Too Much, Too Young, Too Early
Carl Padget and Gráinne Hampson
Pacific Life Re
Too Much, Too Young, Too Early

- What can we learn about anti-selection by analysing Critical Illness claims data?
- Can we use this data to identify anti-selective Critical Illnesses?
- How can we improve our underwriting to reduce the potential to anti-select?
Too Much, Too Young, Too Early

Too Young?

- Average age at claim
Breast Cancer
Too Young?

Average age at diagnosis:

- POPULATION: 55
- CLAIMANTS: 44
Bowel Cancer
Too Young?

Average age at diagnosis:

- **POPULATION:** 64
- **CLAIMANTS:** 47
Too Much, Too Young, Too Early

Too Much, Too Early?

- Population vs. insured incidence
- Average claim amount by duration
## Multiple Sclerosis – Proportion of all claims

### Too Much?

### Multiple Sclerosis incidence as a percentage of all critical illnesses:

**Population vs. Insured Claims**

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>Population Incidence*</th>
<th>Insured Claims Incidence</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Sclerosis (Female)</td>
<td>2.0%</td>
<td>6.3%</td>
<td>+ 210%</td>
</tr>
</tbody>
</table>

*Incidence and prevalence of multiple sclerosis in the UK 1990–2010: a descriptive study in the General Practice Research Database*
## Multiple Sclerosis - Cover Amount and Duration
Too Much, Too Early?

<table>
<thead>
<tr>
<th>Condition \ Policy Duration</th>
<th>Average Claim Amount</th>
<th>Average Claim Amount vs. All Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>53,594</td>
<td>94%</td>
</tr>
<tr>
<td>Benign Brain Tumour</td>
<td>73,345</td>
<td>129%</td>
</tr>
<tr>
<td>Coma</td>
<td>63,288</td>
<td>111%</td>
</tr>
<tr>
<td>CABG</td>
<td>54,121</td>
<td>95%</td>
</tr>
<tr>
<td>Heart Attack</td>
<td>52,445</td>
<td>92%</td>
</tr>
<tr>
<td>HVRoR</td>
<td>69,316</td>
<td>122%</td>
</tr>
<tr>
<td>Kidney Failure</td>
<td>55,848</td>
<td>98%</td>
</tr>
<tr>
<td>MOT</td>
<td>72,051</td>
<td>126%</td>
</tr>
<tr>
<td>MND</td>
<td>74,112</td>
<td>130%</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td>65,913</td>
<td>116%</td>
</tr>
<tr>
<td>Stroke</td>
<td>55,285</td>
<td>97%</td>
</tr>
<tr>
<td>TPD</td>
<td>50,685</td>
<td>89%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death</td>
<td>108%</td>
<td>104%</td>
<td>105%</td>
<td>87%</td>
<td>84%</td>
<td>75%</td>
</tr>
<tr>
<td>Benign Brain Tumour</td>
<td>131%</td>
<td>136%</td>
<td>146%</td>
<td>125%</td>
<td>163%</td>
<td>93%</td>
</tr>
<tr>
<td>Coma</td>
<td>107%</td>
<td>88%</td>
<td>129%</td>
<td>83%</td>
<td>107%</td>
<td>187%</td>
</tr>
<tr>
<td>CABG</td>
<td>92%</td>
<td>110%</td>
<td>94%</td>
<td>100%</td>
<td>79%</td>
<td>94%</td>
</tr>
<tr>
<td>Heart Attack</td>
<td>99%</td>
<td>100%</td>
<td>88%</td>
<td>86%</td>
<td>104%</td>
<td>81%</td>
</tr>
<tr>
<td>HVRoR</td>
<td>196%</td>
<td>136%</td>
<td>128%</td>
<td>174%</td>
<td>97%</td>
<td>86%</td>
</tr>
<tr>
<td>Kidney Failure</td>
<td>138%</td>
<td>92%</td>
<td>106%</td>
<td>93%</td>
<td>86%</td>
<td>88%</td>
</tr>
<tr>
<td>MOT</td>
<td>132%</td>
<td>103%</td>
<td>125%</td>
<td>14%</td>
<td>58%</td>
<td>143%</td>
</tr>
<tr>
<td>MND</td>
<td>152%</td>
<td>64%</td>
<td>79%</td>
<td>181%</td>
<td>138%</td>
<td>111%</td>
</tr>
<tr>
<td>Multiple Sclerosis</td>
<td>137%</td>
<td>118%</td>
<td>132%</td>
<td>104%</td>
<td>96%</td>
<td>108%</td>
</tr>
<tr>
<td>Stroke</td>
<td>114%</td>
<td>93%</td>
<td>85%</td>
<td>113%</td>
<td>90%</td>
<td>89%</td>
</tr>
<tr>
<td>TPD</td>
<td>95%</td>
<td>132%</td>
<td>72%</td>
<td>85%</td>
<td>95%</td>
<td>84%</td>
</tr>
</tbody>
</table>
# Testicular Cancer – Proportion by Cancer Type

## Too Much?

Cancer incidence as a percentage of all cancers:

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>Population Incidence</th>
<th>Insured Claims Incidence</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>37.8%</td>
<td>54.6%</td>
<td>+44%</td>
</tr>
<tr>
<td>Testicular</td>
<td>0.8%</td>
<td>13.0%</td>
<td>+1525%</td>
</tr>
<tr>
<td>Malignant Melanoma (Males)</td>
<td>4.3%</td>
<td>7.8%</td>
<td>+81%</td>
</tr>
<tr>
<td>Leukaemia (Males)</td>
<td>2.7%</td>
<td>6.5%</td>
<td>140%</td>
</tr>
<tr>
<td>Hodgkin’s Disease (Male/Female)</td>
<td>0.5% / 0.3%</td>
<td>5.7% / 2.9%</td>
<td>+ 1040% / 867%</td>
</tr>
<tr>
<td>Brain Tumour (Males)</td>
<td>1.8%</td>
<td>3.4%</td>
<td>+89%</td>
</tr>
</tbody>
</table>
# Testicular Cancer - Cover Amount and Duration

## Too Much, Too Early?

<table>
<thead>
<tr>
<th>Cancer Type \ Policy Duration</th>
<th>Average Claim Amount</th>
<th>Average Claim Amount vs. All Claims</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colon</td>
<td>58,504</td>
<td></td>
<td>94%</td>
<td>130%</td>
<td>95%</td>
<td>132%</td>
<td>87%</td>
<td>76%</td>
</tr>
<tr>
<td>Melanoma of skin</td>
<td>74,875</td>
<td></td>
<td>121%</td>
<td>135%</td>
<td>183%</td>
<td>117%</td>
<td>115%</td>
<td>103%</td>
</tr>
<tr>
<td>Prostate</td>
<td>58,917</td>
<td></td>
<td>95%</td>
<td>157%</td>
<td>106%</td>
<td>101%</td>
<td>105%</td>
<td>79%</td>
</tr>
<tr>
<td>Site not specified</td>
<td>75,457</td>
<td></td>
<td>122%</td>
<td>136%</td>
<td>133%</td>
<td>130%</td>
<td>125%</td>
<td>101%</td>
</tr>
<tr>
<td>Testis</td>
<td>75,724</td>
<td></td>
<td>122%</td>
<td>148%</td>
<td>142%</td>
<td>125%</td>
<td>158%</td>
<td>97%</td>
</tr>
<tr>
<td>Trachea, bronchus and lung</td>
<td>41,495</td>
<td></td>
<td>67%</td>
<td>110%</td>
<td>80%</td>
<td>44%</td>
<td>81%</td>
<td>53%</td>
</tr>
<tr>
<td>Other</td>
<td>61,725</td>
<td></td>
<td>100%</td>
<td>127%</td>
<td>136%</td>
<td>108%</td>
<td>106%</td>
<td>90%</td>
</tr>
<tr>
<td>Unknown</td>
<td>54,981</td>
<td></td>
<td>89%</td>
<td>120%</td>
<td>104%</td>
<td>102%</td>
<td>96%</td>
<td>81%</td>
</tr>
</tbody>
</table>

### Footnotes

- The table shows the average claim amount for different cancer types and policy durations, along with the average claim amount compared to all claims.
- The percentages indicate the increase or decrease compared to the average claim amount for all claims.
Testicular Cancer - Average Claim Amount
Too Much, Too Early?

Average claim: £57,000

Average testicular cancer claim: £75,000

Average testicular cancer claim PY1: £84,000
Testicular Cancer – What we know
Too Much, Too Early?

Claims data points to evidence of higher than average anti-selection:

- Incidence rate 15 times that of population
- Average claim amount 122% of average Cancer claim
- Highest claim amounts for early duration claims

Potential for anti-selection:

- What are the potential risk factors?
- Can these risk factors be mitigated better?
Testicular Cancer – Risk Factors
Too Much, Too Early?

Cryptochydism:
- 6.3x increased risk in unilateral cases
- 1.7x increased risk in the other (descended) testicle
- 1/44 lifetime risk in bilateral cases

Infertility:
- 59% higher risk in sub-fertile men compared to those with normal fertility levels

Family History:
- 8-10x increased risk if brother affected
- 75% increased risk if an identical twin
Too Much, Too Young, Too Early?
What the data tells us

- Evidence of Anti-Selection:
  - Younger age at diagnosis
  - Above average claim amount
  - Higher claim amounts in earlier years
  - Disproportionate proportion of claims compared to population

- Conditions to focus on:
  - Testicular cancer
  - Breast cancer
  - Colon cancer
  - Multiple Sclerosis
Too young..... incidence of breast cancer 2009-2011

Average number of new cases per year and age-specific incidence rates per 100,000 population, females, UK

Approximately 4% of cases with significantly premature presentation of breast cancer
Atypical and suspicious of a dominant genetic issue

Source: Prepared by Cancer Research UK – original data sources are available from http://www.cancerresearchuk.org/cancer-info/cancerstats/
Too young… family history current breast cancer screening

<table>
<thead>
<tr>
<th>Age</th>
<th>Standard Risk</th>
<th>Moderate Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No family history</td>
<td>1 first degree relative &lt;40</td>
</tr>
<tr>
<td></td>
<td>1 first degree relative &gt;40</td>
<td>2 first/second degree relatives with an average age of 50+</td>
</tr>
<tr>
<td></td>
<td>National Screening Programme</td>
<td>3 first/second degree relatives with an average age of &gt;60</td>
</tr>
<tr>
<td></td>
<td>Secondary Care</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lifetime risk at least 17% but less than 30%</td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td><strong>No Screening</strong></td>
<td><strong>No Screening</strong></td>
</tr>
<tr>
<td>30-39</td>
<td><strong>No Screening</strong></td>
<td><strong>No Screening</strong></td>
</tr>
<tr>
<td>40-49</td>
<td><strong>No Screening</strong></td>
<td><strong>Annual Mammogram</strong></td>
</tr>
<tr>
<td>50+</td>
<td><strong>3 Yearly Routine Mammogram</strong></td>
<td><strong>Annual Mammogram</strong></td>
</tr>
</tbody>
</table>
*Certain health authorities now invite females aged 47 years for 3 yearly routine breast screening

Source: NHS / NICE guidelines / Macmillan cancer support
## Too young..... current breast cancer screening

<table>
<thead>
<tr>
<th>Age</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Family history over and above that of “moderate” risk, which include:</td>
</tr>
<tr>
<td></td>
<td>o 1 first/second degree relative diagnosed with ovarian cancer at any age and 1 first/second degree relative diagnosed with breast cancer before 50.</td>
</tr>
<tr>
<td></td>
<td>o 2 first/second degree relatives diagnosed with ovarian cancer at any age</td>
</tr>
<tr>
<td></td>
<td>Lifetime risk at least 30%</td>
</tr>
<tr>
<td></td>
<td>&gt;30% BRCA carrier but no test</td>
</tr>
<tr>
<td></td>
<td>&gt;30% TP53* carrier but no test</td>
</tr>
<tr>
<td></td>
<td>Specialist genetic clinic</td>
</tr>
<tr>
<td>20-29</td>
<td>No Screening</td>
</tr>
<tr>
<td>30-39</td>
<td>Consider Annual Mammogram</td>
</tr>
<tr>
<td>40-49</td>
<td>Annual Mammogram</td>
</tr>
</tbody>
</table>

*TP53 = A gene that carries instructions to make tumour protein p53 (TP53). The protein acts as a tumour suppressor by regulating cell division through stopping cells from growing/dividing too fast or in an uncontrolled way.

Source: NHS / NICE guidelines / Macmillan cancer support
Family history – case study

Life, Critical Illness and TPD £150,000

Female aged 45 years

Application disclosure:-
  o Routine mammogram – normal
  o Family history ovarian cancer – diagnosed 39 years

Decision?

PLRE comment:-
  • Mammogram performed before the routine screening age
  • Reason for mammogram is not known
  • Family history of 1st degree relative with ovarian cancer at any age
  • Second degree family history not known
Too young. incidence of colon cancer 2009-2011

Average number of new cases per year and age-specific incidence rates per 100,000 population, UK

Approximately 5% of cases with significantly premature presentation of colon cancer
Atypical and suspicious of a dominant genetic issue

Source: Prepared by Cancer Research UK – original data sources are available from http://www.cancerresearchuk.org/cancer-info/cancerstats/
## Too young… family history current colon cancer screening

<table>
<thead>
<tr>
<th>Moderate Family History Risk</th>
<th>Screening</th>
<th>Age at initial screening</th>
<th>Screening interval period</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 first degree relatives none &lt;50</td>
<td>Colonoscopy</td>
<td>50 years</td>
<td>5 yearly to age 75</td>
</tr>
<tr>
<td>2 first degree relatives mean age &lt;60</td>
<td>Colonoscopy</td>
<td>50 years</td>
<td>5 yearly to age 75</td>
</tr>
<tr>
<td>2 first degree relatives &gt; 60</td>
<td>Colonoscopy</td>
<td>55 years</td>
<td>Once at age 55 no follow up if result normal</td>
</tr>
<tr>
<td>1 first degree relative &lt;50</td>
<td>Colonoscopy</td>
<td>55 years</td>
<td>Once at age 55 no follow up if result normal</td>
</tr>
</tbody>
</table>

Routine UK screening is not before the age of 50 years
A colonoscopy is not typically performed for routine UK screening unless the FOB result is abnormal or unclear

Source: British Society of Gastroenterology
Too young... family history current colon cancer screening

<table>
<thead>
<tr>
<th>High Risk Family History</th>
<th>Screening</th>
<th>Age at initial screening</th>
<th>Screening interval period</th>
</tr>
</thead>
<tbody>
<tr>
<td>HNPCC</td>
<td>Colonoscopy OGD</td>
<td>Colonoscopy from age 25 OGD from age 50</td>
<td>Colonoscopy 18 -24 months OGD 2 yearly</td>
</tr>
<tr>
<td>FAP</td>
<td>Colonoscopy or alternating colonoscopy &amp; flexible sigmoidoscopy</td>
<td>Teens</td>
<td>Annual colonoscopy or alternating colonoscopy &amp; flexible sigmoidoscopy until age 30</td>
</tr>
<tr>
<td>Peutz-Jeghers Syndrome</td>
<td>Colonoscopy OGD</td>
<td>From age 25</td>
<td>Every 2 years</td>
</tr>
<tr>
<td>Juvenile polyposis</td>
<td>Colonoscopy OGD</td>
<td>Colonoscopy from age 15 OGD from age 25</td>
<td>2 yearly colonoscopy and OGD &gt;35 years greater intervals</td>
</tr>
</tbody>
</table>

Source: British Society of Gastroenterology
Too young..... story so far

Atypical Screenings:
- Colon cancer screening before the age of 50 years – atypical!
- Screening by colonoscopy – atypical!
- Breast cancer screening before the age of 50* years – atypical!
- Annual mammogram screening – atypical!
- Breast MRI screening – atypical!

Atypical investigations:
Investigations or procedures performed indicate medical professionals are concerned regarding possible causes of symptoms – so should we!

In particular, further atypical investigations for consideration:
- Mole Mapping
- MRI Brain
- CTA/MRA
- Lumbar Puncture
Too much Too young… Atypical investigations – mole mapping

• Mole mapping is performed when there is an increased risk of melanoma – **this is not routine**!
• If clinicians are suspicious or concerned – **so should we**!
• There is usually a history of:-
  • Previous excision of moles with existing ones present
  • Multiple moles 50-100+
  • Family history of melanoma
  • Sun damaged skin
• What does the applicant know that we don’t?

**Mole mapping app now available on your phone!**
Too much Too young… atypical investigations – neurological

- MRI/CT scans of the brain are performed for a reason
- They are looking for a cause of symptoms
- They are costly to perform (UK average circa £500)
- It is not a pleasant experience for the patient 😞

What do these terms really mean?
- Essentially normal
- No significant abnormality
- Nil of significance
- Reassured

- Lumbar puncture or CTA/MRA are usually second line as a follow up to imaging
- They are invasive and unpleasant procedures
- There is a risk of complication to the patient 😞

Therefore, medical professionals will not request these investigations unless they are concerned or suspicious – SO SHOULD WE!

Referral letters should provide a better insight
## Too much Too young… vague neurological symptoms

<table>
<thead>
<tr>
<th>Red Flag</th>
<th>Amber Warning</th>
<th>Green Alert</th>
</tr>
</thead>
</table>
| **Optic Neuritis**  
  - Diplopia (double vision)  
  - Unilateral temporary blindness  
  - Nystagmus: uncontrolled eye movement (horizontal/vertical)  
  - Pain in the eye | Dysaesthesia  
  - Pins and needles  
  - Tingling  
  - Numbness  
  - Burning sensations  
  - Crawling sensations | Labyrinthitis  
  Dizziness  
  Vertigo  
| **Lhermitte’s sign / Phenomenon**  
  - Electric shock sensation passing down the back when moving the neck | Balance problems  
  - Lack of co-ordination  
  - Clumsiness  
  - Gait  
  - Fall / Unsteadiness | Tinnitus  
  Hearing Loss  
| **Trigeminal Neuralgia**  
  - Unilateral or bilateral severe (sharp, stabbing, electric shock sensation) facial pain | Cognitive difficulties  
  - Memory / Confusion  
  - Concentration  
  - Attention  
  - Confusion | Fatigue  
  TATT  
| **Dysarthria/Dysphagia/Dysphasia**  
Difficulties with speech/swallowing/words | Seizure/Fit  
  Collapse / Vasovagal  
  Loss of consciousness | (Simple) Faint  
| **Bowel Incontinence**  
Male urinary **Incontinence** | Weakness  
  - Paresis | Female urinary Incontinence  
| | Visual Disturbance |  
| | Tremor |  

### Too much Too young… context is key

<table>
<thead>
<tr>
<th>KEY</th>
<th>CONTEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td><strong>Years ago</strong>&lt;br&gt;<strong>No changes</strong></td>
</tr>
<tr>
<td>Pre-Presentation</td>
<td><strong>Apparent precipitating cause / factors</strong>&lt;br&gt;<strong>No apparent precipitating cause / factors</strong></td>
</tr>
<tr>
<td>Presentation</td>
<td><strong>Sudden onset</strong>&lt;br&gt;<strong>No associated symptoms</strong></td>
</tr>
<tr>
<td>Nature of symptoms</td>
<td><strong>Gradual onset</strong>&lt;br&gt;<strong>Associated symptoms</strong>&lt;br&gt;<strong>Symptoms develop</strong></td>
</tr>
<tr>
<td>Duration</td>
<td><strong>Seconds</strong>&lt;br&gt;<strong>Minutes</strong>&lt;br&gt;<strong>Hours</strong></td>
</tr>
<tr>
<td>Pattern</td>
<td><strong>Acute</strong>&lt;br&gt;<strong>One off</strong>&lt;br&gt;<strong>Short lived</strong>&lt;br&gt;<strong>Persistent</strong>&lt;br&gt;<strong>Chronic</strong>&lt;br&gt;<strong>Intermittent recurrences</strong>&lt;br&gt;<strong>Constant</strong></td>
</tr>
<tr>
<td>Investigations</td>
<td><strong>Clinical history</strong>&lt;br&gt;<strong>Clinical exam</strong>&lt;br&gt;<strong>Bloods</strong></td>
</tr>
<tr>
<td>Referrals</td>
<td><strong>Specialist referral</strong>&lt;br&gt;<strong>MRI brain/spine</strong>&lt;br&gt;<strong>CTA/MRA</strong>&lt;br&gt;<strong>Lumbar puncture</strong></td>
</tr>
<tr>
<td>Risk Factors</td>
<td><strong>No family history</strong>&lt;br&gt;<strong>No associated risk factors</strong>&lt;br&gt;<strong>Family history</strong></td>
</tr>
</tbody>
</table>
Too much Too young… asking the right question

Are you awaiting the results of, or have you been advised to have, any medical investigations, tests or scans or have you any expectation of seeking medical advice or treatment in the near future?

Any condition affecting your stomach, oesophagus or bowel, for example Crohn’s disease, ulcerative colitis?

- Application form questions can be open to interpretation by:-
  - The insurer
  - The consumer
  - The ombudsman
- Terminology potentially impacting on claim experience:
  - Intention or expectation
  - Condition, disease or disorder
  - Problem
  - Suffering or suffered (from)
  - Affecting
  - Medical advice
- There is a growing importance on communication between underwriters and claims
  - Application questions
  - Exclusion wording
  - CI definitions
Too much Too young ... critical illness conclusion

When comparing insured lives to the general population, for certain conditions, we are seeing:

- Materially higher proportions of claims...
- Significantly lower age at diagnosis...
- Cover levels purchased being higher than average...
- Duration from inception to claim being lower than expected...

So, what can we learn from this?
Too much Too young... critical illness conclusion

- Evidence suggests CI is at high risk of **anti-selection**

- Technology and medicine have evolved since the CI product was launched so insurers need to remain **one step ahead of the consumer**

- We need to ensure application form questions, terminology and automated underwriting rules **evolve** with ‘real-world’ claims experience

And finally...

- Underwriters continue to play a key role in safeguarding their office experience (and rates) by preventing avoidable claims through:-
  - Identifying potentially **anti-selective** purchase behaviour
  - Detecting **atypical risks**
  - Obtaining the right **evidence** on atypical risks
Colour palette for PowerPoint presentations

Dark blue
R17  G52  B88
Gold
R217  G171  B22
Mid blue
R64  G150  B184

Secondary colour palette

Light grey
R63  G69  B72
Pea green
R121  G163  B42
Forest green
R0  G132  B82
Bottle green
R17  G179  B162
Cyan
R0  G156  B200
Light blue
R124  G179  B225
Violet
R128  G118  B207
Purple
R143  G70  B147
Fuscia
R233  G69  B140
Red
R200  G30  B69
Orange
R238  G116  29

Dark grey
R63  G69  B72