Update from the UK asbestos working party
John Wilson, Pauline Barthelemy and Robert Brooks
Update from the UK asbestos working party

• Market survey data YE2015
  – Status of claims
  – Mesothelioma Insights
  – Survey 2016 vs. 2009 market estimate

• Mesothelioma deaths: Age-Birth GLM model

• Mesothelioma claimants: CRU & Propensity to Claim

• Next steps
Update from the UK asbestos working party
Agenda

Market survey data YE2015
(Survey 2016)

Status of claims
Market survey data – YE 2015 (Survey 2016)
Status of mesothelioma claims
Market survey data – YE 2015 (Survey 2016)
Status of lung cancer claims
Market survey data – YE 2015 (Survey 2016)
Status of pleural thickening claims
Market survey data – YE 2015 (Survey 2016)
Asbestosis and Pleural Thickening

- Increasingly difficult to distinguish between these (from a legal / medical / claims handling perspective)
- An element of cross contamination from pleural plaques
- Figures still shown separately at this stage but we are moving towards a combined viewpoint going forwards
Market survey data – YE 2015 (Survey 2016)
Status of combined asbestosis and pleural thickening
Update from the UK asbestos working party

Market survey data YE2015

Mesothelioma Insights
Survey 2016 – Mesothelioma Insights
Living / deceased claimants by notification year

Data provided represents only a subset of the 2016 survey – i.e. less than the assumed 78% market share
Survey 2016 – Mesothelioma Insights
Male / female claimants by notification year

Data provided represents only a subset of the 2016 survey – i.e. less than the assumed 78% market share
Survey 2016 – Mesothelioma Insights
Geographic split by notification year

Claim numbers notified

<table>
<thead>
<tr>
<th>Year</th>
<th>England &amp; Wales</th>
<th>Scotland</th>
<th>Northern Ireland</th>
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Incurred Costs £m

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Data provided represents only a subset of the 2016 survey – i.e. less than the assumed 78% market share.
Survey 2016 – Mesothelioma Insights
Cumulative proportion of settled claims (nil & non-nil)
Survey 2016 – Mesothelioma Insights
Cumulative proportion of nil settled claims (settled only)
Update from the UK asbestos working party

Survey 2016 vs. 2009 market estimate

Number of claims and average costs
Survey 2016 vs. 2009 market estimates
Mesothelioma

**Number of claims (includes nils)**

- 2009: 3,000
- 2010: 3,200
- 2011: 3,300
- 2012: 3,400
- 2013: 3,500
- 2014: 3,600
- 2015: 3,700

**Average claim size (includes nils)**

- 2009: £60,000
- 2010: £70,000
- 2011: £80,000
- 2012: £90,000
- 2013: £100,000
- 2014: £110,000
- 2015: £120,000

- Scenario 23*
- Settled basis
- Incurred basis

* Assuming 25.7% nil rate based on 5 year weighted average form Survey 2016 data
Survey 2016 vs. 2009 market estimates
Asbestos related lung cancer

Number of claims (includes nils)

Average claim size (includes nils)

* Assuming 42.4% nil rate based on 5 year weighted average form Survey 2016 data
Survey 2016 vs. 2009 market estimates
Asbestosis

Number of claims (includes nils)

Average claim size (includes nils)

* Assuming 40.3% nil rate based on 5 year weighted average from Survey 2016 data
Survey 2016 vs. 2009 market estimates
Pleural thickening

Number of claims (includes nils)

<table>
<thead>
<tr>
<th>Year</th>
<th>Scenario 2B*</th>
<th>Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>400</td>
<td>800</td>
</tr>
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Average claim size (includes nils)

<table>
<thead>
<tr>
<th>Year</th>
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<td>2015</td>
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* Assuming 37.1% nil rate based on 5 year weighted average form Survey 2016 data
Survey 2016 vs. 2009 market estimates
Asbestosis & pleural thickening combined

Number of claims (includes nils)

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<th>2015</th>
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<td>2,000</td>
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Average claim size (includes nils)

<table>
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<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<th>2015</th>
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* Assuming 39.2% nil rate based on 5 year weighted average form Survey 2016 data
Update from the UK asbestos working party

Survey 2015 vs. 2009 market estimate

Total Insurance Costs
Survey 2016 vs. 2009 market estimate
Total insurance costs 2009 - 2015 (£m)
Survey 2016 vs. 2009 market estimate
Insurance costs 2009 - 2015 by disease (£m)

[Bar chart showing insurance costs for different diseases, with categories for scenario 23/2B, settled basis, and incurred basis]
Survey 2016 vs. 2009 market estimate
Mesothelioma - Insurance cost (£m)
Update from the UK asbestos working party

Mesothelioma deaths: Age-Birth GLM model


Martnez Miranda, M.D., Nielsen, B. and Nielsen, J.P. (2013) Inference and forecasting in the age-period-cohort model with unknown exposure with an application to mesothelioma mortality
http://openaccess.city.ac.uk/4625/1/Final_Asbestos_JRSS_SerA-1.pdf
Age-Birth GLM model

Overview

• No constructing exposure measures and no projecting of future populations

• Inspired by the chain ladder methodology

• Basically an age-period-cohort model using a GLM (Poisson regression with log link) in R¹ to fit the parameters

• Similar forecasts produced for age-cohort model and the age-period-cohort model, so used age-cohort model

• Simplifications taken: Discards cohorts younger than 1966, no future cohorts and only projecting ages 25–89

• Provides a simple benchmark method, checking the robustness of other more sophisticated methods

¹ R package apc. https://cran.r-project.org/package=apc
Age-Birth GLM model

The maths

\[ F_{A,T} = e^{\alpha_0 + \beta_A + \gamma_{T-A}} \]

Where:

- \( F_{A,T} \) = the deaths at age A in year T
- \( \alpha_0 \) = the intercept
- \( \beta_A \) = the coefficient relating to age A
- \( \gamma_B \) = the coefficient relating to birth year B
Age-Birth GLM model

$\beta_A$ - Age parameters

Nielsen et al (2015) - using deaths up to 2013
Nielsen et al (2013) - using deaths up to 2007
Age-Birth GLM model

$\gamma_B$ - Birth year parameters
Age-Birth GLM model
Comparison to HSE

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<th>Nielsen 2015</th>
<th>HSE 2016</th>
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<td>Peak year</td>
<td>2017</td>
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<tr>
<td>Peak deaths</td>
<td>2,079</td>
<td>2,028</td>
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<tr>
<td>Post 2013 deaths</td>
<td>44,801</td>
<td>45,454</td>
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Age-Birth GLM model
Goodness of fit – Nielsen et al 2015
Age-Birth GLM model
Goodness of fit – Nielsen et al 2015

Birth year

Ages

1880 25

1988

95+
Age-Birth GLM model

Summary

Pros:
- Good fit to the historical data
- Reasonably simple structure
- More flexible than the Birth-Cohort model
- Less parameters than other models such as the HSE/HSL
- Allows different death rates

Cons:
- Difficult to relate parameters to exposure
- Difficult to incorporate expert views or empirical evidence
- May underestimate the number of deaths from 80+ year olds in recent years
- Sensitivity to the post-1966 birth year parameters
Age-Birth GLM model
AWP adjustments

An alternative view using the Age-Birth GLM model structure:

- Extended to include ages 90 to 95+
- Given the scarcity of data decided not projecting ages 20-25 like the HSE: (i) small historical volumes of deaths from these ages, (ii) limited likelihood of deaths from these ages in the future and (iii) the limited likelihood of these deaths relating to Employers’ Liability claims
- Simplified parameters by smoothing parameters using polynomial functions. Also used to estimate post-1966 birth year parameters
- Trying not just to fit to the past given a high level model
Age-Birth GLM model
Age parameters - AWP adjustments

Nielsen et al (2015) - using deaths up to 2013  AWP alternative
Age-Birth GLM model
Birth year parameters - AWP adjustments

Nielsen et al (2015) - using deaths up to 2013  AWP alternative
Age-Birth GLM model
Comparison to HSE

Male mesothelioma deaths (ages 25–89)

- AWP alternative
- HSE (2016)
- Observed deaths
Age-Birth GLM model
Goodness of fit - AWP adjustments

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<td>22</td>
<td>5</td>
<td>24</td>
<td>94</td>
<td>59</td>
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<td>(A-E)/E</td>
<td>(1%)</td>
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<td>(2%)</td>
<td>(6%)</td>
<td>3%</td>
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Percentage deviation: (A-E)/E

Age band

25-64  65-69  70-74  75-79  80-84  85-89

2008  2009  2010  2011  2012  2013

Institute and Faculty of Actuaries
Age-Birth GLM model
Goodness of fit - AWP adjustments
Age-Birth GLM model

Conclusion

- Good high-level model, easy to understand how age and birth year influences the level of deaths

- Difficult to infer parameters for future
  - Birth years 1960 and post
  - Ages 85+

- Using the Nielsen & AWP parameters, in the Age-Birth GLM model, produces curves that are similar to the HSE

- Good alternative estimate to sense check projections

- The AWP still prefer the structure of the HSE model, especially as it has a measure for exposure
Update from the UK asbestos working party

CRU & Propensity to Claim
CRU & Propensity to Claim
What is the CRU?

- The Compensation Recovery Unit (CRU) works with insurance companies, solicitors and DWP* customers to recover:
  - Amounts of social security benefits paid as a result of an accident, injury or disease if a compensation payment has been made (the Compensation Recovery Scheme)
  - Costs incurred by NHS hospitals and Ambulance Trusts for treatment from injuries from road traffic accidents and personal Injury claims (Recovery of NHS charges)

(*) Department of Work and Pensions
CRU & Propensity to Claim
What does it do?

- The CRU is responsible for recoveries in England, Scotland and Wales. A separate unit, reporting to the Department for Social Development in Northern Ireland, is responsible for collection of recoveries in Northern Ireland.

- When an insurer is notified of a claim, a standard claim form must be completed within 14 days of notification and submitted to the CRU.

- The CRU will therefore be informed of all asbestos-related claims giving rise to compensation, whether from the insurance industry or the Government.
CRU & Propensity to Claim
Update on Propensity to Claim

• The AWP received new data from CRU in February 2016 covering Mesothelioma claims registered from January 2007 to December 2015

• To calculate the historical propensity to claim, the AWP aggregated the CRU data by claimant over the number of deaths from mesothelioma given by the HSE data:

\[
\text{Propensity to claim} = \frac{\text{Number of claimants (CRU data)}}{\text{Number of deaths from meso (HSE data)}}
\]

• As of now, the HSE data is available up to 2014. The analysis will be updated to obtain 2015 results once the HSE 2015 data is available
### CRU & Propensity to Claim

**Propensity to claim by age band and calendar year**

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<th>70-74</th>
<th>75-79</th>
<th>80-84</th>
<th>85-89</th>
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<td>67%</td>
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<td>2008</td>
<td>71%</td>
<td>84%</td>
<td>68%</td>
<td>66%</td>
<td>64%</td>
<td>51%</td>
<td>55%</td>
<td>33%</td>
<td>65%</td>
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<td>73%</td>
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<td>47%</td>
<td>53%</td>
<td>62%</td>
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<td>58%</td>
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<td>2013</td>
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<td>74%</td>
<td>71%</td>
<td>60%</td>
<td>55%</td>
<td>43%</td>
<td>41%</td>
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<td>56%</td>
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<td>2014</td>
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<td>69%</td>
<td>74%</td>
<td>64%</td>
<td>62%</td>
<td>51%</td>
<td>43%</td>
<td>41%</td>
<td>61%</td>
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</table>

| Average | 73% | 78% | 73% | 66% | 60% | 49% | 44% | 37% | 62% |

- Although we observe volatility on a year by year basis, over age bands the propensity to make a compensation claim (PtC) tends to decrease from 60-64 year olds.
- If PtC remains constant by age, overall PtC will reduce due to ageing
- The AWP looking into future trends

Note figures above exclude government unlike the 2009 AWP figures which included Government claims.
CRU & Propensity to Claim
Diffuse Mesothelioma Payment Scheme (DMPS)

• The DMPS was launched throughout the UK on 6 April 2014. It provides payments to eligible suffers of diffuse mesothelioma, or their eligible dependants, who were negligently exposed to asbestos during a period of employment, but who are unable to take legal action to seek financial redress via the civil courts.

• Following this scheme, an increase of the number of government claims was observed in the CRU data as seen in the next two slides.
## CRU & Propensity to Claim

### CRU Data – Number of claims and claimants

- Number of claims and claimants including and excluding Government registrations

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>No. Claims</th>
<th>No. Claimants</th>
<th>No. Claims excluding Gov</th>
<th>No. Claimants excluding Gov</th>
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<td>2,114</td>
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<td>1,570</td>
<td>2,097</td>
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<td>2010</td>
<td>2,357</td>
<td>1,560</td>
<td>2,230</td>
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<td>2011</td>
<td>2,450</td>
<td>1,626</td>
<td>2,323</td>
<td>1,564</td>
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<td>2012</td>
<td>2,484</td>
<td>1,591</td>
<td>2,368</td>
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<td>2013</td>
<td>2,473</td>
<td>1,547</td>
<td>2,388</td>
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<tr>
<td>2014</td>
<td>2,995</td>
<td>1,904</td>
<td>2,563</td>
<td>1,576</td>
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<td>2015</td>
<td>3,232</td>
<td>1,892</td>
<td>2,701</td>
<td>1,490</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>22,319</strong></td>
<td><strong>15,023</strong></td>
<td><strong>20,586</strong></td>
<td><strong>13,828</strong></td>
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</table>
CRU & Propensity to Claim
CRU Data – Number of claims and claimants

- The number of CRU claimants excluding Government has been stable at around 1,500 for years 2007-2015
- From 2013, the increase in the total number of claims is driven by the Government Mesothelioma scheme
- Government CRU claimants are removed from the AWP analysis to exclude the DMPS hump and as they are not generally insured by insurers
CRU & Propensity to Claim
Registration & Death years investigation

- One of the main assumptions taken by the AWP when calculating the propensity to claim was to assume a one-to-one relationship between the “CRU registration year” and the “HSE year of death”

- However, as suggested by the survey data on living/deceased claimants, this relationship could have been different in the past and could still change in the future

- As seen in the data, the decrease in PtC can be explained by the fact that the population gets older. However, if the relationship between years had changed at any point, would we observe the same pattern?

- The AWP is currently investigating the fact that this relationship might be different overtime
CRU & Propensity to Claim

Conclusion and further investigations

• We observe an overall decreasing trend for the propensity to claim by age bands
  – Further investigations are needed to be able to discuss future trends

• Once the new 2015 HSE data (deaths) is received, some further work on propensity to claim will be carried out

• The AWP are undertaking further analysis using the CRU data to help determine any trends or changes in the propensity to claim, especially looking at the relationship between registration and deaths years and its evolution over time
Update from the UK asbestos working party

Next steps
Next steps

- Partially complete paper includes key sections from previous papers
- Still investigating:
  - Propensity to make a claim
  - Parameterising the HSE model
  - Projecting non-mesothelioma using our mesothelioma curves
- New estimate and paper will not be out before Q1
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