



Pain Management Interstate Variation

INTRODUCTION

As we presented at NCCI's [Annual Insights Symposium \(AIS\) 2025](#), pain management¹ represents a significant portion of workers compensation medical costs, totaling 30% in Service Year (SY) 2023. In this brief, we take a deeper look at pain management across states and examine what, if anything, has replaced the use of opioids in addressing pain.

KEY FINDINGS

- Pain management costs vary significantly by state, even after controlling for mix in diagnoses².
- The costs of treating pain through physical medicine and major surgery have increased across almost all states. This increase, however, has been partially mitigated by a sharp decline in drug costs, primarily driven by a reduction in opioid usage.
- The decline in opioid costs is being offset by an increase in the use of topical creams and gels. The degree of changes in drug costs is a key driver of state differences.
- States with strict physician dispensing limits are among the states with the lowest topical medication costs.

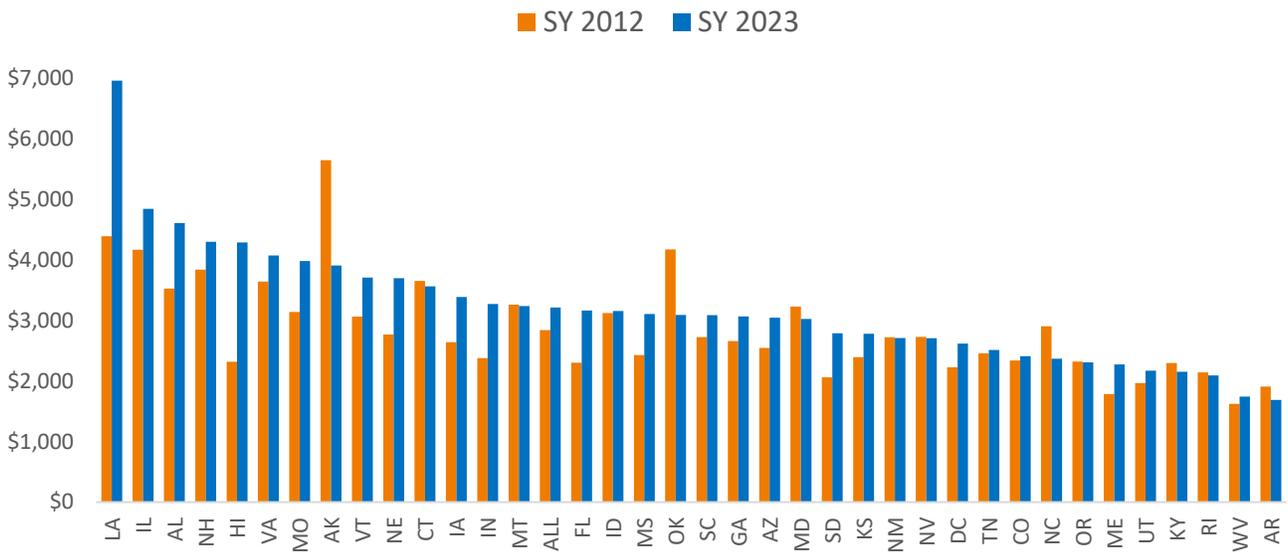
¹ Defined using a combination of treatments and medical conditions, such as opioids or low back pain. Please see Appendix C for more information on the definition of pain management in the context of this study.

² Mix adjustment was done based on the study-states' share of claims by primary medical condition. Please see Appendix C for more information on the methodology behind the mix adjustment.

PAIN MANAGEMENT BY STATE

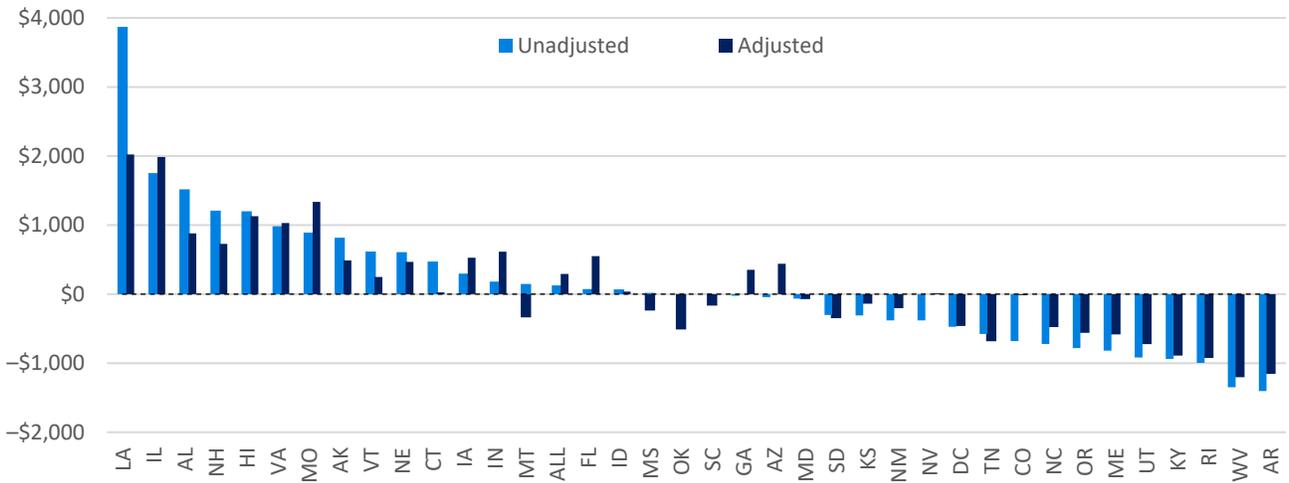
In Figure 1, we see the PnM paid per PnM claim. Most states saw an increase in PnM costs between SY 2012 to SY 2023, although to a lesser degree than total medical costs. PnM paid per PnM claim increased on average by 1% per year, with the largest increase at 5.3% in Louisiana and the largest decrease at 3.0% in Alaska.

Figure 1: PnM Paid per PnM Claim



To better illustrate the variability across states and to highlight those with above- and below-average PnM costs per PnM claim, we focus on SY 2023 and subtract the median value from each state on both a mix-adjusted and unadjusted basis. The mix adjustment by medical condition uses a weighted average of the study-states' claim shares and the state's average cost per claim by medical condition. Prior to adjusting for the mix of medical conditions (light blue), the range of differences across study-states is \$5,025, ranging from \$1,402 below the median in Arkansas to \$3,871 above the median in Louisiana. After adjusting for the mix (dark blue), the range of differences is reduced to \$3,176, ranging from \$1,154 below the median to \$2,022 above that. While the mix adjustment changes the relative order of a few states, most remain unchanged. This suggests that there are significant drivers in PnM cost differences per PnM claim beyond the mix of medical conditions.

Figure 2: Difference in PnM Paid per PnM Claim Relative to Study-State Median, SY 2023



When we adjusted for mix, the variation between states did not significantly decrease, so all future figures are displayed on an unadjusted basis. When breaking down the total PnM paid amounts into medical service categories in Figure 3, the three largest categories that emerge are major surgery, drugs, and physical medicine, which account for 34%, 14%, and 14% of total pain management costs, respectively. In Figure 4, the same information is displayed as differences from the median across the study-states.

Figure 3: PnM Paid per PnM Claim, SY 2023
By Medical Service Category

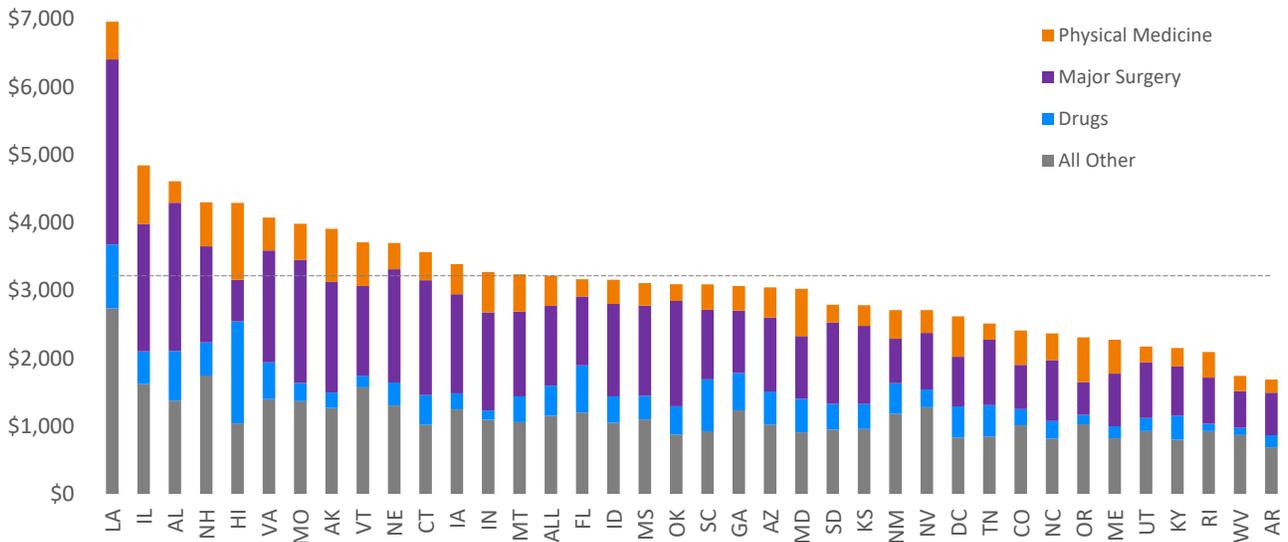
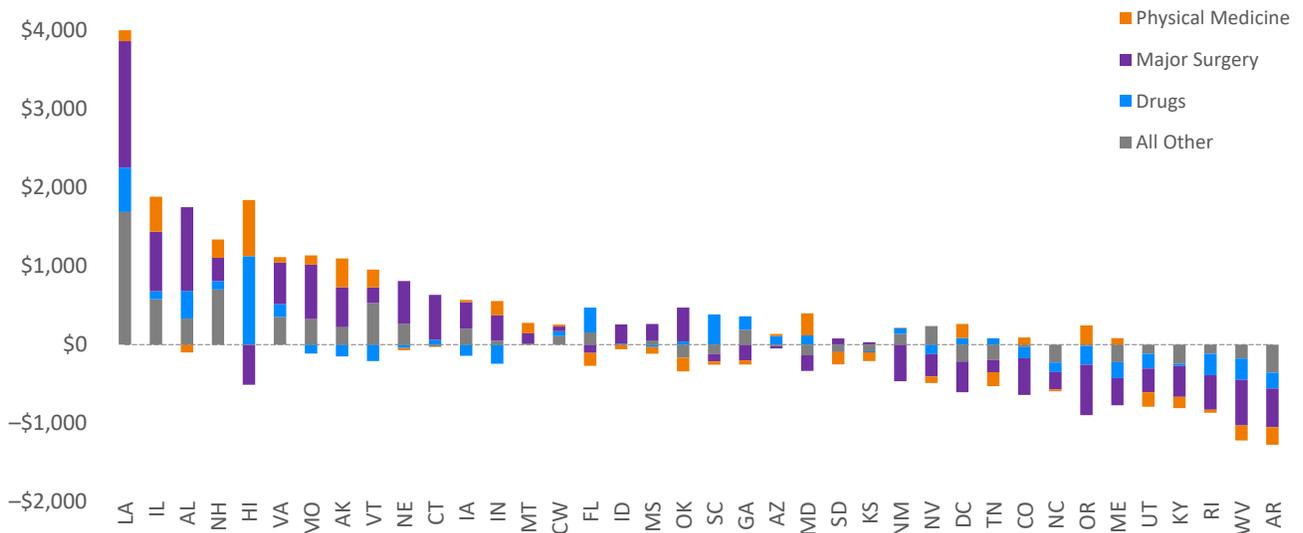
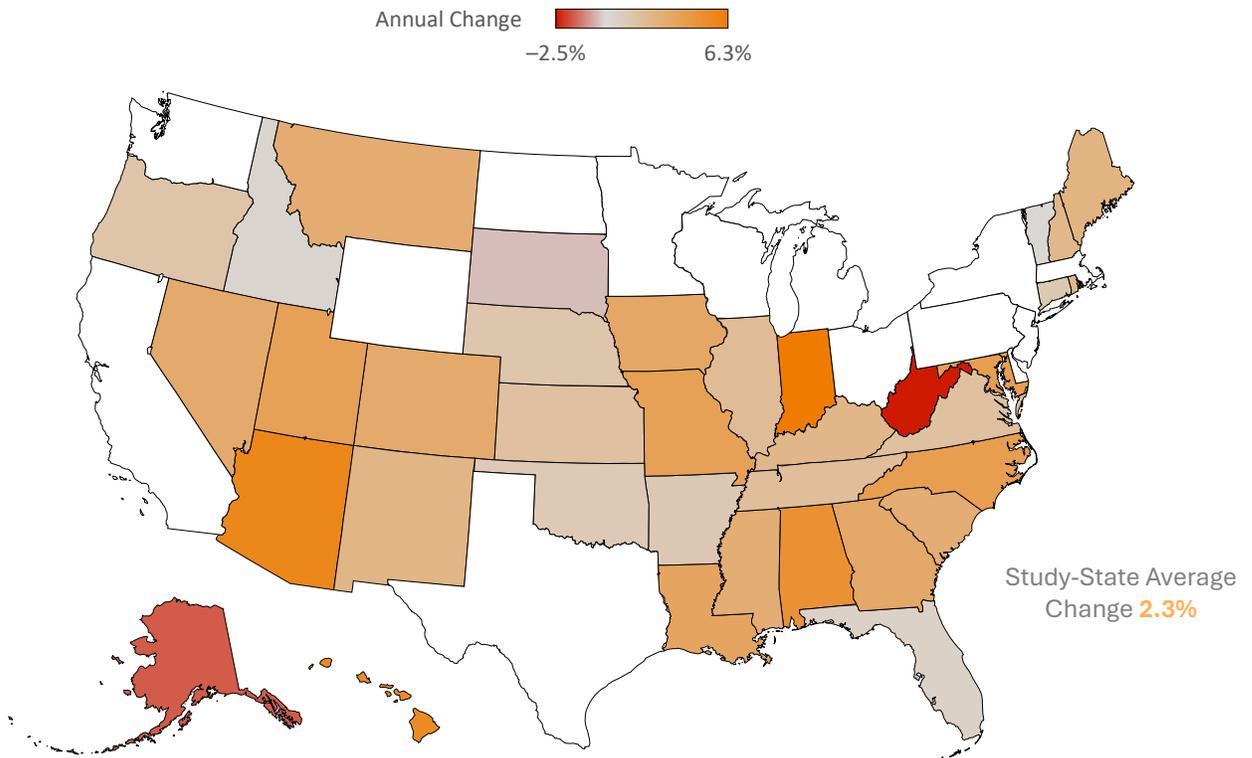


Figure 4: Difference in PnM Paid per PnM Claim Relative to Study-State Median, SY 2023
By Medical Service Category



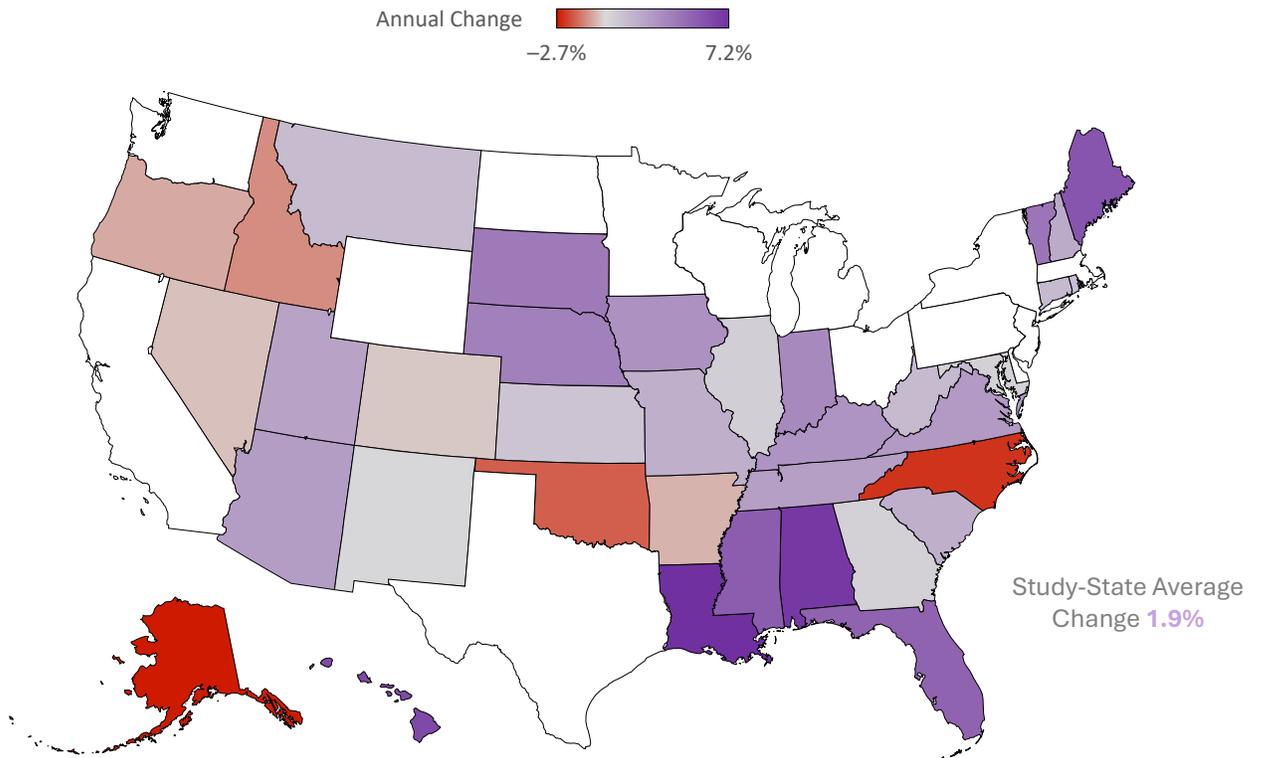
At *AIS 2025*, we shared that pain management costs for both major surgery and physical medicine have risen since SY 2012. Physical medicine PnM costs increased at an average rate of 2.3% annually since 2012 across study-states, with all but three states experiencing rising costs. This is primarily due to an increase in the utilization of physical medicine services.

**Figure 5: Change in Physical Medicine Paid per PnM Claim
SY 2012 to SY 2023**



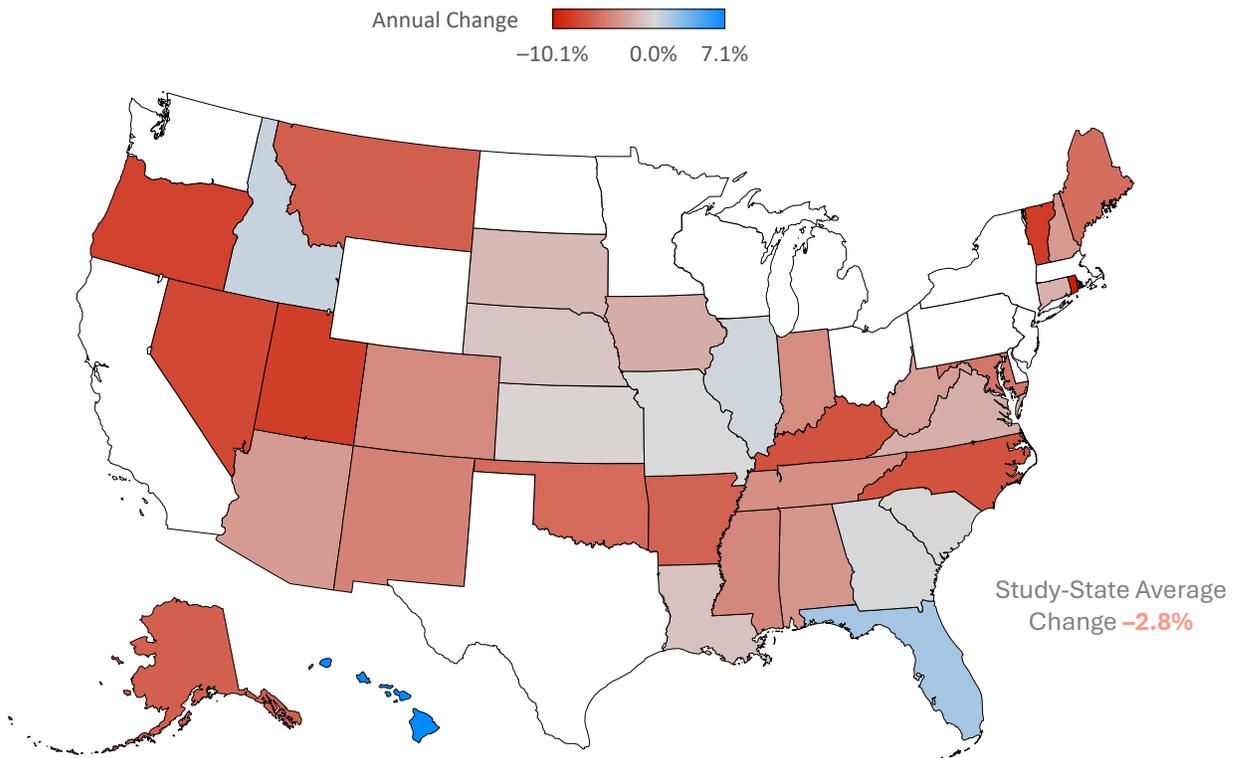
The average costs of major surgery when treating PnM claims have also increased since SY 2012. The study-state average grew by 1.9% per year, with only eight states declining from SY 2012 to SY 2023. In contrast to physical medicine, utilization for major surgery remained stable or declined on average. The overall increase in costs shown in Figure 6 is attributable to rising prices.

**Figure 6: Change in Major Surgery Paid per PnM Claim
SY 2012 to SY 2023**



The increases in both major surgery and physical medicine have been partially offset in most states by significant declines in drug costs per PnM claim, which decreased at an average rate of 2.8% per year. This was driven by the sharp drop in opioid use in workers compensation. However, countering that trend and driving an increase in costs in six states was an increase in the prevalence of topicals and their associated costs, as we show in the next section.

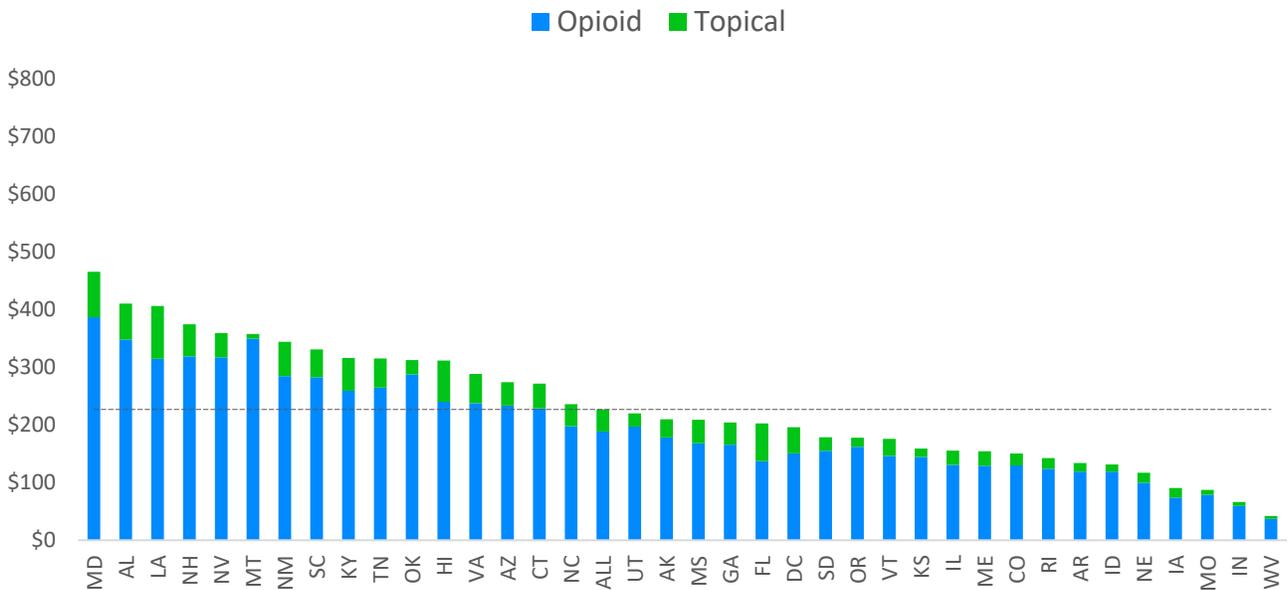
**Figure 7: Change in Drug Paid per PnM Claim
SY 2012 to SY 2023**



OPIOIDS AND TOPICALS

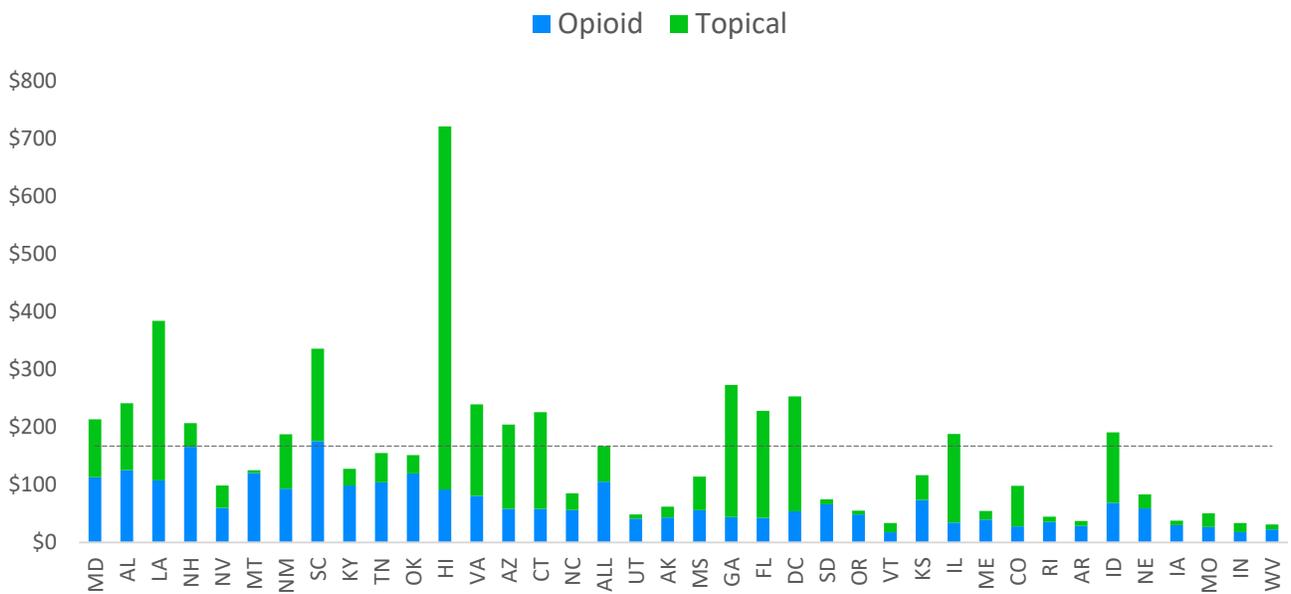
Opioids and topicals make up, on average, 40% of drug costs per PnM claim for all study-states combined. Figure 8a shows that opioids contributed a significantly larger share of PnM costs than topicals in SY 2012, with 85% of the median states' costs between the two going towards opioids. The costs varied considerably across states, ranging from about \$40 to \$390 for opioids and \$5 to \$90 for topicals.

**Figure 8a: Opioid and Topical Paid per PnM Claim
SY 2012**



Contrasting Figure 8a against the estimates for SY 2023 in Figure 8b provides a clear picture of the transformation in opioid and topical drug costs for PnM claims over the past 12 years. The paid per PnM claim for opioids dropped dramatically in both dollar and percentage terms. In contrast, the cost and share for topicals spiked in many states. The range of opioid costs per PnM claim tightened to between \$20 and \$120 across study-states, while the range for topicals expanded to between \$10 and \$630. While topicals are not used to treat PnM claims nearly as often as opioids were at their peak, their high price means even small upticks in utilization can result in significant increases in costs.

**Figure 8b: Opioid and Topical Paid per PnM Claim
SY 2023**



This suggests that much of the variation in state drug costs for PnM claims is due to the prevalence of topicals. To better understand the drivers of topical use, it is important to understand the regulatory framework around pharmaceuticals.

PHARMACEUTICAL RULES AND REGULATIONS

State-specific pharmaceutical rules and regulations play a critical role in shaping prescribing and reimbursement practices for topical medications. These requirements often play a large role in determining which drugs are preferred for prescribing, how they are priced, and the extent to which they are utilized. We examined four different types of rules and regulations in place as of 2023:

1. Closed Drug Formularies

Drug formularies provide physicians with evidence-based guidance for prescribing drug treatments. One formulary that's commonly used in workers compensation is the Official Disability Guidelines Workers' Compensation Drug Formulary (ODG Formulary), which classifies drugs permitted for use without prior payer authorization (Y) or as requiring prior authorization (N). When it comes to topicals, states with closed drug formularies tend to have a topical cost per PnM claim³ that's below the study-state average, although the ODG Formulary does not limit the use of some of the most common topicals like Lidocaine, which can still cost over a thousand dollars per prescription.

2. Compound Drug Restrictions

Compounding is the practice of combining multiple drug ingredients to create a new medication. Many states have legislation that addresses compounding. While legislation varies, prices are generally based on the underlying ingredients plus a compounding fee. Some states have gone further by requiring prior approval for compounding or specifically capping prices on physician and pharmacy compounded topicals. While physician and pharmacy compounding may have been impactful in the past, it currently comprises less than 1% of all topical drug costs.

3. Topical-Specific Rules and Regulations

Topical-specific legislation, until recent years, has often been narrow, focusing on subsets of topicals, such as physician and pharmacy compounded ones. This focus has reduced the costs of these types of topicals, but we are now seeing the rise of a newer phenomenon: high-priced private label topicals, which are often prescribed by physicians. In more recent years, states such as CO, GA, MS, and SC have implemented broader topical-specific regulations that appear to have been initially effective in bringing down costs.

4. Physician Dispensing Limits

As with compounded drugs, many states have limitations on physician-dispensed drugs that are based on average wholesale prices. To address drugs with high average wholesale prices, some states also require prior approval for physician dispensing. The states that have stricter limits exhibit lower physician-dispensed drug costs than the countrywide average, including five of the six lowest states in topical paid per PnM claim.

³ For more on the impact of drug formularies, please see our paper "[Drug Formulary Implementations—A Look at Impacts on Workers Compensation Prescription Drug Experience.](#)"

Figure 9 displays the cost per transaction of topicals that are dispensed at a physician’s office relative to those dispensed by a pharmacy. A dotted line is shown at 1 (costs being equal) to easily see states with costs higher or lower relative to pharmacies. All but four states pay more per transaction at a physician’s office for topicals, with the median state paying about 1.7 times more than those dispensed by pharmacies. With physician-dispensed topicals often being more expensive, they also often make up a larger share of topical payments compared to other drugs. Over 50% of topical payments on average are physician-dispensed, compared to 17% for all other pain management drugs.

Figure 9: Physician-Dispensed Topicals Relative to Pharmacy-Dispensed Topicals, Per Transaction

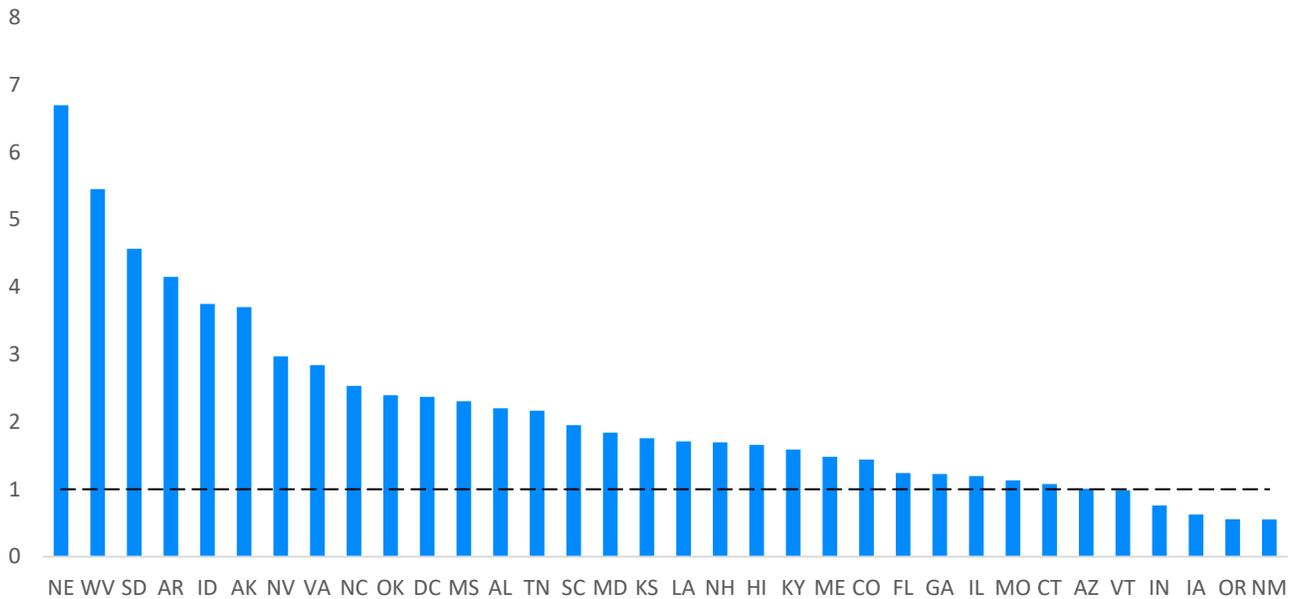


Figure 9: MT, RI, and UT were excluded from the chart due to having fewer than 15 physician-dispensed transactions.

CLOSING REMARKS

Our analysis reveals substantial variation in pain management costs across states, even after adjusting for the mix of medical conditions. While declining opioid usage has put downward pressure on overall costs, most states have seen this offset by larger increases in physical medicine and major surgery costs. Topicals, although not matching past opioid utilization, have emerged as a significant cost driver for prescription drugs due to their high prices. Legislative measures appear to correlate with lower topical costs, suggesting policy can play a meaningful role in managing future topical costs. As pain management continues to evolve, we will monitor new developments and inform the industry.

TERMINOLOGY

Terms used throughout this brief include:

- **Accident Year (AY)**—The year in which an injury occurred.
- **Service Year (SY)**—The year in which a medical service is provided.
- **Study-states**—Aggregate results based on all states included in the study, denoted as “ALL” in each figure, and representing AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MD, ME, MO, MS, MT, NC, NE, NH, NM, NV, OK, OR, RI, SC, SD, TN, UT, VA, VT, and WV.
- **Medical condition**—Grouping of ICD-10 diagnosis codes with similar characteristics.
- **Pain management (PnM)**—Determined using a combination of criteria that are a function of medical condition and paid procedure code; please see Appendix C for more information.
- **PnM claim**—A claim having a pain management service as defined above.

APPENDIX A

Data Tables

FIGURE 1:

PNM PAID PER PNM CLAIM, UNADJUSTED—BY STATE AND SERVICE YEAR

STATE	2012	2023	STATE	2012	2023
ALL	2,842	3,215	ME	1,785	2,272
AK	5,647	3,908	MO	3,140	3,981
AL	3,526	4,608	MS	2,430	3,107
AR	1,909	1,687	MT	3,260	3,237
AZ	2,547	3,045	NC	2,905	2,368
CO	2,340	2,409	NE	2,768	3,698
CT	3,653	3,563	NH	3,840	4,299
DC	2,225	2,617	NM	2,724	2,709
FL	2,302	3,163	NV	2,728	2,708
GA	2,660	3,066	OK	4,174	3,090
HI	2,318	4,289	OR	2,321	2,307
IA	2,642	3,387	RI	2,141	2,093
ID	3,121	3,157	SC	2,726	3,089
IL	4,169	4,843	SD	2,061	2,788
IN	2,378	3,271	TN	2,457	2,512
KS	2,395	2,781	UT	1,966	2,171
KY	2,297	2,152	VA	3,641	4,073
LA	4,391	6,960	VT	3,063	3,707
MD	3,231	3,024	WV	1,621	1,742

APPENDIX A (CONT'D)

Data Tables

FIGURE 2:

DIFFERENCE IN PNM PAID PER PNM CLAIM RELATIVE TO STUDY-STATE MEDIAN—BY STATE AND MIX ADJUSTMENT, SERVICE YEAR 2023

STATE	UNADJUSTED	ADJUSTED
ALL	126	293
AK	818	489
AL	1,519	880
AR	(1,402)	(1,154)
AZ	(44)	440
CO	(680)	(15)
CT	473	25
DC	(473)	(461)
FL	74	551
GA	(23)	353
HI	1,200	1,129
IA	297	526
ID	68	36
IL	1,754	1,986
IN	182	615
KS	(309)	(138)
KY	(938)	(889)
LA	3,871	2,022
MD	(65)	(73)

STATE	UNADJUSTED	ADJUSTED
ME	(817)	(584)
MO	892	1,336
MS	18	(238)
MT	148	(336)
NC	(722)	(476)
NE	609	468
NH	1,209	727
NM	(380)	(204)
NV	(381)	15
OK	1	(512)
OR	(782)	(560)
RI	(996)	(925)
SC	(1)	(167)
SD	(302)	(349)
TN	(577)	(681)
UT	(918)	(725)
VA	984	1,029
VT	618	249
WV	(1,348)	(1,203)

APPENDIX A (CONT'D)

Data Tables

FIGURE 3:

PNM PAID PER PNM CLAIM—BY STATE AND PAYMENT CATEGORY, SERVICE YEAR 2023

State	All Other	Drugs	Major Surgery	Physical Medicine
ALL	1,152	442	1,179	442
AK	1,267	229	1,629	783
AL	1,376	730	2,185	317
AR	688	179	627	194
AZ	1,024	487	1,091	444
CO	1,011	239	653	506
CT	1,018	440	1,693	412
DC	828	463	730	595
FL	1,200	695	1,015	253
GA	1,233	549	920	364
HI	1,039	1,504	615	1,131
IA	1,245	237	1,460	444
ID	1,049	390	1,361	358
IL	1,622	480	1,878	863
IN	1,093	135	1,447	596
KS	958	367	1,151	305
KY	800	354	724	273
LA	2,731	943	2,730	555
MD	907	496	923	698
ME	820	177	775	500
MO	1,369	265	1,815	533
MS	1,098	348	1,329	333
MT	1,059	380	1,249	550
NC	816	259	899	394
NE	1,306	337	1,668	387
NH	1,745	488	1,417	649
NM	1,181	453	654	421
NV	1,279	259	835	335
OK	874	418	1,552	245
OR	1,027	140	480	660
RI	927	108	681	377
SC	925	764	1,024	376
SD	948	379	1,200	261
TN	848	460	965	239
UT	928	192	818	234
VA	1,398	541	1,650	485

VT	1,573	171	1,320	643
WV	867	107	541	227

APPENDIX A (CONT'D)**Data Tables**

FIGURE 4:

DIFFERENCE IN PNM PAID PER PNM CLAIM RELATIVE TO STUDY-STATE MEDIAN—BY STATE AND PAYMENT CATEGORY, SERVICE YEAR 2023

State	All Other	Drugs	Major Surgery	Physical Medicine
ALL	108	63	58	25
AK	223	(150)	508	366
AL	332	351	1,065	(100)
AR	(356)	(200)	(494)	(223)
AZ	(20)	108	(30)	27
CO	(34)	(140)	(467)	90
CT	(26)	60	572	(5)
DC	(216)	83	(390)	178
FL	156	316	(106)	(164)
GA	189	170	(201)	(53)
HI	(5)	1,124	(506)	715
IA	201	(142)	339	27
ID	5	10	240	(59)
IL	578	101	757	446
IN	49	(244)	326	179
KS	(86)	(12)	30	(112)
KY	(244)	(25)	(396)	(144)
LA	1,687	564	1,609	139
MD	(137)	117	(198)	281
ME	(224)	(202)	(346)	83
MO	324	(114)	694	116
MS	54	(31)	208	(84)
MT	15	0	129	133
NC	(228)	(120)	(222)	(23)
NE	262	(42)	548	(30)
NH	701	108	296	233
NM	137	73	(467)	5
NV	235	(120)	(286)	(82)
OK	(170)	39	432	(172)
OR	(17)	(240)	(640)	244
RI	(117)	(272)	(440)	(40)
SC	(119)	385	(97)	(41)
SD	(96)	(0)	79	(156)
TN	(196)	81	(156)	(178)
UT	(116)	(188)	(303)	(183)

VA	354	162	529	68
VT	529	(208)	200	226
WV	(177)	(272)	(580)	(190)

APPENDIX A (CONT'D)

Data Tables

FIGURE 5:
ANNUAL CHANGE IN PHYSICAL MEDICINE PAID PER PNM CLAIM,
SERVICE YEARS 2012 TO 2023

STATE	ANNUAL CHANGE	STATE	ANNUAL CHANGE
ALL	2.3%	ME	2.5%
AK	-1.6%	MO	3.8%
AL	4.8%	MS	2.9%
AR	1.1%	MT	3.0%
AZ	5.6%	NC	4.0%
CO	3.2%	NE	1.3%
CT	1.1%	NH	2.3%
DC	2.9%	NM	2.4%
FL	0.5%	NV	3.2%
GA	3.3%	OK	1.1%
HI	5.3%	OR	1.4%
IA	3.4%	RI	2.3%
ID	0.3%	SC	2.9%
IL	1.9%	SD	-0.4%
IN	6.3%	TN	1.9%
KS	1.6%	UT	3.8%
KY	2.3%	VA	1.7%
LA	3.5%	VT	0.1%
MD	4.0%	WV	-2.5%

APPENDIX A (CONT'D)

Data Tables

FIGURE 6:
ANNUAL CHANGE IN MAJOR SURGERY PAID PER PNM CLAIM,
SERVICE YEARS 2012 TO 2023

STATE	ANNUAL CHANGE	STATE	ANNUAL CHANGE
ALL	1.9%	ME	5.6%
AK	-2.7%	MO	1.8%
AL	6.8%	MS	5.3%
AR	-0.5%	MT	1.3%
AZ	2.5%	NC	-2.4%
CO	-0.2%	NE	3.8%
CT	1.3%	NH	2.0%
DC	2.6%	NM	0.1%
FL	5.0%	NV	-0.4%
GA	0.3%	OK	-1.8%
HI	6.1%	OR	-0.7%
IA	3.0%	RI	1.1%
ID	-1.1%	SC	1.8%
IL	0.5%	SD	4.0%
IN	3.4%	TN	2.5%
KS	0.9%	UT	2.3%
KY	2.9%	VA	2.7%
LA	7.2%	VT	4.2%
MD	0.3%	WV	1.3%

APPENDIX A (CONT'D)

Data Tables

FIGURE 7:
CHANGE IN DRUG PAID PER PNM CLAIM,
SERVICE YEARS 2012 TO 2023

STATE	ANNUAL CHANGE	STATE	ANNUAL CHANGE
ALL	-2.8%	ME	-5.7%
AK	-6.4%	MO	0.0%
AL	-3.6%	MS	-4.3%
AR	-6.3%	MT	-6.5%
AZ	-3.3%	NC	-7.2%
CO	-4.2%	NE	-1.0%
CT	-2.1%	NH	-3.4%
DC	0.9%	NM	-4.6%
FL	1.7%	NV	-7.7%
GA	0.1%	OK	-5.9%
HI	7.1%	OR	-8.0%
IA	-2.4%	RI	-10.1%
ID	0.6%	SC	-0.1%
IL	0.4%	SD	-1.7%
IN	-4.1%	TN	-3.9%
KS	-0.3%	UT	-8.3%
KY	-7.2%	VA	-2.3%
LA	-1.2%	VT	-8.4%
MD	-5.3%	WV	-3.2%

APPENDIX A (CONT'D)

Data Tables

FIGURE 8A:

OPIOID AND TOPICAL PAID PER PNM CLAIM, SERVICE YEAR 2012—BY STATE

STATE	OPIOID	TOPICAL
ALL	188	38
AK	178	31
AL	348	62
AR	119	15
AZ	233	40
CO	130	20
CT	229	42
DC	150	45
FL	137	65
GA	165	39
HI	240	71
IA	74	17
ID	119	13
IL	130	25
IN	59	7
KS	144	15
KY	259	57
LA	314	91
MD	386	79

STATE	OPIOID	TOPICAL
ME	129	25
MO	79	9
MS	168	41
MT	349	8
NC	197	38
NE	100	17
NH	318	56
NM	284	60
NV	317	42
OK	287	25
OR	162	16
RI	124	18
SC	282	48
SD	155	23
TN	264	50
UT	197	23
VA	237	51
VT	146	30
WV	37	5

APPENDIX A (CONT'D)

Data Tables

FIGURE 8B:

OPIOID AND TOPICAL PAID PER PNM CLAIM, SERVICE YEAR 2023—BY STATE

STATE	OPIOID	TOPICAL	STATE	OPIOID	TOPICAL
ALL	105	62	ME	40	15
AK	43	19	MO	27	24
AL	125	116	MS	56	58
AR	29	8	MT	120	5
AZ	58	146	NC	56	29
CO	28	70	NE	59	24
CT	58	167	NH	165	41
DC	54	199	NM	93	94
FL	43	185	NV	60	39
GA	44	229	OK	119	32
HI	92	629	OR	48	7
IA	30	8	RI	35	9
ID	69	122	SC	175	160
IL	34	153	SD	66	9
IN	18	16	TN	104	51
KS	74	43	UT	41	7
KY	99	29	VA	81	158
LA	107	277	VT	18	16
MD	113	100	WV	23	9

APPENDIX A (CONT'D)

Data Tables

FIGURE 9:

PHYSICIAN-DISPENSED TOPICALS RELATIVE TO PHARMACY-DISPENSED TOPICALS, PER TRANSACTION BY STATE

STATE	RELATIVE COST
AK	3.7
AL	2.2
AR	4.1
AZ	1.0
CO	1.4
CT	1.1
DC	2.4
FL	1.2
GA	1.2
HI	1.7
IA	0.6
ID	3.8
IL	1.2
IN	0.8
KS	1.8
KY	1.6
LA	1.7
MD	1.8
ME	1.5

STATE	RELATIVE COST
MO	1.1
MS	2.3
NC	2.5
NE	6.7
NH	1.7
NM	0.6
NV	3.0
OK	2.4
OR	0.6
SC	2.0
SD	4.6
TN	2.2
VA	2.8
VT	1.0
WV	5.5

APPENDIX B

Study Data

Data used in this study is from NCCI's Medical Data Call (MDC). The MDC captures transaction-level detail on workers compensation medical bills processed on or after July 1, 2010, including dates of service, charges, payments, procedure codes, and diagnosis codes. Carriers are not required to report transactions for services provided more than 30 years after the date of the injury.

For this study, we used MDC experience evaluated as of the end of 2023 for:

- Medical services provided between January 1, 2012, and the end of 2023.
- The following states are included: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MD, ME, MO, MS, MT, NC, NE, NH, NM, NV, OK, OR, RI, SC, SD, TN, UT, VA, VT, and WV.
- Jurisdiction-specific results are based on the state of jurisdiction. Data is used with permission.

APPENDIX C

Methodology

IDENTIFICATION OF PAIN MANAGEMENT

The identification of pain management was defined in consultation with physicians and is done using the following:

- Procedure codes: We identified procedure codes that are commonly used for treating pain, such as massage therapy or surgery for lower back pain, as well as drugs. Drugs were included based on their therapeutic class. Any transaction with one of these procedure codes is included.
- Medical condition: Certain conditions were considered to be always for pain, such as low back pain or chronic pain. Any treatment with one of these diagnoses is included regardless of the procedure.
- Facility services: For inpatient, outpatient, and ambulatory surgical services, entire visits were included if they met one of the following criteria:
 - It included a surgery for pain.
 - Greater than 50% of payments were for pain.
 - For inpatient services, the visit was connected to one with the above criteria. We often saw separate visits for physical therapy after a pain-related surgery.

MEDICAL CONDITION MIX ADJUSTMENT

To control for the mix of medical conditions across states, we relied on the study-statewide share of claims with a given diagnosis as well as the payments per claim with a given medical condition by state. An example calculation is as follows:

Example Calculation:

- **Study-State Mix:**
 - Medical Condition A: 40% of claims, Avg. Cost: \$1,000
 - Medical Condition B: 60% of claims, Avg. Cost: \$100
 - Weighted Avg. Cost: \$460
- **State X Mix:**
 - Medical Condition A: 80% of claims, Avg. Cost: \$1,100
 - Medical Condition B: 20% of claims, Avg. Cost: \$200
 - Unadjusted Avg. Cost: \$920
 - **Mix-Adjusted Cost:** \$560 (using study-state weights)