

Montana State Fund

Senate Bill 160 – Firefighter
Presumption Analysis

Estimated Loss and Allocated
Loss Adjustment Expense Cost

January 24, 2020

January 24, 2020

Mr. Laurence Hubbard
President
Montana State Fund
855 Front Street
Helena, MT 59601

Dear Mr. Hubbard:

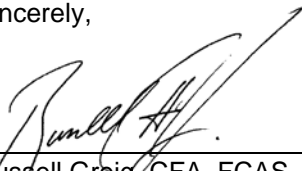
Willis Towers Watson was retained by the Montana State Fund (MSF) to provide an analysis of the estimated workers compensation loss and allocated loss adjustment expense (ALAE) cost to MSF related to the SB0160 firefighter presumption legislation in Montana.

This final report replaces and supersedes the draft issued on January 16, 2020.

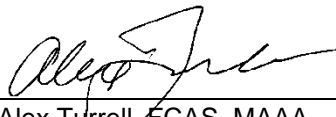
We, Russell Greig and Alex Turrell, are members of the American Academy of Actuaries and meet its qualification standards to render the actuarial opinion contained herein.

We have enjoyed working with you in the preparation of this report. Additional details of our analysis are available upon request. If you have any questions, please let us know.

Sincerely,



Russell Greig, CFA, FCAS, MAAA
678.684.0568



Alex Turrell, FCAS, MAAA
860.843.7018

cc: Mr. Dan Gengler – MSF

Table of Contents

Purpose and Scope	1
Distribution	3
Background	4
Findings	5
Analysis	6
<i>Frequency and Severity Analysis</i>	6
<i>ALAE Load</i>	7
Reliances and Limitations	8
<i>Inherent Uncertainty</i>	8
<i>Extraordinary Future Emergence</i>	9
Data and Information	10

Purpose and Scope

Willis Towers Watson was retained by the Montana State Fund (MSF or you) to provide an analysis of the estimated workers compensation loss and allocated loss adjustment expense (ALAE) cost to MSF related to the SB0160 firefighter presumption legislation in Montana.

This report was prepared solely for the internal use of MSF's management to present our findings with respect to this analysis. It is our understanding that MSF's management will consider our findings for the purposes of evaluating the potential workers compensation cost to MSF. We developed our analysis using a specific set of methods, assumptions and data and the results of our analysis documented herein are not intended or necessarily suitable for any other purposes. In addition, the results of our analysis and the conclusions drawn therefrom may not be extrapolated or otherwise manipulated or applied to other data sets (e.g., more extensive firefighter data) and then attributed to Willis Towers Watson.

The exhibits and appendices attached in support of our conclusions are an integral part of this report. These sections have been prepared so that our actuarial assumptions and judgments are documented. Judgments about the analysis and findings presented in this report should be made only after considering the report in its entirety. Our projections are predicated on a number of assumptions as to future conditions and events. These assumptions are documented in subsequent sections of this report, and should be understood in order to place the actuarial estimates in their appropriate context. In addition, these projections are subject to a number of reliances and limitations, as described in subsequent sections of this report.

We are available to answer any questions that may arise regarding this report. We assume that the user of this report will seek such explanation on any matter in question. Judgments about the analysis and findings presented in this report should be made only after considering this report in its entirety.

In this report, we develop estimates of MSF's expected loss and ALAE cost on several bases representing various intended measures. These include a actuarial central estimate, as well as estimates above and below this actuarial central estimate. These estimates were arrived at through evaluation of the potential frequency of disease incidence and potential severity of disease treatment within MSF's insured firefighter population under different sets of assumptions. As such, the derivation of these estimates does not reflect extreme events which are believed to have a remote possibility of occurring. We consider the actuarial central estimate, and the range of estimates presented here, suitable for use in financial reporting contexts.

The Scope does not include quantification of the uncertainty in our estimates. However, our report includes commentary on this uncertainty, to assist in understanding the financial implications of our results.

Our analysis was performed gross of ceded reinsurance and other recoveries.

Throughout this report, the use of the term loss without modification includes loss and ALAE, but does not include unallocated loss adjustment expense (ULAE).

Distribution

We understand the report is considered public information in Montana. Permission is hereby granted for such distribution on the conditions that:

- Willis Towers Watson is provided a list of the Recipients to whom this report is provided
- The report is distributed in its entirety
- Each Recipient recognizes that Willis Towers Watson is available, at the expense of MSF, to answer any questions concerning the report
- Each Recipient agrees not to reference or distribute the report to any other party
- Each Recipient recognizes that the furnishing of this report is not a substitute for its own due diligence and agrees to place no reliance on this report or the data contained herein that would result in the creation of any duty or liability by Willis Towers Watson to such party
- In the event that the Recipient is required by order of a court of competent jurisdiction, administrative agency or governmental body, or by any law, rule, regulation, subpoena, or any other administrative or legal process to disclose this report, the Recipient may disclose this report without liability hereunder, provided that the Recipient gives Willis Towers Watson prompt notice of any such requirement and, at our discretion, either (1) cooperates with us, at our expense, to prohibit such disclosure, or (2) uses all reasonable efforts to obtain confidential treatment of this report under a protective order or other appropriate mechanism. Furthermore, the Recipient may reference or disclose this report without liability hereunder in the event that such reference or distribution is required by professional standards bodies.
- Each Recipient understands that such RECIPIENT IS DEEMED TO HAVE ACCEPTED THESE TERMS AND CONDITIONS by retaining a copy of this report

No further distribution of this report or reference, either oral or written, to Willis Towers Watson, our analysis or findings related to this report may be made without our prior written consent.

Background

The Montana legislature passed SB0160 with an effective date of July 1, 2019 that provides presumptive workers compensation coverage to firefighters subject to a number of provisions.

The details of the bill are included as Appendix 2. Key eligibility provisions include:

- Successful completion of a physical examination within 90 days of hire to firefighting service. Our analysis assumes that all insured full time firefighters have completed such an examination, but that many volunteer firefighters have not.
- Varying tenure requirements by disease type. Our analysis includes an explicit adjustment for this service requirement, as shown in Appendix 1, Sheet 2.
- No use of, or exposure to, tobacco products. Our analysis includes an explicit adjustment for smokers, based on publicly available information on smoker rates, as shown in Appendix 1, Sheet 2.

Findings

Based on our analysis of disease incidence and treatment costs in the United States, and the application of these statistics to the firefighter population currently insured by MSF, we have reached the conclusions outlined below.

The following table and the three Summary exhibits display the estimated additional ultimate loss and ALAE that would be incurred by MSF's workers compensation program due to SB0160. Our estimate assumes full election of this coverage by MSF's insured firefighters.

EXPECTED ANNUAL ULTIMATE LOSS AND ALAE DUE TO DISEASE PRESUMPTION ACTUARIAL CENTRAL ESTIMATE GROSS OF REINSURANCE RECOVERIES

<u>Exposure Group</u>	<u>Annual Ultimate Loss and ALAE</u>	<u>Rate per \$100 of payroll</u>	<u>Indicated Surcharge</u>
Full Time Firefighters	\$180,211	\$1.147	0.182
Volunteer Firefighters	\$489,519	\$12.855	2.044
Total	\$669,730		

The "low reasonable" and "high reasonable" estimates in the Summary exhibits are meant to depict the range of costs we would expect MSF to incur. However, the actual amounts could fall outside this range. For instance, the cost of a single particularly adverse claim could exceed even the high reasonable estimates contained in this report. The key uncertainties underlying our estimates are detailed in the *Reliances and Limitations* section below.

Analysis

Frequency and Severity Analysis

For each of the reviewed diseases, our analysis consisted of the following steps:

Projected Incidence

Sheet 5 of each Exhibit displays the gender-specific incidence statistics for the general population as documented by the Center for Disease Control.

The overall disease incidence rates were adjusted as follows:

- Based on specific firefighter age and gender demographics as documented in Appendix 1, Sheet 2. Age demographics were judgmentally adjusted to reflect the insured population that have been active firefighters within the most recent ten year period.
- Based on specific tenure eligibility requirements for each disease type. Younger firefighters are less likely to meet the prerequisite tenure.
- Based on modified incidence rates for firefighters as documented in a 2015 study by the National Institute for Occupational Safety and Health.
- Based on publicly available information on smoking rates in Montana. Smoking or living with smokers causes insureds to be ineligible for this benefit.
- Based on judgmental adjustment for the population of firefighters who are not exposed to occupational carcinogenic sources.
- Based on judgmentally reduced propensity to file workers compensation claims and/or ineligibility due to the lack of health screening exams.

Projected Disease Treatment Medical Severity

Sheet 4 of each Exhibit displays projections of the cost of treatment as published in 2011, broken down into the initial cost of care, continuing (annual) cost of care, and last year of life care.

We projected low reasonable, central, and high reasonable total costs of treatment based on the following components:

- The 2011 publicly available cost projections
- Low reasonable, central and high reasonable estimates of the total time of treatment between initial diagnosis and either recovery or death
- Low reasonable, central and high reasonable estimates of the annual medical cost trend. Recent National Council on Compensation Insurance (NCCI) studies indicate workers compensation

medical cost inflation is stabilizing within the 3% to 6% range; oncology costs are generally increasing at a faster rate than other medical costs.

- Low reasonable, central and high reasonable estimates of the rate of survival.

Cost of care estimates for heart attacks (Exhibit 12) are based on a study “Lifetime Costs of Medical Care after Heart Failure Diagnosis” published in 2010.

Projected Indemnity Severity

Sheet 3 of each Exhibit displays projections of the expected indemnity workers compensation cost per claim, based on MSF demographics as documented in Appendix 1 and Montana workers compensation statutes. Average firefighter salary is based on information documented in the 2019 actuarial valuation of the Montana Firefighters’ Unified Retirement System (FURS).

The total time of treatment and survival rate assumptions as described above were utilized to derive a range of severity estimates for the indemnity portion of the expected loss cost. Additionally, an adjustment was made to reflect that a high frequency of diagnosed insureds will be retired. Retirees are ineligible for temporary total or permanent total indemnity benefits, but can be eligible for impairment award and fatality benefits.

Derivation of Total Cost

Sheet 1 and Sheet 2 of each Exhibit displays the range of total estimated loss and ALAE costs for full time and volunteer firefighters, respectively. Firefighter exposure amounts are derived in Appendix I, Sheet 1, based on total payroll provided by MSF, average firefighter salary based on the 2019 FURS actuarial valuation, and firefighter age demographics.

ALAE Load

We selected a ratio of ALAE to loss of 6.5% based on consideration of MSF’s historical workers compensation ALAE to loss ratio as well as industry information. The selection takes into account that it is likely that a higher than average portion of cancer and heart attack claims will be litigated, thus increasing the level of defense costs for these set of claims.

Reliances and Limitations

Inherent Uncertainty

Projections of loss and ALAE are subject to potentially large errors of estimation. Any estimate of future costs is subject to the inherent limitation on one's ability to predict the aggregate course of future events. It should therefore be expected that the actual emergence of loss and ALAE will vary, perhaps materially, from any estimate. Thus, no assurance can be given that MSF's actual loss and ALAE cost relating to SB0160 legislation will not ultimately exceed the estimates contained herein.

The inherent uncertainty associated with loss and ALAE estimates is magnified in this case due to the following circumstances:

- The future level of medical (and specifically oncological) inflation is unknown, increasing the uncertainty in our estimates; this uncertainty is compounded by the changes occurring in the broader health care environment
- We have relied for our analysis on cancer treatment cost statistics that were published in a 2011 study. While we have applied inflation to these cost amounts to place them on a current cost basis, we acknowledge that the use of this data adds uncertainty to our estimates. Additionally, these statistics are on an average cost basis and do not fully capture the range of potential costs related to each type of cancer or treatment protocol.
- The relative cancer incidence rates between firefighters and the general population have been studied but not widely; to the extent that firefighter incidence or severity is significantly above or below the level of the NIOSH study, our estimates may be overstated or understated, perhaps materially
- The geographic concentration of MSF could cause adverse results due to legislative or judicial changes or catastrophic events
- We have relied on US general cancer statistics in developing our estimates. While we believe that the use of publicly available statistics is reasonable as a proxy for the prevalence and severity of cancer in MSF's insured firefighter population, it introduces additional uncertainty to the projections

Note that a quantification of this uncertainty would likely reflect a range of reasonable favorable and adverse scenarios, but not necessarily a range of all possible outcomes. Further, the proper application of any range is dependent on the context.

In our judgment, we have employed techniques and assumptions that are appropriate, and the estimates presented herein are reasonable, given the information currently available.

Ranges of Estimates

The range of estimates presented herein is intended to reflect the reasonably expected variation in loss and ALAE based on information currently available. It is possible, if not probable, that actual results will fall outside this range.

Data Reliance

Throughout this analysis, we have relied on historical data and other quantitative and qualitative information supplied by MSF. We have not independently audited or verified this information; however, we have reviewed it for reasonableness and internal consistency. We have assumed that the information is complete and accurate, and that we have been provided with all information relevant to the analysis of MSF's ultimate loss and ALAE. The accuracy of our results is dependent upon the accuracy and completeness of the underlying data; therefore, any material discrepancies discovered in this data should be reported to us and this report amended accordingly, if warranted.

Extraordinary Future Emergence

We have not anticipated any extraordinary changes to the legal, social, or economic environment that might affect the cost, frequency, or future reporting of claims. In addition, our estimates make no provision for potential future claims arising from loss causes not represented in the historical data (e.g., new types of mass torts or latent injuries) except where claims of these types are included but not identified in the industry statistics and are implicitly analyzed.

Data and Information

MSF provided the following data and information for use in this analysis:

- Average salary and head count for MSF's insured firefighter population, split by full time and volunteer firefighters
- The SB0160 legislation

Montana State Fund

Workers Compensation - Firefighter Disease Presumption Study
 Summary of Expected Loss and ALAE Cost
 Central Estimate

Summary
 Central

Disease Type (1)	Expected Mature Ultimate Loss & ALAE		
	Full Time Firefighters (2)	Volunteer Firefighters (3)	Total (4)
Bladder Cancer	\$6,492	\$14,505	\$20,996
Brain Cancer	8,431	26,325	34,756
Breast Cancer	74	10	84
Colorectal Cancer	28,687	77,000	105,687
Esophageal Cancer	10,854	32,207	43,061
Kidney Cancer	16,931	35,127	52,058
Leukemia	8,299	24,485	32,784
Lung Cancer	45,535	133,186	178,720
Non-Hodgkin's Lymphoma	13,549	32,285	45,834
Mesothelioma	882	2,123	3,005
Myeloma	2,505	5,095	7,600
Myocardial Infarction (Heart Attack)	37,971	107,172	145,143
Total	\$180,211	\$489,519	\$669,730
(5) Payroll	\$13,349,040	\$3,236,795	
(6) Rate per \$100 of payroll (discounted)	1.147	12.855	
(7) Surcharge	0.182	2.044	

Notes:

- (2) From Sheet 1 of each Exhibit.
- (3) From Sheet 2 of each Exhibit.
- (4) (2) + (3).
- (5) Provided by MSF.
- (6) [Total of (2) and (3), respectively] / (5).
- (7) (6) divided by firefighter class rate of 6.29 provided by Montana State Fund.

Montana State Fund

Workers Compensation - Firefighter Disease Presumption Study
 Summary of Expected Loss and ALAE Cost
 Low Reasonable Estimate

Summary
 Low Reasonable

Disease Type (1)	Low Reasonable Mature Ultimate Loss & ALAE		
	Full Time Firefighters (2)	Volunteer Firefighters (3)	Total (4)
Bladder Cancer	\$2,010	\$5,429	\$7,440
Brain Cancer	5,649	17,049	22,698
Breast Cancer	17	3	21
Colorectal Cancer	16,773	45,701	62,474
Esophageal Cancer	7,310	20,756	28,065
Kidney Cancer	9,523	19,633	29,156
Leukemia	4,373	12,469	16,842
Lung Cancer	30,124	82,995	113,119
Non-Hodgkin's Lymphoma	7,645	18,163	25,807
Mesothelioma	578	1,251	1,828
Myeloma	1,390	2,783	4,173
Myocardial Infarction (Heart Attack)	25,648	88,010	113,658
Total	\$111,040	\$314,241	\$425,281
(5) Payroll	\$13,349,040	\$3,236,795	
(6) Rate per \$100 of payroll (discounted)	0.707	8.252	
(7) Surcharge	0.112	1.312	

Notes:

- (2) From Sheet 1 of each Exhibit.
- (3) From Sheet 2 of each Exhibit.
- (4) (2) + (3).
- (5) Provided by MSF.
- (6) [Total of (2) and (3), respectively] / (5).
- (7) (6) divided by firefighter class rate of 6.29 provided by Montana State Fund.

Montana State Fund

Workers Compensation - Firefighter Disease Presumption Study
 Summary of Expected Loss and ALAE Cost
 High Reasonable Estimate

Summary
 High Reasonable

Disease Type (1)	High Reasonable Mature Ultimate Loss & ALAE		
	Full Time Firefighters (2)	Volunteer Firefighters (3)	Total (4)
Bladder Cancer	\$11,806	\$29,190	\$40,996
Brain Cancer	12,259	40,616	52,875
Breast Cancer	118	17	135
Colorectal Cancer	43,578	125,827	169,404
Esophageal Cancer	15,581	49,887	65,468
Kidney Cancer	26,221	59,612	85,833
Leukemia	13,654	43,837	57,492
Lung Cancer	66,110	211,521	277,632
Non-Hodgkin's Lymphoma	21,425	54,612	76,037
Mesothelioma	1,274	3,510	4,783
Myeloma	3,892	8,759	12,651
Myocardial Infarction (Heart Attack)	49,919	129,722	179,641
Total	\$265,837	\$757,110	\$1,022,948
(5) Payroll	\$13,349,040	\$3,236,795	
(6) Rate per \$100 of payroll (discounted)	1.693	19.882	
(7) Surcharge	0.269	3.161	

Notes:

- (2) From Sheet 1 of each Exhibit.
- (3) From Sheet 2 of each Exhibit.
- (4) (2) + (3).
- (5) Provided by MSF.
- (6) [Total of (2) and (3), respectively] / (5).
- (7) (6) divided by firefighter class rate of 6.29 provided by Montana State Fund.

(1) Estimated Frequency	14.62
(2) Estimated Medical Severity	
(a) optimistic	\$40,246
(b) central	\$106,905
(c) pessimistic	\$215,833
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$1,239
(b) central	\$3,290
(c) pessimistic	\$6,643
(5) Estimated Indemnity Cost	
(a) optimistic	\$649
(b) central	\$2,806
(c) pessimistic	\$4,443
(6) Estimated Total Loss Cost	
(a) optimistic	\$1,888
(b) central	\$6,096
(c) pessimistic	\$11,086
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$2,010
(b) central	\$6,492
(c) pessimistic	\$11,806

Notes:

- (1) From Exhibit 1 - Bladder, Sheet 5, Item (13).
- (2) From Exhibit 1 - Bladder, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 1 - Bladder, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	2.92
(2) Estimated Medical Severity	
(a) optimistic	\$40,246
(b) central	\$106,905
(c) pessimistic	\$215,833
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$5,051
(b) central	\$13,418
(c) pessimistic	\$27,089
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$47
(b) central	\$201
(c) pessimistic	\$319
(7) Estimated Total Loss Cost	
(a) optimistic	\$5,098
(b) central	\$13,619
(c) pessimistic	\$27,409
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$5,429
(b) central	\$14,505
(c) pessimistic	\$29,190

Notes:

- (1) From Exhibit 1 - Bladder, Sheet 5, Item (13).
- (2) From Exhibit 1 - Bladder, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 1 - Bladder, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	100%
(b) central	80%
(c) pessimistic	60%
(10) Estimated Severity	
(a) low	\$21,086
(b) central	\$91,158
(c) high	\$144,361

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$25,152	\$25,694	\$25,179
(2) Continuing Cost of Care (2010 dollars)	\$4,677	\$3,710	\$4,629
(3) Last Year of Life Care (2010 dollars)	\$113,659	\$118,047	\$113,878
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			100%
(b) central			80%
(c) pessimistic			60%
(7) Estimated Severity			
(a) low			\$40,246
(b) central			\$106,905
(c) high			\$215,833

Notes:

- (1) - (3) Statistics from "Projections of the Cost of Cancer Care in the United States: 2010-2020" published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)		(4) Tenure Required for Eligibility (Years)		
	Male (2)	Female (3)		FT	VOL
30-34	1.10	0.50			
35-39	2.10	0.90	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	18.16	17.24
40-44	4.40	1.80			
45-49	9.40	3.30			
50-54	20.50	7.00	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	4.50	4.24
55-59	40.20	12.10			
60-64	68.70	18.80	(7) Percentage of Male Firefighters	95%	95%
			(8) Base Frequency	17.48	16.59
			(9) Firefighter Incidence Adjustment	1.12	
			(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	14.62 2.92	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	5.08
(2) Estimated Medical Severity	
(a) optimistic	\$365,964
(b) central	\$565,527
(c) pessimistic	\$873,725
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$3,913
(b) central	\$6,047
(c) pessimistic	\$9,342
(5) Estimated Indemnity Cost	
(a) optimistic	\$1,391
(b) central	\$1,870
(c) pessimistic	\$2,168
(6) Estimated Total Loss Cost	
(a) optimistic	\$5,304
(b) central	\$7,917
(c) pessimistic	\$11,510
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$5,649
(b) central	\$8,431
(c) pessimistic	\$12,259

Notes:

- (1) From Exhibit 2 - Brain, Sheet 5, Item (13).
- (2) From Exhibit 2 - Brain, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 2 - Brain, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	1.01
(2) Estimated Medical Severity	
(a) optimistic	\$365,964
(b) central	\$565,527
(c) pessimistic	\$873,725
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$15,909
(b) central	\$24,584
(c) pessimistic	\$37,982
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$100
(b) central	\$134
(c) pessimistic	\$155
(7) Estimated Total Loss Cost	
(a) optimistic	\$16,009
(b) central	\$24,718
(c) pessimistic	\$38,138
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$17,049
(b) central	\$26,325
(c) pessimistic	\$40,616

Notes:

- (1) From Exhibit 2 - Brain, Sheet 5, Item (13).
- (2) From Exhibit 2 - Brain, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 2 - Brain, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	40%
(b) central	20%
(c) pessimistic	0%
(10) Estimated Severity	
(a) low	\$130,087
(b) central	\$174,855
(c) high	\$202,754

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$138,300	\$129,802	\$137,875
(2) Continuing Cost of Care (2010 dollars)	\$9,434	\$8,803	\$9,402
(3) Last Year of Life Care (2010 dollars)	\$201,366	\$211,337	\$201,865
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			40%
(b) central			20%
(c) pessimistic			0%
(7) Estimated Severity			
(a) low			\$365,964
(b) central			\$565,527
(c) high			\$873,725

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)			
	Male (2)	Female (3)		
30-34	4.00	3.10	(4) Tenure Required for Eligibility (Years)	10
35-39	4.30	3.40	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	FT 6.82 VOL 6.45
40-44	4.90	3.70	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	3.87 3.64
45-49	6.50	4.50	(7) Percentage of Male Firefighters	95% 95%
50-54	9.10	6.10	(8) Base Frequency	6.67 6.31
55-59	12.20	8.30	(9) Firefighter Incidence Adjustment	1.02
60-64	15.70	10.70	(10) Percentage of Firefighters who are/live with smokers	15%
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%
			(13) Final Frequency full time firefighter volunteer firefighter	5.08 1.01

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	0.13
(2) Estimated Medical Severity	
(a) optimistic	\$2,014
(b) central	\$4,545
(c) pessimistic	\$8,625
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$1
(b) central	\$1
(c) pessimistic	\$2
(5) Estimated Indemnity Cost	
(a) optimistic	\$16
(b) central	\$68
(c) pessimistic	\$108
(6) Estimated Total Loss Cost	
(a) optimistic	\$16
(b) central	\$70
(c) pessimistic	\$111
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$17
(b) central	\$74
(c) pessimistic	\$118

Notes:

- (1) From Exhibit 3 - Breast, Sheet 5, Item (13).
- (2) From Exhibit 3 - Breast, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 3 - Breast, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	0.02
(2) Estimated Medical Severity	
(a) optimistic	\$2,014
(b) central	\$4,545
(c) pessimistic	\$8,625
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$2
(b) central	\$5
(c) pessimistic	\$9
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$1
(b) central	\$4
(c) pessimistic	\$7
(7) Estimated Total Loss Cost	
(a) optimistic	\$3
(b) central	\$9
(c) pessimistic	\$16
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$3
(b) central	\$10
(c) pessimistic	\$17

Notes:

- (1) From Exhibit 3 - Breast, Sheet 5, Item (13).
- (2) From Exhibit 3 - Breast, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 3 - Breast, Sheet 3, Item (10).
- (7) $(4) + (6)$.
- (8) $(7) \times$ ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	100.0%
(9) Estimated Survival Rate	
(a) optimistic	100%
(b) central	80%
(c) pessimistic	60%
(10) Estimated Severity	
(a) low	\$56,109
(b) central	\$242,566
(c) high	\$384,134

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$0	\$27,693	\$1,385
(2) Continuing Cost of Care (2010 dollars)	\$0	\$2,207	\$110
(3) Last Year of Life Care (2010 dollars)	\$0	\$94,284	\$4,714
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			100%
(b) central			80%
(c) pessimistic			60%
(7) Estimated Severity			
(a) low			\$2,014
(b) central			\$4,545
(c) high			\$8,625

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)		(4) Tenure Required for Eligibility (Years)		
	Male (2)	Female (3)			
30-34	N/A	28.60			
35-39	N/A	62.40	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	FT N/A	VOL N/A
40-44	N/A	124.60			
45-49	N/A	189.60			
50-54	N/A	225.70	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	2.85	2.45
55-59	N/A	263.60			
60-64	N/A	333.40	(7) Percentage of Male Firefighters	95%	95%
			(8) Base Frequency	0.14	0.12
			(9) Firefighter Incidence Adjustment	1.26	
			(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	0.13 0.02	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
Breast cancer diagnoses must be before age 40.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	34.22
(2) Estimated Medical Severity	
(a) optimistic	\$143,108
(b) central	\$241,020
(c) pessimistic	\$394,624
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$10,306
(b) central	\$17,357
(c) pessimistic	\$28,419
(5) Estimated Indemnity Cost	
(a) optimistic	\$5,443
(b) central	\$9,579
(c) pessimistic	\$12,499
(6) Estimated Total Loss Cost	
(a) optimistic	\$15,749
(b) central	\$26,936
(c) pessimistic	\$40,918
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$16,773
(b) central	\$28,687
(c) pessimistic	\$43,578

Notes:

- (1) From Exhibit 4 - Colorectal, Sheet 5, Item (13).
- (2) From Exhibit 4 - Colorectal, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 4 - Colorectal, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	6.92
(2) Estimated Medical Severity	
(a) optimistic	\$143,108
(b) central	\$241,020
(c) pessimistic	\$394,624
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$42,516
(b) central	\$71,605
(c) pessimistic	\$117,239
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$395
(b) central	\$696
(c) pessimistic	\$908
(7) Estimated Total Loss Cost	
(a) optimistic	\$42,911
(b) central	\$72,301
(c) pessimistic	\$118,147
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$45,701
(b) central	\$77,000
(c) pessimistic	\$125,827

Notes:

- (1) From Exhibit 4 - Colorectal, Sheet 5, Item (13).
- (2) From Exhibit 4 - Colorectal, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 4 - Colorectal, Sheet 3, Item (10).
- (7) $(4) + (6)$.
- (8) $(7) \times$ ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	70%
(b) central	50%
(c) pessimistic	30%
(10) Estimated Severity	
(a) low	\$75,587
(b) central	\$133,007
(c) high	\$173,558

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$62,174	\$61,593	\$62,145
(2) Continuing Cost of Care (2010 dollars)	\$4,595	\$3,159	\$4,523
(3) Last Year of Life Care (2010 dollars)	\$128,507	\$126,778	\$128,421
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			70%
(b) central			50%
(c) pessimistic			30%
(7) Estimated Severity			
(a) low			\$143,108
(b) central			\$241,020
(c) high			\$394,624

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)				
	Male (2)	Female (3)			
30-34	5.80	5.70	(4) Tenure Required for Eligibility (Years)	10	
35-39	10.70	10.30	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	42.10	40.44
40-44	19.80	18.10	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	25.48	24.25
45-49	36.00	30.20	(7) Percentage of Male Firefighters	95%	95%
50-54	67.30	52.00	(8) Base Frequency	41.27	39.63
55-59	81.20	56.30	(9) Firefighter Incidence Adjustment	1.11	
60-64	109.70	72.20	(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	34.22 6.92	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
 Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	8.21
(2) Estimated Medical Severity	
(a) optimistic	\$266,938
(b) central	\$414,685
(c) pessimistic	\$643,528
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$4,615
(b) central	\$7,169
(c) pessimistic	\$11,125
(5) Estimated Indemnity Cost	
(a) optimistic	\$2,249
(b) central	\$3,023
(c) pessimistic	\$3,505
(6) Estimated Total Loss Cost	
(a) optimistic	\$6,864
(b) central	\$10,192
(c) pessimistic	\$14,630
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$7,310
(b) central	\$10,854
(c) pessimistic	\$15,581

Notes:

- (1) From Exhibit 5 - Esophageal, Sheet 5, Item (13).
- (2) From Exhibit 5 - Esophageal, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 5 - Esophageal, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	1.69
(2) Estimated Medical Severity	
(a) optimistic	\$266,938
(b) central	\$414,685
(c) pessimistic	\$643,528
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$19,323
(b) central	\$30,018
(c) pessimistic	\$46,584
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$166
(b) central	\$223
(c) pessimistic	\$258
(7) Estimated Total Loss Cost	
(a) optimistic	\$19,489
(b) central	\$30,241
(c) pessimistic	\$46,842
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$20,756
(b) central	\$32,207
(c) pessimistic	\$49,887

Notes:

- (1) From Exhibit 5 - Esophageal, Sheet 5, Item (13).
- (2) From Exhibit 5 - Esophageal, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 5 - Esophageal, Sheet 3, Item (10).
- (7) $(4) + (6)$.
- (8) $(7) \times$ ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	40%
(b) central	20%
(c) pessimistic	0%
(10) Estimated Severity	
(a) low	\$130,087
(b) central	\$174,855
(c) high	\$202,754

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$95,787	\$95,439	\$95,770
(2) Continuing Cost of Care (2010 dollars)	\$6,450	\$6,853	\$6,470
(3) Last Year of Life Care (2010 dollars)	\$155,612	\$156,417	\$155,652
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			40%
(b) central			20%
(c) pessimistic			0%
(7) Estimated Severity			
(a) low			\$266,938
(b) central			\$414,685
(c) high			\$643,528

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)				
	Male (2)	Female (3)			
30-34	0.20	0.10	(4) Tenure Required for Eligibility (Years)	10	
35-39	0.70	0.20	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	7.08	6.90
40-44	1.80	0.40	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	1.18	1.15
45-49	4.20	0.90	(7) Percentage of Male Firefighters	95%	95%
50-54	8.80	2.00	(8) Base Frequency	6.79	6.62
55-59	16.00	3.30	(9) Firefighter Incidence Adjustment	1.62	
60-64	24.60	4.70	(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	8.21 1.69	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
 Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	21.86
(2) Estimated Medical Severity	
(a) optimistic	\$118,739
(b) central	\$212,488
(c) pessimistic	\$361,515
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$5,464
(b) central	\$9,777
(c) pessimistic	\$16,635
(5) Estimated Indemnity Cost	
(a) optimistic	\$3,478
(b) central	\$6,120
(c) pessimistic	\$7,986
(6) Estimated Total Loss Cost	
(a) optimistic	\$8,942
(b) central	\$15,897
(c) pessimistic	\$24,621
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$9,523
(b) central	\$16,931
(c) pessimistic	\$26,221

Notes:

- (1) From Exhibit 6 - Kidney, Sheet 5, Item (13).
- (2) From Exhibit 6 - Kidney, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 6 - Kidney, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	3.57
(2) Estimated Medical Severity	
(a) optimistic	\$118,739
(b) central	\$212,488
(c) pessimistic	\$361,515
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$18,230
(b) central	\$32,624
(c) pessimistic	\$55,504
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$204
(b) central	\$360
(c) pessimistic	\$469
(7) Estimated Total Loss Cost	
(a) optimistic	\$18,435
(b) central	\$32,983
(c) pessimistic	\$55,973
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$19,633
(b) central	\$35,127
(c) pessimistic	\$59,612

Notes:

- (1) From Exhibit 6 - Kidney, Sheet 5, Item (13).
- (2) From Exhibit 6 - Kidney, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 6 - Kidney, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	70%
(b) central	50%
(c) pessimistic	30%
(10) Estimated Severity	
(a) low	\$75,587
(b) central	\$133,007
(c) high	\$173,558

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$46,048	\$46,077	\$46,049
(2) Continuing Cost of Care (2010 dollars)	\$6,018	\$6,255	\$6,030
(3) Last Year of Life Care (2010 dollars)	\$117,123	\$110,765	\$116,805
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			70%
(b) central			50%
(c) pessimistic			30%
(7) Estimated Severity			
(a) low			\$118,739
(b) central			\$212,488
(c) high			\$361,515

Notes:

- (1) - (3) Statistics from "Projections of the Cost of Cancer Care in the United States: 2010-2020" published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)				
	Male (2)	Female (3)			
30-34	3.70	2.80	(4) Tenure Required for Eligibility (Years)	15	
35-39	7.50	5.10	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	23.74	18.44
40-44	14.00	8.10	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	9.80	7.55
45-49	22.30	11.50	(7) Percentage of Male Firefighters	95%	95%
50-54	33.60	16.60	(8) Base Frequency	23.05	17.90
55-59	48.00	23.30	(9) Firefighter Incidence Adjustment	1.27	
60-64	63.20	30.00	(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	21.86 3.57	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	8.47
(2) Estimated Medical Severity	
(a) optimistic	\$154,817
(b) central	\$304,277
(c) pessimistic	\$545,903
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$2,759
(b) central	\$5,422
(c) pessimistic	\$9,728
(5) Estimated Indemnity Cost	
(a) optimistic	\$1,347
(b) central	\$2,370
(c) pessimistic	\$3,093
(6) Estimated Total Loss Cost	
(a) optimistic	\$4,106
(b) central	\$7,792
(c) pessimistic	\$12,821
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$4,373
(b) central	\$8,299
(c) pessimistic	\$13,654

Notes:

- (1) From Exhibit 7 - Leukemia, Sheet 5, Item (13).
- (2) From Exhibit 7 - Leukemia, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 7 - Leukemia, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	1.75
(2) Estimated Medical Severity	
(a) optimistic	\$154,817
(b) central	\$304,277
(c) pessimistic	\$545,903
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$11,608
(b) central	\$22,815
(c) pessimistic	\$40,933
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$100
(b) central	\$176
(c) pessimistic	\$229
(7) Estimated Total Loss Cost	
(a) optimistic	\$11,708
(b) central	\$22,991
(c) pessimistic	\$41,162
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$12,469
(b) central	\$24,485
(c) pessimistic	\$43,837

Notes:

- (1) From Exhibit 7 - Leukemia, Sheet 5, Item (13).
- (2) From Exhibit 7 - Leukemia, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 7 - Leukemia, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	70%
(b) central	50%
(c) pessimistic	30%
(10) Estimated Severity	
(a) low	\$75,587
(b) central	\$133,007
(c) high	\$173,558

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$43,243	\$39,800	\$43,071
(2) Continuing Cost of Care (2010 dollars)	\$10,249	\$8,537	\$10,163
(3) Last Year of Life Care (2010 dollars)	\$199,774	\$195,196	\$199,545
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			70%
(b) central			50%
(c) pessimistic			30%
(7) Estimated Severity			
(a) low			\$154,817
(b) central			\$304,277
(c) high			\$545,903

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)		(4) Tenure Required for Eligibility (Years)		
	Male (2)	Female (3)			
30-34	4.00	3.30			
35-39	5.10	4.00	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	12.35	12.09
40-44	7.10	5.40			
45-49	10.00	7.30			
50-54	15.60	10.30	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	6.61	6.44
55-59	23.00	14.60			
60-64	34.80	20.30	(7) Percentage of Male Firefighters	95%	95%
			(8) Base Frequency	12.06	11.81
			(9) Firefighter Incidence Adjustment	0.94	
			(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	8.47 1.75	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	37.61
(2) Estimated Medical Severity	
(a) optimistic	\$227,280
(b) central	\$365,325
(c) pessimistic	\$581,518
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$17,989
(b) central	\$28,916
(c) pessimistic	\$46,027
(5) Estimated Indemnity Cost	
(a) optimistic	\$10,296
(b) central	\$13,840
(c) pessimistic	\$16,048
(6) Estimated Total Loss Cost	
(a) optimistic	\$28,286
(b) central	\$42,756
(c) pessimistic	\$62,076
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$30,124
(b) central	\$45,535
(c) pessimistic	\$66,110

Notes:

- (1) From Exhibit 8 - Lung, Sheet 5, Item (13).
- (2) From Exhibit 8 - Lung, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 8 - Lung, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	7.90
(2) Estimated Medical Severity	
(a) optimistic	\$227,280
(b) central	\$365,325
(c) pessimistic	\$581,518
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$77,152
(b) central	\$124,012
(c) pessimistic	\$197,400
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$778
(b) central	\$1,045
(c) pessimistic	\$1,212
(7) Estimated Total Loss Cost	
(a) optimistic	\$77,929
(b) central	\$125,057
(c) pessimistic	\$198,612
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$82,995
(b) central	\$133,186
(c) pessimistic	\$211,521

Notes:

- (1) From Exhibit 8 - Lung, Sheet 5, Item (13).
- (2) From Exhibit 8 - Lung, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 8 - Lung, Sheet 3, Item (10).
- (7) $(4) + (6)$.
- (8) $(7) \times$ ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	40%
(b) central	20%
(c) pessimistic	0%
(10) Estimated Severity	
(a) low	\$130,087
(b) central	\$174,855
(c) high	\$202,754

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$73,062	\$72,639	\$73,041
(2) Continuing Cost of Care (2010 dollars)	\$7,591	\$8,130	\$7,618
(3) Last Year of Life Care (2010 dollars)	\$142,977	\$138,785	\$142,767
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			40%
(b) central			20%
(c) pessimistic			0%
(7) Estimated Severity			
(a) low			\$227,280
(b) central			\$365,325
(c) high			\$581,518

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)		(4) Tenure Required for Eligibility (Years)		
	Male (2)	Female (3)			
30-34	1.10	1.30			
35-39	2.70	2.80	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	45.67	45.59
40-44	7.10	8.10			
45-49	19.70	21.90	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	31.33	31.27
50-54	53.40	52.20			
55-59	107.70	89.80	(7) Percentage of Male Firefighters	95%	95%
60-64	173.60	130.30	(8) Base Frequency	44.95	44.87
			(9) Firefighter Incidence Adjustment	1.12	
			(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	37.61 7.90	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	13.19
(2) Estimated Medical Severity	
(a) optimistic	\$182,958
(b) central	\$325,237
(c) pessimistic	\$551,064
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$5,079
(b) central	\$9,030
(c) pessimistic	\$15,299
(5) Estimated Indemnity Cost	
(a) optimistic	\$2,099
(b) central	\$3,693
(c) pessimistic	\$4,818
(6) Estimated Total Loss Cost	
(a) optimistic	\$7,178
(b) central	\$12,722
(c) pessimistic	\$20,118
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$7,645
(b) central	\$13,549
(c) pessimistic	\$21,425

Notes:

- (1) From Exhibit 9 - Lymphoma, Sheet 5, Item (13).
- (2) From Exhibit 9 - Lymphoma, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 9 - Lymphoma, Sheet 3, Item (10).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	2.15
(2) Estimated Medical Severity	
(a) optimistic	\$182,958
(b) central	\$325,237
(c) pessimistic	\$551,064
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$16,931
(b) central	\$30,098
(c) pessimistic	\$50,996
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$123
(b) central	\$217
(c) pessimistic	\$283
(7) Estimated Total Loss Cost	
(a) optimistic	\$17,054
(b) central	\$30,314
(c) pessimistic	\$51,279
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$18,163
(b) central	\$32,285
(c) pessimistic	\$54,612

Notes:

- (1) From Exhibit 9 - Lymphoma, Sheet 5, Item (13).
- (2) From Exhibit 9 - Lymphoma, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 9 - Lymphoma, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	70%
(b) central	50%
(c) pessimistic	30%
(10) Estimated Severity	
(a) low	\$75,587
(b) central	\$133,007
(c) high	\$173,558

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$72,841	\$69,457	\$72,672
(2) Continuing Cost of Care (2010 dollars)	\$9,337	\$8,622	\$9,301
(3) Last Year of Life Care (2010 dollars)	\$174,894	\$164,763	\$174,387
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			70%
(b) central			50%
(c) pessimistic			30%
(7) Estimated Severity			
(a) low			\$182,958
(b) central			\$325,237
(c) high			\$551,064

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)				
	Male (2)	Female (3)			
30-34	5.50	4.00	(4) Tenure Required for Eligibility (Years)	15	
35-39	7.80	5.50	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	18.20	14.12
40-44	11.20	8.10	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	10.96	8.48
45-49	16.30	12.00	(7) Percentage of Male Firefighters	95%	95%
50-54	24.80	18.50	(8) Base Frequency	17.84	13.84
55-59	35.40	25.70	(9) Firefighter Incidence Adjustment	0.99	
60-64	50.70	36.50	(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%	
			(13) Final Frequency full time firefighter volunteer firefighter	13.19 2.15	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	0.97
(2) Estimated Medical Severity	
(a) optimistic	\$134,826
(b) central	\$229,708
(c) pessimistic	\$381,246
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$276
(b) central	\$470
(c) pessimistic	\$781
(5) Estimated Indemnity Cost	
(a) optimistic	\$266
(b) central	\$358
(c) pessimistic	\$415
(6) Estimated Total Loss Cost	
(a) optimistic	\$543
(b) central	\$829
(c) pessimistic	\$1,196
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$578
(b) central	\$882
(c) pessimistic	\$1,274

Notes:

- (1) From Exhibit 10 - Mesothelioma, Sheet 5, Item (13).
- (2) From Exhibit 10 - Mesothelioma, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 10 - Mesothelioma, Sheet 3,
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	0.20
(2) Estimated Medical Severity	
(a) optimistic	\$134,826
(b) central	\$229,708
(c) pessimistic	\$381,246
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$1,155
(b) central	\$1,967
(c) pessimistic	\$3,265
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$20
(b) central	\$26
(c) pessimistic	\$31
(7) Estimated Total Loss Cost	
(a) optimistic	\$1,174
(b) central	\$1,993
(c) pessimistic	\$3,295
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$1,251
(b) central	\$2,123
(c) pessimistic	\$3,510

Notes:

- (1) From Exhibit 10 - Mesothelioma, Sheet 5, Item (13).
- (2) From Exhibit 10 - Mesothelioma, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 10 - Mesothelioma, Sheet 3, Item (10).
- (7) $(4) + (6)$.
- (8) $(7) \times$ ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	40%
(b) central	20%
(c) pessimistic	0%
(10) Estimated Severity	
(a) low	\$130,087
(b) central	\$174,855
(c) high	\$202,754

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$25,152	\$25,694	\$25,179
(2) Continuing Cost of Care (2010 dollars)	\$4,677	\$3,710	\$4,629
(3) Last Year of Life Care (2010 dollars)	\$113,659	\$118,047	\$113,878
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			40%
(b) central			20%
(c) pessimistic			0%
(7) Estimated Severity			
(a) low			\$134,826
(b) central			\$229,708
(c) high			\$381,246

Notes:

- (1) - (3) Based on mean cost of care statistic from 2019 study "Costs of medical care for mesothelioma", estimated severity is comparable to bladder cancer.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)			
	Male (2)	Female (3)		
30-34	0.10	0.10	(4) Tenure Required for Eligibility (Years)	10
35-39	0.10	0.10	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	FT 0.59 VOL 0.57
40-44	0.20	0.10	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	0.24 0.23
45-49	0.30	0.30	(7) Percentage of Male Firefighters	95% 95%
50-54	0.60	0.30	(8) Base Frequency	0.57 0.55
55-59	1.10	0.60	(9) Firefighter Incidence Adjustment	2.29
60-64	2.40	0.80	(10) Percentage of Firefighters who are/live with smokers	15%
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%
			(13) Final Frequency full time firefighter volunteer firefighter	0.97 0.20

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
 Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	3.42
(2) Estimated Medical Severity	
(a) optimistic	\$105,781
(b) central	\$193,778
(c) pessimistic	\$334,124
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$761
(b) central	\$1,395
(c) pessimistic	\$2,405
(5) Estimated Indemnity Cost	
(a) optimistic	\$544
(b) central	\$957
(c) pessimistic	\$1,249
(6) Estimated Total Loss Cost	
(a) optimistic	\$1,305
(b) central	\$2,352
(c) pessimistic	\$3,654
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$1,390
(b) central	\$2,505
(c) pessimistic	\$3,892

Notes:

- (1) From Exhibit 11 - Myeloma, Sheet 5, Item (13).
- (2) From Exhibit 11 - Myeloma, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 11 - Myeloma, Sheet 3, Item (7).
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	0.57
(2) Estimated Medical Severity	
(a) optimistic	\$105,781
(b) central	\$193,778
(c) pessimistic	\$334,124
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$2,580
(b) central	\$4,727
(c) pessimistic	\$8,150
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$32
(b) central	\$57
(c) pessimistic	\$75
(7) Estimated Total Loss Cost	
(a) optimistic	\$2,613
(b) central	\$4,784
(c) pessimistic	\$8,225
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$2,783
(b) central	\$5,095
(c) pessimistic	\$8,759

Notes:

- (1) From Exhibit 11 - Myeloma, Sheet 5, Item (13).
- (2) From Exhibit 11 - Myeloma, Sheet 4, Item (7).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 11 - Myeloma, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	70%
(b) central	50%
(c) pessimistic	30%
(10) Estimated Severity	
(a) low	\$75,587
(b) central	\$133,007
(c) high	\$173,558

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	Male	Female	Total
(1) Initial Cost of Care (2010 dollars)	\$41,161	\$40,173	\$41,112
(2) Continuing Cost of Care (2010 dollars)	\$7,363	\$5,859	\$7,288
(3) Last Year of Life Care (2010 dollars)	\$97,473	\$95,782	\$97,388
(4) Estimated Years of Care			
(a) optimistic			1
(b) central			3
(c) pessimistic			5
(5) Estimated Medical Cost Trend			
(a) low			3%
(b) central			5%
(c) high			7%
(6) Estimated Survival Rate			
(a) optimistic			70%
(b) central			50%
(c) pessimistic			30%
(7) Estimated Severity			
(a) low			\$105,781
(b) central			\$193,778
(c) high			\$334,124

Notes:

- (1) - (3) Statistics from *"Projections of the Cost of Cancer Care in the United States: 2010-2020"* published by Oxford University Press in 2011.
Total column weighted based on gender statistics in the Appendix.
- (4) - (6) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (7) Calculated based on (1) through (6).

Age (1)	Historical Cancer Rate (per 100,000)			
	Male (2)	Female (3)		
30-34	0.50	0.30	(4) Tenure Required for Eligibility (Years)	15
35-39	1.10	0.80	(5) Overall Male Cancer Rate per 100,000 (adjusted for tenure and age)	FT 6.50 VOL 5.12
40-44	2.60	1.90	(6) Overall Female Cancer Rate per 100,000 (adjusted for tenure and age)	3.76 2.95
45-49	4.80	3.70	(7) Percentage of Male Firefighters	95% 95%
50-54	8.50	6.20	(8) Base Frequency	6.36 5.02
55-59	13.60	9.50	(9) Firefighter Incidence Adjustment	0.72
60-64	21.10	14.00	(10) Percentage of Firefighters who are/live with smokers	15%
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%
			(12) Propensity to File Claim: full time firefighter volunteer firefighter	95% 20%
			(13) Final Frequency full time firefighter volunteer firefighter	3.42 0.57

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Based on a 2015 study by the National Institute for Occupational Safety and Health.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

(1) Estimated Frequency	64.51
(2) Estimated Medical Severity	
(a) optimistic	\$147,214
(b) central	\$178,431
(c) pessimistic	\$215,484
(3) Firefighter Exposures	210
(4) Estimated Medical Cost	
(a) optimistic	\$19,987
(b) central	\$24,225
(c) pessimistic	\$29,255
(5) Estimated Indemnity Cost	
(a) optimistic	\$4,096
(b) central	\$11,429
(c) pessimistic	\$17,617
(6) Estimated Total Loss Cost	
(a) optimistic	\$24,083
(b) central	\$35,654
(c) pessimistic	\$46,873
(7) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$25,648
(b) central	\$37,971
(c) pessimistic	\$49,919

Notes:

- (1) From Exhibit 12 - Myocardial Infarction, Sheet 5, Item (13).
- (2) From Exhibit 12 - Myocardial Infarction, Sheet 4, Item (3).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Based on (1), (3) and severity from Exhibit 12 - Myocardial Infarction, St
- (6) $(4) + (5)$.
- (7) $(6) \times$ ALAE load from Appendix.

(1) Estimated Frequency	13.02
(2) Estimated Medical Severity	
(a) optimistic	\$147,214
(b) central	\$178,431
(c) pessimistic	\$215,484
(3) Firefighter Exposures	4,295
(4) Estimated Medical Cost	
(a) optimistic	\$82,341
(b) central	\$99,802
(c) pessimistic	\$120,527
(5) Indemnity Adjustment	1.8%
(6) Estimated Indemnity Cost	
(a) optimistic	\$297
(b) central	\$829
(c) pessimistic	\$1,278
(7) Estimated Total Loss Cost	
(a) optimistic	\$82,638
(b) central	\$100,631
(c) pessimistic	\$121,805
(8) Estimated Total Loss and ALAE Cost	
(a) optimistic	\$88,010
(b) central	\$107,172
(c) pessimistic	\$129,722

Notes:

- (1) From Exhibit 12 - Myocardial Infarction, Sheet 5, Item (13).
- (2) From Exhibit 12 - Myocardial Infarction, Sheet 4, Item (3).
- (3) From Appendix I, Sheet 1. Assumes full coverage election.
- (4) $(1) \times (2) \times (3) / 100,000$.
- (5) Volunteer firefighter indemnity award is \$19/week.
- (6) Based on (1), (3), (5) and severity from Exhibit 12 - Myocardial Infarction, Sheet 3, Item (10).
- (7) (4) + (6).
- (8) (7) x ALAE load from Appendix.

(1) Average Firefighter Salary	\$84,164
(2) % rate of compensation	66.7%
(3) Weekly benefit	\$1,079
(4) Maximum weekly benefit	\$793
(5) Duration (Permanent Total)	Until retirement
(6) Maximum aggregate (Fatal)	500 weeks
(7) Estimated Years of Care	
(a) optimistic	1
(b) central	3
(c) pessimistic	5
(8) Estimated Percent Working	37.6%
(9) Estimated Survival Rate	
(a) optimistic	95%
(b) central	85%
(c) pessimistic	75%
(10) Estimated Severity	
(a) low	\$30,170
(b) central	\$84,184
(c) high	\$129,763

Notes:

- (1) From Appendix, Sheet 2.
- (2), (4) - (6) Montana Workers Compensation benefit provisions effective July 1, 2018.
- (3) (1) x (2).
- (7), (9) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (8) Estimated based on age distribution in the Appendix.
- (10) Survivor: (3) x (7) x (8) x (9) x 52.
 Fatality: (3) x 500 x (8) x [100% - (9)].

	<u>Total</u>
(1) Lifetime Cost of Care (2010 dollars)	\$109,541
(2) Estimated Medical Cost Trend	
(a) low	3%
(b) central	5%
(c) high	7%
(3) Estimated Severity	
(a) low	\$147,214
(b) central	\$178,431
(c) high	\$215,484

Notes:

- (1) Statistics from "*Lifetime Costs of Medical Care after Heart Failure Diagnosis*" published in 2010.
- (2) Scenarios selected judgmentally based on industry information to reflect a reasonable range of treatment and cost outcomes.
- (3) Calculated based on (1) and (2).

Age (1)	Historical Prevalence (per 100,000)				
	Male (2)	Female (3)			
30-34	30.00	12.48	(4) Tenure Required for Eligibility (Years)	10	
35-39	30.00	12.48	(5) Overall Male Prevalence per 100,000 (adjusted for tenure and age)	89.28	85.61
40-44	30.00	12.48	(6) Overall Female Prevalence per 100,000 (adjusted for tenure and age)	30.95	29.59
45-49	101.00	42.00	(7) Percentage of Male Firefighters	95%	95%
50-54	101.00	42.00	(8) Base Frequency	86.36	82.81
55-59	214.00	89.00	(9) Firefighter Incidence Adjustment	1.00	
60-64	214.00	89.00	(10) Percentage of Firefighters who are/live with smokers	15%	
			(11) Percentage of Firefighters who are not exposed to carcinogens	8%	
			(12) Propensity to File Claim: full time firefighter	95%	
			volunteer firefighter	20%	
			(13) Final Frequency full time firefighter	64.51	
			volunteer firefighter	13.02	

Notes:

- (2), (3) From statistics published by the Center for Disease Control and Prevention.
- (4) From Montana legislation SB160.
- (5), (6) Based on (2), (3) and age and tenure statistics in the Appendix.
- (7) Based on gender statistics in the Appendix.
- (8) $(5) \times (7) + (6) \times [100\% - (7)]$.
- (9) Assumed that pulmonary disease incidence for firefighters is similar to the general population.
- (10) Based on a United Health Foundation report on smoking rate in Montana.
- (11), (12) Selected judgmentally.
Propensity to file adjustment includes reflection of lack of health screening exams for volunteers.
- (13) $(8) \times (9) \times [100\% - (10)] \times [100\% - (11)] \times (12)$.

	Insured Firefighter Payroll (1)	Average Salary (2)	Active Firefighter Exposures (3)	Retired Firefighter Exposures (4)	Total Firefighter Exposures (5)
Full Time	\$13,349,040	\$84,164	159	52	210
Volunteer			3,237	1,058	4,295

Notes:

- (1) Provided by MSF.
- (2) From Appendix I, Sheet 3.
- (3) (1) / (2). Volunteer: Provided by MSF.
- (4) Based on (3) and the ratio of firefighters over the age of 54 to firefighters under the age of 54, as shown on Appendix I, Sheet 2.
- (5) (3) + (4).

Gender

Female	5.0%
Male	95.0%

* Gender distribution is based on publicly available firefighter demographic information.

<u>Age Range - Full Time Firefighters</u>	<u>Active</u>		<u>Within the Last 10 Years</u>		<u>Tenure Adjustment (Years)</u>				
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>4</u>	<u>5</u>	<u>10</u>	<u>12</u>	<u>15</u>
<30	21.0%	37.3%	12.0%	28.3%	50%	40%	20%	10%	0%
30-34	17.8%	17.0%	9.8%	9.0%	70%	60%	40%	30%	10%
35-39	16.4%	8.3%	10.4%	2.3%	100%	90%	80%	70%	50%
40-44	15.6%	16.3%	11.6%	12.3%	100%	100%	100%	100%	90%
45-49	12.6%	15.5%	15.6%	18.5%	100%	100%	100%	100%	100%
50-54	9.9%	3.5%	15.9%	9.5%	100%	100%	100%	100%	100%
55-59	5.0%	2.1%	12.0%	9.1%	100%	100%	100%	100%	100%
60-64	1.6%	0.0%	11.6%	10.0%	100%	100%	100%	100%	100%
>64	0.1%	0.0%	1.1%	1.0%	100%	100%	100%	100%	100%

<u>Age Range - Volunteer Firefighters</u>	<u>Tenure Adjustment (Years)</u>				
	<u>4</u>	<u>5</u>	<u>10</u>	<u>12</u>	<u>15</u>
<30	40%	30%	10%	0%	0%
30-34	60%	50%	30%	20%	0%
35-39	90%	80%	65%	60%	30%
40-44	95%	90%	85%	80%	60%
45-49	100%	95%	90%	85%	70%
50-54	100%	100%	95%	90%	75%
55-59	100%	100%	100%	95%	80%
60-64	100%	100%	100%	100%	85%
>64	100%	100%	100%	100%	100%

* Active firefighter age range from a Data USA study of firefighters.
 Age distribution of firefighters who have been active within the last ten years is based on active firefighter age range judgmentally shifted.
 Tenure adjustment selected judgmentally assuming average 20 year tenure of firefighters.

ALAE Load 6.5%

* ALAE load is based on overall Montana State Fund ALAE rate of 3.6%, adjusted to reflect higher investigation costs on presumption claims.

Percentage of Firefighters who are/live with smokers 15%

* Based on publicly available information on general population smoking rates in Montana.

Percentage of Firefighters who are not exposed to carcinogens 7.5%

* Selected judgmentally based on discussions with Montana State Fund.

Propensity to File Claim:
 full time firefighter 95%
 volunteer firefighter 20%

* Selected judgmentally based on discussions with Montana State Fund.

<u>Age Range - Full Time Firefighters</u>	<u>Completed Years of Service</u>					
	<u>5 to 9</u>	<u>10 to 14</u>	<u>15 to 19</u>	<u>20 to 24</u>	<u>25 to 29</u>	<u>30 to 34</u>
<30	\$70,623					
30-34	\$68,810	\$82,089				
35-39	\$74,051	\$80,724	\$93,514			
40-44	\$77,113	\$81,642	\$89,886	\$93,237		
45-49	\$78,671	\$81,860	\$92,194	\$96,802	\$85,189	
50-54	\$108,513	\$86,279	\$88,266	\$95,162	\$100,130	
55-59		\$71,333	\$100,727	\$95,376	\$94,694	\$100,916
60-64	\$93,817		\$118,892	\$77,905	\$72,315	\$111,198

<u>Age Range - Full Time Firefighters</u>	<u>Number of Employees</u>					
	<u>5 to 9</u>	<u>10 to 14</u>	<u>15 to 19</u>	<u>20 to 24</u>	<u>25 to 29</u>	<u>30 to 34</u>
<30	16					
30-34	50	17				
35-39	36	60	8			
40-44	19	50	37	3		
45-49	7	15	42	28	1	
50-54	4	4	13	18	11	
55-59		2	3	4	10	5
60-64	3		1	1	1	3

Average Salary: \$84,164

Notes:

From Table D-1 of the June 30, 2019 Actuarial Valuation of the Montana Firefighters' Unified Retirement System.

Appendix II



AN ACT ESTABLISHING THE FIREFIGHTER PROTECTION ACT BY CREATING PRESUMPTIVE COVERAGE UNDER WORKERS' COMPENSATION FOR CERTAIN DISEASES ASSOCIATED WITH FIREFIGHTING ACTIVITIES; PROVIDING CONDITIONS; PROVIDING A REBUTTAL OPTION FOR INSURERS; PROVIDING OPT-IN CHOICE FOR VOLUNTEER FIREFIGHTING ENTITIES; INCLUDING PRESUMPTIVE OCCUPATIONAL DISEASE WITHIN THE STATE'S PUBLIC POLICY PROVISIONS FOR WORKERS' COMPENSATION; PROVIDING DEFINITIONS; AMENDING SECTIONS 39-71-105, 39-71-124, AND 39-71-407, MCA; AND PROVIDING AN EFFECTIVE DATE AND AN APPLICABILITY DATE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MONTANA:

Section 1. Presumptive occupational disease for firefighters -- rebuttal -- applicability -- definitions. (1) (a) A firefighter for whom coverage is required under the Workers' Compensation Act is presumed to have a claim for a presumptive occupational disease under the Workers' Compensation Act if the firefighter meets the requirements of [section 2] and is diagnosed with one or more of the diseases listed in subsection (2) within the period listed.

(b) Coverage under [section 2] and this section is optional for the employer of a firefighter for whom coverage under the Workers' Compensation Act is voluntary. An employer of a volunteer firefighter under 7-33-4109 or 7-33-4510 may elect as part of providing coverage under the Workers' Compensation Act to additionally obtain the presumptive occupational disease coverage, subject to the insurer agreeing to provide presumptive coverage.

(2) The following diseases are presumptive occupational diseases proximately caused by firefighting activities, provided that the evidence of the presumptive occupational disease becomes manifest after the number of years of the firefighter's employment as listed for each occupational disease and within 10 years of the last date on which the firefighter was engaged in firefighting activities for an employer:

- (a) bladder cancer after 12 years;
- (b) brain cancer of any type after 10 years;

(c) breast cancer after 5 years if the diagnosis occurs before the firefighter is 40 years old and is not known to be associated with a genetic predisposition to breast cancer;

(d) myocardial infarction after 10 years;

(e) colorectal cancer after 10 years;

(e) esophageal cancer after 10 years;

(f) kidney cancer after 15 years;

(g) leukemia after 5 years;

(h) mesothelioma or asbestosis after 10 years;

(i) multiple myeloma after 15 years;

(j) non-Hodgkin's lymphoma after 15 years; and

(k) lung cancer after 4 years.

(3) For purposes of calculating the number of years of a firefighter's employment history under subsection (2), a firefighter's employment history after July 1, 2014, may be calculated.

(4) The beneficiaries of a firefighter who otherwise would be eligible for presumptive occupational disease benefits under this section but who dies prior to filing a claim, as provided in [section 2], are eligible for death benefits in the same manner as for a death from an injury, as provided in 39-71-407. The beneficiaries under this subsection (4) are similarly bound by the provisions of exclusive remedy as provided in 39-71-411 and subject to the filing requirements in 39-71-601.

(5) (a) Subject to the provisions of subsection (5)(c), an insurer is liable for the payment of compensation for presumptive occupational disease benefits under this chapter in the same manner as provided in 39-71-407, including objective medical findings of a disease listed in subsection (2) but excluding the requirement in 39-71-407(10) that the objective medical findings trace a relationship between the presumptive occupational disease and the claimant's job history. For myocardial infarction or lung cancer under subsection (2), the diseases must be the type that can reasonably be caused by firefighting activities.

(b) (i) An insurer under plan 1, 2, or 3 that disputes a presumptive occupational disease claim has the burden of proof in establishing by a preponderance of the evidence that the firefighter is not suffering from a compensable presumptive occupational disease. An insurer that disputes the claim may pay benefits under 39-71-608 or 39-71-615 and may pursue dispute mechanisms established in Title 39, chapter 71, part 24.

(ii) An insurer is not liable for the payment of workers' compensation benefits for presumptive

occupational disease if the insurer establishes by a preponderance of the evidence that the firefighter was not exposed during the course and scope of the firefighter's duties to smoke or particles in a quantity sufficient to have reasonably caused the disease claimed.

(c) A total claim payment by an insurer under this section is limited to \$5 million for each claim.

(6) This section does not limit an insurer's ability to assert that the occupational disease was not caused by the firefighter's employment history as a firefighter.

(7) A firefighter or the firefighter's beneficiaries may pursue the dispute remedies as provided in Title 39, chapter 71, part 24, if an insurer disputes a claim.

(8) The use of the term "occupational disease" includes a presumptive occupational disease when used in the definitions in 39-71-116 for "claims examiner", "permanent partial disability", "primary medical services", and "treating physician" and when used in 39-71-107, 39-71-307, 39-71-412, 39-71-503, 39-71-601, 39-71-604, 39-71-606, 39-71-615, 39-71-703, 39-71-704, 39-71-713, 39-71-714, 39-71-717, 39-71-1011, 39-71-1036, 39-71-1041, 39-71-1042, 39-71-1101, 39-71-1110, 39-71-1504, 39-71-2311, 39-71-2312, 39-71-2313, 39-71-2316, and 39-71-4003.

(9) [Section 2] and this section:

(a) apply only to presumptive occupational diseases for firefighters; and

(b) do not apply to any other issue relating to workers' compensation and may not be used or cited as guidance in the administration of Title 33 or 37.

(10) For the purposes of [section 2] and this section, the following definitions apply:

(a) "Firefighter" means an individual whose primary duties involve extinguishing or investigating fires, with at least 1 year of firefighting operations in Montana beginning on or after July 1, 2019, as:

(i) a firefighter defined in 19-13-104;

(ii) a volunteer firefighter defined in 7-33-4510, but only if the volunteer firefighter's employer has elected coverage under Title 39, chapter 71, with an insurer that allows an election and the employer has opted separately to include presumptive occupational disease coverage under [section 2] and this section; or

(iii) a volunteer described in 7-33-4109 for a firefighting entity that has elected coverage under Title 39, chapter 71, with an insurer that allows an election and that has opted separately to include presumptive occupational disease coverage.

(b) "Firefighting activities" means actions required of a firefighter that expose the firefighter to extreme

heat or inhalation or physical exposure to chemical fumes, smoke, particles, or other toxic gases arising directly out of employment as a firefighter.

(c) "Presumptive occupational disease" means harm or damage from one or more of the diseases listed under subsection (2) that is established by objective medical findings and that is contracted in the course and scope of employment as a firefighter from either a single day or work shift or for more than a single day or work shift but that is not specific to an accident.

Section 2. Conditions for claiming presumptive occupational disease. (1) Except as provided in subsection (4), the following must be satisfied for the presumption in [section 1] to apply:

(a) the firefighter must timely file a claim for a presumptive occupational disease under Title 39, chapter 71, as soon as the firefighter knows or should have known that the firefighter's condition resulted from a presumptive occupational disease; and

(b) (i) the firefighter must have undergone, within 90 days of hiring, a medical examination that did not reveal objective medical evidence or a family history of the presumptive occupational disease for which the presumption under [section 1] is sought; and

(ii) the firefighter must have undergone subsequent periodic medical examinations at least once every 2 years.

(2) (a) Subsection (1)(b) does not require the employer of a firefighter to provide or pay for a medical examination, either at the time of hiring or during the subsequent term of employment.

(b) If the employer of a firefighter does not provide or pay for a medical examination under subsection (1)(b), the firefighter may satisfy the requirements of subsection (1)(b) by obtaining the medical examination at the firefighter's expense or at the expense of another party.

(3) To qualify for a presumptive occupational disease, a firefighter may not:

(a) be a regular user of tobacco products;

(b) have a history of regular tobacco use in the 10 years preceding the filing of the claim under subsection (1)(a); or

(c) have been exposed by a cohabitant who regularly and habitually used tobacco products within the home for a period of 10 or more years prior to the diagnosis.

(4) A firefighter who, prior to [the effective date of this act], did not receive a medical examination as

frequently as the intervals set forth in subsection (1)(b) is not ineligible on that basis for a presumptive occupational disease claim under [section 1] and this section.

Section 3. Section 39-71-105, MCA, is amended to read:

"39-71-105. Declaration of public policy. For the purposes of interpreting and applying this chapter, the following is the public policy of this state:

(1) An objective of the Montana workers' compensation system is to provide, without regard to fault, wage-loss and medical benefits to a worker suffering from a work-related injury or disease. Wage-loss benefits are not intended to make an injured worker whole but are intended to provide assistance to a worker at a reasonable cost to the employer. Within that limitation, the wage-loss benefit should bear a reasonable relationship to actual wages lost as a result of a work-related injury or disease.

(2) It is the intent of the legislature to assert that a conclusive presumption exists that recognizes that a holder of a current, valid independent contractor exemption certificate issued by the department is an independent contractor if the person is working under the independent contractor exemption certificate. The holder of an independent contractor exemption certificate waives the rights, benefits, and obligations of this chapter unless the person has elected to be bound personally and individually by the provisions of compensation plan No. 1, 2, or 3.

(3) A worker's removal from the workforce because of a work-related injury or disease has a negative impact on the worker, the worker's family, the employer, and the general public. Therefore, an objective of the workers' compensation system is to return a worker to work as soon as possible after the worker has suffered a work-related injury or disease.

(4) Montana's workers' compensation and occupational disease insurance systems are intended to be primarily self-administering. Claimants should be able to speedily obtain benefits, and employers should be able to provide coverage at reasonably constant rates. To meet these objectives, the system must be designed to minimize reliance upon lawyers and the courts to obtain benefits and interpret liabilities.

(5) This chapter must be construed according to its terms and not liberally in favor of any party.

(6) It is the intent of the legislature that:

(a) a stress ~~claims~~ claim, often referred to as a "mental-mental ~~claims~~ claim" and or a "mental-physical ~~claims~~ claim", ~~are~~ is not compensable under Montana's workers' compensation and occupational disease laws.

The legislature recognizes that these claims are difficult to objectively verify and that the claims have a potential to place an economic burden on the workers' compensation and occupational disease system. The legislature also recognizes that there are other states that do not provide compensation for various categories of stress claims and that stress claims have presented economic problems for certain other jurisdictions. In addition, not all injuries are compensable under the present system, and it is within the legislature's authority to define the limits of the workers' compensation and occupational disease system. However, it is also within the legislature's authority to recognize the public service provided by firefighters and to join with other states that have extended a presumptive occupational disease recognition to firefighters.

(b) for occupational disease or presumptive occupational disease claims, because of the nature of exposure, workers should not be required to provide notice to employers of the disease as required of injuries and that the requirements for filing of claims reflect consideration of when the worker knew or should have known that the worker's condition resulted from an occupational disease or a presumptive occupational disease. The legislature recognizes that occupational diseases in the workplace are caused by events occurring on more than a single day or work shift and that ~~it is within the legislature's~~ the legislature has the authority to define an occupational disease or a presumptive occupational disease and establish the causal connection to the workplace."

Section 4. Section 39-71-124, MCA, is amended to read:

"39-71-124. Applicability of Workers' Compensation Act -- exceptions. Except as provided in 39-71-407, 39-71-601, and 39-71-603 and as specified in [section 1], this chapter applies to injuries and occupational diseases."

Section 5. Section 39-71-407, MCA, is amended to read:

"39-71-407. Liability of insurers -- limitations. (1) For workers' compensation injuries, each insurer is liable for the payment of compensation, in the manner and to the extent provided in this section, to an employee of an employer covered under plan No. 1, plan No. 2, and the state fund under plan No. 3 that it insures who receives an injury arising out of and in the course of employment or, in the case of death from the injury, to the employee's beneficiaries, if any.

(2) An injury does not arise out of and in the course of employment when the employee is:

(a) on a paid or unpaid break, is not at a worksite of the employer, and is not performing any specific tasks for the employer during the break; or

(b) engaged in a social or recreational activity, regardless of whether the employer pays for any portion of the activity. The exclusion from coverage of this subsection (2)(b) does not apply to an employee who, at the time of injury, is on paid time while participating in a social or recreational activity or whose presence at the activity is required or requested by the employer. For the purposes of this subsection (2)(b), "requested" means the employer asked the employee to assume duties for the activity so that the employee's presence is not completely voluntary and optional and the injury occurred in the performance of those duties.

(3) (a) ~~An~~ Subject to subsection (3)(c), an insurer is liable for an injury, as defined in 39-71-119, only if the injury is established by objective medical findings and if the claimant establishes that it is more probable than not that:

(i) a claimed injury has occurred; or

(ii) a claimed injury has occurred and aggravated a preexisting condition.

(b) Proof that it was medically possible that a claimed injury occurred or that the claimed injury aggravated a preexisting condition is not sufficient to establish liability.

(c) Objective medical findings are sufficient for a presumptive occupational disease as defined in [section 1] but may be overcome by a preponderance of the evidence.

(4) (a) An employee who suffers an injury or dies while traveling is not covered by this chapter unless:

(i) the employer furnishes the transportation or the employee receives reimbursement from the employer for costs of travel, gas, oil, or lodging as a part of the employee's benefits or employment agreement and the travel is necessitated by and on behalf of the employer as an integral part or condition of the employment; or

(ii) the travel is required by the employer as part of the employee's job duties.

(b) A payment made to an employee under a collective bargaining agreement, personnel policy manual, or employee handbook or any other document provided to the employee that is not wages but is designated as an incentive to work at a particular jobsite is not a reimbursement for the costs of travel, gas, oil, or lodging, and the employee is not covered under this chapter while traveling.

(5) Except as provided in subsection (6), an employee is not eligible for benefits otherwise payable under this chapter if the employee's use of alcohol or drugs not prescribed by a physician is the major contributing cause of the accident.

(6) (a) An employee who has received written certification, as defined in 50-46-302, from a physician for the use of marijuana for a debilitating medical condition and who is otherwise eligible for benefits payable under this chapter is subject to the limitations of subsections (6)(b) through (6)(d).

(b) An employee is not eligible for benefits otherwise payable under this chapter if the employee's use of marijuana for a debilitating medical condition, as defined in 50-46-302, is the major contributing cause of the injury or occupational disease.

(c) Nothing in this chapter may be construed to require an insurer to reimburse any person for costs associated with the use of marijuana for a debilitating medical condition, as defined in 50-46-302.

(d) In an accepted liability claim, the benefits payable under this chapter may not be increased or enhanced due to a worker's use of marijuana for a debilitating medical condition, as defined in 50-46-302. An insurer remains liable for those benefits that the worker would qualify for absent the worker's use of marijuana for a debilitating medical condition.

(7) The provisions of subsection (5) do not apply if the employer had knowledge of and failed to attempt to stop the employee's use of alcohol or drugs not prescribed by a physician. This subsection (7) does not apply to the use of marijuana for a debilitating medical condition because marijuana is not a prescribed drug.

(8) If there is no dispute that an insurer is liable for an injury but there is a liability dispute between two or more insurers, the insurer for the most recently filed claim shall pay benefits until that insurer proves that another insurer is responsible for paying benefits or until another insurer agrees to pay benefits. If it is later proven that the insurer for the most recently filed claim is not responsible for paying benefits, that insurer must receive reimbursement for benefits paid to the claimant from the insurer proven to be responsible.

(9) If a claimant who has reached maximum healing suffers a subsequent nonwork-related injury to the same part of the body, the workers' compensation insurer is not liable for any compensation or medical benefits caused by the subsequent nonwork-related injury.

(10) ~~An~~ Except for cases of presumptive occupational disease as provided in [sections 1 and 2], an employee is not eligible for benefits payable under this chapter unless the entitlement to benefits is established by objective medical findings that contain sufficient factual and historical information concerning the relationship of the worker's condition to the original injury.

(11) (a) For occupational diseases, every employer enrolled under plan No. 1, every insurer under plan No. 2, or the state fund under plan No. 3 is liable for the payment of compensation, in the manner and to the

extent provided in this chapter, to an employee of an employer covered under plan No. 1, plan No. 2, or the state fund under plan No. 3 if the employee is diagnosed with a compensable occupational disease.

(b) The provisions of subsection (11)(a) apply to presumptive occupational disease if the employee is diagnosed and meets the conditions of [sections 1 and 2].

(12) An insurer is liable for an occupational disease only if the occupational disease:

(a) is established by objective medical findings; and

(b) arises out of or is contracted in the course and scope of employment. An occupational disease is considered to arise out of or be contracted in the course and scope of employment if the events occurring on more than a single day or work shift are the major contributing cause of the occupational disease in relation to other factors contributing to the occupational disease. For the purposes of this subsection (12), an occupational disease is not the same as a presumptive occupational disease.

(13) When compensation is payable for an occupational disease or a presumptive occupational disease, the only employer liable is the employer in whose employment the employee was last injuriously exposed to the hazard of the disease.

(14) When there is more than one insurer and only one employer at the time that the employee was injuriously exposed to the hazard of the disease, the liability rests with the insurer providing coverage at the earlier of:

(a) the time that the occupational disease or presumptive occupational disease was first diagnosed by a health care provider; or

(b) the time that the employee knew or should have known that the condition was the result of an occupational disease or a presumptive occupational disease.

(15) In the case of pneumoconiosis, any coal mine operator who has acquired a mine in the state or substantially all of the assets of a mine from a person who was an operator of the mine on or after December 30, 1969, is liable for and shall secure the payment of all benefits that would have been payable by that person with respect to miners previously employed in the mine if acquisition had not occurred and that person had continued to operate the mine, and the prior operator of the mine is not relieved of any liability under this section.

(16) As used in this section, "major contributing cause" means a cause that is the leading cause contributing to the result when compared to all other contributing causes."

Section 6. Codification instruction. [Sections 1 and 2] are intended to be codified as an integral part of Title 39, chapter 71, and the provisions of Title 39, chapter 71, apply to [sections 1 and 2].

Section 7. Contingent voidness. If a court finds any part of [this act] to be in violation of any clause of the U.S. or Montana constitutions relating to workers' compensation claims or a court through any other action or doctrine in law or equity applies the presumption in [sections 1 and 2] to another class of occupation other than firefighters, then [this act] is void.

Section 8. Effective date -- applicability. [This act] is effective July 1, 2019, and applies to presumptive occupational diseases diagnosed on or after July 1, 2019.

- END -

I hereby certify that the within bill,
SB 0160, originated in the Senate.

President of the Senate

Signed this _____ day
of _____, 2019.

Secretary of the Senate

Speaker of the House

Signed this _____ day
of _____, 2019.

SENATE BILL NO. 160

INTRODUCED BY N. MCCONNELL, K. ABBOTT, J. BACHMEIER, J. BAHR, D. BARRETT, B. BENNETT, B. BESSETTE, L. BISHOP, C. BOLAND, Z. BROWN, M. CAFERRO, J. COHENOUR, W. CURDY, K. DUDIK, M. DUNWELL, D. FERN, R. FITZGERALD, P. FLOWERS, M. FUNK, F. GARNER, J. GROSS, B. GRUBBS, J. HAMILTON, D. HARVEY, D. HAYMAN, M. HOPKINS, T. JACOBSON, J. KARJALA, K. KELKER, C. KEOGH, E. KERR-CARPENTER, R. LYNCH, M. MACDONALD, S. MALEK, M. MARLER, E. MCCLAFFERTY, M. MCNALLY, S. MORIGEAU, A. OLSEN, R. PEPPERS, Z. PERRY, G. PIERSON, J. POMNICHOWSKI, J. READ, T. RICHMOND, T. RUNNINGWOLF, M. RYAN, W. SALES, D. SANDS, C. SCHREINER, J. SESSO, R. SHAW, J. SMALL, B. SMITH, F. SMITH, S. STEWART PEREGOY, K. SULLIVAN, S. VINTON, T. WELCH, T. WINTER, T. WOODS

AN ACT ESTABLISHING THE FIREFIGHTER PROTECTION ACT BY CREATING PRESUMPTIVE COVERAGE UNDER WORKERS' COMPENSATION FOR CERTAIN DISEASES ASSOCIATED WITH FIREFIGHTING ACTIVITIES; PROVIDING CONDITIONS; PROVIDING A REBUTTAL OPTION FOR INSURERS; PROVIDING OPT-IN CHOICE FOR VOLUNTEER FIREFIGHTING ENTITIES; INCLUDING PRESUMPTIVE OCCUPATIONAL DISEASE WITHIN THE STATE'S PUBLIC POLICY PROVISIONS FOR WORKERS' COMPENSATION; PROVIDING DEFINITIONS; AMENDING SECTIONS 39-71-105, 39-71-124, AND 39-71-407, MCA; AND PROVIDING AN EFFECTIVE DATE AND AN APPLICABILITY DATE.