

Workforce Reductions and Workers Compensation Claim Costs: A Case Study

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- **GOAL:** Use a specific situation that evolved over a five year period to illustrate the impact of material workforce reductions on considerations and metrics underlying an actuarial analysis.
- **CAVEAT:** Many numbers and charts have been normalized or adjusted to ensure the confidentiality of data. Relativities, trends, and other key metrics have been preserved.

Background

- Commercial and Military Ship Building and Repair
- Multi-jurisdictional Workers Compensation Exposures
 - Claims filed primarily under the USLHWA
 - Numerous state jurisdictions as well
- High Hazard Exposure
 - Inherently dangerous work
 - Long-term exposure to repetitive motion
 - Long-term exposure to hazardous materials
- Unionized and Confrontational Workforce
 - Very much aware of remedies under workers compensation
 - Aided by active and aggressive legal firms
- Self-insured under all jurisdictions

Understanding USLHWA

- High Maximum Weekly Benefit: 200% NAWW
 - Effective 10/1/2012: \$1,325.18
- High Minimum Weekly Benefit: 50% NAWW
 - Effective 10/1/2012: \$331.30
- Temporary Total Disability: no limit on healing period
- COLA: annual change in NAWW limited to 5% annual maximum
 - Fatal
 - PTD
- Lifetime Non-scheduled Permanent Partial Disability Awards
 - Back and other musculoskeletal injuries not listed in schedule
 - Other bodily injuries: respiratory

Understanding USLHWA

- Non-scheduled Permanent Partial Disability Claims are an Issue
 - Scheduled PPD Awards
 - Arm Lost: 312 weeks
 - Leg Lost: 288 weeks
 - Hand Lost: 244 weeks
 - Foot Lost: 205 weeks
 - Eye Lost: 160 weeks
 - Thumb Lost: 75 weeks
 - First Finger Lost: 46 weeks
 - Great Toe Lost: 38 weeks
 - Second Finger Lost: 30 weeks
 - Third Finger Lost: 25 weeks
 - Toe Other Than Great Toe Lost: 16 weeks
 - Fourth Finger Lost: 15 weeks
 - Other PPD are non-scheduled and are paid for the duration of disability

Understanding USLHWA

- Simplified Second Injury Fund Assessments Accrual
 - Unpaid cost of unlimited indemnity benefits
 - Apply historical compensation assessment percentage
 - Unpaid cost of employers claims in the second injury fund
 - Apply historical participation assessment percentage
 - Point: For every additional dollar of indemnity costs generated by the workforce reduction, there is an additional balance sheet requirement on the order of 8% (one half 16%) to provide for second injury fund assessments.
 - \$100 million increase in balance sheet accrual for indemnity costs will generate an additional \$8 million for future assessments

Understanding Multi-jurisdictional Claims

- Claimants cannot collect benefits concurrently from two jurisdictions
- Claimants can and do change jurisdictions during their life cycle to maximize benefits, if permitted by statute:
 - Example: PTD evolves into a widow(er) case
 - USLHWA
 - PTD is $\frac{2}{3}$ AWW subject to \$1,325.18 maximum
 - Widow(er) is $\frac{1}{2}$ AWW subject to \$1,325.18 maximum
 - Other State
 - Widow(er) is $\frac{2}{3}$ AWW subject to state maximum
- Interaction of USLHWA and state acts is complex, and varies by state.
 - Example: Virginia, effective July 1, 2012, law passed that if worker is covered by USLHWA, they can no longer pursue coverage under the state act.

Understanding the Hazard: Traumatic Injuries

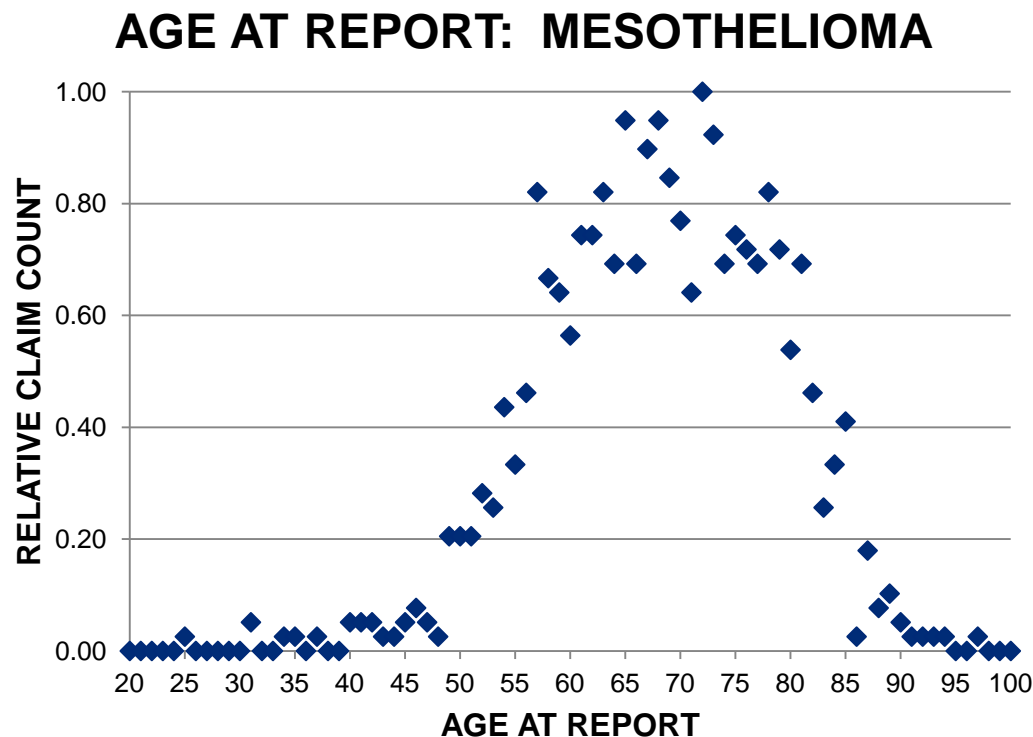
- Employees file many claims throughout career
- Steady state annual frequency is ~25 claims per 100 employees today
 - During the time period considered by this presentation, annual claim frequency was close to 40 claims per 100 active employees
 - During the height of the workforce reduction period, annual claim frequency peaked at 60 claims per 100 active employees
 - These are all claims – lost time and medical only claims
- Steady state pure premiums are ~\$15 per \$100 payroll today
 - During the period of time considered in this presentation, average pure premiums were ~\$20 per \$100 payroll
 - During the height of the workforce reduction, they peaked at \$55
- Current average severity is ~\$40,000 per claim, today.
 - Had been ~10,000 (1988-1991) peaking at ~\$35,000 in 1996

Understanding the Hazard: Latent Disease Exposure

- Exposure to asbestos, heavy metals, toxic fumes, dust, and chemicals
 - Grinding, painting, welding, machining, electroplating, etc.
- Diseases Include: Mesothelioma Lung Cancer
 Other Cancer Asbestosis
 Respiratory Impairment Hearing Loss
- All of these diseases have the potential to (and generally do) emerge many years after last date of exposure (last date worked)
- US statute identifies the responsible employer as the employer where last exposure occurred.
- Underlying latency and associated report lag is a material issue for determining appropriate reserves.

Understanding the Hazard: Latent Disease Exposure

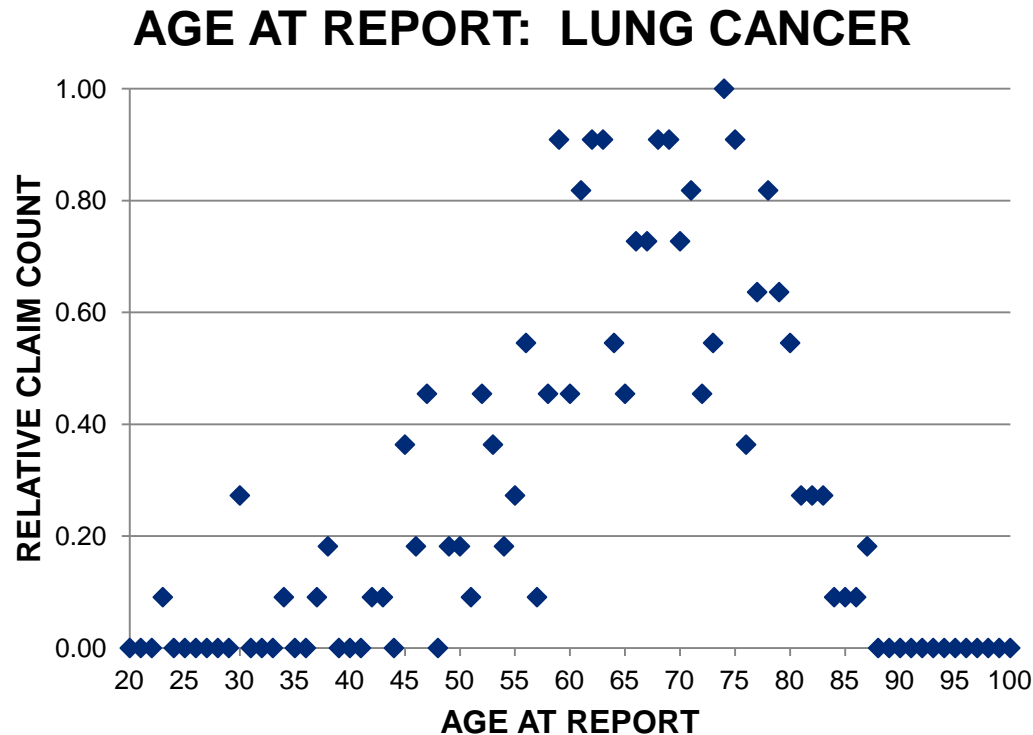
- Mesothelioma



<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	68	0.4 years	87%
> 2	68	10.7 years	13%

Understanding the Hazard: Latent Disease Exposure

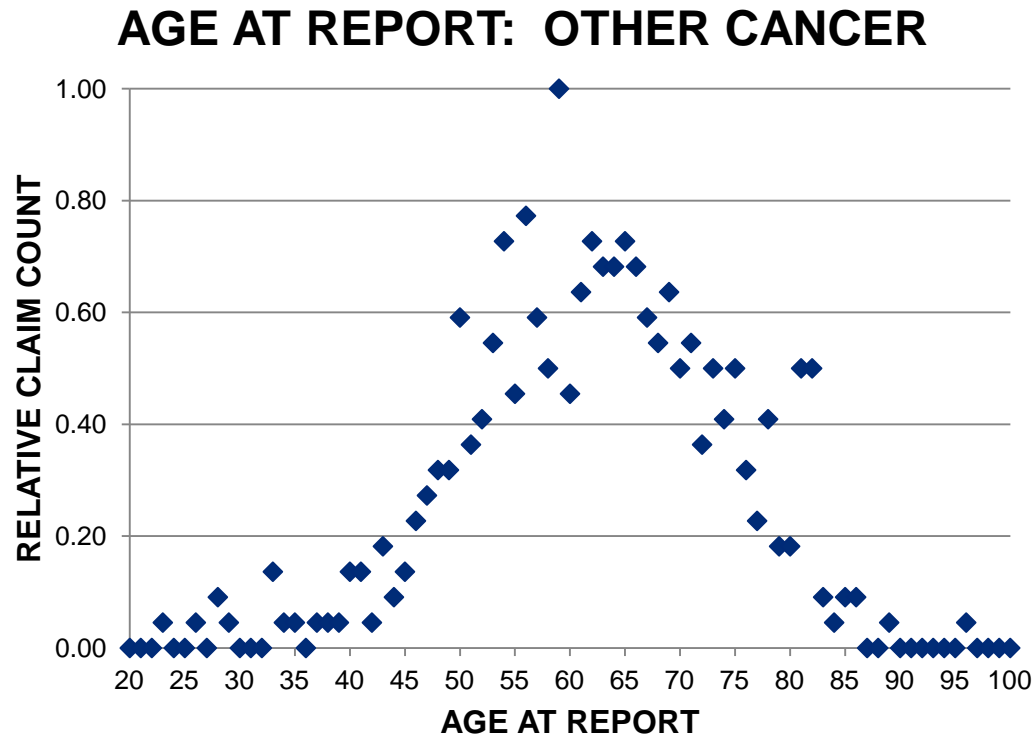
- Lung Cancer



<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	62	0.5 years	38%
> 2	69	13.2 years	62%

Understanding the Hazard: Latent Disease Exposure

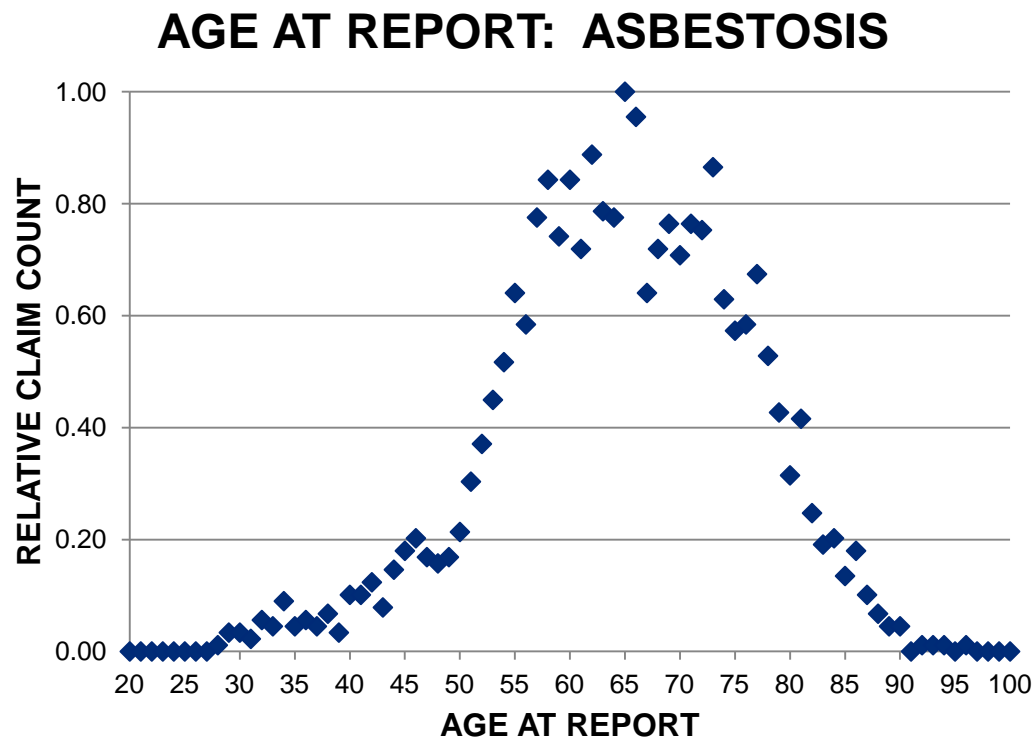
- Other Cancer



<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	59	0.5 years	65%
> 2	69	9.8 years	35%

Understanding the Hazard: Latent Disease Exposure

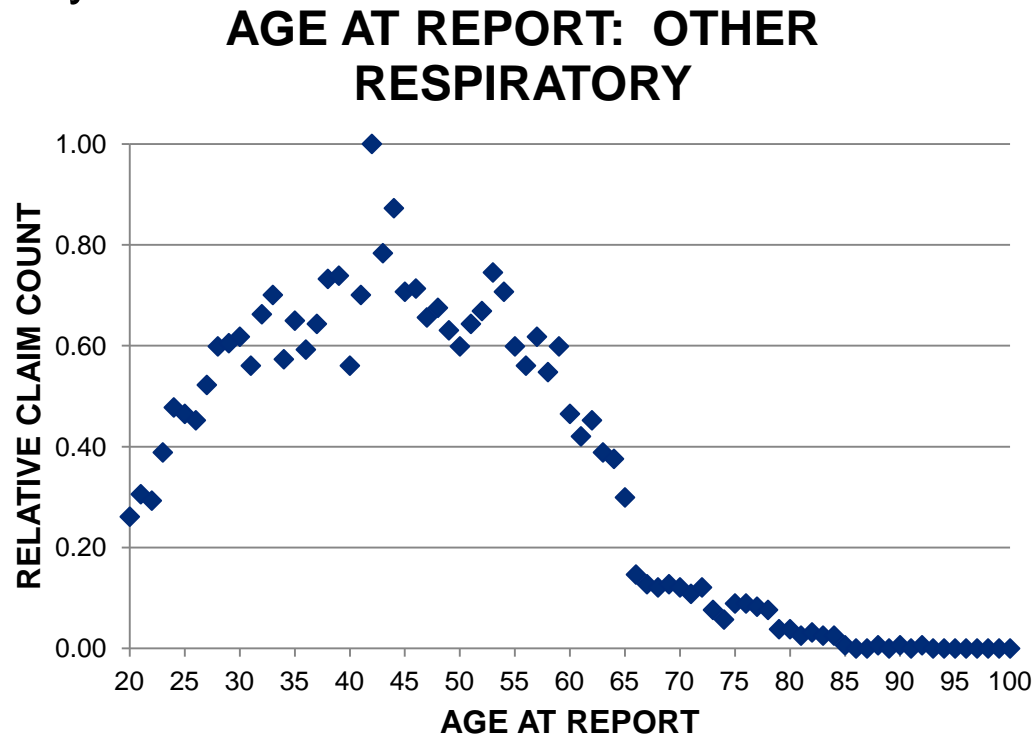
- Asbestosis



<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	63	0.4 years	71%
> 2	67	12.4 years	29%

Understanding the Hazard: Latent Disease Exposure

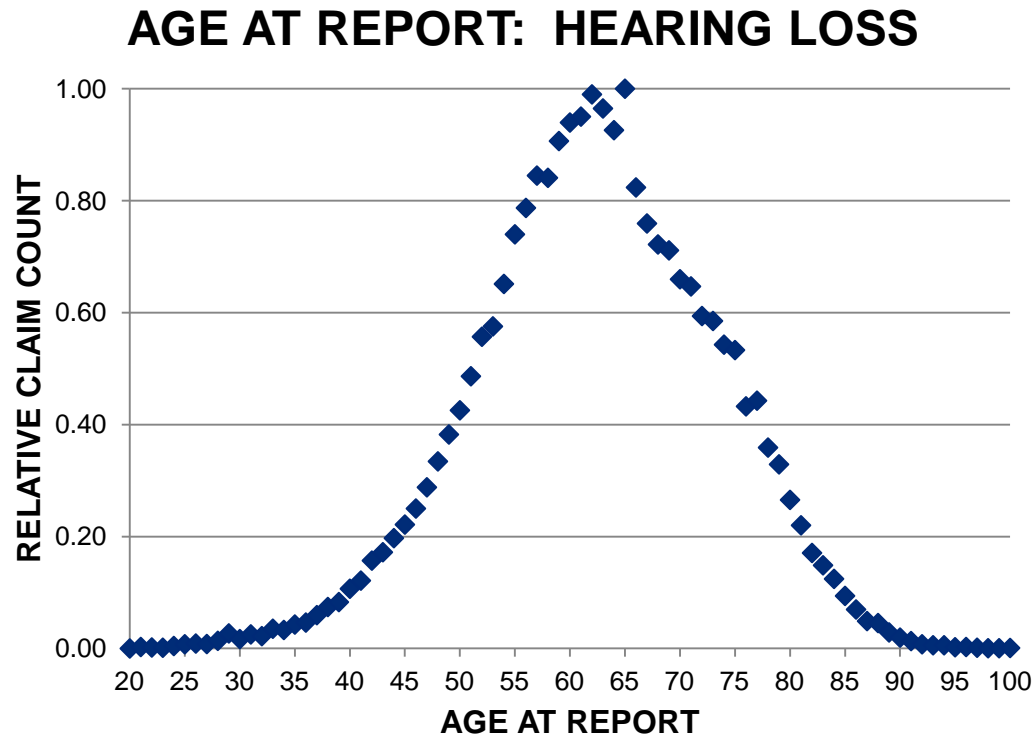
- Other Respiratory



<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	43	0.2 years	91%
> 2	59	9.5 years	9%

Understanding the Hazard: Latent Disease Exposure

- Hearing Loss

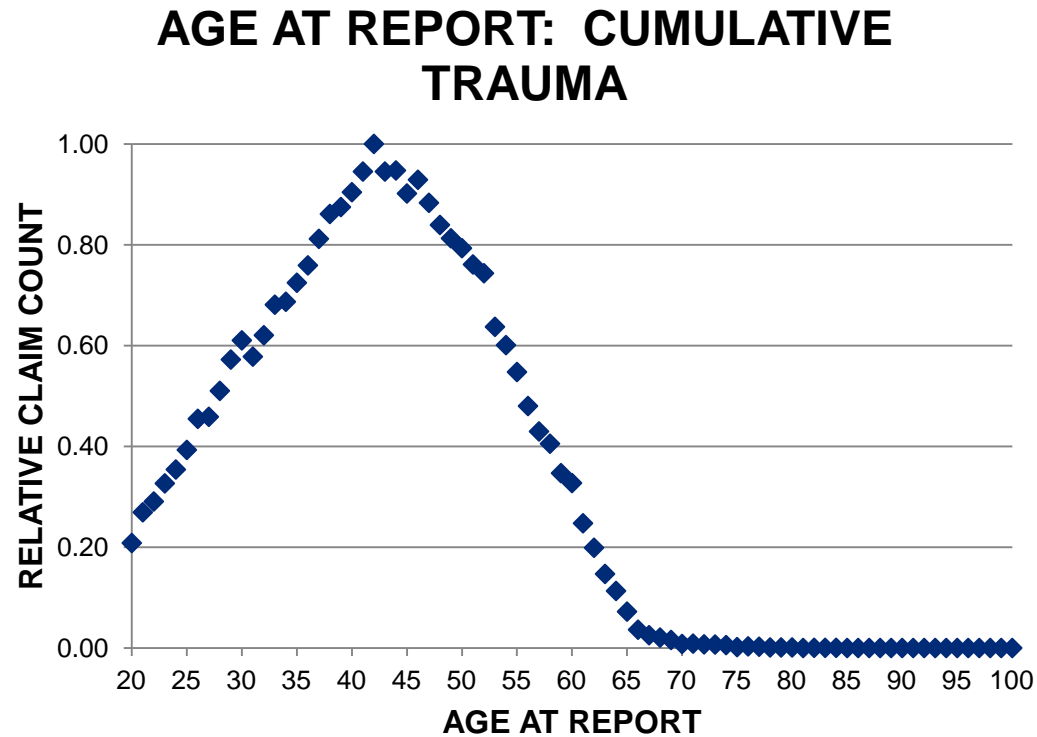


<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	62	0.7 years	92%
> 2	63	8.6 years	8%

Understanding the Hazard: Cumulative Trauma

- Diseases:
 - Carpal Tunnel (and bilateral carpal tunnel)
 - Bursitis
 - Tenosynovitis
 - Epicondylitis
 - Tendonitis
 - Hernia
 - Other Inflammation – arthritis, for example
 - Sprain/Strain/Tear
 - Vibratory White Finger
- Two issues:
 - Immediate claims due to long term exposure
 - Latent claims that emerge years after last date worked

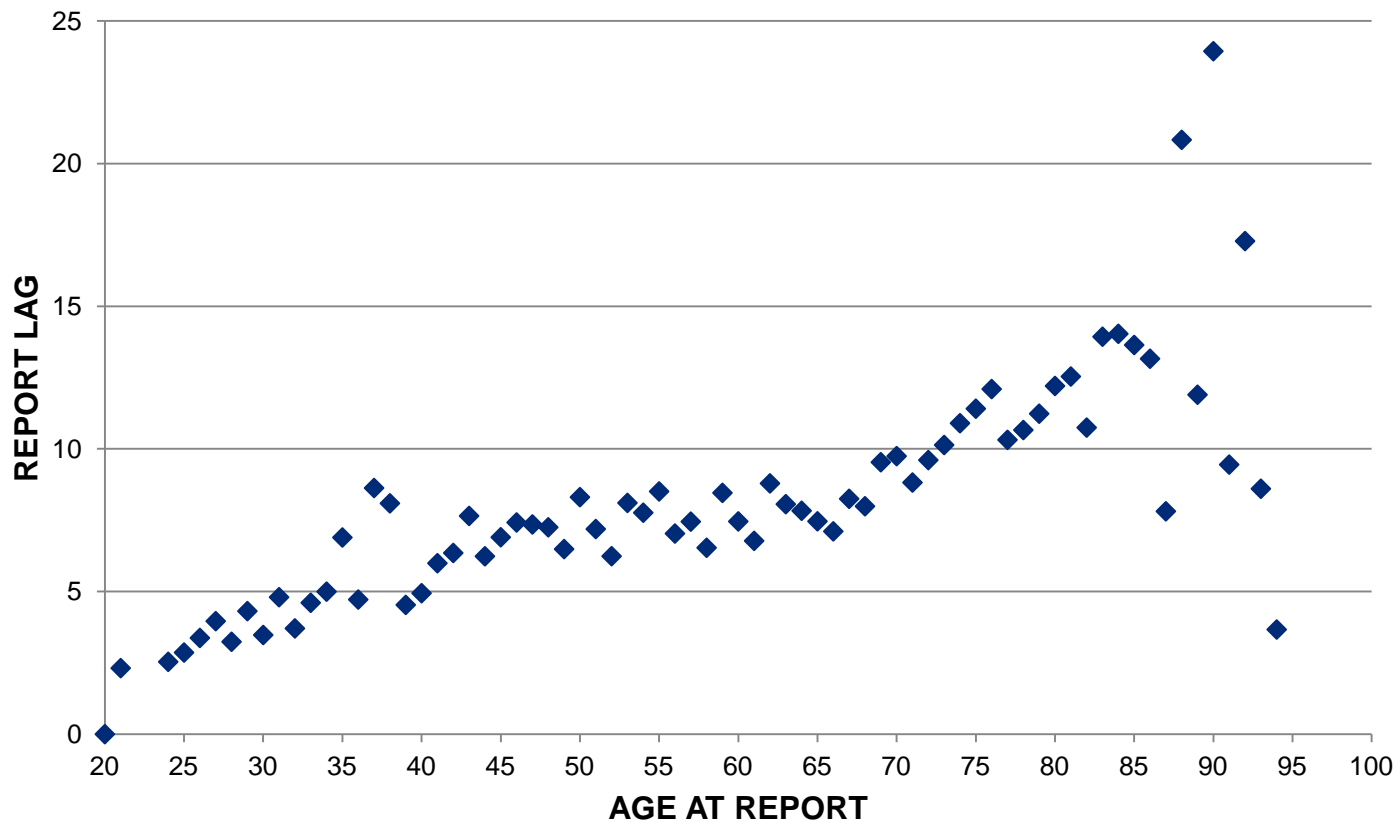
Understanding the Hazard: Cumulative Trauma



<u>Lag</u>	<u>Age at Report</u>	<u>Report Lag</u>	<u>Portion of Claims</u>
≤ 2	42	0.1 years	98%
> 2	48	5.7 years	2%

Understanding the Hazard: Cumulative Trauma

AVERAGE LAG BY AGE AT REPORT: FOR LAG > TWO YEARS CUMULATIVE TRAUMA



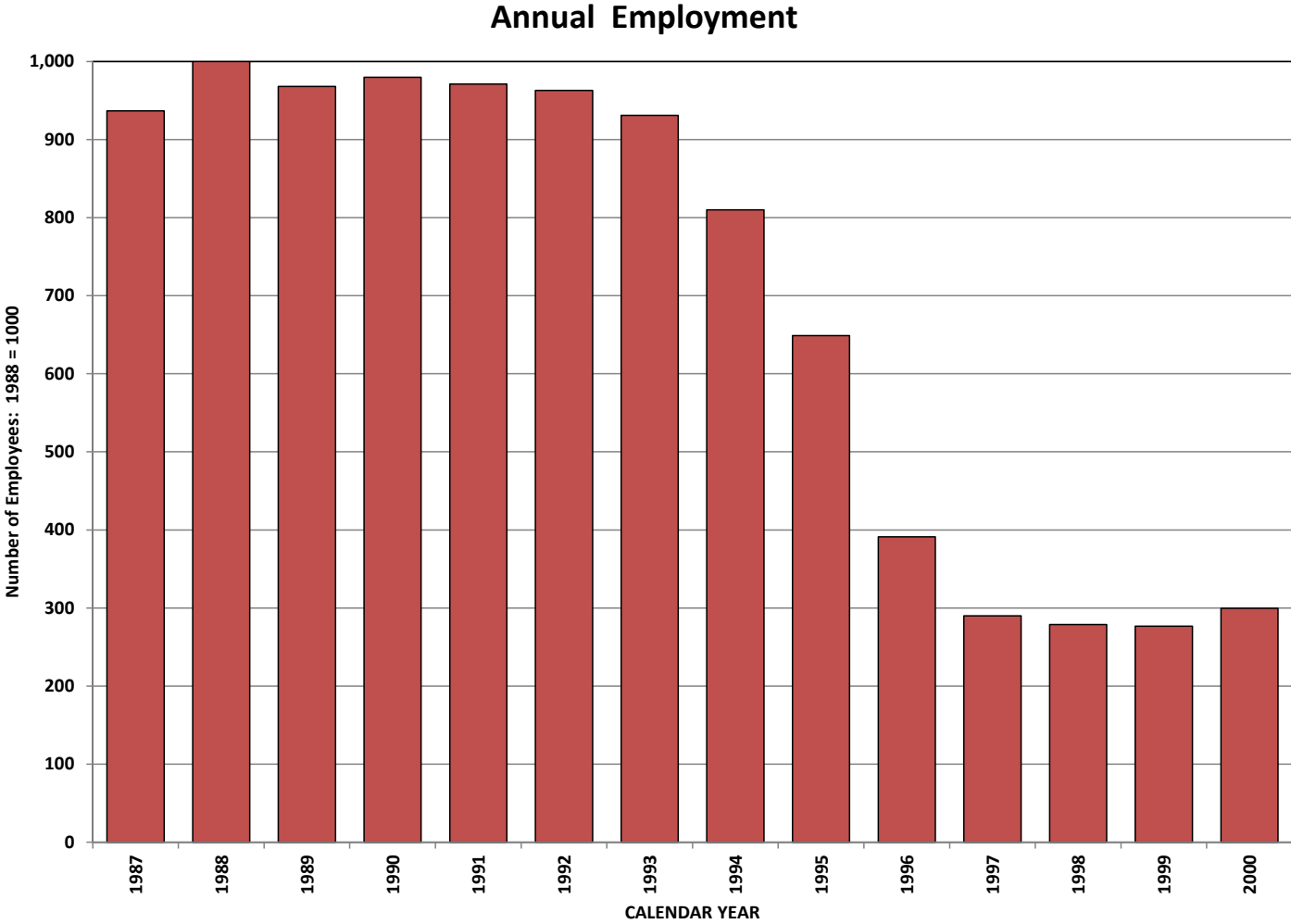
Understanding the Hazard: Latent Disease Exposure Cumulative Trauma

- Financial impact of exposure to hazardous materials and cumulative trauma is focused on a single date: last date of exposure
- Last Date of Exposure = Date of Loss = Last Day Worked
- Material workforce reductions create a highly leveraged financial impact of long-term exposure to workplace hazards
- Cost of latent disease claims, which may not emerge for decades, falls into the accident period during which the workforce reduction occurred.

Description of Workforce Reduction: Impact of Head Count

- Employee Count Maximized in 1988
- Slow Erratic Decline to 1993
 - Cumulative Reduction ~ 7% through 1993
- Large Reductions Begin in 1994

Description of Workforce Reduction: Impact of Head Count



Description of Workforce Reduction: Impact of Head Count

Year over Year Changes to Average Annual Employment

1993 → 1994: 13%

1994 → 1995: 20%

1995 → 1996: 40%

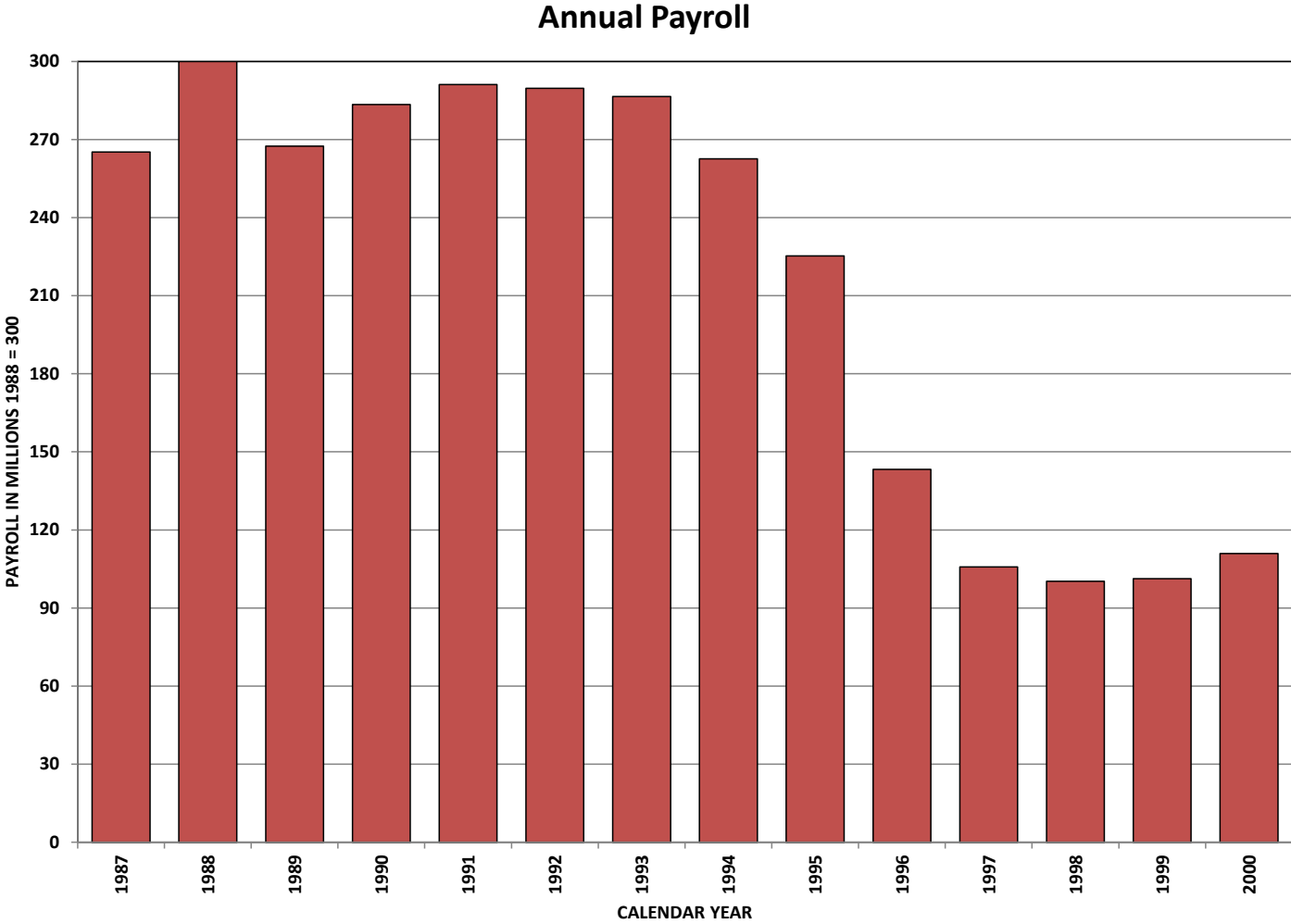
1996 → 1997: 26%

1993 → 1997: Cumulative 70% Reduction
(multiplicative, not additive)

Description of Workforce Reduction: Impact on Payroll

- Payroll Maximized in 1988
- Slow Erratic Decline to 1993
 - Cumulative Reduction ~ 5% through 1993
- Large Reductions Begin in 1994

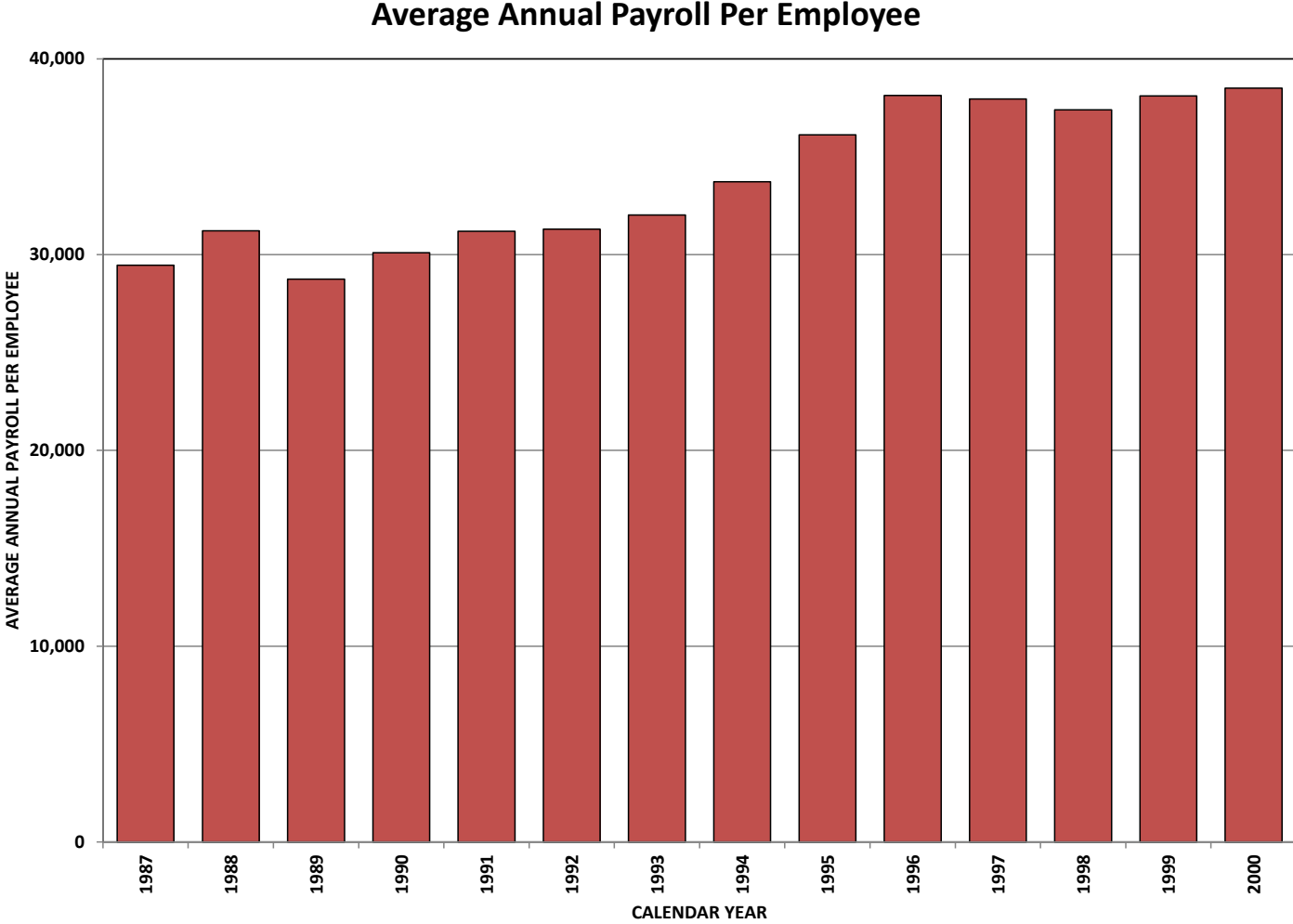
Description of Workforce Reduction: Impact on Payroll



Description of Workforce Reduction: Impact on Payroll

- Union Shop: Last Hired First Fired
 - Varies by Trade or Section
 - Generally, lower pay tier employees terminated first
- Overtime and Shift Premium Increased
 - Distribution of Workload by Section
 - Varying Production Requirements
- Average Annual Compensation Increased

Description of Workforce Reduction: Impact on Payroll



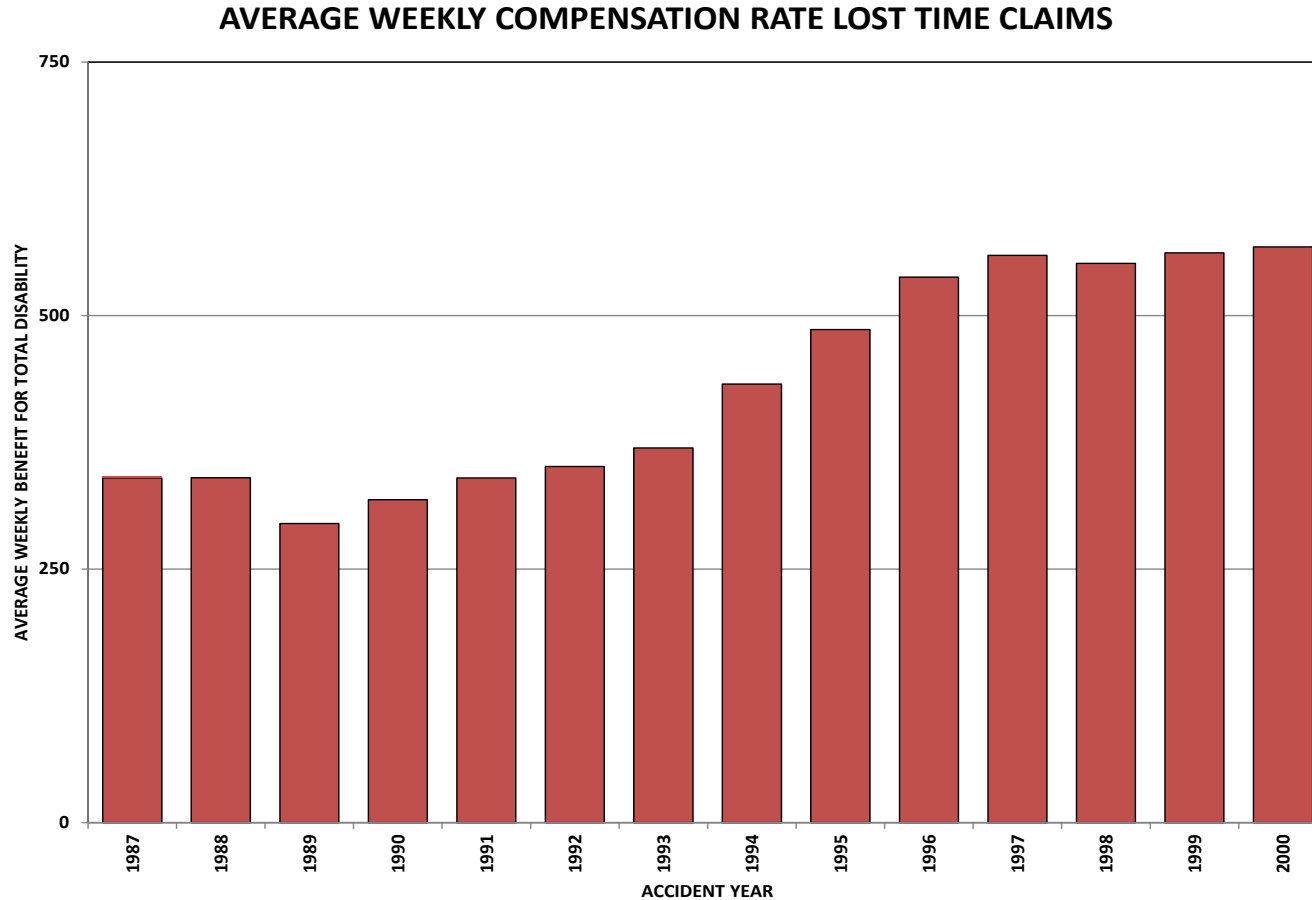
Understanding the Impact on Key Metrics

- Compensation Rate
- Frequency
- Mix of Claims
- Severity
- Average Age at Injury
- Impact of Prior Claims

Understanding the Impact on Key Metrics

- Compensation Rate: Compensation Rate is Benefit for Total Disability
 - Lower tier employees terminated first
 - By 1997, remaining employees from highest pay tier
 - Overtime and Shift Premium
 - Goes directly to calculation of compensation rate

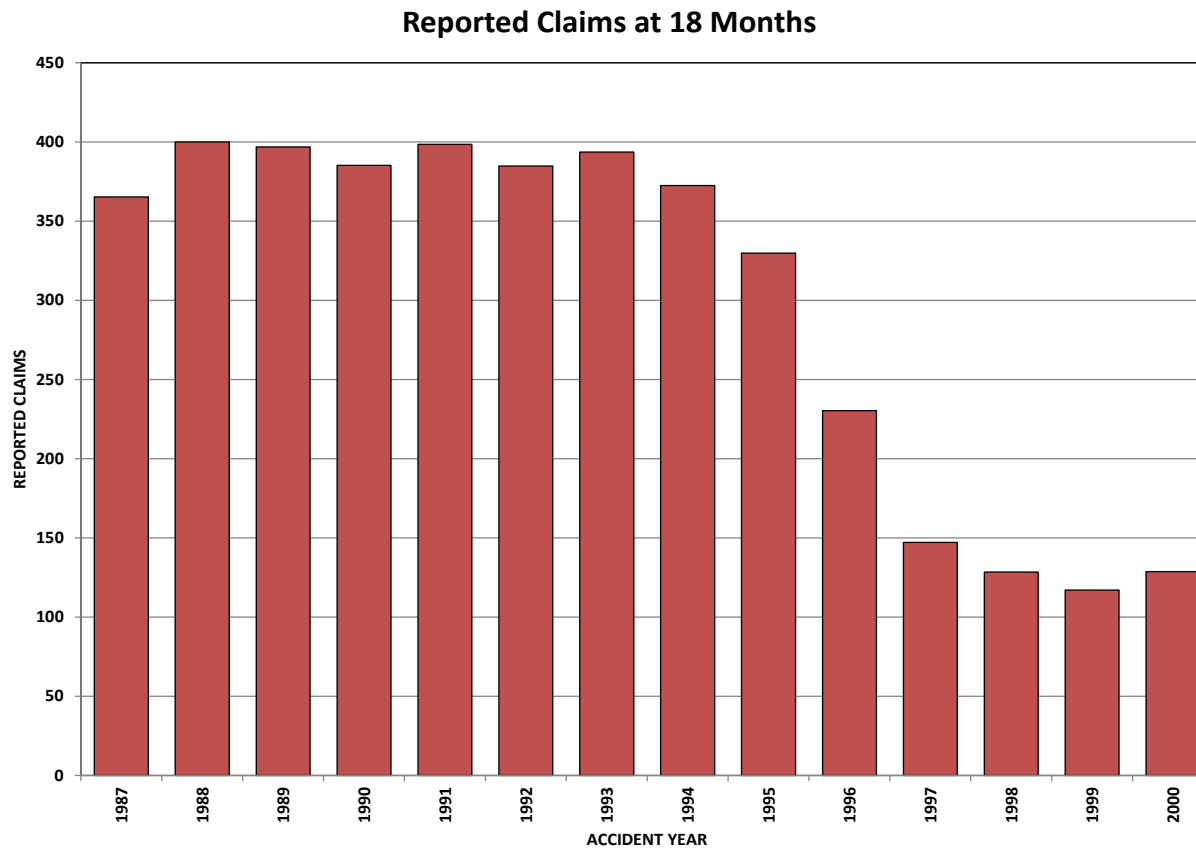
Understanding the Impact on Key Metrics



Note: This is the measurement of the Average Compensation Rate for employees that filed lost-time claims.

Understanding the Impact on Key Metrics

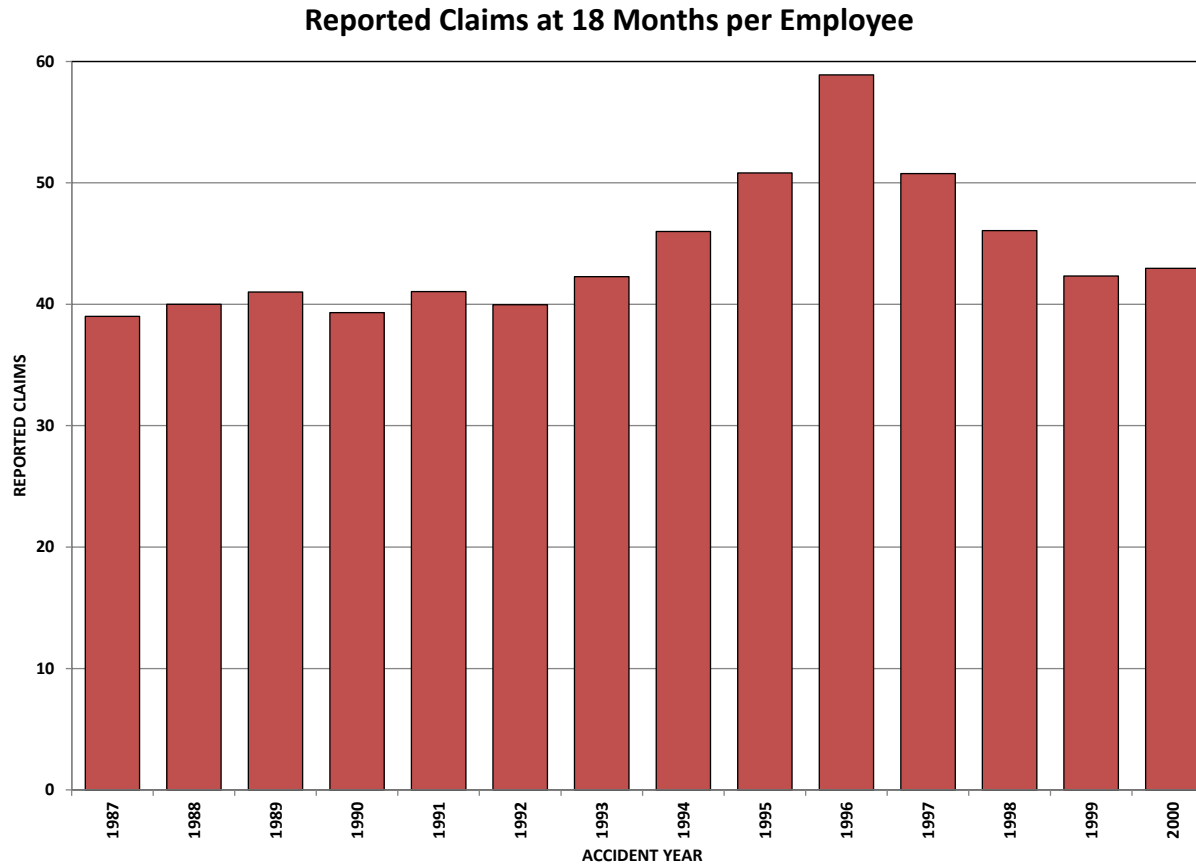
- Frequency and Surge in Claims



Additional Claim Development ~ 1.07 to 1.15 from 18 months to ultimate

Understanding the Impact on Key Metrics

- Frequency and Surge in Claims

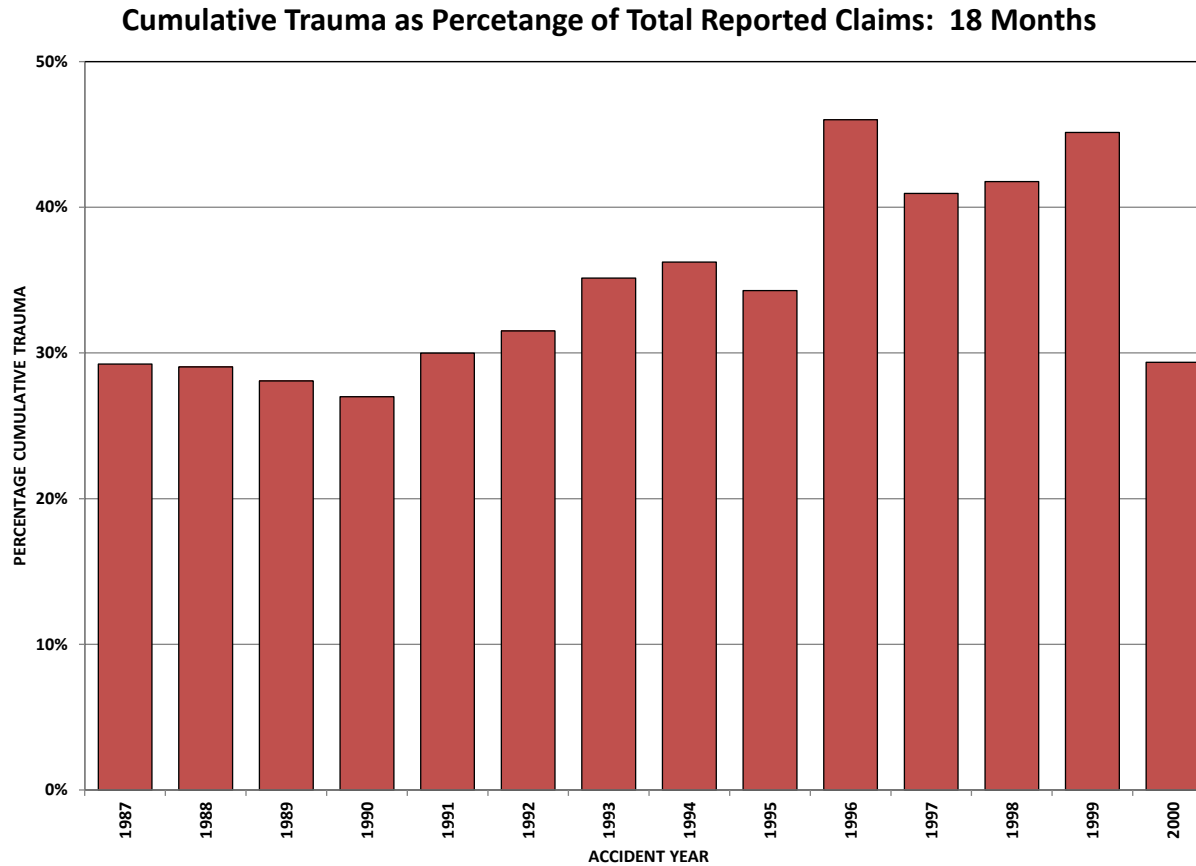


Understanding the Impact on Key Metrics

- Mix of Claims
 - Cumulative Trauma
 - Back
 - Neck
 - Knees
 - Carpal Tunnel
 - Vibratory White Finger

Understanding the Impact on Key Metrics

- Mix of Claims



Understanding the Impact on Key Metrics

- Mix of Claims

- Latent disease claims take years to emerge

Open Late Emerging Claims as of 12/31/12 – PTD/Fatal

1988	6
1989	7
1990	9
1991	9
1992	6
1993	10
1994	11
1995	12
1996	10
1997	6
1998	3
1999	4
2000	5

Average Cost: \$1.2 Million

For AY's 1996 and prior (going back to early 70s):
PTDs had been emerging at 17 per year ~ 2000
Now emerging at a rate of 6 per year

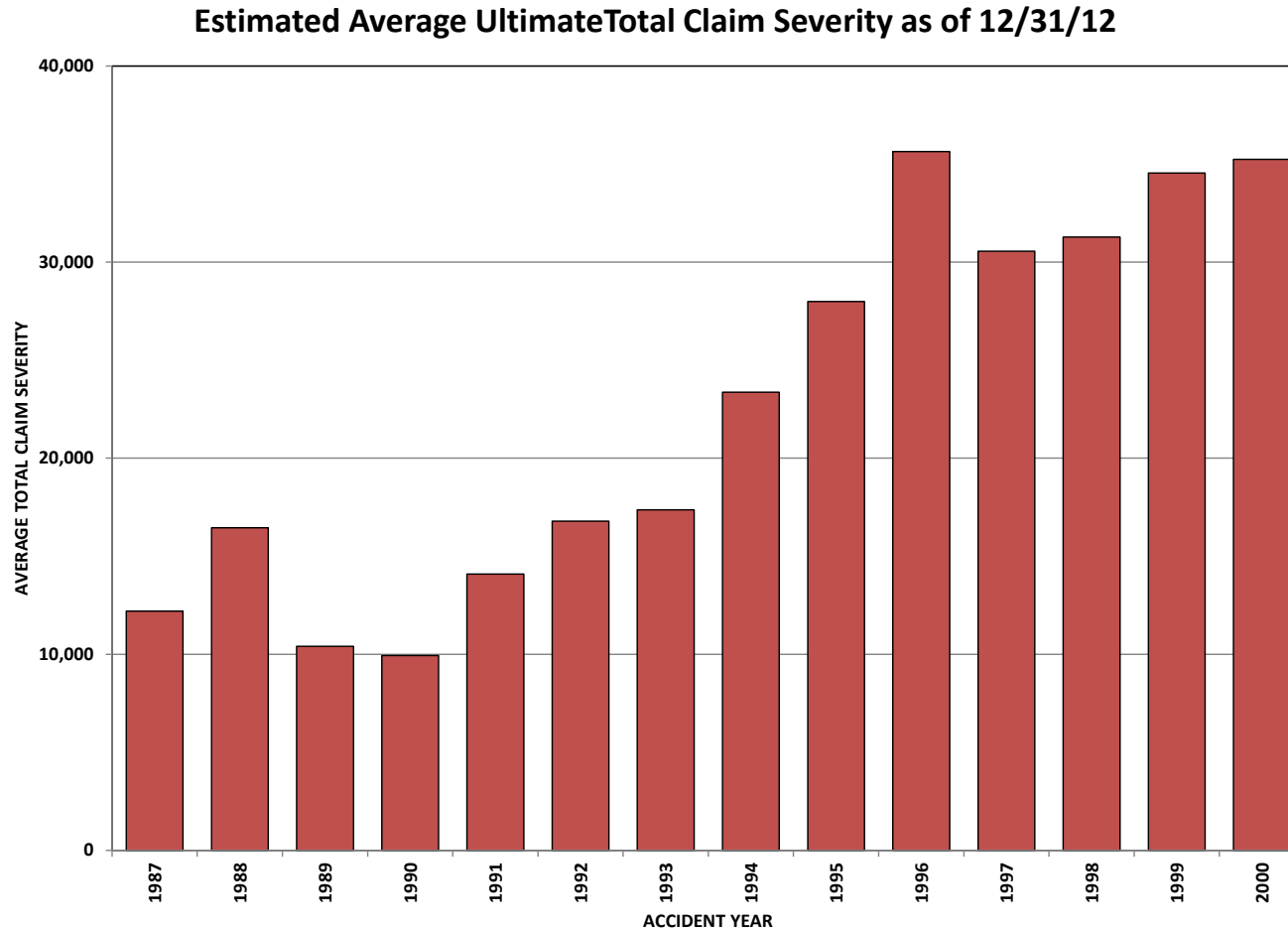
These are open claims:

- Does not include closed (settled) claims

- Does not include claims placed into SIF

Understanding the Impact on Key Metrics

- Severity



Understanding the Impact on Key Metrics

- Severity
 - Indemnity Increased Due to:
 - Change in Claims Mix
 - Increase in Compensation Rate
 - Latent Disease Exposure
 - Medical Increased Due to:
 - Change in Claim Mix
 - Litigation
 - Expenses Increased Due to:
 - Litigation
 - Claim History

Understanding the Impact on Key Metrics

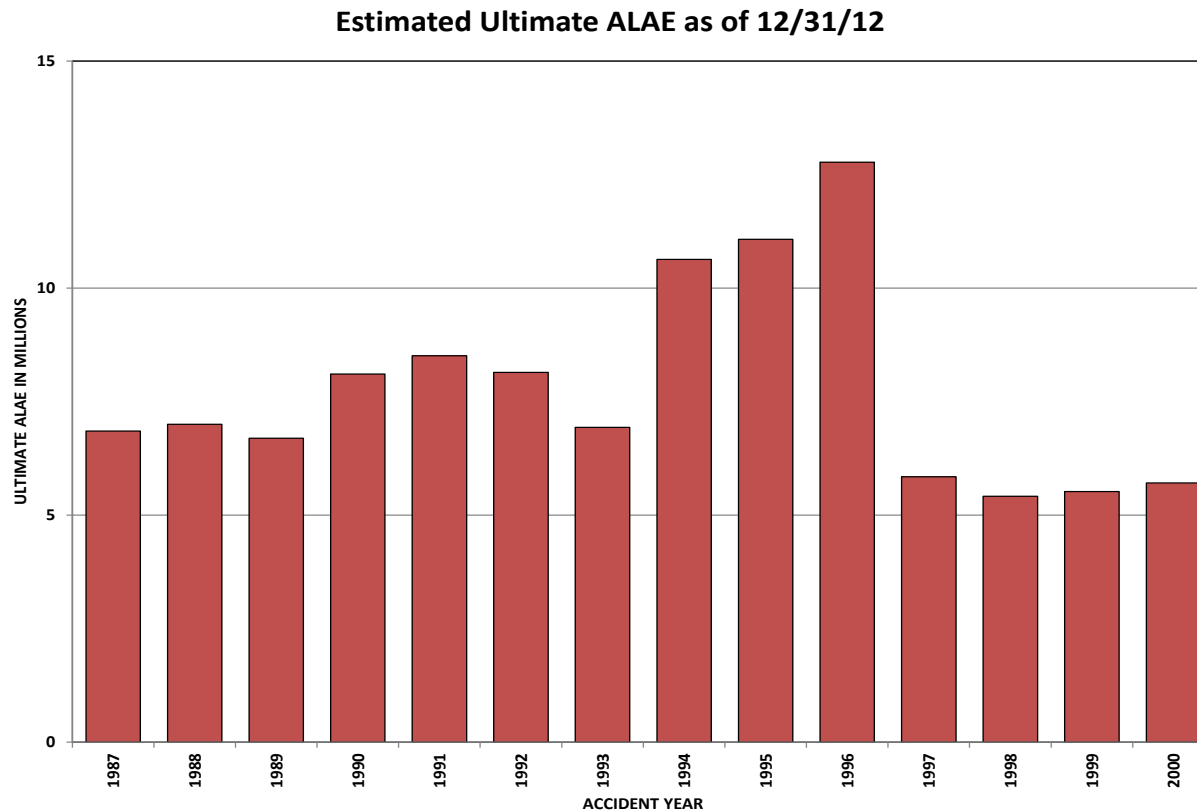
- Severity
 - Defense and Litigation Cost

CALENDAR YEAR	ALAE PAYMENT RELATIVITY
1992	1.00
1993	1.36
1994	1.26
1995	1.22
1996	1.52
1997	1.46
1998	1.52
1999	1.44
2000	1.24

- Calendar year expense payments had been ~ \$4 Million
- These are payments, NOT ultimate costs

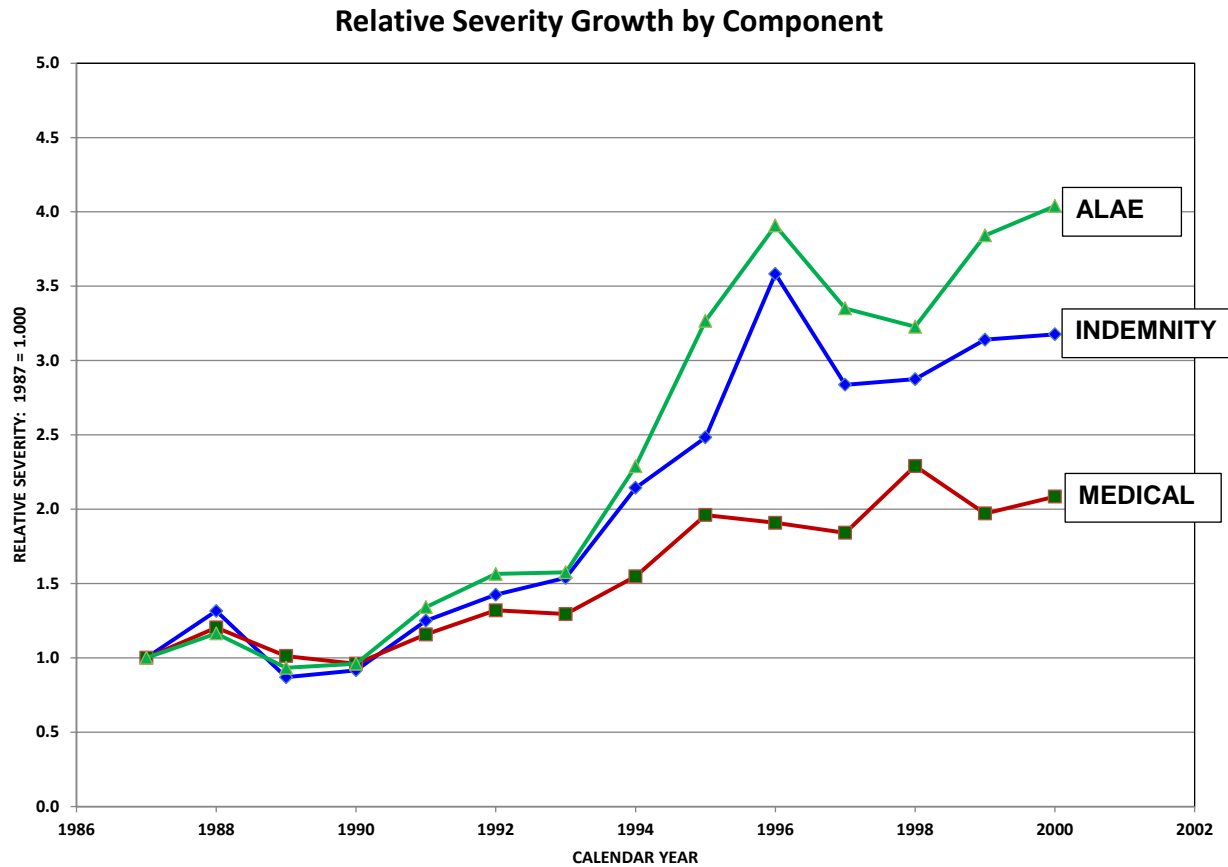
Understanding the Impact on Key Metrics

- Severity
 - Defense and Litigation Cost
 - Impact of Ultimate Cost: Dramatic



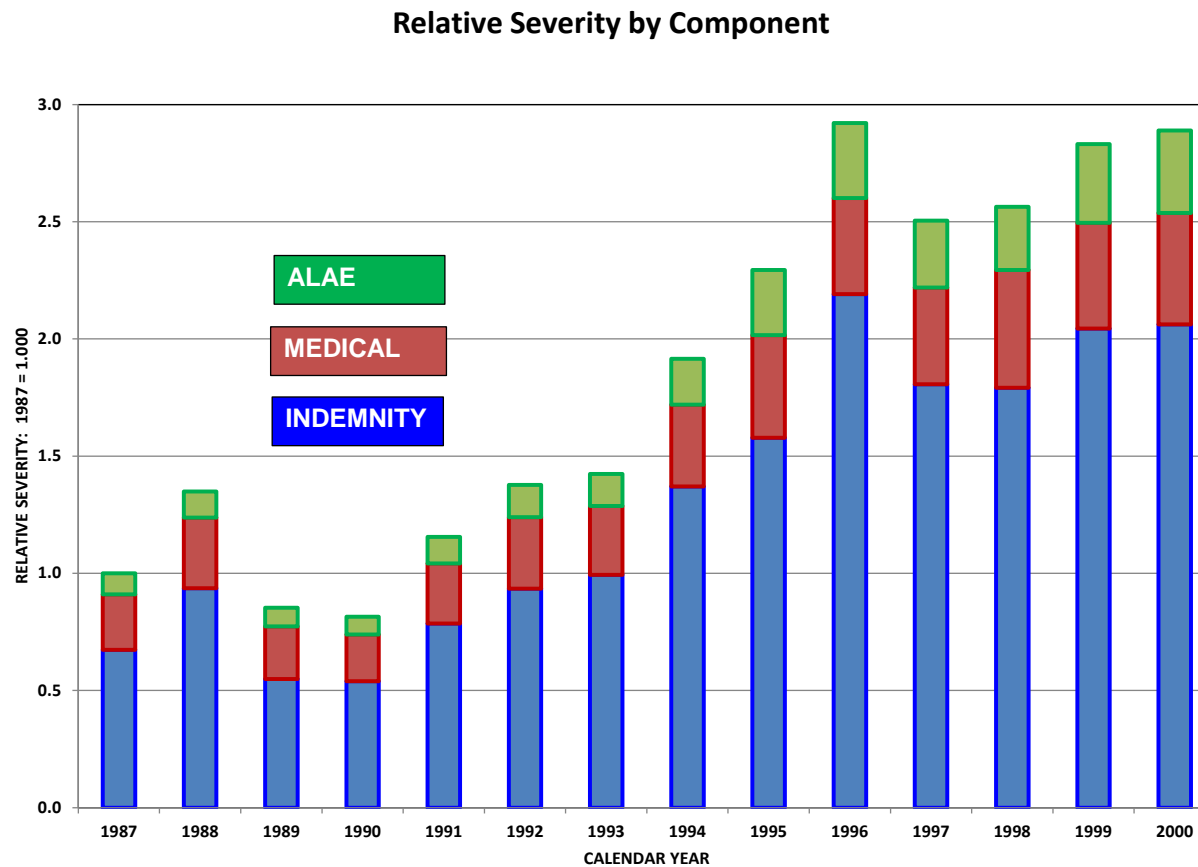
Understanding the Impact on Key Metrics

- Severity



Understanding the Impact on Key Metrics

- Severity
 - Relative Severity by Component



Understanding the Impact on Key Metrics

Average Age at Injury

ACCIDENT YEAR	AVERAGE AGE AT INJURY	PERCENT OF CLAIMS AGE >55	PERCENT OF CLAIMS AGE <35
1987	34	1%	57%
1988	36	2%	48%
1989	36	1%	44%
1990	37	2%	38%
1991	38	2%	33%
1992	40	3%	25%
1993	41	4%	20%
1994	42	6%	15%
1995	44	11%	11%
1996	44	7%	9%
1997	46	13%	4%
1998	47	17%	3%
1999	47	20%	5%
2000	48	24%	5%

Material implications for loss development tail

Average age at injury today is in the very low 50s

Understanding the Impact on Key Metrics

- Impact of Prior Claims
 - Steady State Frequency: 40 Claims / 100 Employees prior to reductions
 - Each claimant has a long claim history
 - 5 to 10 claims or more
 - Settlements required a global impairment rating to consider the impact of the entire claim history

Understanding the Impact on Key Metrics

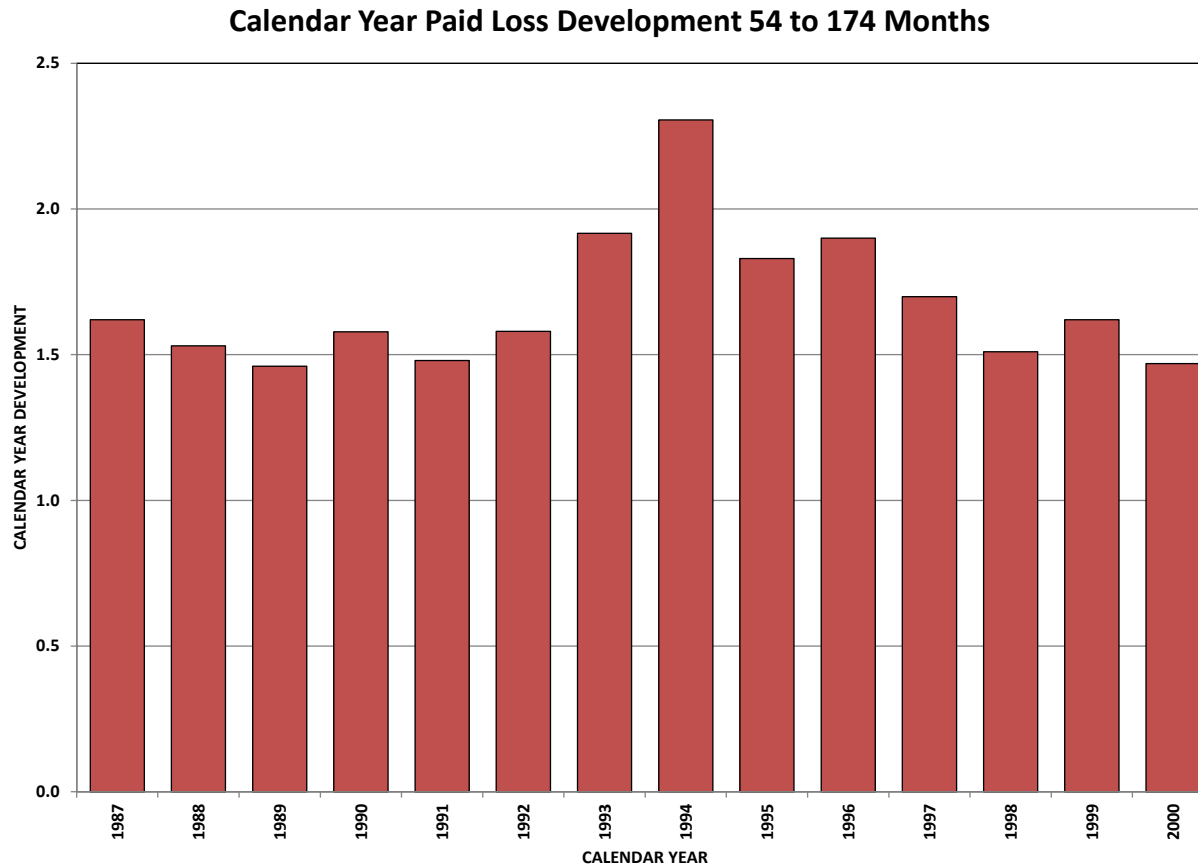
- Impact of Prior Claims
 - Settlement dollars are attributed to each individual claim (and the year that claim occurred)
 - Based on its contribution to total rating:

Accident Year	Relative Contribution	Settlement Allocation Cost
1980	5	\$5,000
1983	15	15,000
1987	10	10,000
1991	20	20,000
1992	5	5,000
1996	45	45,000

Total Settlement Cost: \$100,000

Understanding the Impact on Key Metrics

- Impact of Prior Claims



Summary of the Situation

1. Compensation Rate Surge
2. Frequency Surge
3. Mix of Claims Changed
4. Increase to Severity
 - Indemnity
 - Medical
 - ALAE
5. Average Age at Injury Increased from ~ 35 to ~ 50 years
6. Impact of Prior Claims on Settlement Costs
 - Affects Year of Workforce Reduction
 - Affects Prior Accident Years
7. Attorneys Actively Marketing Workforce
8. Second Injury Fund Issue
 - Rejection of Applicants
 - Additional Contamination of Data

Implication of the Situation

1. Historical Metrics Not Meaningful
 - Frequency
 - Severity
 - Pure Premium
2. Loss Development Histories Not Meaningful
 - Development Surge in Older Years
 - Change in Age at Injury
 - Claim Mix Implications
 - Leveraging of Latent Disease Claims
3. Industry Data Was Not Relevant (nor was anything meaningful available)

Specific Steps Taken at 12/31/96

- Indemnity, Medical and ALAE were measured separately
- Consideration given to all items discussed previously
- All payment based models – reported loss development not meaningful at that point in time

Specific Steps at 12/31/96: Indemnity

- Changes in calendar year loss development data in older accident years were correlated with the year of workforce reduction
 - Measured additional payments in older accident years due to global settlements
 - Considered impact of mix of claims – surge early in payment pattern not expected to continue indefinitely into the future
 - Adjustments made to reduce future loss development as global settlements were expected to decline
 - Expected future workforce levels were considered when selecting future development factors
 - Workforce reductions were behind us, but there was some residual impact as it took 2 years for all workforce reduction related claims to be reported

Specific Steps at 12/31/96: Indemnity Continued

- Process was basically trying to complete the triangles
 - Sounds more complex than it was – Intelligent guess work
 - Adjustments made to reflect increase in age at injury
 - Annuity approach used to make changes to tail factor
 - This step was very important – we use this same approach today
- Complete Review of Second Injury Fund Cases
 - Claims expected to be rejected were accounted for individually by accident year
 - The cost of these claims were estimated using life models and individual claim characteristics

Specific Steps at 12/31/96: Indemnity Continued

- Another consideration is the change in the manner by which claims were managed
 - Attempts to settle and close all claims – material change from the “check-writing” mentality
 - Changed payment patterns significantly
 - Notwithstanding any other issue, this would have materially affected data
- Latent Disease
 - Models constructed to forecast the emergence of widow(er)s claims and PTD claims
 - Primitive and generally inaccurate in 1996
 - Did not have enough information

Specific Steps at 12/31/96: Medical

- Similar adjustments as for indemnity loss development less than 20 years
- Tail development estimated individually by accident year based on age at injury data
 - Annuity approach
 - Average medical payment per open claim is starting point
 - Load annuity payments for additional claim emergence
 - Nothing complex – flat factor based on experience
 - Result is a series of tail factors that decline materially as average age increases
 - Still using this method today
 - Results are generally reasonable in the aggregate

Specific Steps at 12/31/96: ALAE

- ALAE includes both defense costs and claimant attorney costs
- Examine history of paid ALAE to paid indemnity to understand the impact of workforce reductions and claim mix
- Primitive adjustments at the time of analysis:
 - Guessed at what paid to paid ratios would be based on available data
 - Applied to indemnity payment forecasts by calendar year

Net Result of What We Did

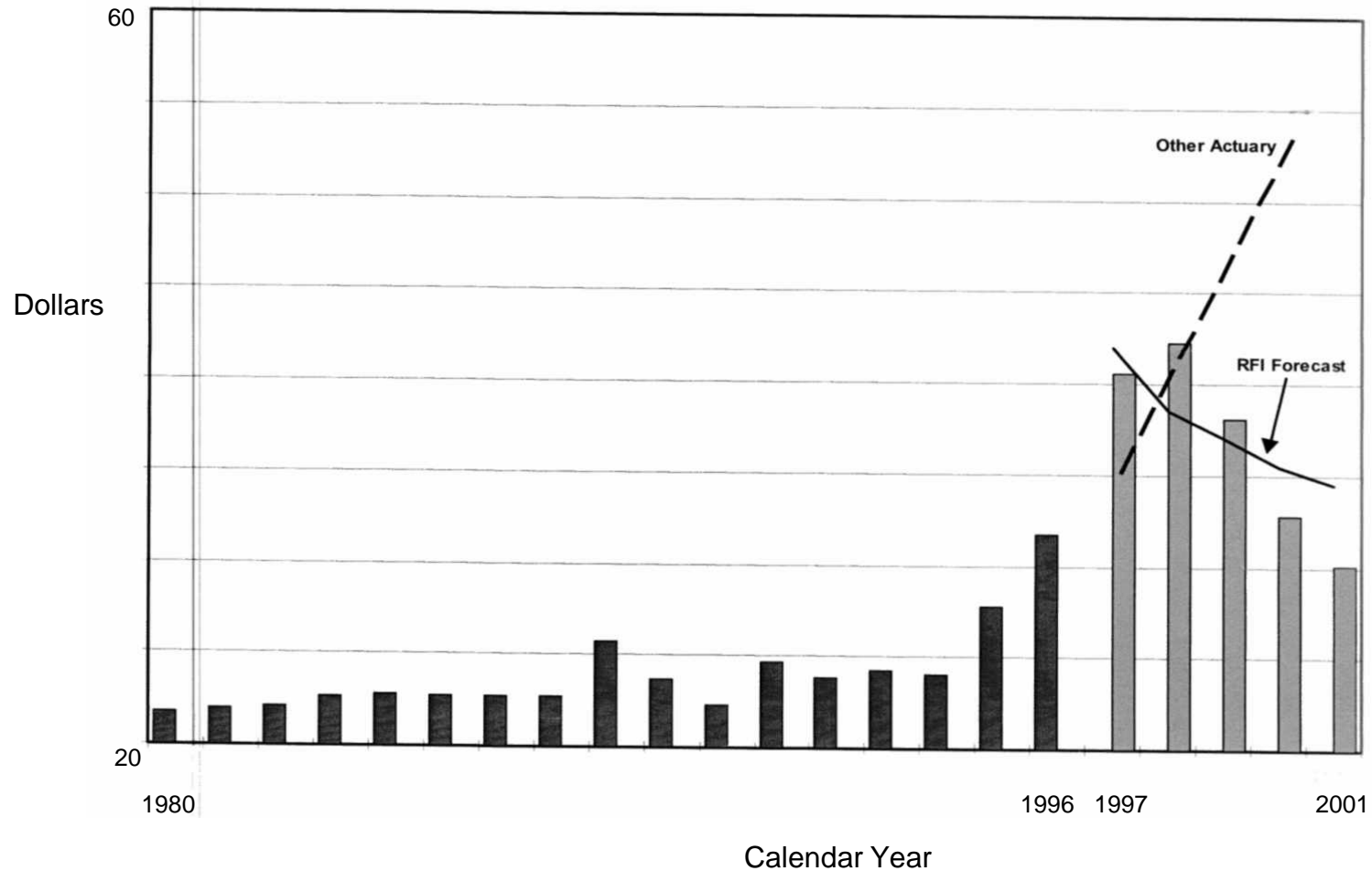
Calendar Year Payments

- Five Year Forecasts Critical to Client
 - Includes payout of current reserve position and contribution from claims with dates of loss during the five year forecast horizon
- Cash Out the Door
- 70 Year+ Payment Pattern
- Inaccuracy of Long-Term Payment Horizon Mitigated by Discounting
- “I am going to be dead in 40 years – get the ****\$\$ five year forecast right!”

Net Result of What We Did

Average Calendar Year Benefit and Expense Payments per \$100 Payroll

Comparison of Forecasts with Actual Results



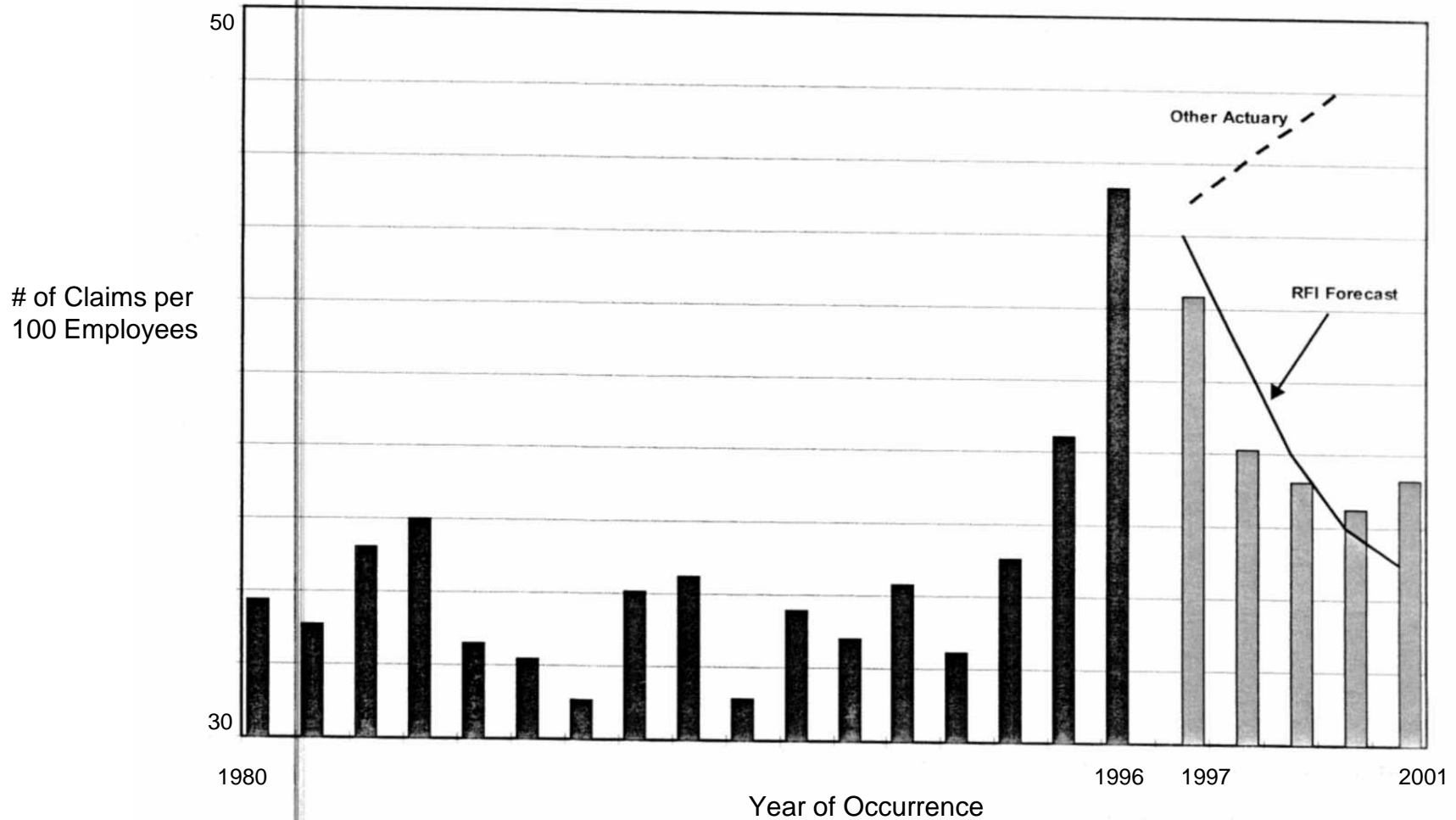
Net Result of What We Did

Claim Frequency

- Critical to Current and Future Reserve Positions
- Measured Contribution of Workforce Reduction to Claim Frequency
- Future Terminated AND Retirement Related Claims Impacted Current Reserve Position
 - Workforce reductions created a new claims environment
 - Claimant attorneys actively soliciting terminated, retired, and active employees
 - Global Settlements

Net Result of What We Did

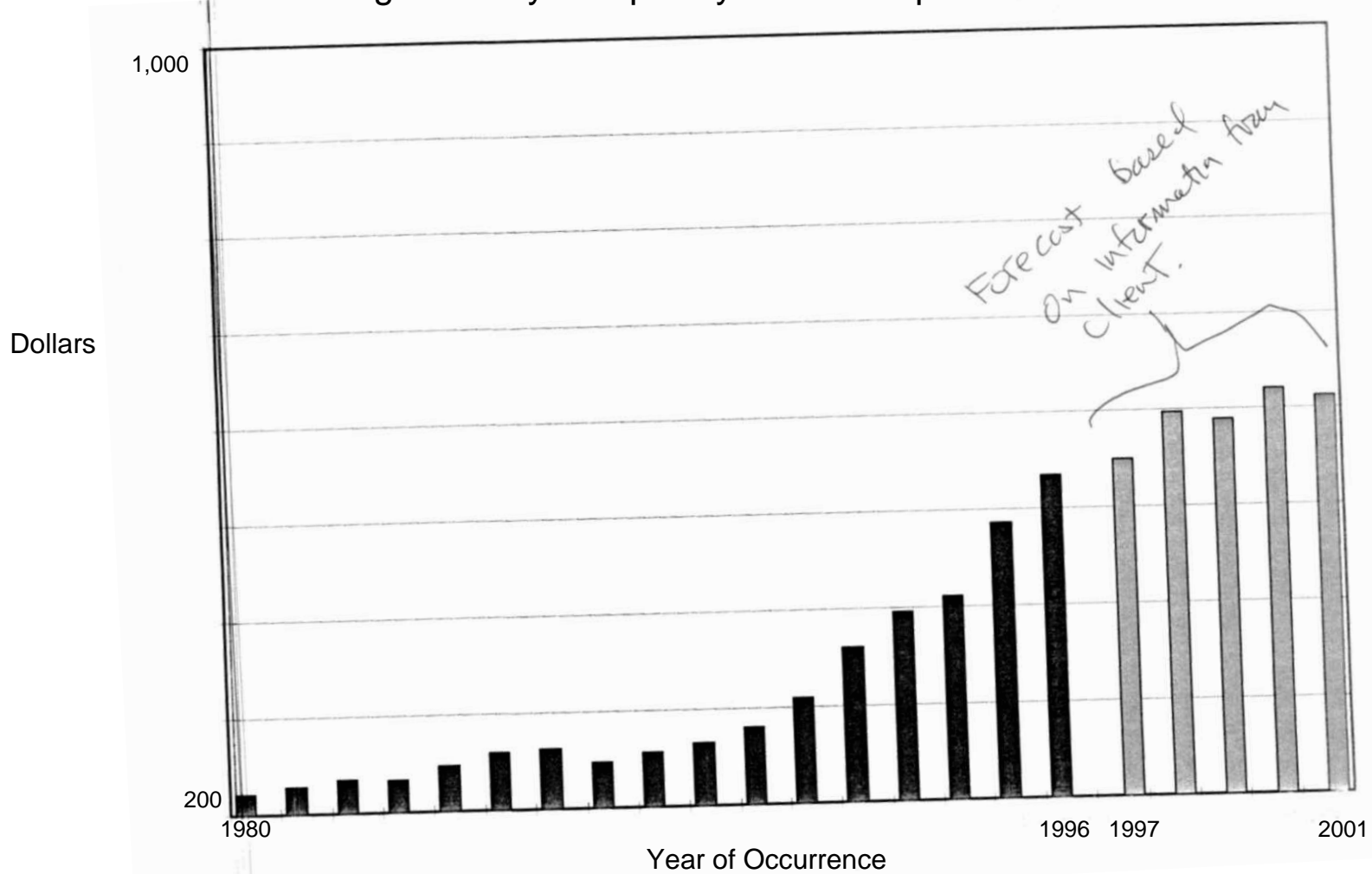
Claim Frequency per 100 Employees by Year of Occurrence Comparison of Forecasts with Actual Results



Net Result of What We Did

Claim Severity

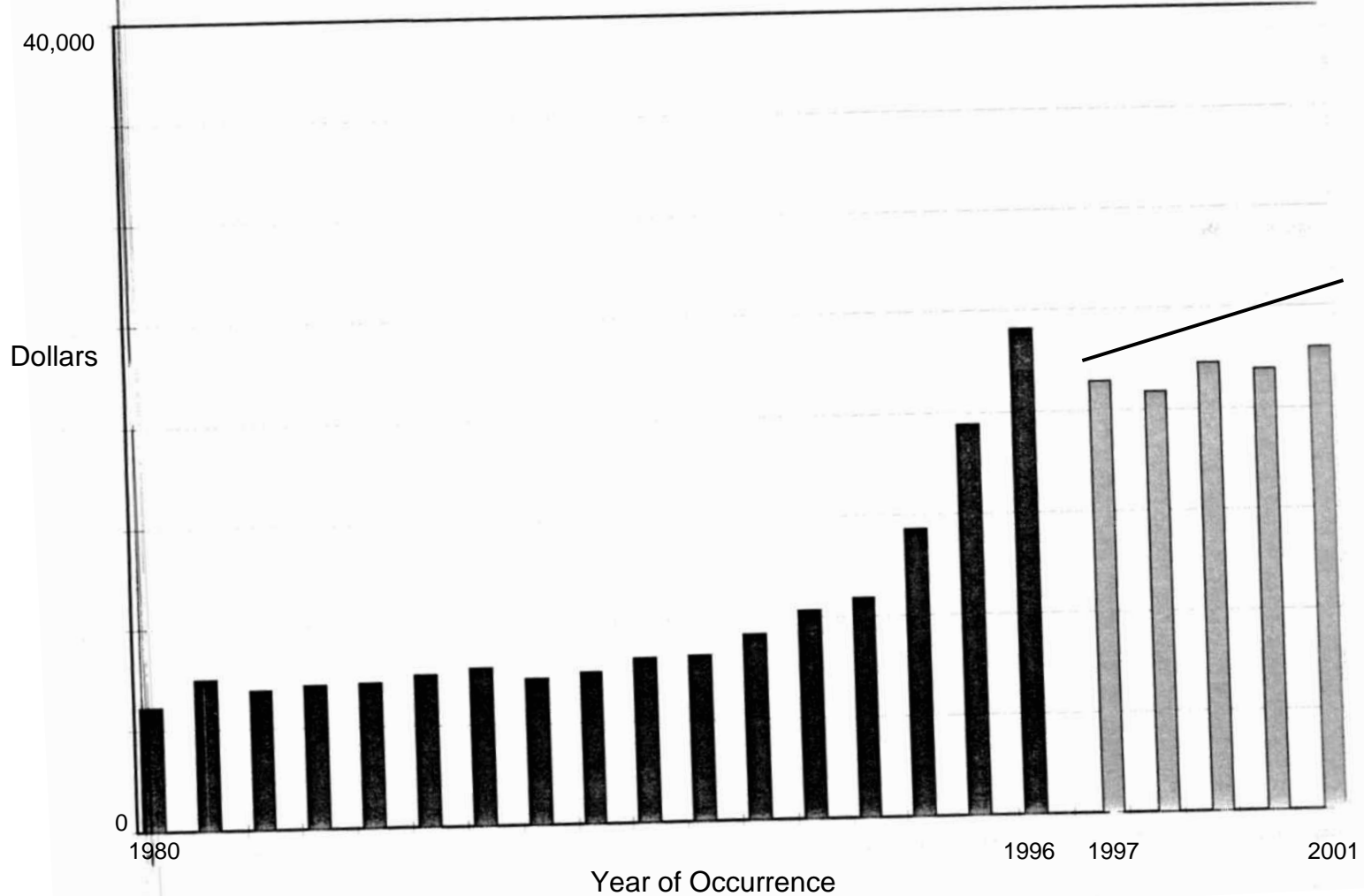
Average Weekly Temporary Total Compensation Rates



Net Result of What We Did

Claim Severity

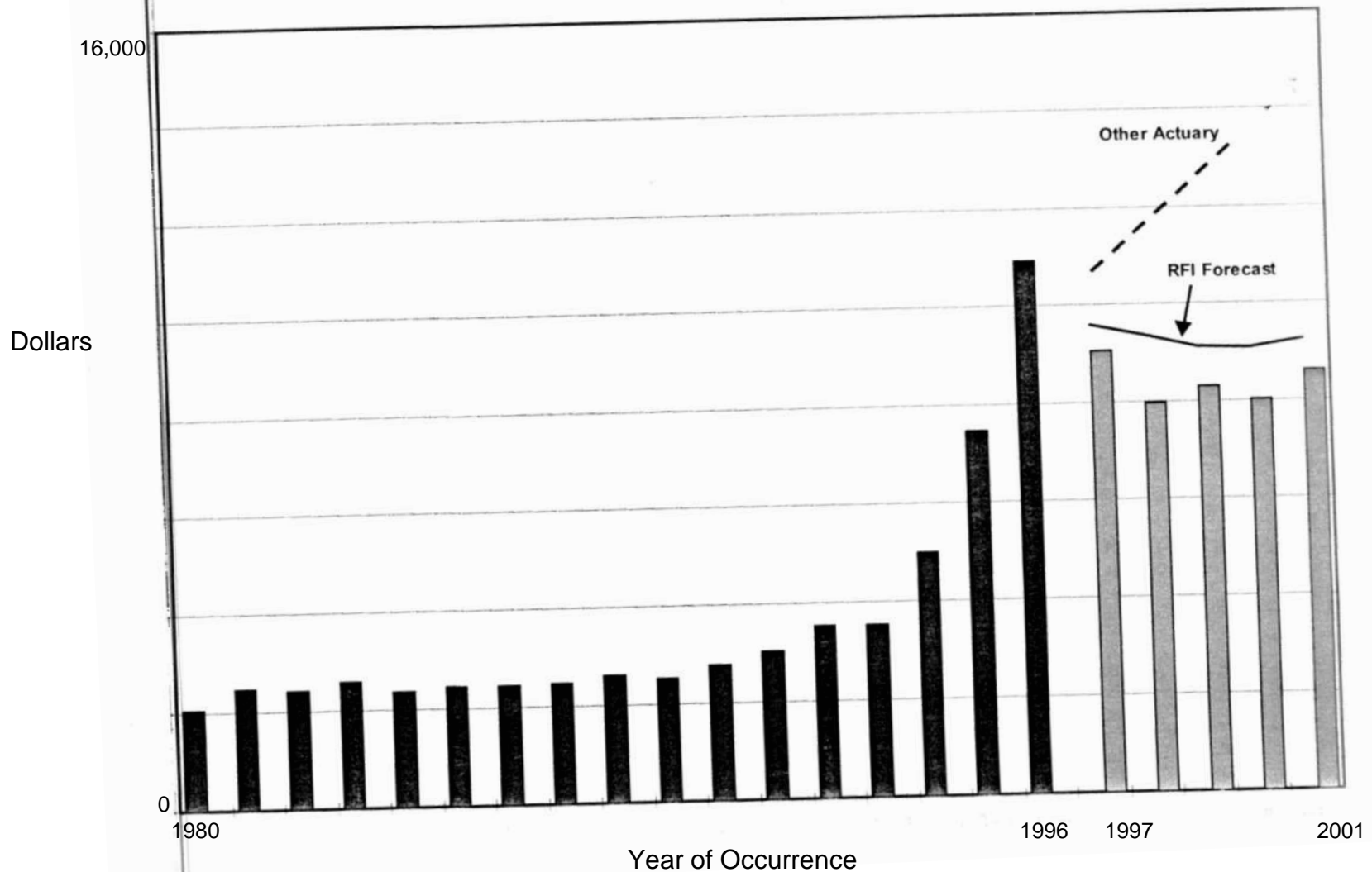
Estimated Ultimate Average Cost Per Claim - Comparison Of Forecast to Actual Results



Net Result of What We Did

Claim Severity

Average Ultimate Cost of Benefits and Expenses per Employee – Comparison of Forecast to Actual Results



Where Are We Today?

Comparison of Estimates of Ultimate Costs: 12/31/12 vs 12/31/00

Accident Year	Ultimate 12/31/2000	Ultimate 12/31/2012	Dollar Difference	Percent Difference
1973	12.56	12.22	(0.34)	(3)%
1974	16.14	17.11	0.97	6%
1975	18.45	19.94	1.50	8%
1976	14.14	14.12	(0.02)	(0)%
1977	16.67	17.50	0.83	5%
1978	19.78	20.13	0.36	2%
1979	20.17	22.11	1.93	10%
1980	28.90	29.98	1.08	4%
1981	32.04	32.36	0.32	1%
1982	30.92	30.92	0.00	0%
1983	35.98	37.75	1.78	5%
1984	51.40	53.05	1.65	3%
1985	63.00	65.20	2.20	3%
1986	72.33	72.25	(0.08)	(0)%
1987	76.56	76.48	(0.08)	(0)%
1988	59.66	60.61	0.95	2%
1989	53.07	55.92	2.85	5%
1990	55.76	62.04	6.28	11%
1991	55.52	60.84	5.32	10%
1992	56.29	57.61	1.32	2%
1993	46.88	48.05	1.17	2%
1994	60.34	69.23	8.88	15%
1995	70.45	81.63	11.18	16%
1996	71.91	80.02	8.11	11%
1997	44.43	40.48	(3.95)	(9)%
1998	42.81	35.84	(6.97)	(16)%
1999	48.92	34.55	(14.37)	(29)%
2000	35.25	39.23	3.98	11%
Ultimate Retained	1,210.31	1,247.16	36.85	3%
Paid at 12/31/2000	925.00	925.00		
Reserve at 12/31/2000	285.31	322.16	36.85	13%

How We Do It Now

Indemnity: Accident Years 1996 and earlier

- Claim Model
- Lifetime awards modeled individually by claim
- Non-lifetime awards modeled assuming case reserves sufficient and assumed durations based on reported loss values
 - Higher values, higher durations
 - Durations range from 1 to 10 years
- Non-lifetime IBNR modeled based on claim-emergence data
 - Cost and duration based on historical data
 - Hearing Loss and Cumulative Trauma
 - Credible data from which to measure claim reporting patterns
 - Low to moderate cost claims: \$15,000 to \$100,000

How We Do It Now

Indemnity: Accident Years 1996 and earlier

- Lifetime IBNR modeled based on claim-emergence data
 - Includes PPD, PTD, and Widow claims
 - Widow claims for the purpose of this analysis are generated by newly reported claims (mesothelioma) as well as the lifetime PPDs.
 - Duration assumed to be life pension

How We Do It Now

Indemnity: Accident Years 1997 and Subsequent

- Workforce has fluctuated, but not materially as in the 1990's
- Standard Development and Development Based Methods Used
 - Common tail based on 52 years of age at injury
 - Starting point is the result of the claim model discussed earlier for accident years 1997 through 2000.

How We Do It Now

Medical: All Years

- Paid Development Based Model
 - Tail factors are annuity based as described earlier
 - Tail factors are not changed unless emerging experience shows a disconnect between model and actual data
- Development forecasts are adjusted by accident year to reflect actual medical payments
 - If observed loss development for a particular accident year is measurably and consistently greater than model, adjustments are made to ensure near-term development factors are consistent with immediate past history. Adjustments are phased out over a ten year time horizon.
 - Adjustments are updated annually, but goal is to prevent large changes in year to year results.
 - Approach works very well in the aggregate

How We Do It Now

ALAE:

- 1996 and Prior – Ratio Based Methods
 - Most recently observed paid ALAE to paid Indemnity ratios are used to estimate unpaid ALAE
- 1997 and Subsequent: - Ratio Based Methods coupled with loss development approaches

