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By The Numbers
Actuarial 
Consulting, Inc.

**TENNESSEE
ADVISORY COUNCIL ON
WORKERS' COMPENSATION**

**ACTUARIAL REPORT
Review of NCCI Loss Cost Filing
Effective 3/1/22**

10/4/21

By The Numbers
Actuarial 
Consulting, Inc.

October 4, 2021

Mr. David H. Lillard, Jr., Tennessee State Treasurer
Chairman, Advisory Council on Workers' Compensation
Andrew Jackson Building, 15th Floor
502 Deaderick Street
Nashville, TN 37243-0248

Dear Mr. Lillard:

Enclosed is the actuarial report prepared for the Tennessee Advisory Council on Workers' Compensation. This report contains our review of the National Council on Compensation Insurance, Inc. (NCCI) filing effective 3/1/22.

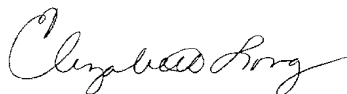
The estimates and analysis contained in this report are based on data provided by NCCI including the filing memorandum dated 8/25/21 and the answers to questions concerning the filing provided by NCCI. Any discrepancy in the completeness, interpretation, or accuracy of the information used may require a revision to this report.

If you have any questions, please contact us. It is a pleasure to be of service to the Advisory Council.

Sincerely,



Mary Jean King, FCAS, CERA, MAAA
Principal and Consulting Actuary



Elizabeth Long, ACAS, MAAA
Principal and Consulting Actuary

cc: Larry Scroggs, Administrator, Advisory Council on Workers' Compensation

TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

ACTUARIAL REPORT

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TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

ACTUARIAL REPORT

PURPOSE

By the Numbers Actuarial Consulting, Inc. (BYNAC) has been retained by the Tennessee Advisory Council on Workers' Compensation (ACWC) to prepare this actuarial report to present a professional analysis of the National Council on Compensation Insurance, Inc. (NCCI) Tennessee Workers Compensation Voluntary Loss Costs and Rating Values filing proposed to be effective 3/1/22. The basis of the analysis is the NCCI filing memorandum dated 8/25/21 and additional information provided by NCCI in support of the filing. BYNAC did not audit the premium or loss data underlying the NCCI filing, nor did we verify the accuracy of NCCI's detail calculations. An analysis of the updates to the experience rating plan and retrospective rating plan parameters is beyond the scope of this report.

The following items will be addressed in this report:

- An analysis of NCCI's methodology in arriving at its calculation of the proposed change in loss costs and loss adjustment expense.
- An examination of the appropriateness of the methodology used by NCCI in its selection of estimates employed to arrive at ultimate loss cost for past and forecast periods.
- An analysis of NCCI's selection of trend and loss adjustment expense allowance.

FINDINGS

Based on BYNAC's review of the NCCI filing, the proposed overall voluntary loss cost level change of -5.6% effective 3/1/22 has been reasonably calculated in accordance with actuarial standards of practice.

BYNAC reviewed paid and paid + case development and experience for policy years 2015 through 2017 in addition to the policy years underlying the filing of 2018 and 2019 in order to test the assumptions made by NCCI in selecting the data and development methods for review.

BYNAC also reviewed the selection of trend. The NCCI selected trend factor is a change from 0.940 to 0.950 for indemnity. There is no change to the NCCI selected trend factor for medical of 0.955. BYNAC's indemnity trend selection is 0.955. BYNAC agrees with the NCCI medical trend selection.

BYNAC reviewed historical information for defense and cost containment expense (DCCE) and adjusting and other expense (AOE). BYNAC believes the NCCI LAE selections are well supported.

The overall indication using BYNAC's experience and trend change and LAE selection is -5.3% (Appendix).

OVERVIEW OF FILING

SUMMARY OF PROPOSED LOSS COST CHANGES

NCCI is proposing a decrease in loss costs based on premium and loss experience effective 3/1/22. The breakdown of the proposed changes by industry groups is as follows:

Industry Group	Loss Cost Change Eff 3/1/22
Manufacturing	-6.5%
Contracting	-6.1%
Office & Clerical	-2.9%
Goods & Services	-6.3%
Miscellaneous	-4.7%
Overall	-5.6%

OTHER PROPOSED CHANGES

In addition to the loss cost changes, NCCI has included in the filing a change to the catastrophe premium endorsement. The endorsement has been changed to define a catastrophe as any single event or peril resulting in aggregate workers compensation losses in excess of \$50 million. The previous wording more narrowly defined catastrophe as single-event losses resulting only from earthquakes, noncertified acts of terrorism, or catastrophic industrial accidents. As noted in the filing, the COVID-19 pandemic has shown that there are other perils that can result in catastrophic losses. NCCI is proposing to fund these additional future perils using the catastrophe provision. While the definition was broadened, no change was made to the currently approved provision.

There is also a change to the methodology used in Federal-Classification ratemaking. This change has not been reviewed by BYNAC due to the small volume of F-classifications in Tennessee (less than 0.1% of Tennessee's total payroll in 2019).

The statewide indication includes an increase of +0.8% to overall workers compensation system costs for the estimated impact of the medical fee schedule update that was effective 1/1/21 and +0.1% for the changes to the medical fee schedule effective 9/22/21. BYNAC believes that these changes have been reasonably calculated.

DATA

The data used for the statewide indication is premium and losses for policy years 2018 and 2019, evaluated as of 12/31/20. The policy years selected are the most recent available. Combined voluntary and assigned risk data are used. Assigned risk represents approximately 12.3% of the policy year 2018 market share and 12.0% of 2019. All claims relating to the COVID-19 pandemic have been excluded from the data used in the filing including trend and loss adjustment expense data. Wage levels used in frequency and severity calculations have been adjusted to remove the effects of COVID-19 related shifts in employment across industry sectors.

COVID-19

The effect of the COVID-19 pandemic remains uncertain. In changing the catastrophe premium endorsement, NCCI has indicated that future pandemics will be considered a catastrophe and removed from the data used in ratemaking. This is also their approach to the ongoing COVID-19 pandemic. The prior definition of catastrophe included only events that are short term in nature.

Removing these events from the data ensures that the rates for the future period are not affected by a catastrophe that has ended. BYNAC's concern is how to account for a catastrophic event such as a pandemic that spans multiple policy periods. As of 12/31/20, healthcare and first responders accounted for almost 75% of all COVID-19 claims. For Tennessee, the dollar amount of excluded claims is small enough relative to the total losses to have little effect on the statewide indication. However, since the claims are concentrated in a small number of class codes, the exclusion does have an impact on individual class codes. NCCI provided estimates of the impact of including the COVID-19 data for two class codes as a test: 8833 (Hospital: Professional Employees) and 9040 (Hospital: All Other Employees). Including the COVID-19 data for class code 8833 resulted in no change to the indicated loss cost. For class code 9040, the inclusion resulted in a 3.1% increase in loss cost from 1.61 to 1.66 and is directly related to the losses from a single claim. Based on these results, it is tempting to assume that the impact of COVID-19 is fairly small. It is important to note, however, that less than 20% of the experience period includes COVID-19 exposure and that this exposure is from the beginning of the pandemic when the rate of infection was lower. The total number of cases in Tennessee during the entire experience period is about equal to the number of cases just in the last two months. If we were to assume that the pandemic will continue into the effective period at the current rate of infection, an upward adjustment to the data for the increased exposure and infection rate would be needed to provide for these losses. A more optimistic assumption is that the recent decline in case rates will continue into the effective period for the proposed loss costs and no additional loss provision is needed. The ongoing uncertainty supports the exclusion of the COVID-19 data from ratemaking for the loss costs that will be effective 3/1/22.

STATEWIDE INDICATION ANALYSIS

OVERVIEW

The statewide indicated change is based on premium and loss data for policy years 2018 and 2019. Standard earned premium is developed to ultimate to account for payroll audits that occur after the valuation date. Premium is then brought to the level of the current loss costs based on changes in loss costs since the experience period.

Two procedures are used to estimate the ultimate incurred losses. In the first method limited indemnity and medical paid losses plus case reserves are developed to ultimate. In the second method paid losses only are developed to ultimate. NCCI selected an average of the two methods as the best estimate of ultimate losses.

An on-level factor is also applied to losses to reflect changes to statutory benefit levels (excluding state average weekly wage (SAWW) related changes) since the experience period. A separate indemnity and medical limited cost ratio is calculated. A projected cost ratio for the proposed policy period is then calculated by applying factors for trend, to adjust the losses to an unlimited basis, and for proposed changes in benefit levels. The medical and indemnity cost ratios are added to arrive at a projected cost ratio for each policy year. The average of the projected cost ratio for the two policy years is selected by NCCI.

The final component of the proposed change is the change in loss adjustment expense. The indicated change based on experience, trend, and benefits is multiplied by the effect of the proposed change in loss based expenses to calculate the proposed overall change.

Indicated Change Based on Experience, Trend, and Benefits:

Policy Year	Projected Cost Ratio		
	Indemnity	Medical	Combined
2019	0.333	0.644	0.977
2018	0.312	0.596	0.908
Selected			0.943

Change in Loss Based Expenses:

	DCCE Ratio	AOE Ratio	LAE Ratio
Current	0.103	0.089	0.192
Proposed	0.099	0.094	0.193
Change			1.001
Overall Change			-5.6%

ANALYSIS OF METHODOLOGY

The methodology used by NCCI to calculate the statewide indication is reasonable. Both paid and paid + case loss development are used in estimating ultimate losses. These are widely used and accepted methods. Inherent in the paid + case loss development technique is the assumption that there are no changes in reserving practices. The paid loss development method provides a check to this assumption. Paid loss development assumes that there are no changes in claims settlement practices.

The use of on-level factors to bring premium to the current loss cost level is also a generally accepted technique. The use of a Tennessee specific distribution of policy effective dates increases the accuracy of the on-level factor calculation. As a matter of simplicity, the most recent distribution is used for all policy years.

In selecting trend factors, NCCI examines claim frequency and severity separately, adjusts the severity to the current statutory benefit level (excluding SAWW related changes), and removes the impact of the growth in payroll over the experience period. NCCI then combines the historical frequency with the adjusted severity to produce loss ratio trend experience. Policy year loss ratio trend is used as the basis for the selection. The selection of trend factors involves a great deal of judgment and is subject to a wide range of opinion concerning the appropriate factor.

Five years of Tennessee specific policy year data is used for the DCCE provision and five years of countrywide accident year data is used for AOE. The increase in the AOE provision is largely off set by a decrease in the DCCE provision.

The methodology to limit losses in the development and trend calculations and adjust the limited cost ratio to an unlimited basis is the same as that used in the prior filing. This methodology was implemented in 2004 to temper the impact of one large claim on the overall statewide indication. The loss limitation threshold is based on pure premium and changes from year to year. The threshold for this filing is a 0.6% increase to \$6,076,577. The selected statewide excess ratio of 2.6% is higher than the ratio used in the prior filing of 2.4%.

DEVELOPMENT

The ultimate cost of claims incurred for a specific time period is usually not known until several years after the close of that period. Loss development factors project the additional cost expected on claims. The calculation and selection of development factors to be applied to paid + case indemnity losses are shown in Table 1, beginning with the age-to-age factors calculated using

Table 1

**STATE OF TENNESSEE
WORKERS COMPENSATION**

INDEMNITY PAID + CASE DEVELOPMENT FACTORS

A. INDEMNITY PAID + CASE AGE TO AGE FACTORS

Policy Year	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	19-Ult
1997																			1.000
1998																	1.000	1.001	1.001
1999															0.999	1.000	0.998	1.000	1.000
2000														1.000	1.002	0.999	0.999	1.000	1.000
2001																			1.000
2002												0.999	1.000	1.000	1.000	1.000	1.000		
2003												1.001	1.002	1.000	1.002	1.001			
2004											1.002	1.005	1.000	1.000	1.001				
2005										1.001	1.002	1.001	0.999	1.000					
2006									1.001	1.001	1.000	1.000	1.000						
2007								0.996	0.999	0.999	1.001	1.000							
2008							1.001	0.998	1.001	1.001	1.001								
2009						1.006	1.005	1.006	0.997	1.000									
2010					1.004	1.002	1.006	1.000	1.001										
2011				1.006	1.002	1.008	0.999	1.002											
2012			1.016	1.011	1.001	1.009	1.002												
2013		1.053	1.008	1.005	1.002	1.004													
2014	1.063	1.034	1.016	1.012	1.010														
2015	1.101	1.040	1.012	1.007															
2016	1.091	1.035	1.021																
2017	1.105	1.055																	
2018	1.120																		
5 Yr Avg	1.096	1.043	1.015	1.008	1.004	1.004	1.003	1.000	1.000	1.000	1.001	1.001	1.000	1.000	1.001	1.000	0.999	1.000	
3 Yr Avg	1.105	1.043	1.016	1.008	1.004	1.004	1.002	1.003	1.000	1.000	1.001	1.000	1.000	1.000	1.001	1.000	0.999	1.000	
5 Yr Mid	1.099	1.043	1.015	1.008	1.003	1.004	1.003	1.000	1.000	1.001	1.001	1.001	1.000	1.000	1.001	1.000	1.000	1.000	
2 Yr Avg	1.113	1.045	1.017	1.010	1.006	1.002	1.001	1.001	0.999	1.001	1.001	1.000	1.000	1.000	1.002	1.001	1.000	1.000	
NCCI Prior	1.093	1.045	1.016	1.009	1.004	1.004	1.003	1.000	1.000	1.000	1.001	1.001	1.000	1.000	1.001	1.000	0.999	1.000	1.001
NCCI Sel	1.096	1.043	1.015	1.008	1.004	1.004	1.003	1.000	1.000	1.000	1.001	1.001	1.000	1.000	1.001	1.000	0.999	1.000	1.001
BYNAC Sel	1.096	1.043	1.015	1.008	1.004	1.004	1.003	1.000	1.000	1.000	1.001	1.001	1.000	1.000	1.001	1.000	0.999	1.000	1.001

B. INDEMNITY PAID + CASE DEVELOPMENT FACTORS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	1.186	1.082	1.037	1.022	1.014	1.010	1.006	1.003	1.003	1.003	1.003	1.002	1.001	1.001	1.001	1.000	1.000	1.001	1.001

Tennessee's limited paid + case policy year losses excluding LAE. The historical and expected loss development patterns are graphically illustrated in Figure 1 by thick and thin lines, respectively. Paid indemnity development is shown in Table 2 and Figure 2. Medical development follows in Tables 3 and 4 and Figures 3 and 4. For both indemnity and medical losses, NCCI selected 5-year average factors for the paid + case development and 2-year averages for the paid development. The NCCI selections are reasonable. However, BYNAC believes that a 3-year paid average is preferable. The BYNAC paid + case indemnity factors are 5-year averages which equal the NCCI selections. BYNAC agrees with the NCCI tail factor selections. The selections are also shown on Tables 1 through 4.

The standard earned premium also needs to be developed to ultimate to account for changes to earned premium such as payroll audits that are completed after the 1st report. Table 5 shows the premium development with the NCCI and BYNAC selections. Age to age factors from prior filings are shown for the older policy periods. These factors are included to illustrate the range of usual factors.

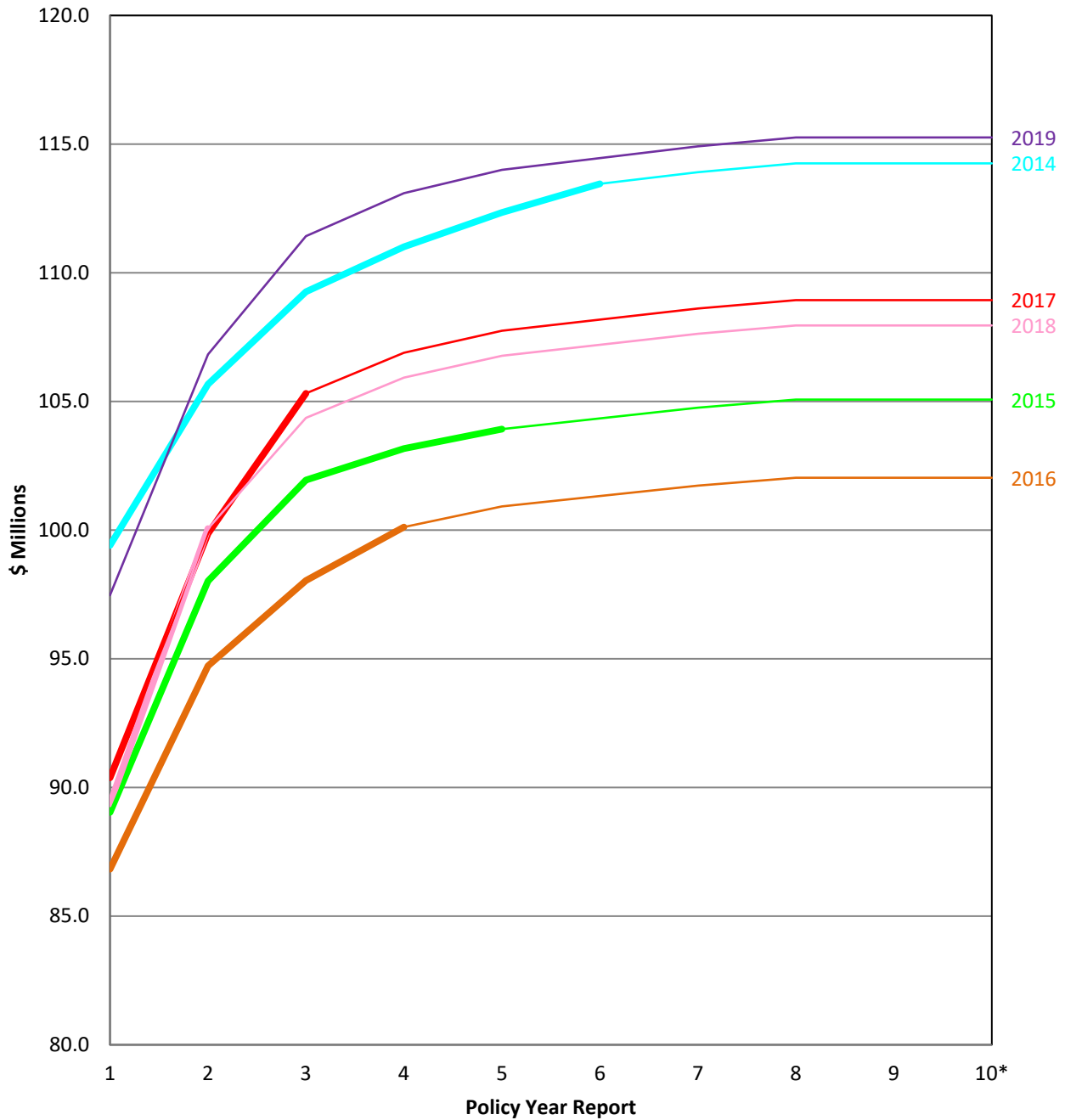
Table 6 shows both NCCI's and BYNAC's estimated ultimate losses and standard earned premium. For the losses, the NCCI selections are based on an average of the indicated ultimate losses using the paid + case and paid development methods. The BYNAC selections are also based on the average of the two methods using BYNAC's selected development factors. The selections are illustrated in Figures 5 and 6.

The indicated loss cost level change for policy years 2015 through 2019 is presented in Table 7. A summary of the indications is provided in Table 8 and Figure 7. BYNAC selected the average

Figure 1

**STATE OF TENNESSEE
WORKERS COMPENSATION**

**HISTORICAL AND EXPECTED DEVELOPMENT OF PAID + CASE LOSSES
INDEMNITY**



* Additional development of 0.3% is expected after 10th report.

Table 2

**STATE OF TENNESSEE
WORKERS COMPENSATION**

INDEMNITY PAID DEVELOPMENT FACTORS

A. INDEMNITY PAID AGE TO AGE FACTORS

Policy Year	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	19-Ult
1997																			1.001
1998																		1.000	1.000
1999																1.000	1.000	1.000	
2000															1.001	1.001	1.001	1.000	
2001														1.001	1.001	1.001	1.001	1.001	
2002													0.999	1.001	1.000	1.000	1.000	1.000	
2003												1.001	1.000	1.000	1.002	1.002			
2004											1.004	1.003	1.001	1.000	1.000				
2005										1.002	1.003	1.003	1.001	1.001					
2006									1.003	1.003	1.000	1.001	1.000						
2007								1.003	1.003	1.002	1.001	1.001							
2008							1.009	1.006	1.006	1.004	1.002								
2009						1.016	1.010	1.003	1.004	1.001									
2010					1.019	1.017	1.006	1.007	1.001										
2011				1.043	1.024	1.021	1.010	1.004											
2012			1.081	1.043	1.027	1.013	1.008												
2013		1.216	1.078	1.037	1.022	1.011													
2014	1.529	1.170	1.085	1.050	1.024														
2015	1.584	1.191	1.083	1.027															
2016	1.591	1.155	1.090																
2017	1.571	1.182																	
2018	1.562																		
5 Yr Avg	1.567	1.183	1.083	1.040	1.023	1.016	1.009	1.005	1.003	1.002	1.002	1.002	1.000	1.001	1.001	1.001	1.000	1.000	
3 Yr Avg	1.575	1.176	1.086	1.038	1.024	1.015	1.008	1.005	1.004	1.002	1.001	1.002	1.001	1.000	1.001	1.001	1.001	1.001	
5 Yr Mid	1.572	1.181	1.083	1.041	1.023	1.015	1.009	1.004	1.003	1.002	1.002	1.002	1.000	1.001	1.001	1.001	1.001	1.000	
2 Yr Avg	1.567	1.169	1.087	1.039	1.023	1.012	1.009	1.006	1.003	1.003	1.002	1.001	1.001	1.001	1.001	1.001	1.001	1.001	
NCCI Prior	1.584	1.170	1.087	1.044	1.025	1.017	1.008	1.005	1.005	1.003	1.001	1.002	1.001	1.001	1.001	1.001	1.001	1.000	1.003
NCCI Sel	1.567	1.169	1.087	1.039	1.023	1.012	1.009	1.006	1.003	1.003	1.002	1.001	1.001	1.001	1.001	1.001	1.001	1.000	1.003
BYNAC Sel	1.575	1.176	1.086	1.038	1.024	1.015	1.008	1.005	1.004	1.002	1.001	1.002	1.001	1.000	1.001	1.001	1.001	1.000	1.003

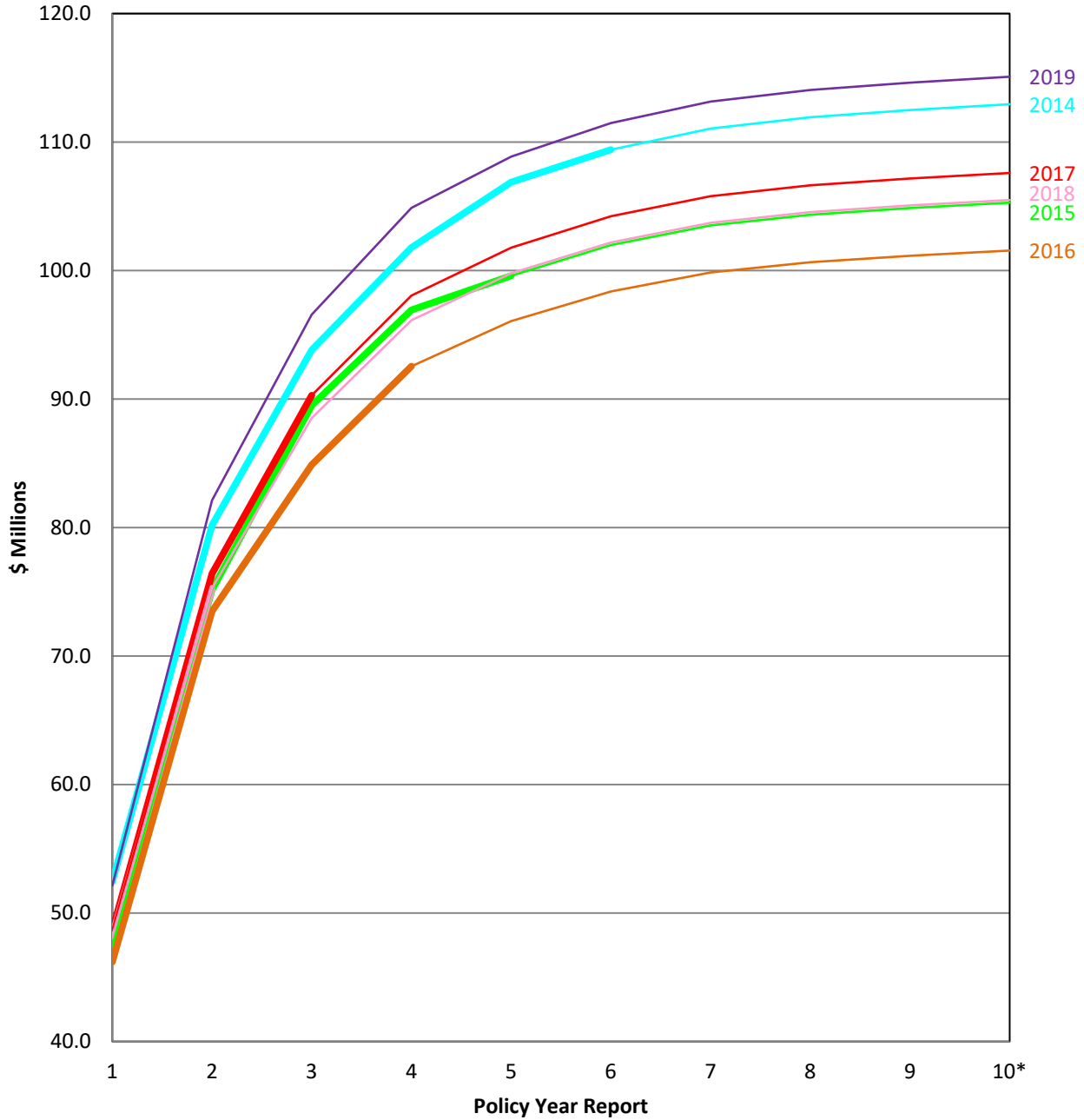
B. INDEMNITY PAID DEVELOPMENT FACTORS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	2.232	1.417	1.205	1.110	1.069	1.044	1.029	1.021	1.016	1.012	1.010	1.009	1.007	1.006	1.006	1.005	1.004	1.003	1.003

Figure 2

**STATE OF TENNESSEE
WORKERS COMPENSATION**

**HISTORICAL AND EXPECTED DEVELOPMENT OF PAID LOSSES
INDEMNITY**



* Additional development of 1.2% is expected after 10th report.

Table 3

**STATE OF TENNESSEE
WORKERS COMPENSATION**

MEDICAL PAID + CASE DEVELOPMENT FACTORS

A. MEDICAL PAID + CASE AGE TO AGE FACTORS

Policy Year	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	19 - Ult
1997																			1.006
1998																	0.997	1.002	
1999																1.005	0.996	0.997	
2000															0.997	0.989	1.003	0.998	
2001														1.006	0.996	0.995	1.002	0.987	
2002													1.002	0.996	1.003	1.001	0.998		
2003												1.000	1.006	0.997	1.003	0.998			
2004											1.001	1.000	1.002	0.995	1.004				
2005										1.001	1.003	1.003	0.979	1.003					
2006									1.012	0.998	0.999	1.001	0.999						
2007								1.022	0.981	0.988	0.995	0.995							
2008							0.990	0.994	0.997	0.997	1.006								
2009						1.012	0.999	1.005	1.003	1.004									
2010					1.012	1.017	0.996	0.997	1.002										
2011				1.000	1.013	1.001	1.002	0.998											
2012			1.017	1.012	1.002	0.994	0.998												
2013		1.030	1.013	0.995	1.004	1.007													
2014	0.986	1.016	1.010	0.988	1.002														
2015	0.987	0.988	1.003	1.013															
2016	0.955	1.005	1.010																
2017	0.999	0.982																	
2018	0.968																		
5 Yr Avg	0.979	1.004	1.011	1.002	1.007	1.006	0.997	1.003	0.999	0.998	1.001	1.000	0.998	0.999	1.001	0.998	0.999	0.998	
3 Yr Avg	0.974	0.992	1.008	0.999	1.003	1.001	0.999	1.000	1.001	0.996	1.000	1.000	0.993	0.998	1.003	0.998	1.001	0.994	
5 Yr Mid	0.980	1.003	1.011	1.002	1.006	1.007	0.998	1.000	1.001	0.999	1.001	1.000	1.001	0.999	1.001	0.998	0.999	0.999	
2 Yr Avg	0.984	0.994	1.007	1.001	1.003	1.001	1.000	0.998	1.003	1.001	1.001	0.998	0.989	0.999	1.004	1.000	1.000	0.993	
NCCI Prior	0.977	1.012	1.018	1.004	1.009	1.010	1.002	1.004	1.003	0.998	1.005	1.003	1.000	0.999	1.000	0.999	0.999	0.999	1.015
NCCI Sel	0.979	1.004	1.011	1.002	1.007	1.006	0.997	1.003	0.999	0.998	1.001	1.000	0.998	0.999	1.001	0.998	0.999	0.998	1.009
BYNAC Sel	0.979	1.004	1.011	1.002	1.007	1.006	0.997	1.003	0.999	0.998	1.001	1.000	0.998	0.999	1.001	0.998	0.999	0.998	1.009

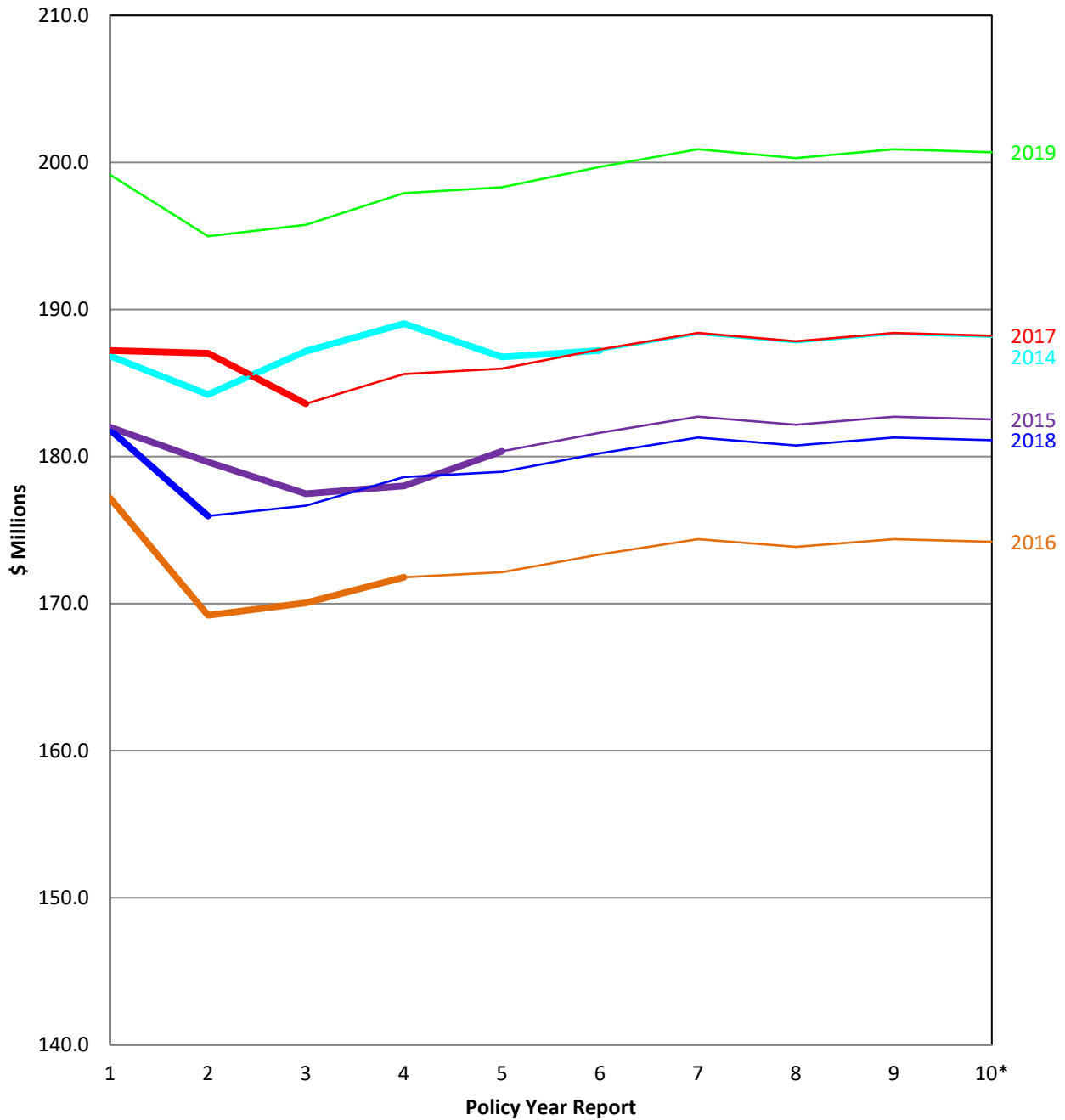
B. MEDICAL PAID + CASE DEVELOPMENT FACTORS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	1.008	1.030	1.026	1.015	1.013	1.006	1.000	1.003	1.000	1.001	1.003	1.002	1.002	1.004	1.005	1.004	1.006	1.007	1.009

Figure 3

**STATE OF TENNESSEE
WORKERS COMPENSATION**

**HISTORICAL AND EXPECTED DEVELOPMENT OF PAID + CASE LOSSES
MEDICAL**



* Additional development of 0.1% is expected after 10th report.

Table 4

**STATE OF TENNESSEE
WORKERS COMPENSATION**

MEDICAL PAID DEVELOPMENT FACTORS

A. MEDICAL AGE TO AGE FACTORS

Policy Year	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7	7 - 8	8 - 9	9 - 10	10 - 11	11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	16 - 17	17 - 18	18 - 19	19 - Ult
1996																			1.009
1997																	1.010	1.009	1.009
1998																1.011	1.008	1.009	1.009
1999															1.008	1.008	1.008	1.005	1.005
2000														1.009	1.011	1.006	1.004	1.003	1.003
2001													1.005	1.008	1.009	1.006	1.007		
2002												1.017	1.011	1.010	1.008	1.005			
2003											1.016	1.010	1.013	1.010	1.007				
2004										1.024	1.017	1.010	1.012	1.007					
2005									1.021	1.024	1.020	1.011	1.010						
2006								1.023	1.019	1.014	1.013	1.010							
2007							1.027	1.016	1.015	1.011	1.011								
2008							1.028	1.024	1.017	1.014	1.011								
2009					1.035	1.029	1.023	1.021	1.012										
2010				1.027	1.019	1.025	1.014	1.012											
2011			1.037	1.025	1.021	1.023	1.012												
2012		1.073	1.037	1.026	1.018	1.015													
2013	1.229	1.066	1.044	1.021	1.011														
2014	1.234	1.061	1.031	1.025															
2015	1.200	1.054	1.031																
2016	1.208	1.063																	
2017	1.203																		
5 Yr Avg	1.215	1.063	1.036	1.025	1.021	1.024	1.020	1.018	1.016	1.017	1.015	1.012	1.010	1.009	1.009	1.007	1.007	1.007	
3 Yr Avg	1.204	1.059	1.035	1.024	1.017	1.021	1.016	1.017	1.014	1.012	1.015	1.010	1.012	1.009	1.008	1.006	1.006	1.006	
5 Yr Mid	1.213	1.063	1.035	1.025	1.019	1.025	1.020	1.018	1.016	1.016	1.015	1.010	1.011	1.009	1.008	1.007	1.008	1.008	
2 Yr Avg	1.206	1.059	1.031	1.023	1.015	1.019	1.013	1.017	1.013	1.011	1.012	1.011	1.011	1.009	1.008	1.006	1.006	1.004	
NCCI Prior	1.204	1.058	1.038	1.025	1.020	1.024	1.019	1.020	1.015	1.013	1.017	1.011	1.013	1.011	1.009	1.006	1.007	1.008	1.115
NCCI Sel	1.206	1.059	1.031	1.023	1.015	1.019	1.013	1.017	1.013	1.011	1.012	1.011	1.011	1.009	1.008	1.006	1.006	1.004	1.085
BYNAC Sel	1.204	1.059	1.035	1.024	1.017	1.021	1.016	1.017	1.014	1.012	1.015	1.010	1.012	1.009	1.008	1.006	1.006	1.006	1.085

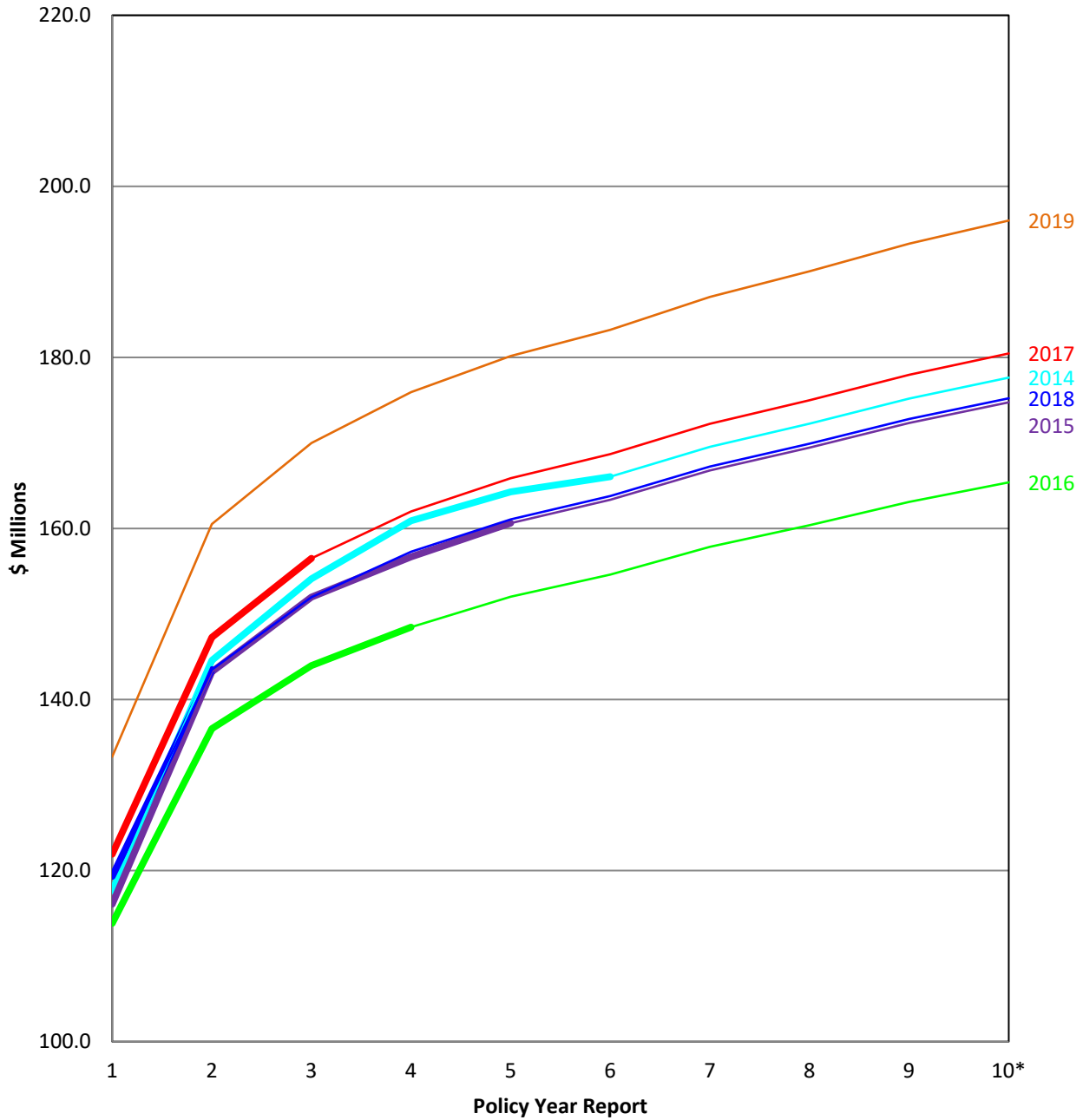
B. MEDICAL PAID LOSS DEVELOPMENT FACTORS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	1.735	1.441	1.361	1.315	1.284	1.263	1.237	1.218	1.198	1.181	1.167	1.150	1.139	1.125	1.115	1.106	1.099	1.092	1.085

Figure 4

**STATE OF TENNESSEE
WORKERS COMPENSATION**

**HISTORICAL AND EXPECTED DEVELOPMENT OF PAID LOSSES
MEDICAL**



* Additional development of 18.1% is expected after 10th report.

Table 5

**STATE OF TENNESSEE
WORKERS COMPENSATION**

PREMIUM DEVELOPMENT FACTORS

A. PREMIUM AGE TO AGE FACTORS

Policy Year	1 - 2	2 - 3	3 - 4	4 - 5	5-Ult
2011	1.014	1.000	1.000	1.000	
2012	1.006	0.999	1.000	1.000	
2013	1.005	1.000	1.000	1.000	
2014	1.011	1.000	1.000	1.000	
2015	1.009	1.001	1.000	0.999	
2016	1.009	1.000	1.001		
2017	1.012	1.000			
2018	1.010				
5 Yr Avg	1.010	1.000	1.000	1.000	
3 Yr Avg	1.010	1.000	1.000	1.000	
5 Yr Mid	1.010	1.000	1.000	1.000	
2 Yr Avg	1.011	1.000	1.001	1.000	
NCCI Prior	1.010	1.000	1.000	1.000	1.000
NCCI Sel	1.010	1.000	1.000	1.000	1.000
BYNAC Sel	1.010	1.000	1.000	1.000	1.000

B. PREMIUM LOSS DEVELOPMENT FACTORS

1	2	3	4	5
1.010	1.000	1.000	1.000	1.000

Table 6

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF PREMIUM AND LOSSES DEVELOPED TO ULTIMATE REPORT

Section A - Policy Year 2019 Experience		NCCI	BYNAC
(1)	Standard Earned Premium	\$462,021,440	\$462,021,440
(2)	Factor to Develop Premium to Ultimate	1.010	1.010
(3)	Standard Earned Premium Developed to Ultimate = (1)x(2)	\$466,641,654	\$466,641,654
(4)	Limited Indemnity Paid Losses	\$52,140,449	\$52,140,449
(5)	Limited Indemnity Paid Development Factor to Ultimate	2.211	2.232
(6)	Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	\$115,282,533	\$116,377,482
(7)	Limited Indemnity Paid+Case Losses	\$97,472,757	\$97,472,757
(8)	Limited Indemnity Paid+Case Development Factor to Ultimate	1.186	1.186
(9)	Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	\$115,602,690	\$115,602,690
(10)	Policy Year 2019 Limited Indemnity Losses Developed to Ultimate NCCI and BYNAC = [(6)+(9)]/2	\$115,442,612	\$115,990,086
(11)	Limited Medical Paid Losses	\$133,321,721	\$133,321,721
(12)	Limited Medical Paid Development Factor to Ultimate	1.705	1.735
(13)	Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	\$227,313,534	\$231,313,186
(14)	Limited Medical Paid+Case Losses	\$199,168,151	\$199,168,151
(15)	Limited Medical Paid+Case Development Factor to Ultimate	1.008	1.008
(16)	Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	\$200,761,496	\$200,761,496
(17)	Policy Year 2019 Limited Medical Losses Developed to Ultimate NCCI and BYNAC = [(13)+(16)]/2	\$214,037,515	\$216,037,341
Section B - Policy Year 2018 Experience		NCCI	BYNAC
(1)	Standard Earned Premium	\$528,879,871	\$528,879,871
(2)	Factor to Develop Premium to Ultimate	1.000	1.000
(3)	Standard Earned Premium Developed to Ultimate = (1)x(2)	\$528,879,871	\$528,879,871
(4)	Limited Indemnity Paid Losses	\$75,274,422	\$75,274,422
(5)	Limited Indemnity Paid Development Factor to Ultimate	1.411	1.417
(6)	Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	\$106,212,209	\$106,663,856
(7)	Limited Indemnity Paid+Case Losses	\$100,059,042	\$100,059,042
(8)	Limited Indemnity Paid+Case Development Factor to Ultimate	1.082	1.082
(9)	Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	\$108,263,883	\$108,263,883
(10)	Policy Year 2018 Limited Indemnity Losses Developed to Ultimate NCCI and BYNAC = [(6)+(9)]/2	\$107,238,046	\$107,463,870
(11)	Limited Medical Paid Losses	\$143,499,412	\$143,499,412
(12)	Limited Medical Paid Development Factor to Ultimate	1.414	1.441
(13)	Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	\$202,908,169	\$206,782,653
(14)	Limited Medical Paid+Case Losses	\$175,959,859	\$175,959,859
(15)	Limited Medical Paid+Case Development Factor to Ultimate	1.030	1.030
(16)	Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	\$181,238,655	\$181,238,655
(17)	Policy Year 2018 Limited Medical Losses Developed to Ultimate NCCI and BYNAC = [(13)+(16)]/2	\$192,073,412	\$194,010,654

Table 6

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF PREMIUM AND LOSSES DEVELOPED TO ULTIMATE REPORT

Section C - Policy Year 2017 Experience		NCCI	BYNAC
(1)	Standard Earned Premium	\$571,069,820	\$571,069,820
(2)	Factor to Develop Premium to Ultimate	1.000	1.000
(3)	Standard Earned Premium Developed to Ultimate = (1)x(2)	\$571,069,820	\$571,069,820
(4)	Limited Indemnity Paid Losses	\$90,290,280	\$90,290,280
(5)	Limited Indemnity Paid Development Factor to Ultimate	1.207	1.205
(6)	Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	\$108,980,368	\$108,799,787
(7)	Limited Indemnity Paid+Case Losses	\$105,313,466	\$105,313,466
(8)	Limited Indemnity Paid+Case Development Factor to Ultimate	1.037	1.037
(9)	Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	\$109,210,064	\$109,210,064
(10)	Policy Year 2017 Limited Indemnity Losses Developed to Ultimate NCCI and BYNAC = [(6)+(9)]/2	\$109,095,216	\$109,004,926
(11)	Limited Medical Paid Losses	\$156,509,465	\$156,509,465
(12)	Limited Medical Paid Development Factor to Ultimate	1.335	1.361
(13)	Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	\$208,940,136	\$213,009,382
(14)	Limited Medical Paid+Case Losses	\$183,592,676	\$183,592,676
(15)	Limited Medical Paid+Case Development Factor to Ultimate	1.026	1.026
(16)	Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	\$188,366,086	\$188,366,086
(17)	Policy Year 2017 Limited Medical Losses Developed to Ultimate NCCI and BYNAC = [(13)+(16)]/2	\$198,653,111	\$200,687,734
Section D - Policy Year 2016 Experience		NCCI	BYNAC
(1)	Standard Earned Premium	\$606,506,596	\$606,506,596
(2)	Factor to Develop Premium to Ultimate	1.000	1.000
(3)	Standard Earned Premium Developed to Ultimate = (1)x(2)	\$606,506,596	\$606,506,596
(4)	Limited Indemnity Paid Losses	\$92,550,994	\$92,550,994
(5)	Limited Indemnity Paid Development Factor to Ultimate	1.110	1.110
(6)	Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	\$102,731,603	\$102,731,603
(7)	Limited Indemnity Paid+Case Losses	\$100,119,383	\$100,119,383
(8)	Limited Indemnity Paid+Case Development Factor to Ultimate	1.022	1.022
(9)	Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	\$102,322,009	\$102,322,009
(10)	Policy Year 2016 Limited Indemnity Losses Developed to Ultimate NCCI and BYNAC = [(6)+(9)]/2	\$102,526,806	\$102,526,806
(11)	Limited Medical Paid Losses	\$148,460,122	\$148,460,122
(12)	Limited Medical Paid Development Factor to Ultimate	1.295	1.315
(13)	Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	\$192,255,858	\$195,225,060
(14)	Limited Medical Paid+Case Losses	\$171,795,534	\$171,795,534
(15)	Limited Medical Paid+Case Development Factor to Ultimate	1.015	1.015
(16)	Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	\$174,372,467	\$174,372,467
(17)	Policy Year 2016 Limited Medical Losses Developed to Ultimate NCCI and BYNAC = [(13)+(16)]/2	\$183,314,163	\$184,798,764

Table 6

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF PREMIUM AND LOSSES DEVELOPED TO ULTIMATE REPORT

Section E - Policy Year 2015 Experience	NCCI	BYNAC
(1) Standard Earned Premium	\$584,757,968	\$584,757,968
(2) Factor to Develop Premium to Ultimate	1.000	1.000
(3) Standard Earned Premium Developed to Ultimate = (1)x(2)	\$584,757,968	\$584,757,968
(4) Limited Indemnity Paid Losses	\$99,595,990	\$99,595,990
(5) Limited Indemnity Paid Development Factor to Ultimate	1.068	1.069
(6) Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	\$106,368,517	\$106,468,113
(7) Limited Indemnity Paid+Case Losses	\$103,925,251	\$103,925,251
(8) Limited Indemnity Paid+Case Development Factor to Ultimate	1.014	1.014
(9) Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	\$105,380,205	\$105,380,205
(10) Policy Year 2015 Limited Indemnity Losses Developed to Ultimate NCCI and BYNAC = [(6)+(9)]/2	\$105,874,361	\$105,924,159
(11) Limited Medical Paid Losses	\$160,624,571	\$160,624,571
(12) Limited Medical Paid Development Factor to Ultimate	1.266	1.284
(13) Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	\$203,350,707	\$206,241,949
(14) Limited Medical Paid+Case Losses	\$180,359,391	\$180,359,391
(15) Limited Medical Paid+Case Development Factor to Ultimate	1.013	1.013
(16) Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	\$182,704,063	\$182,704,063
(17) Policy Year 2015 Limited Medical Losses Developed to Ultimate NCCI and BYNAC = [(13)+(16)]/2	\$193,027,385	\$194,473,006

Figure 5

**STATE OF TENNESSEE
WORKERS COMPENSATION**

**SELECTED ESTIMATED ULTIMATE INCURRED LOSSES
INDEMNITY**

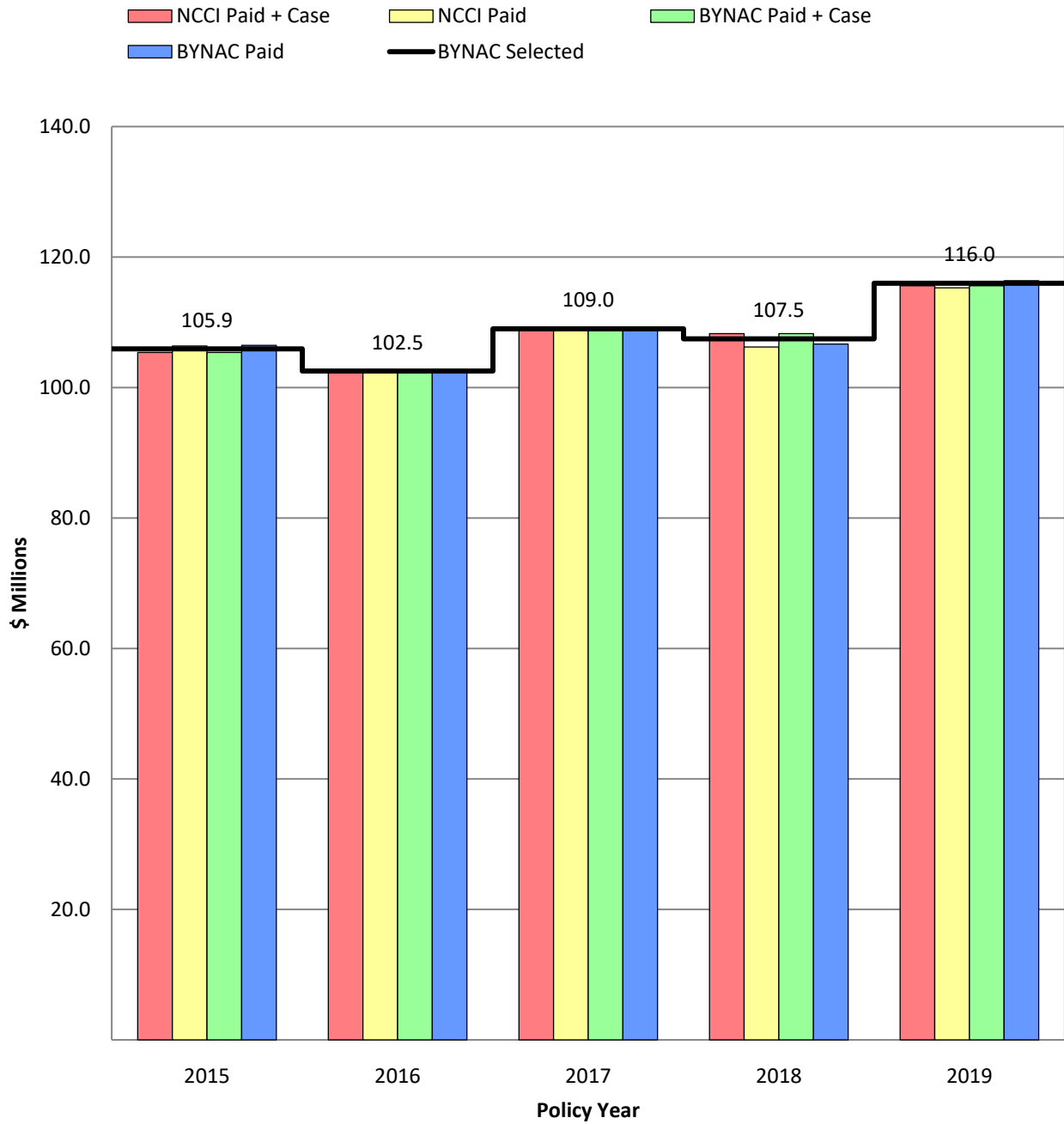


Figure 6

**STATE OF TENNESSEE
WORKERS COMPENSATION**

**SELECTED ESTIMATED ULTIMATE INCURRED LOSSES
MEDICAL**

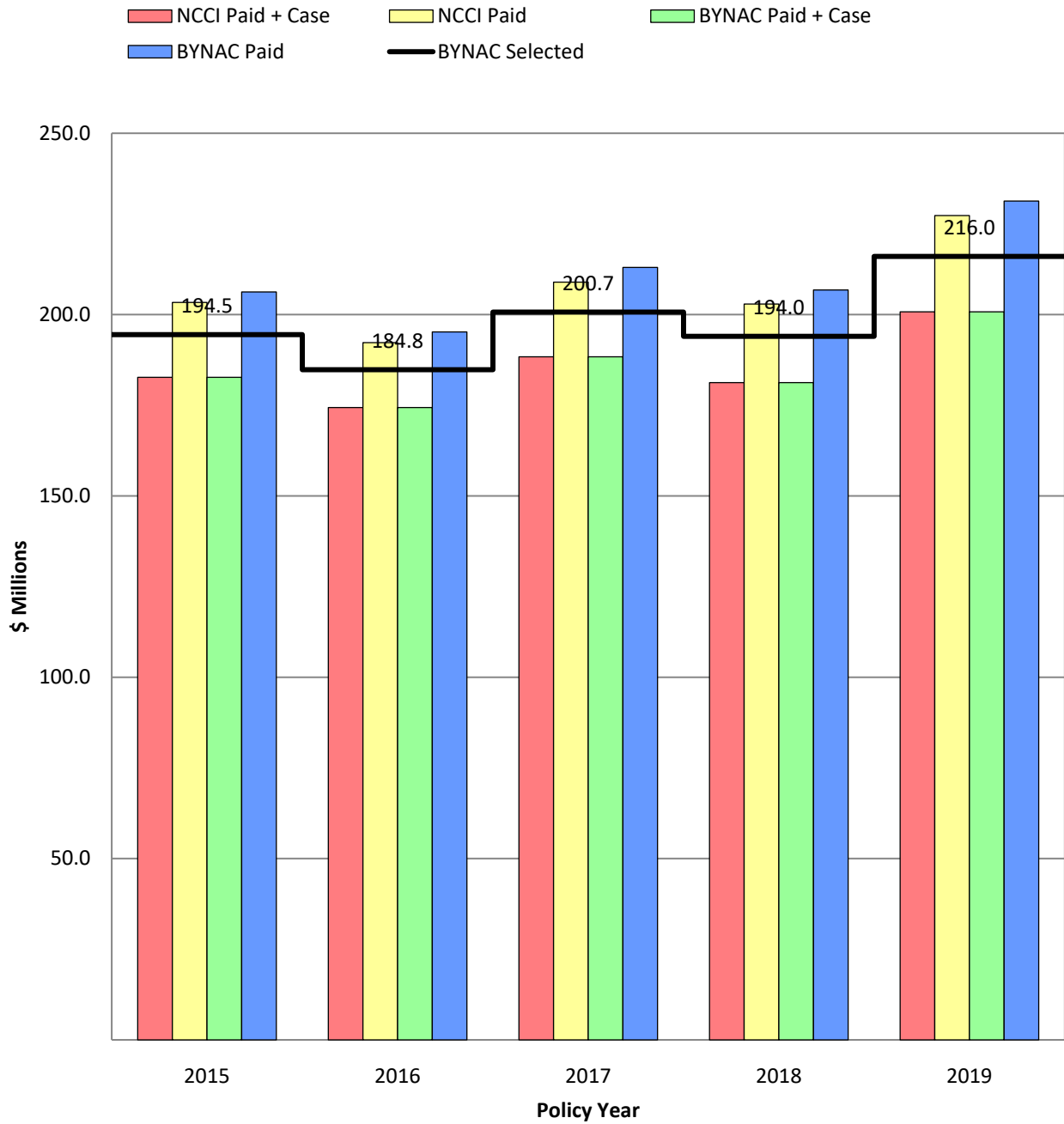


Table 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF INDICATED LOSS COST LEVEL CHANGE

Section A - Policy Year 2019 Experience	<u>NCCI</u>	<u>BYNAC</u>
Premium:		
(1) Standard Earned Premium Developed to Ultimate (Table 6)	\$466,641,654	\$466,641,654
(2) Premium On-level Factor	0.647	0.647
(3) Premium Available for Benefit Costs = (1) x (2)	\$301,917,150	\$301,917,150
Indemnity Benefit Cost:		
(4) Limited Indemnity Losses Developed to Ultimate (Table 6)	\$115,442,612	\$115,990,086
(5) Indemnity Loss On-level Factor	1.000	1.000
(6) Adjusted Limited Indemnity Losses = (4) x (5)	\$115,442,612	\$115,990,086
(7) Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.382	0.384
(8) Factor to Reflect Indemnity Trend	0.848	0.863
(9) Projected Limited Indemnity Cost Ratio = (7) x (8)	0.324	0.331
(10) Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis	1.027	1.027
(11) Projected Indemnity Cost Ratio = (9) x (10)	0.333	0.340
(12) Factor to Reflect Proposed Changes in Indemnity Benefits	1.000	1.000
(13) Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.333	0.340
Medical Benefit Cost:		
(14) Limited Medical Losses Developed to Ultimate (Table 6)	\$214,037,515	\$216,037,341
(15) Medical Loss On-level Factor	1.011	1.011
(16) Adjusted Limited Medical Losses = (14) x (15)	\$216,391,928	\$218,413,752
(17) Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.717	0.723
(18) Factor to Reflect Medical Trend	0.863	0.863
(19) Projected Limited Medical Cost Ratio = (17) x (18)	0.619	0.624
(20) Factor to Adjust Medical Cost Ratio to an Unlimited Basis	1.027	1.027
(21) Projected Medical Cost Ratio = (19) x (20)	0.636	0.641
(22) Factor to Reflect Proposed Changes in Medical Benefits	1.013	1.013
(23) Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.644	0.649
Total Benefit Cost:		
(24) Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.977	0.989

Table 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF INDICATED LOSS COST LEVEL CHANGE

Section B - Policy Year 2018 Experience	<u>NCCI</u>	<u>BYNAC</u>
Premium:		
(1) Standard Earned Premium Developed to Ultimate (Table 6)	\$528,879,871	\$528,879,871
(2) Premium On-level Factor	0.538	0.538
(3) Premium Available for Benefit Costs = (1) x (2)	\$284,537,371	\$284,537,371
Indemnity Benefit Cost:		
(4) Limited Indemnity Losses Developed to Ultimate (Table 6)	\$107,238,046	\$107,463,870
(5) Indemnity Loss On-level Factor	1.000	1.000
(6) Adjusted Limited Indemnity Losses = (4) x (5)	\$107,238,046	\$107,463,870
(7) Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.377	0.378
(8) Factor to Reflect Indemnity Trend	0.806	0.824
(9) Projected Limited Indemnity Cost Ratio = (7) x (8)	0.304	0.311
(10) Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis	1.027	1.027
(11) Projected Indemnity Cost Ratio = (9) x (10)	0.312	0.319
(12) Factor to Reflect Proposed Changes in Indemnity Benefits	1.000	1.000
(13) Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.312	0.319
Medical Benefit Cost:		
(14) Limited Medical Losses Developed to Ultimate (Table 6)	\$192,073,412	\$194,010,654
(15) Medical Loss On-level Factor	1.029	1.029
(16) Adjusted Limited Medical Losses = (14) x (15)	\$197,643,541	\$199,636,963
(17) Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.695	0.702
(18) Factor to Reflect Medical Trend	0.824	0.824
(19) Projected Limited Medical Cost Ratio = (17) x (18)	0.573	0.578
(20) Factor to Adjust Medical Cost Ratio to an Unlimited Basis	1.027	1.027
(21) Projected Medical Cost Ratio = (19) x (20)	0.588	0.594
(22) Factor to Reflect Proposed Changes in Medical Benefits	1.013	1.013
(23) Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.596	0.602
Total Benefit Cost:		
(24) Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.908	0.921

Table 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF INDICATED LOSS COST LEVEL CHANGE

Section C - Policy Year 2017 Experience	<u>NCCI</u>	<u>BYNAC</u>
Premium:		
(1) Standard Earned Premium Developed to Ultimate (Table 6)	\$571,069,820	\$571,069,820
(2) Premium On-level Factor	0.467	0.467
(3) Premium Available for Benefit Costs = (1) x (2)	\$266,689,606	\$266,689,606
Indemnity Benefit Cost:		
(4) Limited Indemnity Losses Developed to Ultimate (Table 6)	\$109,095,216	\$109,004,926
(5) Indemnity Loss On-level Factor	1.000	1.000
(6) Adjusted Limited Indemnity Losses = (4) x (5)	\$109,095,216	\$109,004,926
(7) Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.409	0.409
(8) Factor to Reflect Indemnity Trend	0.765	0.787
(9) Projected Limited Indemnity Cost Ratio = (7) x (8)	0.313	0.322
(10) Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis	1.027	1.027
(11) Projected Indemnity Cost Ratio = (9) x (10)	0.321	0.331
(12) Factor to Reflect Proposed Changes in Indemnity Benefits	1.000	1.000
(13) Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.321	0.331
Medical Benefit Cost:		
(14) Limited Medical Losses Developed to Ultimate (Table 6)	\$198,653,111	\$200,687,734
(15) Medical Loss On-level Factor	1.034	1.034
(16) Adjusted Limited Medical Losses = (14) x (15)	\$205,407,317	\$207,511,117
(17) Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.770	0.778
(18) Factor to Reflect Medical Trend	0.787	0.787
(19) Projected Limited Medical Cost Ratio = (17) x (18)	0.606	0.612
(20) Factor to Adjust Medical Cost Ratio to an Unlimited Basis	1.027	1.027
(21) Projected Medical Cost Ratio = (19) x (20)	0.622	0.629
(22) Factor to Reflect Proposed Changes in Medical Benefits	1.013	1.013
(23) Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.630	0.637
Total Benefit Cost:		
(24) Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.951	0.968

Table 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF INDICATED LOSS COST LEVEL CHANGE

Section D - Policy Year 2016 Experience	<u>NCCI</u>	<u>BYNAC</u>
Premium:		
(1) Standard Earned Premium Developed to Ultimate (Table 6)	\$606,506,596	\$606,506,596
(2) Premium On-level Factor	0.414	0.414
(3) Premium Available for Benefit Costs = (1) x (2)	\$251,093,731	\$251,093,731
Indemnity Benefit Cost:		
(4) Limited Indemnity Losses Developed to Ultimate (Table 6)	\$102,526,806	\$102,526,806
(5) Indemnity Loss On-level Factor	1.000	1.000
(6) Adjusted Limited Indemnity Losses = (4) x (5)	\$102,526,806	\$102,526,806
(7) Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.408	0.408
(8) Factor to Reflect Indemnity Trend	0.727	0.751
(9) Projected Limited Indemnity Cost Ratio = (7) x (8)	0.297	0.306
(10) Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis	1.027	1.027
(11) Projected Indemnity Cost Ratio = (9) x (10)	0.305	0.314
(12) Factor to Reflect Proposed Changes in Indemnity Benefits	1.000	1.000
(13) Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.305	0.314
Medical Benefit Cost:		
(14) Limited Medical Losses Developed to Ultimate (Table 6)	\$183,314,163	\$184,798,764
(15) Medical Loss On-level Factor	1.031	1.031
(16) Adjusted Limited Medical Losses = (14) x (15)	\$188,996,902	\$190,527,526
(17) Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.753	0.759
(18) Factor to Reflect Medical Trend	0.751	0.751
(19) Projected Limited Medical Cost Ratio = (17) x (18)	0.566	0.570
(20) Factor to Adjust Medical Cost Ratio to an Unlimited Basis	1.027	1.027
(21) Projected Medical Cost Ratio = (19) x (20)	0.581	0.585
(22) Factor to Reflect Proposed Changes in Medical Benefits	1.013	1.013
(23) Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.589	0.593
Total Benefit Cost:		
(24) Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.894	0.907

Table 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF INDICATED LOSS COST LEVEL CHANGE

Section E - Policy Year 2015 Experience	<u>NCCI</u>	<u>BYNAC</u>
Premium:		
(1) Standard Earned Premium Developed to Ultimate (Table 6)	\$584,757,968	\$584,757,968
(2) Premium On-level Factor	0.398	0.398
(3) Premium Available for Benefit Costs = (1) x (2)	\$232,733,671	\$232,733,671
Indemnity Benefit Cost:		
(4) Limited Indemnity Losses Developed to Ultimate (Table 6)	\$105,874,361	\$105,924,159
(5) Indemnity Loss On-level Factor	1.000	1.000
(6) Adjusted Limited Indemnity Losses = (4) x (5)	\$105,874,361	\$105,924,159
(7) Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.455	0.455
(8) Factor to Reflect Indemnity Trend	0.691	0.717
(9) Projected Limited Indemnity Cost Ratio = (7) x (8)	0.314	0.326
(10) Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis	1.027	1.027
(11) Projected Indemnity Cost Ratio = (9) x (10)	0.322	0.335
(12) Factor to Reflect Proposed Changes in Indemnity Benefits	1.000	1.000
(13) Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.322	0.335
Medical Benefit Cost:		
(14) Limited Medical Losses Developed to Ultimate (Table 6)	\$193,027,385	\$194,473,006
(15) Medical Loss On-level Factor	1.006	1.006
(16) Adjusted Limited Medical Losses = (14) x (15)	\$194,185,549	\$195,639,844
(17) Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.834	0.841
(18) Factor to Reflect Medical Trend	0.717	0.717
(19) Projected Limited Medical Cost Ratio = (17) x (18)	0.598	0.603
(20) Factor to Adjust Medical Cost Ratio to an Unlimited Basis	1.027	1.027
(21) Projected Medical Cost Ratio = (19) x (20)	0.614	0.619
(22) Factor to Reflect Proposed Changes in Medical Benefits	1.013	1.013
(23) Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.622	0.627
Total Benefit Cost:		
(24) Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.944	0.962

Table 8

**STATE OF TENNESSEE
WORKERS COMPENSATION**

DETERMINATION OF INDICATED LOSS COST LEVEL CHANGE

Indicated Change Based on Experience, Trend, and Benefits

<u>Policy Year</u>	<u>NCCI</u>	<u>BYNAC</u>
2015	0.944	0.962
2016	0.894	0.907
2017	0.951	0.968
2018	0.908	0.921
2019	0.977	0.989
NCCI Selected	0.943	
BYNAC Selected		0.946

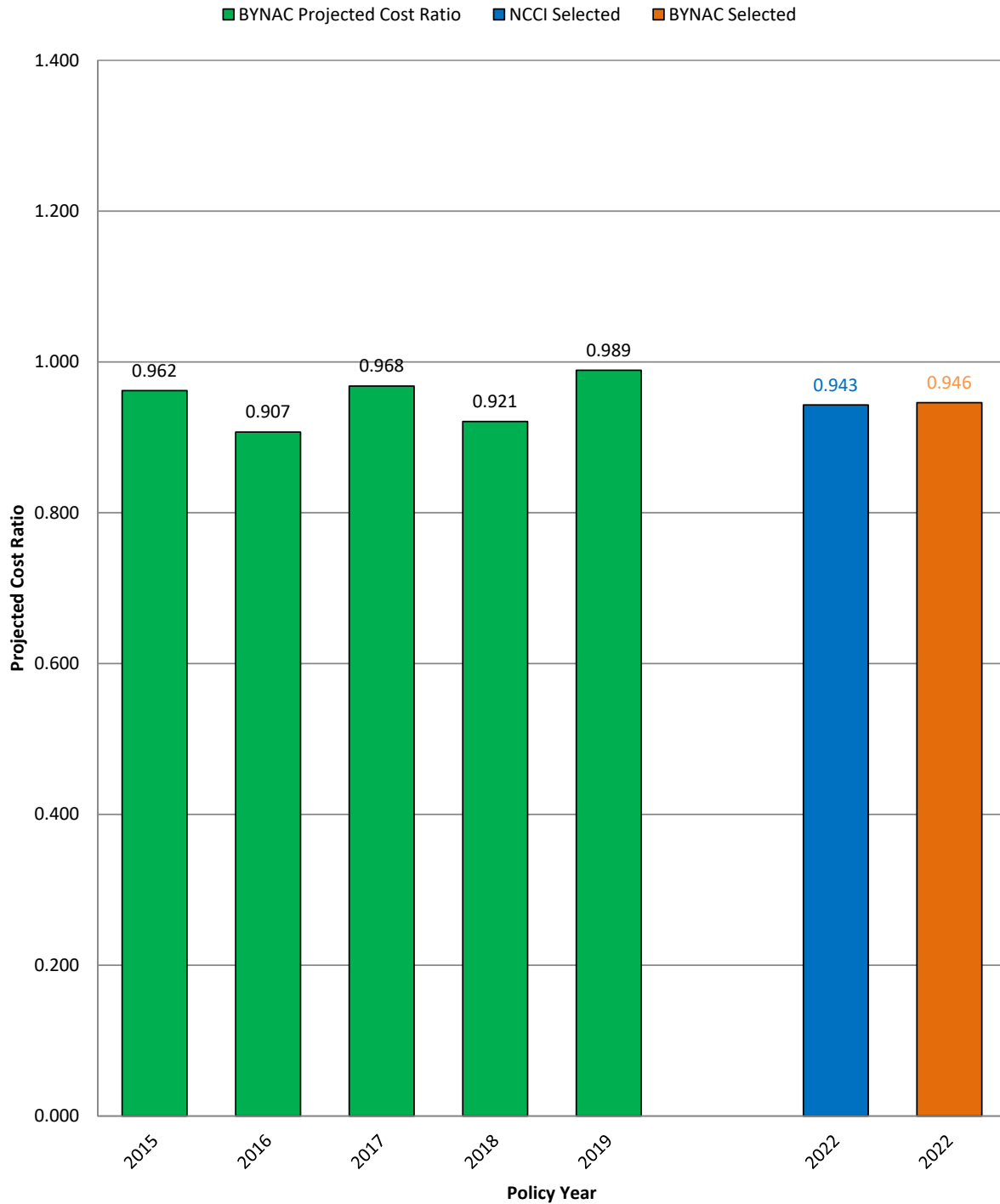
Application of the Premium Offset and Change in Loss-based Expenses

Indicated Loss Cost Level Change	0.943	0.946
Effect of the Change In Loss-Based Expenses	1.001	1.001
Indicated Change Modified for Expense Change	0.944	0.947
Indicated Change as Percentage	-5.6%	-5.3%

Figure 7

**STATE OF TENNESSEE
WORKERS COMPENSATION**

PROJECTED COST RATIO INCLUDING BENEFIT CHANGES



of the 2016 through 2019 BYNAC indications. BYNAC selected a 4-year average to provide stability.

TREND

An exponential regression model is used to project the trend and is presented in Table 9. Both BYNAC and NCCI made judgmental selections based on the frequency, severity, and loss ratio trends presented. It is important to keep in mind that the effect of statutory changes in indemnity benefits associated with the SAWW are incorporated as part of trend. NCCI is no longer calculating and adjusting for these changes separately. NCCI used trends of -5.0% for indemnity and -4.5% for medical in the filing. BYNAC agrees with the NCCI recommendation for medical but feels that -4.5% is more appropriate for indemnity.

In BYNAC's opinion the selection of trend factors is one of the key selections in this filing. The loss ratio decreases have been driven by the strong decreasing frequency trend for a number of years. There is some evidence that the frequency trend may be starting to flatten. Even small differences in the selected trend factors have a significant impact on the overall indication. For example, using the NCCI methodology with selected trend factors of -4.0% for indemnity and -3.5% for medical results in an overall indication of -2.0% instead of the filed -5.6%.

Table 9

**STATE OF TENNESSEE
WORKERS COMPENSATION**

TREND

Policy Year	Lost-Time Claim Frequency	Indemnity		Medical	
		Avg Cost Per Case	Loss Ratio	Avg Cost Per Case	Loss Ratio
2005	36.826	22,588	0.830	37,571	1.383
2006	36.874	24,049	0.889	38,047	1.416
2007	36.319	22,990	0.839	38,919	1.419
2008	34.556	22,723	0.781	37,293	1.289
2009	35.854	21,860	0.784	37,985	1.363
2010	38.363	20,021	0.768	32,815	1.259
2011	34.529	19,393	0.670	30,613	1.057
2012	33.626	18,961	0.638	32,414	1.091
2013	30.850	18,104	0.559	32,471	1.002
2014	29.815	17,140	0.510	30,912	0.921
2015	27.040	16,822	0.455	30,860	0.834
2016	24.101	16,957	0.408	31,255	0.753
2017	23.362	17,504	0.409	32,949	0.770
2018	21.790	17,291	0.377	31,868	0.695
2019	21.142	18,086	0.382	33,901	0.717
4 Point Exponential	-4.5%	1.8%	-2.8%	2.1%	-2.5%
5 Point Exponential	-5.8%	1.7%	-4.2%	2.1%	-3.8%
8 Point Exponential	-6.7%	-0.6%	-7.3%	0.5%	-6.2%
15 Point Exponential	-4.2%	-2.6%	-6.7%	-1.4%	-5.6%
NCCI Prior Selected			0.940		0.955
NCCI Selected			0.950		0.955
BYNAC Selected			0.955		0.955

LOSS ADJUSTMENT EXPENSE

A summary of the LAE selections is shown in Table 10. The DCCE provision is based on Tennessee-specific policy year paid DCCE and losses. The paid DCCE to paid loss ratio is developed to ultimate using DCCE ratio development factors. AOE is calculated using countrywide information since state specific data is not available. The NCCI selections are 9.9% for DCCE and 9.4% for AOE. BYNAC agrees with these selections.

Table 10

**STATE OF TENNESSEE
WORKERS COMPENSATION**

LOSS ADJUSTMENT EXPENSE

<u>Year</u>	<u>NCCI Tennessee PY Developed DCCE Ratio</u>	<u>NCCI Countrywide AY Developed AOE Ratio</u>	<u>Total LAE Ratio</u>
2015	10.5%		
2016	10.9%	8.5%	
2017	10.4%	9.1%	
2018	10.0%	9.1%	
2019	9.3%	9.4%	
2020		9.8%	
5 Year Average	10.2%	9.2%	
3 Year Average	9.9%	9.4%	
NCCI Prior Selected	10.3%	8.9%	19.2%
NCCI Selected	9.9%	9.4%	19.3%
BYNAC Selected	9.9%	9.4%	19.3%
BYNAC Proposed Change in LAE Allowance			
Current Tennessee LAE Allowance			19.2%
BYNAC Proposed LAE Allowance			19.3%
Proposed Change in LAE			0.1%

QUALIFICATIONS AND LIMITATIONS

The estimates contained in this report depend upon the following:

- The actuarial assumptions, quantitative analysis, and professional judgment expressed in this report.
- The reliability of loss experience to serve as an indicator of future losses.
- The completeness and accuracy of data provided by NCCI.
- The ultimate impact of the COVID-19 pandemic on losses.

Material changes in any of the assumptions or information upon which the findings are based will require a re-evaluation of the results of this report and a possible revision of those findings.

This report is intended for the use of the Tennessee Advisory Council on Workers'

Compensation. If the report is released to any third party, it should be released in its entirety.

Please advise BYNAC if this report is distributed to any other third party.

CONSULTATION

The professional opinion given in this report is based on the judgment and experience of BYNAC. An analysis by another actuary may not arrive at the same conclusion. In the event that another actuary is consulted regarding the findings of this report, both actuaries should make themselves available for supplemental advice and consultation.

TENNESSEE ADVISORY COUNCIL ON WORKERS' COMPENSATION

APPENDIX

BYNAC RECOMMENDATIONS

Appendix

**STATE OF TENNESSEE
WORKERS COMPENSATION**

INDICATED LOSS COST LEVEL CHANGE

Indicated Change Based on Experience, Trend, and Benefits:

	Policy Year		<u>NCCI</u>	<u>BYNAC</u>
	<u>2019</u>	<u>2018</u>		
Projected Indemnity Cost Ratio including Benefit Changes	0.333	0.312		
Projected Medical Cost Ratio including Benefit Changes	<u>0.644</u>	<u>0.596</u>		
Total Benefit Cost	0.977	0.908		
Selected			0.943	0.946
Change in Loss Based Expenses:				
Current Tennessee LAE Allowance			19.2%	19.2%
Proposed Tennessee LAE Allowance			19.3%	19.3%
Selected			1.001	1.001
Overall			-5.6%	-5.3%