

HEALTH CARE COST AND UTILIZATION
IN THE TEXAS WORKERS' COMPENSATION SYSTEM
2000-2015



TEXAS DEPARTMENT OF INSURANCE
WORKERS' COMPENSATION
RESEARCH AND EVALUATION GROUP

DECEMBER 2016

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 (REG) 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 837 billing and payment data.

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

This page intentionally left blank.

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	IX
1. INTRODUCTION AND METHODOLOGICAL NOTES	1
<i>Data Sources</i>	1
<i>Claim Types</i>	2
<i>Service Year, Injury Year, and Maturity</i>	2
<i>Measuring Service Utilization</i>	2
2. OVERVIEW: TOTAL HEALTH CARE COST	3
<i>Medical and Income Benefits</i>	3
<i>Costs by Bill Type</i>	4
<i>Total and Average Costs by Claim Type</i>	6
<i>Inflation Adjusted Cost</i>	8
<i>Workers' Compensation Health Care Networks</i>	9
<i>Health Care Cost and Texas Gross Domestic Product</i>	12
3. COST AND UTILIZATION FOR PROFESSIONAL SERVICES.....	14
<i>Changes in Medical Fee Guidelines</i>	15
<i>Cost and Utilization by Service Year</i>	17
<i>Cost and Utilization by Injury Year</i>	25
4. COST AND UTILIZATION FOR HOSPITAL/INSTITUTIONAL SERVICES.....	34
<i>Total Cost and Utilization for Hospital/Institutional Services</i>	34
<i>Hospital/Institutional Costs by Facility Type</i>	35
<i>Hospital/Institutional Costs by Injury Year</i>	37
<i>Professional and Hospital/Institutional Costs Combined</i>	39
5. COST AND UTILIZATION FOR DENTAL SERVICES.....	40
6. COST AND UTILIZATION FOR PHARMACY SERVICES	42
<i>Utilization of Pharmacy Services by Claim Type</i>	42
<i>Total and Average Costs by Claim Type</i>	43
<i>Pharmacy Cost and Utilization by Maturity Group</i>	44
<i>Pharmacy Cost and Utilization by Drug Group</i>	45
<i>Pharmacy Cost and Utilization by Brand/Generic Status</i>	51
<i>Effects of the Pharmacy Closed Formulary</i>	55
<i>Cost and Utilization of Compounded Drugs</i>	60
<i>Rescheduling Hydrocodone Combination Products as Schedule II Drugs</i>	62
7. SUMMARY: TRENDS IN CHANGING COST COMPONENTS.....	64
APPENDIX A: MEASURING SERVICE UTILIZATION	67
APPENDIX B: CALCULATING INCOME BENEFITS BY SERVICE YEAR	69
APPENDIX C: ADDITIONAL DATA	71

LIST OF TABLES

Table 2.1: Medical and Income Benefits, by Service Year (Thousand Dollars)	3
Table 2.2: Number of Unique Claims, by Bill Type	4
Table 2.3: Total Cost, by Bill Type (Thousand Dollars)	5
Table 2.4: Total and Average Costs, by Claim Type, Professional Services	7
Table 2.5: Total and Average Costs, by Claim Type, Hospital/Institutional Services	7
Table 2.6: Total and Average Costs, by Claim Type, Pharmacy Services	8
Table 2.7: Health Care Cost as a Percentage of Texas GDP	13
Table 3.1: Changes in Medicare and Texas Fee Schedule Factors	16
Table 3.2: Fee Schedule Comparisons for Selected Services	16
Table 3.3: Number of Visits and Services per Visit per Claim, by Claim Type, Professional Services	18
Table 3.4: Percent of Claims Receiving Professional Service, by Provider Type, by Service Year	19
Table 3.5: Total Professional Cost (in Thousand Dollars) by Service Year, by Provider Type	20
Table 3.6: Percent of Claims Receiving Certain Professional Services	24
Table 3.7: Total Cost, by Injury Year, by Maturity and Claim Type, Professional Services	26
Table 3.8: Total Cost by Service Year, by Maturity, Professional Services (Thousand Dollars)	28
Table 3.9: Percent of Claims Receiving Certain Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury	29
Table 3.10: Top 20 Services by Total Payments in 2005–2015 Service Years	32
Table 4.1: Number and Share of Claims That Received Hospital/Institutional Services	34
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 4.5: Number of Claims, Total and Average Costs, Professional and Hospital/ Institutional Services Combined, by Injury Year at 12 Months after Injury	39
Table 5.1: Number of Claims, Total and Average Costs per Claim for Dental Services, by Claim Type	40
Table 5.2: Top 10 Dental Services, by Total Cost (2005–2015 Cumulative Totals)	40
Table 5.3: Number of Claims and Cost per Claim (2005–2015 Cumulative Totals), by HRR, Dental Services	41
Table 6.1: Number of Claims and Shares, by Claim Type, Pharmacy Services	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: Average Cost per Prescription by Service Year, by Drug Group by Maturity	50

Table 6.8: Average Cost per Claim by Service Year, by Drug Group by Maturity	51
Table 6.9: Total and Average Costs, by Generic Status by Claim Type	52
Table 6.10: Total and Average Costs, by Generic Status by Maturity	53
Table 6.11: Average Number of Prescriptions per Claim, by Generic Status by Maturity.....	54
Table 6.12: Shares of Generic Drugs, by Service Year by Maturity	54
Table 6.13: Total and Average Costs, by N-drug Status by Claim Type.....	56
Table 6.14: Total and Average Costs, by N-drug Status by Maturity	58
Table 6.15: Number and Cost of Ingredients (Lines) by N-drug Status.....	60
Table 6.16: Cost of Compounded Drugs by Bill Lines, by N-drug Status.....	61
Table 6.17: Number and Cost by Compounded Drug	61
Table 6.18: Top 20 Ingredients (Lines) in Compounded Drugs (Service Year 2015)	61
Table 7.1: Percent Changes in Costs and Utilization in Current and Inflation-Adjusted Prices, by Claim Type, Professional Services for Selected Time Periods.....	65
Table C1: Average Cost per Claim, by Bill Type	71
Table C2: Total Professional Cost, by Service Type (in Thousand Dollars).....	72
Table C3: Average Professional Cost per Claim, by Service Type.....	73
Table C4: Number of Services per Claim, by Service Type, Professional Services	74
Table C5: Average Cost per Claim, by Service Year by Maturity, Professional Services	75
Table C6: Average Cost per Claim by Service Type, Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury	75
Table C7: Number of Services per Claim, Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury	76
Table C8: Average Cost per Service for Selected Services	76
Table C9: Total Cost by Service Year, by Drug Group by Maturity (Thousand Dollars)	77
Table C10: Average Number of Prescriptions per Claim by Service Year, by Drug Group by Maturity	77
Table C11: Pharmacy Cost by Drug Group, by N-Drug Status.....	78
Table C12: Number of Physical Medicine Services per Claim by Drug Status, 12 Months after Injury	78

LIST OF FIGURES

Figure 2.1: Average Cost per Claim, by Bill Type.....	6
Figure 2.2: Professional and Hospital Costs in Current and Inflation-Adjusted Prices, by Service Year.....	9
Figure 2.3: Number of Claims by Network Status, by Service Year.....	10
Figure 2.4: Total Health Care Cost by Network Status, by Service Year.....	10
Figure 2.5: Average Health Care Cost per Claim, by Service Year.....	11
Figure 2.6: Average Health Care Cost per Claim, by Injury Year, Six Months after Injury.....	12
Figure 3.1: Percent of Claims Receiving at Least One Professional Service, by Service Year.....	14
Figure 3.2: Number of Claims by Claim Type, Professional Services, by Service Year.....	17
Figure 3.3: Total Professional Cost, by Claim Type, by Service Year.....	17
Figure 3.4: Average Cost per Claim by Service Year, by Provider Type, Professional Services.....	20
Figure 3.5: Total Professional Cost by Service Year, by Service Type, Lost-time Claims.....	22
Figure 3.6: Average Professional Cost per Claim by Service Year, by Service Type, Lost-time Claims.....	23
Figure 3.7: Number of Professional Services per Claim by Service Year, by Service Type, Lost-time Claims.....	25
Figure 3.8: Average Cost per Claim, by Injury Year by Claim Type, Professional Services.....	27
Figure 3.9: Average Cost per Claim by Service Year, by Maturity, Professional Services.....	29
Figure 3.10: Average Cost per Claim by Service Type, Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury.....	30
Figure 3.11: Number of Services per Claim, Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury.....	31
Figure 3.12: Average Cost per Service by Injury Year, Normalized in 2000 Price Levels.....	33
Figure 4.1: Total Cost by Service Year, by Claim Type, Hospital/Institutional Services.....	35
Figure 4.2: Number of Claims by Service Year, by Facility Type, Hospital/Institutional Services, Lost-time Claims.....	36
Figure 4.3: Total Cost by Service Year, by Facility Type, Hospital/Institutional Services, Lost-time Claims.....	36
Figure 4.4: Cost per Claim by Service Year, by Facility Type, Hospital/Institutional Services, Lost-time Claims.....	37
Figure 6.1: Total Pharmacy Cost, by Service Year 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 Service Year by Drug Group, Lost-time Claims.....	47
Figure 6.4: Average Pharmacy Cost per Claim, by Service Year by Drug Group, Medical-only Claims.....	47
Figure 6.5: Costs of Opioids by Service Year, by Drug Subclass.....	48
Figure 6.6: Total Cost by Service Year, by Drug Group.....	49
Figure 6.7: Generic Drug's Share in Total Cost, by Service Year by Drug Group.....	55
Figure 6.8: Share of N-drug Cost in Each Drug Group, by Service Year.....	57
Figure 6.9: Number of Physical Medicine Services per Claim by Drug Status by Fiscal Injury Year, 12 Months after Injury.....	59
Figure 6.10: Number of HCP Prescriptions and Price, by Month.....	63

EXECUTIVE SUMMARY

This report presents fundamental metrics and 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 comprehensive, general and consistent data and metrics 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 Division of Workers' Compensation, covering professional, hospital/institutional, dental, and pharmacy services, updated as of September 2016. 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

- ★ Health care costs accounted for 67 percent of the total benefits in 2015 service year in the Texas workers' compensation system. Income benefits accounted for the remaining 33 percent.
- ★ The number of claims in 2015 decreased by three percent from 2014, and by 29 percent from 2000. In 2015, 95 percent of all claims received one or more professional services; 28 percent received hospital/institutional services; and 41 percent received pharmacy services.
- ★ Total health care cost in 2015 was \$1.08 billion, slightly down from \$1.16 billion in 2014. Total professional cost decreased by 7 percent from 2014, and by 18 percent since 2000. Hospital cost in 2015 decreased by 7 percent from 2014, but is 21 percent higher than in 2000. Total cost for pharmacy services decreased by 7 percent from 2014 and is 29 percent lower than in 2005.
- ★ The average cost per claim in 2015 decreased by 4 percent from 2014 for professional services, and decreased by two percent for hospital services. Average cost per claim for pharmacy services increased by one percent from 2014. Since 2000, average professional and hospital costs per claim increased by 17 percent and 87 percent, respectively. Average pharmacy cost per claim increased by one percent since 2005.
- ★ Adjusted for inflation, the combined total cost of professional and hospital services decreased by 36 percent from 2000 to 2015, but in current prices without inflation adjustment, the total cost decreased by six percent.
- ★ In 2015, workers' compensation health care networks treated 43 percent of all claims, and accounted for 39 percent of the total health care cost. The average cost per claim in networks was 17 percent lower than that in non-network.
- ★ Total health care costs in the workers' compensation system decreased from an equivalent of about 0.14 percent of the Texas gross domestic product in 2000, to just 0.07 percent in 2015.

PROFESSIONAL COST AND UTILIZATION

- ★ Between 92 percent and 98 percent of all claims received at least one professional service in each service year.
- ★ Total professional cost decreased significantly 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 14 percent since 2011.
- ★ The number of medical-only claims decreased by 26 percent since 2000, with a minor increasing period between 2004 and 2007. The number of lost-time claims actually increased by 8 percent between 2000 and 2002, and then continued to decrease, resulting in an overall decrease of 36 percent between 2000 and 2015.
- ★ About 76 percent of professional costs in 2015 were for lost-time claims while they accounted for 39 percent of all claims.
- ★ The number of visits to health care providers per claim peaked in 2003 and 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 to five services per visit.
- ★ In terms of provider type, the share of claims receiving services from chiropractors declined from 13 percent of all claims in 2005 to 9 percent in 2015. The share of claims receiving services from physical/occupational therapists increased from 20 percent in 2005 to 24 percent in 2015. The participation by physician assistants and certified nurses increased: 23 percent of claims received services from them in 2015, increasing from just 6 percent of the claims in 2005. An increasing use of drug tests also increased the share of services from independent laboratories.
- ★ The average cost per claim for ambulatory surgical centers increased by 110 percent between 2005 and 2011, but decreased by 8 percent since 2011. 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 \$1,181 in 2015.
- ★ For lost-time claims, Physical Medicine was the most expensive service group in most years. Total costs for Impairment Rating (IR) Exam and Report services, and Durable Medical Equipment, Prosthetics, Orthotics, and Supplies (DMEPOS) services grew rapidly by 56 percent and 42 percent, respectively. For medical-only claims, Evaluation and Management (E/M) services were the most costly service in 2015. Costs for Physical Medicine services decreased by 44 percent for lost-time claims and by 33 percent for medical-only claims, and costs for Spinal Surgery decreased by more than 70 percent for both claim types. The share of claims receiving DMEPOS, Diagnostics/Pathology/Lab services, and IR Exam & Report services continued to increase while those for Physical Medicine and Spinal Surgery services decreased.
- ★ The top 20 most costly services accounted for 52 percent of the total cumulative professional cost from 2005 to 2015. The price per individual service for E/M and lumbar spine fusion services has increased continually since 2003. The price per service for low back disc surgery decreased substantially in 2003 but increased moderately since 2008. The average price per service for

durable medical equipment services increased significantly since 2005. MRI prices decreased substantially 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 2015, 28 percent of all claims received at least one hospital or institutional service, unchanged from 2014.
- ★ 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 33 percent since 2000. The total cost increased by 21 percent from 2000 to 2015, but it showed a great deal of fluctuation: costs increased by 39 percent from 2000 to 2002, decreased by 38 percent from 2003 to 2005, increased by 50 percent from 2006 to 2011, and decreased by 6 percent from 2012 to 2015.
- ★ Lost-time claims accounted for about 48 percent of all claims receiving hospital/institutional services in 2015 service year, but they accounted for 86 percent of the total hospital/institutional cost.
- ★ In 2015, 94 percent of lost-time claims received hospital outpatient services while only 11 percent received inpatient services. But hospital inpatient services accounted for 45 percent of the total cost, with hospital outpatient services accounting for 44 percent. Ambulatory surgery centers accounted for five percent of the total cost in 2015, down from 10 percent in 2005.

DENTAL COST AND UTILIZATION

- ★ Dental services accounted for 0.5 percent of all health care costs in 2015 (\$5.1 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 2015, 41 percent of those who received health care services received pharmacy services. Since 2005, lost-time and medical-only claims receiving pharmacy services decreased by 29 percent, especially after 2011.
- ★ In 2015, 54 percent of claims with pharmacy services were lost-time claims, but they accounted for 87 percent of the total cost.
- ★ In 2015, 58 percent of the total pharmacy cost was for legacy claims with four or more years of maturity, but they constituted only 15 percent of all pharmacy claims. New injury claims, which represented 73 percent of all pharmacy claims, accounted for 25 percent of the total pharmacy cost in 2015.
- ★ 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 most costly

- 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 most costly drug group until 2009. In 2015, the 'Others' drug group was the costliest.
 - ★ Generic prescriptions increased steadily from 48 percent of the total pharmacy cost in 2005 to 68 percent in 2015.
 - ★ The use of N-drugs (drugs not recommended per the *Official Disability Guidelines – Treatment in Workers' Comp (ODG)/Appendix A, ODG Workers' Compensation Drug Formulary*) decreased substantially 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 7 percent in 2015. For medical-only claims, it decreased from 27 percent in 2011 to 7 percent in 2015.
 - ★ The use of physical medicine services increased by 29 percent among N-drug users between 2011 and 2013, indicating some initial substitution of physical medicine for N-drugs in the immediate post-formulary years. But this group accounted for less than 10 percent of the claims. Further, a cohort study by REG shows decreases in physical medicine services for N-drug claims in 2014.
 - ★ Physical medicine utilization decreased for most other claims, resulting in the overall three percent decrease in the physical medicine utilization since 2011.
 - ★ Estimates indicate that three percent of prescriptions and cost were associated with compounded drugs in 2010. In 2015, at least six percent of pharmacy prescriptions and 12 percent of the pharmacy cost were associated with compounded drugs.
 - ★ The number of prescriptions for hydrocodone combination products decreased by 50 percent two months after they were rescheduled from Schedule III to Schedule II controlled substance in October 2014. At the same time, the per-prescription price of these products increased by 47 percent.

SUMMARY: TRENDS IN CHANGING COST COMPONENTS

- ★ For lost-time claims, the average cost per claim for professional services increased by 23 percent from 2000 to 2015. When adjusted for inflation, the average cost per claim decreased by 15 percent. The number of claims and the level of utilization all decreased significantly, resulting in the overall decrease in the total cost by 20 percent. Adjusted for inflation, the total cost decreased by 45 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 substantially because of large increases in cost per service.
- ★ Cost trends are similar for lost-time and medical-only claims, but medical-only claims showed a lower rate of decrease in the number of claims and a slightly higher rate of decrease in the utilization of services than lost-time claims.

1. INTRODUCTION AND METHODOLOGICAL NOTES

This report presents fundamental metrics and indicators of health care cost and utilization in the Texas workers' compensation (WC) system since 2000. Health care, consisting of professional, hospital/institutional, dental, and pharmacy services, is one of the major benefits provided by the WC system for injured employees. Injured employees receive health care benefits that pay for appropriate and necessary medical care to treat work-related injuries or illnesses without limits on benefit amount or duration. 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 comprehensive, general and consistent data and metrics 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, provider type, service type, maturity, facility type, and drug type. For other issues on WC health care and income benefits, refer to other reports by the Texas Department of Insurance, WC Research and Evaluation Group (REG) that 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 service providers to insurance carriers for payment. These data are in turn transmitted to the Texas Department of Insurance, Division of Workers' Compensation (TDI-DWC) along with payment amounts and any denial or payment reduction codes. Medical data underwent a major change in 2005 when data collection transitioned to 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.

Medical data collected by TDI-DWC contain direct payments to health care providers and hospitals/institutions. 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.

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 TDI-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 cumulatively account for all payments up to a set period of maturity. For example, 2014 injury year data with six months maturity will cover claims with injuries that occurred in 2014, with services rendered within six months from the date of the injury for each claim. Service dates in this report will therefore span from January 1, 2014, to June 30, 2015.

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. An injury year measure, on the other hand, is 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 cost development patterns using 6 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-tail 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 more than 60 percent of total costs are for the claims with four years or longer maturity.

MEASURING SERVICE UTILIZATION

When evaluating long-term patterns and 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 providers. For the majority of 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 the Appendix A.

2. OVERVIEW: TOTAL HEALTH CARE COST

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

We begin by comparing health care costs with income (or indemnity) benefit costs, which together make up all benefits paid to injured employees and health care providers in the workers' compensation system. At the end of this section, we also discuss the effect of price inflation on cost measures and the share of health care costs in the general economy.

MEDICAL AND INCOME BENEFITS

Medical costs increased rapidly in the late 1990s into the early 2000s. The share of medical costs in total medical and income benefits in the Texas workers' compensation system steadily increased from 56 percent in 2000 to 67 percent in 2015 (see Table 2.1). The combined professional and hospital costs grew by 30 percent from 2000 to 2002. These increases provided compelling rationale for the subsequent workers' compensation reforms by the Texas legislature. Since 2002, the total cost of both health care and income benefits has declined primarily as a result of these reforms. The decline was more prominent and consistent in income benefits than in health care benefits.

Table 2.1: Medical and Income Benefits, by Service Year (Thousand Dollars)

Service Year	Medical Benefits	Income Benefits	Medical Benefit Share
2005	\$1,112,856	\$628,118	63.9%
2006	\$1,077,075	\$551,622	66.1%
2007	\$1,097,292	\$546,612	66.7%
2008	\$1,120,133	\$565,042	66.5%
2009	\$1,137,334	\$580,594	66.2%
2010	\$1,156,716	\$556,284	67.5%
2011	\$1,254,987	\$555,548	69.3%
2012	\$1,227,924	\$547,528	69.2%
2013	\$1,201,002	\$542,288	68.9%
2014	\$1,160,847	\$567,940	67.1%
2015	\$1,082,563	\$543,326	66.6%

Notes: See Appendix B for details on how income benefits are calculated by service year.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

COSTS BY BILL TYPE

Since data availability varies among different types of bills, a more consistent analysis may require separating health care payments 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. When all four databases are combined, there were about 300 thousand unique claims in 2015 (see 'Medical Combined' in Table 2.2). This represents a 29 percent decrease in the number of claims from 2000.

Numbers of unique claims are available from 2000 by bill type (see Table 2.2). Dental and pharmacy data are not available prior to 2005. While 95 percent of the claims received at least one professional service in 2015, only 28 percent of them received hospital/institutional service, and about 41 percent of the claims received pharmacy services. In other words, about half of the claims did not receive pharmacy services, and 72 percent of the claims received their medical services in professional offices only. A noticeable trend in the table is the consistent decrease in the overall number of claims being treated in the workers' compensation system.

Table 2.2: 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	92,037	565	172,154	366,323
2006	334,910	98,727	763	171,639	362,724
2007	337,707	103,460	1,135	180,297	366,960
2008	327,880	100,056	1,318	175,572	357,134
2009	303,096	92,274	1,234	160,704	326,946
2010	304,515	94,314	1,358	160,570	324,905
2011	305,176	96,080	1,378	156,966	323,864
2012	302,005	90,741	1,409	150,428	320,003
2013	291,765	87,222	1,470	141,195	309,209
2014	289,245	86,616	1,473	132,726	306,255
2015	281,332	82,630	1,436	122,061	296,611

Note: Figures for 'Medical Combined' do not include dental and pharmacy services prior to 2005. Numbers of claims are slightly lower than previous reports because of data updates and the removal of claims with no payments in all bills. However, these removed claims are included in utilization metrics in later sections.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Since 2000, total professional costs decreased by 18 percent while hospital costs increased by 21 percent (see Table 2.3). However, professional cost increased steadily between 2007 and 2011, primarily due to increased fees per service. But total professional costs decreased since 2012. Total hospital/institutional costs increased by 51 percent between 2005 and 2011, but they became stable since 2012 mainly because of the decreased number of claims receiving hospital services. Total pharmacy costs, accounting for about 13 percent of total medical costs in 2005, fluctuated around \$150 million until 2011. Pharmacy costs decreased significantly after the 2011 implementation of the pharmacy closed formulary, and accounted for 10 percent of the total medical cost in 2015.

Table 2.3: Total Cost, by Bill Type (Thousand Dollars)

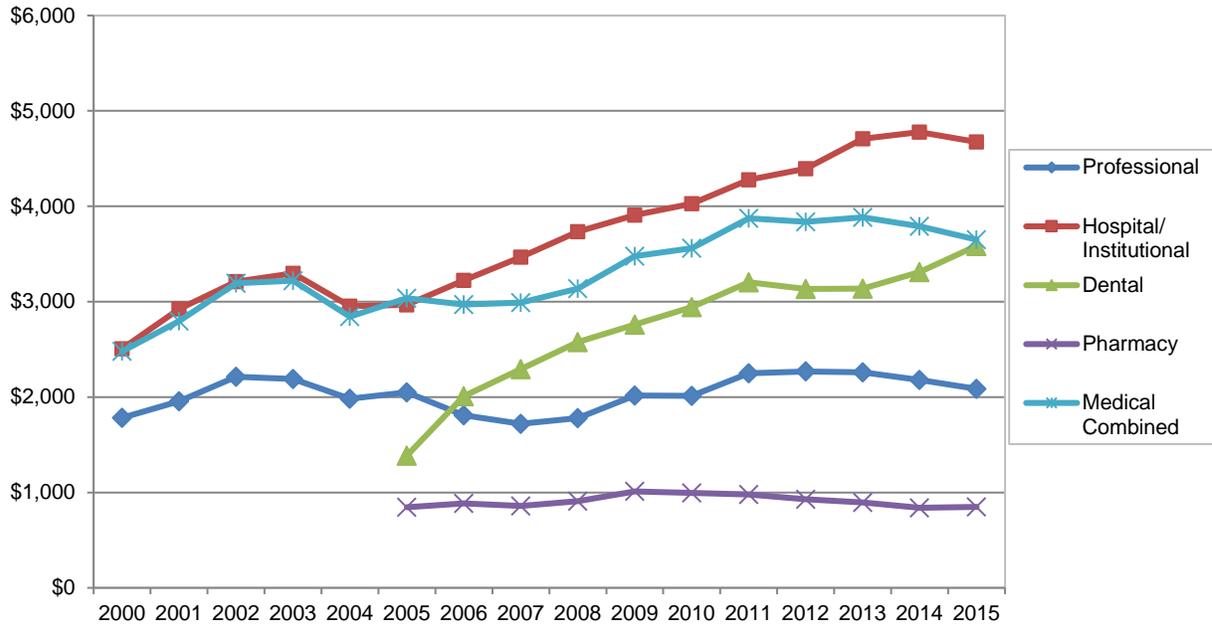
Service Year	Professional	Hospital/ Institutional	Dental	Pharmacy	Medical Combined
2000	\$719,116	\$318,924			\$1,038,040
2001	\$786,084	\$382,012			\$1,168,096
2002	\$906,988	\$441,820			\$1,348,808
2003	\$823,181	\$418,868			\$1,242,049
2004	\$665,591	\$314,486			\$980,076
2005	\$693,524	\$273,031	\$783	\$145,517	\$1,112,856
2006	\$605,439	\$318,279	\$1,533	\$151,825	\$1,077,075
2007	\$580,807	\$358,832	\$2,601	\$155,052	\$1,097,292
2008	\$583,768	\$373,449	\$3,394	\$159,522	\$1,120,133
2009	\$611,039	\$360,469	\$3,407	\$162,420	\$1,137,334
2010	\$613,011	\$379,950	\$3,998	\$159,756	\$1,156,716
2011	\$686,079	\$410,987	\$4,416	\$153,505	\$1,254,987
2012	\$684,916	\$398,706	\$4,416	\$139,886	\$1,227,924
2013	\$659,559	\$410,575	\$4,609	\$126,259	\$1,201,002
2014	\$630,734	\$413,843	\$4,877	\$111,393	\$1,160,847
2015	\$587,311	\$386,394	\$5,149	\$103,710	\$1,082,563

Note: Figures for 'Medical Combined' do not include dental and pharmacy costs prior to 2005.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

The average cost per claim increased by 17 percent for professional services and 87 percent for hospital services since 2000 (see Figure 2.1 and Table C1 in the Appendix C). The average cost per claim for pharmacy services increased by 18 percent between 2005 and 2010, but it decreased by 15 percent from 2010 to 2015, 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 substantially 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



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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 2.4 to 2.6. Claims with more than seven days of lost work days as a result 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 39 percent of the claims receiving professional services in 2015 were lost-time claims, but they accounted for 76 percent of the total professional costs. Lost-time claims accounted for 48 percent of hospital claims and 86 percent of hospital costs. In pharmacy, lost-time claims accounted for 54 percent of the claims and 87 percent of the pharmacy costs.

In 2015, compared to an overall average professional cost of \$2,088 in Figure 2.1, the average cost per claim for lost-time claims was \$4,089, and \$810 for medical-only claims (see Table 2.4). Since 2000, the average cost for professional services increased by 24 percent for lost-time claims and by 22 percent for medical-only claims while total costs decreased for both types.

For hospital services, average cost increased by 101 percent for lost-time claims and by 34 percent for medical-only claims since 2000 (see Table 2.5). Total costs increased by 29 percent for lost-time claims during the period while total costs for medical-only claims decreased by 12 percent, mainly because of the decreasing number of claims in the system.

For pharmacy services, the average cost increased by 8 percent for lost-time claims while it decreased by 31 percent for medical-only claims (see Table 2.6). Total cost decreased by 23 percent and 51 percent for lost-time and medical-only claims, respectively.

Table 2.4: 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	231,271	\$153,137	\$662
2001	178,297	\$626,820	\$3,516	223,569	\$159,265	\$712
2002	188,522	\$742,498	\$3,939	221,243	\$164,491	\$743
2003	176,263	\$676,274	\$3,837	199,993	\$146,908	\$735
2004	156,223	\$538,989	\$3,450	179,741	\$126,601	\$704
2005	149,188	\$555,006	\$3,720	189,467	\$138,518	\$731
2006	140,634	\$470,410	\$3,345	194,356	\$135,029	\$695
2007	136,882	\$442,940	\$3,236	200,895	\$137,867	\$686
2008	134,026	\$449,528	\$3,354	193,915	\$134,240	\$692
2009	129,370	\$479,570	\$3,707	173,785	\$131,468	\$757
2010	128,538	\$479,657	\$3,732	176,020	\$133,354	\$758
2011	126,264	\$531,359	\$4,208	178,954	\$154,720	\$865
2012	123,087	\$527,941	\$4,289	178,960	\$156,975	\$877
2013	117,483	\$507,053	\$4,316	174,330	\$152,507	\$875
2014	114,755	\$482,327	\$4,203	174,538	\$148,407	\$850
2015	109,613	\$448,237	\$4,089	171,760	\$139,073	\$810

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 2.5: 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	66,188	\$61,496	\$929
2001	64,145	\$310,555	\$4,841	66,551	\$71,456	\$1,074
2002	71,995	\$369,218	\$5,128	65,692	\$72,602	\$1,105
2003	67,188	\$352,767	\$5,250	59,823	\$66,101	\$1,105
2004	55,180	\$263,063	\$4,767	51,282	\$51,423	\$1,003
2005	44,220	\$225,815	\$5,107	47,836	\$47,216	\$987
2006	46,250	\$258,939	\$5,599	52,497	\$59,340	\$1,130
2007	47,336	\$293,304	\$6,196	56,149	\$65,528	\$1,167
2008	47,295	\$316,380	\$6,689	52,776	\$57,070	\$1,081
2009	45,463	\$312,370	\$6,871	46,821	\$48,099	\$1,027
2010	46,046	\$327,180	\$7,106	48,273	\$52,770	\$1,093
2011	46,006	\$352,039	\$7,652	50,086	\$58,948	\$1,177
2012	43,741	\$346,216	\$7,915	47,007	\$52,490	\$1,117
2013	42,026	\$360,756	\$8,584	45,205	\$49,819	\$1,102
2014	41,600	\$361,496	\$8,690	45,023	\$52,347	\$1,163
2015	39,251	\$332,315	\$8,466	43,391	\$54,079	\$1,246

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 2.6: 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	93,496	\$117,739	\$1,259	78,691	\$27,778	\$353
2006	90,745	\$122,476	\$1,350	80,942	\$29,349	\$363
2007	91,094	\$125,164	\$1,374	89,250	\$29,887	\$335
2008	89,855	\$131,958	\$1,469	85,754	\$27,564	\$321
2009	85,858	\$133,273	\$1,552	74,879	\$29,146	\$389
2010	86,907	\$134,802	\$1,551	73,690	\$24,955	\$339
2011	85,259	\$130,442	\$1,530	71,735	\$23,062	\$321
2012	80,872	\$120,203	\$1,486	69,582	\$19,683	\$283
2013	76,199	\$107,752	\$1,414	65,025	\$18,507	\$285
2014	72,439	\$96,546	\$1,333	60,314	\$14,847	\$246
2015	66,491	\$90,206	\$1,357	55,597	\$13,505	\$243

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

INFLATION ADJUSTED COST

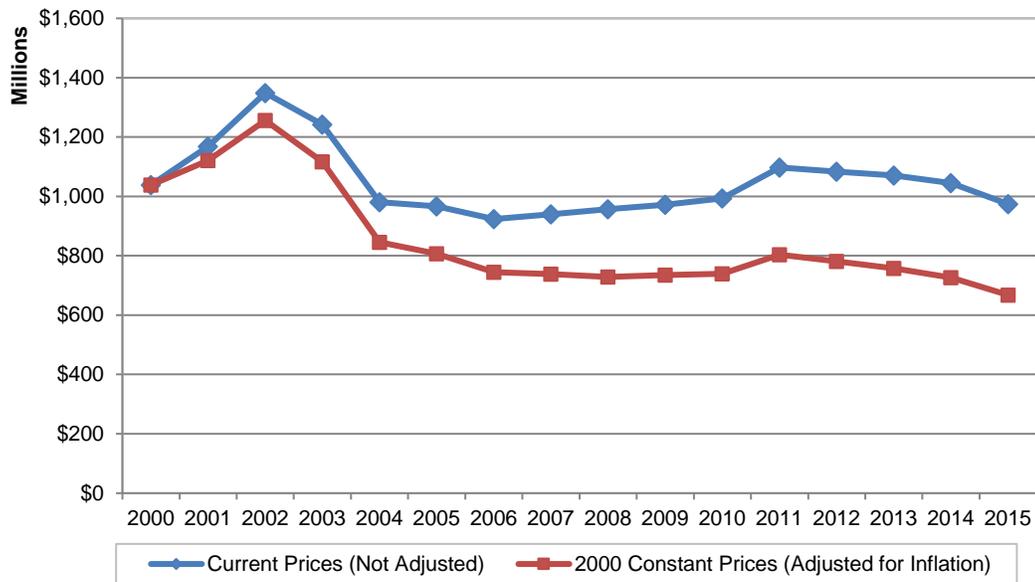
All prices in this report are in current prices without adjustments for inflation. However, in a cost study spanning 15 years, the effects of inflation on current prices are often significant. Unlike utilization measures, costs are nominal values that may increase simply because of price inflation. Prices 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, not only 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 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 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 2015, MEI increased by about 2.6 percent annually (46 percent total). As a comparison, CPI medical care indices on average increased at three or higher percentage rate annually.

Figure 2.2 shows that the 2015 cost of professional and hospital services was six percent lower than the cost in 2000 in current prices, but it was 36 percent lower if we adjust for inflation. Between 2005 and 2015, total health care costs, including pharmacy costs, decreased by three percent in current prices, but by 20 percent in inflation-adjusted prices.

Figure 2.2: Professional and Hospital Costs in Current and Inflation-Adjusted Prices, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

WORKERS' COMPENSATION HEALTH CARE NETWORKS

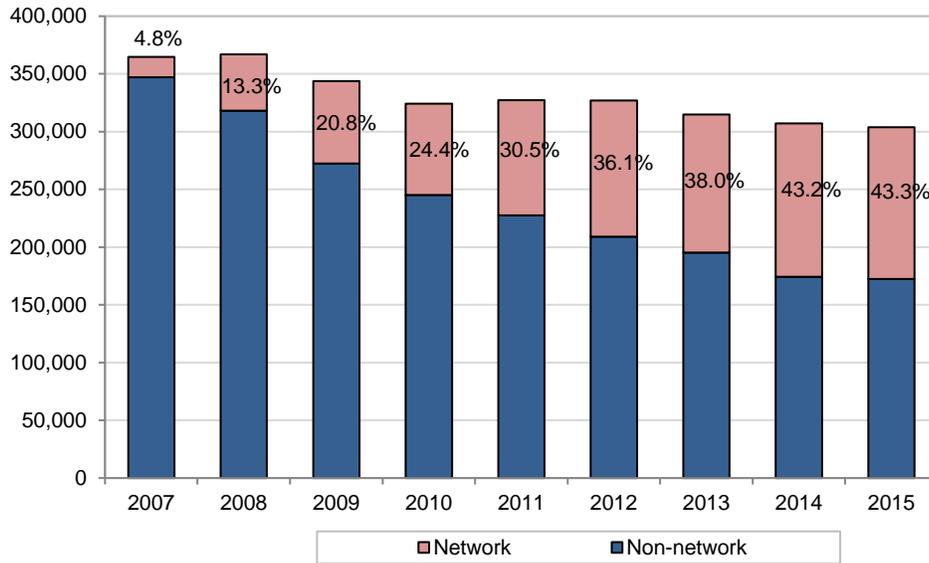
In 2005, the 79th Texas Legislature passed House Bill 7, which authorized the use of workers' compensation health care networks (networks) certified by the Texas Department of Insurance (TDI). TDI began accepting applications for the certification of workers' compensation health care networks in 2006, and by 2015, 20 certified networks were treating injured employees.

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 mental retardation services) also have the option to: 1) use a workers' compensation health care network certified by TDI under Chapter 1305, Texas Insurance Code; 2) continue to allow their injured employees to seek health care as non-network claims; or 3) 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 2.3 shows the number of network and non-network claims in the combined professional, hospital, and pharmacy data. In 2015 service year, 131,628 injured employees were treated in networks, accounting for 43 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 2.4). In 2015, networks accounted for 39 percent of the total medical cost.

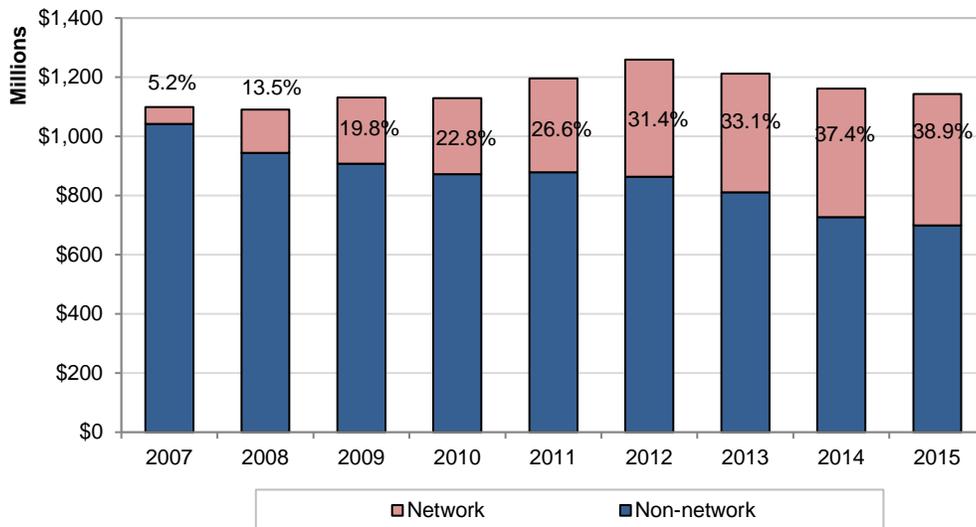
Figure 2.3: Number of Claims by Network Status, by Service Year



Note: Claims' network status were obtained through Data Calls, which cover a period from June to May. Service years are organized accordingly. For example, Service Year 2015 covers service dates from June 1, 2014 to May 31, 2015.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Figure 2.4: Total Health Care Cost by Network Status, by Service Year

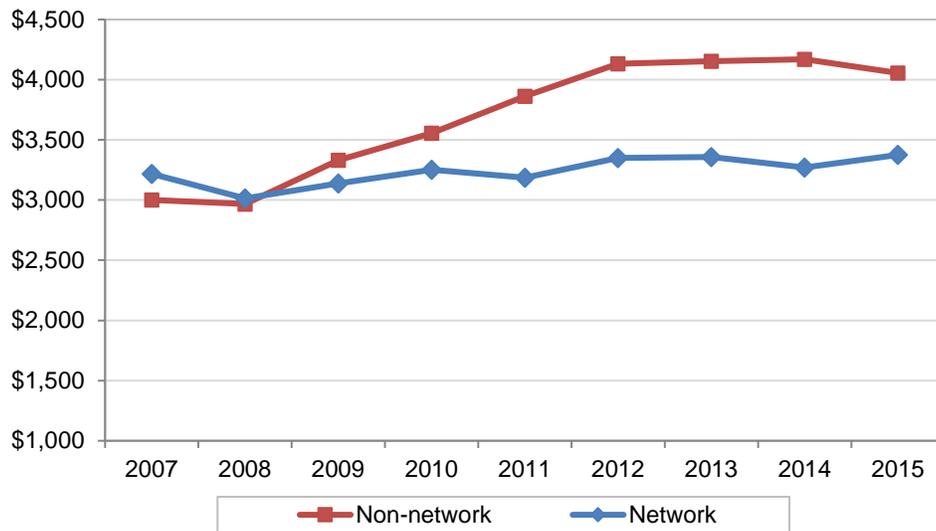


Note: Claims' network status were obtained through Data Calls, which cover a period from June to May. Service years are organized accordingly. For example, Service Year 2015 covers service dates from June 1, 2014 to May 31, 2015.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Networks' cost share is slightly lower than their claim share because networks cost less per claim on average, especially in more recent years. In terms of average cost, networks' average health care cost per claim was similar to that of non-network until 2009 (see Figure 2.5). But since 2009, it remained substantially below that of non-network. In 2015, the average cost per claim in networks was 17 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 utilize TDI-DWC's adopted fee guidelines.

Figure 2.5: Average Health Care Cost per Claim, by Service Year



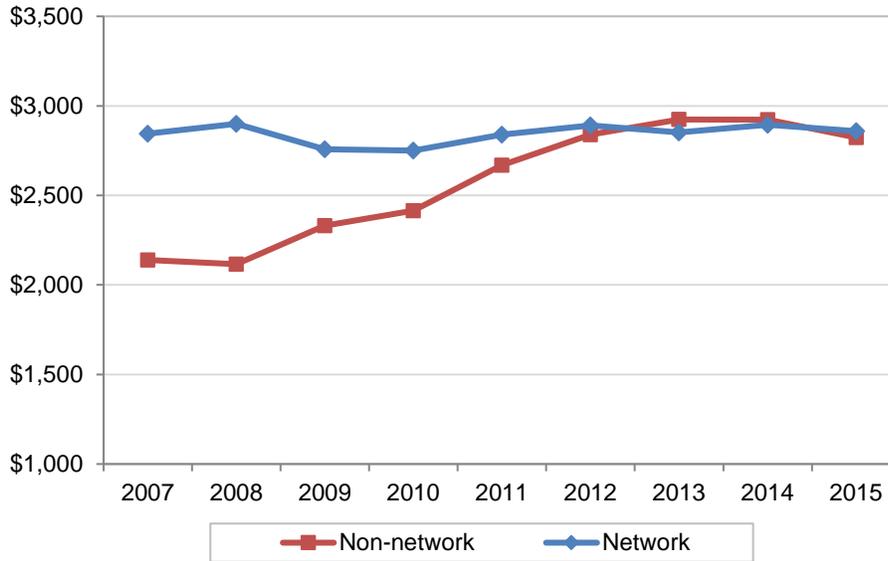
Note: Claims' network status were obtained through Data Calls, which cover a period from June to May. Service years are organized accordingly. For example, Service Year 2015 covers service dates from June 1, 2014 to May 31, 2015.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Another possible factor is networks' heightened focus on initial care, which tends to increase health care costs initially but decrease long-term costs. Figure 2.6 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, indicating higher contracted prices in part to induce health care providers to participate in networks and in part to encourage better initial care.

While network average cost for initial care stayed about the same since 2007, non-network average cost increased steadily. Despite the higher initial medical cost by injury year, per-claim cost in networks by service year (in Figure 2.5) was lower than that of non-network because of a relatively lower share of claims with long-term care costs in networks.

Figure 2.6: Average Health Care Cost per Claim, by Injury Year, Six Months after Injury



Note: Claims' network status were obtained through Data Calls, which cover a period from June to May. Injury years are organized accordingly. For example, Injury Year 2015 covers claims with injury dates from June 1, 2014 to May 31, 2015.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

HEALTH CARE COST AND TEXAS GROSS DOMESTIC PRODUCT

Total WC health care costs account for less than one tenth of one percent of the Texas state Gross Domestic Product (GDP) (see Table 2.7). This GDP share decreased from 0.14 percent in 2000 to 0.07 percent in 2015. Texas GDP (and, roughly, the number of employees) grew by 116 percent since 2000 while the total WC medical cost increased by 14 percent in the same period. In comparison, a National Council on Compensation Insurance research brief in 2010 showed that, nationally, WC medical expenditure was about 0.25 percent of the GDP in 2006.¹ This suggests that, as a share of state GDP, WC costs in Texas are substantially lower than the national average.

WC's lower share of GDP for Texas is partly because WC is not mandatory in Texas. An estimated 66 percent to 73 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" and "Costs to Employers and Efficiencies in the Texas Workers' Compensation System" available at the REG's reports webpage: www.tdi.texas.gov/reports/wcreg/index.html). The most recent non-subscription survey in 2016 showed that 78 percent of Texas private sector employers were subscribers to the workers' compensation system and 82 percent of the employees in the private sector were employed by these subscribers.

¹ See *NCCI Research Brief: Medicare and Workers Compensation Medical Cost Containment*, NCCI Holdings, Inc., 2010. Estimates are based on data published by CMS and US BEA. More recent estimates are not available.

Table 2.7: 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
2005	\$970,997	\$1,113	0.11%
2006	\$1,055,959	\$1,077	0.10%
2007	\$1,147,970	\$1,097	0.10%
2008	\$1,202,104	\$1,120	0.09%
2009	\$1,146,647	\$1,137	0.10%
2010	\$1,251,494	\$1,157	0.09%
2011	\$1,351,048	\$1,255	0.09%
2012	\$1,440,819	\$1,228	0.09%
2013	\$1,527,158	\$1,201	0.08%
2014	\$1,601,977	\$1,161	0.07%
2015	\$1,586,468	\$1,083	0.07%

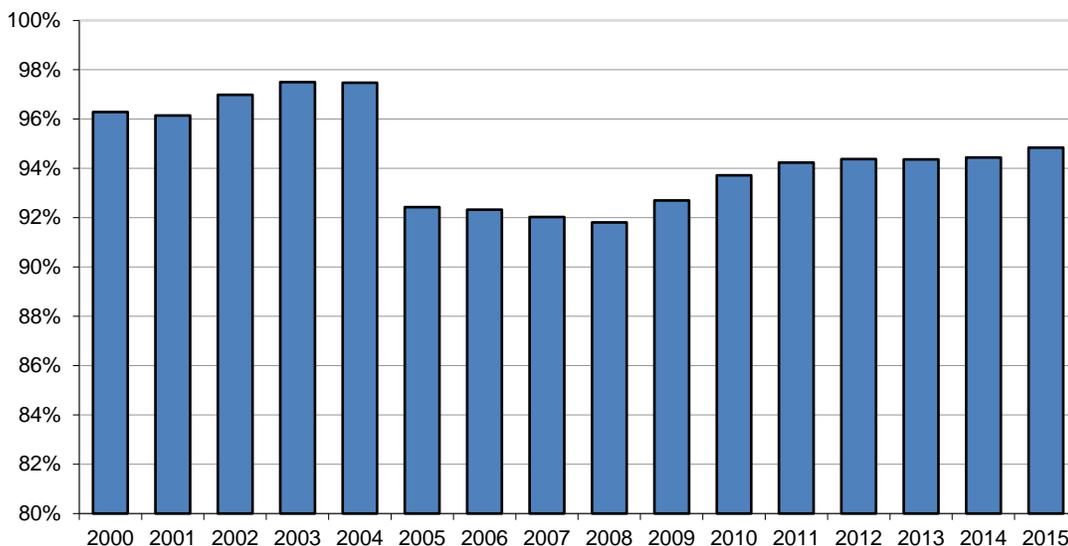
Sources: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016. Texas GDP figures in current dollars are from the Bureau of Economic Analysis, U.S. Department of Commerce.

3. COST AND UTILIZATION FOR PROFESSIONAL SERVICES

Professional service bills include bills for physician and therapy services, durable medical equipment, and ambulatory surgical 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 TDI-DWC under the provisions of the Texas Labor Code §413.007. Insurance carriers report these data to TDI-DWC using a medical billing/payment electronic data interchange process (EDI 837). The EDI version of the professional service bills is based on the CMS-1500 paper forms used by the Centers for Medicare and Medicaid Services. EDI 837 data covers the service years from 2005. 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, over 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 (available at www.tdi.texas.gov/reports/wcreg/index.html). Also, the data for 2004–2005 may be incomplete as data submission was suspended for the transition to the EDI 837 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, 2016.

CHANGES IN MEDICAL FEE GUIDELINES

One factor that affects total and average costs is the change in per-service fees. Changes in service fees are partially explained by changes in regulatory policies. Professional service fees are regulated in the workers' compensation system with Medical Fee Guideline (MFG) establishing 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 providers' usual fees and charges, or the maximum allowable reimbursement (MAR) rate based on relative values of services published by a third party. The adoption of the 2003 professional services fee guideline changed the reimbursement amounts for individual categories of services, raising the rate for certain categories of 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 with the exception of surgery services which used a separate \$66.32 as a conversion factor, resulting in a rate increase for surgery services. Texas conversion factors are adjusted for inflation using the Medicare Economic Index (see Table 3.1). On the other hand, Centers for Medicare and Medicaid Services (CMS) adjust Medicare conversion factor annually because the relative value unit (RVU) and the geographic practice cost index (GPCI) for a service change along with practice cost, inflation, and relative values of procedures. In short, CMS's RVUs and GPICs may change significantly year by year, and their changes affect Texas fee levels independent of Texas's conversion factor. Therefore, changes in RVUs and GPICs for each service determines the service's final price in Texas. Mainly because of the increase in RVUs and GPICs, Texas' fee level for non-surgery services increased from 139 percent of Medicare in 2008 to 161 percent of Medicare in 2012, which decreased to 157 percent in 2015. For surgery services, Texas' fees were 197 percent of Medicare in 2015.

For each service, MAR is calculated by multiplying Texas conversion factors by RVU and GPCI for the service. For example, adjustments in RVUs and GPICs for office visit (service code 99213) resulted in a 38 percent increase in the Texas MAR for the Austin area in the five years from 2008 to 2015 (see Table 3.2). MARs for some services such as MRI decreased significantly as their RVU and GPCI decreased by the CMS. Texas fee increases in 2009 and 2011 were largely due to increases in RVUs and GPICs.

Table 3.1: Changes in Medicare and Texas Fee Schedule Factors

	2008	2009	2010	2011	2012	2013	2014	2015	Changes 2008-2015
Medicare Conversion Factor	\$38.09	\$36.07	\$36.87	\$33.98	\$34.04	\$34.02	\$35.82	\$35.75	-6.1%
Texas Conversion Factor	\$52.83	\$53.68	\$55.32	\$54.54	\$54.86	\$55.30	\$55.75	\$56.20	6.4%
Texas Conversion Factor (Surgery)	\$66.32	\$67.38	\$68.19	\$68.47	\$68.88	\$69.43	\$69.98	\$70.54	6.4%
Texas Price as a Percentage of Medicare Price	139%	149%	150%	161%	161%	163%	156%	157%	13.3%
Texas Price as a Percentage of Medicare Price (Surgery)	174%	187%	185%	202%	202%	204%	195%	197%	13.3%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 3.2: Fee Schedule Comparisons for Selected Services

	2008	2009	2010	2011	2012	2013	2014	2015	Changes 2008-2015
99213 - Office visit, established patient									
GPCIs * RVUs	1.58	1.69	1.80	2.02	2.06	2.13	2.04	2.05	29.4%
Medicare MAR	\$60	\$61	\$65	\$68	\$70	\$73	\$73	\$73	21.4%
Texas MAR	\$84	\$91	\$98	\$110	\$113	\$118	\$114	\$115	37.6%
Average Pay	\$70	\$76	\$81	\$97	\$100	\$103	\$101	\$102	46.6%
29827 - Arthroscopic surgery, shoulder/rotator cuff									
GPCIs * RVUs	28.31	28.02	28.31	31.15	31.08	31.28	30.20	29.98	5.9%
Medicare MAR	\$1,044	\$1,011	\$1,021	\$1,058	\$1,058	\$1,064	\$1,082	\$1,072	2.7%
Texas MAR	\$1,877	\$1,888	\$1,931	\$2,133	\$2,141	\$2,172	\$2,113	\$2,115	12.7%
Average Pay	\$1,228	\$1,543	\$1,633	\$1,838	\$2,035	\$2,020	\$1,910	\$1,938	57.8%
72100 - X-ray, lower spine									
GPCIs * RVUs	1.02	1.05	1.04	1.20	1.11	1.09	1.03	0.99	-3.3%
Medicare MAR	\$39	\$38	\$38	\$41	\$38	\$37	\$37	\$35	-9.3%
Texas MAR	\$54	\$56	\$57	\$65	\$61	\$60	\$57	\$55	2.8%
Average Pay	\$38	\$41	\$42	\$50	\$47	\$46	\$45	\$45	17.2%
72148 - MRI, lumbar spine									
GPCIs * RVUs	14.87	14.44	12.62	13.72	12.76	11.29	6.92	6.29	-57.7%
Medicare MAR	\$566	\$521	\$455	\$466	\$434	\$384	\$248	\$225	-60.3%
Texas MAR	\$786	\$775	\$686	\$748	\$700	\$624	\$386	\$354	-55.0%
Average Pay	\$423	\$448	\$442	\$512	\$503	\$454	\$297	\$275	-35.1%
97110 - Therapeutic exercises									
GPCIs * RVUs	0.71	0.77	0.79	0.87	0.90	0.94	0.90	0.92	28.6%
Medicare MAR	\$27	\$28	\$28	\$29	\$31	\$32	\$32	\$33	20.7%
Texas MAR	\$38	\$42	\$43	\$47	\$49	\$52	\$50	\$52	36.8%
Average Pay	\$32	\$35	\$36	\$43	\$44	\$45	\$43	\$43	33.1%

Note: RVU = relative value unit. GPCI = geographic practice cost index. MAR = maximum allowable reimbursement. Average pay is a calculated pay amount in the DWC database of submitted bills.

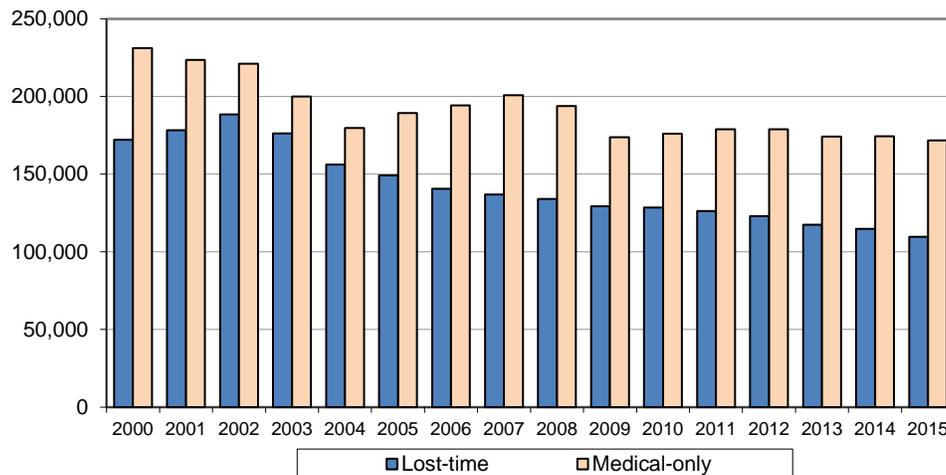
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

COST AND UTILIZATION BY SERVICE YEAR

Professional Cost and Utilization by Claim Type

There was a significant decrease in the number of medical-only claims in the professional service data between 2000 and 2005 (see Figure 3.2). The number of lost-time claims, which are the main cost drivers in the workers' compensation system, actually increased until 2002, but has been decreasing steadily since then. For medical-only claims, unlike lost-time claims, the number of claims fluctuated after 2005, but the long-term trend was declining.

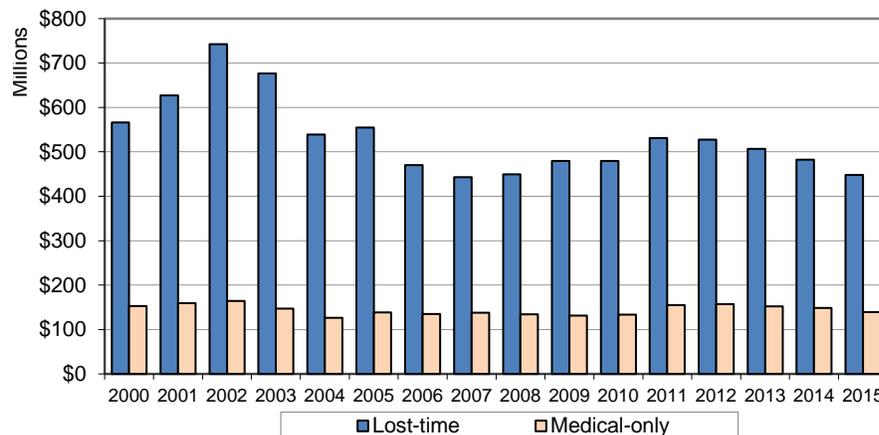
Figure 3.2: Number of Claims by Claim Type, Professional Services, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Figure 3.3 shows that the majority of health care costs were borne by lost-time claims (between 75 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.

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



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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). And since the number of visits was mainly determined by the length of treatment, a shorter duration of medical care resulted in a decreasing number of 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 requirement 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	4.2	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	3.5	3.2
2014	15.0	4.2	3.7	3.3
2015	15.1	4.2	3.5	3.1

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Professional Cost and Utilization by Provider Type

Professional service providers are grouped into MD/DO, DC (Doctor of Chiropractic), PT/OT (physical/occupational therapist), ASC (ambulatory surgical center), DME (durable medical equipment) and the 'Other' that includes all other providers. 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 provider type is used if the bill was for supplies. ASC services are sometimes included in hospital/institutional services in other states, but Texas medical EDI system

receives ASC bills in the professional service bill set, and therefore we include ASC services in this section. Provider type details are more reliable since the implementation of the EDI 837 data collection in 2005.

About 93 percent of the claims received professional services from MD/DOs in 2015 (see Table 3.4). A significant change occurred in chiropractic services (DC): the share of claims receiving chiropractic services decreased from 13 percent in 2005 to 7 percent in 2012, but increased slightly to 9 percent in 2015. This decline resulted from various cost control measures such as stricter billing and payment guidelines for physical medicine in the 2003 professional services fee guideline, 2004 preauthorization requirements for work hardening/conditioning services, and 2006 preauthorization requirements for physical and occupational therapy services. A decreasing percentage of the claims also received services from DME and ASC providers. On the other hand, a higher share of claims received PT or OT services since 2005.

The share of injured employees receiving evaluation and management services from physician assistants (PA) or certified/registered nurses (CR) increased significantly from six percent of the claims in 2005 to 23 percent in 2015. 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 Provider Type, by Service Year

Provider Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ASC	4.0%	3.9%	3.4%	2.8%	2.9%	2.8%	2.6%	2.3%	2.0%	1.8%	1.8%
DC	13.1%	10.6%	8.6%	7.5%	7.8%	7.7%	7.1%	6.6%	8.6%	9.3%	9.2%
DME	15.1%	14.7%	14.6%	13.8%	13.8%	13.4%	11.0%	10.3%	9.7%	8.9%	8.7%
MD/DO	94.5%	95.6%	96.1%	96.5%	96.6%	96.0%	95.7%	94.8%	94.4%	93.6%	92.8%
PT/OT	20.0%	20.0%	20.5%	20.1%	20.7%	20.4%	20.9%	22.1%	23.3%	24.2%	23.8%
PA/CR	5.5%	6.0%	6.5%	7.2%	8.3%	11.1%	13.9%	19.0%	19.7%	20.6%	22.6%
IL	1.2%	1.3%	1.6%	1.9%	2.9%	3.5%	3.7%	4.5%	4.0%	3.8%	3.8%
Other	9.1%	6.3%	5.7%	6.0%	5.9%	5.4%	5.5%	5.3%	5.1%	5.3%	5.3%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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 substantially by 13 percent between 2005 and 2011 because of both the increasing per-service fees and the increasing share of claims utilizing MD/DO, but it decreased by 21 percent since 2011 as fees stabilized and the number of claims continued to decrease. Total cost for ASC services increased until 2010 even though a smaller share of claims was receiving the services. It decreased substantially in 2013 and 2014. Costs for PA/CR and IL providers increased substantially since 2010 as participation by these providers in the workers' compensation system increased.

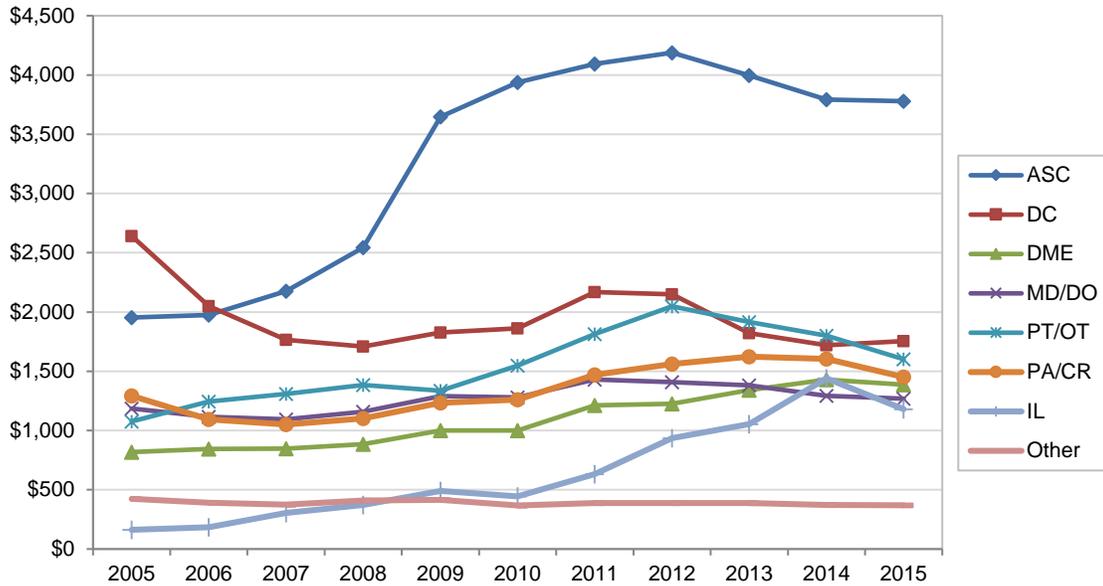
Table 3.5: Total Professional Cost (in Thousand Dollars) by Service Year, by Provider Type

Provider Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ASC	\$26,329	\$25,472	\$24,888	\$22,947	\$32,415	\$33,309	\$32,519	\$28,975	\$22,825	\$19,875	\$19,206
DC	\$116,964	\$72,405	\$51,044	\$41,781	\$43,119	\$43,800	\$46,741	\$42,702	\$45,739	\$46,053	\$45,570
DME	\$41,881	\$41,723	\$41,609	\$40,060	\$41,912	\$40,921	\$40,635	\$38,152	\$37,829	\$36,648	\$33,937
MD/DO	\$378,924	\$357,482	\$355,329	\$367,004	\$377,451	\$374,402	\$417,885	\$403,034	\$379,962	\$350,333	\$331,311
PT/OT	\$87,708	\$73,455	\$72,808	\$72,644	\$77,473	\$78,206	\$94,002	\$104,393	\$110,333	\$112,415	\$97,045
PA/CR	\$7,943	\$7,880	\$8,173	\$9,688	\$10,425	\$12,436	\$16,494	\$22,267	\$22,278	\$22,205	\$23,545
IL	\$636	\$817	\$1,633	\$2,371	\$4,278	\$4,717	\$7,209	\$12,580	\$12,153	\$15,850	\$12,697
Other	\$33,139	\$26,178	\$25,316	\$27,251	\$23,916	\$25,218	\$30,595	\$32,809	\$28,425	\$27,350	\$23,994

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

The average cost per claim increased by 114 percent for ASCs between 2005 and 2012, then decreased by 10 percent since 2012 (see Figure 3.4). ASC's 2009 increase was related to the new Ambulatory Surgical Center (ASC) 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, exclusive of implantables. Except for DC, average costs increased for all providers: by 70 percent for DME, by 49 percent for PT/OT, by 7 percent for MD/DO, by 12 percent for PA/CR, and by over 600 percent for IL providers.

Figure 3.4: Average Cost per Claim by Service Year, by Provider Type, Professional Services



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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 and 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.

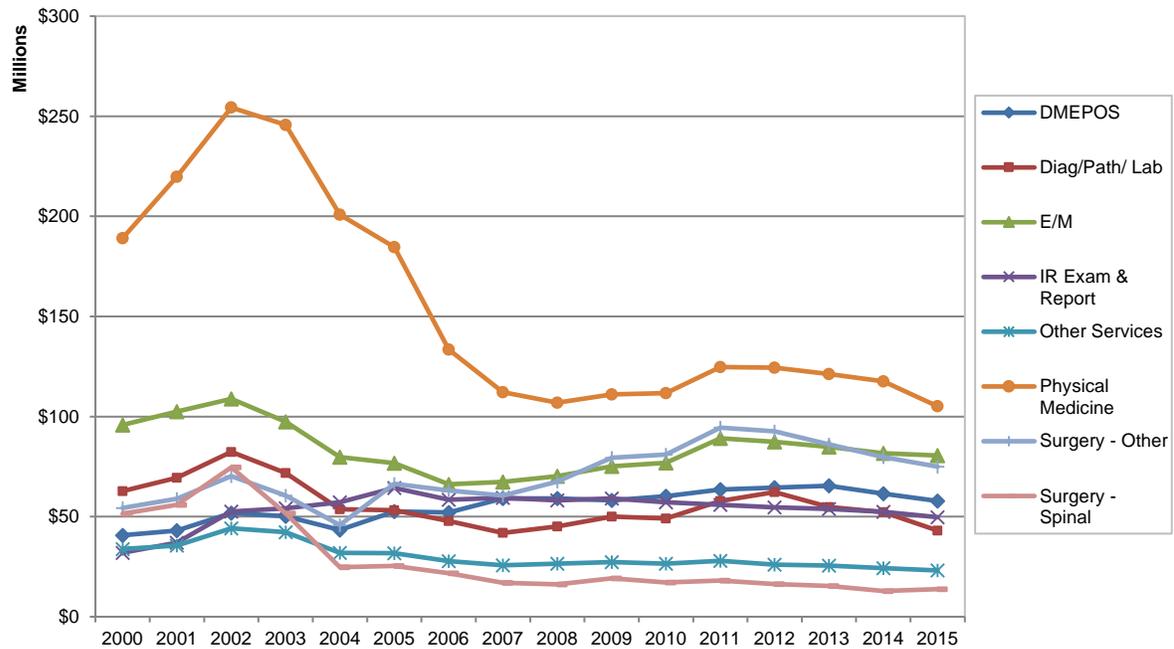
There may be different ways to classify service types depending on how we group various CPT/HCPCS codes. This report uses eight groups in the service type classification:

- ★ 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.
- ★ 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 office visits.
- ★ IR Exam & Report: impairment (or disability) rating 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/occupational therapists, and MD/DO.
- ★ 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 C2 in Appendix C). Increases and decreases were most prominent in Physical Medicine services, which were the costliest services. Costs increased by more than 40 percent since 2000 for IR Exam and Reports, DMEPOS, and Surgery – Other service groups. Cost decreased for all other service groups.

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

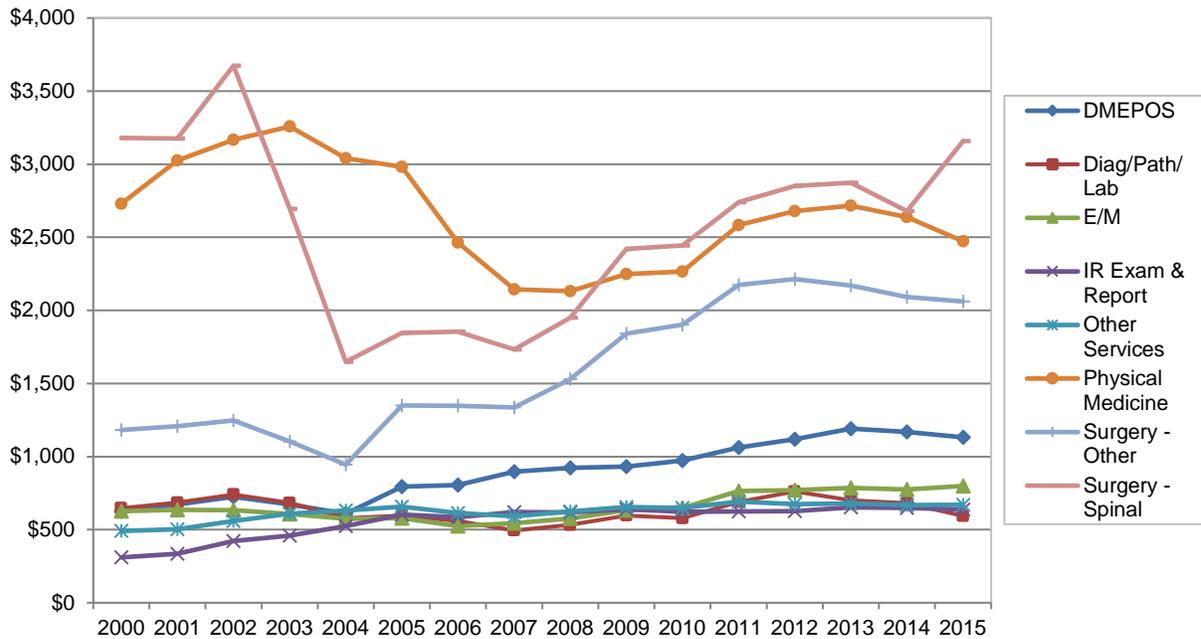


Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

For medical-only claims, Physical Medicine service shows a pattern of increases and decreases similar to that of lost-time claims (see Table C2 in Appendix C), which decreased by 33 percent since 2000. Because of their less serious injuries, E/M services were the most costly service group for medical-only claims. Costs for Surgery – Spinal and Other Services groups decreased most significantly.

Average costs per claim shown in Figure 3.6 (and Table C3 in the Appendix C) 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 106 percent from 2000 to 2015. Average costs for DMEPOS and Surgery-Other services increased by 81 percent and 74 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. In 2015, the large increase in the per-claim cost was mainly due to an increase in the price of neuro-receiver (spinal cord stimulator) implant services. 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 Year, by Service Type, Lost-time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of service utilization, the shares of claims receiving particular services 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 receiving Physical Medicine services while the share for Surgery – Spinal services decreased substantially. An increasing share of claims received DMEPOS, Diag/Path/Lab, and IR Exam & Report services.

It should be noted that a significant number (54 percent to 72 percent) 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 non-severe medical-only claims. It is also worthwhile to note that the share of claims receiving Physical Medicine services did not change significantly for either lost-time or medical-only claims even though total cost of Physical Medicine decreased significantly, mainly because of decrease in service utilization.

Table 3.6: Percent of Claims Receiving Certain Professional Services

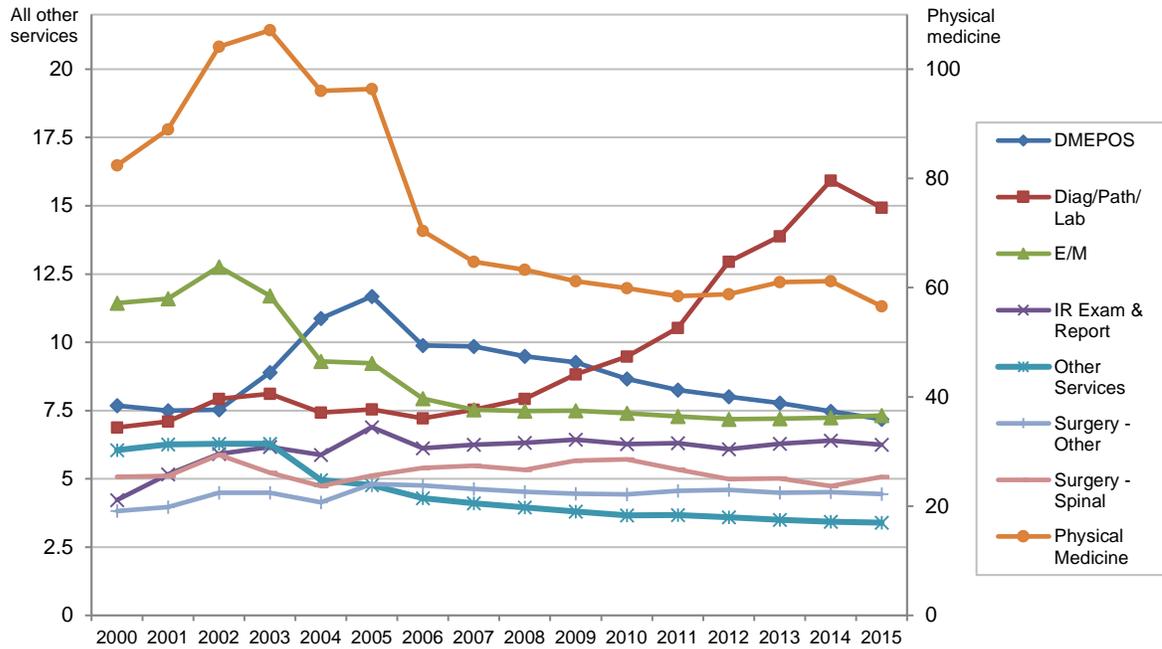
Service Year	DMEPOS	Diag/Path/ Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
Lost-time Claims								
2000	40.0%	58.1%	91.1%	64.9%	43.8%	42.6%	28.5%	9.8%
2001	38.0%	58.6%	92.8%	66.0%	43.3%	43.0%	29.0%	10.3%
2002	40.6%	60.8%	93.8%	69.6%	45.9%	45.0%	31.6%	11.2%
2003	45.9%	61.8%	94.3%	71.2%	45.1%	45.9%	33.1%	11.4%
2004	49.9%	61.9%	93.2%	74.0%	39.7%	45.6%	33.0%	10.1%
2005	49.0%	62.8%	93.6%	75.8%	39.4%	44.7%	35.1%	9.8%
2006	51.6%	64.4%	94.1%	75.2%	39.6%	41.2%	36.0%	8.9%
2007	53.6%	65.5%	94.3%	74.2%	38.7%	40.2%	36.0%	7.7%
2008	52.8%	66.2%	94.1%	74.2%	38.1%	39.2%	35.7%	6.6%
2009	53.6%	67.6%	94.6%	74.8%	38.2%	39.8%	36.0%	6.5%
2010	53.7%	69.0%	95.0%	75.0%	37.4%	39.9%	35.8%	5.8%
2011	53.1%	69.8%	95.2%	74.9%	37.8%	39.6%	36.9%	5.6%
2012	52.8%	69.8%	95.0%	75.0%	36.9%	39.0%	36.7%	5.0%
2013	53.1%	69.9%	94.7%	74.9%	37.4%	39.5%	36.6%	4.9%
2014	52.6%	70.7%	94.8%	74.7%	37.3%	40.3%	36.3%	4.5%
2015	54.0%	70.5%	94.7%	75.1%	37.2%	40.2%	36.3%	4.3%
Medical-only Claims								
2000	24.9%	49.5%	90.5%	53.9%	35.1%	22.2%	17.2%	1.2%
2001	23.4%	49.8%	91.7%	57.5%	34.8%	23.3%	17.3%	1.2%
2002	24.1%	51.2%	93.2%	60.3%	36.5%	23.7%	17.6%	1.3%
2003	31.7%	53.8%	94.0%	63.2%	33.7%	24.4%	18.8%	1.2%
2004	39.6%	53.9%	94.0%	66.3%	22.9%	24.9%	18.2%	1.0%
2005	36.9%	55.1%	95.2%	66.5%	22.2%	23.3%	19.6%	0.9%
2006	41.6%	57.9%	97.1%	68.2%	23.8%	22.2%	20.5%	0.9%
2007	43.2%	58.9%	97.1%	67.9%	23.5%	21.6%	19.9%	0.7%
2008	41.5%	58.7%	96.8%	68.4%	23.4%	20.2%	19.7%	0.5%
2009	41.3%	58.8%	96.9%	70.1%	23.1%	20.1%	19.2%	0.5%
2010	40.6%	58.6%	97.1%	70.4%	22.6%	19.5%	19.3%	0.4%
2011	40.3%	58.2%	97.2%	70.9%	22.1%	19.1%	19.5%	0.4%
2012	40.4%	57.3%	97.3%	71.9%	22.0%	19.5%	19.3%	0.3%
2013	40.5%	57.9%	97.5%	72.3%	22.7%	20.5%	18.5%	0.3%
2014	39.6%	58.0%	97.6%	72.7%	23.4%	21.1%	17.9%	0.3%
2015	38.7%	57.3%	97.6%	72.3%	22.7%	20.2%	18.0%	0.2%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of service utilization, the number of services per claim decreased significantly for Physical Medicine, E/M service and 'Other' Services categories (see Figure 3.7 and Table C4 in the Appendix C). Physical Medicine services peaked in 2003 and decreased substantially since then. Utilization of DMEPOS services increased rapidly until 2005, after which it decreased steadily.

Diag/Path/Lab services per claim increased by 117 percent since 2000. However, this increase in utilization was not translated into an increase in cost. The majority of increased Diag/Path/Lab services since 2010 were low-priced drug tests. At the same time, the price of MRI services decreased substantially as their fees were reduced by the CMS in recent years.

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



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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, most reports from the insurance industry or actuarial reports frequently present statistics by injury year, which often exclude old injury claims. Therefore, we report injury year statistics in this section for an easier comparison.

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 6 months, 12 months, and 24 months after the injury date for each injury year. Medical-only claims often receive only a few treatments, and the services and costs are mostly accounted for by the six-month maturity data. 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 2015 injury year with six-month maturity covers all new injuries that occurred in the 2015 calendar year and accounts for all services received within six months from the date of the injury. This means that service bills up to June 30, 2016, are analyzed. For the 2013 injury year with 24-month maturity, data covers services up to December 31, 2015, and cost and utilization metrics are affected by changes in fee schedules and policies in the 2013 to 2015 service years. As the maturity increases, there will be more services provided and total costs increase accordingly.

For lost-time claims, total costs in each injury year increased significantly as maturity increases 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 claims 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 substantially.

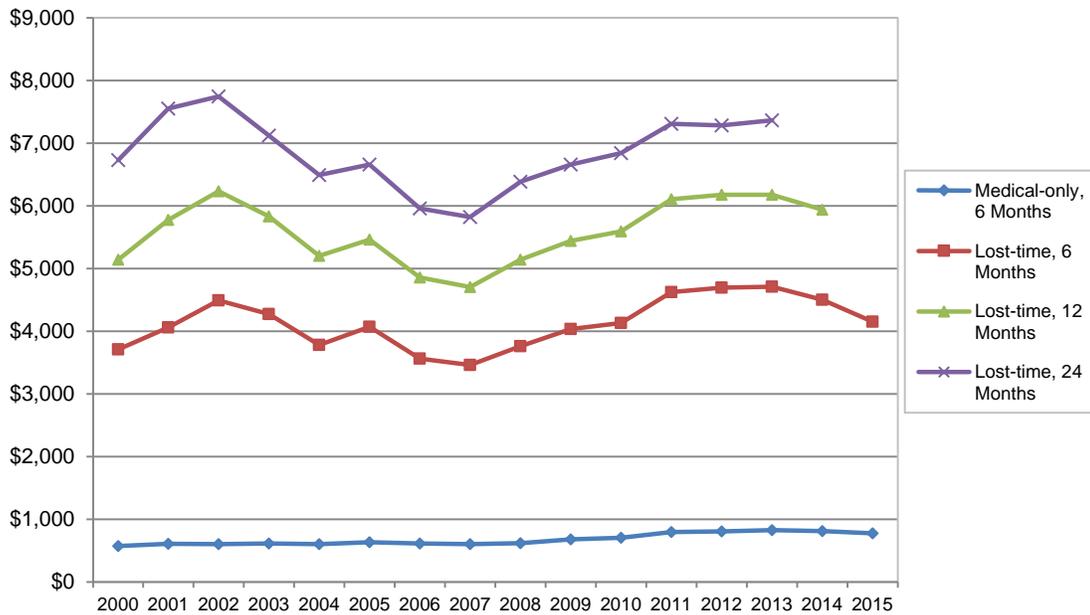
Table 3.7: Total Cost, by Injury Year, by Maturity and Claim Type, Professional Services

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	\$258,537	69,622	\$3,713	\$371,118	72,164	\$5,143	\$498,525	74,051	\$6,732
2001	\$282,426	69,502	\$4,064	\$415,649	71,981	\$5,774	\$554,279	73,409	\$7,551
2002	\$308,345	68,657	\$4,491	\$436,589	70,040	\$6,233	\$548,006	70,743	\$7,746
2003	\$264,599	61,872	\$4,277	\$366,290	62,795	\$5,833	\$456,957	64,175	\$7,120
2004	\$222,576	58,873	\$3,781	\$317,217	60,971	\$5,203	\$399,790	61,588	\$6,491
2005	\$230,631	56,642	\$4,072	\$314,868	57,678	\$5,459	\$387,504	58,171	\$6,661
2006	\$200,910	56,404	\$3,562	\$277,537	57,160	\$4,855	\$342,616	57,485	\$5,960
2007	\$198,408	57,310	\$3,462	\$272,805	57,977	\$4,705	\$339,485	58,330	\$5,820
2008	\$219,641	58,403	\$3,761	\$303,937	59,116	\$5,141	\$379,332	59,417	\$6,384
2009	\$219,241	54,294	\$4,038	\$298,268	54,830	\$5,440	\$366,489	55,033	\$6,659
2010	\$235,184	56,889	\$4,134	\$320,608	57,335	\$5,592	\$393,500	57,497	\$6,844
2011	\$262,090	56,698	\$4,623	\$348,686	57,117	\$6,105	\$418,655	57,273	\$7,310
2012	\$257,283	54,779	\$4,697	\$340,605	55,132	\$6,178	\$402,658	55,279	\$7,284
2013	\$248,074	52,663	\$4,711	\$327,790	53,049	\$6,179	\$391,851	53,200	\$7,366
2014	\$239,106	53,075	\$4,505	\$317,605	53,502	\$5,936			
2015	\$207,081	49,844	\$4,155						
Medical-only Claims									
2000	\$112,038	195,280	\$574	\$130,599	198,228	\$659	\$147,804	200,603	\$737
2001	\$114,321	187,139	\$611	\$133,209	190,002	\$701	\$149,068	191,818	\$777
2002	\$110,440	183,015	\$603	\$126,032	184,847	\$682	\$137,979	185,783	\$743
2003	\$103,541	168,846	\$613	\$116,277	170,103	\$684	\$125,448	171,027	\$734
2004	\$94,107	155,402	\$606	\$105,270	157,017	\$670	\$112,913	157,850	\$715
2005	\$103,911	163,169	\$637	\$114,100	164,269	\$695	\$121,199	164,885	\$735
2006	\$103,909	168,828	\$615	\$114,202	169,853	\$672	\$120,723	170,376	\$709
2007	\$106,465	175,851	\$605	\$116,107	176,822	\$657	\$122,739	177,361	\$692
2008	\$105,501	170,446	\$619	\$113,746	171,327	\$664	\$119,350	171,841	\$695
2009	\$104,042	152,259	\$683	\$111,285	153,028	\$727	\$116,071	153,456	\$756
2010	\$110,276	156,342	\$705	\$118,614	157,067	\$755	\$123,914	157,439	\$787
2011	\$126,932	159,061	\$798	\$136,009	159,804	\$851	\$141,265	160,199	\$882
2012	\$128,910	159,093	\$810	\$136,772	159,750	\$856	\$141,116	160,164	\$881
2013	\$129,186	155,843	\$829	\$137,001	156,580	\$875	\$141,562	156,989	\$902
2014	\$127,439	156,305	\$815	\$134,876	156,980	\$859			
2015	\$120,352	154,792	\$778						

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Average costs per claim differed substantially 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 of their services within that time frame. For lost-time claims, varying maturities did not result in any significant differences in the cost trends. The figure also indicates that the general trend in the average cost comprised increases until 2002, decreases until 2007, and increases until 2011. Average costs were either stable or decreasing after 2011. Since 2000, the average cost for medical-only claims at 6 months maturity increased by 36 percent. Average costs for lost-time claims increased by 12 percent, 15 percent, and 9 percent for 6 months, 12 months, and 24 months maturity, respectively.

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



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

A slightly different configuration for claim maturity is presented in Table 3.8 and Figure 3.9. Total costs are shown for each service year but all services are grouped into one of four maturity groups. The 'In the First Year' group is for new injuries and sums the payments for all services that are provided in a service year to any claim within one year from the date of injury. Subsequent groups only account for services provided during that time frame for claims injured 'In the First Year.' For example, the 'In the Second Year' maturity group is for the previous year's injury claims and totals all services that are provided between 366 days and 730 days from the injury date, and so on. This second year group does not include any services given within one year of injury. This differs from injury year data, in that 'injury year data with 24-month maturity' includes all services from 0 to 730 days from the injury date.

Table 3.8: Total Cost by Service Year, by Maturity, Professional Services (Thousand Dollars)

Service Year	In the First Year	In the Second Year	In the Third Year	4th Year and Older	Total
2000	\$495,573	\$105,792	\$40,688	\$76,806	\$718,859
2001	\$528,692	\$127,838	\$49,047	\$80,458	\$786,034
2002	\$572,129	\$158,485	\$68,048	\$108,245	\$906,907
2003	\$516,303	\$137,786	\$62,648	\$106,363	\$823,100
2004	\$422,594	\$105,845	\$46,564	\$90,528	\$665,530
2005	\$454,256	\$96,487	\$42,570	\$100,202	\$693,515
2006	\$394,309	\$83,536	\$33,854	\$93,707	\$605,406
2007	\$392,499	\$74,420	\$30,049	\$83,826	\$580,794
2008	\$405,830	\$71,489	\$27,220	\$79,187	\$583,726
2009	\$418,949	\$78,865	\$28,335	\$84,828	\$610,977
2010	\$423,277	\$75,585	\$30,220	\$83,904	\$612,987
2011	\$486,503	\$76,994	\$30,211	\$92,351	\$686,060
2012	\$481,782	\$77,748	\$28,206	\$97,146	\$684,882
2013	\$468,861	\$70,220	\$28,337	\$92,084	\$659,502
2014	\$455,404	\$66,143	\$24,636	\$84,468	\$630,652
2015	\$416,837	\$67,970	\$24,418	\$78,029	\$587,255

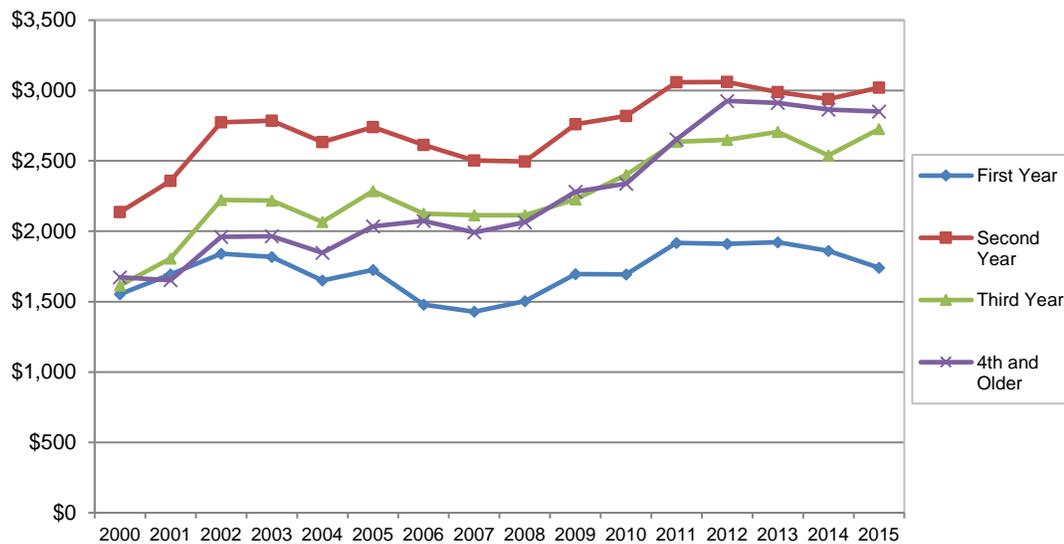
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

The majority of the claims (80 percent in 2015) are in the first-year maturity group since this includes most of the medical-only claims. The other three groups are mostly made up of lost-time claims. In terms of total cost, the majority of costs occurred for treating new claims in the first-year maturity group. Again we note that this measure is different from the injury year data in Table 3.7, since figures for the 12-months maturity in Table 3.7 are inclusive of the 6-months maturity data while the four groups in Table 3.8 each sums up a group of services that are mutually exclusive. Figure 3.9 shows the average cost for each maturity group (see Table C5 in the Appendix C for data).

Since there are more claims in the first year maturity group, their cost is the largest, reaching 72 percent of the total cost in 2015. Services for claims with four or more years of maturity accounted for 13 percent of the total cost in 2015. Cost shares of the second and third year maturity groups decreased while those of one year or less and four years or longer maturity groups increased since the early 2000s. Average cost is the highest in the second year (see Figure 3.9). This is most likely because surgeries and other major treatments are provided in the second year. In recent years, the average cost increased substantially for third year claims and those with four or more years of maturity. As the number of claims in the system decreased, remaining claims may be ones with more severe injuries and therefore with longer duration of care.

Note that these average costs are cumulative. For example, if a claim with a 2014 injury year receives medical care for two years, the average cost in the first two years is roughly \$4,761, which is the sum of \$1,740 for the first year services in 2014 and \$3,021 for the second year services in 2015.

Figure 3.9: Average Cost per Claim by Service Year, by Maturity, Professional Services



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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 3.9). These results are similar to 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 since Table 3.9 excludes old claims that were included in Table 3.6.

Table 3.9: Percent of Claims Receiving Certain Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury

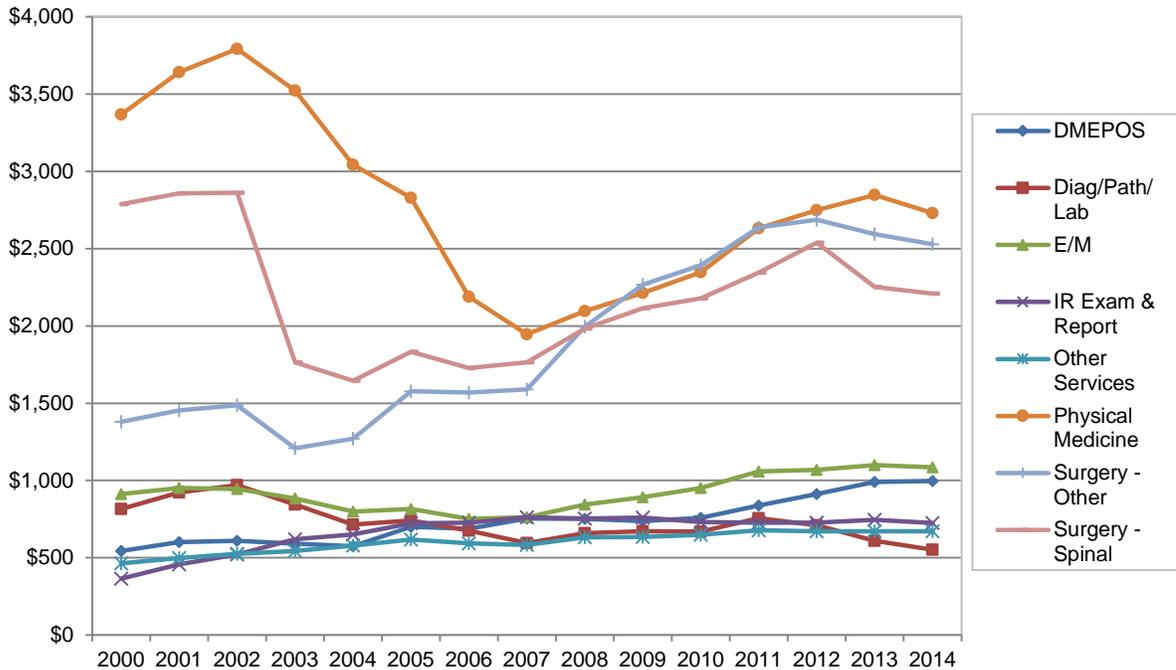
Injury Year	DMEPOS	Diag/Path/Lab	E/M	IR Exam & Report	Other Services	Physical Medicine	Surgery - Other	Surgery - Spinal
2000	47.1%	78.9%	95.0%	74.1%	55.8%	60.3%	39.1%	9.9%
2001	47.1%	80.1%	95.6%	79.7%	57.4%	62.3%	42.1%	10.9%
2002	52.0%	84.1%	97.0%	83.7%	61.0%	64.3%	45.0%	11.1%
2003	61.2%	85.5%	97.0%	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%	96.2%	86.6%	45.9%	62.5%	49.5%	8.4%
2006	65.6%	84.4%	96.4%	86.2%	45.7%	59.5%	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	64.7%	85.5%	97.9%	86.7%	44.8%	57.7%	49.1%	3.4%
2014	63.5%	84.4%	97.7%	86.8%	43.7%	57.7%	47.9%	3.0%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of cost by service type, average cost per lost-time claim increased the most for IR Exam & Report services, by 99 percent since 2000 (see Figure 3.10 and Table C6 in the Appendix C). This increase was in line with a 44 percent increase in the utilization of these services: from 5.9 services per claim for 2000 injury year to 8.5 services for 2015 injury year (see Figure 3.11 and Table C7 in the Appendix C). Surgery – Other and DMEPOS services also showed large increases in the average cost per claim and in utilization.

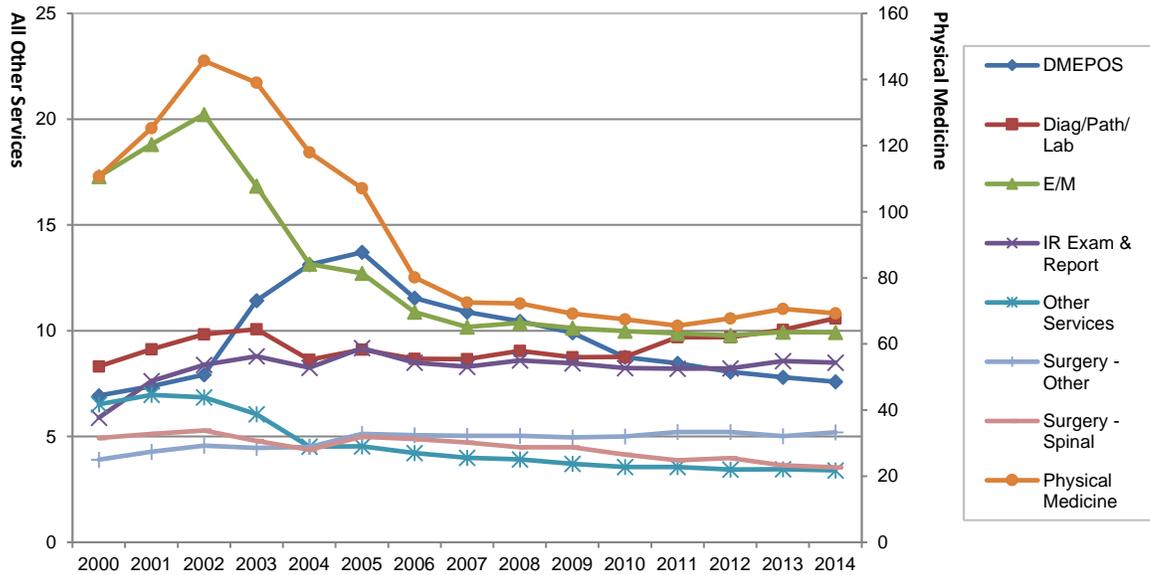
The average cost per claim for Physical Medicine services decreased significantly since its peak in 2002 with a corresponding decrease in the number of services per claim. For Physical Medicine services, the main factor in cost reduction appears to be the decrease in service intensity. The number of services per claim was highest in 2002, but it decreased by 53 percent by 2014. Since 2008, the average cost per claim increased significantly 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 3.10: Average Cost per Claim by Service Type, Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Figure 3.11: Number of Services per Claim, Professional Services, Lost-time Claims, by Injury Year at 12 Months after Injury



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Cost per Service by Injury Year for Selected Professional Services

For payment purposes, 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 account for the majority of costs. The top 10 services accounted for 41 percent of the total payments of \$6.9 billion from 2005 to 2015 while 52 percent and 73 percent of the total costs were associated with the top 20 and the top 100 services, respectively. The top 20 service codes in terms of total payments are shown in Table 3.10. They are mainly E/M, Physical Medicine, IR Exam & Report, and Diag/Path/Lab services.

Figures 3.12 shows average costs per service for selected services, normalized in the 2000 price (see Table C8 in Appendix C 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 so that cost patterns can be compared with each other. An appropriate length of maturity is selected for each service: 6 months for office visit, therapeutic exercises, and MRI; 12 months for disability exam and low back disc surgery; and 24 months for lumbar spine fusion, chronic pain management, and DME.

The cost per service increased significantly since 2000 for DME (527 percent of the 2000 price), office visit (220 percent), and lumbar spine fusion (201 percent). Office visit and surgery prices increased mainly because of fee schedule increases. For DME, a changing mix of supplies toward higher-cost items accounts for the increase. Another reason for the DME's high rate of increase is the low base it had in 2000: it changed from \$79 per claim in 2000 to \$416 in 2013.

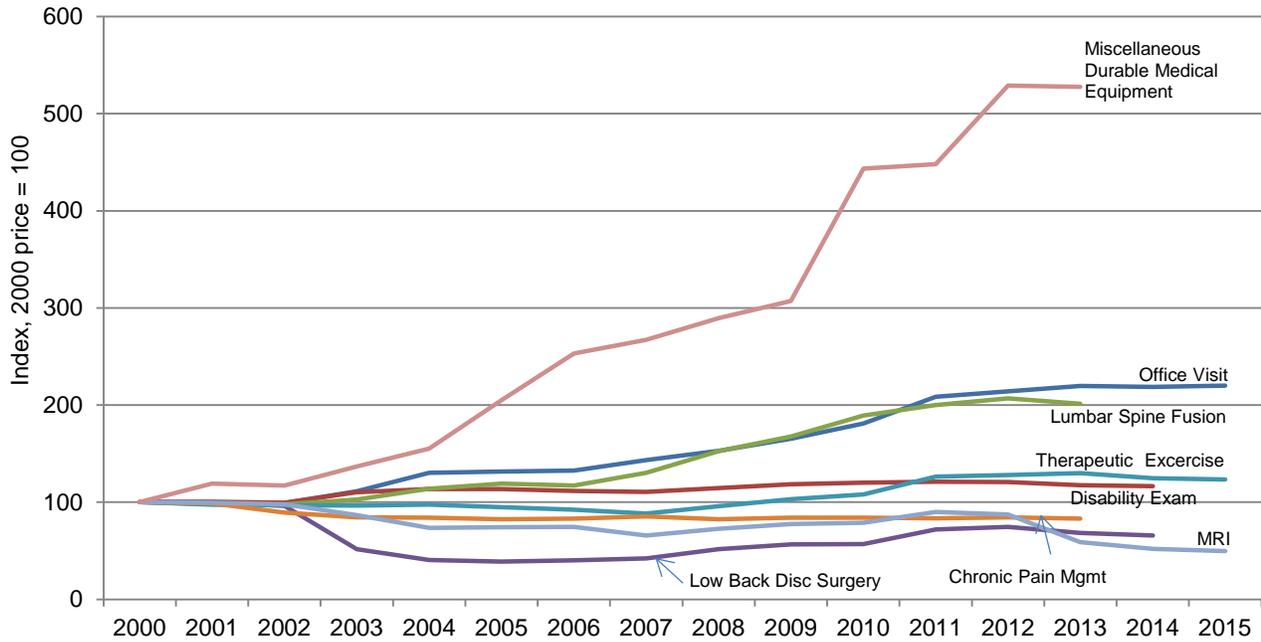
The cost per service for therapeutic exercise (124 percent) and disability exam (117 percent) increased moderately, while those for chronic pain management (83 percent), low back disc surgery (66 percent), and MRI (50 percent) decreased substantially. The decrease in MRI prices since 2012 was mainly due to decreased fees in the Medicare professional fee schedule.

Table 3.10: Top 20 Services by Total Payments in 2005–2015 Service Years

Rank	CPT/ HCPCS	Total Pay (Thousand Dollars)	Description
1	97110	\$662,644	Therapeutic procedure, one or more areas, each 15 minutes
2	99213	\$494,948	Office or other outpatient visit for evaluation and management of established patient
3	99456	\$445,968	Work related or medical disability exam by other than treating physician
4	97799	\$337,567	Unlisted physical medicine/rehabilitation service or procedure
5	99214	\$260,035	Office or other outpatient visit for evaluation and management of established patient
6	99204	\$162,520	Office or other outpatient visit for evaluation and management of new patient
7	99203	\$151,303	Office or other outpatient visit for evaluation and management of new patient
8	97140	\$128,364	Manual therapy techniques, one or more regions, each 15 minutes
9	97530	\$124,034	Therapeutic activities, direct patient contact by the provider
10	97750	\$113,520	Physical performance test or measurement, with written report, each 15 minutes
11	97112	\$107,368	Therapeutic procedure, one or more areas, each 15 minutes; neuromuscular reeducation
12	97546	\$92,136	Work hardening/conditioning; each additional hour
13	99080	\$86,845	Special reports such as insurance forms, more than the information conveyed in the usual medical communications or standard reporting form
14	99455	\$72,588	Work related or medical disability exam by treating physician
15	73721	\$69,746	Magnetic resonance imaging, any joint of lower extremity; without contrast material
16	73221	\$62,315	Magnetic resonance imaging, any joint of upper extremity; without contrast material
17	97001	\$59,272	Physical therapy evaluation
18	72148	\$57,628	Magnetic resonance imaging, spinal canal and contents, lumbar; without contrast material
19	99212	\$55,170	Office or other outpatient visit for evaluation and management of established patient
20	29827	\$50,164	Arthroscopy, rotator cuff repair

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Figure 3.12: Average Cost per Service by Injury Year, Normalized in 2000 Price Levels



Note: For chronic pain management, only bills with “CP” modifier are considered.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

4. COST AND UTILIZATION FOR 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 associated with hospital services. The majority of hospital bills (about 70 percent) are for services provided within the first six months from the injury date. Services at ambulatory surgery centers (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 2015.

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

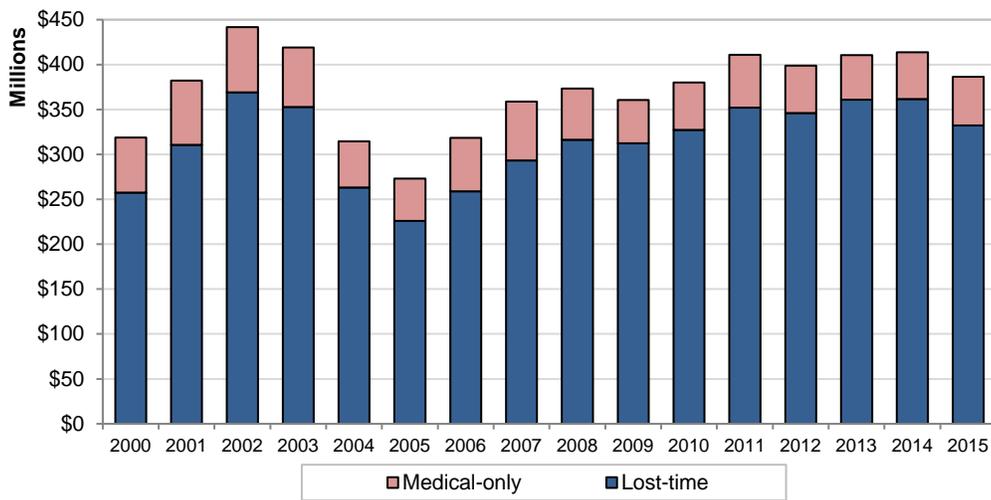
Service Year	Claims - Medical Combined	Claims - Hospital/Institutional*	Hospital/Institutional Claim Share	Lost-time Claims	Medical-only Claims
2000	418,817	127,244	30.4%	61,101	66,188
2001	417,852	130,651	31.3%	64,145	66,551
2002	422,383	137,649	32.6%	71,995	65,692
2003	385,815	126,988	32.9%	67,188	59,823
2004	344,611	106,447	30.9%	55,180	51,282
2005	366,323	92,037	25.1%	44,220	47,836
2006	362,724	98,727	27.2%	46,250	52,497
2007	366,960	103,460	28.2%	47,336	56,149
2008	357,134	100,056	28.0%	47,295	52,776
2009	326,946	92,274	28.2%	45,463	46,821
2010	324,905	94,314	29.0%	46,046	48,273
2011	323,864	96,080	29.7%	46,006	50,086
2012	320,003	90,741	28.4%	43,741	47,007
2013	309,209	87,222	28.2%	42,026	45,205
2014	306,255	86,616	28.3%	41,600	45,023
2015	296,611	82,630	27.9%	39,251	43,391

Note *: Total counts include a few claims that cannot be classified as either lost time or medical only.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016

Figure 4.1 presents a graph of total hospital costs by service year, summing lost-time and medical-only claims costs. In terms of claim type, lost-time claims accounted for between 45 percent and 50 percent in the number of claims, but they accounted for about 85 percent of the total cost in each service year. Medical-only claims, even when utilizing hospital or institutional services, used relatively low-cost services. After the 2002 peak of \$442 million, the total cost decreased substantially to \$273 million in 2005. But by 2011, it had increased to about \$410 million, decreasing slightly to \$386 million in 2015. Because the cost share of lost-time claims is so dominant, some tables and figures in this section will only consider lost-time claims.

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



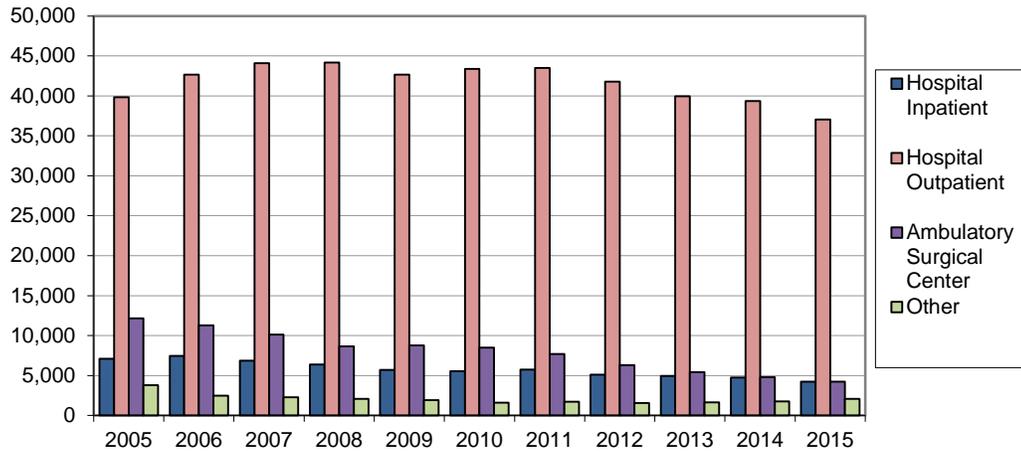
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

HOSPITAL/INSTITUTIONAL COSTS BY FACILITY TYPE

Facility codes in the hospital billing data separate bills by the type of institution (hospital or 'Other' including skilled nursing facility and home health care). Hospital bills are further separated by the nature of service location (inpatient or outpatient). We also show the data for ambulatory surgical centers (ASCs) from the professional services bills. This analysis focuses on the post-EDI period due to the availability of more reliable facility codes in the EDI 837 data.

Most lost-time claims received hospital outpatient services (see Figure 4.2). Hospital outpatient claims increased from 90 percent of all claims in 2005 to 94 percent in 2015. Out of about 40,000 unique lost-time claims in 2015, 4,227 claims received inpatient services, and 4,238 claims received services at ASCs. The share of claims receiving hospital inpatient services decreased from 16 percent (7,081 claims) to 11 percent (4,227) in the same period. Claims receiving services at ASCs also decreased, from 27 percent (12,138) in 2005 to 11 percent (4,238) in 2015.

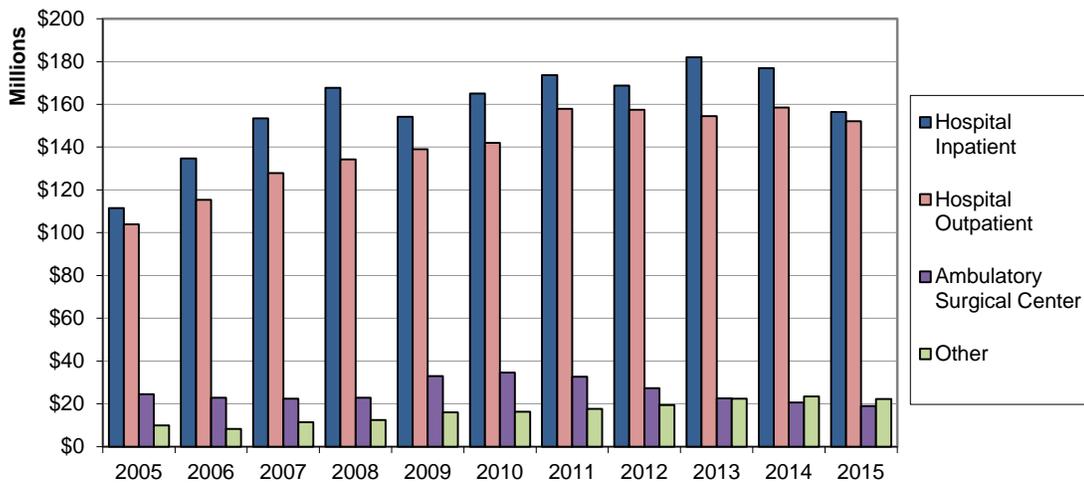
Figure 4.2: Number of Claims by Service Year, by Facility Type, Hospital/Institutional Services, Lost-time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Despite the fact that hospital outpatient services are the most commonly used services, total cost of hospital inpatient services is slightly greater than that of hospital outpatient services, 45 percent vs. 44 percent of the total, respectively, in 2015 (see Figure 4.3).

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

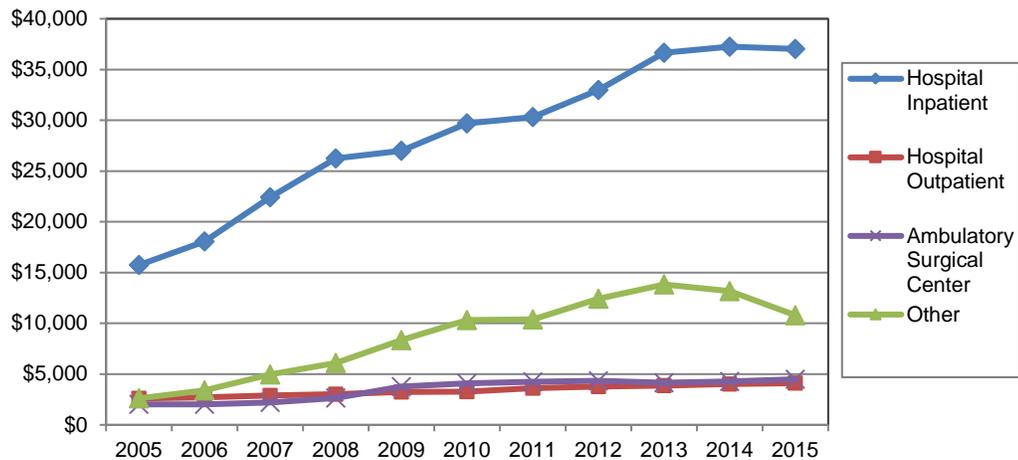


Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

The average cost per claim was much higher for hospital inpatient services, and it 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. The average cost of service at ASCs was 78 percent of hospital outpatient service in 2005. After the 2008 ASC fee guideline, it increased to 116 percent in 2009 and 109 percent in 2015. The most recent service year data indicates that hospital

costs continued to grow faster than professional costs. Average cost per claim for inpatient services increased by 9 percent in 2012, and by 11 percent in 2013, but increased by only one percent in the last two years. The rate of increase appears to be slowing.

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



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

HOSPITAL/INSTITUTIONAL COSTS BY INJURY YEAR

While costs by injury year show only partial pictures of the total costs by disregarding old and legacy claims, they may be more informative if the primary concern is for new injuries. Total cost for medical-only claims with 6-month maturity increased by 20 percent between 2005 and 2015 (see Table 4.2). Costs for lost-time claims with 6-month maturity increased by 53 percent in the same period.

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	\$122,050	\$167,289	\$228,320	\$42,218	\$49,051	\$56,709
2001	\$145,946	\$201,318	\$263,343	\$49,870	\$57,046	\$63,599
2002	\$158,696	\$213,070	\$263,181	\$44,413	\$50,560	\$55,358
2003	\$155,777	\$198,577	\$229,209	\$45,005	\$49,184	\$52,163
2004	\$113,582	\$137,703	\$165,826	\$36,953	\$39,695	\$41,923
2005	\$118,262	\$144,343	\$174,119	\$36,107	\$38,788	\$40,899
2006	\$146,428	\$175,663	\$205,567	\$43,211	\$45,745	\$47,925
2007	\$175,880	\$208,310	\$243,052	\$49,879	\$52,458	\$55,103
2008	\$182,768	\$220,501	\$260,903	\$41,875	\$43,634	\$45,384
2009	\$161,991	\$195,399	\$230,552	\$35,152	\$36,987	\$38,608
2010	\$177,720	\$212,613	\$247,625	\$39,008	\$41,105	\$43,254
2011	\$196,140	\$232,527	\$266,790	\$42,992	\$45,495	\$46,786
2012	\$193,733	\$228,530	\$262,136	\$40,659	\$42,454	\$43,762
2013	\$205,760	\$240,893	\$274,367	\$40,064	\$41,902	\$44,470
2014	\$210,903	\$247,140		\$43,309	\$45,060	
2015	\$181,496			\$43,386		

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

The number of claims decreased by more than 20 percent since 2000 for both lost-time and medical-only claims (see Table 4.3). Average cost per claim increased significantly for lost-time claims: 96 percent increase since 2000 for the 6-month maturity group, 92 percent for the 12-month group, and 84 percent for the 24-month group (see Table 4.4). It is difficult to calculate the per-service cost and per-claim utilization for hospital services because 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 6-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	33,930	38,049	41,070	60,068	61,410	62,363
2001	35,790	40,409	43,139	60,250	61,517	62,261
2002	38,017	41,945	43,743	59,108	60,007	60,482
2003	34,903	37,802	39,003	54,373	55,095	55,439
2004	29,429	31,470	32,767	47,427	47,919	48,195
2005	26,257	28,355	29,641	45,031	45,533	45,816
2006	28,652	30,586	31,560	49,499	50,015	50,249
2007	30,444	32,277	33,288	52,945	53,368	53,613
2008	31,093	33,015	33,991	49,959	50,350	50,550
2009	28,567	30,180	31,017	44,217	44,520	44,725
2010	30,300	31,957	32,720	45,928	46,270	46,447
2011	30,680	32,105	32,815	47,611	47,963	48,129
2012	29,033	30,400	31,023	44,702	44,997	45,152
2013	28,013	29,347	30,011	43,240	43,536	43,695
2014	27,987	29,347		42,953	43,277	
2015	25,691			41,578		

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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	\$3,597	\$4,397	\$5,559	\$703	\$799	\$909
2001	\$4,078	\$4,982	\$6,105	\$828	\$927	\$1,021
2002	\$4,174	\$5,080	\$6,017	\$751	\$843	\$915
2003	\$4,463	\$5,253	\$5,877	\$828	\$893	\$941
2004	\$3,860	\$4,376	\$5,061	\$779	\$828	\$870
2005	\$4,504	\$5,091	\$5,874	\$802	\$852	\$893
2006	\$5,111	\$5,743	\$6,514	\$873	\$915	\$954
2007	\$5,777	\$6,454	\$7,301	\$942	\$983	\$1,028
2008	\$5,878	\$6,679	\$7,676	\$838	\$867	\$898
2009	\$5,671	\$6,474	\$7,433	\$795	\$831	\$863
2010	\$5,865	\$6,653	\$7,568	\$849	\$888	\$931
2011	\$6,393	\$7,243	\$8,130	\$903	\$949	\$972
2012	\$6,673	\$7,517	\$8,450	\$910	\$943	\$969
2013	\$7,345	\$8,208	\$9,142	\$927	\$962	\$1,018
2014	\$7,536	\$8,421		\$1,008	\$1,041	
2015	\$7,065			\$1,043		

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

PROFESSIONAL AND HOSPITAL/INSTITUTIONAL COSTS COMBINED

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 and hospital costs. To facilitate comparisons with these types of reports, Table 4.5 presents the number of claims, the total cost, and the average cost per claim by claim type combining professional and hospital/institutional 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 2014/2015 claims, Texas' average cost was \$10,407 for claims with greater than seven days of lost time and \$1,105 for claims with seven days or less of lost time, combining professional and hospital costs. These compare closely with \$10,485 and \$1,095 for 2014 injury year in Table 4.5. 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. In terms of the number of claims, the share of 'greater than seven days of lost time' claims in the WCRI report was 24 percent of all claims while it was 25 percent for the lost-time claims in Table 4.5.

Table 4.5: Number of Claims, Total and Average Costs, Professional and Hospital/ Institutional Services Combined, by Injury Year at 12 Months after Injury

Injury Year	Lost-time Claims			Medical-only Claims		
	Number of Claims	Total Cost (Thousand Dollars)	Average Cost per Claim	Number of Claims	Total Cost (Thousand Dollars)	Average Cost per Claim
2000	75,304	\$541,979	\$7,197	208,055	\$176,099	\$846
2001	74,045	\$619,318	\$8,364	201,422	\$187,951	\$933
2002	71,778	\$651,429	\$9,076	193,757	\$174,851	\$902
2003	63,899	\$566,047	\$8,858	176,960	\$164,295	\$928
2004	61,574	\$455,428	\$7,396	163,987	\$144,512	\$881
2005	58,091	\$459,211	\$7,905	170,049	\$152,887	\$899
2006	57,510	\$453,200	\$7,880	177,468	\$159,947	\$901
2007	58,326	\$481,115	\$8,249	184,883	\$168,565	\$912
2008	59,423	\$524,437	\$8,825	178,669	\$157,379	\$881
2009	55,103	\$493,666	\$8,959	158,815	\$148,272	\$934
2010	57,616	\$533,221	\$9,255	162,751	\$159,719	\$981
2011	57,404	\$581,213	\$10,125	165,976	\$181,505	\$1,094
2012	55,433	\$569,136	\$10,267	165,930	\$179,225	\$1,080
2013	53,349	\$568,683	\$10,660	163,286	\$178,904	\$1,096
2014	53,862	\$564,745	\$10,485	164,342	\$179,936	\$1,095

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

5. COST AND UTILIZATION FOR 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 2015 (as illustrated in Table 2.3). The majority of the dental cost was for medical-only claims, but the average cost per claim for lost-time claims was about twice that for the medical-only claims. This ratio is relatively low compared to the pattern found in professional or pharmacy costs where lost-time claims have overwhelmingly dominant costs. The average cost per claim increased substantially since 2007: by 50 percent for lost-time claims and by 62 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	390	\$1,175,703	\$3,015	928	\$2,218,065	\$2,390
2009	341	\$1,438,228	\$4,218	893	\$1,968,461	\$2,204
2010	401	\$1,787,557	\$4,458	958	\$2,210,753	\$2,308
2011	383	\$1,761,779	\$4,600	995	\$2,654,650	\$2,668
2012	420	\$1,558,449	\$3,711	989	\$2,857,170	\$2,889
2013	435	\$1,942,068	\$4,465	1,035	\$2,667,416	\$2,577
2014	434	\$1,913,475	\$4,409	1,039	\$2,963,147	\$2,852
2015	418	\$1,862,611	\$4,456	1,018	\$3,285,905	\$3,228

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, 2016.

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

Table 5.2: Top 10 Dental Services, by Total Cost (2005–2015 Cumulative Totals)

Rank	HCPCS	Number of Claims	Total Cost	Procedure Description
1	D6010	1,008	\$4,750,910	Surgical placement of implant body: endosteal implant
2	D2740	1,668	\$2,854,973	Crown-porcelain/ceramic substrate
3	D3310	2,355	\$2,795,308	Endodontic therapy, anterior tooth (excluding final restoration)
4	D2750	1,343	\$2,487,573	Crown-porcelain fused to high noble metal
5	D6750	625	\$1,431,074	Crown-porcelain fused to high noble metal
6	D6240	713	\$1,190,482	Pontic-porcelain fused to high noble metal
7	D2751	576	\$1,101,528	Abutment supported porcelain fused to metal crown (high noble metal)
8	D2950	2,419	\$886,186	Core build-up, including any pins
9	D7210	1,568	\$848,601	Surgical removal of erupted tooth requiring elevation of mucoperiosteal flap and removal of bone and/or section of tooth
10	D9999	964	\$734,562	Unspecified adjunctive procedure, by report

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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 70 percent of the claims and 74 percent of the total payments, which is along the lines of the shares observed in the overall medical data. The geographical distribution for the dental claims and services are similar to those of other types of medical services.

Table 5.3: Number of Claims and Cost per Claim (2005–2015 Cumulative Totals), by HRR, Dental Services

HRR	Number of Claims	Total Cost	Cost per Claim
Odessa	240	\$1,259,226	\$5,247
Houston	2,478	\$10,140,674	\$4,092
Fort Worth	1,146	\$4,639,532	\$4,048
Dallas	1,914	\$7,254,702	\$3,790
Abilene	167	\$618,866	\$3,706
Longview	97	\$359,078	\$3,702
Bryan	105	\$386,735	\$3,683
Victoria	90	\$307,704	\$3,419
San Antonio	1,124	\$3,831,745	\$3,409
Lubbock	296	\$1,003,937	\$3,392
Tyler	280	\$857,071	\$3,061
Austin	674	\$2,040,682	\$3,028
Beaumont	199	\$600,464	\$3,017
McAllen	158	\$475,130	\$3,007
Wichita Falls	99	\$293,803	\$2,968
San Angelo	84	\$245,581	\$2,924
Temple	214	\$608,820	\$2,845
Corpus Christi	260	\$737,164	\$2,835
Harlingen	155	\$416,651	\$2,688
El Paso	277	\$649,153	\$2,344
Waco	170	\$372,154	\$2,189
Amarillo	307	\$633,291	\$2,063
Total	10,534	\$37,732,162	\$3,582
Sum of 5 Metro HRRs	7,336	\$27,907,335	\$3,804
Share of 5 Metro HRRs	69.6%	74.0%	

Note: Five metropolitan areas are highlighted.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

6. COST AND UTILIZATION FOR PHARMACY SERVICES

This section reports the total and average costs for pharmacy benefits from 2005 to 2015. These costs are further analyzed by the brand/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 (TAC), Chapter 134, Subchapter F. 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, open and closed formularies, rules pertaining to the transition to a closed formulary from an open 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 (AWP) with a multiplier (currently 1.25 for generic drugs and 1.09 for brand name drugs). 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 began implementing 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 November 2016, there are 179 drugs with the status of “N” in the drug formulary. Legacy claims— injuries that occurred prior to September 1, 2011—became subject to the closed formulary beginning September 1, 2013.

UTILIZATION OF PHARMACY SERVICES BY CLAIM TYPE

About 41 percent of all claims received at least one pharmacy service in 2015. Claims were about equally represented by lost-time and medical-only types (see Table 6.1). Both lost-time and medical-only claims decreased by 29 percent since 2005. Claims receiving pharmacy services decreased at a greater rate than the overall claims since 2011, indicating that the pharmacy closed formulary reduced pharmacy utilization.

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

Service Year	All Medical, Number of Claims	Pharmacy Lost-time Claims		Pharmacy Medical-only Claims	
		Number of Claims	Share in All Medical	Number of Claims	Share in All Medical
2005	366,323	93,496	25.5%	78,691	21.5%
2006	362,724	90,745	25.0%	80,942	22.3%
2007	366,960	91,094	24.8%	89,250	24.3%
2008	357,134	89,855	25.2%	85,754	24.0%
2009	326,946	85,858	26.3%	74,879	22.9%
2010	324,905	86,907	26.7%	73,690	22.7%
2011	323,864	85,259	26.3%	71,735	22.1%
2012	320,003	80,872	25.3%	69,582	21.7%
2013	309,209	76,199	24.6%	65,025	21.0%
2014	306,255	72,439	23.7%	60,314	19.7%
2015	296,611	66,491	22.4%	55,597	18.7%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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 \$90 million in 2015, accounting for 87 percent of the total pharmacy cost (see Table 6.2). Accordingly, the average pharmacy cost per claim for lost-time claims was about six 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 22 percent, total cost by 31 percent, and the cost per claim by 11 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	93,496	\$117,739	\$1,259	78,691	\$27,778	\$353
2006	90,745	\$122,476	\$1,350	80,942	\$29,349	\$363
2007	91,094	\$125,164	\$1,374	89,250	\$29,887	\$335
2008	89,855	\$131,958	\$1,469	85,754	\$27,564	\$321
2009	85,858	\$133,273	\$1,552	74,879	\$29,146	\$389
2010	86,907	\$134,802	\$1,551	73,690	\$24,955	\$339
2011	85,259	\$130,442	\$1,530	71,735	\$23,062	\$321
2012	80,872	\$120,203	\$1,486	69,582	\$19,683	\$283
2013	76,199	\$107,752	\$1,414	65,025	\$18,507	\$285
2014	72,439	\$96,546	\$1,333	60,314	\$14,847	\$246
2015	66,491	\$90,206	\$1,357	55,597	\$13,505	\$243

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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, we can separate all services into distinct maturity groups depending on how long each claim has been receiving WC benefits. Table 6.3 shows that, in 2015, 58 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 9 percent decrease from 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 15 percent of all claims while most claims were in their first year of treatment (see Table 6.4). The relatively large 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	\$27,401	\$13,602	\$11,543	\$92,972
2006	\$27,773	\$14,100	\$10,550	\$99,401
2007	\$31,541	\$13,603	\$10,361	\$99,546
2008	\$32,762	\$14,135	\$10,321	\$102,304
2009	\$33,740	\$15,976	\$11,072	\$101,631
2010	\$32,728	\$15,713	\$10,813	\$100,502
2011	\$30,687	\$14,045	\$10,343	\$98,427
2012	\$27,396	\$13,561	\$9,503	\$89,425
2013	\$25,647	\$11,724	\$8,741	\$80,147
2014	\$28,315	\$11,041	\$7,318	\$64,718
2015	\$25,804	\$10,711	\$6,617	\$60,577

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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	118,053	19,532	12,208	37,749
2006	119,933	18,587	10,806	36,834
2007	132,051	17,234	9,700	34,926
2008	129,223	17,108	9,126	32,942
2009	116,946	17,171	9,153	30,649
2010	118,877	15,767	8,765	29,412
2011	118,793	14,454	7,710	27,702
2012	114,842	13,946	7,022	25,624
2013	108,003	12,913	6,598	23,643
2014	102,970	11,674	5,994	21,130
2015	94,657	11,263	5,337	19,062

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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	\$232	\$696	\$946	\$2,463
2006	\$232	\$759	\$976	\$2,699
2007	\$239	\$789	\$1,068	\$2,850
2008	\$254	\$826	\$1,131	\$3,106
2009	\$289	\$930	\$1,210	\$3,316
2010	\$275	\$997	\$1,234	\$3,417
2011	\$258	\$972	\$1,342	\$3,553
2012	\$239	\$972	\$1,353	\$3,490
2013	\$237	\$908	\$1,325	\$3,390
2014	\$275	\$946	\$1,221	\$3,063
2015	\$273	\$951	\$1,240	\$3,178

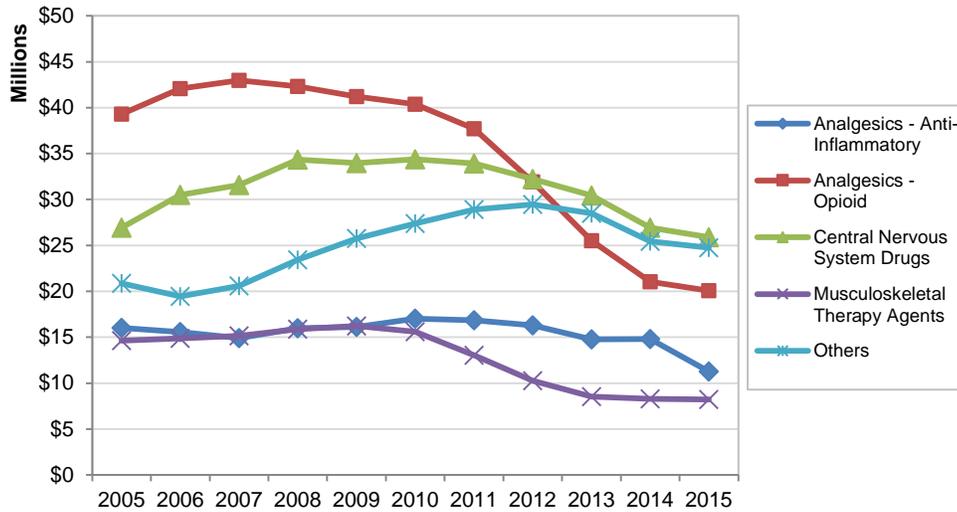
Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

PHARMACY COST AND UTILIZATION BY DRUG GROUP

Drugs are classified into five major groups: Analgesics – Anti-Inflammatory including the so-called 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. Although we grouped anticonvulsants with the CNS Drugs following the Therapeutic Classification System used by Medi-Span, they may be clinically classified with musculoskeletal therapy agents. Anticonvulsants—mainly Gabapentin, Lyrica, Topamax, and Neurontin—account for about half of the total cost within the CNS Drugs group. In the 'Others' group are all remaining drugs including dermatologicals, pharmaceutical chemicals and adjuvants, ulcer drugs, and corticosteroids.

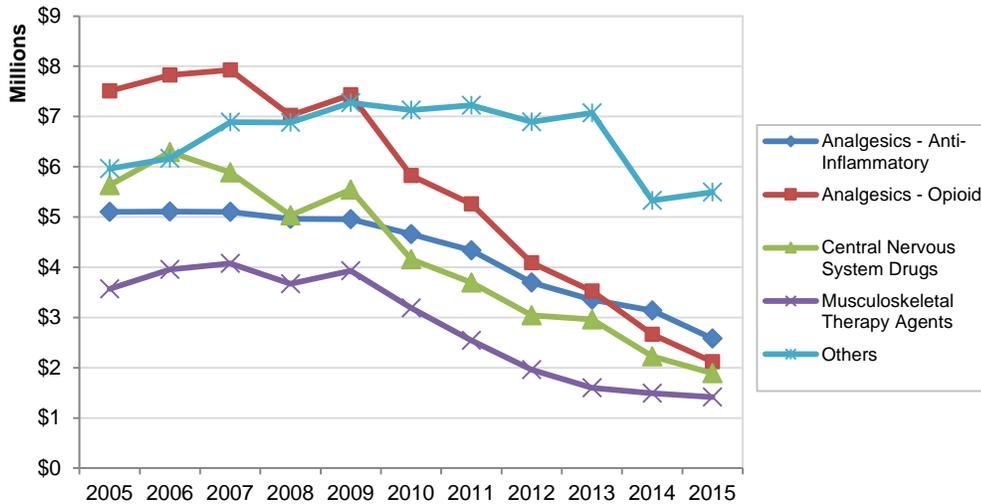
The four named drug groups accounted for 73 percent of the total pharmacy costs for lost-time claims, and 59 percent of medical-only claims costs in 2015 (see Figures 6.1 and 6.2). Among lost-time claims, the total costs of all drug groups decreased since 2010. The most significant factor in the decrease was the pharmacy closed formulary. Notably, total costs of Analgesics – Opioid and Musculoskeletal Therapy Agents decreased by 50 percent and 47 percent, respectively, since 2010. Although relatively small, the total costs for medical-only claims also decreased significantly. 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.

Figure 6.1: Total Pharmacy Cost, by Service Year by Drug Group, Lost-time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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

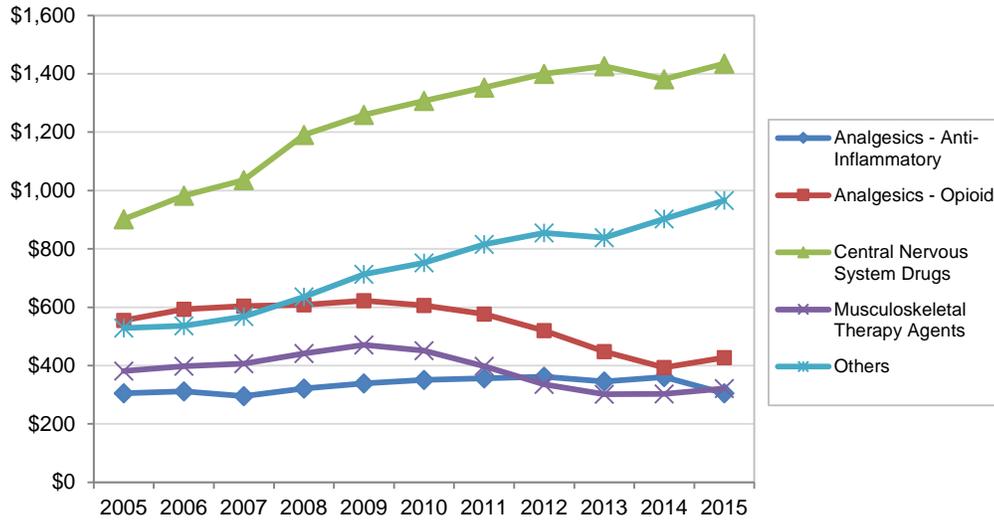


Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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. It 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' group increased moderately, while average costs for Analgesics and Musculoskeletal Therapy

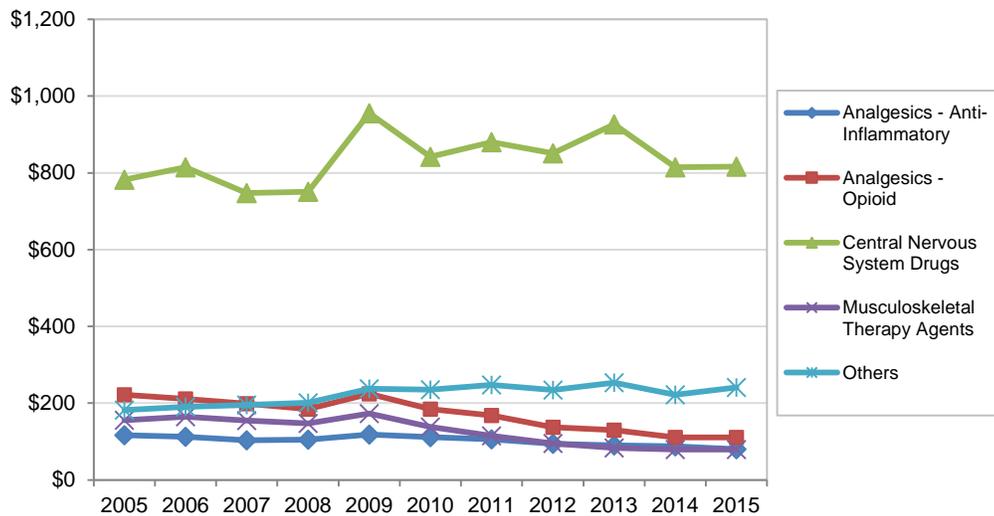
Agents remained relatively stable. The average cost per claim for opioids decreased since 2010 by 30 percent among lost-time claims and by 40 percent among medical-only claims. The share of claims receiving certain drugs was the lowest for CNS Drugs for both claim types (see Table 6.6).

Figure 6.3: Average Pharmacy Cost per Claim, by Service Year by Drug Group, Lost-time Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Figure 6.4: Average Pharmacy Cost per Claim, by Service Year by Drug Group, Medical-only Claims



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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

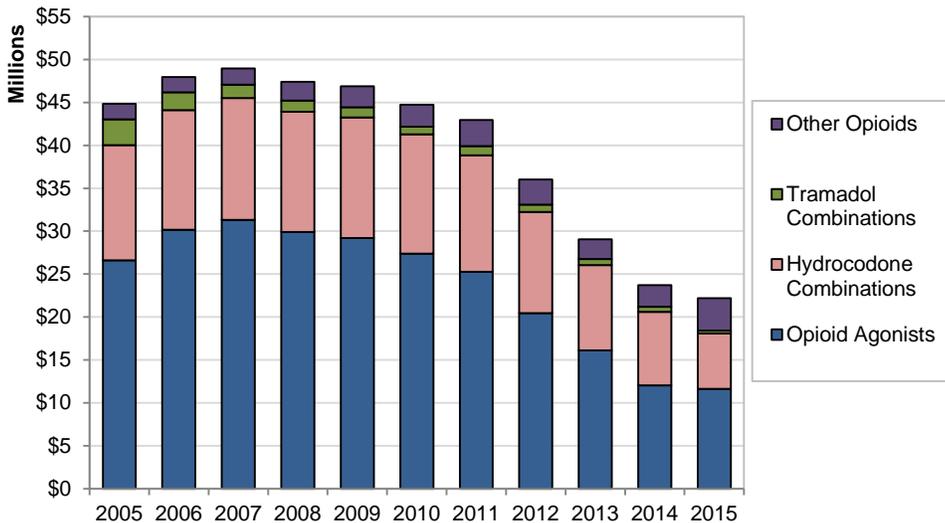
Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Lost-time Claims											
Analgesics - Anti-Inflammatory	56.1%	55.2%	55.4%	55.3%	55.4%	55.8%	55.5%	55.7%	56.2%	56.7%	55.6%
Analgesics - Opioid	75.8%	78.2%	78.1%	77.4%	77.1%	76.6%	76.7%	75.9%	74.8%	74.0%	70.7%
Central Nervous System Drugs	32.0%	34.2%	33.5%	32.1%	31.4%	30.3%	29.4%	28.5%	28.0%	26.9%	27.2%
Musculoskeletal Therapy Agents	41.0%	41.2%	40.9%	40.0%	40.1%	39.9%	38.5%	37.8%	37.1%	37.9%	38.5%
Others	42.2%	39.9%	39.8%	41.0%	42.1%	41.9%	41.6%	42.7%	44.6%	38.9%	38.5%
Medical-only Claims											
Analgesics - Anti-Inflammatory	55.7%	56.0%	55.5%	55.3%	56.0%	56.6%	57.0%	56.6%	57.4%	59.4%	57.9%
Analgesics - Opioid	43.0%	45.8%	44.8%	44.4%	44.3%	42.9%	43.7%	42.9%	41.6%	39.9%	34.5%
Central Nervous System Drugs	9.2%	9.5%	8.8%	7.8%	7.7%	6.7%	5.9%	5.1%	4.9%	4.5%	4.2%
Musculoskeletal Therapy Agents	29.2%	29.6%	29.5%	29.1%	30.3%	31.3%	30.9%	29.8%	29.5%	31.2%	32.1%
Others	41.6%	40.0%	39.5%	39.9%	41.0%	41.2%	40.7%	42.2%	43.0%	39.8%	41.0%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

While CNS Drugs had the highest average cost per claim, Analgesics – Opioid group drugs were the most costly in terms of total cost at \$43 million in 2011. In 2015, the total cost of opioids decreased to \$24 million while total costs of CNS and ‘Others’ drug groups were about \$30 million each (see Table C2 in the Appendix C for data).

The Analgesics – Opioid drug group can be further classified into four 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 2015, followed by the ‘hydrocodone combinations’ subclass with 29 percent (see Figure 6.5).

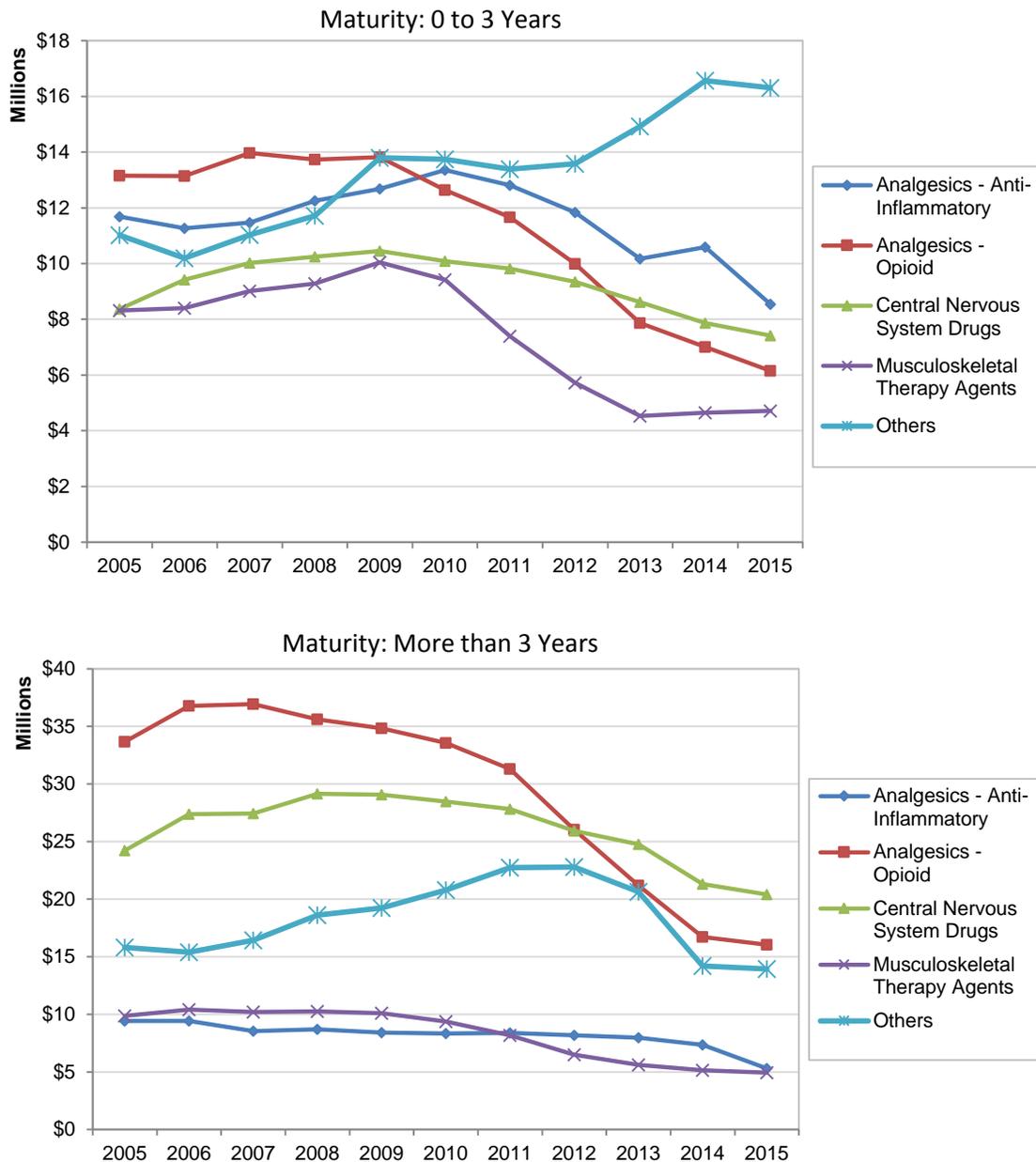
Figure 6.5: Costs of Opioids by Service Year, by Drug Subclass



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of maturity, pharmacy services serve more long-term claims than professional or hospital services. To explore differences by maturity, we compared services within the first three years (36 months) after injury with services for older injuries with more than three years maturity—defined here as “legacy claims.” Figure 6.6 presents total cost by drug group broken down by maturity (see Table C9 in the Appendix C for data), showing totals of lost-time and medical-only claims. Note that there are more medical-only claims in the ‘0 to 3 Years’ maturity group, while those in the ‘more than 3 years maturity’ are mostly lost-time claims.

Figure 6.6: Total Cost by Service Year, by Drug Group



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

For legacy claims, the Analgesics – Opioid group was the most costly drug group in terms of total cost until 2011 before the closed formulary, but its cost decreased rapidly after the pharmacy closed formulary became effective. For claims with up to three years maturity, opioids were also the most costly drugs until 2009, but its cost decreased by 56 percent between 2009 and 2015.

For legacy claims, the average cost per prescription was highest for the Analgesics – Opioid group since 2005, but by 2010, per-prescription cost of 'Others' and CNS Drugs were higher than that of the Analgesics – Opioid group (see Table 6.7). Among the '0 to 3 Years' maturity group, CNS Drugs were the most costly per prescription in all years. The high and increasing average cost of the 'Others' drug group may be in part due to the inclusion of compounded drugs in this group.

Table 6.7: Average Cost per Prescription by Service Year, by Drug Group by Maturity

Maturity	Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0 to 3 Years	Analgesics - Anti-Inflammatory	\$69	\$65	\$63	\$69	\$76	\$78	\$75	\$74	\$68	\$73	\$69
	Analgesics - Opioid	\$46	\$46	\$48	\$48	\$50	\$47	\$44	\$42	\$38	\$37	\$42
	Central Nervous System Drugs	\$92	\$98	\$108	\$119	\$123	\$125	\$126	\$139	\$150	\$149	\$156
	Musculoskeletal Therapy Agents	\$69	\$70	\$73	\$80	\$88	\$82	\$68	\$60	\$52	\$53	\$61
	Others	\$68	\$58	\$58	\$74	\$95	\$99	\$97	\$97	\$117	\$137	\$154
More than 3 Years	Analgesics - Anti-Inflammatory	\$109	\$107	\$108	\$116	\$121	\$124	\$129	\$140	\$148	\$154	\$132
	Analgesics - Opioid	\$131	\$141	\$151	\$150	\$149	\$147	\$144	\$137	\$126	\$114	\$128
	Central Nervous System Drugs	\$117	\$122	\$129	\$140	\$145	\$148	\$153	\$165	\$185	\$199	\$212
	Musculoskeletal Therapy Agents	\$92	\$95	\$101	\$108	\$111	\$109	\$103	\$96	\$95	\$101	\$110
	Others	\$109	\$98	\$109	\$133	\$155	\$166	\$173	\$185	\$195	\$200	\$222

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of the average cost per claim, CNS Drugs were also the costliest (see Table 6.8). Cost increases were greater for legacy claims than for new injury claims. Per-claim cost for CNS drugs among legacy claims grew by 65 percent since 2005, 'Others' drug group by 109 percent, and Analgesics – Anti-inflammatory drugs by 34 percent. The significant decrease in the price and cost of Analgesics – Anti-inflammatory drugs in 2015 was in part due to the availability of generic version (celecoxib) of Celebrex, one of the most commonly used NSAID drugs, from June 2014. Average cost per claim for Analgesics – Opioid drugs decreased by 30 percent and 4 percent among new and legacy claims, respectively, mostly since 2011.

Table 6.8: Average Cost per Claim by Service Year, by Drug Group by Maturity

Maturity	Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0 to 3 Years	Analgesics - Anti-Inflammatory	\$147	\$141	\$134	\$146	\$163	\$169	\$165	\$158	\$143	\$154	\$138
	Analgesics - Opioid	\$168	\$161	\$163	\$164	\$179	\$164	\$152	\$137	\$117	\$112	\$117
	Central Nervous System Drugs	\$431	\$468	\$496	\$547	\$602	\$612	\$631	\$675	\$680	\$644	\$663
	Musculoskeletal Therapy Agents	\$183	\$184	\$185	\$196	\$225	\$205	\$167	\$138	\$118	\$121	\$130
	Others	\$193	\$187	\$191	\$202	\$254	\$250	\$250	\$257	\$292	\$368	\$389
More than 3 Years	Analgesics - Anti-Inflammatory	\$521	\$567	\$555	\$628	\$667	\$703	\$760	\$791	\$821	\$856	\$697
	Analgesics - Opioid	\$1,173	\$1,279	\$1,355	\$1,394	\$1,459	\$1,475	\$1,471	\$1,328	\$1,159	\$1,030	\$1,122
	Central Nervous System Drugs	\$1,269	\$1,376	\$1,417	\$1,628	\$1,771	\$1,812	\$1,893	\$1,913	\$1,971	\$2,002	\$2,096
	Musculoskeletal Therapy Agents	\$578	\$625	\$642	\$713	\$761	\$748	\$717	\$629	\$587	\$626	\$658
	Others	\$995	\$1,048	\$1,162	\$1,366	\$1,471	\$1,684	\$1,948	\$1,993	\$1,831	\$1,904	\$2,078

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

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. Table 6.9 shows that lost-time claims accounted for about 80 percent of the total cost in 2005 and 87 percent in 2015. Among lost-time claims, generic drugs accounted for 68 percent of the total cost in 2015. The number of claims receiving brand-name drugs decreased significantly, 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 cost per claim (shown earlier in Table 6.2) would be some combination of the two averages in Table 6.9.

The number of claims receiving brand name drugs and total cost decreased substantially in both new and legacy groups especially after the 2011 pharmacy closed formulary (see Table 6.10). The number of claims receiving generic drugs fluctuated moderately in the 0 to 3 year maturity claim group with noticeable decreases after 2011. Average per-claim and per-prescription costs increased substantially in all maturity groups.

Table 6.9: 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	\$57,838	353,030	54,298	\$164	\$1,065	\$53,587	832,137	84,914	\$64	\$631
2006	\$62,063	352,091	50,363	\$176	\$1,232	\$57,895	900,785	85,453	\$64	\$678
2007	\$62,336	326,170	47,526	\$191	\$1,312	\$60,056	897,028	86,338	\$67	\$696
2008	\$71,153	333,442	46,468	\$213	\$1,531	\$58,337	878,332	84,982	\$66	\$686
2009	\$72,366	312,304	42,912	\$232	\$1,686	\$57,960	847,743	81,137	\$68	\$714
2010	\$70,668	283,948	39,370	\$249	\$1,795	\$61,288	876,951	82,766	\$70	\$740
2011	\$64,172	238,702	33,554	\$269	\$1,912	\$62,386	892,039	81,816	\$70	\$763
2012	\$53,482	184,701	26,992	\$290	\$1,981	\$61,592	831,626	78,018	\$74	\$789
2013	\$45,058	144,727	23,241	\$311	\$1,939	\$57,936	746,583	73,795	\$78	\$785
2014	\$32,166	97,821	18,773	\$329	\$1,713	\$61,482	720,912	70,863	\$85	\$868
2015	\$28,061	70,489	13,761	\$398	\$2,039	\$59,013	623,856	65,217	\$95	\$905
Medical-only Claims										
2005	\$14,816	109,741	32,080	\$135	\$462	\$12,280	251,868	67,543	\$49	\$182
2006	\$15,390	103,896	29,603	\$148	\$520	\$13,687	276,246	72,851	\$50	\$188
2007	\$14,949	92,257	29,578	\$162	\$505	\$14,338	284,647	80,943	\$50	\$177
2008	\$14,174	79,399	28,076	\$179	\$505	\$12,638	246,887	77,689	\$51	\$163
2009	\$15,084	74,629	22,940	\$202	\$658	\$13,418	237,048	68,411	\$57	\$196
2010	\$11,893	54,942	18,191	\$216	\$654	\$12,087	223,959	68,364	\$54	\$177
2011	\$9,982	41,527	12,777	\$240	\$781	\$11,704	223,164	67,781	\$52	\$173
2012	\$7,070	27,015	8,526	\$262	\$829	\$10,831	205,399	66,625	\$53	\$163
2013	\$6,690	22,210	7,177	\$301	\$932	\$10,496	189,081	62,467	\$56	\$168
2014	\$4,911	14,500	5,885	\$339	\$834	\$9,710	174,133	58,484	\$56	\$166
2015	\$4,370	10,244	4,503	\$427	\$971	\$8,787	147,276	53,930	\$60	\$163

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 6.10: Total and Average Costs, by Generic Status by Maturity

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
0 to 3 Years										
2005	\$23,229	194,382	62,027	\$120	\$374	\$25,886	586,751	121,558	\$44	\$213
2006	\$23,955	181,848	56,385	\$132	\$425	\$26,983	634,657	126,891	\$43	\$213
2007	\$24,782	173,385	55,512	\$143	\$446	\$29,258	669,591	137,252	\$44	\$213
2008	\$27,530	171,996	54,609	\$160	\$504	\$28,853	635,472	134,445	\$45	\$215
2009	\$28,787	159,683	47,756	\$180	\$603	\$30,540	611,824	123,355	\$50	\$248
2010	\$25,792	135,135	40,840	\$191	\$632	\$32,419	628,973	125,876	\$52	\$258
2011	\$20,704	102,767	31,471	\$201	\$658	\$33,420	646,208	125,827	\$52	\$266
2012	\$15,610	70,781	22,347	\$221	\$699	\$33,302	612,243	122,443	\$54	\$272
2013	\$13,472	55,280	18,946	\$244	\$711	\$30,717	552,796	115,427	\$56	\$266
2014	\$12,265	44,968	16,466	\$273	\$745	\$32,777	546,163	110,527	\$60	\$297
2015	\$11,180	32,011	12,147	\$349	\$920	\$30,016	458,559	101,898	\$65	\$295
More than 3 Years										
2005	\$49,426	268,389	26,222	\$184	\$1,885	\$39,982	497,254	33,689	\$80	\$1,187
2006	\$53,497	274,138	25,041	\$195	\$2,136	\$44,600	542,374	33,980	\$82	\$1,313
2007	\$52,503	245,042	22,913	\$214	\$2,291	\$45,136	512,084	32,339	\$88	\$1,396
2008	\$57,797	240,843	21,170	\$240	\$2,730	\$42,122	489,747	30,291	\$86	\$1,391
2009	\$58,663	227,250	19,248	\$258	\$3,048	\$40,838	472,967	28,205	\$86	\$1,448
2010	\$56,768	203,755	17,754	\$279	\$3,197	\$40,955	471,936	27,206	\$87	\$1,505
2011	\$53,449	177,459	15,795	\$301	\$3,384	\$40,669	468,956	25,718	\$87	\$1,581
2012	\$44,942	140,935	13,930	\$319	\$3,226	\$39,121	424,770	23,888	\$92	\$1,638
2013	\$38,275	111,657	12,050	\$343	\$3,176	\$37,715	382,856	22,419	\$99	\$1,682
2014	\$24,811	67,351	8,597	\$368	\$2,886	\$38,415	348,876	20,278	\$110	\$1,894
2015	\$21,251	48,717	6,384	\$436	\$3,329	\$37,782	312,528	18,436	\$121	\$2,049

Note: Rx = prescription.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of pharmacy utilization, the average number of prescriptions increased for generic drugs (see Table 6.11). For legacy claims, the average number of generic prescriptions per claim increased by 15 percent since 2005 while brand drugs decreased by 25 percent, mostly in 2015. For generic drugs, the primary reason for the increase in the drug cost per claim was the increase in utilization. For brand drugs, the increase in the average cost per claim was largely due to increases in the average cost per prescription.

Table 6.11: Average Number of Prescriptions per Claim, by Generic Status by Maturity

Maturity	Drug Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0 to 3 Years	Brand	3.1	3.2	3.1	3.1	3.3	3.3	3.3	3.2	2.9	2.7	2.6
	Generic	4.8	5.0	4.9	4.7	5.0	5.0	5.1	5.0	4.8	4.9	4.5
More than 3 Years	Brand	10.2	10.9	10.7	11.4	11.8	11.5	11.2	10.1	9.3	7.8	7.6
	Generic	14.8	16.0	15.8	16.2	16.8	17.3	18.2	17.8	17.1	17.2	17.0

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Overall, the use of generic drugs in lieu of brand name drugs is indicated by the increasing share of generics in the total cost and utilization. Table 6.12 shows that the share of generic drugs continued to increase since 2005 in terms of the number of prescription for both new and legacy claims. However, in terms of total cost, the share of generic drugs increased only slightly until 2008 for both new and legacy claims, mainly because of the lower cost of generic drugs. Since 2008, shares of generic drugs increased in the number of prescriptions and in the total cost.

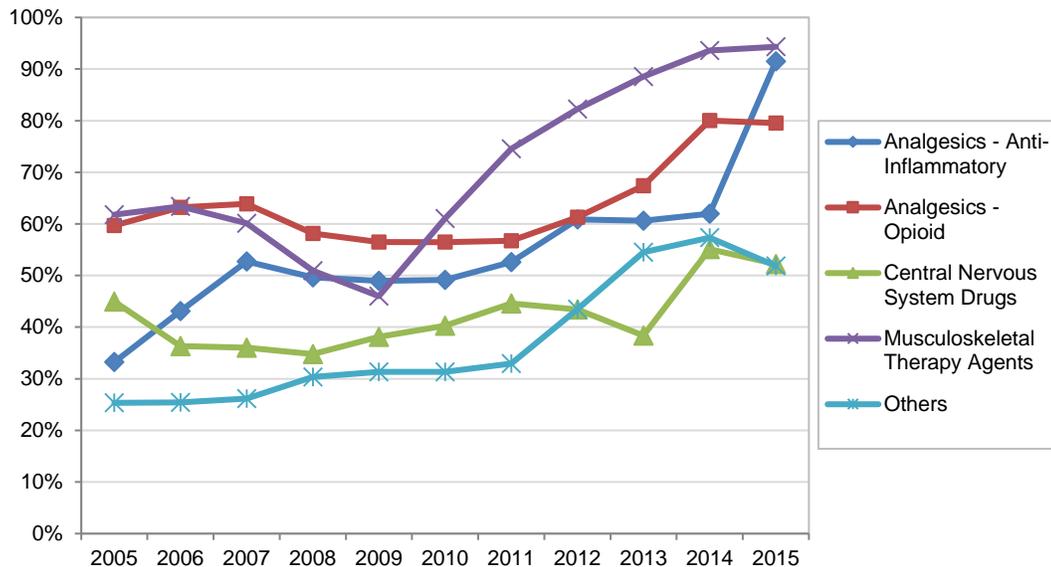
Table 6.12: Shares of Generic Drugs, by Service Year by Maturity

Maturity	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
By Number of Prescription											
0 to 3 Years	75.1%	77.7%	79.4%	78.7%	79.3%	82.3%	86.3%	89.6%	90.9%	92.4%	93.5%
More than 3 Years	64.9%	66.4%	67.6%	67.0%	67.5%	69.8%	72.5%	75.1%	77.4%	83.8%	86.5%
By Total Cost											
0 to 3 Years	52.7%	53.0%	54.1%	51.2%	51.5%	55.7%	61.7%	68.1%	69.5%	72.8%	72.9%
More than 3 Years	44.7%	45.5%	46.2%	42.2%	41.0%	41.9%	43.2%	46.5%	49.6%	60.8%	64.0%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of drug group, the generic substitution rate increased in all groups since the 2011 pharmacy closed formulary (see Figure 6.7). The Musculoskeletal Therapy Agents drug group had the highest rate of generic substitution in 2015 at 94 percent, after increasing rapidly since 2009. The generic substitution rate of the Analgesics – Opioid drug group fluctuated around 60 percent until 2011, but increased rapidly to 67 percent in 2013 and to 80 percent in 2015. The generic rate for the Analgesics—Anti-inflammatory drugs increased from 62 percent in 2014 to 92 percent in 2015 because of the availability of the generic versions of the most commonly used NSAID celecoxib from June 2014.

Figure 6.7: Generic Drug's Share in Total Cost, by Service Year by Drug Group



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

EFFECTS OF THE PHARMACY CLOSED FORMULARY

The pharmacy closed formulary that went into effect on September 1, 2011, and updated monthly, currently contains approximately 179 chemical drugs with 'N' drug status which requires preauthorization. One hundred and three of these have generic equivalents, and 45 of them are opioids and related drugs. Drugs with a 'Y' status 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 in the bills with compounded drugs such as chemicals and compounding fees.

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 uses decreased significantly 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 6.13). In 2015, only 5 percent of the claims received N-drugs. In terms of cost, N-drug cost was 47 percent and 37 percent of the total pharmacy cost for lost-time claims and medical-only claims, respectively, in 2011. N-drug cost was significantly lower in 2015, accounting for 7 percent of the total cost for both lost-time and medical-only claims.

The average cost per claim was considerably higher for lost-time claims due to their longer service duration and resulting higher utilization than medical-only claims. Among lost-time claims, the average cost of N-drugs per claim was about 50 percent higher than that of Y-drugs in 2015. The per-prescription cost for N-drugs was 161 percent higher than Y-drugs. Among medical-only claims, the average cost of N-drugs per claim also increased substantially while the absolute number of claims and total cost decreased. 'Other' drugs are those with missing drug codes or whose status cannot be identified by the formulary drug list by NDC code. The total cost of 'Other' drugs increased by 66 percent since 2011, from \$22 million to \$38 million.

Table 6.13: Total and Average Costs, by N-drug Status by Claim Type

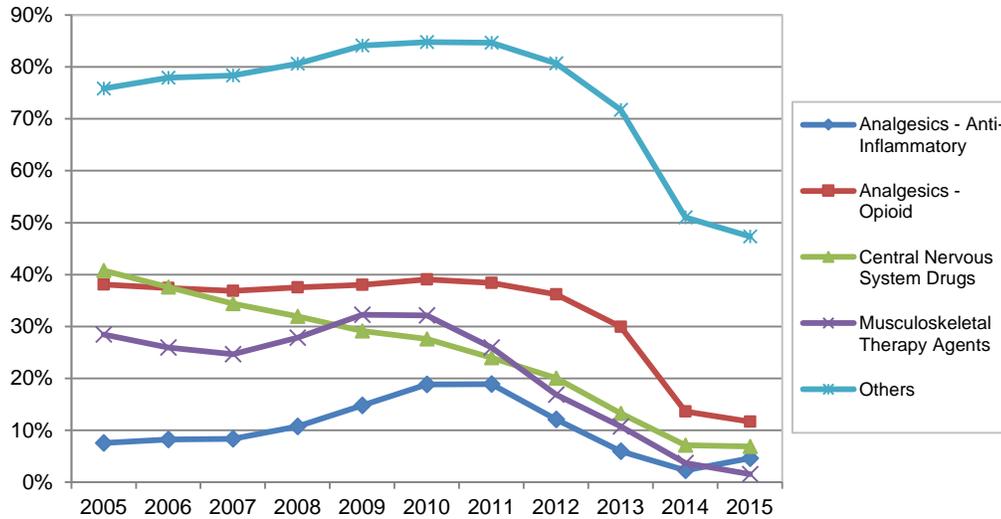
Service Year	N-drug				Y-drug				Other			
	Total Cost ('000 Dollars)	Claims	Avg. Cost per Rx	Avg. Cost per Claim	Total Cost ('000 Dollars)	Claims	Avg. Cost per Rx	Avg. Cost per Claim	Total Cost ('000 Dollars)	Claims	Avg. Cost per Rx	Avg. Cost per Claim
Lost-time Claims												
2005	\$33,959	43,990	\$115	\$772	\$58,851	84,069	\$83	\$700	\$24,928	40,741	\$98	\$612
2006	\$36,678	43,475	\$123	\$844	\$63,508	83,353	\$86	\$762	\$22,290	35,209	\$81	\$633
2007	\$37,457	42,915	\$133	\$873	\$67,067	84,202	\$91	\$796	\$20,641	32,642	\$80	\$632
2008	\$40,986	42,544	\$146	\$963	\$72,157	83,502	\$94	\$864	\$18,816	27,692	\$96	\$679
2009	\$43,059	41,001	\$158	\$1,050	\$71,946	80,234	\$94	\$897	\$18,268	22,151	\$122	\$825
2010	\$45,360	40,596	\$169	\$1,117	\$72,137	81,404	\$92	\$886	\$17,304	19,599	\$128	\$883
2011	\$41,524	31,438	\$191	\$1,321	\$70,919	81,216	\$88	\$873	\$17,999	17,908	\$127	\$1,005
2012	\$31,500	20,997	\$204	\$1,500	\$66,393	77,469	\$89	\$857	\$22,310	19,783	\$144	\$1,128
2013	\$18,933	13,355	\$230	\$1,418	\$63,812	73,245	\$91	\$871	\$25,007	22,340	\$173	\$1,119
2014	\$7,169	5,807	\$264	\$1,235	\$61,903	69,987	\$94	\$884	\$27,474	22,060	\$191	\$1,245
2015	\$5,847	4,630	\$264	\$1,263	\$52,426	62,112	\$101	\$844	\$31,932	29,550	\$189	\$1,081
Medical-only Claims												
2005	\$7,090	16,633	\$101	\$426	\$14,592	63,521	\$65	\$230	\$6,096	29,558	\$78	\$206
2006	\$7,316	17,843	\$102	\$410	\$16,096	67,014	\$68	\$240	\$5,937	28,056	\$75	\$212
2007	\$7,212	18,476	\$111	\$390	\$16,524	74,531	\$69	\$222	\$6,152	28,157	\$74	\$218
2008	\$7,362	18,541	\$132	\$397	\$15,110	72,869	\$69	\$207	\$5,092	22,747	\$82	\$224
2009	\$8,524	17,520	\$147	\$487	\$15,455	65,187	\$72	\$237	\$5,167	15,841	\$110	\$326
2010	\$7,287	15,998	\$153	\$456	\$13,019	64,620	\$66	\$201	\$4,649	14,394	\$110	\$323
2011	\$6,182	10,343	\$180	\$598	\$12,139	64,505	\$60	\$188	\$4,741	12,983	\$116	\$365
2012	\$3,827	3,991	\$213	\$959	\$10,796	63,366	\$58	\$170	\$5,060	13,700	\$128	\$369
2013	\$3,041	2,466	\$257	\$1,233	\$9,888	59,198	\$57	\$167	\$5,577	13,781	\$148	\$405
2014	\$1,491	1,358	\$287	\$1,098	\$8,697	54,744	\$56	\$159	\$4,658	13,933	\$150	\$334
2015	\$915	964	\$282	\$949	\$6,796	46,969	\$59	\$145	\$5,794	21,260	\$142	\$273

Note: Rx = prescription.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of N-drug use by drug group, the share of N-drugs in the total cost, excluding 'Other' drugs, decreased by 69 percent for the Analgesics – Opioid drug group: from 38 percent of the total in 2005 to 12 percent in 2015 (see Figure 6.8 and Table C11 in the Appendix C). Prior to 2011, this share was growing for all drug groups except CNS Drugs. After implementation of the closed formulary, N-drug shares decreased substantially in all drug groups.

Figure 6.8: Share of N-drug Cost in Each Drug Group, by Service Year



Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

In terms of N-drug use by maturity, we compared pharmacy services for three years from injury (0 to 36 months of maturity) with services for more mature claims (more than 36 months of maturity) (see Table 6.14). Cost shares of N-drugs and the number of claims receiving N-drugs decreased substantially since 2011 for both maturity groups. There was only a small difference in the average cost per claim between N-drugs and Y-drugs even though N-drugs are twice as expensive per prescription. Utilization for Y-drugs was much higher. Among 0 to 3 years maturity group, there was a significant decrease in the number of claims, prescriptions, and costs for N-drugs in 2012, reflecting the effect of the pharmacy closed formulary on new claims. Data from 2015 also clearly showed that the pharmacy closed formulary began to have effects on legacy claims as well.

As N-drug usage decreased, pharmacy services increased in 'Other' drugs that are not listed as either 'N' or 'Y' drugs in the formulary. In 2010, 'Other' drugs accounted for 14 percent (\$22 million) of the total pharmacy cost of \$160 million. In 2015, they accounted for 36 percent (\$38 million) of the total \$104 million. We estimate that at least one third of these 'Other' drugs are compounded drugs. The usage of compounded drugs is discussed in the next section.

Table 6.14: Total and Average Costs, by N-drug Status by Maturity

Service Year	N-drug				Y-drug				Other			
	Total Cost (in '000)	Number of Claims	Avg. Cost per Rx	Avg. Cost per Claim	Total Cost (in '000)	Number of Claims	Avg. Cost per Rx	Avg. Cost per Claim	Total Cost (in '000)	Number of Claims	Avg. Cost per Rx	Avg. Cost per Claim
0 to 3 Years												
2005	\$10,236	40,267	\$73	\$254	\$31,535	116,878	\$60	\$270	\$10,774	52,521	\$65	\$205
2006	\$10,775	41,093	\$76	\$262	\$32,625	119,601	\$61	\$273	\$9,023	47,508	\$51	\$190
2007	\$10,815	42,104	\$79	\$257	\$35,529	129,314	\$63	\$275	\$9,160	46,697	\$50	\$196
2008	\$12,452	43,184	\$92	\$288	\$36,355	128,515	\$65	\$283	\$8,410	38,471	\$66	\$219
2009	\$14,972	42,028	\$109	\$356	\$36,278	119,444	\$65	\$304	\$9,539	27,989	\$99	\$341
2010	\$15,487	40,833	\$118	\$379	\$35,147	121,090	\$62	\$290	\$8,620	25,467	\$106	\$338
2011	\$12,495	28,346	\$135	\$441	\$33,978	122,094	\$58	\$278	\$8,602	23,144	\$106	\$372
2012	\$6,897	13,290	\$148	\$519	\$31,832	118,857	\$57	\$268	\$11,732	25,499	\$124	\$460
2013	\$2,939	6,630	\$157	\$443	\$28,755	111,840	\$55	\$257	\$14,417	27,338	\$159	\$527
2014	\$1,456	3,982	\$156	\$366	\$27,489	106,110	\$56	\$259	\$17,729	28,732	\$175	\$617
2015	\$1,189	3,259	\$156	\$365	\$21,774	92,542	\$60	\$235	\$20,167	42,409	\$160	\$476
More than 3 Years												
2005	\$30,813	21,896	\$138	\$1,407	\$41,908	33,535	\$102	\$1,250	\$20,250	18,762	\$121	\$1,079
2006	\$33,219	21,522	\$145	\$1,543	\$46,979	33,267	\$107	\$1,412	\$19,203	16,430	\$109	\$1,169
2007	\$33,853	20,462	\$161	\$1,654	\$48,061	31,707	\$114	\$1,516	\$17,632	14,695	\$112	\$1,200
2008	\$35,895	18,973	\$178	\$1,892	\$50,911	29,959	\$121	\$1,699	\$15,498	12,419	\$119	\$1,248
2009	\$36,611	17,518	\$189	\$2,090	\$51,124	27,995	\$120	\$1,826	\$13,896	10,366	\$139	\$1,341
2010	\$37,161	16,692	\$201	\$2,226	\$50,009	26,893	\$120	\$1,860	\$13,333	8,810	\$138	\$1,513
2011	\$35,211	14,220	\$221	\$2,476	\$49,078	25,556	\$118	\$1,920	\$14,137	8,061	\$140	\$1,754
2012	\$28,431	12,329	\$226	\$2,306	\$45,356	23,674	\$122	\$1,916	\$15,638	8,251	\$156	\$1,895
2013	\$19,035	9,506	\$252	\$2,002	\$44,945	22,178	\$127	\$2,027	\$16,167	9,106	\$177	\$1,775
2014	\$7,205	3,276	\$313	\$2,199	\$43,110	20,046	\$132	\$2,151	\$14,403	7,558	\$195	\$1,906
2015	\$5,572	2,389	\$313	\$2,333	\$37,447	17,650	\$140	\$2,122	\$17,557	8,777	\$211	\$2,000

Note: Rx = prescription.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

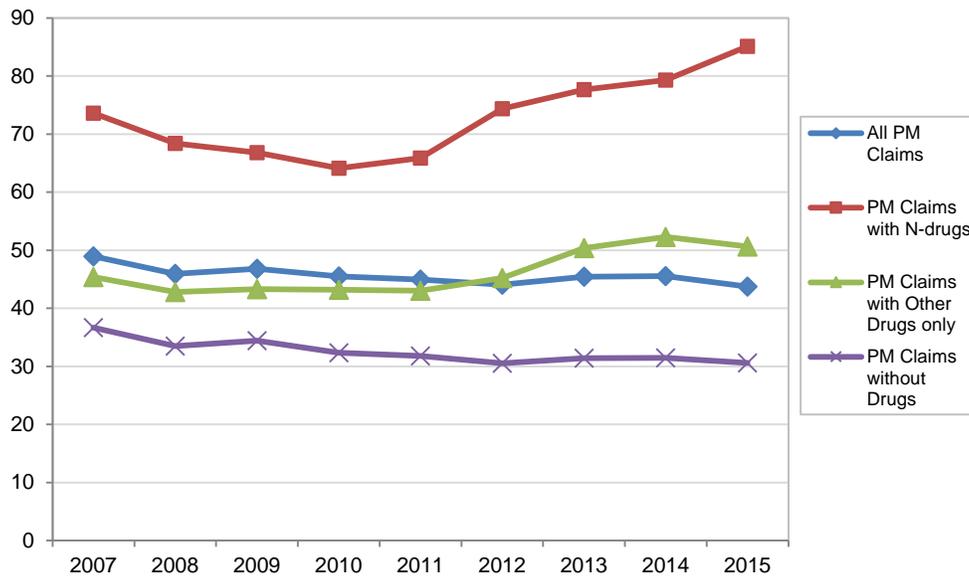
While the usage of N-drugs decreased since 2011, the data shows that this decrease did not cause an overall increase in non-N-drugs. N-drugs decreased absolutely without being substituted by other drugs. However, Table 6.14 also shows that the use of 'Other' drugs increased rapidly. Along with the increasing total cost, the number of claims receiving 'Other' drugs also increased by 49 percent since 2010. '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. A large part of these 'Other' drugs are related to an increasing use of compounded drugs.

Another potential substitution effect of the pharmacy closed formulary, especially in regard to a decreased access to opioids and other pain medicine, is the use of non-pharmacologic treatments such

as physical medicine services. The cost and utilization of physical medicine services continued to decrease significantly because of the preauthorization requirement and other regulatory measures implemented since 2002 (as seen in Figures 3.5, 3.10 and 3.11). Figure 3.11 showed that the number of physical medicine services per claim increased slightly in 2012 and 2013 injury years for the first time since 2002, but decreased in 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 6.9 and Table C12 in the Appendix C). Since 2011, utilization of physical medicine services increased by 29 percent among those with N-drugs, and by 18 percent among those with 'Other' drugs while it decreased by four percent among those without pharmacy services.

However, N-drug claims with increased physical medicine services accounted for three percent of the total claims in 2015. The slight increase in physical medicine utilization among 'Other' 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 group actually decreased by three percent since 2011.

Figure 6.9: 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, 2016.

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. The vast majority of compounded drugs are topical pain medications, for which there is a growing debate about their effectiveness and cost. In this section, we present initial estimates of the prevalence 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 identifies them as a compounded drug prescription. However, Texas regulation requires each ingredient (billing line) of a compounded drug to be listed and calculated separately ([28 TAC §134.502](#)). Therefore, we used chemicals and pharmaceutical adjuvants as an indicator for compounding, and separated bills that contained one or more billing lines of these ingredients as compounded drugs.

The billing line share of compounded drugs increased from 3.4 percent in 2010 to 6.1 percent in 2015 (see Table 6.15). Because of the rapid increase in the cost per ingredient (billing line), the cost share of compounded drugs increased significantly from 3.7 percent of the total pharmacy cost in 2010 to 11.5 percent in 2015 (see Table 6.16). A typical compounded drug contained about 3.5 ingredients (billing lines) and cost \$736 in 2015 (see Table 6.17). The average cost of a compounded drug increased by 131 percent between 2010 and 2015.

The top 20 most common ingredients in compounded drugs in 2015 are shown in Table 6.18. The absolute number of claims receiving compounded drugs is somewhat small, but the average cost per ingredient (billing line) and the average cost per claim are relatively high. Resveratrol and Fluticasone propionate were the most expensive ingredients.

Table 6.15: Number and Cost of Ingredients (Lines) by N-drug Status

Service Year	Compounded drug: Number of Ingredients (Lines)				Share of Compounded Drug Billing Lines in Total Billing Lines
	N-drug	Y-drug	Other	Total	
2010	468	897	48,359	49,724	3.4%
2011	210	492	53,875	54,577	3.8%
2012	156	595	66,646	67,397	5.2%
2013	81	411	58,470	58,962	5.1%
2014	31	843	65,125	65,999	6.5%
2015	17	791	52,277	53,085	6.1%

Note: Billing lines with no payment are removed from analysis.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 6.16: Cost of Compounded Drugs by Bill Lines, by N-drug Status

Service Year	Compounded Drug Cost by N-drug Status at the Bill Line Level				Total pharmacy cost	Cost share of compounded drugs
	N-drug	Y-drug	Other	Total cost		
2010	\$97,867	\$122,639	\$5,669,421	\$5,889,927	\$159,756,432	3.7%
2011	\$57,053	\$70,060	\$5,977,639	\$6,104,752	\$153,504,682	4.0%
2012	\$37,277	\$77,449	\$9,147,604	\$9,262,331	\$139,885,705	6.6%
2013	\$42,827	\$89,485	\$12,870,432	\$13,002,743	\$126,258,717	10.3%
2014	\$25,731	\$99,098	\$13,801,131	\$13,925,959	\$111,392,973	12.5%
2015	\$9,373	\$109,847	\$11,784,603	\$11,903,824	\$103,710,192	11.5%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 6.17: Number and Cost by 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	18,502	50,747	\$5,889,927	\$318	2.7
2011	18,344	55,605	\$6,104,752	\$333	3.0
2012	20,554	68,928	\$9,262,331	\$451	3.4
2013	19,662	60,167	\$13,002,743	\$661	3.1
2014	21,370	67,865	\$13,925,959	\$652	3.2
2015	16,180	56,158	\$11,903,824	\$736	3.5

Note: Bill lines with no payment are included if there is one or more ingredients with non-zero payment in the compounded drug.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table 6.18: Top 20 Ingredients (Lines) in Compounded Drugs (Service Year 2015)

Rank	Drug Name	Number of Rx	Number of Claims	Total Pay	Average Cost per Rx	Average Cost per Claim
1	GABAPENTIN	4,581	1,219	\$2,161,633	\$472	\$1,773
2	FLURBIPROFEN	3,100	869	\$1,492,237	\$481	\$1,717
3	BACLOFEN	5,081	1,300	\$1,153,616	\$227	\$887
4	FLUTICASONE PROPIONATE	192	81	\$529,456	\$2,758	\$6,536
5	TRAMADOL HCL	1,682	345	\$519,190	\$309	\$1,505
6	CYCLOBENZAPRINE HCL	3,434	967	\$516,322	\$150	\$534
7	KETOPROFEN	2,183	660	\$493,232	\$226	\$747
8	SALT STABLE LS ADVANCED	1,238	419	\$469,124	\$379	\$1,120
9	VERSAPRO	2,417	435	\$322,288	\$133	\$741
10	PCCA LIPODERM BASE	1,241	427	\$305,590	\$246	\$716
11	AMANTADINE HCL	1,705	433	\$248,939	\$146	\$575
12	KETAMINE HCL	457	181	\$231,347	\$506	\$1,278
13	AMITRIPTYLINE HCL	1,800	524	\$208,396	\$116	\$398
14	PCCA CUSTOM LIPO-MAX	561	224	\$202,767	\$361	\$905
15	PCCA PRACASIL TM-PLUS BAS	364	97	\$195,220	\$536	\$2,013
16	MELOXICAM	1,639	341	\$183,993	\$112	\$540
17	RELYYT	123	92	\$179,298	\$1,458	\$1,949
18	BUPIVACAINE HCL	2,601	472	\$168,149	\$65	\$356
19	RESVERATROL	43	32	\$158,963	\$3,697	\$4,968
20	ETHOXY DIGLYCOL	3,030	599	\$142,092	\$47	\$237

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Another aspect of the compounded drugs is the high concentration of a small number of providers prescribing them. The top 10 individual prescribing doctors (or pain management clinics) accounted for 50 percent of all bills.

In addition, the majority of the bills have a National Drug Code (NDC) that is not identified in the pharmacy closed formulary. As a result, compounded drugs are classified as 'Other' drugs in Table 6.16, being neither N nor Y drugs. Given the rapid increase in the use of these ingredients, an expanded coverage of all NDC codes may be necessary in the formulary. About 20 percent of 'Other' drugs in Table 6.17 have missing or '999' NDC codes. The majority of '999' code bills appear to be bills for compounding fees.

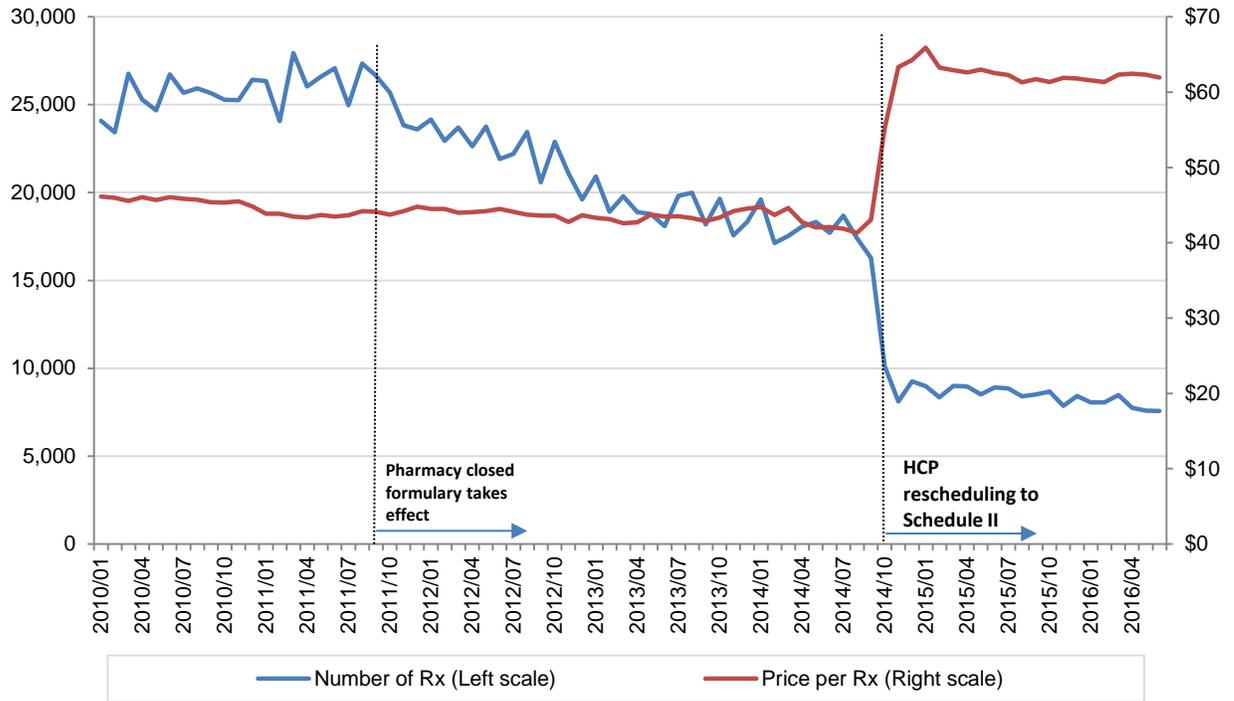
RESCHEDULING HYDROCODONE COMBINATION PRODUCTS AS SCHEDULE II DRUGS

Hydrocodone combination products (HCPs) are one of the most prescribed drugs, accounting for 28 percent of all opioid prescriptions and 29 percent of the opioid cost in 2015. However, HCPs were not "N" status drugs in the pharmacy closed formulary, and they were classified as Schedule III controlled substances by the Drug Enforcement Agency (DEA). Beginning October 6, 2014, HCPs became Schedule II drugs. For Schedule II drugs, no refills are allowed without a new office visit with a physician, and prescriptions are allowed for a maximum of 90 days only with three pre-dated 30-day prescriptions. In comparison, Schedule III drugs can be prescribed for six months, and over-the-phone refills are allowed.

Even before this rescheduling, the pharmacy closed formulary had a gradual effect on the use of HCPs as the overall use of opioids decreased. From August 2011 to September 2014, the number of HCP prescriptions decreased by 41 percent (see Figure 6.10) and its total cost decreased by 42 percent. The rescheduling of HCPs impacted their utilization in a similar pattern as if they had been classified as "N" drugs by the formulary. After the reclassification, the number of prescriptions decreased by 50 percent and the total cost of HCPs decreased by 27 percent in two months from September 2014 to November 2014. Since then, the monthly number of HCP prescriptions decreased slightly from 8,000 in November 2014 to 7,579 in June 2016.

Per-claim utilization of HCPs also decreased from about 1.4 prescriptions per claim in 2011 to 1.1 prescriptions in 2016. However, the cost per HCP prescription increased by 47 percent from September 2014 to November 2014, possibly indicating a higher cost of dispensing the drug due to Schedule II regulations or an offsetting increase in the average wholesale price in anticipation of drop in volume.

Figure 6.10: Number of HCP Prescriptions and Price, by Month



Note: HCP = Hydrocodone Combination Product.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

7. SUMMARY: TRENDS IN CHANGING COST COMPONENTS

Medical costs, combining professional and hospital costs, in the Texas workers' compensation system increased by 30 percent between 2000 and 2002, then decreased by 30 percent between 2002 and 2007. Between 2007 and 2015, costs increased by 4 percent. With pharmacy and dental costs (data available only from 2005) included, all health care costs decreased by three percent between 2005 and 2015 service years.

Analyzing by provider bill type, the total cost of professional services decreased by 18 percent since 2000 while the total cost of hospital services increased by 21 percent. Pharmacy cost decreased by 29 percent from 2005 to 2015. However, because the number of claims decreased by 29 percent since 2000, the average costs per claim increased: since 2000, average professional cost increased by 17 percent, and average hospital cost increased by 87 percent, while average pharmacy cost per claim increased by one 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 in the price inflation. Many observers in the workers' compensation system note that the changes in total cost are often a result of 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 30 percent and 35 percent for professional and hospital services, respectively, from 2000 to 2015.

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 metric 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. From 2000 to 2002, system costs generally increased rapidly, continuing the pattern of growth seen in the 1990s. From 2002 to 2007, system costs declined equally rapidly due to various reforms implemented during the period, including new fee guidelines, preauthorization rules, and the reorganization of the regulatory agency itself from the Texas Workers' Compensation Commission to the Division of Workers' Compensation in the Texas Department of Insurance. The period from 2007 to 2015 represents a maturing stage of these and continuing reforms. This period showed a continuing decrease in the number of claims, a stable or decreasing utilization level, and a moderately increasing trend in fees for service.

The four columns numbered from (1) to (4) represent the four basic components of system costs: the number of claims, the service frequency (visits), 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 as column series (a) and with adjustments for inflation using MEI in column series (b).

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									
2000-2002	10.5%	10.9%	13.8%	-5.4%	-11.9%	31.9%	22.9%	19.4%	11.2%
2002-2007	-26.7%	-21.7%	-13.8%	21.2%	2.3%	-40.0%	-49.4%	-18.2%	-31.0%
2007-2015	-19.9%	0.3%	3.6%	21.6%	6.1%	1.2%	-11.7%	26.4%	10.3%
2000-2015	-35.1%	-12.9%	1.6%	39.4%	-4.4%	-19.9%	-45.1%	23.4%	-15.4%
Medical-only Claims									
2000-2002	-4.9%	3.2%	9.4%	-1.5%	-8.2%	5.8%	-1.5%	11.2%	3.6%
2002-2007	-10.0%	-11.6%	-10.7%	15.2%	-2.7%	-18.0%	-30.8%	-9.0%	-23.2%
2007-2015	-14.5%	-6.0%	1.7%	23.5%	7.7%	0.9%	-12.0%	18.0%	2.9%
2000-2015	-26.8%	-14.2%	-0.7%	40.2%	-3.9%	-12.5%	-40.0%	19.5%	-18.1%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

For lost-time claims, the average cost per claim increased by 23 percent from 2000 to 2015 (see column 6a). Adjusted for inflation, the average cost per claim decreased by 15 percent (column 6b) since inflationary prices increased by 46 percent during the same period according to the MEI. The number of claims and the level of utilization all decreased, resulting in the overall decrease in the total cost by 20 percent (column 5a). If we adjust for inflation, the total cost decreased by 45 percent since 2000 (column 5b). The decrease in utilization was mainly through reduced service frequency (visits) while the service intensity increased slightly since 2007.

The main factor in the overall decrease in total costs was the large decline in the number of claims. Because the number of claims decreased more steeply than the level of utilization, the overall cost decreased despite the increase in the cost per service.

Medical-only claims showed similar trends with a lower rate of decrease in the number of claims and a slightly higher rate of decrease in utilization compared to lost-time claims. Since 2000, the total cost decreased by 13 percent while the number of medical-only claims decreased by 27 percent. The price per service increased by 40 percent, but it decreased by 4 percent if we adjust for inflation. The large decrease in the total cost was largely a result of decreasing number of claims and decreasing service utilization.

APPENDIX A: MEASURING SERVICE UTILIZATION

A measurement for service utilization can be decomposed 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 particular 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 doctor or 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 whether the bill was paid by the insurance carrier or not. Since bills do not provide service time, multiple visits to the same 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 Current Procedural Terminology (CPT) or Medicare's Healthcare Common Procedure Coding System (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. 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 98 percent 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 and payers/reviewers, resulting in inconsistent units billed. The units for these codes were adjusted statistically.

Qualitative Service Intensity

Another potential dimension in the utilization measurement is the qualitative difference in service intensity. For example, some CPT/HCPCS codes are already differentiated by service intensity or qualitative differences. There are different CPT codes for office visits of different length and quality. 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 is 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.

APPENDIX B: CALCULATING INCOME BENEFITS BY SERVICE YEAR

Income benefits replace a portion of wages an injured employee loses as a result of a work-related injury or illness. There are four types of income benefits: temporary income benefits (TIBs), impairment income benefits (IIBs), supplemental income benefits (SIBs), and lifetime income benefits (LIBs).

TIBs are paid to any injured employee who loses all or some of their wages for more than seven days. TIBs end on the day one reaches the maximum medical improvement (MMI) or at the end of 104 weeks from the eighth day of disability. For this reason, TIBs may be paid out over two or three service years. IIBs are paid if one has a permanent impairment from a work-related injury or illness. When the health care provider determines one has reached MMI, the health care provider will determine if there is any permanent physical damage to one's body as a result of the injury or illness, and assign an impairment rating (IR). Three weeks of IIBs are paid for each percentage of impairment. Since IIBs are paid after TIBs end, income benefits may cover several service years.

For those with an IR of 15 percent or more, SIBs are paid after IIBs if one has not returned to work due to impairment. SIBs may be paid up to 401 weeks from the date of injury. Finally, LIBs are paid for lifetime for certain severe disabilities such as loss of both feet, eyes, or hands. Detailed information about income benefits is available at the DWC's information page at www.tdi.texas.gov/wc/employee/incomeben.html.

While income benefits may cover multiple service years, only total amounts of benefits are reported to TDI-DWC. Even though the injury date, begin and end dates of benefits, and the weeks of benefits paid are also reported, previous reports analyzed income benefits using the injury year, making it difficult to compare with medical data which is in service year. Also, most recent injury year claims were not reported since income benefits had not ended.

To remedy these problems, we calculated income benefit payments by service year. Its result is presented in Table 2.1. Total benefit amounts were divided by the number of benefit weeks, and applied to weeks following the injury date. This resulted in benefits being divided into multiple service years. Then, total benefits were summed by each service year.

The key issue is how to determine the number of benefit weeks. Insurance carriers report this number, along with the amount of weekly benefits (compensation rates), and service begin and end dates. However, these reported data do not correspond to each other, or are extreme, in 30 percent of the claims. Some may be due to data entry errors or temporary benefit suspensions.

For those 30 percent of cases, we used reported benefit weeks, calculated weeks based on compensation rates, or calculated weeks based on service dates. When two of the three measures match within a certain acceptable range, we used the matching weeks. When all three measures are different, we compared measurements of absolute difference, and selected one of the two closest measures with higher data reliability. Given the limitations in data, this resulted in the best estimates of

income benefits by service year and allowed us to compare income benefits with medical costs reported by service year.

APPENDIX C: ADDITIONAL DATA

Table C1: 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	\$845	\$3,038
2006	\$1,808	\$3,224	\$2,010	\$885	\$2,969
2007	\$1,720	\$3,468	\$2,291	\$860	\$2,990
2008	\$1,780	\$3,732	\$2,575	\$909	\$3,136
2009	\$2,016	\$3,907	\$2,761	\$1,011	\$3,479
2010	\$2,013	\$4,029	\$2,944	\$995	\$3,560
2011	\$2,248	\$4,278	\$3,205	\$978	\$3,875
2012	\$2,268	\$4,394	\$3,134	\$930	\$3,837
2013	\$2,261	\$4,707	\$3,136	\$894	\$3,884
2014	\$2,181	\$4,778	\$3,311	\$839	\$3,790
2015	\$2,088	\$4,676	\$3,585	\$850	\$3,650

Note: Figures for 'Medical Combined' do not include dental and pharmacy costs prior to 2005.

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C2: 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	\$52,489	\$53,261	\$76,780	\$64,343	\$31,682	\$184,605	\$66,387	\$25,459
2006	\$52,067	\$47,733	\$66,149	\$58,444	\$27,759	\$133,500	\$63,029	\$21,720
2007	\$59,050	\$41,857	\$67,303	\$59,454	\$25,731	\$112,167	\$60,451	\$16,927
2008	\$59,098	\$45,022	\$70,201	\$58,159	\$26,452	\$106,877	\$67,479	\$16,236
2009	\$58,107	\$50,097	\$75,116	\$59,091	\$27,301	\$111,117	\$79,447	\$19,254
2010	\$60,251	\$48,991	\$76,852	\$57,170	\$26,443	\$111,739	\$81,051	\$17,160
2011	\$63,468	\$57,736	\$89,121	\$55,824	\$27,956	\$124,680	\$94,447	\$18,126
2012	\$64,547	\$62,246	\$87,431	\$54,572	\$25,985	\$124,327	\$92,542	\$16,291
2013	\$65,404	\$54,740	\$84,880	\$53,838	\$25,549	\$121,258	\$86,018	\$15,363
2014	\$61,479	\$52,294	\$81,700	\$52,434	\$24,227	\$117,623	\$79,711	\$12,857
2015	\$57,852	\$43,049	\$80,583	\$49,781	\$23,122	\$105,094	\$74,947	\$13,809
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	\$11,052	\$16,091	\$38,329	\$15,268	\$4,570	\$38,182	\$12,747	\$2,278
2006	\$12,014	\$17,020	\$39,965	\$14,689	\$4,682	\$30,439	\$14,036	\$2,165
2007	\$13,725	\$16,443	\$44,112	\$15,405	\$4,674	\$28,667	\$13,196	\$1,639
2008	\$13,236	\$16,558	\$45,082	\$14,403	\$4,332	\$26,550	\$12,601	\$1,459
2009	\$12,332	\$16,434	\$45,005	\$14,033	\$4,001	\$26,717	\$11,671	\$1,264
2010	\$12,264	\$15,915	\$47,641	\$13,358	\$3,953	\$27,106	\$11,886	\$1,230
2011	\$15,041	\$18,672	\$55,533	\$14,046	\$4,362	\$32,432	\$13,470	\$1,166
2012	\$15,535	\$18,265	\$56,831	\$13,250	\$4,248	\$35,010	\$13,041	\$789
2013	\$12,493	\$16,022	\$57,036	\$12,479	\$4,280	\$37,312	\$11,918	\$951
2014	\$11,697	\$14,598	\$55,138	\$12,444	\$4,252	\$38,506	\$11,020	\$751
2015	\$10,509	\$13,427	\$55,421	\$11,417	\$4,227	\$32,884	\$10,421	\$764

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C3: 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	\$2,981	\$1,350	\$1,845
2006	\$805	\$559	\$524	\$586	\$615	\$2,464	\$1,347	\$1,853
2007	\$896	\$494	\$543	\$620	\$593	\$2,144	\$1,337	\$1,731
2008	\$923	\$532	\$577	\$618	\$624	\$2,132	\$1,531	\$1,949
2009	\$932	\$597	\$634	\$639	\$654	\$2,249	\$1,841	\$2,421
2010	\$974	\$578	\$650	\$623	\$649	\$2,265	\$1,902	\$2,445
2011	\$1,062	\$691	\$764	\$625	\$692	\$2,583	\$2,174	\$2,741
2012	\$1,118	\$761	\$771	\$627	\$674	\$2,679	\$2,214	\$2,852
2013	\$1,191	\$701	\$786	\$652	\$680	\$2,716	\$2,171	\$2,873
2014	\$1,168	\$682	\$774	\$648	\$669	\$2,638	\$2,092	\$2,678
2015	\$1,132	\$593	\$799	\$638	\$670	\$2,472	\$2,061	\$3,158
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	\$180	\$163	\$225	\$129	\$146	\$923	\$370	\$1,462
2006	\$178	\$165	\$228	\$118	\$140	\$758	\$394	\$1,424
2007	\$188	\$151	\$242	\$119	\$133	\$696	\$372	\$1,366
2008	\$194	\$156	\$254	\$114	\$126	\$718	\$370	\$1,523
2009	\$202	\$171	\$281	\$121	\$130	\$802	\$387	\$1,578
2010	\$206	\$164	\$293	\$113	\$132	\$827	\$387	\$1,671
2011	\$252	\$192	\$334	\$117	\$146	\$994	\$422	\$1,842
2012	\$260	\$190	\$341	\$109	\$142	\$1,050	\$417	\$1,556
2013	\$218	\$170	\$353	\$106	\$143	\$1,094	\$411	\$1,836
2014	\$213	\$156	\$342	\$105	\$140	\$1,094	\$398	\$1,770
2015	\$199	\$146	\$347	\$97	\$144	\$989	\$379	\$2,070

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C4: 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	107.1	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	70.4	4.8	5.4
2007	9.8	7.5	7.5	6.2	4.1	64.7	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	58.4	4.6	5.3
2012	8.0	13.0	7.2	6.1	3.6	58.8	4.6	5.0
2013	7.8	13.9	7.2	6.3	3.5	61.0	4.5	5.0
2014	7.5	15.9	7.2	6.4	3.4	61.2	4.5	4.7
2015	7.2	14.9	7.3	6.2	3.4	56.6	4.4	5.1
Medical-only Claims								
2000	3.3	2.6	3.8	2.2	3.2	35.6	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	38.3	1.9	4.3
2003	3.7	2.7	3.6	2.8	3.0	38.0	1.9	4.1
2004	4.3	2.6	3.1	2.8	2.4	33.6	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	27.2	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	24.5	1.8	4.2
2009	3.7	2.6	2.8	2.7	2.0	24.3	1.7	4.0
2010	3.5	2.7	2.8	2.7	2.0	24.2	1.7	4.5
2011	3.3	2.8	2.8	2.7	2.0	24.5	1.7	4.1
2012	3.1	2.8	2.8	2.7	1.9	25.0	1.7	3.2
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	23.4	1.7	3.6

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C5: Average Cost per Claim, by Service Year by Maturity, Professional Services

Service Year	First Year	Second Year	Third Year	4th and Older
2000	\$1,553	\$2,136	\$1,615	\$1,673
2001	\$1,693	\$2,358	\$1,806	\$1,652
2002	\$1,840	\$2,775	\$2,222	\$1,961
2003	\$1,818	\$2,786	\$2,217	\$1,964
2004	\$1,651	\$2,633	\$2,067	\$1,848
2005	\$1,725	\$2,740	\$2,285	\$2,035
2006	\$1,478	\$2,613	\$2,126	\$2,074
2007	\$1,428	\$2,503	\$2,114	\$1,991
2008	\$1,503	\$2,496	\$2,114	\$2,065
2009	\$1,697	\$2,761	\$2,227	\$2,282
2010	\$1,694	\$2,819	\$2,400	\$2,337
2011	\$1,918	\$3,058	\$2,636	\$2,653
2012	\$1,912	\$3,060	\$2,651	\$2,926
2013	\$1,922	\$2,990	\$2,707	\$2,911
2014	\$1,861	\$2,940	\$2,540	\$2,864
2015	\$1,740	\$3,021	\$2,726	\$2,851

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C6: 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	\$2,789
2001	\$601	\$922	\$951	\$456	\$498	\$3,642	\$1,454	\$2,857
2002	\$611	\$970	\$946	\$522	\$525	\$3,794	\$1,487	\$2,861
2003	\$591	\$845	\$883	\$620	\$544	\$3,522	\$1,209	\$1,764
2004	\$576	\$715	\$800	\$650	\$578	\$3,044	\$1,271	\$1,646
2005	\$700	\$742	\$816	\$723	\$619	\$2,830	\$1,577	\$1,832
2006	\$688	\$675	\$752	\$727	\$593	\$2,188	\$1,568	\$1,728
2007	\$754	\$595	\$763	\$763	\$582	\$1,945	\$1,590	\$1,765
2008	\$752	\$660	\$843	\$754	\$633	\$2,097	\$1,996	\$1,983
2009	\$738	\$671	\$891	\$760	\$634	\$2,213	\$2,268	\$2,114
2010	\$757	\$670	\$951	\$732	\$649	\$2,347	\$2,393	\$2,179
2011	\$839	\$755	\$1,059	\$726	\$677	\$2,632	\$2,638	\$2,346
2012	\$913	\$711	\$1,069	\$727	\$672	\$2,749	\$2,687	\$2,539
2013	\$990	\$609	\$1,101	\$745	\$672	\$2,848	\$2,594	\$2,253
2014	\$996	\$552	\$1,086	\$724	\$672	\$2,731	\$2,529	\$2,210

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C7: 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	125.3	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	139.1	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	4.5	107.1	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	72.5	5.0	4.7
2008	10.5	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	69.2	5.0	4.5
2010	8.7	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	65.5	5.2	3.9
2012	8.0	9.7	9.8	8.2	3.4	67.7	5.2	4.0
2013	7.8	10.0	9.9	8.6	3.5	70.6	5.0	3.6
2014	7.6	10.6	9.9	8.5	3.4	69.3	5.2	3.5

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C8: 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	\$578	\$79
2001	\$46	\$396	\$895	\$1,848	\$33	\$123	\$575	\$94
2002	\$46	\$392	\$893	\$1,777	\$33	\$111	\$566	\$92
2003	\$51	\$436	\$938	\$955	\$33	\$105	\$502	\$108
2004	\$60	\$449	\$1,040	\$750	\$33	\$104	\$426	\$122
2005	\$61	\$449	\$1,089	\$718	\$33	\$103	\$429	\$162
2006	\$61	\$440	\$1,071	\$746	\$32	\$103	\$432	\$200
2007	\$66	\$437	\$1,191	\$781	\$30	\$106	\$381	\$211
2008	\$70	\$452	\$1,394	\$957	\$33	\$102	\$419	\$228
2009	\$76	\$467	\$1,531	\$1,045	\$35	\$104	\$448	\$242
2010	\$83	\$474	\$1,730	\$1,050	\$37	\$105	\$456	\$350
2011	\$96	\$478	\$1,828	\$1,333	\$43	\$104	\$520	\$353
2012	\$99	\$476	\$1,891	\$1,379	\$44	\$105	\$506	\$417
2013	\$101	\$464	\$1,839	\$1,262	\$44	\$103	\$341	\$416
2014	\$101	\$460		\$1,215	\$43		\$302	
2015	\$101				\$42		\$288	

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C9: Total Cost by Service Year, by Drug Group by Maturity (Thousand Dollars)

Maturity	Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0 to 3 Years	Analgesics - Anti-Inflammatory	\$11,681	\$11,262	\$11,468	\$12,249	\$12,681	\$13,353	\$12,806	\$11,831	\$10,173	\$10,592	\$8,547
	Analgesics - Opioid	\$13,150	\$13,138	\$13,967	\$13,734	\$13,820	\$12,643	\$11,665	\$9,990	\$7,862	\$7,009	\$6,155
	Central Nervous System Drugs	\$8,374	\$9,425	\$10,026	\$10,243	\$10,448	\$10,088	\$9,818	\$9,343	\$8,620	\$7,867	\$7,412
	Musculoskeletal Therapy Agents	\$8,319	\$8,407	\$9,016	\$9,281	\$10,040	\$9,426	\$7,393	\$5,719	\$4,534	\$4,647	\$4,717
	Others	\$11,023	\$10,192	\$11,028	\$11,711	\$13,801	\$13,744	\$13,393	\$13,578	\$14,922	\$16,559	\$16,301
More than 3 Years	Analgesics - Anti-Inflammatory	\$9,436	\$9,429	\$8,535	\$8,691	\$8,407	\$8,342	\$8,383	\$8,179	\$7,964	\$7,359	\$5,307
	Analgesics - Opioid	\$33,657	\$36,778	\$36,938	\$35,607	\$34,817	\$33,545	\$31,305	\$26,025	\$21,178	\$16,704	\$16,029
	Central Nervous System Drugs	\$24,202	\$27,379	\$27,436	\$29,142	\$29,071	\$28,460	\$27,826	\$25,928	\$24,771	\$21,310	\$20,388
	Musculoskeletal Therapy Agents	\$9,874	\$10,410	\$10,200	\$10,262	\$10,107	\$9,374	\$8,190	\$6,501	\$5,604	\$5,135	\$4,926
	Others	\$15,802	\$15,405	\$16,437	\$18,602	\$19,229	\$20,781	\$22,723	\$22,792	\$20,630	\$14,209	\$13,927

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C10: Average Number of Prescriptions per Claim by Service Year, by Drug Group by Maturity

Maturity	Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
0 to 3 Years	Analgesics - Anti-Inflammatory	2.1	2.2	2.1	2.1	2.1	2.2	2.2	2.2	2.1	2.1	2.0
	Analgesics - Opioid	3.6	3.5	3.4	3.4	3.6	3.5	3.5	3.3	3.1	3.0	2.8
	Central Nervous System Drugs	4.7	4.8	4.6	4.6	4.9	4.9	5.0	4.9	4.5	4.3	4.2
	Musculoskeletal Therapy Agents	2.7	2.6	2.5	2.4	2.6	2.5	2.4	2.3	2.3	2.3	2.1
	Others	2.9	3.2	3.3	2.7	2.7	2.5	2.6	2.6	2.5	2.7	2.5
More than 3 Years	Analgesics - Anti-Inflammatory	4.8	5.3	5.1	5.4	5.5	5.6	5.9	5.7	5.6	5.6	5.3
	Analgesics - Opioid	8.9	9.1	9.0	9.3	9.8	10.0	10.2	9.7	9.2	9.0	8.8
	Central Nervous System Drugs	10.9	11.3	11.0	11.6	12.2	12.2	12.4	11.6	10.7	10.0	9.9
	Musculoskeletal Therapy Agents	6.3	6.6	6.4	6.6	6.9	6.8	7.0	6.6	6.2	6.2	6.0
	Others	9.1	10.7	10.6	10.3	9.5	10.2	11.3	10.8	9.4	9.5	9.4

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C11: Pharmacy Cost by Drug Group, by N-Drug Status

Drug Group	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
N Drugs											
Analgesics - Anti-Inflammatory	\$1,440	\$1,568	\$1,553	\$2,090	\$2,920	\$3,789	\$3,643	\$2,025	\$910	\$336	\$331
Analgesics - Opioid	\$15,215	\$15,230	\$15,934	\$16,850	\$17,107	\$17,256	\$16,181	\$12,895	\$8,605	\$3,180	\$2,474
Central Nervous System Drugs	\$11,703	\$12,882	\$12,182	\$12,015	\$11,084	\$10,262	\$8,722	\$6,843	\$4,287	\$1,951	\$1,753
Musculoskeletal Therapy Agents	\$4,588	\$4,392	\$4,291	\$5,128	\$6,191	\$5,771	\$3,882	\$1,952	\$1,005	\$311	\$121
Others	\$8,103	\$9,922	\$10,708	\$12,266	\$14,281	\$15,569	\$15,279	\$11,613	\$7,167	\$2,883	\$2,083
Y Drugs											
Analgesics - Anti-Inflammatory	\$17,559	\$17,397	\$16,984	\$17,402	\$16,848	\$16,316	\$15,645	\$14,727	\$14,357	\$14,189	\$6,821
Analgesics - Opioid	\$24,746	\$25,451	\$27,300	\$28,075	\$27,893	\$26,906	\$25,966	\$22,747	\$20,128	\$20,115	\$18,724
Central Nervous System Drugs	\$17,014	\$21,413	\$23,231	\$25,575	\$26,965	\$26,946	\$27,597	\$27,305	\$28,063	\$25,502	\$23,648
Musculoskeletal Therapy Agents	\$11,546	\$12,527	\$13,111	\$13,269	\$12,995	\$12,191	\$11,083	\$9,628	\$8,328	\$8,028	\$7,712
Others	\$2,579	\$2,816	\$2,965	\$2,946	\$2,701	\$2,797	\$2,767	\$2,782	\$2,824	\$2,766	\$2,317
N Drug Cost Share in Total Cost (N + Y drugs)											
Analgesics - Anti-Inflammatory	7.6%	8.3%	8.4%	10.7%	14.8%	18.8%	18.9%	12.1%	6.0%	2.3%	4.6%
Analgesics - Opioid	38.1%	37.4%	36.9%	37.5%	38.0%	39.1%	38.4%	36.2%	29.9%	13.6%	11.7%
Central Nervous System Drugs	40.8%	37.6%	34.4%	32.0%	29.1%	27.6%	24.0%	20.0%	13.3%	7.1%	6.9%
Musculoskeletal Therapy Agents	28.4%	26.0%	24.7%	27.9%	32.3%	32.1%	25.9%	16.9%	10.8%	3.7%	1.6%
Others	75.9%	77.9%	78.3%	80.6%	84.1%	84.8%	84.7%	80.7%	71.7%	51.0%	47.3%

Source: Texas Department of Insurance, Workers' Compensation Research and Evaluation Group, 2016.

Table C12: 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	73.6	45.4	36.6
2008	45.9	68.4	42.8	33.5
2009	46.8	66.8	43.3	34.4
2010	45.5	64.1	43.2	32.3
2011	45.0	65.9	43.0	31.8
2012	44.1	74.4	45.2	30.5
2013	45.4	77.6	50.3	31.4
2014	45.6	79.3	52.3	31.5
2015	43.7	85.1	50.7	30.6
Rate of change (2011-2015)	-2.8%	29.3%	17.7%	-3.7%

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, 2016.

This page intentionally left blank.



Health Care Cost and Utilization in the Texas Workers' Compensation System 2000-2015

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