

# Disability product pricing

Life Insurance – Technical Area

## Level of Intervention

- Development
- Consulting
- Expertise
- Project management

## Tools & programming

- R
- SAS

## Context & issues

Since few years, our client is experiencing significant yearly loss on its closed book disability product (disability annuity and waiver of premium). Detralytics was mandated to reprice the old tariff generation. Mission extension was made to price the open book as well.

## Detail of the intervention & realisations

- Thorough analysis of the product and available data to design the modelling approach and granularity
- Data processing: Homogenization of information and treatments
- Modelling:
  - Usage of a 3 states (Active, Disable, Death) semi-Markovian model.
  - Usage of external data to derive the incidence rates and then rely on relational models to rescale these values at portfolio level.
  - Computation of Waters algorithm to derive the different transition probabilities from incidence rates.
  - Integral discretization to compute the reserves within the various states and thus determine the premium.
- Model assessment:
  - Assessment of the different parameters' calibration achieved.
  - Retrospective analysis including specific risk profile assessment.
  - Prospective analysis including planning dialogue figures.
- Technical project management was achieved by Detralytics, insuring weekly, steerco and BoM project presentations.
- Involvement of Detralytics' Scientific Advisors to validate results and provide methodological guidance.

## Deliverables

- R codes containing the whole methodology and analysis made during the assessment.
- Complete documentation of the methodology, results and codes (using markdown file for the later).
- Various presentation support used during weekly point, steerco or BoM meetings.