Investigating asbestos risks: asbestos exposure incidents – current concerns

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Introduction
• A brief history
• Asbestos exposures in present times
• Quantitative estimation of risk for incidents
• Where we are now in terms of expectations
• Where IOM has investigated risk arising from asbestos exposure

An outline history
1906 first case report of asbestosis
1930 first comprehensive health survey
1931 Asbestos Industry Regulations
1949 first suspicion of a link with lung cancer
1955 link with lung cancer shown by Doll
1960 crocidolite linked with mesothelioma
1969 Asbestos Regulations
1980 problems in removal industry
1987 Control of Asbestos at Work Regulations
2006 new Control of Asbestos Regulations
1965 publication finding mesothelioma

- Newhouse and Thompson (1965) published an account of mesothelioma from occupational and domestic exposure to asbestos in London;
- 1969 asbestos regulations


"asbestos remains the primary carcinogenic toxin in the workplace in most countries." …

"In the industrialised countries of Western Europe, North America, Japan and Australia, 20,000 asbestos-induced lung cancers and 10,000 mesothelioma cases are estimated to occur each year*.

"In transition and developing countries the risk is now even higher than in the established market economies and it is certain that in the transition and developing countries in 20 to 30 years’ time asbestos will prove to be a health “time bomb”.

www.hvbg.de/d/asbest/erklarer/declarat.pdf

Risk and what is observable

- Observe incidence in populations
- Predict risks for populations
- Infer that is the risk for the individual
- What matters to the individual
- What matters to society, organisation, or group.
Risk model for prediction of risk of mesothelioma

Incidents where IOM has been asked to assess asbestos exposure and predict

- Industrial workplaces;
- Offices;
- Commercial buildings;
- Construction sites;
- Residential – gardens in brown-field developments and in rural sites
- Schools – with asbestos-containing materials

Risk from asbestos cement on tracks in England

Residential properties adjoin the track

Dust generated by traffic along that track

Asbestos cement on tracks
- Tracks could be dusty when dry but
- Asbestos in air concentrations low
- Exposure not continuous
- Risks to health very low
Testing for asbestos fibre concentrations in a school classroom (ACMs in the cupboard)

Dust in the cupboards

School: Risks to pupils

- Based on the estimated asbestos fibre in air concentrations during tests
- Taking account of ventilation and activities
- And assessing time spent in the affected rooms:
  - past exposure to asbestos estimated as approximately 1 fibre/ml.hrs per year, for 5 years, for pupils.
Outcome – at the school with cupboards:
Relatively low risks to the pupils

- The predicted risks were very low for individual pupils in comparison with other risks
  - for example, a small fraction of the risks from smoking and a fraction of the lifetime risk of being a victim of murder.
- Benchmarks below which non-occupational risks are generally considered to be “acceptable” are very low at 1 in 100,000.
- This benchmark was slightly exceeded by our best estimate of predicted risks of lung cancer and mesothelioma.

Risk within a large population

- Low risk to the individual
- Expectation of incidence of disease if large populations are exposed

The predicted risks are not always so low

Same school, 20 years as teacher in affected class room

Estimated risk of mesothelioma:
- best estimate 10 in 100,000
- Upper estimate 40 in 100,000

Small population
Lung cancer risks

- Asbestos-related increase in lung cancer risks may cause more deaths
- But these are generally still a small percentage of smoking related lung cancer deaths

Key issues in risk estimation and communication

- Completeness: all relevant facts
- Clarity: explain how the risk estimate is derived
- Uncertainty (in risk estimate)
- Communication (two way)
- Put in context with examples of other familiar risks
- Known and explained magnitude reduces the “uncertainty” factor
- Be careful about value judgements (similar magnitude does not necessarily make risks “equivalent” in acceptability)
- Independence / trust
- Expertise (epidemiology, retrospective exposure estimation, asbestos measurement, asbestos related diseases)

Modern understanding of risk

- No known threshold below which exposure would be completely safe
- Relationships between exposure and risk
  - for mesothelioma and
  - for risk lung cancer
- Health Effects Institute (review 1991), Hodgson and Darnton, 2005
IOM and asbestos

- Research (published) reports
- Legal reports
- Practical advice
- Preparation of guidance
- Confidential reports to clients

Asbestos continues to be a major hazard in the UK and even more so in the developing world.