Session 30 PD, Group Life Mortality Update

Moderator:
Susan R. Sames, FSA, MAAA

Presenters:
Amy Suzanne Whinnett, FSA, MAAA
SESSION 30

GROUP LIFE MORTALITY UPDATE


John Bettano, FSA MAAA, Prudential
Amy Whinnett, FSA MAAA, Munich Re, U.S. (Life)
Agenda

1. Study Overview
2. Goals of Study and Accomplishment of Goals
3. Lessons Learned
4. Preliminary Results
5. Final Deliverables and Future Studies
Study Overview
2016 Group Life Mortality Study
Overview

- Experience years 2010 - 2013
- Update to 2013 study with exposure years 2007 - 2009
- Includes Group Life, Waiver Incidence, AD&D
- List billed Only
- Some of the New features of 2016 study
  - Industry groupings available at 2 digit
  - Salary (In Pivot Table)
  - Portability Data
  - And Others
- Results in Pivot Table Format consistent with last 2 studies
From 2013 study lessons learned we decided to approach this study differently and take a “sub-committee” approach.

Folks did not feel as “engaged” thru the process.

A large “dead period” while data is gathered.

We created 5 different Sub Committees.

Also as a condition of having up your name on the final paper you must contribute tangible work effort.
2016 Group Life Mortality Study
Committee Makeup

- John Bettano - Chairperson, Amy Whinnett - Vice-Chair, Sue Sames-Past Chairperson Emeritus
- SOA Research/support staff Korrel Rosenberg, Cindy MacDonald, Patrick Nolan, Muz Waheed
- Data vendor MIB - Jessica O’Neil, Leo De’Angelo, Jaron Arboleda, Arun Paul (and others)
## 2016 Group Life Mortality Study Committee Makeup

<table>
<thead>
<tr>
<th>Prior Study Analysis (publish additional 2013 analysis)</th>
<th>Data Call Committee (data design request)</th>
<th>Data Gathering Committee/Data Buddies (help facilitate data gathering)</th>
<th>Data Scrubbing Committee (clean the submissions)</th>
<th>Data Base Design Committee (what data fields will be in Pivot table, checking complete data)</th>
<th>Analysis and Write up (Paper write up)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amy Whinnett, Trevor Pollitt, Muz Waheed (SOA)</td>
<td>John Bettano, Sue Sames, John Schwegel, Delaine Hare, Jaron Arbodela (MIB), Muz Waheed (SOA), MIB</td>
<td>Amy Whinnett, Natalya Mill, Michele Goldstein, Jeremy Fleischer, Jay Barriss, Jennifer Fleck, Pat Wallner, Patrick Nolan (SOA), MIB</td>
<td>Sue Sames, Amy Whinnett MIB</td>
<td>John Bettano, John Kaspar, Andrew Jenkins, Michael Jiang, Georgia Nykorczuk, Dan Skwire, Patrick Nolan (SOA), MIB</td>
<td>John Bettano, Amy Whinnett, Bram Spector, Scott Haglund, Kyle Strese</td>
</tr>
<tr>
<td>Study Phase/Subcommittee</td>
<td>Initial Time Frame</td>
<td>Final Time Frame (I hope)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>--------------------------</td>
<td>----------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Call</td>
<td>May 2014 - Sept 2014</td>
<td>May 2014 - Sept 2014 Completed</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Data Scrubbing</td>
<td>N/A</td>
<td>Oct 2015 - March 2016 Completed</td>
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<tr>
<td>Data Base Design</td>
<td>August 2015 - Jan 2016</td>
<td>April 2016 - May 2016 Completed</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Write Up(s)</td>
<td>Feb 2016 - June 2016</td>
<td>June 2016 - August 2016 In progress</td>
<td></td>
<td></td>
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### Participating Companies

<table>
<thead>
<tr>
<th>Anthem</th>
<th>Lincoln</th>
<th>Prudential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assurant</td>
<td>Met Life</td>
<td>Security Mutual</td>
</tr>
<tr>
<td>Fort Dearborn</td>
<td>Minnesota Life</td>
<td>The Standard</td>
</tr>
<tr>
<td>Guardian</td>
<td>Mutual of Omaha</td>
<td>State Farm</td>
</tr>
<tr>
<td>The Hartford</td>
<td>Principal</td>
<td>Unum</td>
</tr>
</tbody>
</table>

- 15 companies participated
- Some new participants, lost some
- Includes seven of the top 10 carriers
- Some participants’ exposure excluded due to data issues or smoothed due to size
2 Goals of study and accomplishment of goals
Goals of 2016 SOA Group Life Mortality Study

- Improve on 2006/2013 studies (lessons learned)
- More communication throughout study period
- Recurring studies on a 3 year schedule
- Include additional companies not in prior studies
- Require consistent data format
- Include face amount/salary bands
- Add retiree indicator
- Seek ways to capture mortality improvement
- List billed data only
2016 Accomplishments

- Improvement - No question we added to the prior study items such as TWO digit SIC, Portability data, etc. Grade?
- Communication - Grade?
- Recurring studies on a three year schedule - This was accomplished, future?
- Include additional companies not in prior studies - Gained some, lost some.
- Require consistent data format - Only THREE companies slightly altered format. (Data Buddies big part here).
2016 Accomplishments

- Include face amount/salary bands - **Accomplished.**
- Add retiree indicator - **Not attainable.**
- Seek ways to capture mortality improvement - **Extreme caution when comparing to prior studies, different companies and hugely different exposure amounts in last three studies.**
- Self Administer data not collected - **SOA has a minimum threshold of five companies. We were not going to get this, so we did not pursue this.**
3 Lessons learned
The more thorough the directions, generally results in better submissions, however they will never be perfect, and data will always need scrubbing.

While we constantly strive for clearer directions, and we discuss within a subcommittee, people’s own experience within their individual companies and personal experience can lead to misinterpretations.

Submission Due Date—The industry as a whole will rarely, if ever, submit data much before the deadline, no matter how much prodding from Data Buddies.

Probably the biggest lesson learned. I overestimated the impact the Data Buddies could have on the Due Date. Although, they provided an invaluable service in getting cleaner submissions.
The Chair and the Vice Chair takes a tremendous amount of time.

- While I have been on many committees, I had never been the "lead dog." It is a tremendous amount of work.

Data Clean Up—Shortly after gathering the data, realization set in that there was going to be a large amount of scrubbing. While we were going for cleaner data (which we obtained), thinking that it would be pristine was naïve. MIB hugely critical here.

- With the help of the SOA we need to get more committee folks involved at the data scrubbing stage. There are issues with confidentiality etc… of the individual companies submission. Any Suggestions?
Preliminary Results
2016 Group Life Mortality Study
Key Findings

- Lower mortality than 2013 study results **BUT** need to consider differences in study exposure
- Strong correlation between mortality and salary/face amount
- Industry differences in mortality in line with expectations
- Region variations in mortality exist after adjusting for income differences
- LTD linked policies continue to show significantly higher waiver incidence
- Portability mortality rates 300%+ group life rates, impacted by whether UW is required
2016 Group Life Mortality Study
Study Exposure

44.4M life years exposure with almost 100k claims, more than twice 2013 study exposure

<table>
<thead>
<tr>
<th>Age</th>
<th>Basic Male</th>
<th>Basic Female</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>LYE</td>
<td>Volume $M</td>
</tr>
<tr>
<td>20-24</td>
<td>1,102,025</td>
<td>36,038</td>
</tr>
<tr>
<td>25-29</td>
<td>2,485,420</td>
<td>105,660</td>
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<tr>
<td>30-34</td>
<td>2,874,978</td>
<td>144,483</td>
</tr>
<tr>
<td>35-39</td>
<td>2,902,913</td>
<td>164,111</td>
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<tr>
<td>40-44</td>
<td>3,146,583</td>
<td>187,205</td>
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<td>45-49</td>
<td>3,255,253</td>
<td>193,405</td>
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<tr>
<td>50-54</td>
<td>3,211,111</td>
<td>189,210</td>
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<tr>
<td>55-59</td>
<td>2,672,165</td>
<td>155,544</td>
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<td>60-64</td>
<td>1,821,796</td>
<td>102,810</td>
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<td>65-69</td>
<td>918,641</td>
<td>38,275</td>
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<tr>
<td>70+</td>
<td>694,922</td>
<td>1,332,411</td>
</tr>
<tr>
<td>TOTAL</td>
<td>25,085,807</td>
<td>2,649,151</td>
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2013 Total

<table>
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<th>Age</th>
<th>Basic Male</th>
<th>Basic Female</th>
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<tr>
<td></td>
<td>Volume $M</td>
<td>Claims</td>
</tr>
<tr>
<td>20-24</td>
<td>36,038</td>
<td>707</td>
</tr>
<tr>
<td>25-29</td>
<td>105,660</td>
<td>1,136</td>
</tr>
<tr>
<td>30-34</td>
<td>144,483</td>
<td>1,418</td>
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<tr>
<td>35-39</td>
<td>164,111</td>
<td>1,734</td>
</tr>
<tr>
<td>40-44</td>
<td>187,205</td>
<td>2,650</td>
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<tr>
<td>45-49</td>
<td>193,405</td>
<td>4,117</td>
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<tr>
<td>50-54</td>
<td>189,210</td>
<td>6,390</td>
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<tr>
<td>55-59</td>
<td>155,544</td>
<td>8,138</td>
</tr>
<tr>
<td>60-64</td>
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</tr>
<tr>
<td>70+</td>
<td>1,332,411</td>
<td>30,854</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,649,151</td>
<td>71,670</td>
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2013 Total

<table>
<thead>
<tr>
<th>Age</th>
<th>Basic Male</th>
<th>Basic Female</th>
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</thead>
<tbody>
<tr>
<td>20-24</td>
<td>572,516</td>
<td>24,546</td>
</tr>
<tr>
<td>25-29</td>
<td>36,038</td>
<td>707</td>
</tr>
<tr>
<td>30-34</td>
<td>105,660</td>
<td>1,136</td>
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<tr>
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<td>144,483</td>
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</tr>
<tr>
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<td>1,332,411</td>
<td>30,854</td>
</tr>
<tr>
<td>TOTAL</td>
<td>572,516</td>
<td>24,546</td>
</tr>
</tbody>
</table>
2016 Group Life Mortality Study
Basic Life by Age and Gender 2013 vs. 2016 Studies

Annual Mortality Rate per 1,000

- 16 M Dth Rt #
- 16 M Dth Rt $
- 13 M Dth Rt #
- 13 M Dth Rt $
2016 Group Life Mortality Study
Basic Life by Age and Gender 2013 vs. 2016 Studies
2016 Group Life Mortality Study
Basic Life by Age and Gender 2013 vs. 2016 Studies

Annual Mortality Rate per 1,000
2016 Group Life Mortality Study
Basic Life by Age and Gender 2013 vs. 2016 Studies

Annual Mortality Rate per 1,000
A/E by count > 100% indicates higher underlying mortality, greater A/E by amount indicates antiselection by face amount.

*Expected based on 2016 Basic mortality by age and gender by count and amount.
A/E by count > 100% indicates higher underlying mortality, greater A/E by amount indicates antiselection by face amount

*Expected based on 2016 Basic mortality by age and gender by count and amount
Strong correlation between Basic A/E and face amount, less correlation for Supplemental
Lower A/E as salary increases for Basic and Supplemental
A/E impacted by industry and salary, similar slope of A/E by collar as salary increases.
A/E > 100% in most industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>A/E Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Agriculture, Forestry, and Fishing</td>
<td>120%</td>
</tr>
<tr>
<td>B. Mining</td>
<td>110%</td>
</tr>
<tr>
<td>C. Construction</td>
<td>160%</td>
</tr>
<tr>
<td>D. Manufacturing - Food</td>
<td>115%</td>
</tr>
<tr>
<td>E. Manufacturing - Clothes, Textile</td>
<td>120%</td>
</tr>
<tr>
<td>F. Manufacturing - Wood Products</td>
<td>125%</td>
</tr>
<tr>
<td>H. Manufacturing - heavy, steel etc.</td>
<td>130%</td>
</tr>
<tr>
<td>J. Transport, Communication, Utilities</td>
<td>180%</td>
</tr>
</tbody>
</table>

- Basic $
2016 Group Life Mortality Study
A/E Mortality Rates by Industry – Grey Collar

Higher A/E driven by Unknown industries
Basic A/E below 100% in all but public administration, large spread between basic and supp
Regional variations exist after adjustment for salary differences.
2016 Group Life Mortality Study

Basic Disability Rates

Female incidence 10-60% above male
A/E > 100% in all industries except Manufacturing - Food

A. Agriculture, Forestry, and Fishing
B. Mining
C. Construction
D. Manufacturing - Food
E. Manufacturing - Clothes, Textile
F. Manufacturing - Wood Products
G. Manufacturing - heavy, steel etc.
J. Transport, Communication, Utilities

Basic $  Supp $
2016 Group Life Mortality Study
A/E Disability Rates by Industry – Grey Collar

Some industries below 100% A/E
2016 Group Life Mortality Study
A/E Disability Rates by Industry – White Collar

Health Services significantly over 100% A/E

- N. Banks & Securities
- O. Insurance, Other Finance
- Q. Computers
- S. Health Services
- T. Legal Services
- U. Educational Services
- V. Services - Public
- W. Services - Technical
- X. Public Administration

Basic $  Supp $
2016 Group Life Mortality Study
A/E Disability Rates by LTD Linking and EP

- Significantly higher incidence if linked to LTD
- Does not account for higher recovery, lower mortality
- Large % of exposure with EP <270 days

<table>
<thead>
<tr>
<th>EP Days</th>
<th>Linked w/LTD</th>
<th>Not Linked</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=90</td>
<td>959,457</td>
<td>382,471</td>
<td>1,603,801</td>
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<tr>
<td>91-180</td>
<td>6,117,059</td>
<td>2,850,031</td>
<td>36,632</td>
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<tr>
<td>181-270</td>
<td>8,768,285</td>
<td>3,394,098</td>
<td></td>
</tr>
<tr>
<td>&gt;270</td>
<td>5,328</td>
<td>2,200</td>
<td></td>
</tr>
</tbody>
</table>
## 2016 Group Life Mortality Study
Portability Mortality Rates

- Mortality rates 200% at all ages for males and females
- Higher mortality if disables allowed to port
- Does not account for other differences in plan design by carrier

<table>
<thead>
<tr>
<th>Disables Port?</th>
<th>Policies Exposed</th>
<th>Amount Exposed</th>
<th>No of Claims</th>
<th>Claims Amount</th>
<th>Death Rate by Amount (Per $1,000)</th>
<th>Death Rate by Count (Per 1,000)</th>
<th>A/E Ratio by Count</th>
<th>A/E Ratio by Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = No</td>
<td>148,777</td>
<td>19,088,743,262</td>
<td>1,037</td>
<td>79,226,210</td>
<td>4.2</td>
<td>7.0</td>
<td>200.0%</td>
<td>255.8%</td>
</tr>
<tr>
<td>Unknown</td>
<td>59,403</td>
<td>7,493,171,583</td>
<td>1,089</td>
<td>84,023,073</td>
<td>11.2</td>
<td>18.3</td>
<td>716.0%</td>
<td>838.7%</td>
</tr>
<tr>
<td>Y = Yes</td>
<td>26,563</td>
<td>2,112,568,305</td>
<td>305</td>
<td>20,372,000</td>
<td>9.6</td>
<td>11.5</td>
<td>514.5%</td>
<td>703.2%</td>
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<tr>
<td>Grand Total</td>
<td>234,743</td>
<td>28,694,483,150</td>
<td>2,431</td>
<td>183,621,283</td>
<td>6.4</td>
<td>10.4</td>
<td>333.1%</td>
<td>418.4%</td>
</tr>
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5

Final deliverables and future studies
Final Deliverables and Future Studies

- June 2016 - SOA Spring Health Meeting
- August 2016 - Final Write Ups Due
- September 2016 – Paper/Pivots on www.soa.org
- Late 2016 – Begin work on Waiver Study
- 2017 – Commence 2019 SOA Group Life Study