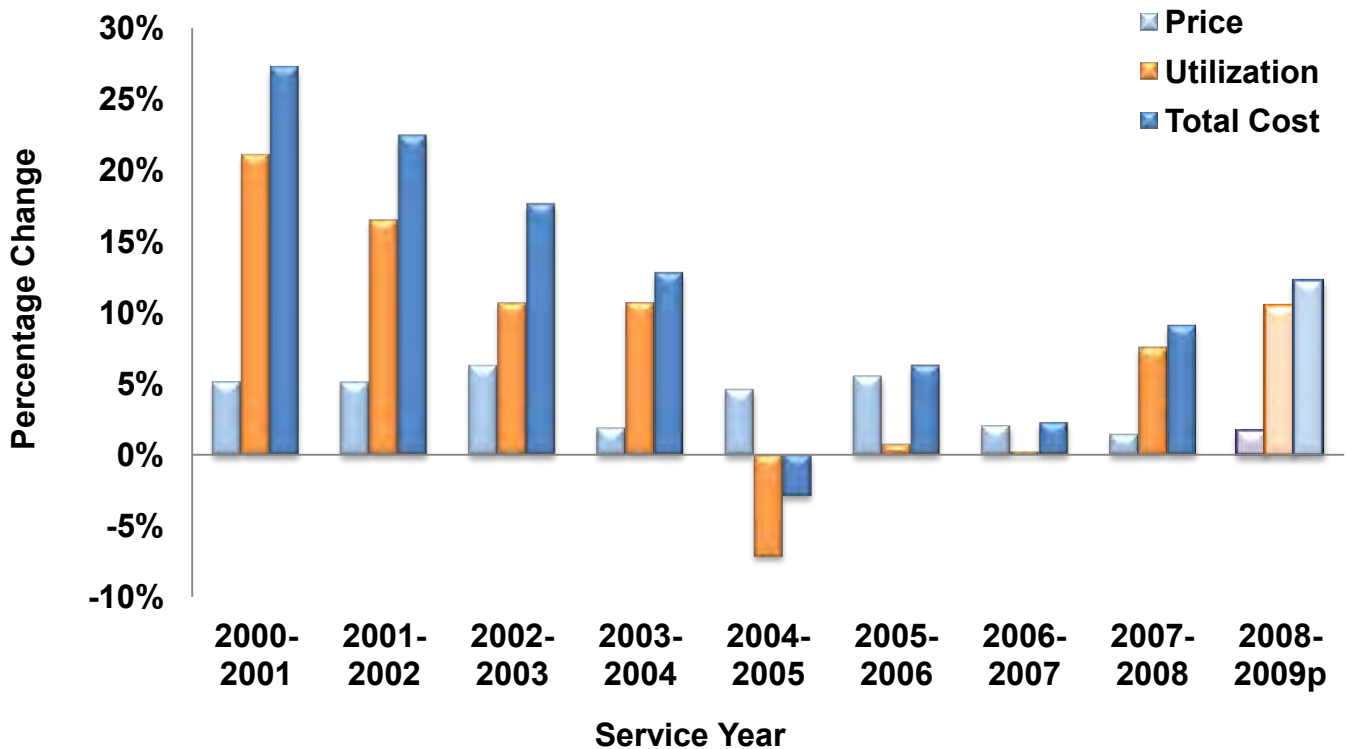
In this exhibit:

- Total cost is the year-over-year impact on WC Rx spend per claim
- Price is the portion of total cost change that can be attributed to changes in the price of the drugs relative to the previous year
- Utilization change is the difference between total cost change and price change, and it includes changes in the number of prescriptions per claim and the impact of changes in the mix of drugs prescribed (i.e., from previously used drugs to newer and more costly alternatives)

The most significant driver for the two most recent years, 2008 and 2009, is utilization. For the three years preceding this period, both total cost and utilization increases had been smaller. This suggests a shift toward either:

- Prescribing more drugs
- Prescribing more expensive drugs
- Some combination of the two

Utilization Continues to Be a Major Cost Driver



Source: Derived from sample data provided by carriers
 Aggregation of states where NCCI provides ratemaking services, excl. WV, plus CA, DE, MA, MI, MN, NJ, PA, and WI
 2009p = Preliminary

Exhibit 5

PHYSICIAN DISPENSING UPDATE

NCCI's previous WC Rx update [1] focused on physician-dispensed drugs. This section updates select findings from that study.

Usually, when a doctor prescribes a drug for a patient, the patient purchases the drug from a pharmacy. But sometimes the doctor fills the prescription in their own office. Some reasons for this include:

1. The physician wants the patient to start taking the drug immediately and dispenses enough medication to last until the patient can get to a pharmacy
2. The physician cannot be sure what the right medication or dosage should be and dispenses a few days' supply of medication to determine whether that course is effective
3. It might be inconvenient for the patient to get to a pharmacy
4. The physician is looking to increase revenue by retaining some of the business they would otherwise send to pharmacies

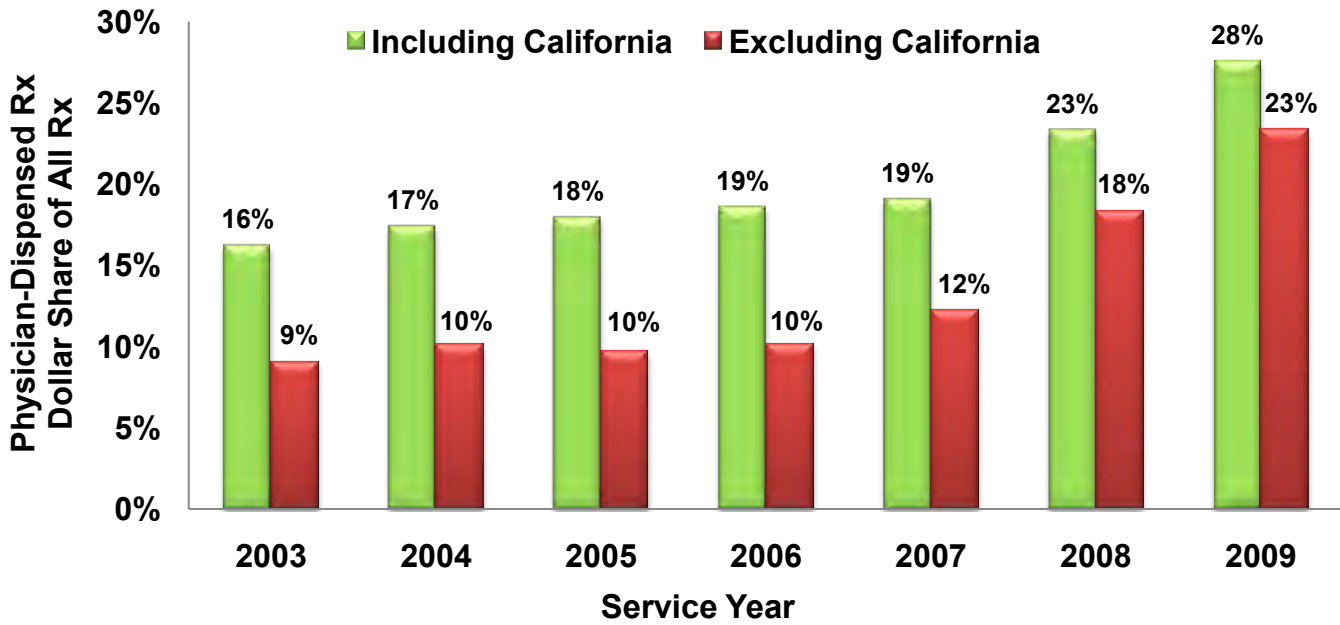
The cost per unit of physician-dispensed drugs is often higher than the cost per unit of the same drug dispensed by a pharmacy. Factors contributing to lower per-unit costs for drugs supplied by pharmacies include:

- Overall economies of scale
- Pharmacies often dispense larger quantities of drugs in each transaction
- Pharmacies can be part of a Pharmacy Benefit Manager's (PBM's) network; PBMs can lower costs by:
 - Negotiating lower prices from manufacturers and pharmacies and then passing these savings on to WC carriers
 - Using formularies (lists of approved drugs) to increase use of generics and other less expensive, but therapeutically equivalent, drugs
 - Providing management reports detailing provider prescribing patterns and drug usage by injured worker

The previous NCCI study found that the share of WC Rx costs associated with physician dispensing, which had been very stable, increased dramatically in Service Year 2008. Exhibit 6 shows that this share increased again in Service Year 2009.

California is a large state and has had a large share of WC drug costs due to physician-dispensed drugs every year from 2003 through 2009. As such, California has a big impact on countrywide statistics.

Physician Dispensing Continues to Increase in Service Year 2009



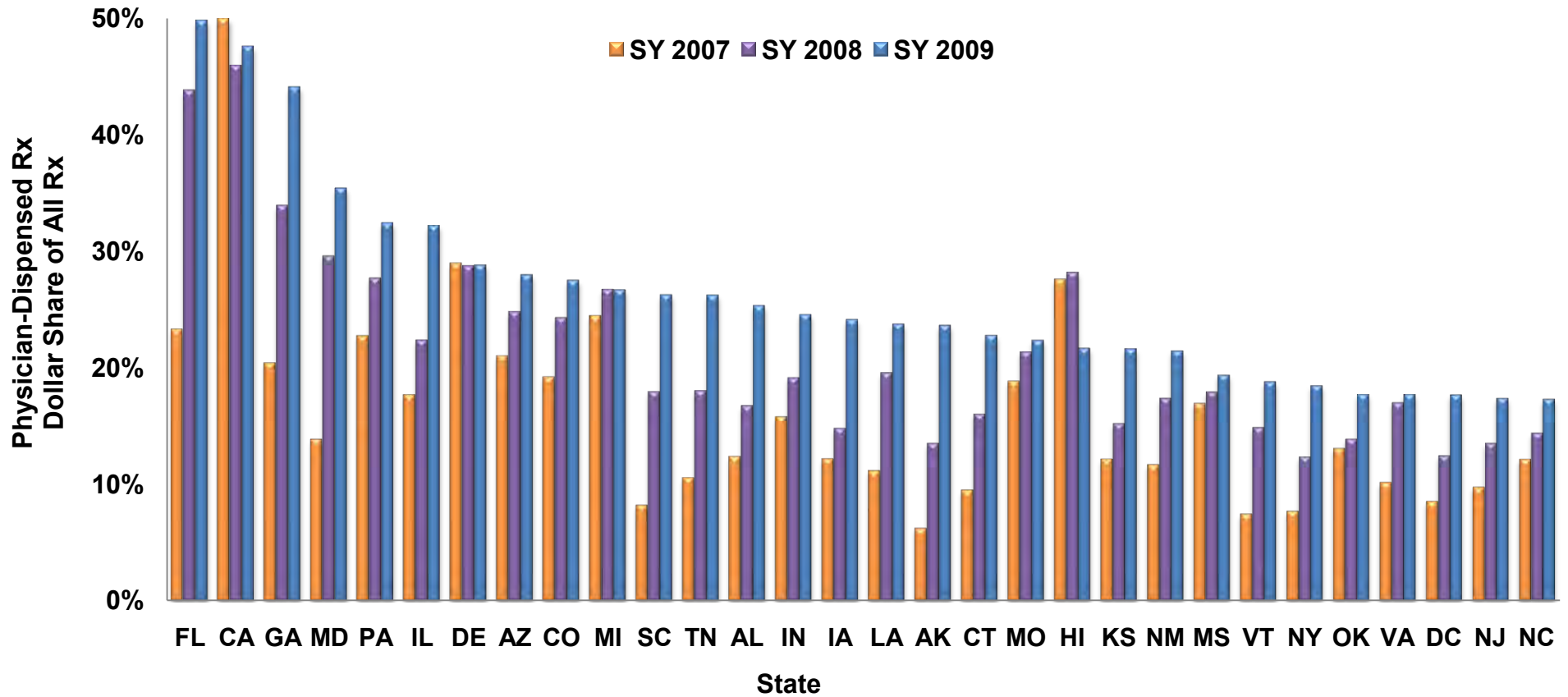
Source: Derived from sample data provided by carriers

Aggregation of states where NCCI provides ratemaking services, excl. WV, plus CA, DE, MA, MI, MN, NJ, NY, PA, and WI
1st through 10th relative service year

Exhibit 6

Physician Dispensing Is on the Rise in Most States

States With Physician Dispensing in 2009 \geq 15.5%

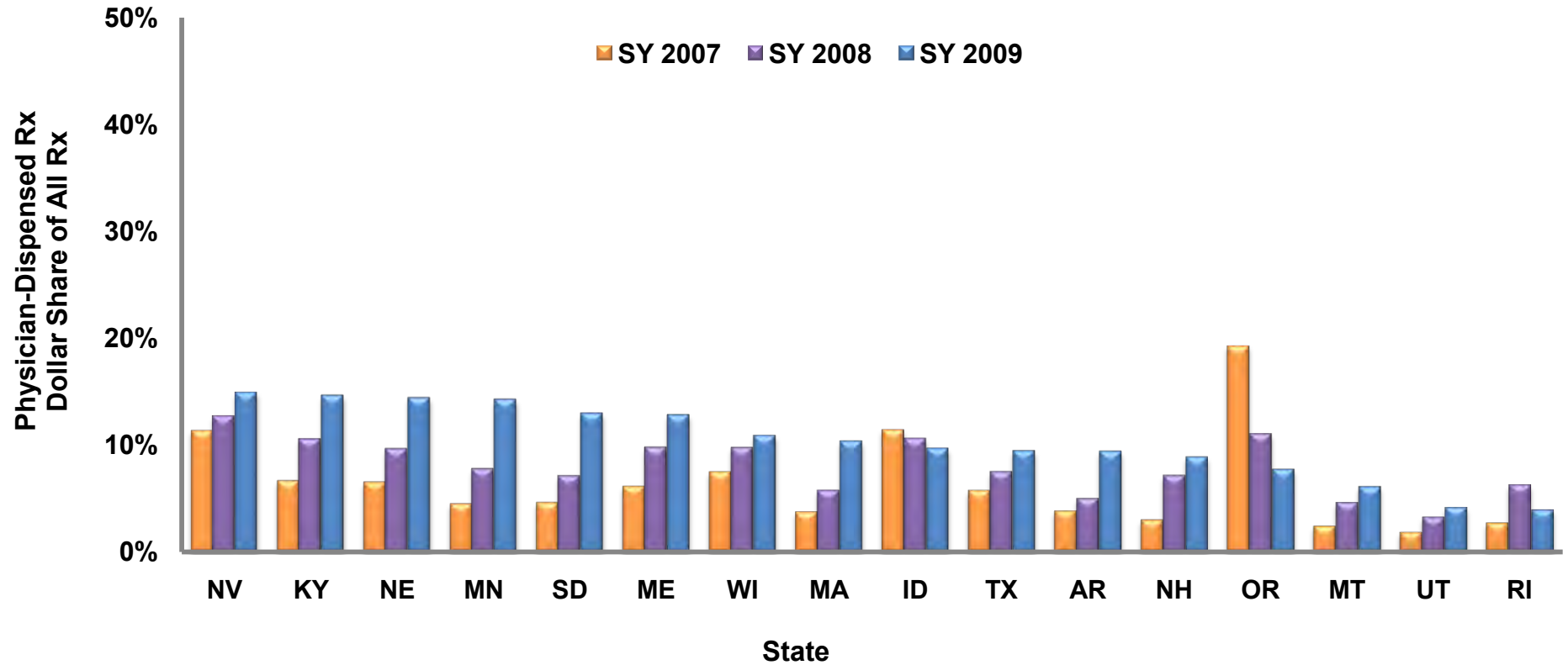


Source: Derived from sample data provided by carriers
 1st through 10th relative service year
 Statistics are based on at least \$150,000 paid Rx for each state service year combination

Exhibit 8

Physician Dispensing Is on the Rise in Most States

States With Physician Dispensing in 2009 < 15.5%



Source: Derived from sample data provided by carriers
 1st through 10th relative service year
 Statistics are based on at least \$150,000 paid Rx for each state service year combination

Exhibit 9

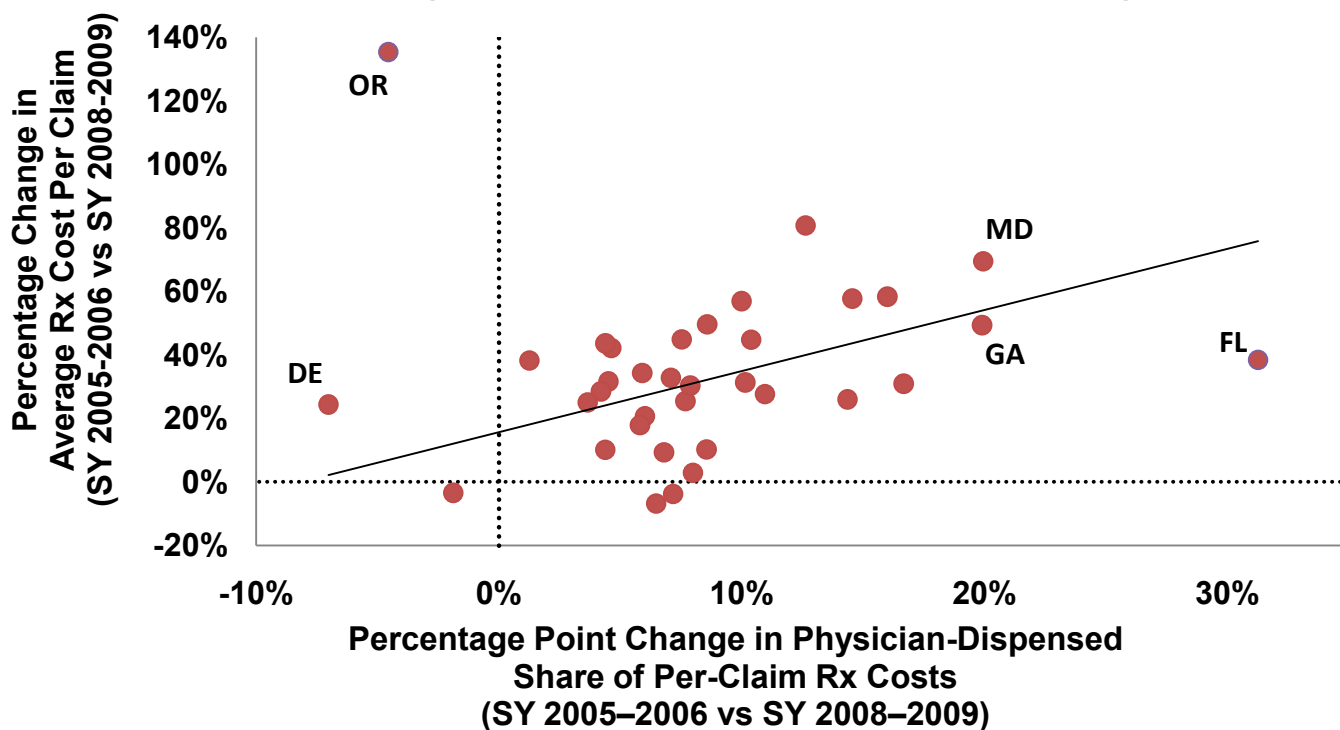
INCREASED PHYSICIAN DISPENSING INCREASES DRUG COSTS PER CLAIM

While the previous section points towards an increased rate of physician dispensing, this section examines how physician dispensing impacts claim costs.

Exhibit 10 shows that increased physician dispensing is related to increased drug costs per claim. States with larger than average increases in the share of drug costs arising from physician-dispensed drugs typically have larger than average increases in per-claim Rx costs. The two notable exceptions are Oregon and Florida.

In our 2010 update [1], we noted that Oregon had recently reduced reimbursement rates and reduced dispensing fees for WC prescriptions; this could explain its lack of growth in the share of Rx costs arising from physician dispensing. And while Oregon has seen higher than average growth in the per-claim Rx costs in total, this growth only shifts Oregon from a rather low Rx cost state to a more typical Rx cost state. Later exhibits will take a closer look at Florida.

Increases in the Share of Drug Costs Due to Physician Dispensing Are Associated With Increases in Drug Costs



Source: Derived from sample data provided by carriers
 States shown have more than 2,500 medical claims for each AY in 1996 to 2009
 Claim counts defined as claims with a medical service by RSY 2 (AY 2009 is projected)
 Regression line does not consider OR and FL

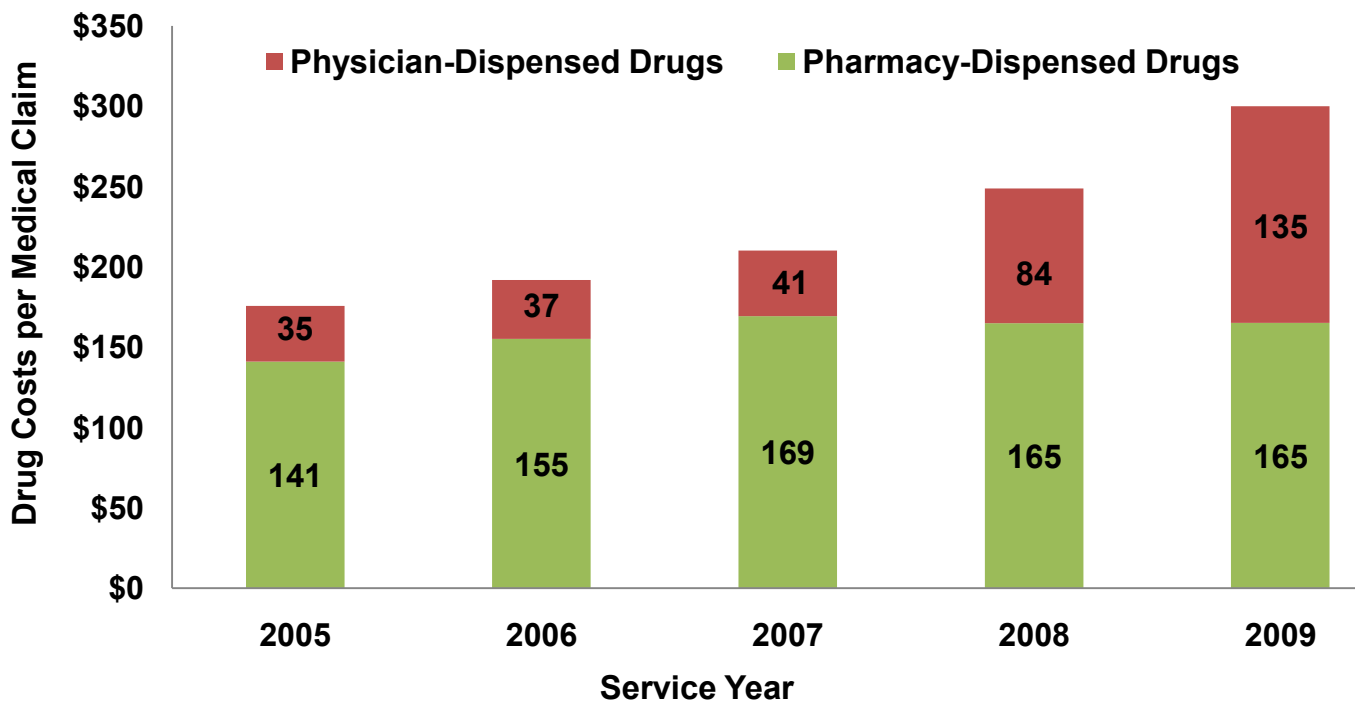
Exhibit 10

We now take a closer look at Georgia (Exhibits 11, 12, and 13) and Florida (Exhibits 14, 15, and 16). Georgia and Florida are chosen because they are two of the three states with the highest share of Rx costs related to physician dispensing. While examining the following exhibits, the reader should keep in mind that Georgia exhibits patterns that are more representative of those from the typical state.

Exhibit 11 separates per-claim Rx costs by service year into costs arising from drugs dispensed by physicians and costs arising from drugs dispensed by pharmacies. Costs due to physician-dispensed drugs in Service Year 2009 are more than 3.5 times those in Service Year 2005. In contrast, costs arising from pharmacy-dispensed drugs are only 17% higher in Service Year 2009 than in 2005.

In total, per-claim WC Rx costs in Georgia grew 71% from Service Year 2005 to Service Year 2009, mostly due to increased physician dispensing. This outpaces the growth of the national Rx-spend for general healthcare, which grew by 21% over the same time period, according to IMS Institute for Healthcare Informatics [6].

Costs From Physician Dispensed Drugs Have Recently Risen in Georgia



Source: Derived from sample data provided by carriers
 Claim counts defined as claims with a medical service by RSY 2 (AY 2009 is projected)

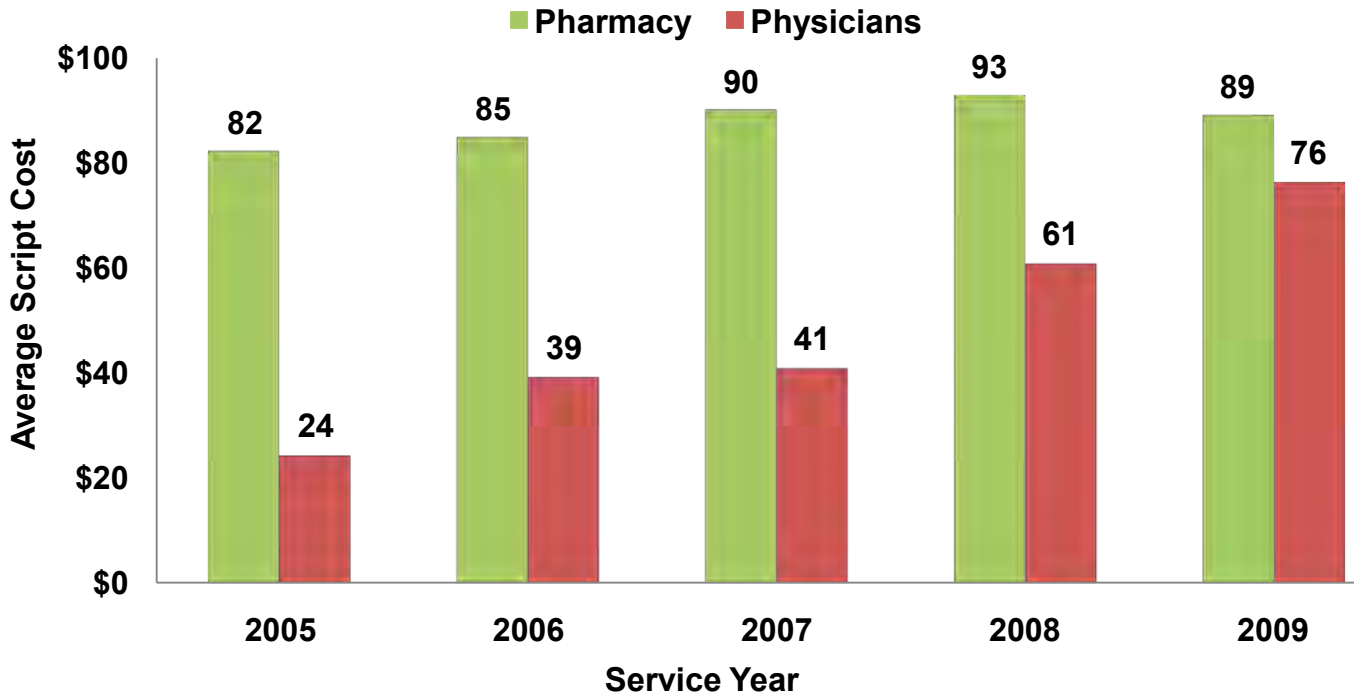
Exhibit 11

The increases in per-claim Rx costs arising from physician dispensing can come from either:

- An increase in the number of scripts dispensed by physicians
- A change in the average cost of physician-dispensed scripts
- A combination of the two

In Exhibit 12, one can see that the average cost of a physician-dispensed script in Georgia grew more than threefold from Service Year 2005 to Service Year 2009. This accounts for more than 80% of the growth in per-claim Rx costs arising from drugs dispensed by physicians shown in Exhibit 11. In contrast, the average cost of a pharmacy-dispensed script grew by only 9% over the same period.

Physicians in Georgia Have Shifted to Dispensing More Expensive Scripts



Source: Derived from sample data provided by carriers

Exhibit 12

The reason for changes in average script costs must be carefully considered. Such changes could be the result of either:

1. More pills being dispensed for a given script
2. An increase in price per pill
3. A shift in what drugs physicians dispense
4. Some combination of the above

Of the top 10 physician-dispensed drugs for 2009 (Exhibit 13), 6 were not in the top 10 in 2005. Of these 6 newly popular drugs, 5 have an average physician-dispensed script cost of more than \$150. Over the same period, the average physician-dispensed script cost nearly doubled for 3 of the 4 remaining drugs from 2005 to 2009.

Top Physician-Dispensed Drugs in Georgia

2005			2009	
Drug Name	Price Per Script	Drug Name	Price Per Script	
1	IBUPROFEN	\$13	MELOXICAM	\$199
2	CYCLOBENZAPRINE HCL	\$35	LIDODERM®	\$419
3	DICLOFENAC SODIUM	\$45	HYDROCODONE-ACETAMINOPHEN	\$48
4	ETODOLAC	\$67	TRAMADOL HCL	\$63
5	RANITIDINE HCL	\$65	CARISOPRODOL	\$171
6	CEPHALEXIN	\$45	RANITIDINE HCL	\$121
7	TRAMADOL HCL	\$32	GABAPENTIN	\$167
8	NAPROXEN SODIUM	\$25	NAPROXEN	\$60
9	SKELAXIN®	\$80	OMEPRAZOLE	\$231
10	NAPROXEN	\$32	CYCLOBENZAPRINE HCL	\$47

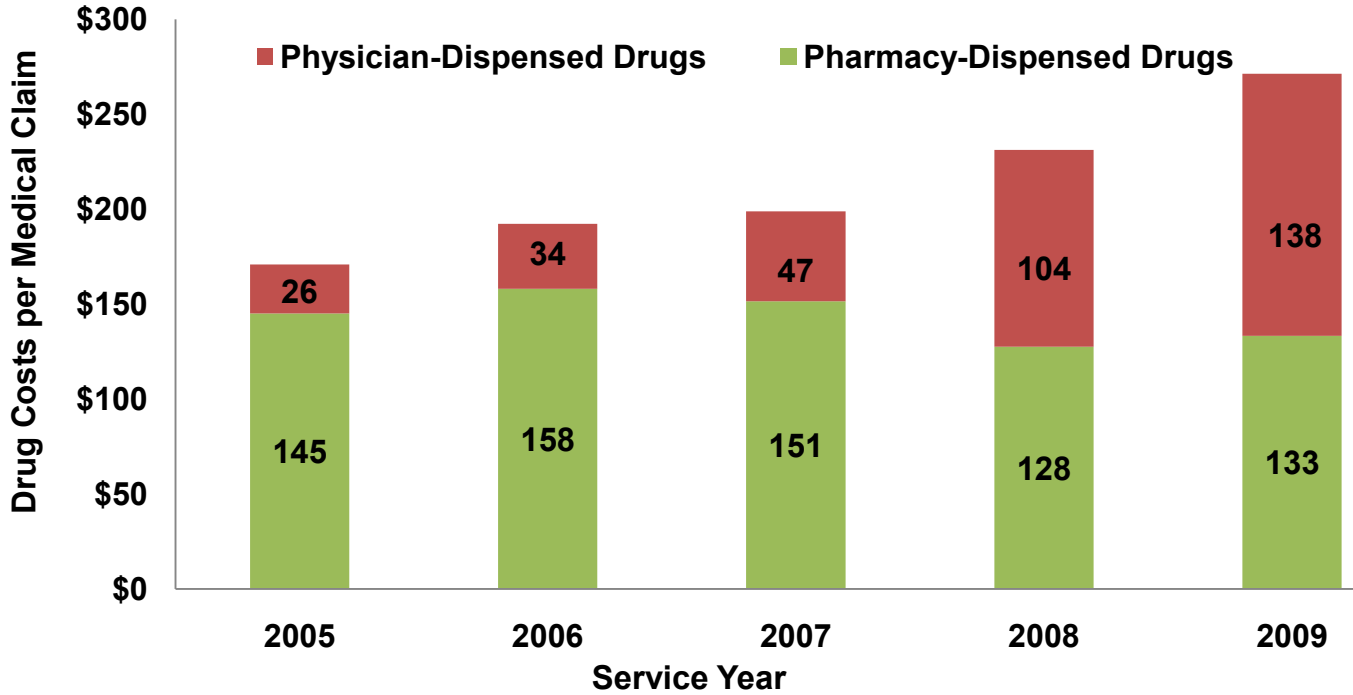
Source: Derived from sample data provided by carriers
Ranks are by total dollars paid

Exhibit 13

Exhibits 14, 15, and 16 examine Florida. Like Georgia, per-claim costs arising from physician-dispensed drugs in Service Year 2009 are more than 5 times those of Service Year 2005. Unlike Georgia, however, Florida saw its per-claim costs arising from pharmacy-dispensed drugs decline by 8%. This suggests that, to some degree, physicians are dispensing drugs that otherwise would have been dispensed by pharmacies.

Even with this shift, Exhibit 14 shows that total per-claim drug costs in Florida grew by 58% from Service Year 2005 to Service Year 2009. Again, this outpaces the growth in national Rx-spending over the same time period.

Costs From Physician-Dispensed Drugs Have Recently Risen in Florida

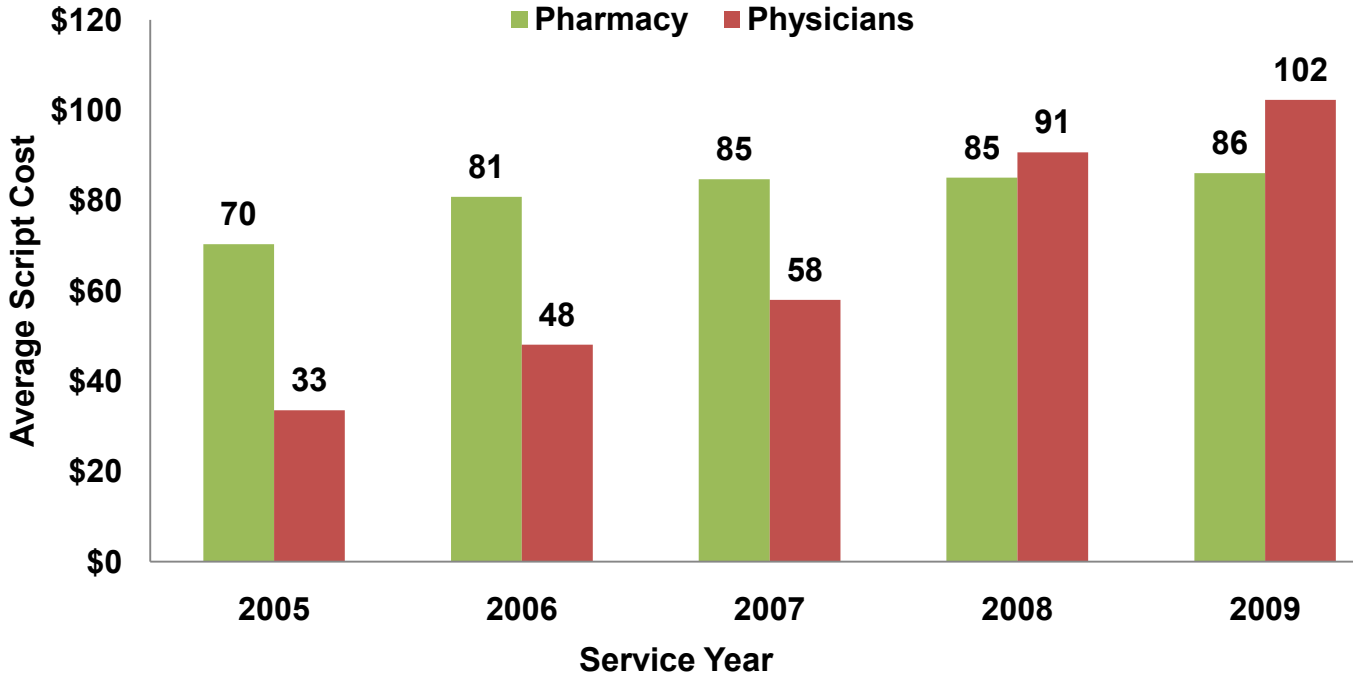


Source: Derived from sample data provided by carriers
 Claim counts defined as claims with a medical service by RSY 2 (AY 2009 is projected)

Exhibit 14

Exhibit 15 shows that the average price per script of physician-dispensed drugs in Florida has grown much more rapidly than the price per script of pharmacy-dispensed drugs. The average price for physician-dispensed scripts grew threefold from Service Year 2005 to Service Year 2009. Over the same time period, the average price for pharmacy-dispensed scripts grew by only 23%. Furthermore, in Service Years 2008 and 2009, the average physician-dispensed script cost more than the average pharmacy-dispensed script.

Physicians in Florida Have Shifted to Dispensing More Expensive Scripts



Source: Derived from sample data provided by carriers

Exhibit 15

Exhibit 16 compares the top 10 physician-dispensed drugs from 2009 to 2005 for Florida. Florida sees only 4 drugs newly making the top 10 list in 2009. The average cost for physician-dispensed scripts appearing in the top 10 for both years doubled from 2005 to 2009. Also, 3 of the 4 newly popular drugs in 2009 have an average physician-dispensed script cost of over \$150. The price per script for each of Carisoprodol, Tramadol HCL, Etodolac, and Cyclobenzaprine HCL more than doubled between 2005 and 2009.

Future studies will drill down into the number of pills per script.

Top Physician-Dispensed Drugs in Florida

	2005		2009	
	Drug Name	Price Per Script	Drug Name	Price Per Script
1	CARISOPRODOL	\$118	MELOXICAM	\$192
2	NAPROXEN	\$35	CARISOPRODOL	\$272
3	CEPHALEXIN	\$52	TRAMADOL HCL	\$80
4	TRAMADOL HCL	\$35	OMEPRAZOLE	\$279
5	SKELAXIN®	\$50	RANITIDINE HCL	\$175
6	IBUPROFEN	\$12	LIDODERM®	\$502
7	RANITIDINE HCL	\$92	NAPROXEN	\$57
8	ETODOLAC	\$52	HYDROCODONE-ACETAMINOPHEN	\$50
9	CYCLOBENZAPRINE HCL	\$28	CYCLOBENZAPRINE HCL	\$63
10	DICLOFENAC SODIUM	\$56	ETODOLAC	\$126

Source: Derived from sample data provided by carriers
Ranks are by total dollars paid

Exhibit 16

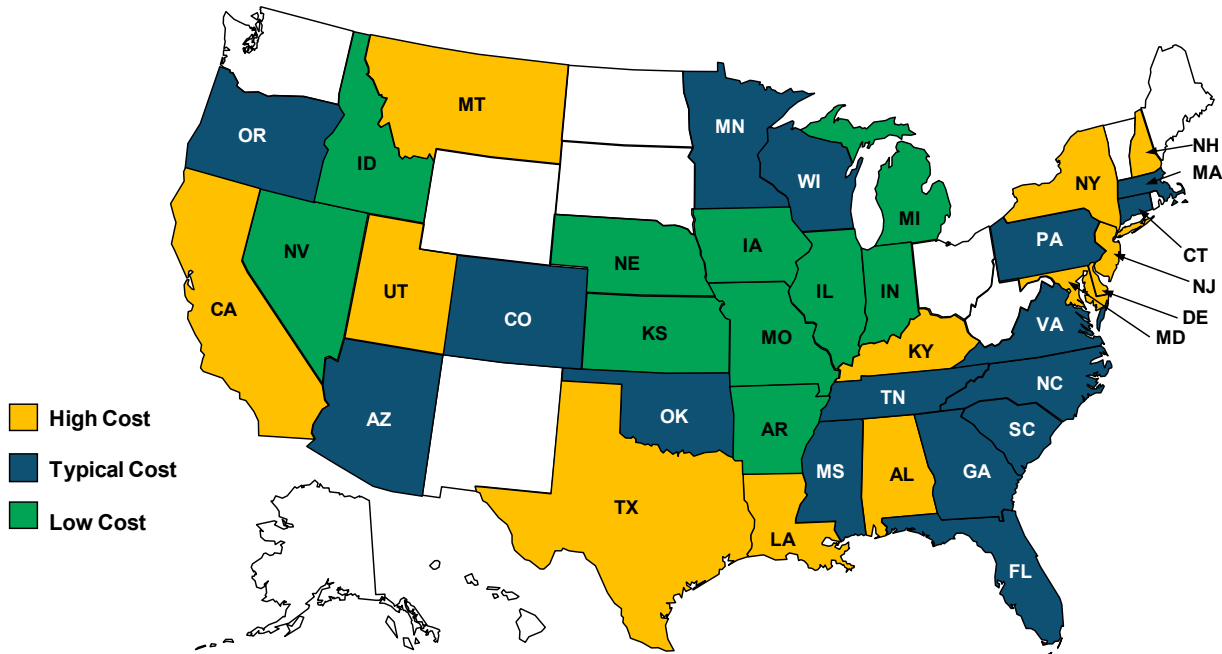
STATE DIFFERENCES IN PER-CLAIM RX COSTS

Exhibit 17 categorizes states into high-, typical-, and low-cost states based on estimated per-claim Rx costs at ultimate.* In this exhibit:

- High-cost states are estimated to have an ultimate per-claim Rx cost of more than 1.5 times the median estimate
- Typical-cost states are estimated to have an ultimate per-claim Rx cost between 1.5 and 0.8 times the median estimate
- Low-cost states are estimated to have an ultimate per-claim Rx cost of less than 0.8 times the median estimate

Appendix 3 provides a brief discussion on why per-claim Rx costs at ultimate is our preferred metric.

Rx Costs per Medical Claim Vary by State



Source: Derived from sample data provided by carriers

Estimates based on AY 2000 to 2009

All state-years have (or are expected to have) at least 2,500 medical claims

Claim counts defined as claims with a medical service by RSY 2 (AY 2009 is projected)

Ranges are determined by comparing individual state averages to the median value; High Cost (>1.5 Median); Low Cost (<.8 Median)

Exhibit 17

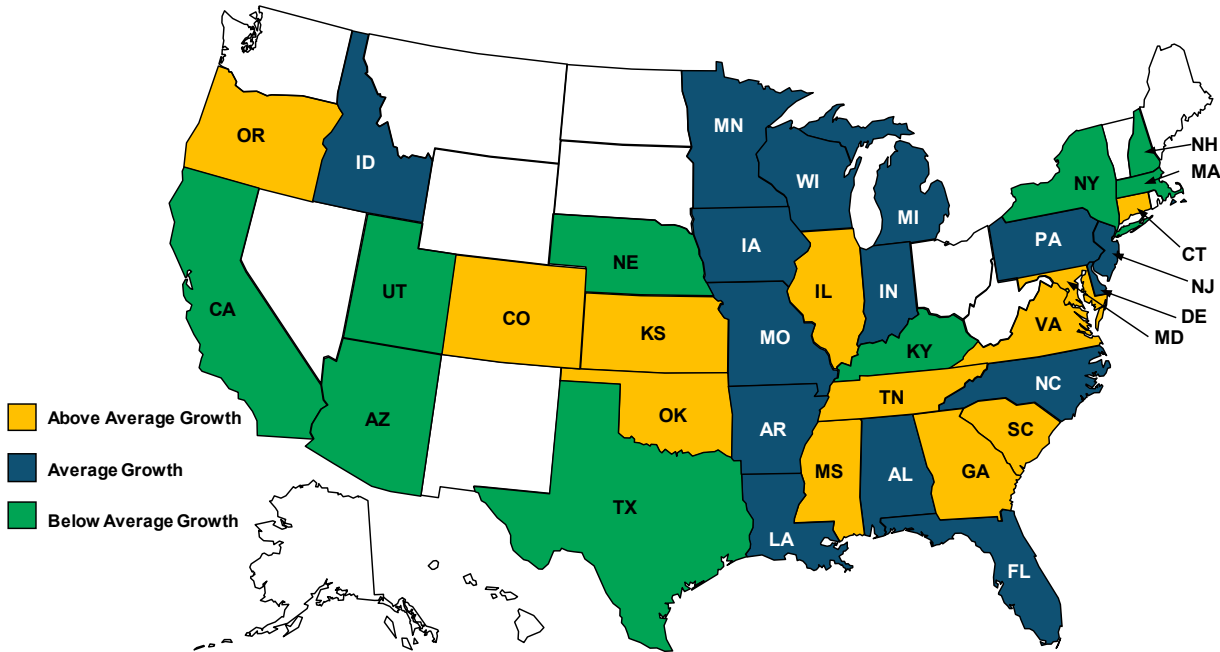
* In 2007, NCCI released a similar categorization of states [2]. Differences are largely due to either:

- Differences in emerged incremental Rx costs per claim (especially in later relative service years)
- Revisions to state-specific tail factors
- Some combination of the two

Take Utah, for example. The 2007 study classified Utah as a typical-cost state, while the current study classifies Utah as a high-cost state. At the time of the 2007 study, the last observed relative service year was the 12th, and the two largest observed incremental Rx shares of medical in Utah were 45% and 39%. For the current study, the last observed relative service year is the 16th, and the two largest observed incremental Rx shares in Utah are 73% and 68%. Furthermore, at the time of the 2007 study, it was estimated that 31% of medical payments had yet to be paid as of Relative Service Year 12; the 44% from the current study compounds the impact of observing higher incremental Rx shares.

Exhibit 18 shows states that have above average, average, and below average growth in per-claim Rx costs. Few states are extreme in both the current level and growth in the level of Rx costs per medical claim. Only Nebraska is categorized as low under both measures, and only Maryland is categorized as high under both measures.

Growth in Rx Costs per Medical Claim Varies by State



Source: Derived from sample data provided by carriers
 States shown have more than 2,500 medical claims for each AY in 1996 to 2009
 Claim counts defined as claims with a medical service by RSY 2 (AY 2009 is projected)
 Growth is measured as percentage change in per-claim Rx costs from SYs 2005 and 2006 to SYs 2008 and 2009
 Above Average: Greater than 40%; Below Average: Less than 20%

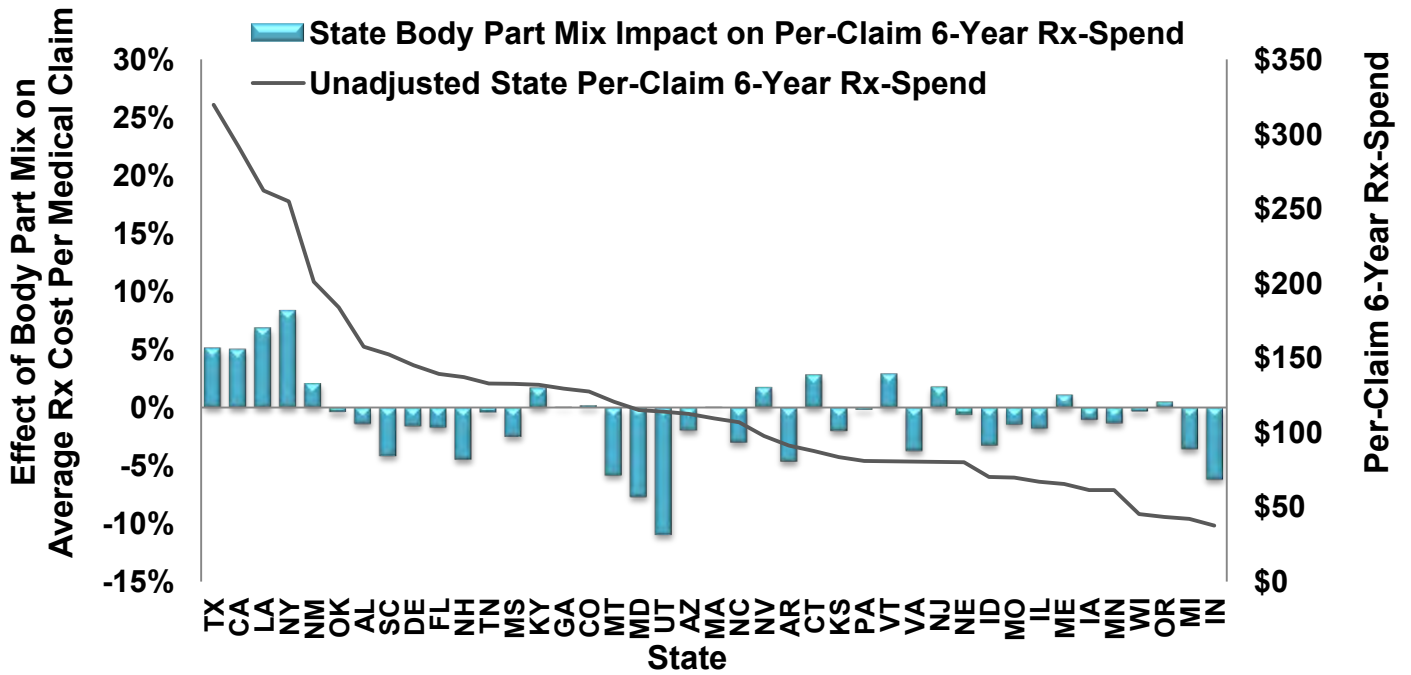
Exhibit 18

There are many factors that could contribute to state variation. One such factor is occupational mix. Suppose that most of the workers in state A are employed as office workers, and most of the workers in state B are employed as roofers. Under such a scenario, the typical injury, corresponding course of treatment, and resulting per-claim Rx cost would be expected to vary by state. Using the distribution of injured body parts as a proxy for such differences, Exhibit 19 displays the impact of such differences on the per-claim cumulative amount paid on Rx through Relative Service Year 6 (per-claim 6-year Rx-spend). The impact on per-claim Rx costs is estimated by restating per-claim costs to what they would have been if the distribution of injured body parts in each state were equal to the national distribution.

- The per-claim 6-year Rx-spend for each state is represented by the line, which is measured on the right vertical axis. States are sorted according to the per-claim 6-year Rx-spend. For instance, the per-claim 6-year Rx-spend in Texas was about \$320.
- The estimated impact that the distribution of injured body parts has on each state's per-claim 6-year Rx-spend is indicated by the bars, which are measured on the left vertical axis. For instance, the per-claim 6-year Rx-spend in Texas is about 5% higher due to its deviation from the national distribution of injured body parts. That is, if Texas had the same distribution of injured body parts as the nation, then its per-claim 6-year Rx-spend would be about \$305 instead of \$320—or 5% lower.

While Exhibit 19 shows that differences in the distribution of injured body parts explain some state variation, it stops far short of being a major factor. The estimated impact for states with the highest per-claim 6-year Rx-spend is about 5%, but the per-claim 6-year Rx-spend in these states is about three times that of the median state. Clearly, there is more going on than differences in the distribution of injured body parts.

States With High Rx Claim Costs Are Higher in Part Because of Differences in Injured Body Parts



Source: Derived from sample data provided by carriers
 Injury Years 2000 through 2004 and Relative Service Years 1 through 6 are included
 Per-Claim 6-Year Rx-Spend refers to cumulative paid through Relative Service Year 6

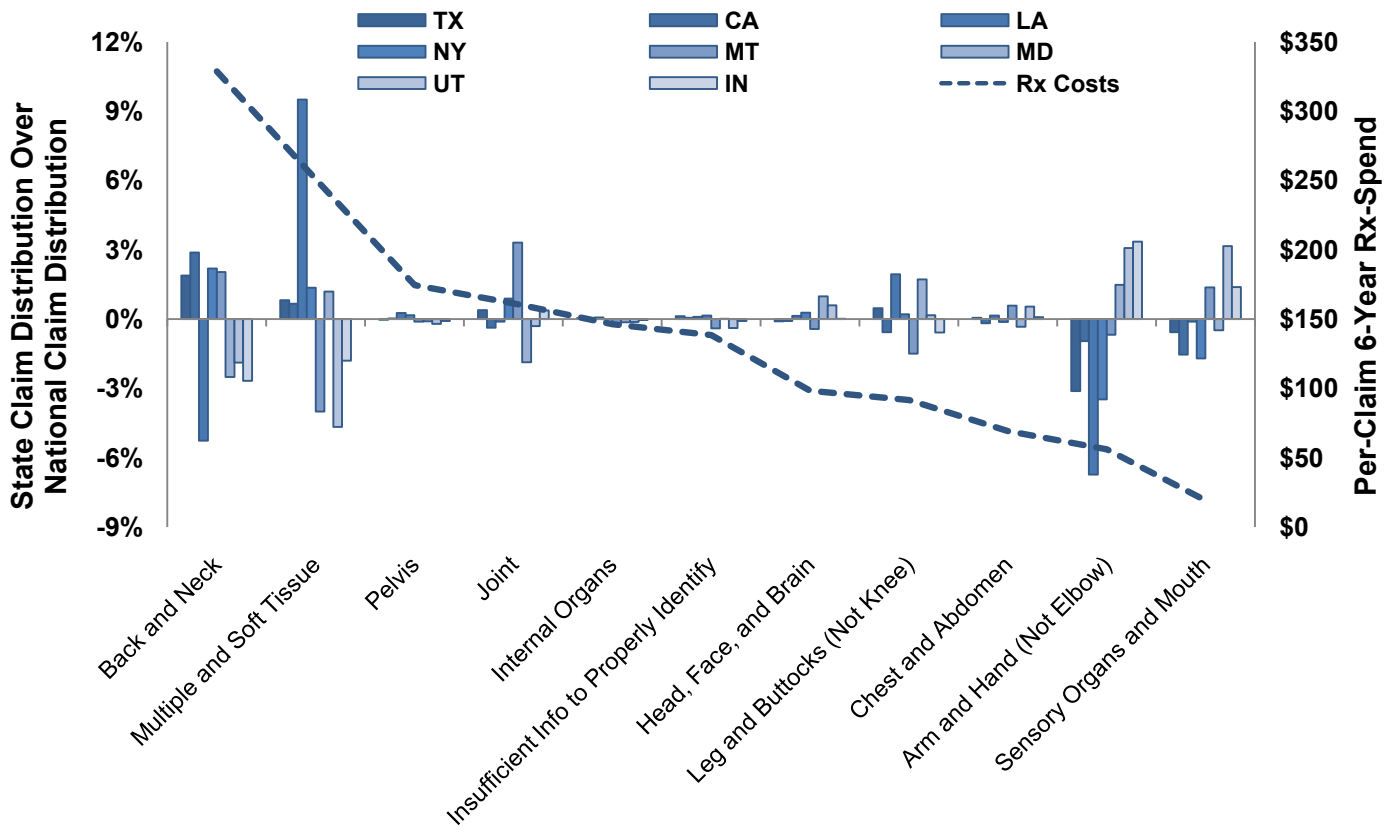
Exhibit 19

Exhibit 20 takes a closer look at states where the estimated impact of differences in the injured body part distribution (from Exhibit 19) is more than 5% in magnitude.

- The national per-claim 6-year Rx-spend for claims involving various body parts is represented by the line, which is measured on the right vertical axis. Body parts are ordered based on the national per-claim 6-year Rx-spend. For instance, claims involving *Back and Neck* injuries typically sustain \$330 in drug costs.
- The difference between the state-specific and national distribution of injuries involving the specified body part is represented by the bars, which are measured on the left vertical axis. Within each body part grouping, bars to the left represent higher cost states, and bars to the right represent lower cost states. For instance, the share of claims involving *Multiple and Soft Tissue* in Louisiana is 9.5 percentage points higher than the national distribution.

This exhibit shows that claimants in higher-cost states tend to have more high Rx-cost injuries (*Back and Neck* and *Multiple and Soft Tissue*) and fewer low Rx-cost injuries (*Arm and Hand* and *Sensory Organs and Mouth*), and vice versa. Louisiana exhibits an interesting anomaly. Louisiana has a lower share of claims involving *Back and Neck* but a higher share of claims involving *Multiple and Soft Tissue*.

Higher-Cost States Typically Have More High-Cost Injuries



Source: Derived from sample data provided by carriers
 Injury Years 2000 through 2004 and Relative Service Years 1 through 6 are included
 Per-Claim 6-Year Rx-Spend refers to cumulative paid through Relative Service Year 6

Exhibit 20

CLOSING REMARKS

This update has shown that physician dispensing continues to increase in 2009. The update points toward new evidence that physician dispensing increases drug costs on claims. It also looked into the drivers of state differences in per-claim Rx costs.

NCCI will continue to look for other drivers of per-claim Rx costs and will continue to monitor and report on prescription drugs and other important issues that affect the workers compensation industry.

Note: John Robertson and Jim Stevens contributed to this study.

APPENDIX 1

Projecting Incremental Rx Shares

The current methodology for estimating the ultimate Rx share of total medical requires projected incremental Rx shares. These shares are weighted together to produce the ultimate estimate.

Two items make arriving at accurate projections for incremental Rx shares difficult:

1. There can be different trends by service year, relative service year, and injury year
2. Traditional techniques can violate the constraint that projected incremental shares must be between 0.0 and 1.0

The first issue can be solved by employing *lossDev*, which is a tool for statistical analysis of loss development. This package takes into consideration service year, relative service year, and injury year trends. *lossDev* models incremental payments as lognormals. That is, if X is the incremental payment for the t injury year and the s relative service year, then *lossDev* assumes that X is a normal distribution.

The second issue can be addressed by a simple transformation. *lossDev*'s support for incremental payments is X . If X represents the incremental Rx share for the t injury year and the s relative service year, then the transformation $Y = \frac{X - \min(X)}{\max(X) - \min(X)}$ will have the proper support (except at the boundaries).

More information on *lossDev* can be found on the R home page (<http://www.r-project.org/>) and in the paper "Robust Loss Development Using MCMC" by Frank A. Schmid (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1501706).

APPENDIX 2

Top 15 Prescription Drugs in WC for Service Year 2009

1. **OXYCONTIN[®]** (Ox i KON tin) is a controlled-release narcotic painkiller prescribed for around-the-clock relief of moderate to severe pain.
2. **LIDODERM[®]** (LYE doe derm) is used to relieve the pain associated with sunburn; insect bites; poison ivy; poison oak; poison sumac; minor cuts, scratches, and burns; sores in the mouth; dental procedures; hemorrhoids; and shingles (herpes infection).
3. **HYDROCODONE W/ACETAMINOPHEN** (hye droe KOE done)/(ah see ta MIH no fen) (generic form of Vicodin[®]) is a narcotic analgesic used to relieve moderate to severe pain.
4. **LYRICA[®]** (LEER i kah) is an anticonvulsant and neuropathic pain agent used for treating fibromyalgia or nerve pain caused by certain conditions (e.g., shingles, diabetic nerve problems). It is also used in combination with other medicines to treat certain types of seizures.
5. **CELEBREX[®]** (SELL eh breks) is a nonsteroidal anti-inflammatory drug (NSAID) used to treat pain or inflammation caused by many conditions such as arthritis, ankylosing spondylitis, and menstrual pain. It is also used in the treatment of hereditary polyps in the colon.
6. **GABAPENTIN** (ga bah PEN tin) (generic form of Neurontin[®], approved in 2003) is used in the treatment of some types of seizures and the management of postherpetic neuralgia (nerve pain caused by the herpes virus or shingles).
7. **SKELAXIN[®]** (skell AX in) is a muscle relaxant used to treat skeletal muscle conditions such as pain or injury.
8. **CYMBALTA[®]** (sim BALL ta) is used to treat major depression—a disorder marked by continuing, serious, and overwhelming feelings of depression that interfere with daily functioning. It is used to treat diabetic peripheral neuropathy, a painful nerve disorder associated with diabetes that affects the hands, legs, and feet.
9. **MELOXICAM** (mell OX ih kam) (generic form of Mobic[®]) is used to relieve the pain and stiffness of osteoarthritis and rheumatoid arthritis.
10. **CYCLOBENZAPRINE HCL** (sye kloe BEN za preen)/(HYE droe KLOR ide) (generic form of Flexeril[®]) is a muscle relaxant used to treat skeletal muscle conditions such as muscle spasms resulting from injuries such as sprains, strains, or pulls.
11. **TRAMADOL HCL** (TRA ma dol)/(HYE droe KLOR ide) (generic form of Ultram[®]) is prescribed to relieve moderate to moderately severe pain.
12. **OMEPRAZOLE** (oh MEP ra zole) (generic form of Prilosec[®]) is prescribed for the short-term treatment (four to eight weeks) of the following: stomach ulcer, duodenal ulcer (near the exit of the stomach), erosive esophagitis (inflammation of the esophagus), and heartburn and other symptoms of gastroesophageal reflux disease (also known as GERD, which occurs when stomach acid backs up into the tube connecting the throat to the stomach).
13. **FENTANYL** (FEN ta nil) (generic form of Duragesic[®]) prescribed for chronic pain when short-acting narcotics and other types of painkillers fail to provide relief.
14. **FLECTOR[®]** is a patch that is placed on the skin to apply pain medication directly to the source. It is used to treat pain caused by minor strains, sprains, and bruises.
15. **OXYCODONE HCL** (ox i KOE done)/(HYE droe KLOR ide) (generic form of Roxicodone[®] or OxyContin[®] if extended release) is a narcotic pain reliever used to treat moderate to severe pain. The extended-release form of this medication is for around-the-clock treatment of pain.

Source: drugs.com

Note: These drugs might also be used for purposes other than those listed.

APPENDIX 3**Estimating Per-Claim WC Rx Costs at Ultimate**

Two separate but related items to consider when comparing per-claim Rx costs between states are treatment patterns and the persistence of medical payments.

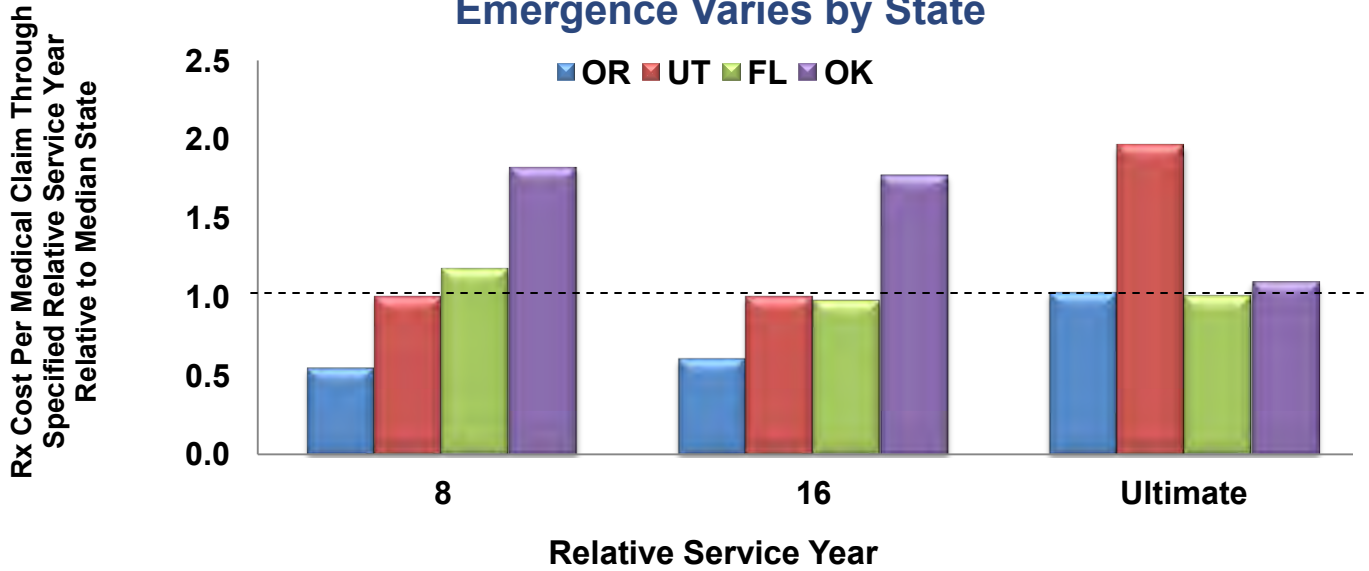
- Treatment patterns can vary by state. Doctors in State A may treat injuries more aggressively than doctors in State B. This could initially lead to higher per-claim Rx costs in State A. However, if claimants in State B have sustained Rx use over a longer time horizon, then per-claim Rx costs in State B may eventually exceed those in State A.
- Medical costs, including Rx, for WC injuries are covered indefinitely. Even after 16 relative service years, only approximately 80% of all medical payments have been made. This means that a substantial portion of costs are not observed in our dataset. Furthermore, as seen in Exhibit 2, the incremental Rx share of medical costs increases with relative service year. This serves to amplify the impact of state differences in the persistence of medical payments after 16 relative service years.

Exhibits 21 and 22 demonstrate these two points for select states.

Exhibit 21 shows how per-claim Rx costs develop differently by state. Oregon initially has lower than average per-claim Rx costs but is expected to reach average cost levels at ultimate. Oklahoma initially has higher than average per-claim Rx costs but is expected to drop to average cost levels at ultimate.

The medical (including Rx) payout pattern for these states can be seen in Exhibit 22. Oregon and Utah, both states where the estimated per-claim Rx cost relativity to the typical state increases from Relative Service Year 8 to ultimate, have 45% and 41% of medical payments left to pay after 16 years. In contrast, Oklahoma, where the estimated per-claim Rx cost relativity to the typical state decreases from Relative Service Year 8 to ultimate, has only 7% of medical costs left to pay after 16 years.

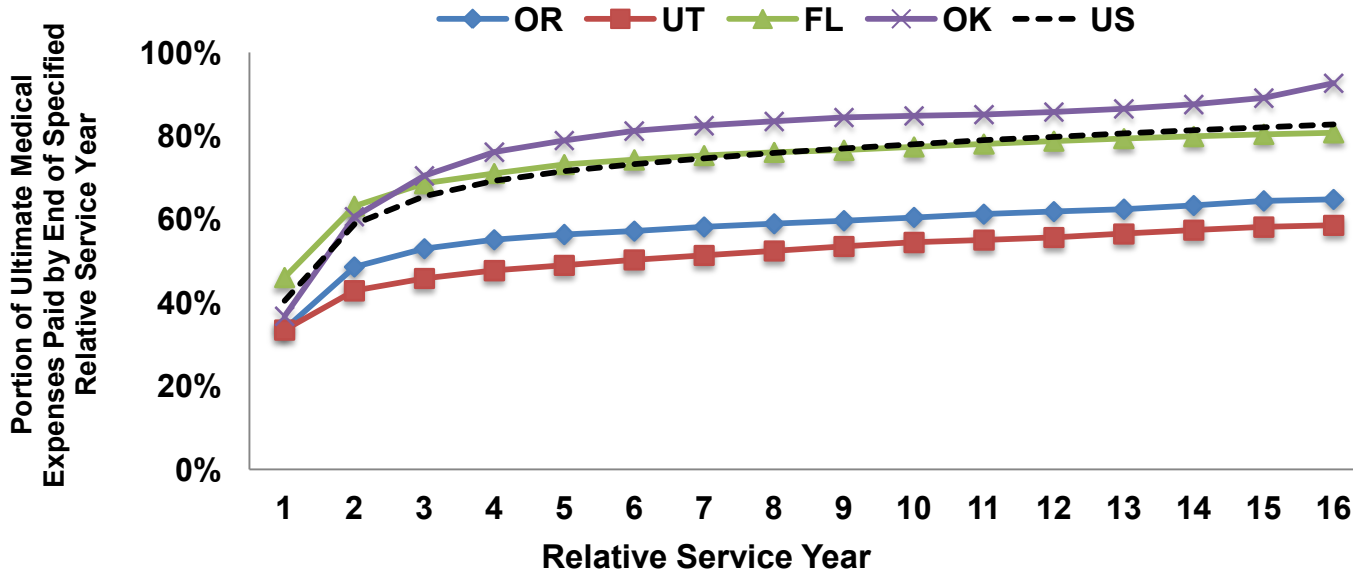
Average Rx Cost per Medical Claim Emergency Varies by State



Source: Derived from sample data provided by carriers
 Number of medical claims is observed (or project) number of claims with a medical transaction within 2 RSYs
 Estimates based on AY 2000 to 2009

Exhibit 21

Medical Payments Can Continue for Many Years



Source: Derived from sample data provided by carriers

Exhibit 22

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