



The design of the program is at your firm’s discretion; the “wellness plan” mentioned earlier is just one example of possible elements of a health incentive program.

Your firm has been asked to produce a report that includes the following details of your proposed program as well as its impacts on the associated life insurance policies:

- Objectives,
- Program Design (incentives and features),
- Pricing/Costs,
- Assumptions,
- Risk and Risk Mitigation Strategies, and
- Data and Data Limitations.

A task force consisting of SuperLife’s Chief Actuary, Chief Marketing Officer, and the company’s product development team will evaluate your proposed program and competing programs from other consulting firms using each of the objectives outlined earlier.

## Data

The task force has provided your consulting firm with inforce data for SuperLife’s current block of business, the research assembled by its product development team, and key facts about Lumaria. The task force inputs include:

- An Online Encyclopedia Entry on Lumaria providing general information about the country, Geographical and Political Statistics, Demographic Statistics, Economic Statistics, Social and Cultural Statistics, Other Statistics, Fascinating Curiosities and Major Holidays;<sup>1</sup>
- Lumaria Historical Inflation and Interest Rates including inflation, overnight rates, one-year spot rates and 10-year spot rates;
- Lumaria Mortality Table for the general population;
- SuperLife Inforce Dataset containing policy data for the most recent 20 years on 20-year level-term and single premium whole life (non-participating) products;<sup>2</sup>
- A key to the SuperLife Inforce Dataset; and
- Research assembled by SuperLife’s product development team on the approximate cost and impact of interventions that affect mortality rates.<sup>3</sup>

All data files are available on the [2024 SOA Research Institute Student Research Case Study Challenge webpage](https://www.soa.org/research/opportunities/2024-student-research-case-study-challenge/), URL: <https://www.soa.org/research/opportunities/2024-student-research-case-study-challenge/>.

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<sup>1</sup> Some of the information in the Online Encyclopedia Entry was created with the assistance of Bard, a generative AI from Google AI, in November 2023 in response to numerous prompts and specifications provided by the Society of Actuaries Research Institute 2024 Student Research Case Study development team. Bard’s resulting output has been edited for style and content.

<sup>2</sup> The SuperLife Inforce Database is based on data that was generated by ChatGPT, a generative AI from OpenAI, with the Notable plugin on November 14, 2023, in response to numerous successive prompts and specifications provided by the Society of Actuaries Research Institute 2024 Student Research Case Study development team. The Case Study development team edited and modified ChatGPT’s output, resulting in the dataset provided for the 2024 Student Research Case Study.

<sup>3</sup> The interventions data was generated by ChatGPT, a generative AI from OpenAI, on November 21, 2023, in response to an initial prompt from the Society of Actuaries Research Institute 2024 Student Research Case Study development team as follows: create a list of 50 different specific interventions that a life insurance company might promote to encourage reduced mortality among its policyholders. After reviewing the response from ChatGPT, the Case Study team constructed a series of successive follow-up prompts to produce additional details or revisions. The resulting output has been edited for style.

*Some of the data was created with the assistance of generative AI tools as described in the footnotes. Should students use any form of generative AI in any phase of the development of their Student Research Case Study Challenge submission, students are strongly encouraged to use very robust forms of citation.*

## Deliverables

The task force requires that your consulting firm deliver a high-level report, informed by your research and analysis, that addresses all the following items:

### 1. Objectives

- The main objectives of the proposed program.
- Key metrics to measure the success of the proposed program over suitable time horizons.

### 2. Program Design

- Describe program incentives that contribute to a decrease in expected mortality.
- Describe program incentives that encourage participation in the program.
- Describe any other key program features or requirements.
- Justify the above features and requirements, including quantitative analysis.
- Define short- and long-term timeframes for evaluating the program, including justification for the timeframes your team has chosen.

### 3. Pricing/Costs

- Determine the mortality savings SuperLife would have realized if your team's plan had been implemented for the past 20 years.
- Determine the economic value of the proposed program and insurance benefits for different insurance policies that might be sold over suitable projection timeframes. Verify that the aggregate value of policy benefits with the proposed program exceeds the value of policy benefits without the proposed program.
- Propose any pricing changes needed to optimize sales and the value of the policies to be sold.

### 4. Assumptions

- List all assumptions used in your firm's analysis. In the body of the report, include a summary of the assumptions your firm used. You may use an Appendix to your report to describe these assumptions in more detail, if necessary.
- In the body of your report, identify the assumptions that have the most significant impact on the proposed program's costs. Include your firm's rationale and analysis for each assumption.

### 5. Risk and Risk Mitigation Considerations

Provide a risk analysis that discusses potential risks that may have a material impact on the proposed program. Your analysis should include, but is not limited to, the following elements:

- Identify both quantifiable and qualitative risks.
- Rank these risks using appropriate metrics such as likelihood and severity estimates for the quantifiable risks.
- For the key risks, suggest possible risk mitigation techniques.
- Perform a sensitivity analysis that examines the financial impact of actual experience that differs from key assumptions. For each quantitative assumption, provide recommended ranges to achieve desired results. This sensitivity analysis should demonstrate both favorable and unfavorable sensitivities.
- Indicate the degree of certainty that the proposed program would have lowered mortality for the past 20 years. Provide justification for the degree of certainty selected.

- Indicate the degree of certainty that the value of benefits derived from policies sold with the proposed program will exceed the value of benefits derived from policies sold without the proposed program.

#### 6. Data and Data Limitations

- Identify any data limitations and the impact of any such limitations on your analysis.
- Identify any data sources your team used.

### PROJECT EVALUATION CRITERIA

Jes B. Zane and Pat Moneywize’s product development team will evaluate your firm’s report using the following criteria:

- Organization, form, clarity, and cohesiveness of your report, as appropriate for the task force audience, which includes very busy, high-level officials who represent a wide variety of disciplines, many of which are not quantitative.
- Clear, concise, and complete responses to all items listed in the “**Deliverables**” section of this SuperLife Saving Lives Case Study.
- Detailed mathematical analysis applying the concepts of probability, probability distributions, and time value of money (with explanations of any formulas, models, and other aspects to the analysis you use) that are understood by technically minded individuals on the task force.
- Creative and strategic recommendations.
- Secondary research, including a bibliography showing a list of all sources cited throughout your report.
- Consideration of the provided data, including documentation of data limitations.
- Documentation of assumptions.
- Adherence to all items discussed in the “**SUBMISSION REQUIREMENTS**” subsection of this SuperLife Saving Lives Case Study.

### SUBMISSION REQUIREMENTS

Your team’s submission must contain a written report that meets all the criteria outlined under the WRITTEN REPORT CRITERIA, SUPPORTING ANALYSIS, and WHEN AND WHERE TO SUBMIT subsections below. For further information, please refer to the 2024 Student Research Case Study Challenge Official Rules, which are available on the [2024 Student Research Case Study Challenge webpage](https://www.soa.org/research/opportunities/2024-student-research-case-study-challenge/), URL <https://www.soa.org/research/opportunities/2024-student-research-case-study-challenge/>.

### WRITTEN REPORT CRITERIA

Your written report should be addressed to Jes B. Zane and Pat Moneywize’s product development team. The product development team includes individuals with financial expertise, including the Chief [Actuary](#) of SuperLife. The product development team also includes marketing and research experts.

The report format must meet all the following criteria. If your team fails to meet items 1 through 3 below, the task force will not accept your report and will not pay your consulting fees.

1. The report must be in a single Microsoft Word (docx or doc) or Adobe (pdf) format, must not be password protected, and must be smaller than 25 MB. The submission form cannot accept files larger than 25 MB.
2. Your report must be written in English.

3. On the top page of your report (cover page, if you are using a cover page, or the first page of your report if you are not using a cover page), state your team name, university affiliation, and each team member's name. Do *not* include any email information or phone numbers for any team member.<sup>4</sup>

The task force also expects your report to meet the following criteria numbered 4 through 9 below. If your team fails to meet the items numbered 4 through 9 below, the task force will be disappointed, may disregard your report, and may not pay your consulting fees in full.

4. Your report should be readable and formatted to professional standards.
5. The filename of your report must be your team name and a *brief* description of the content for quick identification (for example: "Team ABC Report.docx" or "ABC Consulting Report.pdf").
6. For an item under the section header "**Deliverables**" in this SuperLife Saving Lives Case Study to be considered during judging, it must appear in the main body of your report.
7. You must reference in a bibliography all elements of your report that are not original with full citations. This requirement applies to all written material, tables, graphs, charts, images, and data other than data provided by the task force for this SuperLife Saving Lives Case Study.
8. Your report and its supporting calculations must be the original work of your team specifically for this SuperLife Saving Lives Case Study. Previously prepared or published work should not be repurposed or submitted.
9. Any generative Artificial Intelligence (AI) tools used in developing a submission shall be acknowledged and documented responsibly and appropriately. If you use AI tools, you are accountable for the originality and integrity of the content of your research and work and for ensuring that any AI-generated output, citations, or references have been validated.
10. Your report's length cannot exceed 10 pages with 1-inch (2.5-cm) margins and a 12-point font size. If your report exceeds 10 pages, the task force will consider only the first 10 pages. Reports with narrower margins or smaller font sizes will be downgraded during judging. The following items *will not count* toward the 10-page limit:
  - a. Cover page, if using (cover page is optional)
  - b. Table of contents, if using (table of contents is optional)
  - c. Bibliography containing cited sources
  - d. Appendix (optional) or appendices. Information in appendices should be supplemental with the intent of providing additional detail to support the deliverables discussed in the main body of your report for the more technically focused task force members. Material in the appendices will not be considered in the evaluation of whether deliverables were met. Consequently, it is good practice to provide summarizing sentences in the main body for any appendix referred to. Appendices may contain:
    - i. Supporting formulas, calculations, or data,
    - ii. Further elaboration or amplification on any item in the main body of the report,
    - iii. Program code, or
    - iv. Direct citations of external research.

## SUPPORTING ANALYSIS

As noted, your report must be submitted in Microsoft Word without macros (.docx or .doc) or Adobe (.pdf) format. You may optionally support your project with up to three additional files showing calculations done in any programming language. However, any supporting files—for example, as an appendix to the main report—may be submitted only in Microsoft Word without macros (.docx or .doc), Microsoft Excel without macros (.xlsx or .xls), or Adobe (.pdf) formats. Other formats will not be considered. The maximum size of each supporting file is 25 MB.

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<sup>4</sup> Winning reports will be posted on the Society of Actuaries Research Institute website. For privacy reasons, the Society of Actuaries Research Institute does not recommend providing email addresses.

## INTENT TO SUBMIT

The judges ask that if you intend to submit an entry, please complete the online [Intention to Submit Form](https://soa.wufoo.com/forms/z1eojtcg0du2rem/), URL: <https://soa.wufoo.com/forms/z1eojtcg0du2rem/>, by Sunday, March 10, 2024.

## WHEN AND WHERE TO SUBMIT

Complete the [online submission form](https://soa.wufoo.com/forms/zworvny1s0mck9/), URL: <https://soa.wufoo.com/forms/zworvny1s0mck9/>, including attaching your final submission. Submissions must be received by 5:00 p.m. U.S. Daylight Standard Time on March 22, 2024. Please include the names and email addresses of all team members and your faculty advisor, as well as your university affiliation. Your team name and student names should be written as you would like them to appear on your certificate of participation. Please ensure the email addresses you enter are correct because they will be used for communicating advancement during judging and providing certificates of participation or completion after judging. The online submission form will accept up to 4 files, each with a maximum size of 25,000 KB (25 MB). Note that the online submission form may not be available until mid-March 2024.

Soon after submission, the first team member identified on the form will receive email confirmation of the submission. If the first team member does not receive an email confirmation of your submission form within 15 minutes after clicking the “Submit” button, either the first team member’s email address was incorrect or your submission was not accepted. Please resubmit after double-checking all email addresses and file sizes.

If submission fails a second time, please email your submission to [research@soa.org](mailto:research@soa.org), copy all team members and your faculty advisor, and include in the body of your email the names and email addresses of all team members and your faculty advisor. The maximum size of email that SOA can accept is 50,000 KB (50 MB).

## Questions/Comments

Please direct any questions or clarifications on the rules to the SOA Research Institute via email at [research@soa.org](mailto:research@soa.org).

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