

HEALTH CARE COST AND UTILIZATION
IN THE TEXAS WORKERS' COMPENSATION SYSTEM
2000 - 2017



TEXAS DEPARTMENT OF INSURANCE
WORKERS' COMPENSATION
RESEARCH AND EVALUATION GROUP

JANUARY 2019

Texas Department of Insurance
333 Guadalupe | Austin, Texas 78701
(800) 578-4677
www.TDI.texas.gov

Per Chapter 405 of the *Texas Labor Code*, the Workers' Compensation Research and Evaluation Group at the Texas Department of Insurance is responsible for conducting professional studies and research on various system issues, including:

- ★ the delivery of benefits;
- ★ litigation and controversy related to workers' compensation;
- ★ insurance rates and rate-making procedures;
- ★ rehabilitation and reemployment of injured employees;
- ★ the quality and cost of medical benefits;
- ★ employer participation in the workers' compensation system;
- ★ employment health and safety issues; and
- ★ other matters relevant to the cost, quality, and operational effectiveness of the workers' compensation system.

Information in this report can be obtained in alternative formats by contacting the Texas Department of Insurance.

For more information, email WCResearch@tdi.texas.gov

This report is available online at www.tdi.texas.gov/wc/regulation/roc

ACKNOWLEDGMENTS

The Workers' Compensation Research and Evaluation Group would like to thank the Division of Workers' Compensation for their help in obtaining, evaluating, and analyzing medical billing and payment data.

Dr. Soon-Yong Choi, an economist, managed the project, conducted the analyses, and authored the report. D.C. Campbell, Conrado Garza, and Amy Lee provided valuable editorial comments.

This page intentionally left blank.

TABLE OF CONTENTS

LIST OF TABLES	VI
LIST OF FIGURES.....	VIII
EXECUTIVE SUMMARY.....	IX
1. INTRODUCTION AND METHODOLOGICAL NOTES	1
Data Sources.....	1
Claim Types.....	2
Service Year, Injury Year, and Maturity.....	2
Measuring Service Utilization.....	2
2. OVERVIEW: TOTAL HEALTH CARE COSTS	3
Costs by Bill Type	3
Average Cost per Claim by Injury Year	5
Total and Average Costs by Claim Type.....	6
Inflation Adjusted Cost	9
Workers' Compensation Health Care Networks	10
Health Care Cost and Texas Gross Domestic Product	13
3. COST AND UTILIZATION OF PROFESSIONAL SERVICES	15
Changes in Medical Fee Guidelines.....	16
Cost and Utilization by Service Year	18
Cost and Utilization by Injury Year	26
4. COST AND UTILIZATION OF HOSPITAL/INSTITUTIONAL SERVICES	33
Total Cost and Utilization for Hospital/Institutional Services	33
Hospital/Institutional Costs by Facility Type	34
Hospital/Institutional Costs by Injury Year.....	36
5. COST AND UTILIZATION OF DENTAL SERVICES.....	39
6. COST AND UTILIZATION OF PHARMACY SERVICES	42
Utilization of Pharmacy Services by Claim Type.....	42
Total and Average Costs by Claim Type.....	43
Pharmacy Cost and Utilization by Maturity Group	44
Pharmacy Cost and Utilization by Drug Group.....	45
Pharmacy Cost and Utilization by Brand/Generic Status	49
Effects of the Pharmacy Closed Formulary	51
Cost and Utilization of Compounded Drugs.....	54
7. SUMMARY TRENDS IN CHANGING COST COMPONENTS.....	56
APPENDIX A: MEASURING SERVICE UTILIZATION	59
APPENDIX B: DATA FOR FIGURES AND ADDITIONAL DATA	61

LIST OF TABLES

Table 2.1: Number of Unique Claims, by Bill Type	4
Table 2.2: Total Cost, by Bill Type (Thousand Dollars)	4
Table 2.3: Total and Average Costs, by Claim Type, Professional Services	7
Table 2.4: Total and Average Costs, by Claim Type, Hospital/Institutional Services	8
Table 2.5: Total and Average Costs, by Claim Type, Pharmacy Services	8
Table 2.6: Health Care Cost as a Percentage of Texas GDP	14
Table 3.1: Changes in Medicare and Texas Fee Schedule Factors	17
Table 3.2: Fee Schedule Comparisons for Selected Services	17
Table 3.3: Number of Visits and Services per Visit per Claim, by Claim Type, Professional Services	19
Table 3.4: Percent of Claims Receiving Professional Service by Health Care Provider Type, by Service Year	20
Table 3.5: Total Professional Cost (in Thousand Dollars) by Health Care Provider Type, by Service Year	21
Table 3.6: Percent of Claims Receiving Certain Professional Services	25
Table 3.7: Total Cost, by Injury Year, by Maturity and Claim Type, Professional Services	28
Table 3.8: Percent of Claims Receiving Certain Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury	29
Table 3.9: Top 20 Services by Total Payments in 2005 - 2017 Service Years	31
Table 4.1: Number and Share of Claims That Received Hospital/Institutional Services	33
Table 4.2: Total Hospital/Institutional Cost (Thousand Dollars), by Injury Year at 6, 12, and 24 Months after Injury	37
Table 4.3: Number of Claims Receiving Hospital/Institutional Services, by Injury Year at 6, 12, and 24 Months after Injury	38
Table 4.4: Average Hospital/Institutional Cost per Claim, by Injury Year at 6, 12, and 24 Months after Injury	38
Table 5.1: Number of Claims, Total and Average Costs per Claim for Dental Services, by Claim Type	39
Table 5.2: Top 10 Dental Services, by Total Cost (2005 - 2017 Cumulative Totals)	40
Table 5.3: Number of Claims and Cost per Claim (2005 - 2017 Cumulative Totals), by HRR, Dental Services	41
Table 6.1: Number and Share of Claims Receiving Pharmacy Services, by Claim Type	43
Table 6.2: Total and Average Costs per Claim, by Claim Type, Pharmacy Services	43
Table 6.3: Total Cost, by Maturity Group, Pharmacy Services (Thousand Dollars)	44
Table 6.4: Number of Claims, by Maturity Group, Pharmacy Services	44
Table 6.5: Average Pharmacy Cost per Claim, by Maturity Group	45
Table 6.6: Percent of Claims Receiving Certain Drug Groups, by Service Year	48
Table 6.7: Total and Average Costs, by Generic Status by Claim Type	50
Table 6.8: Total and Average Costs, by N-Drug Status by Claim Type	52
Table 6.9: Number and Cost of Compounded Drug	55
Table 7.1: Percent Changes in Costs and Utilization in Current and Inflation-Adjusted Prices, by Claim Type, Professional Services for Selected Time Periods	57
Table B1: Average Cost per Claim, by Bill Type	61

Table B2: Total Professional Cost, by Service Type (in Thousand Dollars).....62

Table B3: Average Professional Cost per Claim, by Service Type63

Table B4: Number of Services per Claim, by Service Type, Professional Services64

Table B5: Average Cost per Claim by Service Type, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury65

Table B6: Number of Services per Claim, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury.....65

Table B7: Average Cost per Service for Selected Services66

Table B8: Pharmacy Cost by Drug Group, by N-Drug Status.....67

Table B9: Number of Physical Medicine Services per Claim by Drug Status, 12 Months after Injury67

LIST OF FIGURES

Figure 2.1: Average Cost per Claim, by Bill Type.....	5
Figure 2.2: Average Medical Cost by Claim Type, by Injury Year at 12 Months after Injury	6
Figure 2.3: Professional and Hospital Costs in Current and Inflation-Adjusted Prices, by Service Year	10
Figure 2.4: Number of Claims by Network Status, by Service Year	11
Figure 2.5: Total Health Care Cost by Network Status, by Service Year	11
Figure 2.6: Average Health Care Cost per Claim, by Service Year.....	12
Figure 2.7: Average Health Care Cost per Claim, by Injury Year, Six Months after Injury	13
Figure 3.1: Percent of Claims Receiving at Least One Professional Service, by Service Year	15
Figure 3.2: Number of Claims by Claim Type, Professional Services, by Service Year	18
Figure 3.3: Total Professional Cost, by Claim Type, by Service Year	18
Figure 3.4: Average Cost per Claim by Health Care Provider Type, Professional Services	21
Figure 3.5: Total Professional Cost by Service Type, Lost-Time Claims	23
Figure 3.6: Average Professional Cost per Claim by Service Type, Lost-Time Claims	24
Figure 3.7: Number of Professional Services per Claim by Service Type, Lost-Time Claims.....	26
Figure 3.8: Average Cost per Claim by Claim Type, Professional Services.....	27
Figure 3.9: Average Cost per Claim by Service Type, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury	30
Figure 3.10: Number of Services per Claim, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury	30
Figure 3.11: Average Cost per Service by Injury Year, Normalized in 2000 Price Levels	32
Figure 4.1: Total Cost by Claim Type, Hospital/Institutional Services.....	34
Figure 4.2: Number of Claims by Facility Type, Hospital/Institutional Services, Lost-Time Claims	35
Figure 4.3: Total Cost by Facility Type, Hospital/Institutional Services, Lost-Time Claims	35
Figure 4.4: Cost per Claim by Facility Type, Hospital/Institutional Services, Lost-Time Claims.....	36
Figure 6.1: Total Pharmacy Cost by Drug Group, Lost-Time Claims.....	46
Figure 6.2: Total Pharmacy Cost, by Service Year by Drug Group, Medical-Only Claims	46
Figure 6.3: Average Pharmacy Cost per Claim by Drug Group, Lost-Time Claims	47
Figure 6.4: Average Pharmacy Cost per Claim by Drug Group, Medical-Only Claims.....	47
Figure 6.5: Costs of Opioids by Drug Subclass	49
Figure 6.6: Generic Drug's Share in Total Cost by Drug Group	51
Figure 6.7: Share of N-Drug Cost in Each Drug Group	53
Figure 6.8: Number of Physical Medicine Services per Claim by Drug Status by Fiscal Injury Year, 12 Months after Injury.....	54

EXECUTIVE SUMMARY

This report presents essential indicators of the health care cost and utilization in the Texas workers' compensation system since 2000. The primary purpose of this report is to provide system participants with a set of complete, general, and consistent data for monitoring and analyzing the trends in health care cost and utilization.

The data used in this report consists of medical billing and payment data submitted by insurance carriers to the Texas Department of Insurance, Division of Workers' Compensation (DWC), covering professional, hospital/institutional, dental, and pharmacy services. Claims are grouped as either 'lost-time' or 'medical-only' claims. Lost-time claims have more than seven days of lost time from work because of a work-related injury or illness and receive medical, as well as income benefits. Medical-only claims receive medical benefits, but not income benefits and have seven days or less of lost time.

Overview: Total Health Care Cost

- Total health care cost in 2017 was \$1.01 billion, slightly down from \$1.06 billion in 2016. Total professional cost decreased by 3.2 percent from 2016, and by 23 percent since 2000. Hospital cost in 2017 decreased by 2.7 percent from 2016, but was 16 percent higher than in 2000. Total cost for pharmacy services decreased by 22 percent from 2016 and was 47 percent lower than in 2005.
- The number of claims in 2017 decreased by 0.5 percent from 2016, and by 31 percent from 2000. In 2017, 95 percent of all claims received one or more professional services; 28 percent received hospital/institutional services; and 38 percent received pharmacy services.
- The average cost per claim in 2017 decreased by 3 percent from 2016 for professional services and decreased by 3 percent for hospital services. Average cost per claim for pharmacy services decreased by 18 percent from 2016. Since 2000, average professional and hospital costs per claim increased by 12 percent and 80 percent, respectively. Average pharmacy cost per claim decreased by 18 percent since 2005.
- The combined total cost of professional and hospital services decreased by 11 percent from 2000 to 2017 in current prices without inflation adjustment. Adjusted for inflation, the total cost decreased by 41 percent.
- In 2017 workers' compensation health care networks treated 47 percent of all claims and accounted for 40 percent of the total health care cost. The average health care cost per claim in networks (\$2,488) was 7 percent lower than that in non-network (\$2,660).
- Total health care costs in the workers' compensation system decreased from about 0.14 percent of the Texas gross domestic product (GDP) in 2000 to just 0.06 percent of the Texas GDP in 2017.

Professional Cost and Utilization

- Total professional cost decreased greatly between 2003 and 2008 coinciding with the changes in the 2003 professional services fee guideline. The revised Medical Fee Guideline of 2008 resulted in cost increases between 2008 and 2011; but total cost decreased by 19 percent since 2011.
- The number of medical-only claims decreased by 25 percent since 2000. The number of lost-time claims fluctuated but resulted in an overall decrease of 39 percent between 2000 and 2017.
- About 74 percent of professional costs in 2017 were for lost-time claims, while they accounted for 37 percent of all claims.
- The number of visits to health care providers per claim peaked in 2003 and have decreased since then. Lost-time claims had about three and half times more visits per claim than medical-only claims in most years. The number of services per visit, as a measure of utilization intensity, was relatively similar across claim types and service years at about three services per visit.
- In terms of health care provider type, the share of claims receiving services from chiropractors declined from 13 percent of all claims in 2005 to 7 percent in 2012, and then increased to 10 percent in 2017. The participation by physician assistants increased greatly: 31 percent of claims received services from them in 2017, increasing from just 6 percent of the claims in 2005. An increased use of drug tests also resulted in an increased share of services from independent laboratories in recent years. Services for durable medical equipment decreased from 15 percent in 2005 to 8 percent in 2017.
- The average cost per claim for ambulatory surgery centers increased by 115 percent between 2005 and 2012 but has decreased by 11 percent since then. The average cost for chiropractors decreased by 34 percent since 2005. The average cost per claim from independent laboratories increased from \$162 in 2005 to \$1,185 in 2015, then decreased to \$632 in 2017.
- For lost-time claims, physical medicine was the most expensive service group in most years. For medical-only claims, evaluation and management (E/M) services was the costliest service group in 2017.
- Since 2000, total costs for physical medicine services decreased by 49 percent for lost-time claims and by 35 percent for medical-only claims. Total costs for spinal surgery decreased by more than 70 percent for both claim types.
- The top 20 most costly services accounted for 52 percent of the total cumulative professional cost from 2005 to 2017.
- The price per individual service for E/M and lumbar spine fusion services has increased continually since 2003. The average price per service for durable medical equipment services increased greatly since 2005. MRI prices decreased sharply since 2013 because of reductions in the Medicare fee schedule. Most other services showed a moderately increasing price trend.

Hospital/Institutional Cost and Utilization

- In 2017, 28 percent of all claims received at least one hospital or institutional service, which has remained stable since 2012.
- Hospital/institutional bills included payments for services in skilled nursing facilities, home health care, and other institutions in addition to hospital inpatient and outpatient services. However, non-hospital services accounted for less than 10 percent of the total cost.
- The number of claims receiving hospital/institutional services decreased by 36 percent since 2000. The total cost increased by 16 percent from 2000 to 2017, but fluctuated greatly during that time: costs increased by 39 percent from 2000 to 2002, decreased by 38 percent from 2003 to 2005, increased by 53 percent from 2006 to 2014, and decreased by 12 percent from 2014 to 2017.
- About 46 percent of all claims that received hospital/institutional services in 2017 service year were lost-time claims, but they accounted for 85 percent of the total hospital/institutional cost.
- In 2017, 95 percent of lost-time claims received hospital outpatient services while only 10 percent received inpatient services. But hospital inpatient services accounted for 45 percent of the total cost, with hospital outpatient services accounting for 45 percent. Ambulatory surgery centers accounted for 6 percent of the total cost in 2017, down from 12 percent in 2005.

Dental Cost and Utilization

- Dental services accounted for 0.5 percent of all health care costs in 2017 (\$5.4 million), a slight increase from 0.3 percent in 2009.
- Most common dental services were implants, crowns, and root canals.

Pharmacy Cost and Utilization

- In 2017, 38 percent of those who received health care services received pharmacy services, decreasing from 47 percent in 2005. Since 2005, the number of lost-time and medical-only claims that received pharmacy services decreased by 37 percent and 33 percent, respectively, especially after 2011.
- In 2017, 53 percent of claims with pharmacy services were lost-time claims, but they accounted for 86 percent of the total cost.
- In 2017, legacy claims that received services after four or more years from injury constituted 13 percent of all pharmacy claims but accounted for 59 percent of the total pharmacy cost. New injury claims, which represented 75 percent of all pharmacy claims, accounted for 25 percent of the total pharmacy cost in 2017.
- For lost-time claims, the most frequently prescribed and costly drug group until 2011 was analgesics - opioid. After 2011, the central nervous system drugs group became the costliest drug group. Central nervous system drugs (comprising anticonvulsants, anti-anxiety agents, anti-depressants, and hypnotics) had the highest average cost per claim among lost-time claims.

- For medical-only claims, the analgesics - opioid was the costliest drug group until 2009. Since 2010, the “others” drug group, which includes dermatologicals, chemicals and adjuvants, had been the costliest drug group.
- Generic prescriptions increased steadily from 48 percent of the total pharmacy cost in 2005 to 66 percent in 2017.
- The use of N-drugs (drugs not recommended in the *Official Disability Guidelines - Treatment in Workers' Comp, Appendix A, ODG Workers' Compensation Drug Formulary*) decreased greatly after the implementation of the pharmacy closed formulary in 2011. In terms of total cost, N-drugs accounted for 32 percent of all pharmacy costs for lost-time claims in 2011 but decreased to 6 percent in 2017. For medical-only claims, it decreased from 27 percent in 2011 to 4 percent in 2017.
- After the pharmacy closed formulary was implemented, the total cost of analgesics - opioid drugs decreased by 67 percent among lost-time claims and by 77 percent among medical-only claims.
- The use of physical medicine services increased by 30 percent among N-drug users between 2011 and 2015, which indicated some initial substitution of physical medicine for N-drugs in the post-formulary years. But this group accounted for 2.5 percent of the claims in 2015. Physical medicine utilization decreased for most other claims, which resulted in the overall 14 percent decrease in physical medicine utilization since 2011.
- There were more than 18,000 compounded drug prescriptions in 2010, with a cost of \$6 million that represented about 4 percent of the total pharmacy cost in 2010. In 2014, compounded drugs increased to over 21,000 prescriptions and a cost of \$14 million (13 percent of the total pharmacy cost). However, compounded drugs decreased greatly in 2017 to about 5,000 prescriptions at a total cost of \$2.5 million (about 3 percent of the total pharmacy cost). From the peak of 2014, compounded drug cost decreased by \$11.6 million (82 percent).

Summary Trends in Changing Cost Components

- For lost-time claims, the average cost per claim for professional services increased by 20 percent from 2000 to 2017. When adjusted for inflation, the average cost per claim decreased by 20 percent. The number of claims and the level of utilization all decreased greatly, which resulted in the overall decrease in the total cost by 26 percent. Adjusted for inflation, the total cost decreased by 51 percent.
- The main factor in the decrease in total costs was the large decline in the number of claims and service utilization. The average cost per claim increased greatly because of large increases in cost per service, which increased by 61 percent and 47 percent for lost-time and medical-only claims, respectively.
- Cost trends are similar for lost-time and medical-only claims, but medical-only claims showed lower rates of decrease in the number of claims and the utilization of services than lost-time claims.

1. INTRODUCTION AND METHODOLOGICAL NOTES

This report presents essential indicators of health care cost and utilization in the Texas workers' compensation system since 2000. Health care, consisting of professional, hospital/institutional, dental, and pharmacy services, is one of the major benefits provided by the workers' compensation system for injured employees. Injured employees receive health care benefits that pay for all appropriate and necessary medical care for their work-related injuries or illnesses. Because there are no limits to medical benefits and no copayments or deductibles for patients, payers, as well as legislators and regulators of workers' compensation insurance coverage pay close attention to the changes and trends in health care costs and service utilization.

The primary purpose of this report is to provide system participants with a set of complete, general, and consistent data for monitoring and analyzing the trends in health care cost and utilization. In addition to summarizing major cost and utilization statistics, this report also provides drill-down analyses by claim type, health care provider type, service type, maturity, facility type, and drug type. For other issues on workers' compensation health care and income benefits, refer to other reports by the Texas Department of Insurance, Workers' Compensation Research and Evaluation Group (REG) which can be found at the REG's reports webpage (www.tdi.texas.gov/reports/wcreg/index.html).

Data Sources

The medical data underlying the REG's health care cost and utilization studies is comprised primarily of bills submitted by health care service providers to insurance carriers for payment. These data are in turn transmitted to DWC along with payment amounts and any denial or payment reduction codes.¹ Costs are determined by payments made by insurance carriers to health care providers.

Medical data collected by DWC contain direct payments to health care providers. Other costs such as bill and utilization reviews, dispute resolution expenses, and costs paid to third parties are not included. These data, however, include information about bill review actions taken by the insurance carriers such as payment decisions and payment adjustment amounts. Using this information, bills for services deemed not compensable are deleted from both cost and utilization analyses. Bills with zero payment are also excluded from the cost analysis but they are included in the utilization metrics. These zero-payment bills may be for disputed services, denied services, non-payable services, or payment updates.

¹ Medical data underwent a major change in 2005 when data collection changed to electronic data interchange (EDI) standards from a tape-submission system. The number of bills collected for the 2004 service year, which was the last service year before the implementation of EDI, was initially unusually low, but the current data for the pre-EDI period was extensively updated in 2010. Nevertheless, missing data during the EDI transition resulted in low figures for 2004. In addition, some data for the 2005 service year, being the first year of EDI implementation, may not be as reliable as those of later years. This was especially true for dental service data.

Claim Types

Claims are classified as either lost-time claims if they receive medical as well as income benefits, or medical-only claims if they receive only medical benefits without any income benefits. Income benefits include short-term temporary as well as long-term disability payments as defined by DWC (see www.tdi.texas.gov/wc/employee/incomeben.html). Most claims that receive income benefits are those that have more than seven days of lost time away from work. Medical-only claims may have no lost time or a maximum of seven days of lost time.

Service Year, Injury Year, and Maturity

Cost and utilization analyses are presented in both service year and injury year. Service year statistics account for all services and payments in a given calendar year for all claims regardless of their injury date. In comparison, injury year statistics are organized by the year of the injury, and account for all payments up to a set period of maturity. For example, 2016 injury year data with six months maturity will cover claims with injuries that occurred in 2016, with services provided within six months from the date of the injury for each claim. Service dates for the injury year 2016 will therefore extend from January 1, 2016, to June 30, 2017.

Economic and accounting cost analyses are best presented in the service year format since it accounts for all costs for all claims in the system within a given calendar year. Injury year statistics, on the other hand, are concerned only with new injuries, presenting a partial picture of the costs involved. But it offers consistent sets of data that are suited for developing cost trends and setting insurance rates. When appropriate, we show injury year statistics using six months, 12 months, and 24 months of maturity. More than 80 percent of total professional costs are incurred within 24 months after injury. To account for long-term effects of severe injuries on health care costs, some tables show separate maturity groups that include four years or more of maturity. The longer maturity is especially necessary for pharmacy services for which about 60 percent of total costs are for the claims with four years or longer maturity.

Measuring Service Utilization

When evaluating long-term trends in health care service utilization, a consistent and proper unit of service must be chosen to reflect the differences in frequency and intensity of services. The basic units for utilization analysis are based on straightforward measures: the number of visits to a health care provider as a measure of service frequency, and the number of services provided in one visit as a measure of service intensity. While the number of visits is an uncomplicated measurement, the number of services will depend on the way service bills are submitted by the health care providers. For most of the services, one bill equals to one instance of service. In some services such as physical therapy, multiple 15-minute sessions may be billed as a service, for which we calculated the number of sessions billed in each bill. A more detailed discussion about utilization metrics is presented in Appendix A.

2. OVERVIEW: TOTAL HEALTH CARE COSTS

In this section, we present an overall view of the total and average health care costs by type of health care provider (biller) and claim type. Remaining sections focus on one bill type consisting of professional, hospital, dental, and pharmacy services.

We begin by comparing health care costs by bill type such as professional, hospital, or pharmacy services, and by claim type such as medical-only claims or lost-time claims with income benefits. At the end of this section, we also discuss the effect of price inflation on cost measures and the share of workers' compensation health care costs in the general economy.

Costs by Bill Type

Texas workers' compensation medical bills are collected as four separate databases, consisting of bills for professional, hospital/institutional, dental, and pharmacy services. Since the databases are separate, some claims may have bills in some databases but not in others.

Numbers of unique claims are available from 2000 by bill type, presented in Table 2.1. When all four databases are combined, there were about 295,000 unique claims in 2017 (see 'medical combined' in Table 2.1). This represents a 30 percent decrease in the number of claims from 2000. Dental and pharmacy data are not available prior to 2005.² While 95 percent of the claims received at least one professional service in 2017, only 28 percent of them received hospital/institutional service, and about 38 percent of the claims received pharmacy services. In other words, 72 percent of the claims did not have hospital services, and less than half of the claims received pharmacy services. A noticeable trend in the table is the consistent decrease in the overall number of claims being treated in the workers' compensation system.

Since 2000, total professional costs decreased by 23 percent while hospital costs increased by 16 percent (see Table 2.2). However, professional cost increased steadily between 2007 and 2011, primarily due to increased fees per service. But total professional costs decreased since 2011. Total hospital/institutional costs increased by 53 percent between 2005 and 2014 but have remained stable since 2014. Total pharmacy costs, which accounted for about 13 percent of total medical costs in 2005, fluctuated around \$150 million until 2011. Pharmacy costs decreased greatly after the 2011 implementation of the pharmacy closed formulary and accounted for 7.7 percent of the total medical cost in 2017.

² DWC data collection process transitioned from paper to EDI beginning 2005. This transition may have affected the data for 2004.

Table 2.1: Number of Unique Claims, by Bill Type

Service Year	Professional	Hospital/ Institutional	Dental	Pharmacy	Medical Combined
2000	403,280	127,244			418,817
2001	401,745	130,651			417,852
2002	409,650	137,649			422,383
2003	376,165	126,988			385,815
2004	335,906	106,447			344,611
2005	338,594	92,038	565	172,185	366,333
2006	334,906	98,728	763	171,465	362,666
2007	337,705	103,460	1,135	180,160	366,924
2008	327,880	100,056	1,318	175,466	357,113
2009	303,097	92,275	1,234	160,626	326,914
2010	304,522	94,315	1,358	160,493	324,886
2011	305,206	96,089	1,379	156,923	323,874
2012	302,101	90,789	1,408	150,419	320,081
2013	292,386	87,470	1,469	141,414	309,857
2014	290,431	87,181	1,474	133,155	307,496
2015	283,949	84,395	1,455	122,931	299,296
2016	281,302	81,889	1,449	118,016	295,882
2017	279,841	82,092	1,541	112,034	294,679

Note: Figures for 'medical combined' do not include dental and pharmacy services prior to 2005. These numbers are understated compared to figures from 2005.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 2.2: Total Cost, by Bill Type (Thousand Dollars)

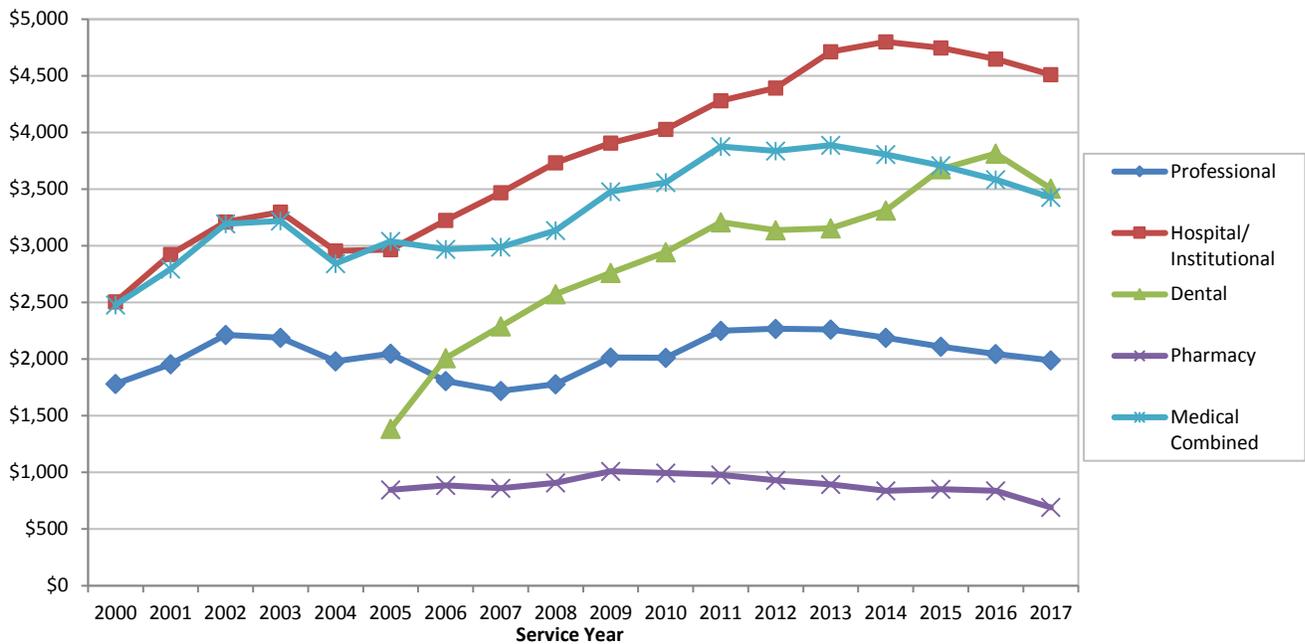
Service Year	Professional	Hospital/ Institutional	Dental	Pharmacy	Medical Combined
2000	\$719,116	\$318,924			\$1,038,040
2001	\$786,084	\$382,012			\$1,168,096
2002	\$906,988	\$441,820			\$1,348,808
2003	\$823,181	\$418,868			\$1,242,049
2004	\$665,591	\$314,486			\$980,076
2005	\$693,520	\$273,057	\$783	\$145,931	\$1,113,293
2006	\$605,482	\$318,278	\$1,533	\$151,987	\$1,077,280
2007	\$580,841	\$358,860	\$2,601	\$154,847	\$1,097,149
2008	\$583,735	\$373,443	\$3,394	\$159,508	\$1,120,080
2009	\$611,032	\$360,461	\$3,407	\$162,313	\$1,137,213
2010	\$613,076	\$379,948	\$3,998	\$159,690	\$1,156,712
2011	\$686,627	\$411,284	\$4,423	\$153,516	\$1,255,850
2012	\$685,317	\$398,888	\$4,417	\$139,874	\$1,228,496
2013	\$661,481	\$412,184	\$4,636	\$126,541	\$1,204,842
2014	\$635,354	\$418,467	\$4,881	\$111,661	\$1,170,362
2015	\$598,836	\$400,638	\$5,351	\$104,709	\$1,109,535
2016	\$575,119	\$380,677	\$5,527	\$98,953	\$1,060,276
2017	\$556,832	\$370,434	\$5,404	\$77,453	\$1,010,123

Note: Figures for 'medical combined' do not include dental and pharmacy services prior to 2005. These numbers are understated compared to figures from 2005.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

The average cost per claim increased by 12 percent for professional services and 80 percent for hospital/institutional services since 2000 (see Figure 2.1 and Table B1 in Appendix B). The average cost per claim for pharmacy services increased by 17 percent between 2005 and 2010, but it decreased by 31 percent from 2010 to 2017, mainly because of the new pharmacy closed formulary. Although total health care costs remained stable over the past 15 years, average costs per claim increased greatly because of a combination of factors including the declining number of low-cost claims, increases in fee for service, and price increases due to inflation.

Figure 2.1: Average Cost per Claim, by Bill Type



Note: Figures for Medical Combined do not include dental and pharmacy services prior to 2005. These numbers are understated compared to figures from 2005.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

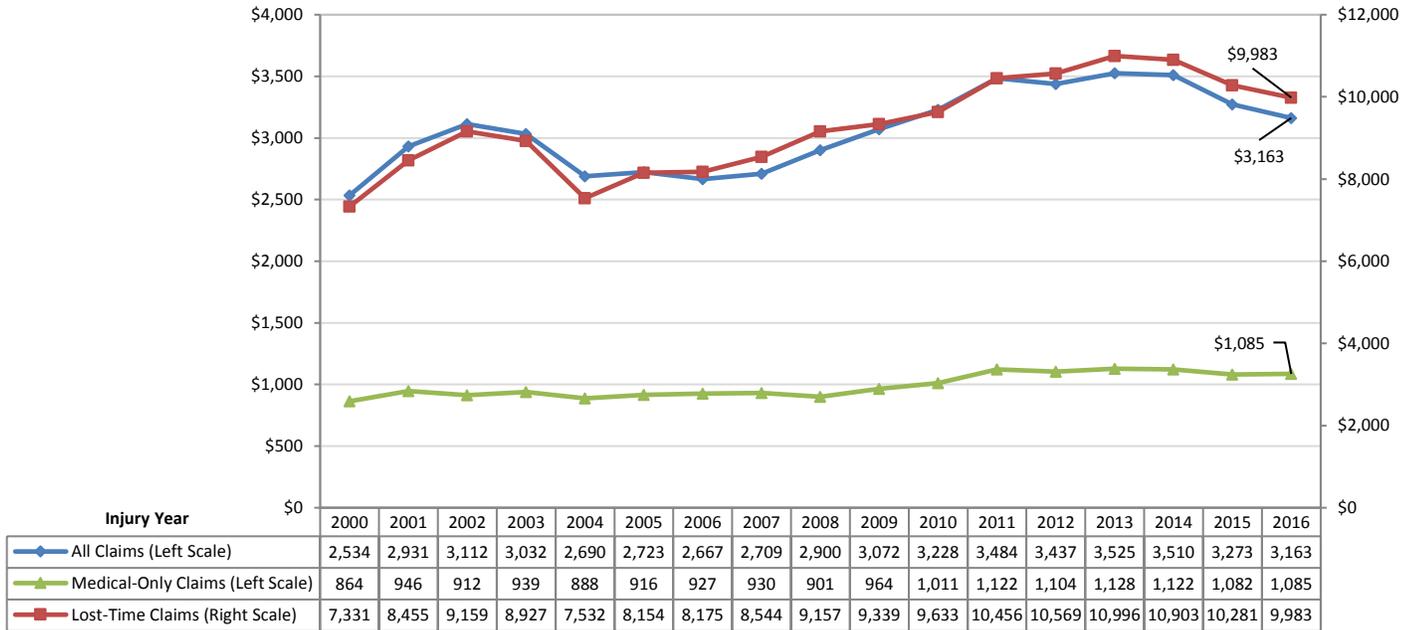
Average Cost per Claim by Injury Year

Data by claim type in this report will help stakeholders compare Texas' costs with other states' costs. Many reports published by other workers' compensation agencies and research organizations primarily report on claims with more than seven days of lost time. This group of claims is roughly equivalent to the lost-time claims in this report. In addition, in some reports, medical costs often combine professional, hospital, and pharmacy costs. To facilitate comparisons with these types of reports, Figure 2.2 presents the average cost per claim by claim type combining professional, hospital/institutional, and pharmacy services. Services are by injury year with 12 months of maturity.

For example, *CompScope Medical Benchmarks* from the Workers' Compensation Research Institute (WCRI) showed that, for 2016 and 2017 claims with 12 months of maturity, Texas' average medical cost was \$3,064 for all claims, \$9,802 for claims with greater than seven days of lost time, and \$1,049 for

claims with seven days or less of lost time.³ These compare closely to average costs of \$3,163, \$9,983, and \$1,085 for 2016 injury year in Figure 2.2. The small differences may be due to different definitions for the injury year and maturity, and different treatments of extreme values, outliers, and cases with missing data. Also, the results in this report are based on all bills in the workers' compensation system instead of samples used by WCRI.

Figure 2.2: Average Medical Cost by Claim Type, by Injury Year at 12 Months after Injury



Note: Professional, hospital, and pharmacy costs are combined in the figure, but pharmacy costs are included from 2005. Numbers prior to 2005 are understated.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Total and Average Costs by Claim Type

Because of the large difference in costs by claim type, average costs are broken down by claim type in Tables 2.3 to 2.5. Claims with more than seven days of lost work days because of a compensable work-related injury are classified as lost-time claims. These claims receive income benefits for lost time and impairment. The remaining claims are classified as medical-only claims. Medical-only claims, although often more numerous than lost-time claims, account for a small portion of the total cost. About 37 percent of the claims that received professional services in 2017 were lost-time claims, but they accounted for 74 percent of the total professional costs. Lost-time claims accounted for 46 percent of hospital claims and 85 percent of hospital costs. In pharmacy, lost-time claims accounted for 53 percent of the claims and 86 percent of the pharmacy costs.

³ See *CompScope Medical Benchmarks for Texas, 19th Edition*, published by Workers Compensation Research Institute, Cambridge, MA, 2018.

In 2017, compared to an overall average professional cost of \$1,990 in Figure 2.1, the average cost per claim for lost-time claims was \$3,993, and \$810 for medical-only claims (see Table 2.3). Since 2000, the average cost for professional services increased by 21 percent for lost-time claims and by 22 percent for medical-only claims while total costs decreased for both types, unadjusted for inflation.

For hospital services, average cost increased by 99 percent for lost-time claims and by 37 percent for medical-only claims since 2000 (see Table 2.4). Total costs increased by 22 percent for lost-time claims during the period while total costs for medical-only claims decreased by 7 percent, largely because of the decreasing number of claims in the system.

For pharmacy services, the average cost decreased by 11 percent for lost-time claims while it decreased by 42 percent for medical-only claims (see Table 2.5). Total cost decreased by 44 percent and 61 percent for lost-time and medical-only claims, respectively. The decrease in pharmacy costs occurred after 2011 when the pharmacy closed formulary was implemented.

Table 2.3: Total and Average Costs, by Claim Type, Professional Services

Service Year	Lost-Time Claims			Medical-Only Claims		
	Number of Claims	Total Costs (Thousand Dollars)	Cost per Claim	Number of Claims	Total Costs (Thousand Dollars)	Cost per Claim
2000	172,135	\$565,979	\$3,288	231,145	\$153,137	\$663
2001	178,297	\$626,820	\$3,516	223,448	\$159,265	\$713
2002	188,522	\$742,498	\$3,939	221,128	\$164,491	\$744
2003	176,263	\$676,274	\$3,837	199,902	\$146,908	\$735
2004	156,223	\$538,989	\$3,450	179,683	\$126,601	\$705
2005	149,089	\$554,485	\$3,719	189,505	\$139,035	\$734
2006	140,538	\$470,010	\$3,344	194,368	\$135,472	\$697
2007	136,781	\$442,648	\$3,236	200,924	\$138,194	\$688
2008	133,930	\$449,110	\$3,353	193,950	\$134,626	\$694
2009	129,257	\$478,965	\$3,706	173,840	\$132,068	\$760
2010	128,437	\$479,136	\$3,731	176,085	\$133,941	\$761
2011	126,162	\$531,523	\$4,213	179,044	\$155,104	\$866
2012	122,995	\$527,825	\$4,291	179,106	\$157,492	\$879
2013	117,571	\$507,895	\$4,320	174,815	\$153,585	\$879
2014	115,075	\$485,637	\$4,220	175,356	\$149,717	\$854
2015	111,141	\$459,589	\$4,135	172,808	\$139,248	\$806
2016	108,002	\$436,889	\$4,045	173,300	\$138,231	\$798
2017	103,733	\$414,179	\$3,993	176,108	\$142,653	\$810

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 2.4: Total and Average Costs, by Claim Type, Hospital/Institutional Services

Service Year	Lost-Time Claims			Medical-Only Claims		
	Number of Claims	Total Costs (Thousand Dollars)	Cost per Claim	Number of Claims	Total Costs (Thousand Dollars)	Cost per Claim
2000	61,101	\$257,428	\$4,213	66,143	\$61,496	\$930
2001	64,145	\$310,555	\$4,841	66,506	\$71,456	\$1,074
2002	71,995	\$369,218	\$5,128	65,654	\$72,602	\$1,106
2003	67,188	\$352,767	\$5,250	59,800	\$66,101	\$1,105
2004	55,180	\$263,063	\$4,767	51,267	\$51,423	\$1,003
2005	44,194	\$225,678	\$5,107	47,844	\$47,380	\$990
2006	46,213	\$258,609	\$5,596	52,515	\$59,669	\$1,136
2007	47,313	\$293,188	\$6,197	56,147	\$65,672	\$1,170
2008	47,267	\$316,183	\$6,689	52,789	\$57,260	\$1,085
2009	45,412	\$312,129	\$6,873	46,863	\$48,332	\$1,031
2010	45,997	\$327,080	\$7,111	48,318	\$52,867	\$1,094
2011	45,969	\$352,238	\$7,663	50,120	\$59,046	\$1,178
2012	43,718	\$346,595	\$7,928	47,071	\$52,293	\$1,111
2013	42,093	\$361,880	\$8,597	45,377	\$50,304	\$1,109
2014	41,805	\$365,208	\$8,736	45,376	\$53,260	\$1,174
2015	40,182	\$346,224	\$8,616	44,213	\$54,414	\$1,231
2016	38,649	\$327,215	\$8,466	43,240	\$53,462	\$1,236
2017	37,439	\$313,440	\$8,372	44,653	\$56,994	\$1,276

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 2.5: Total and Average Costs, by Claim Type, Pharmacy Services

Service Year	Lost-Time Claims			Medical-Only Claims		
	Number of Claims	Total Costs (Thousand Dollars)	Cost per Claim	Number of Claims	Total Costs (Thousand Dollars)	Cost per Claim
2005	93,461	\$118,120	\$1,264	78,724	\$27,812	\$353
2006	90,570	\$122,621	\$1,354	80,895	\$29,366	\$363
2007	90,956	\$125,011	\$1,374	89,204	\$29,835	\$334
2008	89,739	\$131,931	\$1,470	85,727	\$27,577	\$322
2009	85,743	\$133,150	\$1,553	74,883	\$29,163	\$389
2010	86,789	\$134,756	\$1,553	73,704	\$24,934	\$338
2011	85,159	\$130,550	\$1,533	71,764	\$22,966	\$320
2012	80,780	\$120,299	\$1,489	69,639	\$19,575	\$281
2013	76,227	\$108,271	\$1,420	65,187	\$18,271	\$280
2014	72,600	\$96,889	\$1,335	60,555	\$14,772	\$244
2015	67,338	\$91,443	\$1,358	55,593	\$13,266	\$239
2016	63,779	\$86,365	\$1,354	54,237	\$12,588	\$232
2017	58,906	\$66,614	\$1,131	53,128	\$10,840	\$204

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Inflation Adjusted Cost

All prices in this report are in current prices without adjustments for inflation. However, in a cost study spanning more than 15 years, the effects of inflation on current prices are often significant. Unlike utilization measures, costs are nominal values that may increase simply because of price inflation. Prices in most reports are not adjusted for inflation because there are issues and problems associated with indices used to adjust. Nevertheless, it is important to note that a significant part of what appears to be cost increases is due to inflation, in addition to changes in utilization or fee schedule. In this section, we consider one of the most standard ways to adjust prices for inflation, which will provide us with some indication about how large the effects of price inflation may be on cost changes.

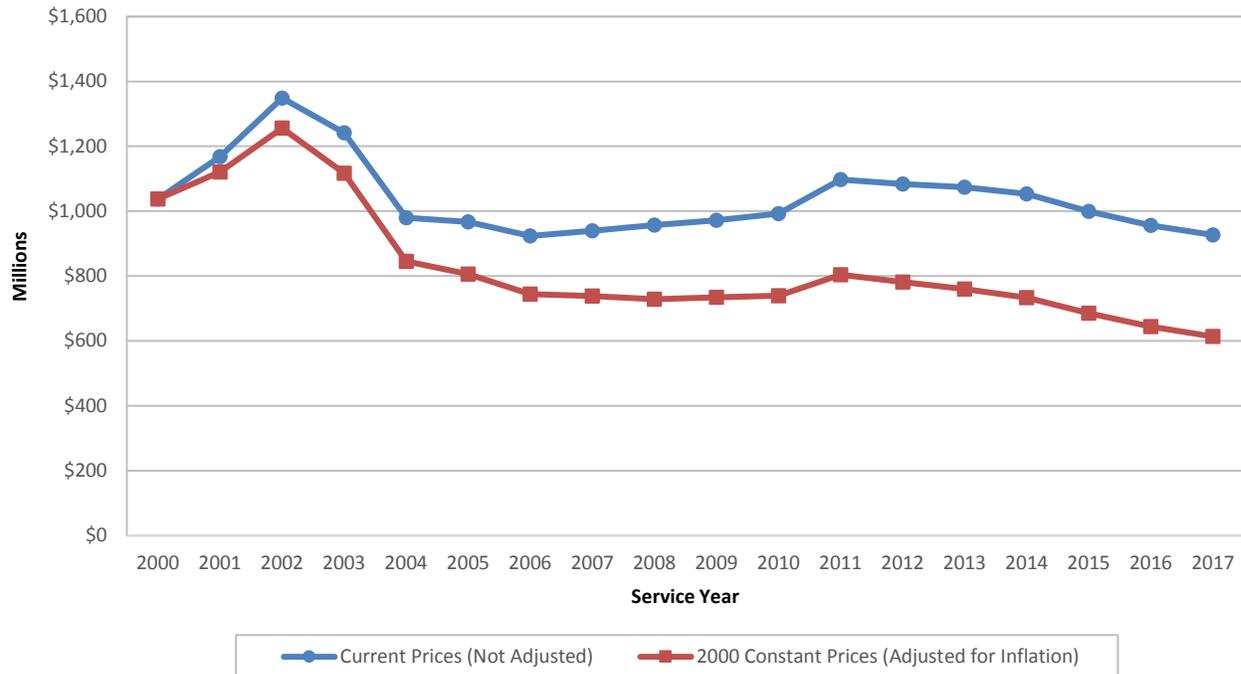
There are two indices commonly used to adjust inflationary price effects on health care costs. First, the Centers for Medicare and Medicaid Services (CMS) publishes a nationwide measurement called the Medicare Economic Index (MEI) which measures the changes in the prices paid for health care inputs, and it is used to adjust and update payment rates for Medicare and Medicaid. Regional variations are weighted by geographical indices.

Secondly, the Bureau of Labor Statistics publishes Consumer Price Indexes (CPI) that measure changes in prices paid by urban consumers for a selected basket of goods and services. True to their purposes, the MEI focuses on health care provider payments while the CPI is primarily concerned with retail prices that consumers pay. CPI medical care index is limited to patient out-of-pocket expenditures (including insurance premiums) without considering health care provider payments paid by insurers.

For our purposes, we use MEI to adjust prices for inflationary effects. From 2000 to 2017, MEI increased by about 2.5 percent annually (51 percent total). As a comparison, CPI medical care indices on average increased at a three or higher percentage rate annually.

Figure 2.3 shows that the 2017 cost of professional and hospital services was 11 percent lower than the cost in 2000 in current prices, but it was 41 percent lower if we adjust for inflation. Between 2005 and 2017, total health care costs, including pharmacy costs, decreased by 16 percent in current prices, but by 34 percent in inflation-adjusted prices.

Figure 2.3: Professional and Hospital Costs in Current and Inflation-Adjusted Prices, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Workers' Compensation Health Care Networks

In 2005, the 79th Texas Legislature passed House Bill 7, which authorized the use of workers' compensation health care networks certified by the Texas Department of Insurance (TDI). TDI began accepting applications for the certification of workers' compensation health care networks in 2006. Twenty-nine networks were certified by 2018 and 19 certified networks were treating injured employees as of May 31, 2017.

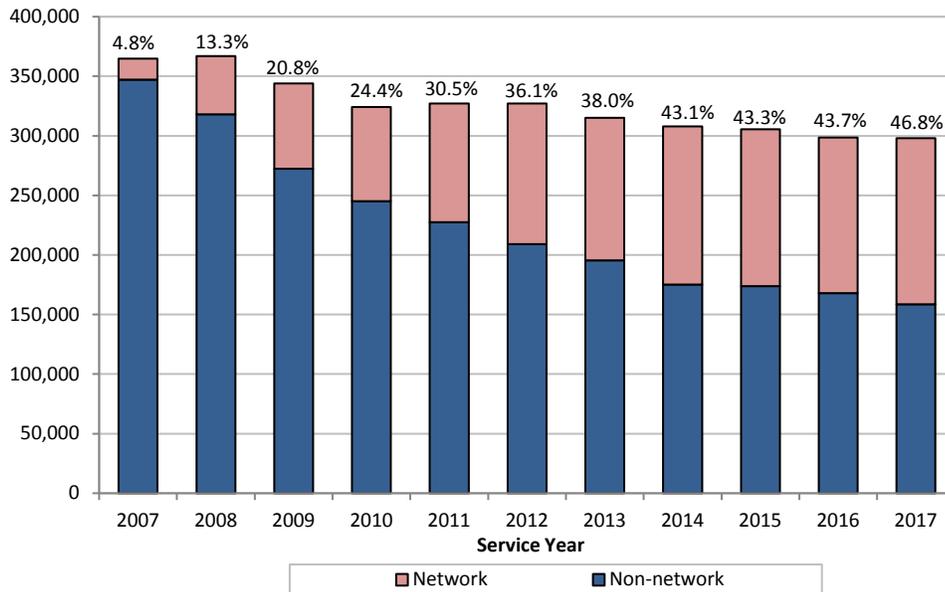
In addition, certain public entities and political subdivisions (such as counties, municipalities, school districts, junior college districts, housing authorities, and community centers for mental health and intellectual disability services) also have the option to:

- use a workers' compensation health care network certified by TDI under Chapter 1305, Texas Insurance Code;
- continue to allow their injured employees to seek health care as non-network claims;
- contract directly with health care providers if the use of a certified network is not "available or practical," essentially forming their own health care network.

Figure 2.4 shows the number of network and non-network claims in the combined professional, hospital, and pharmacy data. In 2017 service year, 139,470 injured employees were treated in networks,

accounting for 47 percent of all injured employees. Networks' share of the total health care cost had increased since 2006 at about the same rate as their share of the total claims (see Figure 2.5). In 2017, networks accounted for 40 percent of the total medical cost.

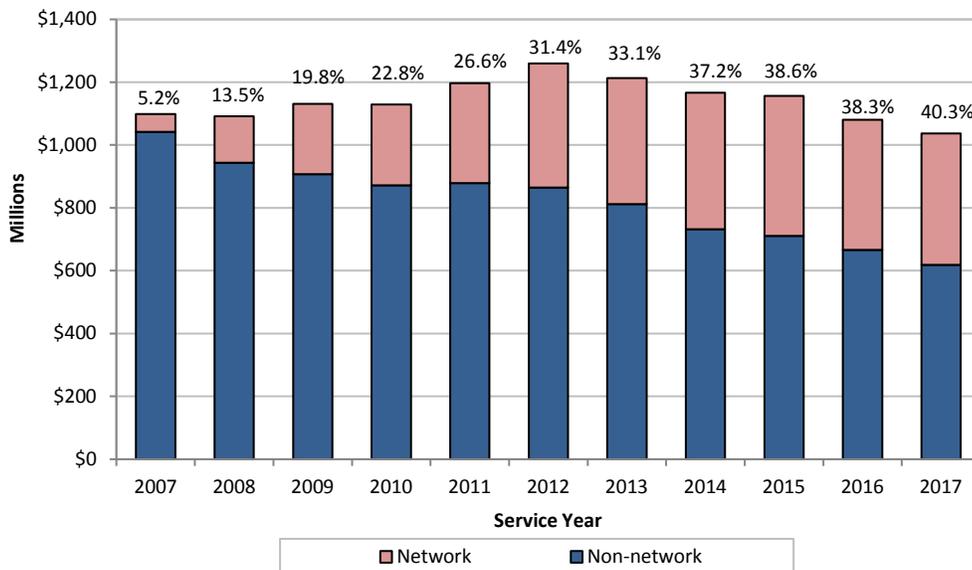
Figure 2.4: Number of Claims by Network Status, by Service Year



Note: Claims' network status was obtained through data calls, which cover a period from June 1 of one year to May 31 of the following year for injury years. Service years are organized accordingly. For example, Service Year 2017 covers service dates from June 1, 2016, to May 31, 2017.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Figure 2.5: Total Health Care Cost by Network Status, by Service Year

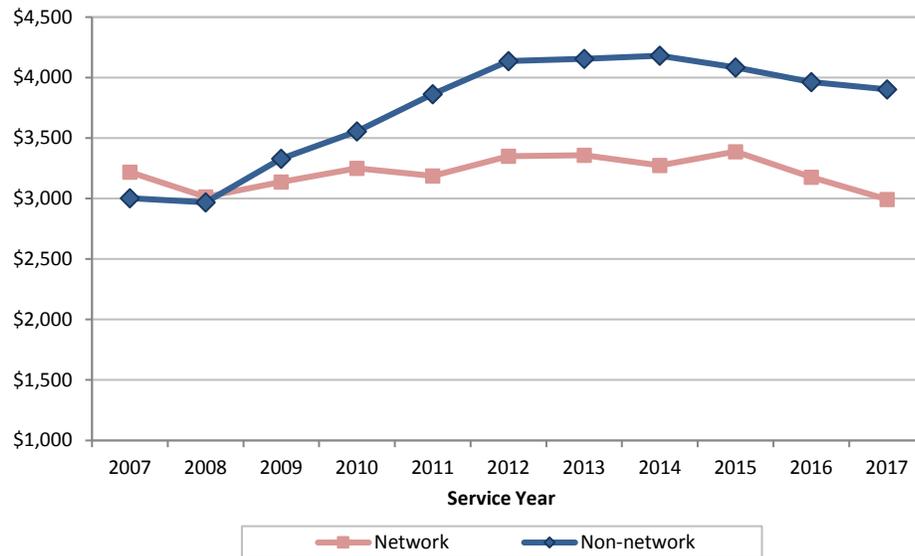


Note: Claims' network status was obtained through data calls, which cover a period from June to May. Service years are organized accordingly. For example, Service Year 2017 covers service dates from June 1, 2016, to May 31, 2017.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Networks' cost share is slightly lower than their claim share because networks' average cost per claim is lower, especially in more recent years. In terms of average cost, networks' average health care cost per claim was like that of non-network until 2009 (see Figure 2.6). Since 2009, it remained greatly below that of non-network. In 2017, the average cost per claim in networks was 23 percent lower than non-network. One factor for the stable network cost is the fact that health care providers and workers' compensation certified networks may negotiate fees under the network model rather than use DWC's adopted fee guidelines.

Figure 2.6: Average Health Care Cost per Claim, by Service Year

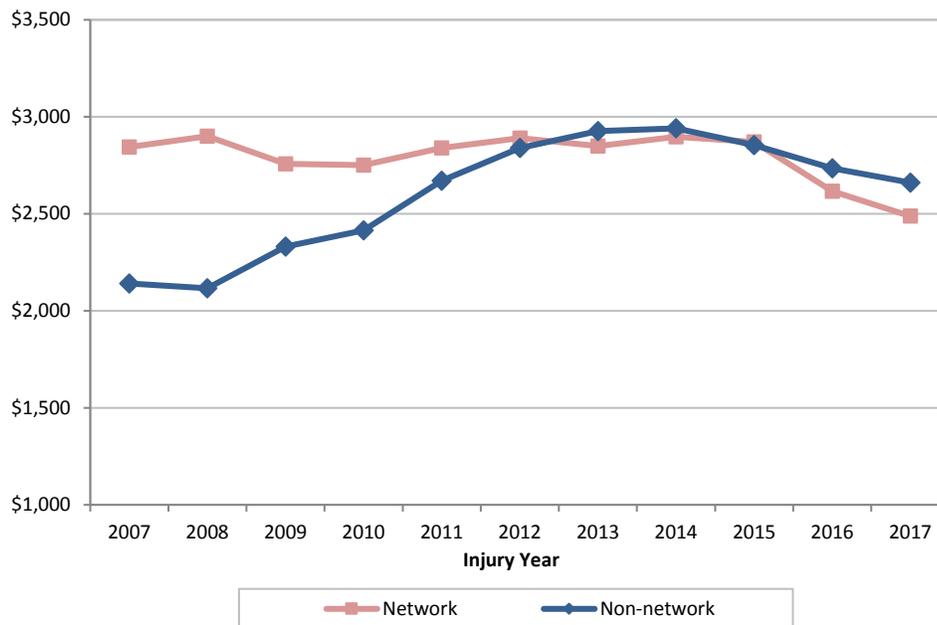


Note: Claims' network status was obtained through data calls, which cover a period from June to May. Service years are organized accordingly. For example, Service Year 2017 covers service dates from June 1, 2016, to May 31, 2017. Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Another possible factor is networks' heightened focus on early initial care, which tends to increase health care costs initially but decreases long-term costs. Figure 2.7 shows the average health care cost per claim by injury year for the first six months after an injury. Average cost in networks in 2007 was higher than in non-network, which indicated higher contracted prices. This was in part to induce health care providers to participate in networks and to encourage better initial care.

While network average cost for initial care stayed about the same or lower since 2007, non-network average cost increased. Despite the higher initial medical cost by injury year, per-claim cost in networks by service year (as in Figure 2.6) was lower than that of non-network because of a relatively lower share of claims with long-term care costs in networks.

Figure 2.7: Average Health Care Cost per Claim, by Injury Year, Six Months after Injury



Note: Claims' network status was obtained through data calls, which cover a period from June to May. Injury years are organized accordingly. For example, Injury Year 2017 covers claims with injury dates from June 1, 2016, to May 31, 2017.
 Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Health Care Cost and Texas Gross Domestic Product

Total workers' compensation health care costs account for less than one tenth of 1 percent of the Texas state gross domestic product (GDP) (see Table 2.6). This GDP share decreased from 0.14 percent in 2000 to 0.06 percent in 2017. Texas GDP (and, roughly, the number of employees) grew by 129 percent since 2000 while the total workers' compensation medical cost decreased by 3 percent in the same period. In comparison, a National Council on Compensation Insurance research brief in 2010 showed that, nationally, workers' compensation medical expenditure was about 0.25 percent of the GDP in 2006.⁴ This suggests that, as a share of state GDP, workers' compensation costs in Texas are much lower than the national average.

The lower share of GDP for Texas is partly because workers' compensation is not mandatory in Texas. An estimated 82 percent of Texas employees in the private sector (measured by payroll amount) are covered by workers' compensation insurance coverage (see REG's biennial reports on "Employer Participation in the Texas Workers' Compensation System" (www.tdi.texas.gov/reports/wcreg/documents/nonsub2016.pdf) and "Costs to Employers and Efficiencies in the Texas Workers' Compensation System" (www.tdi.texas.gov/reports/wcreg/documents/Employers_cost.pdf)). The most recent non-subscription survey in 2018 showed that 72 percent of Texas private sector employers were

⁴ See NCCI Research Brief: *Medicare and Workers Compensation Medical Cost Containment*, NCCI Holdings, Inc., 2010. More recent estimates are not available.

subscribers to the workers' compensation system, and 82 percent of the employees in the private sector were employed by these subscribers.⁵

Table 2.6: Health Care Cost as a Percentage of Texas GDP

Service Year	Texas GDP (Millions)	Total Health Care Cost (Millions)	Health Care Cost as a Percentage of GDP
2000	\$741,115	\$1,038	0.14%
2001	\$776,521	\$1,168	0.15%
2002	\$788,944	\$1,349	0.17%
2003	\$833,469	\$1,242	0.15%
2004	\$909,635	\$980	0.11%
2005	\$990,054	\$1,113	0.11%
2006	\$1,088,295	\$1,077	0.10%
2007	\$1,179,214	\$1,097	0.09%
2008	\$1,243,387	\$1,120	0.09%
2009	\$1,166,516	\$1,137	0.10%
2010	\$1,243,398	\$1,157	0.09%
2011	\$1,344,733	\$1,256	0.09%
2012	\$1,437,893	\$1,228	0.09%
2013	\$1,536,472	\$1,205	0.08%
2014	\$1,612,973	\$1,170	0.07%
2015	\$1,611,958	\$1,110	0.07%
2016	\$1,601,517	\$1,060	0.07%
2017	\$1,696,206	\$1,010	0.06%

Note: 2000 - 2004 health care costs are for professional and hospital costs only. Pharmacy and dental costs are added for 2005 - 2017.

Sources: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018. Texas GDP figures in current dollars are from the Bureau of Economic Analysis, U.S. Department of Commerce.

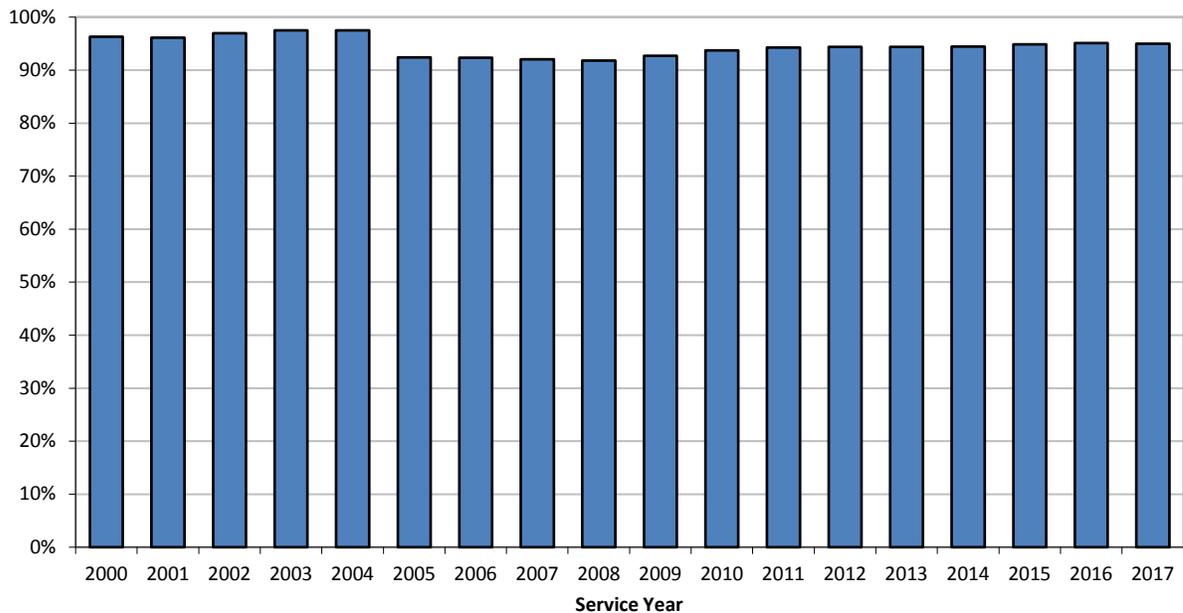
⁵ See DWC's "Setting the Standard: An Analysis of the Impact of the 2005 Legislative Reforms on the Texas Workers' Compensation System, 2018 Results", Section 9 (www.tdi.texas.gov/reports/wcreg/documents/biennial2018.pdf).

3. COST AND UTILIZATION OF PROFESSIONAL SERVICES

Professional service bills include bills for physician services, physical therapy services, durable medical equipment, and ambulatory surgery center services. Billing and payment data in the Texas workers' compensation system come from a statewide database of medical charges, actual payments, and treatment codes, maintained by DWC under the provisions of the Texas Labor Code §413.007. Insurance carriers report these data to DWC using a medical billing/payment EDI process. The EDI version of the professional service bills is based on the CMS-1500 paper forms used by CMS. EDI data covers the service years from 2005 forward. The data integrity and reliability are relatively higher for the EDI datasets than the pre-2005 data collected by the tape-based process.

Since most injured employees visit a physician's office (Doctor of Medicine (MD) or Doctor of Osteopathic Medicine (DO)) for their first treatment, more than 90 percent of the claims received at least one professional service (see Figure 3.1). The remaining claims received only hospital/institutional, dental, or pharmacy services. The lower rates from 2005 may indicate a problem of access, since the number of primary care physicians who accepted workers' compensation patients decreased slightly from 2003 to 2005. REG's reports on the access to medical care have details about the changes in the number of physicians accepting workers' compensation patients (See www.tdi.texas.gov/reports/wcreg/documents/accesstc2018.pdf). Also, the data for 2004 - 2005 may be incomplete as data submission was suspended during the transition to the EDI system.

Figure 3.1: Percent of Claims Receiving at Least One Professional Service, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Changes in Medical Fee Guidelines

One factor that affects total and average medical costs is the change in per-service fees. Changes in per-service fees are in part explained by changes in regulatory policies. Professional service fees are regulated in the workers' compensation system with a medical fee guideline (MFG) that establishes maximum reimbursements for medical services. Since 1998, there were two major changes in fee guidelines that should be noted.

First, the 2003 professional services fee guideline changed reimbursement rates to a uniform 125 percent of the Medicare billing rates from the existing 1996 MFG. The 1996 MFG established as maximum the lesser of the health care providers' usual fees and charges or the maximum allowable reimbursement rate based on relative values of services published by a third party. The adoption of the 2003 MFG resulted in changes in the reimbursement amounts for certain categories of services, raising the rate for professional services such as evaluation and management services and spinal fusion, while lowering the rate for such services as disc and other surgeries. As a result, the cost impact of the 2003 fee guideline varied considerably for individual categories of services.

Second, from March 1, 2008, a new professional services fee guideline began to use a conversion factor of \$52.83, except for surgery services which used a separate \$66.32 as a conversion factor. These conversion factors are different from the Medicare conversion factor used by CMS. Texas conversion factors are adjusted annually for inflation using the MEI. To obtain the Texas maximum allowable reimbursement for a service, the Texas conversion factor is multiplied by the relative value unit and the geographic practice cost index for the service. Texas' fee level for non-surgery services increased from 139 percent of Medicare in 2008 to 163 percent of Medicare in 2013. This decreased to 160 percent in 2017. For surgery services, Texas' fees were 201 percent of Medicare in 2017 (see Table 3.1).

Maximum allowable reimbursement rates for selected services are shown in Table 3.2.⁶ Texas maximum allowable reimbursement rates show a great deal of changes. For example, rates for office visits resulted in a 42 percent increase for the Austin area from 2008 to 2017. Some services, such as MRI, decreased greatly. Texas fee increases in 2009 and 2011 were largely due to adjustments made by CMS. Actual pay rates were lower than the maximum allowable reimbursement rates, ranging between 77 percent and 98 percent of the maximum allowable reimbursement rates. Actual average pays are lower mainly because of discounts effected by certified and informal networks.

⁶ In Table 3.2, Austin is used to calculate geographic practice cost index.

Table 3.1: Changes in Medicare and Texas Fee Schedule Factors

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Changes 2008-2017
Medicare Conversion Factor	\$38.09	\$36.07	\$36.87	\$33.98	\$34.04	\$34.02	\$35.82	\$35.84	\$35.80	\$35.89	-5.8%
Texas Conversion Factor	\$52.83	\$53.68	\$55.32	\$54.54	\$54.86	\$55.30	\$55.75	\$56.20	\$56.82	\$57.50	8.8%
Texas Conversion Factor (Surgery)	\$66.32	\$67.38	\$68.19	\$68.47	\$68.88	\$69.43	\$69.98	\$70.54	\$71.32	\$72.18	8.8%
Texas Price as a Percentage of Medicare Price	139%	149%	150%	161%	161%	163%	156%	157%	159%	160%	15.5%
Texas Price as a Percentage of Medicare Price (Surgery)	174%	187%	185%	202%	202%	204%	195%	197%	199%	201%	15.5%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 3.2: Fee Schedule Comparisons for Selected Services

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Changes 2008-2017
99213 - Office visit, established patient											
GPCI x RVU	1.58	1.69	1.80	2.02	2.06	2.13	2.04	2.04	2.05	2.06	30.5%
Medicare MAR	\$60	\$61	\$65	\$68	\$70	\$73	\$73	\$73	\$74	\$74	23.0%
Texas MAR	\$84	\$91	\$98	\$110	\$113	\$118	\$114	\$115	\$117	\$119	42.1%
Average Pay	\$70	\$76	\$81	\$97	\$100	\$103	\$101	\$102	\$103	\$105	50.7%
29827 - Arthroscopic surgery, shoulder/rotator cuff											
GPCI x RVU	28.31	28.02	28.31	31.15	31.08	31.28	30.20	29.91	30.03	29.98	5.9%
Medicare MAR	\$1,044	\$1,011	\$1,021	\$1,058	\$1,058	\$1,064	\$1,082	\$1,072	\$1,075	\$1,076	3.1%
Texas MAR	\$1,877	\$1,888	\$1,931	\$2,133	\$2,141	\$2,172	\$2,113	\$2,110	\$2,142	\$2,164	15.3%
Average Pay	\$1,228	\$1,543	\$1,633	\$1,838	\$2,035	\$2,020	\$1,917	\$1,947	\$2,004	\$2,133	73.7%
72100 - X-ray, lower spine											
GPCI x RVU	1.02	1.05	1.04	1.20	1.11	1.09	1.03	0.98	0.99	1.00	-2.0%
Medicare MAR	\$39	\$38	\$38	\$41	\$38	\$37	\$37	\$35	\$35	\$36	-7.7%
Texas MAR	\$54	\$56	\$57	\$65	\$61	\$60	\$57	\$55	\$56	\$58	6.6%
Average Pay	\$38	\$41	\$42	\$50	\$47	\$46	\$45	\$45	\$45	\$47	22.2%
72148 - MRI, lumbar spine											
GPCI x RVU	14.87	14.44	12.62	13.72	12.76	11.29	6.92	6.27	6.34	6.39	-57.0%
Medicare MAR	\$566	\$521	\$455	\$466	\$434	\$384	\$248	\$225	\$227	\$229	-59.5%
Texas MAR	\$786	\$775	\$686	\$748	\$700	\$624	\$386	\$353	\$360	\$367	-53.2%
Average Pay	\$423	\$448	\$442	\$511	\$503	\$454	\$297	\$275	\$280	\$285	-32.6%
97110 - Therapeutic exercises											
GPCI x RVU	0.71	0.77	0.79	0.87	0.90	0.94	0.90	0.92	0.91	0.92	29.5%
Medicare MAR	\$27	\$28	\$28	\$29	\$31	\$32	\$32	\$33	\$33	\$33	22.0%
Texas MAR	\$38	\$42	\$43	\$47	\$49	\$52	\$50	\$51	\$52	\$53	40.9%
Average Pay	\$32	\$35	\$36	\$43	\$44	\$45	\$43	\$43	\$42	\$41	29.7%

Notes: GPCI = geographic practice cost index. RVU = relative value unit. MAR = maximum allowable reimbursement. Average pay is a calculated pay amount in the DWC database of submitted bills. Actual average pays are lower than the Texas MAR mainly because of certified and informal network discounts.

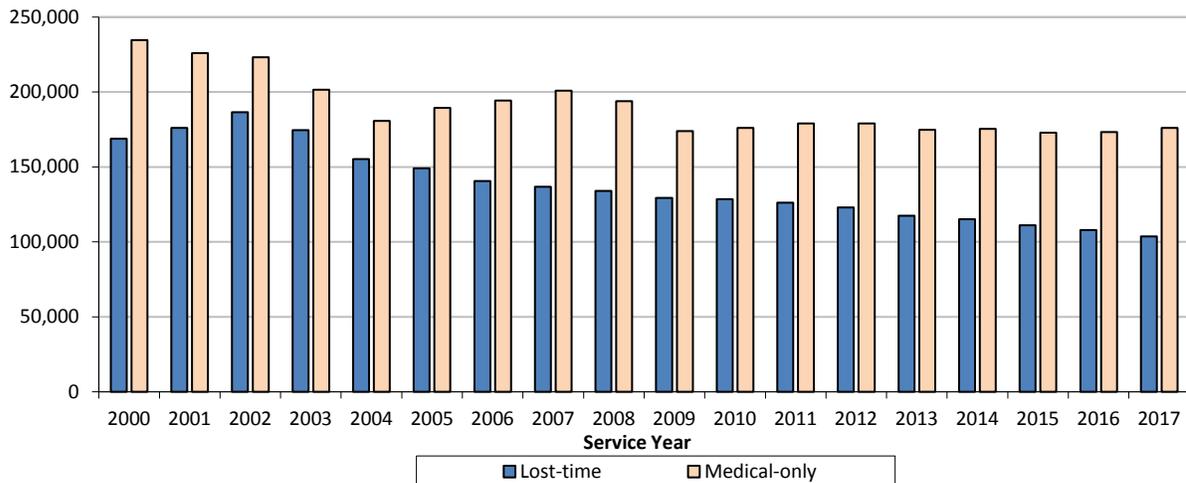
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Cost and Utilization by Service Year

Professional Cost and Utilization by Claim Type

The number of lost-time claims, which are the main cost drivers in the workers' compensation system, increased until 2002, but have been decreasing steadily since then (see Figure 3.2). There was a significant decrease in the number of medical-only claims in the professional service data between 2000 and 2004. Unlike lost-time claims, the number of medical-only claims fluctuated after 2004, but the long-term trend was declining.

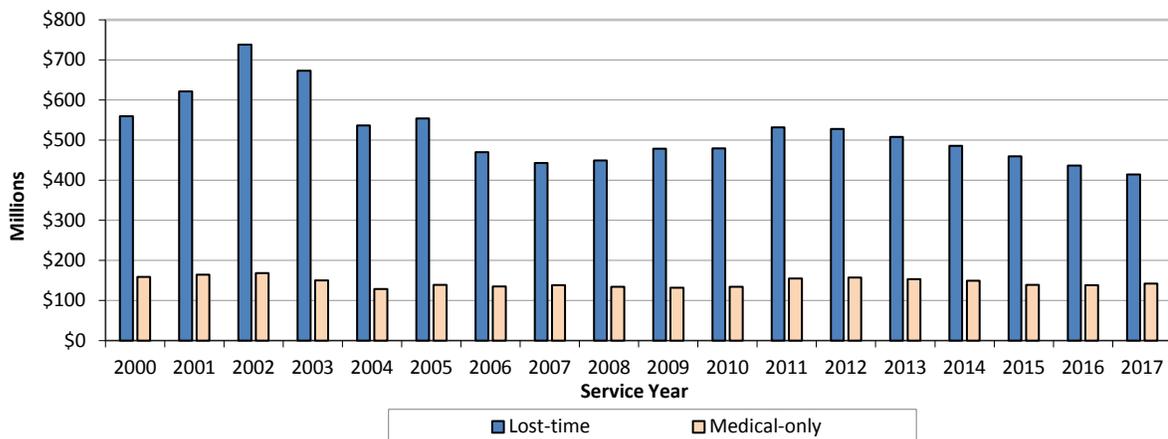
Figure 3.2: Number of Claims by Claim Type, Professional Services, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Figure 3.3 shows that most of health care costs were borne by lost-time claims (between 74 percent and 82 percent of the total cost). The total cost of lost-time claims increased from 2007 to 2011, while the number of claims decreased. Total costs have been decreasing steadily since 2011.

Figure 3.3: Total Professional Cost, by Claim Type, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of utilization, the number of visits—a measure of service frequency—peaked in 2003 and decreased since then (see Table 3.3). Lost-time claims had about 3.5 times more visits per claim than medical-only claims because lost-time claims had more serious injuries and received health care for a longer duration.

The number of services received in each visit to a health care provider is a measure of intensity. This measure stayed relatively stable and similar over the years for both lost-time and medical-only claims. This indicates that the variations in service utilization were due more to service frequency (number of visits) than to service intensity (number of services per visit). Since the number of visits was mainly determined by the length of treatment, a shorter duration of medical care resulted in fewer visits per claim. Possible causes of the decreasing number of visits and shorter duration may include less severe injuries and better safety practices at workplaces, preauthorization requirements and treatment guidelines, stricter utilization reviews, denials of service or payment, better treatment, and enhanced return-to-work efforts.

Table 3.3: Number of Visits and Services per Visit per Claim, by Claim Type, Professional Services

Service Year	Visits per Claim		Services per Visit	
	Lost-Time Claims	Medical-Only Claims	Lost-Time Claims	Medical-Only Claims
2000	17.4	4.9	3.4	3.1
2001	17.8	5.0	3.5	3.3
2002	19.3	5.1	3.9	3.4
2003	19.6	5.2	3.9	3.4
2004	18.5	5.1	3.7	3.3
2005	17.8	4.8	3.8	3.3
2006	15.5	4.5	3.4	3.1
2007	14.9	4.4	3.3	3.1
2008	14.7	4.2	3.3	3.1
2009	15.3	4.3	3.2	3.0
2010	15.0	4.3	3.2	2.9
2011	14.9	4.2	3.3	3.0
2012	14.9	4.2	3.3	3.0
2013	15.0	4.2	3.4	3.1
2014	15.0	4.2	3.6	3.2
2015	15.2	4.1	3.4	3.0
2016	15.2	4.1	3.0	2.9
2017	14.7	4.2	2.9	2.8

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Professional Cost and Utilization by Health Care Provider Type

Professional service health care providers are grouped into MD/DO, Doctor of Chiropractic (DC), physical/occupational therapist (PT/OT), ambulatory surgery center (ASC), durable medical equipment (DME) and “other” that includes all other health care providers. In this report, the MD/DO type includes not only Doctor of Medicine and Doctor of Osteopathic Medicine, but also Clinical Psychologist, Doctor

of Podiatric Medicine, Doctor of Optometry, and Psychologist. The DME is used if the bill was for supplies. ASC services are sometimes included in hospital/institutional services in other states, but the Texas medical EDI system receives ASC bills in the professional service bill set, therefore we include ASC services in this section. Data are presented from 2005 because health care provider type details are more reliable since 2005 when the EDI data collection began.

About 90 percent of the claims received professional services from MDs/DOs in 2017 (see Table 3.4). A significant change occurred in chiropractic services by DCs: the share of claims receiving chiropractic services decreased from 13 percent in 2005 to 7 percent in 2012 but increased slightly to 10 percent in 2017. This decline resulted from various cost control measures such as stricter billing and payment guidelines for physical medicine in the 2003 MFG, 2004 preauthorization requirements for work hardening/conditioning services, and 2006 preauthorization requirements for physical and occupational therapy services.⁷

A decreasing percentage of the claims also received services from DME and ASC health care providers. On the other hand, a higher share of claims received PT or OT services since 2005. The share of injured employees who received evaluation and management services from physician assistants (PA) or certified/registered nurses (CR) increased greatly from 6 percent of the claims in 2005 to 31 percent in 2017. The share of claims receiving drug test services from independent laboratories (IL) also increased since 2009.

Table 3.4: Percent of Claims Receiving Professional Service by Health Care Provider Type, by Service Year

Health Care Provider Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ASC	4.0%	3.9%	3.4%	2.8%	2.9%	2.8%	2.6%	2.3%	1.9%	1.6%	1.5%	1.4%	1.4%
DC	13.1%	10.5%	8.6%	7.5%	7.8%	7.7%	7.1%	6.6%	8.6%	9.3%	9.4%	10.8%	9.8%
DME	15.1%	14.7%	14.6%	13.8%	13.8%	13.4%	11.0%	10.3%	9.7%	8.9%	8.7%	8.7%	8.1%
MD/DO	94.5%	95.6%	96.1%	96.5%	96.5%	96.0%	95.7%	94.8%	94.4%	93.7%	92.8%	91.3%	89.6%
PT/OT	20.0%	20.0%	20.5%	20.1%	20.7%	20.4%	20.9%	22.0%	23.2%	24.1%	23.6%	23.8%	24.3%
PA/CR	5.5%	6.0%	6.5%	7.3%	8.3%	11.1%	13.9%	19.0%	19.8%	20.7%	22.8%	26.0%	31.0%
IL	1.2%	1.3%	1.6%	1.9%	2.9%	3.5%	3.7%	4.5%	3.9%	3.8%	3.8%	3.9%	3.7%
Other	9.1%	6.3%	5.7%	6.0%	5.9%	5.4%	5.5%	5.3%	5.1%	5.3%	5.4%	5.6%	5.5%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of total cost, chiropractors' costs decreased rapidly while the total cost for physical and occupational therapy services increased in recent years (see Table 3.5). Total payments to MD/DO increased greatly by 10 percent between 2005 and 2011 because of both the increased per-service fees and the increased share of claims using MD/DO, but it decreased by 18 percent since 2011 as fees stabilized and the number of claims continued to decrease. Total cost for ASC services increased until

⁷ The increasing share of claims receiving services from DCs since 2013 is related to a shift in the type of services provided by DCs. In 2005, DC services were mostly in physical medicine (69 percent of total payment) and E/M (16 percent of total payment). In 2017, IR exam and report services accounted for 53 percent of total payment to DCs while physical medicine and E/M services were 36 percent and 10 percent of the total payment to DCs, respectively.

2010 even though a smaller share of claims received the services. It decreased greatly in 2013 and 2014. Costs for PA/CR and IL health care providers increased greatly since 2010 as participation by these health care providers in the workers' compensation system increased. However, costs for IL services have decreased greatly since 2015.

Table 3.5: Total Professional Cost (in Thousand Dollars) by Health Care Provider Type, by Service Year

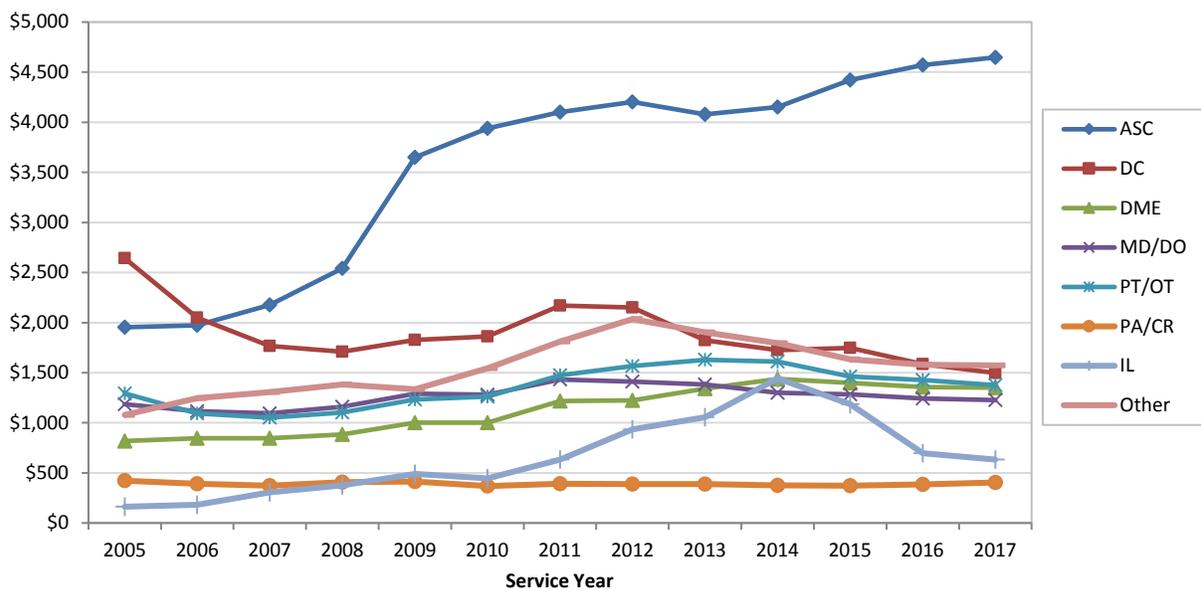
Health Care Provider Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ASC	\$26,329	\$25,470	\$24,884	\$22,943	\$32,414	\$33,306	\$32,503	\$28,949	\$22,806	\$19,731	\$19,164	\$17,992	\$18,459
DC	\$116,974	\$72,429	\$51,089	\$41,793	\$43,132	\$43,819	\$46,781	\$42,754	\$45,926	\$46,453	\$46,772	\$48,383	\$40,885
DME	\$41,884	\$41,727	\$41,605	\$40,051	\$41,946	\$40,937	\$40,725	\$38,075	\$37,950	\$37,015	\$34,705	\$33,136	\$30,557
MD/DO	\$378,861	\$357,403	\$355,392	\$367,031	\$377,441	\$374,268	\$418,374	\$403,755	\$381,452	\$353,305	\$338,142	\$319,333	\$307,785
PT/OT	\$87,723	\$73,452	\$72,802	\$72,621	\$77,405	\$78,416	\$93,872	\$104,112	\$110,371	\$113,003	\$97,971	\$95,628	\$93,620
PA/CR	\$7,924	\$7,895	\$8,168	\$9,667	\$10,443	\$12,468	\$16,589	\$22,304	\$22,356	\$22,465	\$24,197	\$28,235	\$34,968
IL	\$636	\$817	\$1,632	\$2,366	\$4,276	\$4,716	\$7,213	\$12,578	\$12,177	\$15,909	\$12,950	\$7,677	\$6,556
Other	\$33,189	\$26,261	\$25,262	\$27,241	\$23,923	\$25,145	\$30,571	\$32,786	\$28,428	\$27,469	\$24,929	\$24,732	\$23,993

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Except for DC, average costs per claim increased for most health care providers: by 65 percent for DME, by 6 percent for PT/OT, by 4 percent for MD/DO, and by 290 percent for IL health care providers (see Figure 3.4). The average cost per claim decreased by 5 percent for PA/CR between 2005 and 2017.

The average cost per claim increased by 115 percent for ASCs between 2005 and 2012, then increased by 11 percent between 2012 and 2017. ASC's 2009 increase was related to the new Ambulatory Surgery Center Fee Guideline that went into effect in September 2008. This guideline set a reimbursement rate at 235 percent of the Medicare rate for ASC services, except for implantables.

Figure 3.4: Average Cost per Claim by Health Care Provider Type, Professional Services



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Professional Cost and Utilization by Service Type

Medical bills are normally submitted and processed using a service as the basic unit because the Medicare payment model used in Texas and most other states is basically a fee-for-service model. Services are unbundled (unless otherwise instructed to bundle multiple services) and billed for each service. The type and nature of the service is determined by entering a Current Procedural Terminology (CPT[®]) code, maintained by the American Medical Association, or a Healthcare Common Procedure Coding System (HCPCS) code in each bill. Service types are based on these service codes.

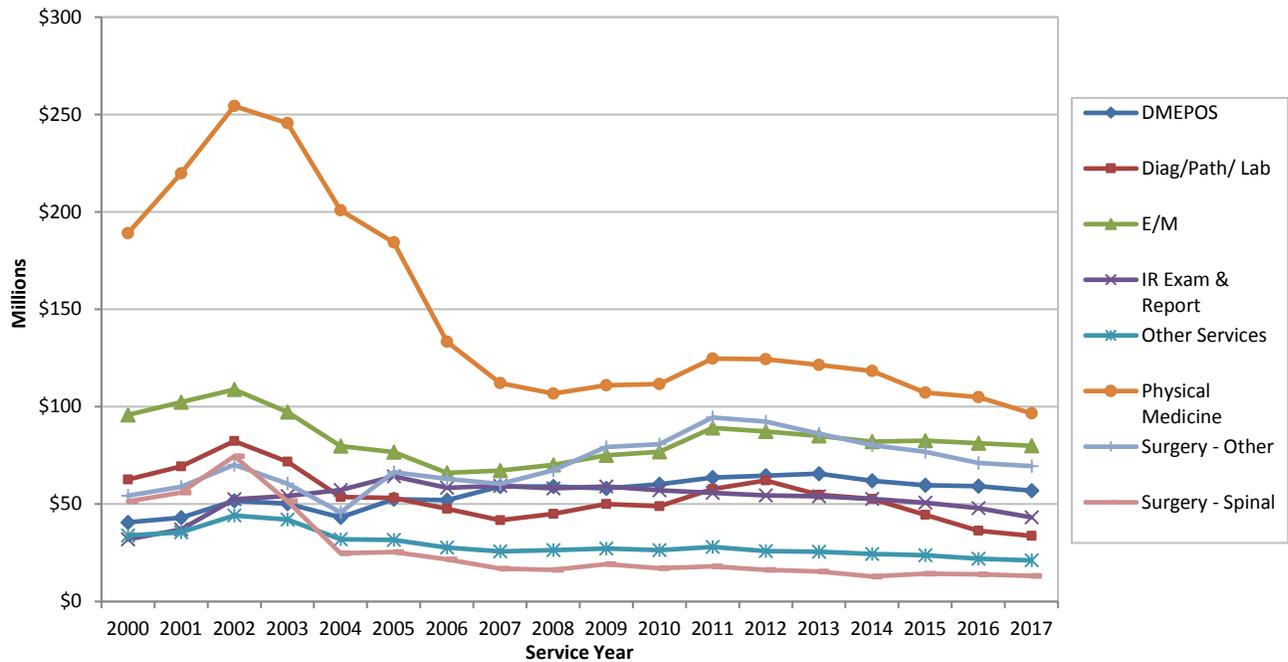
There may be different ways to classify service types depending on how we group various CPT/HCPCS codes. This report uses eight groups in the service type classification:

- DMEPOS: Durable medical equipment, prosthetics, orthotics, and supplies. This group consists of all HCPCS Level II codes, including ambulance services, but excluding functional reporting and drug test G-codes (HCPCS codes that begin with 'G').
- Diag/Path/Lab: Diagnostic, pathology, and laboratory services. This service group includes functional reporting and drug test G-codes.
- E/M: Evaluation and management services such as an office visit.
- IR Exam & Report: Impairment rating or disability examination services, special reports, physical performance tests, and range of motion tests. These services are not for treatment but for system-specific functions of the workers' compensation system.
- Other Services: This is a catch-all group for all services not in the other seven groups. However, about half of this group's total costs are for anesthesia services.
- Physical Medicine: All manipulative and physical therapies and exercises provided by chiropractors, physical or occupational therapists, and MDs and DOs.
- Surgery - Other: Surgery services except for spinal surgeries.
- Surgery - Spinal: Spinal surgeries including spine fusion, laminectomy, and laminotomy.

Physical medicine service bills are by far the most numerous bills, accounting for about half of all professional bills. However, the number of unit billed reported in the EDI data tables is not consistent and often incorrect. To create better measurements of utilization, a new service utilization unit is calculated for each physical medicine bill (see Appendix A for more details). Since 2013, CMS required functional reporting about patient progress for outpatient therapy services in Medicare billing. These evaluative services are reported using non-payable G-codes. These services are excluded from utilization metrics.

For lost-time claims, the 2002 service year was the peak year for most services in terms of total cost (see Figure 3.5 and Table B2 in Appendix B). Increases and decreases were most prominent in physical medicine services, which were the costliest services. Costs increased by 35, 40, and 28 percent since 2000 for IR exam and reports, DMEPOS, and surgery - other service groups, respectively. Cost decreased for all other service groups.

Figure 3.5: Total Professional Cost by Service Type, Lost-Time Claims



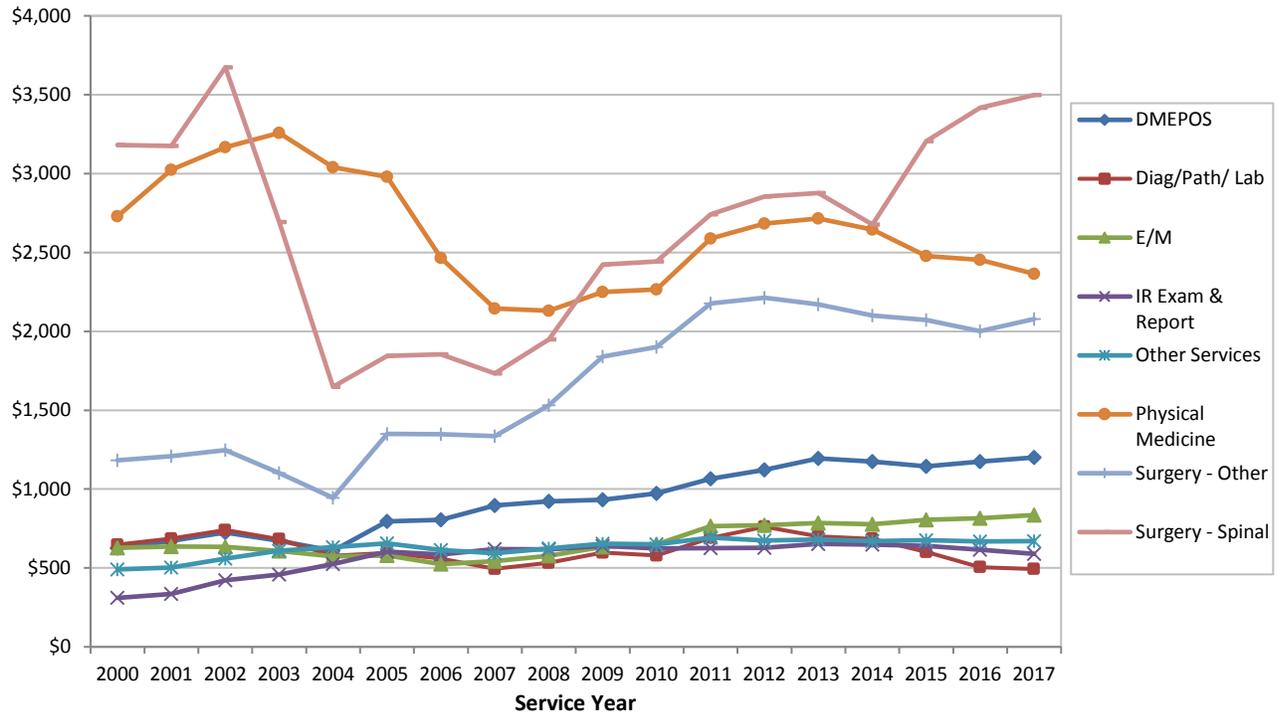
Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

For medical-only claims, physical medicine service shows a pattern of increases and decreases like that of lost-time claims, which decreased by 35 percent since 2000 (see Table B2 in Appendix B). Because of their less serious injuries, E/M services were the costliest service group for medical-only claims. Costs for surgery - spinal and “other” services groups decreased most.

Average costs per claim shown in Figure 3.6 (and Table B3 in Appendix B) are influenced by the number of claims receiving each type of service and utilization intensity such as the number of visits per claim and the number of services per visit. For lost-time claims, average costs for IR exam & report increased by 90 percent from 2000 to 2017. Average costs for DMEPOS and surgery - other services increased by 92 percent and 76 percent, respectively, during the same period. Spinal surgery services showed a great deal of changes year by year, which may be due to the relatively small number of services provided and price changes in specific services such as neuro-receiver (spinal cord stimulator) implant services in 2015. For medical-only claims, E/M services increased the most while spinal surgery and diagnostic services decreased the most. Price changes per individual service are discussed later in this section.

Figure 3.6: Average Professional Cost per Claim by Service Type, Lost-Time Claims



Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of service utilization, the shares of claims receiving each service increased for all services except surgery - spinal, physical medicine, and “other” service groups (see Table 3.6). There was a slight decrease in the share of claims that received physical medicine services while the share for surgery - spinal services decreased greatly. An increased share of claims received DMEPOS, diag/path/lab, and IR exam & report services.

It should be noted that a significant number (67 percent in 2017) of medical-only claims received IR exam & report services in a given year, even though most medical-only claims did not result in an impairment rating. These services for medical-only claims were typically reports rather than IR exams, but it indicates that non-treatment, system-specific services increased even in less severe medical-only claims. It is also worthwhile to note that the share of claims receiving physical medicine services did not change greatly for either lost-time or medical-only claims even though total cost of physical medicine decreased greatly. This decrease in total cost was mainly due to drops in service utilization per claim.

Table 3.6: Percent of Claims Receiving Certain Professional Services

Service Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
Lost-Time Claims								
2000	38.5%	57.4%	90.5%	61.0%	40.8%	41.0%	27.2%	9.6%
2001	36.3%	57.6%	91.5%	62.6%	40.1%	41.3%	27.7%	10.0%
2002	38.3%	59.6%	92.1%	66.6%	42.3%	43.1%	30.1%	10.9%
2003	42.7%	60.1%	91.8%	67.6%	39.6%	43.2%	31.4%	11.0%
2004	45.8%	59.8%	89.4%	70.1%	32.6%	42.6%	31.2%	9.6%
2005	44.2%	59.9%	88.9%	71.4%	32.3%	41.5%	33.0%	9.2%
2006	46.0%	60.7%	89.7%	71.0%	32.1%	38.5%	33.3%	8.3%
2007	48.2%	61.9%	90.5%	70.0%	31.7%	38.2%	33.0%	7.1%
2008	47.8%	63.1%	90.7%	70.2%	31.6%	37.4%	32.9%	6.2%
2009	48.2%	64.9%	91.6%	71.4%	32.3%	38.2%	33.4%	6.1%
2010	48.1%	65.9%	92.0%	71.4%	31.7%	38.4%	33.1%	5.5%
2011	47.3%	66.2%	92.4%	70.7%	32.0%	38.2%	34.4%	5.2%
2012	46.9%	66.4%	92.1%	70.7%	31.3%	37.7%	34.0%	4.6%
2013	46.7%	66.5%	92.0%	70.2%	32.0%	38.0%	33.7%	4.6%
2014	45.9%	66.9%	92.0%	70.6%	31.6%	38.9%	33.3%	4.2%
2015	47.0%	66.5%	92.1%	71.3%	31.6%	39.0%	33.4%	4.0%
2016	46.7%	66.5%	92.3%	72.0%	30.5%	39.6%	32.9%	3.8%
2017	45.8%	65.9%	92.2%	70.7%	30.3%	39.4%	32.2%	3.6%
Medical-Only Claims								
2000	23.2%	47.2%	86.4%	48.0%	32.2%	21.0%	16.0%	1.1%
2001	21.7%	47.7%	87.6%	53.7%	32.0%	22.1%	16.2%	1.2%
2002	22.4%	49.0%	89.0%	57.0%	33.6%	22.5%	16.5%	1.2%
2003	28.7%	51.2%	89.3%	59.5%	28.4%	22.9%	17.6%	1.1%
2004	35.0%	51.5%	89.3%	62.5%	17.0%	23.4%	17.1%	0.9%
2005	32.3%	52.1%	89.9%	62.6%	16.5%	21.9%	18.2%	0.8%
2006	34.7%	53.2%	90.2%	64.0%	17.2%	20.7%	18.4%	0.8%
2007	36.3%	54.3%	90.9%	64.2%	17.5%	20.5%	17.7%	0.6%
2008	35.2%	54.6%	91.4%	65.0%	17.7%	19.1%	17.6%	0.5%
2009	35.1%	55.3%	92.1%	66.9%	17.7%	19.2%	17.4%	0.5%
2010	33.9%	55.0%	92.4%	67.2%	17.0%	18.6%	17.5%	0.4%
2011	33.3%	54.4%	92.9%	67.1%	16.7%	18.3%	17.8%	0.4%
2012	33.4%	53.6%	93.1%	68.2%	16.8%	18.6%	17.5%	0.3%
2013	32.8%	54.0%	92.6%	67.7%	17.2%	19.6%	16.6%	0.3%
2014	31.5%	53.5%	92.3%	68.1%	17.5%	20.2%	15.9%	0.2%
2015	30.7%	53.3%	92.9%	68.1%	17.1%	19.1%	16.1%	0.2%
2016	31.7%	53.6%	93.7%	68.6%	17.6%	18.8%	16.0%	0.2%
2017	31.5%	54.1%	93.9%	66.9%	17.5%	19.4%	15.7%	0.2%

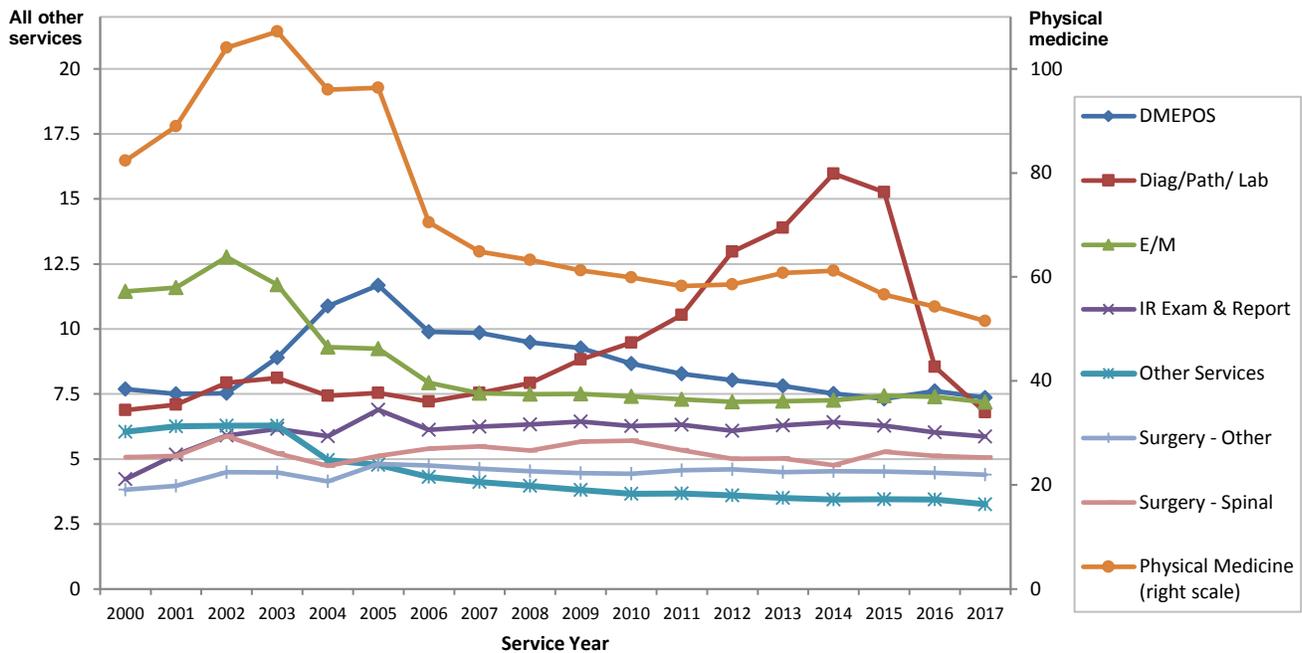
Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of service utilization, the number of services per claim decreased greatly for physical medicine, E/M service, and “other” services categories (see Figure 3.7 and Table B4 in Appendix B). Physical medicine services peaked in 2003 and has decreased greatly since then. Utilization of DMEPOS services increased rapidly until 2005, after which it decreased steadily.

Diag/path/lab services per claim increased by 132 percent between 2000 and 2014. However, this increase in utilization did not mean an increase in cost. Most of the increase in diag/path/lab services since 2010 were for low-priced drug screening tests. At the same time, the price of MRI services decreased greatly as their fees were reduced by the CMS in recent years. In 2016 and 2017, drug screening services decreased greatly.

Figure 3.7: Number of Professional Services per Claim by Service Type, Lost-Time Claims



Notes: The utilization level of services is based on billed services except for physical medicine services (on the right scale) for which multiple sessions in a billed service are separated, when appropriate. See Appendix A for more detail. The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Cost and Utilization by Injury Year

Costs by service year, as we have presented above, account for economic costs of all services delivered in a calendar year regardless of one's injury date. Thus, service year statistics include both new injury and old injury claims. However, reports from the insurance industry or actuarial reports frequently present statistics by injury year, which often exclude old injury claims. In this section, we report injury year statistics to help readers compare this report's results with other reports.

For injury year statistics, services within a set length of time from the injury date are summed up to show different levels of maturity. In this report, we use three maturity periods of six months, 12 months, and 24 months after the injury date for each injury year. Medical-only claims often receive only a few treatments, and services are used mostly within six months from injury. On the other hand, lost-time

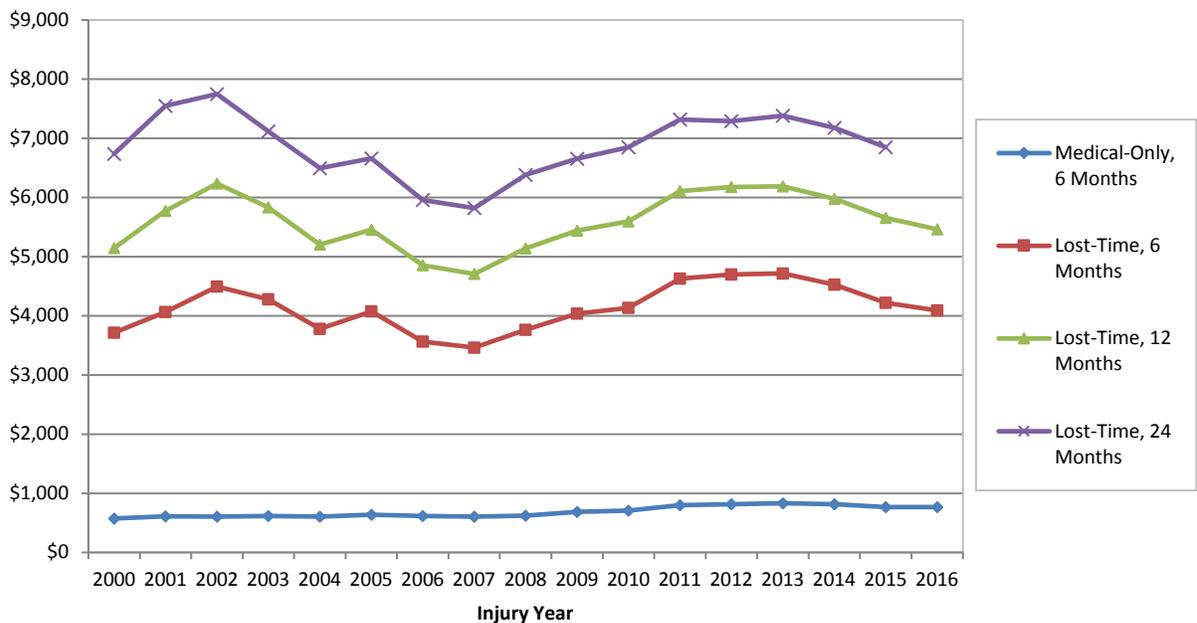
claims have more serious injuries that may require surgeries, rehabilitation services, and pharmacy services for pain management, necessitating a longer maturity for analysis.

The data for the 2016 injury year with 12-month maturity covers all new injuries that occurred in the 2016 calendar year and accounts for all services received within six months from the date of the injury. This means that service bills up to December 31, 2017, are analyzed. For the 2015 injury year with 24-month maturity, data also covers services up to December 31, 2017, and cost and utilization metrics are affected by changes in fee schedules and policies in 2015, 2016, and 2017 service years. As the maturity increases, there will be more services provided and total costs increase accordingly.

Average costs per claim differed greatly between medical-only claims and lost-time claims (see Figure 3.8). For medical-only claims, figures are shown only for the six-month maturity since most of them received all their services within that time frame. For lost-time claims, different maturities did not result in any important differences in the cost trend. The figure also shows a general trend in the average cost which increased until 2002, decreased until 2007, increased until 2011, and began to decrease after 2011.

Between 2000 and 2017, the average cost for medical-only claims at six months maturity increased by 33 percent. Average costs for lost-time claims increased by 10 percent, 6 percent, and 2 percent for six months, 12 months, and 24 months maturity, respectively.

Figure 3.8: Average Cost per Claim by Claim Type, Professional Services



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

For lost-time claims, total costs in each injury year increased greatly as maturity increase while medical-only claims' costs increased only slightly as we extend the maturity horizon (see Table 3.7). Since 2000, total costs declined in most claim groups and maturities. But for both claim types, the total number of claims decreased faster than total costs, at around 20 percent to 30 percent. As a result, average cost per claim increased greatly.

Table 3.7: Total Cost, by Injury Year, by Maturity and Claim Type, Professional Services

Injury Year	6 Months			12 Months			24 Months		
	Total Cost (Thousand Dollars)	Number of Claims	Average Cost per Claim	Total Cost (Thousand Dollars)	Number of Claims	Average Cost per Claim	Total Cost (Thousand Dollars)	Number of Claims	Average Cost per Claim
Lost-Time Claims									
2000	\$258,391	69,583	\$3,713	\$370,973	72,124	\$5,144	\$498,382	74,007	\$6,734
2001	\$282,123	69,441	\$4,063	\$415,202	71,916	\$5,773	\$553,681	73,345	\$7,549
2002	\$308,098	68,587	\$4,492	\$436,287	69,970	\$6,235	\$547,618	70,673	\$7,749
2003	\$264,290	61,798	\$4,277	\$365,819	62,720	\$5,833	\$456,377	64,100	\$7,120
2004	\$222,403	58,820	\$3,781	\$316,973	60,920	\$5,203	\$399,498	61,537	\$6,492
2005	\$230,475	56,602	\$4,072	\$314,642	57,638	\$5,459	\$387,256	58,132	\$6,662
2006	\$200,573	56,331	\$3,561	\$277,088	57,087	\$4,854	\$342,127	57,413	\$5,959
2007	\$198,274	57,263	\$3,463	\$272,649	57,929	\$4,707	\$339,230	58,282	\$5,821
2008	\$219,418	58,350	\$3,760	\$303,470	59,061	\$5,138	\$378,788	59,363	\$6,381
2009	\$218,957	54,233	\$4,037	\$297,886	54,767	\$5,439	\$365,988	54,970	\$6,658
2010	\$234,947	56,827	\$4,134	\$320,438	57,272	\$5,595	\$393,385	57,436	\$6,849
2011	\$262,031	56,641	\$4,626	\$348,615	57,059	\$6,110	\$418,604	57,215	\$7,316
2012	\$256,990	54,718	\$4,697	\$340,302	55,070	\$6,179	\$402,525	55,212	\$7,291
2013	\$248,744	52,736	\$4,717	\$328,657	53,106	\$6,189	\$393,234	53,255	\$7,384
2014	\$241,405	53,320	\$4,527	\$321,288	53,746	\$5,978	\$386,797	53,909	\$7,175
2015	\$215,289	51,032	\$4,219	\$290,723	51,413	\$5,655	\$353,053	51,559	\$6,848
2016	\$204,761	50,035	\$4,092	\$274,980	50,333	\$5,463			
Medical-Only Claims									
2000	\$112,185	195,319	\$574	\$130,742	198,268	\$659	\$147,948	200,648	\$737
2001	\$114,624	187,200	\$612	\$133,655	190,067	\$703	\$149,664	191,882	\$780
2002	\$110,693	183,087	\$605	\$126,344	184,919	\$683	\$138,384	185,855	\$745
2003	\$103,863	168,921	\$615	\$116,763	170,179	\$686	\$126,050	171,103	\$737
2004	\$94,279	155,456	\$606	\$105,514	157,069	\$672	\$113,206	157,902	\$717
2005	\$104,092	163,210	\$638	\$114,358	164,310	\$696	\$121,497	164,925	\$737
2006	\$104,261	168,898	\$617	\$114,666	169,923	\$675	\$121,226	170,445	\$711
2007	\$106,608	175,897	\$606	\$116,304	176,869	\$658	\$123,043	177,408	\$694
2008	\$105,690	170,500	\$620	\$114,151	171,383	\$666	\$119,859	171,897	\$697
2009	\$104,309	152,321	\$685	\$111,673	153,092	\$729	\$116,629	153,520	\$760
2010	\$110,544	156,410	\$707	\$118,932	157,135	\$757	\$124,223	157,507	\$789
2011	\$127,190	159,141	\$799	\$136,371	159,882	\$853	\$141,681	160,276	\$884
2012	\$129,529	159,240	\$813	\$137,626	159,898	\$861	\$142,043	160,312	\$886
2013	\$130,047	156,295	\$832	\$138,140	157,033	\$880	\$142,970	157,442	\$908
2014	\$128,322	157,094	\$817	\$135,706	157,766	\$860	\$139,672	158,109	\$883
2015	\$119,563	155,738	\$768	\$126,596	156,355	\$810	\$130,544	156,635	\$833
2016	\$119,822	156,698	\$765	\$126,705	157,282	\$806			

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Professional Cost and Utilization by Service Type

In terms of utilization trends by injury year, an increasing percentage of claims received DMEPOS, surgery - other, and IR exam & report services in recent years, while the percentage of claims receiving surgery - spinal, "other" services, and physical medicine decreased (see Table 3.8). These results are like those of the service-year data shown in Table 3.6. Overall percentages in the injury year are somewhat higher than those in the service year because Table 3.8 excludes (from the denominator) old claims that were included in Table 3.6.

Table 3.8: Percent of Claims Receiving Certain Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury

Injury Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
2000	47.1%	78.9%	95.0%	74.1%	55.8%	60.4%	39.1%	9.9%
2001	47.1%	80.2%	95.6%	79.7%	57.4%	62.3%	42.1%	10.9%
2002	52.0%	84.1%	97.0%	83.8%	61.0%	64.3%	45.0%	11.1%
2003	61.2%	85.5%	97.0%	85.5%	56.2%	65.3%	47.3%	10.4%
2004	64.1%	82.2%	95.4%	85.5%	45.1%	63.5%	46.1%	9.0%
2005	61.9%	84.6%	96.3%	86.6%	46.0%	62.5%	49.5%	8.4%
2006	65.6%	84.4%	96.4%	86.2%	45.7%	59.4%	50.1%	7.2%
2007	67.4%	85.4%	97.0%	85.6%	45.6%	58.5%	49.6%	5.9%
2008	66.5%	85.8%	97.3%	86.6%	46.1%	57.7%	49.9%	5.2%
2009	67.4%	86.7%	97.8%	88.2%	46.0%	58.9%	49.4%	4.9%
2010	66.2%	86.5%	98.1%	87.9%	45.1%	58.4%	49.0%	4.5%
2011	65.6%	86.1%	98.2%	87.6%	45.3%	57.2%	50.2%	4.0%
2012	65.5%	85.7%	98.2%	87.4%	44.3%	57.0%	49.5%	3.6%
2013	64.8%	85.5%	98.0%	86.7%	44.8%	57.7%	49.2%	3.4%
2014	63.6%	84.5%	97.7%	86.9%	43.8%	57.7%	48.0%	3.0%
2015	63.6%	84.4%	98.0%	87.4%	43.2%	57.7%	47.5%	2.7%
2016	64.3%	84.1%	98.3%	87.4%	41.9%	57.4%	46.2%	2.4%

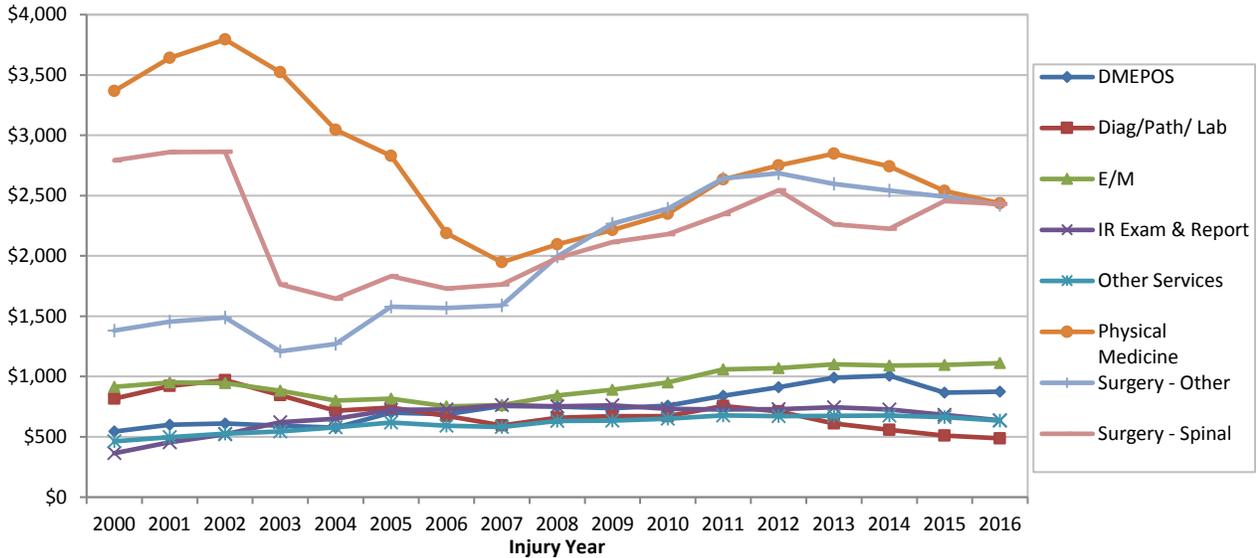
Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of cost by service type, average cost per lost-time claim increased the most for IR exam & report services, by 75 percent since 2000 (see Figure 3.9 and Table B5 in Appendix B). This increase was in line with a 33 percent increase in the utilization of these services: from 5.9 services per claim for 2000 injury year to 7.8 services for 2016 injury year (see Figure 3.10 and Table B6 in Appendix B). Surgery - other and DMEPOS services also showed large increases in the average cost per claim and in utilization.

The average cost per claim for physical medicine services decreased greatly since its peak in 2002 with a corresponding decrease in the number of services per claim. For physical medicine services, the main factor in cost reduction appears to be the decrease in service intensity. The number of services per claim was highest in 2002, but it decreased by 60 percent between 2002 and 2017. Since 2008, the average cost per claim increased greatly for physical medicine and surgery services. Since utilization levels did not increase as much, the main cost driver appears to be the fee schedule increases.

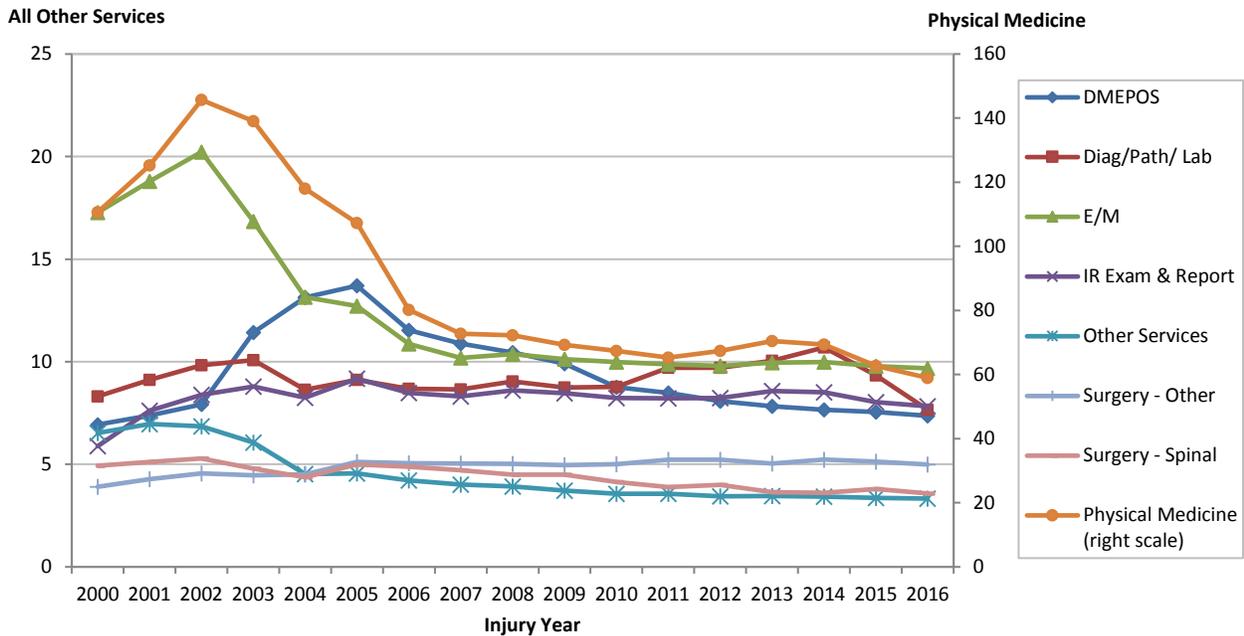
Figure 3.9: Average Cost per Claim by Service Type, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury



Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Figure 3.10: Number of Services per Claim, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury



Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Cost per Service by Injury Year for Selected Professional Services

For payment purposes, health care providers and billers use more than 10,000 different medical services (by CPT or HCPCS code) that, along with multipart modifiers, represent specific services, procedures, and supplies. However, a few common services accounted for most of the cost. The top 10 services accounted for 42 percent of the total payments of \$8.1 billion from 2005 to 2017, while 52 percent and 63 percent of the total cost was explained by the top 20 and the top 100 services, respectively. The top 20 service codes in terms of total payments are shown in Table 3.9. They are mainly physical medicine and E/M services, along with a few of IR exam & report and diag/path/lab services.

Table 3.9: Top 20 Services by Total Payments in 2005 - 2017 Service Years

Rank	CPT/ HCPCS	Total Pay (Thousand Dollars)	Description
1	97110	\$771,889	Therapeutic procedure, one or more areas, each 15 minutes
2	99213	\$603,860	Office or other outpatient visit for evaluation and management of established patient
3	99456	\$521,319	Work related or medical disability exam by other than treating physician
4	97799	\$383,747	Unlisted physical medicine/rehabilitation service or procedure
5	99214	\$319,022	Office or other outpatient visit for evaluation and management of established patient
6	99204	\$201,617	Office or other outpatient visit for evaluation and management of new patient
7	99203	\$186,169	Office or other outpatient visit for evaluation and management of new patient
8	97140	\$151,130	Manual therapy techniques, one or more regions, each 15 minutes
9	97530	\$146,393	Therapeutic activities, direct patient contact by the provider
10	97112	\$131,352	Therapeutic procedure, one or more areas, each 15 minutes; neuromuscular reeducation
11	97750	\$126,113	Physical performance test or measurement, with written report, each 15 minutes
12	97546	\$101,342	Work hardening/conditioning; each additional hour
13	99080	\$100,574	Special reports such as insurance forms, more than the information conveyed in the usual medical communications or standard reporting form
14	99455	\$80,827	Work related or medical disability exam by treating physician
15	73721	\$77,345	Magnetic resonance imaging, any joint of lower extremity; without contrast material
16	73221	\$69,373	Magnetic resonance imaging, any joint of upper extremity; without contrast material
17	97001	\$65,672	Physical therapy evaluation
18	29827	\$63,488	Arthroscopy, rotator cuff repair
19	72148	\$62,139	Magnetic resonance imaging, spinal canal and contents, lumbar; without contrast material
20	99212	\$59,890	Office or other outpatient visit for evaluation and management of established patient

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

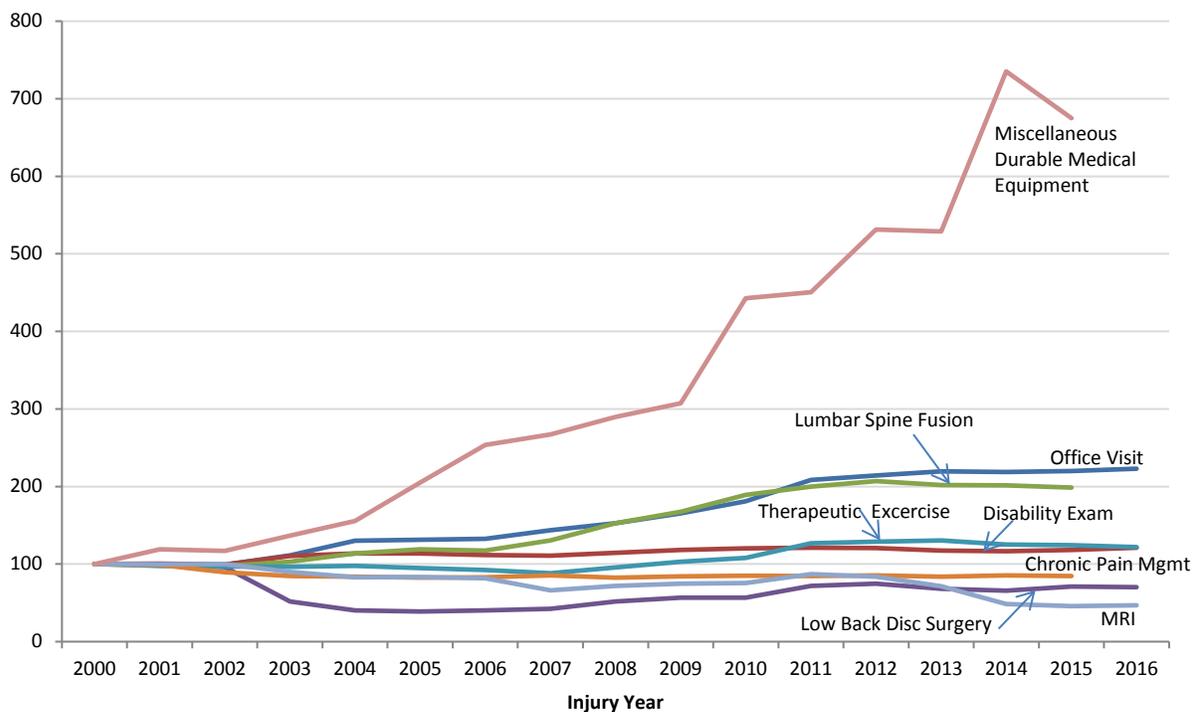
Figure 3.11 shows average costs per service for selected services, normalized in the 2000 price (see Table B7 in Appendix B for real dollar amounts). When some of the top 20 services are in the same service group, we have selected only a representative service to avoid duplication. We also show surgery, DME, and other services that may not be in the top 20 but are of interest. The results are by injury year, and an appropriate length of maturity is selected for each service: six months for an office visit, therapeutic

exercises, and MRI; 12 months for a disability exam and low back disc surgery; and 24 months for lumbar spine fusion, chronic pain management, and DME.

The cost per service increased greatly between 2000 and 2017 for miscellaneous DME (675 percent of the 2000 price), office visit (220 percent), and lumbar spine fusion (223 percent). Office visit and surgery prices increased mainly because of fee schedule increases. For miscellaneous DME, a changing mix of supplies toward higher-cost items may account for the increase. Another reason for the DME's high rate of increase is the low base it had: it changed from \$79 per claim in injury year 2000 to \$531 in injury year 2015.⁸

The cost per service for therapeutic exercise and disability exam increased moderately (by 122 and 121 percent of the 2000 price, respectively). The cost per service for some services decreased greatly: 2016 prices of chronic pain management, low back disc surgery, and MRI services were just 84 percent, 70 percent, and 47 percent of the 2000 prices, respectively. The decrease in MRI price since 2012 was mainly due to decreased fees in the Medicare professional fee schedule.

Figure 3.11: Average Cost per Service by Injury Year, Normalized in 2000 Price Levels



Note: For chronic pain management, only bills with "CP" modifiers are considered.
 Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

⁸ The decrease in the price of miscellaneous DME (HCPCS code E1399) for injury year 2015 was largely because of a decrease in the average billed and paid price in the service year 2017. CMS stated that the HCPCS code E1399 was meant to be used if there was no appropriate code to use for billing. In 2016, CMS explored ways to refine this miscellaneous item code along with K0108 billing code for various parts and repair costs of wheelchairs. CMS did not finalize new rules. However, increased attention to billing and post-billing reviews may have resulted in less billing of expensive items using E1399.

4. COST AND UTILIZATION OF HOSPITAL/INSTITUTIONAL SERVICES

Hospital/institutional services include hospital inpatient and outpatient services, services in skilled nursing facilities, home health care, and other services provided at special facilities. However, about 90 percent of the bills are hospital services, and most of hospital bills (about 70 percent) are for services provided within the first six months from the injury date. Services at ASCs are reported in the professional service dataset and discussed in Section 3. However, we also present ASC services in this section when comparison with hospital services is appropriate.

Hospital outpatient services were reimbursed on a fair and reasonable basis until DWC adopted a new hospital fee guideline effective March 2008. Billing and reimbursements for inpatient services were previously based on the 1997 fee guideline that specified different methods depending on the types of hospitals and services. The new 2008 guideline standardized reimbursement methods using the Medicare model. In general, reimbursement rates were 200 percent of Medicare for outpatient services and 143 percent of Medicare for inpatient services.

Total Cost and Utilization for Hospital/Institutional Services

Slightly less than 30 percent of all claims that received health care benefits had one or more Hospital/institutional service bills (see Table 4.1). This share decreased from a high of 33 percent in 2003 to 28 percent in 2017. Lost-time claims and medical-only claims were 46 percent and 54 percent of the total hospital claims in 2017, respectively.

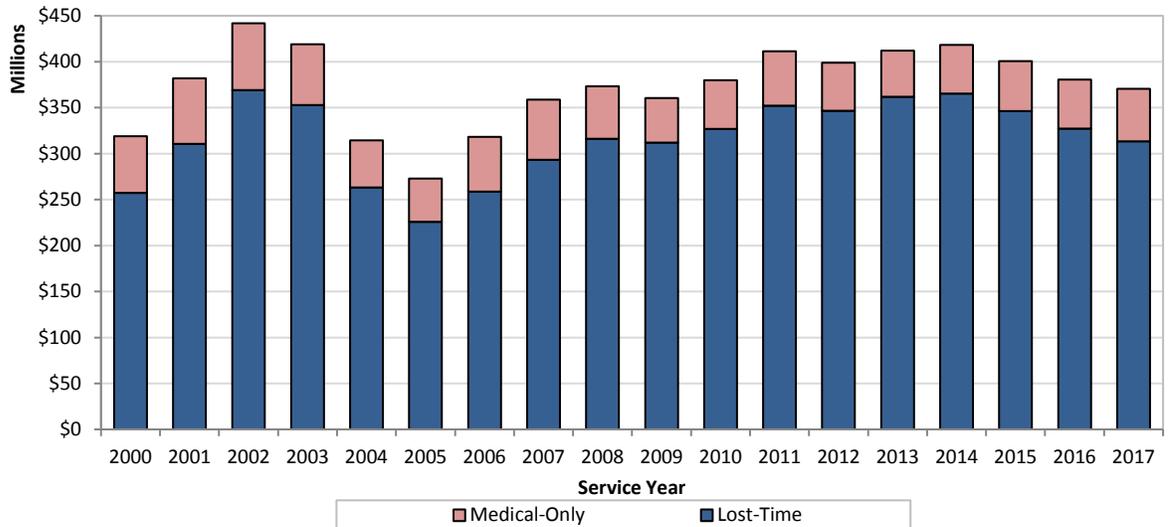
Table 4.1: Number and Share of Claims That Received Hospital/Institutional Services

Service Year	Claims - Medical Combined	Claims - Hospital/Institutional	Hospital/Institutional Claim Share in Medical Combined	Hospital/Institutional Lost-Time Claims	Hospital/Institutional Medical-Only Claims
2000	418,817	127,244	30.4%	61,101	66,143
2001	417,852	130,651	31.3%	64,145	66,506
2002	422,383	137,649	32.6%	71,995	65,654
2003	385,815	126,988	32.9%	67,188	59,800
2004	344,611	106,447	30.9%	55,180	51,267
2005	366,333	92,038	25.1%	44,194	47,844
2006	362,666	98,728	27.2%	46,213	52,515
2007	366,924	103,460	28.2%	47,313	56,147
2008	357,113	100,056	28.0%	47,267	52,789
2009	326,914	92,275	28.2%	45,412	46,863
2010	324,886	94,315	29.0%	45,997	48,318
2011	323,874	96,089	29.7%	45,969	50,120
2012	320,081	90,789	28.4%	43,718	47,071
2013	309,857	87,470	28.2%	42,093	45,377
2014	307,496	87,181	28.4%	41,805	45,376
2015	299,296	84,395	28.2%	40,182	44,213
2016	295,882	81,889	27.7%	38,649	43,240
2017	294,679	82,092	27.9%	37,439	44,653

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Figure 4.1 presents total hospital costs by service year, summing lost-time and medical-only claims costs. After the 2002 peak of \$442 million, the total hospital cost decreased greatly to \$273 million in 2005. But by 2011, it had increased to about \$411 million, and decreased slightly to \$370 million in 2017. Lost-time claims accounted for about 85 percent of the total cost in each service year even though they accounted for almost 50 percent of the claims in terms of the number of claims.⁹ Medical-only claims used relatively-low cost services even when utilizing hospital or institutional services.

Figure 4.1: Total Cost by Claim Type, Hospital/Institutional Services



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

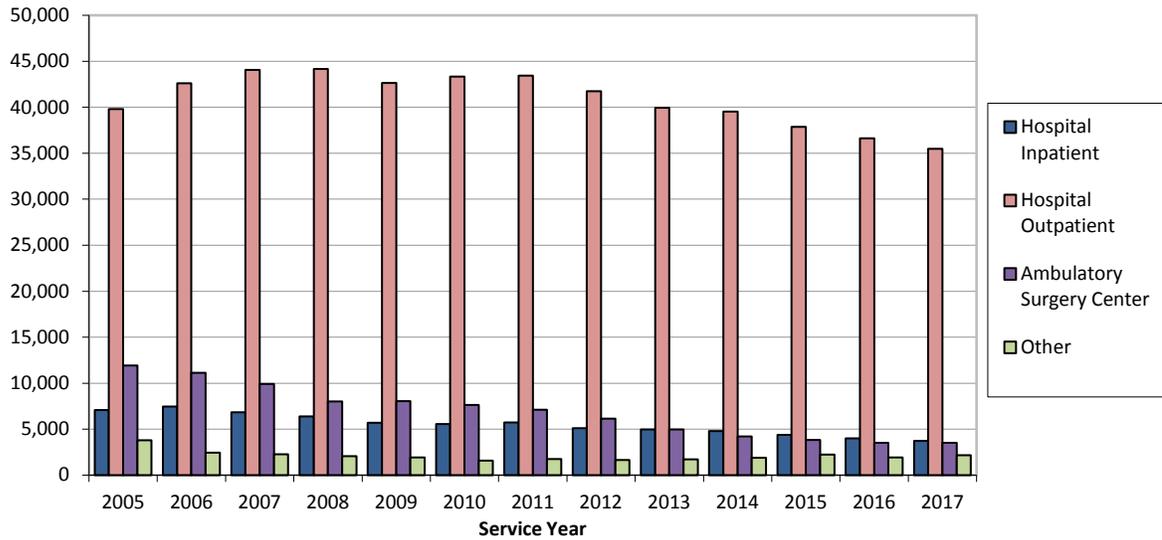
Hospital/Institutional Costs by Facility Type

In this section, we analyze costs by facility type. Facility codes in the hospital billing data separate bills by the type of institution (hospitals or Other non-hospital facilities such as skilled nursing facility and home health care). Hospital bills are further separated by the nature of service location (inpatient or outpatient). In addition, the data for ASCs from the professional services bills are presented for comparison. This analysis focuses on the post-EDI period (since 2005) because of the availability of more reliable facility codes in the EDI data.

Most lost-time claims received Hospital Outpatient services (see Figure 4.2). About 90 percent of all hospital claims in 2005 and 95 percent in 2017 received outpatient services. Out of about 37,000 unique lost-time claims in 2017, 3,709 claims received inpatient services, and 3,522 claims received services at ASCs. The share of claims receiving hospital inpatient services decreased from 16 percent in 2006 to 10 percent of all hospital claims in 2017. Claims that received services at ASCs also decreased, from 27 percent in 2005 to 9 percent in 2017.

⁹ Some tables and figures will only present lost-time claims when the cost share of lost-time claims is dominant.

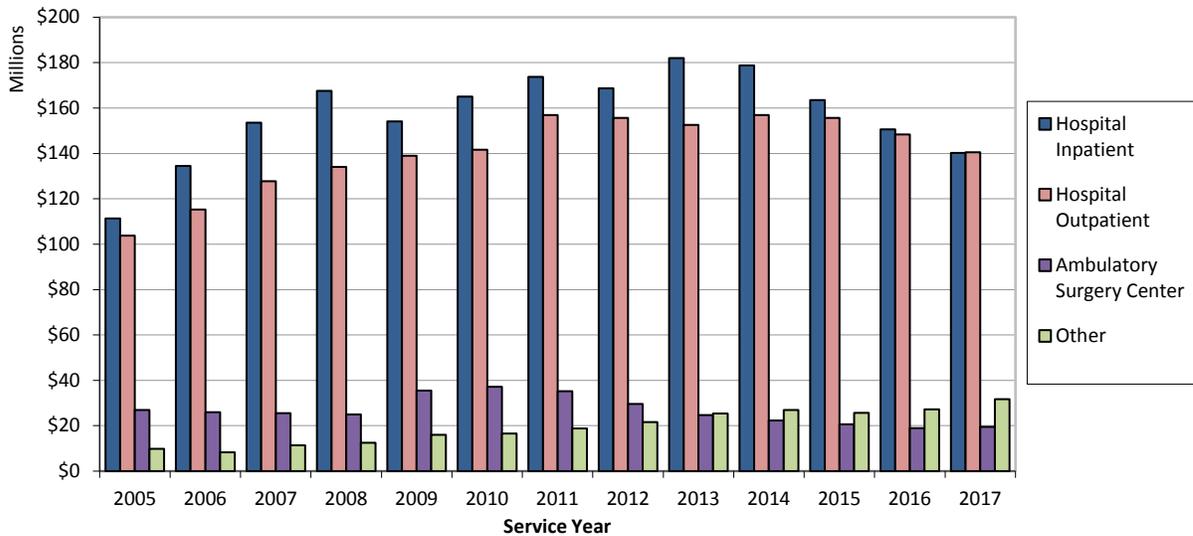
Figure 4.2: Number of Claims by Facility Type, Hospital/Institutional Services, Lost-Time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Even though hospital outpatient services are the most commonly used services, total cost of hospital outpatient services is slightly lower than that of inpatient services. However, in recent years, the inpatient cost decreased, and total costs of inpatient and outpatient services were about the same in 2017 (see Figure 4.3).

Figure 4.3: Total Cost by Facility Type, Hospital/Institutional Services, Lost-Time Claims



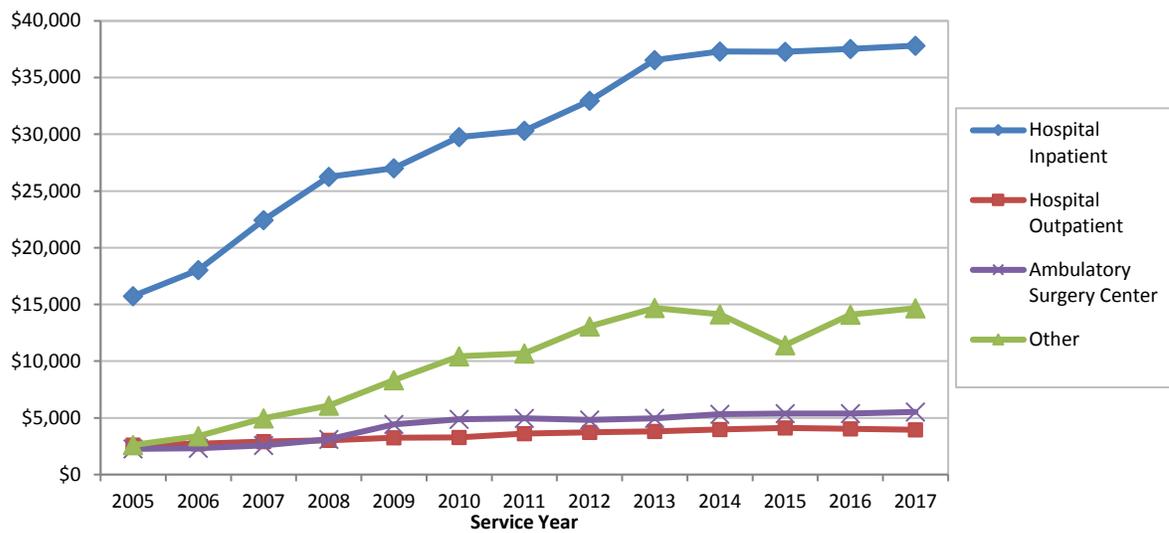
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

The average hospital inpatient cost per claim was much higher and increased much faster than outpatient or other facility services (see Figure 4.4). But its growth rate was slightly lower from 2009 to 2011 after the revised hospital fee guideline went into effect. Since 2013, its growth slowed considerably.

The average cost per claim at ASCs was 87 percent of the average hospital outpatient cost in 2005. After the 2008 ASC fee guideline, it increased to 136 percent of the hospital outpatient cost in 2009 and 140 percent in 2017.

The most recent service year data indicates that the rate of increase in average costs per claim appears to be slowing for hospital/institutional services. Average cost per claim for inpatient services increased annually by less than 1 percent in the last four years. The cost per claim for outpatient services decreased by 1.5 percent in 2016 and again decreased by 2.2 percent in 2017.

Figure 4.4: Cost per Claim by Facility Type, Hospital/Institutional Services, Lost-Time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Hospital/Institutional Costs by Injury Year

Costs by injury year show partial pictures of the total costs by ignoring old and legacy claims and focusing on new injury claims and initial services after injury.

Total cost for medical-only claims with six-month maturity increased by 3 percent between 2000 and 2016 (see Table 4.2). Total cost for lost-time claims with six-month maturity increased by 54 percent in the same period. In comparison, service year data in Figure 4.1 showed that total cost decreased by 10 percent for medical-only claims and increased by 25 percent for lost-time claims in the same period. Growth rates in cost were lower for 12-month and 24-month maturities. This may indicate an emphasis on initial care or a decreasing share of legacy claims.

Table 4.2: Total Hospital/Institutional Cost (Thousand Dollars), by Injury Year at 6, 12, and 24 Months after Injury

Injury Year	Lost-Time Claims			Medical-Only Claims		
	6 Months	12 Months	24 Months	6 Months	12 Months	24 Months
2000	\$120,548	\$165,515	\$226,113	\$43,717	\$50,824	\$58,913
2001	\$145,249	\$200,362	\$262,100	\$50,554	\$57,987	\$64,828
2002	\$158,219	\$212,366	\$262,244	\$44,886	\$51,266	\$56,295
2003	\$155,068	\$197,687	\$228,280	\$45,712	\$50,073	\$53,085
2004	\$113,538	\$137,660	\$165,779	\$37,028	\$39,769	\$42,009
2005	\$118,188	\$144,261	\$174,058	\$36,182	\$38,872	\$40,982
2006	\$146,185	\$175,409	\$205,285	\$43,452	\$45,997	\$48,206
2007	\$175,784	\$208,172	\$242,888	\$49,982	\$52,603	\$55,277
2008	\$182,709	\$220,316	\$260,711	\$41,925	\$43,809	\$45,563
2009	\$161,792	\$195,151	\$230,204	\$35,342	\$37,210	\$38,974
2010	\$177,847	\$212,945	\$248,334	\$38,896	\$40,803	\$42,575
2011	\$196,062	\$232,502	\$266,900	\$43,272	\$45,774	\$46,980
2012	\$193,389	\$228,252	\$261,859	\$40,901	\$42,667	\$44,061
2013	\$206,077	\$241,628	\$275,601	\$41,083	\$43,035	\$45,715
2014	\$213,121	\$250,367	\$282,080	\$43,660	\$45,388	\$46,688
2015	\$190,894	\$222,566	\$250,689	\$44,159	\$45,776	\$46,633
2016	\$185,138	\$215,684		\$44,829	\$46,917	

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

The number of claims receiving hospital services decreased by more than 20 percent since 2000 for both lost-time and medical-only claims (see Table 4.3). As a result, average hospital cost per claim increased greatly for lost-time claims: 100 percent increase since 2000 for the six-month maturity group, 82 percent for the 12-month group, and 56 percent for the 24-month group (see Table 4.4). Average hospital cost per claim also increased for medical-only claims by 51 percent, 38 percent, and 17 percent for six-month, 12-month, and 24-month maturity groups, respectively, during the same time.

Unlike the case of professional services, it is difficult to calculate the per-service cost and per-claim utilization for hospital services because many hospital bills are not separated by individual services. Nevertheless, the large increase in the average cost per claim indicates an increase in service fees and utilization. The increase in the average cost was greater for the six-month maturity group than for 12-month and 24-month groups.

Table 4.3: Number of Claims Receiving Hospital/Institutional Services, by Injury Year at 6, 12, and 24 Months after Injury

Injury Year	Lost-Time Claims			Medical-Only Claims		
	6 Months	12 Months	24 Months	6 Months	12 Months	24 Months
2000	33,170	37,243	40,230	60,827	62,215	63,203
2001	35,379	39,969	42,672	60,660	61,956	62,727
2002	37,730	41,633	43,421	59,395	60,319	60,804
2003	34,631	37,512	38,708	54,645	55,386	55,735
2004	29,306	31,347	32,642	47,550	48,042	48,320
2005	26,234	28,332	29,617	45,054	45,556	45,840
2006	28,614	30,549	31,522	49,537	50,052	50,287
2007	30,429	32,259	33,270	52,960	53,386	53,631
2008	31,064	32,984	33,959	49,988	50,381	50,582
2009	28,529	30,137	30,972	44,255	44,563	44,770
2010	30,264	31,924	32,689	45,965	46,305	46,479
2011	30,655	32,077	32,786	47,642	47,997	48,164
2012	29,002	30,374	30,998	44,782	45,076	45,231
2013	28,061	29,401	30,071	43,422	43,719	43,876
2014	28,145	29,527	30,173	43,306	43,631	43,770
2015	26,509	27,884	28,512	42,338	42,609	42,743
2016	25,420	26,670		41,410	41,688	

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 4.4: Average Hospital/Institutional Cost per Claim, by Injury Year at 6, 12, and 24 Months after Injury

Injury Year	Lost-Time Claims			Medical-Only Claims		
	6 Months	12 Months	24 Months	6 Months	12 Months	24 Months
2000	\$3,634	\$4,444	\$5,620	\$719	\$817	\$932
2001	\$4,106	\$5,013	\$6,142	\$833	\$936	\$1,033
2002	\$4,193	\$5,101	\$6,040	\$756	\$850	\$926
2003	\$4,478	\$5,270	\$5,897	\$837	\$904	\$952
2004	\$3,874	\$4,391	\$5,079	\$779	\$828	\$869
2005	\$4,505	\$5,092	\$5,877	\$803	\$853	\$894
2006	\$5,109	\$5,742	\$6,512	\$877	\$919	\$959
2007	\$5,777	\$6,453	\$7,301	\$944	\$985	\$1,031
2008	\$5,882	\$6,679	\$7,677	\$839	\$870	\$901
2009	\$5,671	\$6,475	\$7,433	\$799	\$835	\$871
2010	\$5,877	\$6,670	\$7,597	\$846	\$881	\$916
2011	\$6,396	\$7,248	\$8,141	\$908	\$954	\$975
2012	\$6,668	\$7,515	\$8,448	\$913	\$947	\$974
2013	\$7,344	\$8,218	\$9,165	\$946	\$984	\$1,042
2014	\$7,572	\$8,479	\$9,349	\$1,008	\$1,040	\$1,067
2015	\$7,201	\$7,982	\$8,792	\$1,043	\$1,074	\$1,091
2016	\$7,283	\$8,087		\$1,083	\$1,125	

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

5. COST AND UTILIZATION OF DENTAL SERVICES

Payments for dental services in the Texas workers' compensation system accounted for about 0.5 percent of the total health care cost in 2017 (as illustrated in Table 2.2). Most of the dental cost was for medical-only claims, but the average cost per claim for lost-time claims was about 50 percent higher than for the medical-only claims (see Table 5.1). This ratio is relatively low compared to the pattern found in professional or pharmacy costs, where lost-time claims have overwhelmingly dominant costs. In terms of price trend, the average dental cost per claim increased greatly since 2007, by 48 percent for lost-time claims and by 57 percent for medical-only claims.

Table 5.1: Number of Claims, Total and Average Costs per Claim for Dental Services, by Claim Type

Service Year	Lost-Time Claims			Medical-Only Claims		
	Number of Claims	Total Cost	Cost per Claim	Number of Claims	Total Cost	Cost per Claim
2005	180	\$300,654	\$1,670	385	\$482,838	\$1,254
2006	234	\$613,456	\$2,622	529	\$919,983	\$1,739
2007	342	\$1,014,753	\$2,967	794	\$1,586,048	\$1,998
2008	391	\$1,176,678	\$3,009	927	\$2,217,090	\$2,392
2009	341	\$1,438,228	\$4,218	893	\$1,968,461	\$2,204
2010	399	\$1,786,229	\$4,477	960	\$2,212,081	\$2,304
2011	382	\$1,758,463	\$4,603	997	\$2,664,306	\$2,672
2012	419	\$1,556,954	\$3,716	989	\$2,859,583	\$2,891
2013	432	\$1,937,235	\$4,484	1,037	\$2,699,186	\$2,603
2014	434	\$1,916,538	\$4,416	1,040	\$2,964,277	\$2,850
2015	423	\$1,938,482	\$4,583	1,032	\$3,412,476	\$3,307
2016	440	\$2,458,065	\$5,587	1,009	\$3,069,076	\$3,042
2017	453	\$1,993,214	\$4,400	1,088	\$3,411,273	\$3,135

Note: Since the collection of dental billing data began in 2005, the table indicates that 2005 and 2006 data may be incomplete.
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

The top 10 most billed dental procedures are shown in Table 5.2. These 10 procedures accounted for 49 percent of the total dental cost during the 13-year period. Most common services were implant, crown, and root canal procedures.

Table 5.2: Top 10 Dental Services, by Total Cost (2005 - 2017 Cumulative Totals)

Rank	HCPCS	Number of Claims	Total Cost	Procedure Description
1	D6010	1,295	\$6,511,687	Surgical placement of implant body: endosteal implant
2	D2740	2,308	\$4,178,342	Crown-porcelain/ceramic substrate
3	D3310	2,856	\$3,492,446	Endodontic therapy, anterior tooth (excluding final restoration)
4	D2750	1,471	\$2,766,152	Crown-porcelain fused to high noble metal (restorative)
5	D6750	705	\$1,686,382	Crown-porcelain fused to high noble metal (bridges)
6	D6240	807	\$1,399,863	Pontic-porcelain fused to high noble metal
7	D2751	641	\$1,243,055	Abutment supported porcelain fused to metal crown (high noble metal)
8	D2950	3,022	\$1,181,845	Core build-up, including any pins
9	D7210	1,974	\$1,138,479	Surgical removal of erupted tooth requiring elevation of mucoperiosteal flap and removal of bone and/or section of tooth
10	D6058	317	\$1,057,406	Abutment supported porcelain/ceramic crown

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Total dental payments are broken down by hospital referral region (HRR) in Table 5.3 shown in a descending order of the average cost per claim. HRRs are developed by the *Dartmouth Atlas of Health Care* project. In Texas, there are 24 HRRs constructed using Medicare hospitalization records and patient referral patterns. Two HRRs are removed from our analysis: Texarkana and Shreveport HRRs that are primarily located in Arkansas and Louisiana, respectively. Texas HRRs also roughly correspond to major metropolitan areas. For this analysis, patients' HRRs are assigned based on injured employees' home ZIP codes since facility ZIP codes are incomplete in the data.

The largest five metro areas (Houston, Dallas, Fort Worth, San Antonio, and Austin) accounted for 65 percent of the dental claims and 69 percent of the total dental payments, which is along the lines of the shares observed in the overall medical data. The geographical distributions of the dental claims and services are like those of other types of medical services.

Table 5.3: Number of Claims and Cost per Claim (2005 - 2017 Cumulative Totals), by HRR, Dental Services

HRR	Number of Claims	Total Cost	Cost per Claim
Odessa	279	\$1,715,448	\$6,149
Houston	2,994	\$12,834,394	\$4,287
Fort Worth	1,391	\$5,875,468	\$4,224
Dallas	2,363	\$9,675,931	\$4,095
Abilene	193	\$753,570	\$3,905
Longview	116	\$427,201	\$3,683
Lubbock	355	\$1,270,532	\$3,579
Victoria	107	\$377,593	\$3,529
San Antonio	1,372	\$4,820,892	\$3,514
Corpus Christi	297	\$984,752	\$3,316
Austin	856	\$2,836,778	\$3,314
Wichita Falls	113	\$373,649	\$3,307
Bryan	128	\$421,349	\$3,292
San Angelo	98	\$321,586	\$3,281
Beaumont	230	\$750,549	\$3,263
Tyler	326	\$1,021,761	\$3,134
McAllen	193	\$603,906	\$3,129
Temple	263	\$780,798	\$2,969
Harlingen	181	\$507,875	\$2,806
Waco	205	\$528,630	\$2,579
El Paso	335	\$816,292	\$2,437
Amarillo	346	\$760,590	\$2,198
Total	12,741	\$48,459,544	\$3,803
Sum of 5 Metro HRRs	8,233	\$33,580,334	\$4,079
Share of 5 Metro HRRs	64.6%	69.3%	

Note: The five largest metropolitan areas are highlighted.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

6. COST AND UTILIZATION OF PHARMACY SERVICES

This section reports total and average costs for pharmacy benefits from 2005 to 2017. These costs are further analyzed by the brand or generic status, the “N” drug status, and the maturity, which reflect major changes in the pharmacy benefit rules.

Pharmacy benefits in the Texas workers' compensation system are based on the rules contained in the 28 Texas Administrative Code §134.500 - §134.550. These rules cover commonly used definitions, initial pharmaceutical coverage, prescribing of generics and over-the-counter drugs in addition to brand name drugs, a pharmacy fee guideline, a closed formulary, and other pharmaceutical provisions. Changes in these rules are one of the most significant factors that affect the trends in pharmacy cost and utilization. For more information about pharmacy benefits, see the information page at www.tdi.texas.gov/wc/pharmacy/index.html.

The pharmaceutical services guideline and the pharmacy fee guideline, first adopted in 2002, apply to the dispensing and reimbursement of prescription drugs and nonprescription drugs or over-the-counter medications for outpatient use in the Texas workers' compensation system. Doctors are required to consider generic equivalents or over-the-counter alternatives whenever clinically appropriate. The reimbursement rate is based on the average wholesale price with a multiplier (currently 1.25 for generic drugs and 1.09 for brand name drugs).¹⁰ Injured employees are entitled to receive clinically necessary pharmacy benefits for the first seven days after the injury regardless of the claim's liability or compensability status since the insurance carriers may be reimbursed for these payments from the Subsequent Injury Fund.

DWC implemented a pharmacy closed formulary guideline in September 2011. For injuries on or after September 1, 2011, pharmacy benefits are subject to the closed formulary that requires preauthorization for drugs identified with a status of “N” in the current edition of the *Official Disability Guidelines Treatment in Workers' Comp, Appendix A, ODG Workers' Compensation Drug Formulary*, or any compound that contains a "N" status drug, and any investigational or experimental drug. As of December 2017, there were 188 drugs with the status of “N” in the drug formulary. Legacy claims— injuries that occurred before September 1, 2011—became subject to the closed formulary beginning September 1, 2013.

Utilization of Pharmacy Services by Claim Type

About 38 percent of all claims received at least one pharmacy service in 2017. Claims with pharmacy services were about equally represented by lost-time and medical-only types (see Table 6.1). Since 2005, the number of lost-time claims receiving pharmacy services decreased by 37 percent, and medical-only

¹⁰ Insurance carriers are permitted to use informal and voluntary networks (not certified networks) to obtain discounted fees if those networks meet statutory and regulatory requirements.

claims by 33 percent. The number of claims decreased most since 2011, which indicates that the pharmacy closed formulary reduced pharmacy utilization.

Table 6.1: Number and Share of Claims Receiving Pharmacy Services, by Claim Type

Service Year	Total Number of Claims	Lost-Time Claims Receiving Pharmacy Services		Medical-Only Claims Receiving Pharmacy Services	
		Number of Claims	Share	Number of Claims	Share
2005	366,333	93,461	25.5%	78,724	21.5%
2006	362,666	90,570	25.0%	80,895	22.3%
2007	366,924	90,956	24.8%	89,204	24.3%
2008	357,113	89,739	25.1%	85,727	24.0%
2009	326,914	85,743	26.2%	74,883	22.9%
2010	324,886	86,789	26.7%	73,704	22.7%
2011	323,874	85,159	26.3%	71,764	22.2%
2012	320,081	80,780	25.2%	69,639	21.8%
2013	309,857	76,227	24.6%	65,187	21.0%
2014	307,496	72,600	23.6%	60,555	19.7%
2015	299,296	67,338	22.5%	55,593	18.6%
2016	295,882	63,779	21.6%	54,237	18.3%
2017	294,679	58,906	20.0%	53,128	18.0%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Total and Average Costs by Claim Type

Although there was about an equal number of lost-time and medical-only claims, costs were dominated by lost-time claims at \$67 million out of \$78 million in 2017, which accounted for 86 percent of the total pharmacy cost (see Table 6.2). Accordingly, the average pharmacy cost per claim for lost-time claims was five and a half times greater than the average cost for medical-only claims. Since the pharmacy closed formulary took effect in 2011, for lost-time claims, the number of claims decreased by 31 percent, total cost by 49 percent, and the cost per claim by 26 percent.

Table 6.2: Total and Average Costs per Claim, by Claim Type, Pharmacy Services

Service Year	Lost-Time Claims			Medical-Only Claims		
	Number of Claims	Total Cost (Thousand Dollars)	Cost per Claim	Number of Claims	Total Cost (Thousand Dollars)	Cost per Claim
2005	93,461	\$118,120	\$1,264	78,724	\$27,812	\$353
2006	90,570	\$122,621	\$1,354	80,895	\$29,366	\$363
2007	90,956	\$125,011	\$1,374	89,204	\$29,835	\$334
2008	89,739	\$131,931	\$1,470	85,727	\$27,577	\$322
2009	85,743	\$133,150	\$1,553	74,883	\$29,163	\$389
2010	86,789	\$134,756	\$1,553	73,704	\$24,934	\$338
2011	85,159	\$130,550	\$1,533	71,764	\$22,966	\$320
2012	80,780	\$120,299	\$1,489	69,639	\$19,575	\$281
2013	76,227	\$108,271	\$1,420	65,187	\$18,271	\$280
2014	72,600	\$96,889	\$1,335	60,555	\$14,772	\$244
2015	67,338	\$91,443	\$1,358	55,593	\$13,266	\$239
2016	63,779	\$86,365	\$1,354	54,237	\$12,588	\$232
2017	58,906	\$66,614	\$1,131	53,128	\$10,840	\$204

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Pharmacy Cost and Utilization by Maturity Group

Lost-time claims received pharmacy benefits for a longer period than medical-only claims. In each service year, services can be separated into distinct maturity groups depending on how long each claim has been receiving workers' compensation benefits. Table 6.3 shows that, in 2017, 59 percent of the total cost was for claims that were in their fourth or later year (37 months or more) after their injury dates. This was a 5 percent decrease from their 64 percent share in 2013. This decrease coincided with the pharmacy closed formulary being applied to legacy claims beginning September 2013. These legacy claims accounted for 13 percent of all pharmacy claims while most pharmacy claims were in their first year of treatment (see Table 6.4). The relatively large claim share of the first year maturity group was mainly due to the large number of short-term, medical-only claims in this group. The average cost per claim increased greatly with increases in maturity (see Table 6.5).

Table 6.3: Total Cost, by Maturity Group, Pharmacy Services (Thousand Dollars)

Service Year	First Year Maturity	Second Year Maturity	Third Year Maturity	4+ Years Maturity
2005	\$27,489	\$13,632	\$11,580	\$93,230
2006	\$27,852	\$14,097	\$10,559	\$99,479
2007	\$31,568	\$13,595	\$10,338	\$99,345
2008	\$32,815	\$14,120	\$10,304	\$102,269
2009	\$33,729	\$15,967	\$11,056	\$101,562
2010	\$32,759	\$15,693	\$10,806	\$100,431
2011	\$30,693	\$14,032	\$10,320	\$98,468
2012	\$27,415	\$13,542	\$9,487	\$89,429
2013	\$25,759	\$11,748	\$8,749	\$80,285
2014	\$28,552	\$11,088	\$7,320	\$64,700
2015	\$26,205	\$10,972	\$6,687	\$60,842
2016	\$27,246	\$11,380	\$6,611	\$53,712
2017	\$19,261	\$7,598	\$5,244	\$45,349

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 6.4: Number of Claims, by Maturity Group, Pharmacy Services

Service Year	First Year Maturity	Second Year Maturity	Third Year Maturity	4+ Years Maturity
2005	118,073	19,495	12,188	37,742
2006	119,818	18,536	10,769	36,779
2007	131,941	17,194	9,674	34,893
2008	129,141	17,074	9,099	32,916
2009	116,890	17,150	9,135	30,622
2010	118,845	15,725	8,746	29,386
2011	118,760	14,433	7,700	27,693
2012	114,842	13,930	7,013	25,611
2013	108,222	12,911	6,589	23,646
2014	103,382	11,692	5,993	21,133
2015	95,460	11,332	5,367	19,078
2016	92,633	10,583	5,153	17,419
2017	88,743	9,506	4,819	15,844

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table 6.5: Average Pharmacy Cost per Claim, by Maturity Group

Service Year	First Year Maturity	Second Year Maturity	Third Year Maturity	4+ Years Maturity
2005	\$233	\$699	\$950	\$2,470
2006	\$232	\$761	\$980	\$2,705
2007	\$239	\$791	\$1,069	\$2,847
2008	\$254	\$827	\$1,132	\$3,107
2009	\$289	\$931	\$1,210	\$3,317
2010	\$276	\$998	\$1,236	\$3,418
2011	\$258	\$972	\$1,340	\$3,556
2012	\$239	\$972	\$1,353	\$3,492
2013	\$238	\$910	\$1,328	\$3,395
2014	\$276	\$948	\$1,221	\$3,062
2015	\$275	\$968	\$1,246	\$3,189
2016	\$294	\$1,075	\$1,283	\$3,084
2017	\$217	\$799	\$1,088	\$2,862

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Pharmacy Cost and Utilization by Drug Group

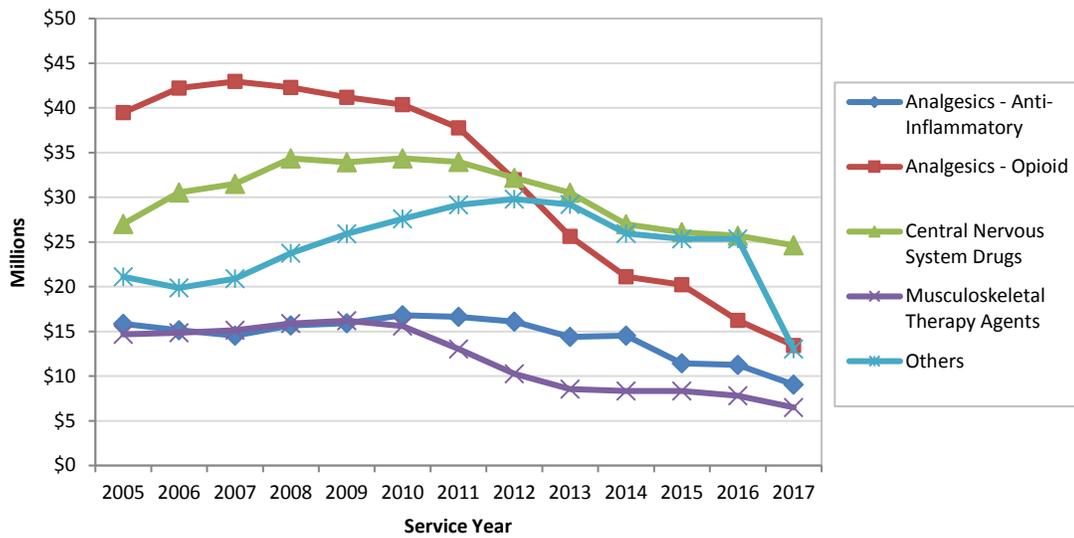
Drugs are classified into five major groups in this report: analgesics - anti-inflammatory including the nonsteroidal anti-inflammatory drugs (NSAIDs), analgesics - opioid, central nervous system (CNS) drugs, musculoskeletal therapy agents, and all others in “others” group. The CNS drugs group comprises anti-anxiety agents, anti-depressants, hypnotics, and anticonvulsants.¹¹ Anticonvulsants—mainly Gabapentin, Lyrica, Topamax, and Neurontin—account for about half of the total cost within the CNS drugs group. Those in the “others” group are all remaining drugs including dermatologicals, pharmaceutical chemicals and adjuvants (main ingredients in compounded drugs), ulcer drugs, and corticosteroids.

The four named drug groups accounted for 81 percent of the total pharmacy costs for lost-time claims, and 63 percent of medical-only claims costs in 2017 (see Figures 6.1 and 6.2). Among lost-time claims, the total costs of all drug groups decreased since 2010. The most significant factor in the decrease was the pharmacy closed formulary. Notably, total costs of analgesics - opioid and musculoskeletal therapy agents decreased by 67 percent and 58 percent, respectively, since 2010. Although relatively small, the total costs for medical-only claims also decreased greatly. New injury claims are dominant in medical-only claims, and the decrease since 2008 may have been related to treatment guidelines and new pharmacy benefit rules, including the pharmacy closed formulary. The total cost of “others” drug group decreased by 49 percent from 2016 to 2017. This was largely a result of a decrease in compounded drugs.¹²

¹¹ We followed Medi-Span's Therapeutic Classification System that assigned anticonvulsants in the CNS drug group but they may be clinically classified as musculoskeletal therapy agents drugs in some reports.

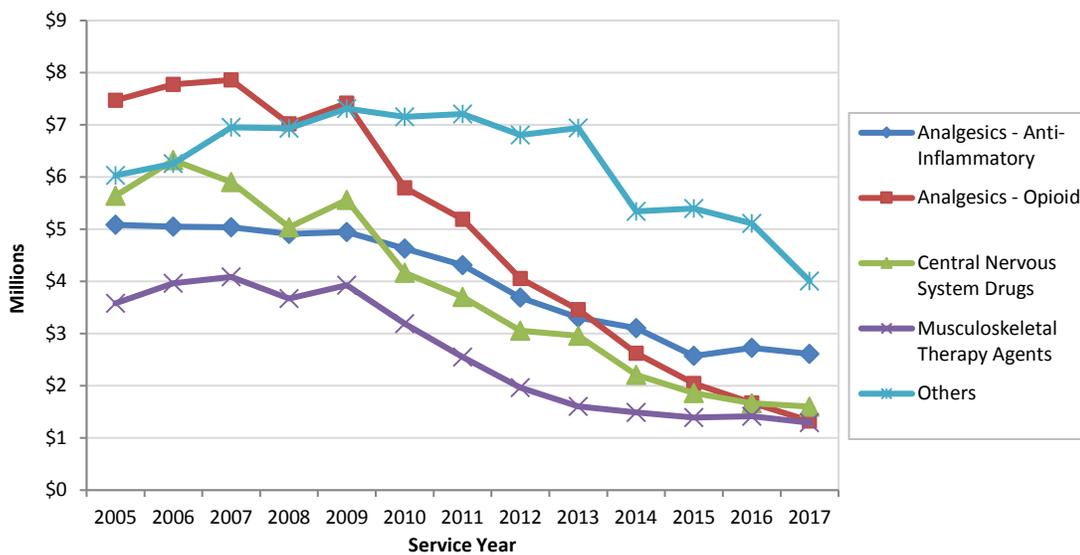
¹² The State Office of Administrative hearings (SOAH) in June 2016 decided that a compounded drug was considered investigational or experimental and therefore required preauthorization. See SOAH decision at [www.tdi.texas.gov/medcases/soah16/454-16-1884.M4\(R\)-NP.pdf](http://www.tdi.texas.gov/medcases/soah16/454-16-1884.M4(R)-NP.pdf). DWC also initiated a plan-based audit of several doctors prescribing compounded drugs.

Figure 6.1: Total Pharmacy Cost by Drug Group, Lost-Time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

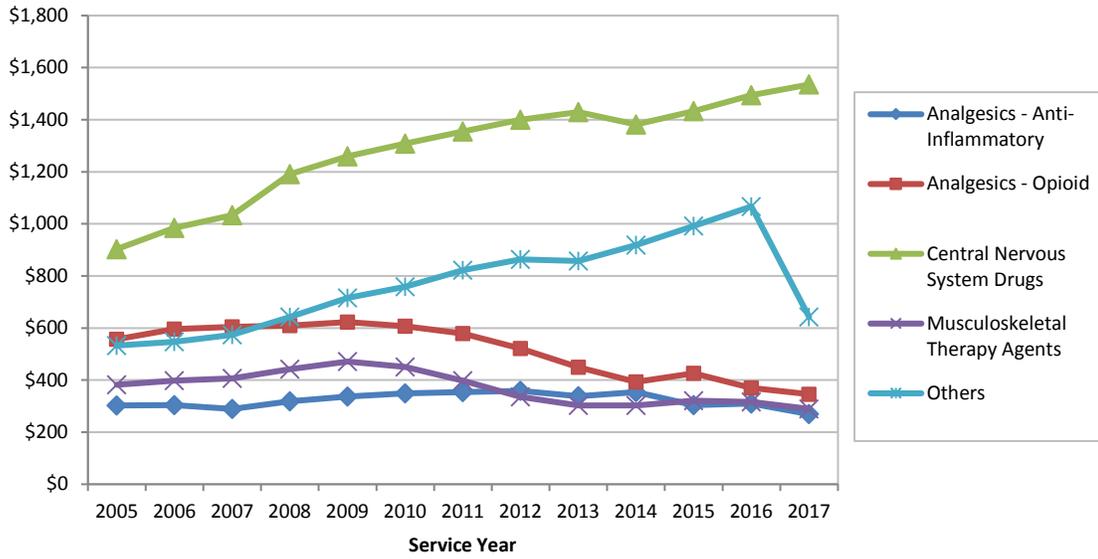
Figure 6.2: Total Pharmacy Cost, by Service Year by Drug Group, Medical-Only Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

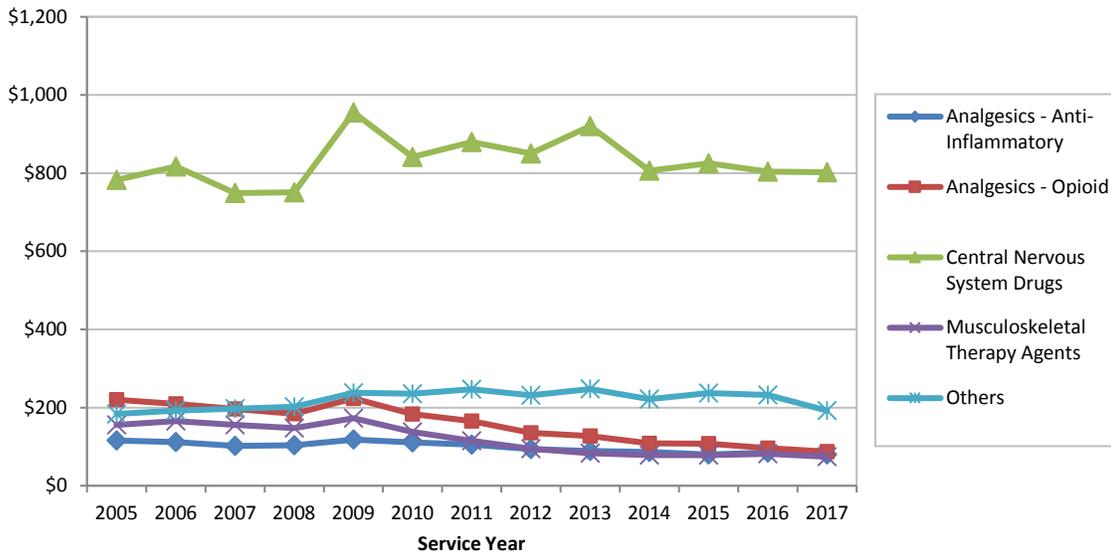
The average pharmacy cost per claim was highest for CNS drugs for both lost-time and medical-only claims as shown in Figures 6.3 and 6.4. Costs increased at a consistently high rate since 2005, although the average cost for medical-only claims increased at a lower rate. The average cost per claim for the “others” drug group increased moderately, while average costs for analgesics and musculoskeletal therapy agents remained relatively stable. The average cost per claim for opioids decreased since 2010 by 43 percent among lost-time claims and by 52 percent among medical-only claims. The noticeable decrease in the average cost of “others” drug group in 2017 is also related to the decreased use of compounded drugs.

Figure 6.3: Average Pharmacy Cost per Claim by Drug Group, Lost-Time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Figure 6.4: Average Pharmacy Cost per Claim by Drug Group, Medical-Only Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

After the 2011 pharmacy closed formulary, a decreasing share of claims received opioids (see Table 6.6). Overall, the share of claims receiving certain drugs was the lowest for CNS drugs for both claim types.

Table 6.6: Percent of Claims Receiving Certain Drug Groups, by Service Year

Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Lost-Time Claims													
Analgesics - Anti- Inflammatory	56%	55%	55%	55%	55%	56%	55%	56%	56%	57%	56%	57%	57%
Analgesics - Opioid	76%	78%	78%	77%	77%	77%	77%	76%	75%	74%	71%	69%	66%
Central Nervous System Drugs	32%	34%	34%	32%	31%	30%	29%	28%	28%	27%	27%	27%	27%
Musculoskeletal Therapy Agents	41%	41%	41%	40%	40%	40%	38%	38%	37%	38%	39%	39%	38%
Others	42%	40%	40%	41%	42%	42%	42%	43%	45%	39%	38%	37%	34%
Medical-Only Claims													
Analgesics - Anti- Inflammatory	56%	56%	55%	55%	56%	56%	57%	57%	57%	59%	58%	59%	61%
Analgesics - Opioid	43%	46%	45%	44%	44%	43%	44%	43%	42%	40%	34%	32%	29%
Central Nervous System Drugs	9%	10%	9%	8%	8%	7%	6%	5%	5%	5%	4%	4%	4%
Musculoskeletal Therapy Agents	29%	30%	29%	29%	30%	31%	31%	30%	29%	31%	32%	32%	33%
Others	42%	40%	40%	40%	41%	41%	41%	42%	43%	40%	41%	41%	39%

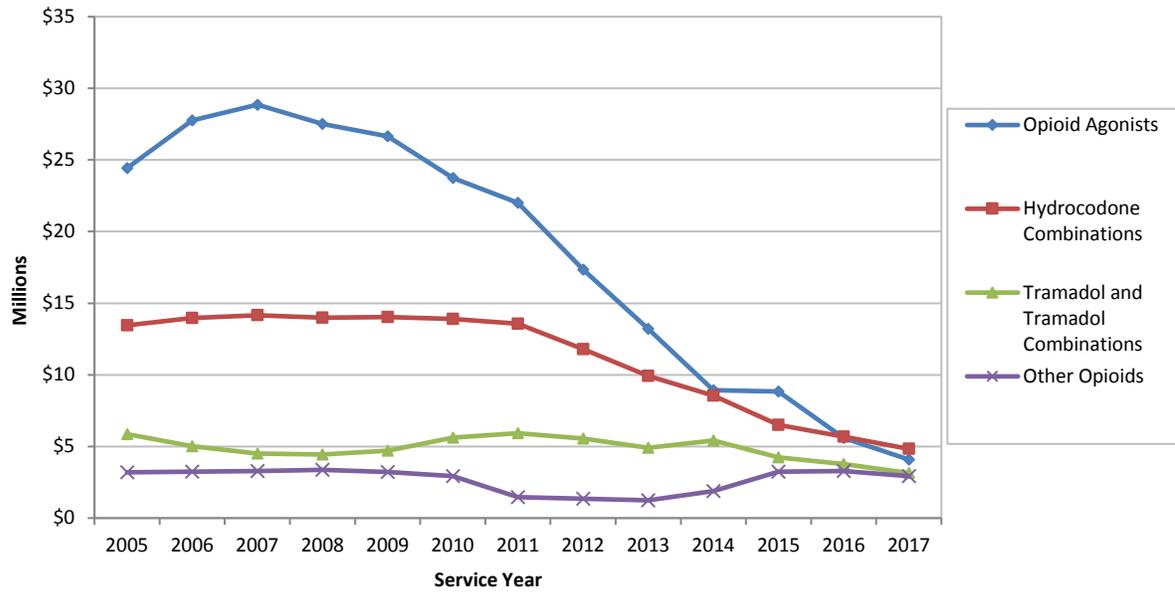
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

While CNS drugs had the highest average cost per claim, drugs in the analgesics - opioid group were the costliest in terms of total cost at \$43 million in 2011. In 2017, the total cost of opioids decreased to \$15 million while total costs of CNS drugs were \$26 million (see Table B8 in Appendix B for data). The total cost of the "others" drug group decreased from \$36 million in 2011 to \$17 million in 2017.

The analgesics - opioid drug group can be further classified into subclasses to analyze trends in utilization and costs within the opioid group. Among these subclasses, the opioid agonists' subclass accounted for about 52 percent of total opioid drug costs in 2005, followed by the hydrocodone combinations subclass with 29 percent (see Figure 6.5). The opioid agonists subclass includes such drugs as fentanyl (including brand drugs such as Actiq and Duragesic), hydromorphone, morphine sulfate (including brand drugs such as Avinza), and oxycodone (including brand drugs such as Oxycontin). The decreasing cost trend since 2007 was largely due to the treatment guideline, the pharmacy closed formulary, and the increasing use of generic drugs.

Hydrocodone combination products were the most prescribed opioids and they are "Y" drugs in the pharmacy formulary. However, the use of these products still decreased since the formulary was implemented in 2011. Hydrocodone combination products status also changed in October 2014 from Schedule III to a higher level of Schedule II controlled substances. There was a slight decrease in the hydrocodone combination products cost trend in 2015, but the effect of their schedule change on the cost trend was not noticeable. While the number of these prescriptions decreased after the schedule change, the cost per prescription increased, resulting in a minor change in the total cost of hydrocodone combination products.

Figure 6.5: Costs of Opioids by Drug Subclass



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Pharmacy Cost and Utilization by Brand/Generic Status

The pharmaceutical service guideline in 2002 required doctors to prescribe generic drugs when available and clinically appropriate. Among lost-time claims, generic drugs accounted for 66 percent of the total cost in 2017 (see Table 6.7). The number of claims that received brand-name drugs decreased greatly, but per-claim and per-prescription costs for brand drugs increased. Generic drug prescriptions were far more numerous than brand drugs, and their unit price per prescription was typically about a quarter of a brand drug.

In terms of average cost per claim, brand-name drugs were two to four times costlier than generic drugs. Note that since each claim may have received both generic and brand drugs, the total average cost per claim (shown earlier in Table 6.2) would be some combination of the two averages in Table 6.7.

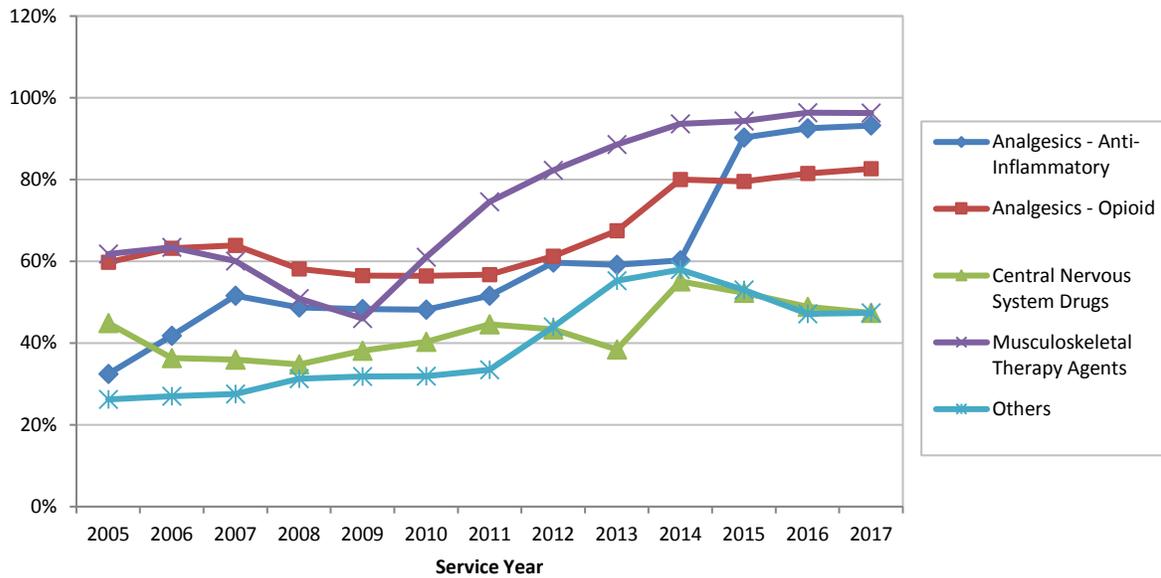
Table 6.7: Total and Average Costs, by Generic Status by Claim Type

Service Year	Brand					Generic				
	Total Cost (Thousand Dollars)	Number of Rx	Number of Claims	Average Cost per Rx	Average Cost per Claim	Total Cost (Thousand Dollars)	Number of Rx	Number of Claims	Average Cost per Rx	Average Cost per Claim
Lost-Time Claims										
2005	\$58,063	354,078	54,313	\$164	\$1,069	\$53,736	834,027	84,908	\$64	\$633
2006	\$62,185	351,829	50,293	\$177	\$1,236	\$57,924	900,789	85,292	\$64	\$679
2007	\$62,267	325,168	47,468	\$191	\$1,312	\$59,976	896,397	86,213	\$67	\$696
2008	\$71,163	333,181	46,435	\$214	\$1,533	\$58,304	877,820	84,866	\$66	\$687
2009	\$72,341	312,986	43,077	\$231	\$1,679	\$57,873	845,887	81,002	\$68	\$714
2010	\$70,706	287,278	40,043	\$246	\$1,766	\$61,207	873,011	82,547	\$70	\$741
2011	\$64,318	243,452	34,662	\$264	\$1,856	\$62,344	887,230	81,555	\$70	\$764
2012	\$53,633	190,196	28,550	\$282	\$1,879	\$61,542	825,618	77,691	\$75	\$792
2013	\$45,261	148,259	24,430	\$305	\$1,853	\$58,251	744,663	73,698	\$78	\$790
2014	\$32,375	106,018	21,932	\$305	\$1,476	\$61,611	714,501	70,665	\$86	\$872
2015	\$28,508	78,599	17,003	\$363	\$1,677	\$60,305	626,485	65,706	\$96	\$918
2016	\$29,731	70,530	15,430	\$422	\$1,927	\$55,097	568,928	62,243	\$97	\$885
2017	\$22,570	58,016	13,502	\$389	\$1,672	\$43,729	491,997	57,413	\$89	\$762
Medical-Only Claims										
2005	\$14,802	109,917	32,120	\$135	\$461	\$12,326	252,816	67,608	\$49	\$182
2006	\$15,356	104,016	29,619	\$148	\$518	\$13,729	277,072	72,857	\$50	\$188
2007	\$14,887	92,228	29,585	\$161	\$503	\$14,347	284,837	80,935	\$50	\$177
2008	\$14,176	79,386	28,108	\$179	\$504	\$12,649	247,208	77,693	\$51	\$163
2009	\$15,076	75,088	23,197	\$201	\$650	\$13,434	236,977	68,354	\$57	\$197
2010	\$11,891	56,099	18,917	\$212	\$629	\$12,066	223,051	68,141	\$54	\$177
2011	\$9,942	43,287	13,971	\$230	\$712	\$11,645	221,524	67,420	\$53	\$173
2012	\$7,046	29,213	10,094	\$241	\$698	\$10,746	203,572	66,202	\$53	\$162
2013	\$6,634	23,502	8,134	\$282	\$816	\$10,316	188,514	62,392	\$55	\$165
2014	\$4,948	19,459	9,592	\$254	\$516	\$9,602	170,146	57,838	\$56	\$166
2015	\$4,370	14,833	8,151	\$295	\$536	\$8,638	141,591	53,011	\$61	\$163
2016	\$4,155	14,210	8,339	\$292	\$498	\$8,296	132,612	51,521	\$63	\$161
2017	\$3,636	14,284	8,440	\$255	\$431	\$7,169	126,031	50,244	\$57	\$143

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of drug group, the generic substitution rate increased in all groups since the 2011 pharmacy closed formulary (see Figure 6.6). The musculoskeletal therapy agents drug group had the highest rate of generic substitution in 2017 at 93 percent, after it increased rapidly since 2009. The generic substitution rate of the analgesics - opioid drug group fluctuated around 60 percent until 2011 but increased rapidly to 83 percent in 2017. The generic rate for the analgesics - anti-inflammatory drugs increased from 60 percent in 2014 to 93 percent in 2017, partly because of the availability of the generic versions of the most commonly used NSAID celecoxib from June 2014 (sold under brand name Celebrex and others).

Figure 6.6: Generic Drug's Share in Total Cost by Drug Group



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Effects of the Pharmacy Closed Formulary

The pharmacy closed formulary went into effect on September 1, 2011, and, as of December 2017, contains 188 drugs with “N” drug status which requires preauthorization. One hundred and twenty-one of these have generic equivalents, and 52 of them are opioids and related drugs. Drugs that do not have an “N” status (Y-drug) do not require preauthorization. Drugs that are not identified in the *ODG Workers' Compensation Drug Formulary* or that do not have a valid drug code for identification are classified as “other” drugs in this report. The majority of “other” drugs are associated with compounded drugs.

Claims with injury dates on or after September 1, 2011, became subject to the closed formulary, and under a transitional rule, all claims in the Texas workers' compensation system are subject to the closed formulary beginning September 1, 2013, regardless of the injury date. Note that the pharmacy closed formulary affected only new injuries in the last four months of 2011 and all new claims since 2012.

N-drug use decreased greatly since 2011 in terms of the number of prescriptions and the number of claims, even though only new claims were subject to the closed formulary initially. About 35 percent of those who received pharmacy services received at least one N-drug in 2005 (see Table 6.8). In 2017, only 3.5 percent of the claims received N-drugs. In terms of cost, N-drug cost was 32 percent and 27 percent of the total pharmacy cost for lost-time claims and medical-only claims, respectively, in 2011. N-drug cost was greatly lower in 2017, which accounted for 6 percent of the total cost for lost-time claims and 4 percent for medical-only claims.

The average pharmacy cost per claim was considerably higher for lost-time claims due to their longer service duration and resulted in a higher utilization of drugs than medical-only claims. Among lost-time claims, the average cost of N-drugs per claim was 58 percent higher than that of Y-drugs in 2017. The per-prescription cost for N-drugs was 135 percent higher than Y-drugs. Among medical-only claims, the average cost of N-drugs per claim increased greatly until 2014 while the absolute number of claims and total cost decreased.

Table 6.8: Total and Average Costs, by N-Drug Status by Claim Type

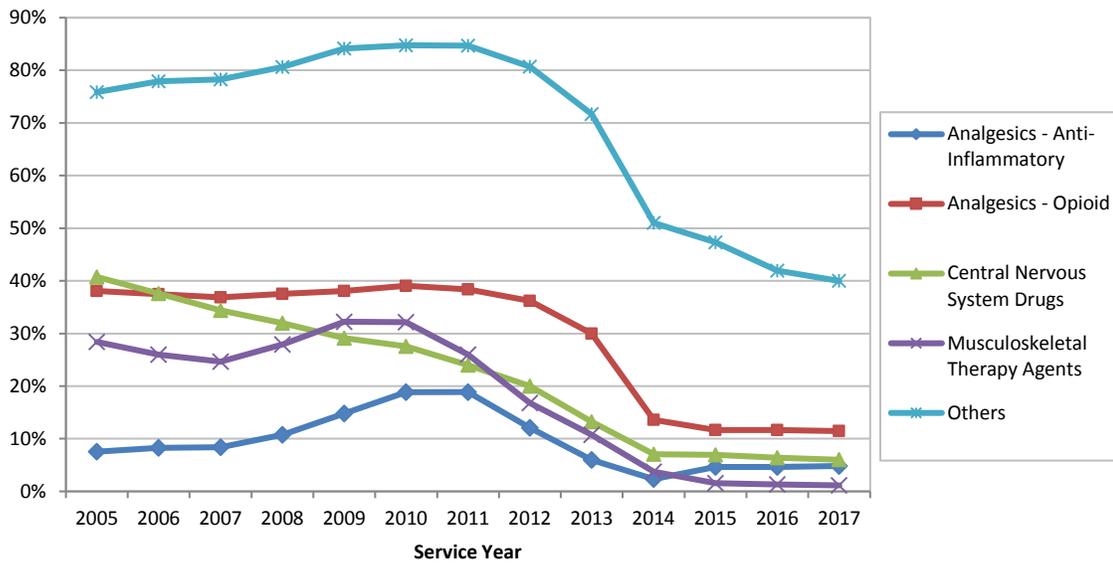
Service Year	N-Drug				Y-Drug				Other			
	Total Cost ('000 Dollars)	Claims	Avg. Cost per Rx	Avg. Cost per Claim	Total Cost ('000 Dollars)	Claims	Avg. Cost per Rx	Avg. Cost per Claim	Total Cost ('000 Dollars)	Claims	Avg. Cost per Rx	Avg. Cost per Claim
Lost-Time Claims												
2005	\$34,097	44,026	\$116	\$774	\$59,014	84,055	\$83	\$702	\$25,008	40,763	\$98	\$614
2006	\$36,792	43,410	\$123	\$848	\$63,542	83,211	\$86	\$764	\$22,287	35,165	\$82	\$634
2007	\$37,448	42,879	\$133	\$873	\$66,963	84,087	\$91	\$796	\$20,601	32,616	\$80	\$632
2008	\$40,985	42,499	\$146	\$964	\$72,153	83,400	\$94	\$865	\$18,793	27,628	\$96	\$680
2009	\$43,043	40,955	\$158	\$1,051	\$71,857	80,140	\$94	\$897	\$18,250	22,156	\$122	\$824
2010	\$45,331	40,548	\$169	\$1,118	\$72,112	81,307	\$92	\$887	\$17,312	19,541	\$128	\$886
2011	\$41,593	31,409	\$191	\$1,324	\$70,910	81,128	\$88	\$874	\$18,046	17,904	\$128	\$1,008
2012	\$31,540	20,966	\$205	\$1,504	\$66,359	77,381	\$89	\$858	\$22,401	19,768	\$144	\$1,133
2013	\$19,073	13,354	\$231	\$1,428	\$63,980	73,280	\$91	\$873	\$25,218	22,361	\$174	\$1,128
2014	\$7,227	5,833	\$265	\$1,239	\$61,979	70,141	\$94	\$884	\$27,683	22,121	\$191	\$1,251
2015	\$5,962	4,696	\$265	\$1,270	\$52,872	62,899	\$101	\$841	\$32,609	29,981	\$190	\$1,088
2016	\$4,928	3,867	\$260	\$1,274	\$46,849	58,659	\$103	\$799	\$34,588	33,678	\$197	\$1,027
2017	\$3,955	3,251	\$256	\$1,216	\$40,299	52,342	\$109	\$770	\$22,360	35,916	\$133	\$623
Medical-Only Claims												
2005	\$7,059	16,654	\$100	\$424	\$14,636	63,588	\$65	\$230	\$6,117	29,599	\$77	\$207
2006	\$7,274	17,876	\$101	\$407	\$16,132	67,025	\$68	\$241	\$5,960	28,086	\$75	\$212
2007	\$7,152	18,477	\$110	\$387	\$16,535	74,536	\$69	\$222	\$6,148	28,153	\$74	\$218
2008	\$7,367	18,575	\$132	\$397	\$15,123	72,879	\$69	\$208	\$5,087	22,749	\$82	\$224
2009	\$8,524	17,543	\$146	\$486	\$15,481	65,218	\$72	\$237	\$5,159	15,853	\$110	\$325
2010	\$7,283	16,027	\$153	\$454	\$13,022	64,659	\$65	\$201	\$4,629	14,396	\$109	\$322
2011	\$6,109	10,364	\$178	\$589	\$12,153	64,555	\$60	\$188	\$4,704	12,993	\$116	\$362
2012	\$3,777	4,019	\$210	\$940	\$10,823	63,448	\$58	\$171	\$4,975	13,712	\$126	\$363
2013	\$2,935	2,480	\$247	\$1,184	\$9,896	59,371	\$57	\$167	\$5,440	13,832	\$145	\$393
2014	\$1,435	1,365	\$277	\$1,051	\$8,698	54,989	\$56	\$158	\$4,639	14,033	\$147	\$331
2015	\$860	965	\$265	\$891	\$6,691	46,951	\$58	\$143	\$5,715	21,280	\$141	\$269
2016	\$535	830	\$215	\$644	\$6,033	44,335	\$59	\$136	\$6,021	24,474	\$138	\$246
2017	\$459	713	\$224	\$644	\$5,074	40,974	\$57	\$124	\$5,306	28,133	\$105	\$189

Note: Rx = prescription.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

In terms of N-drug use by drug group, the share of N-drugs in the total cost, excluding “other” drugs, decreased for the analgesics - opioid drug group from 38 percent of the total in 2005 to 12 percent in 2017 (see Figure 6.7 and Table B8 in Appendix B). Prior to 2011, this share was growing for all drug groups except CNS drugs. After implementation of the closed formulary, N-drug shares decreased greatly in all drug groups.

Figure 6.7: Share of N-Drug Cost in Each Drug Group



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

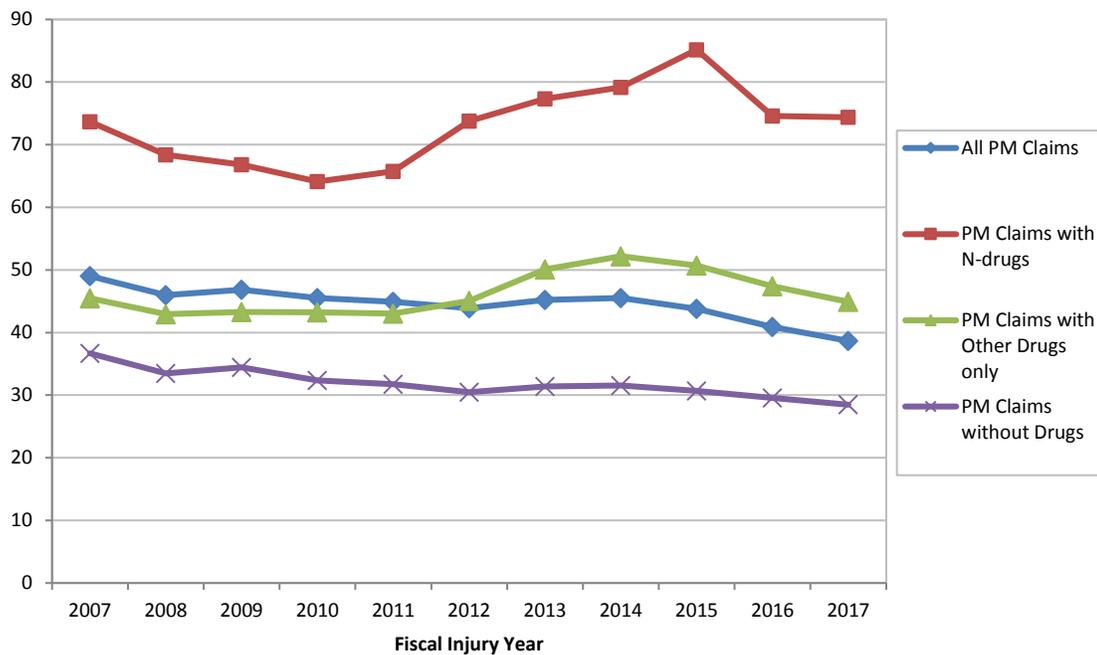
While the usage of N-drugs decreased since 2011, the data shows that this decrease did not cause an overall increase in non-N-drugs. N-drugs decreased absolutely without being substituted by other drugs. However, Table 6.8 also shows that the use of “other” drugs increased rapidly. “Other” drugs are those that are not classified either as “N” or “Y” drugs by the formulary or those drugs submitted without a valid code to classify. The total cost of “other” drugs increased by 66 percent since 2011, from \$23 million to \$41 million in 2016. Along with the increased total cost, the number of claims that received “other” drugs also increased by 71 percent between 2010 and 2016. However, it decreased greatly to \$28 million in 2017. A large part of these “other” drugs are related to an increasing use of compounded drugs. The usage of compounded drugs is discussed in the next section.

Another potential substitution effect of the pharmacy closed formulary, especially regarding a decreased access to opioids and other pain medicine, is the use of non-drug treatments such as physical medicine services. The cost and utilization of physical medicine services continued to decrease greatly because of the preauthorization requirement and other regulatory measures implemented since 2002, as previously seen in Figure 3.5. Figure 3.7 also showed that the number of physical medicine services per claim increased slightly in 2012 and 2013 injury years for the first time since 2003 but has decreased since 2014.

It is difficult to verify whether this increase was directly related to the decrease in N-drugs or not. Nevertheless, since 2011, utilization metrics of physical medicine increased among those receiving pharmacy services (see Figure 6.8 and Table B9 in Appendix B). Since 2011, utilization of physical medicine services increased by 13 percent among those with N-drugs, and by 4 percent among those with “other” non-N-drugs while it decreased by 10 percent among those without pharmacy services.

However, N-drug claims with increased physical medicine services accounted for less than 2 percent of the total claims in 2017. The slight increase in physical medicine utilization among “other” non-N-drug users may be related to some of the former N-drug users moving into this category after the formulary. Physical medicine utilization in the overall “other” non-N-drug group decreased by 14 percent since 2011.

Figure 6.8: Number of Physical Medicine Services per Claim by Drug Status by Fiscal Injury Year, 12 Months after Injury



Note: Figures are presented by fiscal injury year covering a year from September to August. For example, Fiscal Injury Year 2011 covers new claims with an injury date from September 1, 2010, to August 31, 2011, and the 12-month maturity covers services up to August 31, 2012.
 Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Cost and Utilization of Compounded Drugs

Drug compounding is a specialty service that provides injured employees with certain pharmaceutical products in dosage forms, strength, or delivery methods that are not available commercially. Most compounded drugs are topical pain medications, for which there is a growing debate about their effectiveness and cost. This section presents estimates of the number and cost of compounded drugs in the Texas workers' compensation system.

One difficulty in analyzing compounded drugs is the fact that pharmacy bills do not have data that clearly identifies them as compounded drugs. However, Texas regulation requires each ingredient (billing line) of a compounded drug to be listed and calculated separately (see 28 TAC §134.502). Therefore, chemicals and pharmaceutical adjuvants are indicators for compounding, and separated bills that contained one or more billing lines of these ingredients are considered compounded drugs.

The result showed that the number of compounded drug prescriptions increased from 18,491 in 2010 to 21,486 in 2014 and then decreased to 5,246 in 2017 (see Table 6.9). The total cost of compounded drugs increased greatly from about \$6 million in 2010 to \$14 million in 2014 and \$11.8 million in 2016.¹³ However, it decreased greatly in 2017 to about \$2.5 million. The average cost of a compounded drug also increased from \$320 in 2010 to \$780 in 2016, but it also decreased greatly in 2017 to \$476.

Table 6.9: Number and Cost of Compounded Drug

Service Year	Number of Compounded Drugs	Number of Ingredients (Lines)	Total Cost	Average Cost per Compounded Drug	Average Number of Ingredients (Lines) per Compounded Drug
2010	18,491	51,037	\$5,915,571	\$320	2.8
2011	18,347	55,993	\$6,125,896	\$334	3.1
2012	20,563	69,269	\$9,287,207	\$452	3.4
2013	19,675	60,383	\$13,043,228	\$663	3.1
2014	21,486	68,721	\$14,048,517	\$654	3.2
2015	16,488	57,690	\$12,210,341	\$741	3.5
2016	15,084	47,968	\$11,766,394	\$780	3.2
2017	5,246	16,031	\$2,496,507	\$476	3.1

Note: Bill lines with no payment are included if there are one or more ingredients with non-zero payment in the compounded drug.
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

As discussed earlier, the decrease in compounded drugs in 2017 was related to DWC's compounded drug audit and the SOAH decision in June 2016 that compounded drugs were investigational or experimental and therefore required preauthorization. The use of compounded drugs will further change in the future. The definition of the closed formulary was amended in April 2018 to exclude from the closed formulary any prescription drug created through compounding. Consequently, all new prescriptions for drugs created through compounding after July 1, 2018, will require preauthorization. The effect of the new rule will appear in future reports.

¹³ See also TDI REG's report "Baseline Evaluation of the Utilization and Cost Patterns of Compounded Drugs" published in May 2017 at www.tdi.texas.gov/reports/wcreg/documents/compdrugs2017.pdf.

7. SUMMARY TRENDS IN CHANGING COST COMPONENTS

Medical costs, combining professional and hospital costs, in the Texas workers' compensation system decreased by 11 percent between 2000 and 2017. With pharmacy and dental costs included (data available only from 2005), total health care costs decreased by 9 percent between 2005 and 2017 service years.

Analyzing by bill type, the total cost of professional services decreased by 23 percent since 2000 while the total cost of hospital services increased by 16 percent. Pharmacy cost decreased by 31 percent from 2005 to 2017. However, because the number of claims decreased by 30 percent since 2000, the average costs per claim increased: since 2000, average professional cost increased by 12 percent, and average hospital cost increased by 80 percent, while average pharmacy cost per claim decreased by 18 percent since 2005.

Changes in the total health care cost over time are due to changes in total cost's components that include the number of claims treated, the level of utilization for health care services, and the level of prices, or fees, paid for such services. An increase in total cost may be due to an increase in claims, utilization, fees, or any combination of all three.

Prices per service are adjusted periodically through changes in the medical services fee guidelines and changes in the Medicare payment model. At the same time, prices are also subject to increases because of price inflation. Many observers in the workers' compensation system note that the changes in total cost are often a result of a changing level of service utilization that is affected by treatment guidelines and rules regarding preauthorization. It is also plausible that the changes in prices and utilization are negatively related so that, when price decreases, the level of utilization increases, or vice versa, to result in the same level of total cost.

Data presented in this report indicate that the main factor behind the increase in the average cost per claim is the significant decrease in the number of claims treated while the level of utilization and the price per service increased. The number of claims decreased by 31 percent and 35 percent for professional and hospital services, respectively, from 2000 to 2017.

To evaluate the relative significance of cost components in the overall change, we present a summary table of cost components in Table 7.1. In addition to the number of claims, the utilization measurement is further divided into the frequency (number of visits) and the intensity (number of services per visit) components. Prices can also be divided into changes due to inflation and changes in real prices. It should be noted that Table 7.1 is limited to professional services because professional bills are the only data set that contains sufficient information about utilization metrics.

Table 7.1 summarizes the rate of change in three distinct time periods. Between 2000 and 2007, system costs began to decrease rapidly after a peak in 2002. During this period, system costs declined due to various reforms implemented including new fee guidelines, preauthorization rules, and the

reorganization of the regulatory agency itself from the Texas Workers' Compensation Commission to DWC, a division of TDI.

Table 7.1: Percent Changes in Costs and Utilization in Current and Inflation-Adjusted Prices, by Claim Type, Professional Services for Selected Time Periods

Time Period	Number of Claims (1)	Number of Visits (2)	Number of Services per Visit (3)	Cost per Service		Total Cost		Cost per Claim	
				Current Price (4a)	2000 Price (4b)	Current Price (5a)	2000 Price (5b)	Current Price (6a)	2000 Price (6b)
Lost-Time Claims									
2000-2007	-19.0%	-13.2%	-1.8%	14.5%	-10.0%	-20.9%	-37.8%	-2.4%	-23.3%
2007-2011	-7.8%	-1.2%	-2.3%	34.9%	25.7%	20.1%	12.0%	30.2%	21.4%
2011-2017	-17.8%	-1.3%	-8.2%	4.5%	-5.6%	-22.1%	-29.6%	-5.2%	-14.4%
2000-2017	-38.6%	-15.3%	-11.9%	61.4%	6.8%	-26.0%	-51.0%	20.4%	-20.3%
Medical-Only Claims									
2000-2007	-14.3%	-8.7%	-2.3%	13.6%	-10.7%	-13.2%	-31.8%	1.3%	-20.3%
2007-2011	-10.9%	-5.8%	-2.3%	37.0%	27.7%	12.2%	4.6%	26.0%	17.5%
2011-2017	-1.6%	-0.7%	-0.4%	-5.4%	-14.6%	-8.0%	-17.0%	-6.5%	-15.6%
2000-2017	-24.9%	-14.6%	-5.0%	47.2%	-2.6%	-10.4%	-40.7%	19.4%	-21.0%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

The period from 2007 to 2011 represented a developing stage of continuing reforms. In addition to adopting a Medicare billing model for professional services reimbursement, fee guidelines for hospital and ambulatory surgery centers were adopted. This period showed a continued decrease in the number of claims, a stable or decreasing utilization level, and a moderately increasing trend in fees for service.

The period from 2011 to 2017 represents a maturing stage of the reforms and some additional reform measures such as the pharmacy closed formulary.

The four columns numbered from (1) to (4) represent the four basic components of system costs: the number of claims, the service frequency, the service intensity, and the service price. By multiplying these components, we get the total cost (shown in the (5) column). After dividing the total cost by the number of claims, we get the average cost per claim, that is (6) = (5) ÷ (1). Price columns (4), (5), and (6) are shown in current prices without adjustments for price inflation in column series (a) and with adjustments for inflation using MEI in column series (b).

For lost-time claims, the average cost per claim increased by 20 percent from 2000 to 2017 (see column 6a). But this increase was mostly because of price inflation. Adjusted for inflation, the average cost per claim decreased by 20 percent in terms of 2000 prices (column 6b). The number of claims and the level of utilization all decreased, resulting in the overall decrease in the total cost by 26 percent (column 5a). If we adjust for inflation, the total cost decreased by 51 percent since 2000 (column 5b). The decrease in utilization was more from the declining service frequency (visits) than the service intensity. However,

this decrease in service frequency occurred mostly before 2007 while the decrease in service intensity occurred more after 2011.

The cost per service increased greatly between 2007 and 2011, which resulted in a 20 percent increase in total cost during the period. However, its growth slowed down greatly after 2011.

The main factor in the overall decrease in total costs was the large decline in the number of claims (a 39 percent decrease in the number of lost-time claims). Because the number of claims decreased sharply along with utilization levels, the overall cost decreased by 26 percent despite the 61 percent increase in the cost per service. Because of the decrease in the number of claims and the increase in the total cost, the cost per claim increased by 20 percent between 2000 and 2017.

Medical-only claims showed similar trends with a lower rate of decrease in the number of claims and service utilization compared to lost-time claims. Since 2000, the total cost decreased by 10 percent while the number of medical-only claims decreased by 25 percent. The price per service increased by 47 percent, but it decreased by less than 3 percent if adjusted for inflation. The decrease in the total cost was largely a result of decreasing number of claims and decreasing service utilization as in the case of lost-time claims. The cost per claim increased at about the same rate as that of lost-time claims.

APPENDIX A: MEASURING SERVICE UTILIZATION

A measurement for service utilization can be divided into two measures: service frequency and service intensity. Total utilization is a product of frequency and intensity. Service frequency is measured by the number of visits to a health care provider on a given day. Service intensity is measured by the number of services in a given visit.

Number of Visits

The number of visits is the unit of service in measuring and comparing service frequency. A unique service visit is identified by a visit ID that is unique to the day of the visit and the health care provider ID. A unique visit ID accounts for a visit to a doctor's office on a given day regardless of the number of services or bills associated with that visit and whether the bill was paid by the insurance carrier or not. Since bills do not provide service time, multiple visits to the same health care provider on the same day are counted as one visit.

Number of Services

A visit consists of one or more services, and a service is identified by a unique service code known as American Medical Association's CPT or Medicare's HCPCS. Each bill is considered a service. Even though one bill is equal to one service, certain services are customarily billed in a multi-unit bill or a bundle. In these cases, the number of services is based on the days/units specified in the bill.

However, it is not a simple matter to properly count the number of services from the medical bills. Some codes such as anesthesia and injection services are billed by units like milliliters or milligrams. These service bills are treated as one unit of service due to the inconsistent nature of unit measures reported.

Physical medicine services are the one service group that requires further attention regarding service units. These services are billed according to special billing rules. Therefore, in this study, these bills are adjusted to produce accurate measurements of utilization to the extent possible. This procedure is detailed in the section below.

Utilization Metrics for Physical Medicine Services

Physical medicine service bills are by far the most numerous bills, accounting for about half of all professional bills. Sixty-five million service bills out of 135 million total bills from 1998 to 2011 were physical medicine services. In addition, 85 percent of these bills are charges for one unit of service. Most of these are service-based codes that are billed as one service regardless of time involved. For these bills, one bill was counted as one service.

The remaining 15 percent of the physical medicine bills were charges for multiple treatment sessions in one bill using time-based codes, usually in increments of 15 minutes, and therefore considering these bills as one service would underestimate or miscalculate the actual level of service utilization. Therefore, special attention has been given to these bills by adjusting their units of service.

Considering the above 15 percent of physical medicine services with multiple billed units, there were eight CPT codes that together accounted for most of the total cost of the multiple service bills. These are therapy exercises (97110), neuromuscular reeducation (97112), aquatic therapy/exercises (97113), manual therapy (97140), therapeutic activities (97530), work hardening (97545 and 97546), and other physical medicine procedures (97799). For these service codes, a new service utilization unit was calculated based on multiple factors including amount of charges, actual payments, units billed, and the median charge and pay amounts. In addition, work hardening and rehabilitation procedures had special billing rules that sometimes confused some billers, payers, and reviewers, which resulted in inconsistent units billed. The units for these codes were adjusted statistically.

Qualitative Service Intensity

A bill or service can also be differentiated by the level of quality. For example, some CPT and HCPCS codes are already differentiated by service intensity or qualitative differences. There are different CPT codes for office visits of different length and quality. Although two services may use the same code, they may be different services in quality. To remedy this problem, a suitable measurement of intensity could be created as a unit of service intensity—for example by assigning one unit for 99201, two units for 99202 and so on—relative to other codes. But even this measurement may be inadequate to distinguish qualitative differences among these service codes. In this study, one billed service is counted as one service utilization for all codes except for the eight physical medicine codes that are recoded. However, it should be noted that there may be certain qualitative shifts in service utilization that may result in meaningful cost differences but are not captured in our analysis.

APPENDIX B: DATA FOR FIGURES AND ADDITIONAL DATA

Table B1: Average Cost per Claim, by Bill Type

Service Year	Professional	Hospital/ Institutional	Dental	Pharmacy	Medical Combined
2000	\$1,783	\$2,506			\$2,479
2001	\$1,957	\$2,924			\$2,795
2002	\$2,214	\$3,210			\$3,193
2003	\$2,188	\$3,298			\$3,219
2004	\$1,981	\$2,954			\$2,844
2005	\$2,048	\$2,967	\$1,387	\$848	\$3,039
2006	\$1,808	\$3,224	\$2,010	\$886	\$2,970
2007	\$1,720	\$3,469	\$2,291	\$859	\$2,990
2008	\$1,780	\$3,732	\$2,575	\$909	\$3,136
2009	\$2,016	\$3,906	\$2,761	\$1,011	\$3,479
2010	\$2,013	\$4,028	\$2,944	\$995	\$3,560
2011	\$2,250	\$4,280	\$3,207	\$978	\$3,878
2012	\$2,269	\$4,394	\$3,137	\$930	\$3,838
2013	\$2,262	\$4,712	\$3,156	\$895	\$3,888
2014	\$2,188	\$4,800	\$3,311	\$839	\$3,806
2015	\$2,109	\$4,747	\$3,678	\$852	\$3,707
2016	\$2,044	\$4,649	\$3,814	\$838	\$3,583
2017	\$1,990	\$4,512	\$3,507	\$691	\$3,428

Note: Figures for Medical Combined do not include dental and pharmacy services prior to 2005. These numbers are understated compared to figures from 2005.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B2: Total Professional Cost, by Service Type (in Thousand Dollars)

Service Year	DMEPOS	Diag/Path/Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
Lost-Time Claims								
2000	\$40,681	\$62,722	\$95,824	\$31,962	\$33,841	\$189,067	\$54,359	\$51,461
2001	\$42,997	\$69,413	\$102,428	\$37,033	\$35,502	\$219,823	\$58,939	\$55,916
2002	\$51,766	\$82,348	\$108,827	\$52,547	\$44,164	\$254,336	\$70,134	\$74,588
2003	\$50,219	\$71,772	\$97,306	\$54,192	\$42,159	\$245,606	\$60,548	\$51,531
2004	\$43,300	\$53,672	\$79,741	\$57,214	\$31,964	\$200,907	\$45,799	\$24,683
2005	\$52,460	\$53,192	\$76,727	\$64,295	\$31,653	\$184,398	\$66,338	\$25,420
2006	\$52,019	\$47,674	\$66,076	\$58,396	\$27,730	\$133,400	\$62,982	\$21,722
2007	\$59,032	\$41,814	\$67,263	\$59,402	\$25,712	\$112,114	\$60,384	\$16,925
2008	\$59,044	\$44,983	\$70,148	\$58,130	\$26,423	\$106,736	\$67,425	\$16,217
2009	\$58,054	\$50,023	\$75,029	\$59,028	\$27,276	\$110,960	\$79,310	\$19,245
2010	\$60,180	\$48,964	\$76,797	\$57,105	\$26,400	\$111,693	\$80,861	\$17,136
2011	\$63,621	\$57,718	\$89,094	\$55,817	\$27,962	\$124,729	\$94,467	\$18,115
2012	\$64,651	\$62,197	\$87,358	\$54,559	\$25,981	\$124,326	\$92,439	\$16,315
2013	\$65,656	\$54,821	\$84,993	\$53,928	\$25,592	\$121,387	\$86,115	\$15,401
2014	\$62,066	\$52,716	\$82,171	\$52,710	\$24,377	\$118,350	\$80,364	\$12,880
2015	\$59,744	\$44,466	\$82,544	\$50,668	\$23,783	\$107,292	\$76,838	\$14,251
2016	\$59,174	\$36,338	\$81,349	\$47,910	\$21,949	\$104,915	\$71,188	\$14,063
2017	\$56,979	\$33,702	\$79,904	\$43,219	\$21,127	\$96,580	\$69,501	\$13,159
Medical-Only Claims								
2000	\$8,971	\$21,247	\$40,983	\$10,151	\$8,729	\$48,905	\$13,915	\$6,045
2001	\$8,696	\$22,172	\$40,602	\$11,712	\$8,221	\$52,232	\$13,860	\$6,489
2002	\$9,616	\$22,927	\$40,062	\$14,087	\$8,658	\$52,368	\$13,233	\$7,247
2003	\$9,515	\$19,516	\$37,617	\$13,274	\$6,799	\$46,889	\$11,828	\$4,330
2004	\$9,000	\$14,888	\$35,774	\$13,118	\$4,278	\$39,591	\$9,659	\$1,940
2005	\$11,082	\$16,159	\$38,382	\$15,316	\$4,598	\$38,386	\$12,795	\$2,316
2006	\$12,066	\$17,084	\$40,041	\$14,736	\$4,710	\$30,575	\$14,081	\$2,162
2007	\$13,745	\$16,487	\$44,152	\$15,460	\$4,693	\$28,757	\$13,255	\$1,640
2008	\$13,292	\$16,589	\$45,127	\$14,431	\$4,355	\$26,699	\$12,637	\$1,478
2009	\$12,397	\$16,505	\$45,083	\$14,088	\$4,019	\$26,891	\$11,800	\$1,272
2010	\$12,332	\$15,935	\$47,688	\$13,414	\$3,992	\$27,254	\$12,071	\$1,254
2011	\$14,964	\$18,732	\$55,633	\$14,108	\$4,385	\$32,602	\$13,493	\$1,188
2012	\$15,465	\$18,361	\$56,968	\$13,323	\$4,276	\$35,162	\$13,172	\$762
2013	\$12,458	\$16,106	\$57,331	\$12,590	\$4,331	\$37,692	\$12,102	\$960
2014	\$11,870	\$14,654	\$55,521	\$12,554	\$4,317	\$38,816	\$11,194	\$789
2015	\$10,748	\$13,296	\$55,522	\$11,474	\$4,200	\$32,732	\$10,458	\$813
2016	\$11,029	\$12,942	\$57,253	\$11,008	\$4,002	\$31,447	\$9,828	\$720
2017	\$11,652	\$13,474	\$60,418	\$10,275	\$4,100	\$32,021	\$10,176	\$534

Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B3: Average Professional Cost per Claim, by Service Type

Service Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
Lost-Time Claims								
2000	\$626	\$647	\$627	\$310	\$491	\$2,729	\$1,182	\$3,181
2001	\$673	\$685	\$636	\$336	\$503	\$3,024	\$1,209	\$3,175
2002	\$725	\$741	\$633	\$423	\$560	\$3,166	\$1,247	\$3,673
2003	\$673	\$683	\$607	\$459	\$610	\$3,257	\$1,103	\$2,693
2004	\$609	\$578	\$574	\$525	\$632	\$3,040	\$945	\$1,649
2005	\$795	\$595	\$579	\$604	\$657	\$2,980	\$1,350	\$1,844
2006	\$805	\$559	\$524	\$586	\$615	\$2,464	\$1,347	\$1,854
2007	\$896	\$494	\$543	\$620	\$593	\$2,145	\$1,336	\$1,732
2008	\$923	\$532	\$577	\$618	\$624	\$2,131	\$1,531	\$1,948
2009	\$933	\$597	\$634	\$639	\$654	\$2,249	\$1,839	\$2,423
2010	\$973	\$578	\$650	\$623	\$649	\$2,266	\$1,900	\$2,442
2011	\$1,066	\$691	\$764	\$625	\$692	\$2,587	\$2,176	\$2,741
2012	\$1,121	\$761	\$771	\$627	\$674	\$2,683	\$2,213	\$2,854
2013	\$1,195	\$701	\$786	\$653	\$680	\$2,716	\$2,171	\$2,877
2014	\$1,174	\$685	\$776	\$649	\$670	\$2,645	\$2,100	\$2,676
2015	\$1,144	\$601	\$806	\$639	\$676	\$2,477	\$2,071	\$3,206
2016	\$1,174	\$506	\$816	\$616	\$667	\$2,453	\$2,001	\$3,418
2017	\$1,200	\$493	\$836	\$589	\$671	\$2,364	\$2,078	\$3,499
Medical-Only Claims								
2000	\$165	\$192	\$202	\$90	\$116	\$994	\$370	\$2,347
2001	\$177	\$206	\$205	\$96	\$114	\$1,048	\$378	\$2,461
2002	\$192	\$210	\$202	\$111	\$116	\$1,044	\$359	\$2,678
2003	\$165	\$189	\$209	\$111	\$119	\$1,016	\$334	\$1,974
2004	\$142	\$160	\$222	\$116	\$139	\$938	\$312	\$1,172
2005	\$181	\$164	\$225	\$129	\$147	\$926	\$371	\$1,474
2006	\$179	\$165	\$228	\$118	\$141	\$760	\$394	\$1,417
2007	\$188	\$151	\$242	\$120	\$133	\$697	\$373	\$1,360
2008	\$195	\$157	\$255	\$114	\$127	\$721	\$370	\$1,536
2009	\$203	\$172	\$281	\$121	\$130	\$805	\$390	\$1,572
2010	\$207	\$164	\$293	\$113	\$133	\$830	\$392	\$1,695
2011	\$251	\$192	\$334	\$117	\$147	\$997	\$422	\$1,859
2012	\$258	\$191	\$342	\$109	\$142	\$1,053	\$421	\$1,520
2013	\$217	\$170	\$354	\$106	\$144	\$1,101	\$416	\$1,843
2014	\$215	\$156	\$343	\$105	\$141	\$1,096	\$401	\$1,814
2015	\$203	\$144	\$346	\$97	\$142	\$989	\$377	\$2,253
2016	\$201	\$139	\$352	\$93	\$131	\$963	\$354	\$2,322
2017	\$210	\$142	\$365	\$87	\$133	\$937	\$368	\$1,713

Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B4: Number of Services per Claim, by Service Type, Professional Services

Service Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
Lost-Time Claims								
2000	7.7	6.9	11.4	4.2	6.0	82.4	3.8	5.1
2001	7.5	7.1	11.6	5.2	6.3	89.0	4.0	5.1
2002	7.5	7.9	12.8	5.9	6.3	104.1	4.5	5.9
2003	8.9	8.1	11.7	6.2	6.3	107.2	4.5	5.2
2004	10.9	7.4	9.3	5.9	5.0	96.0	4.1	4.7
2005	11.7	7.5	9.2	6.9	4.8	96.4	4.8	5.1
2006	9.9	7.2	7.9	6.1	4.3	70.5	4.8	5.4
2007	9.8	7.5	7.5	6.2	4.1	64.9	4.6	5.5
2008	9.5	7.9	7.5	6.3	4.0	63.3	4.5	5.3
2009	9.3	8.8	7.5	6.4	3.8	61.2	4.5	5.7
2010	8.7	9.5	7.4	6.3	3.7	59.9	4.4	5.7
2011	8.3	10.5	7.3	6.3	3.7	58.3	4.6	5.3
2012	8.0	13.0	7.2	6.1	3.6	58.6	4.6	5.0
2013	7.8	13.9	7.2	6.3	3.5	60.8	4.5	5.0
2014	7.5	16.0	7.3	6.4	3.4	61.2	4.5	4.8
2015	7.3	15.3	7.4	6.3	3.4	56.6	4.5	5.3
2016	7.6	8.5	7.4	6.0	3.4	54.3	4.5	5.1
2017	7.4	6.8	7.2	5.9	3.3	51.5	4.4	5.1
Medical-Only Claims								
2000	3.3	2.6	3.8	2.2	3.2	35.7	1.9	3.9
2001	3.3	2.7	3.8	2.7	3.1	36.6	1.9	4.1
2002	3.4	2.7	3.8	2.8	3.2	38.5	1.9	4.3
2003	3.7	2.7	3.6	2.8	3.0	38.1	1.9	4.1
2004	4.3	2.6	3.1	2.8	2.4	33.7	1.8	3.6
2005	4.4	2.6	3.0	3.1	2.2	32.4	1.9	4.1
2006	4.1	2.6	2.9	2.9	2.2	27.3	1.9	4.3
2007	4.0	2.6	2.9	2.7	2.1	25.3	1.9	4.2
2008	3.8	2.6	2.8	2.7	2.1	24.6	1.8	4.3
2009	3.7	2.7	2.8	2.7	2.0	24.4	1.7	4.0
2010	3.5	2.7	2.8	2.7	2.0	24.3	1.7	4.5
2011	3.3	2.8	2.8	2.7	2.0	24.5	1.7	4.1
2012	3.1	2.9	2.8	2.7	1.9	25.0	1.7	3.1
2013	3.1	2.9	2.8	2.8	2.0	26.0	1.7	3.6
2014	2.9	3.0	2.8	2.8	2.0	26.8	1.7	3.4
2015	2.8	3.0	2.7	2.6	2.1	23.3	1.7	3.8
2016	2.9	2.6	2.7	2.6	2.1	22.6	1.7	4.0
2017	2.8	2.5	2.7	2.6	2.0	21.8	1.7	3.2

Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B5: Average Cost per Claim by Service Type, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury

Injury Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
2000	\$544	\$816	\$913	\$364	\$463	\$3,368	\$1,380	\$2,791
2001	\$601	\$922	\$950	\$456	\$498	\$3,640	\$1,454	\$2,860
2002	\$611	\$970	\$946	\$522	\$525	\$3,794	\$1,488	\$2,863
2003	\$591	\$845	\$883	\$620	\$544	\$3,521	\$1,209	\$1,763
2004	\$576	\$715	\$800	\$650	\$578	\$3,044	\$1,270	\$1,646
2005	\$701	\$742	\$816	\$723	\$619	\$2,829	\$1,578	\$1,832
2006	\$688	\$675	\$752	\$727	\$593	\$2,188	\$1,569	\$1,730
2007	\$755	\$595	\$763	\$763	\$582	\$1,947	\$1,591	\$1,764
2008	\$751	\$659	\$843	\$754	\$633	\$2,095	\$1,994	\$1,982
2009	\$738	\$671	\$891	\$760	\$634	\$2,214	\$2,267	\$2,114
2010	\$759	\$671	\$951	\$732	\$649	\$2,349	\$2,392	\$2,179
2011	\$840	\$756	\$1,059	\$726	\$678	\$2,634	\$2,641	\$2,347
2012	\$912	\$711	\$1,070	\$728	\$672	\$2,750	\$2,685	\$2,544
2013	\$991	\$610	\$1,101	\$746	\$673	\$2,848	\$2,597	\$2,262
2014	\$1,007	\$558	\$1,092	\$727	\$676	\$2,742	\$2,542	\$2,224
2015	\$867	\$511	\$1,095	\$682	\$664	\$2,540	\$2,491	\$2,456
2016	\$874	\$488	\$1,111	\$636	\$635	\$2,437	\$2,422	\$2,432

Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B6: Number of Services per Claim, Professional Services, Lost-Time Claims, by Injury Year at 12 Months after Injury

Injury Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
2000	6.9	8.3	17.3	5.9	6.5	110.6	3.9	4.9
2001	7.4	9.1	18.8	7.6	7.0	125.2	4.3	5.1
2002	7.9	9.8	20.2	8.4	6.8	145.7	4.6	5.3
2003	11.4	10.1	16.8	8.8	6.1	139.0	4.5	4.8
2004	13.1	8.6	13.2	8.2	4.5	118.0	4.5	4.4
2005	13.7	9.1	12.7	9.2	4.6	107.3	5.1	5.0
2006	11.5	8.7	10.9	8.5	4.2	80.2	5.1	4.9
2007	10.9	8.7	10.2	8.3	4.0	72.7	5.0	4.7
2008	10.4	9.0	10.4	8.6	3.9	72.3	5.0	4.5
2009	9.9	8.7	10.1	8.5	3.7	69.3	5.0	4.5
2010	8.8	8.8	10.0	8.2	3.6	67.4	5.0	4.1
2011	8.5	9.7	9.9	8.2	3.6	65.3	5.2	3.9
2012	8.1	9.7	9.8	8.2	3.4	67.4	5.2	4.0
2013	7.8	10.1	10.0	8.6	3.5	70.4	5.0	3.6
2014	7.7	10.7	10.0	8.5	3.4	69.4	5.2	3.6
2015	7.5	9.3	9.8	8.0	3.4	62.7	5.1	3.8
2016	7.4	7.7	9.7	7.8	3.3	59.0	5.0	3.6

Note: The DMEPOS service group includes DMEPOS as well as all services with a HCPCS Level II code except functional reporting and drug test G-codes.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B7: Average Cost per Service for Selected Services

Injury Year	Office Visit	Disability Exam	Lumbar Spine Fusion	Low Back Disc Surgery	Therapeutic Exercise	Chronic Pain Mgmt	MRI	Miscellaneous DME
2000	\$46	\$395	\$914	\$1,849	\$34	\$124	\$605	\$79
2001	\$46	\$396	\$895	\$1,849	\$33	\$123	\$603	\$94
2002	\$46	\$392	\$892	\$1,775	\$33	\$111	\$605	\$92
2003	\$51	\$436	\$940	\$956	\$33	\$105	\$544	\$108
2004	\$60	\$449	\$1,040	\$748	\$33	\$104	\$501	\$122
2005	\$61	\$449	\$1,089	\$718	\$33	\$103	\$504	\$162
2006	\$61	\$440	\$1,071	\$747	\$32	\$103	\$493	\$200
2007	\$66	\$437	\$1,194	\$784	\$30	\$106	\$399	\$211
2008	\$70	\$452	\$1,396	\$957	\$33	\$102	\$435	\$228
2009	\$76	\$467	\$1,531	\$1,045	\$35	\$105	\$453	\$242
2010	\$83	\$474	\$1,728	\$1,050	\$37	\$105	\$458	\$349
2011	\$96	\$478	\$1,828	\$1,331	\$43	\$105	\$527	\$355
2012	\$99	\$476	\$1,891	\$1,379	\$44	\$106	\$507	\$419
2013	\$101	\$464	\$1,846	\$1,262	\$45	\$104	\$433	\$417
2014	\$101	\$460	\$1,842	\$1,216	\$43	\$106	\$293	\$579
2015	\$101	\$466	\$1,814	\$1,312	\$43	\$105	\$277	\$531
2016	\$103	\$478		\$1,300	\$42		\$282	

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B8: Pharmacy Cost by Drug Group, by N-Drug Status

Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
N-Drugs													
Analgesics - Anti-Inflammatory	\$1,442	\$1,569	\$1,551	\$2,094	\$2,921	\$3,786	\$3,640	\$2,024	\$910	\$339	\$336	\$278	\$229
Analgesics - Opioid	\$15,248	\$15,255	\$15,910	\$16,844	\$17,114	\$17,247	\$16,165	\$12,900	\$8,621	\$3,171	\$2,478	\$1,945	\$1,486
Central Nervous System Drugs	\$11,738	\$12,903	\$12,169	\$12,007	\$11,076	\$10,257	\$8,720	\$6,834	\$4,298	\$1,945	\$1,778	\$1,575	\$1,367
Musculoskeletal Therapy Agents	\$4,597	\$4,396	\$4,288	\$5,137	\$6,177	\$5,772	\$3,887	\$1,946	\$1,004	\$312	\$121	\$96	\$70
Others	\$8,132	\$9,943	\$10,682	\$12,271	\$14,279	\$15,552	\$15,290	\$11,612	\$7,174	\$2,895	\$2,109	\$1,569	\$1,262
Y-Drugs													
Analgesics - Anti-Inflammatory	\$17,610	\$17,387	\$16,976	\$17,403	\$16,833	\$16,312	\$15,645	\$14,725	\$14,402	\$14,206	\$6,881	\$5,665	\$4,511
Analgesics - Opioid	\$24,812	\$25,489	\$27,263	\$28,072	\$27,868	\$26,902	\$25,965	\$22,737	\$20,167	\$20,135	\$18,816	\$14,765	\$11,486
Central Nervous System Drugs	\$17,067	\$21,449	\$23,196	\$25,587	\$26,952	\$26,935	\$27,605	\$27,310	\$28,130	\$25,522	\$23,756	\$23,030	\$21,397
Musculoskeletal Therapy Agents	\$11,576	\$12,531	\$13,103	\$13,267	\$12,987	\$12,188	\$11,081	\$9,626	\$8,344	\$8,034	\$7,763	\$7,249	\$6,086
Others	\$2,585	\$2,818	\$2,961	\$2,947	\$2,697	\$2,798	\$2,766	\$2,782	\$2,832	\$2,779	\$2,347	\$2,173	\$1,894
N-Drug Cost Share in Total Cost (N- and Y-Drugs)													
Analgesics - Anti-Inflammatory	7.6%	8.3%	8.4%	10.7%	14.8%	18.8%	18.9%	12.1%	5.9%	2.3%	4.7%	4.7%	4.8%
Analgesics - Opioid	38.1%	37.4%	36.9%	37.5%	38.0%	39.1%	38.4%	36.2%	29.9%	13.6%	11.6%	11.6%	11.5%
Central Nervous System Drugs	40.7%	37.6%	34.4%	31.9%	29.1%	27.6%	24.0%	20.0%	13.3%	7.1%	7.0%	6.4%	6.0%
Musculoskeletal Therapy Agents	28.4%	26.0%	24.7%	27.9%	32.2%	32.1%	26.0%	16.8%	10.7%	3.7%	1.5%	1.3%	1.1%
Others	75.9%	77.9%	78.3%	80.6%	84.1%	84.8%	84.7%	80.7%	71.7%	51.0%	47.3%	41.9%	40.0%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018.

Table B9: Number of Physical Medicine Services per Claim by Drug Status, 12 Months after Injury

Fiscal Service Year	All PM Claims	PM Claims with N-drugs	PM Claims with Other Drugs only	PM Claims without Drugs
2007	49.0	73.7	45.5	36.7
2008	46.0	68.4	42.9	33.5
2009	46.8	66.8	43.3	34.4
2010	45.5	64.1	43.2	32.4
2011	44.9	65.7	43.0	31.8
2012	43.9	73.8	45.1	30.5
2013	45.2	77.3	50.1	31.4
2014	45.5	79.2	52.2	31.5
2015	43.8	85.2	50.7	30.7
2016	40.9	74.6	47.4	29.6
2017	38.7	74.4	44.9	28.5
Rate of Change (2011-2017)	-13.9%	13.1%	4.3%	-10.3%

Note: Figures are presented by fiscal service year covering a year from September to August. For example, Fiscal Service Year 2011 covers all services from September 1, 2010, to August 31, 2011.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2018



Health Care Cost and Utilization in the Texas Workers' Compensation System 2000 - 2017

Texas Department of Insurance, Workers' Compensation Research and Evaluation Group