SECTION 1: OBJECTIVES

1.1 OBJECTIVES

SuperLife's main objectives are to encourage healthier lifestyles and decrease expected mortality through the fitness tracker and health screening incentives. By improving the product's marketability and competitiveness, SuperLife aims to secure a stronger foothold in the life insurance industry by bolstering sales and adding economic value to the company.

1.2 KEY METRICS

The program's success will be assessed using the following four metrics:

- **Savings:** The amount of money saved if the intervention program was implemented 20 years ago.
- **Profit margin:** The expected profit for each death benefit amount for the base case policyholder.
- **Mortality reduction:** The expected reduction in mortality after the program has been implemented, compared to current mortality figures.
- **Participation rate:** The percentage of policyholders expected to participate in the program.

SECTION 2: PROGRAM DESIGN

2.1 PROGRAM INCENTIVES FOR MORTALITY DECREASE

Program incentives aimed at reducing expected mortality include fitness tracking and regular heart health screenings. Fitness tracking involves using a fitness tracking device to monitor and improve physical activity by striving to hit personalised fitness goals. Heart health screenings include blood pressure and blood cholesterol tests. On average, participation in fitness tracking is associated with a 3-6% decrease in expected mortality, while engagement in regular heart health screenings can contribute to a reduction of 5-10%.

2.2 PROGRAM INCENTIVES FOR PARTICIPATION

Free fitness tracker

A complimentary fitness tracker will be provided, allowing a convenient system to track fitness such as physical activity, daily step count, heart rate, blood pressure and BMI. As the cost of purchasing a fitness tracker may discourage policy holders from tracking fitness, offering a free device incentivises removes this barrier to participation.

Tiered Reward System

Policyholders are able to earn Super points as they continually track fitness and achieve specific fitness and health goals. Fitness goals can include a 10,000 daily step count, healthy eating, weight loss, limit on alcohol and tobacco use and health goals include attending regular health screenings. As a person accumulates Super points, they are able to advance in tier status and receive premium reductions for term insureds or cash backs for whole life insureds. Inactivity for more than 4 weeks may result in loss of points, incentivising consistent tracking.

Table 4.2.1: Rewards per tier status for term insurance and whole life insurance

	Term Insurance		Whole Life Insurance	
Tier	**Average time spent in tier**	**Premium Reduction**	**Average time spent in tier**	**Cash Back as a % of single premium**
Wellness Pioneer	1-2 years	2%	1-4 years	2%
Endurance Warrior	3-5 years	4%	5-9 years	4%
Vitality Master	6-10 years	7%	10-14 years	7%
Fitness Apex	10-20 years	10%	15+ years	10%

Referral Incentive

Participants can earn additional Super points by referring others to join the program. If the referred individuals stay enrolled for at least 12 months, the referrer receives extra points. This encourages current participants to promote Superlife and the program to others, increasing life insurance sales.

Leaderboard Recognition

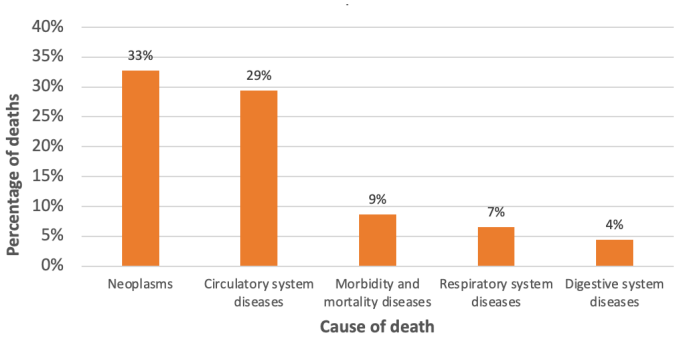
A leaderboard showcasing notable weekly point earners can serve as a form of recognition and motivation. High performing individuals can be highlighted, encouraging friendly competition and inspiring others to increase participation.

2.3 JUSTIFICATION FOR PROGRAM

Causes of death

Neoplasms and diseases of the circulatory system accounted for 33% and 29% of all Superlife's deaths respectively. The fitness tracking and heart health screening incentives were chosen to attenuate the number of deaths stemming from these two causes.

Figure 2.3.1: Distribution of the top 5 causes of death



Targeting the risk factors for neoplasms and circulatory system diseases

Circulatory diseases risk factors include unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol. Risk factors for neoplasms include obesity, smoking and excessive alcohol use. Fitness tracking acts as a preventative strategy to put policyholders at lower risk of developing circulatory diseases and neoplasms. Coupled with goals and rewards, this incentive targets the risk factors of unhealthy diet, physical inactivity, excessive alcohol use, tobacco use and obesity. The heart health screening incentive acts as a curative strategy, incentivising people already predisposed to or diagnosed with circulatory diseases or neoplasms for early detection and intervention, potentially preventing further complications or progression of the disease.

Leveraging data collection

The majority of deaths occurred within the 'moderate' risk category (40%) and the lowest in the 'high' risk category (17%), indicating a potential flaw in SuperLife's current method of classifying individuals. More comprehensive data will be obtained through the fitness tracking incentive, which can be leveraged to better assess policyholders' risk profiles. In doing so, Superlife is able to carry out more precise pricing and implement better suited interventions to decrease mortality.

2.4 SHORT-TERM & LONG-TERM PROGRAM EVALUATION TIME FRAME

The short-term time frames of 1 and 3 years and the long-term time frame of 5 years were chosen to evaluate the program. To discount future claims cost, future spot rates were predicted using an exponential smoothing method. The exponential smoothing model assigns a larger weighting to the more recent spot rates and a lower weighting to the spot rates that become more distant. Thus, this method produces slightly unreliable long-term forecasts. Choosing a narrower time horizon of 1 to 5 years would allow for less volatility in estimation of spot rates from the exponential smoothing model and hence, lower volatility in predicting future claims costs.

No lapse assumption

The calculation of mortality savings includes the assumption that there are no lapses before the term ends for term insurance (Refer to Appendix A1). Having a 5 year time frame is thus more suitable than a longer time frame of 10 years or 20 years as there will be fewer lapses, allowing the assumption of no lapses to be justified.

Dilution of policyholder pool

It was assumed that the policy population would not be diluted by new entrants to reduce the uncertainty of estimation, as new entrants may alter the characteristics of the policyholder pool. Thus in the future, ongoing monitoring of the pool will be required to account for new policy entrants in updated premium prices. Moreover, it would be crucial to see how mortality characteristics of new entrants factor into the effectiveness of the proposed program in terms of reducing mortality and the economic value it holds.

SECTION 3: PRICING & COSTS

3.1 MORTALITY SAVINGS

The ages of policyholders on record over the last 20 years (2004 - 2023) were determined and matched with the available age-specific mortality rates. Periods before the policy issuance year or after the lapse year for any policyholder, however, were ignored to ensure accurate matching of expected claims experience.

Possible viable interventions were tested, based on the findings from exploratory data analysis (EDA), and assumptions were made about their characteristics (Appendix A3). The expected value of the savings made from claims loss for each policyholder's insured year was determined by the product of the policyholder's face amount, mortality rate, intervention's reduction factor and participation rate. The savings made on each policyholder's experience was then inflated to its present value in 2024, using historical inflation rates, and the total savings made on claims was determined by aggregating these individual values for the 20-year time frame.

Expected program costs were estimated on a program-by-program basis, as one-time costs were assumed to be made upon policy issuance while ongoing costs were accrued on an annual basis. The total costs per policyholder were aggregated, and subtracted from the benefit savings, to determine the overall net savings from the implementation of the health intervention in Table 3.2.1.

Since it was projected that both the fitness tracking incentives and heart health screenings would have effected the highest mortality savings (over Č1.4 billion), a combination of these were utilised in the chosen program.

Table 3.2.1: Aggregate Mortality Savings in Last 20 Years

Aggregate Mortality Savings Summary				
Timeframe	Smoking Cessation	Fitness Tracker	Heart Screenings	Weight Management
Net Mortality Savings	Č383,785,999	Č1,427,729,113	Č1,470,828,591	Č1,335,694.974

3.2 ECONOMIC VALUE

The economic value of the proposed program was measured in a similar manner, by forecasting potential mortality savings over the next 1, 3 and 5 year timeframes. This analysis had to be separated into the Whole Life and 20-Year Term policyholder cohorts, as special considerations had to be made for lapses, which were not applicable to Whole Life policyholders.

Using a combined mortality reduction factor of 12.822%, the benefit savings and program costs for the different insured cohorts were projected over the different timeframes. Since any new policy entrants were ignored, the only costs incurred during the period were from the annual costs of heart screenings. The projected savings are shown in Tables 3.2.2 and 3.2.3 below.

Table 3.2.2: Projected Term Assurance Mortality Savings

T20 Mortality Savings Summary			
Timeframe	1 Year	3 Years	5 Years
Net Mortality Savings	Č55,402,016.10	Č150,464,745.71	Č216,984,825.40
Economic Value Per Year	Č55,402,016.10	Č50,154,915.24	Č43,396,965.08

Table 3.2.3: Projected Whole Life Insurance Mortality Savings

SPWL Mortality Savings Summary			
Timeframe	1 Year	3 Years	5 Years
Net Mortality Savings	Č285,178,739.59	Č895,799,149.36	Č1,546,036,639.63
Economic Value Per Year	Č285,178,739.59	Č298,599,716.50	Č309,207,327.90

Evidently, the projections reveal that the economic benefit of the proposed program wanes over time for T20 policies, while conversely, SPWL policies benefit more from the program over longer time frames.

3.3 OPTIMISATION OF SALES & VALUE OF POLICIES

To optimise sales and policy value, pricing adjustments carefully considered both the expected mortality savings and the expected costs of running incentives. By balancing these two components, premiums are able to remain competitive while covering program expenses. Additionally, the reward and referral system within the health incentive program can optimise sales by incentivising ongoing participation and encouraging customer referrals. This approach strengthens customer loyalty, expands our customer base, and drives sales growth effectively.

3.4 PRICING METHODOLOGY

This section outlines the methodology employed to develop a pricing model for two insurance products: a 20-year term insurance policy and a whole life policy. The primary objective was to project future cash flows to determine pricing strategies that ensure sustainability and profitability. The approach taken integrates industry research, EDA and simplified assumptions regarding mortality rates to navigate the complexities inherent in such financial products.

Simplification Strategy

Acknowledging the challenges posed by diverse mortality rates, a simplification strategy was employed. By focusing on the most common policyholder profile identified in the dataset, we were able to establish a base from which to apply loading factors. These factors allowed for adjustments in pricing for other policyholders with different mortality risks. Loading factors were determined through a tanh model, where the input is the death rate ratio of other factors relative to the characteristics of the base policyholder. These outputs are then multiplied together to produce a final loading factor, which is roughly bound between 0.9 and 1.1 (Appendix B). This approach ensured a balance between accuracy in mortality rate representation and practicality in model application.

Cash Flow Projections

With assumptions and simplification strategies in place, the model proceeded to project future cash flows. These projections encompassed a comprehensive range of financial elements relevant to the insurance policies, including but not limited to premiums received, reserves held, death benefits paid out, and lapse rates. The projection of these cash flows was fundamental in assessing the viability and profitability of the insurance products over time.

Profit Calculation and Pricing Adjustment

The culmination of the methodology was the calculation of profit, which was intricately linked to the pricing strategy. The model was designed to solve for a scenario in which the net profit, considering the lowest mortality risk and associated price, would be zero. This calculation was crucial in ensuring that the pricing model would sustain the insurance products while covering all anticipated costs. Adjustments were then made to the pricing to accommodate different mortality rates and ensure overall profitability across the product offerings.

3.5 PRICING RESULTS

Term 20 Year Life Insurance (T20)

The T20 product shows relatively low premiums across all coverage levels, which suggests that it is positioned as an affordable option for consumers seeking life insurance protection without a long-term commitment. For instance, a consumer can secure a Č100,000 death benefit for a modest premium of Č280, which is accessible to a broad customer base. The small incremental increases in premiums as the coverage amount rises make the T20 product an attractive option for individuals looking for higher coverage while maintaining affordability.

From an actuarial standpoint, the modest profit margins indicate a competitive pricing strategy where the program aims to offer lower-cost options to capture a larger market share. This could be particularly appealing to younger individuals or those with limited disposable income, for whom affordability is a concern.

Table 3.5.1: Term Insurance Profit Summary at Base Policyholder

T20 Profit Summary						
Death benefit	Č50,000	Č100,000	Č250,000	Č500,000	Č1,000,000	Č2,000,000
Premium	Č278	Č280	Č287	Č297	Č317	Č358
Profit	Č0.65	Č1.29	Č3.23	Č6.45	Č12.90	Č25.79

Whole Life Insurance (WL)

On the other hand, the WL product, with its significantly higher premiums, may be less affordable to the average consumer. The WL policy is designed for those who have a greater financial ability to pay higher premiums for the added benefit of cash value accumulation over time. The higher premiums can be justified by the long-term value proposition of the WL product, which combines life coverage with an investment element. However, the higher cost may limit the market to more affluent consumers or those with specific financial planning needs that justify the extra expense.

Table 3.5.2: Whole Life Profit Summary at Base Policyholder

WL Summary						
Death benefit	Č50,000	Č100,000	Č250,000	Č500,000	Č1,000,000	Č2,000,000
Premium	Č6,376	Č10,830	Č24,194	Č46,467	Č91,013	Č180,105
Profit	Č47.97	Č95.97	Č239.97	Č479.97	Č959.97	Č1,919.96

SECTION 4: ASSUMPTIONS

4.1 ASSUMPTIONS LIST

Population Assumptions

The mortality savings forecasts were made simpler through assumptions about the general Lumarian population. This included specifying that the age-specific mortality behaviour of policyholders would not

change across different time periods. Since Lumaria's economy is primarily driven by manufacturing and agriculture, there is unlikely to be a major medical breakthrough that would significantly impact long-term mortality behaviour. However, any major changes to mortality would impact the likelihood of claims experience and the relevance of the mortality savings forecasts.

There was also an optimistic outlook towards the effectiveness of the proposed program, as the universal Lumarian healthcare system allows for easier population-wide implementation and uptake. Hence, the upper bound of the mortality reduction thresholds were used from the provided data. However, during implementation, if the program is not as effective as intended, then the forecasts might overstate the savings.

Model Assumptions

It is unrealistic to expect all policyholders to be disciplined enough to follow the program's guidelines. Hence, participation rates were assigned to each intervention based on similar case studies and the likelihood of policyholders utilising it for its intended effect. This provides a necessary adjustment to the mortality reduction factors to ensure a more realistic expectation of the estimated savings for SuperLife.

The assumptions critical to the pricing model were derived from the preliminary research and EDA. Lapse rates in particular were calculated using the given dataset, whereas expenses were incorporated through the impacts of the program (Appendix A1 and A2). Special attention was given to the complexity of mortality rates, a pivotal factor in insurance pricing. To manage this complexity, a base policyholder profile was identified as the most common in the dataset, this being a Male, non smoker aged 44 with the moderate risk underwriting category. This profile served as a benchmark for modelling, with loading factors applied to accommodate variations in mortality rates among different policyholders.

4.2 SENSITIVITY ANALYSIS

A sensitivity analysis was performed by adjusting the assumptions of discount rate, participation rate for fitness tracker, and expenses. The impact on profit is shown for a death benefit of Č500,000. It is evident that change in participation rate has a minimal impact on profit, discount rate has a large impact on profit and expenses have an extreme impact on profit per person for the base user. (See Appendix C1 & C2)

The proposed program incentives will remain financially sustainable within the following recommended ranges.

Table 4.2.1: Recommended ranges of assumptions

Assumption	Recommended range
Discount rate	1% - 7.62%
Expenses	Fitness tracker: Č0 - $Č105.48 Heart health screening: Č0 - Č219
Participation rate fitness tracker	20% - 100%
Participation rate heart screenings	20% - 100%

4.3 DEGREE OF CERTAINTY OF LOWERING MORTALITY

In a study cited by the University of Copenhagen, increasing baseline steps from a sedentary lifestyle to 10,000 daily steps was associated with a 46% reduction in all-cause mortality. However, the majority of Lumaria's population consists of blue-collar workers, who already lead a less sedentary lifestyle. Hence, the baseline steps count is likely to be higher than measured in the quoted study. Therefore, a greatly diminished mortality reduction factor of 6% allows us to have a higher degree of certainty in the forecasted mortality savings.

Similarly, studies showed that heart screenings reduced all-cause mortality by 7% for all ages, with a relative reduction of 11% for those aged above 65. Since only 4% of the Lumarian population is currently above 65, the expected mortality reduction would be about 7.16%. However, with 12% of the population approaching this age group in a few years, the future mortality reduction potential of this intervention can be slightly overstated with a high degree of certainty, to 10%.

Following the sensitivity analysis on our various assumptions, it is clear that our program assumptions allow for significant mortality savings to be experienced, with a high degree of certainty. However, the threshold for the various financial conditions impacting our forecasts is much narrower and so, more care must be taken in ensuring that program-related expenses are well-managed to avoid a financial liability.

SECTION 5: RISK & RISK MITIGATIONS

5.1 QUANTITATIVE RISKS

Replacement of Fitness Trackers

Given that we are providing consumers access to fitness trackers for free, there is a hidden cost that emerges as a result of the replacement of these products. As a result, this has the potential to incur hefty losses on SuperLife's bottom line, exposing them to financial risk.

Assuming that fitness trackers last for an average of 5 years, on average, SuperLife will need to replace 20% of trackers per year. Therefore, we have given this risk a likelihood rating of medium. However, to measure the severity, we performed a stress test and concluded that the yearly cost of replacement would be Č 65,674,420.

To mitigate the likelihood of this risk occurring, Superlife can retain and exploit this risk by leveraging economies of scale. By forecasting future lost trackers on a regular basis, SuperLife can create larger orders of fitness trackers. As a result, assuming that economies of scale holds, the per unit cost of these trackers will reduce, thus minimising the loss per unit on these products. Furthermore, Superlife can also impose a penalty to the policyholder in the case of lost or damaged fitness trackers. By doing so, we can successfully cap the amount lost per unit, thus mitigating the financial risk of this program.

False Screenings and Tracking Reports

SuperLife's only means of measuring policyholder habits such as daily step count etc. is through the information provided from the screenings or fitness trackers. Not only can these devices be inaccurate but policyholders could also manipulate fitness tracker readings to give them a more favourable score for a lower premium.

The likelihood of this risk is very high as all policyholders have a reasonable incentive to manipulate their fitness score. Given that all policyholders could reach a 10% premium reduction without adjusting for any

healthier lifestyle choices, SuperLife would be effectively cutting revenue by 10% without any of the expected savings from the program. Therefore, the severity of this risk is very high.

SuperLife would have to retain this risk by using previous data/AI to analyse patterns in fitness and monitor whether their activity is in line with their current performance. Engagement patterns could also be measured this way and suspicious behaviour could be flagged and checked by a risk team. Furthermore, SuperLife can retain this risk by providing psychological help through education and counselling programs. These programs can provide additional stimulus in teaching individuals the importance of their health which could in turn reduce the risk of policyholders faking results.

5.2 QUALITATIVE RISKS

Risk of Data Breach/Data Leaks

Given the sensitive nature of the data being collected (heart rate, location, health records etc.), hackers may target SuperLife and use such information for malicious intent. Operational risk arises as a result of the data breaches impact on the technology and other data of Superlife. Assuming that hackers have entered Superlife's databases, this gives them access to policyholder profiles and technology, which will incur large costs to protect or replace. Given that Superlife is one of the largest insurers in Lumaria, any data breaches will also be heavily reported within the nation, causing reputational risk. This will result in existing and new policyholders losing trust in their operations, thus affecting the insurer's future performance.

Given that widespread data breaches are not common within larger insurance companies, we believe this breach has a likelihood rating of very low. However, given the extensive impact such an event could have on the existing and future performance of the firm, it has a high severity rating.

To mitigate the likelihood of this strategy, Superlife should look to retain or remove this risk. This can be done through introducing new teams and/or headcount dedicated towards cybersecurity and data breaches of this strategy. On top of regularly auditing and improving current security measures, this staff should look to implement new policies and monitoring practices to consistently maintain high level security. Such measures could include penetration testing, data encryption software and securing any remote third parties the data is visible to.

Regulatory/Ethical Risk

Given that Superlife will be collecting sensitive data from policyholders, it is crucial the firm ensures they are operating under the regulatory guidelines outlined by the Lumarian government. This program may impact the laws relating to consent of tracking and anti-discrimination.

This risk has a likelihood rating of high, given most countries' legislation contains a high level of complexity with respect to personal data collection and transparency. The severity of this risk is also considered a high, as underestimating this risk can lead to legal liabilities, financial penalties and reputational harm.

SuperLife will have to retain and reduce the risk of this occurring through consulting legal counsel during all stages of planning, implementation and monitoring to ensure continuous compliance. Any changes in the regulatory environment must be assessed, and the product must be rectified if any material changes occur. Furthermore, Superlife can reduce the risk by actively communicating and ensuring consumers are aware of what data is being collected. This would help mitigate the risk exposure by providing protection if the firm was to be pursued legally.

5.3 RISK ASSESSMENT

After categorising the risks from the information in the previous two sections, we can determine that the two most important risks to mitigate are false screening & tracking records and risk of data breach or data leak. Risk mitigation strategies would primarily focus on retaining and reducing these risks as described in the previous sections.

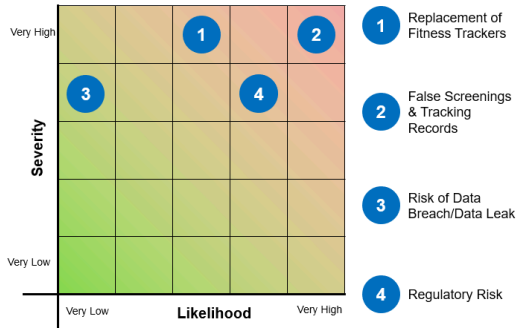


Table 5.3.1: Risk map of likelihood and severity

SECTION 6: DATA LIMITATIONS

6.1 DATA LIMITATIONS

Insufficient rating factors

More data regarding our policyholders enables us to categorise them more effectively, allowing us to choose which incentives will have a greater impact on our book. Additional rating factors are required to assess the health characteristics of an individual comprehensively e.g. cholesterol level, blood glucose lvl, weight, height, sleeping patterns, genetic predispositions and current diseases.

Lack of information on participation rates for incentives

Lack of data on projected participation rate for any incentive meant that we had to rely on comparisons to similar incentives by other companies. However, there is always a risk that these comparisons may not be very correlated to our circumstances due to differences in product design, characteristics of our policyholders and current government regulations. Thus, our participation rate was a high source of volatility for future projections.

Lack of competitor information

Lack of competitor information includes data on competitor product design, incentives, pricing strategies and market share. This information plays a critical role in gaining a greater insight into reasons why policyholders may have lapsed in our term insurance book. In addition, understanding of SuperLife's current position in the life insurance market plays a factor in making key business decisions on whether we should focus on growing and retaining the volume of our book or maximising profits from our book.

Pricing Model Generalisations

For the pricing model, focusing on the most common policyholder profile and applying loading factors to adjust for others might not accurately represent the risk profiles of less common policyholder types. This could lead to pricing inaccuracies for those not closely matching the base profile. The boundaries set for loading factors (roughly between 0.9 and 1.1) may not adequately accommodate extreme variations in mortality risk, leading to under- or over-pricing for certain policyholder segments.

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SECTION 8: APPENDIX

Appendix A1: T20 Key Model Assumptions

Assumption	Value	Rationale
Required Capital (per 1000 DB)	0.01	*The low required capital reflects the robust risk management strategies and reinsurance treaties in place that minimise the capital needed to back the policies.*
Investment Earnings Rate	5.50%	*An investment earnings rate of 5.50% is assumed based on current long-term investment yields, ensuring that projections are aligned with market realities and conservative enough to account for market fluctuations.*
Discount Rate	7.38%	*The discount rate of 7.38% is set to reflect the time value of money and the risk profile of the liabilities, benchmarking against industry standards for such products.*
Lapse Rate 1	1.04%	*From EDA*
Lapse Rate 2-5	3.51%	*From EDA*
Lapse Rate 6-10	7.61%	*From EDA*
Lapse Rate 11-15	11.90%	*From EDA*
Lapse Rate 16+	15.62%	*From EDA*
Commissions (as % of Prem) 1	80%	*Structured to incentivize initial sales while maintaining cost-effectiveness over the policy's lifetime.* *High commission rate of 80% of the premium to incentivise agents.*
Commissions (as % of Prem) 2+	5%	*Reduced to 5% to reflect the lower effort required for renewals.*
Expenses 1	Č323	*Initial expense of Č323 to cover acquisition costs such as underwriting, marketing, and administrative setup.*
Expenses 2+	Č218	*Ongoing expenses reduced to Č218, considering the lower cost of servicing existing policies compared to acquiring new ones, however there is still maintenance for the program incentive.*
Premium Discount Rates 1-2 Years	2%	*A modest discount is offered initially to acknowledge the commitment while covering the costs of underwriting and administration for new policyholders.*
Premium Discount Rates 3-5 Years	4%	*As policyholders demonstrate continued loyalty, the risk of lapse decreases, and the insurer starts to benefit from the invested premiums, allowing for a slightly higher discount.*
Premium Discount Rates 6-10 Years	7%	*With a more established relationship, the insurer has a clearer risk profile and reduced administrative costs, justifying a more substantial discount.*
Premium Discount Rates 11-20 Years	10%	*Long-term customers have proven their loyalty and lower risk through sustained coverage, meriting the highest discount level as a reward for their long-standing patronage and contributing to a stable risk pool.*

Appendix A2: Whole Life Insurance Key Assumptions

Assumption	Value	Rationale
Investment Earnings Rate	5.50%	*This rate is an estimate of the average return the insurer expects to earn on its investment portfolio. The rate must be realistic yet conservative to ensure the insurer can meet its future obligations to policyholders.*
Discount Rate	12%	*The discount rate of 12% is set to reflect the time value of money and the risk profile of the liabilities over a longer time horizon compared to the T20 product, benchmarking against industry standards for such products.*
Commissions (as % of Prem) 1	10%	*This represents the commission paid to agents for the first year's premium, typically higher to cover agent acquisition costs.*
Commissions (as % of Prem) 2+	0%	*Commissions are front-loaded and that the insurer does not pay renewal commissions, which can reduce long-term policy costs.*
Expenses 1	Č270	*Initial expense of Č270 to cover acquisition costs such as underwriting, marketing, and administrative setup.*
Expenses 2+	Č196	*Ongoing expenses reduced to Č196, considering the lower cost of servicing existing policies compared to acquiring new ones, however there is still maintenance for the program incentive.*
Reserve Interest Rate	4.00%	*This rate, at which the policy's reserve grows, is typically set at a conservative rate, ensuring the insurer can guarantee the policy's cash value growth without taking on excessive investment risk.*
SV Interest Rate	6.00%	*The surrender value interest rate being set higher than the reserve rate may act as an incentive for policyholders to keep their policy in force rather than surrendering it for its cash value. It also represents the additional earnings the insurer expects to make by investing the funds over the term of the policy.*

Appendix A3: Health Intervention Assumptions

Intervention	Reduction Factor	Participation Rate	Program Cost
Smoking Cessation Program	50% (Not applicable to non-smokers)	40%	Č2,178
Fitness Tracking Incentive	6%	70%	Č105
Heart Health Screening	10%	90%	Č218
Weight Management Program	10%	50%	Č523

Appendix B: Premium Loading Factors

			Loading Factor (Term Insurance)	Loading Factor (Whole Life Insurance)
M	NS	high risk	0.98798288	0.996394864
M	NS	low risk	0.946698428	0.984009529
M	NS	moderate risk	1	1
M	NS	very low risk	0.942926894	0.982878068
M	S	high risk	0.913975169	0.974032113
M	S	low risk	0.875783249	0.96192475
M	S	moderate risk	0.925092112	0.977556337
M	S	very low risk	0.872294232	0.960818684
F	NS	high risk	0.946097898	0.983722383
F	NS	low risk	0.906563678	0.971494568
F	NS	moderate risk	0.957605559	0.987281668
F	NS	very low risk	0.902952036	0.970377498
F	S	high risk	0.875227703	0.961644049
F	S	low risk	0.838654908	0.949690672
F	S	moderate risk	0.885873349	0.965123451
F	S	very low risk	0.835313806	0.948598673

Appendix C1: Sensitivity analysis

	Discount rate	Profit (Č)	Expenses	Profit (Č)
Unfavourable	8.49% (15% increase)	-26.13	Maximum	-991.58
Assumption	7.38%	6.45	Average	6.45
Favourable	6.27% (15% decrease)	42.66	Minimum	1011.79

Appendix C2: Sensitivity analysis

	Participation rate fitness tracker	Profit (Č)	Participation rate heart screenings	Profit (Č)
Unfavourable	0.5	6.32	0.85	6.39
Assumption	0.7	6.45	0.9	6.45
Favourable	0.9	6.58	0.95	6.51