



# Class Ratemaking for Workers Compensation: NCCI's New Methodology

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# Overview of the Paper

- NCCI has modified its approach for determining the class relativities in its loss cost and rate filings.
- Why were the changes made and how was the research completed?
- How does the new methodology work?
- Many supporting research exhibits in Appendix A.
- Derivation of a loss cost for a class code in Appendix B.

# Goals of the New Class Methodology

- Improve loss cost accuracy and equity by class.
- Improve year-to-year stability at a class code level.

Other important considerations:

- Explore the potential of new data elements provided by carriers.
- Standardize a methodology across states.

## Unit Report Expansion and More Data

- NCCI began to collect additional data elements (URE) to enhance the Workers Compensation Statistical Plan (WCSP) starting in the late 1990's.
- Some of the new data elements included:
  - Paid ALAE (Case reserves optional)
  - Paid losses separate from paid plus case losses
  - Injured Part of Body
  - Nature and Cause of Injury
  - Deductible Reimbursement Amounts
  - Lump Sum Indicator
- Unit reports beyond 5<sup>th</sup> report (to 10<sup>th</sup>).

# Overview of the Methodology Changes

- Loss Limits
- Loss Development
- Expected Excess Provision
- Industry Group Differentials
- Class Credibility

# Loss Limits for a Class Code

## Current Methodology

- Limits ranged by state from \$500K to \$1.1M.
- Computed as follows:

5 X State Serious Average

Cost per Case = Limit

- Current limit relative to mean claim size was about 99<sup>th</sup> percentile.

## New Methodology

- Targeted 95<sup>th</sup> percentile relative to mean claim size.
- \$500K for every state.

Advantages:

- Reduced loss limit of \$500K will enhance stability by class code.
- Aligns with NCCI Call 31

# Loss Development – Current

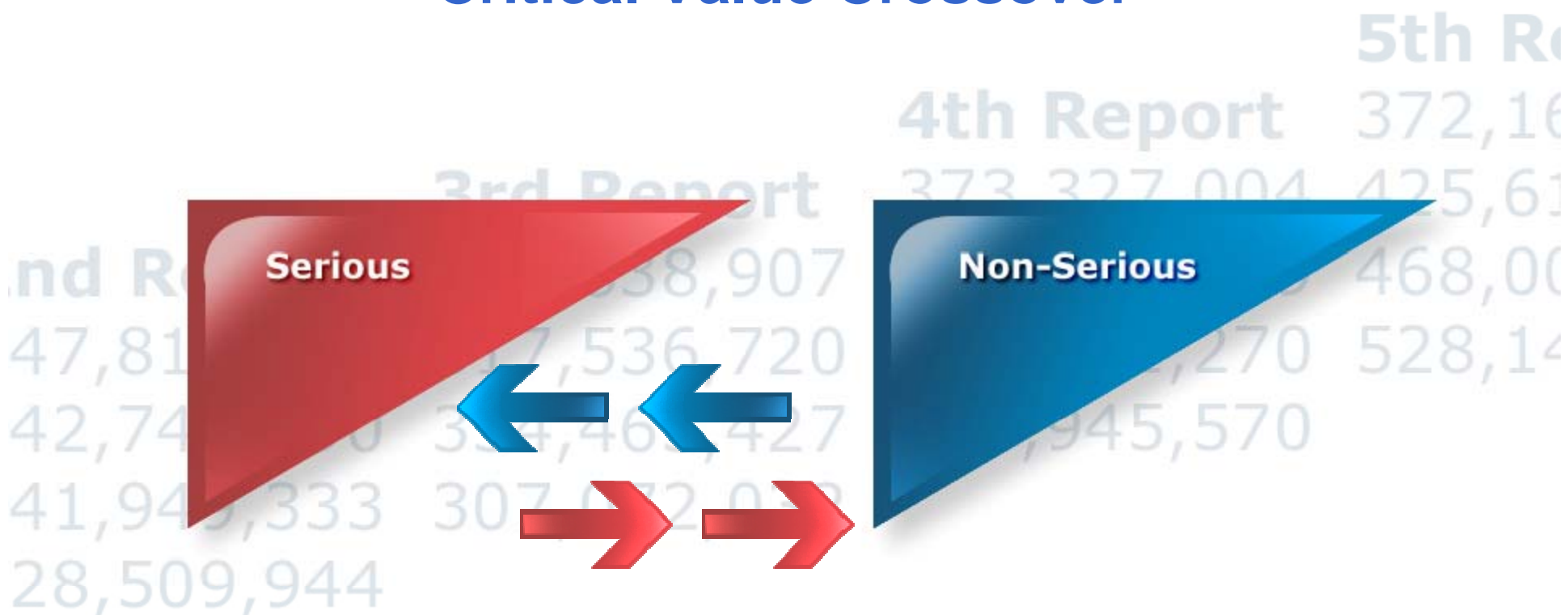
- Unlimited dollars of loss are currently organized into two loss development groupings: Serious and Non-Serious
- The critical value delineates major and minor PPD claims.
- Indemnity and Medical are separately computed. However, the medical loss development triangles do not differentiate serious and non-serious from 1<sup>st</sup> to 5<sup>th</sup> report.



\* PPD – permanent partial disability

# Issues with Current Methodology

## Critical Value Crossover



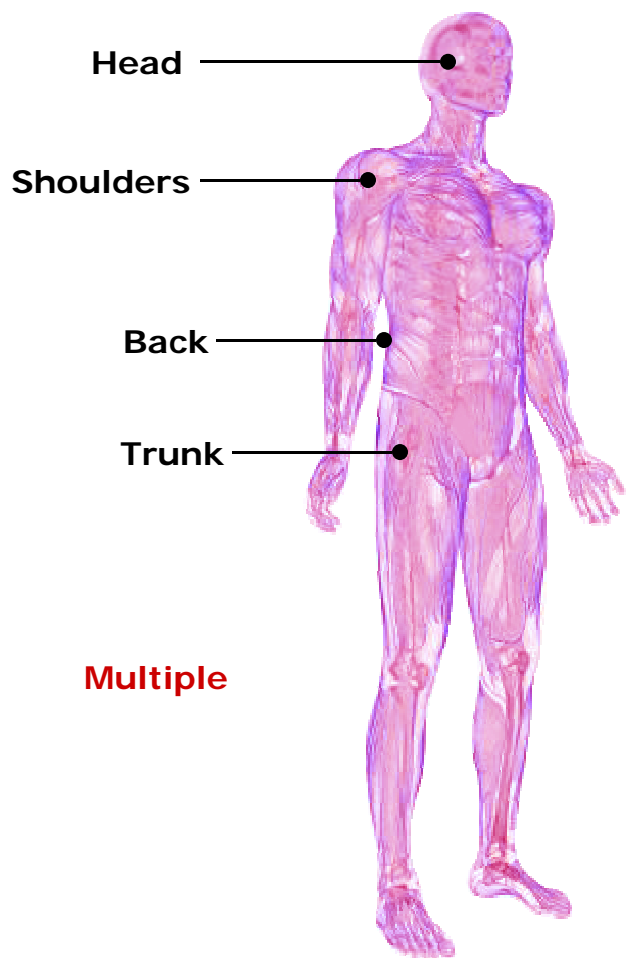
**Claims frequently jump triangles at different reports as they cross the Critical Value dollar amount.**

**Examples: TTD to Major PPD, Minor PPD to Major PPD**

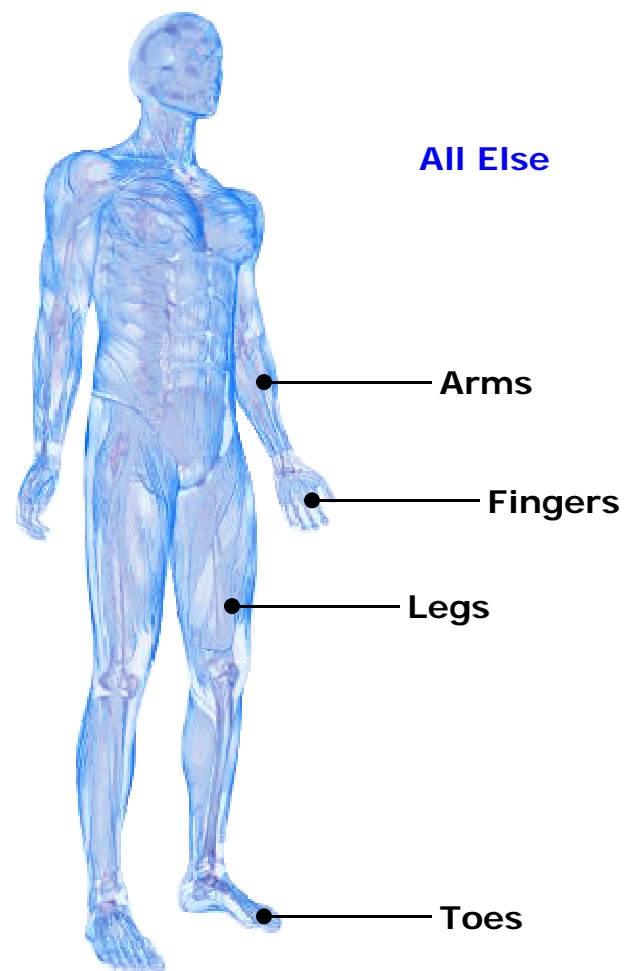
**Note: A tail factor is applied to serious @5th. No tail factor is applied to non-serious.**



# Body Part Mapping



**Likely-to-Develop Body Part Map**



**Not-Likely-to-Develop Body Part Map**

# Loss Development – NCCI Proposal

- Eliminate the Critical Value.
- Dollars of loss organized into two loss development groupings by POB and Injury Type Combination: Likely-to-Develop and Not-Likely-to-Develop. Indemnity and Medical are separately computed.



Note: “L” and “N” refer to the injured part of body on specific claims, not the grouping.

## Loss Development – More Refinements Were Added

- Injured Part of Body @ 1st report
- Open and Closed Claims @ 1<sup>st</sup> report
- An analysis of loss development for each Injury Type was completed using combinations of the Part Of Body mappings and the Open and Closed claim status.
- Triangles will be expanded to 10th report over time.
- These changes should enhance stability, and improve class equity and accuracy.

# Loss Development - Final NCCI Proposal

**Likely-to-Develop Claims**

**Not-Likely-to-Develop Claims**

**Fatal @2<sup>nd</sup> & all subsequent reports**

**Permanent Total: @ all reports**

**\*Permanent Partial: L and (Open @ 1<sup>st</sup>)**

**\*Temporary Total: L and (Open @ 1<sup>st</sup>)**

**Fatal @ 1st report only**

**Medical Only: @ all reports**

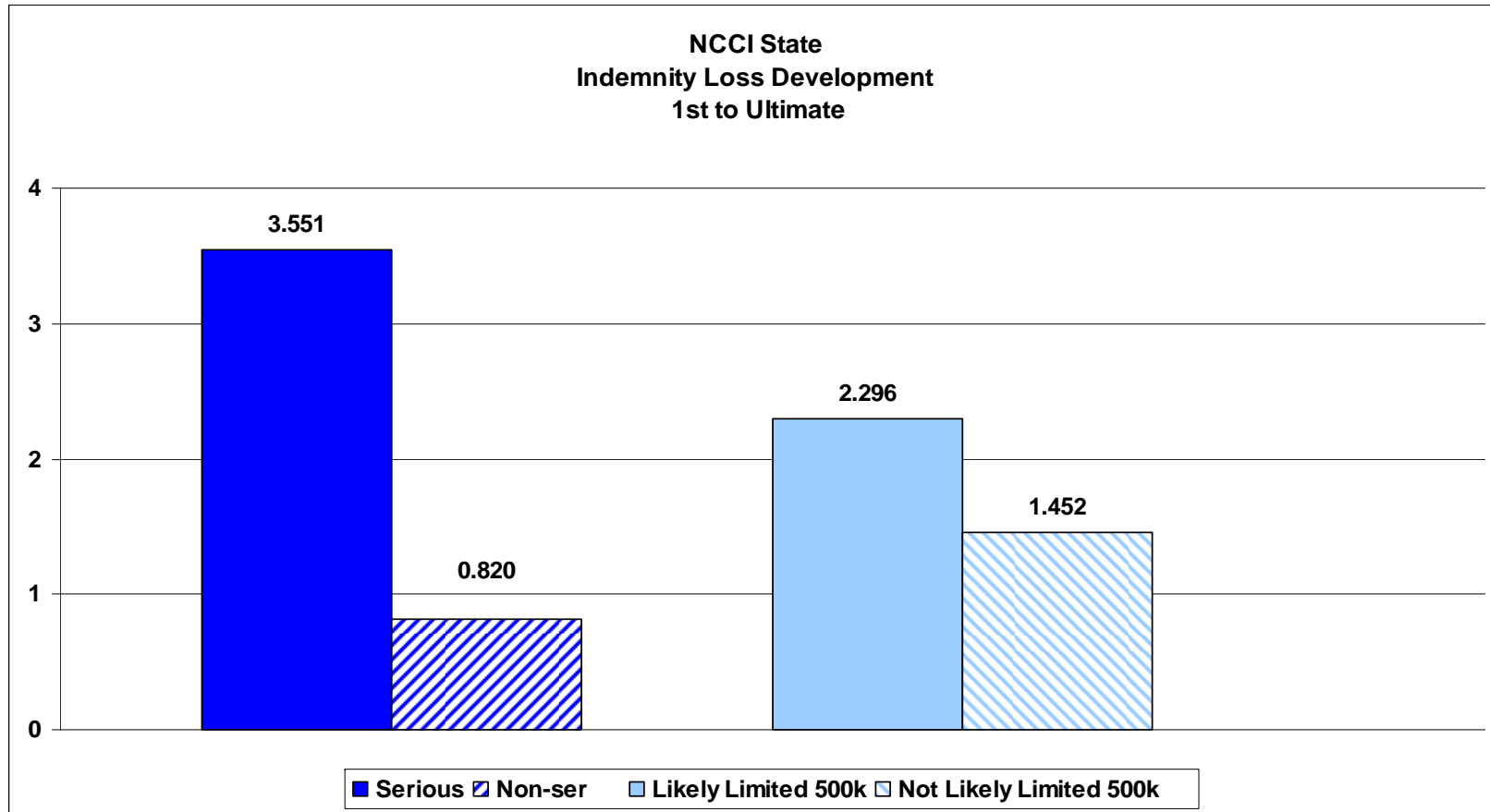
**\*Permanent Partial: NL or (Closed @ 1<sup>st</sup>)**

**\*Temporary Total: NL or (Closed @ 1<sup>st</sup>)**

\* “L” and “NL” here refer to the injured part of body on specific claims, and not the triangle grouping.

# Loss Development Comparison

## Current Methodology vs. Final NCCI Proposal



# New Loss Development Methodology

- Base losses and WCSP loss development factors (LDFs) are limited to \$500k.
- The 5<sup>th</sup> to ultimate tail factors will be based upon the state's financial call "paid + case" development factor (same as today).
- A small portion (20%) of tail development dollars will be apportioned to Not Likely triangles.
- The tail factor will eventually attach at 10<sup>th</sup> report.
- Claims arising @ 2nd and all subsequent reports will be considered open @ 1st.
- Elimination of critical value dollar amount eliminates serious and non-serious partial pure premiums: **Indemnity and Medical will be the new partial pure premiums.**

# Expected Excess Provision is Introduced by NCCI

- The actual dollars in a class code excess of \$500K are not included in the ratemaking data.
- A provision for losses in excess of \$500K will be determined using adjusted per claim excess ratios (XS) from the new 7 hazard group (HG) mapping.
- A multiplicative factor of  **$1.0/(1.0 - \text{HG XS}@500\text{K})$**  will be applied to the limited developed losses by class to derive expected unlimited losses for each class.
- The factor applied varies from hazard group A to G.
- This replaces the current unlimited to limited ratio by Industry Group.
- 40% of the expected excess dollars derived by class for indemnity will be transferred to the medical expected excess dollars.

# Expected Excess Provision-Research Approach

- An analysis on 16 alternatives for spreading excess and limiting large losses using Monte Carlo simulation techniques was performed.
- The paper describes the simulation approach NCCI used and the 4 metrics we observed for assessing the success of each alternative.
- NCCI selected the multiplicative factor as it performed well on the metrics and for the reasons below:

## Advantages of multiplicative excess factor:

- Multiplicative excess aligns well with aggregate large loss procedure.
- Given 2 classes of the same size within the same hazard group, the class with more primary losses will have a higher excess component.
- Enhances stability from year to year, and improves class equity and accuracy.



# Industry Group (IG) Differentials

## Current Methodology

- Uses unlimited actual losses by IG.
- NCCI Staff judgmentally tempers the final industry group differentials at [0.90, 1.10].
- Credibility standards vary by IG.

## New Methodology

- Uses limited developed losses plus expected excess by IG.
- NCCI Staff judgmentally tempers the final industry group differentials at [0.90, 1.10].
- Uniform credibility standard of 12,000 lost-time claims for each IG.

## Industry Group Differential Credibility

- The table below shows the number of lost-time claims used for current and new full credibility standards by industry group:

Industry Group	Current	New
Manufacturing	10,000	12,000
Contracting	8,000	12,000
Office & Clerical	7,000	12,000
Goods & Services	9,000	12,000
Miscellaneous	11,000	12,000

The changes to the industry group differential calculation should improve stability from year-to-year.

# Class Credibility

- The current three-way credibility weighting procedure will remain the same for Indicated, National, and Present On-Rate Level pure premiums.
- However, the serious and non-serious pure premiums are being changed to one combined indemnity pure premium. This necessitated deriving new full credibility standards.
- NCCI decided to derive new full credibility standards which keep assigned credibility levels about the same as is applied today. This enhances stability and is done because:
  - Stabilizing forces were added to the new class methodology, which suggested to decrease full credibility standards (FCS).
  - The indicated full credibility standards derived from an updated regression analysis suggested to increase the current FCS.
- $FCS \times \text{State Average Cost per Case}$  derives the full credibility expected losses used for all classes in that state.

## Full Credibility Standards (FCS) for State Indicated Pure Premium

	(1) Current FCS	(2) Indicated FCS	(3) (1) / (2)	(4) Selected	(5)= 2 x 4 Final New FCS
Serious	125	244	51%	—	—
Non-Serious	350	491	71%	—	—
Indemnity	—	1397	—	61%	<b>850</b>
Medical (current)	750	1341	56%	—	—
Medical (new)	—	719	—	56%	<b>400</b>

# Full Credibility Standards (FCS) for State Indicated Pure Premium Summary of NCCI Decisions

- Use a medical severity index (i.e. average cost per case) for determining the new medical full credibility standard. Current approach uses non-serious indemnity average cost per case.
- State Average Cost per Case for medical will be total medical dollars divided by number of lost-time claims (analogous to financial call medical cost per case for lost-time claims).
- The new medical FCS will be  $N_f = 400$ .
- The combined indemnity FCS will be  $N_f = 850$ .
- NCCI decided to keep the 0.4 power rule and the current credibility formula, but now applied to indemnity and medical partial pure premiums.

# Full Credibility Standards for National Pure Premium (actual lost-time claims)

	(1) Current FCS	(2) Indicated FCS	(3) (1) / (2)	(4) Selected	(5)= 2 x 4 Final New FCS
Serious	175	271	65%	—	—
Non-Serious	500	1132	44%	—	—
Indemnity	—	2127	—	54%	<b>1150</b>
Medical	1000	1548	65%	65%	<b>1000</b>

# Full Credibility Standards for National Pure Premium Summary of NCCI Decisions

- The National Pure Premium full credibility standards will continue to be based on actual number of lost-time cases (three years) by class.
- All classes in all NCCI states will continue to use the full credibility standard for the National pure premium.
- The indemnity FCS will be:  $N_f = 1,150$ .
- The medical FCS will be:  $N_f = 1,000$ .

# Final Thoughts

- This paper would make for a timely addition to a CAS Exam syllabus.
- New methodology will be implemented in the NCCI loss cost filings starting with effective dates 10-1-09 and subsequent.
- All aspects of the new methodology will be closely monitored over time including:
  - Credibility formulae
  - Mapping of injured body parts and the 4 groupings
  - 80/20 tail factor, transfer of excess, etc.





**Thank you!**

**Any Questions?**