Critical Illness Pricing: Can Prices get any Lower?
Matthew Smith, Pacific Life Re

Themes...
- How critical illness pricing compares with term assurance
- Historic changes in attitude to critical illness pricing
- Potential drivers to tumbling CI prices
- Are we missing anything. Definition creep, trend risk and more…
- Lessons from around the Globe
Critical Illness Pricing
- Premium Rates in the Recent Past

Critical Illness Pricing
- And as a % of 2004 rates

Critical Illness Pricing
- Potential Drivers for Price Reductions

- Reinsurer morbidity basis (base tables, future trends)
- Reinsurer margins (capital, expenses, margins)
- Quota share %
- Reinsurer morbidity basis (base tables, future trends)
- Lapse basis
- Expense reductions, commission rates
- Margin cuts
- Capital & guarantee loadings

Let's focus on the morbidity basis...
Mortality vs Morbidity Pricing - History of Critical Illness as a Product

- Mid 80s: Launch of CI in the UK
- 1990: "Dread Disease Cover – an Actuarial Perspective" published
- 1990s: Gained momentum
- 1999: ABI SoBP
- 2002: ABI SoBP
- 2002: Sales peak, highly competitive
- 2003: Swiss Re withdrew, prices increased
- 2004: ABI SoBP
- 2005: CMI Publish WP18 and make the 99-02 data available
- 2006: ABI SoBP
- 2006: "Exploring the Critical Path" published (CIBT02)
- 2007: Gen Re publishes CIT00 Tables
- 2010: CMI publish WP43 and produce draft tables
- 2011: ABI SoBP
- 2011: CMI publish WP50 and produce the ACL04 tables
- 2013: "Extending the Critical Path" published (CIBT08)

Mortality vs Morbidity Pricing - How does Pricing Compare to Mortality?

"Mortality rates are more complicated than morbidity rates... for the former, you have to fall ill and die, not just fall ill"

Clearly this is nonsense...

Mortality vs Morbidity Pricing - Perception of Greater Uncertainty around Morbidity Pricing?

- Event is Diagnosis
- Healthy
- Critical Illness
- Death from non-CI cause
- Ups?
- Downs?
Potential Drivers to Pricing Changes
- Growing coverage... trends

Average Number of Critical Illness Conditions

Potential Drivers to Pricing Changes
- Growing coverage... costing

Increasing Incidence/reducing overlap

Don't Even Bother
Ticking Time Bomb
Token Freestyle
Genuine Value

Creutzfeldt-Jacob Disease
Progressive Supranuclear Palsy
Graftversus-host Disease
Systemic Lupus Erythematosus
Cardiomyopathy
Chronic Rheumatoid Arthritis

Examples...

Likely High Decline Rate

Increasing Incidence/reducing overlap

Creutzfeldt-Jacob Disease
Progressive Supranuclear Palsy
Graftversus-host Disease
Systemic Lupus Erythematosus
Cardiomyopathy
Chronic Rheumatoid Arthritis

Don't Even Bother
Ticking Time Bomb
Token Freestyle
Genuine Value

Examples...

Likely High Decline Rate
Potential Drivers to Pricing Changes
- Growing coverage... price impact

• Conclusion?
Potential Drivers to Pricing Changes
- Treating Customers Fairly & Non-Disclosure... impact on claims

- Conclusion?

Potential Drivers to Pricing Changes
- Treating Customers Fairly & Non-Disclosure... price impact

Potential Drivers to Pricing Changes
- Definition Drift...claims declined for not meeting the definition
Potential Drivers to Pricing Changes
- Definition Drift… claims paid examples where definition not met

<table>
<thead>
<tr>
<th>Case Study</th>
<th>% Paid Where Definition Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>MI – Infero basal hypokinesis</td>
<td>100%</td>
</tr>
<tr>
<td>MI – Mildly impaired systolic function</td>
<td>75%</td>
</tr>
<tr>
<td>Dilated cardiomyopathy – controlled well</td>
<td>50%</td>
</tr>
<tr>
<td>Sub-acute MCA – no symptoms</td>
<td>50%</td>
</tr>
<tr>
<td>Acoustic neuritis with surgery</td>
<td>40%</td>
</tr>
<tr>
<td>Possible MS, type of neurology not clarified</td>
<td>40%</td>
</tr>
<tr>
<td>Cerebellar ataxia with MS – full disability</td>
<td>25%</td>
</tr>
<tr>
<td>Inoperable Glioma – no symptoms</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: Pacific Life Re’s “Grey Claims” Survey 2010

---

Potential Drivers to Pricing Changes
- Definition Drift … price impact

• Conclusion?

---

Potential Drivers to Pricing Changes
- Data & Pricing Uncertainty… comparison with Mortality

<table>
<thead>
<tr>
<th>Mortality</th>
<th>Morbidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Established CMI investigation</td>
<td></td>
</tr>
<tr>
<td>• History of mortality tables</td>
<td></td>
</tr>
<tr>
<td>• High volumes of internal data</td>
<td></td>
</tr>
</tbody>
</table>

• Early reliance of population data
• Growing CMI investigation
• Tables in their infancy
• Anti-selection unclear
• Growing condition coverage

Is this changing?
Potential Drivers to Pricing Changes
- Data & Pricing Uncertainty…Growing CMI Dataset

Cumulative Claims by Calendar Year in the CMI Investigation

Source: CMI

Potential Drivers to Pricing Changes
- Data & Pricing Uncertainty…but not that simple

Mix of products, underwriting years
Relevance to prospective experience is not clear

CMI methodology not perfect
Continually evolving

Select shape
Limited ultimate claims, and particularly difficult to quantify given above

Age shape
Credibility is limited at the table extremes and experience for minor conditions yet to emerge

14 May 2014
Potential Drivers to Pricing Changes
- Data & Pricing Uncertainty... price impact

• (Possible)
Conclusion?

Potential Drivers to Pricing Changes
- Trends... what conditions matter for males?

Potential Drivers to Pricing Changes
- Trends... what conditions matter for females?

Source: PLRe Internal
Potential Drivers to Pricing Changes
- Trends... cancer... the ups

Breast Cancer Incidence as % of 1971 (Females)

Source: ONS Cancer Registry

Potential Drivers to Pricing Changes
- Trends... cancer... the ups

Colonial Cancer Incidence as % of 1971 (Males)

Source: ONS Cancer Registry

Potential Drivers to Pricing Changes
- Trends... cancer... the ups

Melanoma Incidence as % of 1971 (Both)

Source: ONS Cancer Registry
Potential Drivers to Pricing Changes
- Trends... cancer...the ups

Prostate Cancer Incidence as % of 1971 (Males)
Source: ONS Cancer Registry

Testicular Cancer Incidence as % of 1971 (Males)
Source: ONS Cancer Registry

Thyroid Cancer Incidence as % of 1971 (Both)
Source: ONS Cancer Registry
Potential Drivers to Pricing Changes
- Trends... cancer... the downs

Lung Cancer Incidence as % of 1971 (Both)

Source: ONS Cancer Registry
14 May 2014

Potential Drivers to Pricing Changes
- Trends... cancer... the downs

Cervical Cancer Incidence as % of 1971 (Females)

Source: ONS Cancer Registry
14 May 2014

Potential Drivers to Pricing Changes
- Trends... cancer... the downs

Stomach Cancer Incidence as % of 1971 (Both)

Source: ONS Cancer Registry
14 May 2014
Potential Drivers to Pricing Changes
- Trends… overall cancer

Cancer Incidence as % of 1971 (Both)

Source: ONS Cancer Registry

14 May 2014

Potential Drivers to Pricing Changes
- Trends… does the mortality component help?

Residual Deaths as % of 1971 (Both)

Source: ONS Cancer Registry

14 May 2014

Potential Drivers to Pricing Changes
- Trends… what about the cardio-vascular conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Trends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Attack</td>
<td>▼/▲</td>
</tr>
<tr>
<td>Stroke</td>
<td>▼/▲</td>
</tr>
<tr>
<td>Coronary Artery Bypass-grafts</td>
<td>▼</td>
</tr>
</tbody>
</table>

14 May 2014
Potential Drivers to Pricing Changes
- Trends... price impact

• Conclusion?

| Potential Drivers to Pricing Changes | Impact?
|--------------------------------------|--------
| Distribution management              | ▼      
| BMI/alcohol                          | ▲      
| Underwriting Developments            | ??     
| Persistency                          | ??     |

Lessons from Around the Globe
- Thyroid Cancer in Korea
Lessons from Around the Globe
- Melanoma in Australia

Lessons from Around the Globe
- Prostate Cancer in North America/Australia

Lessons from Around the Globe
- Colorectal Cancer in Asia
Summary
- Can prices get any lower?

- It's a surprise they're reduced so much!
  - Given the movements in declined claims
  - And the increasing coverage/definition with
  - As well as general cancer trends

- Still a risky product
  - Uncertainties relative to mortality pricing are still present
  - Despite the growing volumes of data
  - Should note what has happened around the world

- Evolving
  - Coverage is growing
  - Need to be ready for any surprises
  - Care required over definition creep and declined claims trends

Summary
- Possible Conclusions

- Ensure margins vs mortality are sensible
  - Emerging experience is uncertain given complexity of earned
  - Disconty and changing distribution landscapes

- Pricing Discipline
  - Consider size related Thyroid cancer exclusions
  - General exclusion of nano-sized cancers
  - Tiered definitions

- Definition
  - Internal Model Calibration
  - More research (working parties etc)

Questions
Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.
The views expressed in this presentation are those of the presenter.