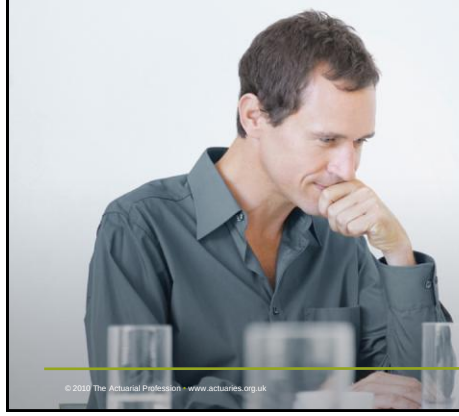
The Actuarial Profession
making financial sense of the future

UK Asbestos Working Party



Current Issues in General Insurance

Brian Gravelsons, Daniel Sykes, Darren Michaels, Gregory Overton

10 May 2010

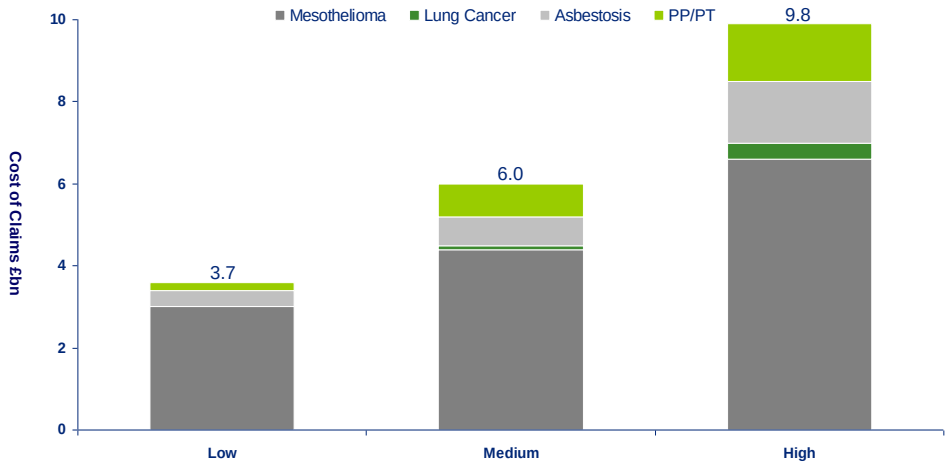
Agenda

- Recap: 2004 UK Asbestos Working Party Projections
- Actual vs Expected Experience 2004-2008
- 2009 UK Asbestos Working Party Projections

Recap: 2004 UK Asbestos Working Party Projections

2

2004 UK Asbestos Working Party: £4-10bn



3

2004 UK Asbestos Working Party Estimates

Mesothelioma

- Based on HSE 2003 projections of future male mesothelioma deaths
- Projected until 2040 only
- Close correspondence between number of deaths and insurance claims
  - One third of people dying making claims
  - 2.5 claims per claimant
  - Assumed no change going forward
- Average costs based on market survey

Other claim types

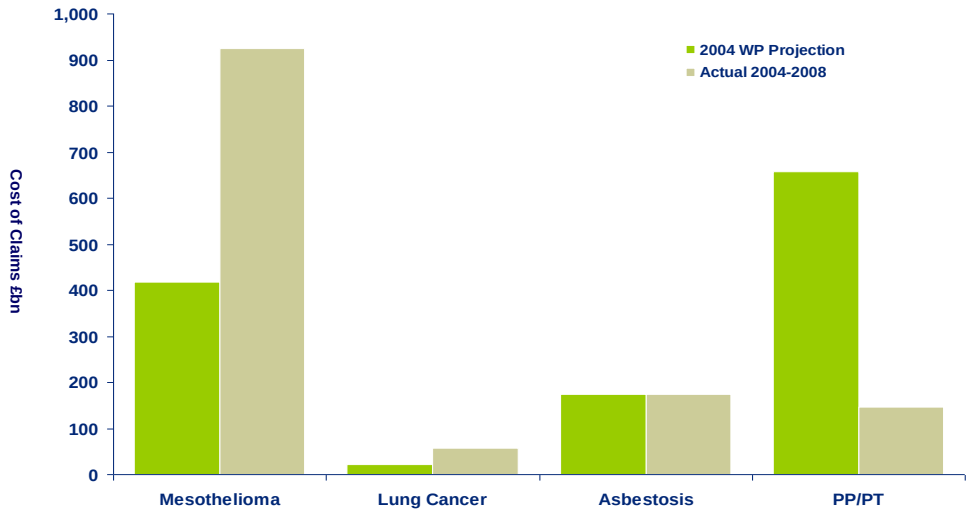
- Numbers and average costs based on market survey
- Pleural Plaques

4

Actual versus Projected Experience 2004-2008

5

Actual vs Projected Experience 2004-2008



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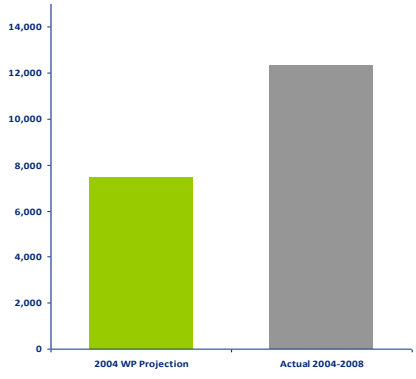
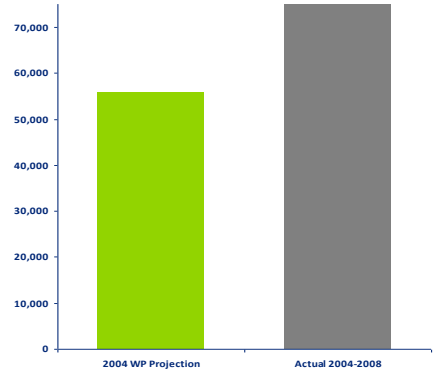
Actual vs Projected Experience 2004-2008: Mesothelioma

Number of Claims



Average Claim Size (£)



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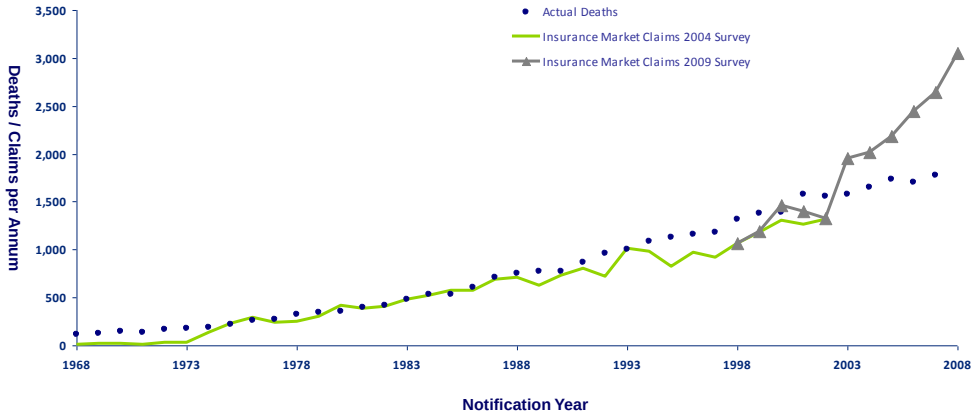
Mesothelioma Insurance Claims Experience 1968-2008



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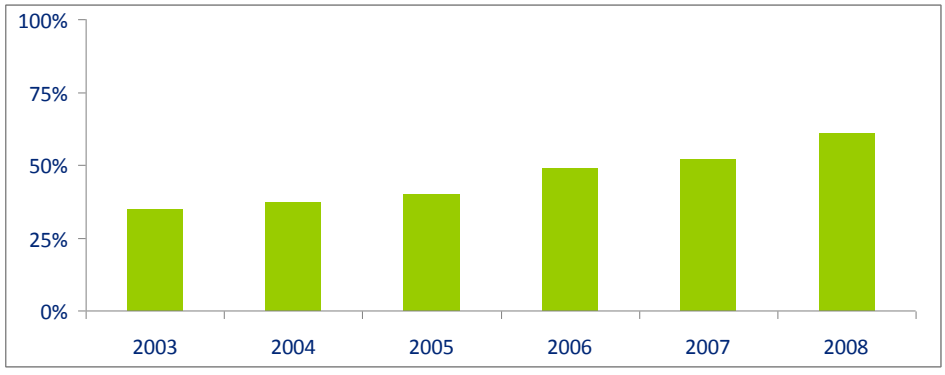
The Claimant to Death Ratio has Nearly Doubled



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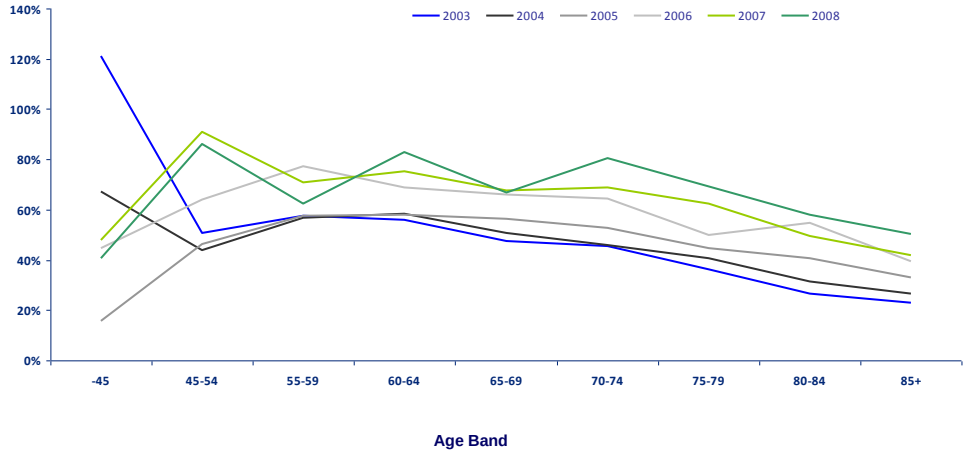
Claimant to Death Ratio by Age Band



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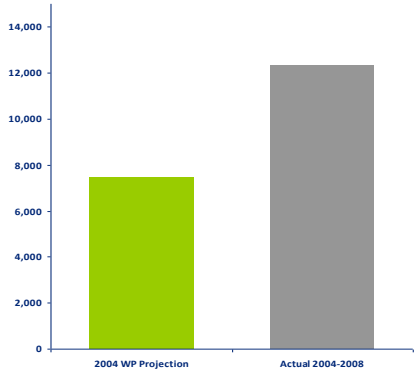
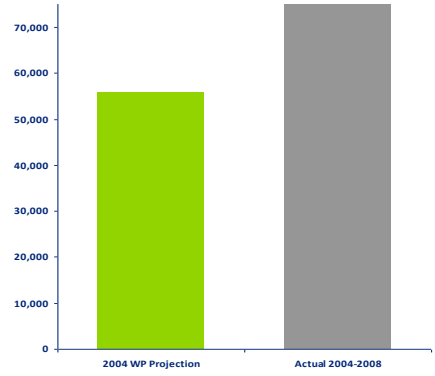
Actual vs Projected Experience 2004-2008: Mesothelioma

Number of Claims



Average Claim Size (£)



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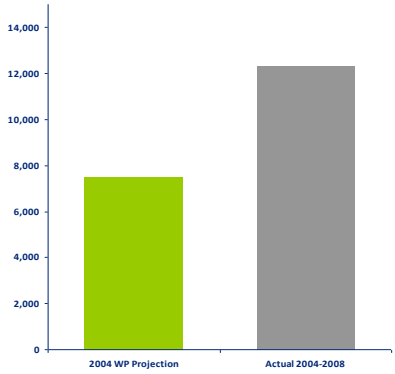
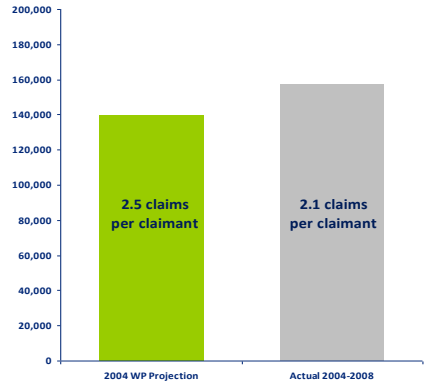
Actual vs Projected Experience 2004-2008: Mesothelioma

Number of Claims



Average Claimant Size (£)



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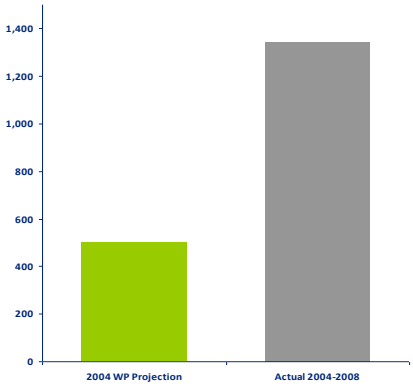
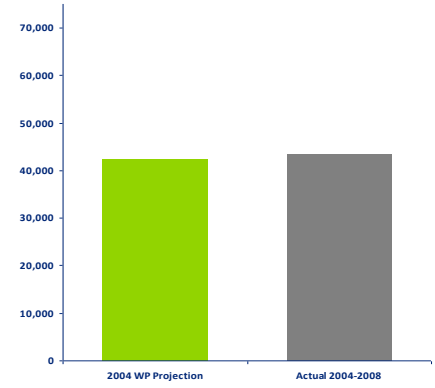
Actual vs Projected Experience 2004-2008: Lung Cancer

Number of Claims



Average Claim Size (£)



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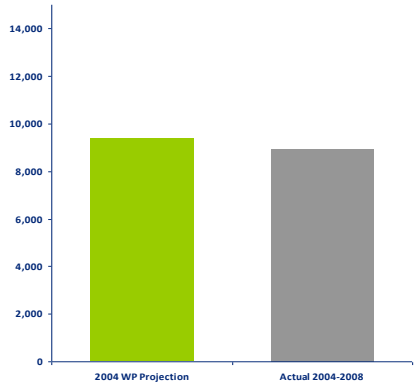
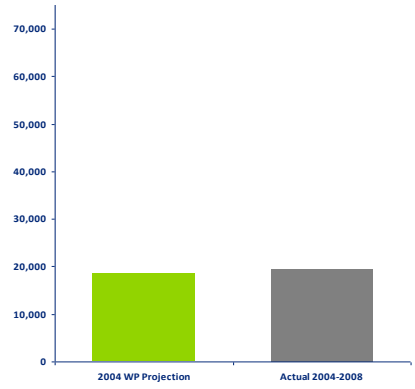
Actual vs Projected Experience 2004-2008: Asbestosis

Number of Claims



Average Claim Size (£)



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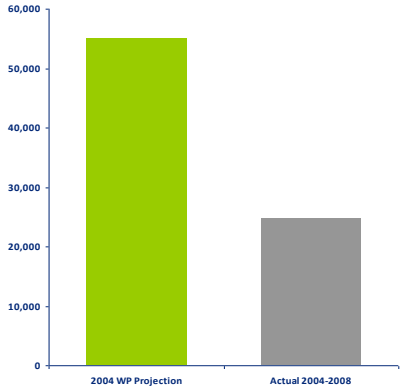
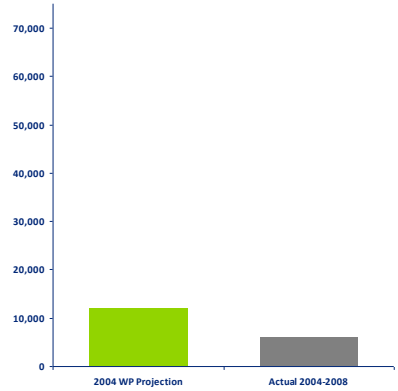
Actual vs Projected Experience 2004-2008: Pleural Plaques/Pleural Thickening

Number of Claims



Average Claim Size (£)



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2009 UK Asbestos Working Party Projections

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Mesothelioma

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2009 UK Asbestos Working Party Assumptions
Mesothelioma

Claim Numbers

- Population deaths – 3 different model structures
  - HSE/HSL
  - Latency
  - Simple birth cohort
- Proportion of deaths that result in an insurance claim – 5 scenarios

Average cost per claim

- Considered separate heads of damage
  - Vary by age
  - Deceased vs living
  - Predominant driver of inflation

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HSE/HSL 2009 Projections of GB Population Mesothelioma Deaths

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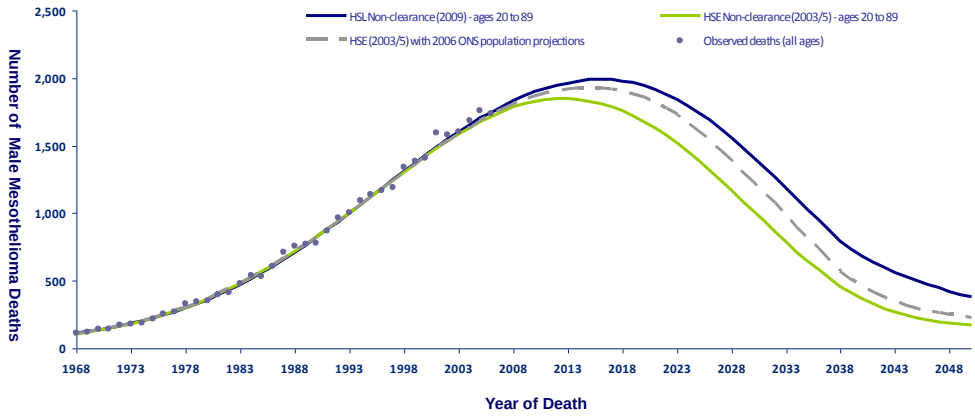
HSE/HSL 2009 Projection of GB Popluation Mesothelioma Deaths



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HSE/HSL Model
It's complicated……

- The formula used by the HSL for estimating the number of mesothelioma deaths at age A, in year T ($F_{A,T}$) is:

$$F_{A,T} = \frac{[\sum_{l=1}^{A-1} W_{A-l} D_{T-l} I\,(l+1-L)^k\, 0.5^{l/H}] D_{x_T} P_{A,T} (M - \sum_{A=20}^{89} \sum_{T=1968}^{2006} B_{A,T})}{\sum_{A=20}^{89} \sum_{T=1968}^{2006} [\sum_{l=1}^{A-1} W_{A-l} D_{T-l}\,(l+1-L)^k\, 0.5^{l/H}] D_{x_T} P_{A,T}} + B_{A,T}$$

Where:

$P_{A,T}$ = The number of people alive (or person-years at risk) at age A in year T

W_A = Age specific exposure potential at age A.

D_T = Overall population exposure in year T.

D_{xT} = Proportion of mesothelioma deaths diagnosed in year T.

L = Lag period (in years) before effect starts.

H = Half life (in years) for clearance of asbestos from lungs.

k = Exponent of time, modelling the increase of risk of developing mesothelioma with increasing time from exposure.

$B_{A,T}$ = The total number background deaths for age A in year T.
$B_{A,T}$ = background rate * $P_{A,T}$,
these deaths are then allocated to age using the proportion of $I * (A - L)^k$.

I = Indicator variable where $I = 0$ if $l < 1 - L$ and $I = 1$ otherwise.

l = Indexes years lagged from the risk year.

M = The total number of observed mesothelioma deaths to date.

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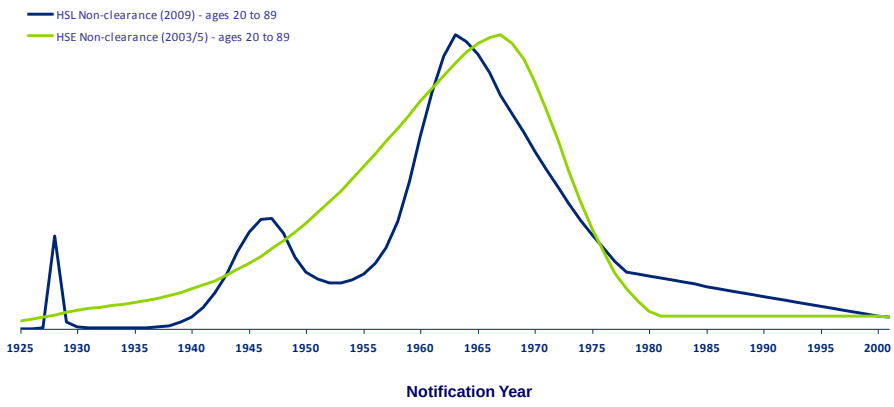
HSE/HSL Exposure Assumptions



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HSE/HSL Model
UK population projections

- Mesothelioma deaths are estimated by applying a risk structure to the projected UK population
- Population projections are from the Office for National Statistics
- Changes since HSE 2003 model are
  - Improving longevity
  - More recent data on immigration / emigration
- New model uses mid-2006 estimates
- Increased population and mesothelioma deaths.

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Latency Model

Latency Model

- Based on amount and timing of past imports
- Risk relativities
- Latency period
- Usage period
- Separately for each type of asbestos
  - Blue
  - Brown
  - White

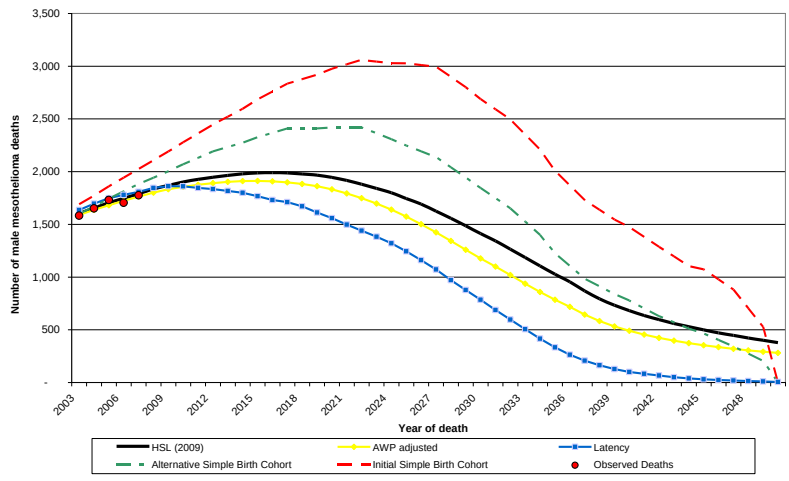
Simple Birth Cohort Model

Simple Birth Cohort Model

- Projects death split by year of birth cohort
  - Applied to assumed future population
- Key assumption
  - Development of death rates by age is constant for each birth cohort
- Professor Julian Peto
  - Cancer Research UK Chair of Epidemiology at London School of Hygiene & Tropical Medicine
  - University of Melbourne 22 April 2008

2009 UK Asbestos Working Party Assumptions

2009 UK Asbestos Working Party Assumptions Comparison of Models



2009 UK Asbestos Working Party Assumptions Comparison of Models

HSE/HSL Model Structure selected by AWP

- Greater flexibility but large number of parameters
- Very sensitive to key parameters

Simple birth cohort and latency models

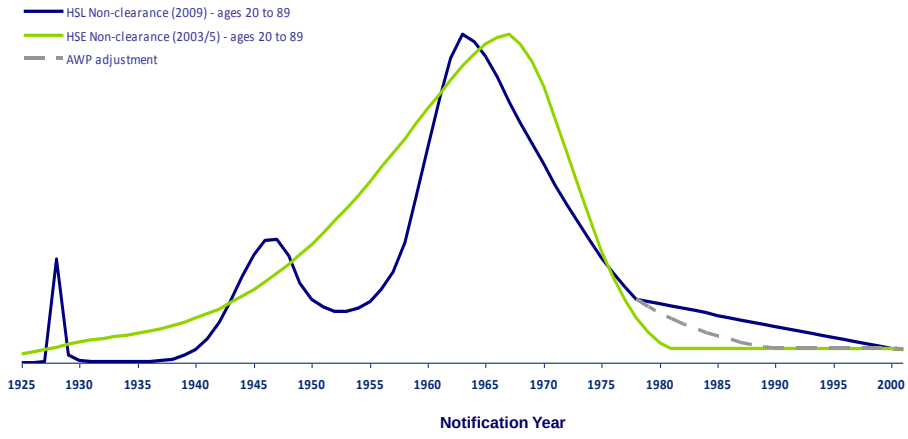
- Less complex construction
- Very sensitive to key parameters
- Don't capture some key characteristics, such as
  - Changes between birth cohorts
  - Changing population mix
- Likely model / parameter error
- Therefore used to illustrate possible ranges.

2009 UK Asbestos Working Party Assumptions Mesothelioma Population Deaths

- Model structure based on HSE/HSL

- Changes to selected underlying assumptions
  - Mesothelioma incidence rate does not continually increase with increasing time since exposure
    - HSE/HSL considered doing this
    - Cap after 60 years from exposure
    - Reduces 80+ aged deaths
  - Different exposure profile post 1978
    - Based on imports

2009 UK Asbestos Working Party Assumptions
Mesothelioma Exposure Assumptions



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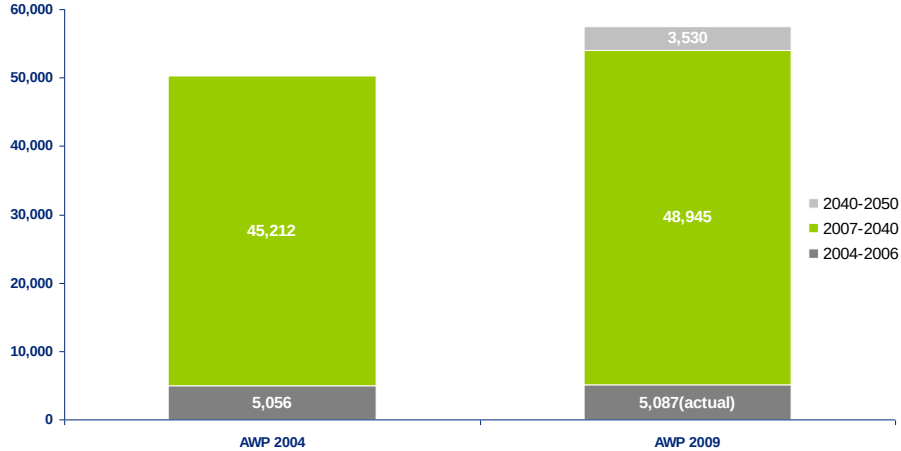
2009 UK Asbestos Working Party Assumptions
Mesothelioma Population Deaths

Comparison with 2004 Projections



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2009 UK Asbestos Working Party Assumptions
Mesothelioma Claimant to Death Ratio

5 Scenarios

1. Fixed from 2009 onwards
2. Increase for 10 years until overall ratio reaches 75%
3. As per 2 except continue to increase until 2050
4. Reaches 90% of theoretical maximum in 10 years
5. Reaches 100% of theoretical maximum in 5 years

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2009 UK Asbestos Working Party Assumptions
Mesothelioma Average Cost

Head of Damage	Age Related?	Inflation Type	Live / Deceased Differential?
General Damages (pain / suffering / loss of amenity)	Yes	Court (RPI + 2%)	No
Special Damages (loss of future income)	Yes	Wage	Yes
PWCA	No	RPI	No
CRU	Yes	RPI	Yes
Bereavement Award	No	RPI	Yes
Funeral Expenses	No	RPI	Yes
Care Costs	No	Wage	No
Miscellaneous Expenses	No	RPI	No
Other	No	Wage	No
Legal Expenses	Yes	Wage	No

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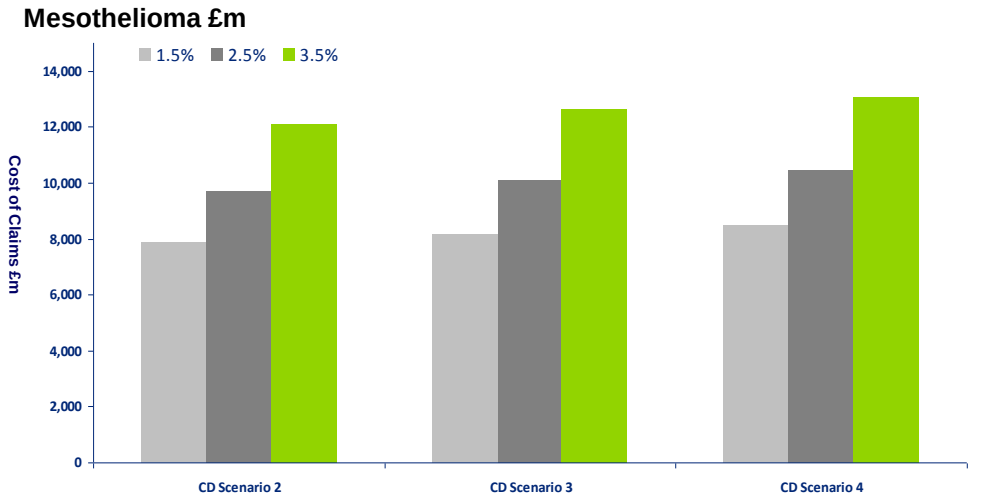
2009 UK Asbestos Working Party Estimates



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Lung Cancer

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2009 UK Asbestos Working Party Assumptions
Lung Cancer

- **Tiny fraction of deaths result in asbestos-related claim**
  - **Biggest influences:**
    - **Smoking rates**
    - **Propensity to claim**
  - **Considerable uncertainty**
- **Pragmatic approach based on these underlying drivers**

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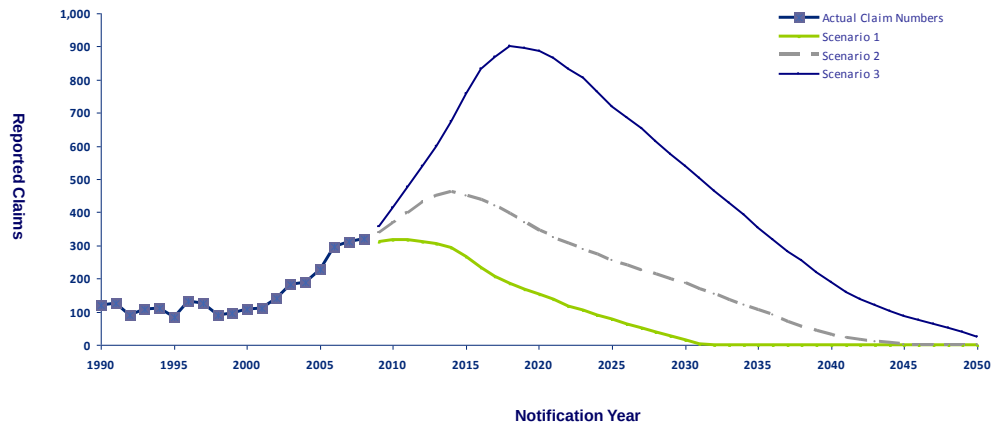
2009 UK Asbestos Working Party Assumptions
Lung Cancer Claim Number Projections



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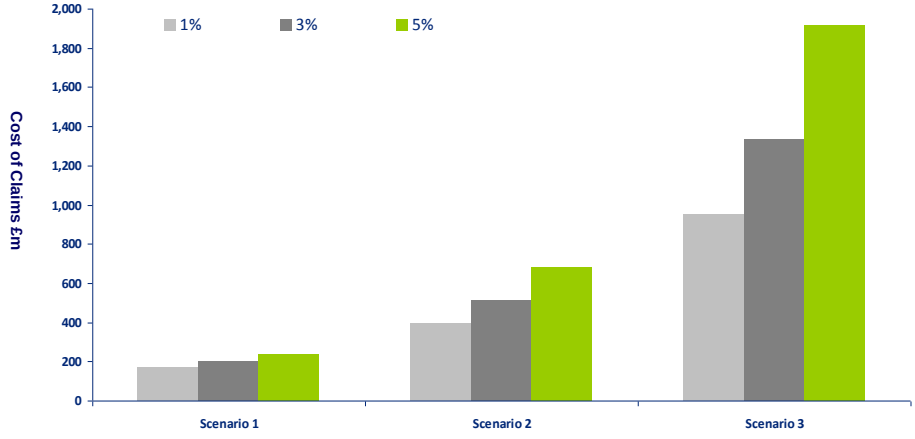
2009 UK Asbestos Working Party Estimates

Lung Cancer £m



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Asbestosis

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2009 UK Asbestos Working Party Assumptions
Asbestosis

- **Previous projections somewhat more reliable**
- **Not affected by changes in propensity to claim**
- **Claim numbers have been decreasing since 2003**
- **3 Scenarios for future claim numbers**

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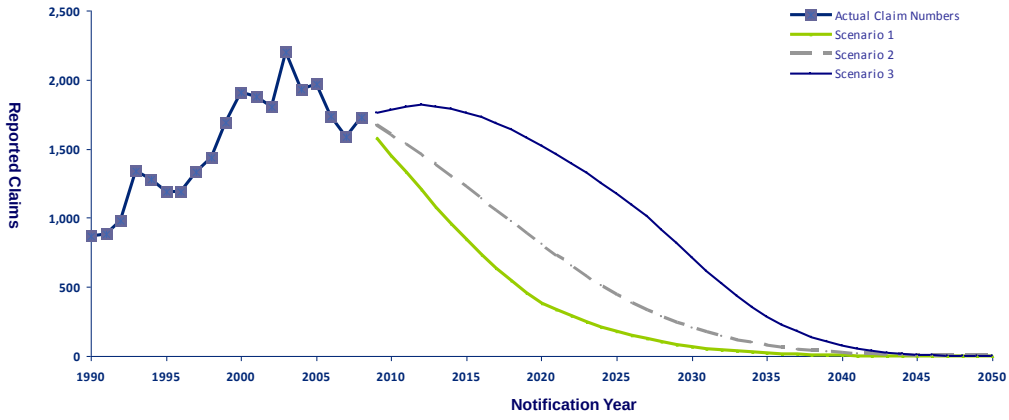
2009 UK Asbestos Working Party Assumptions
Asbestosis Claim Number Projections



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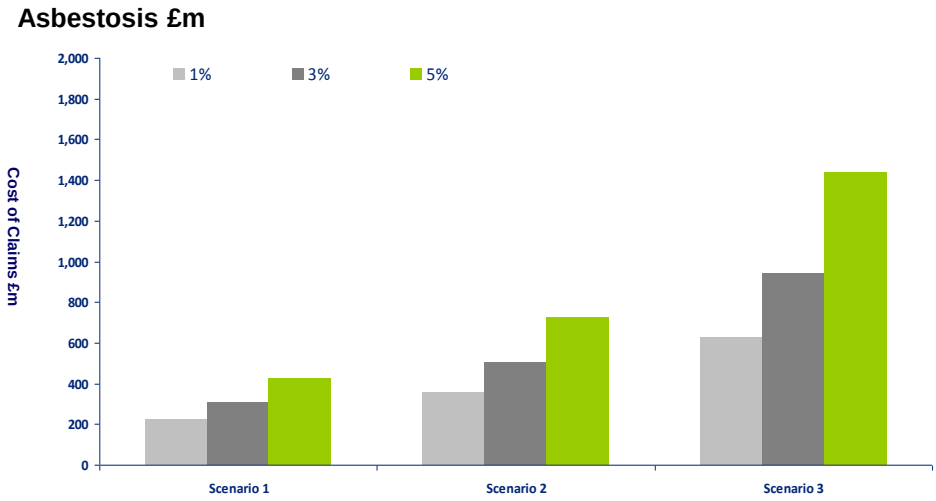
2009 UK Asbestos Working Party Estimates



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Pleural Thickening
(& Pleural Plaques)

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2009 UK Asbestos Working Party Assumptions
Pleural Thickening

- **Previously, estimate of Pleural Plaques and Pleural Thickening were combined**
- **Only produced estimates for Pleural Thickening**
- **3 Scenarios for future claim numbers**

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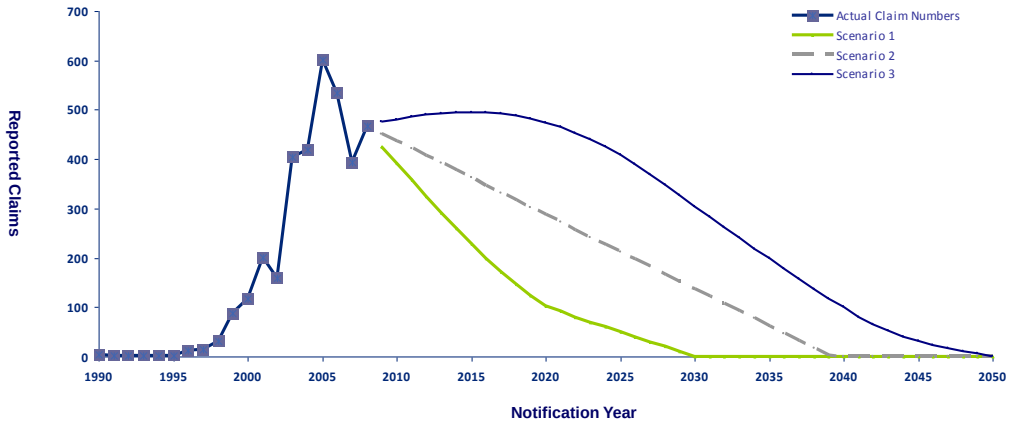
2009 UK Asbestos Working Party Assumptions
Pleural Thickening Claim Number Projections



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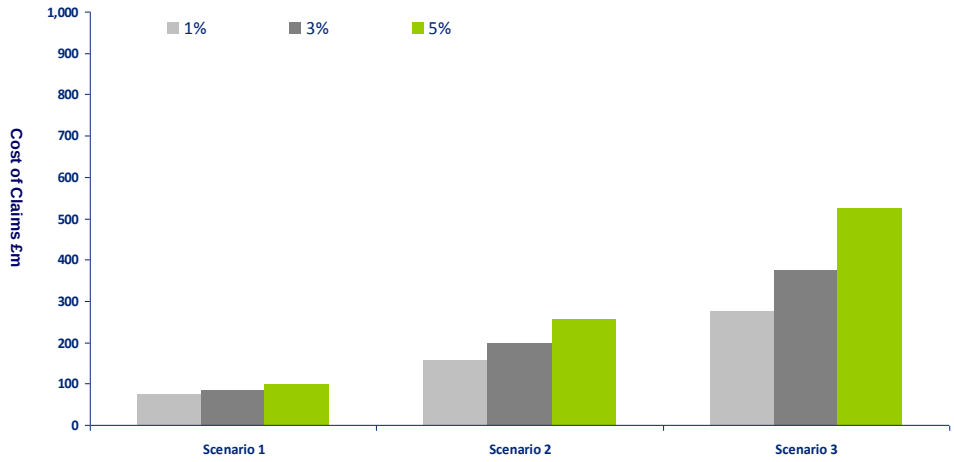
2009 UK Asbestos Working Party Estimates

Pleural Thickening £m



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Pleural Plaques

- House of Lords – pleural plaques did not constitute actionable damage and therefore were not compensable (17 October 2007)
- Scottish Parliament – Bill introduced to reverse HoL ruling in Scotland (March 2009)
- Insurers launched Judicial Review (May 2009)
  - Court of Session rejected claims Act was invalid (January 2010)
  - Insurers announced intention to appeal (January 2010)
- Northern Ireland: recommended change in law to allow compensation (June 2009)
- On 25th February 2010, the Government announced that it would not be legislating to make pleural plaques compensable in England and Wales.

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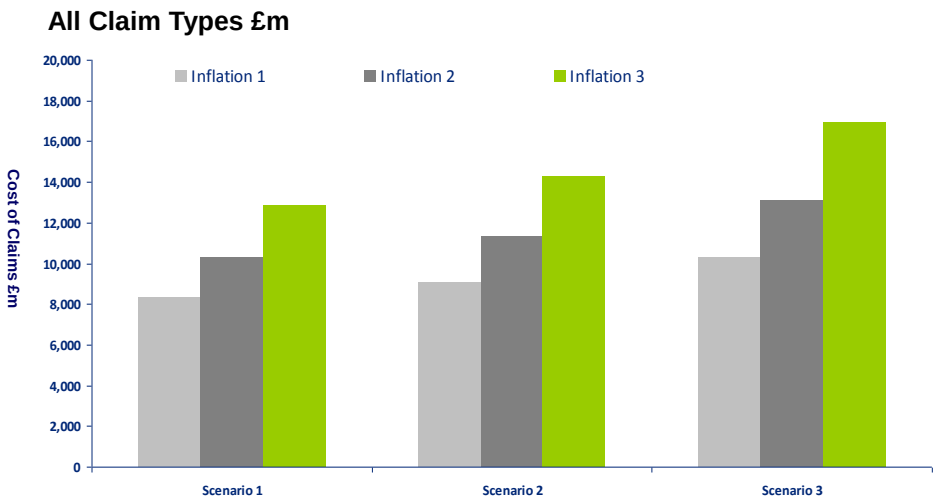
All Claim Types

2009 UK Asbestos Working Party Estimates
Total Insurance Market Estimates



Summary of the Changes in the UK Insurance Market Estimate 2004-2009

	Impact on UK Insurance Market Cost (£bn)
2004 Estimate (2009 to 2040)	4.7
Change due to Projection of Population Mesothelioma Deaths	0.6
Change due to Proportion of Deaths that Result in a Claim	3.7
Change due to Mesothelioma Average Cost	0.7
Change due to Mesothelioma Claims Inflation	(0.6)
Change due to Extension of Projection Period to 2050	1.7
Change due to Non-Mesothelioma Claim Types	0.5
2009 Estimate (2009 to 2050)	11.3

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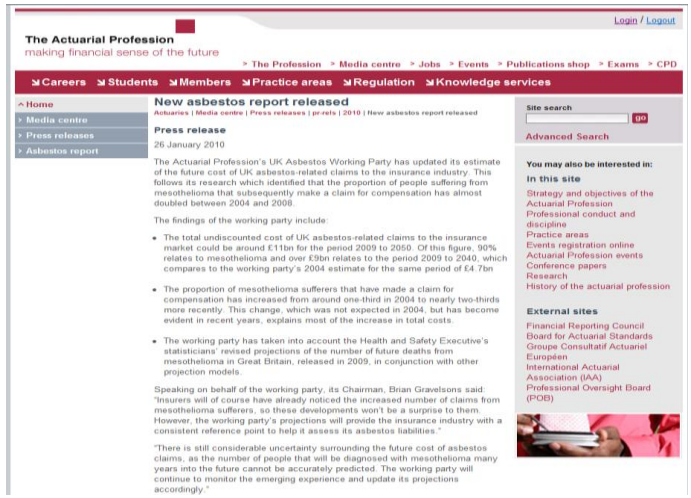
For a Copy of the Paper: www.actuaries.org.uk



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What will the AWP do now?

- Monitor experience and regularly report back any emerging issues.
- Continue to develop relationships.
- Develop current insights where possible.
- DWP Accessing Compensation Consultation Paper.

Questions or comments?