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## Claim Reserve Model: How Actuaries rely upon the claim data they receive

### *MAIN POINTS*

*Continuance Tables*

*Paid Amounts*

*Incurred But Not Reported (IBNR) Reserves*

### Continuance Tables

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1. The many variables associated with claims administration usually cause distortions
2. Information about dates of loss (incurred dates), dates of service and paid dates is known accurately when the actuaries derive the continuance tables, but not when they apply those continuance tables
3. Actuaries use historical experience when developing the tables, but they apply them to ongoing claims where the dates are not as well-identified for setting reserves
4. Administrators are not usually able to accurately identify all of the information for an open claim file
  - a. The administrator may not have paid the benefits for some days if he did not receive all of the information that was needed to verify payment
  - b. If this happens for a significant number of claims, the reserve calculation may be understated
5. Administrators try to be up-to-date with the claim status, however they may unintentionally create a stronger bias, as the information may be easier to update on certain classes of people
  - a. For example, it may be easier to close a claim for death or recovery than to update a surviving claimant
  - b. If the concluded claims are more up-to-date than the surviving claims, the continuance probabilities become biased toward understating the reserve
6. Administrators may close claims upon hearing that a claim has terminated (either by death or recovery), without waiting for the last set of expenses to be submitted.
  - a. Such claims may not make it to the open claim file, thus creating a twofold bias
    - i. a reserve may not be set up for their final payment
    - ii. these claims represent the claimants that are about to terminate, again causing the otherwise good continuance curve to be biased toward an understatement
7. Adjustments to overcome this bias-generating practice
  - a. Make adjustments to the claim reserves for the closed claims
  - b. Adjust the reserves of the remaining claims in order to address the bias in the continuance pattern that is created by the process
8. To avoid a bias from administration processes, the actuaries may theoretically keep every claim open that has ever been open
  - a. Calculate the expected remaining payout as of the valuation date
  - b. This should work if the continuance tables accurately reflect the claim population
  - c. The reserve needs to be adjusted for interest from the incurred date to the valuation date

- d. It also needs to have the anticipated claims from the true last service date to the valuation date added
- e. If the average lag from the true last service date to valuation date is not long, the dollar value can be approximated reasonably by:
  - i. the number of days lagged X the average dollars paid per day in a recent period
  - ii. A small adjustment may be appropriate to recognize that some of the claims would not have lasted through the entire lag period

### Paid Amounts

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1. The variables that determine the paid amount are numerous and paid amounts will likely vary according to
  - a. diagnosis;
  - b. time since the onset of disability;
  - c. size of the daily maximum;
  - d. whether inflation is included;
  - e. whether the claimant has incentive to preserve some of his lifetime maximum for the future;
  - f. gender;
  - g. type of care provider;
  - h. region;
  - i. age;
  - j. whether a spouse is alive and is healthy;
  - k. the reason the claim qualified for benefits
2. The actuaries depend upon accurate reporting of the above items
  - a. Some of the listed items are identified in the in-force policyholder file
  - b. Some may change through the course of time
    - i. type of care provider
    - ii. region
    - iii. whether the spouse is healthy
  - c. Accuracy in recording of these items in the claim file may have a material impact on the size of the reserve

### Incurred But Not Reported (IBNR) Reserves

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1. IBNR estimates may depend on how claims are counted and reported by the actuaries
  - a. include pending claims (open claims without any payments) in the IBNR
  - b. apply continuance tables to the pending claims along with a probability that they will be eligible claims (pure IBNR)
  - c. identify IBNR counts using completion factors
    - i. Pure IBNR case: derive the IBNR counts from claim triangles using counts by incurred dates and reports dates
    - ii. Including pending claims in IBNR: derive IBNR from claim triangles using counts by incurred dates and first payment dates
2. The nature of the exposure identifies the expected claim incidence as a reasonableness test for the calculated IBNR
  - a. If the exposure has reached a steady state, the new claim counts (including IBNR) ought to remain fairly level relative to the exposure

- b. If the exposure has an increasing percentage of new business, the new claim counts will normally be declining relative to the exposure
  - c. If the exposure has a declining percentage of new business, the new claim counts will normally be increasing relative to the exposure
  - d. This concept can be fine-tuned by segmenting the exposure and the new claim counts by factors such as
    - i. policy duration
    - ii. age
    - iii. sex
3. Seasonality may also be a factor in completing claim counts, so the actuaries need to account for it in calculating the IBNR count
4. Usually, more judgment is needed to estimate IBNR than to derive reserves for known claims
- a. Range of IBNR values will be relatively wide compared to the reserve on known claims
    - i. This is because the estimate of the IBNR reserve usually depends upon recent developments in the exposed population
  - b. The relatively large range for IBNR will usually be relatively small for the entire reserve