

SOCIETY OF ACTUARIES INDIVIDUAL LIFE EXPERIENCE COMMITTEE

2021 MORTALITY FORECASTING CONTEST

These are the Official Rules governing the Society of Actuaries' ("SOA") "Individual Life Experience Committee: ("ILEC") 2021 Mortality Forecasting Contest" ("Contest"). In these rules, "you" and "your" refers to an eligible Contest entrant ("Entrant"). By entering, Entrants acknowledge compliance with these Official Rules, including all eligibility requirements.

1. BACKGROUND AND CONTENT

Being able to make accurate and timely estimates of future claims is a fundamental task for actuaries. Questions of profitability, product competitiveness, and insurer solvency depend on understanding future claims, with mortality being one of the central issues facing a life insurer.

Actuaries are being called upon to delve ever more deeply into insurer experience to glean useful and actionable insights, all the while being asked to do so with shorter and shorter time horizons. This contest is designed to give both actuaries and non-actuaries an opportunity to demonstrate their ability to fulfill this mandate. Moreover, as the ability for practitioners to communicate their message clearly and efficiently is more important than ever, this contest is also an opportunity to show off communication skills, including data visualization and innovative message delivery modes.

2. GOALS FOR THE CONTEST

We are providing the 2009-2016 Individual Life Experience dataset. Submissions ("Submission") must at a minimum include the following:

1. An analysis of the data
2. A projection of mortality for the upcoming 2017 experience year, submitted using the supplied grid of cells
3. Creative and effective visual exhibits which clearly communicate the results of your analysis and of your projected claims

3. DATASET

The dataset being provided is the 2009-2016 Individual Life Experience Study.

Entrants may also employ external datasets. However, such datasets should be available to the SOA and ILEC without cost or limitation, and the Submission must make clear how such data were used in developing the prediction of 2017 actual experience.

4. CONTEST ENTRY PERIOD

The period to submit a Submission begins **March 31, 2021 at 12:00:01 a.m.** Central Daylight Time ("CDT") and ends **July 31, 2021, at 11:59:59 p.m.** CDT (Entry Period). You may enter the Contest by sending your Submission prior to the close of the Entry Period. Notification of an intent to submit must be received by July 20, 2021 in order for your submission to be valid. You will receive further instructions to facilitate submitting the large file required for your Submission once the Society of Actuaries has been notified of your intent to submit.

Please submit all your Submissions or intents via e-mail to:

Korrel Crawford, Senior Research Administrator
Society of Actuaries
e-mail: kcrawford@soa.org

5. COUNTRY OF RESIDENCE REQUIREMENTS

The Contest is open only to legal residents of the United States and Canada (void in Quebec) who are at least eighteen (18) years of Age or the age of majority as of March 31, 2021. All employees of Society of Actuaries ("Sponsor"), their contractors or agents (all of the foregoing, together with Sponsor collectively, "Contest Entities"), members of the ILEC, and their immediate family members and those with whom they are domiciled are ineligible to enter or win the Contest. All applicable federal, state, provincial and local laws and regulations apply.

6. CONTEST GUIDELINES

Submissions should showcase innovative data analysis, forecasting, and visualization methods that will impact actuarial work. The Submissions must meet the following rules:

- Entrants must submit the complete program ("Program") used to develop the mortality projections AND the complete program used for any visualizations and/or any information referenced in the Submission. Entrants must include the name and version of the software.
- Entrants must submit a presentation with their chosen format: a written essay, a PowerPoint a video, or an entrant's preferred format, subject to the following:
 - a) Essay Requirements:
 - i. Maximum of 2,000 words. In the event that an essay exceeds 2,000 words, the essay may be declined or returned to the author with a request for further editing and resubmission. There is no requirement for formal or extensive footnoting.
 - ii. Essays may be in Microsoft® Word, PDF format, R Markdown or Jupyter Notebook. (R Markdown and Jupyter Notebooks need to be submitted with output in Word or PDF format.)
 - b) PowerPoint Requirements:
 - i. Maximum of twenty (20) slides. In the event that a PowerPoint exceeds 20 slides, the Submission may be declined or returned to the author with a request for further editing and resubmission.
 - c) Video Requirements:
 - i. Minimum of two (2) minutes and a maximum of eight (8) minutes. In the event that a video exceeds 8 minutes, the video may be declined or returned to the author with a request for further editing and resubmission.
 - ii. MP4 or MPEG video files are preferred for video Submissions
- Submissions must be in English.
- The Submission must include a fully populated grid of predicted mortality rates.
 - a) The grid is provided as part of the downloadable materials for this contest.
 - b) The grid of predicted mortality rates must be uploaded using the instructions provided by the SOA. Submitting the grid by email will not be accepted.
 - c) The mortality rate for each cell must be the annual rate of mortality (q) for the given combination of attributes in the cell.
- When emailing a Submission, the email must include the Entrant's name, credentials or designations (if appropriate); title; organization/company; e-mail address, physical address; and phone number and contact information for the co-author/co-presenter, if

applicable. All co-authors have to notify the SOA with their acknowledgment to participate in this contest.

- By entering a Submission in this Contest, you and your co-author(s) are agreeing to provide the SOA with the right to publish your Submission, in accordance with Section 11.
- Submissions that contain any overt political statements, commercial content, and other inappropriate material will not be accepted. Articles must comply with the [SOA's antitrust guidelines](#).

7. JUDGING

The winning Submissions will be determined based on the following criteria: Creativity; Originality; Practical Significance (e.g. the extent to which an idea could contribute to the further development of solutions); Prediction Accuracy; and Overall Submission Quality. Submissions will be graded by the Project Oversight Group (“POG”) of the ILEC. One judge will be named the Chairperson of the panel.

Unlike the other criteria, Prediction Accuracy is a quantitative measure. This measure will be assessed by ranking entries against the actual 2017 observed experience. The 2017 experience will be available to the judges in time for assessing submissions, but will not be released to the public until sometime after the close of the Entry Period. Prediction accuracy will be assessed using the following formula in ascending order:

$$\sqrt{\frac{\sum_{i \in \{2017 \text{ data rows}\}} \frac{(O_i - E_i)^2}{E_i}}{\sum_{i \in \{2017 \text{ data rows}\}} L_i}}$$

where O_i is the actual death claim amount, E_i is the predicted death claim amount, and L_i is policies exposed. Only the top five entries based on Prediction Accuracy will be go on to be scored and judged.

It is expected that Prediction Accuracy will be a major factor in determining winning entries. However, actuaries are ordinarily called upon to ensure that their models have the required Practical Significance for their intended purposes and are properly and effectively communicated to their stakeholders. Therefore, it is possible for small relative deficits in Prediction Accuracy to be overcome by relative superiority in the other criteria. We ask that entrants please keep this in mind when crafting a Submission.

In the event of a tie, the Chairperson’s scores will be used to determine the winning Submission. The judges’ decision is final and binding, as will be the Chairperson’s in the event of a tie. The judges reserve the right not to award any prizes if they determine that no Submission is qualified. The judges reserve the right to modify the judging process.

8. AWARDS

There will be three (3) prizes awarded in this competition: one (1) \$3,000 USD prize for “first place;” and two (2) prizes of \$1,000 each for “second place and third place”. If the Submission has more than one author/presenter, the prize will be divided among the co-authors/co-presenters equally. In exchange for award money, selected authors will be required to assign all copyrights for their Submissions to the Society of Actuaries.

Prize Winner(s) will be determined on or before August 15, 2021, at approximately 10:00:00 AM CDT at the offices of the SOA located at 475 N. Martingale Rd., Suite 600, Schaumburg, Illinois 60173 USA, and the Prize Winner(s) will be notified no later than August 31, 2021. Prize Winners will be announced publicly on or about August 31, 2021. The SOA will mail a check to the Prize Winners at its own expense. The Prize Winners will be required to complete Affidavit of Eligibility/Liability/Publicity Release (where legal) and W9 or W-8BEN Taxpayer Form. These documents must be signed, notarized and returned within fourteen (14) days of issuance of notification. Failure to comply will result in disqualification and the Prize will be forfeited. All taxes on the Prizes and other expenses related to accepting and/or using the Prizes not listed in these Official Rules are the sole responsibility of the Prize Winners, who will receive an IRS Form 1099 reflecting the final actual value of the Prize. Prizes are not transferable or equivalent for Canadian entrants. No substitution allowed except, at the SOA's sole discretion, a prize of equal or greater value may be substituted.

9. SUBMISSION RULES

Entrants may submit a maximum of one (1) Submission, either individually or with a co-author/co-presenter. No purchase necessary to enter or win. By entering a Submission in the Contest, Entrant is verifying ownership of the Submission and compliance with the Official Rules. Submissions cannot infringe upon any third-party personal or proprietary rights. Any Entrant whose Submission contains elements not owned by the Entrant must be able to provide legal releases for such use, including Sponsors' use, in a form satisfactory to the judges.

10. PARTICIPANT OBLIGATIONS

- a. By entering, Entrants consent to the use of their name, Submission, biographical information, photographs and/or likenesses for advertising and publicity purposes without additional compensation (except where prohibited) by SOA for purposes concerning this Contest or succeeding contests and for publicity, special events and advertising purposes in connection with promoting the Society of Actuaries, the SOA's Mortality and Longevity research program, the SOA website and/or this Contest or succeeding contests.
- b. By entering, Entrants grant SOA a perpetual, royalty-free, non-exclusive, non-transferable license to publish, display, and reproduce their Submission in any and all media, in whole or in part, throughout the world for any purpose including commercial purposes. Entrants hereby grant the Sponsor permission to format their Submission for the Sponsor's purposes at the Sponsor's sole discretion.
- c. By entering, Entrants grant SOA an unlimited license to print or republish their Submissions, with proper attribution given to the author(s).
- d. By entering, each Entrant agrees to defend, indemnify, release and hold harmless the Sponsor from and against any and all losses, demands, damages, rights, claims, injuries, actions and liabilities of any kind arising out of or related to Entrant's participation in the Contest. Any disputes that may arise hereunder shall be governed in all respects by the laws of the State of Illinois without regard to the conflicts of laws principles of any jurisdiction. Venue with respect to any such disputes shall be had in the state and federal courts of the State of Illinois. Sponsor's failure to enforce any term of these rules shall not constitute a waiver of that provision. In any cause of action, the Sponsor's liability will be limited to five hundred dollars (\$500.00), and in no event shall the Sponsor be liable for attorneys' fees and/or experts' fees and costs. By participating in the Contest, each Entrant waives the right to claim any additional damages whatsoever, including, but not limited to, punitive, consequential, incidental or indirect damages.
- e. By entering, Entrants attest that the submitted work is their own, and that they have an unencumbered right to the use of the computational resources, including but not limited to software, hardware, and network connectivity, that were used in the creation of the Submission.

11. PUBLICATION AND PRESENTATION

Depending on how many entries are received and the diversity among the Submissions, a suitable format for electronic publication and dissemination will be selected. Submissions may also be presented at SOA meetings, webcasts, or other professional development events.

In addition, other venues for publication or presentation of the ideas outside of the SOA will be considered. It is hoped that publication of the visualizations will further knowledge and stimulate discussion as well as promote future efforts in this area.

12. PERSONAL INFORMATION

The personal information collected through this Contest is subject to SOA's Privacy Policy, located at <http://www.soa.org/legal/privacy-policy/>. By entering this Contest, you agree to the use of your personal information as described in the above Privacy Policy.

13. SPONSORS

The Sponsor of this Contest is the Society of Actuaries' Actuarial Innovation and Technology Steering Committee 475 N. Martingale Road, Suite 600, Schaumburg, IL 60173 USA.

14. QUESTIONS

Please direct any questions regarding this Contest to:

Korrel Crawford, Senior Research Administrator
Society of Actuaries
e-mail: kcrawford@soa.org