Risk management in medical expense insurance

Dr. Wolfgang Droste
Gen Re Life Health
Risk Management: did it work?
Does that work?
Agenda

• General Aspects of Risk Management

• Risk Management at Gen Re LifeHealth

• Examples from Asia
Agenda

• General Aspects of Risk Management
  – Why?
  – How?

• Risk Management at Gen Re LifeHealth

• Examples from Asia
(Some) External Requirements concerning Risk Management

Today:

• 1998: KonTraG (Early Warning System) [GER]
• 2001: DRS 5-20 (Risk Reporting) [GER]
• 2003: Sarbanes Oxley (Internal Control of Financial Processes) [USA]
• 2009: MaRisk for Insurance Companies [GER]

Tomorrow:

• 2012: Solvency II [EU]
Agenda

• General Aspects of Risk Management
  – Why?
  – How?

• Risk Management at Gen Re LifeHealth

• Examples from Asia
Risk Management – How?

- Principle-based, prospective, holistic, risk-oriented approach
- Responsibility of senior management to establish adequate risk management
- Risk strategy based on business strategy
- Independent risk management function (strict separation) including consolidated risk reporting
Components of Risk Management

**Risk Management**

**Risk environment**
- Risk strategy
- Risk bearing capacity
- Limit system
- Early warning system

**Risk processes**
- Identification
- Communication
- Assessment
- Monitoring
- Steering

**Internal controls**
- **Internal Control system**
  - Organizational structure
  - Process organization
  - Separation of functions
  - Incentive scheme
- Disaster recovery plan, BCP
- Outsourcing

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**Internal Audit**

**Documentation and regular updates of documentation**
Risk strategy

- Risk strategy: basis for risk management taking into account the type, scope and time horizon of the risks associated with the business

- Complete risk map (principle of materiality)

- Risk areas:
  - Underwriting risk
  - Market risk
  - Credit risk
  - Operational risk
  - Liquidity risk
  - Concentration risk
  - Strategic risk
  - Reputation risk
  - Legal and compliance risk
Risk strategy contd

- **Framework for the risk-bearing capacity**
- **Guidelines and limit system**
  (concrete quantitative standards for the operational units)
- **Annual review**
Organisational requirements

- **Organisational structure:**
  Clear definition and distribution of tasks and responsibilities in the risk management system
  - Management Board
  - Independent risk control function

- **Operational structure:**
  Clear definition, management and monitoring of all material risk-relevant business processes
  - Underwriting
  - Reserving
  - Asset management
  - Retrocession
  - Operational risk
  - …
Organisational requirements contd

- Referrals
- Escalation process
- Reporting
Internal control system

• **Creation of a risk-bearing capacity concept**
  – Consideration of the strategic business goals
  – Definition of the risk tolerance
  – Steering/controlling tools, limit system

• **Installation of a risk control process**
  – Risk identification
  – Risk analysis and assessment
  – Risk control (guidelines, limits, key figures)
  – Risk monitoring

• **Communication and reporting**

• **Risk culture**
Risk reporting

- Adequate internal communication
- Top-down-bottom-up process
- Transparency of risk inventory and the effectiveness of controls
- Regular and ad hoc reporting
- Reporting to the Supervisory Board and Supervisory Authority (BaFin)
Internal audit

- Risk-oriented audit plan, including risk management, its efficiency and documentation
- Separation from risk management function
Agenda

- General Aspects of Risk Management
- Risk Management at Gen Re LifeHealth
- Examples from Asia
Charlie and I believe that a CEO must not delegate risk control. It’s simply too important. … If Berkshire ever gets in trouble, it will be my fault. It will not be because of misjudgments made by a Risk Committee or Chief Risk Officer.*

*Letter to the Shareholders of Berkshire Hathaway Inc., 27 February 2010
Risk Management at Gen Re / Cologne Re

- KonTraG
- Operational Risk Management
- Sarbanes-Oxley 404

Risk Council
Cologne Re Board
CR Audit Committee
Cologne Re Annual Report

Global Project Management Office
SOX Manager Gen Re
Audit Committee Gen Re

Status Report:
Risk Report acc. to DRS 5-20

Ultimately: Berkshire Hathaway
Risk reporting

- **Annual risk report**
  - From: Risk Council
  - To: Board of Executive Directors
    - Audit Committee of the Supervisory Board

- **“ad-hoc” reports**
  - From: Business Units
  - To: Board of Executive Directors
  - In case of significant deterioration of a risk
Annual risk report

• Broadly categorised into
  – Underwriting & Reserving Risks
  – Investment & Asset Risks
  – Operational Risks
Annual risk report

For each risk

- **Identification / description of the risk**
- **Estimation**
  - Impact: A – E
  - Probability: 0 – IV
- **Control measures**
  - What?
  - Who?
- **Monitoring of controls**
  - What?
  - Who?
**Annual risk report**

For each risk establish the following:

<table>
<thead>
<tr>
<th>Type</th>
<th>Risk Description</th>
<th>Financial Risk Rating</th>
<th>Legal / Regulatory Risk Rating</th>
<th>Reputation Risk Rating</th>
<th>Overall Inherent Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operational risks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Underwriting Execution risks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Adherence to Guidelines risk</td>
<td>Underwriter writes business that breaches underwriting guidelines</td>
<td>High - 9</td>
<td>N/A</td>
<td>Low - 3</td>
<td>High - 8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Risk Control</th>
<th>Monitoring of risk control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing controls</td>
<td>Responsibility</td>
<td>Frequency</td>
</tr>
<tr>
<td>Existing monitoring procedures</td>
<td>Responsibility</td>
<td>Frequency</td>
</tr>
</tbody>
</table>

**Risk Control Monitoring of risk control**

- **Unlikely - 2**
  - Underwriting tools
  - Referral
- **Likely - 3**
  - Underwriting Audits, BU Managers, Internal Audit
  - BU Audit process and reports. Sox testing
## Types of risk

<table>
<thead>
<tr>
<th>FINANCIAL</th>
<th>UNDERWRITING</th>
<th>OPERATIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Credit</td>
<td>• Random fluctuation</td>
<td>• Planning</td>
</tr>
<tr>
<td>• Market</td>
<td>• Change</td>
<td>• Reputation</td>
</tr>
<tr>
<td>• Portfolio Composition</td>
<td>• Error</td>
<td>• Legal / Regulatory</td>
</tr>
<tr>
<td>• Liquidity</td>
<td>• Portfolio balance</td>
<td>• Operational Control</td>
</tr>
<tr>
<td></td>
<td>• Retrocession</td>
<td>• Taxation</td>
</tr>
<tr>
<td></td>
<td>• Pre-Financing</td>
<td>• Fraud</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Human Resources</td>
</tr>
</tbody>
</table>

> 60 individual risks
Types of risk
Example: Underwriting

RANDOM FLUCTUATION
- Natural catastrophe
- Terrorism
- Accumulation (per risk)
- Accumulation (per country)
- Single catastrophic event
- Epidemics

ERROR
- Incorrect premiums
- Incorrect reserves
- PML miscalculation
Annual Risk Report 2008 (Life)
Number of Risks by Impact and Probability
Risk management operates on two levels

Upper Management
- Monitoring
- Combined Ratio
- Planning

Account Management
- Monitoring
- Target Margins
- Planning

Pricing

Feedback
Agenda

- General Aspects of Risk Management
- Risk Management at Gen Re LifeHealth
- Examples from Asia
  - Product design risk
  - Risk of change
  - Claims management risk
  - Definition/Exclusion “risk”
  - Select/ultimate risk
  - Age/Region “risk”
  - Utilisation risk
Health (re)insurance – Various outcomes

- Established Reimbursement
- Maturing Fixed Benefit
- Small closed reimbursement
- Large established fixed benefit
What impacts the various outcomes

• Product design
• Pricing
• Monitoring
• Claims management
  – Monitoring claims
  – Changes in management
  – Life claims management practices applied to health business
• Initial versus ultimate experience
• High lapse rates and competing products
Example 1: Product design risk – or: You can’t always get it right!

- Market: Korea

- Product: Surgical cash benefit

- “Significant” lump sum for surgery due to urinary incontinence

Subsequently, this type of surgery became very popular

- Estimated loss to the industry > US$ 1 billion
Example 2: Risk of change
DD definitions and guarantees

• The 2000 – 2004 DD claim survey revealed a significant trend in prostate cancer incidence in the UK.

• As definitions have been standardized since the 90ies, the industry applied a standard definition not excluding this form of cancer. However, most policies have long guarantees.

• With PSA testing cheaply available it can be assumed that policyholders have a strong incentive to go for a check-up

• Average sums assured at about US$ 120,000
Prostate Cancer Claims

Prostate Cancer as % of All Cancers - Insured Lives Vs Population Age-adjusted

- China
- Hong Kong
- Malaysia
- Singapore
- United Kingdom

Population

Insured lives
## Admitted Prostate Cancer Claims as % of all Cancers

<table>
<thead>
<tr>
<th>Diagnosis Year</th>
<th>China</th>
<th>Hong Kong</th>
<th>Malaysia</th>
<th>Singapore</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0.0%</td>
<td>0.4%</td>
<td>27%</td>
<td>22%</td>
<td>108%</td>
</tr>
<tr>
<td>2001</td>
<td>0.1%</td>
<td>0.1%</td>
<td>16%</td>
<td>20%</td>
<td>12%</td>
</tr>
<tr>
<td>2002</td>
<td>0.8%</td>
<td>0.6%</td>
<td>41%</td>
<td>0.9%</td>
<td>18%</td>
</tr>
<tr>
<td>2003</td>
<td>0.3%</td>
<td>18%</td>
<td>19%</td>
<td>17%</td>
<td>162%</td>
</tr>
<tr>
<td>2004</td>
<td>0.4%</td>
<td>10%</td>
<td>12%</td>
<td>31%</td>
<td>22%</td>
</tr>
<tr>
<td>2000-2004</td>
<td>0.3%</td>
<td>0.8%</td>
<td>22%</td>
<td>20%</td>
<td>153%</td>
</tr>
</tbody>
</table>
Cancer definition – exclusion of early stage prostate cancer

• **Old ABI Definition (before Dec 2002)**
  – A malignant tumour characterised by the uncontrolled growth and spread of malignant cells and invasion of tissue. The following are excluded:
    - All tumours which are histologically described as pre-malignant, as non-invasive or as cancer in situ
    - All forms of lymphoma in the presence of any Human Immunodeficiency Virus
    - Kaposi’s sarcoma in the presence of any Human Immunodeficiency Virus
    - Any skin cancer other than invasive malignant melanoma

• **New Cancer definition revised (after Dec 2002) to read:**
  – Any malignant tumour …. The term cancer includes leukemia and Hodgkins disease but the following are excluded:
    - ...
    - **All tumours of the prostate unless histologically classified as having a Gleason score greater than 6 or having progressed to at least TNM classification T2N0M0**
    - ...

INTERNATIONAL CONGRESS OF ACTUARIES | 7-12 MARCH 2010 | CAPE TOWN
Example 3: Claims management risk – or: How closely should one monitor a portfolio

- A large South East Asian Medical Expense portfolio
  - Transition to in-house claims management
  - Allegedly large backlog of claims handled by outside TPA
Would annual monitoring be enough?
Change in claims management team - impact on loss ratio

Could have other causes: select/ultimate, but corrective action definitely needed
Example 4: Claim Causes

- Shows claims causes to focus on
- Monitor application of exclusions
- Indicate future product design changes that may be required
- Indicate a change in claims management/processing
Claim causes – India Vs UK


Claim Causes
Change in claims management team

Before
- Fractures
- Hernia
- Appendix
- Cataract
- Infectious
- Gall Stones
- Reproductive
- Kidneys
- Gall Bladder

After
- Fractures
- Appendix
- Cataract
- Infectious
- Gall Stones
- Hernia
- Reproductive
- Kidneys
- Gall Bladder
Example 5: Health claims are not life claims
An example

- Initial claim:
  - Headache
  - Diagnosed with migraine and panic attacks
  - Psychiatric evaluation
  - Claims admitted for psychalgia

Mental Illness and personality disorders are excluded.
### Health claims are not life claims: An example

<table>
<thead>
<tr>
<th>Month</th>
<th>Description</th>
<th>USD</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Various admissions for psychalgia, headaches</td>
<td>6,400</td>
<td>6,400</td>
</tr>
<tr>
<td>4</td>
<td>Various admissions for psychalgia, headaches</td>
<td>4,300</td>
<td>10,700</td>
</tr>
<tr>
<td>6</td>
<td>Various admissions for psychalgia, headaches</td>
<td>18,600</td>
<td>29,300</td>
</tr>
<tr>
<td>7</td>
<td>Admissions for psychalgia &amp; chronic pain</td>
<td>21,600</td>
<td>50,900</td>
</tr>
<tr>
<td>8</td>
<td>Admissions for psychalgia &amp; chronic pain</td>
<td>11,700</td>
<td>62,600</td>
</tr>
</tbody>
</table>

Mental Illness and personality disorders are excluded.
Health claims are not life claims
An example

• psychalgia /psy·chal·gia/ (si-kal´jah)
  1. pain, usually in the head and perceived as being of emotional origin, that may accompany intolerable ideas, obsessions, or hallucinations.
  2. psychogenic pain.psychal´gic
      • Dorland's Medical Dictionary for Health Consumers

Mental Illness and personality disorders are excluded.
What could have been different?

• Clear wording for the exclusion

• Claims could have been more actively challenged initially to ensure it is not mental illness related

• Earlier flagging of difficult or problematic claims

• Not automatically admitting follow up claims because initial claim admitted
Example 6
Ultimate experience

- Initial experience better than ultimate
  - Claim Waiting periods
  - Cause specific waiting periods / time based exclusions
  - Underwriting
  - Accident Incidence varies only initially

Hospital Incidence

<table>
<thead>
<tr>
<th>Year 1: Year 2</th>
<th>3 months: Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heavily affected by product design and underwriting
Example 6: Impact of ultimate rates and lapses

A simple model

- **Initial versus ultimate experience**
  - Months 1-3 = 50%
  - Months 4-6 = 75%
  - Months 7-12 = 85%
  - Year 2+ = 100%

- **Lapse rate = 10%**

- **Theoretical break even price 74%**
Results over time
Remember claim delays

![Graph showing claim delays over time]

% claims reported vs. Delay from month of claims
Example 7: What else to look for?
Regional differences
Example 7: What else to look for? Age differences
## Example 8: What else to look for? Utilisation

<table>
<thead>
<tr>
<th>Room and Board</th>
<th>Plan</th>
<th>Male Total claims paid (USD)</th>
<th>Male Max benefit payable (USD)</th>
<th>Utilization rate</th>
<th>Female Total claims paid (USD)</th>
<th>Female Max benefit payable (USD)</th>
<th>Utilization rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private</td>
<td>5,702</td>
<td>12,540</td>
<td>45%</td>
<td>6,033</td>
<td>17,820</td>
<td>34%</td>
</tr>
<tr>
<td></td>
<td>Semi-private</td>
<td>30,473</td>
<td>67,200</td>
<td>45%</td>
<td>32,569</td>
<td>78,750</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td>Ward</td>
<td>174,794</td>
<td>347,775</td>
<td>50%</td>
<td>222,928</td>
<td>373,500</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Private (SMM)</td>
<td>66,052</td>
<td>133,980</td>
<td>49%</td>
<td>44,539</td>
<td>67,320</td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td>Semi-private (SMM)</td>
<td>151,703</td>
<td>327,300</td>
<td>46%</td>
<td>162,335</td>
<td>255,450</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>Ward (SMM)</td>
<td>1,041,525</td>
<td>1,589,625</td>
<td>66%</td>
<td>1,247,993</td>
<td>1,750,875</td>
<td>71%</td>
</tr>
</tbody>
</table>
### Example 8: What else to look for? Utilisation

<table>
<thead>
<tr>
<th>Plan</th>
<th>Total claims paid (USD)</th>
<th>Male</th>
<th>Max benefit payable (USD)</th>
<th>Utilization rate</th>
<th>Total claims paid (USD)</th>
<th>Female</th>
<th>Max benefit payable (USD)</th>
<th>Utilization rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>7,587</td>
<td>12,540</td>
<td>61%</td>
<td>5,962</td>
<td>17,820</td>
<td>33%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-private</td>
<td>36,600</td>
<td>67,200</td>
<td>54%</td>
<td>36,830</td>
<td>78,750</td>
<td>47%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td>192,973</td>
<td>347,775</td>
<td>55%</td>
<td>263,281</td>
<td>373,500</td>
<td>70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private (SMM)</td>
<td>89,982</td>
<td>133,980</td>
<td>67%</td>
<td>53,024</td>
<td>67,320</td>
<td>79%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-private (SMM)</td>
<td>188,978</td>
<td>327,300</td>
<td>58%</td>
<td>194,560</td>
<td>255,450</td>
<td>76%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward (SMM)</td>
<td>1,187,873</td>
<td>1,589,625</td>
<td>75%</td>
<td>1,473,805</td>
<td>1,750,875</td>
<td>84%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Example 8: What else to look for? Utilisation**

<table>
<thead>
<tr>
<th>Surgical fee</th>
<th>Plan</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total claims</td>
<td>Max benefit payable</td>
<td>Total claims</td>
</tr>
<tr>
<td></td>
<td>paid (USD)</td>
<td>(USD)</td>
<td>paid (USD)</td>
</tr>
<tr>
<td>Private</td>
<td>14,838</td>
<td>15,950</td>
<td>10,937</td>
</tr>
<tr>
<td>Semi-private</td>
<td>59,717</td>
<td>74,679</td>
<td>53,994</td>
</tr>
<tr>
<td>Ward</td>
<td>312,859</td>
<td>383,943</td>
<td>521,756</td>
</tr>
<tr>
<td>Private (SMM)</td>
<td>69,536</td>
<td>104,067</td>
<td>62,538</td>
</tr>
<tr>
<td>Semi-private (SMM)</td>
<td>213,639</td>
<td>268,503</td>
<td>267,760</td>
</tr>
<tr>
<td>Ward (SMM)</td>
<td>1,633,731</td>
<td>1,917,447</td>
<td>2,589,358</td>
</tr>
</tbody>
</table>
Example 8: What else to look for?

**Utilisation**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of cases of inpatient</td>
<td>9,297</td>
<td>10,878</td>
<td>20,146</td>
</tr>
<tr>
<td>Total number of cases admitted to ICU</td>
<td>29</td>
<td>15</td>
<td>44</td>
</tr>
<tr>
<td>Percentage admitted to ICU</td>
<td>0.31%</td>
<td>0.14%</td>
<td>0.22%</td>
</tr>
</tbody>
</table>
Example 9: “Regulatory” risk

- **Pricing and reserving interest rates**
  - Asset-liability-mismatch guaranteed

- **Pricing mortality rate**
  - An annuity time bomb

- **Pricing morbidity risk**
  - Guaranteed cancer incidence rates???
The end

Thank you! 谢谢！

Any questions?
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