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Introduction of actuarial model

Assignment 1

- 1) → develop a well-defined set of objectives which need to be met by the modelling process.
  - plan the modelling process & how the model will be validated.
  - collect & analyse the necessary data for the model
  - define parameters for the model & consider appropriate parameter values
  - define the model initially by capturing essence of real-world system.
  - involve experts on the real-world system you are trying to imitate to get feedback on validity of conceptual model.
  - decide on whether a simulation or general-purpose language is appropriate for the implementation of the model. Choose a statistically reliable random number generator.
  - write the computer program for the model.
  - debug the program to make sure it performs the intended operations in the model definition.
  - test the reasonableness of the output of the model.
  - review & carefully consider the approximations of the model in the light of small changes in input parameters.
  - analyse the output of the model.
  - ensure that any professional guidance has been compiled with.
  - communicate & document the results and the model.
- 2) → model development requires a considerable investment of time & expertise
  - to study the outputs for any given set of inputs, several independent runs of the model are needed. if this is not done, the model could be inaccurate.
  - it's important to check validity of model's assumptions, the computer code, reasonableness of results & the way in which results can be interpreted by audience. if this isn't done, model's probability could be inaccurate.
  - low quality or <sup>low</sup> credible input will give flawed output

3) → objectives of modelling exercise.

- validity of model of purpose to which it is to be put.
- validity of data & assumptions
- errors associated with model or parameters used not being perfect representative of real world situation.
- impact of correlations between random variables that drive the model.
- Extent of correlation between various results produced from model
- current relevance of models written & used in past.
- ease of communication of model & results
- regulatory requirement, dangers of spurious activity accuracy, the credibility of data input & result output.

4) definition of input data, summary of model results, purpose or objectives of model, name & professional qualification, assumptions underlying the model, how model might be adapted or extended, tests performed to validate the output of model, any limitations of model identified,

5) Predictive data is used.

#### Advantages

- model is simple to understand & communicate
- model is easy & cheap to implement
- model takes account of one major source of variation in consumption rates.

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#### Disadvantages

- values may be missing in data.
- data collected from different sources may vary in quality & format.
- data could be incomplete
- any duplicates or outliers in data.

6) The second person may not know about the model fully. The procedure may not have been followed properly. The ~~parameters~~ ~~an~~ assumption that the parameter will not change results may be incorrect. There may be other differences than the ~~to~~ parameter in both the runs.

7) → the model is simple to apply  
→ data specified are likely to be available from reliable sources  
→ the model is straightforward to explain  
→ current rates.  
→ unforeseen events may occur which may affect current rates.  
→ the starting point for planned population maybe wrong.  
→ current age distribution of area may not be representative of new town.

8) → ease of communication of model  
→ budget & resources available for model  
→ capability of staff.  
→ who will use the model? is it user-friendly?  
→ the complexity of model - whether it is stochastic or deterministic  
→ general trend in sickness at national level may need to be built in.  
→ any previous attempts on this model.  
→ what illness will be considered in the model.