

Society Society Society

November 2019

DON'T BREATHE IN:
BRIDGING THE ASBESTOS SAFETY GAP

A review of research, policy and practice

Mark Morrin, Jack Aldane & Hamza King



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ResPublica Acknowledgements

This project has been supported by the independent asbestos campaigner Charles Pickles, whom ResPublica would like to thank for his contribution to this report. The views expressed in this independent publication are those of the authors and Mr. Pickles himself. Case Study material has been drawn from publicly available material, unless specified. Also with thanks to Emily Hansen, for her contributions to the research and analysis of Freedom of Information requests; and, Charlie Hanzel for proofreading.

This report has been written as part of the nationwide campaign 'Airtight on Asbestos' (www.airtightonasbestos.uk), sponsored by Charles Pickles and powered by ResPublica.

Design, layout and graphics by BlondCreative (www.blondcreative.com)

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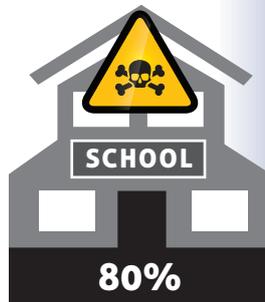
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ELEPHANT IN THE ROOM

There are six million tonnes of asbestos spread across 1.5 million buildings in the UK



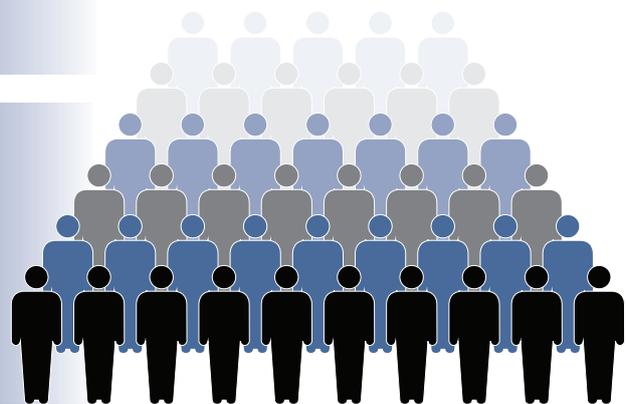
SCHOOLS AND HOSPITALS



Many vital public buildings in the United Kingdom contain high levels of asbestos

KNOWN UNKNOWN

Occupational deaths due to mesothelioma above the age of 75 are not recorded, yet more than half of all deaths occur above this age



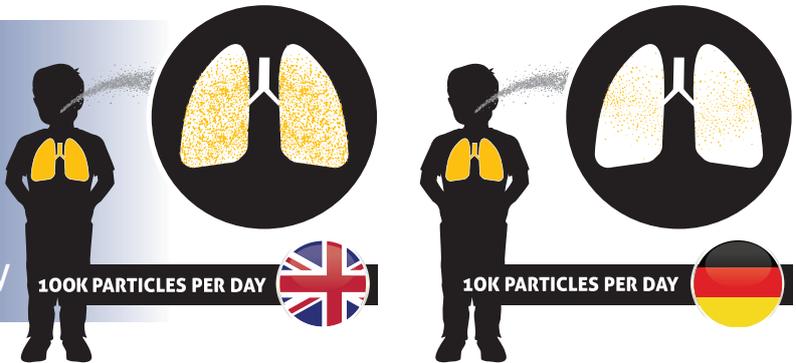


TEACHERS & NURSES

Nurses and teachers are 3 to 5 times more likely to develop mesothelioma than the general UK population

SCHOOLCHILDREN & ASBESTOS

The UK permits schoolchildren to breathe up to 10 times more airborne particles than Germany

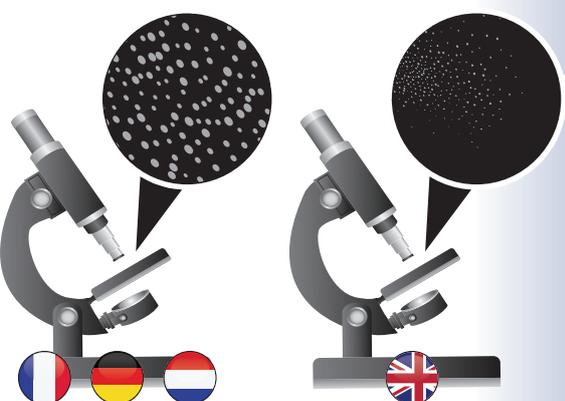


100K PARTICLES PER DAY 

10K PARTICLES PER DAY 

MEASURING ASBESTOS

The method used to measure airborne asbestos in public buildings in France, Germany and the Netherlands is 10 times more accurate than that used in the UK





EXECUTIVE SUMMARY

Sometimes a danger can be everywhere and appear nowhere at all. Since the turn of the millennium, the UK has lived with the increasingly unknown dangers of one regrettable by-product of the Industrial Revolution: its legacy dependence on asbestos.

This group of naturally occurring minerals, once a mainstay of the construction industry, is still mined and used in many parts of the world today. During the 20th century, it was extracted, processed and manufactured on an industrial scale to form insulating and fire-retardant products that were widely used in the built environment. Asbestos was a highly versatile and useful substance. However, it has also proven to be a highly toxic material that can cause serious and fatal forms of cancer and lung disease.

As the full extent of its dangers emerged, asbestos use was banned by most developed nations.¹ It is now twenty years since the UK banned the manufacturing and use of all asbestos, meaning buildings constructed after 1999, when the ban came into force, no longer contain this deadly material. However, anything built or refurbished before this date may still contain asbestos, where it remains in an increasingly aged and deteriorating condition.

The UK today remains a storehouse of asbestos. There are six million tonnes of asbestos in the UK, most of which can be found in over 1.5 million buildings across our public estate, including our hospitals and schools. This means that many people are still exposed to the potential dangers of asbestos on a daily basis. And while workers are no longer manufacturing or installing asbestos, the substance continues to be the UK's number one occupational killer, causing more than 5,500 deaths last year.²

This review summarises the discussion around current asbestos legislation and regulation and aims to highlight the dangerous unknowns in current research, policy and practice. We also make the case throughout this report that asbestos, far from being yesterday's problem, is a real and present threat to potentially thousands of lives for many generations to come. Our goal is to inform the objectives of a national campaign to reorder the Health and Safety Executive's (HSE's) parameters for the management of asbestos in-situ.

ASBESTOS AND ITS HARMS

There are three types of asbestos commonly found in UK buildings today: Chrysotile (white), Amosite (brown) and Crocidolite (blue). All three carry varying levels of risk. For instance, brown asbestos is 100 times more toxic than white, while blue is 500 times more toxic than white. As we shall explain, however, all three present a significant risk to human health.

The total tonnage of asbestos in the UK is the result of a more than one hundred-year glut of imports to its shores. During the 20th century, the UK imported and installed more asbestos per capita than any other country. Much of that intake was of the more toxic forms of asbestos – proportionally more on aggregate than was imported by other nations during the same period. On this evidence alone, we should not be surprised that the UK also has the highest rates of asbestos-related deaths in the world.

Mesothelioma, lung cancer and asbestosis are the three most common diseases associated with asbestos exposure and asbestos-induced fatalities. Since mesothelioma can be directly related to asbestos exposure, it is taken as the most accurate indication of harm. A key challenge in identifying causation, however, is the latency period between first exposure to asbestos and the diagnosis of mesothelioma, which can range between 25 and 50 years. As life expectancy has increased, more people have developed and subsequently died from this disease.

Although annual deaths from mesothelioma have increased steeply over the last 50 years, HSE projections suggest that overall death rates are now stabilising and are predicted to fall from 2020 onwards as fewer people work directly with asbestos.³ More than half of mesothelioma deaths now occur in those aged 75 years and over, with death rates increasing for this group despite falling for those aged below 70.⁴

The HSE statistics also mask an accelerating rise in the incidence of mesothelioma amongst groups not associated with handling asbestos materials at work, such as teachers and nurses. Since 1980, there have been almost 300 recorded deaths from mesothelioma among teachers in the UK. According to one study, teachers are five times more likely to contract mesothelioma, and nurses three times more likely, because of the locations in which they work.⁵

The assumption is that the harm caused by asbestos is a historical issue relating to traditionally hazardous occupations and industries. However, this view underestimates the dangers of chronic low-level exposure resulting from working in buildings containing asbestos. Mesothelioma can develop from exposure to only a small concentration of asbestos fibres, making secondary exposure no less a cause for concern.

The incidence of escalating risks through secondary exposure implies that the current standards of health and safety in all buildings need to be reconsidered. It is not only those working in the premises that are at risk. The reality is that children in schools could be exposed from an early age. We do not know how many have subsequently died in the UK from exposure to asbestos as a pupil in school.

WHERE ASBESTOS IS LOCATED

To understand why regulatory compliance measures around asbestos safety are failing, it is important to know first where risk is concentrated across the UK public estate and what has so far been done to address that risk.

The Education and Skills Funding Agency (ESFA) estimates that up to 80% of all UK schools contain asbestos, including both traditional and System-Built Schools (SBS). In addition, hospitals contain large amounts of asbestos. One BBC news article shows that 198 of the 211 NHS Trusts that responded to its inquiry claimed asbestos was present in their hospitals.

There is also a growing concern about university buildings, including student halls of residence. A recent Freedom of Information (FoI) request sent out by Stephenson Solicitors to 106 universities in England revealed that roughly 74% of the buildings surveyed contained asbestos.⁶

Of course, large quantities of asbestos remain dispersed across privately-owned buildings too, including dockyards, factories, and domestic premises. Asbestos even remains a threat to health on many construction sites despite its prohibition nearly two decades ago. Schools and hospitals, however, pose by far the most concentrated health risk to teachers and nurses and their respective pupils and patients.

MANAGING ASBESTOS IN-SITU

The Control of Asbestos Regulations 2012 (CAR12) state that asbestos should be maintained rather than removed, provided it is in a 'good condition and well protected either by its position or physical protection'. The HSE requires a duty holder to 'identify the location and condition of asbestos in non-domestic premises' and keep a written record of this in order to 'manage the risk and prevent harm'. In most instances this duty holder would be the owner or leaseholder of the premises.

This is where the problem of compliance with CAR12 comes into play. The term 'duty holder' can apply to different individuals in different institutions. What is known is provided via self-assessment and non-mandatory responses to surveys, such as the recent Asbestos Management Assurance Process. Compounding these factors is that HSE does not hold a central register or database that accurately records any such information, including which types of asbestos are present in which buildings or in what quantity. Overall, there would appear to be no regime for systematic audit and inspection in our public buildings.

General awareness about the location of asbestos and its dangers are lacking amongst those who work in premises where it is contained. The National Education Union has argued that teachers are frequently underinformed by the duty holder. This is reinforced by numerous surveys and Freedom of Information (FoI) requests which have demonstrated that not all duty holders are able to satisfactorily account for the type and condition of asbestos in their premises, even where policies and protocols are in place. An FoI request undertaken for this report revealed that less than 50% of Local Education Authorities in the UK were able to provide the names of schools within their control by the type of asbestos present.

THE SAFETY GAP

In circumstances where asbestos may have been disturbed, the duty holder is responsible for carrying out an air monitoring test to measure the concentration of asbestos particles in the air. The UK's current regime permits levels of airborne asbestos (10,000 fibres per meter cubed or 0.01 f/cm³) which are ten times greater than the acceptable levels in Germany (0.001 f/cm³). This is not merely a technical observation, but one which carries a serious message about what the UK considers safe compared to other developed European nations.

The UK uses phased contrast microscopy (PCM) to measure airborne asbestos fibres. This is far less accurate than the electron microscopy techniques used in Germany, France and the Netherlands.

The current practice and standards for measuring asbestos exposure in the UK are therefore insufficiently sensitive to observe most asbestos fibres in a given sample of air. ***A child inhales between 5 and 10 cubic metres of air per day, meaning the permitted levels of airborne asbestos in the UK can expose a child to 100,000 fibres per day, compared to 10,000 fibres in Germany.***

In addition to their higher levels of toxicity, brown and blue asbestos are 10 times more dusty than white asbestos, making them more easily disturbed and released into the environment. However, the relative risk of each type is estimated by the HSE at a ratio of **1** (white) : **2** (brown) : **3** (blue). Some commentators and experts have suggested that the relative dangers are under-estimated and that *the real risk is 1:1000:5000*.

There is no accepted 'safe', and therefore permissible, level of exposure to asbestos. A single particle of airborne asbestos could lead to a related disease. What is certain, however, is that the UK's current safety limit is not safe enough.

RESEARCH AND DATA REVIEW

The academic literature relating to the management of asbestos in-situ is not extensive, although there is evidence to support the aims of campaigners seeking to reform the current health and safety regime in the UK. This includes research supporting the greater efficacy of electron microscopy in measuring airborne asbestos.

The literature describes how the health harms posed by asbestos have been obfuscated. In the UK, the asbestos industry heavily influenced the development of asbestos legislation. Workers and their unions had very little influence on this process or the findings of the medical boards, which were supposed to safeguard them from harm. Consequently, there has been and continues to be a lag between the scientific evidence and policy. This 'science of doubt' has been likened to the tobacco industry's attempts to deny the harms of smoking.

There are areas where more research would be beneficial to campaigners. This includes investigations into the degree of harm asbestos exposure causes in children compared to adults; the degree to which damaged Asbestos Containing Materials (ACM) in different environments (e.g. schools) pose an increased

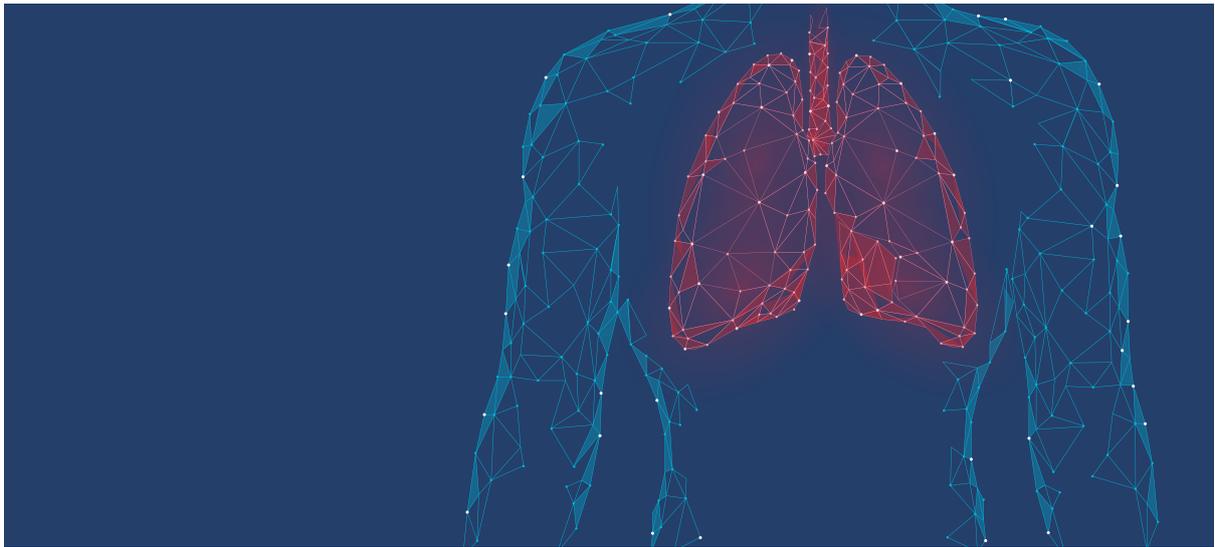
risk of fibre release; the costs and benefits of removing all in-situ asbestos from public buildings in the UK; and the evaluation of the current regulatory regime.

The consistency, accuracy, type and amount of data collected about asbestos has been contested by campaigners. This has ramifications for the way asbestos is managed in-situ and how its harm is assessed. The accuracy of HSE data has been questioned in relation to occupational fatality rates in so far as they do not include deaths from mesothelioma for those aged over 74, only consider the occupation recorded on an individual's death certificate, and in the case of schools, do not include support staff (caretakers, cleaners and secretaries). The gaps in existing data and HSE statistics therefore under-represent the actual harm caused by asbestos exposure. This implies that we do not know the real scale of the problem, since the actual number of people who have died as a result of exposure to asbestos is not known.

RECOMMENDATIONS

1. Government should bring the Health & Safety regime for the management of asbestos up to the highest international standards, as currently practiced in Germany, the Netherlands and France.
2. Government should establish a central register of all asbestos currently in place in public buildings across the UK (including schools, hospitals and social housing). This should identify precise location, type and condition. We suggest that this duty, alongside appropriate resources and capability, should be devolved to the local authority level.
3. Government should commission a cost-benefit analysis for the removal of all asbestos from public buildings in the UK. In turn, it should commit to a frame for phased removal on the basis of danger and risk to public health.

4. The Health and Safety Executive should revise the current 'Duty to Manage'. The practice and evidence that has emerged in the last two decades shows that complexity works against compliance. In addition, raised awareness amongst duty holders and those working in premises containing asbestos is urgently required to strengthen compliance.
5. The Health and Safety Executive should amend guidance and risk assessments to take account of:
 - a) Early exposure (e.g. children in school and social housing)
 - b) Different levels of 'in-situ' risks (e.g. secondary schools and social housing double the risk; primary schools quadruple the risk)
 - c) The higher risks posed by Amosite and Crocidolite, to ensure they are properly acknowledged and accepted within the Health and Safety Executive's risk assessment.
6. The Health and Safety Executive should accurately measure and represent fatality figures and the actual harm caused by asbestos exposure by:
 - a) Including all those who have died from mesothelioma over the age of 74 in occupational statistics
 - b) Including statistics for support staff who work in schools (caretakers, cleaners and secretaries, etc.)
 - c) Ensuring that, where death is attributable to mesothelioma, efforts are made to capture all past occupations, beyond that stated on the death certificate.
7. The Health and Safety Executive should assure (rather than assume) buildings are safe, through the requirement for periodic sensitive air monitoring based upon revised risk and priority assessment. The Health and Safety Executive, in line with the best international practice, should use electron microscopy to measure airborne fibres up to 0.0001 f/cm³. These tests should take place when the buildings are in use.
8. The Health and Safety Executive should improve the regime for reporting the disturbance of asbestos materials and ensure that the reporting regime in schools reflects that children are both:
 - a) At greater risk of harm due to exposure, and
 - b) Liable to disturb asbestos-containing materials.
9. Research funding bodies in the UK should consider the current gaps in the academic literature about the risk asbestos-containing materials pose in-situ, and particularly:
 - a) The degree of harm asbestos exposure causes in children compared to adults
 - b) The degree to which damaged asbestos poses an increased risk of fibre release and the methods that can be used to suppress this
 - c) The efficacy of contemporary legislation and where this legislation is sub-optimal.



1. INTRODUCTION

Twenty years ago, the UK banned the manufacturing and use of all asbestos.⁷ The substance widely used in a range of building products had been proved to cause serious and fatal harm.

Since November 1999 when the ban came into force, no new buildings have contained this deadly material. However, anything built or refurbished before this date may still contain asbestos, where it remains in an increasingly aged and deteriorating condition. It is estimated that over six million tonnes of asbestos were imported into the UK during the last century,⁸ most of which can be found in more than 1.5 million buildings.⁹ Enough to fill fourteen Wembley stadiums to the brim.

Consequently, many people are still exposed to the potential dangers of asbestos on a daily basis. While workers are no longer manufacturing or installing asbestos, this substance continues to be the UK's number one occupational killer, causing more than 5,500 deaths last year.¹⁰ The knowledge of the risks posed to those who worked directly with asbestos has led to concerns about possible risks to the health of those exposed to asbestos in the wider built environment, including the workplace and the home.

Following the enforcement of the ban, the UK has continued to combat the long-term health consequences of its import legacy. This has had a secondary effect of proliferating dangerous unknowns, which if otherwise recognised might compel us to improve the way we manage asbestos.

This report has been conducted as part of the background and familiarisation phase of a national campaign to reorder the Health and Safety Executive's (HSE's) parameters for the management of asbestos in-situ. The campaign aims to reform legislation and regulation so that they reflect the genuine risk asbestos poses to public health and safety, bringing practice in line with other European countries.

Although asbestos is present in a variety of premises, this report is concerned primarily with asbestos in public buildings, with an emphasis on schools. This is because schools pose a unique risk, as they are used by both children and those who work in them. The purpose of this review is to summarise the discussion around asbestos legislation and regulation; to highlight the dangerous unknowns in current research, policy and practice; and to inform the campaign's media messages and recommendations to policymakers.

The report does not seek to provide an exhaustive account of the locations where asbestos is present or a systematic review of all the academic literature relating to asbestos and its potential harm. The focus is on the discussions and research evidence that support the specific aims of the campaign to reduce asbestos exposure in public buildings. Recommendations drawn from this report's content are intended to inform the campaign's aim to influence the HSE's position so that the risk of asbestos exposure is better managed to reduce the potential for harm.



2. BACKGROUND AND CONTEXT

For a long time, asbestos was considered a miraculous natural resource. Marketed as the ‘magic mineral’ for its lightweight and durable texture as well as its insulating properties, asbestos became a prime material for the construction of buildings throughout the 20th century. It was used in virtually all building works, from private housing to schools, hospitals, shipyards and factories. As the full extent of its dangers emerged, its use was subsequently banned by most developed nations and it is no longer imported by the UK.¹¹

2.1 ASBESTOS IN THE UK

Between 1920 and 2000, Europe accounted for over 50% of all asbestos traded throughout the world and formed the global centre of asbestos use. During this period, the UK imported more asbestos per capita than any other country. Consequently, Europe has the largest proportion of asbestos-related deaths, with the UK having the highest rates amongst its European counterparts.

There are a variety of different types of asbestos, which broadly fall into two categories:

- Serpentine asbestos – including Chrysotile (white)
- Amphibole asbestos – including Amosite (brown) and Crocidolite (blue).

Of the different types of asbestos, three in particular– white, brown and blue – have been used in UK industry. All three have been linked to diseases, although amphibole forms of asbestos are considered more harmful than serpentines: brown is 100 times more toxic than white asbestos, while blue is 500 times more toxic. Significantly, the UK has historically imported and installed in buildings a greater proportion of higher risk amphibole asbestos relative to other countries.

In addition to their toxicity, both brown and blue asbestos are estimated to be ten times ‘dustier’. The structure of their fibres is more friable and as a result more easily disturbed and released into the environment.

The HSE currently estimate that the relative risks for Chrysotile, Amosite and Crocidolite are 1: 2: 3, respectively.¹² Those seeking improved standards in the management of asbestos in-situ argue that the relative dangers posed by Amosite and Crocidolite are under-estimated, given their differences in both toxicity and dustiness.¹³ The relative risk might be expressed better as a ratio of 1: 1000: 5000.

	White	Brown	Blue
HSE Risk	1	2	3
Dustiness	1	10	10
Toxicity	1	100	500
Hypothecated Risk	(1x1) = 1	(10x100) = 1000	(10x500) = 5000

2.2 THE IDENTIFICATION OF HARM

While the health consequences of asbestos exposure can be traced back to at least the end of the 19th century, awareness of the full extent of the harm caused by the various forms of asbestos took longer to emerge. A key challenge in recognising harm was the latency period of a related disease known as mesothelioma, which can range between 25 and 50 years from first exposure. Gradually, with increasing life expectancy, more people have developed and died from this disease.

Between 2014 and 2016, Mesothelioma UK found that in England and Wales around 53% of pleural mesothelioma occurred in those aged above 75.¹⁴ This indicates that asbestos is a latent killer, which often causes death decades after initial exposure. As these harms have been identified, legislation has been passed to adapt to the UK ban of asbestos. Yet the vast quantities of asbestos that remain in buildings, owing to the scale of its use in the past, mean that the nature of exposure and the consequent harm caused has changed. Evidence now points to the health risks resulting from persistent low-level environmental exposure to asbestos, particularly amongst those working in schools and hospitals.

The UK’s current air monitoring regime permits levels of airborne asbestos that are at least ten times greater than the accepted levels in Germany and the Netherlands.¹⁵ The country’s commitment to remove asbestos meanwhile lags other European states. For example, Poland is now committed to removing all asbestos by 2032; similarly, the European Parliament has called for ‘the removal of asbestos from all European public buildings by 2028’.¹⁶

This disparity in the monitoring and removal of asbestos is indicative of the larger problem this report seeks to highlight, namely, that the UK is failing to manage and respond to the threat of asbestos exposure in a timely and effective manner.

2.3 INCIDENCE OF ASBESTOS-RELATED DISEASES

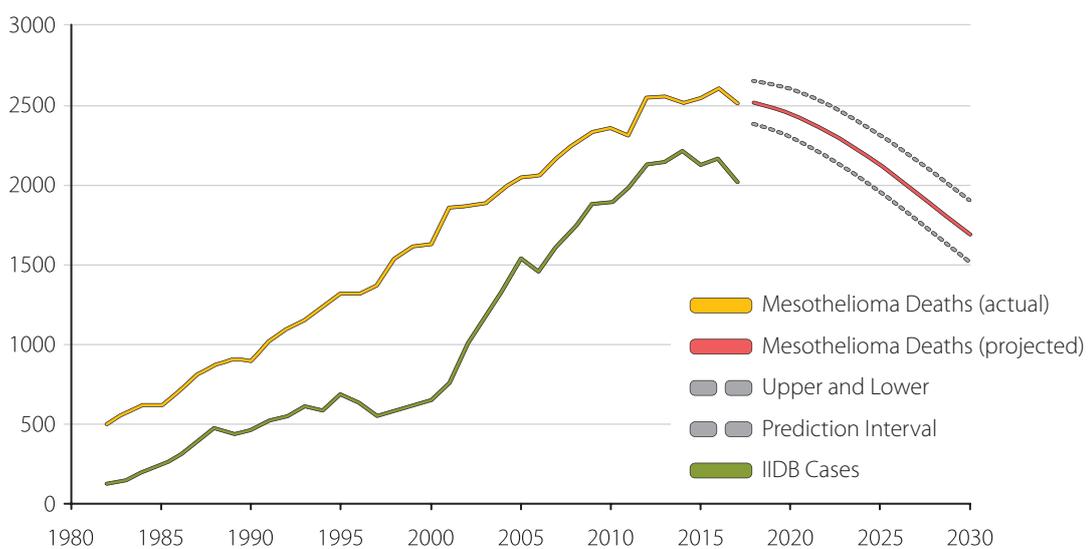
The HSE has estimated that there are roughly 12,000 annual lung disease deaths due to past exposure at work in the UK.¹⁷ Mesothelioma, lung cancer and asbestosis are the three most common diseases associated with asbestos exposure. Epidemiological information estimates that the number of fatalities from asbestosis is the lowest (c. 500 annually) while mesothelioma (c. 2,500 annually) and lung cancer (c. 2,500 annually) result in a greater number of asbestos-induced fatalities.¹⁸ When adding the mortality rates from all three asbestos-related diseases (ARD), **approximately 44% of all occupational lung disease deaths are due to occupational exposure to asbestos in the past.**

This is not an exhaustive list, as there have been fatal cases of larynx and stomach cancer recorded in recent years.¹⁹ However, **mesothelioma is often taken as the most accurate indicator of the prevalence of asbestos exposure.** This is because an overwhelming proportion of mesothelioma cases are directly due to asbestos exposure. In contrast, lung cancer may be due to a variety of different factors (such as smoking) and there is usually 'no specific clinical signs associated with particular causes', making an association between lung cancer rates and asbestos exposure difficult.²⁰

Annual asbestos deaths in Britain have increased steeply over the last 50 years, a consequence of mainly occupational asbestos exposure that occurred because of widespread industrial use between 1950 and 1980. The latest information shows there were 2,523 mesothelioma deaths in Great Britain in 2017, a figure broadly similar to each of the previous five years. The latest projections suggest that there will continue to be around 2,500 deaths per year for the rest of the current decade before annual numbers begin to decline.

It cannot be stressed enough in this report that mesothelioma – the form of asbestos-related disease with the highest death count on record – is one which does not require high-level exposure in order to cause harm.

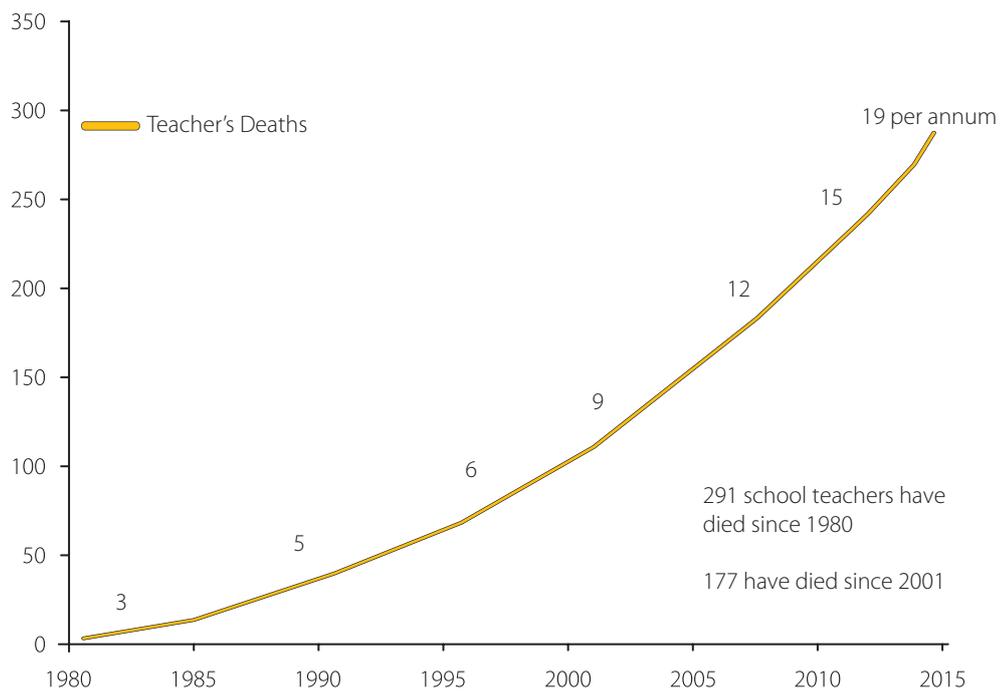
Figure 1: Mesothelioma Annual Deaths, IIDB Cases and Projected Future Deaths to 2030 in GB



Source: Health and Safety Executive, 2019

However, this projection of a stabilising and then falling death rate masks an accelerating rise in the incidence of mesothelioma amongst groups that have not been associated with handling asbestos materials at work, such as teachers and nurses.

Figure 2: Mesothelioma Deaths for School Teachers 1980 - 2012



Source: Health and Safety Executive, mesothelioma deaths for selected occupations

2.4 OCCUPATIONAL EXPOSURE

Traditionally, shipbuilding, railway engineering and industries which used asbestos-containing materials (ACMs) have posed a high-risk of asbestos exposure. However, as these industries have diminished in size, mesothelioma mortality rates have fallen.

Men who worked in the building industry when asbestos was used extensively are now among those most at risk of developing mesothelioma. Analysis of the occupations recorded on the HSE's register of death certificates indicates that mesothelioma mortality rates among plumbers, gas fitters, carpenters and electricians are generally higher than among other occupations.²¹

Yet the notion that asbestos is only a historical health risk ignores clear evidence that we are witnessing a second tranche of fatalities among people in new, as well as traditional, occupations.²²

Figure 2 shows the rise in mortality rates among teachers who have been and continue to be subject to chronic low-level exposure resulting from working in buildings containing asbestos, with almost 300 recorded deaths from mesothelioma since 1980.

According to one study, **teachers are five times more likely to develop mesothelioma, and nurses three times more likely**, because of the locations in which they work.²³ This suggests that over a period of time, they are exposed to concentrations of airborne asbestos fibres that exceed the 'safe limits' specified by the HSE.

Further, it implies that levels of awareness about potential dangers as well as general standards of health and safety in all buildings need to be reconsidered in light of the changing nature of risk, since not only those working in the buildings are exposed. In the case of schools, the reality is that children could be exposed from a considerably earlier age, with a higher probability than adults of living long enough to develop mesothelioma. A study in the USA has estimated that **for every teacher's death nine pupils will subsequently die** from exposure at school.²⁴ In the UK, it is not known how many adults have subsequently died because of their exposure to asbestos as a pupil in school.

CASE STUDY: PUPIL EXPOSED TO ASBESTOS AT SCHOOL

Dianne Willmore, 49, was the UK's first recorded case of a former pupil who successfully sued a local authority for its negligence of a secondary school in which asbestos had been disturbed. Willmore died of mesothelioma in 2009. She was exposed to asbestos on several occasions during the 1970s while a pupil at a newly built comprehensive school in Knowsley, Merseyside. Electricians working on a ceiling in one of the corridors had removed tiles and stacked them in the walkways. A Guardian report adds that school bullies would often hide children's satchels and blazers above the ceiling tiles where the asbestos had been disturbed. Willmore won the £240,000 compensation claim upheld by the supreme court, though died soon after.

2.5 GEOGRAPHIC CONCENTRATIONS

We recognise that the vast proportion of cases of mesothelioma have affected former industrial workers in the UK, with mortality rates in England higher than in Scotland, Northern Ireland and Wales. The regions of England with the highest mortality rates meanwhile are the north-east and south-east. At a municipal level, Plymouth and Glasgow reveal the highest mortality rates, along with traditional ship-building towns such as West Dunbartonshire, Barrow-in-Furness, Portsmouth, South Tyneside, North Tyneside and Southampton.²⁵

All are areas where asbestos was used heavily in industry and which generally contain ports, dockyards, railway stations and factories used raw asbestos during manufacturing.²⁶

Figure 3: Mesothelioma deaths by Local Authority, England and Wales, 2013 – 2017.

Local Authority	2013	2012	2015	2016	2017
High-Risk					
Plymouth	20	23	10	14	22
Portsmouth	15	13	11	7	18
Southampton	18	10	12	19	9
Low-Risk					
Kensington & Chelsea	2	2	2	4	1
Newcastle-Under-Lyme	6	2	4	8	3
Barnsley	7	5	7	5	4

Source: Office for National Statistics, 2019²⁷

In contrast, Kensington and Chelsea, Coventry, Newcastle-Under-Lyme and Barnsley, have some of the lowest mesothelioma mortality rates. According to the most recent data released by the Office for National Statistics, a person living in Plymouth is up to 22 times more likely to develop mesothelioma than a person living in Kensington & Chelsea.



3. ASBESTOS IN-SITU

The position we take in this report relies on thinking about asbestos as it exists and is used today. Asbestos is no longer an imported hazard and is no longer handled unless it needs to be removed. Its greatest potential harms are therefore confined to its management in-situ, which is to say the condition in which asbestos is kept and maintained over time.

3.1 THE PUBLIC ESTATE

As we have explained, schools and hospitals often contain large amounts of asbestos, which poses a significantly high risk to public health, especially to those who work within these buildings.

3.1.1 SCHOOLS

It has been estimated that more than 80% of all schools contain asbestos,²⁸ including both traditional and System-Built Schools (SBS).²⁹

The HSE have identified that SBS pose an increased risk of asbestos exposure and have prioritised funding for schools they consider to be at the highest risk of asbestos exposure. For example, SBS built between the 1950s and 1980s had their structural columns fireproofed with asbestos materials, which are enclosed in metal casings and are likely to release fibres if damaged.³⁰

This concern about SBS corresponds to the governments Priority School Building Programme (PSBP), which prioritises funding 'schools in most need'.³¹ This is a two-phase programme which will rebuild and/or refurbish 537 schools in total, with a focus on individual buildings rather than whole schools.³² Since asbestos management can be costly, this approach prioritises high-risk schools to achieve more efficient harm-reduction.

There is a higher chance that asbestos will be disturbed in schools, as pupils tend to disrupt and damage parts of the building when playing games. School teachers and staff have voiced concerns on multiple occasions about the risk asbestos poses, not only in the school building but also in teaching equipment, such as Bunsen burners.³³

These examples show how the school environment is substantially different from other workplaces, raising specific challenges to compliance with HSE standards that increase the likelihood of teachers and pupils becoming exposed and potentially developing a related disease. It is arguable on this basis that schools require special consideration to reflect how different they are from other environments.

3.1.2 HOSPITALS

The BBC found that 198 of the 211 NHS Trusts that responded to its inquiry said that asbestos was present in their hospitals.³⁴ Hospitals are public buildings that are used daily by large numbers of people, which increases the chance that asbestos will be disturbed and inhaled.

CASE STUDY: DOCTOR EXPOSED TO ASBESTOS AT WORK

A father of two children lost his wife (aged 58) to mesothelioma caused by asbestos fibres released from severe damage done to a hospital where she worked as a doctor after the great storm of 1987. The storm caused plastic sheeting used to cover asbestos, as part of existing buildings works in her wing of the hospital, to fall. This exposed her over time to accumulative asbestos fibres. According to her husband, however, very little information was shared with staff or patients about the hazards posed by the airborne fibres. She was diagnosed 25 years later.

Between January 2013 and December 2017, 352 claims were made against health trusts by sufferers of ARD in NHS buildings, resulting in pay-outs of approximately £6.8 million.³⁵

CASE STUDY: FREEDOM OF INFORMATION REQUEST

Mesothelioma UK recently conducted an FoI request (on 3 September 2019) inquiring about claims made against the NHS between the 2004/5 and 2018/9 by current or former employees who have developed mesothelioma:

- There has been an increase in claims made between 2004/5 (38) and 2018/9 (140) of 102
- There has been an increase in the amount paid out in favour of employees of £4,740,917 between 2004/5 (15 claims: £155,860) and 2018/9 (59 claims: £4,896,777)
- There have been a greater number of female claims (644) than male claims (585) between 2004/5 and 2018/9.

In addition, hospitals harbour vulnerable people who are susceptible to developing diseases. Not only does the presence of asbestos in hospitals increase the likelihood of patients and staff developing ARD, but it damages the reputation of the NHS as people lose faith in the health service.

3.1.3 UNIVERSITIES

There has also been a growing concern about the presence of asbestos in university buildings, including student's halls of residence. A recent FoI request sent out by Stephenson Solicitors to 106 universities in England revealed that roughly 74% of the university buildings surveyed contained asbestos.³⁶

Other FoI requests have found that numerous universities contain asbestos in their halls of residence, of which students remain uninformed. Around 10 halls of residence at Bristol University,³⁷ as well as 2,313 rooms in Warwick University have been found to contain asbestos.³⁸ The University of Cardiff, Aberystwyth and Trinity St David meanwhile have each reported more than 3000 students who had not been told their dorms contained asbestos.³⁹

3.2 THE PRIVATE ESTATE

Large quantities of asbestos remain scattered across privately owned buildings in the UK. As we have mentioned already, certain buildings identified as posing an increased risk of asbestos exposure include dockyards, factories, construction sites and domestic premises.

3.2.1 DOCKYARDS AND FACTORIES

In addition to dockyards, factories have and continue to contain asbestos-containing materials (ACMs), resulting in workers developing ARDs. Large amounts of Crocidolite were used on naval vessels from 1944 to 1963 and the use of Amosite for machinery insulation increased between 1950 and 1963.⁴⁰ This heavy use of amphiboles in the construction of ships has led many who worked on dockyards throughout this period to develop mesothelioma and other ARD. For example, an analysis of the mortality rate in Devonport dockyard workers between 1979 and 1999 identified 301 deaths due to malignant mesothelioma.⁴¹

Although measures have since been implemented to reduce asbestos-exposure in workers, ACMs often remain in-situ in dockyards and factories. A longitudinal study of workers in a Rochdale factory found that lung cancer rates amongst textile workers approximately doubled following cumulative asbestos exposure of approximately 100 fibres per cm³.⁴²

Although measures have since been implemented to reduce asbestos-exposure in workers, ACMs often remain in-situ in dockyards and factories, posing a health risk if disturbed. Furthermore, para-occupational exposure has led to the families of workers developing asbestos-related disease.

CASE STUDY: PARA-OCCUPATIONAL EXPOSURE TO ASBESTOS

Debbie Brewer was diagnosed with mesothelioma in 2006, which she developed from hugging her father when he came home from working at the Devonport dockyard as an asbestos lagger. The Ministry of Defence, which owned the factory Debbie's father worked in, accepted liability and paid her compensation in 2007. The threat of asbestos exposure on dockyards and ships remains today. John Chillingworth, senior principal of Lucion Marine, argues that the International Maritime Organisation's Safety of Life at Sea (SCOLA) convention for asbestos on ships is failing, with 80% of new and existing ships containing asbestos, despite many being declared 'asbestos free'.

3.2.2 CONSTRUCTION SITES

The historic use of asbestos in UK buildings has resulted in high levels of in-situ asbestos on construction sites. The Construction Industry Research Information Association (CIRIA) has suggested that high levels of asbestos fibres are 'buried in Britain's brown field sites' and that the current threshold of 0.001% asbestos fibres in soil 'may not be suitable in all cases'.⁴³

The Construction (Design and Management) Regulations of 2015 require those responsible for construction sites to manage the risk posed by asbestos to health and safety.⁴⁴ Asbestos remains a threat to health on many construction sites despite its prohibition over two decades ago.

3.2.3 DOMESTIC PREMISES

Non-traditional or 'system-built' flats, constructed between 1945 and 1980 are likely to contain large amounts of amphibole asbestos products, such as sprayed coatings and partitioning, as well as Chrysotile materials, in vulnerable positions with high potential for fibre release.

Concerns about inadequate measures being implemented to manage the risk of asbestos during the refurbishment of social housing properties led HSE to write to council and housing associations in 2009. Unfortunately, in 2014, Anchor (one of the country's largest care home providers) was fined £10,000 by HSE for failing its duty to manage asbestos.⁴⁵

Earlier this year, social housing tenants voiced concerns about asbestos in their property, which they had not been informed about prior to moving in. They claimed that asbestos debris had been scattered by men doing work in their home.⁴⁶



4. THE HEALTH AND SAFETY EXECUTIVE'S POSITION

The HSE's efforts to ensure the safe management of asbestos in-situ so far includes the publication of the Control of Asbestos Regulations (CAR12), an Approved Code of Practice and Guidance (ACOP), which came into force on the 6 April 2012. CAR12 was triggered to replace the previous 2006 law and to recognise concerns by the European Commission that the UK had not fully implemented its previous directive.⁴⁷ It is now the most up to date legislation on the management of asbestos in non-domestic premises (with some modifications) and combines two ACOPs:

- L127 (the management of asbestos in non-domestic premises) and
- L143 (working with materials containing asbestos).

4.1 CONTROL OF ASBESTOS REGULATIONS 2012 (CAR12)

CAR12 stipulates that it is 'usually safer to leave [asbestos] in place and manage it', provided it is in a 'good condition, well protected either by its position or physical protection'.⁴⁸ The effective management of in-situ asbestos is reliant on the three key assumptions that:

- A 'duty holder' is aware of and able to carry out their responsibilities appropriately
- The air monitoring regime accurately detects and represents the harm damaged asbestos poses
- There is compliance with HSE regulations from those within the premises where asbestos is present.

4.1.1 THE ROLE OF DUTY HOLDER

The duty holder can be the owner, leaseholder, tenant or managing agent with responsibility for the maintenance or repair of non-domestic premises. The extent of the duty can also vary depending on the type of

building and how the responsibility for maintenance is agreed. In many cases, the agreement might be to share the duty between owners and leaseholders.

In public buildings, the identity of the duty holder will depend on how the responsibility for maintenance of the premises is allocated. For example, for most schools, the duty holder will be the 'employer'. However, this can vary according to the type of school. For local authority-managed schools (community schools and voluntary-controlled schools) the employer is the local authority. For voluntary-aided and foundation schools, it will be the school governing body, and for academies and free schools, the academy trust will be the employer. For independent and fee-paying schools, it may be the proprietor, governors or trustees. Budgets for repair and maintenance of school buildings are sometimes delegated to schools by a local authority. In such cases, the duty to manage asbestos is shared between schools and the local authority.

In principle, the duty holder should keep an updated written record of the location, condition and form (product type) of asbestos on the premises, including an illustration of that premises. This is commonly referred to as an 'asbestos register', which should be shared with anyone carrying out maintenance or other works on the premises.⁴⁹ If asbestos is likely to be disturbed during maintenance work or during 'daily use of the building', in which the material 'cannot be easily repaired or protected', then it should be removed.⁵⁰ Work involving the removal of asbestos should be carried out by someone 'trained to carry out Non-Notifiable Licensed Work, or non-licensed work'.⁵¹ The responsibility to fulfil this requirement rests on the duty holder of the premises.

4.1.2 THE MONITORING REGIME

When a duty holder undertakes work, which is liable to expose employees to asbestos, they must ensure that the premises are kept and left in a clean state after that work is complete; if this work is 'licensable'⁵² and has occurred indoors. The HSE set out a four-stage process for legitimate licensed work:⁵³

- Step One - Preliminary check of site condition and job completeness
- Step Two - Thorough visual inspection
- Step Three - Clearance air monitoring
- Step Four - Final assessment post-enclosure/work area dismantling.

Stage three requires that the concentration of airborne asbestos fibres be as low as 'reasonably practicable', before allowing people to re-enter the premises. In most cases, the threshold for 'reasonably practicable' applies to a concentration lower than 0.01 fibres per cubic centimetre of air (f/cm³). However, HSE describe how this clearance threshold of 0.01 f/cm³ should be considered a 'transient indication of site cleanliness' and not 'an acceptable, permanent environmental level'.⁵⁴

NOTE: HSE measure asbestos differently to all other carcinogens, which are measured in fibres per meter cubed (f/m³). This has the effect of presenting asbestos fibre concentration 100 times smaller than other carcinogenic substances.

4.1.3 COMPLIANCE WITH CAR12

The HSE, Education and Skills Funding Agency (ESFA) and the Department for Education (DfE) have carried out investigations into the levels of compliance with CAR12 specifically from schools across the UK. These investigations had different aims and targeted different types of schools, but their focus on an environment which we argue differs drastically from others makes the three reports published since CAR12 especially interesting to examine.

In 2014, the HSE published a report based on a survey from a sample of 153 schools (131 in England, 11 in Wales and 11 in Scotland), titled: 'Asbestos Compliance in non-LA Managed Schools'. This report determined the levels of compliance with CAR12 in both independent or fee-paying schools and those outside local authority control.⁵⁵ The results indicate that there are generally high levels of compliance with CAR12 in independent or fee-paying schools and those outside of Local Authority control. Some of the key findings are:

- 64% of schools had a full understanding of who the duty holder was and a further 32% had a broad understanding (96% with a full or broad understanding)
- 77% of schools had completed an Asbestos Management Plan (AMP), which was an improvement on figures from a 2010/2011 survey
- 85% of schools completed a management survey.⁵⁶

In 2017, the ESFA published a report title: 'Asbestos Management in Schools: Data Collection Report', which aimed to improve the evidence base around the management of asbestos in schools, inform policy thinking and promote the importance of good asbestos management in schools.⁵⁷ This was a non-mandatory survey which collected data from 5,592 schools in England (25.2% of all schools), then sent automated responses providing guidance on compliance with CAR12 according to the data provided by that school.⁵⁸ Of the participating schools 4,646 (83.1%) said asbestos was present, and of these:

- 98% had an asbestos management survey
- 97% have an asbestos register
- 97% have processes and procedures in place to manage asbestos.⁵⁹

In July 2019, the DfE published a report titled: 'Asbestos Management Assurance Process (AMAP) report'; this UK-wide voluntary survey received responses from 19,522 (88.4%) schools out of a total 22,072.⁶⁰ Out of those schools which participated:

- 18,846 (96.9%) were 'broadly managing asbestos in line with regulatory requirements'
- 15,796 (80.9%) stated asbestos was present on their estate; out of the schools with asbestos on their estate
- 15,145 (95.4%) have an AMP and 15,767 (99.6%) have precautions to ensure anyone who may disturb ACM is provided with information about any asbestos present.⁶¹

The AMAP report concluded that there is 'good practice in the majority of schools, but some gaps in the management of asbestos in some schools'. From the DfE perspective, a majority of schools are in fact compliant with CAR12:

"As long as asbestos is in good condition, well-managed and unlikely to be damaged or disturbed, it is not a significant risk to the health of teachers and pupils during their daily activities."⁶²

4.2 CRITICISMS OF CAR12

Although the UK has taken steps to better manage asbestos in-situ, we argue that these measures simply do not meet the challenge effectively. CAR12 came into force partly to address the UK's failure to implement regulatory standards set out in European law. Yet, compliance with CAR12 is still thought to fall behind the standards governing asbestos safety in other European states.

4.2.1 ASBESTOS AWARENESS

Despite the general success of the AMAP survey, The House of Commons Committee for Public Accounts describes some of the problems that arose in the initial rounds. The Department for Education initially requested that AMAP's be completed by 31 May 2018, this was then pushed back: first to the 25th June 2018, then the 27th July 2018 and finally to the 15th February 2019. This suggests that schools found it difficult to comply with this new requirement. However, the DfE maintain that the window for schools to respond is still open and it will publish updated reports bi-annually.

The duty holder is the lynchpin of asbestos regulation. As we've shown however, many duty holders are either unaware of their responsibilities or unable to fulfil them. This is particularly problematic in schools, because what qualifies the duty holder so often varies from one school to the next. This ultimately makes it **'more difficult for the government to effectively articulate universal responsibilities for such a role'**.⁶³ In practice, confusion about who the duty holder is ripples out to those whom the duty holder is meant to inform, leaving a trail of ignorance among teachers and support staff.

In 2017, the National Union of Teachers (NUT) conducted an online survey with its members. The findings of this survey indicate that **teachers and school staff are not routinely informed by the duty holder about the presence and locations of asbestos in schools and that an overwhelming majority support the phased removal of asbestos in schools**.⁶⁴ Some of the key findings are as follows:

- Nearly 50% of all respondents had not been told that their school contains asbestos (although roughly 86% of all schools do contain asbestos)
- Of the 46% of respondents who had been told their school contained asbestos, roughly 50% had not been told where it was located
- 75% said staff had not been provided asbestos awareness training
- 85% had not been shown an AMP
- 96% agreed that there should be a long-term government strategy for the phased removal of all asbestos from schools by 2028.⁶⁵

In 2018, the Institute for Occupational Health and Safety (IOSH) published a fact sheet as part of their 'No Time to Lose' campaign, which summarised the HSE requirements for those working with and around asbestos. This fact sheet condensed the HSE requirements into eight clear steps, which informs duty holders about what is required

of them.⁶⁶ In addition, the fact sheet contains links to other resources, many of which are on the HSE website, that offer further information around asbestos and its legislation.⁶⁷ This campaign has also encouraged organisations to pledge to take action against ARD by better managing asbestos in their buildings. However, the objective of the campaign appears to be around increasing levels of compliance with CAR12.

CASE STUDY: FREEDOM OF INFORMATION REQUEST

ResPublica sent a FoI Request to all Local Education Authorities (LEA) in England, Scotland and Wales. This request asked a series of questions, designed to determine the extent of the asbestos problem in LEA schools.

Of 206 requests 158 responded. Headline findings include:

- 47.5% of councils were able to provide information on the schools that contain asbestos and the types of asbestos which they have
- 36.7% of all councils had claims pursued against them between the period 2010-2019 (77.2% of councils were able to provide information on the number of claims made against schools. Of these, 47.5% of councils had claims pursued against them)
- 21.5% of councils were able to provide information on the number of schools that have dealt with a leaky roof, broken window or damaged wall panel during the last 5 years
- 27.2% of all councils had commissioned air testing between the period 2010-2019 (67.7% of councils were able to provide information on when and why emergency air testing was commissioned by schools. Of these, 40.2% had commissioned emergency air testing).

4.2.2 AIR MONITORING

The UK clearance indicator for acceptable airborne asbestos fibre concentrations (0.01 f/cm^3) is significantly higher than in France (0.005 f/cm^3), Germany (0.001 f/cm^3) and the Netherlands (0.002 f/cm^3), where a further lowering of the threshold is intended for amphibole asbestos (0.0003 f/cm^3).⁶⁸

In short, the UK is ten times more lenient on this issue than Germany.

The UK uses what is known as phased contrast microscopy (PCM) to measure airborne asbestos fibres. This is a far less accurate method of measuring levels of airborne asbestos fibres than electron microscopy, which is used throughout Germany, France and the Netherlands. Electron microscopy (including scanning electron microscopy and transmission electron microscopy) can measure up to 0.0005 f/cm^3 , while PCM can only measure up to 0.01 f/cm^3 . Furthermore, electron microscopy can differentiate between the different types of asbestos fibres and other non-asbestos fibres⁶⁹ and can:

- Allow for the prioritisation of risk and targeting of funding towards the removal of asbestos in highest risk locations
- Bolster a defence against future claims by demonstrating that the most up to date technology was being used to assess risk
- Provide long-term occupational exposure assessments and allowing for back up re-inspection surveys, as electron microscopy gives an actual risk level at the time of sampling.⁷⁰

Our current practice for measuring asbestos exposure is insufficiently sensitive to observe most asbestos fibres in a given sample of air. **A child inhales between 5 and 10 cubic metres of air per day, meaning the permitted levels of airborne asbestos in the UK can expose a child to 100,000 fibres per day, compared to 10,000 fibres in Germany.**⁷¹

Critics of CAR12 are therefore seeking a legal requirement to strengthen air monitoring processes in the UK, to accurately detect and measure potentially harmful levels of airborne asbestos fibres in public buildings.

4.2.3 PRIORITISED PHASED REMOVAL

The All-Party Parliamentary Group (APPG) on Occupational Safety and Health recently published a report **calling for the phased and planned removal of all asbestos in-situ in the UK**, owing to the inevitable danger that hidden and non-identified asbestos poses to public health.⁷² The report lists four recommendations which would help to achieve this aim:

- All public buildings should be registered with HSE through a survey (to be completed by 2022) which indicates whether asbestos is present and if so where it is located
- If asbestos is identified, then any planned construction work around the premises should be extended to include its removal, if nothing is planned then the duty holder should develop a plan to have it removed when reasonably practical (but before 2028 for public buildings)
- The HSE should develop a programme of workplace inspection to ensure ACM are marked and managed effectively, while providing resources for the eventual removal of all asbestos within an acceptable timeframe
- Finally, a survey indicating where asbestos is located should be carried out prior to the sale of any house.⁷³

The Joint Union on Asbestos Control (JUAC) and the Asbestos in Schools Group (AiS) **have also called for the prioritised phased removal of asbestos from schools which have the highest risk.** They have highlighted that the Property Data Survey Programme (PDSP), which audits the general condition of school buildings, has 'specifically excluded asbestos' from its survey.⁷⁴ And without the appropriate evidence quantifying the amount and type of asbestos in schools, the Department for Education's 2015 policy review was unable to calculate the cost-benefits of phased removal compared with the maintenance of asbestos in-situ.⁷⁵ This feeds into larger concerns about there not being a central database recording the prevalence of asbestos across the United Kingdom.

4.3 NATIONAL DATA

We've seen how attempts to enforce compliance with asbestos safety measures in UK public buildings have led to difficulties in practice, which have had consequences for how we collect data. The consistency, accuracy, type

and amount of data collected about asbestos has also been contested by campaigners. This has ramifications for the way in which asbestos is managed in-situ, specifically how the HSE prioritises its funding for phased removal. This can result in certain places suffering disproportionately from asbestos exposure compared to others.

The UK does not have a complete database of all buildings containing asbestos, identifying type, location and condition. Where attempts have been undertaken to 'audit' the extent of the problem, for example among schools in England, this has returned an incomplete record. Numerous Fol requests with Local Education Authorities and Hospital Trusts identify that information is not held in a central location in a standardised format.

Asbestos is widespread and the level of detail required to protect those who live and work in public buildings is so great that, we need a system capable of maintaining this information, which HSE can use to hold Duty Holders to account. This need not be an onerous or expensive endeavour. The task would simply require Duty Holders to record the information, which they are required to collect, using a standardised form available via an online platform. The UK could follow the example of the Dutch, who have put such a system in place.

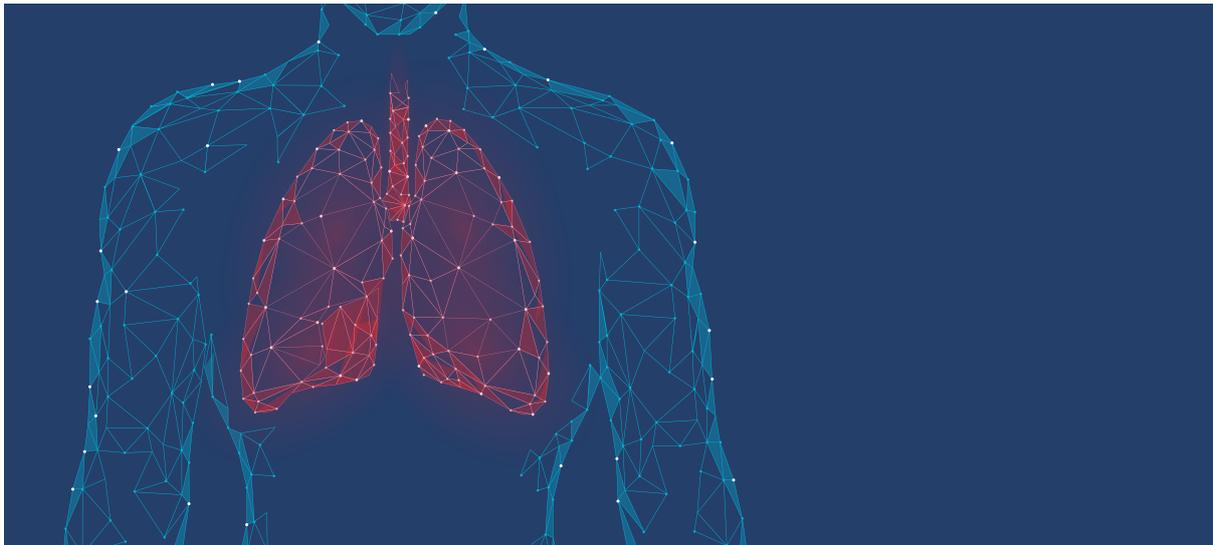
And while the AMAP report expresses satisfaction with how schools in England are managing asbestos, in Scotland, concerns have been raised about a lack of relevant data outlining the extent of the problem. Glasgow janitors went on strike in 2016, partly because 'asbestos logs were not being completed by external contractors.'⁷⁶

Clydeside Action on Asbestos has called for **a survey of all Scottish schools in line with the ESFA Data Collection Report**. As a medium-term priority, they call for better monitoring techniques to bring us in line with France, Germany and the Netherlands. And as a long-term priority, they call for the presence and condition of asbestos in schools to be a central factor in determining priorities considered in the construction of new schools.⁷⁷

The accuracy of HSE data has also been questioned in relation to measuring fatality rates and how they **under-represent the actual harm** caused by asbestos exposure.

- **HSE statistics 'do not list occupational mortality from mesothelioma when a person is over the age of 74.'**⁷⁸ This is problematic given mesothelioma's long latency period and the fact that since 1968, 25% of male and 44% of female mesothelioma deaths were recorded by HSE as being over the age of 74⁷⁹
- **HSE statistics only consider the occupation recorded on an individual's death certificate**, which omits all those who may have previously worked in occupations that are considered a risk (e.g. teachers) and then switched professions or left employment before their death⁸⁰
- **HSE statistics do not include support staff who work in schools** (caretakers, cleaners and secretaries), as they do not hold the same professional qualification, which belittles the actual levels of harm caused to those working in schools.⁸¹

The fundamental accuracy of basic data about asbestos: where it is, how harmful it is, and who has been harmed by it, is questionable. This implies the scale of the problem and its implications remain unknown. The quality of information available to establish the scale of the problem therefore only adds to the problem itself. What we are left with is a multitude of dangerous unknowns made more worrying by what little we do know.



5. OVERVIEW OF THE RESEARCH LITERATURE

We have provided an overview of the research literature around the management of asbestos in-situ, the risk of exposure and the potential for the development of related disease.

Search terms were formulated and used to provide an indication of what research exists that might support the campaign and where there are gaps in this body of research. Examples of the search terms used include:

- Development of UK asbestos legislation
- Biopersistence of asbestos fibres in children
- Degradation of asbestos-containing materials in-situ
- PCM compared to TEM in measuring airborne asbestos fibres
- Asbestos-related disease across the world
- The costs and benefits of asbestos removal.

This analysis is not the result of a comprehensive or systematic literature review and therefore does not draw conclusions on the entire body of international research about asbestos and asbestos-related disease. Rather, it draws out some key, relevant findings from the literature and identifies areas where research could be expanded.

5.1 DEVELOPMENT OF ASBESTOS LEGISLATION

We carried out multiple searches around the term: 'development of UK asbestos legislation'. One article describes how knowledge about the harm of 'asbestos dust' has emerged slowly and sometimes falteringly since the

early 20th century', as **'scientific disputes and policy uncertainties' obfuscated the actual harm of asbestos.**⁸² Additionally, a large proportion of documents explain how corporate interests influenced the development of asbestos legislation. In 1930, Merewether and Price published a pioneering article, which found there to be a direct link between one's duration of exposure to asbestos and one's likelihood of developing asbestosis. The findings in this article paved the way for the 1931 Asbestos Regulations, the first legislation governing the use of asbestos, which remained in force until reforms in the 1970s.

One article describes how the 1931 Asbestos Regulations were 'largely agreed between the Home Office and the manufacturers before trade unions were consulted'.⁸³ Although the 1931 Asbestos Regulations were influenced by the asbestos textile industry, they did establish medical boards, which examined workers to check whether they had developed ARD and entitled those who had to compensation. However, another article argues that medical boards created other problems. These medical boards have been accused of not effectively identifying large numbers of workers who had developed asbestosis and giving 'the asbestos industry every opportunity to keep reported cases of asbestosis to a minimum'.⁸⁴ We may never know whether the asbestos industry intentionally confused the harms of asbestos to continue profiting from it. Nonetheless, **the academic literature frequently describes how the asbestos industry negatively impacted the development of laws and procedures designed to protect workers and reduce the threat posed by asbestos.**

As recently as 1997, two years before the nation-wide ban, a UK Government-funded report by the Institute for Environment and Health concluded that:

*"There is no current justification for any substantive change in the advice previously issued by the UK Government on asbestos."*⁸⁵

5.2 HARM OF ASBESTOS EXPOSURE IN CHILDREN

We carried out multiple searches around the term: 'biopersistence of asbestos fibres in children'. One article argues that there have not been enough high-quality studies to allow for clear conclusions to be drawn about how the age of exposure to asbestos affects the risk of developing asbestos-related cancers in the future.⁸⁶ Many articles provide evidence supporting the claim that exposure to asbestos early in life significantly increases the likelihood of developing mesothelioma.⁸⁷ Some articles go into greater detail, describing how **the risk of developing mesothelioma doubles every ten years before the age of 30 in which someone is exposed to asbestos.**⁸⁸ There is contention around whether children have an increased likelihood of developing other ARDs that have a shorter latency period as mesothelioma.

There is a gap in the research around whether children's incomplete development increases their vulnerability to ARDs. However, the academic literature does establish that exposure to asbestos at a younger age substantially increases the likelihood that one will develop mesothelioma since one is more likely to live to an age where the symptoms will develop.

5.3 DEGRADATION OF ASBESTOS IN-SITU

We carried out searches around the term: 'degradation of asbestos-containing materials in-situ'. Many of the documents focus on the use of thermal (and other forms of) decomposition to detoxify and recycle.⁸⁹ A proportion of the articles examine how different types of asbestos degrade in vivo (inside a living organism)⁹⁰ A minority of the documents examine the increased risk of releasing asbestos fibres from damaged materials in comparison to undamaged materials. One paper finds that weathered and corroded asbestos products emit chemically-changed fibres with a carcinogenic potency resembling that of standard Chrysotile fibres.⁹¹ Another paper examines how air and brush erosion affect the release of fibres from asbestos-containing materials in buildings, concluding that the application of good encapsulants reduced the levels of fibre release.⁹² Our findings suggest that there is **less research around the risks damaged ACMs pose in-situ compared with research into potential methods of recycling and detoxifying ACMs, as well as into the effect asbestos fibres have in vivo.**

5.4 AIR MONITORING STANDARDS

We carried out multiple searches around the term: 'PCM compared to TEM in measuring airborne asbestos fibres.' A large proportion of the research examines the efficacy of phased contrast microscopy (PCM) in comparison to scanning electron microscopy (SEM) and transmission electron microscopy (TEM) in analysing airborne asbestos (and other) fibres. Many of these documents differentiate between PCM, SEM and TEM; one describes how these methods of air monitoring increase in accuracy, respectively.⁹³ Others examine the circumstances in which particular methods of air monitoring are necessary, concluding that although TEM is the most accurate, it is long and expensive and should only be used when fibre levels are low or when fibres are short (such as with Chrysotile).⁹⁴ Most articles draw the same conclusion about the accuracy of each method, describing PCM as the least and TEM as the most accurate.⁹⁵ Findings suggest that there has been engagement from academics around the most effective ways of measuring asbestos fibres. **The literature advocates the use of TEM in air monitoring if accuracy is required while identifying PCM as the least accurate method.**

5.5 INTERNATIONAL COMPARISONS

We conducted searches around the term: 'asbestos-related disease across the world'. Many of the articles describe how **the United Kingdom is amongst the countries with the highest rates of mesothelioma**, along with Australia and Belgium.⁹⁶ Although there has been a decline in the use of asbestos across developed countries, asbestos is still used extensively in many developing countries. One article describes how many people in developing countries are ill-informed on the harms of asbestos; for example, there are rumours in India that certain ethnicities have a 'genetic immunity' to ARDs.⁹⁷ Laws on asbestos vary across the world and international attempts to regulate asbestos are often thwarted by countries with a vested interest in the global asbestos market. Other articles describe the 'science of doubt' across the world that obfuscates the harms of asbestos (Chrysotile in particular). For example, the asbestos industry has actively seized 'opportunities to challenge the carcinogenicity of Chrysotile, trying to create the impression that it is still a matter of legitimate scientific debate.'⁹⁸ The academic literature indicates that **in many developing countries, asbestos is still used heavily owing to a 'science of doubt' which has misinformed people about asbestos' harm. As a result, developing countries suffer disproportionately from ARDs.**

5.6 COST BENEFITS OF ASBESTOS REMOVAL

We carried out multiple searches around the term: 'economic analysis of asbestos removal in the UK'. These searches found no articles which accurately quantify the cost of removing asbestos from public buildings in the UK. There is material which provides a general analysis of the economic burden that asbestos removal poses, but even within this research there is recognition that few 'studies have calculated the cost-effectiveness of control programs.'⁹⁹ We also identified material examining the efficacy of asbestos removal in local areas rather on a national level. These advised that the success of asbestos abatement depends on the quality of budgeting and the information available about the location of asbestos.¹⁰⁰ However, **there appears to be a gap in the literature examining the cost of removing all in-situ asbestos from public buildings in the UK.**



6. MEDIA REVIEW

An analysis of media coverage in the UK can provide some insight into the salience of asbestos-related diseases as a popular news story and can indicate potential areas where Government might be influenced to make policy interventions.

6.1 NATIONAL PRINT MEDIA

The number of news stories about asbestos in the national print media has risen over the past ten years. The trend has been broadly consistent, peaking in 2018 with 60 stories, compared with 20 stories in 2010. The Guardian (74 features) and The Mail (73 features) represent almost 40% of all the national coverage, followed by The Mirror (41 features).

The main content for news stories featured in the national press includes:

- Asbestos contamination of products (e.g. talc, tobacco, make-up and cosmetics)
- Asbestos in schools
- Asbestos settlement/compensation cases
- Personal anti-asbestos campaigns.

There are many examples reported in the media about the real-life stories of individuals who have been affected by exposure to asbestos.

CASE STUDY: TEACHER EXPOSED TO ASBESTOS AT WORK

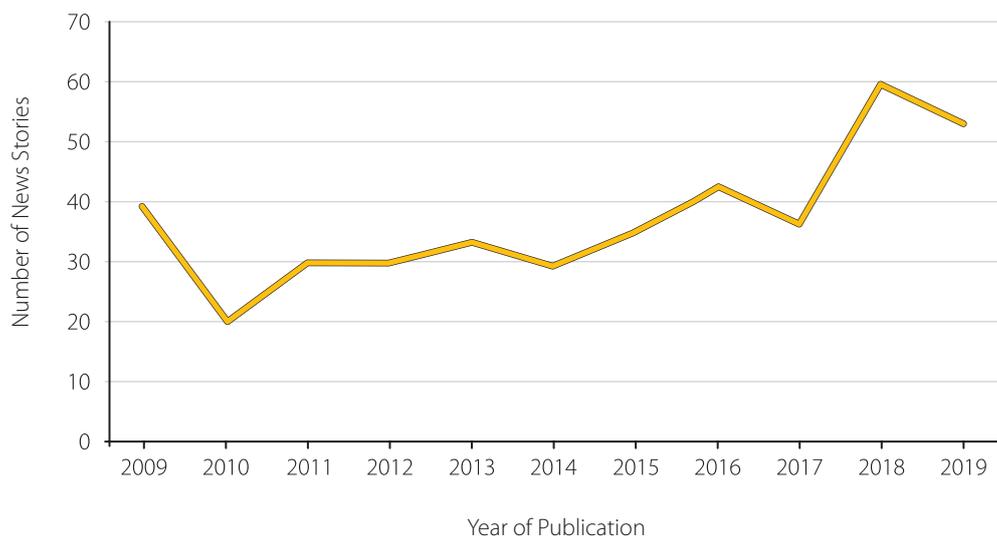
The death of primary school teacher Sue Stephens was reported by The Mirror earlier in May this year after findings emerged that more than 200 teachers have died from exposure to asbestos since 2009.

An inquest was carried out in 2016 after Stephens passed away from mesothelioma aged 68 following a career teaching at schools in Buckinghamshire. According to the coroner, Stephens had “likely suffered fatal exposure to asbestos during building work at one of them”.

Figure 4 illustrates that, while the overall trend in asbestos related articles is rising, 2019 has seen a fall in the total number of printed articles despite some prominent headlines marking the 20th anniversary of the asbestos ban.

On 5th July, The Guardian newspaper featured a story about asbestos risk in schools on its front page. This was followed on 7th July by an online edition of the same newspaper with an article headlined, “Britain’s death toll from asbestos at crisis level, figures reveal”.

Figure 4: Asbestos Stories in National Press



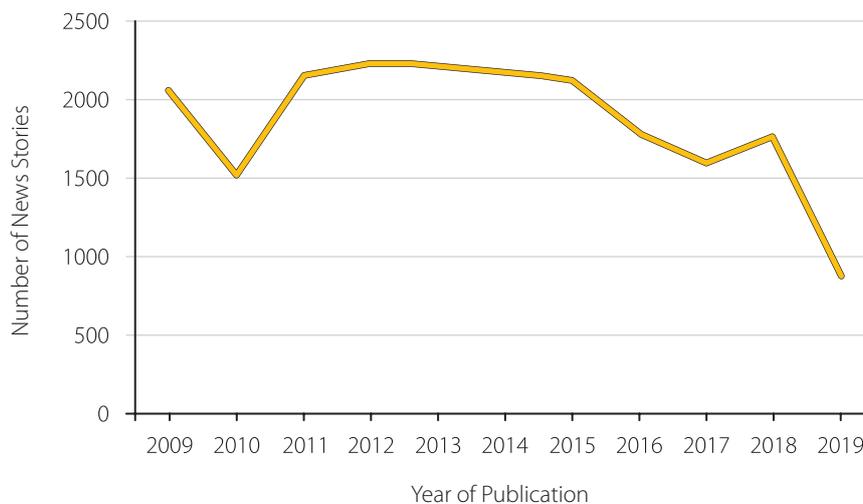
Source: LexisNexis

6.2 NATIONAL AND LOCAL PRINT MEDIA

By contrast, the total number of stories featured in all print media, combining national and local press, has fallen over the same time period. From a peak of 2,200 stories in 2012, coverage fell to 879 stories in 2019, with an even more marked decline in the last year. It is difficult to account for the different trends in national and local news stories. One might expect that overall coverage would be driven by human interest in personal campaigns, such as Lucy Seven’s campaign to remove asbestos in schools (her mother died at age 68 from cancer related to exposure, over 30 years teaching in schools), and by local stories about individual asbestos victims.

However, the falling trend might be explained by shifting priorities at the local level where the capacity to respond to a wide range of issues is limited. With many other social problems (homelessness, crime, social care) worsening and grabbing headlines in an era of austerity, asbestos-related stories may have been set aside. There is a noticeable drop-off in local coverage following the General Election in 2015 Brexit.

Figure 5: Asbestos Stories in National and Local Press

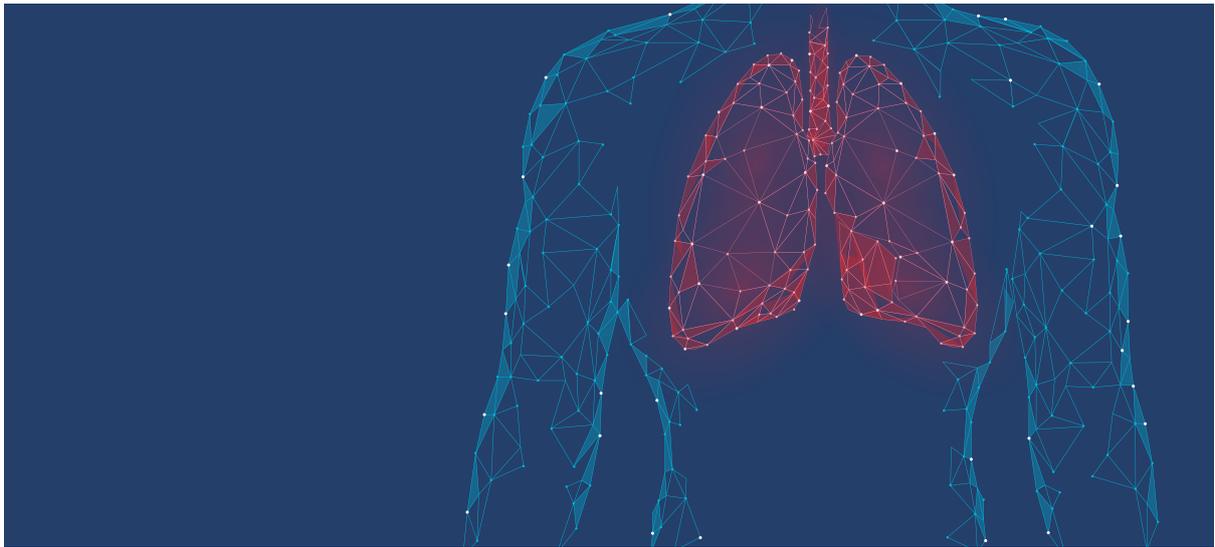


Source: LexisNexis

6.3 ONLINE MEDIA

Online news items about asbestos are more difficult to quantify, requiring specialised multi-media analytics. Features are often duplicated and reproduced by multiple outlets and platforms. However, the BBC news website includes a dedicated asbestos webpage that provides regular updates to news stories.

Twitter also appears to be a source of content and connectivity for those living with an ARD and those campaigning on their behalf.



7. CONCLUSIONS AND RECOMMENDATIONS

The ban on asbestos in the UK has undeniably saved many lives over the last 20 years. But while attempts to manage its potential harm have been made, there remain clear and present dangers to the wider population from asbestos in-situ. This is primarily due to the sheer volume of asbestos in our built environment. Owing to the quantity of asbestos imported and used in the construction of UK public buildings, the task of managing this material demands a strong response from government. Unfortunately, we find this to be absent in the current health and safety regime.

Understanding the true scale of this problem is difficult. There is no definitive record or central database that can identify which buildings contain which type of asbestos, where within these structures asbestos is present, and what condition it is in.

The current health and safety regime is based on the assumption that asbestos is safe unless disturbed. Management in-situ, rather than systematic phased removal, is therefore the preferred policy position, with responsibility falling on individual 'duty holders' to ensure that health and safety regulations are complied with.

Where asbestos in-situ is disturbed, there is a requirement to monitor for asbestos fibres released into the air. Yet air monitoring standards in the UK fall below those of other European countries, whose testing methods are up to one hundred times more sensitive in detecting dangerous airborne particles. Additionally, our current regime does not adequately reflect the relative dangers of differing types of asbestos, with Amosite (brown) and Crocidolite (blue) asbestos presenting a significantly higher risk than Chrysotile (white) asbestos.

The broader assumption is that asbestos is largely a historical problem that afflicted those exposed to the substance before the ban. Overall, asbestos-related deaths have stabilised and are projected to fall. However, these figures mask an accelerating rise in the incidence of mesothelioma amongst groups not traditionally at risk, such as teachers and nurses.

This suggests that asbestos now represents a different kind of danger through continuous low levels of exposure. It is a secondary risk, analogous to passive smoking, which although less concentrated and less localised, could place far more people in harm's way. This includes all those that work, or spend considerable time, in public buildings. The ban, while it might have served as an emollient to the harm caused by asbestos, came nonetheless too late to prevent harms associated with existing buildings.

Asbestos is still with us, hazardously deteriorating each year, out of sight and out of mind.

This review has identified emerging evidence that has not yet been accepted as part of the regulatory framework. It has also revealed gaps in our knowledge and understanding that we argue point to dangerous unknowns. Acknowledging the specific nature of these risks and the widespread potential for harm suggests that a different approach to the regulatory regime is required to better manage asbestos in-situ.

RECOMMENDATIONS

1. Government should bring the Health & Safety regime for the management of asbestos up to the highest international standards, as currently practiced in Germany, the Netherlands and France.
2. Government should establish a central register of all asbestos currently in place in public buildings across the UK (including schools, hospitals and social housing). This should identify precise location, type and condition. We suggest that this duty, alongside appropriate resources and capability, should be devolved to the local authority level.
3. Government should commission a cost-benefit analysis for the removal of all asbestos from public buildings in the UK. In turn, it should commit to a timeframe for phased removal on the basis of danger and risk to public health.
4. The Health and Safety Executive should revise the current 'Duty to Manage'. The practice and evidence that has emerged in the last two decades shows that complexity works against compliance. In addition, raised awareness amongst duty holders and those working in premises containing asbestos is urgently required to strengthen compliance.
5. The Health and Safety Executive should amend guidance and risk assessments to take account of:
 - a) Early exposure (e.g. children in school and social housing)
 - b) Different levels of 'in-situ' risks (e.g. secondary schools and social housing double the risk; primary schools quadruple the risk)
 - c) The higher risks posed by Amosite and Crocidolite, to ensure they are properly acknowledged and accepted within the Health and Safety Executive's risk assessment.

6. The Health and Safety Executive should accurately measure and represent fatality figures and the actual harm caused by asbestos exposure by:
 - a) Including all those who have died from mesothelioma over the age of 74 in occupational statistics
 - b) Including statistics for support staff who work in schools (caretakers, cleaners and secretaries, etc.)
 - c) Ensuring that, where death is attributable to mesothelioma, efforts are made to capture all past occupations, beyond that stated on the death certificate.
7. The Health and Safety Executive should assure (rather than assume) buildings are safe, through the requirement for periodic sensitive air monitoring based upon revised risk and priority assessment. The Health and Safety Executive, in line with the best international practice, should use electron microscopy to measure airborne fibres up to 0.0001 f/cm³. These tests should take place when the buildings are in use.
8. The Health and Safety Executive should improve the regime for reporting the disturbance of asbestos materials and ensure that the reporting regime in schools reflects that children are both:
 - a) At greater risk of harm due to exposure, and
 - b) Liable to disturb asbestos-containing materials.
9. Research funding bodies in the UK should consider the current gaps in the academic literature about the risk asbestos-containing materials pose in-situ, and particularly:
 - a) The degree of harm asbestos exposure causes in children compared to adults
 - b) The degree to which damaged asbestos poses an increased risk of fibre release and the methods that can be used to suppress this
 - c) The efficacy of contemporary legislation and where this legislation is sub-optimal.

Endnotes

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Society

The UK has one of the most centralised states in the developed world and one of the most disaffected and politically passive populations in Europe. We hold our leaders in contempt, but despair of doing anything for ourselves or our community. The dysfunction at the highest level of society stems from the collapse of our social and personal foundation. There is little doubt that we are becoming an increasingly fragmented and individualist society and this has deep and damaging consequences for our families, our communities and our nation state.

Starting from the bottom up, the collapse of the extended family and the ongoing break-up of its nuclear foundation impacts on all, but disproportionately so on the poor and on their offspring. Too many children at the bottom of our society are effectively un-parented as too much is carried by lone parents who are trying to do more and more with less and less. We know that the poorer you are, the less connected with your wider society you tend to be. Lacking in both bridging and bonding capital and bereft of the institutions and structures that could help them, too many poorer families and communities are facing seemingly insurmountable problems alone, unadvised and without proper aid.

Based on the principle of subsidiarity, we believe that power should be devolved to the lowest appropriate level. Public services and neighbourhoods should be governed and shaped from the 'bottom up', by families and the communities. These neighbourhoods need to be served by a range of providers that incorporate and empower communities. Moving away from a top-down siloed approach to service delivery, such activity should be driven by a holistic vision, which integrates need in order to ascertain and address the most consequent factors that limit and prevent human flourishing. Local and social value must play a central role in meeting the growing, complex and unaddressed needs of communities across the UK.

The needs of the bottom should shape provision and decision at the top. To deliver on this, we need a renewal and reform of our major governing institutions. We need acknowledgement of the fact that the state is not an end in itself, but only one means by which to achieve a greater end: a flourishing society. Civil society and intermediary institutions, such as schools, faith groups and businesses, are also crucial means to achieving this outcome. We also need new purpose and new vision to create new institutions which restore the organic and shared society that has served Britain so well over the centuries.

Society Society Society

It has been 20 years since the use of asbestos was banned in the UK. Yet the material is still present in many of our buildings, where it remains a serious threat to public health. This report considers the potential harm which this substance continues to present, especially in our public buildings including our schools and hospitals.

The report argues for the reform of the Health and Safety regime around the management of in-situ asbestos to accurately reflect the risk it poses to the people who work in and attend our public buildings. It shows that the UK's current asbestos monitoring standards fall significantly short of other European nations and calls for parity with these standards to better protect teachers, nurses and other members the UK public.

The recommendations outlined in the report are designed to move us towards a society free from asbestos and its associated health risks.

ISBN: 978-1-908027-80-1

Price: £19.95

*ResPublica is the trading name of The ResPublica Partnership Limited
Registered office: 10 Lonsdale Gardens, Tunbridge Wells, Kent, TN1 1NU
Company Registration No: 11068087 England and Wales*