How to provide insurance without data?

June 30th, 2011

Agenda

• Product design and **pricing** in the absence of statistical data.

• The outcome? Our experience.

• Other actuarial roles in microinsurance.
Focus Today: Health Microinsurance

Why?

• Because it's more difficult to price – you need more than a mortality table.
• Because it's more important to get right – portfolios are smaller but claims more frequent.
• Because it's more difficult to re-price – premium is considerably higher than for life insurance so customers are sensitive.

Not in focus today: interest rate assumptions or reserving.

• Why? Because most microinsurance is short term.

Example 1 – Hospitalisation in Rural Pakistan

The product:

• Semi-mandatory for villagers in remote mountainous area.
• All costs of an inpatient admission to a hospital up to $400.
• Cashless in network hospitals.
• No age limit (newborns and elderly).
• No exclusion of pre-existing conditions, few other exclusions.
• No waiting periods, no co-payments.
• Maternity: normal delivery + complications.
• Newborns automatically covered free of cost.
Example 1 – Hospitalisation in Rural Pakistan

The product (continued):

- No underwriting – only requirement: ≥ 50% of households per village, and entire households have to enrol.
- Enrolment possible initially once a year (later twice), single annual premium ($5 pp) due upfront.
- One OPD voucher pp/py.
- $400 death/funeral benefit for breadwinner.

<table>
<thead>
<tr>
<th>Incidence in Total Population</th>
<th>Average Cost (in PKR)</th>
<th>Premium (in PKR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Maternity 3.60%</td>
<td>3,601</td>
<td>130</td>
</tr>
<tr>
<td>C-Section 0.33%</td>
<td>14,665</td>
<td>48</td>
</tr>
<tr>
<td>Normal Delivery 1.87%</td>
<td>2,043</td>
<td>38</td>
</tr>
<tr>
<td>Total Health Insurance 5.80%</td>
<td>3,724</td>
<td>216</td>
</tr>
<tr>
<td>Life Assurance 0.03%</td>
<td>25,000</td>
<td>7</td>
</tr>
</tbody>
</table>

Net Risk Premium 223
Intermediaries’ Commission 83
Insurer’s Margin 25
Gross Premium 330
OPD Voucher 50
Total Premium 380
Example 2 – Hospitalisation in Urban Pakistan

The product:
• Mandatory for microfinance borrowers and their family.
• All costs of an inpatient admission to a hospital up to $400.
• Local ambulance service.
• Cashless in network hospitals.
• Age limit adults 65, no minimum age for children.
• 50% co-payment for pre-ex conditions during first 3 months.
• No waiting periods, few exclusions (e.g. maternity).
• No underwriting.

<table>
<thead>
<tr>
<th>Max. Benefit</th>
<th>25'000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>4%</td>
</tr>
<tr>
<td>Average claims size</td>
<td>6371</td>
</tr>
<tr>
<td>Std. deviation</td>
<td>100%</td>
</tr>
<tr>
<td>net risk premium</td>
<td></td>
</tr>
<tr>
<td>assuming Lognormal claims size distribution</td>
<td>246.64</td>
</tr>
<tr>
<td>assuming Exponential claims size distribution</td>
<td>230.03</td>
</tr>
<tr>
<td>by comparison: without benefit limit</td>
<td>254.82</td>
</tr>
<tr>
<td>loading</td>
<td>35%</td>
</tr>
<tr>
<td>gross commercial premium adults</td>
<td></td>
</tr>
<tr>
<td>assuming Lognormal claims size distribution</td>
<td>379.29</td>
</tr>
<tr>
<td>assuming Exponential claims size distribution</td>
<td>353.90</td>
</tr>
<tr>
<td>by comparison: without benefit limit</td>
<td>392.04</td>
</tr>
<tr>
<td>suggested market premium</td>
<td>400</td>
</tr>
</tbody>
</table>
Example 2 – Hospitalisation in Urban Pakistan

Pricing rationale:

- Incidence: 94 non-maternity claims between November and March in Rural Hospitalisation program, implying annual incidence of 3.7%.
  Incidence experience of another urban Hospitalisation microinsurance in the same period implied incidence of 0.5% (not credible: scheme small, claims few).

- Average claims size: Lahore expected average (as per discussions with hospitals, from the other urban Hospitalisation microinsurance) adjusted to Karachi level of hospitalisation costs by comparison of C-section and appendectomy.

Experience with Rural Hospitalisation
Reasons for Rural Losses – Year 1

- Average claims size assumed for pricing
- Observed average claims size

- Delivery: 2,059
- CS: 15,196
- Others: 3,604
- Total: 3,668

Reasons for Rural Losses – Year 1

- Incidence assumed for pricing
- Observed incidence

- Delivery: 2.8%
- CS: 0.4%
- Others: 9.4%
- Total: 12.7%
Reasons for Rural Losses – Year 1

- Family size distribution in population
- Insured lives’ family size distribution

Reasons for Rural Losses – Year 1

Length of stay (percentage of total hospitalisations)

- 54.7%
- 18.4%
- 10.0%
- 6.6%
- 4.5%
- 3.4%
- 0.7%
- 0.7%
- 0.7%
- 0.5%
Reasons for Rural Losses – Year 1

Reasons for Rural Losses – Year 2 vs. Year 1
Experience with Urban Hospitalisation

Incidence Trend

Experience with Urban Hospitalisation

Average Claims Cost Trend
Experience with Urban Hospitalisation

My Approach to Pricing in the Absence of Data

- (Search as much appropriate data as possible.)
- Transfer data from similar environments and adjust as much as possible.
- Be bold! Despite deficiencies, launch product priced with best guess (but limit exposure i.e. enrolment volumes and time).
- Be vigilant! Monitor and analyse claims experience intensively.
- Be quick! Take corrective action as soon as you see something’s wrong.

That's the theory …
My Experience with Pricing in the Absence of Data

- You may not get the necessary claims experience data in time. Is there any reliable automated MIS in place? Do the locals understand how to feed the reporting systems, and why? (Do they want to?)
- You may fail to understand what's wrong by just looking at numbers (and you may not be able to go there often).
- You may fail to implement the necessary corrective measures – who “owns” the business anyway?

Other actuarial roles in microinsurance

- Help people understand the concept of risk pooling (and why some demands are unreasonable).
- Help people understand the need for experience monitoring.
- Help design and implement the necessary processes for experience monitoring.
- Help people understand the results of experience analysis.
- Help people understand reinsurance; analyse reinsurance needs and availabilities; help arrange and administer reinsurance.
Questions or comments?

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

Thank you for your attention