Session 184: IBNR: Insights, Barriers, and Nuances of Reserving

SOA Antitrust Compliance Guidelines
SOA Presentation Disclaimer

2019 ANNUAL MEETING & EXHIBIT

Session 184: IBNR: Insights, Barriers, and Nuances of Reserving

Nazir Valani
Todd Sherman
Ross Zilber

October 30, 2019
Society of Actuaries 2019 Annual Meeting

SOCIETY OF ACTUARIES®

SOCIETY OF ACTUARIES
Antitrust Compliance Guidelines

Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants.

The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

- **Do not** discuss prices for services or products or anything else that might affect prices
- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions
- **Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone's responsibility; however, please seek legal counsel if you have any questions or concerns.

Presentation Disclaimer

Presentations are intended for educational purposes only and do not replace independent professional judgment. Statements of fact and opinions expressed are those of the participants individually and, unless expressly stated to the contrary, are not the opinion or position of the Society of Actuaries, its cosponsors or its committees. The Society of Actuaries does not endorse or approve, and assumes no responsibility for, the content, accuracy or completeness of the information presented. Attendees should note that the sessions are audio-recorded and may be published in various media, including print, audio and video formats without further notice.

Agenda

Accounting Basics

Claim Reserves versus Claim Liabilities

Types of Unpaid Claim Liabilities for Health Plans

Estimating Unpaid Claim Liabilities for Health Plans

Retrospective Review for Health Claim Liabilities

Other Related Liabilities

IBNR Liabilities for Other Coverages

Accounting and Actuarial Guidance for Claim Liabilities

Audit Considerations

Accounting Basics

Accrual accounting measures the financial performance and financial position of a company by recognizing economic events regardless of when cash transactions occur.

From *ASC 944-40 (previously FAS60):*

25-1 “Both of the following shall be accrued when insured events occur: (a) A liability for unpaid claims (including estimates of costs for claims relating to insured events that have occurred but have not been reported to the insurer), and (b) A liability for claim adjustment expenses; that is a liability for all costs expected to be incurred in connection with the settlement of unpaid claims.”

25-2 “The estimated liability for unpaid claims includes the amount of money that will be required for future payments on both of the following: (a) Claims that have been reported to the insurer, and (b) Claims relating to insured events that have occurred but have not been reported to the insurer as of the date the liability is estimated.”

Similar Guidance exists in Statement of Statutory Accounting Principles (SSAP) No. 55.

Claim Reserves versus Claim Liabilities

Claim Reserves:

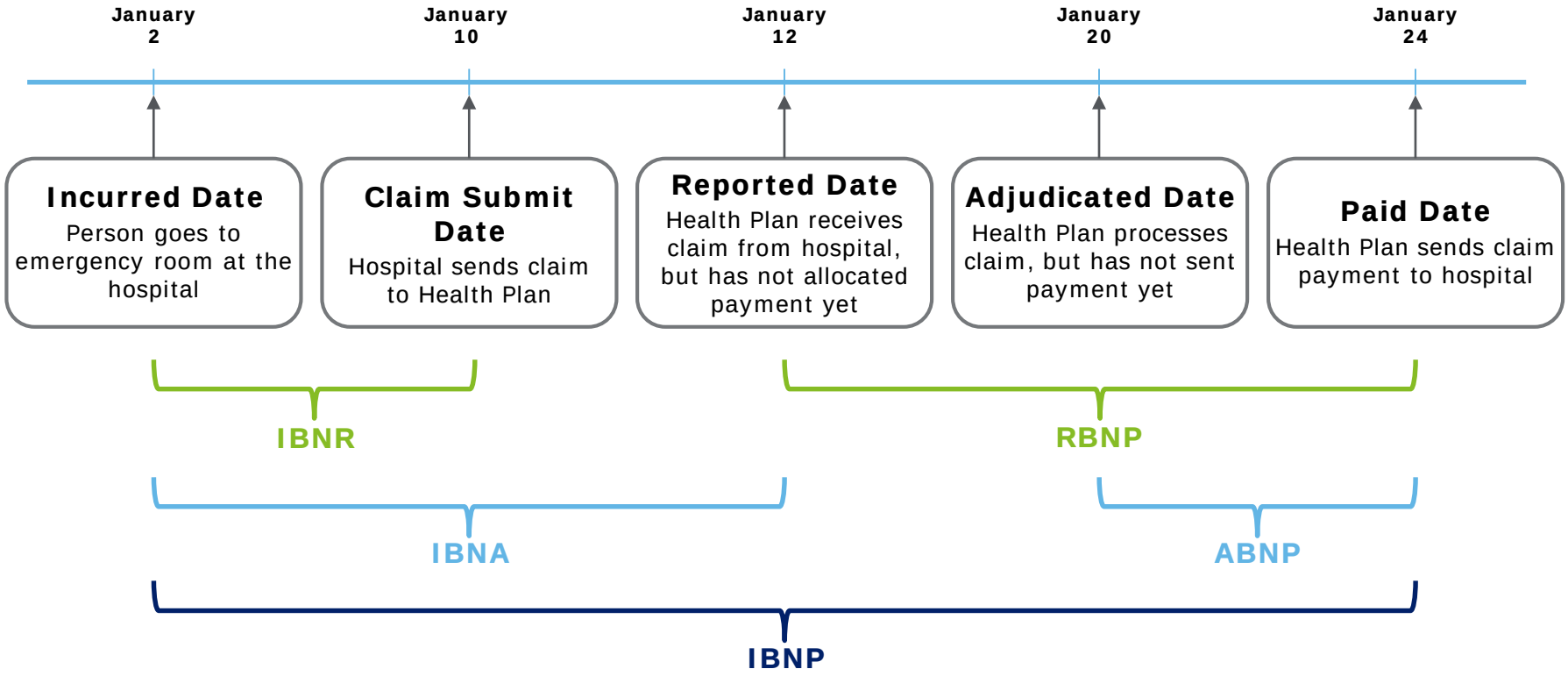
- Also commonly referred to as Present Value of Amounts Not Yet Due (PVANYD).
- Future benefit amounts amounts related to claims already incurred but for which payment are contingent on future events (i.e., a claimant remaining disabled).

Claim Liabilities:

- Benefit payments which are due upon receipt and successful adjudication
- Includes both reported and unreported claims

Companies that file the NAIC Blue Blank put Claim Reserves in Exhibit 6 and Claim Liabilities in Exhibit 8.

Types of Unpaid Claim Liabilities for Health Plans



IBNP = IBNR + RBNP

IBNP = IBNA + ABNP

Estimating Unpaid Claim Liabilities for Health Plans

Some Basic Considerations:

- There are numerous methods to estimate incurred claims, and subsequently unpaid claim liabilities, for Health Plans.
- Unpaid claim liabilities are the incurred claim estimate for a given incurred date (or Date of Service) minus claims already paid for that incurred date.
- The methodology chosen to estimate incurred claims will be dictated by the data available, reporting requirements, the level of precision needed for management and other stakeholders (e.g., regulators), etc.
- Accounting conventions at a given company, along with the level of data available, will determine what type of unpaid claim liabilities (e.g., IBNP vs IBNA) are recorded in the company's general ledger.
- The incurred claim estimate is most likely going to be wrong, but the actuary's 50/50 Best Estimate will, on average, be correct.

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Common Methodologies Used for Health Plans:

- Development Method
  - a.k.a., Lag Triangle Method, Chain-Ladder Method, Completion Factor Method
- Expected Loss Method
- Projection Method
- Bornhuetter-Ferguson Method

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Development Method

- Most common method used at health plans for estimating Unpaid Claim Liabilities
- Relies on historical claims data organized into "triangles" by paid date and incurred date.
  - Could alternatively be on an adjudicated or reported basis
- Most health plans include 36 or 48 months of paid and incurred data in their lag triangles.
- Assumes the historical payment data exhibit consistent runout patterns and can be used to predict runout for incomplete incurral months.

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Development Method: Calculating Age-to-Age Completion Ratios

# Months	Incurral Date											
Following	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
0	76,439	72,721	89,123	74,415	78,671	73,344	66,979	76,331	69,204	72,897	64,131	70,786
1	110,744	105,497	117,139	108,016	102,705	92,096	95,822	109,453	90,134	97,981	101,171	
2	119,285	110,908	125,578	112,785	107,270	97,483	96,835	114,901	94,282	105,734		
3	119,873	112,948	128,541	114,135	110,527	100,785	97,474	117,937	95,592			
4	123,240	114,169	129,497	116,277	112,914	101,387	98,731	118,249				
5	124,601	114,373	130,390	118,129	113,388	103,314	99,104					
6	124,601	114,993	130,796	118,378	113,645	104,658						
7	125,334	113,993	132,528	118,378	114,057							
8	126,036	114,993	132,556	118,541								
9	126,130	115,144	132,556									
10	126,395	115,233										
11	126,395											

# Months	Incurral Date										
Following	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17
1	1.4488	1.4507	1.3144	1.4515	1.3055	1.2557	1.4306	1.4339	1.3024	1.3441	1.5776
2	1.0771	1.0513	1.0720	1.0442	1.0444	1.0585	1.0106	1.0498	1.0460	1.0791	
3	1.0049	1.0184	1.0236	1.0120	1.0304	1.0339	1.0066	1.0264	1.0139		
4	1.0281	1.0108	1.0074	1.0188	1.0216	1.0060	1.0129	1.0026			
5	1.0110	1.0018	1.0069	1.0159	1.0042	1.0190	1.0038				
6	1.0000	1.0054	1.0031	1.0021	1.0023	1.0130					
7	1.0059	1.4348	1.0132	1.0000	1.0036						
8	1.0056	0.6970	1.0002	1.0014							
9	1.0007	1.0013	1.0000								
10	1.0021	1.0008									
11	1.0000										

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Development Method: Lag factor development using normal averaging and averaging excluding high and low

# Months	Incurral Date											Average	Lag
Following	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	CF	Factor
1	1.4488	1.4507	1.3144	1.4515	1.3055	1.2557	1.4306	1.4339	1.3024	1.3441	1.5776	1.391	0.648
2	1.0771	1.0513	1.0720	1.0442	1.0444	1.0585	1.0106	1.0498	1.0460	1.0791		1.048	0.901
3	1.0049	1.0184	1.0236	1.0120	1.0304	1.0339	1.0066	1.0264	1.0139			1.021	0.944
4	1.0281	1.0108	1.0074	1.0188	1.0216	1.0060	1.0129	1.0026				1.012	0.963
5	1.0110	1.0018	1.0069	1.0159	1.0042	1.0190	1.0038					1.009	0.975
6	1.0000	1.0054	1.0031	1.0021	1.0023	1.0130						1.004	0.983
7	1.0059	1.4348	1.0132	1.0000	1.0036							1.092	0.987
8	1.0056	0.6970	1.0002	1.0014								0.926	1.078
9	1.0007	1.0013	1.0000									1.001	0.998
10	1.0021	1.0008										1.001	0.999
11	1.0000											1.000	1.000

6 Months of Averaging

# Months	Incurral Date											Average	Lag
Following	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	CF	Factor
1	1.4488	1.4507	1.3144	1.4515	1.3055	1.2557	1.4306	1.4339	1.3024	1.3441	1.5776	1.378	0.656
2	1.0771	1.0513	1.0720	1.0442	1.0444	1.0585	1.0106	1.0498	1.0460	1.0791		1.050	0.903
3	1.0049	1.0184	1.0236	1.0120	1.0304	1.0339	1.0066	1.0264	1.0139			1.021	0.948
4	1.0281	1.0108	1.0074	1.0188	1.0216	1.0060	1.0129	1.0026				1.011	0.968
5	1.0110	1.0018	1.0069	1.0159	1.0042	1.0190	1.0038					1.008	0.979
6	1.0000	1.0054	1.0031	1.0021	1.0023	1.0130						1.003	0.986
7	1.0059	1.4348	1.0132	1.0000	1.0036							1.008	0.990
8	1.0056	0.6970	1.0002	1.0014								1.001	0.997
9	1.0007	1.0013	1.0000									1.001	0.998
10	1.0021	1.0008										1.001	0.999
11	1.0000											1.000	1.000

6 Months of Averaging excluding High and Low (4 of 6)

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Development Method: Estimating ultimate incurred claims and IBNR using lag factors

# Months Following	Cumulative Paid In Jan-17	Completion Ratio	% Complete
0	76,439	1.449	60.5%
1	110,744	1.077	87.6%
2	119,285	1.005	94.4%
3	119,873	1.028	94.8%
4	123,240	1.011	97.5%
5	124,601	1.000	98.6%
6	124,601	1.006	98.6%
7	125,334	1.006	99.2%
8	126,036	1.001	99.7%
9	126,130	1.002	99.8%
10	126,395	1.000	100.0%
11	126,395		100.0%

Calculated as the subsequent lag factor divided by the completion ratio

$$\frac{94.8\%}{1.005} = 94.4\%$$

Assumes January (the incurral month with 12 months of runout) is 100% complete

	Incurral Date											
	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Paid to date	126,395	115,233	132,556	118,541	114,057	104,658	99,104	118,249	95,592	105,734	101,171	70,786
Lag Factor	1.000	1.000	0.998	0.997	0.992	0.986	0.986	0.975	0.948	0.944	0.876	0.605
Ultimate	126,395	115,233	132,835	118,879	115,023	106,165	100,531	121,276	100,793	112,036	115,469	117,048
IBNR	0	0	279	338	966	1,507	1,427	3,027	5,201	6,302	14,298	46,262

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Development Method: Other Considerations

- Exposure basis (e.g., membership, premium, inpatient days)
- Manual picks/adjustments for the most recent months
- Large claims and case reserves
- Outlier payments/recoveries and triangle "smoothing"
- Claim processing issues
- Granularity of data and conservatism bias
- Rx versus Medical
- Claims data reconciliations

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Development Method: Other Technical Considerations

- Number of months of CF averaging
- Different CF averaging methods (e.g., arithmetic, geometric, harmonic)
- Recoveries and Lag Factors > 1.000 (i.e., negative IBNR amounts)
- Frequency of claim payments (e.g., daily vs. one day a week)
- Immature lines of business (ultimate completion factor)

Estimating Unpaid Claim Liabilities for Health Plans (con't)

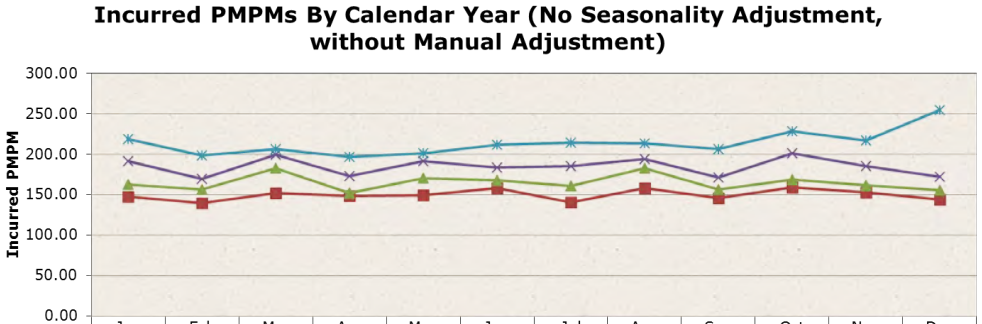
Expected Loss Method

- Often used with new lines of business where there is not enough claims data to develop claims triangles.
- Relies on an *a priori* loss ratio, typically from a pricing or forecasting department.
  - Alternatively, could use expected loss PMPM
- Unpaid claim liabilities equal expected losses minus paid claims, where the expected losses are equal to the expected loss ratio multiplied by earned premiums
- As claim payments are made, may need to increase (decrease) the expected loss ratio if the resultant IBNR appear too low (high)

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Projection Method

- Complete (or mostly complete) incurral periods are used to project expected ultimate losses for incomplete periods.
- Relies heavily on trend assumptions
- May need to make adjustments for change in the exposure basis (e.g., membership growth).
- May need to make adjustments for seasonal claims incurral patterns



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008												
2009	147.21	139.54	151.71	148.36	149.11	158.35	140.72	157.85	146.22	158.59	153.25	144.31
2010	162.32	156.65	182.38	152.10	170.80	167.63	160.51	182.46	156.61	168.55	161.32	155.27
2011	191.14	169.54	199.70	173.26	191.58	183.42	185.70	194.26	171.01	201.47	184.94	172.05
2012	218.88	198.25	206.01	197.16	200.83	211.53	214.30	213.79	206.16	227.90	216.72	254.69
CF	99.9%	99.9%	99.7%	99.6%	99.4%	99.2%	98.9%	98.0%	96.2%	91.9%	77.1%	19.9%

Estimating Unpaid Claim Liabilities for Health Plans (con't)

Bornhuetter-Ferguson Method

- The B-F method is a blend of the Development Method and the Expected Loss Method
- Development methods are used to determine how complete claims payments are for each incurred date
- Future claims runout payments are based on expected loss amounts
- Most appropriate with lines of business with sporadic claim payments and/or longer payment lags
- As claim payments are made over time, expected losses grade to ultimate losses as actual payments deviate from expected
- May make sense to switch to pure development method at some level of completion
- May need to adjust expected loss ratio if the resulting claim liabilities are unreasonable (e.g., negative IBNR)

Estimating Unpaid Claim Liabilities for Health Plans (con't)

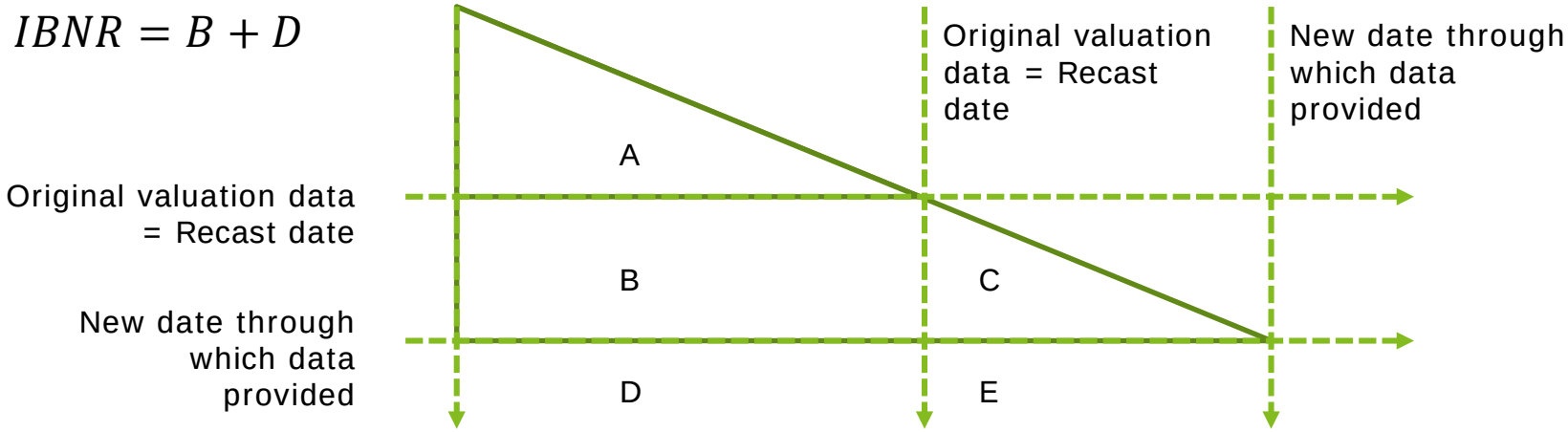
Bornhuetter-Ferguson Method Example

- The Completion Ratio from the Development method is determined to be 45%.
- Paid claims to date = $50,000
- Total Expected Losses = $100,000
- Expected IBNR = (1 - 45%) * $100,000 = $55,000
- B-F Expected Ultimate Losses = $50,000 + $55,000 = $105,000

Retrospective Review for Health Claim Liabilities

Calculates the IBNR for a date prior to the valuation date by incorporating run-out experience

$$IBNR = B + D$$



- Also known as Recast Analysis or Lookback Analysis
- Tests the adequacy of a prior period IBNR Estimate and potentially incorporate adjustments to the current period estimate
- Useful in determining if the IBNR model is biased

Other Related Liabilities

Provision for Adverse Deviation

- GAAP accounting generally precludes the use of risk margins
- Actuarial and Statutory accounting guidance generally require that IBNR Claim Liabilities include a level of prudency.
  - ASOP 28: *"When the actuary opines that the liabilities make good and sufficient provision, the actuary should include a provision for adverse deviation. The provision should result in amounts that, in the actuary's professional judgment, are sufficient to cover obligations under moderately adverse conditions."*
- Very rare to see GAAP vs. Statutory differences for Health Plan claim liabilities.

Other Related Liabilities

Provision for Adverse Deviation (con't)

- PADs can be an implicit, explicit, or somewhere in between, e.g.,
  - Implicit PADs could be due to inherent conservatism in the IBNR model
  - Explicit PADs could be to add **X%** to the base IBNR amount
  - Setting incurred claim estimates above the 50/50 estimate could be considered implicit or explicit

- Explicit PADs that are expressed as a percent of the base IBNR amount should have some basis for how they were determined, e.g.,
  - The base IBNR is a true 50/50 best estimate.
  - With an additional **X%** added to the base IBNR, the total liability is expected to be sufficient **Y%** of the time
  - **X%** is determined based on statistical analysis
  - **Y%** is based on the company's risk appetite

Other Related Liabilities

Claims Adjustment Expense (CAE) Liability

- Also known as Loss Adjustment Expense (LAE)
- Both GAAP and Statutory guidance require CAE
- The CAE liability is intended to fund claim operations to pay run-out claims in the event of company insolvency
- Typically expressed as a percent of the base IBNR amount
- The CAE percent can be determined based on internal expense studies, e.g.,
  - The ratio of claims department expenses in a given calendar year divided by the total paid claims for the year

IBNR Liabilities for Other Coverages

Dental, Vision, Specified Disease (e.g., Cancer), Accident, Hospital Indemnity, et al.

- Typically determined in a similar manner as Major Medical claims
- Some lines may complete very fast (e.g., Vision)
- May use a one month lag depending on reporting requirements in order to minimize restatements

Disability

- Often uses lag triangles
- May be based on # of claims outstanding multiplied by a expected average claim amount
- May be based on a % of premium developed through periodic study
- May include a portion of PVANYD and a portion of claims payable

Life, LTC

- *Ross to discuss in detail*

Accounting and Actuarial Guidance for IBNR Claim Liabilities

- ASC 944 (*previously FAS60*)
- SSAP 55
- NAIC Health Reserves Guidance Manual
- NAIC Annual Statement Instructions
- ASOP 5 (*Incurred Health and Disability Claims*)
- ASOP 42 (*Health and Disability Actuarial Assets and Liabilities Other Than Liabilities for Incurred Claims)*
- ASOP 28 (*Statements of Actuarial Opinion Regarding Health Insurance Liabilities and Assets)*

Audit Considerations

- Planning
  - Audit Approach
  - Timelines
  - Data Requests
  - Company Updates
- Communication
- Documentation
  - Processes and Controls
  - Methodologies and Assumptions
  - Analysis and Results

2019 ANNUAL MEETING & EXHIBIT

SOCIETY OF ACTUARIES®

Session 184: IBNR: Insights, Barriers, and Nuances of Reserving - Continued

Ross Zilber

October 30, 2019

Society of Actuaries 2019 Meeting

Manulife John Hancock

IBNR in Blue Book

- Exhibit 6: Claim Reserve - line 10. Present Value of amounts not yet due on claims (PVANYD)
  - This line includes reserves for unaccrued benefits on incurred but unreported claims
  - PVANYD is also Disabled Life Reserves or DLR. LTC DLR is reported in this line
- Exhibit 8: Part 1 – Line 3: Incurred but unreported
  - This line reports all contract claims incurred on or prior to Dec 31 of the statement year but not reported to the company until after that date.
  - It includes liabilities for "accrued" benefit payments that are due to the policyholder as of the valuation date.
  - LTC/Life/Annuities reports IBNR (accrued liabilities) in this line.

IBNR Methodologies

- IBNR methodologies
  - Projection Exposure Method
    - Per capita exposure
    - Loss Ratio
    - Average claim
  - Development Method
  - Case reserve Method (Exhibit 8 part 1 line 2)
  - Non-traditional methods (stochastic, neural network)

Practical considerations

- IBNR = factor * NAAR; same IBNR calc for both NAIC and IFRS
- IBNR = factor * Net Premium
- TBNR– Negative IBNR for LTC
- VA IBNR
- Other IBNR
  - Note 21 - IBNR on subprime defaults
  - Schedule S Part 4 (reinsurance ceded to unauthorized companies), column 6 include IBNR
  - Schedule S Part 5 column 10

Questions ???

Thank You!