John Hancock Life Insurance Company (U.S.A.)
Actuarial Memorandum for Inforce Rate Increase – Leading Edge Policy Series
April 26, 2023

Product Name	Form Number	Issue Date Range
Leading Edge	LTC-06 MD	Feb 2007 - Jan 2011

These policy form rates were originally priced with a margin for moderately adverse experience in accordance with the NAIC model rate stability regulations which were being implemented on a State by State basis during the time of our initial rate filing.

1. Scope & Purpose

This memorandum consists of materials which support the development of new premium rates for the above captioned policy series forms. The purpose of this memorandum is to demonstrate that the requirements of this State in regards to an in force rate increase request have been met. This rate filing is not intended to be used for any other purpose.

2. Justification for Rate Increase

John Hancock has completed our most recent triennial comprehensive long-term care experience study which examines the usage trends for our insured population. Relative to previous expectations, the new data demonstrates lower mortality for non-claimants, higher utilization of benefits, and lower than expected claim terminations, partly offset by lower claim incidence. Based on that data, we have determined that there is a need to increase premiums on certain policy series. Further detail on assumptions and recent analysis is provided in **Addendum #1 - Assumptions and Analysis Performed**.

3. Requested Rate Increase

The Company is requesting an average rate increase of 55.2%, which varies by inflation option, and ranges from 51.8% to 88.8%. Rate increases were derived as outlined below, ensuring at each step that the proposed rate increases did not result in premium rates that exceed rates for older issue ages:

1. The Company first determined the projected lifetime loss ratio for this form based on nationwide actual experience and projected future experience assuming the prior rate increase request was approved in full and within three months of the original filing date. We then determined the amount of rate increase (57.4%) that would be needed to satisfy the rate stability rule ensuring a loss ratio no less than 85% (or the original pricing loss ratio if greater) on the rate increase portion, while applying 58% (or the original pricing loss ratio if greater) on the original rate schedule.
2. Rate increases were adjusted to account for the timing of approvals on prior filings in your State. Adjustments are proportional to the amounts requested in prior filings and were determined to satisfy the rate stability rule. After the application of this adjustment, the average rate increase for the forms listed in this memo is a flat 59.2%.
3. Unapproved rate increases initially requested in our prior inforce rate filing (SERFF Tracking No. MULF-131481804) were included in this filing. These rate increases continue to be actuarially justified and are unchanged from our original request with the following exception: to account for the delayed implementation of the originally-requested rate increases, we have adjusted the portion of the current proposed rate increases attributable to the remainder so that on a present-value basis it is equivalent to implementing our original request all at once. After taking the unapproved amount into account and applying this adjustment, the average rate increase for the forms listed in this memo is a flat 88.8%.

4. After applying the projected gains from improved hedge terms as a reduction to claims, we ensured that the resulting overall increase in rates continues to satisfy the rate stability rule. This is demonstrated at the bottom of Exhibit 1 where it can be seen that the sum of past and future projected incurred claims excluding past losses is not less than the sum of the original premium times the greater of 58% and the original pricing loss ratio and the rate increase premium times the greater of 85% and the original pricing loss ratio. The resulting average rate increase for CPI policies, reduced for the projected hedge gains, is a flat 51.8%, while the resulting rate increase for non-CPI policies is a flat 88.8%.
5. In accordance with COMAR 31.14.01.04(A)(5), we are willing to phase-in the requested rate increase on an equivalent basis such that the maximum annual rate increase does not exceed 15%.

A summary of proposed rate increases can be found in **Appendix A.**

In the rate schedules by policy form, **Appendix B1** contains the new proposed rate tables for all policy forms included with this filing.

Please note that the actual rates implemented may vary slightly from those in the Appendices due to implementation rounding algorithms.

Exhibit 1 contains nationwide past premium and claims experience as well as future premium and claim projections and hedge gains. Waived premiums are not included. It illustrates that the anticipated lifetime loss ratio, net of hedge gains and with the requested rate increase is 69.3%, compared to the original pricing loss ratio (updated for actual CPI) of 65.6%. The lifetime loss ratio as of 12/31/2021 is calculated as the sum of accumulated past and discounted future claims less hedge gains divided by the sum of accumulated past and discounted future earned premium where accumulation and discounting occur at the maximum statutory valuation discount rate.

In addition, **Exhibit 1** contains the original expected loss ratio projections with the lifetime loss ratio calculated as stated above, adjusted for the following.

- For contracts with the CPI linked inflation rider, both past and future benefits were updated to reflect the impact of actual past CPI rates differing from the original pricing assumption. In this way, the current projected benefits and the benefits projected in original pricing are based on the same level of CPI indices. This adjustment is needed to neutralize the impact on the rate increase for differences in actual past CPI from original pricing assumptions; i.e. the need for a rate increase and the level of a rate increase is not dependent on changes in the CPI levels. Adjustments will be made in both directions (i.e. when actual CPI is higher or lower than original pricing).
- Updated to reflect the actual mix of business sold.

For contracts with CPI-linked inflation, we are using the same future CPI assumptions as were used in original pricing (2.9%) in order to ensure that the need for a rate increase and the level of a rate increase is not dependent on changes to future CPI levels.

Furthermore, **Exhibit 1** demonstrates that the calculated loss ratio respects the applicable pre or post stability form requirements:

<u>Post-stability form requirements:</u>

The sum of the accumulated value of incurred claims without the inclusion of active life reserves, and the present value of future 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 the greater of the original assumed lifetime loss ratio and 58%,
2. Accumulated value of prior premium rate schedule increases times the greater of the original assumed lifetime loss ratio and 85%,
3. Present value of future projected initial earned premium times the greater of the original assumed lifetime loss ratio and 58%, and
4. Present value of future projected premium in excess of the projected initial earned premium times the greater of the original assumed lifetime loss ratio and 85%.

<u>Pre-stability form requirements:</u>
The sum of the accumulated value of incurred claims without the inclusion of active life reserves, and the present value of future 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 the greater of the original assumed lifetime loss ratio and 60%,
2. Accumulated value of prior premium rate schedule increases times the greater of the original assumed lifetime loss ratio and 80%,
3. Present value of future projected initial earned premium times the greater of the original assumed lifetime loss ratio and 60%, and
4. Present value of future projected premium in excess of the projected initial earned premium times the greater of the original assumed lifetime loss ratio and 80%.

4. Nationwide Loss Ratio Exhibit (Exhibit 1)

Leading Edge (LTC-06)

		Original Assumptions			Historical & Projected Experience					
					Before Proposed Increase			With Proposed Rate Increase		
	Calendar Year	Incurred Claims	Earned Premium	Incurred Loss Ratio	Incurred Claims	Earned Premium	Incurred Loss Ratio	Incurred Claims	Earned Premium	Incurred Loss Ratio
	2002	-	-	0%	-	1,430	0%	-	1,430	0%
	2003	-	-	0%	-	8,411	0%	-	8,411	0%
	2004	-	-	0%	-	17,584	0%	-	17,584	0%
	2005	-	-	0%	-	38,337	0%	-	38,337	0%
Historical	2006	686	527,796	0%	-	670,062	0%	-	670,062	0%
Experience	2007	100,935	10,877,546	1%	-	11,659,012	0%	-	11,659,012	0%
	2008	468,119	31,028,661	2%	536,219	32,082,276	2%	536,219	32,082,276	2%
	2009	1,113,120	49,303,222	2%	114,380	49,487,722	0%	114,380	49,487,722	0%
	2010	2,030,409	62,972,058	3%	1,905,388	62,485,468	3%	1,905,388	62,485,468	3%
	2011	3,077,518	65,216,519	5%	2,214,016	63,963,943	3%	2,214,016	63,963,943	3%
	2012	4,181,853	64,059,559	7%	2,311,292	62,636,974	4%	2,311,292	62,636,974	4%
	2013	5,385,960	62,991,707	9%	2,581,678	61,913,112	4%	2,581,678	61,913,112	4%
	2014	6,680,316	61,931,843	11%	6,093,226	61,473,670	10%	6,093,226	61,473,670	10%
	2015	8,063,084	60,803,403	13%	6,557,403	60,837,979	11%	6,557,403	60,837,979	11%
	2016	9,516,533	59,601,957	16%	7,612,554	60,435,731	13%	7,612,554	60,435,731	13%
	2017	11,095,653	58,339,854	19%	8,955,539	60,146,630	15%	8,955,539	60,146,630	15%
	2018	12,913,343	57,015,767	23%	11,029,727	65,226,316	17%	11,029,727	65,226,316	17%
	2019	14,821,325	55,628,121	27%	14,631,660	66,221,669	22%	14,631,660	66,221,669	22%
	2020	16,669,228	54,177,312	31%	16,374,091	64,982,380	25%	16,374,091	64,982,380	25%
	2021	18,719,545	52,664,600	36%	21,975,724	63,858,966	34%	21,975,724	63,858,966	34%
Projected	2022	21,032,613	51,084,301	41%	25,665,030	63,256,232	41%	25,665,030	63,256,232	41%
Future	2023	23,924,132	49,431,074	48%	30,253,430	61,665,420	49%	30,253,430	61,665,420	49%
Experience	2024	27,445,001	47,690,528	58%	35,079,081	60,071,963	58%	34,535,356	87,322,466	40%
	2025	31,379,506	45,856,294	68%	40,443,453	58,382,097	69%	39,189,706	87,671,733	45%
	2026	35,588,522	43,931,059	81%	45,858,210	56,580,644	81%	44,436,606	84,928,825	52%
	2027	39,713,787	41,920,109	95%	51,810,305	54,688,956	95%	50,204,186	82,052,326	61%
	2028	43,538,167	39,830,690	109%	58,947,717	52,693,764	112%	57,120,338	79,022,919	72%
	2029	47,589,494	37,667,534	126%	66,561,920	50,574,598	132%	64,498,501	75,810,260	85%
	2030	51,904,334	35,436,464	146%	74,546,636	48,326,571	154%	72,235,690	72,407,382	100%
	2031	56,417,301	33,148,022	170%	82,713,957	45,948,246	180%	80,149,824	68,812,452	116%
	2032	60,169,563	30,823,051	195%	90,893,266	43,451,982	209%	88,075,575	65,044,438	135%
	2033	62,344,527	28,491,845	219%	98,799,751	40,852,831	242%	95,736,958	61,126,156	157%
	2034	64,236,482	26,188,264	245%	106,182,633	38,174,278	278%	102,890,971	57,093,118	180%
	2035	66,219,258	23,940,053	277%	112,875,857	35,443,470	318%	109,376,705	52,986,243	206%
	2036	68,612,392	21,764,778	315%	118,590,546	32,688,530	363%	114,914,239	48,847,661	235%
	2037	70,001,654	19,677,027	356%	123,034,965	29,936,420	411%	119,220,881	44,717,675	267%
	2038	69,013,512	17,687,520	390%	125,756,012	27,212,901	462%	121,857,576	40,634,589	300%
	2039	67,380,456	15,808,861	426%	126,998,200	24,552,590	517%	123,061,256	36,649,890	336%
	2040	65,747,445	14,050,671	468%	126,778,262	21,995,571	576%	122,848,136	32,822,783	374%
	2041	64,799,665	12,415,777	522%	125,253,890	19,573,890	640%	121,371,019	29,200,733	416%
	2042	63,209,505	10,908,143	579%	122,401,291	17,310,344	707%	118,606,851	25,817,414	459%
	2043	59,660,758	9,527,045	626%	118,401,794	15,213,734	778%	114,731,338	22,685,442	506%
	2044	55,674,184	8,273,385	673%	113,452,995	13,289,325	854%	109,935,952	19,812,152	555%
	2045	51,850,633	7,144,501	726%	107,681,005	11,537,888	933%	104,342,894	17,198,267	607%
	2046	48,810,579	6,133,500	796%	101,363,415	9,957,353	1018%	98,221,149	14,840,323	662%
	2047	45,681,035	5,235,051	873%	94,593,661	8,542,581	1107%	91,661,257	12,730,361	720%
	2048	41,577,783	4,442,004	936%	87,576,892	7,285,974	1202%	84,862,008	10,856,797	782%
	2049	37,480,728	3,749,051	1000%	80,402,643	6,178,226	1301%	77,910,161	9,205,560	846%
	2050	33,595,926	3,148,833	1067%	73,234,782	5,209,452	1406%	70,964,504	7,761,775	914%
	2051	30,306,464	2,632,360	1151%	66,162,618	4,369,019	1514%	64,111,577	6,509,459	985%
	2052	27,370,271	2,191,744	1249%	59,424,343	3,645,760	1630%	57,582,188	5,431,861	1060%
	2053	24,300,201	1,817,934	1337%	52,969,170	3,027,677	1749%	51,327,126	4,511,033	1138%
	2054	21,497,191	1,502,547	1431%	46,940,940	2,503,489	1875%	45,485,771	3,730,128	1219%

Note: Please refer to the Actuarial Memorandum, section "Ensuring No Cross-Subsidization Between States", for adjustments made to experience exhibits

Values as of 12/31/2021 (discounted at maximum statutory valuation rates)

	Incurred Claims	Earned Premium	Incurred Loss Ratio	Incurred Claims	Earned Premium	Incurred Loss Ratio	Incurred Claims	Earned Premium	Incurred Loss Ratio
Past :	136,557,281	1,074,614,552	12.7%	119,725,748	1,118,852,920	10.7%	119,725,748	1,118,852,920	10.7%
Future :	901,134,111	506,548,772	177.9%	1,529,271,029	686,410,734	222.8%	1,484,021,011	965,608,342	153.7%
Lifetime :	1,037,691,392	1,581,163,324	65.6%	1,648,996,777	1,805,263,654	91.3%	1,603,746,759	2,084,461,261	76.9%
Lifetime Net of Hedges :	**1,037,691,392**	**1,581,163,324**	**65.6%**	**1,490,776,330**	**1,805,263,654**	**82.6%**	**1,445,526,312**	**2,084,461,261**	**69.3%**

Total Incurred Claims exceed Total Initial Premiums x max(58%, Original Pricing Loss Ratio) + Increased Premiums x max(85%, Original Pricing Loss Ratio)

Impact of Improved Hedge Terms =	**(158,220,447)**		Accum Value of Past Initial Prm x 65.6% =	715,059,427
Minimum (Accum Value of Past Incurred Claims,			Present Value of Future Initial Prm x 65.6% =	390,285,155
Accum Value of Adjusted Expected Incurred Claims) =	119,725,748		Accum Value of Prior Increases x 85.0% =	24,900,040
Present Value of Future Incurred Claims =	1,484,021,011		Present Value of Future Increases x 85.0% =	315,280,689
Total =	1,445,526,312	>=	Total =	1,445,525,312

Total Incurred Claims exceed Total Initial Premiums x max(60%, Original Pricing Loss Ratio) + Increased Premiums x max(80%, Original Pricing Loss Ratio)

Impact of Improved Hedge Terms =	**(158,220,447)**		Accum Value of Past Initial Prm x 65.6% =	715,059,427
Minimum (Accum Value of Past Incurred Claims,			Present Value of Future Initial Prm x 65.6% =	390,285,155
Accum Value of Adjusted Expected Incurred Claims) =	119,725,748		Accum Value of Prior Increases x 80.0% =	23,435,332
Present Value of Future Incurred Claims =	1,484,021,011		Present Value of Future Increases x 80.0% =	296,734,766
Total =	1,445,526,312	>=	Total =	1,425,514,681

5. Proposed Effective Date

These rates will be effective on the next policy anniversary date, following at least a 90 day policyholder notification period. The assumed effective date used to calculate the rate increase is 01/01/2024.

6. History of Previous Rate Revisions

A 12.5% rate increase on these policy forms was accepted by your state on March 18, 2019.

7. Reduced Benefit Options (RBOs)

If the full or substantial portion of the rate increase request is approved and per the state's agreement, we will file the following additional options which provide policyholders alternatives to the rate increase:

- ***Shared Cost Option***
  Shared Cost option is an actuarially equivalent option that allows policyholders without CPI-linked inflation the option to offset the rate increase. The Shared Cost option would:

  - Reduce the policyholder's current policy benefit amounts by their Shared Cost percentage. The daily/monthly benefit and the policy limit will be reduced by the Shared Cost percentage
  - Apply a percentage factor to any future claim payments equal to the Shared Cost percentage. John Hancock will pay our portion (1 minus the Shared Cost percent) of any covered services, but will not pay more than the new reduced daily/monthly benefit amount and the policyholder will be responsible for the remainder.

  Shared Cost Percentages are calculated using seriatim, nationwide data for each benefit period, inflation type and issue age band combination. All Shared Cost percentages are determined to be actuarially equivalent to the requested rate increases by combination of 5-year issue age band, benefit period and inflation type. The Shared Cost option is not available to limited pay policies or policyholders who have elected two prior Shared Cost options.

- ***Voluntary Enhanced Paid-Up Policy Option***
  For those who choose to stop paying premiums. This option will be a paid-up policy with a policy limit equal to the lesser of the current policy limit and 150% of premiums paid less any benefits received.

The premium rate tables reflecting these options will be filed upon request following a full or substantial approval.

8. State Policyholder Counts & Average Annual Premium

The table below summarizes the number of policies inforce that could be affected by the rate increase in your state and their annualized premiums, as well as the average annual premium per policy before and after the requested increase.

Counts and premiums are based on policies inforce as of 12/31/2021. Premium-paying policies as well as policies on claim are included, since although the premium for policies on claim is currently waived, they could be subject to the rate increase upon recovery. Paid-up policies and policies which have exercised the nonforfeiture benefit option are excluded.

Form	Number of Policies	2021 Annualized Premium*	2021 Average Annual Premium Before the rate increase*	2021 Average Annual Premium After the rate increase
LTC-06 MD	1,098	2,680,175	2,440	3,786

*Premiums reflect the rate increases approved in prior filing(s), including approvals where implementation is not yet complete

9. State and Nationwide Distribution of Business as of December 31, 2021

The state-specific and nationwide distribution of business for policyholders impacted by the rate increase is shown below by inflation type, benefit period, and issue age. The breakdown of business by Premium Payment Option is also included to show the number of policyholders no longer paying premiums due to nonforfeiture election or paid-up status.

Inflation Type

State	GPO	Compound	CPI	Total
NW	12%	0%	88%	100%
MD	11%	0%	89%	100%
NW	3,459	64	25,814	29,337
MD	120	0	978	1,098

Benefit Period

State	3 yr	5 yr	Lifetime	Total
NW	41%	48%	11%	100%
MD	43%	49%	8%	100%
NW	12,013	14,107	3,217	29,337
MD	470	542	86	1,098

Issue Age

State	< 40	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Total
NW	3%	4%	9%	18%	29%	25%	10%	2%	0%	100%
MD	2%	4%	11%	20%	31%	21%	8%	2%	0%	100%
NW	875	1,093	2,549	5,407	8,554	7,231	2,857	671	100	29,337
MD	22	49	123	222	344	230	87	21	0	1,098

Premium Payment Option

State	Lifetime Pay	On Claim	Limited Pay	NFO*	Limited Pay, Paid Up*	Total
NW	93%	1%	1%	1%	4%	100%
MD	93%	1%	2%	0%	4%	100%
NW	28,731	319	287	350	1,083	30,770
MD	1,066	9	23	3	51	1,152

*Policies not included in distributions by count shown above as they are not impacted by the rate increase.

10. Benefit Description(s)

A brief policy description for the policy form:

LTC-06 MD
Individually underwritten long-term care policies that provide comprehensive long-term care coverage for care received in a nursing home or assisted care living facility, home health care, hospice care, respite care, or attendance at an Adult Day Care Center providing Adult Day Care.

Provides reimbursement of covered long-term care expenses incurred after an elected elimination period is met, up to the maximum daily/monthly amount. The benefit eligibility is determined based on the insured's cognitive impairment or their requiring physical assistance to perform two out of six activities of daily living (ADLs) of bathing, dressing, eating, toileting, transferring and maintaining continence.

Premiums are waived after the insured has met the elimination period and is receiving benefits and will continue to be waived until the insured stops receiving such benefits.

11. Renewability

All policy forms are guaranteed renewable.

12. Applicability

This filing is applicable to in force policies only, as these policy forms are no longer being sold in the market. The premium changes will apply to the base forms as well as all applicable riders.

13. Trend Assumptions

As this is not medical insurance, we have not included any explicit medical cost trends in the projections.

14. Marketing Method

This product was typically marketed through our traditional agency system and brokers involving a personal contact with each applicant.

15. Underwriting

These policy forms were underwritten using a medical and risk questionnaire. We also utilized Attending Physician Statement and personal interviews depending on the age of the applicant and medical conditions.

16. Premium Classes

The base policy premium rates vary by issue age, benefit period, inflation option, home health care maximum benefit percentage, and underwriting class, as in the initial rate filing.

All premium factors related to the insured elected benefit design options or any eligible discount remain unchanged from the initial rate filing.

17. Premium Modalization Rules

Frequency	Multiple of Annual Premium
Semiannual	.52
Quarterly	.2625
Monthly	.0875

18. Issue Age Range

The issue age range is 18-79 for all policy forms.

19. Area Factors

Area factors are not applicable to any of the policy forms or riders.

20. Reserves

Active Life Reserves have not been used in this rate increase demonstration. Minimum Statutory Claim reserves as of 12/31/2021 have been discounted to the date of incurral of each respective claim and included in the historical incurred claims. Incurred But Not Reported claim reserves as of 12/31/2021 have also been allocated to the calendar year of incurral and included in historic incurred claims.

21. Data Credibility

Regarding the credibility of data for younger blocks of business such as Leading Edge, the Company would like to draw attention to the American Academy of Actuaries Issue Brief "*Understanding Premium Rate Increases on Private LTCI Policyholders 060216.pdf*", which has been included with this filing. The brief provides guidance on determining the need for premium rate increases on pages 4 and 5. This guidance includes a discussion on determining assumptions used for projections, particularly in situations where experience credibility may be low. Because of the long duration nature of Long Term Care policies, claims are often not seen in early durations which leads to lower credibility in actual experience for younger groups of policies. In situations where this is the case, the Actuarial Standards of Practice require that industry data or company data for older, similar business be used to set assumptions. Specifically, the brief states the following:

> "Section 3.2.1 of Actuarial Standard of Practice No. 18, Long-Term Care Insurance, requires actuaries to use alternative data sources such as public data or experience from the insurance company's older, similar policy forms for identifying reasonable assumptions. Waiting until sthere is adequate claim information on each policy form could result in much larger, less affordable rate increases."

Since Leading Edge is a younger block of business, our proposed rate increases on this form are based on our experience from this form as well as similar forms where we have over 20 years of experience. Overall, our unfavorable morbidity experience is at later durations and older attained ages, where we have significant data on our older plans and less on younger ones. With our combined data we are able to make credible decisions regarding future assumptions, in accordance with ASOP 18. Focusing solely on past experience for this product discredits our future projections and prevents us from acting on this information in a timely manner. Delaying rate increases until we have amassed similar experience on this particular policy form would take a considerable amount of time and would result in much higher rate increases for our customers which would be more difficult to manage and would require larger reductions in benefits in order to mitigate them.

22. Ensuring No Cross-Subsidization Between States

We have ensured no state's rate increase approvals will subsidize other states' rate increases. Rate increases will vary by state, but only to reflect the timing and amount of prior rate increases approved by that state. This is accomplished by first backing-out all prior approved rate increases from our nationwide premium data. We then re-introduce actual prior rate increases with the amount and timing based on your state's prior approvals (as detailed in the section entitled **History of Previous Rate Revisions**). The current proposed rate increases are then determined based on the amounts needed in order to achieve our target lifetime loss ratios certified to in our prior filing.

Although some states may have capped our previous inforce rate increase filings, in each case this was done with the understanding that the full amount of the proposed rate increases were justified and that John Hancock would be refiling for the remainder at a later date. In instances where the remainder remains unapproved, it has been included in the current filings.

23. Past Losses Testing

Preventing companies from recouping past losses was the subject of a discussion by the NAIC in late 2013. The accepted methodology which was incorporated into the 2014 Long Term Care Model Regulation defines past losses as actual past claims less expected past claims when determining loss ratio compliance. Expected past claims are defined as the following:

> "Expected claims shall be calculated based on the original filing assumptions assumed until new assumptions are filed as part of a rate increase. New assumptions shall be used for all periods beyond each requested effective date of a rate increase [regardless of whether or not the rate increase is approved]. Expected claims are calculated for each calendar year based on the in-force at the beginning of the calendar year. Expected claims shall include margins for moderately adverse experience; either amounts included in the claims that were used to determine the lifetime loss ratio consistent with the original filing or as modified in any rate increase filing."

We apply this methodology in demonstrating that we are not recouping past losses.

The 'Adjusted Expected Incurred Claims' are initially calculated by applying the original pricing durational loss ratio to the actual earned premium in a given calendar year. Later, in years in which and after which we filed for inforce rate increases, expected incurred claims are based on the new assumptions that were filed.

The accumulated value of the Adjusted Expected Incurred Claims is compared to the accumulated value of Actual Incurred Claims. The lesser of the Adjusted Expected Incurred Claims or Actual Incurred Claims is used for past claims when ensuring that the resulting overall increase in rates satisfies the rate stability rule ensuring a loss ratio no less than 85% (or the original pricing loss ratio if greater) on the rate increase portion, while applying 58% (or the original pricing loss ratio if greater) on the original rate schedule. This is demonstrated at the bottom of **Exhibit 1**. The derivation of Adjusted Expected Incurred Claims and comparison to Actual Incurred Claims can be seen in **Addendum #2 – Demonstration of not Recouping Past Losses**.

24. Actuarial Certification

I am a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries, and I meet the Academy's qualification standards for rendering this opinion and am familiar with the requirements for filing long-term care insurance premiums and filing for increases in long-term care insurance premiums. This memorandum has been prepared in conformity with all applicable Actuarial Standards of Practice, including ASOP No. 8.

The preceding Actuarial Memorandum contains:

a) the assumptions on which this certification is based;
b) the adjustments to prior assumptions with an explanation of the reasons previous assumptions were not realized;
c) a lifetime projection of the prior premium rate schedules and incurred claims plus future expected premiums and claims which demonstrates that the revised premium rate schedule meets the loss ratios standards and necessary details of this state; and
d) disclosure of the manner, if any, in which reserves have been recognized.

If the requested premium rate schedule increase is implemented and the underlying assumptions which reflect moderately adverse conditions are realized, no further premium rate schedule increases are anticipated.

I have reviewed and taken into consideration the policy design and coverage provided, and our current underwriting and claims adjudication processes.

In forming my opinion, I have used actuarial assumptions and actuarial methods 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 state.

The basis for contract reserves has been previously filed and there is no anticipation of any changes.

Katherine A Gillis

Katherine A Gillis, FSA, MAAA
Actuary, Long Term Care Inforce Management
John Hancock Life Insurance Company

Addendum #1 - Assumptions and Analysis Performed

As part of the inforce management of the business, the Company monitored the performance of the business by completing periodic analysis for morbidity, voluntary lapse rates, and mortality. The findings from these analyses were used in projecting the inforce business to determine the effect of experience on the projected lifetime loss ratio. The most current studies show unfavorable trends since the study that prompted our 2019 rate increase filings.

Relative to previous expectations, the new data demonstrates lower mortality for non-claimants, higher utilization of benefits, and lower than expected claim terminations, partly offset by lower claim incidence.

[REDACTED]

A. <u>Current & Prior Assumptions</u>

<u>Morbidity</u>

[REDACTED]

Incidence

[REDACTED]

After updating assumptions to reflect the generally favorable experience, the overall A/E ratio is 101%.

Incidence (Count)		
Duration	**A/E Before Assumption Update**	**A/E After Assumption Update**
10-11	93%	99%
12-14	95%	101%
15+	94%	102%
Total	**94%**	**101%**

Claim Terminations

[REDACTED]

After updating assumptions to reflect termination experience, the A/E is 99% for the first 5 months on claim and 97% overall.

Terminations (Count)						
	All Months		Months 1-5		Months 6+	
Benefit Period	**A/E Before Assumption Update**	**A/E After Assumption Update**	**A/E Before Assumption Update**	**A/E After Assumption Update**	**A/E Before Assumption Update**	**A/E After Assumption Update**
<10 years	97%	98%	95%	99%	98%	97%
10+ years	91%	96%	91%	102%	92%	93%
Total	**96%**	**97%**	**94%**	**99%**	**97%**	**96%**

Utilization

[REDACTED]

After updating our assumption based on experience, the total A/E is 102%.

Utilization (Amount)		
Inflation Type	**A/E Before Assumption Update**	**A/E After Assumption Update**
None/GPO	101%	101%
Simple	102%	101%
Compound	112%	104%
Total	**106%**	**102%**

<u>Voluntary Lapses</u>

[REDACTED]

Actual to Expected ratios by amount for this block (John Hancock individual business) summarized by inflation and duration groups before and after the assumption update are shown below.

Lapse (Amount)						
	No Inflation		With Inflation		Total	
Duration	A/E Before Assumption Update	A/E After Assumption Update	A/E Before Assumption Update	A/E After Assumption Update	A/E Before Assumption Update	A/E After Assumption Update
1-5	120%	72%	91%	100%	91%	99%
6-10	104%	87%	105%	107%	105%	104%
11-15	88%	95%	96%	100%	95%	99%
16-20	125%	93%	128%	103%	128%	101%
21-25	126%	119%	127%	123%	127%	121%
26+	109%	100%	88%	92%	104%	98%
Total	**107%**	**96%**	**105%**	**104%**	**105%**	**102%**

The changes to the expected lapse assumption improved the fit across cohorts and resulted in a total A/E of 102%.

<u>Mortality</u>

[REDACTED]

The below table shows the healthy life A/E ratios by amount before and after the assumption update for our Retail Individual business.

Mortality (Amount)		
Duration	A/E Before Assumption Update	A/E After Assumption Update
1-5	100%	105%
6-10	99%	99%
11-15	96%	99%
16-20	94%	102%
21-25	97%	101%
26+	76%	84%
Total	**95%**	**100%**

<u>Expenses</u>

[REDACTED]

<u>CPI Inflation Rate</u>

[REDACTED]

B. Original Pricing Assumptions

[REDACTED]

Addendum #2 – Demonstration of not Recouping Past Losses
Leading Edge (LTC-06)

	Calendar Year	Original Incurred Loss Ratio	Historic Data Earned Premium	**Adjusted Expected Incurred Claims**		Historic Data Incurred Claims
Original Pricing	1988	0%	-	**-**		-
	1989	0%	-	**-**		-
	1990	0%	-	**-**		-
	1991	0%	-	**-**		-
	1992	0%	-	**-**		-
	1993	0%	-	**-**		-
	1994	0%	-	**-**		-
	1995	0%	-	**-**		-
	1996	0%	-	**-**		-
	1997	0%	-	**-**		-
	1998	0%	-	**-**		-
	1999	0%	-	**-**		-
	2000	0%	-	**-**		-
	2001	0%	-	**-**		-
	2002	0%	1,430	**-**		-
	2003	0%	8,411	**-**		-
	2004	0%	17,132	**-**		-
	2005	0%	36,956	**-**		-
	2006	0%	616,488	**802**		-
	2007	1%	11,060,812	**102,669**		-
	2008	2%	31,189,533	**470,697**		536,219
	2009	2%	48,922,780	**1,104,902**		114,380
	2010	3%	62,229,456	**2,007,220**		1,905,388
	2011	5%	66,387,282	**3,134,127**		2,214,016
	2012	7%	67,822,702	**4,430,094**		2,311,292
	2013	9%	67,104,518	**5,743,100**		2,581,678
	2014	11%	66,643,059	**7,200,509**		6,093,226
	2015	13%	65,969,435	**8,773,393**		6,557,403
2016 RI	2016			**7,084,765**		7,612,554
	2017			**8,771,629**		8,955,539
	2018			**10,665,732**		11,029,727
2019 RI	2019			**15,842,683**		14,631,660
	2020			**18,446,779**		16,374,091
	2021			**21,653,401**		21,975,724
Values as of 12/31/2021 (discounted at maximum statutory valuation rates)						
Past :				**136,710,090**	>	119,725,748

Minimum (Accum Value of Past Incurred Claims,
Accum Value of Adjusted Expected Incurred Claims) = 119,725,748

The lesser of actual and expected past claims, $119,725,748, is used in demonstrating compliance with the minimum loss ratio in Exhibit 1

Appendix A
Leading Edge (LTC-06)
Rate Increase Percentages

(applied across all elimination periods, and across all Assisted Living Facilities, Home and Community Care percentages)

Age	5% Compound Guaranteed			Automatic Inflation		
	Benefit Period			Benefit Period		
	3 Years	5 Years	5 Years + $1M Rider	3 Years	5 Years	5 Years + $1M Rider
18-29	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
30	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
31	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
32	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
33	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
34	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
35	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
36	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
37	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
38	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
39	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
40	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
41	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
42	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
43	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
44	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
45	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
46	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
47	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
48	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
49	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
50	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
51	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
52	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
53	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
54	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
55	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
56	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
57	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
58	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
59	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
60	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
61	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
62	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
63	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
64	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
65	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
66	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
67	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
68	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
69	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
70	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
71	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
72	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
73	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
74	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
75	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
76	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
77	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
78	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
79	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
80	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
81	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
82	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
83	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
84	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
85	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
86	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
87	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
88	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
89	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
90	88.8%	88.8%	88.8%	51.8%	51.8%	51.8%
91	88.8%	88.8%	88.8%			
92	88.8%	88.8%	88.8%			
93	88.8%	88.8%	88.8%			
94	88.8%	88.8%	88.8%			
95	88.8%	88.8%	88.8%			
96	88.8%	88.8%	88.8%			
97	88.8%	88.8%	88.8%			
98	88.8%	88.8%	88.8%			
99	88.8%	88.8%	88.8%			
100+	88.8%	88.8%	88.8%			