Welcome to Asbestos 2019

Thank you to our exhibitors

FAAM BOHS

MANAGING ASBESTOS REMOVAL CONTRACTS

Bruce Sutherland MFAAM, MIDE, CFIOSH

Aspire Safety Ltd

LICENSED WORK - FRIABLE

THERMAL INSULATION, SPRAY COATING AND ASBESTOS INSULATING BOARD

- 400 Contractors – 4000 workers
- Annual Training
- Face fit test and 2 yearly medical
- Generally full enclosure – Negative Pressure Hepa 8 to 10 air changes per hour
- Powered full face RPE P3 filters
- 2 stage decontamination – Type H vacuum and then shower
- End Point – visual and air test by ISO 17025 consultant PCM 0.01f/ml

NON LICENSED WORK

THE MAJORITY OF THE REST – ASBESTOS CEMENT, ROPE, GASKETS, TEXTURED COATING, VINYL FLOOR TILES AND SOME SHORT DURATION WORK ON PRODUCTS THAT ARE LICENSED

- Lots of Contractors – lots of workers
- Annual Training
- Face fit test and sometimes 3 yearly medical
- No enclosure
- Half mask or disposable P3 filters
- Decontamination -Type H vacuum or removing coveralls
- End point contractors own visual

REGULATORY INVOLVEMENT

- Licensed – notification 14 days all issued by HSE – 3 years
- Notifiable non licensed notification depends on speed of internet
- HSE
- ORR - Rail
- ONR - Nuclear
- LA

- Waste – EA / SEPA ……VOSA

Product
What you are doing to it
Where it is

Product
What you are doing to it
Where it is

Product
What you are doing to it
Where it is
End point
Caveats

The Three C's

- Client
- Consultants
- Contractors

CLIENT

- Organisation or Person who pays the end bill
- May not even own the asbestos could just be a tenant wanting to do some building work
- Who do they get their information from?
- Survey
- What type of work with asbestos is it and who is going to do it
- Specification
- Expectation - Caveats

CONSULTANT

- Organisation or Person who can advise Client and may be UKAS accredited against ISO 17025 to do Four Stage Clearance
- Likely to be technically trained in asbestos
- But what about trained in writing specifications, project management and health and safety?
- Caveats
- Analyst doing the four stage clearance

CONTRACTOR REMOVALIST

- Licensed or staff have just done a days course
- Survey
- Specification
- POW – caveats
- Staff – direct, agency, short term contracts
- Control

THINGS

REMOVALIST THINGS!

- **Workforce**
- **Smoke Test**
- **Enclosure Ventilation**
- **Blagging**
- **RR833**
- **Electrocution - Cwmcarn – James Paul – 26 died 2013, Inquest 2016 PR Caswell 2016 in liquidation£10k fine (£200 to £1m)**
- **Heat**
- **Collapse**
- **Work at height**


EGG &
WATERCRESS
CHOP
CHOP


CCTV IN
OPERATION
asbo


asbe

How to split clean from dirty?

Now we know why its out of scope?

- CDM
- Tehidy

THE FOURTH C

THE FOURTH C - CDM

- **Client**
- Provide Information
- Check competency
- Make appointments – PD, PC
- Notify F10

- **Designer**
- Provide Information
- Check competency
- Make appointments – PD, PC

- **Contractor**
- H and S Plan
- Check competency
- Manage
- H and S File

THE FOURTH C

- construction work" means the carrying out of any building, civil engineering or engineering construction work and includes—
- (a)
- the construction, alteration, conversion, fitting out, commissioning, renovation, repair, upkeep, redecoration or other maintenance (including cleaning which involves the use of water or an abrasive at high pressure, or the use of corrosive or toxic substances), de-commissioning, demolition or dismantling of a structure;
- (b)
- the preparation for an intended structure, including site clearance, exploration, investigation (but not site survey) and excavation (but not pre-construction archaeological investigations), and the clearance or preparation of the site or structure for use or occupation at its conclusion;
- (c)
- the assembly on site of prefabricated elements to form a structure or the disassembly on site of the prefabricated elements which, immediately before such disassembly, formed a structure;
- (d)
- the removal of a structure, or of any product or waste resulting from demolition or dismantling of a structure, or from disassembly of prefabricated elements which immediately before such disassembly formed such a structure;
- (e)
- the installation, commissioning, maintenance, repair or removal of mechanical, electrical, gas, compressed air, hydraulic, telecommunications, computer or similar services which are normally fixed within or to a structure,

THE FOURTH C

- "contractor" means any person (including a non-domestic client) who, in the course or furtherance of a business, carries out, manages or controls construction work;
- "design" includes drawings, design details, specifications and bills of quantities (including specification of articles or substances) relating to a structure, and calculations prepared for the purpose of a design;
- "designer" means any person (including a client, contractor or other person referred to in these Regulations) who in the course or furtherance of a business—
- (a)
- prepares or modifies a design; or
- (b)
- arranges for, or instructs, any person under their control to do so,
- relating to a structure, or to a product or mechanical or electrical system intended for a particular structure, and a person is deemed to prepare a design where a design is prepared by a person under their control;

THE FIFTH C

Court and Cost

- Sentencing Guidelines Feb 2016
- Culpability
- Seriousness of Harm
- Likelihood
- Means
- R V Science Museum

Large
Turnover or equivalent: £50 million and over

	Starting point	Category range
Very high culpability		
Harm category 1	£4,000,000	£2,600,000 – £10,000,000
Harm category 2	£2,000,000	£1,000,000 – £5,250,000
Harm category 3	£1,000,000	£500,000 – £2,700,000
Harm category 4	£500,000	£240,000 – £1,300,000
High culpability		
Harm category 1	£2,400,000	£1,500,000 – £6,000,000
Harm category 2	£1,100,000	£550,000 – £2,900,000
Harm category 3	£540,000	£250,000 – £1,450,000
Harm category 4	£240,000	£120,000 – £700,000
Medium culpability		
Harm category 1	£1,300,000	£800,000 – £3,250,000
Harm category 2	£600,000	£300,000 – £1,500,000
Harm category 3	£300,000	£130,000 – £750,000
Harm category 4	£130,000	£50,000 – £350,000
Low culpability		
Harm category 1	£300,000	£180,000 – £700,000
Harm category 2	£100,000	£35,000 – £250,000
Harm category 3	£35,000	£10,000 – £140,000
Harm category 4	£10,000	£3,000 – £60,000

Please refer to the guideline(s) on the Sentencing Council website www.sentencingcouncil.org.uk

Small
Turnover or equivalent: between £2 million and £10 million

	Starting point	Category range
Very high culpability		
Harm category 1	£450,000	£300,000 – £1,600,000
Harm category 2	£200,000	£100,000 – £800,000
Harm category 3	£100,000	£50,000 – £400,000
Harm category 4	£50,000	£20,000 – £190,000
High culpability		
Harm category 1	£250,000	£170,000 – £1,000,000
Harm category 2	£100,000	£50,000 – £450,000
Harm category 3	£54,000	£25,000 – £210,000
Harm category 4	£24,000	£12,000 – £100,000
Medium culpability		
Harm category 1	£160,000	£100,000 – £600,000
Harm category 2	£54,000	£25,000 – £230,000
Harm category 3	£24,000	£12,000 – £100,000
Harm category 4	£12,000	£4,000 – £50,000
Low culpability		
Harm category 1	£45,000	£25,000 – £130,000
Harm category 2	£9,000	£3,000 – £40,000
Harm category 3	£3,000	£700 – £14,000
Harm category 4	£700	£100 – £5,000

- Expectation
- Specification
- Caveats
- Communication

- MANAGEMENT

Asbestos 2019

20th November 2019

Tracey Boyle MSc DipOH CFFOH MFAAM
Chartered Occupational Hygienist

Retrospective risk assessment

WES
Workplace Environment Solutions
Chartered Occupational Hygienists

Hodgson and Darnton (2000)

- Tradesperson – 0.01 to 0.03 fibre/ml years
  - Roughly 4.7 to 11 deaths / 100,000 (best estimate)

- Staff – 0.001 to 0.003 fibre/ml years
  - 0.54 to 1.3 deaths/100,000

  so a slight risk above 'insignificant'

- Public - 0.00004 to 0.00017 fibre/ml years
  - 0.66 deaths/100,000 (for an infant)
  - 0.024 deaths/100,000 (for a 55 year old)

  So insignificant risk

WES Workplace Environment Solutions
Chartered Occupational Hygienists

Hodgson and Darnton (2000)

"No estimates have been given for lifetime risks lower than 1 in 100 000, and this level is referred to as 'insignificant'.

A lifetime risk of 1 in 100 000 corresponds to an annual risk well below 1 in a million, which HSE has suggested (1999) as a "guideline for the boundary between the broadly acceptable and tolerable regions [of fatal risk to an individual]."

It is also well below the level at which it is suggested that mesothelioma would occur in the absence of asbestos exposure: a clear majority of the very few mesotheliomas that would occur at this level would not be caused by asbestos."

**Hodgson and Darnton (2000): The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos Exposure, Ann Occup Hyg Vol 44, No 8*

WES Workplace Environment Solutions
Chartered Occupational Hygienists

Asbestos risk matrix

	Application/ Interpretation	Exposure likelihood			
		Probable	Possible	Remote	Nil/ negligible
SERIOUS HEALTH EFFECT	Asbestosis Lung cancer Mesothelioma	Exposures to multiples of the control limit	Exposure above the control limit likely	Control limit for amphibole forms and for chrysotile	Benchmark
Based on 5 years exposure (typical worker aged 30-35)					

Table taken from HSE's operational circular OC365 (~2014)

Exposure level	Duration	Risk estimate
0.1 f/ml	5 years	89 in 100,000
5-10 f/ml	4-6 hours	4.7-11 in 100,00

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Risk Perception

- No safe level
- No exposures are acceptable
- All retrospective risk assessments carry uncertainty – numbers act as a rough guide only

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Risk Perception- what do we tell the person exposed

- One fibre won't kill you
- We all have lots of asbestos in our lungs
- One off incidents typically present low risks – so you shouldn't worry
- BUT your employer SHOULD NOT have allowed this to happen

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Risk Perception – the Courts

- ‘Material risk’ – disease claims, looking back was there enough exposure even if the risk was low
- Sentencing – looking forward, what is the likely level of harm
- Harm categories (H, M, L) are not defined for asbestos but we should not over-egg the risk because of guilt

Risk Perception – the Courts

Cause of death	Annual risk
Cancer	1 in 387
Injury & poisoning	1 in 3,137
Accidents	1 in 4,064
Road accidents	1 in 18,800
Lung cancer - radon	1 in 29,000
Gas incident	1 in 1,510,000
Lightning	1 in 18,700,000

http://www.hse.gov.uk/risk/theory/r2p2.pdf

Council fined £200k for exposing primary school staff to asbestos

4 September 2018

A school in Sittingbourne, Kent failed to heed recommendations from a survey to remove asbestos disturbed by its caretaker 18 months earlier, a court was told.

Kent County Council was fined £200,000 for the oversight because, as the employer under the Health and Safety at Work Act, it had failed to ensure

Under the sentencing guidelines, Judge Heather Norton said the case was medium culpability, harm category 3. Dealing with the council as a large organisation, she reduced the starting point

transferred to the Stour Academy Trust and was no

Reasonable worst case scenario was 0.03 fibre/ml years

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Health and Safety
Executive

Asbestos Incident Retrospective Risk Analysis

FAAM CONFERENCE

Nottingham

November 2019

Dr Martin Gibson

HSE

Agenda

- Risk model uncertainty
- Defined boundaries on harm risk categories

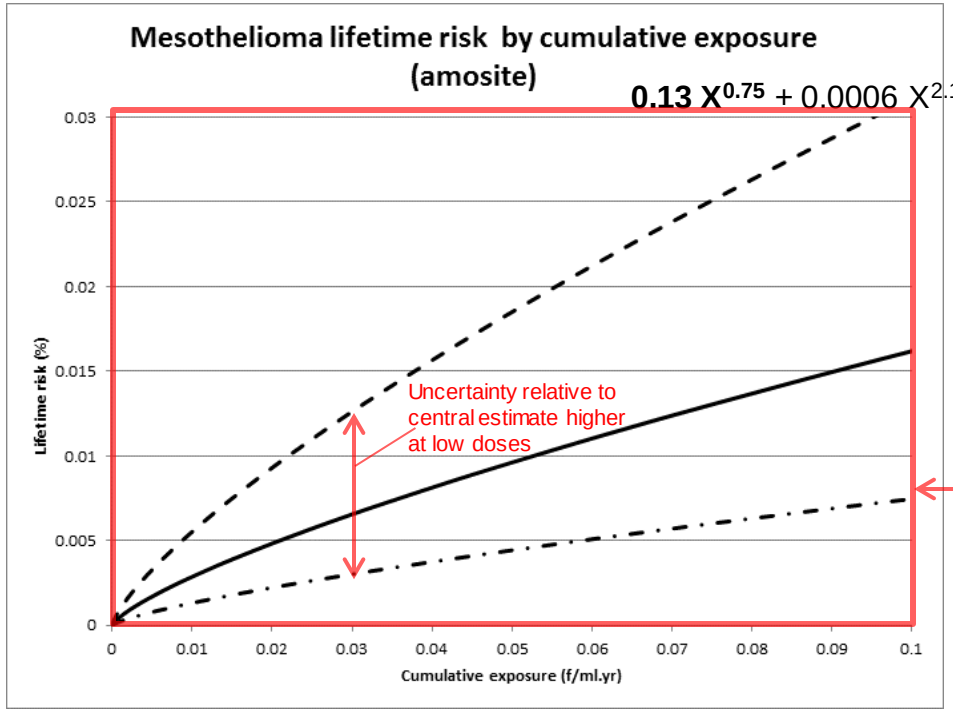
RRA/RISK Models: Word of Caution

- Risk predictions encompass considerable uncertainty from the calculation of the exposure doses and from the risk models themselves.
- Quality of information very important:
  - Work conditions and circumstances
  - Establishing exposure doses
- The calculated numbers suggest a particular level of accuracy but the results are never definitive and will always have a large degree of uncertainty

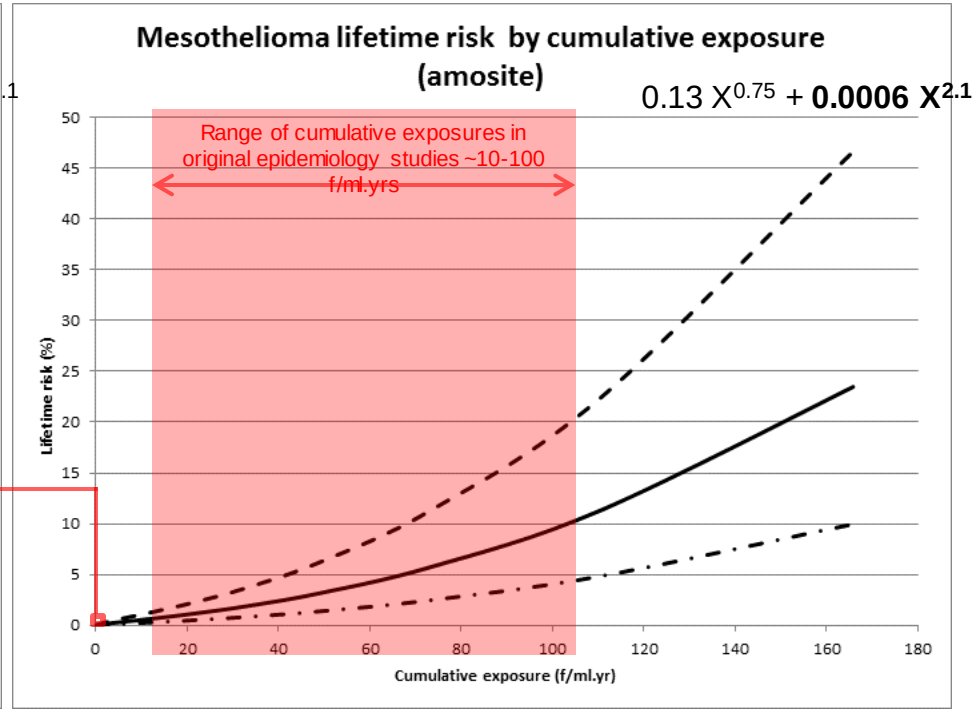
Risk Model Uncertainty

(Lifetime risk in relation to cumulative asbestos exposure accrued over 5 years from age 30 based on Hodgson and Darnton 2000)

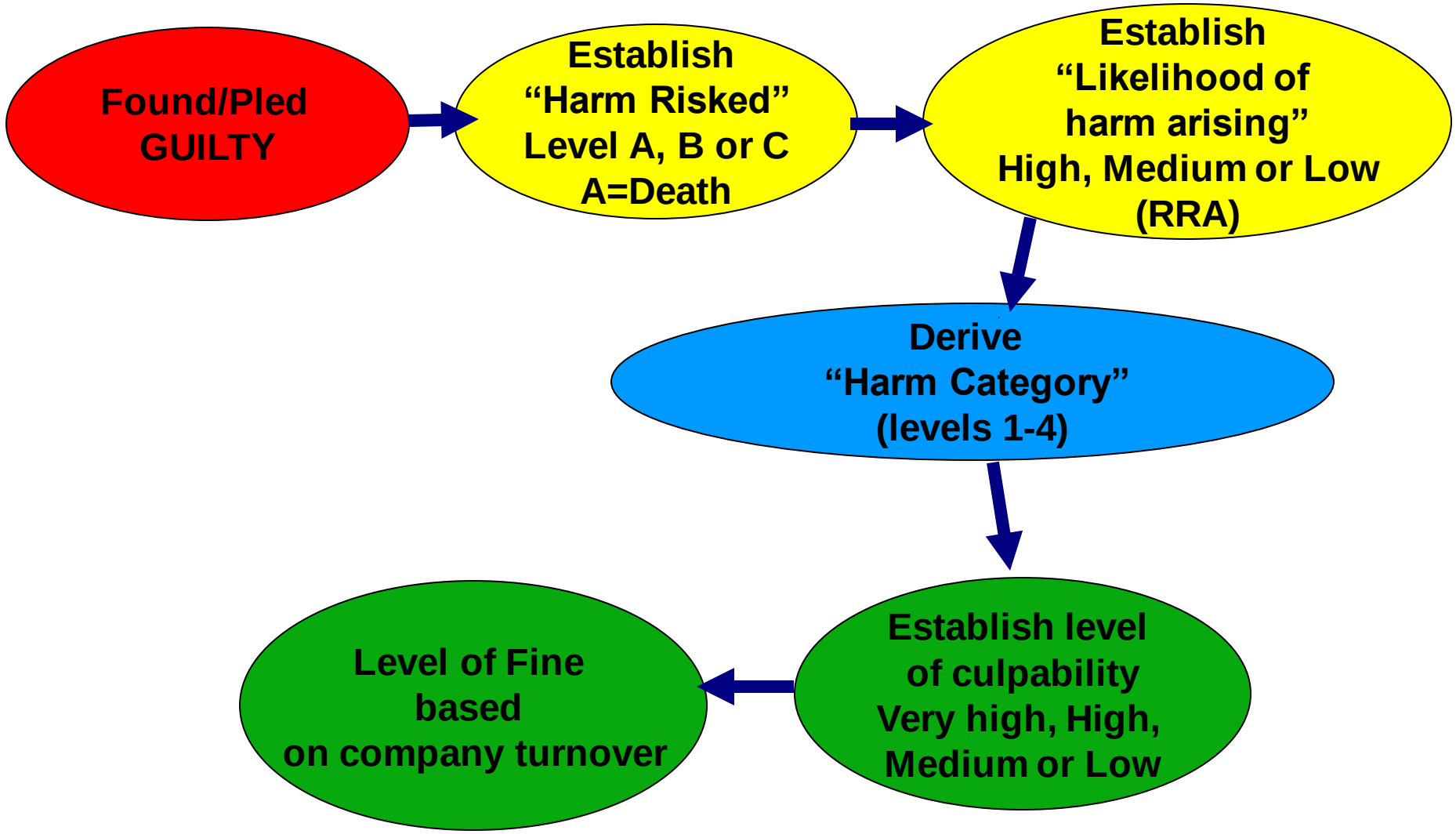
Lower doses



Higher doses



Sentencing Guidelines: Process Summary for the Court



Harm: "Seriousness of harm risked": A, B or C (Not probability)

- There is NO safe level of exposure
- The risk of death is NEVER zero
  - Even with low or very low exposures
- Seriousness of harm risked is always Level A

Health outcome	Seriousness of harm risked		
	Level A • Death • Physical or mental impairment resulting in lifelong dependency on third party care for basic needs • Significantly reduced life expectancy	**Level B** • Physical or mental impairment, not amounting to Level A, which has a substantial and long-term effect on the sufferer's ability to carry out normal day-to-day activities or on their ability to return to work • A progressive, permanent or irreversible condition	**Level C** • All other cases not falling within Level A or Level B

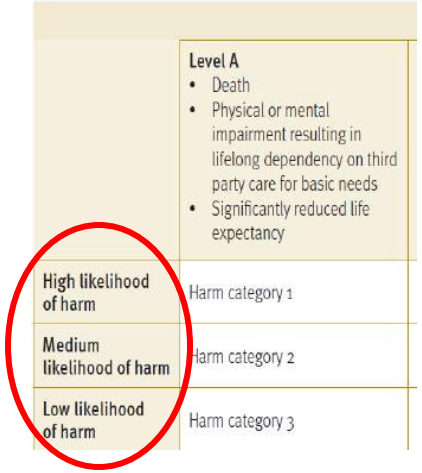
Harm: “Likelihood of harm occurring” (ie probability)

RRA

Health outcome	Level A • Death • Physical or mental impairment resulting in lifelong dependency on third party care for basic needs • Significantly reduced life expectancy
High likelihood of harm	Harm category 1
Medium likelihood of harm	Harm category 2
Low likelihood of harm	Harm category 3

Sentencing Guidelines: Likelihood of Harm: RRA

- Currently: No guidance on what "Low, Medium and High" means quantitatively
- To assist the court, there needs to be some guidance on what Low, Medium and High mean quantitatively ie quantitative boundaries between:
  - Low and medium risk
  - Medium and high risk
- Probability needs a context rather than random views on what constitutes low, medium and high



	Level A • Death • Physical or mental impairment resulting in lifelong dependency on third party care for basic needs • Significantly reduced life expectancy
High likelihood of harm	Harm category 1
Medium likelihood of harm	Harm category 2
Low likelihood of harm	Harm category 3

Incident
Likelihood (Probability) of Harm

- **Likelihood of harm depends on:**
  - Exposure level and duration
- **Incident:**
  - Asbestos Type: Amosite
  - Exposure Duration: 4-6hours
  - Exposure Level: 5-10f/ml
- **Exposure Dose:**
  - Tradesperson: 0.01-0.03f/ml.yrs
  - Staff: 10x less
  - Public: 100x less

Sentencing Guidelines: Likelihood of Harm: Context

- **Establishing boundary between low and medium risk:**
  - **There is a background risk of developing mesothelioma in the UK**
  - **1 in 10,000 (0.01%)(Ref).**
  - **Most would agree that this a low risk.**
- **This risk level has been used in civil cases as the benchmark and test for causation in mesothelioma cases**

Sentencing Guidelines: Causation of Disease: Civil Cases

- Supreme Court held view that a "material" increase in risk over background was a suitable test for establishing causation
- "Doubling the risk" over background is a higher threshold than a material increase and statistically (ie on the balance of probabilities) means that it is more likely that, if disease occurred, this exposure dose would be responsible
- This is a significant increase (100%) in risk over background

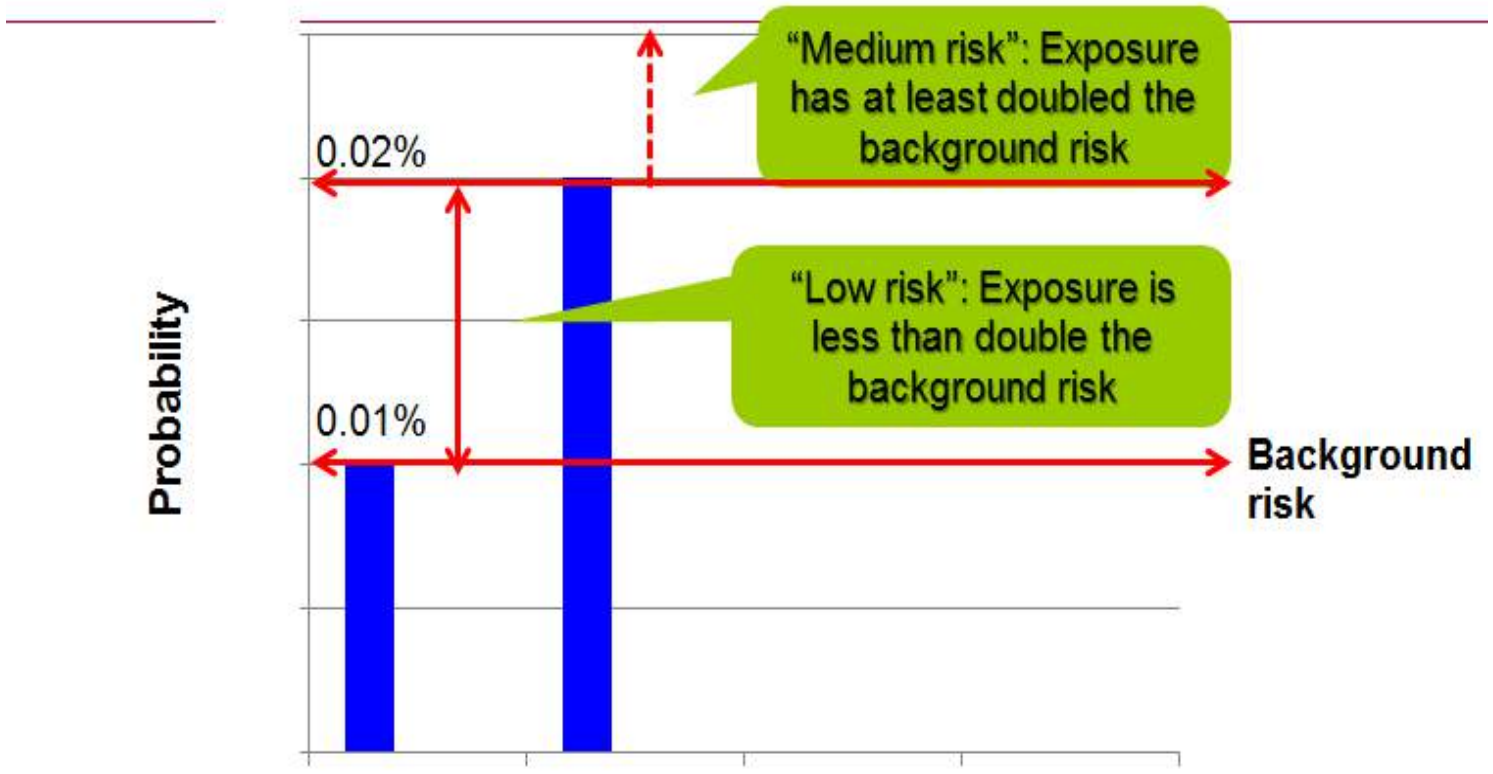
Sentencing Guidelines
Summary Boundary: Low-medium risk

- Doubling the risk over background is a natural boundary for low to medium risk
  - An additional risk of 1 in 10,000 (ie on top of the background risk) doubles the overall risk and therefore more than "materially increases the risk"

- Any exposure which does not at least double the risk over background is considered to be in the low category

Low-medium Boundary:

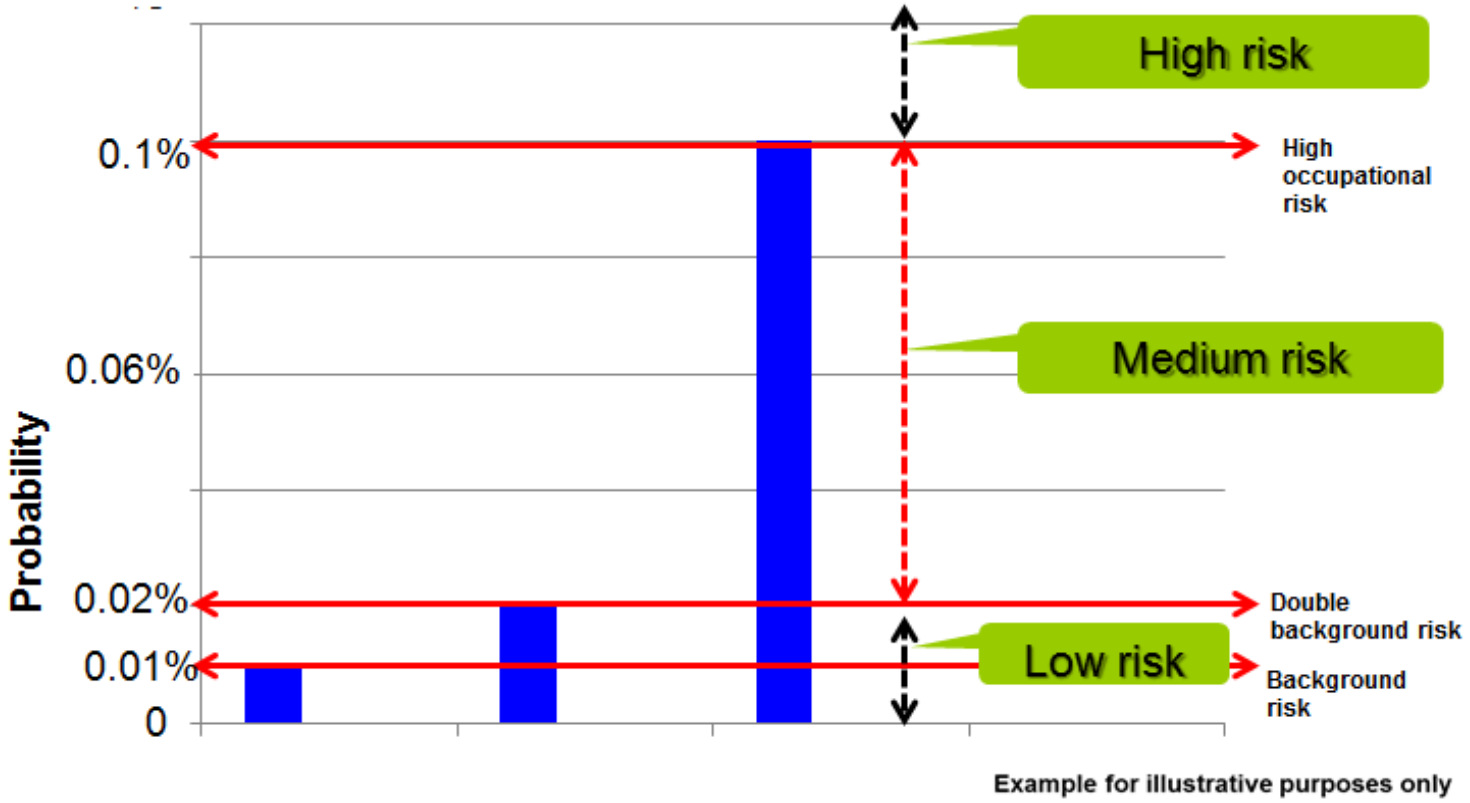
Risk is at-least doubled: More than a “Material increase”



Sentencing Guidelines
Boundary: Medium-high risk

- "High risk" asbestos jobs and activities have given rise to a lifetime risk of developing mesothelioma of 1 in 1000 (0.1%)
- It is 10-fold higher than the background risk of developing mesothelioma
- This risk level forms a natural boundary between medium and high risk

Summary Boundaries: low-medium-high risk



Sentencing Guidelines Boundary Summary

Sentencing Guidelines: Risk Classification Category	Lifetime risk of Developing Mesothelioma	Comments: Asbestos Risk from Incident:
Low	Less than (<) or equal to 1 in 10,000	Additional risk is less than double the background or spontaneous risk from asbestos
Medium	1 in 10,000 to <1 in 1000	Additional risk is significantly higher (ie at least double (ie 100% greater than)) the background risk but is less than the risks for high risk jobs in the past
High	1 in 1000 or higher	Risk consistent with historical high risk jobs and a risk level that is mainly responsible for the current high mesothelioma incidence rate in the UK

Application of the boundaries to the Incident (Dose = 0.01-0.03 f/ml.yrs)

HSE

Cumulative exposure bands for which lifetime risks are Low (L), Medium (M) or High (H)

Cumulative exposure (f/ml.yrs)	Probability of developing mesothelioma (%)	Sentencing Guidelines Likelihood of Harm
10 or more	>0.5	H
0.5 to <10	>0.1	H
0.2 to <0.5	>0.1	H
0.02 to <0.2	0.02-<0.1	M
0.01 to <0.02	0.02-<0.1	M
0.001 to <0.01	<0.02	L
<0.001	<0.01	L

Finally:

HSE website: www.hse.gov.uk/asbestos

- Best to avoid incidents altogether
- Asbestos App..... Web/mobile/Tablet

Risk assessment for the AIB drilling incident: Quantitative approach to sentencing criteria

Andrey Korchevskiy, PhD, DABT, CIH

Dr. Andrey Korchevskiy, PhD, DABT, CIH

- Director of Research and Development at Chemistry & Industrial Hygiene, Inc. (Wheat Ridge, CO)
- Diplomate of American Board of Toxicology (DABT)
- Certified Industrial Hygienist (CIH)
- Distinguished lecturer of AIHA
- PhD in applied mathematics and doctorate in biology
- Chair of the International Task Force for Children's Environmental Health
- Chair of the AIHA Standards Advisory Panel (SAP)

Assumptions:

Category	Worst case cumulative exposure to amosite (f/cc-years)
Tradesperson (25 years old)	0.03
Bystander staff (20-50 years old)	0.003
Public (6 month – 75 years)	0.00017

Quantitative risk assessment results (based on Hodgson, Darnton linear method)

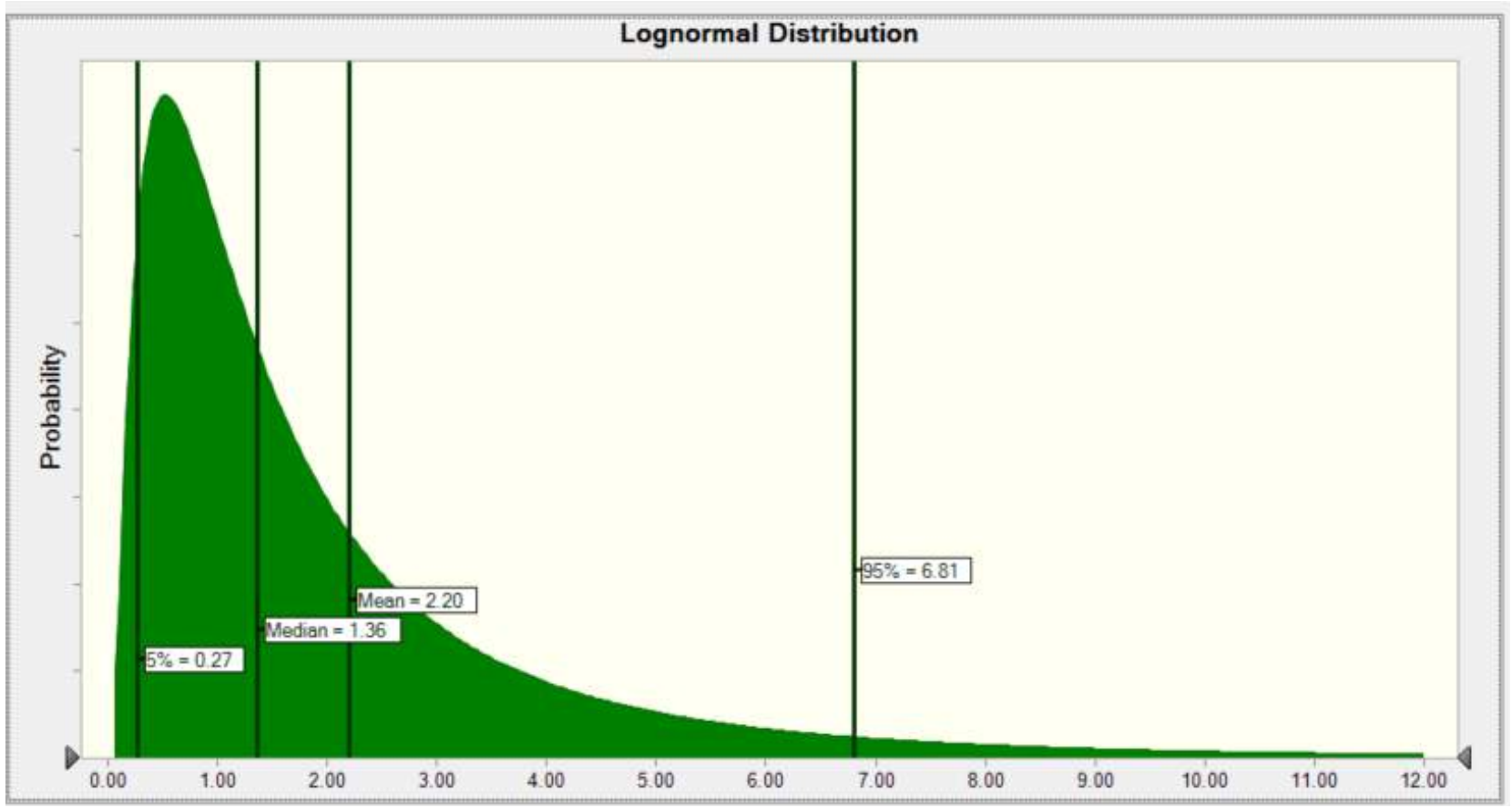
Category	Worst case cumulative exposure to amosite (f/cc-years)	Cancer risk per 1,000,000 per lifetime		
		Mesothelioma	Lung cancer	Total
Tradesperson (25 years old)	0.03	34	58	92
Bystander staff (20-50 years old)	0.003	5	6	11
Public (6 month – 75 years)	0.00017	1	0	1

Quantitative criteria for the likelihood of harm (suggestions)

Workers:	
High	More than 1 case per 1,000 per lifetime
Medium	More than 1 case per 10,000 per lifetime, but lower than 1 case per 1,000 per lifetime
Low	Less than 1 case per 10,000 per lifetime

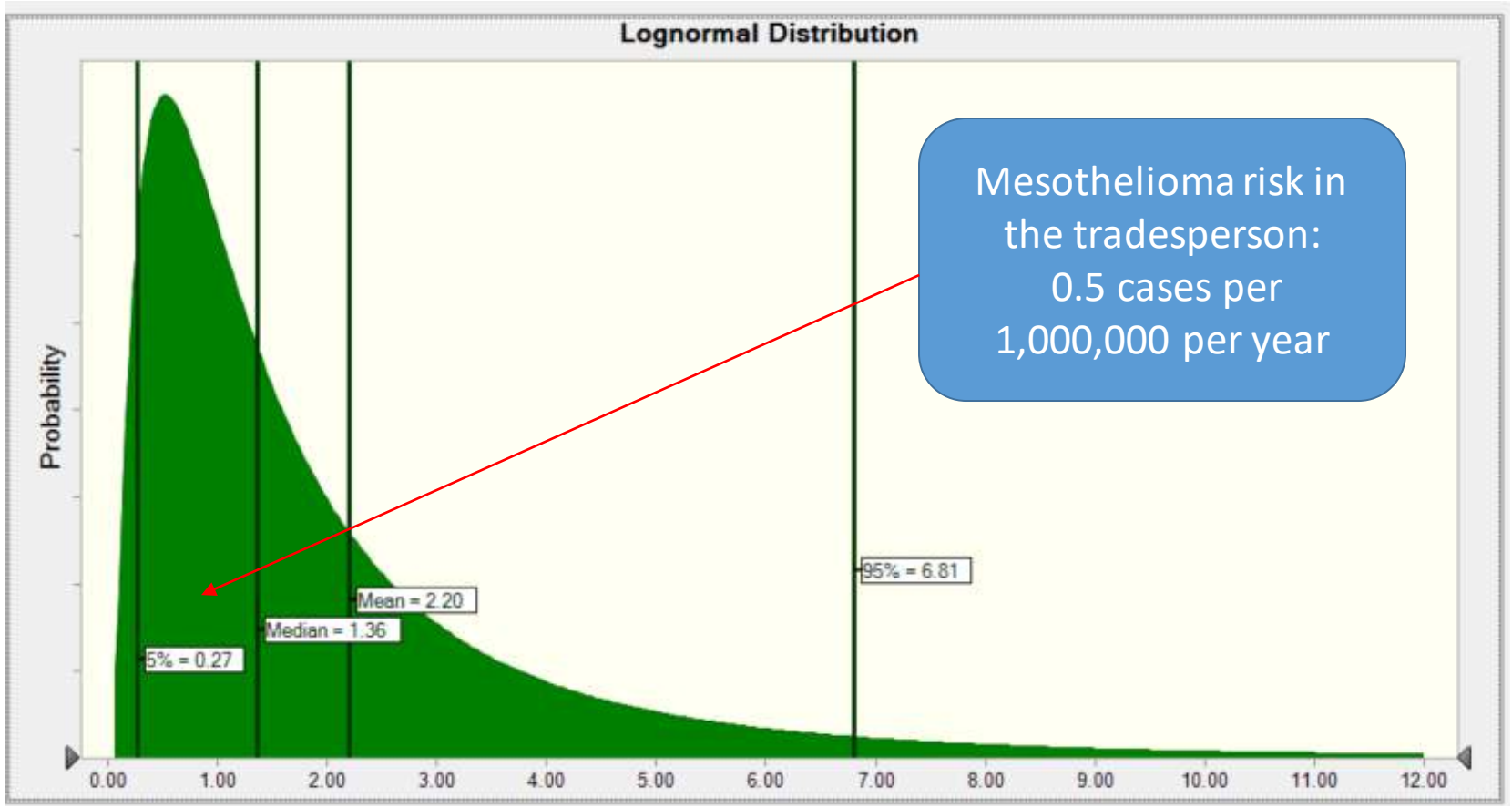
Population:	
High	More than 1 case per 100,000 per lifetime
Medium	More than 1 case per 1,000,000 per lifetime, but lower than 1 case per 100,000 per lifetime
Low	Less than 1 case per 1,000,000 per lifetime

Mesothelioma background rate: Statistical estimation from various sources (Rasmuson, Korchevskiy, 2018)



Cases per 1,000,000 per year

Mesothelioma background rate: Statistical estimation from various sources (Rasmuson, Korchevskiy, 2018)



Cases per 1,000,000 per year

What is seriousness of harm for the case?

- Level A (most probably cancer is classified as such)
- However, the incident could add some excess value to cancer probability, but very improbably will be causative for the illness or mortality (background risk seems to be significantly higher)

What is the category of harm in this case?

Not higher than Category 3, but can potentially be argued for Category 4 (because the excess risk is well below the background range).

Are the current sentencing criteria satisfactory?

Potentially, some adjustments may be needed…

Thank you for your attention!