MASSACHUSETTS MUTUAL LIFE INSURANCE COMPANY

Address: 1295 State Street, Springfield, MA 01111

500 and 511 Series Actuarial Memorandum

December 3, 2024

Product	Number
500 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-MD et al.
Tax-Qualified Facility Only Long-Term Care Policy Form	MM501-P-MD et al.
511 Series	
Tax-Qualified Comprehensive Long-Term Care Policy Form	MM500-P-1-MD et al.
Tax-Qualified Facility Only Long-Term Care Policy Form	MM501-P-1-MD et al.

Massachusetts Mutual Life Insurance Company (MassMutual) is requesting a rate increase on the above-listed long-term care policy forms. The company issued these policy forms in Maryland between April 9, 2008 and February 27, 2013.

Nationwide, the company intends to pursue actuarially equivalent rate levels (based on lifetime loss ratios) in all jurisdictions, except where required due to regulatory and jurisdiction-specific requirements. Unless otherwise specified, the nationwide request captures all MassMutual long-term care products from the 500 and 511 Series that are no longer being marketed in any jurisdiction. This actuarial memorandum captures the pooled experience of the above-listed policy forms and similar policy forms issued nationwide across the two rate series.

In prior rate filings these forms were pooled with other rate series. The company is now managing the block of business separately by rate series when reviewing experience and determining when a rate increase is needed to be pursued.

As indicated in the enclosed cover letter, the company acknowledges that the requested rate increase exceeds the 15% annual maximum required by COMAR 31.14.01.04.A(5). Once the company and the Department have come to an agreement regarding the requested rate increase, an actuarially equivalent phased-in rate increase pursuant to COMAR 31.14.01.04.A(5) will be determined.

This actuarial memorandum reflects the nationwide requested rate increase, except the jurisdiction-specific requested rate increase is reflected in Section 19 and certain experience provided in the supplement to the actuarial memorandum. The nationwide requested rate increase is described in Section 2 below and the jurisdiction-specific request is described in the enclosed cover letter.

1. **Purpose of Filing**

    This actuarial memorandum has been prepared for the purpose of demonstrating that the requested rate increase meets the minimum requirements of the 2014 National Association of Insurance Commissioners (NAIC) Long-Term Care Insurance Model Regulation (Model Regulation). The supplement to the actuarial memorandum demonstrates compliance with the applicable regulatory requirements of this jurisdiction to the extent that they differ from the Model Regulation. It may not be suitable for other purposes.

2. **Requested Rate Increase**

    The company is requesting a premium rate increase on the above-listed forms, including all associated riders. These forms need a premium rate increase due to emerging and projected experience running more adversely than originally expected.

    This rate increase request is the second nationwide filing on these policy forms. The first nationwide request in 2018 sought to achieve a rate level consistent with that on the company's 513 Series product, which was capped at a maximum increase of 100%, except where required due to regulatory and jurisdiction-specific requirements. In jurisdictions that did not approve the initial increase as requested, the company requested follow-up increases to target a lifetime loss ratio actuarially equivalent to the 2018 request. The 2018 nationwide request did not certify to rate stability.

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The company intends to pursue actuarially equivalent rate levels (based on lifetime loss ratios) in all jurisdictions, except where required due to regulatory and jurisdiction-specific requirements. The rate levels vary by rate series and inflation option and were developed with consideration for the prior rate increase history of each jurisdiction.

Table 2.1 provides the average prior approved increase, the average requested increase, and the resulting average cumulative rate increase based on the nationwide increase request for each rate series by inflation option. Because the prior nationwide request included rate caps based on the 513 Series rates that were applied on a seriatim basis, the nationwide rate increase may vary by rate series and all available options and riders. The enclosed cover letter provides similar information to Table 2.1 based on the prior approved increases for this jurisdiction.

Table 2.1
Nationwide Rate Increase Summary by Series and Inflation Option[1]

Series	Inflation Option	Average Prior Approved Increase[2]	Average Requested Increase	Average Cumulative Increase
500	Auto	58%	68%	165%
	None	38	41	95
	All	56	65	157
511	Auto	28	17	50
	None	18	7	27
	All	27	16	48
All	All	47	53	125

[1] Values based on insureds in force as of 12/31/2023; excludes policies assumed to be paid up prior to the rate increase implementation date.
[2] Reflects the full implementation of rate increases approved through January 2024.

While this current rate increase request is being sought to help alleviate the adverse performance on this business, approving this rate increase as requested will not constitute a rate guarantee, as the company reserves the right to request additional increases in the future.

Upon reaching an agreement with the Department on the increase, the company will provide the corresponding rate tables.

As the company is not currently marketing new standalone long-term care products, the required statement that the renewal premium rate schedules are not greater than the new business premium rate schedules is not applicable.

Options for Reducing Benefits

The company offers insureds affected by the premium increase the option of reducing their policy benefits to provide flexibility of choice for those insureds who wish to maintain a premium level reasonably close to what they were paying prior to the rate increase. The company's notification letter outlines several available reduced benefit options (RBO) including:

- reducing the benefit period;
- reducing the maximum daily benefit amount;
- extending the elimination period;
- removing or reducing inflation protection; and
- removing or reducing other optional riders.

The company administers the reduction or removal of inflation protection in a consumer-friendly manner that exceeds industry norms. Insureds who elect to reduce or remove their inflation protection keep their inflated (current) daily benefit amounts and their premium rates are determined using the reduced inflation option factor and their uninflated (original) daily benefit. This allows for these insureds to significantly mitigate a rate increase, as their premiums are based on their uninflated daily benefit, while

maintaining meaningful long-term care coverage, as they will retain all daily benefit inflation accrued to-date.

3. Description of Benefits

The 500 and 511 Series are existing tax-qualified policy forms that provide long-term care coverage. They are individually underwritten and provide either comprehensive coverage or facility-only coverage on a reimbursement basis. Certain policy forms also included a rider to convert to coverage on an indemnity basis. These forms have benefit eligibility requirements that involve activities of daily living (ADL) deficiencies or cognitive impairment. Waiver of premium is provided when certain benefits are being paid.

A daily benefit amount, benefit period, and elimination period were selected at issue. The available choices for benefit period and elimination period varied by rate series and are shown in Section 21.

At issue, the policyowner may have had the option to choose one of the following inflation options, the availability of which varied by rate series as shown in Section 21: no inflation, simple 5% inflation, compound 3% inflation, or compound 5% inflation. The simple inflation option provides for benefit levels that increase on each anniversary date by 5% of the daily benefit amount chosen at issue for the life of the insured. The compound inflation options provide for benefit levels that increase on each anniversary date by 3% or 5% compounded annually for the life of the insured. These automatic increasing benefits apply even when the insured is in claim status.

Premiums are paid for the life of the policy, unless the policyowner elected at issue a limited premium payment period, as shown in Section 21. An additional option was available for all premium payment periods in which the policyowner could pay a higher first year premium followed by discounted (reduced) renewal premium thereafter (a.k.a., discounted renewal).

At issue, the policyowner may have been offered the option of selecting riders (e.g., restoration of benefits, shared care) that provide the types of coverage, which vary by rate series, as shown in the enclosed rate tables.

These are participating policy forms. Explicit dividend margin was incorporated into the pricing for the business in this filing that was to be released to policyowners if experience emerged as originally expected in pricing. However, as emerging experience is worse than that expected with the dividend margin, no dividends have been paid historically nor are expected to be paid going forward on the long-term care business in this filing.

Most jurisdictions included Partnership-eligible policy forms or options for each rate series, subject to the individual Partnership requirements of each jurisdiction.

The options to reduce benefits, like those described in Section 2, are available any time and not only at the time of a rate increase.

A contingent benefit upon lapse (CBUL) will be available to all insureds affected by the rate increase, even if the increase is not considered substantial.

In some jurisdictions, the benefits made available to insureds were limited relative to what was offered nationwide and described above.

4. Renewability

These policies are guaranteed renewable for life.

5. **Applicability**

   This rate increase applies to all policies issued on the above-listed policy forms in this jurisdiction. The rate changes will apply to the premium of the base policy form and all associated options and riders.

6. **Actuarial Assumptions**

   The following assumptions are used to project the experience shown in this filing (current assumptions). As described in Appendix A to this memorandum, experience on all of MassMutual's standalone long-term care products available at the time of development was combined in determining the assumptions such that not all product attributes described in Appendix A may apply to this filing as highlighted below.

   a. Active Assumptions

      i. <u>Claim Incidence Probabilities</u> were developed using the 2017 Milliman *Long-Term Care Guidelines* (*Guidelines*) incidence curves with adjustments for retrospective improvement. The incidence curves were developed based on starting site of care—assisted living facility (ALF), home health care (HHC), or skilled nursing facility (SNF)—and further adjusted based on historical experience for sex, partner status at issue, benefit period, inflation option, payment type, underwriting, rate series, and attained age.

      ii. <u>Voluntary Lapse Probabilities</u> vary by policy duration (ultimate for 9+), attained age (ultimate for 70+), inflation option, benefit period, payment method, and partner status at issue (i.e., partnered versus non-partnered). Exhibit A-2a of Appendix A to this memorandum summarizes the ultimate lapse probabilities by key characteristics.

      iii. <u>Active Mortality Probabilities</u> were developed using the 2012 Individual Annuitant Mortality (IAM) Basic table with adjustments to make it applicable to an active life exposure base and reflect retrospective active mortality improvement. These mortality probabilities were then adjusted based on historical mortality experience by sex, partner status at issue, underwriting, policy duration, and attained age. The mortality adjustment factors can be found in Exhibit A-3a of Appendix A to this memorandum.

   b. Disabled Assumptions

      i. <u>Disabled Mortality Probabilities</u> reflect disabled mortality tables developed in conjunction with the *Guidelines*. These mortality probabilities were then adjusted based on historical experience by starting site of care, sex, benefit period, partner status at issue, payment type, claim duration, and incurred age.

      ii. <u>Implied Recovery Probabilities</u> were developed from the composite claim terminations and the disabled mortality assumption with adjustments to ensure the resulting recovery probabilities were reasonable by claim month and across key claimant characteristics. Appendix A to this memorandum provides the formula used to develop the implied recovery probabilities.

   c. Utilization Assumption

      i. <u>Policy Duration Utilization</u> was developed using the *Guidelines* with adjustments to reflect recent utilization experience and cost of care trends. The policy duration utilization assumption also captures how utilization by site of care changes over time due to (1) inflation of the daily benefit and (2) cost of care trends.

      ii. <u>Claim Duration Utilization</u> was developed based on the policy duration utilization assumption described above with adjustments for actual claim experience by starting site of care. These adjustments were based on historical utilization experience by benefit period, inflation option,

and incurred age. The claim duration adjustment factors can be found in Exhibit A-8a of Appendix A to this memorandum.

d. <u>Insured Behavior Due to the Rate Increase</u>

At the time of a rate increase, insureds have the option to elect a CBUL or RBO. An increase in morbidity for adverse selection due to the rate increase is assumed based on the percentage of insureds that elect a CBUL and RBO.

Insureds who elect a CBUL are modeled as a lapse (i.e., the CBUL benefit is not modeled), which results in a slightly lower lifetime loss ratio than if the CBUL benefit had been modeled.

CBUL and RBO election rates are determined as a function of the rate increase magnitude. Adverse selection associated with the requested increase is a function of CBUL and RBO election and is applied to the claim incidence probabilities. These assumptions are applied on a seriatim basis. The following provides approximate averages for these assumptions based on the nationwide experience in this filing and the average requested increase described in Section 2: 3% CBUL election rate, 11% RBO election rate, and 2% morbidity increase due to adverse selection.

e. <u>Prospective Improvement</u> is not assumed for any assumption.

f. <u>Interest Rate</u> consistent with the maximum valuation interest rate applicable to the year of issue (ranges from 3.5% to 4.0% and averages 3.9%) is used to demonstrate compliance with the minimum loss ratio requirements.

g. <u>Expenses</u> have not been explicitly projected. Originally filed expense assumptions are assumed to remain appropriate, except that commissions are not paid on the increased premium.

h. <u>Dividends</u> are not projected in the current experience as the company has not historically paid a dividend and does not anticipate paying a dividend in the future on its long-term care business in this filing.

The above assumptions are based on the experience of the above-listed policy forms and similar forms issued by MassMutual, industry experience, and actuarial judgment. These assumptions are based on the nationwide experience of all standalone long-term care business issued by MassMutual at the time of development, which includes the 200-513 Series. The assumptions above are deemed reasonable for the policy forms in this filing and for the purpose of this filing are considered "current" and "best estimate" (most likely without explicit margin) based on the experience used to develop the assumptions.

In establishing the assumptions described in this section, the policy design, underwriting, and claims adjudication practices for the above-listed policy forms were taken into consideration. Appendix A to this memorandum provides a description of the development of and justification for the assumptions used in this filing.

The company is not currently marketing standalone long-term care products. As a result, the requirement to reflect on any assumptions that deviate from those used for pricing other forms currently available for sale is not applicable.

7. **Marketing Method**

These policy forms were marketed by agents of MassMutual and/or by independent brokers.

8. **Underwriting Description**

These policies were individually underwritten with the use of various underwriting tools in addition to the application, which may have included medical records, medical history questionnaires, paramedical

functional assessments, cognitive screenings, phone interviews, face-to-face interviews, and/or attending physician statements.

9. **Premiums**

   Premiums are unisex and payable for life unless the insured selected a limited premium payment period option. The premiums may vary by policy form, issue age, elimination period, benefit period, uninflated (original) daily benefit amount, inflation option, premium payment option, underwriting class, discounts (e.g., partner status), home care coverage, and the selection of any riders.

10. **Issue Age Range**

    Issue ages are from 18 to 84.

11. **Area Factors**

    Area factors are not used for these products.

12. **Premium Modalization Rules**

    The following modal factors and percent distributions (based on the nationwide in-force insured count as of December 31, 2023) are applied to the annual premium (AP):

Table 12.1
Nationwide Modal Factors and Distribution

Premium Mode	Modal Factors	Percent Distribution
Annual	1.000*AP	53%
Semi-Annual	0.520*AP	4
Quarterly[1]	0.265*AP	7
Monthly	0.088*AP	36

[1] Factor may vary based on policy form and payment option.

13. **Reserves**

    Active life reserves and reserves for the election of a CBUL have not been used in the experience exhibits for this rate increase analysis, except as described in the supplement to the actuarial memorandum. Claim reserves as of December 31, 2023 have been discounted to the incurral date of each respective claim and included in historical incurred claims. An incurred but not reported (IBNR) reserve balance as of December 31, 2023 has been allocated to the 2023 calendar year and included in historical incurred claims.

14. **Trend Assumptions**

    As this is not medical insurance, an explicit medical cost trend is not included in the projections.

15. **Demonstration of Satisfaction of Loss Ratio Requirements**

    The nationwide experience used in this filing includes experience on MassMutual long-term care products from the 500 and 511 Series. These products are no longer being marketed in any jurisdiction. Pooling these forms' experience is appropriate as the policy forms have similar benefits and combining experience increases credibility.

    Exhibit I provides actual and projected experience using the assumptions described in Section 6. Actual experience is provided from inception through 2023 and then projected on a seriatim basis for 60 years. The actual and projected experience is based on nationwide premiums reflecting the full implementation

of rate increases approved through January 2024. The after-increase projected experience reflects the additional increases needed to achieve the cumulative increases shown in Section 2 on a seriatim basis.

Values in Exhibit I are shown (a) before and (b) after the requested rate increase. Included are calendar year earned premiums, incurred claims, end of year lives, and annual loss ratios. As shown in Exhibit I, the anticipated lifetime loss ratio with the requested rate increase exceeds the minimum loss ratio required by pre-rate stability regulation.

Table 15.1 demonstrates that the lifetime loss ratios by rate series also exceed the minimum loss ratio required by pre-rate stability regulation. While compliance with the minimum loss ratio requirement is evaluated on a series-specific basis, additional splits by inflation option are included in Table 15.1 for reference. The 'All' Series row corresponds to that shown in Exhibit I.

Table 15.1
Lifetime Loss Ratios by Series and Inflation Option
Using Maximum Valuation Interest

Series	Inflation Option	Before Increase[1]	After Increase
500	Auto	107%	86%
	None	72	63
	All	103	84
511	Auto	83	77
	None	67	65
	All	82	76
All	All	98	82

[1] Reflects full implementation of rate increases approved through January 2024.

The majority of insureds in this jurisdiction subject to the rate increase will trigger a substantial rate increase and are eligible for a contingent benefit upon lapse. Because of this, an alternative version of the 58%/85% test, which uses the greater of 58% and the original anticipated lifetime loss ratio, is provided as required by rate stability regulation.

Exhibit II provides a demonstration that the requested rate increase nationwide meets the alternative 58%/85% minimum loss ratio test under moderately adverse conditions as required by rate stability regulation. Exhibit II shows that the sum of the accumulated value of incurred claims, without the inclusion of active life reserves, and the present value of projected incurred claims, without the inclusion of active life reserves, will not be less than the sum of the following:

1. Accumulated value of the initial earned premium times 59%,
2. 85% of the accumulated value of prior premium rate schedule increases,
3. Present value of projected initial earned premium times 59%, and
4. 85% of the present value of projected premium in excess of the projected initial earned premium.

Moderately adverse conditions are defined as any combination of deterioration in experience and/or assumptions that results in a deterioration in future experience. The projected incurred claims in Exhibit II were increased by 13% for the 500 Series and 14% for the 511 Series from the assumptions described above in Section 6 to reflect assumptions that include moderately adverse conditions.

Table 15.2 demonstrates that the alternative 58%/85% test is passed by rate series. While compliance with this test is evaluated on a series-specific basis, additional splits by inflation option are included in Table 15.2 for reference. The 'All' Series row corresponds to that shown in Exhibit II. The 'Alternative 58% Loss Ratio' represents the greater of 58% and the expected lifetime loss ratio shown in Table 16.1 below.

Table 15.2
Alternative 58%/85% Test by Series and Inflation Option ($ in millions)

Series	Inflation Option	Alternative 58% Loss Ratio	Item 5[1]	Item 7[2]	Result[3]
500	Auto	59%	$1,029	$1,504	Pass
	None	58	100	111	Pass
	All	58	1,121	1,616	Pass
511	Auto	65	314	405	Pass
	None	59	25	30	Pass
	All	64	339	436	Pass
All	All	59	1,456	2,051	Pass

[1] Item 5 is the Lifetime Earned Premium Times Prescribed Factor. Reflects full implementation of rate increases approved through January 2024.
[2] Item 7 is Lifetime Incurred Claims with Rate Increase.
[3] Test of whether Item 7 is not less than Item 5.

16. Actual-to-Expected Experience

The following table provides a comparison of actual and projected experience using the assumptions described in Section 6 to that expected using original pricing assumptions. Values in the following table are shown (a) before and (b) after the requested rate increase.

Table 16.1
Actual and Expected Loss Ratios by Series and Inflation Option

Series	Inflation Option	Lifetime Loss Ratio			Actual-to-Expected	
		Before Increase[1]	After Increase	Expected[2]	Before Increase	After Increase
500	Auto	107%	86%	59%	1.81	1.46
	None	72	63	50	1.44	1.28
	All	103	84	58	1.78	1.45
511	Auto	83	77	65	1.29	1.19
	None	67	65	59	1.14	1.11
	All	82	76	64	1.28	1.19
All	All	98	82	59	1.65	1.38

[1] Reflects full implementation of rate increases approved through January 2024.
[2] Projected actual policies sold from issue using original pricing assumptions.

Actual and projected experience in the above table is identical to that described in Exhibit I. Expected experience uses the actual policies sold and projects from issue on a seriatim basis using the original pricing assumptions for each rate series. The expected experience for the 500 Series includes an adjustment for dividend margin assumed in pricing. However, for the 511 Series, the expected loss ratio based on actual mix of business sold exceeded the original pricing loss ratio based on assumed sales mix with dividend margin. As such, no adjustment for dividend margin is included for the 511 Series expected experience.

Exhibit III provides a summary of the original pricing assumptions for each rate series that underlie the expected experience.

17. History of Previous Rate Revisions

Prior rate increase(s) have been approved and implemented on the above-listed forms.

Exhibit IV provides a status of the rate increase filings nationwide. The status is shown for each jurisdiction in which there is business in force as of December 31, 2023. Also included are the number of insureds and annualized premium based on insureds in force as of December 31, 2023. These

values exclude insureds assumed to be paid up prior to the requested rate increase implementation date. Annualized premium in Exhibit IV reflects full implementation of rate increases approved through January 2024. The status listing provides the status of all prior and current requested increases and is grouped by the year in which each batch of filings was first submitted.

18. Analysis Performed to Consider a Rate Increase

This rate increase request is part of a second nationwide filing on these policy forms. At the time of the first nationwide request in 2018 an analysis of the business was performed which confirmed that a rate increase could be considered as experience had been more adverse than expected in original pricing.

For the business subject to rate stability regulation, an analysis was performed at the time of the 2018 nationwide request demonstrating that the projected loss ratio compared to that assumed at the time of original pricing revealed that experience unfolded more than moderately adverse and crossed the original pricing threshold for which the company could consider a rate increase.

Table 16.1 demonstrates that experience continues to be more adverse than that expected using original pricing assumptions as the actual-to-expected (A:E) loss ratios exceed 1.0. The adverse experience is driven by higher-than-expected persistency and morbidity.

19. Average Annual Premium

Table 19.1 shows the number of insureds and the corresponding average annual premium that will be affected by this rate increase filing based on insureds in force as of December 31, 2023.

Table 19.1
Number of Insureds and Average Annual Premium[1]

Series	Inflation Option	Number of Insureds	Before Increase Premium[2]	After Increase Premium
Maryland				
500	Auto	488	$4,049	$8,097
	None	55	2,157	4,745
	All	543	3,857	7,758
511	Auto	101	3,509	4,281
	None	8	2,690	3,578
	All	109	3,449	4,229
All	All	652	3,789	7,168
Nationwide				
500	Auto	11,926	$3,879	$6,510
	None	1,898	2,726	3,837
	All	13,824	3,721	6,143
511	Auto	4,915	3,317	3,882
	None	641	2,367	2,537
	All	5,556	3,207	3,727
All	All	19,380	3,573	5,450

[1] Excludes insureds assumed to be paid up prior to the rate increase implementation date.
[2] Reflects full implementation of rate increases approved through January 2024.

20. Proposed Effective Date

This rate increase will apply to policies on their next policy anniversary date following at least a 60-day policyowner notification period following approval, but no sooner than five years after the first phase-in of the prior rate increase was effective. No policyowner will receive more than one increase during a 12-month period.

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21. Distribution of Business

Table 21.1 provides distributions of business based on insureds in force as of December 31, 2023.

Table 21.1
Nationwide Distributions of Business

Issue Ages	Percent Distribution		
	All	500	511
<40	2%	2%	2%
40-44	4	4	5
45-49	9	9	9
50-54	20	20	21
55-59	28	29	26
60-64	24	24	23
65-69	10	10	12
70-74	2	2	2
75-79	<1	<1	<1
80+	<1	<1	0
Average Issue Age	57	57	56

Elimination Period	Percent Distribution		
	All	500	511
30-Day	2%	3%	2%
60-Day	2	3	2
90-Day	87	86	91
180-Day	8	8	5

Benefit Period	Percent Distribution		
	All	500	511
2 Years	6%	6%	6%
3 Years	23	21	28
4 Years	14	14	14
5 Years	22	22	19
6 Years	13	9	23
10 Years	3	4	2
Lifetime	19	24	7

Inflation Option	Percent Distribution		
	All	500	511
None	12%	13%	11%
Simple 5%	20	27	N/A
Compound 3%	32	17	74
Compound 5%	36	44	15

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Premium Payment Duration	Percent Distribution		
	All	500	511
Ten-Pay	12%	14%	6%
Pay to Age 65	2	2	1
Lifetime-Pay	87	85	93

Premium Payment Option	Percent Distribution		
	All	500	511
No Discounted Renewal	99%	99%	100%
Discounted Renewal	1	1	<1

Coverage Type	Percent Distribution		
	All	500	511
Facility Only	1%	2%	1%
Comprehensive	99	98	99

Benefit Type	Percent Distribution		
	All	500	511
Reimbursement	86%	81%	100%
Indemnity	14	19	N/A

Underwriting Class[1]	Percent Distribution		
	All	500	511
Preferred	47%	49%	43%
Standard	45	44	47
Substandard	8	8	10

[1] At issue, the labels may have differed, but were grouped into these three generic labels.

Partner Status at Issue	Percent Distribution		
	All	500	511
Partnered	84%	84%	84%
Non-Partnered	16	16	16

22. Number of Insureds and Annualized Premium

Table 22.1 shows the number of insureds and annualized premium that will be affected by this rate increase filing based on insureds in force as of December 31, 2023.

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Table 22.1
Number of Insureds and Annualized Premium[1]

Series	Inflation Option	Number of Insureds	Annualized Premium[2]
Maryland			
500	Auto	488	$1,975,778
	None	55	118,620
	All	543	2,094,398
511	Auto	101	354,409
	None	8	21,522
	All	109	375,931
All	All	652	2,470,329
Nationwide			
500	Auto	11,926	$46,260,765
	None	1,898	5,173,770
	All	13,824	51,434,534
511	Auto	4,915	16,302,457
	None	641	1,517,309
	All	5,556	17,819,766
All	All	19,380	69,254,300

[1] Excludes insureds assumed to be paid up prior to the rate increase implementation date.
[2] Reflects full implementation of rate increases approved through January 2024.

23. Actuarial Certification

I am a Principal and Consulting Actuary for Milliman, Inc. and retained by MassMutual to render an opinion with regard to long-term care insurance rates. I am a member of the American Academy of Actuaries. I meet the Academy's qualification standards to render this actuarial opinion and am familiar with the requirements for filing long-term care insurance premiums and rate increases.

This memorandum has been prepared in conformity with all applicable Actuarial Standards of Practice, including Actuarial Standards of Practice No. 8, "Regulatory Filings for Health Benefits, Accident and Health Insurance, and Entities Providing Health Benefits" and 18, "Long-Term Care" and other applicable standards.

I hereby certify that, to the best of my knowledge and judgment, this rate submission is in compliance with the applicable laws and regulations of this jurisdiction and the rules of the Department. In my opinion, the rates are not excessive or unfairly discriminatory, and bear reasonable relationship to the benefits based on the loss ratio standards of this jurisdiction. This filing will enhance premium adequacy but may not be sufficient to prevent future rate action. Therefore, the certification that rates will remain stable under moderately adverse conditions cannot be made.

In forming my opinion, I have used actuarial assumptions and actuarial methods (which gave consideration to policy design, underwriting, and claim adjudication) and such tests of the actuarial calculations as I considered necessary. Based on these assumptions, or statutory requirements where necessary, the premium rate filing is in compliance with the loss ratio standards of this jurisdiction.

Certain models were developed to estimate the values included in this filing. The intent of the models was to estimate future experience. I have reviewed the models for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice.

I have relied on data and information provided by MassMutual and its third-party administrator to develop this filing, including but not limited to management's view of when a rate change may be considered, policy design, underwriting and claim adjudication process, seriatim in-force data, claim data, dividend expectation, and the company's long-term earnings rate. I have not audited or verified this data and information. If the underlying data or information is inaccurate or incomplete, the results of this filing may likewise be inaccurate or incomplete.

The basis for statutory contract reserves has been previously filed and is not impacted by this filing.

Missy Gordon
_____

Missy Gordon, FSA, MAAA
Principal and Consulting Actuary

Date: December 3, 2024

Exhibit I-a
Massachusetts Mutual Life Insurance Company
Actual and Projected Experience by Calendar Year
Nationwide Experience Before Requested Rate Increase
500 and 511 Series Combined

| | Calendar Year | Without Interest | | | | With Max. Val. Interest | | |
| | | A | B | C = B / A | D | E | F | G = F / E |
		Earned Premium	Incurred Claims	Incurred Loss Ratio	End of Year Lives	Earned Premium	Incurred Claims	Incurred Loss Ratio
	2008	1,163,543	0	0%	1,363	2,136,974	0	0%
	2009	9,315,855	4,222	0%	4,778	16,451,523	7,456	0%
	2010	22,502,295	126,906	1%	9,163	38,209,988	215,492	1%
	2011	38,999,398	370,488	1%	15,398	63,675,834	604,910	1%
	2012	66,298,722	421,299	1%	23,050	104,085,098	661,415	1%
	2013	78,729,575	2,512,125	3%	25,672	118,476,388	3,792,201	3%
	2014	80,179,464	4,279,219	5%	25,370	115,849,947	6,211,281	5%
Historical	2015	79,049,834	3,652,354	5%	25,187	109,859,873	5,094,052	5%
Experience	2016	78,145,036	1,852,609	2%	24,942	104,460,158	2,471,771	2%
	2017	77,354,403	2,783,233	4%	24,752	99,468,674	3,585,717	4%
	2018	76,177,624	5,390,597	7%	24,426	94,236,421	6,639,542	7%
	2019	73,859,203	8,001,218	11%	24,054	87,898,801	9,545,237	11%
	2020	72,706,644	9,843,359	14%	23,619	83,242,122	11,284,229	14%
	2021	70,620,775	12,011,536	17%	23,117	77,782,523	13,236,650	17%
	2022	65,141,624	16,255,034	25%	22,480	69,020,615	17,232,160	25%
	2023	64,741,922	23,689,285	37%	22,074	66,001,693	24,155,700	37%
	2024	64,961,444	18,160,406	28%	21,766	63,721,723	17,810,784	28%
	2025	65,347,027	21,534,981	33%	21,451	61,677,139	20,315,213	33%
	2026	64,527,364	25,450,963	39%	21,119	58,601,786	23,094,357	39%
	2027	62,958,368	30,006,372	48%	20,765	55,016,955	26,190,541	48%
	2028	61,241,856	35,267,351	58%	20,382	51,496,170	29,609,899	57%
	2029	59,438,008	41,383,566	70%	19,970	48,092,928	33,421,610	69%
	2030	57,508,321	48,322,392	84%	19,528	44,776,138	37,539,528	84%
	2031	55,489,592	56,107,377	101%	19,055	41,575,236	41,928,307	101%
	2032	53,347,643	64,680,010	121%	18,548	38,464,151	46,495,504	121%
	2033	51,154,513	74,030,524	145%	18,002	35,493,617	51,192,672	144%
	2034	48,845,779	84,125,264	172%	17,417	32,615,984	55,960,685	172%
	2035	46,430,255	94,797,010	204%	16,792	29,836,990	60,661,690	203%
	2036	43,915,448	105,826,818	241%	16,129	27,160,451	65,146,083	240%
	2037	41,358,547	116,685,003	282%	15,427	24,618,581	69,102,228	281%
Projected	2038	38,747,355	127,444,716	329%	14,691	22,199,029	72,607,881	327%
Future	2039	36,092,000	137,594,802	381%	13,924	19,902,895	75,417,110	379%
Experience	2040	33,428,051	146,881,285	439%	13,130	17,743,876	77,454,754	437%
	2041	30,767,970	155,104,055	504%	12,316	15,721,403	78,690,552	501%
	2042	28,145,973	161,876,546	575%	11,489	13,844,804	79,016,224	571%
	2043	25,581,005	167,223,729	654%	10,655	12,114,134	78,536,880	648%
	2044	23,094,203	170,568,002	739%	9,821	10,529,562	77,080,380	732%
	2045	20,706,743	171,910,573	830%	8,997	9,090,366	74,755,309	822%
	2046	18,438,018	171,537,923	930%	8,190	7,794,296	71,780,122	921%
	2047	16,302,937	169,412,455	1,039%	7,407	6,636,736	68,217,074	1,028%
	2048	14,313,427	165,549,834	1,157%	6,655	5,611,683	64,151,212	1,143%
	2049	12,477,557	159,841,295	1,281%	5,940	4,711,693	59,609,792	1,265%
	2050	10,800,179	152,837,260	1,415%	5,266	3,928,385	54,855,773	1,396%
	2051	9,282,655	144,841,691	1,560%	4,638	3,252,601	50,033,241	1,538%
	2052	7,922,924	135,935,125	1,716%	4,059	2,674,599	45,192,352	1,690%
	2053	6,716,518	126,265,150	1,880%	3,528	2,184,591	40,402,666	1,849%
	2054	5,656,227	116,320,659	2,057%	3,048	1,772,725	35,826,752	2,021%
	2055	4,732,930	106,271,422	2,245%	2,617	1,429,440	31,506,132	2,204%
	2056	3,936,038	96,277,895	2,446%	2,234	1,145,640	27,476,056	2,398%
	2057	3,254,065	86,774,759	2,667%	1,896	912,843	23,835,843	2,611%
	2058	2,675,278	77,640,873	2,902%	1,601	723,341	20,528,001	2,838%
	2059-2063	7,512,110	269,856,782	3,592%	4,817	1,849,060	64,404,927	3,483%
	2064-2068	2,527,799	127,883,030	5,059%	1,837	517,353	25,305,090	4,891%
	2069-2073	803,039	52,884,990	6,586%	657	136,095	8,673,566	6,373%
	2074-2078	234,156	19,044,203	8,133%	225	32,649	2,582,830	7,911%
	2079-2083	59,437	5,981,412	10,063%	74	6,784	666,524	9,825%
History		954,985,916	91,193,483	10%		1,250,856,630	104,737,813	8%
Future		1,140,732,756	4,240,138,505	372%		779,614,430	1,887,076,147	242%
Lifetime		2,095,718,672	4,331,331,988	207%		2,030,471,061	1,991,813,960	98%

Actuarial Memorandum   Exhibits

	Calendar Year	Without Interest				With Max. Val. Interest		
		A	B	C = B / A	D	E	F	G = F / E
		Earned Premium	Incurred Claims	Incurred Loss Ratio	End of Year Lives	Earned Premium	Incurred Claims	Incurred Loss Ratio
Historical Experience	2008	1,163,543	0	0%	1,363	2,136,974	0	0%
	2009	9,315,855	4,222	0%	4,778	16,451,523	7,456	0%
	2010	22,502,295	126,906	1%	9,163	38,209,988	215,492	1%
	2011	38,999,398	370,488	1%	15,398	63,675,834	604,910	1%
	2012	66,298,722	421,299	1%	23,050	104,085,098	661,415	1%
	2013	78,729,575	2,512,125	3%	25,672	118,476,388	3,792,201	3%
	2014	80,179,464	4,279,219	5%	25,370	115,849,947	6,211,281	5%
	2015	79,049,834	3,652,354	5%	25,187	109,859,873	5,094,052	5%
	2016	78,145,036	1,852,609	2%	24,942	104,460,158	2,471,771	2%
	2017	77,354,403	2,783,233	4%	24,752	99,468,674	3,585,717	4%
	2018	76,177,624	5,390,597	7%	24,426	94,236,421	6,639,542	7%
	2019	73,859,203	8,001,218	11%	24,054	87,898,801	9,545,237	11%
	2020	72,706,644	9,843,359	14%	23,619	83,242,122	11,284,229	14%
	2021	70,620,775	12,011,536	17%	23,117	77,782,523	13,236,650	17%
	2022	65,141,624	16,255,034	25%	22,480	69,020,615	17,232,160	25%
	2023	64,741,922	23,689,285	37%	22,074	66,001,693	24,155,700	37%
Projected Future Experience	2024	64,961,444	17,611,792	27%	21,766	63,721,723	17,272,777	27%
	2025	65,333,012	20,870,647	32%	21,451	61,663,916	19,688,672	32%
	2026	76,080,421	23,540,154	31%	20,545	69,084,784	21,361,340	31%
	2027	83,320,720	26,906,944	32%	20,195	72,786,249	23,487,336	32%
	2028	80,968,103	31,623,600	39%	19,818	68,053,560	26,553,721	39%
	2029	78,506,729	37,115,385	47%	19,417	63,487,847	29,978,850	47%
	2030	75,864,680	43,351,241	57%	18,987	59,030,765	33,683,346	57%
	2031	73,089,556	50,353,940	69%	18,528	54,721,426	37,636,220	69%
	2032	70,143,417	58,070,736	83%	18,035	50,531,551	41,753,746	83%
	2033	67,163,343	66,499,138	99%	17,504	46,557,343	45,996,213	99%
	2034	64,035,741	75,613,586	118%	16,935	42,713,927	50,312,648	118%
	2035	60,769,900	85,259,290	140%	16,327	39,006,716	54,575,020	140%
	2036	57,377,213	95,253,708	166%	15,681	35,441,215	58,656,782	166%
	2037	53,936,339	105,123,298	195%	14,998	32,061,282	62,277,517	194%
	2038	50,432,043	114,919,349	228%	14,282	28,850,389	65,497,031	227%
	2039	46,880,513	124,202,815	265%	13,535	25,810,796	68,104,732	264%
	2040	43,325,672	132,716,476	306%	12,763	22,958,135	70,015,780	305%
	2041	39,785,013	140,298,964	353%	11,971	20,291,555	71,212,140	351%
	2042	36,307,381	146,597,929	404%	11,166	17,824,509	71,593,067	402%
	2043	32,916,647	151,607,304	461%	10,355	15,555,730	71,238,942	458%
	2044	29,640,331	154,852,040	522%	9,545	13,484,585	70,015,660	519%
	2045	26,505,883	156,293,209	590%	8,744	11,609,286	68,002,017	586%
	2046	23,538,057	156,191,351	664%	7,959	9,925,967	65,396,161	659%
	2047	20,755,296	154,483,786	744%	7,198	8,427,572	62,242,929	739%
	2048	18,171,928	151,180,357	832%	6,468	7,105,263	58,619,085	825%
	2049	15,797,053	146,225,860	926%	5,773	5,948,361	54,566,486	917%
	2050	13,635,561	140,061,702	1,027%	5,119	4,945,082	50,302,547	1,017%
	2051	11,687,536	132,965,815	1,138%	4,509	4,082,647	45,960,536	1,126%
	2052	9,948,810	125,003,602	1,256%	3,946	3,347,702	41,584,933	1,242%
	2053	8,412,069	116,326,527	1,383%	3,431	2,726,924	37,246,380	1,366%
	2054	7,066,560	107,395,381	1,520%	2,965	2,207,030	33,098,601	1,500%
	2055	5,899,250	98,309,335	1,666%	2,546	1,775,248	29,163,569	1,643%
	2056	4,895,292	89,223,025	1,823%	2,173	1,419,496	25,478,065	1,795%
	2057	4,039,071	80,561,164	1,995%	1,845	1,128,644	22,141,868	1,962%
	2058	3,314,741	72,219,059	2,179%	1,558	892,623	19,104,979	2,140%
	2059-2063	9,278,095	251,988,670	2,716%	4,691	2,273,847	60,163,631	2,646%
	2064-2068	3,115,102	119,685,039	3,842%	1,790	634,344	23,692,157	3,735%
	2069-2073	987,773	49,235,093	4,984%	640	166,550	8,078,700	4,851%
	2074-2078	284,689	17,619,920	6,189%	220	39,549	2,390,159	6,044%
	2079-2083	70,171	5,589,714	7,966%	73	7,999	622,300	7,779%

	A	B	C		E	F	G
History	954,985,916	91,193,483	10%		1,250,856,630	104,737,813	8%
Future	1,438,241,154	3,872,946,944	269%		972,302,138	1,718,766,644	177%
Lifetime	2,393,227,071	3,964,140,427	166%		2,223,158,769	1,823,504,456	82%

Projected incurred claims in 2024 and 2025 are different from those in the before increase projections due to an immaterial modeling simplification in the application of the assumed reduced benefit option elections.

Exhibit II
Demonstration that the Requested Rate Increase Passes the 59%/85% Loss Ratio Minimum
Massachusetts Mutual Life Insurance Company
500 and 511 Series Combined Nationwide Experience

1	Accumulated value of initial earned premium	1,206,426,330	x	59%	=	715,461,051
2a	Accumulated value of earned premium	1,250,856,630				
2b	Accumulated value of prior premium rate schedule increases (2a - 1)	44,430,301	x	85%	=	37,765,755
3	Present value of future projected initial earned premium	481,979,152	x	59%	=	285,833,708
4a	Present value of future projected premium	972,302,138				
4b	Present value of future projected premium in excess of the projected initial earned premiums (4a - 3)	490,322,986	x	85%	=	416,774,538
5	Lifetime Earned Premium Times Prescribed Factor: Sum of 1, 2b, 3, and 4b					1,455,835,052
6a	Accumulated value of incurred claims without the inclusion of active life reserves					104,737,813
6b	Present value of future projected incurred claims without the inclusion of active life reserves					1,946,642,923
7	Lifetime Incurred Claims with Rate Increase: Sum 6a and 6b					2,051,380,736
8	Test: 7 is not less than 5					Pass

Items 2a, 4a, and 6a are consistent with the accumulated and present values shown in Exhibit I-b.
All accumulated or present values use the maximum valuation interest rate for contract reserves applicable to the year of issue, which ranges from 3.5% to 4.0% and averages 3.9%.
Item 3 reflects the impact of CBUL and RBO to align persistency with that in Item 4a.
Item 6b is higher than incurred claims shown in Exhibit I-b to reflect moderately adverse conditions. Incurred claims are 13% higher for the 500 Series and 14% higher for the 511 Series.

	Morbidity
500 Series	The basis of the morbidity assumptions were those used in the development of the company's previously approved policy form (MM-400, et al.). The 400 Series claim costs were modified based on the experience of the company's reinsurance carrier.
511 Series	The morbidity assumption was derived using industry experience as reported in the Intercompany Study 1984-2004 published by the Society of Actuaries Long Term Care Experience Committee (2004 Study) and adjusted, to the extent credible, by the aggregate experience of the company's reinsurer.

	Mortality
500 Series	80% of Annuity 2000 (A2000) Mortality table is used for active lives along with underwriting selection. Disabled Life Mortality is assumed to be the lesser of the claim termination rate and a multiple of the active mortality rate. The multiple varies by claim termination age. For claim termination ages less than or equal to 75, the multiple is 20.0. For claim termination ages greater than or equal to 90, the multiple is 5.0. The multiple grades linearly from ages 75 to 90.
511 Series	A2000 Mortality table is used for active lives along with adjustments by attained age and gender. The disabled mortality assumption is derived using industry experience as reported in the 2004 Study.

	Lapse Rates
500 Series	Voluntary lapse rates vary by duration and issue age. Lapse rates for the lifetime-payment option are provided in the table below.

Lifetime-Payment Lapse Rates

Duration	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	7.50%	5.50%	3.75%	3.00%	2.50%	2.50%	3.25%	4.50%	5.50%	7.75%
2	5.75%	4.25%	3.00%	2.25%	2.00%	2.00%	2.50%	3.50%	4.50%	6.00%
3	4.25%	3.25%	2.25%	1.75%	1.50%	1.50%	1.75%	2.50%	3.25%	4.25%
4	3.25%	2.25%	1.75%	1.25%	1.00%	1.00%	1.25%	2.00%	2.50%	3.25%
5	2.00%	1.50%	1.00%	0.75%	0.75%	0.75%	1.00%	1.25%	1.50%	2.25%
6	1.75%	1.25%	0.75%	0.65%	0.65%	0.65%	0.75%	1.00%	1.25%	2.00%
7	1.50%	1.00%	0.65%	0.65%	0.65%	0.65%	0.65%	0.75%	1.00%	1.75%
8	1.25%	0.75%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.75%	1.50%
9	1.00%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	1.25%
10	0.75%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	1.00%
11	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.75%
12+	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%

For limited-pay policies, the voluntary lapse rates are 3.5% in the first year and 0% thereafter.

	Lapse Rates Continued
511 Series	Voluntary lapse rates vary by duration and issue age.

	Lifetime-Payment Lapse Rates									
	Issue Ages									
Duration	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	8.60%	4.50%	3.70%	3.55%	2.85%	3.50%	3.50%	3.85%	4.05%	3.55%
2	5.55%	4.15%	3.60%	2.90%	2.40%	2.35%	2.75%	3.15%	3.00%	3.10%
3	3.55%	3.00%	2.25%	2.10%	1.80%	1.85%	1.95%	1.95%	2.05%	2.05%
4	3.30%	2.05%	2.15%	1.70%	1.50%	1.55%	1.60%	1.80%	1.85%	1.75%
5	2.15%	1.95%	1.70%	1.35%	1.05%	1.00%	1.20%	1.15%	1.20%	1.35%
6	2.15%	1.95%	1.60%	1.10%	1.00%	1.00%	1.10%	1.15%	1.15%	1.25%
7	2.15%	1.95%	1.60%	1.10%	1.00%	1.00%	1.10%	1.15%	1.15%	1.25%
8	1.35%	1.35%	1.25%	1.05%	0.95%	0.90%	0.95%	1.05%	1.00%	1.00%
9	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%	0.80%
10	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%	0.70%
11+	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%

	Limited-Payment Lapse Rates									
	Issue Ages									
Duration	<40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
1	3.20%	2.65%	2.30%	2.00%	1.85%	1.90%	2.15%	2.30%	2.35%	2.15%
2	2.85%	2.45%	2.05%	1.75%	1.55%	1.60%	1.70%	1.90%	2.00%	1.85%
3	2.30%	1.80%	1.55%	1.20%	1.10%	1.20%	1.25%	1.30%	1.70%	1.30%
4	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
5	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
6	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%
7	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
8+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

	Benefit Expiry Rates
All	An explicit benefit expiry assumption was not included in the original pricing memoranda.

	Interest Rate
All	4.0% maximum valuation rate

	Improvement
All	An annual improvement assumption was not included in pricing.

Exhibit IV
Massachusetts Mutual Life Insurance Company
Status of Filings as of November 20, 2024
All Jurisdictions in Which These Forms Are in Force
500 and 511 Series

Jurisdiction	Rate Series	Insureds In Force [1] (12/31/2023)	Annualized Premium [1] (12/31/2023)	Percent of Total Premium	2018 Avg Req Inc [2]	2018 Disposition Date	2018 Avg Inc to be Impl [2][4]	2019 Avg Req Inc [2]	2019 Disposition Date	2019 Avg Inc to be Impl [2][4]	2020 Avg Req Inc [2]	2020 Disposition Date	2020 Avg Inc to be Impl [2][4]	2021 Avg Req Inc [2]	2021 Disposition Date	2021 Avg Inc to be Impl [2][4]	2023 Avg Req Inc [2]	2023 Disposition Date	2023 Avg Inc to be Impl [2][4]	2024 Avg Req Inc [2]	Status [3][5][6]	2024 Date Submitted	2024 Disposition Date	2024 Avg Inc to be Impl [2][4]	Avg Cumulative Inc to be Impl [2][4]
Alaska	500 Series	2	$3,489	0.0%	77%	Not Applicable[7]	77%										21%	Not Applicable[7]	21%		Not Filed				115%
Alaska	511 Series	4	$13,422	0.0%	35%	Not Applicable[7]	35%										4%	Not Applicable[7]	4%		Not Filed				41%
Alabama	500 Series	103	$338,919	0.5%	69%	2/5/2021	15%							15%	3/16/2022	15%	15%	12/11/2023	15%		Not Yet Filed				52%
Alabama	511 Series	35	$101,203	0.1%	31%	2/5/2021	15%							15%	3/16/2022	15%	10%	12/11/2023	10%		Not Yet Filed				45%
Arkansas	500 Series	31	$86,893	0.1%	55%	8/1/2018	0%	57%	3/31/2020	15%	36%	2/1/2021	14%	42%	5/12/2022	6%	78%	4/11/2024	15%		Not Yet Filed				60%
Arkansas	511 Series	3	$8,869	0.0%	27%	8/1/2018	0%	27%	3/31/2020	15%	10%	2/1/2021	10%	15%	5/12/2022	8%	6%	4/11/2024	6%		Not Yet Filed				46%
Arizona	500 Series	133	$475,079	0.7%	51%	12/26/2019	43%				28%	1/14/2022	28%				22%				TBD				83%
Arizona	511 Series	49	$150,517	0.2%	29%	12/26/2019	29%										8%				TBD				29%
California	500 Series	964	$4,057,927	5.9%	91%	6/29/2021	85%														Not Filed				85%
California	511 Series	1,237	$3,808,345	5.5%	30%	6/29/2021	17%														Not Filed				17%
Colorado	500 Series	173	$785,830	1.1%	127%	3/11/2022	104%														Not Filed				104%
Colorado	511 Series	565	$1,876,741	2.7%	45%	3/11/2022	45%														Not Filed				45%
Connecticut	500 Series	242	$1,208,635	1.7%	68%	8/22/2018	44%							29%	7/25/2022	21%					Not Filed				73%
Connecticut	511 Series	58	$196,903	0.3%	28%	8/22/2018	38%														Not Filed				38%
District of Columbia	500 Series	50	$230,904	0.3%	84%	8/24/2018	10%	67%	9/29/2020	9%				9%	7/22/2022	9%	95%	12/15/2023	8%		Not Yet Filed				42%
District of Columbia	511 Series	10	$47,868	0.1%	42%	8/24/2018	10%	29%	9/29/2020	10%				9%	7/22/2022	9%	18%	12/15/2023	5%		Not Yet Filed				39%
Delaware	500 Series	30	$105,918	0.2%	72%	7/11/2019	68%										35%	5/6/2024	42%		Not Filed				139%
Delaware	511 Series	3	$17,958	0.0%	27%	7/11/2019	27%										8%	5/6/2024	8%		Not Filed				37%
Florida	500 Series	602	$2,258,105	3.3%	99%	12/10/2020	49%										24%				Not Filed				49%
Florida	511 Series	426	$1,306,538	1.9%	25%	12/10/2020	28%							6%	6/20/2022	0%	24%				TBD				28%
Georgia	500 Series	455	$1,548,789	2.2%	64%	9/6/2018	17%	43%	4/1/2020	11%	30%	3/24/2021	10%	29%	5/19/2022	5%	51%	3/19/2024	8%		Not Yet Filed				64%
Georgia	511 Series	139	$400,673	0.6%	28%	9/6/2018	18%	9%	4/1/2020	7%	1%	3/24/2021	1%	10%	5/19/2022	10%	0%	3/19/2024	0%		Not Yet Filed				41%
Hawaii	500 Series	118	$365,005	0.5%	61%	8/10/2020	61%														Not Filed				61%
Hawaii	511 Series	37	$101,784	0.1%	30%	8/10/2020	30%														Not Filed				30%
Iowa	500 Series	126	$428,810	0.6%	67%	9/25/2018	15%	48%	6/10/2020	31%				26%	10/7/2022	10%	39%	8/23/2024	10%		Not Filed				81%
Iowa	511 Series	44	$119,565	0.2%	32%	9/25/2018	15%	15%	6/10/2020	15%				10%	10/7/2022	10%	0%	8/23/2024	0%		Not Filed				45%
Idaho	500 Series	45	$120,961	0.2%	60%	3/5/2021	35%										87%				TBD				35%
Idaho	511 Series	9	$34,630	0.1%	27%	3/5/2021	20%										26%				TBD				20%
Illinois	500 Series	375	$1,395,307	2.0%	67%	7/24/2020	67%										34%	4/11/2024	34%		Not Filed				124%
Illinois	511 Series	170	$555,132	0.8%	29%	7/24/2020	29%										10%	4/11/2024	10%		Not Filed				41%
Indiana	500 Series	205	$610,940	0.9%	76%	11/25/2019	9%				66%	4/30/2021	10%				114%	9/23/2024	20%		Not Filed				44%
Indiana	511 Series	31	$110,503	0.2%	30%	11/25/2019	10%				19%	4/30/2021	9%				21%	9/23/2024	10%		Not Filed				32%
Kansas	500 Series	138	$447,643	0.6%	64%	10/4/2019	64%										31%				TBD				64%
Kansas	511 Series	36	$96,756	0.1%	30%	10/4/2019	30%										7%				TBD				30%
Kentucky	500 Series	157	$490,392	0.7%	61%	6/16/2019	61%										40%	6/7/2024	40%		Not Filed				126%
Kentucky	511 Series	28	$75,644	0.1%	28%	6/16/2019	28%										8%	6/7/2024	8%		Not Filed				38%
Louisiana	500 Series	85	$267,312	0.4%	68%	4/30/2019	20%				47%	5/12/2021	19%				69%	7/19/2024	24%		Not Filed				78%
Louisiana	511 Series	21	$61,258	0.1%	27%	4/30/2019	18%				7%	5/12/2021	7%				7%	7/19/2024	7%		Not Filed				36%
Massachusetts	500 Series	501	$2,126,210	3.1%	62%	4/26/2019	30%				38%	2/24/2021	20%				57%	4/19/2024	61%		Not Filed				151%
Massachusetts	511 Series	255	$982,675	1.4%	31%	4/26/2019	20%				8%	2/24/2021	8%				10%	4/19/2024	10%		Not Filed				43%
Maryland	500 Series	543	$2,094,398	3.0%	77%	8/25/2020	35%													101%	Not Yet Filed				35%
Maryland	511 Series	109	$375,931	0.5%	30%	8/25/2020	24%													23%	Not Yet Filed				24%
Maine	500 Series	22	$85,579	0.1%	49%	8/28/2019	50%										62%	3/4/2024	62%		Not Filed				143%
Maine	511 Series	10	$30,494	0.0%	27%	8/28/2019	29%										9%	3/4/2024	9%		Not Filed				41%
Michigan	500 Series	323	$1,121,989	1.6%	51%	8/27/2018	51%										22%	10/17/2023	22%		Not Filed				84%
Michigan	511 Series	92	$273,664	0.4%	28%	8/27/2018	28%										4%	10/17/2023	4%		Not Filed				33%
Minnesota	500 Series	219	$800,344	1.2%	63%	4/30/2019	30%				24%	12/9/2021	45%				31%				TBD				88%
Minnesota	511 Series	50	$150,781	0.2%	29%	4/30/2019	28%				1%	12/9/2021	13%				0%				TBD				44%
Missouri	500 Series	330	$1,018,928	1.5%	65%	3/23/2020	65%										32%				TBD				65%
Mississippi	500 Series	121	$403,317	0.6%	65%	4/26/2019	24%	33%	4/7/2021	18%				10%	7/7/2023	7%	25%				TBD				56%
Mississippi	511 Series	23	$65,330	0.1%	28%	4/26/2019	22%	5%	4/7/2021	5%				10%	7/7/2023	10%	0%				TBD				40%
Montana	500 Series	27	$121,329	0.2%	52%	2/3/2020	53%										23%	9/17/2024	20%		Not Filed				83%
North Carolina	500 Series	393	$1,230,645	1.8%	61%	4/9/2020	43%										55%				TBD				43%
North Carolina	511 Series	120	$347,468	0.5%	29%	4/9/2020	29%										10%				TBD				29%
North Dakota	500 Series	5	$8,003	0.0%	78%	8/15/2018	0%										165%	4/10/2024	0%		Not Filed				0%
North Dakota	511 Series	5	$12,401	0.0%	38%	8/15/2018	0%										54%	4/10/2024	0%		Not Filed				0%
Nebraska	500 Series	320	$1,050,375	1.5%	92%	12/2/2019	83%										22%				TBD				83%
Nebraska	511 Series	70	$177,521	0.3%	28%	12/2/2019	30%										8%				TBD				30%
New Hampshire	500 Series	83	$571,495	0.8%	55%	5/19/2020	44%										69%	12/29/2023	69%		Not Filed				143%
New Hampshire	511 Series	42	$157,872	0.2%	28%	5/19/2020	30%										12%	12/29/2023	12%		Not Filed				46%
New Jersey	500 Series	503	$2,009,101	2.9%	85%	3/29/2023	33%														Not Filed				33%
New Jersey	511 Series	277	$949,149	1.4%	37%	3/29/2023	21%														Not Filed				21%
New Mexico	500 Series	95	$273,546	0.4%	66%	8/22/2018	10%	53%	3/20/2020	15%	34%	1/13/2021	11%	29%	5/9/2022	0%	61%				TBD				41%
New Mexico	511 Series	16	$57,676	0.1%	24%	8/22/2018	10%	13%	3/20/2020	10%	2%	1/13/2021	2%	18%	5/9/2022	0%	7%				TBD				24%
Nevada	500 Series	15	$52,507	0.1%	79%	5/20/2019	79%										34%	3/13/2024	32%		Not Filed				137%
Nevada	511 Series	5	$20,716	0.0%	25%	5/20/2019	25%										8%	3/13/2024	5%		Not Filed				31%
New York	500 Series	1,445	$5,500,503	7.9%	70%	4/11/2019	5%	65%	10/12/2021	5%							125%	11/19/2024	69%		Not Filed				86%
New York	511 Series	295	$1,171,514	1.7%	32%	4/11/2019	5%	25%	10/12/2021	5%							33%	11/19/2024	16%		Not Filed				28%
Ohio	500 Series	370	$1,108,291	1.6%	63%	2/4/2019	15%	42%	10/29/2021	13%							72%				TBD				30%
Ohio	511 Series	127	$403,850	0.6%	30%	2/4/2019	15%	13%	10/29/2021	10%							11%				TBD				27%
Oklahoma	500 Series	175	$675,117	1.0%	63%	8/22/2018	10%	51%	3/16/2020	28%				33%	4/20/2022	8%	51%	12/4/2023	6%		Not Yet Filed				61%
Oklahoma	511 Series	56	$137,095	0.2%	29%	8/22/2018	10%	17%	3/16/2020	17%				10%	4/20/2022	10%	0%	12/4/2023	0%		Not Yet Filed				42%
Oregon	500 Series	67	$150,974	0.2%	161%																TBD				0%
Oregon	511 Series	18	$36,375	0.1%	54%																TBD				0%
Pennsylvania	500 Series	924	$3,878,562	5.6%	62%	12/18/2018	45%							31%	10/14/2022	33%					Not Filed				93%
Pennsylvania	511 Series	225	$797,918	1.2%	28%	12/18/2018	28%							10%	10/14/2022	10%					Not Filed				41%
Puerto Rico	500 Series	102	$253,685	0.4%	45%	11/9/2020	45%										30%				TBD				45%
Puerto Rico	511 Series	37	$80,514	0.1%	23%	11/9/2020	23%										8%				TBD				23%
Rhode Island	500 Series	58	$179,932	0.3%	50%	4/21/2022	50%														Not Filed				50%
Rhode Island	511 Series	14	$45,167	0.1%	30%	4/21/2022	30%														Not Filed				30%
South Carolina	500 Series	255	$800,825	1.2%	59%	12/12/2018	20%	35%	3/23/2021	16%				33%	6/13/2022	7%	49%	5/24/2024	10%		Not Filed				63%
South Carolina	511 Series	101	$294,882	0.4%	26%	12/12/2018	19%	6%	3/23/2021	6%				14%	6/13/2022	10%	0%	5/24/2024	0%		Not Filed				39%
South Dakota	500 Series	29	$70,601	0.1%	59%	8/22/2018	59%										25%	4/29/2024	25%		Not Filed				99%
South Dakota	511 Series	3	$9,361	0.0%	31%	8/22/2018	31%										4%	4/29/2024	4%		Not Filed				36%
Tennessee	500 Series	301	$1,332,664	1.9%	59%	1/7/2019	48%				10%	3/8/2021	7%	26%	8/31/2022	2%	28%	12/18/2023	28%		Not Filed				107%
Tennessee	511 Series	103	$324,921	0.5%	29%	1/7/2019	29%										6%	12/18/2023	6%		Not Filed				36%
Texas	500 Series	1,064	$3,938,997	5.7%	84%	9/1/2020	83%										20%				TBD				83%
Texas	511 Series	272	$815,790	1.2%	33%	9/1/2020	33%										9%				TBD				33%

Exhibit IV
Massachusetts Mutual Life Insurance Company
Status of Filings as of November 20, 2024
All Jurisdictions in Which These Forms Are in Force
500 and 511 Series

Jurisdiction	Rate Series	12/31/2023 Insureds In Force[1]	12/31/2023 Annualized Premium[1]	Percent of Total Premium	2018 Rate Filings Average Requested Increase[2]	Disposition Date	Average Increase to be Implemented[2][4]	2019 Rate Filings Average Requested Increase[2]	Disposition Date	Average Increase to be Implemented[2][4]	2020 Rate Filings Average Requested Increase[2]	Disposition Date	Average Increase to be Implemented[2][4]	2021 Rate Filings Average Requested Increase[2]	Disposition Date	Average Increase to be Implemented[2][4]	2023 Rate Filings Average Requested Increase[2]	Disposition Date	Average Increase to be Implemented[2][4]	2024 Rate Filings Average Requested Increase[2]	Status[3][5][6]	Date Submitted	Disposition Date	Average Increase to be Implemented[2][4]	Average Cumulative Increase to be Implemented[2][4]
Utah	500 Series	90	$246,434	0.4%	53%	12/19/2018	53%										26%	3/3/2024	26%		Not Filed				94%
	511 Series	19	$43,730	0.1%	30%	12/19/2018	30%										5%	3/3/2024	5%		Not Filed				37%
Virginia	500 Series	752	$2,748,241	4.0%	65%	5/18/2021	60%										42%	TBD							60%
	511 Series	247	$812,770	1.2%	29%	5/18/2021	29%										12%	TBD							29%
Vermont	500 Series	21	$87,975	0.1%	92%	1/13/2022	92%														Not Yet Filed				92%
	511 Series	3	$10,774	0.0%	38%	1/13/2022	38%														Not Yet Filed				38%
Washington	500 Series	458	$1,613,021	2.3%	100%	12/15/2020	26%							26%	3/17/2022	26%	38%	7/11/2024	38%		Not Filed				119%
Wisconsin	500 Series	119	$490,659	0.7%	61%	8/29/2018	61%										30%	12/5/2023	30%		Not Filed				109%
	511 Series	48	$130,476	0.2%	28%	8/29/2018	28%										7%	12/5/2023	7%		Not Filed				37%
West Virginia	500 Series	40	$102,471	0.1%	42%	3/19/2019	42%										26%	7/2/2024	26%		Not Filed				78%
	511 Series	8	$15,343	0.0%	21%	3/19/2019	21%										5%	7/2/2024	5%		Not Filed				27%
Wyoming	500 Series	20	$60,958	0.1%	67%	9/12/2018	67%										29%	6/27/2024	32%		Not Filed				121%
	511 Series	1	$3,300	0.0%	43%	9/12/2018	43%										5%	6/27/2024	5%		Not Filed				50%

[1] Excludes policies assumed to be paid up prior to January 1, 2026. Reflects increases approved through January 2024.

[2] Average rate increase percentages are based on the distribution of business in force as of December 31, 2023, and reflect the most recent request made in the filing, which may have been updated from the initial request over the course of the filing.

[3] "Approved" is used in a generic sense to indicate that a rate increase has been approved, accepted, filed for use, etc., by a jurisdiction.

[4] Certain jurisdictions may have approved a multi-year increase, which results in a slightly higher rate level than requested.

[5] Where "Not Filed" is indicated, the company is not currently requesting an increase as part of the referenced filing due to prior rate guarantees, phase-ins, or other state-specific requirements.

[6] "TBD" (to be determined) is used in jurisdictions where the prior filing is still pending.

[7] Alaska does not require Long-Term Care rates to be filed before use.

Appendix A
Development and Justification of Assumptions Used in this Filing

This appendix describes the development of, and justification for, the actuarial assumptions used in this filing.

The persistency and morbidity assumptions were developed using historical experience of MassMutual policies. Where actual experience had low credibility or did not exist, industry experience and actuarial judgment was also used. Historical experience through 2018 was used in the assumption development and morbidity experience included claim runout through 2019. Experience on all of MassMutual's standalone long-term care (LTC) products available at the time of development was combined in determining the assumptions described herein. Due to this pooling, not all product attributes and related assumptions described below may apply to this filing.

The persistency and morbidity assumptions were developed on a first principles basis. In this context, "first principles" means developing key assumptions (namely, morbidity and mortality) at the component level and modeling active and disabled lives separately. Separate assumptions were developed for: (1) claim incidence, (2) voluntary lapse, (3) active mortality, (4) claim termination (including separate assumptions for disabled mortality and recovery), and (5) utilization. For each assumption except utilization, experience from 2009 through 2018 with runout through 2019 was used. The utilization assumption was developed based on historical experience from 2015 through September 30, 2019 with runout through December 31, 2019 to capture more recent information as cost of care and utilization trends can fluctuate over short periods of time. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below.

As an additional consideration, the COVID-19 pandemic has created uncertainty regarding future LTC experience. However, due to the long duration nature of LTC insurance, minor deviations in experience over a relatively small number of calendar years are not expected to have a significant impact on lifetime projections. Therefore, no adjustments were made to these assumptions to capture anticipated impacts of the pandemic. However, emerging experience and trends will continue to be monitored so that adjustments can be included in the future if believed to be representative of long-term trends.

The rate increase dependent assumptions were developed using historical experience and actuarial judgment where experience was limited or did not exist. A nationwide rate increase was filed for 200-511 Series beginning in 2018 and for the 513 Series beginning in 2022 such that this experience and considerations for these prior rate increases are described as applicable in the sections that follow.

The sections that follow provide more detail on the development of and justification for the assumptions used in the projections in this filing.

Active Assumptions

The assumptions for active (i.e., healthy) lives were developed based on MassMutual's historical experience from 2009 through 2018, with runout through 2019. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below. The active assumptions include (1) claim incidence (the probability that an active life becomes disabled), (2) voluntary lapse, and (3) active mortality.

Claim Incidence

Claim incidence probabilities (i.e., the probability of an insured becoming disabled) were developed using the 2017 Milliman *Long-Term Care Guidelines* (*Guidelines*) incidence curves with adjustments for retrospective morbidity improvement. These assumptions were developed based on the following three starting sites of care—assisted living facility (ALF), home health care (HHC), or skilled nursing facility (SNF).

Exhibit A-1 provides a summary of actual-to-expected (A:E) experience by site of care for claim incidence in policy durations 7 and later for each characteristic by which the claim incidence assumption varies. The following items are included:

- Exposure [A] reflects the length of time a covered life is exposed to the risk of becoming disabled (i.e., an exact exposure basis).

- Claim counts [B] are based on historical claim experience and are provided by situs.

- A:E ratios are calculated as actual claim incidence probabilities to the *Guidelines* with a retrospective morbidity improvement adjustment [C] and to the assumption used in this filing [D]. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

Appendix A
Development and Justification of Assumptions Used in this Filing

Lifetime Payment Voluntary Lapse

The voluntary lapse assumption for policies with a lifetime payment option, without a discounted renewal payment option, uses the base lapse probabilities underlying the all-lives assumption used in the company's 2018 rate increase filings, which varied by policy duration and partner status at issue (i.e., partnered versus non-partnered). This prior assumption was developed for use with an all-lives exposure base (i.e., including both active and disabled insureds); however, it is considered an appropriate expected basis for an active assumption because lapses due to benefit expiry were explicitly removed from the prior study and the ultimate lapse probability was assumed to be constant (rather than decreasing).

The attained age adjustment factors developed from the predictive model produced a U-shaped pattern (i.e., decreased and then increased) by attained age. However, the attained age adjustment factors are held constant for attained ages less than 50 and for attained ages 70 and older to produce an ultimate voluntary lapse assumption that is constant rather than increasing by attained age. The adjustments are held constant after this point as this increasing lapse trend may be due to miscoding of deaths or underreporting of deaths in the Social Security Death Master File. An additional attained age adjustment to mortality was developed (Exhibit A-3a) to capture these terminations (i.e., higher lapses at older attained ages) such that the combined mortality and voluntary lapse assumption better aligns with actual experience as shown in Exhibit A-4.

Exhibit A-2 supports the voluntary lapse assumption and provides the following information by benefit period (non-lifetime or lifetime), inflation protection option (auto or none), payment method (with or without discounted renewal payment option), and attained age.

- Exhibit A-2a provides the ultimate voluntary lapse probabilities after all experience adjustments. These ultimate voluntary lapse probabilities are applicable for attained ages 70 and older in policy durations 9 and later.

- Exhibit A-2b provides A:E experience and includes the following:

  - Exposure [A] reflects the length of time a covered life is exposed to the risk of voluntary lapse (i.e., exact exposure basis).

  - Actual lapses [B].

  - A:E ratios are calculated as actual lapse probabilities to the unadjusted voluntary lapse assumption used in the company's nationwide 2018 rate increase filings [C], the assumption with experience adjustments directly from the predictive model (i.e., without the attained age caps) [D], and the assumption used in this filing (i.e., with the attained age caps) [E]. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience. Additionally, the A:E in column [E] is greater than 1.0 due to the reallocation of lapses at higher attained ages as described above.

The experience underlying Exhibit A-2b captures policies with a lifetime payment option, without a discounted renewal payment option, for policy durations 9 and later to focus on the fit of the ultimate voluntary lapse assumption and excludes "shock" lapses. For all cohorts except the 513 Series, there have been prior rate increases in the underlying experience, and thus the option to lapse with a contingent benefit (a.k.a., shock lapse). Policyowners that elected a contingent benefit upon lapse (CBUL) were not counted as a voluntary lapse; however, their annual policy exposure was valued up to the date of election. That said, the number of rate increases approved prior to December 31, 2018 is limited and considered immaterial to the development of this assumption.

Discounted Renewal or Limited Payment Voluntary Lapse

For policies with a discounted renewal payment option and/or limited payment option, the voluntary lapse assumption is a function of the voluntary lapse probabilities for policies with a lifetime payment option, without a discounted renewal payment option. The discounted renewal payment option and limited payment option lapse adjustments are unchanged from the all-lives assumption used in the company's 2018 rate increase filings and were validated using sensitivity testing analysis in lieu of leveraging predictive analytics or traditional A:E studies. Based on this sensitivity testing, the impact of adjustments to the discounted renewal payment option and limited payment option voluntary lapse assumptions on the projections is immaterial.

Appendix A
Development and Justification of Assumptions Used in this Filing

Active Mortality

Active mortality was developed based on the 2012 Individual Annuity Mortality table (2012IAM) with adjustments to make it applicable to an active-life exposure base and reflect retrospective active mortality improvement. Experience adjustment factors were developed using predictive analytics with additional adjustments to increase mortality for ages 70 and older commensurate with the capping applied for voluntary lapse mentioned above.

Exhibit A-3 supports the active mortality assumption and provides the following information by policy duration, sex, partner status at issue, attained age, and underwriting class:

▪ Exhibit A-3a provides the adjustment factors that are to be applied to the 2012IAM hazard rates; the adjusted hazard rates are converted back into mortality probabilities to create the adjusted mortality assumption. The attained age adjustment factors are applicable to policy durations 7 and later.

▪ Exhibit A-3b provides A:E results for business in policy durations 7 and later, and includes the following:

  • Exposure [A] reflects the length of time a covered life is exposed to the risk of death (i.e., exact exposure basis).

  • Actual deaths of active insureds [B].

  • A:E ratios are calculated as actual mortality probabilities to the unadjusted active 2012IAM mortality probabilities with a retrospective mortality improvement adjustment [C], the assumption with experience adjustments directly from the predictive model (i.e., without the composite termination attained age adjustments) [D], and the assumption used in this filing (i.e., with the composite termination attained age adjustments) [E]. This fit will not be perfect (i.e., ratio deviates from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience. Additionally, the A:E in column [E] is less than 1.0 due to the reallocation of lapses at higher attained ages as described above.

Composite Policy Terminations

Exhibit A-4 supports the active composite termination (i.e., active mortality and voluntary lapse combined) assumption. It provides an A:E comparison of the composite termination experience and includes the following:

• Exposure [A] reflects the length of time a covered life is exposed to the risk of termination (i.e., exact exposure basis).

• Actual composite terminations of active insureds [B].

• A:E ratios are calculated as actual termination probabilities to the expected composite termination probabilities [C]. The A:E provides an indication of fit. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

The experience underlying Exhibit A-4 reflects policies with a lifetime payment option, without a discounted renewal payment option, for policy durations 9 and later to focus on the fit of the ultimate composite termination assumption. It also excludes "shock" lapses as described above for Exhibit A-2b.

Disabled Assumptions

The assumptions for disabled (i.e., on-claim) lives were developed based on detailed historical experience from 2009 through 2018 with runout through 2019. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below. The disabled assumptions include (1) disabled mortality and (2) recovery. A composite claim termination assumption was also developed and used to derive an implied recovery assumption, as described below.

Disabled Mortality

Disabled mortality probabilities were developed based on the disabled mortality tables developed in conjunction with the *Guidelines* with adjustments to reflect experience from 2009 through 2018 with runout through 2019. The

experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below.

Exhibit A-5 provides a summary of A:E results for experience in claim months 4 through 96 for each characteristic by which the disabled mortality assumption varies (starting site of care, sex, benefit period, partner status at issue, payment type, claim duration, and incurred age) and includes the following:

- Exposure [A] reflects the length of time a disabled insured is exposed to the risk of death (i.e., exact exposure basis).

- Actual deaths [B] of disabled insureds.

- A:E ratios are calculated as actual deaths of disabled insureds to the unadjusted disabled mortality tables developed in conjunction with the *Guidelines* [C] and the disabled mortality assumption used in this filing [D]. The A:E provides an indication of fit. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

Implied Recovery

Implied recovery probabilities were developed from the composite claim termination (described below) and disabled mortality assumptions using the following formula:

Implied Recovery Probability = 1 – [(1 – Claim Termination Probability) / (1 – Disabled Mortality Probability)]

Minor smoothing was applied to ensure that the resulting recovery probabilities were reasonable by claim month and across key claimant characteristics.

Exhibit A-6 provides a summary of A:E results for experience in claim months 4 through 96 for each characteristic by which the implied recovery assumption varies (starting site of care, sex, benefit period, partner status at issue, payment type, claim duration, and incurred age) and includes the following:

- Exposure [A] reflects the length of time a disabled insured is exposed to the opportunity of recovery (i.e., exact exposure basis).

- Actual recoveries [B] of disabled insureds.

- A:E ratios are calculated as actual recoveries of disabled insureds to the recovery tables developed in conjunction with the *Guidelines* [C] and the implied recovery assumption used in this filing [D]. The *Guidelines* A:E result is included for illustrative purposes only as this expected basis was not directly used in developing the implied recovery assumption.

Composite Claim Terminations

Composite claim termination probabilities were developed using the *Guidelines* with adjustments to reflect experience from 2009 through 2018 with runout through 2019. The experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below.

Exhibit A-7 provides a summary of A:E results for experience in claim months 4 through 96 for each characteristic by which the composite claim termination assumption varies (starting site of care, sex, benefit period, partner status at issue, payment type, claim duration, and incurred age) and includes the following:

- Exposure [A] reflects the length of time a disabled insured is exposed to the risk of claim termination (i.e., exact exposure basis).

- Actual terminations [B] of disabled insureds.

- A:E ratios are calculated as actual claim terminations to the unadjusted *Guidelines* claim termination tables [C] and the claim termination assumption used in this filing [D]. The A:E provides an indication of fit. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience.

Appendix A
Development and Justification of Assumptions Used in this Filing

Utilization Assumption

Utilization recognizes that less than the full potential benefit may be paid for an LTC claim due to services received less frequently than daily ("day" utilization) or actual charges less than the daily maximum ("dollar" utilization). The utilization assumption is a "total" utilization assumption—that is, it captures the impact of both day and dollar utilization. The utilization assumption was developed based on historical experience from 2015 through September 30, 2019 with runout through December 31, 2019.

For MassMutual's in-force business that pays services on a reimbursement basis, total utilization was split into two components (1) policy duration utilization and (2) claim duration utilization.

Policy Duration Utilization

Total policy duration utilization was developed using the *Guidelines* utilization projection model with inputs based on MassMutual's actual utilization percentages and cost of care trends.

The policy duration utilization assumption also captures how utilization by site of care changes over time due to (1) inflation of the daily benefit and (2) cost of care trends.

The policy duration utilization assumption produced using these assumptions and the *Guidelines* utilization projection model were then used as the underlying expectation for the claim duration utilization analysis described below.

Claim Duration Utilization

Total utilization by claim duration was developed based on the policy duration utilization assumption described above with adjustments for MassMutual's actual claim experience by starting site of care. Experience adjustment factors were developed using predictive analytics as described in the Predictive Analytics section below, with additional adjustments to trend the utilization assumption towards an ultimate level in late claim durations where experience was limited.

Exhibit A-8 supports the claim duration total utilization assumption for policies that pay for services on a reimbursement basis and provides the following information by starting site of care, claim duration month, benefit period (non-lifetime or lifetime), inflation protection option (auto or none), and incurred age.

- Exhibit A-8a provides the claim duration adjustment factors described above.

- Exhibit A-8b provides A:E results for experience in claim months 4 through 96 and includes the following:

  - Actual paid claims [A].

  - A:E ratios are shown separately for the policy duration utilization assumption described above [B] and the utilization assumption used in this filing [C]. This fit will not be perfect (i.e., ratios deviate from 1.0) because the main goal is to develop an assumption that generalizes well to new data by balancing assumption complexity and fit on the historical experience. Additionally, as seen in Exhibit A-8b, the trend adjustments applied move the overall fit for claim years 5 and later further from 1.00 as this is the point at which the trend adjustments are applied to the assumption.

For MassMutual's in-force business that pays for services on an indemnity basis, an explicit day utilization assumption was developed based on the days of care used only. Indemnity business has dollar utilization of 100%; therefore, its total utilization assumption is equal to the day utilization. Exhibit A-9 provides information like Exhibit A-8, except for policies that pay services on an indemnity basis.

Prospective Improvement

No prospective improvement is assumed for any assumption.

Rate Increase Dependent Assumptions

At the time of a rate increase, policyowners have options to elect a CBUL or reduced benefit options (RBO). Adverse selection is assumed relative to CBUL and RBO elections. These policyowner behavior assumptions are provided below and were developed primarily based on MassMutual's actual CBUL and RBO election rate experience and actuarial judgment—particularly at the higher rate increase magnitudes where limited experience exists.

Contingent Benefit Upon Lapse Election Rates

A CBUL election rate is determined as a function of the magnitude of the rate increase. The assumption is applied on a seriatim basis based on the cumulative increase, as shown in the following table. The CBUL election rate is then prorated between that for the cumulative increase and, if applicable, the prior approved increase.

Cumulative Rate Increase	CBUL Election Assumption
15-80%	Cumulative Rate Increase x 6%
80%+	(80% x 6%) + (Cumulative Rate Increase - 80%) x 3%

No CBUL elections are assumed for cumulative increases less than 15% or for policies with a limited payment option.

Reduced Benefit Options

The RBO election rate and its impact on premium is determined as a function of the magnitude of the rate increase. The assumption is applied on a seriatim basis based on the cumulative increase, as shown in the following table. The RBO election rate and impact for the requested increase is then prorated between that for the cumulative increase and, if applicable, the prior approved increase. The percent reduction in premium is assumed to correspond to an equivalent percent reduction in claims.

Cumulative Rate Increase	RBO Election Assumption
5-80%	5% + (Cumulative Rate Increase x 20%)
80%+	5% + (80% x 20%) + (Cumulative Rate Increase - 80%) x 7%

No RBO is assumed for cumulative increases less than 5% or for policies with a limited payment option. The RBO election rate is capped at 40%.

Based on the RBO election function, the reduction to premium and claims can then be determined as follows:

> Reduction to premium and claims due to the election of RBO
> = 1 – (Average premium level after the cumulative rate increase with RBO election / Premium level after the full cumulative rate increase without any RBO election), where

> Average premium level after the cumulative rate increase with RBO election
> = weighted average premium level of the assumed percentage of policyowners electing RBO with the percentage assumed to accept the full cumulative rate increase

Adverse Selection

The adverse selection assumption is a function of the CBUL and RBO election rates such that the relative increase to morbidity due to adverse selection varies by the cumulative rate increase's magnitude. The percentage increase in morbidity due to adverse selection was developed from the following formula and actuarial judgment. It is assumed that at the time of the rate increase, policyowners that elect a CBUL will be selective in that their relative morbidity is 25% lower than that of the remaining pool. Similarly, it is assumed that at the time of the rate increase, policyowners that elect an RBO will be selective in that their relative morbidity is 12.5% lower than that of the remaining pool.

> PoolMorb = AdvSelMorb x (1 – CBUL – RBO) + [(1 – 25%) x AdvSelMorb] x CBUL + [(1 – 12.5%) x AdvSelMorb] x RBO, where

> PoolMorb =   morbidity of the pool before the rate increase = 1.0
> AdvSelMorb =   adverse morbidity of the remaining pool after the rate increase due to selective lapses
> CBUL =   percentage of policyowners that elect CBUL
> RBO =   percentage of policyowners that elect RBO

Solving the above for the adverse selection component results in the following formula:

Adverse Selection = 1 / (1 – 25% x CBUL – 12.5% x RBO)

Predictive Analytics

In developing the experience adjustment factors described above, predictive analytics was employed in the form of a penalized generalized linear model (GLM) as well as a gradient boosting machine (GBM) model.

Penalized Generalized Linear Model

A penalized GLM was used to develop adjustments for (1) situs-specific incidence, (2) lifetime payment option voluntary lapse, (3) active mortality, (4) on-claim utilization, and (5) day utilization.

A penalized GLM is like a traditional GLM. The key difference is that it adds an additional constraint that penalizes the size of the model's coefficients to control overfitting the model to the historical data. This penalty placed on the coefficients can be seen as a credibility lever which controls how much weight is given to the company's actual experience. A high penalty would give no weight to the data, leaving the benchmark assumption (e.g., *Guidelines*) unadjusted. No penalty would give full weight to the company's historical data, potentially making large adjustments to the benchmark assumption, which could be overfitting the historical experience. Therefore, when using a penalized GLM it is important to choose a penalty that gives the right amount of weight to the actual data to avoid underfitting or overfitting the experience. A standard approach for choosing such a penalty is to use a k-fold cross-validation (described below) to test a series of penalty values.

Gradient Boosting Machine

GBM models were used to develop adjustments for (1) composite claim termination and (2) disabled mortality. As part of our experience analyses, GBM models were also used to explore key drivers for certain assumptions which informed our decisions regarding assumption complexity, the predictive modeling technique(s) to use in developing adjustments, and the variables to capture in the experience analyses.

A GBM model is a nonparametric algorithm that uses an ensemble of decision trees to develop predictions which automatically create key interactions of the independent variables in the model to minimize the prediction error of the model (i.e., the difference between the actual versus predicted counts). At each decision point in the trees, the model cycles through each variable and chooses the optimal data split that minimizes the prediction error. This process determines variable importance and how to partition variables such that the model can navigate complex interactions in an automated fashion.

A GBM model includes several inputs that control the model complexity and learning process, which are referred to as hyperparameters. These inputs are used to produce a model that determines the amount of weight to place on the historical data (i.e., not overfitting or underfitting) such that it will generalize well to future experience. A standard approach for tuning such hyperparameters is to use a k-fold cross-validation (described below).

K-Fold Cross-Validation

A k-fold cross-validation is an automated process by which model hyperparameters can be selected and evaluated. This process splits the data into "k" subsets and iteratively trains and tests the model independently on each subset of the data. This process gives an estimation of how well a model will generalize to new data that was not used to develop assumptions. Through the k-fold cross-validation the impact that hyperparameters had on a model's ability to predict on the unseen data was evaluated by testing a range of hyperparameters. Hyperparameters were selected to balance minimizing the k-fold cross-validation prediction error with the generalizability of the model. This allows for a robust and automated approach to determine the amount of weight to give actual experience versus the benchmark assumptions.

Hazard Rates and Probabilities

Each assumption consists of a base assumption and experience adjustment factors. The base assumption was converted to a hazard rate for use in predictive modeling. The experience adjustment factors are applied to the base hazard rate. The assumption is then converted back to a probability for use in projection. Adjustment factors were developed to be applied to hazard rates as part of the predictive modeling process described above. Hazard rates are converted from the base probability assumption and equal –LN[1-probability]. After applying all applicable

adjustments, adjusted hazard rates are converted back to probabilities to create the assumption, where probability = 1 – EXP[–hazard rate].

A hazard rate represents the instantaneous likelihood (rate per unit of time) of an event (i.e., incidence, death, lapse, or recovery) at different times, whereas the probability is the likelihood that an event will occur within a specific time interval (e.g., one policy year). Because exact exposure is used in the predictive model, hazard rates were used in the development. They are then converted to probabilities for use in the projection models. Please note that this conversion of probabilities to hazard rates is only applicable for assumptions that follow a Poisson distribution (i.e., whether an event occurs) and as such are not applicable to the claim duration utilization assumption and indemnity day utilization assumption, which are non-binary (i.e., based on dollars and days, respectively, versus events).

		ALF			HHC			SNF			Total		
		Claim	Actual-to-Expected (A:E)		Claim	A:E		Claim	A:E		Claim	A:E	
Policy or Insured Characteristic	Exposure [A]	Count [B]	2017 *Guidelines* [C]	Expected[1] [D]	Count [B]	2017 *Guidelines* [C]	Expected[1] [D]	Count [B]	2017 *Guidelines* [C]	Expected[1] [D]	Count [B]	2017 *Guidelines* [C]	Expected[1] [D]
Sex													
Female	259,872	309	1.00	0.96	839	1.07	1.03	139	0.39	0.69	1,286	0.88	0.95
Male	205,434	180	1.22	1.12	520	1.08	1.01	114	0.46	0.81	814	0.92	0.99
Partner Status													
Partnered	341,646	210	0.98	0.96	811	1.21	1.09	119	0.39	0.70	1,140	0.96	1.00
Non-Partnered	123,660	279	1.15	1.07	547	0.92	0.93	133	0.44	0.77	960	0.83	0.93
Benefit Period													
Lifetime	329,616	261	1.00	0.97	899	1.13	1.06	149	0.42	0.75	1,310	0.92	0.99
Non-Lifetime	135,691	228	1.16	1.07	459	0.97	0.96	103	0.42	0.73	790	0.85	0.94
Inflation Option													
Auto	416,899	339	1.10	1.03	1,044	1.08	1.04	166	0.39	0.71	1,549	0.91	0.98
None	48,407	150	1.01	0.98	314	1.04	0.97	86	0.48	0.79	551	0.86	0.93
Payment Type													
Indemnity	152,745	71	0.78	0.81	394	1.28	1.18	70	0.54	0.89	535	1.01	1.07
Reimbursement	312,562	418	1.14	1.06	964	1.01	0.97	183	0.38	0.69	1,565	0.86	0.94
Underwriting													
Preferred	305,777	295	1.02	0.97	801	0.99	0.96	143	0.37	0.66	1,239	0.83	0.91
Standard	136,705	155	1.08	1.03	457	1.16	1.08	88	0.48	0.82	701	0.97	1.02
Substandard	22,824	39	1.55	1.45	100	1.60	1.44	22	0.69	1.11	161	1.34	1.38
Rate Series													
200 Series	197,434	335	1.20	1.10	857	1.22	1.08	162	0.45	0.80	1,355	1.00	1.03
300+ Series	267,872	154	0.86	0.87	501	0.89	0.93	90	0.37	0.65	745	0.75	0.87
Attained Age													
<65	200,211	19	0.82	0.87	141	0.98	1.03	16	0.40	0.55	177	0.85	0.94
65 - 69	124,121	50	1.14	1.07	176	0.80	0.94	24	0.33	0.61	250	0.74	0.92
70 - 74	87,189	88	1.01	0.99	288	0.97	1.00	51	0.41	0.79	427	0.84	0.97
75 - 79	38,217	123	1.04	0.99	325	1.13	1.00	66	0.44	0.81	515	0.92	0.97
80 - 84	12,137	117	1.11	1.06	279	1.41	1.08	57	0.47	0.80	453	1.05	1.02
85+	3,431	92	1.17	1.03	149	1.24	1.07	38	0.42	0.68	279	0.93	0.95
Total	465,306	489	1.07	1.02	1,358	1.07	1.02	252	0.42	0.74	2,100	0.90	0.97

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-2a
Ultimate Voluntary Lapse Probabilities
Lifetime Payment Option for Attained Age 70 and Older and Policy Durations 9+
All Rate Series

Inflation Option	Benefit Period	Lifetime Payment		Discounted Renewal Lifetime Payment	
		Non-Partnered	Partnered	Non-Partnered	Partnered
None	Non-Lifetime	0.9%	0.5%	0.7%	0.4%
	Lifetime	0.7%	0.4%	0.5%	0.3%
Auto	Non-Lifetime	0.6%	0.4%	0.5%	0.3%
	Lifetime	0.5%	0.3%	0.4%	0.2%

Exhibit A-2b
Actual-to-Expected Voluntary Lapse Experience 2009-2018
Lifetime Payment Option[1] for Policy Durations 9+
All Rate Series Combined

Policy or Insured Characteristic	Policy Year Exposure [A]	Actual Lapses [B]	Actual-to-Expected Lapse Probability		
			Unadjusted[2] [C]	Modeled [D]	Expected[3] [E]
Benefit Period and Inflation Option					
Lifetime and Auto	178,652	841	0.77	0.96	0.99
Lifetime and None	18,095	122	1.04	1.11	1.22
Non-Lifetime and Auto	66,603	364	0.88	1.01	1.07
Non-Lifetime and None	14,132	199	2.12	1.64	1.94
Attained Age					
<65	89,326	672	1.25	1.17	1.15
65 - 69	78,049	318	0.67	0.97	0.97
70 - 74	64,439	285	0.72	0.98	1.08
75 - 79	31,826	133	0.65	0.82	0.94
80 - 84	10,689	86	1.18	1.08	1.56
85+	3,152	32	1.37	1.11	1.63
Total	277,482	1,526	0.89	1.04	1.10

[1] Excludes experience for policies with Discounted Renewal Payment Option.

[2] All-lives lapse assumption from the 2018 rate increase filings.

[3] Expected = assumption used in this filing reflecting all experience adjustments.

Attained Age[1]	Preferred Underwriting				Standard Underwriting				Substandard Underwriting			
	Female		Male		Female		Male		Female		Male	
	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered	Partnered	Non-Partnered
<50	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
50	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
51	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
52	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
53	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
54	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
55	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
56	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
57	0.97	0.98	0.97	0.97	0.98	0.99	0.98	0.98	0.99	0.99	0.98	0.99
58	0.95	0.96	0.94	0.95	0.97	0.98	0.96	0.97	0.97	0.98	0.97	0.98
59	0.93	0.94	0.92	0.94	0.95	0.96	0.94	0.96	0.96	0.97	0.95	0.97
60	0.90	0.92	0.90	0.92	0.92	0.95	0.92	0.95	0.94	0.96	0.94	0.96
61	0.86	0.89	0.86	0.89	0.89	0.92	0.89	0.92	0.90	0.94	0.91	0.94
62	0.85	0.89	0.85	0.89	0.87	0.91	0.88	0.92	0.89	0.94	0.90	0.94
63	0.82	0.87	0.83	0.88	0.85	0.91	0.86	0.91	0.88	0.93	0.88	0.94
64	0.81	0.87	0.81	0.87	0.84	0.90	0.85	0.91	0.87	0.93	0.87	0.94
65	0.80	0.86	0.80	0.87	0.83	0.90	0.84	0.91	0.86	0.93	0.87	0.94
66	0.81	0.88	0.82	0.89	0.85	0.92	0.87	0.93	0.88	0.95	0.90	0.97
67	0.83	0.88	0.85	0.90	0.87	0.93	0.89	0.95	0.91	0.97	0.93	0.99
68	0.86	0.90	0.89	0.94	0.89	0.94	0.93	0.98	0.93	0.98	0.97	1.02
69	0.88	0.92	0.93	0.97	0.92	0.96	0.97	1.01	0.95	0.99	1.00	1.05
70	0.92	0.95	0.98	1.02	0.95	0.99	1.02	1.06	0.98	1.01	1.05	1.08
71	0.94	0.97	1.01	1.04	0.98	1.01	1.05	1.09	0.99	1.02	1.07	1.11
72	0.96	0.99	1.04	1.07	1.00	1.04	1.08	1.12	1.01	1.05	1.09	1.13
73	0.98	1.02	1.06	1.09	1.04	1.07	1.12	1.15	1.03	1.06	1.11	1.14
74	1.02	1.03	1.09	1.11	1.06	1.07	1.14	1.15	1.05	1.07	1.13	1.15
75	1.03	1.03	1.09	1.10	1.06	1.07	1.13	1.14	1.06	1.06	1.13	1.13
76	1.04	1.04	1.09	1.09	1.07	1.06	1.12	1.12	1.07	1.06	1.12	1.12
77	1.04	1.02	1.07	1.06	1.06	1.05	1.10	1.09	1.07	1.05	1.11	1.09
78	1.02	1.02	1.03	1.03	1.05	1.05	1.06	1.06	1.06	1.06	1.07	1.07
79	1.02	1.02	1.01	1.01	1.06	1.06	1.05	1.05	1.06	1.07	1.06	1.06
80	1.02	1.03	1.01	1.02	1.07	1.08	1.05	1.07	1.07	1.09	1.06	1.07
81	1.02	1.04	1.01	1.02	1.07	1.09	1.05	1.07	1.07	1.09	1.06	1.07
82	1.02	1.04	1.01	1.03	1.07	1.09	1.06	1.08	1.07	1.09	1.06	1.08
83	1.02	1.03	1.03	1.04	1.07	1.08	1.08	1.09	1.06	1.07	1.07	1.09
84	1.02	1.03	1.04	1.05	1.06	1.06	1.08	1.09	1.05	1.06	1.08	1.09
85	1.00	1.01	1.03	1.03	1.04	1.04	1.07	1.07	1.04	1.04	1.07	1.07
86	1.01	1.01	1.04	1.04	1.04	1.04	1.07	1.07	1.04	1.04	1.07	1.07
87	1.01	1.01	1.04	1.04	1.04	1.04	1.07	1.07	1.04	1.04	1.06	1.06
88	1.02	1.02	1.04	1.04	1.05	1.05	1.06	1.06	1.05	1.05	1.06	1.06
89	1.03	1.03	1.04	1.04	1.05	1.05	1.06	1.06	1.05	1.05	1.06	1.06
90	1.05	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
91	1.05	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.05	1.05	1.06	1.06
92	1.05	1.05	1.05	1.05	1.06	1.06	1.06	1.06	1.05	1.05	1.05	1.05
93	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
94	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
95	1.04	1.04	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05
96	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
97	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
98	1.03	1.03	1.03	1.03	1.03	1.03	1.04	1.04	1.03	1.03	1.03	1.03
99	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03
100	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.03	1.02	1.02	1.03	1.03
101	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
102	1.01	1.01	1.02	1.02	1.02	1.02	1.02	1.02	1.01	1.01	1.02	1.02
103	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
104	1.00	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
105+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Policy Duration	Duration Adjustment
1	0.94
2	0.90
3	0.86
4	0.83
5	0.81
6	0.84
7	0.87
8	0.89
9	0.91
10	0.93
11	0.94
12	0.96
13	0.98
14	1.00
15	1.02
16	1.02
17	1.02
18	1.01
19	1.01
20	1.00
21	1.01
22+	1.00

[1] Attained age adjustments are applicable to policy durations 7+.

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Exhibit A-3b
Actual-to-Expected Active Mortality Experience 2009-2018
Policy Durations 7+
All Rate Series Combined

</div>

Policy or Insured Characteristic	Policy Year Exposure [A]	Actual Deaths [B]	Actual-to-Expected Active Mortality Probability		
			Unadjusted [C]	Modeled [D]	Expected[1] [E]
Sex					
Female	259,872	917	0.82	0.92	0.89
Male	205,434	1,107	0.93	1.02	0.99
Partner Status					
Partnered	341,646	1,338	0.83	0.93	0.91
Non-Partnered	123,660	686	0.97	1.05	1.02
Underwriting Class					
Preferred	305,777	1,214	0.79	0.88	0.86
Standard	136,705	629	0.95	1.04	1.01
Substandard	22,824	181	1.64	1.78	1.73
Policy Duration					
7 - 9	185,581	537	0.77	0.93	0.92
10 - 14	228,952	1,057	0.88	0.97	0.94
15+	50,774	430	1.02	1.03	0.99
Attained Age					
<65	200,211	322	0.74	0.90	0.90
65 - 69	124,121	402	0.75	0.91	0.91
70 - 74	87,189	541	0.96	1.01	0.98
75 - 79	38,217	400	0.98	1.01	0.96
80 - 84	12,137	238	1.03	1.06	1.01
85+	3,431	121	0.90	0.93	0.88
Total	465,306	2,024	0.88	0.97	0.95

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-4
Actual-to-Expected Composite[1] Termination Experience 2009-2018
Lifetime Payment Option[2] for Policy Durations 9+
All Rate Series Combined

Attained Age	Policy Year Exposure [A]	Actual Terminations [B]	Actual-to-Expected Composite Termination Probability [C]
<65	89,326	844	1.12
65 - 69	78,049	575	0.94
70 - 74	64,439	698	1.03
75 - 79	31,826	482	0.98
80 - 84	10,689	300	1.14
85+	3,152	142	0.97
Total	277,482	3,041	1.03

[1] Combination of active mortality and voluntary lapse.

[2] Excludes experience for policies with Discounted Renewal Payment Option.

	ALF Starting Site of Care				HHC Starting Site of Care				SNF Starting Site of Care				Total			
		Actual	Actual-to-Expected (A:E)			Actual	A:E			Actual	A:E			Actual	A:E	
Policy or Insured Characteristic	Exposure [A]	Deaths [B]	2017 Guidelines [C]	Expected[1] [D]	Exposure [A]	Deaths [B]	2017 Guidelines [C]	Expected[1] [D]	Exposure [A]	Deaths [B]	2017 Guidelines [C]	Expected[1] [D]	Exposure [A]	Deaths [B]	2017 Guidelines [C]	Expected[1] [D]
Sex																
Female	8,222	91	0.79	0.93	18,755	231	0.86	0.97	2,281	45	0.98	1.09	29,259	367	0.86	0.97
Male	4,523	72	0.74	0.88	10,859	218	0.97	1.03	1,803	45	0.88	0.98	17,185	335	0.90	0.99
Benefit Period																
Lifetime	7,405	80	0.74	0.90	21,074	290	0.89	0.98	2,683	52	0.89	1.01	31,162	422	0.86	0.97
Non-Lifetime	5,340	83	0.80	0.91	8,540	159	0.95	1.02	1,401	38	0.98	1.07	15,282	280	0.90	0.99
Partner Status																
Partnered	4,976	73	0.83	0.95	16,867	280	0.95	1.01	1,737	50	1.13	1.22	23,580	403	0.94	1.02
Non-Partnered	7,769	90	0.73	0.88	12,747	169	0.85	0.97	2,347	40	0.75	0.87	22,863	299	0.80	0.93
Payment Type																
Indemnity	2,080	27	0.81	1.08	9,529	106	0.68	0.83	1,141	22	0.80	0.97	12,751	155	0.72	0.88
Reimbursement	10,665	136	0.76	0.88	20,085	343	1.01	1.06	2,943	68	0.98	1.05	33,693	547	0.93	1.01
Claim Duration (Annual)																
1	3,446	42	0.62	0.76	7,403	133	0.75	0.88	1,322	45	0.99	1.11	12,170	220	0.76	0.89
2	3,346	45	0.93	1.09	7,584	90	0.82	0.90	1,029	22	1.11	1.23	11,960	157	0.88	0.99
3	2,376	24	0.66	0.77	5,256	90	1.26	1.28	725	6	0.45	0.49	8,358	120	0.99	1.05
4	1,605	22	0.86	0.99	3,556	53	1.10	1.12	470	8	0.95	1.04	5,630	83	1.01	1.07
5	889	15	1.00	1.17	2,340	35	1.03	1.07	261	3	0.60	0.65	3,490	53	0.98	1.05
6+	1,083	15	0.77	0.90	3,475	48	0.91	0.97	277	6	1.18	1.34	4,836	69	0.89	0.98
Incurred Age																
<65	1,026	10	0.66	0.83	5,236	74	0.87	0.99	474	7	0.69	0.81	6,736	91	0.83	0.96
65 - 69	2,349	25	0.70	0.87	4,339	69	0.96	1.08	579	9	0.62	0.72	7,267	103	0.84	0.98
70 - 74	2,542	23	0.55	0.69	5,600	91	0.99	1.09	1,021	14	0.58	0.69	9,163	128	0.81	0.93
75 - 79	3,101	40	0.81	0.97	6,671	89	0.82	0.90	998	26	1.17	1.28	10,770	155	0.86	0.97
80 - 84	2,007	30	0.88	1.02	5,312	86	0.95	1.00	723	22	1.28	1.34	8,042	138	0.97	1.04
85+	1,719	35	0.97	1.01	2,456	40	0.88	0.90	289	12	1.31	1.32	4,465	87	0.96	0.99
Total	12,745	163	0.77	0.91	29,614	449	0.91	0.99	4,084	90	0.93	1.03	46,443	702	0.87	0.98

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Policy or Insured Characteristic	ALF Starting Site of Care				HHC Starting Site of Care				SNF Starting Site of Care				Total			
	Exposure [A]	Actual Recoveries [B]	Actual-to-Expected (A:E) 2017 *Guidelines*[1] [C]	Expected[2] [D]	Exposure [A]	Actual Recoveries [B]	A:E 2017 *Guidelines*[1] [C]	Expected[2] [D]	Exposure [A]	Actual Recoveries [B]	A:E 2017 *Guidelines*[1] [C]	Expected[2] [D]	Exposure [A]	Actual Recoveries [B]	A:E 2017 *Guidelines*[1] [C]	Expected[2] [D]
Sex																
Female	8,222	17	1.04	0.93	18,755	121	0.84	0.90	2,281	16	1.44	1.24	29,259	154	0.90	0.93
Male	4,523	5	0.41	0.38	10,859	57	1.01	1.06	1,803	12	1.33	1.10	17,185	74	0.95	0.95
Benefit Period																
Lifetime	7,405	9	0.61	0.52	21,074	115	0.91	0.96	2,683	15	1.23	1.01	31,162	139	0.91	0.91
Non-Lifetime	5,340	13	0.95	0.92	8,540	63	0.84	0.93	1,401	13	1.64	1.46	15,282	89	0.92	0.98
Partner Status																
Partnered	4,976	4	0.34	0.37	16,867	85	0.74	0.82	1,737	12	1.36	1.26	23,580	101	0.75	0.82
Non-Partnered	7,769	18	1.07	0.87	12,747	93	1.08	1.09	2,347	16	1.41	1.12	22,863	127	1.11	1.06
Payment Type																
Indemnity	2,080	3	0.66	0.46	9,529	75	1.21	1.09	1,141	10	1.81	1.27	12,751	88	1.22	1.06
Reimbursement	10,665	19	0.80	0.76	20,085	103	0.74	0.86	2,943	18	1.23	1.13	33,693	140	0.79	0.87
Claim Duration (Annual)																
1	3,446	6	0.69	0.53	7,403	110	1.10	1.08	1,322	13	1.39	1.08	12,170	129	1.09	1.03
2	3,346	7	1.02	0.94	7,584	34	0.68	0.74	1,029	10	2.10	1.84	11,960	51	0.83	0.86
3	2,376	3	0.58	0.59	5,256	15	0.65	0.81	725	3	1.03	1.01	8,358	21	0.67	0.79
4	1,605	1	0.26	0.29	3,556	9	0.67	0.89	470	1	0.55	0.57	5,630	11	0.57	0.71
5	889	2	1.15	1.08	2,340	4	0.59	0.76	261	0	0.00	0.00	3,490	6	0.66	0.76
6+	1,083	3	1.46	1.42	3,475	6	0.80	0.95	277	1	1.50	1.21	4,836	10	0.98	1.08
Incurred Age																
<65	1,026	0	0.00	0.00	5,236	54	1.41	1.30	474	4	1.87	1.36	6,736	58	1.37	1.23
65 - 69	2,349	2	0.39	0.32	4,339	40	1.27	1.26	579	3	1.03	0.79	7,267	45	1.14	1.08
70 - 74	2,542	4	0.68	0.56	5,600	33	0.82	0.89	1,021	9	1.82	1.36	9,163	46	0.90	0.91
75 - 79	3,101	7	1.01	0.93	6,671	28	0.62	0.70	998	4	0.79	0.72	10,770	39	0.68	0.74
80 - 84	2,007	8	1.78	1.87	5,312	15	0.46	0.58	723	5	1.34	1.41	8,042	28	0.68	0.83
85+	1,719	1	0.26	0.29	2,456	8	0.61	0.65	289	3	2.18	2.18	4,465	12	0.65	0.70
Total	12,745	22	0.77	0.70	29,614	178	0.89	0.95	4,084	28	1.39	1.18	46,443	228	0.91	0.94

[1] The 2017 *Guidelines* is included for illustrative purposes only as this expected basis was not directly used in developing the implied recovery assumption.

[2] Expected = assumption used in this filing reflecting all experience adjustments.

Policy or Insured Characteristic	ALF Starting Site of Care				HHC Starting Site of Care				SNF Starting Site of Care				Total			
	Exposure [A]	Claim Terminations [B]	Actual-to-Expected (A:E) 2017 Guidelines [C]	Expected[1] [D]	Exposure [A]	Claim Terminations [B]	A:E 2017 Guidelines [C]	Expected[1] [D]	Exposure [A]	Claim Terminations [B]	A:E 2017 Guidelines [C]	Expected[1] [D]	Exposure [A]	Claim Terminations [B]	A:E 2017 Guidelines [C]	Expected[1] [D]
Sex																
Female	8,222	108	0.82	0.93	18,755	352	0.85	0.94	2,281	61	1.06	1.13	29,259	521	0.86	0.96
Male	4,523	77	0.71	0.81	10,859	275	0.97	1.03	1,803	57	0.94	1.00	17,185	409	0.90	0.98
Benefit Period																
Lifetime	7,405	89	0.72	0.84	21,074	405	0.89	0.98	2,683	67	0.94	1.01	31,162	561	0.87	0.95
Non-Lifetime	5,340	96	0.81	0.91	8,540	222	0.91	0.99	1,401	51	1.09	1.15	15,282	369	0.90	0.99
Partner Status																
Partnered	4,976	77	0.77	0.88	16,867	365	0.88	0.96	1,737	62	1.17	1.23	23,580	504	0.89	0.97
Non-Partnered	7,769	108	0.77	0.88	12,747	262	0.92	1.01	2,347	56	0.86	0.93	22,863	426	0.87	0.96
Payment Type																
Indemnity	2,080	30	0.79	0.95	9,529	181	0.83	0.92	1,141	32	0.96	1.05	12,751	243	0.84	0.94
Reimbursement	10,665	155	0.76	0.87	20,085	446	0.93	1.01	2,943	86	1.02	1.07	33,693	687	0.89	0.98
Claim Duration (Annual)																
1	3,446	48	0.63	0.72	7,403	243	0.87	0.96	1,322	58	1.05	1.11	12,170	349	0.85	0.94
2	3,346	52	0.94	1.07	7,584	124	0.78	0.85	1,029	32	1.30	1.37	11,960	208	0.87	0.95
3	2,376	27	0.65	0.74	5,256	105	1.11	1.18	725	9	0.55	0.59	8,358	141	0.92	1.00
4	1,605	23	0.78	0.89	3,556	62	1.00	1.07	470	9	0.88	0.95	5,630	94	0.92	1.01
5	889	17	1.02	1.16	2,340	39	0.96	1.02	261	3	0.53	0.56	3,490	59	0.93	1.01
6+	1,083	18	0.83	0.95	3,475	54	0.90	0.97	277	7	1.21	1.32	4,836	79	0.90	0.99
Incurred Age																
<65	1,026	10	0.58	0.68	5,236	128	1.03	1.10	474	11	0.89	0.95	6,736	149	0.97	1.05
65 - 69	2,349	27	0.66	0.78	4,339	109	1.05	1.14	579	12	0.69	0.74	7,267	148	0.91	1.01
70 - 74	2,542	27	0.56	0.67	5,600	124	0.93	1.03	1,021	23	0.79	0.86	9,163	174	0.83	0.92
75 - 79	3,101	47	0.83	0.97	6,671	117	0.76	0.84	998	30	1.10	1.16	10,770	194	0.82	0.91
80 - 84	2,007	38	0.98	1.13	5,312	101	0.81	0.90	723	27	1.29	1.35	8,042	166	0.90	1.00
85+	1,719	36	0.90	0.94	2,456	48	0.81	0.85	289	15	1.42	1.44	4,465	99	0.90	0.94
Total	12,745	185	0.77	0.88	29,614	627	0.90	0.98	4,084	118	1.00	1.06	46,443	930	0.88	0.97

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Claim Duration Month	Non-Lifetime Benefit Period						Lifetime Benefit Period					
	No Inflation			Auto Inflation			No Inflation			Auto Inflation		
	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+
1	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
2	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
3	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
4	0.89	0.88	0.96	0.86	0.86	0.94	0.83	0.83	0.90	0.81	0.81	0.88
5	0.88	0.88	0.96	0.86	0.87	0.95	0.82	0.82	0.89	0.80	0.81	0.88
6	0.88	0.88	0.97	0.87	0.88	0.96	0.81	0.82	0.89	0.80	0.81	0.89
7	0.90	0.91	0.97	0.90	0.92	0.98	0.84	0.86	0.91	0.85	0.87	0.92
8	0.91	0.92	0.97	0.94	0.94	0.99	0.88	0.89	0.93	0.90	0.91	0.95
9	0.94	0.94	0.98	0.97	0.97	1.00	0.92	0.92	0.96	0.94	0.95	0.98
10	0.97	0.96	0.99	1.00	0.99	1.02	0.96	0.95	0.98	0.99	0.99	1.02
11	0.97	0.96	0.98	1.00	0.99	1.01	0.98	0.97	0.99	1.02	1.00	1.03
12	0.98	0.95	0.98	1.00	0.98	1.01	1.00	0.97	1.00	1.03	1.00	1.03
13	0.98	0.96	0.99	1.01	0.99	1.02	1.01	0.99	1.02	1.04	1.01	1.05
14	0.99	0.98	1.01	1.02	1.01	1.04	1.02	1.00	1.03	1.05	1.03	1.06
15	1.00	0.99	1.02	1.03	1.02	1.05	1.02	1.01	1.04	1.05	1.05	1.08
16	1.00	1.00	1.03	1.04	1.04	1.06	1.02	1.02	1.05	1.06	1.06	1.09
17	1.01	1.02	1.04	1.05	1.05	1.08	1.02	1.02	1.05	1.06	1.06	1.09
18	1.02	1.02	1.04	1.05	1.06	1.08	1.02	1.02	1.05	1.06	1.06	1.08
19	1.02	1.02	1.04	1.06	1.05	1.08	1.02	1.02	1.04	1.06	1.06	1.08
20	1.02	1.01	1.04	1.05	1.05	1.07	1.02	1.02	1.04	1.05	1.05	1.08
21	1.02	1.01	1.03	1.05	1.04	1.07	1.03	1.02	1.05	1.06	1.05	1.08
22	1.01	1.00	1.03	1.05	1.04	1.06	1.04	1.03	1.05	1.07	1.06	1.09
23	1.01	1.00	1.02	1.04	1.03	1.05	1.05	1.03	1.05	1.08	1.07	1.09
24	1.00	0.99	1.01	1.04	1.02	1.04	1.05	1.03	1.05	1.09	1.07	1.09
25	1.00	0.98	1.00	1.04	1.02	1.04	1.05	1.03	1.05	1.10	1.08	1.10
26	1.00	0.98	1.00	1.05	1.03	1.04	1.06	1.04	1.05	1.11	1.08	1.10
27	1.01	0.98	1.00	1.06	1.04	1.05	1.06	1.03	1.05	1.11	1.09	1.10
28	1.01	0.99	1.00	1.07	1.04	1.05	1.06	1.03	1.05	1.11	1.09	1.10
29	1.02	0.99	1.00	1.08	1.05	1.06	1.06	1.03	1.05	1.13	1.09	1.11
30	1.03	1.00	1.01	1.09	1.06	1.07	1.07	1.04	1.05	1.13	1.10	1.11
31	1.03	1.00	1.01	1.10	1.06	1.07	1.07	1.03	1.05	1.14	1.10	1.11
32	1.03	1.00	1.01	1.10	1.06	1.07	1.07	1.03	1.04	1.13	1.10	1.11
33	1.03	0.99	1.01	1.10	1.06	1.07	1.07	1.03	1.04	1.14	1.10	1.11
34	1.03	0.99	1.00	1.10	1.05	1.07	1.07	1.03	1.04	1.14	1.09	1.11
35	1.03	0.98	1.00	1.09	1.04	1.06	1.07	1.02	1.03	1.13	1.08	1.10
36	1.03	0.98	0.99	1.09	1.04	1.05	1.07	1.01	1.03	1.13	1.08	1.09
37	1.02	0.97	0.98	1.09	1.03	1.04	1.07	1.01	1.02	1.13	1.08	1.08
38	1.02	0.96	0.96	1.09	1.03	1.03	1.07	1.01	1.01	1.14	1.08	1.08
39	1.01	0.96	0.95	1.09	1.03	1.02	1.06	1.00	0.99	1.14	1.08	1.07
40	1.01	0.95	0.94	1.09	1.03	1.01	1.06	1.00	0.98	1.14	1.08	1.06
41	1.00	0.95	0.93	1.08	1.03	1.01	1.05	1.00	0.97	1.14	1.08	1.06
42	1.00	0.95	0.92	1.08	1.03	1.00	1.04	1.00	0.97	1.13	1.08	1.05
43	1.00	0.96	0.93	1.08	1.03	1.00	1.04	1.00	0.97	1.13	1.08	1.05
44	1.00	0.96	0.94	1.08	1.03	1.01	1.04	1.00	0.97	1.12	1.07	1.05
45	1.01	0.97	0.95	1.08	1.04	1.01	1.04	1.00	0.98	1.11	1.07	1.05
46	1.01	0.97	0.96	1.07	1.04	1.02	1.04	1.00	0.98	1.10	1.07	1.05
47	1.02	0.98	0.97	1.07	1.04	1.02	1.04	1.00	0.99	1.10	1.06	1.05
48	1.01	0.98	0.97	1.07	1.03	1.02	1.04	1.01	1.00	1.09	1.06	1.05
49	1.01	0.98	0.97	1.05	1.03	1.01	1.04	1.01	1.00	1.09	1.06	1.04
50	1.01	0.99	0.97	1.05	1.03	1.01	1.04	1.02	1.01	1.09	1.06	1.05
51	1.01	0.99	0.97	1.04	1.02	1.01	1.05	1.03	1.01	1.08	1.06	1.05
52	1.01	0.99	0.98	1.04	1.02	1.00	1.05	1.04	1.02	1.08	1.07	1.05
53	1.01	1.00	0.98	1.03	1.02	1.00	1.06	1.04	1.03	1.08	1.07	1.05
54	1.02	1.00	0.99	1.04	1.02	1.01	1.06	1.05	1.03	1.09	1.07	1.05
55	1.03	1.01	1.00	1.05	1.03	1.02	1.07	1.05	1.04	1.09	1.07	1.06
56	1.03	1.01	1.01	1.04	1.03	1.02	1.06	1.05	1.04	1.08	1.06	1.05
57	1.03	1.02	1.01	1.04	1.03	1.02	1.06	1.04	1.04	1.07	1.05	1.05
58	1.03	1.02	1.02	1.04	1.03	1.02	1.05	1.04	1.04	1.05	1.05	1.04
59	1.03	1.02	1.02	1.03	1.03	1.02	1.04	1.04	1.04	1.04	1.04	1.04
60	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.04	1.03	1.04	1.04	1.03
61	1.02	1.02	1.02	1.02	1.02	1.02	1.03	1.04	1.03	1.03	1.04	1.03
62	1.01	1.02	1.01	1.02	1.02	1.02	1.03	1.04	1.03	1.03	1.04	1.03
63	1.01	1.02	1.01	1.02	1.03	1.01	1.03	1.04	1.03	1.04	1.05	1.04
64	1.00	1.02	1.00	1.02	1.03	1.01	1.03	1.05	1.03	1.04	1.06	1.04
65	1.00	1.02	1.00	1.01	1.03	1.01	1.03	1.05	1.03	1.05	1.06	1.04
66	1.00	1.02	0.99	1.01	1.03	1.01	1.03	1.05	1.03	1.05	1.07	1.04
67	0.99	1.01	0.99	1.01	1.03	1.01	1.03	1.05	1.03	1.05	1.07	1.04
68	0.99	1.01	0.99	1.01	1.03	1.00	1.03	1.05	1.02	1.04	1.06	1.04
69	0.99	1.01	0.98	1.00	1.02	1.00	1.02	1.04	1.02	1.04	1.06	1.03
70	0.99	1.00	0.98	1.00	1.01	0.99	1.02	1.03	1.01	1.03	1.05	1.03
71	0.99	1.00	0.98	1.00	1.01	0.99	1.02	1.03	1.01	1.03	1.04	1.02
72	0.99	0.99	0.98	1.00	1.00	0.99	1.01	1.02	1.01	1.02	1.03	1.02
73	0.99	0.99	0.98	0.99	1.00	0.99	1.01	1.01	1.00	1.02	1.02	1.01
74	0.98	0.99	0.98	0.99	0.99	0.98	1.01	1.01	1.00	1.02	1.02	1.01
75	0.98	0.98	0.97	0.99	0.99	0.98	1.00	1.00	0.99	1.01	1.01	1.00
76	0.98	0.98	0.97	0.99	0.99	0.98	1.00	1.00	0.99	1.01	1.01	1.00
77	0.97	0.97	0.96	0.98	0.99	0.97	1.00	1.00	0.99	1.01	1.01	1.00
78	0.96	0.97	0.95	0.98	0.99	0.97	0.99	1.00	0.99	1.01	1.02	1.00
79	0.96	0.97	0.95	0.97	0.98	0.97	1.00	1.00	0.99	1.01	1.02	1.00
80	0.96	0.96	0.95	0.97	0.98	0.96	1.00	1.00	0.99	1.02	1.02	1.01
81	0.96	0.96	0.94	0.97	0.98	0.96	1.00	1.01	0.99	1.02	1.03	1.01
82	0.96	0.96	0.94	0.98	0.98	0.96	1.00	1.01	0.99	1.02	1.03	1.01
83	0.96	0.96	0.94	0.98	0.98	0.96	1.01	1.01	0.99	1.03	1.03	1.01
84	0.97	0.97	0.95	0.99	0.99	0.97	1.01	1.01	0.99	1.03	1.03	1.01
85	0.97	0.97	0.95	0.99	0.99	0.97	1.01	1.01	0.99	1.04	1.04	1.01
86	0.97	0.97	0.95	1.00	1.00	0.98	1.01	1.01	0.99	1.04	1.04	1.02
87	0.98	0.98	0.95	1.00	1.00	0.98	1.02	1.01	0.99	1.04	1.04	1.02
88	0.98	0.98	0.96	1.01	1.01	0.98	1.02	1.01	0.99	1.05	1.04	1.02
89	0.98	0.98	0.96	1.01	1.01	0.99	1.02	1.01	0.99	1.05	1.04	1.02
90	0.98	0.98	0.96	1.01	1.01	0.99	1.02	1.01	0.99	1.05	1.04	1.02
91	0.98	0.98	0.96	1.01	1.01	0.99	1.02	1.01	0.99	1.05	1.04	1.02
92	0.99	0.98	0.96	1.01	1.01	0.99	1.01	1.01	0.99	1.04	1.04	1.02
93	0.99	0.99	0.97	1.01	1.01	0.99	1.01	1.01	0.99	1.03	1.03	1.01
94	0.99	0.99	0.98	1.01	1.00	0.99	1.01	1.00	0.99	1.02	1.02	1.01
95	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01
96+	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.00

Claim Duration Month	Non-Lifetime Benefit Period						Lifetime Benefit Period					
	No Inflation			Auto Inflation			No Inflation			Auto Inflation		
	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+
1	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
2	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
3	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
4	0.92	0.89	1.01	0.88	0.85	0.96	0.91	0.88	1.00	0.87	0.84	0.95
5	0.90	0.87	1.01	0.84	0.81	0.95	0.88	0.85	1.00	0.83	0.80	0.93
6	0.89	0.85	1.02	0.82	0.79	0.94	0.87	0.84	1.00	0.80	0.77	0.92
7	0.90	0.88	1.04	0.83	0.81	0.96	0.89	0.86	1.02	0.82	0.79	0.94
8	0.92	0.91	1.07	0.85	0.84	0.98	0.91	0.90	1.05	0.84	0.82	0.96
9	0.95	0.95	1.09	0.88	0.88	1.01	0.93	0.94	1.07	0.86	0.87	1.00
10	0.97	1.00	1.11	0.91	0.93	1.04	0.96	0.99	1.10	0.90	0.92	1.03
11	1.00	1.05	1.14	0.95	0.99	1.08	1.00	1.04	1.14	0.95	0.99	1.08
12	1.03	1.09	1.17	0.99	1.04	1.12	1.04	1.09	1.18	0.99	1.05	1.13
13	1.05	1.11	1.20	1.01	1.07	1.16	1.06	1.12	1.21	1.02	1.08	1.17
14	1.06	1.12	1.21	1.03	1.09	1.18	1.08	1.14	1.23	1.05	1.11	1.20
15	1.08	1.13	1.23	1.05	1.10	1.20	1.10	1.15	1.25	1.07	1.12	1.22
16	1.10	1.14	1.25	1.07	1.11	1.22	1.12	1.16	1.28	1.10	1.14	1.25
17	1.11	1.15	1.26	1.09	1.13	1.24	1.14	1.17	1.29	1.12	1.16	1.27
18	1.13	1.15	1.28	1.12	1.14	1.26	1.16	1.18	1.31	1.14	1.16	1.29
19	1.16	1.17	1.29	1.15	1.15	1.28	1.19	1.19	1.32	1.17	1.18	1.30
20	1.18	1.18	1.31	1.18	1.17	1.30	1.21	1.21	1.33	1.20	1.20	1.32
21	1.21	1.20	1.32	1.21	1.20	1.32	1.24	1.23	1.35	1.24	1.23	1.35
22	1.23	1.22	1.33	1.25	1.23	1.35	1.26	1.24	1.36	1.27	1.26	1.37
23	1.25	1.23	1.34	1.27	1.25	1.36	1.28	1.25	1.36	1.30	1.27	1.39
24	1.26	1.23	1.34	1.28	1.26	1.37	1.29	1.26	1.37	1.31	1.28	1.40
25	1.26	1.23	1.34	1.29	1.26	1.37	1.29	1.27	1.38	1.32	1.30	1.41
26	1.25	1.23	1.33	1.29	1.26	1.37	1.30	1.27	1.38	1.33	1.31	1.42
27	1.25	1.23	1.33	1.29	1.27	1.37	1.30	1.28	1.39	1.34	1.32	1.43
28	1.23	1.22	1.32	1.27	1.26	1.36	1.31	1.30	1.39	1.35	1.34	1.44
29	1.23	1.23	1.31	1.27	1.28	1.35	1.31	1.32	1.40	1.36	1.37	1.45
30	1.22	1.24	1.30	1.27	1.29	1.35	1.32	1.34	1.41	1.37	1.40	1.46
31	1.21	1.24	1.29	1.26	1.30	1.35	1.32	1.36	1.41	1.38	1.41	1.47
32	1.21	1.25	1.29	1.26	1.30	1.34	1.32	1.36	1.41	1.38	1.43	1.47
33	1.21	1.25	1.28	1.26	1.30	1.33	1.32	1.37	1.40	1.38	1.43	1.46
34	1.21	1.25	1.27	1.26	1.30	1.33	1.33	1.37	1.39	1.38	1.43	1.45
35	1.22	1.25	1.26	1.27	1.30	1.32	1.34	1.37	1.39	1.39	1.43	1.45
36	1.22	1.25	1.26	1.27	1.30	1.31	1.35	1.38	1.39	1.40	1.43	1.44
37	1.23	1.26	1.25	1.28	1.30	1.30	1.37	1.39	1.39	1.41	1.44	1.44
38	1.25	1.27	1.26	1.28	1.31	1.29	1.38	1.40	1.39	1.42	1.45	1.43
39	1.25	1.28	1.26	1.29	1.32	1.29	1.38	1.41	1.38	1.41	1.45	1.42
40	1.26	1.30	1.26	1.29	1.32	1.28	1.38	1.42	1.38	1.41	1.45	1.41
41	1.25	1.30	1.25	1.28	1.32	1.28	1.37	1.42	1.37	1.40	1.45	1.40
42	1.24	1.29	1.24	1.27	1.32	1.27	1.36	1.41	1.36	1.39	1.45	1.39
43	1.23	1.28	1.23	1.26	1.31	1.26	1.35	1.40	1.35	1.38	1.44	1.38
44	1.22	1.27	1.21	1.26	1.31	1.25	1.35	1.40	1.34	1.39	1.45	1.38
45	1.21	1.26	1.19	1.26	1.31	1.24	1.35	1.41	1.34	1.41	1.47	1.39
46	1.20	1.25	1.17	1.26	1.31	1.23	1.36	1.41	1.33	1.43	1.48	1.39
47	1.20	1.24	1.16	1.27	1.31	1.23	1.37	1.42	1.32	1.44	1.50	1.40
48	1.21	1.24	1.15	1.28	1.32	1.22	1.38	1.42	1.31	1.47	1.51	1.40
49	1.21	1.24	1.14	1.29	1.33	1.22	1.38	1.42	1.30	1.48	1.52	1.39
50	1.20	1.23	1.12	1.29	1.32	1.20	1.37	1.41	1.28	1.48	1.51	1.38
51	1.19	1.21	1.11	1.28	1.30	1.19	1.36	1.39	1.27	1.47	1.49	1.36
52	1.18	1.20	1.10	1.26	1.28	1.18	1.35	1.37	1.26	1.45	1.47	1.35
53	1.16	1.18	1.08	1.24	1.26	1.16	1.34	1.36	1.25	1.43	1.45	1.33
54	1.14	1.16	1.07	1.20	1.22	1.13	1.32	1.35	1.25	1.40	1.42	1.32
55	1.12	1.15	1.07	1.17	1.20	1.11	1.31	1.34	1.25	1.37	1.40	1.30
56	1.11	1.15	1.07	1.15	1.18	1.10	1.31	1.35	1.25	1.35	1.39	1.30
57	1.10	1.15	1.06	1.13	1.18	1.10	1.30	1.35	1.26	1.34	1.39	1.29
58	1.10	1.15	1.06	1.13	1.18	1.09	1.30	1.36	1.26	1.33	1.40	1.30
59	1.09	1.15	1.06	1.12	1.18	1.09	1.30	1.37	1.26	1.33	1.41	1.30
60	1.09	1.15	1.06	1.12	1.18	1.09	1.29	1.37	1.26	1.34	1.41	1.30
61	1.08	1.14	1.06	1.12	1.19	1.10	1.28	1.36	1.26	1.34	1.41	1.31
62	1.07	1.13	1.05	1.12	1.18	1.10	1.27	1.34	1.25	1.34	1.41	1.31
63	1.06	1.11	1.04	1.12	1.17	1.10	1.26	1.32	1.24	1.33	1.40	1.31
64	1.05	1.10	1.04	1.12	1.16	1.10	1.25	1.30	1.23	1.33	1.38	1.30
65	1.05	1.09	1.03	1.11	1.16	1.10	1.23	1.28	1.22	1.31	1.36	1.30
66	1.04	1.08	1.03	1.11	1.15	1.10	1.22	1.27	1.21	1.30	1.35	1.29
67	1.04	1.07	1.03	1.10	1.14	1.10	1.21	1.25	1.21	1.29	1.33	1.29
68	1.04	1.07	1.03	1.10	1.13	1.10	1.21	1.24	1.21	1.28	1.32	1.28
69	1.03	1.06	1.03	1.09	1.12	1.09	1.20	1.24	1.20	1.28	1.31	1.28
70	1.03	1.05	1.03	1.09	1.11	1.09	1.20	1.23	1.20	1.27	1.30	1.27
71	1.03	1.05	1.03	1.09	1.10	1.08	1.22	1.24	1.21	1.28	1.30	1.28
72	1.03	1.04	1.02	1.08	1.09	1.07	1.22	1.23	1.21	1.28	1.30	1.27
73	1.02	1.03	1.01	1.07	1.08	1.06	1.22	1.23	1.21	1.27	1.29	1.26
74	1.02	1.03	1.01	1.06	1.07	1.05	1.21	1.23	1.20	1.26	1.27	1.25
75	1.02	1.03	1.01	1.05	1.06	1.04	1.21	1.23	1.20	1.25	1.27	1.24
76	1.01	1.03	1.01	1.04	1.06	1.03	1.20	1.22	1.19	1.24	1.25	1.23
77	1.01	1.03	1.00	1.03	1.05	1.02	1.19	1.21	1.18	1.21	1.24	1.21
78	1.00	1.02	1.00	1.02	1.04	1.02	1.18	1.21	1.18	1.20	1.23	1.20
79	1.00	1.02	1.00	1.02	1.04	1.01	1.18	1.20	1.17	1.20	1.22	1.19
80	1.01	1.02	0.99	1.03	1.04	1.01	1.19	1.20	1.17	1.21	1.22	1.20
81	1.01	1.01	0.99	1.04	1.04	1.02	1.20	1.19	1.17	1.22	1.22	1.20
82	1.02	1.01	1.00	1.05	1.04	1.02	1.21	1.19	1.17	1.24	1.22	1.20
83	1.03	1.01	1.00	1.06	1.04	1.02	1.22	1.19	1.18	1.25	1.22	1.21
84	1.05	1.01	1.00	1.07	1.04	1.03	1.23	1.19	1.18	1.26	1.22	1.21
85	1.06	1.02	1.01	1.09	1.04	1.03	1.25	1.19	1.18	1.27	1.21	1.21
86	1.08	1.02	1.01	1.09	1.04	1.03	1.25	1.18	1.18	1.27	1.20	1.20
87	1.08	1.02	1.02	1.10	1.03	1.03	1.25	1.18	1.18	1.27	1.19	1.19
88	1.09	1.02	1.02	1.10	1.03	1.03	1.25	1.17	1.17	1.27	1.18	1.19
89	1.09	1.01	1.02	1.10	1.03	1.03	1.25	1.16	1.17	1.27	1.18	1.18
90	1.09	1.01	1.02	1.10	1.03	1.03	1.25	1.16	1.17	1.26	1.17	1.18
91	1.09	1.01	1.02	1.10	1.02	1.03	1.25	1.16	1.17	1.26	1.17	1.18
92	1.07	1.01	1.02	1.08	1.02	1.03	1.20	1.13	1.14	1.21	1.14	1.15
93	1.06	1.01	1.01	1.07	1.02	1.02	1.16	1.11	1.11	1.17	1.12	1.12
94	1.04	1.01	1.01	1.05	1.01	1.02	1.12	1.08	1.08	1.13	1.09	1.09
95	1.03	1.01	1.01	1.03	1.01	1.01	1.08	1.05	1.06	1.08	1.06	1.06
96+	1.02	1.00	1.00	1.02	1.00	1.01	1.04	1.03	1.03	1.04	1.03	1.03

Claim Duration Month	Non-Lifetime Benefit Period						Lifetime Benefit Period					
	No Inflation			Auto Inflation			No Inflation			Auto Inflation		
	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+	<75	75-84	85+
1	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
2	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
3	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
4	0.89	0.90	0.91	0.86	0.86	0.88	0.90	0.90	0.91	0.86	0.86	0.88
5	0.88	0.89	0.90	0.84	0.85	0.86	0.88	0.89	0.91	0.85	0.86	0.87
6	0.86	0.88	0.89	0.83	0.85	0.85	0.87	0.89	0.90	0.84	0.85	0.86
7	0.88	0.90	0.90	0.85	0.87	0.87	0.89	0.91	0.91	0.86	0.88	0.88
8	0.89	0.92	0.92	0.87	0.90	0.89	0.90	0.94	0.93	0.88	0.91	0.91
9	0.91	0.95	0.93	0.89	0.93	0.91	0.92	0.96	0.95	0.90	0.94	0.93
10	0.92	0.97	0.95	0.91	0.95	0.94	0.94	0.98	0.97	0.92	0.96	0.95
11	0.93	0.98	0.96	0.91	0.96	0.95	0.94	0.99	0.97	0.92	0.97	0.95
12	0.93	0.99	0.97	0.91	0.96	0.95	0.93	0.98	0.97	0.91	0.96	0.95
13	0.94	0.99	0.98	0.92	0.97	0.95	0.93	0.98	0.97	0.91	0.96	0.94
14	0.95	1.00	0.99	0.92	0.98	0.96	0.93	0.98	0.97	0.90	0.96	0.94
15	0.95	1.01	0.99	0.93	0.98	0.97	0.92	0.98	0.97	0.90	0.96	0.94
16	0.96	1.02	1.00	0.94	0.99	0.98	0.92	0.98	0.97	0.91	0.96	0.95
17	0.96	1.02	1.00	0.94	1.00	0.98	0.93	0.98	0.97	0.91	0.96	0.95
18	0.96	1.01	1.00	0.95	1.00	0.99	0.93	0.98	0.97	0.92	0.97	0.96
19	0.95	1.00	0.99	0.95	1.00	0.99	0.93	0.97	0.96	0.92	0.97	0.96
20	0.95	1.00	0.99	0.94	0.99	0.98	0.92	0.97	0.96	0.92	0.97	0.96
21	0.95	0.99	0.99	0.94	0.99	0.98	0.92	0.97	0.96	0.92	0.97	0.96
22	0.94	0.99	0.98	0.94	0.99	0.98	0.92	0.96	0.96	0.92	0.96	0.96
23	0.94	0.98	0.98	0.94	0.98	0.98	0.92	0.96	0.96	0.92	0.96	0.95
24	0.95	0.99	0.98	0.94	0.98	0.98	0.92	0.96	0.96	0.92	0.96	0.95
25	0.95	0.99	0.99	0.95	0.98	0.98	0.93	0.97	0.96	0.92	0.96	0.96
26	0.96	0.99	0.99	0.95	0.98	0.98	0.94	0.97	0.97	0.93	0.96	0.96
27	0.97	1.00	1.00	0.95	0.98	0.98	0.95	0.97	0.97	0.93	0.96	0.96
28	0.98	1.01	1.00	0.96	0.99	0.98	0.95	0.98	0.98	0.94	0.96	0.96
29	0.98	1.01	1.00	0.96	0.99	0.99	0.95	0.98	0.98	0.94	0.97	0.96
30	0.98	1.01	1.01	0.96	1.00	0.99	0.95	0.98	0.97	0.93	0.97	0.96
31	0.98	1.02	1.01	0.96	1.00	0.99	0.95	0.98	0.97	0.93	0.97	0.96
32	0.98	1.02	1.01	0.96	1.00	0.99	0.94	0.98	0.97	0.93	0.97	0.96
33	0.97	1.02	1.01	0.96	1.00	0.99	0.94	0.98	0.97	0.92	0.97	0.95
34	0.97	1.02	1.00	0.95	1.00	0.99	0.94	0.98	0.97	0.92	0.96	0.95
35	0.97	1.01	1.00	0.95	1.00	0.98	0.94	0.98	0.97	0.92	0.96	0.95
36	0.96	1.01	0.99	0.94	0.99	0.97	0.93	0.98	0.97	0.92	0.96	0.95
37	0.96	1.00	0.99	0.93	0.98	0.96	0.93	0.98	0.96	0.91	0.95	0.94
38	0.95	1.00	0.98	0.92	0.97	0.95	0.93	0.98	0.96	0.91	0.95	0.94
39	0.94	0.99	0.97	0.92	0.96	0.95	0.93	0.98	0.96	0.91	0.95	0.94
40	0.94	0.99	0.97	0.91	0.96	0.94	0.93	0.98	0.96	0.91	0.95	0.93
41	0.94	0.99	0.97	0.91	0.96	0.94	0.94	0.98	0.96	0.91	0.95	0.93
42	0.95	0.99	0.97	0.92	0.96	0.95	0.94	0.98	0.97	0.91	0.95	0.94
43	0.96	0.99	0.98	0.93	0.97	0.96	0.95	0.98	0.97	0.92	0.96	0.95
44	0.96	1.00	0.99	0.94	0.97	0.97	0.95	0.99	0.98	0.93	0.96	0.95
45	0.97	1.00	1.00	0.95	0.98	0.97	0.96	0.99	0.98	0.94	0.97	0.96
46	0.98	1.01	1.00	0.96	0.99	0.98	0.97	0.99	0.98	0.95	0.97	0.97
47	0.99	1.01	1.01	0.97	0.99	0.99	0.97	0.99	0.99	0.95	0.97	0.97
48	0.99	1.01	1.01	0.98	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
49	0.99	1.01	1.01	0.98	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
50	0.99	1.00	1.01	0.97	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
51	0.99	1.00	1.00	0.97	0.99	0.99	0.98	0.99	0.99	0.96	0.98	0.98
52	0.99	1.00	1.00	0.97	0.99	0.99	0.98	0.99	0.99	0.96	0.97	0.98
53	0.99	1.00	1.00	0.97	0.98	0.99	0.97	0.99	0.99	0.96	0.97	0.97
54	0.98	1.00	1.00	0.97	0.98	0.99	0.97	0.98	0.99	0.96	0.97	0.97
55	0.99	1.00	1.00	0.97	0.98	0.99	0.97	0.98	0.99	0.96	0.97	0.97
56	0.99	1.00	1.00	0.97	0.98	0.99	0.97	0.98	0.99	0.96	0.97	0.97
57	0.99	1.00	1.00	0.97	0.98	0.99	0.98	0.98	0.99	0.96	0.97	0.97
58	0.99	1.00	1.00	0.98	0.99	0.99	0.98	0.99	0.99	0.97	0.97	0.98
59	0.99	1.00	1.00	0.98	0.99	0.99	0.98	0.99	0.99	0.97	0.98	0.98
60	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00	0.98	0.99	0.99
61	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00	0.98	0.99	0.99
62	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.00	1.00	0.98	1.00	0.99
63	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.01	1.01	0.99	1.00	1.00
64	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.01	0.99	1.00	1.00
65	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.01	0.99	1.01	1.00
66	0.99	1.00	1.00	0.99	1.00	0.99	1.00	1.01	1.01	0.99	1.01	1.00
67	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.00	0.99	1.00	1.00
68	0.99	1.00	1.00	0.98	1.00	0.99	1.00	1.01	1.00	0.99	1.00	1.00
69	0.99	1.00	1.00	0.98	0.99	0.99	0.99	1.01	1.00	0.99	1.00	1.00
70	0.99	1.00	0.99	0.98	0.99	0.99	0.99	1.01	1.00	0.99	1.00	0.99
71	0.98	1.00	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.98	1.00	0.99
72	0.98	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.98	1.00	0.99
73	0.98	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.99	1.00	0.99
74	0.98	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.99	1.00	1.00
75	0.99	0.99	0.99	0.98	0.99	0.99	0.99	1.00	1.00	0.99	1.00	1.00
76	0.99	0.99	0.99	0.99	0.99	0.99	0.99	1.00	1.00	0.99	1.00	1.00
77	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
78	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
79	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
80	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00
81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
91	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	0.99	0.99
92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
96+	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

	ALF Starting Site of Care			HHC Starting Site of Care			SNF Starting Site of Care			Total		
	Paid	Actual-to-Expected (A:E)		Paid	A:E		Paid	A:E		Paid	A:E	
	Claims	Policy Duration	Expected[1]	Claims	Policy Duration	Expected[1]	Claims	Policy Duration	Expected[1]	Claims	Policy Duration	Expected[1]
Policy or Insured Characteristic	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]	[A]	[B]	[C]
Inflation Option												
Auto	33,114,855	1.04	1.00	43,673,599	1.23	1.01	7,177,014	0.86	0.92	83,965,467	1.11	0.99
None	6,877,349	0.94	0.95	11,484,533	1.34	1.08	2,901,278	0.93	0.96	21,263,161	1.12	1.02
Benefit Period												
Lifetime	24,909,371	1.04	1.00	38,534,998	1.31	1.04	6,800,301	0.87	0.92	70,244,670	1.15	1.01
Non-Lifetime	15,082,834	0.98	0.97	16,623,134	1.12	0.98	3,277,990	0.90	0.95	34,983,958	1.03	0.97
Incurral Age												
<75	18,875,970	1.05	1.00	22,061,201	1.22	0.99	3,252,523	0.77	0.83	44,189,693	1.10	0.98
75-84	16,838,435	0.99	0.98	26,935,259	1.23	1.01	5,692,446	0.95	1.00	49,466,140	1.10	1.00
85+	4,277,799	0.99	0.99	6,161,672	1.49	1.21	1,133,323	0.91	0.95	11,572,795	1.19	1.09
Claim Duration (Annual)												
1	9,451,948	0.88	0.96	9,355,082	0.88	0.98	2,890,881	0.82	0.91	21,697,911	0.87	0.96
2	10,879,620	1.05	1.01	13,999,327	1.20	1.02	2,554,593	0.91	0.95	27,433,540	1.11	1.01
3	7,618,306	1.09	1.01	11,415,469	1.41	1.06	2,074,441	0.92	0.96	21,108,216	1.22	1.03
4	5,425,831	1.09	1.02	8,138,340	1.51	1.09	1,333,358	0.87	0.92	14,897,529	1.26	1.05
5	3,210,531	1.07	1.00	5,046,337	1.51	1.06	787,707	0.92	0.93	9,044,575	1.26	1.03
6+	3,405,969	1.03	0.92	7,203,576	1.38	0.91	437,312	0.92	0.87	11,046,857	1.23	0.91
Total	39,992,204	1.02	0.99	55,158,132	1.25	1.02	10,078,292	0.88	0.93	105,228,628	1.11	1.00

[1] Expected = assumption used in this filing reflecting all experience adjustments.

Exhibit A-9a
Day Utilization Adjustment Factors
All Rate Series
Indemnity Payment Type

Attained	Starting Site of Care		
Age	ALF	HHC	SNF
<70	0.96	0.80	0.89
70	0.96	0.80	0.89
71	0.96	0.80	0.89
72	0.96	0.80	0.89
73	0.96	0.80	0.89
74	0.96	0.80	0.89
75	0.96	0.80	0.89
76	0.96	0.81	0.89
77	0.96	0.81	0.89
78	0.96	0.81	0.91
79	0.96	0.81	0.92
80	0.96	0.81	0.92
81	0.96	0.81	0.93
82	0.96	0.81	0.93
83	0.96	0.82	0.93
84	0.96	0.83	0.93
85	0.96	0.84	0.93
86	0.96	0.86	0.93
87	0.96	0.88	0.93
88	0.96	0.90	0.93
89	0.96	0.91	0.93
90	0.96	0.91	0.93
91	0.96	0.91	0.93
92	0.96	0.92	0.94
93	0.96	0.93	0.95
94	0.96	0.94	0.96
95	0.96	0.96	0.97
96	0.96	0.97	0.98
97	0.96	0.97	0.98
98	0.96	0.97	0.99
99	0.96	0.97	0.99
100	0.97	0.97	0.99
101	0.98	0.97	0.99
102	0.98	0.97	0.99
103	0.98	0.97	0.99
104	0.98	0.97	0.99
105+	0.98	0.97	0.99

Exhibit A-9b
Actual-to-Expected Claim Duration Utilization Experience January 1, 2015-September 30, 2019
Indemnity Payment Type[1] with Claim Months 4 to 96
All Rate Series Combined

Attained Age	ALF Starting Site of Care Days Paid [A]	ALF Actual-to-Expected (A:E) Unadjusted[2] [B]	ALF Expected[3] [C]	HHC Starting Site of Care Days Paid [A]	HHC A:E Unadjusted[2] [B]	HHC Expected[3] [C]	SNF Starting Site of Care Days Paid [A]	SNF A:E Unadjusted[2] [B]	SNF Expected[3] [C]	Total Days Paid [A]	Total A:E Unadjusted[2] [B]	Total Expected[3] [C]
<65	2,930	0.85	0.89	22,663	0.91	1.11	1,610	0.88	0.99	27,203	0.90	1.07
65-69	5,640	0.94	0.97	20,034	0.71	0.86	2,613	0.67	0.75	28,286	0.74	0.87
70-74	13,484	1.01	1.05	37,587	0.87	1.07	3,234	0.69	0.76	54,305	0.89	1.04
75-79	14,505	0.97	1.00	38,297	0.90	1.08	4,733	0.77	0.84	57,534	0.90	1.03
80-84	9,145	0.95	0.98	28,267	0.87	1.04	2,392	0.75	0.80	39,804	0.88	1.01
85+	3,522	0.84	0.86	25,240	0.96	1.05	2,853	0.65	0.70	31,615	0.91	0.98
Total	49,225	0.95	0.99	172,088	0.87	1.04	17,435	0.72	0.79	238,748	0.87	1.01

[1] Excludes experience from policies with a caregiver indemnity rider.

[2] Actual days utilization experience.

[3] Expected = assumption used in this filing reflecting all experience adjustments.