



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



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 Amberniã and Palõminiã 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

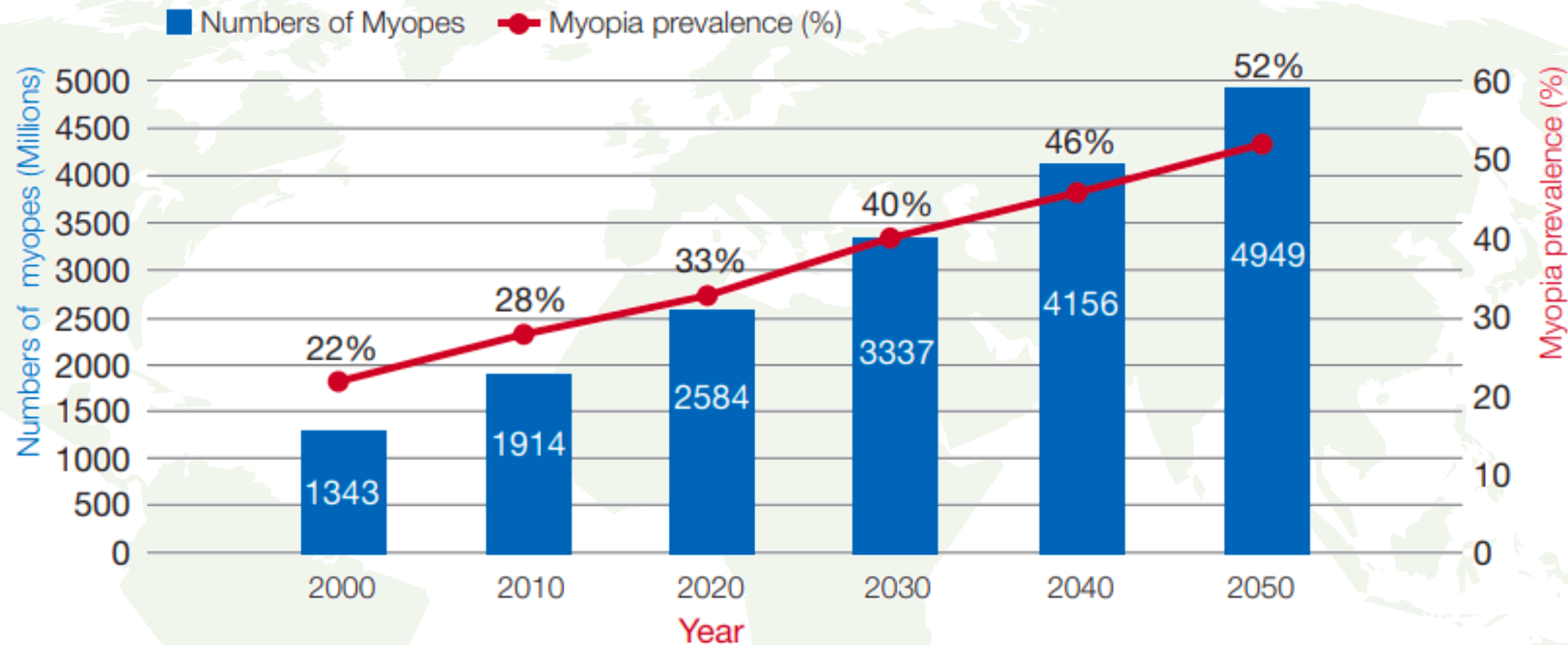
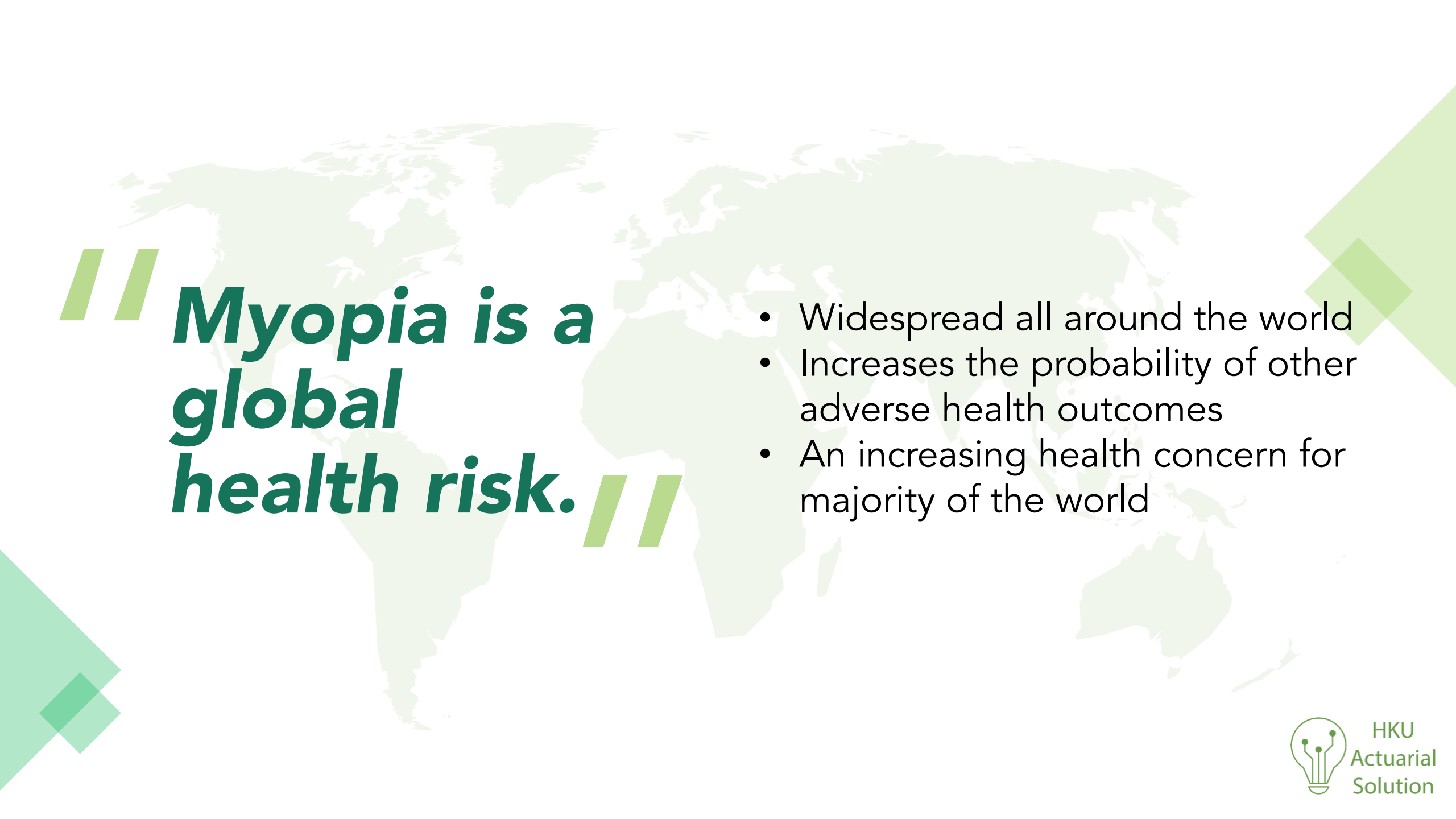


Figure 1: WHO's projection of the number of cases and prevalence of myopia worldwide from 2000 to 2050.

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 (diopetre)
- Losses cannot be easily reimbursed
- Myopia risk is individual (no catastrophic loss)

Product Features

Related Parties

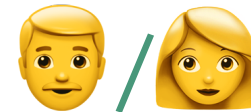
The Insured

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)
Palöminia 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-

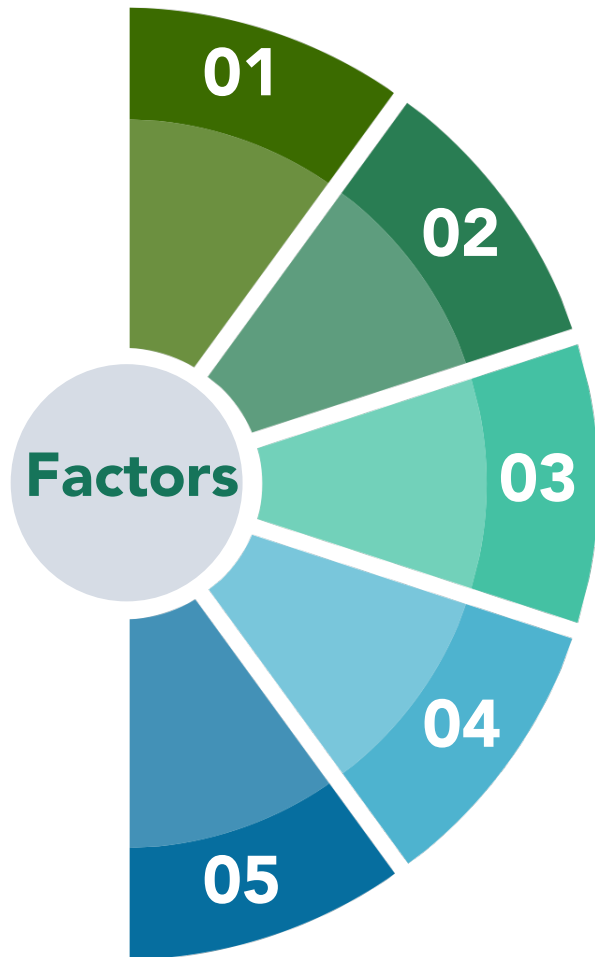


Obstetrics Clinics
-For promotion-

NEW WORLD Existing Products

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

Myopia Assumption



Age of child

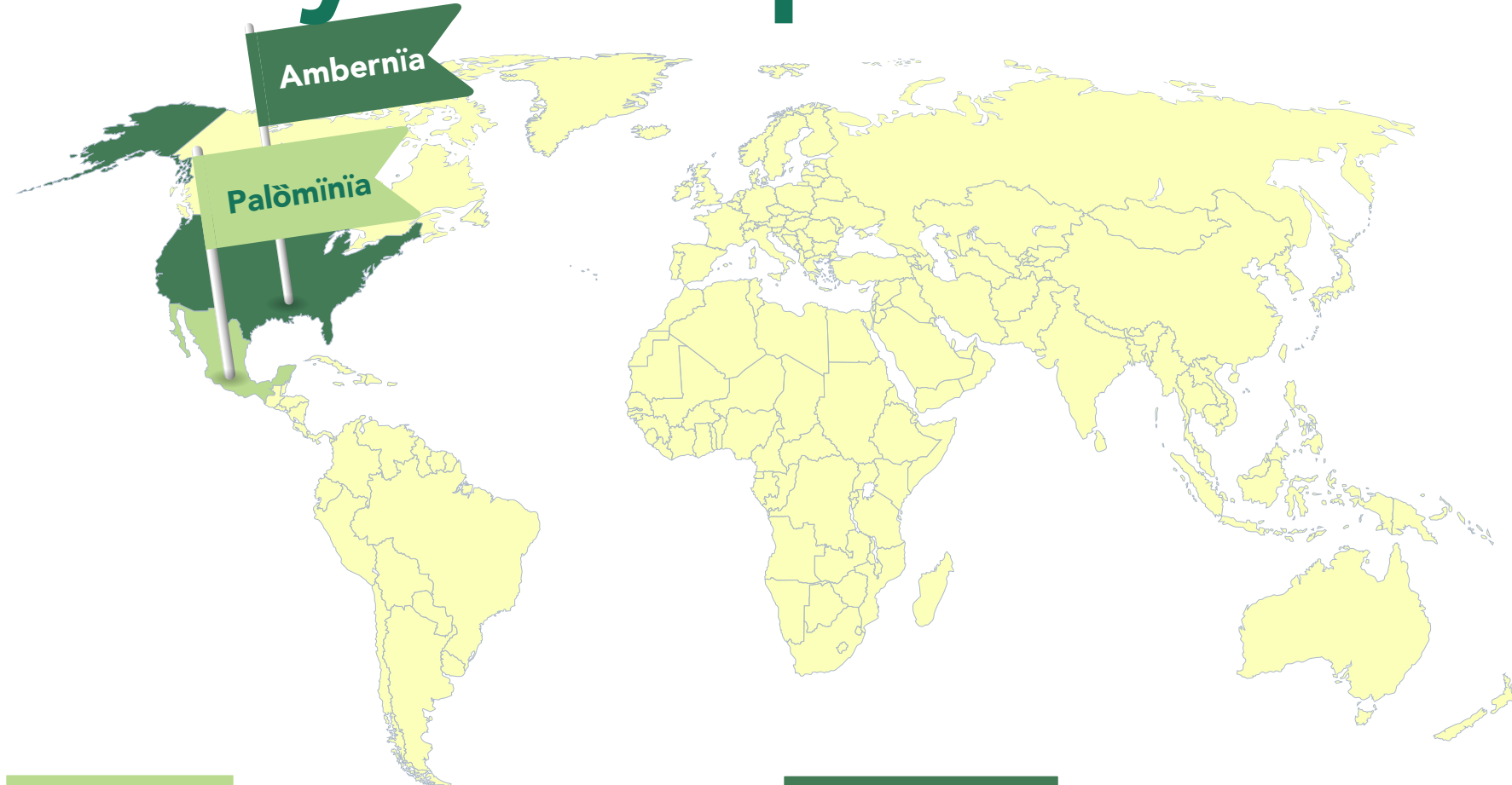
Education level of parents

Parental myopia

Sports/outdoors hours

Sex

Mortality Assumption



Palöminia

Mexico

Mexico Mortality Table 2000

Ambernia

United States

United States Life Table 2017



Expense & Economic Assumptions

*** From Past Economic Data**



Inflation rate	Palöminia	Ambernia
	7.44%	1.35%



Long-term interest rate	Palöminia	Ambernia
Mean	4.07%	1.94%
Volatility	1.71%	1.67%



3-month interest rate	Palöminia	Ambernia
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

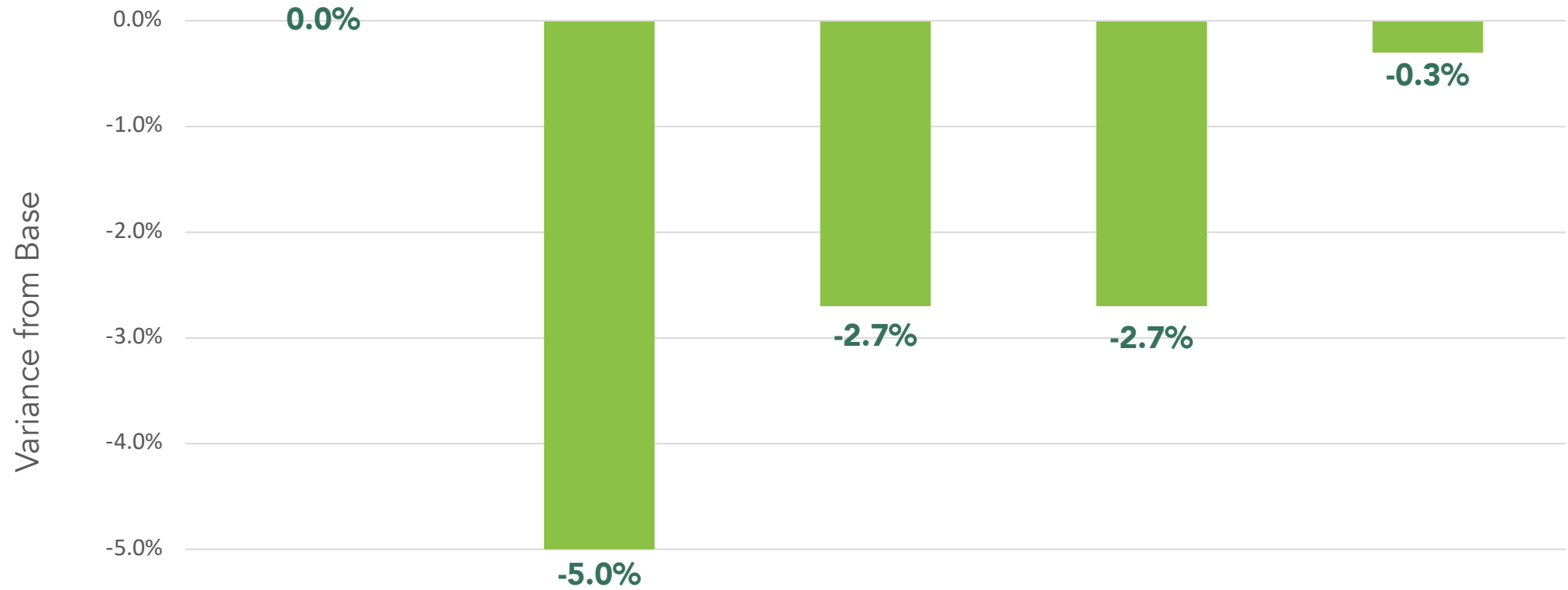
4.3% of gross premiums

3 Claim expense rate

25.6% of gross premiums

4 Income tax rate

Sensitivity Analysis



	Mortality * 120%	Myopia * 120%	Myopia Trend	Earn Rate -50bps	Expense * 120%
■ Variance from Base	0.0%	-5.0%	-2.7%	-2.7%	-0.3%



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

Formulas

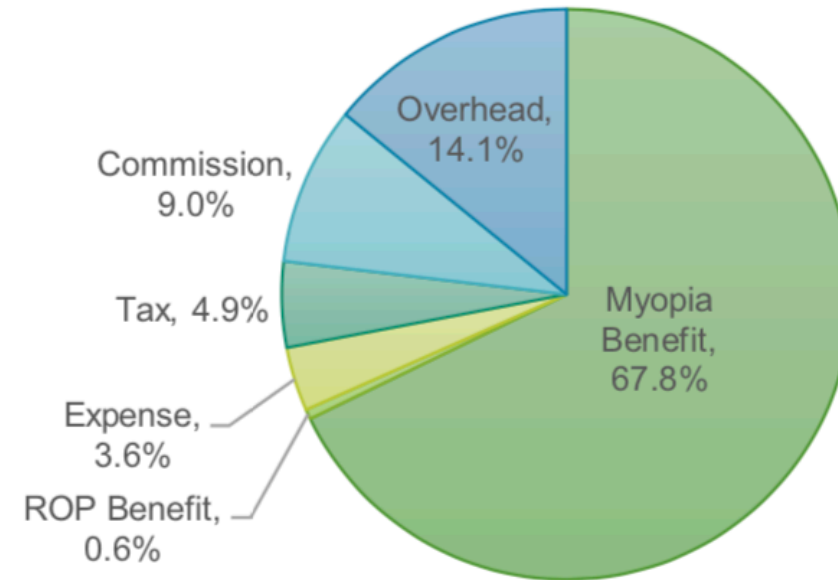
Category	Formula
Expense	$\text{Commission expense rate} = \frac{\text{Commissions}}{\text{Gross premium written}} \times 100\%$
	$\text{Maintenance expense rate} = \frac{\text{Salaries and fees}}{\text{Gross premium written}} \times 50\%$
	$\text{Claim expense rate} = \frac{\text{Net adjusting expense}}{\text{Gross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

Premium Rates

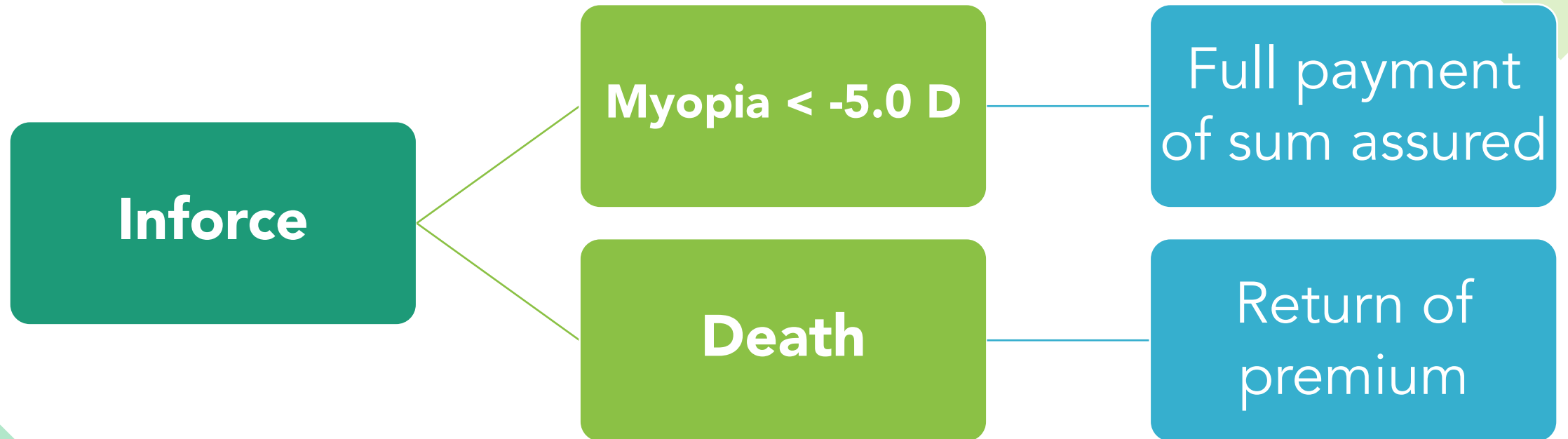
Premium Rate Category	Description	Premium Rate (Per 1000 Sum Assured)	
		Palöminia	Ambernia
Highest rate	<ul style="list-style-type: none"> Sex: male Number of myopic parents: 2 Number of parents with undergraduate degree: 2 	198.00	259.01
Average rate	Average of the expected business mix	74.81	100.63
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

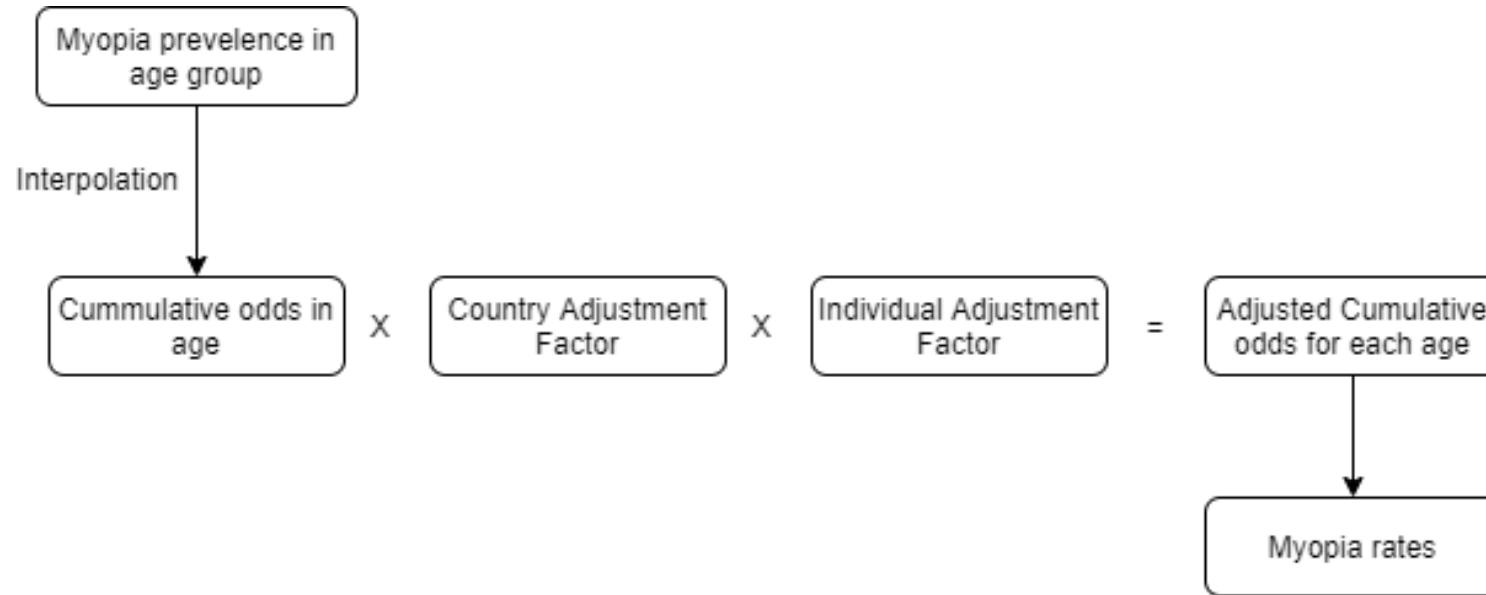
Country	Market Penetration
Palöminia	50%
Ambernia	50%

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	
		Palöminia	Ambernia
No	1	66.80%	16.68%
Yes	0.9	33.20%	83.32%

Income	Odds Ratio	Exposure	
		Palöminia	Ambernia
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

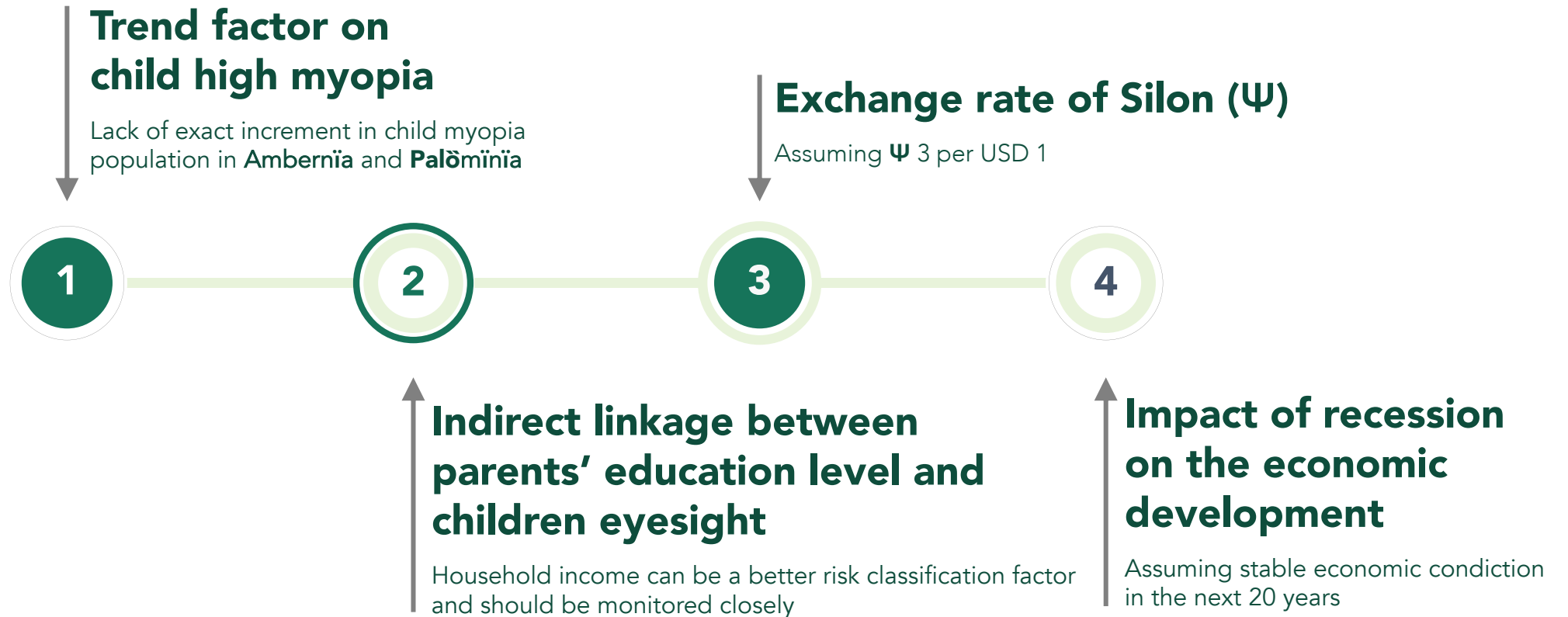
Number of High Educated Parents	Odds Ratio
0: both father and mother do not obtain undergraduate degree	1
1: either father or mother obtains undergraduate degree	1.1
2: both father and mother obtain undergraduate degree	1.21

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