Medical Trend

The Health Insurer's Perspective

Rob Bachler, Vice President & Actuary
Munich Re America HealthCare

Agenda

Medical Trend - Components

Commercial and Government Programs

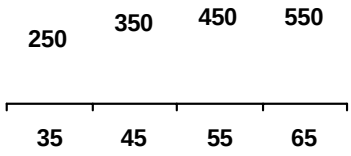
- Medical CPI
- Changes in Morbidity
- Changes in utilization/technology

Specific to Commercial Carriers

- Changes in provider contracts
- Changes in plan benefit design

Medical Trend – Components
Changes in Morbidity

Population Aging



Increases costs by 0.5% - 1.0% per year

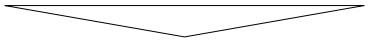
Increases in Chronic Disease

Medical Trend – Components
Changes in Technology/Utilization

In times past, performance of an MRI required a trip to the hospital.

Today, more free-standing diagnostic clinics and large medical practices have these machines, making the procedure more convenient for patients.

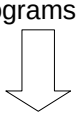
Result: From 2000 to 2004, the number of MRIs performed in the U.S. increased 60% (9.9% annually)



New technologies, patient convenience, and better outcomes sometimes have a cost

Medical Trend – Components
Changes in Provider Contracts

Government programs reduce payments



Providers (doctors, hospitals, etc.) must make up revenue

Providers increase charges to other payors

Providers look for other sources of revenue

Medical Trend – Components
Changes in Benefit Design

Effect depends on form of cost sharing

- Fixed copays/deductibles
  - Changes required to keep neutral
  - Without changes, percentage of costs shared by patient shrinks.
- Coinsurance percentages
  - Increases in coinsurance will reduce plan trend (all else equal)

As cost-sharing percentage changes, so does utilization

- Foundation of MSA and CDHP concepts
- RAND Health Insurance Experiment

Medical Trend - Drivers

- Prevalence of Chronic Disease
- Prescription Drugs
- Other Life-saving/End of Life Technology

Medical Trend – Drivers
Chronic Disease Prevalence

Obesity	In 1996, 17% of adult Americans were obese In 2006, 25% of adult Americans were obese Studies link to multiple chronic diseases (diabetes, CHF, etc.)
Diabetes	In 1995, 6.2% of Americans aged 45-64 were diabetic In 2005, 10.2% of Americans aged 45-64 were diabetic Presence of diabetes increases an individual's costs by over $6,000 per year
End-stage Renal Disease (ESRD)	In 1995, 287,000 Americans had diagnosed ESRD In 2005, 485,000 Americans had diagnosed ESRD (5.4% increase per annum) Average cost in 2005 per ESRD patient ($53,000 Medicare, $95,000 commercial)

Medical Trend – Drivers
Prescription Drugs

THE PAST

- **General Trend**
  - **From mid-90s to early 2000s, hospital and physician costs rose 4-7% annually**
  - **Meanwhile, prescription drugs were rising from 12-17% annually**
  - **Prescription drugs as share of national health expenditures rose from 5% in 1994 to 10% in 2004. In many commercial plans, drugs rose to 20-25% of total spend.**
- **"Blockbuster" Drugs**
  - **First "blockbuster" drug was released in 1977 (Tagamet), with about $300M in sales in 1980.**
  - **Top ten drugs in 2005 sold more than $3.8B ($1.6B in 1980 dollars)**

Medical Trend – Drivers
Prescription Drugs

THE FUTURE

- **Specialty Drugs**
  - **Numax®**, for RSV prevention in infants, expected to cost $18,000 for 6 months of treatment
  - **Remodulin®,** for pulmonary hypertension, at $85K/year with assumed life expectancy of 10-15 years
  - **Ixempra®,** for breast cancer, at $20K/course
  - **Nexavar®,** for liver cancer, at $5K/month

Medical Trend – Drivers
Life Saving Technology

Transplants and Implantable Devices	Intestinal – from 22 in 1992 to 198 in 2007 ($950K per) Liver – from 3,064 in 1992 to 6,492 in 2007 ($520K per) LVADs – Introduced as a bridge to heart transplant in mid-1990s.
Premature Babies	25 years ago, babies born before 28 weeks of gestation died. Today, babies are viable at 23-24 weeks, but if they live, are virtually guaranteed to incur over $500K in medical costs. Increase in premature babies due to in vitro technologies
End of Life	For the period 2001-2005, in the last 2 years of life, Medicare patients with chronic conditions incurred an average of over $46,000. *Will we have to decide the value of life?*

Medical Trend – Sources of Information

- Center for Medicare/Medicaid Services (CMS)
- Industry Publications
- Analysis of Available Databases

Medical Trend – Sources of Information
CMS

National Health Expenditure (NHE) data

- **Available at (http://www.cms.hhs.gov/NationalHealthExpendData)**
- **Historical Data and Projections**
- **Various Breakouts**
  - **Type of payor (Private, Medicare, Medicaid)**
  - **Type of service (Inpatient, Physician, Drug, etc.)**
- **Totals only (no member/exposure counts)**

Medical Trend – Sources of Information
Industry Publications

Kaiser Family Foundation	Website: http:/www.kff.org Detailed analysis of CMS' NHE Employer Health Benefits Survey
Milliman	Website: http://www.healthcostindex.com/ Health Cost Index Report
Center for Health System Change	Website: http:/www.hschange.com General industry information and studies on specific issues

Medical Trend – Sources of Information
Available Databases

- Multiple vendors
  - Ingenix
  - Medstat (MarketScan)
  - Solucient
  - CMS (Medicare 5% sample)
- Costs range from $5-10,000 (CMS 5% sample) to $100+K for commercial database of 15+ million lives
- Can require significant effort, but allow for detailed and customized trend analyses.

WSIB Workplace Safety & Insurance Board
CSPAAT Commission de la sécurité professionnelle et de l'assurance contre les accidents du travail

Joint SoA/CAS/CIA Meeting

Québec City
June 18, 2008

Session 85 – Health Care Cost (Medical Trend) Inflation
Canadian Workers Compensation Perspective

Rob Hinrichs, FSA, FCIA

Agenda

- Workers Compensation in Canada
- WC Health Care Benefits Overview
- Historical Health Care Trends
- Health Care Pricing Approach
- Health Care Initiatives

Workers Compensation in Canada
Overview

- No-fault collective liability for employers and workers
  - workers give up the right to sue for their work-related injuries in return for guaranteed compensation
  - employers receive protection from lawsuits for work-related injuries in exchange for financing the program through premiums
  - coverage is defined by legislation (started in early 1900s), and covers most businesses
- Provincial government trust agencies administer Acts and provide coverage
  - agencies established at same time as legislation
  - for example, Workplace Safety & Insurance Board of Ontario (WSIB) is the workers compensation board in the Province of Ontario
- Main focus is claims and benefit services to injured workers
  - most boards also provide health and safety services
- Long term vision is elimination of all workplace injuries, illnesses and fatalities

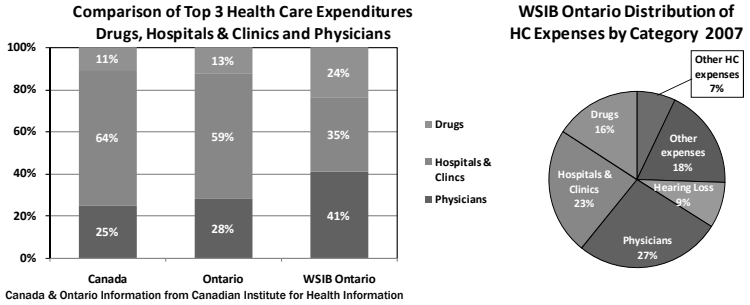
Workers Compensation in Canada
Health Care Benefits Overview

- Health care provided by workers compensation boards predates medicare legislation in Canada
- Workers compensation is first-dollar payer if work-related injury
- Lifetime HC benefits with few limits
- Examples of health care:
  - professional services provided by physicians, surgeons and chiropractors
  - services provided by hospitals and health care facilities
  - prescription drugs
  - assistive devices and prostheses
  - services of attendants
  - modifications to person's home and vehicle, and other measures to facilitate independent living
  - transportation costs to obtain health care

Comparison to Group Insurance

	Workers Compensation	Group Insurance
Coverage	Mandatory	Selective
Eligibility and Underwriting	Active employees of most occupations. No underwriting other than broad business risk classifcation system	Active employees. Subject to group (and in some cases individual) underwriting
Benefits	Established by provincial Act. Subject to change, including retrospective application. Examples: wage loss, death benefits, health care, vocational rehabilitation, return to work and retirement benefits	Specified in insurance contract. Examples: life, disability, health care over basic provincial health insurance program, dental, vision, accidental death
Health Care Benefits		
Health Care Benefits Covered	All HC expenses including expenses normally covered by the provincial health insurance (e.g. hospital & physicians)	Limited additional benefits and services as described in group contract, such as private room, out-of-country referral, and trip interruption
HC Duration and Co-insurance	Lifetime benefits, without maximum. No direct payment by injured worker	Co-insurance common with benefit payment limitations
Pricing	Annually re-rated. All benefits priced together	Benefits priced separately
Renewability	Automatically renewable. No renewal underwriting. Some annual re-classification	As specified in each contract

Health Care Benefits Overview
Canada, Ontario and WSIB Ontario

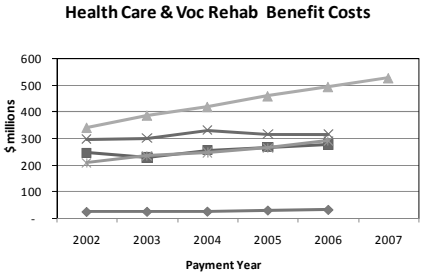


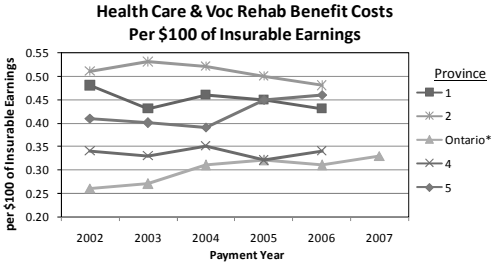
Canada & Ontario Information from Canadian Institute for Health Information

- Physician costs are highest of top 3 HC expenses at WSIB Ontario
- Most WSIB physician costs are for medical assessments, but category also includes costs for chiropractors, physiotherapists, psychologists and reports
- WSIB's drug costs proportion is higher than province of Ontario due to therapies specific to treating work-related injuries and illnesses

Historical Health Care Trends Among 5 Canadian WC Boards

- In 2006, health care and vocational rehabilitation costs represented 27% of all claim costs across 5 Canadian workers compensation boards

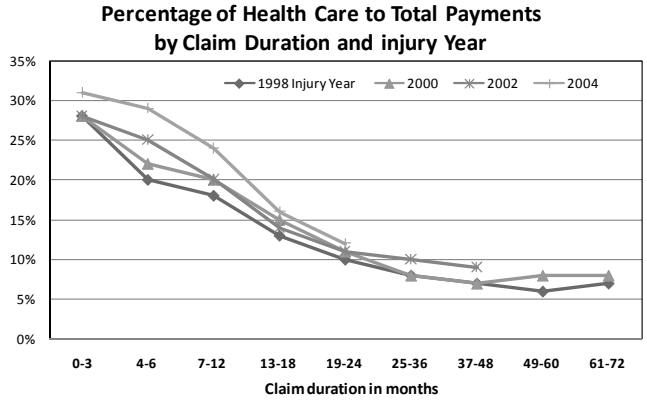




Source: Association of Workers Compensation Boards of Canada
* Ontario includes Health Care costs only

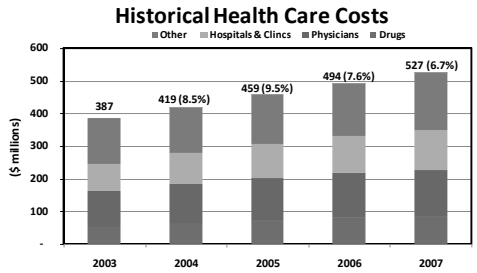
- Ontario has highest increase in health care benefit costs among 5 Canadian boards from 2002 to 2007. However, because of its size, Ontario is among the lowest cost rate, based on insurable earnings

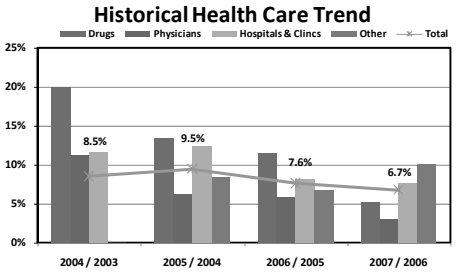
WSIB Ontario



- Proportion of health care payments to total claim payments declines as duration increases
- Proportion has been rising across all claim durations in more recent injury years

WSIB Ontario
Trend in Health Care Costs





- Slowing growth rates in top 3 HC costs are attributable to several factors, including
  - drug cost increases have slowed due to more generic drug substitution
  - physician and hospital costs increases have slowed due to more focused care through specialty clinics and greater facilitation of nurse care management
- However, other health care costs have been rising (no change in 2004 became 10% increase in 2007)

Health Care Escalation Assumptions

- Escalation assumption includes utilization and inflation
- Different approaches are common among 5 Canadian workers compensation boards

Health Care Escalation by Year End

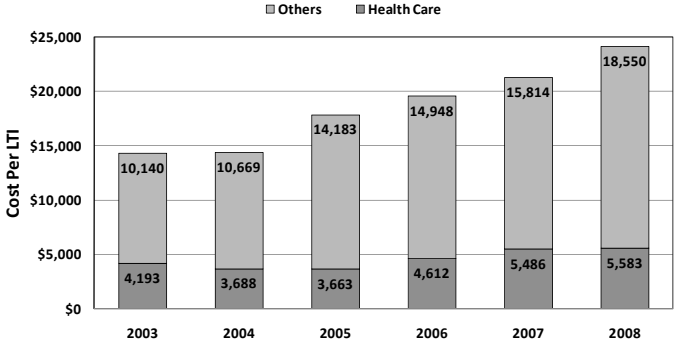
Province	2002	2005	2007
1	6.00%	5.45%	CPI + 2.5%
2	6.50%	6.75%	6.75%
Ontario	6.50%	6.50%	6.50%
4	3.40%	3.40%	2.0% (1st year) 3.4% (later years)
5	4.35%	4.00%	4.00% (hospital) 7.50% (medical)

Health Care Pricing Approach

- Annual re-pricing based on past experience and assumptions projected to future injury year
- Premium rates are determined for all benefits combined (e.g. wage loss, health care, survivor benefits, etc) and by business risk
  - for example, Ontario sets separate premium rates for each of its 155 business risk rate groups, based on three factors:
    - assumed insurable payroll increase/decrease for upcoming pricing year
    - assumed number of lost-time injury claims (LTI), and
    - assumed claim cost per LTI for pricing year, which is the sum of assumed claim costs for each benefit type
- For larger employers, incentive programs help to reduce premium costs for those employers that have better than average health and safety and return to work practices. These efforts usually lead to lower than expected LTIs and lower claim cost experience, and as a result higher incentives and lower cost

WSIB Ontario

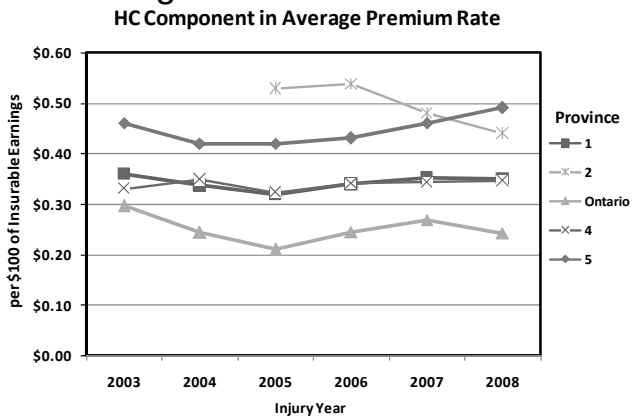
Health Care Component of Total Cost per Lost Time Injury



Source: WSIB premium rate manuals

- Expected health care costs per lost-time injury (LTI) have increased at a slower rate than for other benefit costs

Health Care Component of Premium Rates Among 5 Canadian WC Boards



- Health care costs are not priced separately but are included in total workers compensation premium rate

Health Care Initiatives

- Continuing to modify HC programs to improve HC and claim outcomes
- For example, more generic drug substitution, strategic sourcing, and more worker- and workplace-focused protocols have helped to slow annual increase in HC claim costs, and are expected to lead, in the long term, to lower overall claim costs
- Improvements in data analysis, systems and procedures are expected to lead to better health care outcomes for injured workers

How NCCI Measures Medical Trends in Workers Compensation

Barry Lipton, FCAS, MAAA
Practice Leader and Senior Actuary

Medical Trends Panel
SOA Life Spring Meeting, Joint Day with the CIA, CAS & IAA
June 18, 2008

NCCI Evaluates Medical Costs for Three Major Applications

- Research on medical cost drivers for legislative analysis
- Medical trends for use in ratemaking
- Countrywide industry results analyses

How NCCI Measures Medical Trends for Research

- Focus is on the medical cost per claim
- We decompose the medical cost into its components
- We measure changes in components over time
- We drill down on components for further insights

Costs Are a Combination of Price and Utilization

- Price: Charge per service
- Utilization: Number of services
- Mix: Distribution of Services provided
  - e.g., X-Ray vs. MRI
- "Model" of Claim Costs

Cost = Price x Utilization

Utilization = Quantity and Mix

- Cost differences are the sum of price component and utilization component

Price Versus Cost

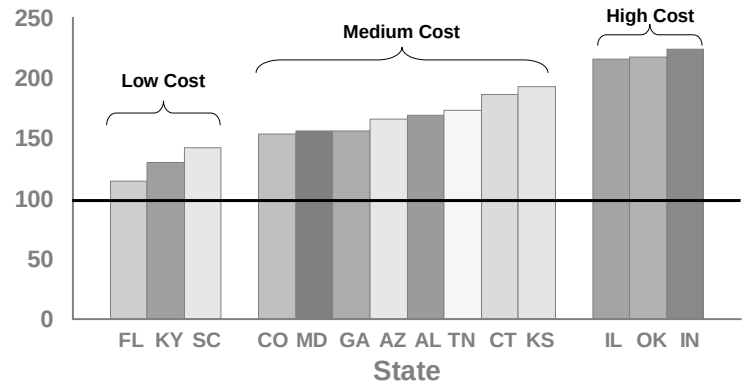
- Cost and price are usually but not always correlated
- Our utilization patterns are the difference

Cost Differences Vary by State

Workers Compensation Versus Group Health

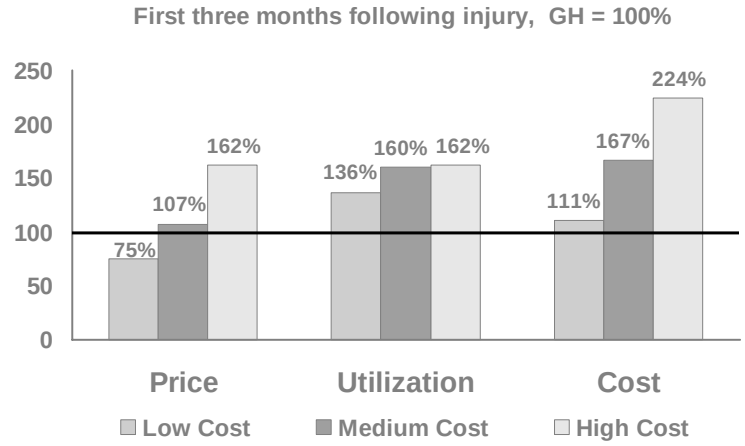
Percent

First three months following injury, GH = 100%



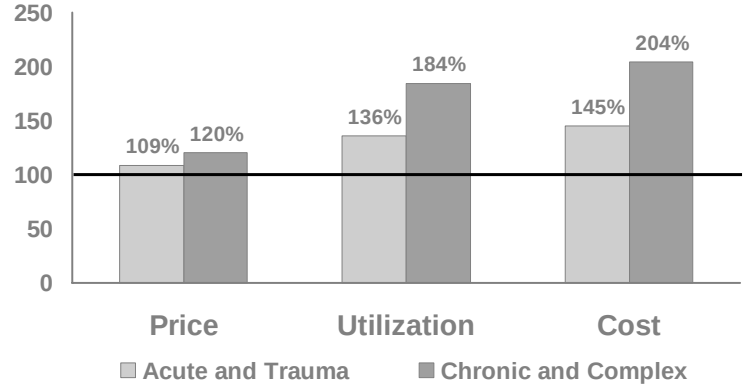
Price Differences and Cost Differences Between WC and GH Correlate by State

Percent



Cost Difference Is Bigger for Chronic and Complex Injuries Due to Utilization

Percent **Workers Compensation Versus Group Health**



How NCCI Measures Medical Trends for Ratemaking

- For ratemaking, we calculate loss ratio trends
- We look at the residual trend after removing the impact of:
  - Benefit changes
  - Rate changes
  - Wage inflation
- Ratemaking trend calculations use the development methodology and data type (policy or accident year) selected for the filing in that particular year
  - Paid
  - Paid + Case

Ratemaking Medical Trends Example

APPENDIX A-III

POLICY YEAR TREND FACTORS

(1) Policy Year	(2) Paid On-leveled Indemnity Loss Ratio	(3) Paid+Case On-leveled Indemnity Loss Ratio	(4) Paid On-leveled Medical Loss Ratio	(5) Paid+Case On-leveled Medical Loss Ratio
1998	0.422	0.414	0.647	0.693
1999	0.373	0.362	0.637	0.691
2000	0.381	0.371	0.655	0.708
2001	0.346	0.341	0.655	0.681
2002	0.349	0.328	0.678	0.725
2003	0.313	0.296	0.618	0.649
2004	0.250	0.227	0.535	0.561
2005	0.228	0.248	0.521	0.559

		Indemnity	Medical
• Current approved annual trends (effective March 1, 2007)		0.980	1.015
• Range of indicated annual trend factors based on frequency/severity analysis:	Lower estimate:	0.907	0.959
	Upper estimate:	0.967	1.015
• Countrywide annual trend factors:		0.979	1.020
Selected annual trend factors:		**0.965**	**1.005**

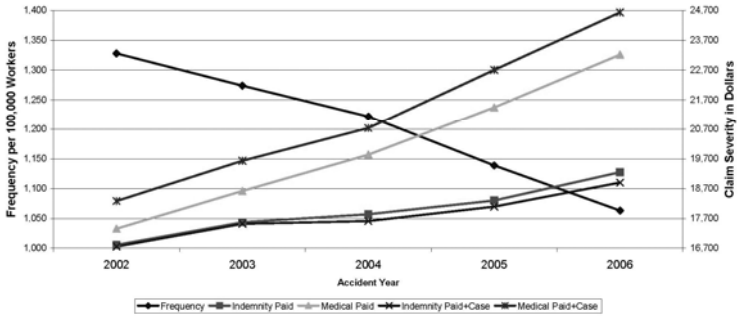
How NCCI Measures Medical Trends for Countrywide Industry Results Analyses

- Medical trends in countrywide industry results analyses
  - Medical severity per lost-time claim
  - Medical-only claim dollars are removed from medical severity
  - Displays both both paid and paid plus case losses on an accident year basis

Countrywide Trends

Accident Year Frequency and Severity by State
Data Valued as of 12/31/2006

Countrywide



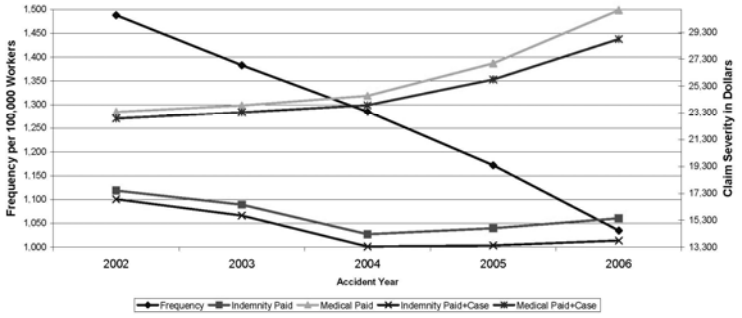
Calendar-Accident Year	Frequency per 100,000 Workers at Ultimate		Paid Development to Ultimate				Paid+Case Development to Ultimate			
			Indemnity Losses		Medical Losses		Indemnity Losses		Medical Losses	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
2002	1,328	xxx	16,806	xxx	17,349	xxx	16,752	xxx	18,280	xxx
2003	1,274	-4.1%	17,567	+4.5%	18,616	+7.3%	17,513	+4.5%	19,632	+7.4%
2004	1,222	-4.1%	17,836	+1.5%	19,840	+6.6%	17,608	+0.5%	20,741	+5.6%
2005	1,139	-6.8%	18,296	+2.6%	21,445	+8.1%	18,092	+2.7%	22,704	+9.5%
2006	1,063	-6.7%	19,250	+5.2%	23,218	+8.3%	18,902	+4.5%	24,632	+8.5%

Source: NCCI Financial Data Valued as of 12/31/2006
Losses and claim counts are developed to ultimate. Losses are at historical benefit levels and historical inflation levels.
Premium is converted to number of workers for frequency.
Medical-only claim counts and losses are excluded.

Large State Example

Accident Year Frequency and Severity by State
Data Valued as of 12/31/2006

Florida



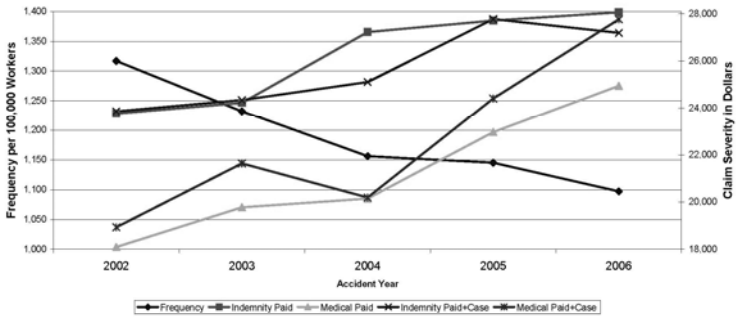
Calendar-Accident Year	Frequency per 100,000 Workers at Ultimate		Paid Development to Ultimate				Paid+Case Development to Ultimate			
			Indemnity Losses		Medical Losses		Indemnity Losses		Medical Losses	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
2002	1,488	xxx	17,507	xxx	23,377	xxx	16,861	xxx	22,866	xxx
2003	1,383	-7.1%	16,455	-6.0%	23,858	+2.1%	15,645	-7.2%	23,346	+2.1%
2004	1,285	-7.1%	14,266	-13.3%	24,576	+3.0%	13,348	-14.7%	23,881	+2.3%
2005	1,172	-8.8%	14,704	+3.1%	26,997	+9.9%	13,433	+0.6%	25,792	+8.0%
2006	1,035	-11.7%	15,448	+5.1%	30,952	+14.6%	13,800	+2.7%	28,807	+11.7%

Source: NCCI Financial Data Valued as of 12/31/2006
Losses and claim counts are developed to ultimate. Losses are at historical benefit levels and historical inflation levels.
Premium is converted to number of workers for frequency.
Medical-only claim counts and losses are excluded.

Small State Example

Accident Year Frequency and Severity by State
Data Valued as of 12/31/2006

Maine



Calendar-Accident Year	Frequency per 100,000 Workers at Ultimate		Paid Development to Ultimate				Paid+Case Development to Ultimate			
			Indemnity Losses		Medical Losses		Indemnity Losses		Medical Losses	
	Value	Change	Value	Change	Value	Change	Value	Change	Value	Change
2002	1,317	xxx	23,769	xxx	18,093	xxx	23,861	xxx	18,933	xxx
2003	1,232	-6.5%	24,224	+1.9%	19,772	+9.3%	24,347	+2.0%	21,634	+14.3%
2004	1,156	-6.2%	27,230	+12.4%	20,142	+1.9%	25,109	+3.1%	20,191	-6.7%
2005	1,145	-1.0%	27,715	+1.8%	22,964	+14.0%	27,775	+10.6%	24,406	+20.9%
2006	1,097	-4.2%	28,065	+1.3%	24,943	+8.6%	27,193	-2.1%	27,762	+13.8%

Source: NCCI Financial Data Valued as of 12/31/2006
Losses and claim counts are developed to ultimate. Losses are at historical benefit levels and historical inflation levels.
Premium is converted to number of workers for frequency.
Medical-only claim counts and losses are excluded.

Summary Differences Between Results Analysis and Ratemaking

Countrywide Analysis	Rate Filing Trend Exhibits
– Medical Cost per Lost-Time Claim Trend	– Medical Loss Ratio Trend
– Calendar-Accident Year Data	– Either Policy Year or Calendar-Accident Year Data, Depending on What is Filed
– No Loss Limitation Is Used	– Individual Claim Amounts Are Limited
– Claim Counts and Losses Are Developed to Ultimate	– Claim Counts and Losses Are Developed to Ultimate
– Paid, Paid Plus Case, and Filed Development Methods Are Used	– Development Uses the Filed Methodology
– Losses Are at the Historical Benefit Level	– Losses Are on the Current Benefit Level

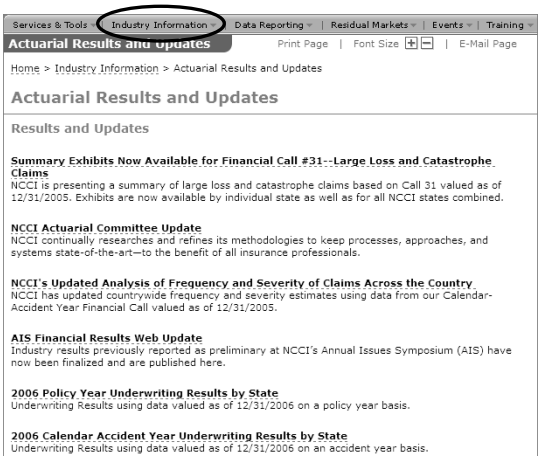
(continued)

Summary Differences Between Results Analysis and Ratemaking

Countrywide Analysis	Rate Filing Trend Exhibits
– Losses Are Not Adjusted for Wage Inflation	– Losses Are Adjusted for Wage Inflation
– Medical-Only Losses Are Excluded	– Medical-Only Losses Are Included
– Exposure Base for Frequency Is the Number of Workers	– Exposure Base for Frequency Is Premium
– Premium Is Divided by the Average Rate to Estimate Payroll	– Premium Is on Current Rate Level
– Payroll Is Divided by Average Wage to Estimate the Number of Workers	– Premium Is Adjusted for Wage Inflation
– Losses Are Not Adjusted for Wage Inflation	– Losses Are Adjusted for Wage Inflation

Aggregate Industry Results

Affiliates can find more information as well as published industry results in the Actuarial Results and Updates section, located in the Industry Information tab of ncci.com:



Q & A

Medical Trends in Workers Compensation:
The Company Perspective

Mike Toth, FCAS, MAAA

Medical Trend

- **Inflationary effects**
- **Utilization effects**
- **Components are useful for explaining magnitude of medical trends**
- **Overall impact necessary for pricing and reserving**

Workers Comp Medical Benefits

- Medical costs associated with a work injury are covered for life
- Priced today
- Trends affect all open claims
- Examples

How Large Can a WC Claim Become?

- Consider a 25 year old quadriplegic.
- Indemnity benefits of $23,500 a year.
- Attendant care costs $135,000 a year.
- Other medical costs of $72,500. Includes prescriptions, doctors visits, etc.
- These costs continue until death.

How Big Can a WC Claim Become?

Age at Death	Medical Inflation 3%	5%	7%	9%
45	$6.4	$7.0	$7.6	$8.5
60	$14.0	$16.3	$20.2	$26.5
75	$25.5	$33.0	$48.6	$81.5

Costs in millions

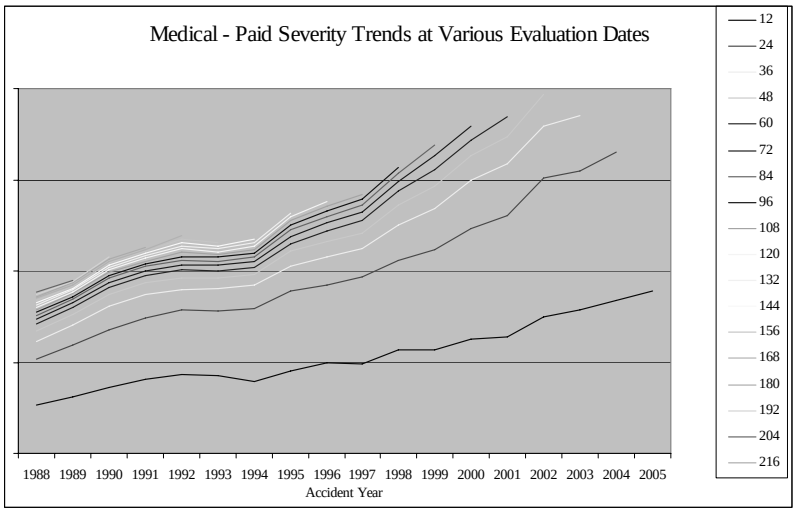
Differences in Pricing and Reserving

- Pricing is done considering the time value of money
- Reserves carried on a nominal basis
- Unexpected changes in medical trends can have detrimental effect on the balance sheet

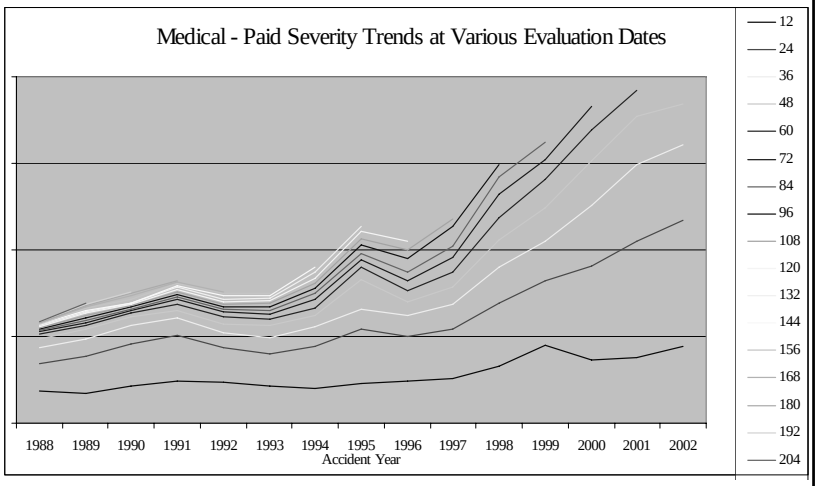
Methods for Measuring Trends

- **Post analysis curve fit**
- **Pre-analysis curve fits and visual inspection**
  - **Not biased by development selection and techniques**
  - **Demonstrates predictive power (or lack thereof) of early observations**

Medical Trend Example



Medical Trend Example



Medical Trends in WC

- **Medical trends in WC are persistently greater than Medical CPI**
- **Medical trends take time to develop**
- **Medical costs are impacted by external shocks to the system**

Medical Trends

- **Medical trends in WC differ from Group Health for many known reasons**
- **How different are the trends when all costs are covered by mandated government programs?**
- **In WC, a key to understanding the difference is the price vs utilization effect.**
- **WC carriers need to consider the long term effect of medical trends**
  - **Coverage sold today provides medical treatments for the remaining life of the injured worker**
  - **Reserves must be carried on a nominal basis**