

NewVision

Myopia Parametric Insurance

For NEW WORLD

Presented by HKU Actuarial Solutions





Agenda

- 1 ***Introduction***
- 2 ***Product Features***
- 3 ***Assumptions***
- 4 ***Risks and Mitigations***
- 5 ***Q&A***

Objectives



HKU
Actuarial
Solution

WHO ARE WE

Team HKU Actuarial Solutions
from a consulting firm



NEW WORLD'S REQUEST

Get a first-mover advantage
by developing a
parametric insurance product



WHAT WE OFFER

A proposal to NEW WORLD's
Executive Committee

NewVision



1st parametric eyecare insurance product in the market

Protect the insured in Ambernia and Palominia against
economic losses related to short-sightedness

Product Highlights

**Flexible Sum
Assured**

- Cater customer's personal preferences & financial abilities

**Simple
Purchase**

- Various distribution channels
- Simple underwriting process

**Parametric
Insurance**

- Simple makes perfect
- Reduce maintenance cost and other expenses



Myopia

noun. Unable to see distant objects clearly.

synonym: short-sightedness

- Measure the refractive error of eyes
- Indicated by dioptre (D)
- Diagnosis of myopia: $-0.50 < D < -5.00$
- Diagnosis of high myopia: $D < -5.00$

Results: Myopia - Now and in 2050

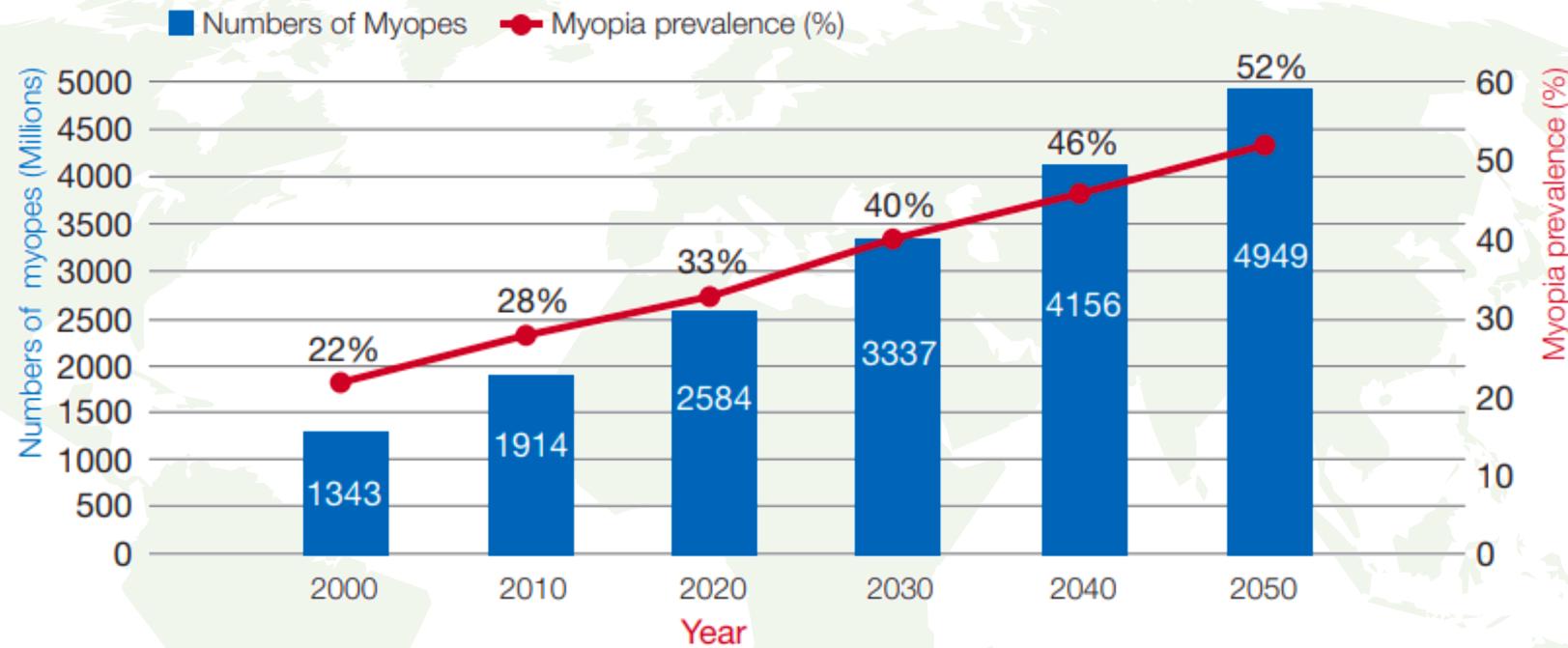
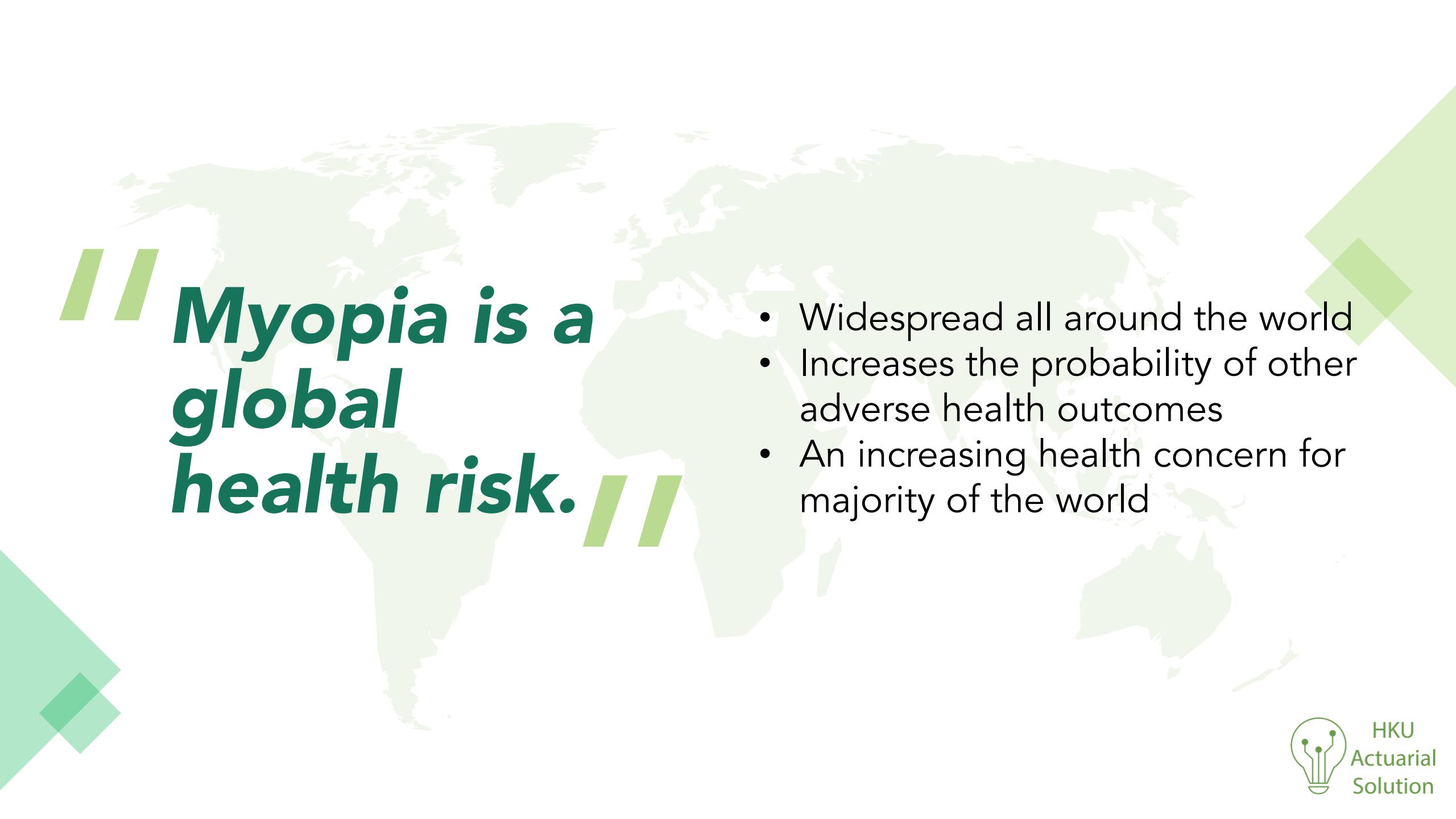


Figure 1: WHO's projection of the number of cases and prevalence of myopia worldwide from 2000 to 2050.

Myopia is a global health risk.



/// Myopia is a global health risk. //

- Widespread all around the world
- Increases the probability of other adverse health outcomes
- An increasing health concern for majority of the world



Myopia

noun. Unable to see distant objects clearly.

synonym: short-sightedness

- Easily worsen at young age, stabilize at around 21 years old
- Timely corrective treatment is required
 - e.g., wear glasses, LASIK surgery
- High myopia severely affects one's normal vision
- Risk factor for glaucoma, cataract, and blindness

Cost Related to Myopia

USD 378 Annual cost for a short-sighted child in Singapore

USD 2000-3000 LASIK surgery for 1 eye in the United States

- Further medical costs if other visual impairments are inflicted
- Possible loss of job opportunities (e.g., pilots, firefighters)

Why Parametric Insurance?

- Myopia can be easily determined by a numerical measure (dioptre)
- Losses cannot be easily reimbursed
- Myopia risk is individual (no catastrophic loss)

Product Features

Related Parties

The Insured

Child



Policyholder

Parent



Product Features

Sum Assured

OPTION 1

Ψ 18,000

Corrective cost

OPTION 2

Ψ 60,000

Corrective cost

Surgery cost

OPTION 3

Ψ 100,000

Corrective cost

Surgery cost

Implicit economic loss

Product Features

Issue Age & Policy Term

Issue Age

Before birth

Policy Term

21 years

Issue Age

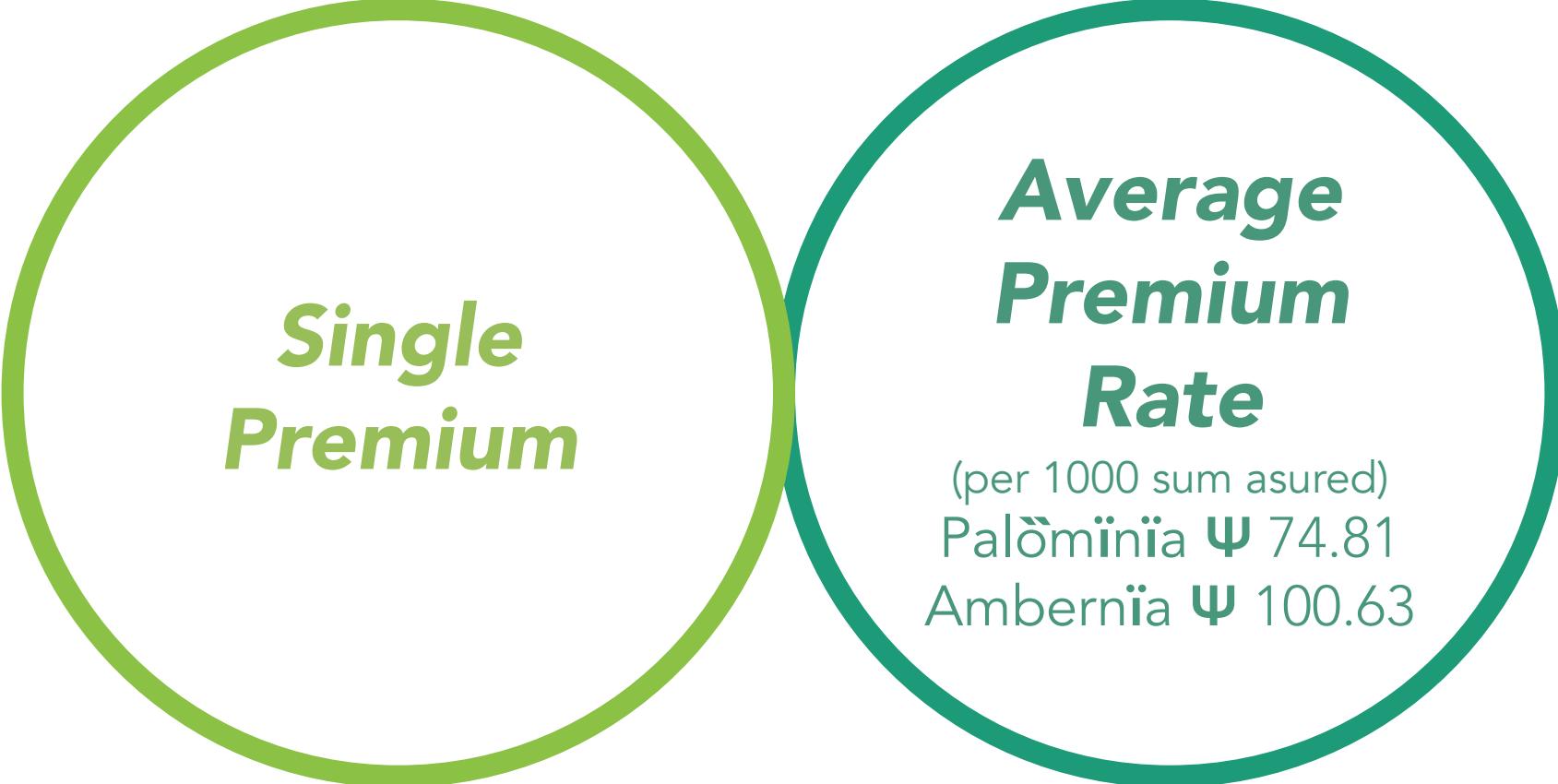
0 – 6 months

Policy Term

20.5 – 21 years

Product Features

Premium Payment Mode & Premium Structure



**Single
Premium**

**Average
Premium
Rate**

(per 1000 sum assured)

Palomäria Ψ 74.81

Ambernia Ψ 100.63

Product Features

Triggering Event & Benefits

Triggering Event

Upon diagnosis of
-5.00D in either eye
by qualified
optometrist

Myopia Benefit

- 100% of sum assured
- A lump sum payment

Death Benefit

Return of
premium to the
policyholder

ψ 44 million

NEW
BUSINESS
VALUE

ψ 11,159 million

TOTAL
EXPOSURE

ψ 880 million

TOTAL
Gross
Premium

Distribution Channels

Online Purchase



Simple underwriting

Partnership with



Optometry Clinics
-Prevent fraud-

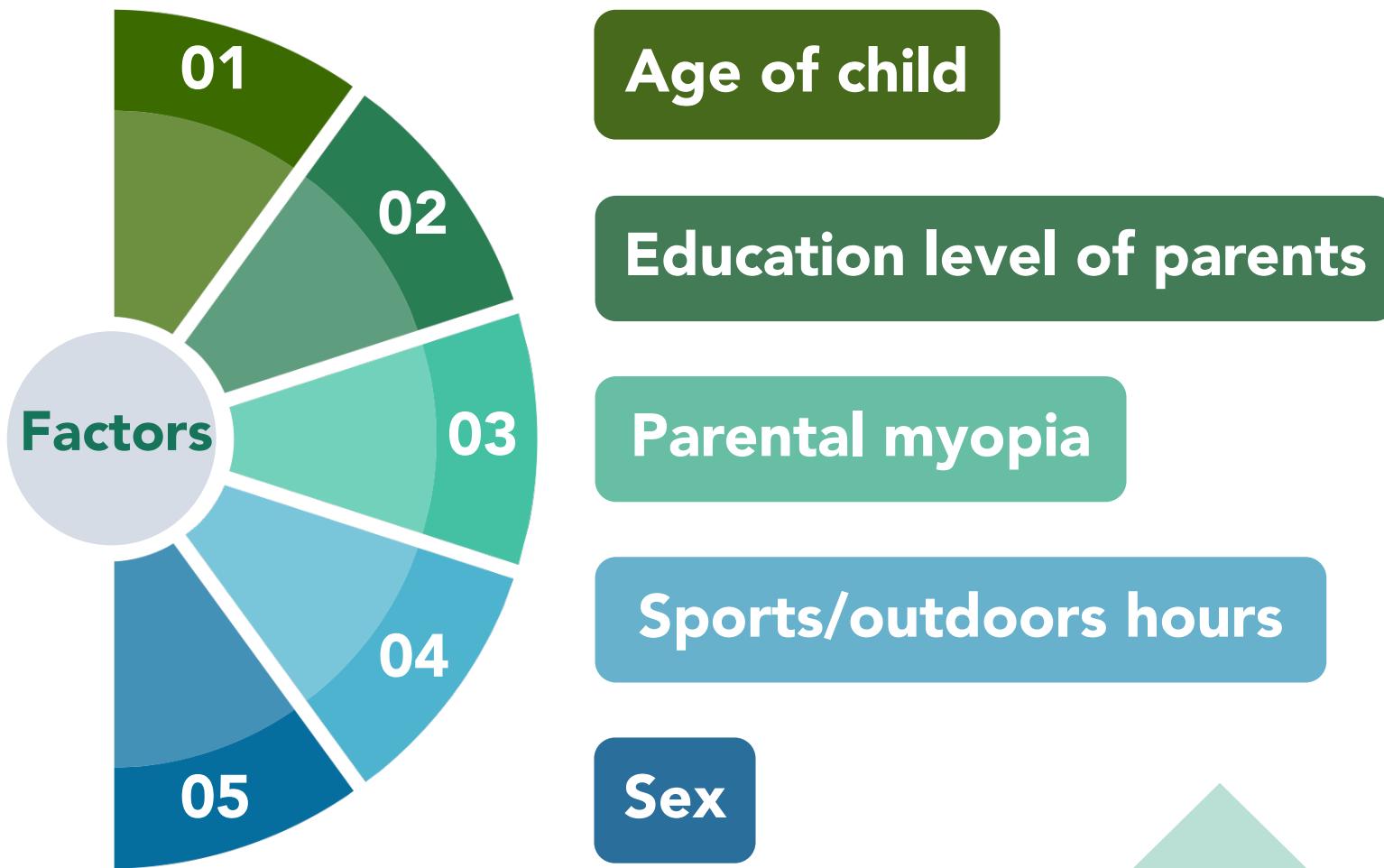


Obstetrics Clinics
-For promotion-

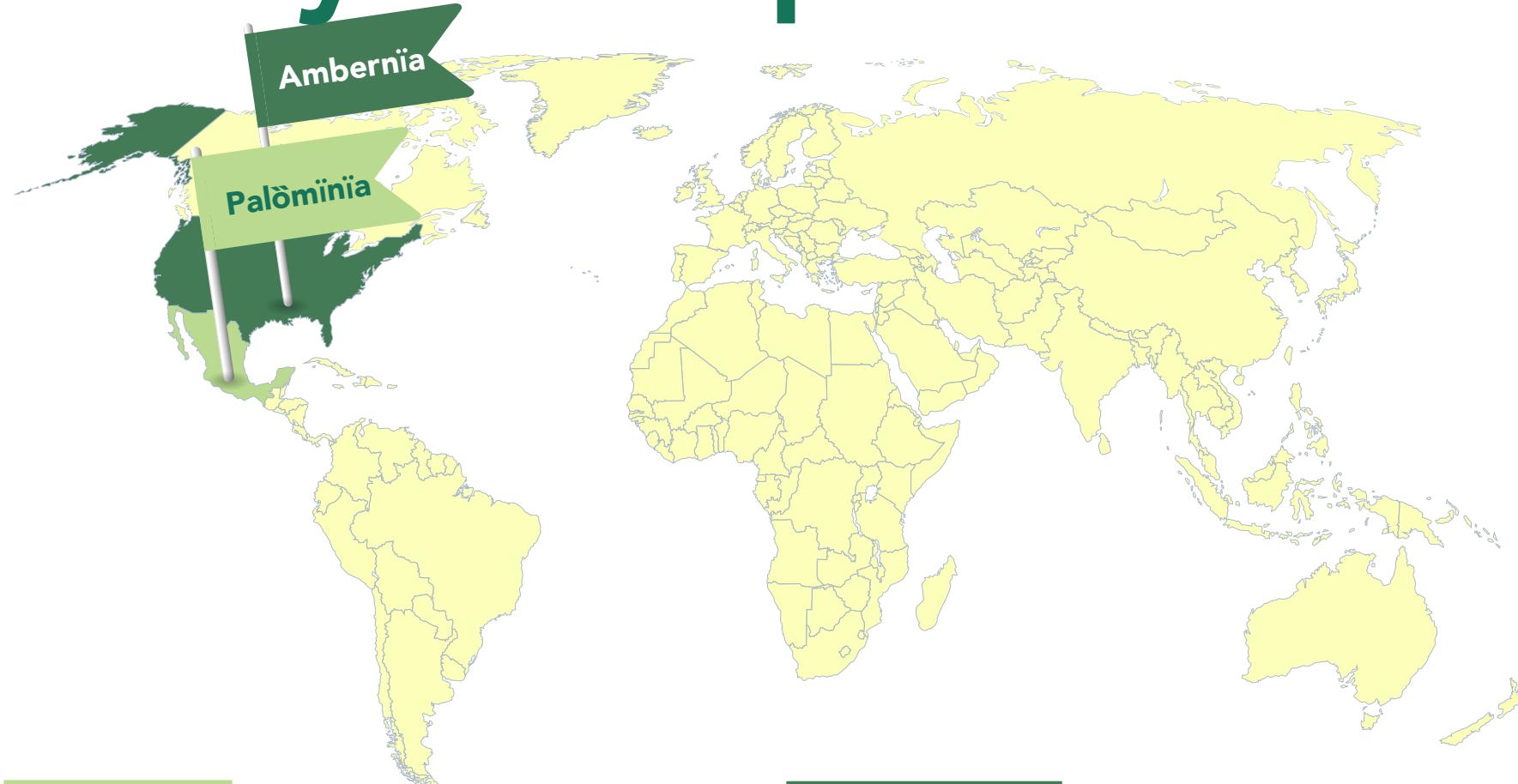
NEW WORLD Existing Products

As a rider in NEW-WORLD current line of health and maternity insurance products

Myopia Assumption



Mortality Assumption



Palominia

Mexico

Mexico Mortality Table 2000

Ambernia

United States

United States Life Table 2017

Expense & Economic Assumptions

* From Past Economic Data



| Inflation rate | Palòmínia | Ambernía |
|----------------|-----------|----------|
| | 7.44% | 1.35% |



| Long-term interest rate | Palòmínia | Ambernía |
|-------------------------|-----------|----------|
| Mean | 4.07% | 1.94% |
| Volatility | 1.71% | 1.67% |



| 3-month interest rate | Palòmínia | Ambernía |
|-----------------------|-----------|----------|
| Mean | 2.63% | 0.43% |
| Volatility | 1.67% | 0.97% |

Expense & Economic Assumptions

*From NEW WORLD's Income Statement

9.0% of gross premiums

1

Commission expense rate

4.5% of gross premiums

2

Maintenance expense rate

4.3% of gross premiums

3

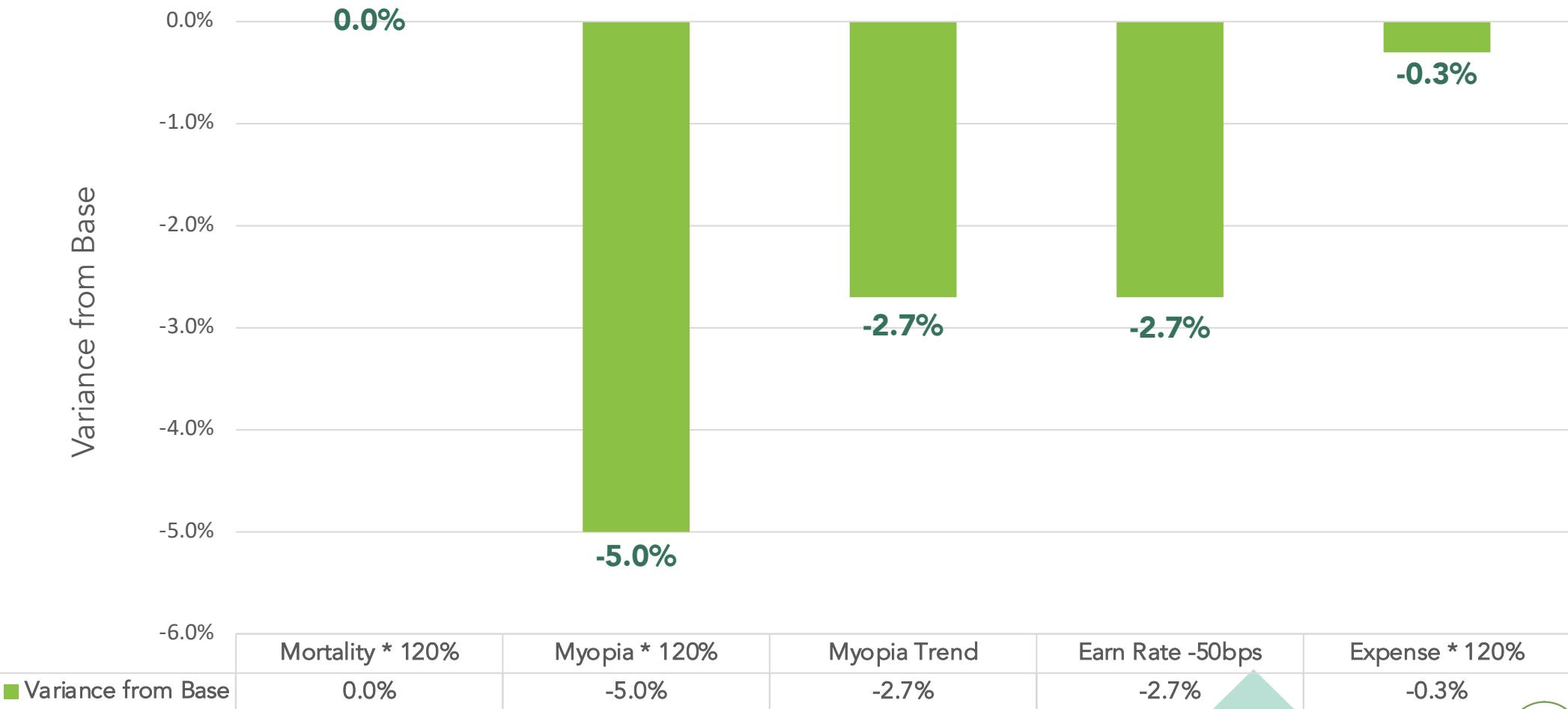
Claim expense rate

25.6% of gross premiums

4

Income tax rate

Sensitivity Analysis



Key Risks and Mitigation



[Insurance]
Adverse selection risk

[Insurance]
Myopia rate risk

Mitigation:

- Seek partnership with reinsurers
- Investigate the possibility of issuing CAT bonds

[Financial]
Interest rate risk

Mitigation:

Implement sustainable asset liability management technique and interest rate swaps

[Operational]
Claim fraud

Mitigation:
Partner with optical clinics

[Strategic]
Sales performance risk

Mitigation:
Do market research before launching



// **NewVision,
creates a new vision
for NEW WORLD.** //

NewVision



- 🏆 First-to-market
- ⭐ Revolutionary parametric eyecare protection
- 👍 Simple makes perfect



Q&A

Thank You!

Formulas

| Category | Formula |
|---|---|
| Gross premium and NBV projection | $Total exposure = Population \times Birth Rate \times Average SA \times Market Penetration$ |
| | $Gross premium = Total exposure \times Average Rates$ |
| | $NBV = Gross premium \times NBV per gross premium$ |
| Expense | $Expense per year = \frac{(Total expense + Tax)}{a_{\overline{20} }}$ |
| Profit signature | $Profit = Premium - Benefit Outgo - Expense Outgo - Change in Reserve - Tax + Interest$ |

Formulas

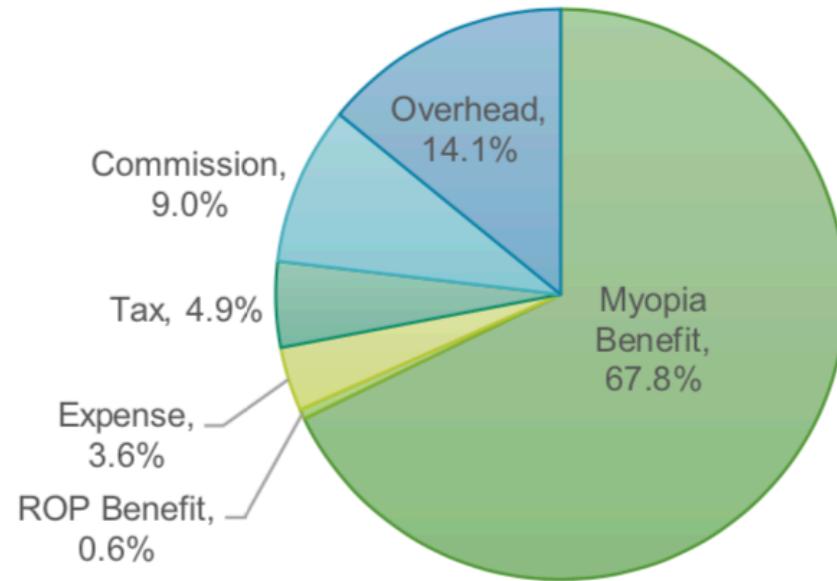
| Category | Formula |
|----------|---|
| Expense | $\text{Commission expense rate} = \frac{\text{Commissions}}{\text{Gross premium written}} \times 100\%$ |
| | $\text{Maintenance expense rate} = \frac{\text{Salaries and fees}}{\text{Gross premium written}} \times 50\%$ |
| | $\text{Claim expense rate} = \frac{\text{Net adjusting expense}}{\text{Gross premium written}} \times 50\%$ |
| Economic | $\text{Income tax rate} = \frac{\text{Income tax expense}}{\text{Income before income tax expense}} \times 100\%$ |

Premium Rates

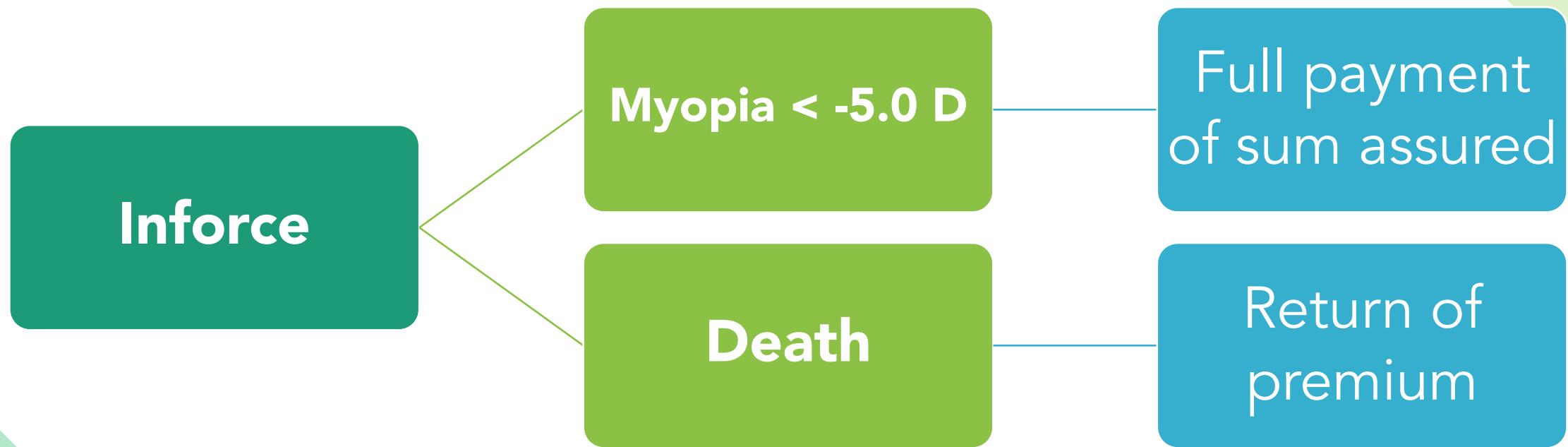
| Premium Rate Category | Description | Premium Rate (Per 1000 Sum Assured) | |
|-----------------------|--|-------------------------------------|----------|
| | | Palömïnia | Ambernïa |
| Highest rate | <ul style="list-style-type: none">• Sex: male• Number of myopic parents: 2• Number of parents with undergraduate degree: 2 | 198.00 | 259.01 |
| Average rate | Average of the expected business mix | 74.81 | 100.63 |
| Lowest rate | <ul style="list-style-type: none">• Sex: female• Number of myopic parents: 0• Number of parents with undergraduate degree: 0 | 39.67 | 52.86 |

Premium Breakdown

| Premium Component | Proportion |
|-----------------------|------------|
| Myopia benefit | 67.8% |
| ROP benefit | 0.6% |
| Expense | 3.6% |
| Tax | 4.9% |
| Commission | 9.0% |
| Overhead | 14.1% |
| Total | 100.0% |



Multiple Decrement Model



Business Mix

| Country | Percentage of Total Sum Assured | |
|-----------|---------------------------------|--|
| Palöminia | 86% | |
| Ambernia | 14% | |

| Option of Sum Assured | Palöminia | Ambernia |
|-----------------------|-----------|----------|
| Option 1: ψ 18,000 | 50% | 30% |
| Option 2: ψ 60,000 | 30% | 50% |
| Option 3: ψ 100,000 | 20% | 20% |
| Average Sum Assured | ψ 47,000 | ψ 55,400 |

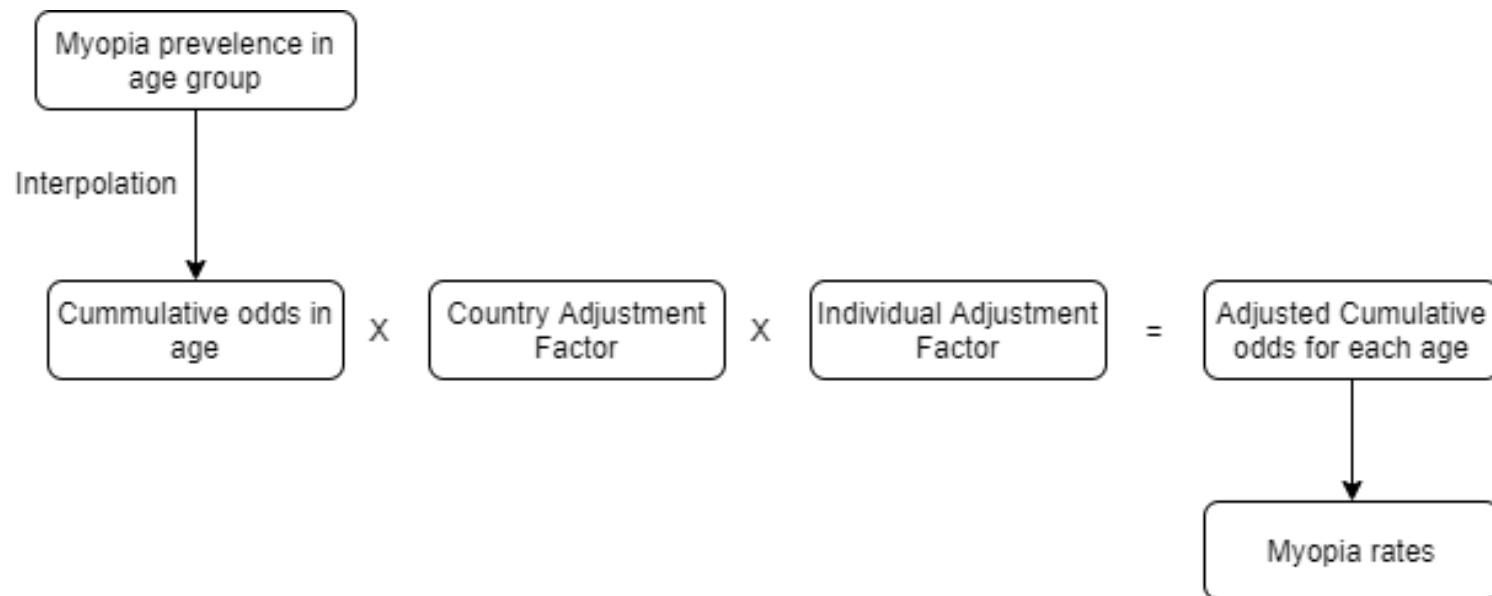
| Country | Market Penetration | |
|-----------|--------------------|--|
| Palöminia | 50% | |
| Ambernia | 50% | |

| Sex | Palöminia | Ambernia |
|--------|-----------|----------|
| Male | 50% | 50% |
| Female | 50% | 50% |

| Number of Myopic Parents | Palöminia | Ambernia |
|--|-----------|----------|
| 0: both father and mother are not myopic | 45% | 45% |
| 1: either father or mother is myopic | 45% | 45% |
| 2: both father and mother are myopic | 10% | 10% |

| Number of Highly Educated Parents | Palöminia | Ambernia |
|--|-----------|----------|
| 0: both father and mother do not obtain undergraduate degree | 60% | 50% |
| 1: either father or mother obtains undergraduate degree | 10% | 10% |
| 2: both father and mother obtain undergraduate degree | 30% | 40% |

Myopia Calculation Flowchart



$$\text{Cumulative Probability} = \frac{\text{Adjusted Odds}}{1 + \text{Adjusted Odds}}$$

$$\text{Rate for age } x = \frac{(\text{Cumulative Prob for age } x) - (\text{Cumulative Prob for age } x - 1)}{1 - (\text{Cumulative Prob for age } x - 1)}$$

Odds Ratio for Myopia Assumption

| Exercise | Odds Ratio | Exposure | |
|----------|------------|-----------|----------|
| | | Palòmïnïa | Ambernïa |
| No | 1 | 66.80% | 16.68% |
| Yes | 0.9 | 33.20% | 83.32% |

| Income | Odds Ratio | Exposure | |
|--------|------------|-----------|----------|
| | | Palòmïnïa | Ambernïa |
| High | 1 | 0% | 100% |
| Low | 0.9 | 100% | 0% |

| Number of Myopic Parents | Odds Ratio |
|--|------------|
| 0: both father and mother are not myopic | 1 |
| 1: either father or mother is myopic | 2.08 |
| 2: both father and mother are myopic | 5.07 |

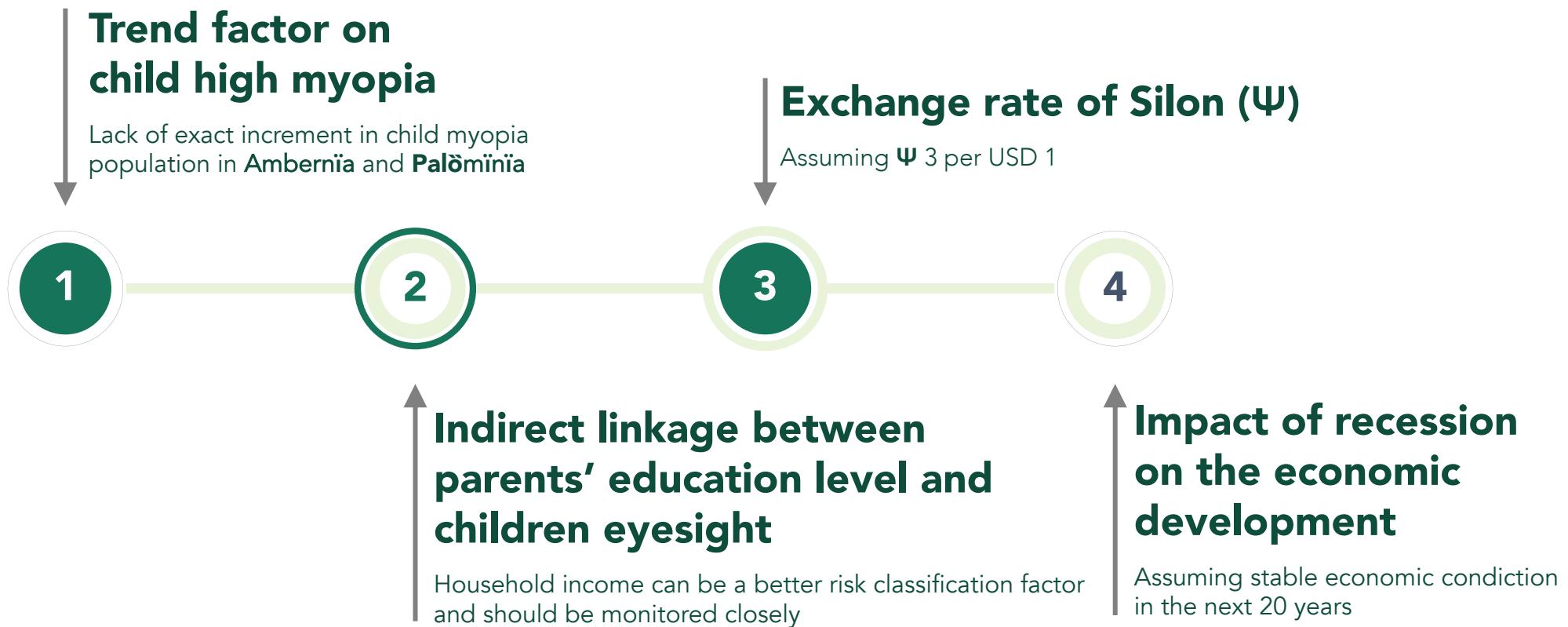
| Number of High Educated Parents | Odds Ratio |
|--|------------|
| 0: both father and mother do not obtain undergraduate degree | 1 |
| 1: either father or mother obtains undergraduate degree | 1.1 |
| 2: both father and mother obtain undergraduate degree | 1.21 |

Source of Data for Myopia Assumption

| Factor | Source of Data | | | |
|-----------------------------|--|---------------------------------------|--|------|
| | Journal | Where did the author(s) collect data? | Institution | Year |
| Age of child | Clinical Ophthalmology | Southern California | Department of Ophthalmology, Southern California Medical Group | 2018 |
| Education levels of parents | Acta Ophthalmology | Hong Kong | Chinese University of Hong Kong | 2020 |
| Sex | | | | |
| Parental myopia | Investigative Ophthalmology and Visual Science | Orinda, California | Ohio State University | 2007 |
| Sports/outdoors hours | | | | |



Data Limitation



Reporting Schedule and Metrics

Myopia rates

- Experience studies every 3 years
- Work with local census and health authorities to ensure credibility

Interest rates

- Experience studies by investment team on a regular basis
- Re-pricing or re-vamp action if needed

Mortality rates

- Experience studies every 3 years
- Make a reference on the mortality assumption of other NEW·WORLD products