Gary Pharo
gary.pharo@srsafety.com

PCA – Most Damaging Respiratory Hazards both Current & Future

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AGENDA

- ❑ Work Related & Occupational Respiratory Health
- ❑ Selecting R.P.E
- ❑ Facial Hair
- ❑ Types of Hazards
- ❑ Current & Future Respiratory Hazards
  - Counterfeit Products
  - HSE Focus Areas
  - Construction Dust
    - Wood dust
    - Respirable Crystalline Silica
  - Asbestos
  - Welding Fumes
  - MMMF
  - Diesel Fumes
  - Pandemics

RESPIRATORY PROTECTION SINCE 1926

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WORK-RELATED & OCCUPATIONAL RESPIRATORY HEALTH
SOME COLD HARD FACTS

1 The percentage of work related deaths attributed to poor safety

99 The percentage of work related deaths attributed to ill health

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WORK-RELATED & OCCUPATIONAL RESPIRATORY HEALTH

12,000 people will sadly lose their lives this year due to past workplace exposure

18,000 new cases of “breathing and lung problems” each year caused or made worse by work

43,000 people who worked in the last 12 months currently have “breathing or lung problems” they regard as caused or made worse by work

144,000 people who have ever worked currently have “breathing or lung problems” they regard as caused or made worse by work

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WORK-RELATED & OCCUPATIONAL RESPIRATORY HEALTH

In 2018 there were 4,255 new cases of occupational lung diseases assessed for Industrial Injuries Disablement Benefit (IIDB), of which:

3,920 (92%) were diseases associated with past asbestos exposure

285 (7%) were non-malignant long latency diseases, and

45 (1%) were cases of shorter latency disease (occupational asthma and allergic alveolitis)

WORK-RELATED & OCCUPATIONAL RESPIRATORY HEALTH
THE POSITIVE OUTLOOK

The good news is that we can protect workers' health and actually prevent most of these deaths by:

Recognising the hazards

Evaluating the risks

Controlling exposures

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HIERARCHY OF CONTROLS

The laws governing the control of harmful substances in the workplace (COSHH), and their supporting ACOP, say that you should only use RPE after you have taken all other reasonably practicable measures to prevent or control exposure.

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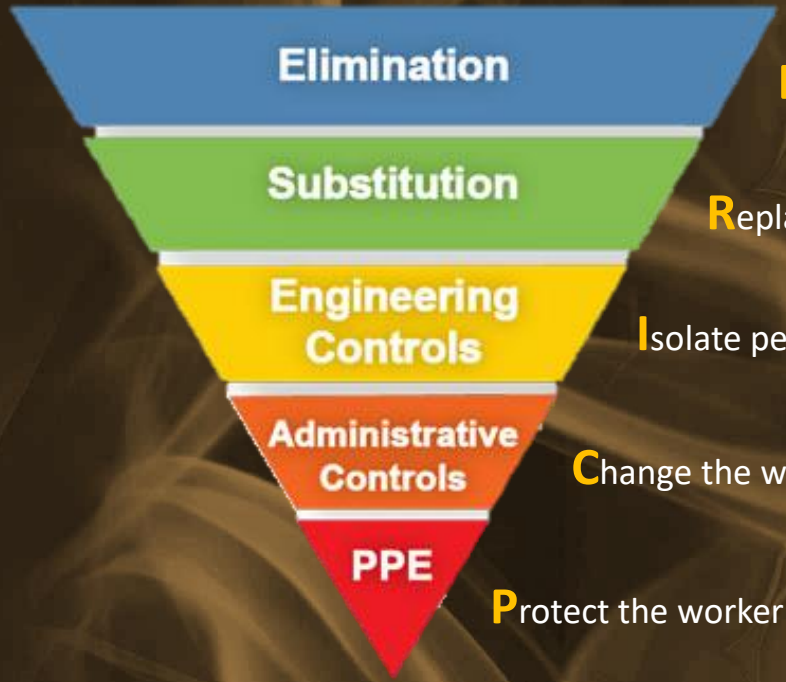
HIERARCHY OF CONTROLS

Most effective

Least effective



Eliminate the hazard

Replace the hazard

Isolate people from the hazard

Change the way people work

Protect the worker with PPE

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TYPES OF RPE

Most Effective

Least effective

Breathing apparatus

The user is supplied with breathable air from a non-contaminated source

Not dependent on surrounding atmosphere

Filter Purification

Air passes through a filter that remove contaminants

Dependent on surrounding atmosphere

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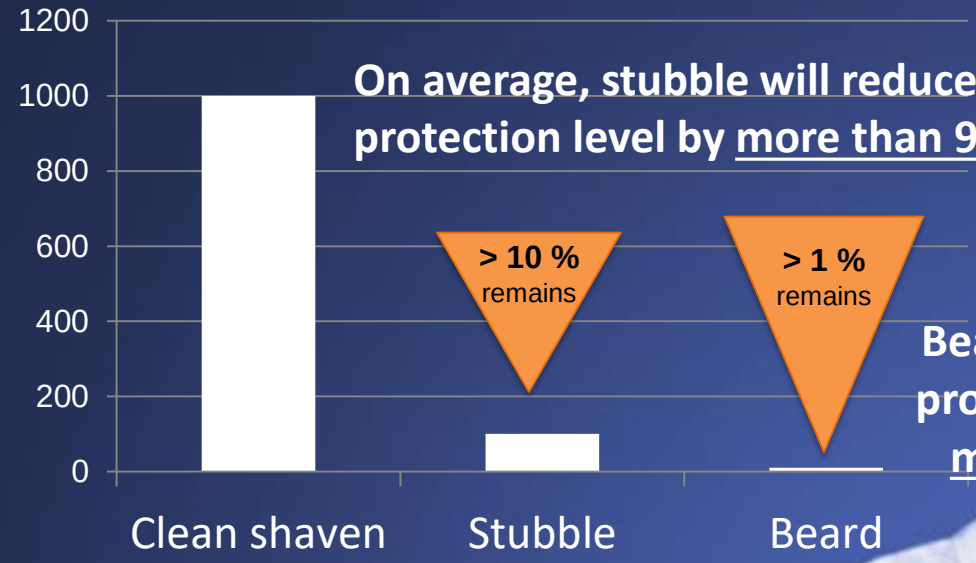
FACIAL HAIR AND PROTECTION FACTOR



On average, stubble will reduce the protection level by more than 90%

> 10 % remains

> 1 % remains

Beards reduce the protection level by more than 99%

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FACIAL HAIR – THE OPTIONS

❖ Remove the person from the hazardous environment
This isn't always possible or realistic

❖ Introduce a clean shaven requirement into your health and safety policy.
Requires a good management system to be in place, requires constant monitoring and supervision, and actions taken when breaches with the policy occur. It can prove challenging to enforce, but establishes a level playing field for all staff.

❖ Supply alternative RPE that does not rely on a tight seal
A clean shaven policy may not be possible to enforce in certain circumstances such as where beards are worn for religious reasons, or someone has a genuine skin complaint that makes it impractical to shave every day. In these instances you'll be required to supply alternative RPE that does not rely on a tight seal.

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WAYS OF EXPOSURE

- Through the skin
- Through the digestive system
- Through inhalation

The main route of exposure for airborne hazards is inhalation

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HEALTH EFFECTS OF COMMON CONTAMINANTS

Brain & Nervous System
Dizziness, Headaches, Memory Loss, Impaired Motor Functions
Pesticides, Solvents, Lead, Mercury, Arsenic, Manganese, Cadmium, Acetone, Petrol, Kerosene, Adhesives

Lungs
Asthma, COPD, Silicosis, Lung Cancer, Mesothelioma
Fine particulate matter including Flour, Grain, Asbestos, Silica Dust. Metal Dust, Ozone, Cadmium, Diesel Emissions, Welding Fumes, Toluene Diisocyanate, Ammonia, Epoxy Resins, Hexavalent Chromium, Moulds, Viruses

Reproductive System
Damage to unborn Child, Premature Birth, Low Birth Weight, Infertility
Lead, Mercury, Radiation, Benzene, Pesticides, PCB's, Manganese, PVC,

Eyes, Nose & Throat
Failing sight or blindness, Sinusitis, Rhinitis, Nose or Throat Cancer
Isocyanates, Benzene, Formaldehyde, Ammonia, Hexavalent Chromium

Heart & Circulatory System
Heart Attack, Anemia, Chest Pains
Carbon Monoxide, Vinyl Chloride, Benzene, Trichloroethylene and fine particulate matter

Digestive System & Liver
Irritation of stomach and intestines, Nausea, Vomiting, Diarrhoea, Bowel Cancer, Liver Cancer
Formaldehyde, Xylene, Lead, Coke Oven Emissions, Mercury, Welding Fumes, Chlorinated Hydrocarbons

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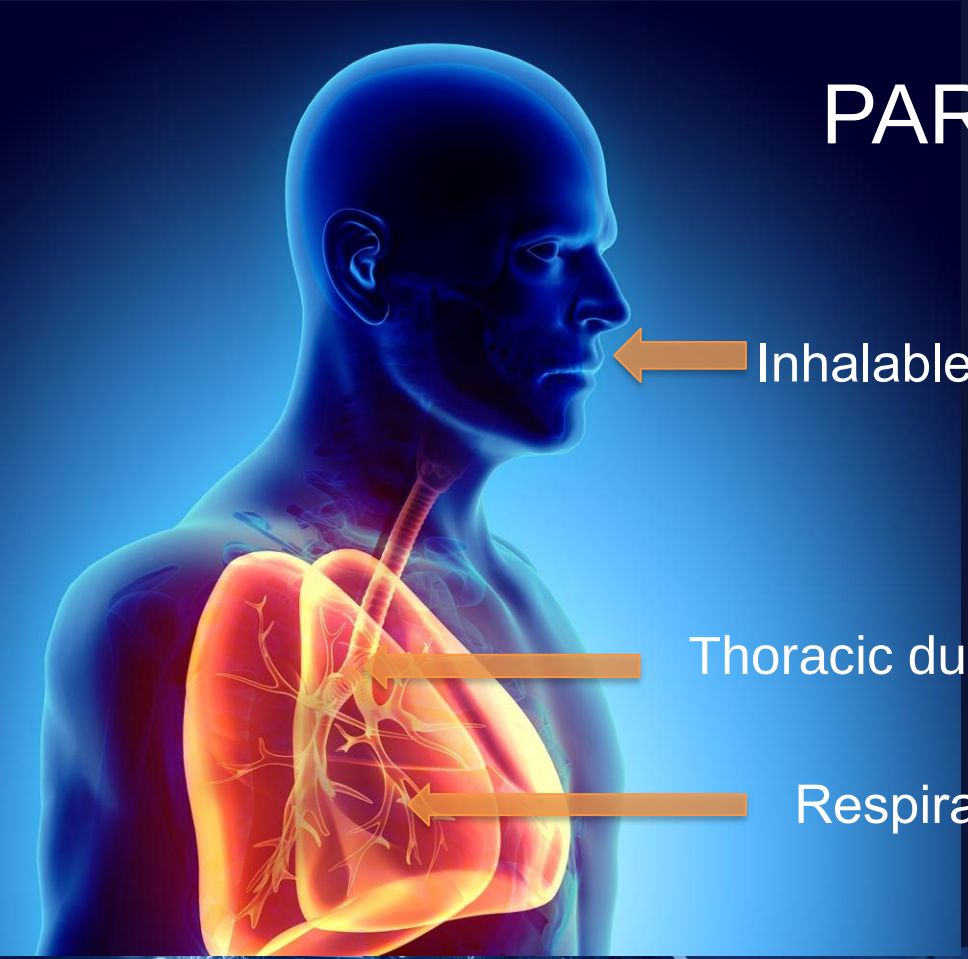
Two types of contaminants – three risk areas

Gas / Vapours

Lack of Oxygen

Particles

PARTICLE SIZE GROUPS



Inhalable dust (100 µm)

Thoracic dust (10 µm)

Respirable dust (4 µm)

Hairs in the nose & throat (cilia) along with mucous membranes in the nose, mouth and throat capture most particles larger than 10 µm

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MOST DAMAGING PARTICLE SIZE

The total active surface area of the 600 million alveoli in our lungs is 75 - 100 m^2

Thats the size of a typical 3 bed house

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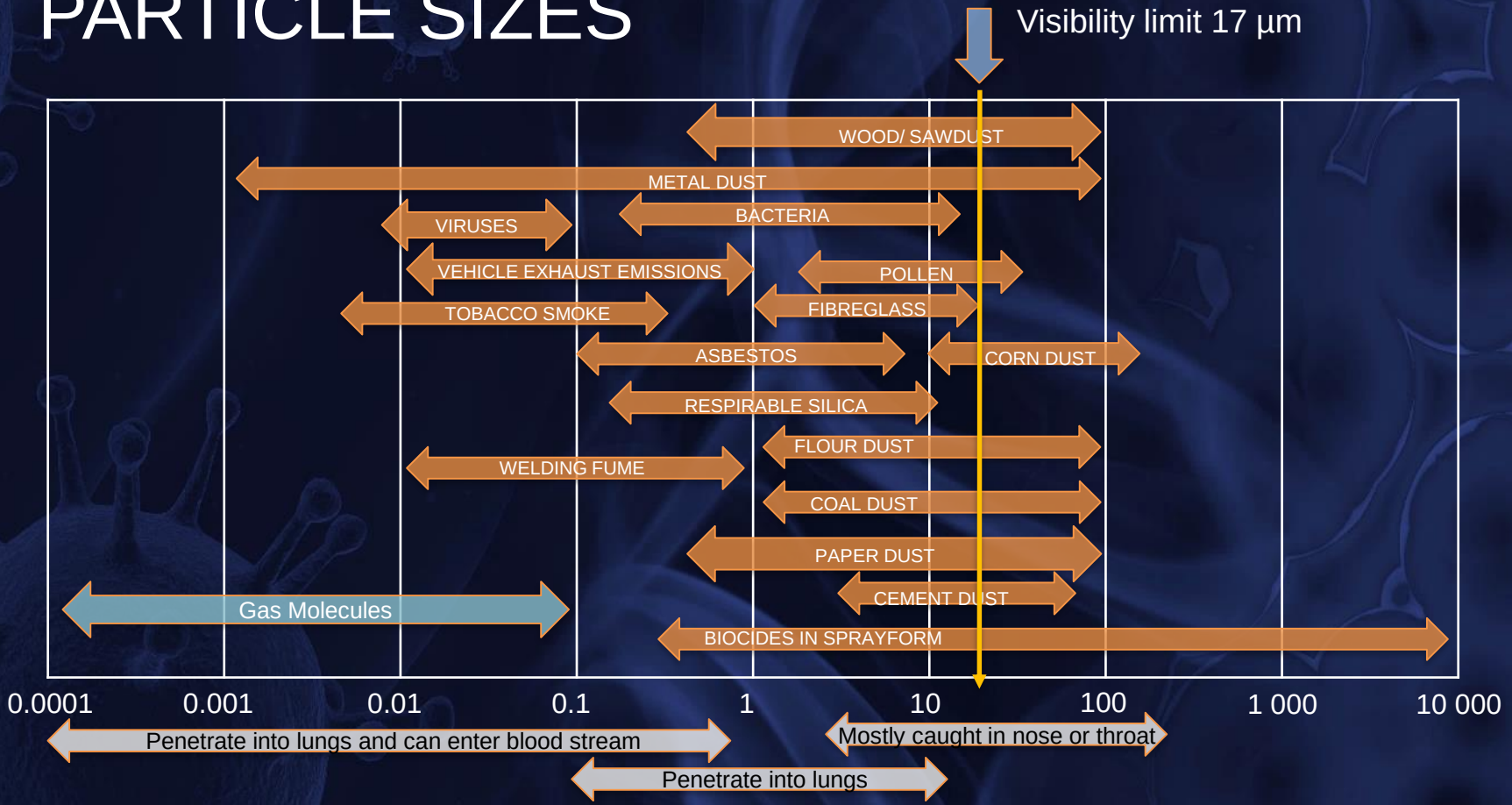
PARTICLE SIZES



PARTICLE CONTAMINANT EXAMPLES

Mould & Fungal Spores

Mineral fibres

(from insulation or asbestos)

Fine dusts from cutting wood, MDF etc

Fine dusts containing silica from concrete, cement and stone

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GAS/ VAPOUR CONTAMINANT EXAMPLES

Working with Solvents

Ammonia

Petrol, Diesel or Kerosene (liquid)

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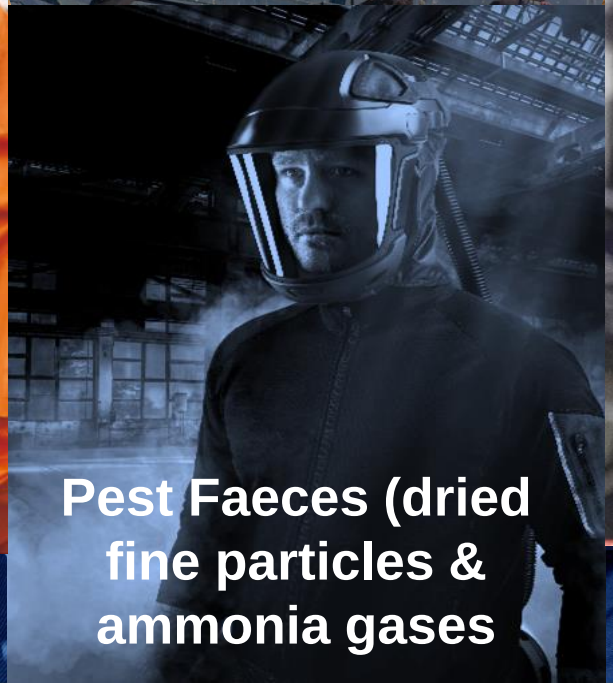
COMBINATION CONTAMINANT EXAMPLES

Spraying Pesticides & Biocides



Pest Faeces (dried fine particles & ammonia gases

Spraying Paints/ Resins

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CURRENT & FUTURE RESPIRATORY HAZARDS

- Counterfeit Products
- HSE Focus Areas
- Construction Dust
  - Wood dust
  - Respirable Crystalline Silica
- Asbestos
- Welding Fumes
- MMMF
- Diesel Fumes
- Pandemics

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COUNTERFEIT PRODUCTS

Is it really a problem

15%

Who has the responsibility

Employers have an obligation to undertake their own due diligence and to ensure that whatever they buy is compliant.

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HSE FOCUS AREAS (OG-00109)

Food manufacture
Woodworking
Welding Fume (fabricated metal, shipbuilding and repair)
Metalworking fluids (MWF's)
Ship and boat building
Molten metals
Concrete products
Stone working
Brick and tile
Potteries and ceramics
Rubber products

CONSTRUCTION DUST

This is a general term used to describe different dusts that you may find on a construction site. There are three main types:

- silica dust – from materials such as concrete, mortar and sandstone
- wood dust – from soft or hard wood and wood-based products like MDF and plywood;
- lower toxicity dusts – most common include gypsum, limestone, marble & dolomite.

The following tasks are most likely to generate construction dust:


Wall chasing


Block and stone cutting


Movement of rubble during site clearance


Demolition


Cutting wood based products


Grinding and sanding


Drilling


Sweeping floors


Carpentry

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WOOD DUST

Both hardwood and softwood dust have a “sen” notification indicating they are capable of causing occupational asthma.

The International Agency for Research on Cancer (IARC) has classified wood dust as category 1 (carcinogenic to humans) carcinogen and makes no distinction between hard and soft woods.

The WEL for hardwood dust is 3mg/m3 (based on an 8-hour time-weighted average).

The WEL for softwood dust is 5mg/m3 (based on an 8-hour time-weighted average).

For mixtures of hardwood & softwood dusts the 3mg/m3 applies to all wood dusts present in that mixture.

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RESPIRABLE CRYSTALLINE SILICA

Silica is a natural mineral found in many construction materials such as concrete and mortar.

Substance	% Silica content
Brick	Up to 30
Concrete, cement, mortar	25 to 70
Tile	30-45
Sandstone, gritstone, quartzite	More than 70
Granite	Up to 30
Sand, gravel, flint	More than 70
Slate	Up to 40
Flint	More than 80

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RESPIRABLE CRYSTALLINE SILICA

The law in the UK requires companies to make sure that staff are breathing in levels of silica dust well below the amount illustrated on a daily basis

(illustration to scale)

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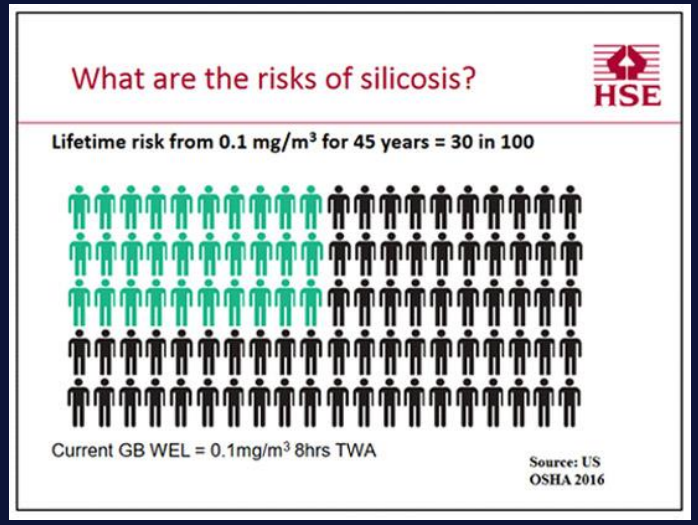
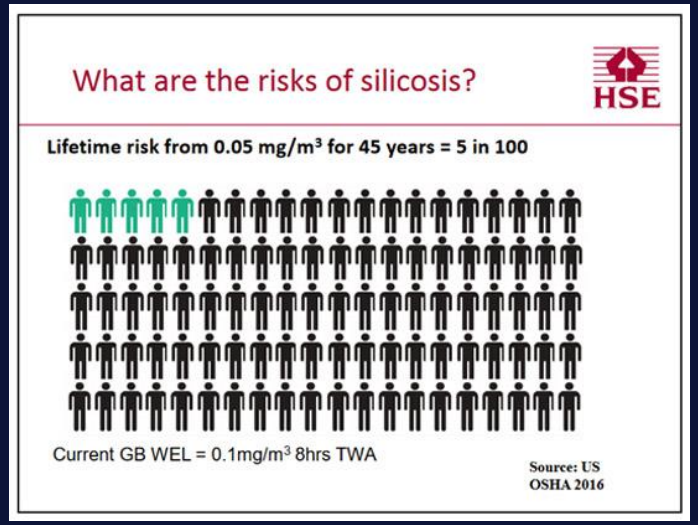
RESPIRABLE CRYSTALLINE SILICA

Unite have launched a register for workers previously exposed to RCS





Since April 2013, HSE‘s pared back inspection programme, has discovered over 1,600 instances of UK companies exposing their workforce to dangerous levels of silica dust.

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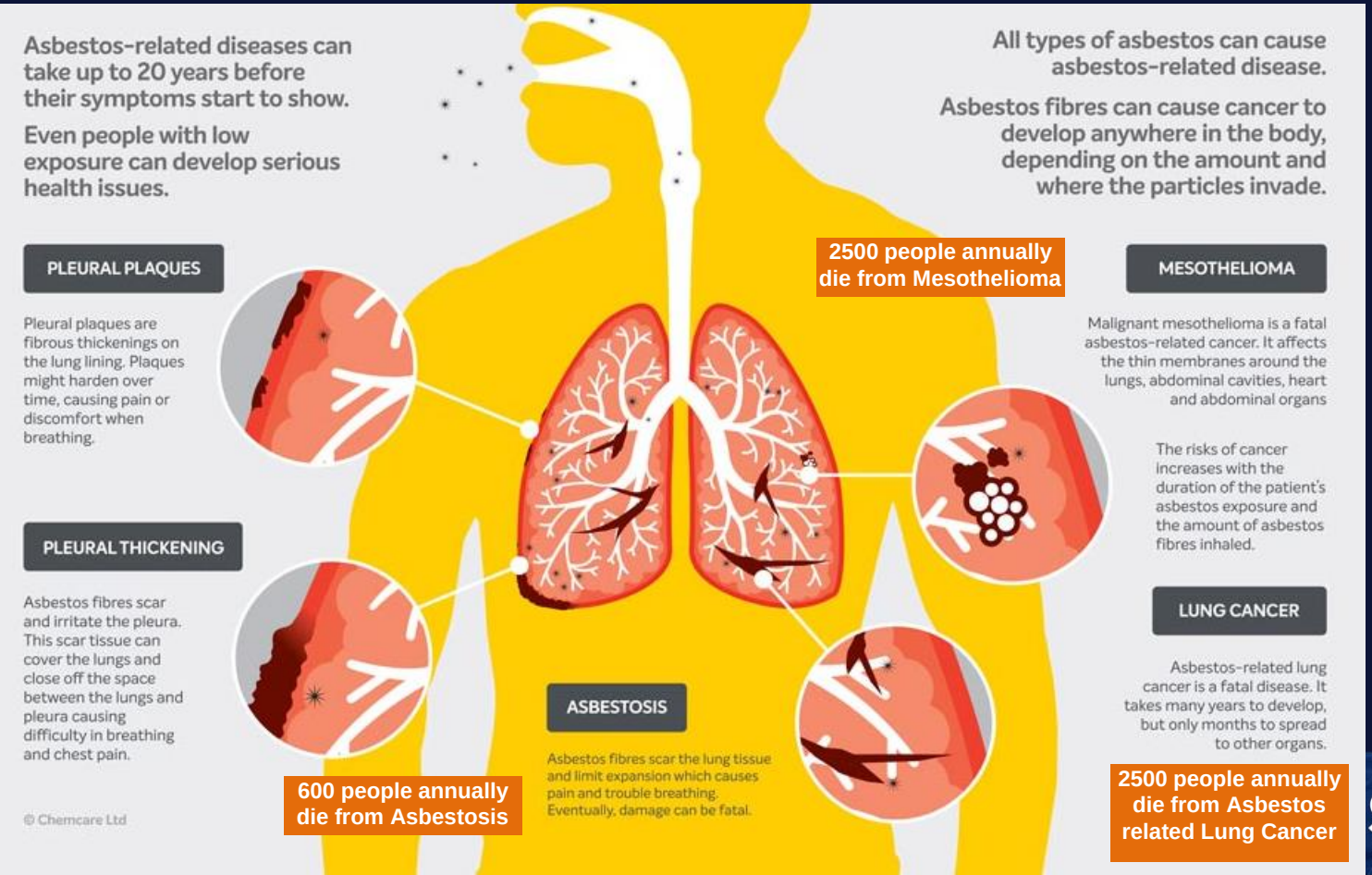
ASBESTOS



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WORK-RELATED & OCCUPATIONAL RESPIRATORY HEALTH: MESOTHELIOMA

1 in 5 Work related deaths are caused by mesothelioma

20 Tradespeople die EVERY WEEK from mesothelioma; of which:

8 Joiners

6 Electricians

4 Plumbers

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WELDING FUME

In January 2019, the HSE shared that they would raise enforced control measures for welding operations in the UK with immediate effect under COSHH Regulation 7. This also applies to hot cutting and similar processes

Indoor welding tasks require the use of LEV. If LEV is unable to control fume capture then Respiratory Protective Equipment (RPE) is also required.

Outdoor welding requires use of RPE.

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Synthetic Mineral Fibres

Ceramic, Glass Wool, Insulation

Ceramic Fibres (Respirable Size).
NTP classification:
Reasonably anticipated to be human carcinogen.

Certain Glass Wool Fibres (Inhalable).
NTP classification: Reasonably anticipated to be a human carcinogen.

Insulation Glass Wool, Stone Wool, and Slag Wool:
Considered not classifiable as to carcinogenicity in humans

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Vehicle Emissions

Including Motor Vehicles, Boats, Trains, Buses & Coaches, Agricultural Machinery, Military Vehicles and other plant which may be used regularly in tunnelling, mining or on construction sites.

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Pandemic Viruses

Coronavirus represents a wide variety of viruses present in animals that can in certain circumstances jump to humans. Contact with meat from various animals sold in Huanan Wholesale Seafood Market has been established as the likely cause of the first reported human infections.

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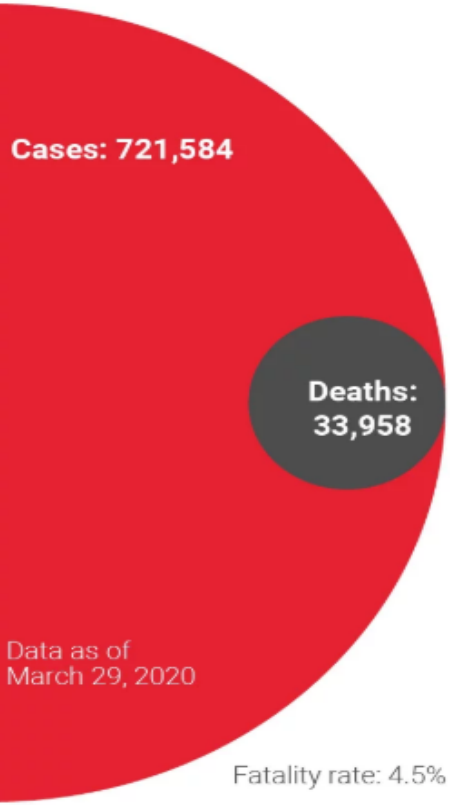
Pandemic Viruses

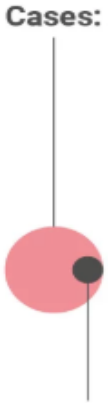
Covid-19
Identified: 2020



Data as of
March 29, 2020

Fatality rate: 4.5%

Sars
Identified: 2003



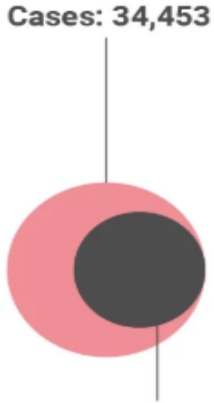
Fatality rate: 10%

Mers
Identified: 2012

Fatality rate: 34.4%

Data as of
November 2019

Ebola
Identified: 1976



Fatality rate: 43.9%

Data as of
January 20, 2020

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Q & A

ukhelpdesk@srsafety.com

KEEP BREATHING

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