

# Deep Dive Into Hybrid Life / LTC Products

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# Deep Dive Into Hybrid Life / LTC Products

*SOA 2020 Life & Annuity Virtual Symposium*

Al Schmitz

MAY 4, 2020



# Life / LTC Combination Products – Terminology

- Combination products: Generic overarching term of all products that have LTC benefits as part of a life insurance or annuity product
- Acceleration benefit rider: Provides LTC payments as early payment of a death benefit upon meeting an LTC benefit trigger
- Extension of benefits rider: Benefits beyond the acceleration of a death benefit. Typically creates a separate pool of LTC benefits
- Linked benefit (aka Hybrid) product: Product that offers “true LTC insurance” via an extension of benefits or inflation compounding or both
- Asset based product: Subset of linked benefit products. Generally funded as a single premium by moving an existing asset. Generally also includes a return of premium benefit from day one of the product.

# Life Acceleration Benefit Rider Comparisons

## Chronic Illness Rider

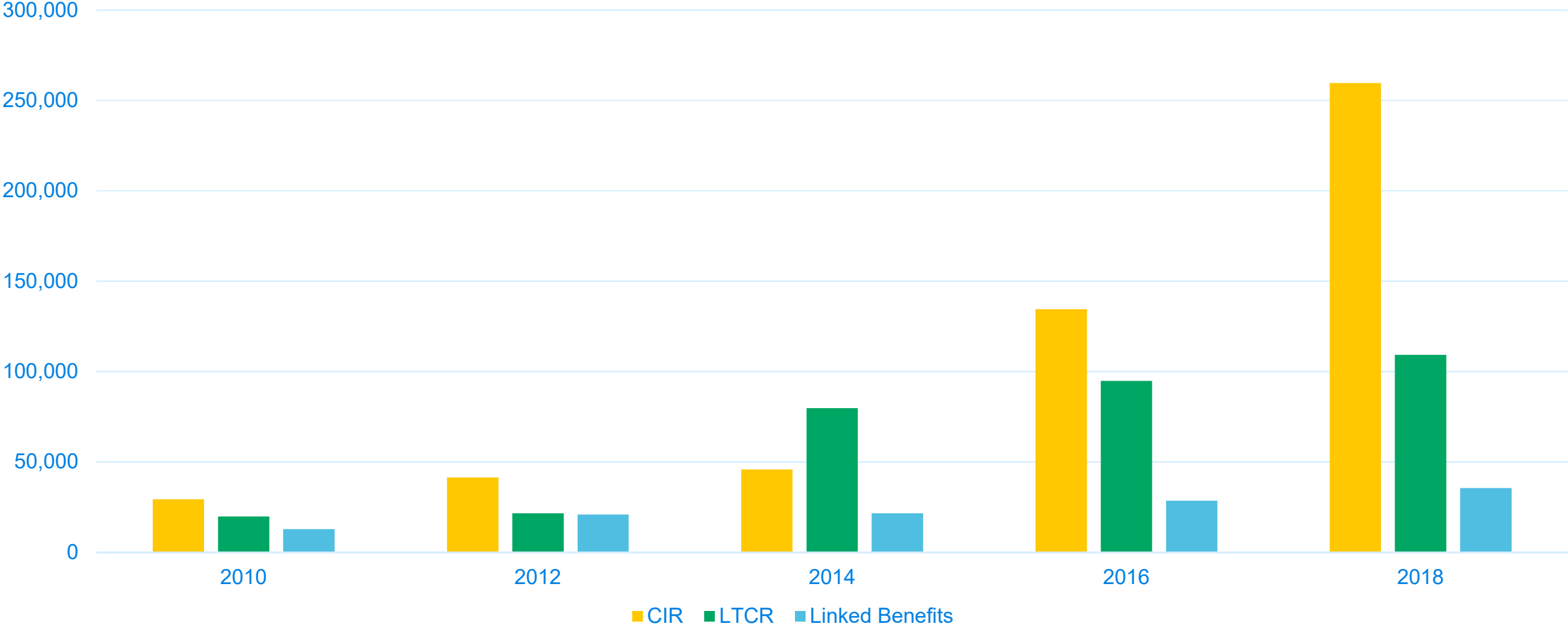
1. IRS Section 101(g)
2. **Cannot** be described or marketed as long-term care insurance
3. No restrictions are permitted on use of payments (cash)
4. Must offer **lump sum** benefit (annual lump sum may be an option)
5. Previously limited to a '**permanence** requirement'
  - Interstate Compact now allows temporary
6. LTC regulations don't apply, except HIPAA daily limit for tax purposes, but Model Reg 641 applies
7. Must include terminal illness benefits

## Long Term Care Rider

1. IRS Section 7702
2. Can be **marketed as LTC**
3. Can be **reimbursement**, indemnity (fixed benefits but formal care needed), or disability (cash)
4. **Periodic payments**
5. No permanence requirement
6. LTC regulations generally apply
7. No terminal illness benefit requirement

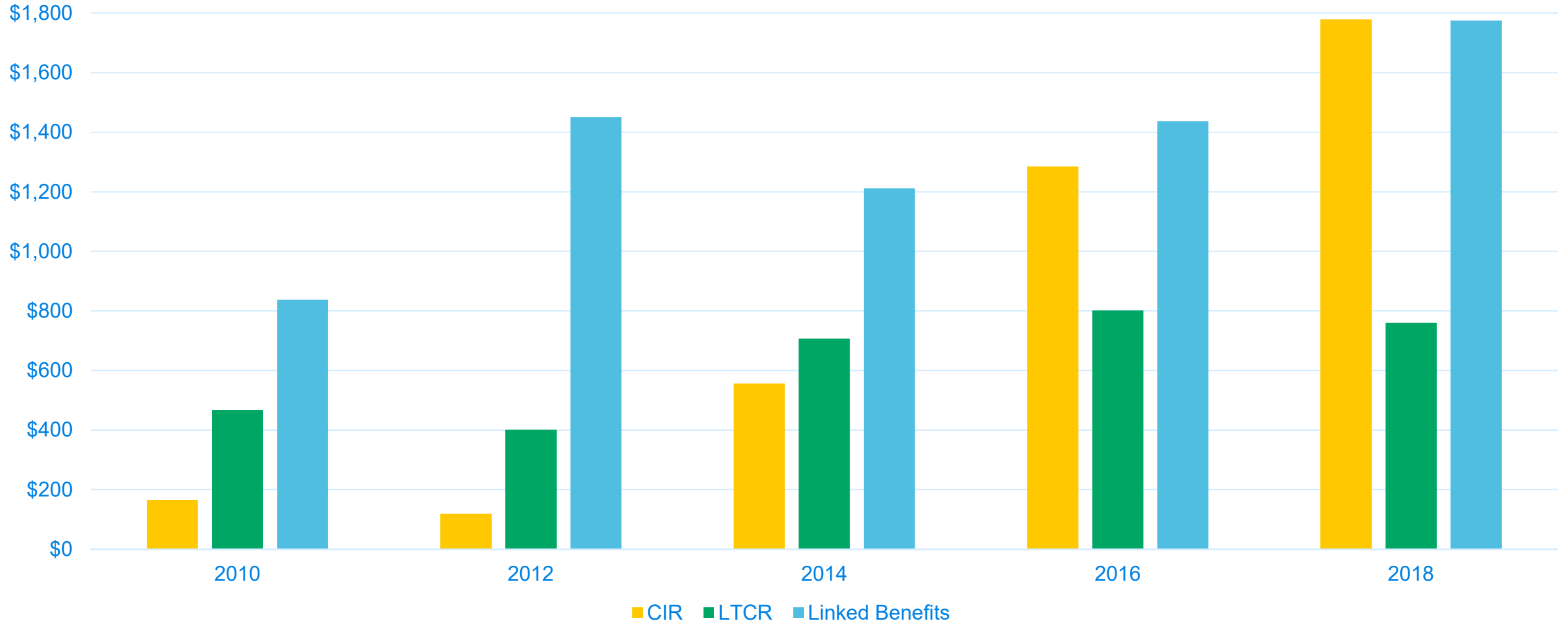
# Sales: Life with LTC Combinations

## Policies Sold



# Sales: Life with LTC Combinations *(continued)*

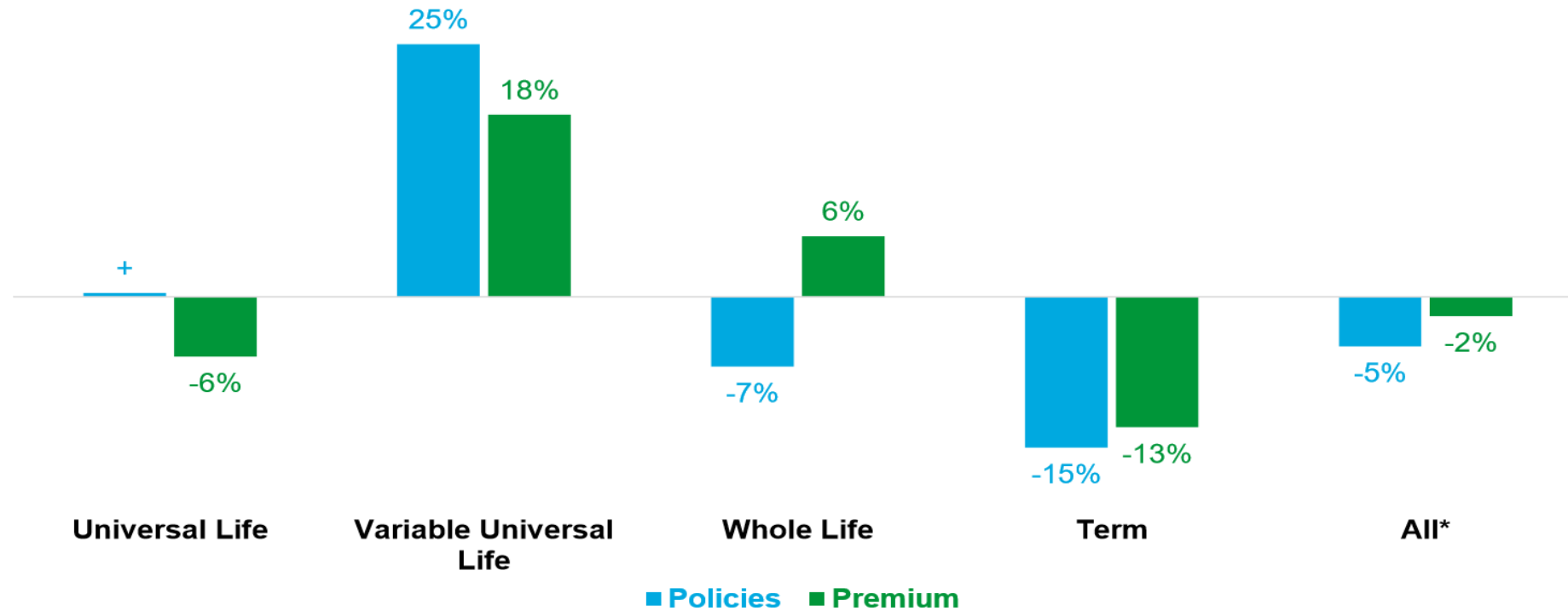
## Premium Issued





# Combination Product Sales Growth by Base Life Plan – First Half 2019

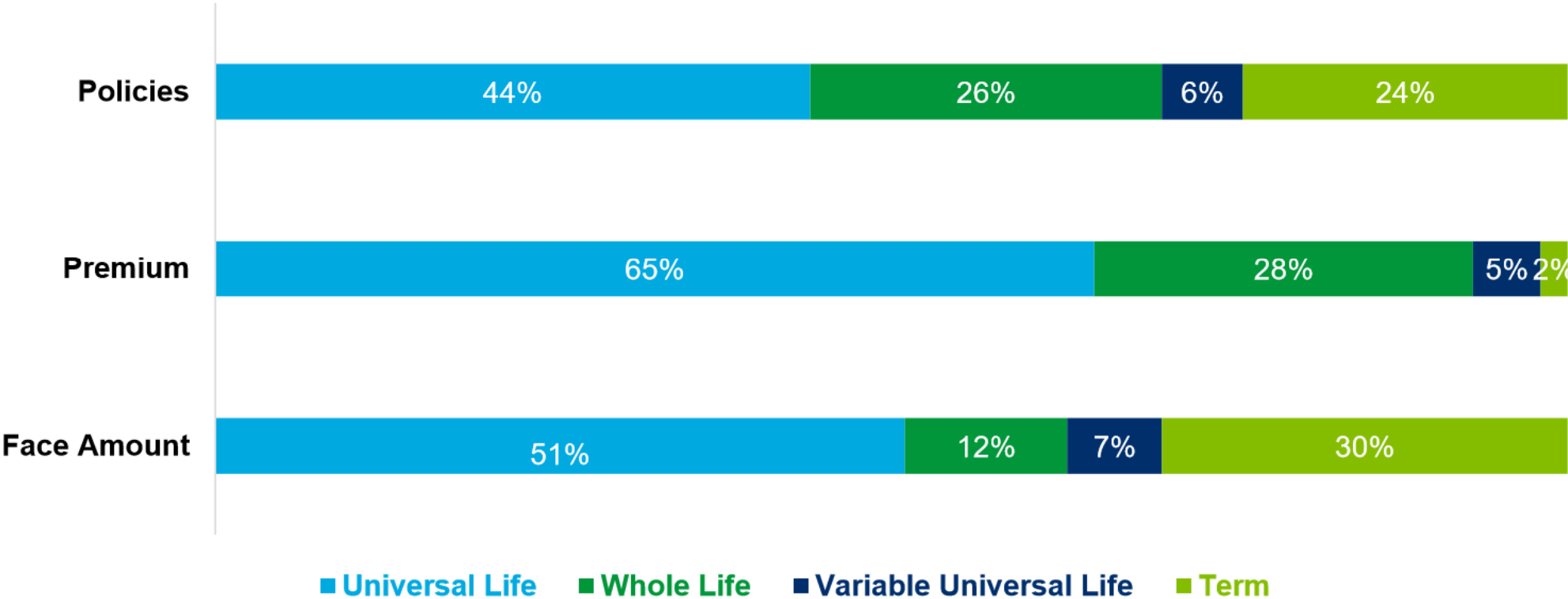
**2019 Sales Growth by Product Type Through June**  
*(percent change compared with the same period of 2018)*



+ Less than 1/2 of 1%

# Combination Product Sales by Base Life Plan – First Half 2019

### Market Share by Product



# Chronic Illness Rider – Designs

## Discounted Death Benefit

- No upfront charge
- Insurer pays **discounted %** of face amount at time of payment, either monthly, annually, or lump sum
- Difficult to illustrate how deep those discounts may be across a range of claims scenarios

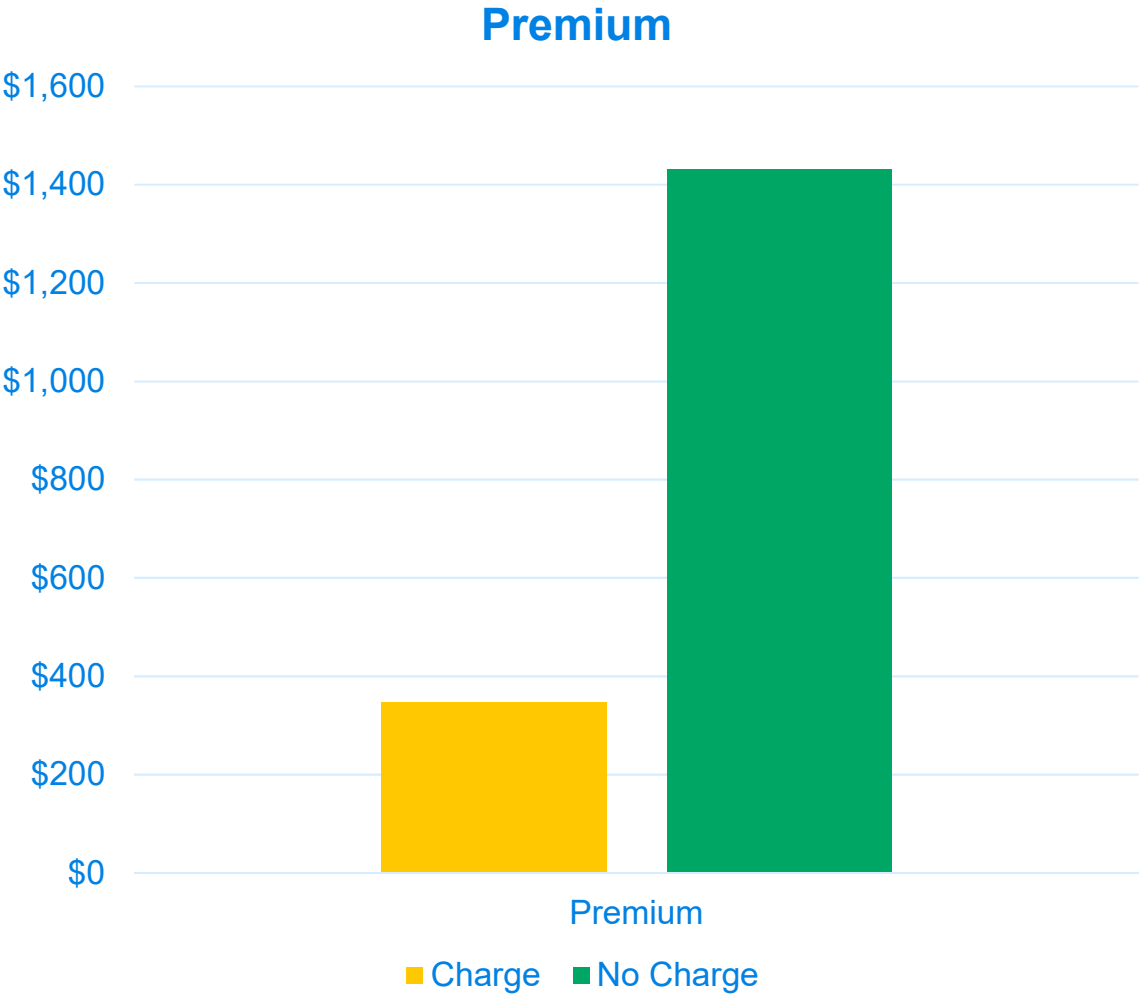
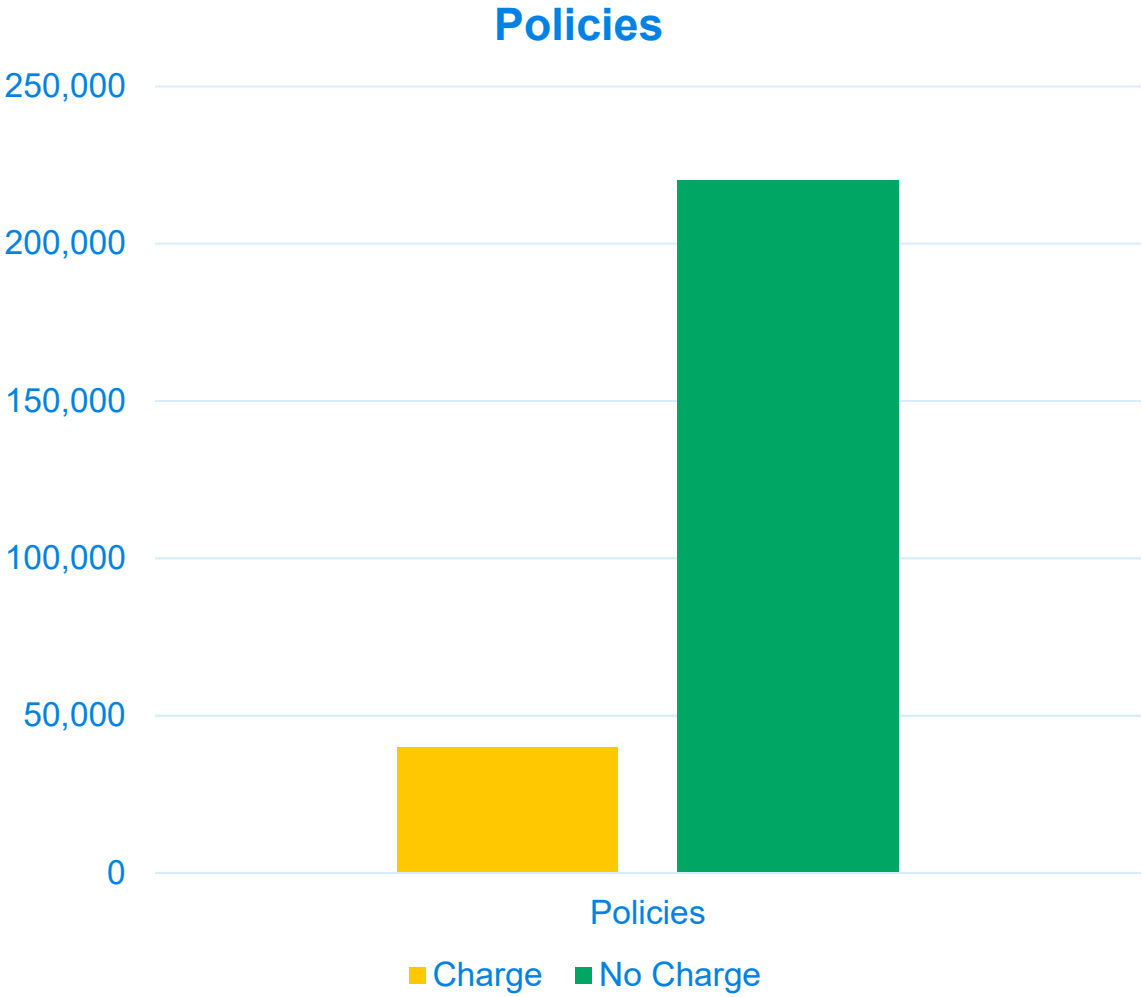
## Lien Approach

- No upfront charge (usually)
- Payment of benefit is a **lien** against the death benefit of the policy
- Future premiums, charges, cash value are **unaffected by payment** and continue as if lien had not occurred

## Dollar for Dollar

- **Upfront rider charges**
- Benefit Payment reduces Death Benefit **dollar for dollar**
- **Cost of the rider is a fraction of the cost of a stand-alone LTC plan paying the same nominal benefit dollars (time value of money cost of paying DB early, and foregoing some premiums)**

# 2018 CIR: Charge vs. No Charge



# CIR vs. LTCR: Which is Better?

## Advantages of CIR

- For insurers and producers, may be **easier path** as a life rider 101(g) and Model Reg 641 vs. health type benefit
- **Fewer LTC forms** requirements
- Agents **do not need** to be **health licensed** to sell

## Advantages of LTCR

- Can be **sold** as an **LTC solution**
  - **Can also add extension of benefit rider** to address full range of LTC needs above the life face amount
- **Doesn't impose** the lump sum requirement of CIR which is more costly
- Reimbursement designs help with **risk protection**
- LTC training requirements can protect the company, the producer, and the consumer

# Hybrid Design

- **Bundled product** with Base + ABR + EBR
- Client gets access to the **Death Benefit plus more** (i.e., the EBR)
- Regulations require the 5% compound **inflation benefit** to be offered
- Available as **Single Pay** or **Multi-pay**
  - The vast majority of sales until the last few years were single pay
  - Multi-pay was traditionally 10 year or less, but seeing longer options recently
- Traditionally offers decent **return of premium** value
  - 70% to 100%
- Sold as the **Live-Die-Quit Story**
  - Self Funding alternative to Stand Alone LTC
  - Avoids use it or lose it characteristic

<u>Event</u>	<u>Product Use</u>
Live	Long Term Care
Die	Death Benefit
Quit	Return of Premium

# Product Comparisons – \$4500 Initial Monthly LTC Benefit, 4 Year Benefit Period, 3% Inflation, Issue Ages 50 and 65

- Challenges in comparing different products with different characteristics regarding values payable across, surrender, various levels of LTC claim, and death
- Guarantees vary by product
- Premium schedules used vary
  - Stand-alone LTC level annual premium
  - Life hybrids were 10 pay up to 20 pay
  - Annuity hybrids were single pay
- Male / female averages were used because stand-alone LTC was all sex-distinct while some hybrids were still unisex (changing)
- At least one company had no inflation protection during the acceleration period

# Product Comparison

Solving for the same initial  
Monthly LTC Benefit  
Male / Female  
Average Issue Age 50

Premium			
Year	Life	Annuity	LTC
10	57,842	123,148	16,460
20	93,926	123,148	32,920
30	93,926	123,148	49,380
40	93,926	123,148	65,840

Death Benefit			
Year	Life	Annuity	LTC
10	109,500	132,909	-
20	121,423	163,111	-
30	110,881	200,182	-
40	109,500	245,666	-

Cash Surrender Value			
Year	Life	Annuity	LTC
10	31,703	132,909	-
20	80,668	163,111	-
30	85,991	200,182	-
40	90,212	245,686	-

Maximum LTC Benefit			
Year	Life	Annuity	LTC
10	293,765	361,886	294,769
20	368,460	490,175	396,145
30	482,283	667,800	532,386
40	635,251	924,490	715,482

## Leverage Ratios (Maximum Benefit / Cumulative Premium)

Death Benefit			
Year	Life	Annuity	LTC
10	189%	108%	0%
20	129%	132%	0%
30	118%	163%	0%
40	117%	200%	0%

Cash Surrender Value			
Year	Life	Annuity	LTC
10	55%	108%	0%
20	86%	132%	0%
30	92%	163%	0%
40	96%	200%	0%

Maximum LTC Benefit			
Year	Life	Annuity	LTC
10	491%	294%	1791%
20	392%	398%	1203%
30	513%	542%	1078%
40	676%	751%	1087%



# Product Comparison *(continued)*

Solving for the same initial  
 Monthly LTC Benefit  
 Male / Female  
 Average Issue Age 50

## IRRs (Annual return to policyholder on premiums if maximum benefits are paid)

Death Benefit			
Year	Life	Annuity	LTC
10	11%	1%	n/a
20	2%	1%	n/a
30	1%	2%	n/a
40	0%	2%	n/a

Cash Surrender Value			
Year	Life	Annuity	LTC
10	-11%	1%	n/a
20	-1%	1%	n/a
30	0%	2%	n/a
40	0%	2%	n/a

Maximum LTC Benefit			
Year	Life	Annuity	LTC
10	28%	13%	60%
20	11%	8%	22%
30	7%	6%	14%
40	6%	5%	10%

# Producers

- LTC sales have evolved over time
- Protection product advisor vs. Financial advisor
  - Needs based vs. investment focus
  - Protection product advisor more comfort with medical underwriting
- Producer challenges
  - Limited pay and waiver of premium product features
  - There is somewhat limited availability of designs providing shared benefits between a couple
  - Coverage for international care is limited

# Producers' Themes from *Contingencies* Article Interviews

- Leverage
  - **Consumers like leverage** of potential LTC benefits being a large multiple of premium
- Sales motivation: Sales are often driven by emotional issues
  - As one producer commented, “**statistics kill LTC sales**, while personal experiences and stories sell the coverage”
- Lower coverage levels
  - Producers are selling **lower average monthly benefits** than in the past as more focus is being put on home health care services and assisted living facilities
- Simplicity
  - The more the industry can reduce the number of choices and decisions for the insured, the better
  - The simplicity of the new business process, including underwriting, is also very important
- Financial strength
  - The relative financial strength of the insurance carrier is very important
- Producer confidence
  - Producers are getting more and more comfortable selling combination products
  - **1035 Exchanges** are a big market and could get bigger

# Tax Catalyst for Growth of “Combination Products”

## Pension Protection Act of 2006

- Has a section (eff. 1/1/10) addressing plans **that combine life insurance or non-qualified annuities with LTC**
- Acceleration of base plan values in the event of a qualified LTC need are **tax-free LTC benefits**
- Charges are **tax-free distributions**, but reduce basis in the contract
- **Allows 1035 exchanges** into combination products (annuity plans to annuity combos, life plans to any combo)
- Taxes are not payable on gains in the contract under these 1035 exchange rules, **continuing to be deferred** until withdrawal, or death on annuity combos
  - Only way to get otherwise taxable gains out of an annuity contract is if cash values are paid out as accelerated benefits for LTC

# LTC Rider to Life Contract Tax Implications

- Tax impact of LTC charges paid from cash values
  - Reduces the cost basis in the policy (per the Pension Protection Act)
  - Upon surrender, plans with an ROP benefit could end up with a taxable gain equal to the LTC charges
  - Rider costs are not tax deductible to individuals or businesses
  - Rider costs cannot be paid with HSA dollars
- Riders sold with separable premiums
  - May avoid potential taxable gains on surrender
  - Premiums may be tax deductible
  - Premiums may be able to be paid with HSA dollars



# Thank you

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# **BASICS OF PRICING LTC COMBO PRODUCTS**

May 4, 2020

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# DISCUSSION OVERVIEW

- Claim cost method
- First-principles method
- Other modeling considerations
- Assumption development



# CLAIM COST METHOD

- First used in early products that came to market in the late 1980s
- “Keller Method” described in an early paper:
  - *Pricing of Accelerated Benefits Plans*, Transactions of Society of Actuaries, 1990
- Calculates the incremental cost associated with the payment of an accelerated death benefit
- For any given acceleration payment:
  - Incremental Cost = Benefit Payment – Death Benefit Savings
  - Death Benefit Savings = Disabled Mortality Net Single Premium \* Benefit Payment

# CLAIM COST METHOD: SIMPLE ILLUSTRATION 1

- Cash flow approach
- \$1,000 life policy with a 25% lump sum acceleration upon disability

Year	Lives	qx	Base Death Benefits	Disability Incidence	Accel. Payments	Disabled Lives	Disabled qx	Death Benefit Savings	Increm. Costs	Total Benefits
1	1,000	2%	20,000							20,000
2	980	3%	29,400							29,400
3	951	4%	38,024							38,024
4	913	5%	45,629							45,629
5	867	6%	52,017	5.0%	10,837				10,837	62,854
6	815	7%	57,045			43	14%	-1,517	-1,517	55,528
7	758	8%	60,631			37	16%	-1,491	-1,491	59,140
8	697	9%	62,753			31	18%	-1,409	-1,409	61,344
9	635	10%	63,450			26	20%	-1,284	-1,284	62,166
10	571	100%	571,051			21	100%	-5,136	-5,136	565,916
Total			1,000,000		10,837			-10,837	0	1,000,000
PV @5%			676,464		8,491			-7,126	1,365	677,829

Base Death Benefits = Lives x qx x \$1000 (face amount)

Acceleration Payments = Lives x Disability Incidence x \$1,000 x 25%

Death Benefit Savings = Disabled Lives x Disabled qx x \$1,000 x 25%

Incremental Costs = Acceleration Payments - Death Benefit Savings

Total Benefits = Base Death Benefits + Incremental Costs

# CLAIM COST METHOD: SIMPLE ILLUSTRATION 2

- Keller Method
- \$1,000 life policy with a 25% lump sum acceleration upon disability

Year	Lives	qx	Base Death Benefits	Disability Incidence	Accel. Payments	Disabled Ax	Death Benefit Savings	Increm. Costs	Total Benefits
1	1,000	2%	20,000						20,000
2	980	3%	29,400						29,400
3	951	4%	38,024						38,024
4	913	5%	45,629						45,629
5	867	6%	52,017	5.0%	10,837	0.818	-9,095	1,742	53,759
6	815	7%	57,045						57,045
7	758	8%	60,631						60,631
8	697	9%	62,753						62,753
9	635	10%	63,450						63,450
10	571	100%	571,051						571,051
PV @5%			676,464		8,491		-7,126	1,365	677,829

Base Death Benefits = Lives x qx x \$1000 (face amount)

Acceleration Payments = Lives x Disability Incidence x \$1,000 x 25%

Death Benefit Savings = Acceleration Payments x Disabled Ax

Incremental Costs = Acceleration Payments - Death Benefit Savings

Total Benefits = Base Death Benefits + Incremental Costs

# APPLICATION OF SIMPLE ILLUSTRATIONS TO LTC BENEFITS

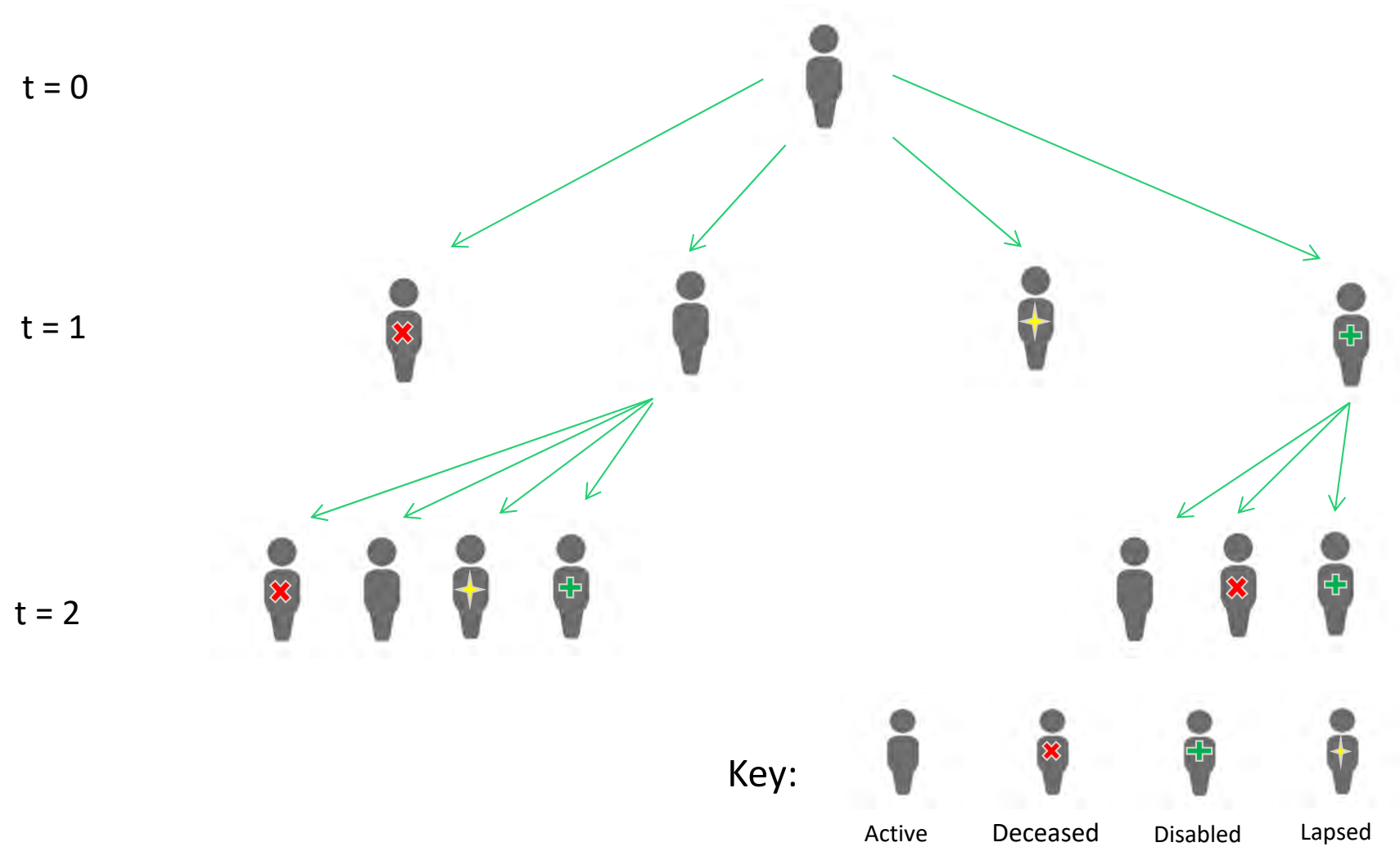
- Acceleration of death benefit for LTC benefits is shown as an example in the Transactions paper
- More complex than a lump sum payment
  - Monthly benefits are paid over an extended period
  - Monthly waived premium or charges are added as a cost
  - A separate disabled Ax is applied to each individual payment to determine its specific death benefit offset
- Although it is more complex, this approach can be modeled using spreadsheet software
- It can also be used for extension benefits that are paid after face amount is depleted by capping the death benefit savings calculation

# CLAIM COST METHOD: PROS AND CONS

- Pros:
  - Simple method for calculating incremental claim costs of LTC benefits
  - Can be calculated using spreadsheet software
  - Might be a good starting point for a test product with minor benefits
- Cons:
  - Does not explicitly model exact timing of cash flows, policy reserves, disabled life reserves and account value changes
  - Does not explicitly consider recoveries or lapses after disability
  - Not recommended for more sophisticated products with rich benefits (extension of benefits)
  - Cannot accommodate principles-based reserving

# FIRST-PRINCIPLES METHODS

- The core requirement of a first-principles LTC combo model is the ability to track the insured population in multiple states:



# FIRST-PRINCIPLES CHALLENGES (1/2)

**In addition to tracking lives in various states, models must also track:**

- Monthly LTC payments while disabled
- Impact of the monthly LTC payments on the values of:
  - LTC benefit remaining
  - Life insurance death benefit, account value and cash value
  - Life insurance policy reserve
- Waived premium and account value charges
- Active and disabled life reserves for the LTC benefits

# FIRST-PRINCIPLES CHALLENGES (2/2)

**Assumptions must be developed and deployed at a granular level:**

- Active life mortality and lapse rates
- LTC incidence, claim recovery, disabled life mortality and benefit utilization
- LTC assumptions may also vary by level of care received (nursing home, assisted living and home care)

**Deterministic or stochastic?**

- The number of variations that must be tracked and captured in a deterministic model can be overwhelming and difficult to code
- Some actuaries have moved to a stochastic approach and load the mean results of thousands of randomly generated scenarios into pricing models



# OTHER MODELING CONSIDERATIONS: SIMPLER COMBO PRODUCTS

Generally deployed for ADB-only products using the claim cost method

- Pricing:
  - LTC claim costs are loaded in to the base policy pricing model
  - Solve for premiums / charges that preserve base policy profit goals (profit margin, IRR, ROE)
  - Simplified premium structures produced subsidies due to differences in life vs. LTC risk
- Statutory reserves:
  - LTC claim costs are loaded into a spreadsheet model that calculates tabular reserve factors
  - Reserve factors use prescribed stand-alone LTC mortality, lapse and interest
- GAAP follows base product (FASB 60 or 97 until LDTI becomes effective)
- Earnings projections generally lacked refined timing of rider elements

# OTHER MODELING CONSIDERATIONS: RICHER COMBO PRODUCTS

Generally deployed for extension of benefit products using first-principles

- Pricing:
  - Holistic pricing of the combined features product
  - Sensitivity results for LTC-rich products resemble those of stand-alone LTC products
  - Solve for premiums / charges that have profit targets that provide appropriate return for the LTC risk
- Statutory reserves
  - Principles-based reserves for new products
  - PAD requirements for individual assumptions are challenging:
    - Cumulative nature of PADs on multiple components of assumptions creates very large PADs
    - Some PADs are not additive
- GAAP movement to LDTI will remove most PADs, but will create additional reporting requirements

# ASSUMPTION DEVELOPMENT: LTC INCIDENCE

Followed the evolution of stand-alone LTC assumptions

- Initially used population studies:
  - 1985 National Nursing Home Survey
  - 1982, 1984, 1989 National LTC Surveys
- Then moved to industry studies of stand-alone LTC
  - SOA Intercompany LTC Experience Studies
  - Experience compiled by consulting firms
- Then, to experience from carrier's stand-alone LTC products
- Early entrants now incorporate their own combo experience where credible
- Death benefit preservation behavior?
  - Early experience indicates incidence rates that are lower than stand-alone LTC
  - Is this a self-imposed elimination period, forgotten benefits or healthier lives?
  - What impact will this have on disabled life mortality?

# ASSUMPTION DEVELOPMENT: DISABLED LIFE MORTALITY

- Initially could not leverage stand-alone LTC thinking or data
- Early ADB rider pricing based on judgement, often applying a constant multiple of aggregate mortality
- Population studies became available in mid 2000s
  - 1999 National Nursing Home Survey
  - 2000 Home and Hospice Care Survey
- Stand-alone LTC studies emerged within the last 10 years, and are commonly used as a source
  - From need to better understand tail risk in longer claims
  - From movement to first-principles modeling
- Aggregated experience studies miss the historical shift of care setting from nursing homes towards assisted living facilities (with much lower mortality rates)

# INTERACTION OF ASSUMPTIONS

First-principles assumptions must exhibit property integrity in a model

## Conservation of mortality test:

Active + disabled = total mortality

## Check for orphans:

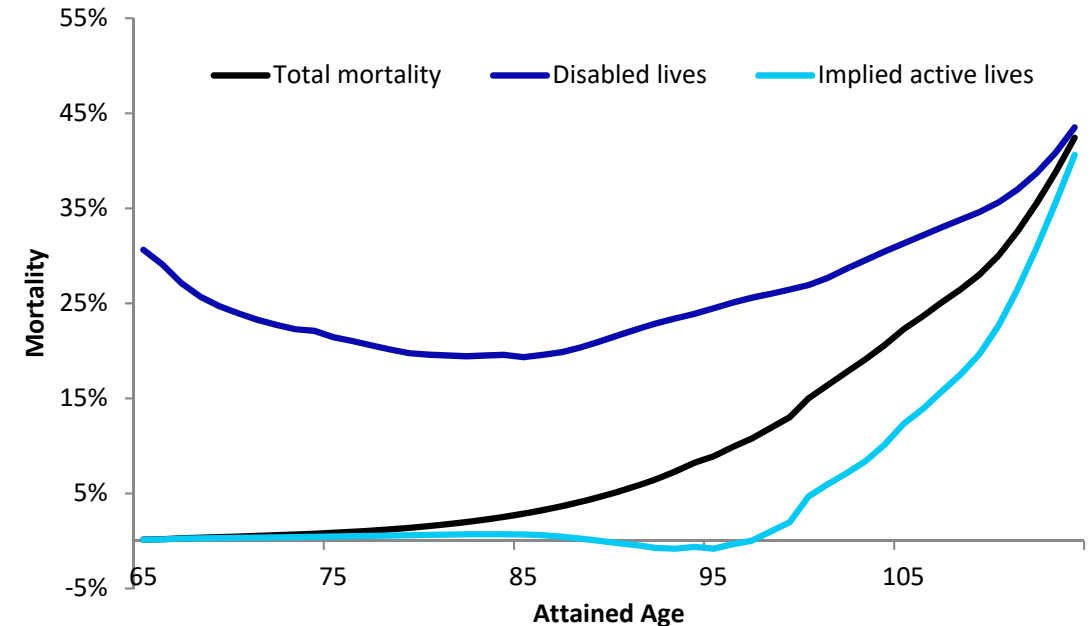
All entrants must have an accounted for exit:

- Lapse
- Active life death
- Disabled life death
- Benefit exhaustion without residual death benefit

All LTC incidents must have an accounted for exit:

- Death: disabled life mortality; exits model
- Recovery: re-enter active population with remaining benefits
- Benefit exhaustion: retain in model if a residual death benefit is paid

**If these integrity checks are not preserved, the actuary should revisit the assumptions**





**OLIVER WYMAN**

# Deep Dive Into Hybrid Life / LTC Products

## Sample Case Study

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May 4, 2020

# Sample Case Study - Agenda

- Overview of Case Study Model Parameters
- Sample Hybrid Benefit Cash Flows by Component
- Individual Assumption Impact Analysis
- Assumption Interactions



# Overview of Case Study Model

# Overview of Case Study Model – Product Features/Demographics

The results offered in this presentation are based on the following key characteristics:

Product Group	BP (or ABR   EBR)	Average Max Daily Benefit	Return of Premium ("ROP")	Benefit Inflation Option ("BIO")*
Standalone LTC 2 Yr	2	\$200	No	Yes
Standalone LTC 6 Yr	6	\$200	No	Yes
Universal Life Only	n/a	\$200	Yes up to 80%	No
Hybrid with 1x LTC no BIO (Acceleration Rider Only)	2   0	\$200	Yes up to 80%	No
Hybrid with 1x LTC	2   0	\$200	Yes up to 80%	Yes
Hybrid with 2x LTC	2   2	\$200	Yes up to 80%	Yes
Hybrid with 3x LTC	2   4	\$200	Yes up to 80%	Yes

\* BIO: Approximately a 20%, 65%, 15% mix of 0%, 3%, 5% compound inflation, respectively

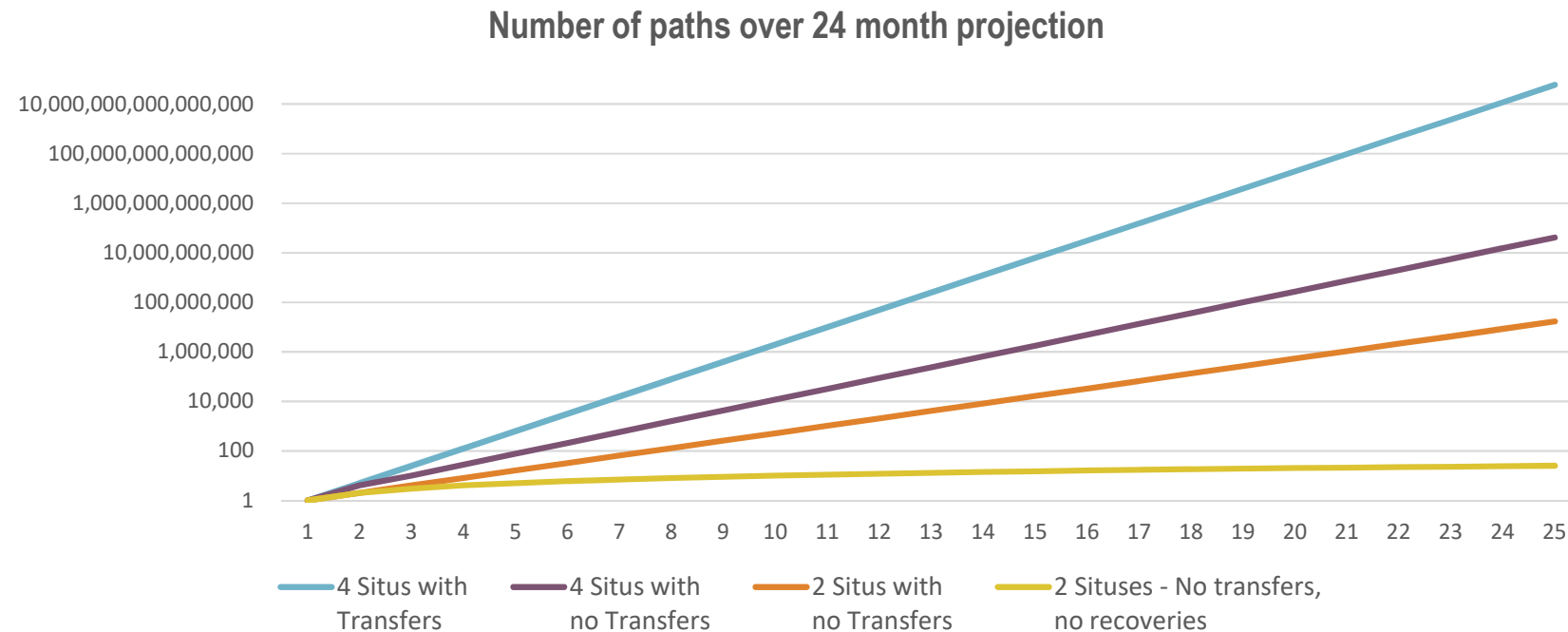
- For comparison purposes, the same assumptions & policy demographics are applied to all product groups.
- The assumptions within the model, and projections shown are for illustration purposes only and should not be relied upon.

# Overview of Case Study Model – General Model Methodology

- First Principles Multi-state Model
- Varies by situs
  - Ability to track lives by situs provides valuable insights (e.g. How a shift of incidence from NH to ALF is more impactful by extension period)
  - Provides the ability to dynamically validate results by situs and quickly react
- Full integration of life & LTC benefits and features
  - Although guidance is limited, the Riders and Supplemental Benefits section of the Valuation Manual (i.e. Subsection 6) indicates that the Secondary Guarantee and LTC Rider should be integrated with the base policy.
- Monthly processing of results
  - Allows for more exact tracking of benefit pools, as well as a more accurate application of claim termination and utilization assumptions

# Overview of Case Study Model – Model Processing

- The processing power to track all paths can cause major run-time and memory concerns

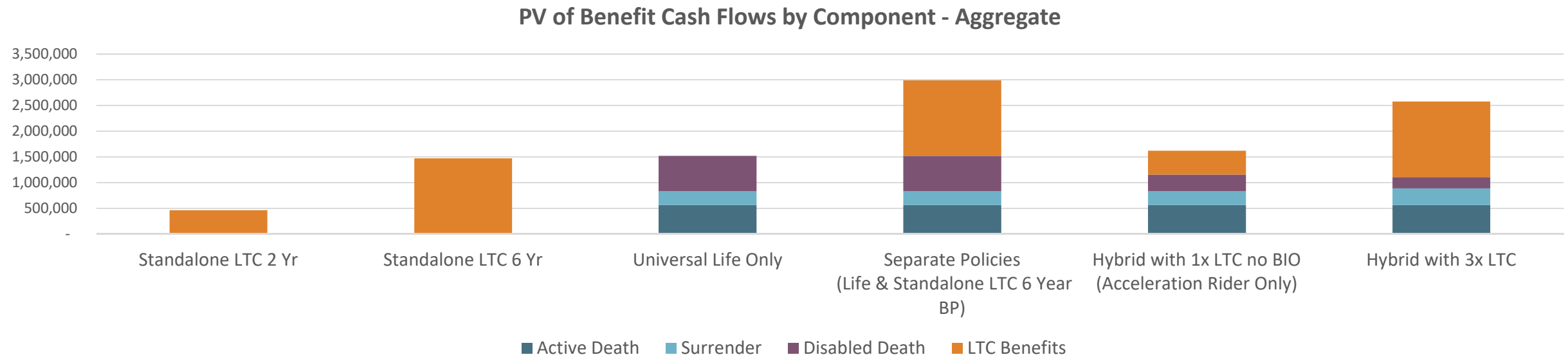


The case study model uses a combination of the following model processing simplifications:

- Bucketing of ‘tunnels’ – using average calculations for benefit pools
- Thresholds to stop a path that becomes immaterial

# Sample Benefit Cash Flows by Component

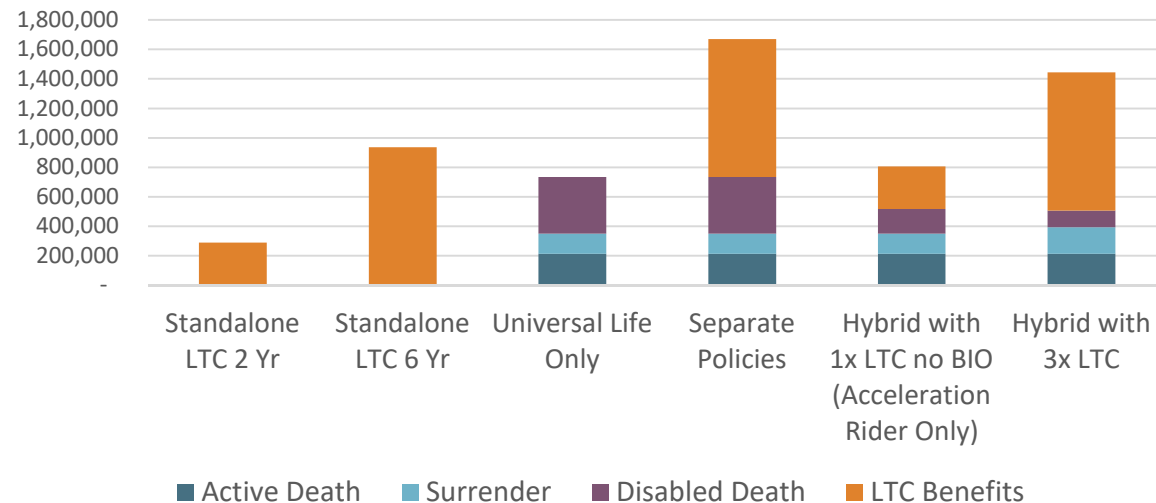
# Projected Benefit Cash Flows by Component - Aggregate



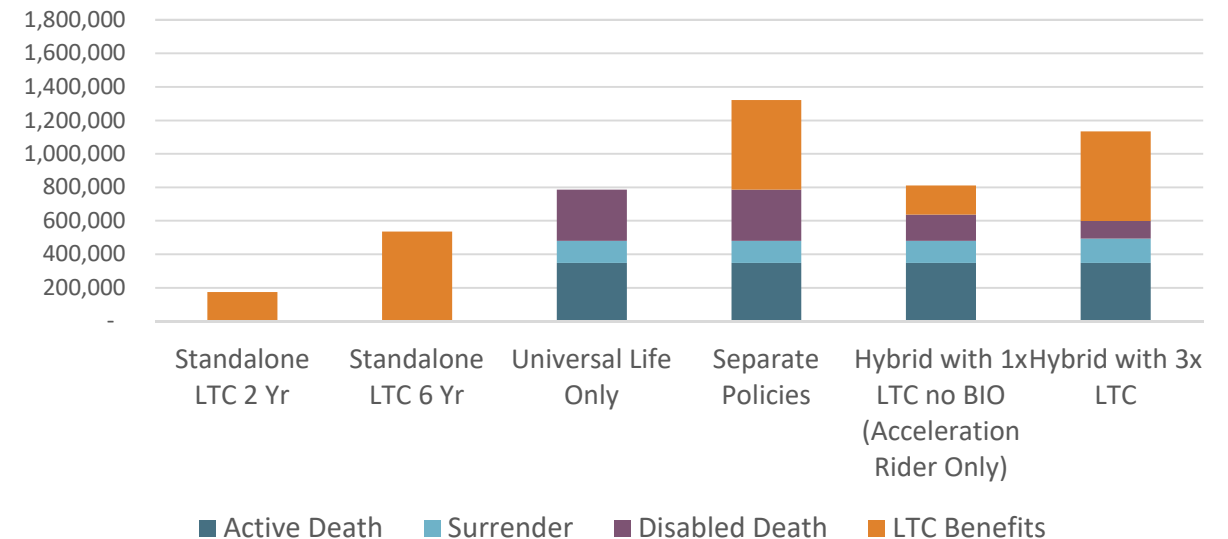
- In this case study, a hybrid product with 3x extension of benefits is approximately 15% cheaper than purchasing both a standalone life & LTC product, in terms of PV of benefits.
  - This varies significantly by demographics & product features
  - Other cost savings (expenses/risk hedge) would likely make the premium discount cheaper.

# Projected Benefit Cash Flows by Component – By Gender

## PV of Benefit Cash Flows by Component - Female



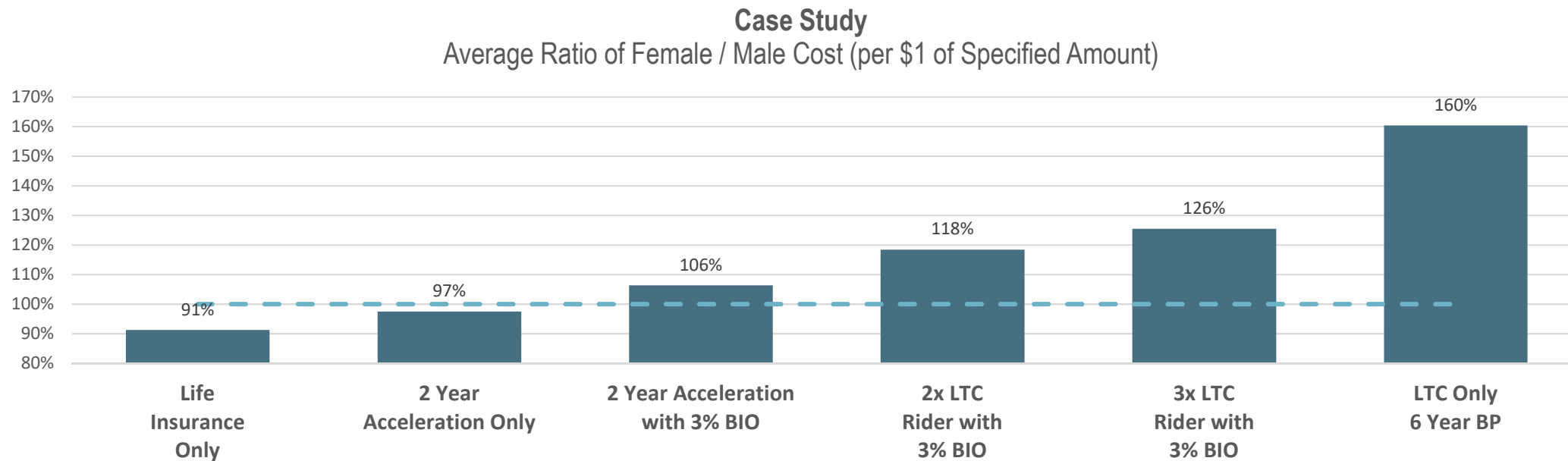
## PV of Benefit Cash Flows by Component - Male



- The lower life expectancy of males means that the death benefit savings per \$1 of LTC claim is greater.
- This combined with the higher female claims costs leads to each a much more costly rider for females.
- The split of Life vs. LTC benefits is materially more skewed towards LTC for females, relative to males

# Projected Benefit Cash Flows by Component – By Gender

- Below is an alternate view on the cost by gender, focusing on cells with 3% Compound BIO

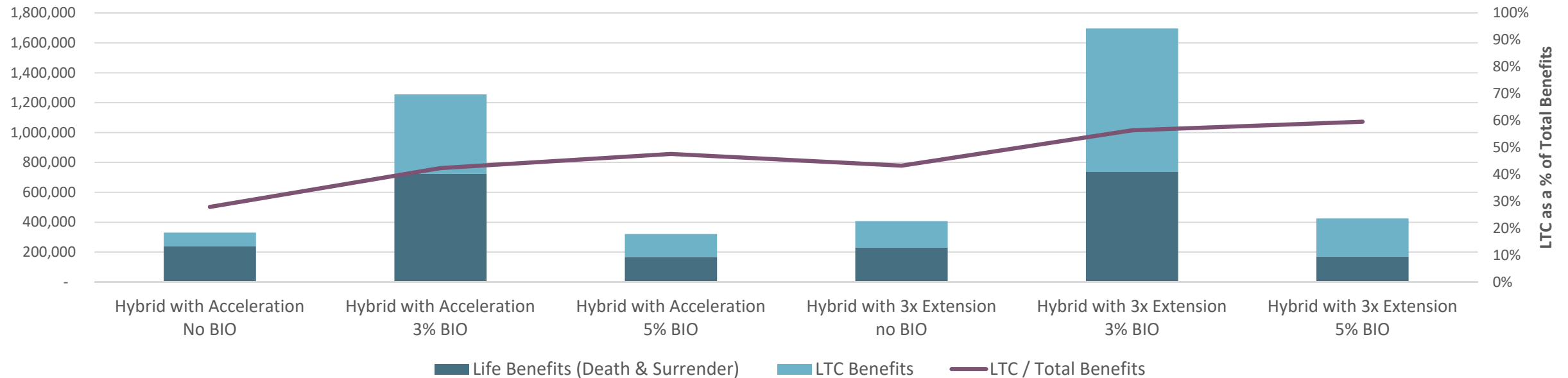


- Generally any LTC benefits richer than acceleration will cause Female costs to exceed Male
- The cost of a Female hybrid policy relative to Male will not be as disparate as a standalone LTC product



# Projected Benefit Cash Flows by Component – By BIO

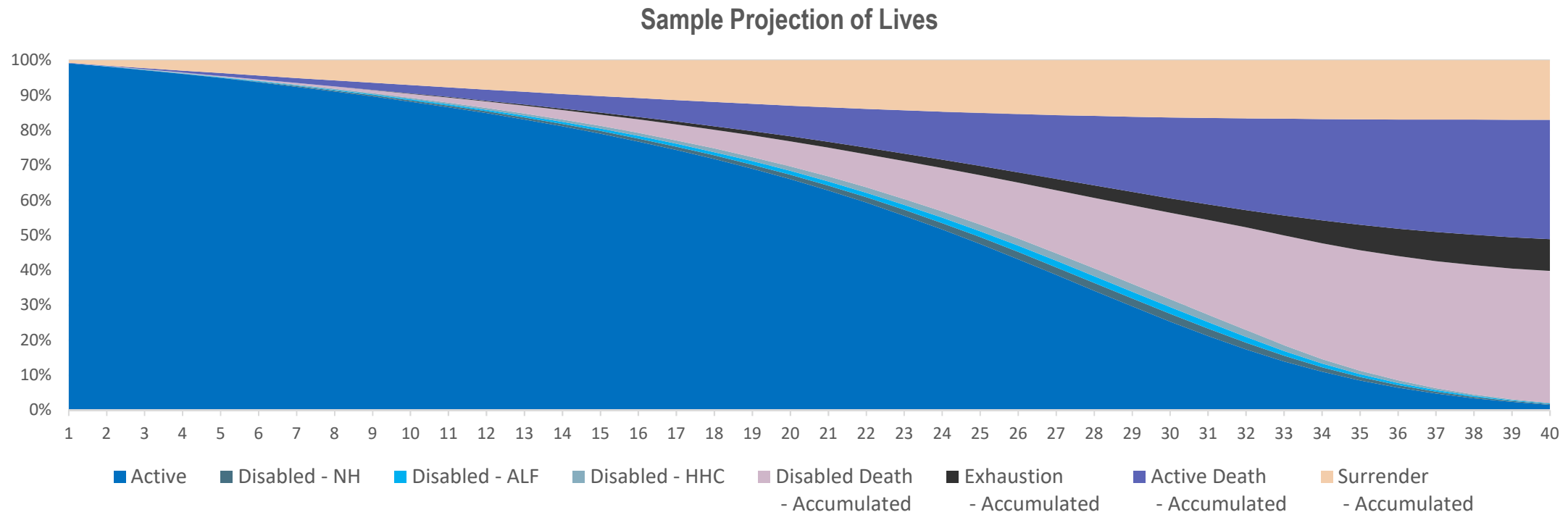
PV of Benefit Cash Flows by Component - BIO



- The chart above shows the mix of LTC benefits paid as a proportion of total benefits grows from about 25% to 50% for acceleration-only hybrid products
- This trends up to 65% as extension of benefits are added
- This can be even higher within certain cells

# Projected Movement of Lives - Sample

- The graph below shows the projected in-force count and cumulative decrements for a subset of 60-year old issue age policyholders.
- This is a valuable view to ensure all policies are accounted for throughout the projection.
- Viewing this at the policy level, along with transfers in and out of each state, provides valuable insight into the key product risks



# Individual Assumption Impact Analysis

# Individual Assumption Impact Analysis

- The following slides provide output from the sample model for the following sensitivity results:

Sensitivity	Description
Active Mortality Increase (Life)	Active mortality is increased by a constant 10% factor
Surrender Increase (Life)	Ultimate surrender assumption changed from 0.5% to 2.0%
Utilization Up (LTC)	Increase utilization rates by a constant 10% factor
Claim Terminations Down (LTC)	Decrease incidence rates by a constant 10% factor
Incidence Up (LTC)	Increase incidence rates by a constant 10% factor

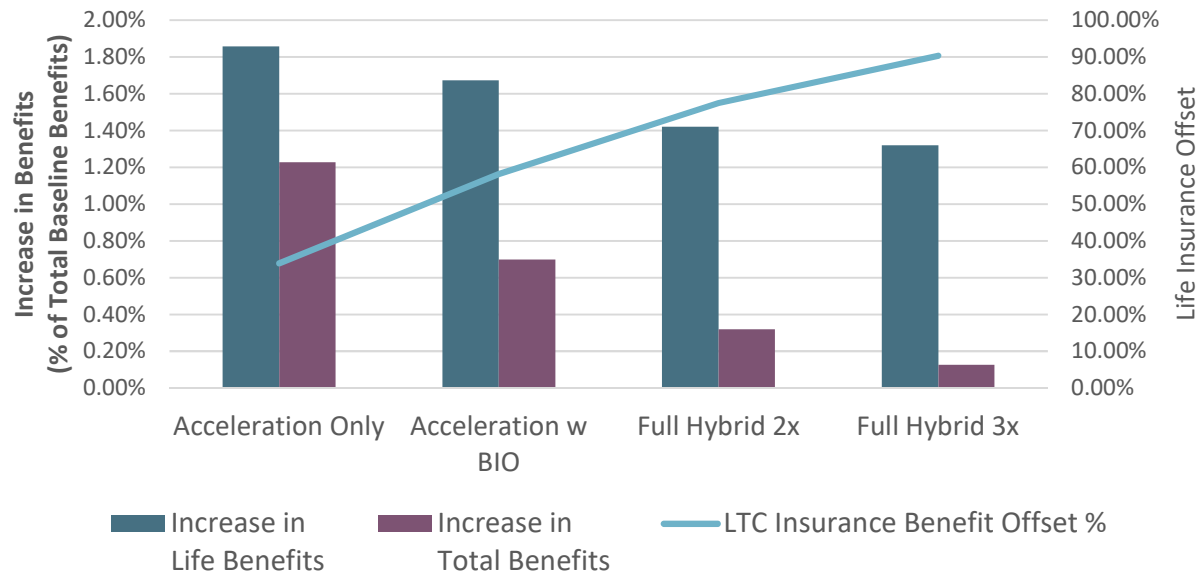
- These sensitivities show:
  - 1) The increase in Life or LTC benefits (depending on the benefits that are adversely affected), and
  - 2) The increase in Total PV of benefits
- The difference is the benefit savings from the offsetting LTC or Life hedge, which is shown as a ratio



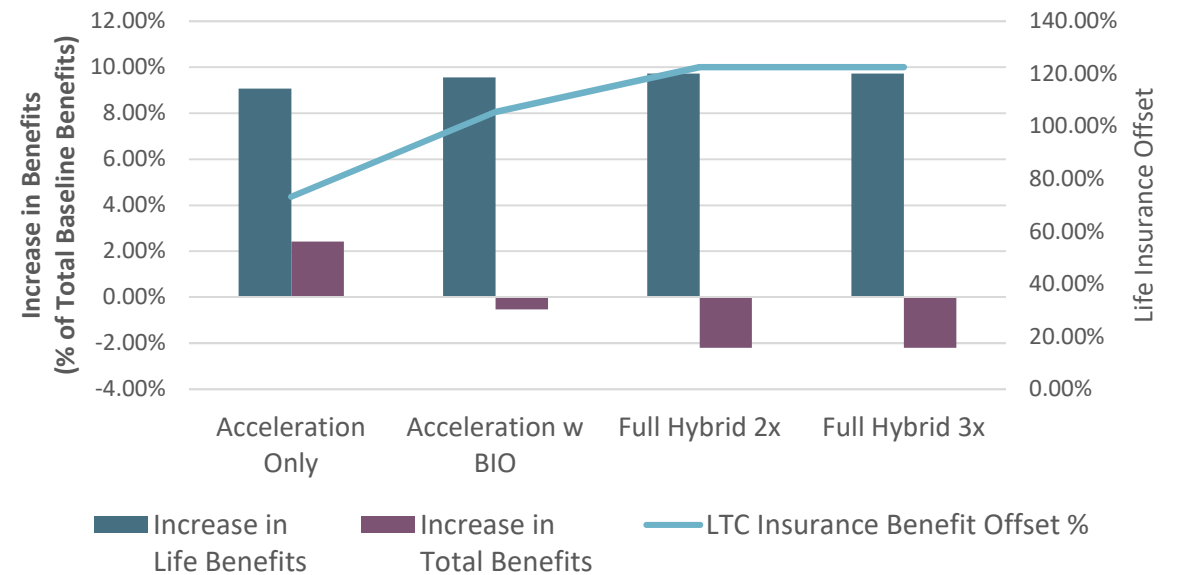
The results of these sensitivities do not take into account correlated impacts. Hybrid assumptions and cash flows are highly correlated and should be adjusted very carefully.

# Adverse Life Insurance Scenarios

**Sensitivity Impact by Product Type**  
Active Mortality Increase

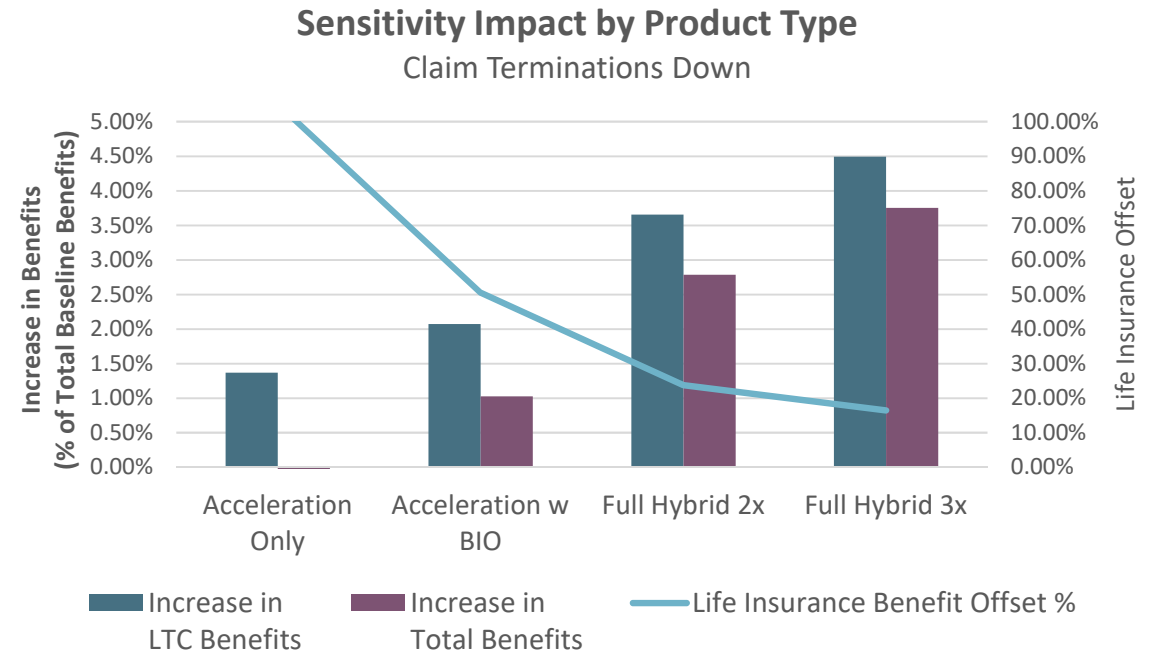
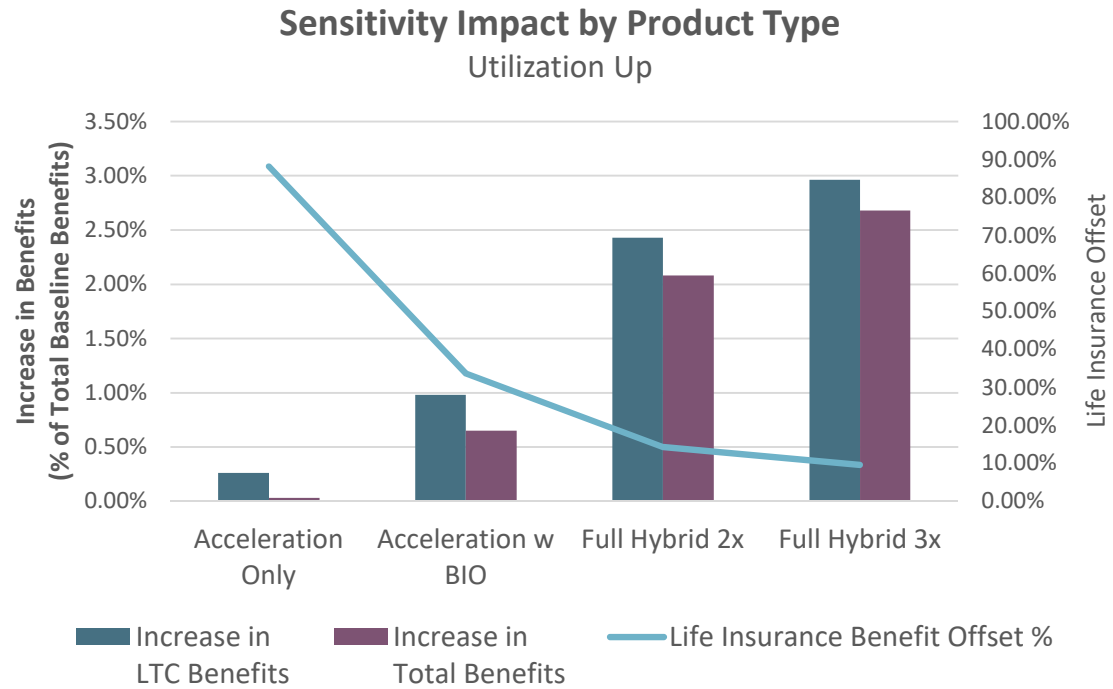


**Sensitivity Impact by Product Type**  
Surrender Increase



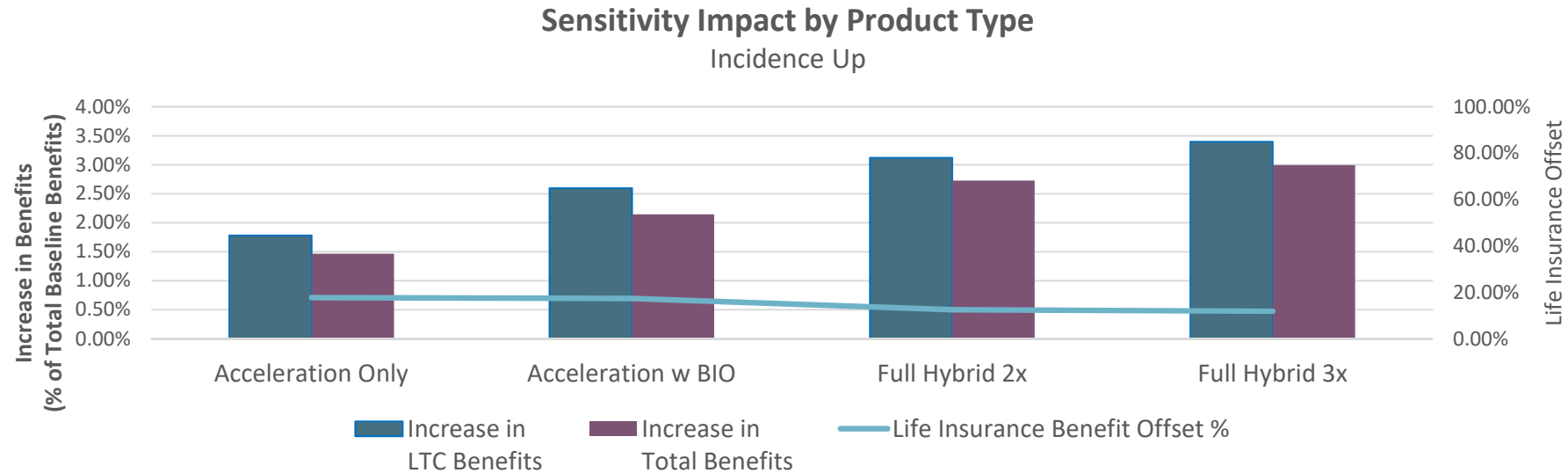
- Products with richer LTC benefits are more immune to active mortality and lapse experience, in terms of % of total benefits.
- Very rich LTC benefits would cause the product to be lapse/death-supported.

# Adverse LTC Insurance Scenarios



- Utilization & Claim termination rates are not very material for acceleration products. Any additional LTC benefits are offset by a corresponding death benefit.
- For richer LTC benefits, the death benefit offset decreases significantly, but there can still be a 20% death benefit savings even on the richest products.

# Adverse LTC Insurance Scenarios



- The death benefit savings offset in this sample is very limited when incidence rates are increased, even on the acceleration product
- This is due to the additional death benefits that occur as a result of more lives being exposed to disabled mortality
  - Note that these results do not re-calibrate total mortality based on the new prevalence rates (more on this in the next section)

# Assumption Interactions



# Assumption Correlations

- Setting and adjusting assumptions should be done carefully. Adjusting assumptions in isolation could have unintended consequences.
  - Mixing & matching various assumption sources (Emerging hybrid experience, Standalone LTC or Life experience)
  - Making arbitrary adjustments based on speculation on how these products will behave
  - Applying PADs for reserving purposes
- May need to dynamically model policyholder behavior
- Examples of these correlations will be demonstrated by assessing hypothetical assumption proposals, shown on the following slide

# Case Study - Assumptions

- Highbread Insurance Company has decided to use standalone LTC industry experience to model their new hybrid life/LTC product, with the following exceptions:

## Active Life Mortality

- Assumption: Set equal 10% higher than Standalone
- Basis: This is the relative experience for company's Life only products
- Justification: This is the relative experience for company's Life only products

## Ultimate Surrender Rate

- Assumption: Set equal to 2%
- Basis: Experience on Standalone ULSG Specified Premium with ROP product
- Justification: 100% ROP feature is expected to result in a lapse rate higher than the typical sub-1% ultimate rates on Standalone LTC

## Incidence

- Assumption: Set equal 10% less than Standalone
- Basis: Emerging hybrid experience
- Justification: Reluctance for policyholders to accelerate (no 'Use-it-or-lose-it' mentality)\*, better UW standards.

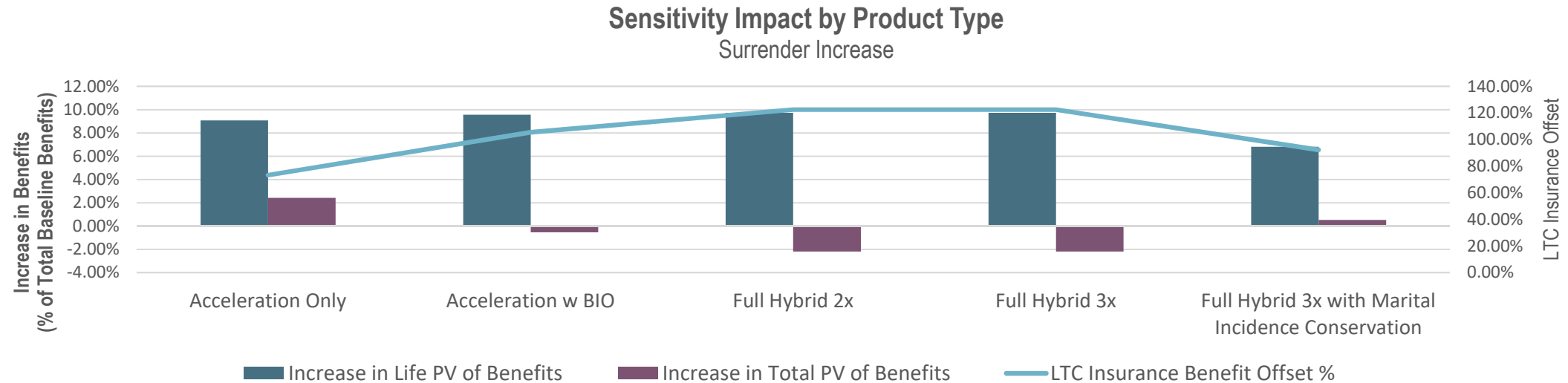
\* This reluctance appears to diminish as LTC benefits get richer (i.e. BIO or extension create additional 'use-it-or-lose-it' benefits above the death benefit face amount.)

# Active Life Mortality - Conservation of Deaths

- The proposed assumption of 10% above standalone mortality requires careful thought on conservation of deaths
- Two general ways to conserve mortality in a hybrid model:
  1. Feed in Total/Disabled lives or Total/Active lives & allow model to conserve total mortality
    - Pros: Simpler to develop, especially if starting from a total lives assumption.
    - Cons: Calculations are not transparent. Could unintentionally adjust assumptions. May need to decide whether Active or Disabled life mortality is the lever to conserve mortality.
  2. Manually solve for Active / Disabled assumptions that conserve total mortality
    - Pros: Not a black-box
    - Cons: Significant effort. Likely not perfect.
- If there is not a residual death benefit, the model may 'throw-out' exhausted policies. This could cause an overstatement of active mortality. Can continue to track exhausted policies at the expense of run time.
- Changes in any assumption will change overall prevalence. Will need to assess how active/disabled/total mortality needs to be adjusted.

# Surrender Rate Considerations

- The example below is based on the subset of policies that are issued as Married



- The impact of setting the ultimate surrender rate to 2% infers that additional surrender benefits paid (8-10% of total benefits) are offset by a larger reduction in LTC benefits, for a net decrease in benefits of 2%.
- This does not take into consideration any selective lapsation. If morbidity assumptions are based on standalone experience with significantly lower lapse rates, it may be reasonable to
- Conservation of morbidity** - A scenario has been included where the Married incidence factors are blended with Single factors, implying the persisting policies are more likely to be Single.
- Additional morbidity selection beyond the marital discount may exist.

# Incidence Rate Considerations

- A reduction in incidence rates will change prevalence
  - This particular example uses the justification of 1) more reluctance to use benefits, 2) better UW. A reasonable interpretation of this is that
    - (1) The reluctance to stay 'active': Conserve total mortality by increasing active life mortality,
    - (2) Better UW practices: Allow the incidence to reduce total deaths (implicitly through lower disabled lives) and not conserve total mortality
  - Whether total mortality is being conserved as part of the model code, or manually during the assumption setting process, the resulting increase in active or disabled mortality should be assessed.
- Those who are not reluctant to accelerate benefits may have longer-term diagnosis with longer lengths of stay. An offsetting adjustment to claim termination assumptions, or a dynamic adjustment in the model, may be prudent.

# Other Modeling Concerns

# Reserves

- VM-20 adds additional complexities to modeling hybrid products
  - Full hybrid products life-chassis with material lifetime secondary guarantees
  - Net impact should be moderately adverse scenarios.
  - Asset modeling should be integrated into valuation models
- Practice varies widely due to limited explicit guidance on how to model these types of products.

# Questions?

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