

1) The steps I would take in the development of the model are: -

- Develop a set of objectives and assume the worst case scenarios
- Plan the modelling process.
- Collect data and analyse the difference between the assets and liabilities.
- Define the parameter.
- Relate the model to the real world and making the model more detailed and accurate.
- Involve experts who have experience in the field of insurance to get feedback on the model.
- Write program for the model on R.
- Check the program for bugs.
- Analyse the output of the model.

2) The factors which cause the probability to be inaccurate

could be:-

- Models rely heavily on the data. If the data is flawed then the output will definitely be inaccurate.
- It is not possible to include all possible future events, which causes outputs to be flawed.
- If several independent runs of the model are not done, data might be inaccurate.

3) The stages to identify an appropriate model are;

- Note down the objectives of the exercise, in this case, forecasting future mortality
- The validity of the model.
- The validity of the data to be used.
- The validity of assumptions
- The possible errors associated to the model.
- The ease with which the model and its results can be communicated.

4)

- Validation of the output of the model.
- Defining the data that has been inputted.
- Identifying the limitations of the model.
- The model which has been chosen.
- Summary of the results.
- Validity of the results.
- Objective of model.
- The assumptions made are also to be mentioned.

5)

Advantages

- The model will be easy to understand.
- The model takes multiple factors into account and will therefore be accurate.
- The model is easy to make and implement.

- The model can be adapted easily to different sample populations.

Disadvantages:

- Unforeseen circumstances can come true.
- A fluctuation in consumption rates is unlikely to be sustained for a long period.
- Consumption may be sensitive to pricing, which may change in future.
- Factors other than age may be important.

6)

- The runs (one or both) might be inaccurate.
- The assumption may be incorrect (model was not sensitive to a particular parameter).
- The difference between the runs may not have been the parameter change, the runs may have different number of simulations or

seeds.

7) The model should be simple to apply and understand.

- The data should be reliable.
- Unforeseen circumstances, such as pandemic or war could take place which would change the rates.
- Starting point of sample population may be wrong.
- The model is easier to explain to the developers.
- Mortality rates unlikely to be significant relative to the uncertainty of the projection.
- Current age distributions for the area may not be representative of the whole town.

as)

- The nature of the existing sickness data that the company possesses
- The complexity of the model.
- General trends in sickness

at the national level may need to be built in.

- The definition of sickness and level of benefits under the scheme.
- The ease to communicate about the model.
- Capability of staff to understand the model.
- The independence of sickness rates should be taken into account.