



THE IMPACT OF CLAIMANT AGE ON LATE-TERM MEDICAL COSTS

INTRODUCTION

Recent NCCI research [1] found that for workers compensation medical payments made between 20 and 30 years after an injury, the average annual payments for claimants younger than age 60 at the time of treatment are greater than the average annual payments for claimants older than age 60. This study examines this difference by looking at the following claims characteristics for injured workers in these age groups:

- Number of medical services and overall average prices paid for medical services
- Injury mix
- Prescription drug use

For this study, late-term medical care consists of all medical services provided during 2011 and 2012, for claims that occurred 20 to 30 years ago.

KEY FINDINGS

- The average annual late-term medical cost per claim generally decreases gradually with increasing claimant age.
- The number of services per claim is a larger contributor to age-related annual late-term medical cost differences than is cost per service.
- Average annual late-term medical costs per claim are about 60% higher for claimants born after 1950 than for older claimants. About 80% of this difference is explained by:
 - The mix of injuries being treated and, in particular, differences in the share of quadriplegic and paraplegic claims. This explains approximately 60% of the difference.
 - Use of prescription drugs and, in particular, differences in the use of narcotics. This explains approximately 20% of the difference.

STUDY DATA

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

The data used in this study was evaluated as of March 2013 for:

- Services provided in 2011 and 2012 that are 20 to 30 years post injury
- Injuries occurring between 1983 and 1990
- Claimants with dates of birth between 1920 and 1970
- States for which NCCI collects MDC

DIFFERENCES IN LATE-TERM MEDICAL CARE COSTS BY CLAIMANT AGE

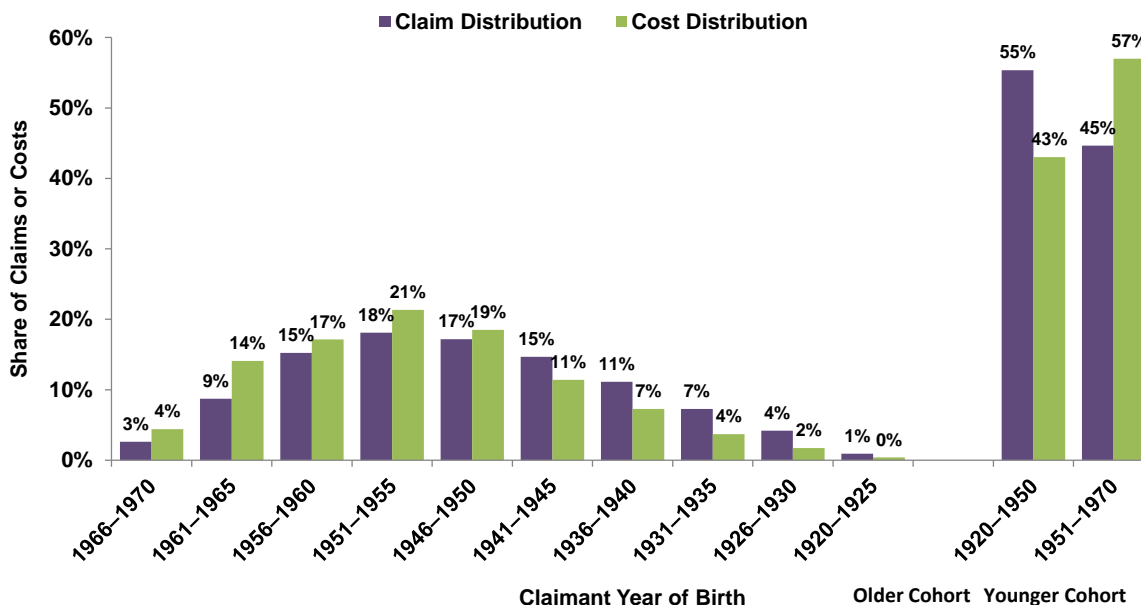
For many analyses in this study, we divide claimants into two cohorts:

- Older Cohort—Claimants born between 1920 and 1950. Approximately 16,000 claims are in this cohort.
- Younger Cohort—Claimants born between 1951 and 1970. Approximately 13,000 claims are in this cohort.

The division point for these age cohorts was selected to approximately segregate claimants into cohorts older than age 60 and younger than age 60 during the period 2011 to 2012, and to be consistent with the prior study.

Exhibit 1 shows that the younger cohort has a larger share of late-term costs, but a smaller share of claims than the older cohort. This indicates that annual medical cost per claim is larger for the younger cohort. Having only 45% of the claims, but 57% of the cost, the younger cohort costs approximately 60% more per year per claim to treat than the older cohort.¹

The Younger Cohort Has a Larger Share of Costs but a Smaller Share of Claims



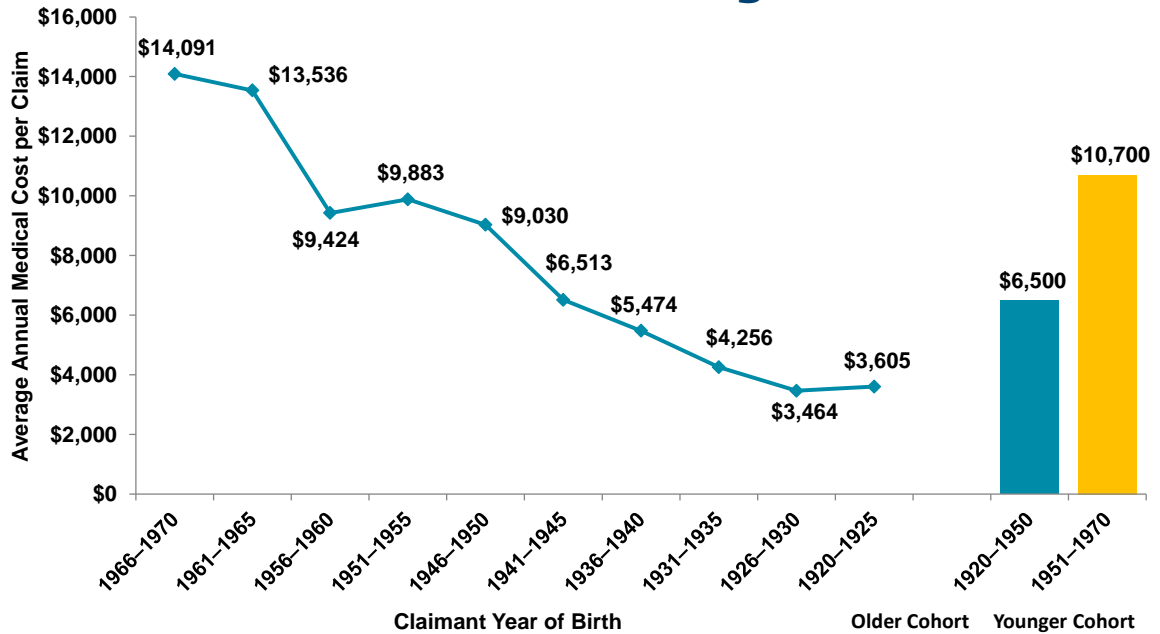
Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 1

¹ (57%/45%) / (43%/55%) – 100% = 62%.

Average annual late-term medical cost per claim generally decreases at a gradual pace as claimant age increases, as shown in Exhibit 2. Claimants born in the 1960s cost almost 300% more to treat per year than those born in the 1920s. Consistent with the deduced cost difference between age cohorts from Exhibit 1, the younger cohort costs about 60% more to treat than the older cohort, or approximately \$4,200 more per year.

Average Annual Cost per Claim for Late-Term Medical Care Decreases With Claimant Age

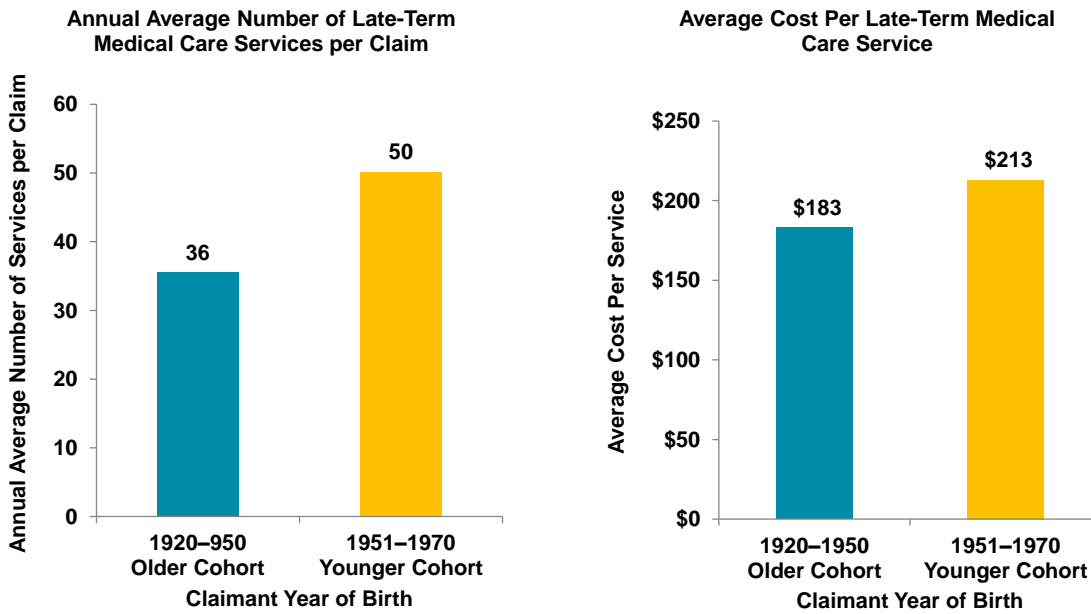


Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 2

Average annual late-term medical cost per claim can be decomposed into average annual number of medical care services per claim and average cost of those services (Cost = Utilization x Price). Exhibit 3 compares the average annual number of late-term medical care services per claim and average cost per late-term medical care service for the age cohorts. The comparison shows that number of services per claim is a larger contributor to the difference in costs between age cohorts than is cost per service. The younger cohort, on average, receives 14 more late-term medical care services per claim than the older cohort—approximately 40% more. However, average cost per late-term medical care service is only about 16% higher for the younger cohort or roughly \$30 per service more.

Number of Services per Claim is a Large Contributor to the Difference in Costs



Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

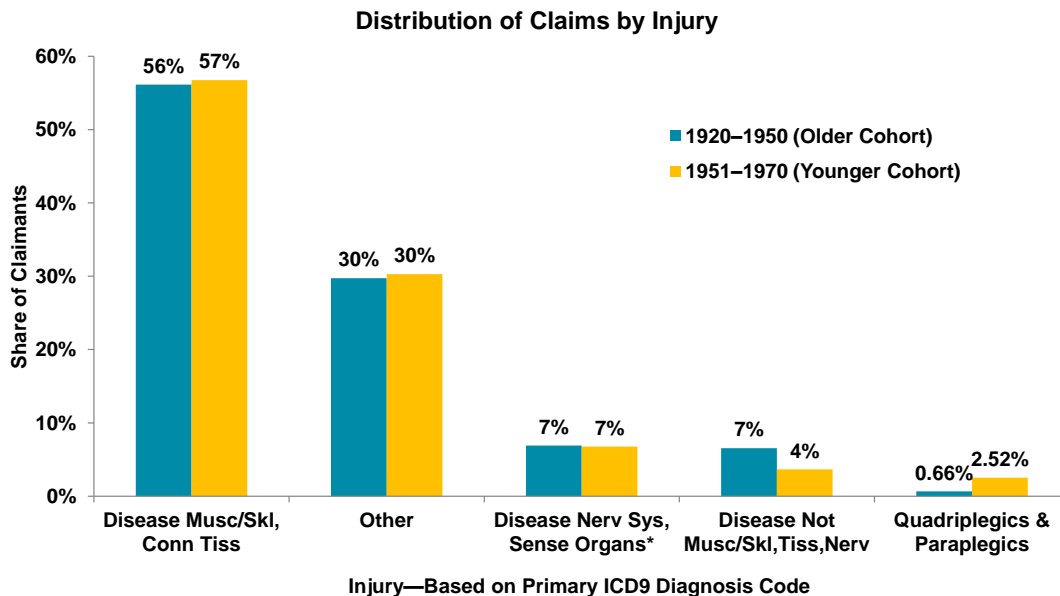
Exhibit 3

IMPACT OF INJURY MIX ON LATE-TERM MEDICAL CARE COSTS

In this section, we examine the impact of injury mix² on late-term medical care costs. The distributions of claims by type of injury for the two age cohorts are illustrated in Exhibit 4, where type of injury is determined by primary ICD-9 diagnosis code.³ Disease cases account for approximately 70% of late-term claims for both age groups. Although the distributions by type of injury for the older and younger cohorts are similar, differences exist between cohorts for some specific injuries.

A noticeable difference between age cohorts exists for quadriplegic and paraplegic claims. The share of quadriplegic and paraplegic claims for the younger cohort is more than three times the share of quadriplegic and paraplegic claims for the older cohort. According to the National Spinal Cord Injury Statistical Center (NSCISC), life expectancies for persons with spinal cord injuries are significantly shorter than life expectancies for those with no spinal cord injury [2]. For instance, a 40-year-old paraplegic has a 12-year shorter life expectancy than a 40-year-old individual with no spinal cord injury. Therefore, a possible reason for the difference in the share of quadriplegic and paraplegic claims between age cohorts is the difference in life expectancies between claimants with and without spinal cord injuries.

The Younger Cohort Has a Larger Share of Claims That Are Quadriplegics and Paraplegics



*Excludes quadriplegic and paraplegic claims

Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 4

² Consider the following hypothetical example, which shows that the mix of injuries affects the overall average cost per claim:

Group A consists of:

- 7 Fractures at \$500 each, and
- 3 Head Injuries at \$2,000 each
- Average Cost = \$950 = $[(7 \times \$500) + (3 \times \$2,000)] / 10$

Group B consists of:

- 3 Fractures at \$250 each, and
- 7 Head Injuries at \$1,500 each
- Average Cost = \$1,125 = $[(3 \times \$250) + (7 \times \$1,500)] / 10$

Each type of injury is more expensive for Group A than for Group B, but the average cost for Group B is higher because of the mix of injuries (i.e., more head injuries).

³ ICD-9 refers to the International Classification of Diseases. NCCI assigns a primary ICD-9 code to each claim based on an algorithm that considers a number of factors. Injury is based on groupings of similar diagnoses.

Exhibit 5a shows that the distributions of annual costs by type of injury for the two age cohorts are not as similar as the distributions of claims shown in Exhibit 4. In addition, quadriplegic and paraplegic claims are a larger share of annual costs than of claims for both age cohorts. This is because WC quadriplegic and paraplegic claims that have been open for more than 20 years are costly relative to other injuries as demonstrated by Exhibit 5b. Exhibit 5b also indicates that quadriplegic and paraplegic claims’ annual average medical cost per claim is higher for the older cohort than for the younger cohort.

Quadriplegics and Paraplegics Are a Larger Share of Costs Than of Claims

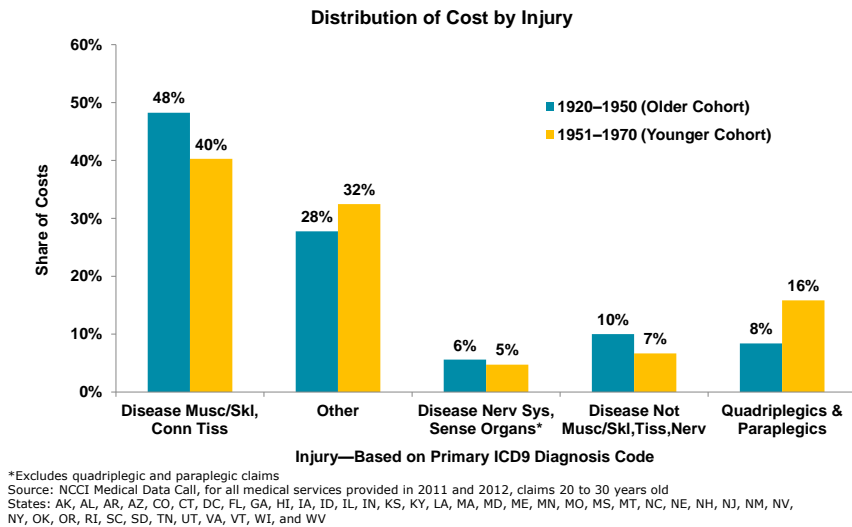


Exhibit 5a

Quadriplegic and Paraplegic Annual Average Medical Cost per Claim Is Higher for Older Cohort Than Younger Cohort

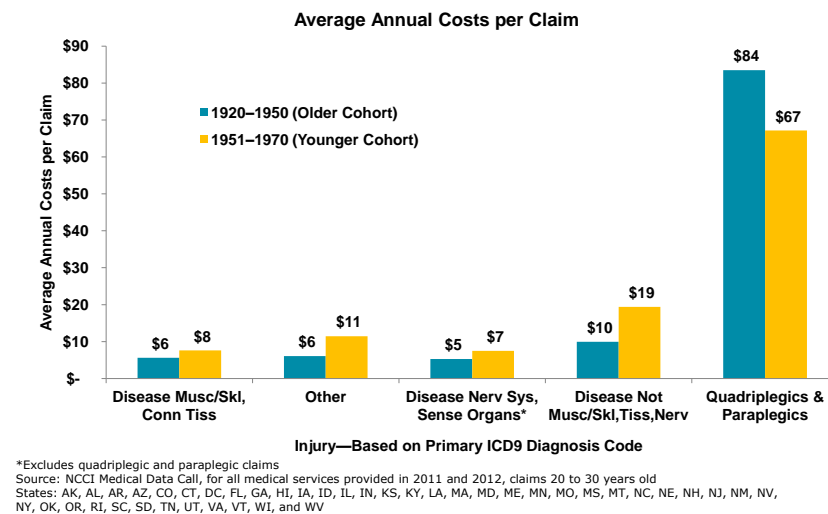
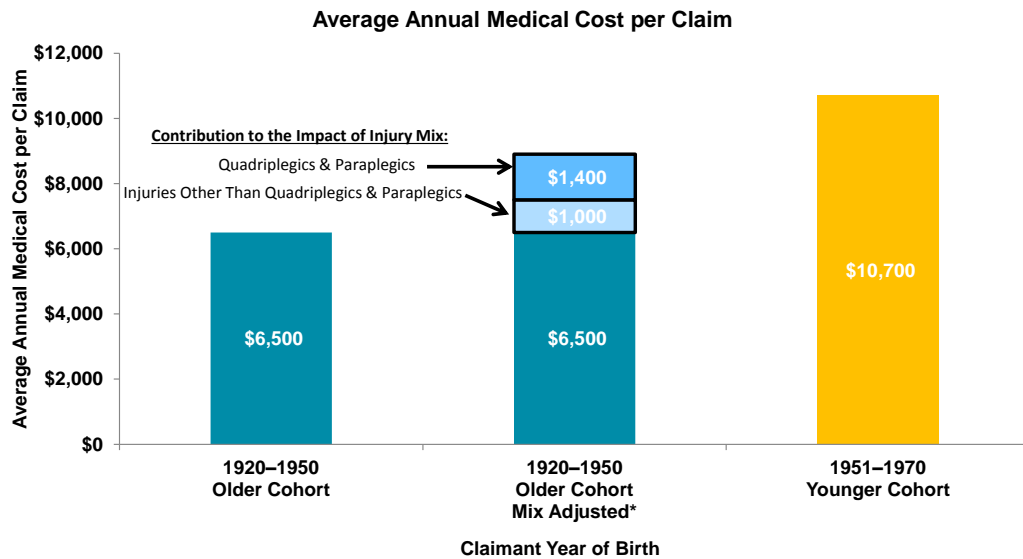


Exhibit 5b

Mix of injuries being treated accounts for about 60% of the difference in average annual late-term medical costs between the older and younger age cohorts. Exhibit 6 indicates that mix of injuries being treated accounts for approximately \$2,400 of the \$4,200 difference in average annual late-term medical costs between age cohorts.

Mix-adjusted⁴ average annual medical cost per claim displayed in Exhibit 6 is based on average annual cost by injury for the older cohort and the distribution of injuries for the younger cohort. The fact that the mix-adjusted average annual cost for the older cohort is larger than the unadjusted cost suggests that the younger cohort has a more costly mix of injuries than the older cohort. Exhibits 4 and 5 show that quadriplegic and paraplegic claims are costly claims that are a larger share of late-term claims in the younger cohort than in the older cohort. In fact, the difference in the shares of quadriplegic and paraplegic claims between the two age cohorts accounts for somewhat more than half (\$1,400 of \$2,400) of the impact of injury mix on the average annual cost difference between the two age cohorts.

Mix of Injuries Is a Major Driver of Difference in Average Annual Costs Between Age Cohorts



*Mix adjusted older cohort to mix of injuries for younger cohort, based on primary ICD9 diagnosis

Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 6

⁴ As an illustration of the concept of adjusting for injury mix, consider the following, based on the example in footnote 2:

Group A consists of:

- 7 Fractures at \$500 each, and
- 3 Head Injuries at \$2,000 each
- Average Cost = \$950 = [(7 x \$500) + (3 x \$2,000)] / 10

Group B consists of:

- 3 Fractures at \$250 each, and
- 7 Head Injuries at \$1,500 each
- Average Cost = \$1,125 = [(3 x \$250) + (7 x \$1,500)] / 10

Group A mix-adjusted consists of Group A's average injury cost and Group B's injury distribution:

- 3 Fractures at \$500 each, and
- 7 Head Injuries at \$2,000 each
- Average Cost = \$1,550 = [(3 x \$500) + (7 x \$2,000)] / 10

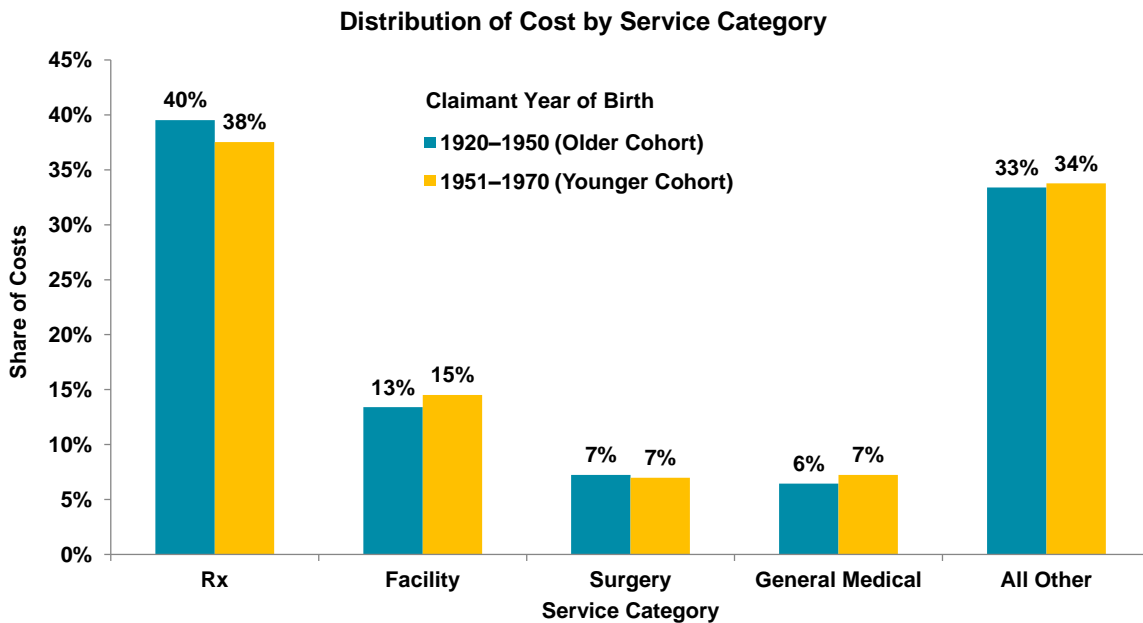
Considering that each type of injury is more expensive for Group A than for Group B, the mix-adjusted average cost for Group A is larger than the average cost for Group B.

LATE-TERM-CARE PRESCRIPTION DRUGS

Relative utilization of late-term-care medical services is shown in Exhibit 7, which compares the distributions of late-term cost by service category between age cohorts. Although the exhibit demonstrates no significant difference in the distributions of cost by service category between age cohorts, it indicates that prescription drugs is the largest service category for late-term medical care.

As shown in previous NCCI research on claims 20 or more years old [1], the prescription drugs service category showed the greatest utilization difference between early and late-term care. For medical services provided within 20 years of the date of injury, drug costs were about 10% of total medical costs, while for services provided 20 to 30 years after the date of injury, drug costs were about 40% of total medical costs. This difference might be at least partly explained by the general late-term-care emphasis on relieving pain rather than curing the condition/injury.

Prescription Drugs Is the Largest Service Category for Late-Term Medical Care



Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 7

Exhibit 8 compares the top drugs prescribed in late-term medical care by share of cost between the two age cohorts. The older cohort and the younger cohort have eight of the top drugs in common. However, eight of the top drugs for the younger cohort are narcotics, while only four of the top drugs for the older cohort are narcotics. Considering all drugs, Exhibit 9 shows that the narcotics share of drug costs generally decreases with claimant age. It follows that the narcotics share of drug costs is larger for the younger cohort than for the older cohort.

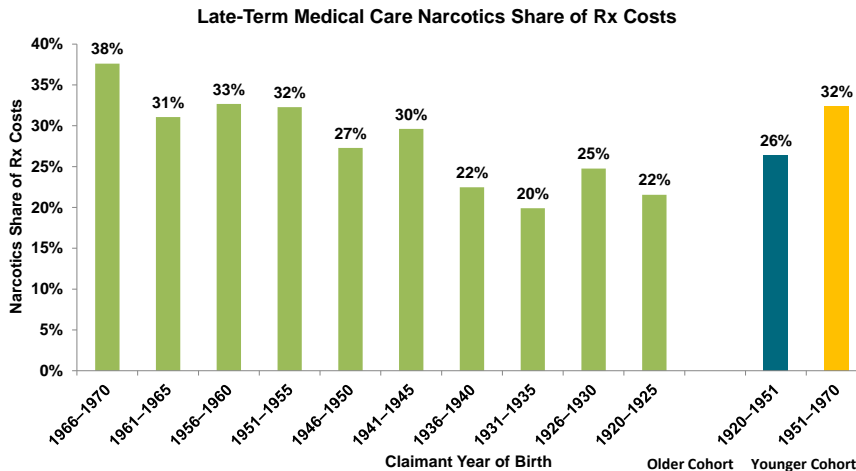
Top Drugs by Cost

Older Cohort Born 1920–1950			Younger Cohort Born 1951–1970		
Name	Rx Share	Narcotic	Name	Rx Share	Narcotic
OXYCONTIN	9.0%	Y	OXYCONTIN	9.8%	Y
CELEBREX	4.5%	N	LIDODERM	2.8%	N
LIDODERM	3.5%	N	LYRICA	2.6%	N
GABAPENTIN	3.2%	N	CYMBALTA	2.5%	N
LYRICA	2.7%	N	GABAPENTIN	2.4%	N
FENTANYL	2.2%	Y	CELEBREX	2.4%	N
CYMBALTA	2.2%	N	FENTANYL	2.1%	Y
PERCOCET	2.1%	Y	OPANA ER	2.0%	Y
HYDROCODONE-ACETAMINOPHEN	1.8%	Y	MORPHINE SULFATE ER	1.7%	Y
NEXIUM	1.8%	N	FENTANYL CITRATE	1.7%	Y
CYCLOBENZAPRINE HCL	1.3%	N	HYDROCODONE-ACETAMINOPHEN	1.5%	Y
TRAMADOL HCL	1.1%	N	OXYCODONE HCL	1.5%	Y
SOMA	1.0%	N	MS CONTIN	1.5%	Y

Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 8

Narcotics Share of Drug Costs Decreases With Claimant Age



Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

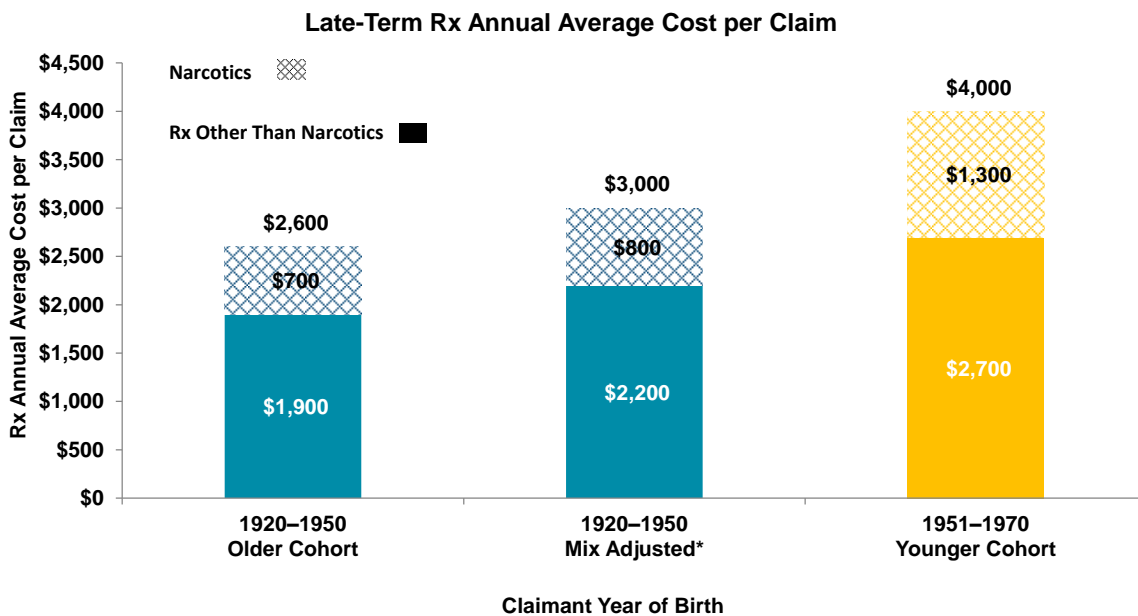
Exhibit 9

Prescription drugs account for about 20% of the difference in average annual late-term medical cost between age cohorts. Exhibit 10 compares late-term average annual prescription drug costs per claim between age cohorts. It shows that even after accounting for mix of injuries being treated, the younger cohort's average annual prescription drug cost per claim is \$1,000 higher (\$1,000 = \$4,000 – \$3,000). Narcotics are about half the difference (\$500 = \$1,300 – \$800), and, of course, drugs other than narcotics are about half the difference (\$500 = \$2,700 – \$2,200). This suggests that regardless of the type of injury, the younger cohort is either:

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

Differences in prescribing patterns between age cohorts might be partly attributable to an increasing possibility of adverse drug interactions as claimants age, and reductions in the ability of the body to absorb drugs as claimants age. According to the US Food and Drug Administration (FDA) [3], the likelihood of using multiple prescription drugs increases with age, resulting in an increased chance of harmful drug interactions. Furthermore, the FDA mentions that as individuals age, changes to the body can affect the way medicines are absorbed and used.

Annual Average Rx Cost per Claim is Higher for the Younger Cohort Than for the Older Cohort



*Mix adjusted older cohort to mix of injuries for younger cohort, based on primary ICD9 diagnosis
 Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

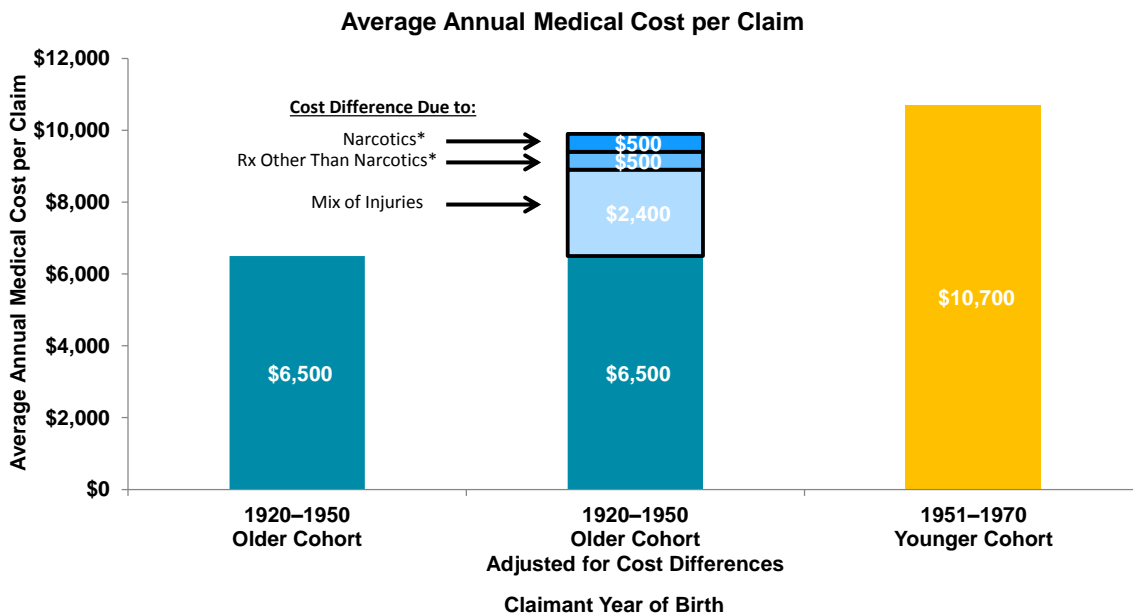
Exhibit 10

CLOSING REMARKS

A summary of age-related differences in late-term medical average annual cost is shown in Exhibit 11. About 80% of the difference in average annual late-term medical cost per claim between the older and younger cohorts is explained by:

- The mix of injuries being treated
 - The difference in the share of quadriplegics and paraplegics is the largest contributor
- Prescription drugs
 - Narcotics is a large contributor

Summary of Age-Related Differences in Late-Term Medical Annual Average Cost



*Cost differences due to narcotics and Rx other than narcotics are the remaining cost differences after adjusting for mix of injuries.

Source: NCCI Medical Data Call, for all medical services provided in 2011 and 2012, claims 20 to 30 years old
 States: AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, ME, MN, MO, MS, MT, NC, NE, NH, NJ, NM, NV, NY, OK, OR, RI, SC, SD, TN, UT, VA, VT, WI, and WV

Exhibit 11

CREDITS

Barry Lipton, John Robertson, and Patrick O'Brien contributed to this study.

REFERENCES

- [1] B.Lipton, J.Robertson, D.Corro, "Medical Services for Claims 20 or More Years Old," NCCI, January 2013
www.ncci.com/documents/Med-Svcs-20yrs.pdf
- [2] "Spinal Cord Injury Facts and Figures at a Glance," National Spinal Cord Injury Statistical Center, February 2013
www.nscisc.uab.edu/PublicDocuments/fact_figures_docs/Facts%202013.pdf
- [3] "As You Age: You and Your Medicines," US Food and Drug Administration, August 2011
www.fda.gov/drugs/resourcesforyou/consumers/ucm143566.htm

© Copyright 2014 National Council on Compensation Insurance, Inc. All Rights Reserved.

THE RESEARCH ARTICLES AND CONTENT DISTRIBUTED BY NCCI ARE PROVIDED FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE PROVIDED "AS IS." NCCI DOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS NOR DOES NCCI ASSUME ANY LIABILITY THAT MAY RESULT IN YOUR RELIANCE UPON SUCH INFORMATION. NCCI EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES OF ANY KIND INCLUDING ALL EXPRESS, STATUTORY AND IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.