Aims of the Presentation

<table>
<thead>
<tr>
<th><strong>Trends</strong></th>
<th>A site by site analysis of trends in incidence, mortality &amp; survival</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Worldwide perspective</strong></td>
<td>Scenario based analysis of cancer incidence from around the World</td>
</tr>
<tr>
<td><strong>Insured vs Population</strong></td>
<td>A review of the key differences between the population as a whole and insured lives</td>
</tr>
<tr>
<td><strong>Consumer Survey</strong></td>
<td>Connecting observed statistics with consumer views</td>
</tr>
</tbody>
</table>
Background

Why cancer is important

Cancer is increasingly important
- As a cause of mortality

All Charts “age standardised” to an insured portfolio
Cancer is many different conditions
- Affecting different ages (male)

Cancer is many different conditions
- Affecting different ages (female)
Cancer is many different conditions
- But largely an older age condition (male)

Cancer is many different conditions
- But largely an older age condition (female)
Cancer is evolving
- In different ways (male)

Cancer is evolving
- In different ways (female)
Cancer is dominant
- As a cause of claim for critical illness insurance (male)

Cancer is dominant
- As a cause of claim for critical illness insurance (female)
Lung Cancer (male)

General Trends

Incidence Deteriorations

Key Facts

% of all male cancers: 10%-15%
% of all male cancer CI claims: 5%-10%
% of all male cancer deaths: 20%-25%

Known Drivers:
Smoking prevalence

Mortality Improvements
Lung Cancer (female)

General Trends

Incidence Deteriorations

Key Facts

% of all female cancers: 10%-15%
% of all female cancer CI claims: 2.5%-5%
% of all female cancer deaths: 20%-25%

Known Drivers:

Smoking prevalence

Mortality Improvements

Colorectal Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: 10%-15%
% of all cancer CI claims: 5%-10%
% of all cancer deaths: 5%-10%

Known Drivers:

Screening, diet

Mortality Improvements
Melanoma (both)

General Trends

[Graph showing trend lines for incidence, mortality, 5-yr survival, and 5-yr survival rates over time.]

Incidence Deteriorations

[Heatmap showing incidence deterioration rates with color gradients.

Key Facts

% of all cancers: 2.5%-5%
% of all cancer CI claims: 5%-10%
% of all cancer deaths: 1%-2.5%

Known Drivers:

Sun-related behaviour

Stomach Cancer (both)

General Trends

[Graph showing trend lines for incidence, mortality, 5-yr survival, and 5-yr survival rates over time.]

Incidence Deteriorations

[Heatmap showing incidence deterioration rates with color gradients.

Key Facts

% of all cancers: 1%-2.5%
% of all cancer CI claims: 1%-2.5%
% of all cancer deaths: 1%-2.5%

Known Drivers:

Refrigeration/prevalence of H. pylori
Bladder Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: 1%-2.5%
% of all cancer CI claims: 1%-2.5%
% of all cancer deaths: 1%-2.5%

Known Drivers:
Smoking, occupational carcinogens, classification change

Mortality Improvements

Brain Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: 1%-2.5%
% of all cancer CI claims: 1%-2.5%
% of all cancer deaths: 2.5%-5%

Known Drivers:
Diagnostics, coding changes

Mortality Improvements
Kidney Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

- % of all cancers: 2.5%-5%
- % of all cancer CI claims: 2.5%-5%
- % of all cancer deaths: 2.5%-5%

Known Drivers:

- Imaging, smoking/obesity

Larynx Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

- % of all cancers: 0.5%-1%
- % of all cancer CI claims: 0.5%-1%
- % of all cancer deaths: 0.5%-1%

Known Drivers:

- Smoking prevalence, fruit/veg
**Leukaemia (both)**

**General Trends**

**Incidence Deteriorations**

**Key Facts**

% of all cancers: 1%-2.5%
% of all cancer CI claims: 2.5%-5%
% of all cancer deaths: 1%-2.5%

**Known Drivers:**

Classification

---

**Myeloma (both)**

**General Trends**

**Incidence Deteriorations**

**Key Facts**

% of all cancers: 1%-2.5%
% of all cancer CI claims: 1%-2.5%
% of all cancer deaths: 1%-2.5%

**Known Drivers:**

Diagnostics/classification
Oesophageal Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: 1%-2.5%
% of all cancer CI claims: 1%-2.5%
% of all cancer deaths: 5%-10%

Known Drivers:
Smoking, diet, alcohol

Pancreatic Cancer (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: 1%-2.5%
% of all cancer CI claims: 0.5%-1%
% of all cancer deaths: 5%-10%

Known Drivers:
Smoking, obesity
Hodgkin’s Disease (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: <0.5%
% of all cancer CI claims: 0.5%-1%
% of all cancer deaths: <0.5%

Known Drivers:
Diagnostics, classification

Non-Hodgkin’s Lymphoma (both)

General Trends

Incidence Deteriorations

Key Facts

% of all cancers: 2.5%-5%
% of all cancer CI claims: 5%-10%
% of all cancer deaths: 2.5%-5%

Known Drivers:
Diagnostics, classification
Thyroid Cancer (both)

General Trends

Key Facts
% of all cancers: 0.5%-1%
% of all cancer CI claims: <0.5%
% of all cancer deaths: <0.5%

Known Drivers:
Incidental/ultrasound, radiation, obesity

Mortality Improvements

Prostate Cancer (male)

General Trends

Key Facts
% of all male cancers: 25%-30%
% of all male cancer CI claims: 10%-15%
% of all male cancer deaths: 5%-10%

Known Drivers:
TURP/PSA Testing

Mortality Improvements
Testicular Cancer (male)

General Trends

Incidence Deteriorations

Key Facts

Mortality Improvements

% of all male cancers: 0.5%-1%
% of all male cancer CI claims: 10%-15%
% of all male cancer deaths: <0.5%

Known Drivers:

Unknown/environmental, awareness

Breast Cancer (female)

General Trends

Incidence Deteriorations

Key Facts

Mortality Improvements

% of all female cancers: 30%-40%
% of all female cancer CI claims: 50%-60%
% of all female cancer deaths: 15%-20%

Known Drivers:

Screening, HRT
Cervical Cancer (female)

General Trends

Incidences Deteriorations

Key Facts

% of all female cancers: 1%-2.5%
% of all female cancer CI claims: 1%-2.5%
% of all female cancer deaths: 1%-2.5%

Known Drivers:
Screening, Jade Goody, vaccine

Ovarian Cancer (female)

General Trends

Incidences Deteriorations

Key Facts

% of all female cancers: 2.5%-5%
% of all female cancer CI claims: 2.5%-5%
% of all female cancer deaths: 5%-10%

Known Drivers:
Contraceptive pill
Uterine Cancer (female)

**General Trends**

**Incidence Deteriorations**

**Key Facts**

% of all female cancers: 5%-10%
% of all female cancer CI claims: 5%-10%
% of all female cancer deaths: 2.5%-5%

**Known Drivers:**

Obesity, reproductive behaviour

**Mortality Improvements**

![Graph showing incidence and mortality trends over time]

![Heatmap showing relative survival rates by year and age group]

Institute
and Faculty
of Actuaries

Incidence
A Worldwide Perspective

![Institute and Faculty of Actuaries logo]

[06/11/2014]
Melanoma

Prostate Cancer
Colorectal Cancer

Breast Cancer
Thyroid Cancer

Incidence
An insured perspective
**Insured vs Population**
- **Key differences**

**Socio-economic Class**
Generally speaking insured products are sold to lives of a higher socio-economic class than the general population.

**Anti-selection**
Critical illness insurance can be anti-selective particularly for some causes of claim.

**Risk Classes**
Insurance products are usually segregated into risk classes such as smokers/non-smokers and sub-standard lives generally attract a loading.

**Insured vs Population**
- **Cause of Claim (male)**

![Insured vs Population Graph](image-url)
Insured vs Population
- Socio-economic class (female)

Insured vs Population
- All Cause/cancer experience
The Customer
Consumer Survey Results

The Customer
- Consumer Survey, description

Questions
21 questions investigating consumer attitudes towards purchasing life insurance

Themes
Needs, attitude to questions, application process, barriers, claims, underwriting evidence, perception of risk

When
Carried out in April 2014 and weighted to be nationally representative of adults in Great Britain (conducted by ICM research)
The Customer  
- Consumer Survey, selected results

Question: Which one of the following forms of Cancer do you think is the most common?

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Survey Results</th>
<th>Approx % of Claims</th>
<th>Actual Rank (of subset)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>29%</td>
<td>33%</td>
<td>1</td>
</tr>
<tr>
<td>Skin</td>
<td>13%</td>
<td>7%</td>
<td>2</td>
</tr>
<tr>
<td>Bowel</td>
<td>13%</td>
<td>6%</td>
<td>3</td>
</tr>
<tr>
<td>Prostate</td>
<td>12%</td>
<td>5%</td>
<td>4</td>
</tr>
<tr>
<td>Liver/Lung</td>
<td>11%</td>
<td>5%</td>
<td>5</td>
</tr>
<tr>
<td>Cervix</td>
<td>1%</td>
<td>1%</td>
<td>6</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>21%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The Customer  
- Consumer Survey, selected results

Question: Which one of the following forms of Cancer do you think is the most life threatening?

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Survey Results</th>
<th>Survival Rank</th>
<th>Mortality Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver/Lung</td>
<td>47%</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>22%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bowel</td>
<td>13%</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Prostate</td>
<td>8%</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Cervix</td>
<td>4%</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Breast</td>
<td>3%</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Skin</td>
<td>2%</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
The Customer
- Consumer Survey, selected results

Question: Do you think more people are being diagnosed with Cancer now than 5 years ago?

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Survey Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>67%</td>
</tr>
<tr>
<td>No</td>
<td>8%</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>25%</td>
</tr>
</tbody>
</table>

Summary & Conclusions

- Cancer is the most important cause of death and cause of claim for most insurance products
- Cancer is changing and it is important to monitor & understand for assessing future claims cost and capital calibration

- We should learn from events overseas for calibrating our 1 in 200 events
- Policy wordings can always be improved

- Customers are more knowledgeable than we think
- Attitudes and behaviors are opportunities for product development
- But we should always be aware of anti-selection
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.

Appendix
- Data Sources

<table>
<thead>
<tr>
<th>Cancer Registrations</th>
<th>ONS Cancer Registrations in England 1971-2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death Registrations</td>
<td>ONS Death Registrations by Cause 1911-2012 (&quot;Mortality in the 20th and 21st Century&quot; publications)</td>
</tr>
<tr>
<td>Non-UK Data</td>
<td>Relevant territory’s government statistical website</td>
</tr>
<tr>
<td>Age Standardisation</td>
<td>Weighted towards an insured portfolio where relevant</td>
</tr>
</tbody>
</table>

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