MESOTHELIOMA UK

Clearing The Air:

The costs and benefits of removing asbestos from UK schools and hospitals

In partnership with:

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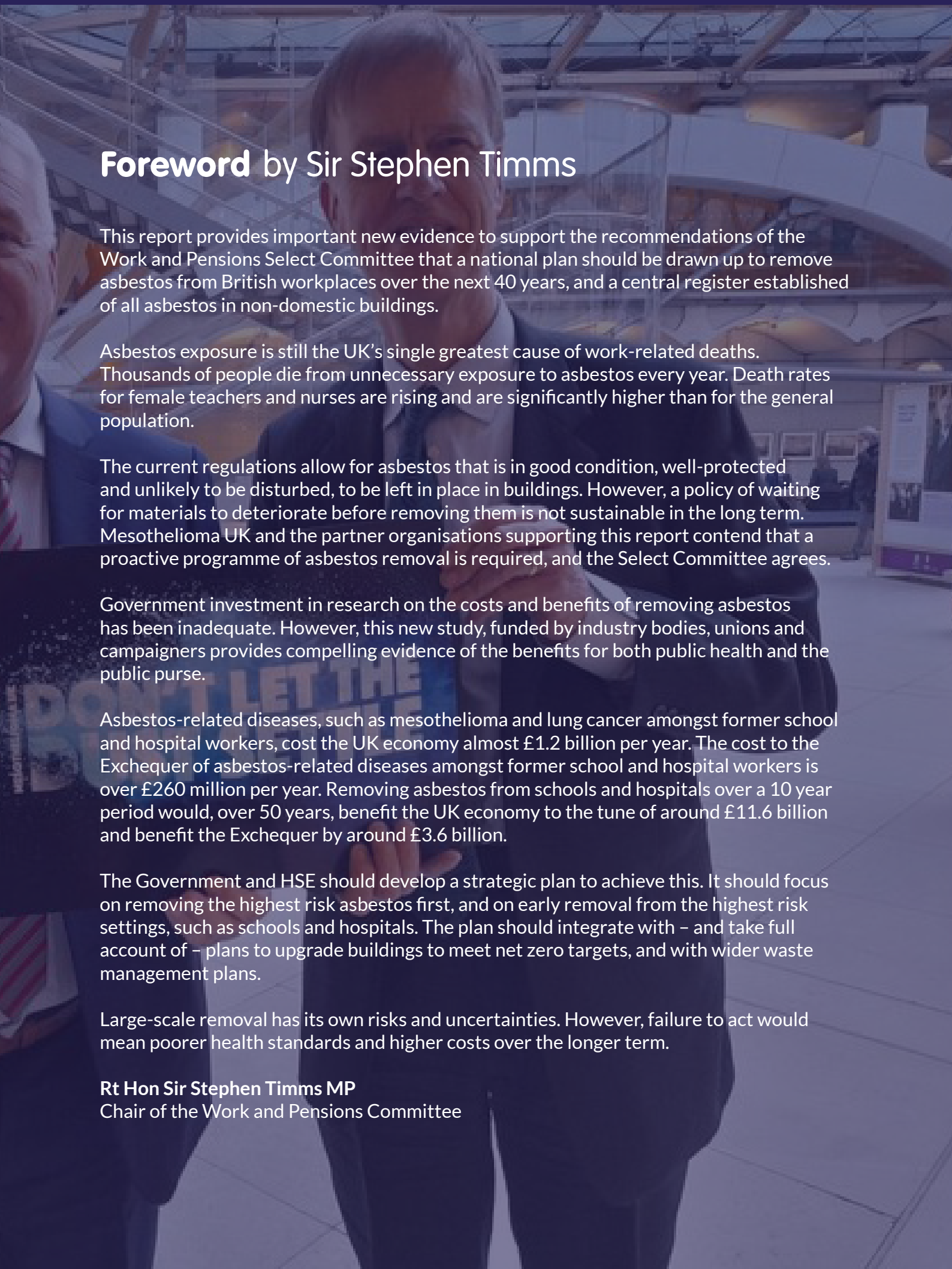

Foreword by Sir Stephen Timms

This report provides important new evidence to support the recommendations of the Work and Pensions Select Committee that a national plan should be drawn up to remove asbestos from British workplaces over the next 40 years, and a central register established of all asbestos in non-domestic buildings.

Asbestos exposure is still the UK's single greatest cause of work-related deaths. Thousands of people die from unnecessary exposure to asbestos every year. Death rates for female teachers and nurses are rising and are significantly higher than for the general population.

The current regulations allow for asbestos that is in good condition, well-protected and unlikely to be disturbed, to be left in place in buildings. However, a policy of waiting for materials to deteriorate before removing them is not sustainable in the long term. Mesothelioma UK and the partner organisations supporting this report contend that a proactive programme of asbestos removal is required, and the Select Committee agrees.

Government investment in research on the costs and benefits of removing asbestos has been inadequate. However, this new study, funded by industry bodies, unions and campaigners provides compelling evidence of the benefits for both public health and the public purse.

Asbestos-related diseases, such as mesothelioma and lung cancer amongst former school and hospital workers, cost the UK economy almost £1.2 billion per year. The cost to the Exchequer of asbestos-related diseases amongst former school and hospital workers is over £260 million per year. Removing asbestos from schools and hospitals over a 10 year period would, over 50 years, benefit the UK economy to the tune of around £11.6 billion and benefit the Exchequer by around £3.6 billion.

The Government and HSE should develop a strategic plan to achieve this. It should focus on removing the highest risk asbestos first, and on early removal from the highest risk settings, such as schools and hospitals. The plan should integrate with – and take full account of – plans to upgrade buildings to meet net zero targets, and with wider waste management plans.

Large-scale removal has its own risks and uncertainties. However, failure to act would mean poorer health standards and higher costs over the longer term.

Rt Hon Sir Stephen Timms MP
Chair of the Work and Pensions Committee

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Acknowledgements

This report was produced by Mesothelioma UK with the kind support of the Asbestos Removal Contractors Association (ARCA); the Asbestos Testing and Consultancy Association (ATaC); the National Education Union (NEU), UNISON, the Airtight on Asbestos Campaign; and ResPublica.

We would like to thank all those members of the steering committee including: Liz Darlison, Chief Executive of Mesothelioma UK; Steve Sadley, Chief Executive of ARCA; Jonathan Francis, Chairman of ATaC; John Richards, ATaC Committee Member; Charles Pickles, Founder of Airtight on Asbestos; Mark Morrin, ResPublica.

Thanks also to Helen Bone, Emma Dowling and Monica Johnston for allowing us to use their experience as case studies within this report.

Additionally, we would also like to thank Peter Allmark and Beth Taylor from MUKRC, Charlie Wells from Charlotte Wells Associates, and Christine Emmett for their valuable comments and contributions to this study.

Finally we would also like to thank Howard Reed, Director of Landman Economics, for the cost benefit analysis and authoring the report.

In Remembrance

This report is dedicated to Mavis Nye, a tireless campaigner for asbestos awareness, who died this month. In 2009, Mavis developed mesothelioma and was told there was no cure and no treatment available. Fourteen years from her original prognosis Mavis has campaigned passionately around the dangers of asbestos, and was one of the first people to galvanise all sides of the debate. Mavis will be remembered with admiration and appreciation by all those who knew her and especially by those suffering the cruel effects of exposure to asbestos.

Executive Summary

This report analyses the costs and benefits of removing asbestos from public buildings in the UK. The analysis focuses on two types of public building: schools and hospitals. Previous research has found that asbestos is present in 80% of schools and 94% of hospital trusts in England[1]. In particular, there are a large number of school and hospital buildings constructed between 1945 and 1980 using system build techniques, for example CLASP schools[2], where asbestos was used as an integral part of the building and cannot usually be removed without demolishing the building.

Historically, research and campaigning activities around asbestos have looked at the incidence of asbestos-related diseases (ARDs) for people who worked directly with asbestos (for example in construction or manufacturing). By contrast, this report focuses on ARDs arising because of **incidental** exposure to asbestos – for teachers, doctors, nurses and other employees who never worked directly in asbestos manufacturing or fitting, but who did work in schools and hospitals containing asbestos. This incidental exposure remains an ongoing and serious problem even as incidence of ARDs arising from working directly with asbestos has fallen markedly.

Incidence of asbestos-related diseases for former school and hospital workers

This report estimates the number of cases of the two most prominent ARDs – mesothelioma and lung cancer – for people who have worked in schools or hospitals in the UK. The official statistics from the Health and Safety Executive (HSE) severely underestimates the number of cases of mesothelioma for these former workers, for three main reasons:

1. The HSE exclude deaths from mesothelioma for people aged 75 and above (which is the majority of deaths from mesothelioma) from their statistics.
2. The HSE statistics only include people whose final occupation was working as a teacher, doctor or nurse. People who worked in these occupations earlier in their career but then switched occupations are excluded.
3. The HSE statistics exclude people who worked in schools or hospitals in administrative or maintenance jobs.

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[1] Morrin M, Aldane J, King H. Don't Breathe In: Bridging the Asbestos Safety Gap, ResPublica, 2019.

[2] The Consortium of Local Authorities Special Programme (abbreviated and more commonly referred to as CLASP), was formed in England in 1957 to combine the resources of local authorities with the purpose of developing a prefabricated school building programme.

When these omissions are taken into account, this report estimates that there are approximately 87 cases of mesothelioma per year for former hospital workers (over seven times more than the official HSE statistics) and 89 cases per year for former hospital workers (almost six times as many as the HSE statistics).

In line with the most recent published research on the number of cases of asbestos-related lung cancer compared to mesothelioma, this report assumes that there are just over eight cases of asbestos-related lung cancer for each recorded case of mesothelioma. This is much higher than the HSE's current working assumption of a 1:1 ratio between asbestos-related lung cancer cases and mesothelioma cases.

The costs of ARDs for former school and hospital workers in 2023

This report estimates the costs of ARDs for people working in schools or hospitals in the UK. The cost calculation includes the following components:

- Costs of social care
- Costs to the NHS
- Lost productivity for people forced to retire early due to an ARD
- Lost tax receipts and increased benefit payments for people forced to retire early
- The value of lost years of life for those who die early due to an ARD
- Compensation claims paid out by NHS Resolution (for former health workers exposed to asbestos) and local authorities (for former school workers exposed to asbestos).

This report estimates that in 2023, the total costs to the UK economy and society of asbestos-related diseases for former school and hospital workers were just over £1.3 billion. Of these, around £150 million were costs due to mesothelioma with the remainder being due to lung cancer. The largest components of costs were the costs due to early death (just under £1 billion) and the costs of social care (£275 million).

The costs to the public finances in 2023 were just over £270 million, of which just under £50 million was due to mesothelioma. The largest components of costs to the public finances were local authority social care costs (just under £190 million) and costs to the NHS (just under £60 million).

Comparing costs under Business As Usual with a Rapid Removal Programme

Based on the current speed of school and hospital rebuilding programmes in England it will take over 400 years to remove all the asbestos from schools and hospitals. This report calculates the cost savings (in terms of reduced incidence of ARDs) from removing all the asbestos from schools and hospitals over a 10-year Rapid Removal Programme (RRP), compared to the current approach (which we label Business As Usual, or BAU). The analysis takes into account the lag between exposure to asbestos and developing ARDs several decades later.

The results suggest that over a 50-year time horizon, a Rapid Removal Programme for asbestos would save the UK economy around £11.6 billion in reduced economic and social costs of ARDs relative to the current Business As Usual scenario. The savings to the UK public finances would be around £3.6 billion. This analysis discounts savings for future years by 3.5% each year in line with HM Treasury's preferred methodology for appraising costs and benefits.

The costs of removing asbestos from schools and hospitals

This report estimates the costs of fully removing asbestos from all schools and hospitals in the UK, taking into account the need to demolish system-built schools and hospitals constructed using techniques such as CLASP. Questionnaire responses from asbestos removal and demolition firms were used to obtain realistic asbestos removal and demolition costs. Because there is no central register of information on the extent and type of asbestos in the school and hospital estate, assumptions based on the total floorspace of the NHS and schools and the proportion of schools and hospitals containing asbestos were used (these are detailed in Appendix D).

Overall, this report estimates a total cost of removing asbestos of around £3.2 billion for removal from schools and £1.3 billion for removal from hospitals, making a total removal cost of just under £4.5 billion total. Demolition of system-build schools and hospitals is estimated to cost an additional £11.2 billion on top of this.

Estimated Return on Investment (comparing the costs of removing asbestos with the benefits of lower incidence of ARDs)

This report combines the estimates for the costs of removing asbestos with the estimated benefits of lower incidence of ARDs to estimate the return on investment (RoI) from a 10-year Rapid Removal Plan which would eliminate all asbestos from schools and hospitals by 2034. If only asbestos removal costs are considered, the benefit-cost ratio is three – meaning that the benefits of removing asbestos outweigh the cost of removing asbestos by a factor of three. This means that for each £1 million that removing asbestos costs, the reduced cost of ARDs saves the UK economy £3 million.

If demolition costs are also taken into consideration, the benefit-cost ratio falls to 0.85, so that for each £1 million that asbestos removal costs, the reduced costs of ARDs saves the economy around £850,000. This substantial fall in the ratio reflects that demolition plus removal is significantly more expensive than removal of asbestos considered in isolation. However, even when demolition costs are considered, the benefit-cost ratio is not far below 1:1, indicating that the net cost to the UK economy of removing asbestos over a much faster time frame than at the current rate based on school and hospital rebuilding plans is relatively small – approximately £2 billion, or £200 million per year over 10 years.

These findings suggest that there is a clear cost-benefit case for introducing a programme to remove asbestos from schools and hospitals on a 10 year timetable.

1. Introduction

Over 20 years ago the UK banned the manufacturing and use of all asbestos, including its use in buildings and construction. However, anything built or refurbished before 1999 may still contain asbestos, where it remains in an increasingly aged and deteriorating condition.

In 2022 the Work and Pensions Committee concluded its inquiry into the management of asbestos in UK buildings[3]. The inquiry identified that insufficient evidence exists about the extent and condition of asbestos in buildings, or the costs and benefits of its removal. The Committee recommended that the Government and HSE should set a deadline for the removal of asbestos from non-domestic buildings within 40 years.

"The Government and HSE should develop and publish a strategic plan to achieve this, focusing on removing the highest risk asbestos first, and the early removal from the highest risk settings including schools. This plan should, in the first instance, commit to improving urgently the evidence base for safe asbestos removal and disposal, considering relative costs and benefits."[4]

This report analyses the costs and benefits of removing asbestos from two types of public building in the UK: **schools and hospitals**. Previous research has found that asbestos is present in 80% of schools and 94% of hospital trusts in England[5]. Much of the existing school and hospital estate in England and the other countries of the UK was constructed between 1945 and 1980 when system building techniques (such as CLASP schools) were often used, and these construction techniques used large quantities of asbestos in the buildings' construction, due to the fire-retardant properties of asbestos (Designing Buildings, 2021).

There are other types of public building – for example university campuses and halls of residence, law courts, the parliamentary estate, council offices and prisons – which also contain asbestos. However, there is not sufficient information on the extent of asbestos in these buildings, the costs of asbestos removal, demolition or rebuilding costs, to be able to estimate the costs of removing asbestos. Therefore, this report has focused on schools and hospitals to ensure that the analysis is feasible and tractable. The techniques and methodology used in this report could, however, be used for other parts of the public estate, if reasonable data were available. With some modifications the analysis could also be applied to the private sector.

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[3] 'The Health and Safety Executive's approach to asbestos management', Work and Pensions Select Committee, House of Commons, 21 April 2022.

[4] Ibid, p.9.

[5] Morrin M, Aldane J, King H. Don't Breath In: Bridging the Asbestos Safety Gap, ResPublica, 2019.

Historically, research and campaigning activities around asbestos have looked at the incidence of asbestos-related diseases for people who worked directly with asbestos – for example installing it in buildings when it was still in use in new construction. By contrast, this report focuses on asbestos-related diseases arising because of incidental exposure to asbestos – for teachers, doctors, nurses and other employees who did not work directly in the manufacture or fitting of asbestos, but who did work in schools and hospitals containing asbestos. This incidental exposure remains an ongoing and serious problem even as incidence of ARDs arising from working directly with asbestos has fallen.

Structure of Report

The report is structured as follows.

Chapter 2 looks at the current incidence of asbestos-related diseases (ARDs) in the UK, focusing on mesothelioma and lung cancer caused by asbestos exposure. This looks, in particular, at current cases of mesothelioma and lung cancer among people who worked as teachers as well as other school workers, hospital workers and university lecturers and other higher education workers in their working lives.

Chapter 3 estimates the current costs to the UK economy and society of ARDs – including the social care costs, the costs to the NHS, lost productivity and the value of lost lives. The chapter also estimates the costs of ARDs to the UK public finances, including lost tax revenues and increased benefit spending as well as NHS and local authority social care costs, and the costs of compensation payments to people who contract ARDs.

Chapter 4 estimates the Net Present Value of ARDs to the UK economy and public finances over a 50-year time period under different baseline assumptions about how quickly the UK government (and devolved governments in Scotland, Wales and Northern Ireland) move to remove asbestos from schools and hospitals. The chapter also estimates the gains to the UK economy and public finances of removing the asbestos from schools and hospitals over a timeframe of 10 years, which is much quicker than the current rate of progress.

Chapter 5 estimates the costs of removing asbestos from schools and hospitals in the UK. The detailed methodology for estimating the costs of removing asbestos – and the costs of demolition for system-built schools and hospitals – is explained in Appendix D of the report.

Chapter 6 compares the costs and benefits of removing asbestos from schools and hospitals and estimates the Return on Investment (RoI) for removal of asbestos.

Chapter 7 looks at ways in which the analysis in this report could be extended in terms of considering other costs and benefits of removing asbestos, and the possibility of producing analyses for the costs and benefits of removing asbestos from other parts of the UK public estate and the private sector. To a large extent any extensions are dependent on the availability of better quality data on the amount of asbestos in other buildings in the UK.

Chapter 8 offers conclusions and recommendations.

2. The incidence of asbestos-related diseases for former school and hospital workers

2.1 Introduction

This chapter estimates the number of cases of the two most prominent asbestos-related diseases (ARDs) – mesothelioma[6] and lung cancer – for people who have worked in schools or hospitals in the UK.

2.2 The incidence of mesothelioma in the UK for people who worked in schools or hospitals

HSE statistics

The Health and Safety Executive (HSE) produces statistics on the number of deaths from mesothelioma each year by occupational group using the SOC2010 occupational classification (HSE, 2023). Table 2.1 shows the number of mesothelioma deaths by broad occupational group for occupational groups (and selected subgroups) in the data.

Table 2.1:
Deaths from mesothelioma for professionals in health and schools

Group	Men	Women	Total	Per Year
Health professionals (e.g. doctors and nurses)	39	87	126	11.5
Professionals in schools (e.g. teachers, teaching assistants)	68	103	171	15.5

Source: Health and Safety Executive (2023)

[6] Mesothelioma is a type of cancer that develops in the lining that covers the outer surface of some of the body's organs. More than 2,700 people are diagnosed with mesothelioma each year in the UK. See www.nhs.uk/conditions/mesothelioma for more details.

Table 2.1 shows that according to the HSE statistics in the 11 years 2011 to 2021 (inclusive) there were 11.5 deaths per year in the health professionals sector and 15.5 per year in schools.

However, the HSE statistics have several drawbacks, as follows:

- They only show deaths from mesothelioma for ages up to 74. As shown in the section below citing data on Industrial Injuries Disablement Benefit (IIDB) claims, at least half of mesothelioma deaths occur at ages 75 or above, so there is an inbuilt downward bias in the HSE death statistics.
- The HSE only includes deaths from mesothelioma according to final occupation (before retirement from the labour market). So a person who worked as a teacher or nurse (for example) early in their career, but then switched to another occupation, is not counted in the statistics.
- The data do not include people who worked in schools but not as teachers – for example, office administrative staff, caretakers and maintenance staff. People who worked in hospitals in administrative, maintenance and cleaning or similar jobs are also excluded from the HSE figures.

Analysis of Industrial Injuries Disablement Benefit statistics

Industrial Injuries Disablement Benefit (IIDB) is a benefit for people who are disabled and/or suffering long-term sickness due to an accident or disease caused by the conditions or environment they worked in. The UK Department for Work and Pensions publishes data on the number of recipients of IIDB and have provided researchers at the Mesothelioma UK Research Centre at the University of Sheffield (MURC) with a breakdown of the IIDB claims data according to the occupation of the claimant before they had to stop work due to ill health.

The data from the DWP as analysed by Allmark (2023) suggest 65 cases of mesothelioma for former hospital workers and 70 for teaching staff. This gives a total of 135 claims for IIDB due to mesothelioma per year in these working groups out of 1,780 claims in total – about 7.5% or 1 in 12 claims. Data on IIDB claims has been used for these groups as a proxy for the number of people who worked previously in schools and hospitals who subsequently contracted mesothelioma.

Estimating the number of former administrative workers in schools and hospitals with mesothelioma

The occupational breakdown by DWP of the IIDB claims data only covers teachers in schools and doctors, nurses or similar frontline service delivery staff in hospitals. They do not cover administrative workers in this sector. To estimate the number of former admin workers in these sectors who contract meso, data has been used from the 2001 Labour Force Survey[7] in the relevant industrial classifications[8]. The number of people in 'professional' occupations (SOC 2000 categories 2 and 3) has been compared with the number of people in 'administrative' occupations including administrative staff as well as cleaners, maintenance workers and similar occupations (SOC 2000 categories 4, 7 and 9). Table 2.2 shows the results.

[7] Because mesothelioma is a condition which usually takes a few decades to become apparent after exposure to asbestos, it is more suitable to use the Labour Force Survey from earlier decades than the current (2023) Labour Force Survey data to identify the number of administrative workers in health and education. The 2001 Labour Force Survey is the oldest wave of LFS to use the SOC2000 occupational classification which allows administrative workers to be identified reliably.

[8] Using the SIC92 industrial classification in use at the time of the 2001 Labour Force Survey, these are: 85.1 (human health activities), 80.1 (primary education) and 80.2 (secondary education).

Table 2.2:
Total number of people in work in health and schools sectors (professionals compared to other occupations), 2001

	SIC (Standard Industrial Classification)	
SOC (Standard Occupational Classification)	**Health**	**Schools**
1: Managers and senior officials	251	49
2: Professional occupations	521	1,884
3: Associate professional and technical	1,491	154
4: Admin and secretarial	698	241
5: Skilled trades occupations	68	61
6: Personal service occupations	891	825
7: Sales and customer services	12	4
8: Process, plant and machine operatives	24	7
9: Elementary occupations	277	518
Total	**4,233**	**3,743**
Professionals		
Administrators, customer services, elementary	2,903	2,863
Admin as percentage of professionals	34%	27%
Number of professionals with mesothelioma each year	65	70
Estimated number of admin workers with mesothelioma each year	22	19
Totals	**87**	**89**

Source: author's analysis of data from Labour Force Survey, 2001

Overall, in 2001 there was around one administrative worker employed in the health sector for every three health professionals and around one administrative worker employed in schools for every four professionals. Estimates of the number of former workers in schools and hospitals have therefore been increased to take account of these additional administrative workers using the ratios in the 'Admin as % of professionals' row of table 2.2. The total estimates are 87 former workers in the hospitals sector with mesothelioma each year (including 22 administrative workers) and 89 former workers in the schools sector with mesothelioma each year (including 19 administrative workers).

2.3 The incidence of lung cancer in the UK for people who worked in schools or hospitals

Current Health and Safety Executive position

Estimating the number of people suffering from lung cancer in the UK who contracted it as a result of asbestos exposure is more difficult than for mesothelioma. This is because mesothelioma is mainly caused by exposure to asbestos whereas lung cancer has a wide range of possible causes, of which asbestos is only one possible risk factor[9].

The current position of the UK Health and Safety Executive is that there is an average of one case of lung cancer caused by asbestos for every case of mesothelioma (HSE, 2023b).

Findings from recent research studies

Recent research studies looking at the relationship between the incidence of lung cancer among people who used to work in environments containing asbestos compared to the background incidence for the population, controlling for other factors which cause lung cancer, find an excess risk of lung cancer for workers exposed to asbestos which is larger than the HSE's 1:1 preferred ratio.

[9] The biggest single risk factor for lung cancer is smoking tobacco. Other risk factors include passive smoking, radon gas, air pollution, asbestos and other chemicals or substances at work (Macmillan Cancer Support, 2023).

The most recent two studies are:

- McCormack, Peto, Byrnes, Straif and Boffetta (2012) who find a ratio of 1.9 lung cancers per mesothelioma case for people who worked in the presence of mixed fibre asbestos, with four for people working with amosite (brown) asbestos[10].
- Darnton (2023) finds a ratio of between 8.4 and 35.8 lung cancers per mesothelioma case for people who worked with crocidolite (blue) and amosite (brown) combined[11].

This work uses the estimate of 8.4 lung cancers per mesothelioma case (the Darnton estimate for blue asbestos).

Applying the ratio of 8.4 lung cancer cases per mesothelioma case as a multiplier to the number of mesothelioma cases for schools and hospital workers estimated in table 2.2 above suggests that there are around 731 cases of asbestos-caused lung cancer for hospital workers and 748 cases for school workers each year.

CASE STUDY

Helen is 40 and lives in the North-East of England with her husband and three daughters.

She qualified as a nurse in 2004 before becoming an Advanced Clinical Practitioner (ACP). Her career has involved both intensive care and respiratory work. When Covid hit she was on the front line working with critically ill patients. She was diagnosed with mesothelioma two years ago aged 38.

"Asbestos exists in the majority of our schools and hospitals, and these are all buildings that were at one point in time intact and lovely and new. However, a lot of these buildings are now falling into disrepair, so I feel the risks are going to be really poignant in the next decade or so...the thing with asbestos is it's a silent killer, it's just there, and when you breath it in, there isn't an alarm that goes off. So much more could be done"

[10] There is also a figure of 6.1 lung cancer cases per mesothelioma case for people working with chrysotile (white asbestos) although this is out of line with most other research which finds a lower risk for chrysotile than other types of asbestos.

[11] For crocidolite the ratio of excess deaths is (4.3/0.51), i.e. just over 8.4. For amosite the ratio is (4.3/0.12), i.e. 35.8.

3. The costs of asbestos related-diseases for former school and hospital workers in 2023

3.1 Introduction

This chapter estimates the costs of mesothelioma and lung cancer for people working in schools or hospitals in the UK. The cost calculation comprises the following components:

- Costs of social care (Section 3.2)
- Costs to the NHS – care and drug costs (Section 3.3)
- Average life expectancy for someone diagnosed with mesothelioma or asbestos-related lung cancer (Section 3.4)
- Lost productivity for people forced to retire early due to mesothelioma or lung cancer (Section 3.5)
- Lost tax receipts and increased benefit payments for people forced to retire early (Section 3.6)
- The value of lost years of life for those who die early due to mesothelioma or lung cancer (Section 3.7)
- Compensation claims paid out by NHS Resolution (for former health workers exposed to asbestos) and local authorities (for former school workers exposed to asbestos) (Section 3.8)

Section 3.9 presents an estimate of the total current costs of asbestos-related diseases for former school and hospital workers.

3.2 Costs of social care

Mesothelioma sufferers

Mesothelioma is a debilitating condition and the costs of social care for people with the condition are often expensive. For this report we have used information on typical care costs provided by Charlotte Wells, an expert in social care for mesothelioma sufferers[12]. The average current costs of care are around £92,000 per year for someone with mesothelioma who doesn't have any family carers and around £74,000 per year for someone who has other family members living in the household who can help provide care. More detailed information on care costs is given in Appendix A of this report.

[12]See www.charlottewells.org for more details.

Data from the 2023 Labour Force Survey has been used to estimate the proportion of IIDB claimants who have other carers in their household and used this as a proxy for the proportion of mesothelioma sufferers who have other carers in their households. The figure of £74,000 has been used as the annual costs figure for paid care for people with other carers in their household and £92,00 for people who do not have any carers in their household. However, an additional implicit cost for unpaid care has been used, based on research by Reed (2021) on the costs of unpaid care for smokers and ex-smokers.

When assessing the costs to the government (discussed in more detail below) this study uses the lower figure for mesothelioma sufferers (but adjusted to take account of the proportion of care costs which the government actually funds, based on evidence of comparative costs for local authorities and self-funders in the social care system[13]).

Lung cancer

For the costs of social care to lung cancer patients this study uses the costs provided by Charlotte Wells for mesothelioma patients in Appendix A as a proxy. This is on the grounds that lung cancer is also a debilitating disease requiring substantial amounts of care during treatment and especially in the months before death.

3.3 NHS treatment costs

As well as care costs, there are costs to the NHS associated with treatment for mesothelioma and lung cancer sufferers, based on diagnosis and treatments.

For mesothelioma, a Regulatory Impact Assessment for a proposed Recovery of Medical Costs for Asbestos Diseases Bill in Wales in 2012 (Antoniw, 2012) estimated that the average annual NHS care cost cost of treatment per mesothelioma patient was just over £23,000. This cost estimate has been uprated to 2023 prices using the Consumer Price Index for healthcare costs (which is more appropriate than the general CPI because healthcare costs tend to increase faster than general inflation due to the availability of new treatments).

[13]See Reed (2021) for more information.

We have also included an allowance for the costs of NHS drug treatment for mesothelioma patients based on a statistic from the Royal College of Physicians' National Mesothelioma Audit Report 2020 that 40% of patients diagnosed with pleural mesothelioma underwent systematic anticancer therapy (SACT) treatment (RCP and Mesothelioma UK, 2020). Using average data on the costs of drug treatments for mesothelioma treatments if purchased privately (obtained from information on a range of compensation claims for mesothelioma patients who underwent private treatment) and information from the Association of the British Pharmaceutical Industry on the average discount for drugs if purchased by the NHS compared to list prices. The average annual cost of NHS drug treatment per mesothelioma patient is estimated at around £30,000. This is added to the care cost estimate of £23,000 to give a total cost of around £53,000 per patient.

For lung cancer, an estimate of the annual cost from academic research by Laudicella *et al* (2016) is used. The estimate is just over £9,000 per year in 2010 prices, which equates to just over £12,000 in 2023 prices using the healthcare costs CPI to uprate. This estimate includes nursing care costs plus drug costs.

3.4 Average life expectancy for someone diagnosed with mesothelioma or asbestos-related lung cancer

The average life expectancy for someone diagnosed with mesothelioma is not very long, although some people with the condition can live for 10 years or more. Based on evidence from Cancer Research UK (2023) an average life expectancy of two years for each person diagnosed with the condition is assumed. This affects the measured care and NHS costs per person diagnosed with each of the conditions.

For lung cancer, based on evidence from Public Health England (2021) on the survival rates of people diagnosed with lung cancer an average of two years for the average current survival rate is assumed.

3.5 Lost productivity due to early retirement from the workforce due to ARDs

People diagnosed with mesothelioma are usually unable to work due to the debilitating nature of the condition. To the extent that diagnosis occurs during working age this will result in a loss of productivity due to patients not being able to work up to retirement age when many of them otherwise would have done so. An analysis of the age distribution of IIDB claims for mesothelioma in the DWP data shows that only around 6% of diagnoses occur under age 65, with the median age of diagnosis between 75 and 79 years of age.

In this report data from the Labour Force Survey has been used to estimate the employment rate for education and health workers aged 60-64 by comparing the number of people still in work in this age group who are working in the health or education sectors with the number of retired people whose previous job before retiring was in the health or education sectors. This data has been combined with the Annual Hours and Earnings Survey (ASHE) on average earnings for people in the health and education sectors aged 60 and over to produce an estimate of the lost annual earnings for former school and hospital workers forced to leave employment due to mesothelioma.

For lost productivity due to asbestos-related lung cancer, a similar age profile to mesothelioma cases has been assumed.

3.6 Reduced tax receipts and increased benefit payments for people forced to retire early due to ARDs

The inability to work due to diagnosis of mesothelioma or lung cancer leads to a loss of tax receipts (income tax and National Insurance contributions) due to the resulting loss of earnings. Furthermore, there is a reduction in indirect tax receipts for the Exchequer because people diagnosed with these conditions have lower disposable income when out of the labour market and therefore spend less. To estimate the losses to the Exchequer arising from early retirement due to asbestos-related diseases, data has been used from ASHE on average earnings for people in the health and education sectors aged 60 and over to produce an estimate of reduced income tax and NICs receipts (and also reduced indirect tax receipts due to lower spending), per person forced to retire early. Increased benefit payments have been estimated due to IIDB and other out-of-work benefits, using data from the DWP's Stat-Xplore system on average IIDB payments and other benefit claimants (such as Personal Independence Payment) for IIDB claimants.

3.7 Value of lost life for people who die prematurely due to mesothelioma

As well as lost productivity, there is an intrinsic lost value of life for people who die prematurely due to mesothelioma. We value loss of life in this cost-benefit analysis using HM Treasury's approach (as set out in the Green Book (HMT, 2022)) of using Quality-Adjusted Life Years (QALYs). HMT recommends using a value of £70,000 per QALY in policy appraisals. To estimate the number of QALYs lost for each former school or hospital worker with mesothelioma, we have used data from the ONS's National Life Tables (ONS, 2021) which show life expectancy conditional on age for men and women and converted life expectancy to QALYs using estimates from McNamara *et al* (2023) on the relationship between life expectancy and number of QALYs remaining[14].

[14]Reed (2023) provides more details of the procedure used to map life expectancy to QALYs.

2.8 The cost of compensation claims to the NHS and school authorities

Compensation claims by former public sector workers who have contracted mesothelioma due to asbestos exposure in schools, hospitals and other buildings are an important component of the costs of asbestos exposure to the UK Government. This report uses evidence from Freedom of Information (FoI) requests made by the Mesothelioma Research Centre at the University of Sheffield (and also other researchers, for example Lucy Darnton at the Health and Safety Executive) to establish how many compensation claims for exposure to asbestos have been paid out in recent years, and what the overall cost to the UK Government is. More information on the claims data from the FoI requests is summarized in Appendix B.

Overall, FoI requests from NHS Resolution show 154 successful compensation claims for former NHS workers with mesothelioma over a 15 year period between 2007/08 and 2021/22 (i.e. around 10 claims per year), with an average value of £202,000 per claim. The equivalent data for schools is more patchy because there is no central equivalent to NHS Resolution (the organisation established to handle compensation claims for the NHS). Instead, FoI requests have had to be made separately to each individual local education authority. Appendix B contains more details of the FOI requests made.

Analysis of recent FoI requests to local education authorities in England shows a total of 89 successful compensation claims for which full data are available, with an average value of £105,000 per claim. The number of claims have been scaled up to 12 per year (the same as for former NHS workers) while using the average claim value as presented above.

For lung cancer, it has not been possible to estimate compensation costs because detailed claims data were not available. Whereas for mesothelioma the primary cause is exposure to asbestos, for lung cancer asbestos is only one of several possible causes and it is harder to establish employer liability when a former employee develops lung cancer than it is for mesothelioma.

3.9 Estimate of total costs of asbestos-related diseases for former school and hospital workers in 2023

Table 3.3 presents estimates of the total costs of asbestos-related diseases for school and hospital workers to the UK economy and society in the current year, based on the methodology outlined in this chapter[15].

[15] Note that compensation costs are not included in this table because rather than a cost to the economy as a whole, they are a transfer from the UK public sector (NHS Resolution for former hospital workers, local education authorities for former school workers) to the individuals receiving the compensation payments. Similarly, taxes and benefits are not included here for the same reason, but productivity losses are included. Conversely, Table 3.4 does include compensation payouts and reduced tax payments and additional benefit spending as these are costs to the public sector.

Table 3.3: Total costs to UK economy and society of asbestos-related diseases for former school and hospital workers in 2023 (£m)

Mesothelioma	Hospital workers	School workers	Total
Care costs	14	15	29
NHS costs	10	11	21
Lost productivity	1	1	2
Early death (QALYs)	51	52	103
Total	**77**	**79**	**156**

Lung cancer	Hospital workers	School workers	Total
Care costs	122	124	246
NHS costs	18	18	36
Lost productivity	11	10	21
Early death (QALYs)	429	439	867
Total	**579**	**591**	**1,170**

Total costs	Hospital workers	School workers	Total
Care costs	136	139	275
NHS costs	28	29	57
Lost productivity	13	11	24
Early death (QALYs)	480	401	970
Total	**657**	**670**	**1,326**

Source: Landman Economics calculations

Table 3.3 shows that the total estimated costs of asbestos-related diseases to the UK in 2023 are just over £1.3 billion. The total costs of mesothelioma are just over £150 million compared to just under £1.2 billion for lung cancer. In other words the economic and social cost of lung cancer caused by asbestos is estimated to be around seven and a half times larger than the economic and social cost of mesothelioma.

The total costs of asbestos-related diseases for former hospital workers and former school workers are approximately the same, at just over £600 million each. The largest single component of costs is early death (measured using the QALYs valuation method) at just over £850 million, followed by care costs at £275 million.

Table 3.4 shows the total costs to the UK public sector of asbestos-related diseases for former school and hospital workers in 2023.

Table 3.4: Total costs to UK public finances of asbestos-related diseases for former school and hospital workers in 2023 (£m)

Mesothelioma	Hospital workers	School workers	Total
Care costs (local authorities)	10	10	21
NHS costs	10	11	21
Reduced tax receipts	1	0	1
Increased benefit spending	1	1	2
Compensation payouts	1	2	3
Total	**23**	**24**	**47**

Lung cancer	Hospital workers	School workers	Total
Care costs (local authorities)	85	87	172
NHS costs	18	18	36
Reduced tax receipts	4	4	8
Increased benefit spending	4	5	9
Total	**112**	**114**	226

Total costs	Hospital workers	School workers	Total
Care costs (local authorities)	95	98	193
NHS costs	28	29	57
Reduced tax receipts	5	4	9
Increased benefit spending	5	5	10
Compensation payouts	1	2	3
Total	**135**	**138**	**273**

Source: Landman Economics calculations

Table 3.4 shows that total costs to the public sector are just over £270 million per year. As for the overall economic and social costs, the public sector costs are split fairly evenly between former school workers and former hospital workers. Mesothelioma costs make up around 17% of total public sector costs, compared to 83% for lung cancer. Care costs to local authorities are by far the largest component of public sector costs; reduced tax receipts, increased benefit payments and compensation payments are a small proportion of the total.

4. Long-run costs of asbestos-related diseases for former school and hospital workers

4.1 Introduction

This chapter provides estimates of the long-run costs of asbestos-related diseases for former school and hospital workers under different assumptions about the speed of removal of asbestos. Section 4.2 discusses the speed of removal under a 'Business As Usual' scenario (i.e. current government policy), while Section 4.3 discusses an alternative timescale for removal based on a 10-year programme to remove asbestos from the entire public estate (a 'Rapid Removal Programme'). Section 4.4 presents estimates of the costs of asbestos-related diseases for former school and hospital workers under the 'Business As Usual' and 'Rapid Removal Programme' scenarios and calculates the potential for rapid removal of asbestos to reduce costs to the UK economy and the public finances by reducing the numbers of cases of ARDs in the future.

4.2 The speed of asbestos removal under current UK Government policy

Schools

In England, the most recent school rebuilding programme is the School Rebuilding Programme (SRP) (Department for Education, 2022). This is the third in a series of rebuilding programmes after the two Priority School Rebuilding Programmes which ran consecutively from the early 2010s through to the early 2020s. The current aim of the SRP is to rebuild blocks in 50 schools per year, focusing on school buildings which are in the worst condition and structurally unsound. Many of these schools were originally constructed using system build methods such as CLASP (Designing Buildings, 2021) where asbestos was an important and integral material in the school construction.

The Department for Education (DfE) has identified an estimated 13,800 system-built blocks in England out of a total of around 24,200 schools in England (National Audit Office, 2023). This indicates that about 57% of England's schools contain system-built blocks, many of which have large amounts of asbestos. Research by Morrin *et al* (2019) estimates that around 80% of schools in England may contain asbestos, based on an estimate from the Education and Skills Funding Agency; this would be approximately 19,400 schools. At the current rate of rebuilding 50 schools (or blocks in schools) per year, it would take almost **400 years** to remove all the asbestos from all school buildings in England. Even

using the lower figure of 13,800 schools with system-built blocks it would take over 275 years to remove these at the current rate of school rebuilding. Given that the expected lifespan for system-built schools was only around 60 years (Designing Buildings, 2021) it is clear that the Department for Education's school rebuilding programme is totally inadequate to address the increasingly dilapidated state of England's schools. Evidence from the other countries of the UK suggests that the school estate across the UK also contains a large number of buildings with asbestos[16].

In 2020, the UK Government announced a target of building 40 new hospitals by 2030. Currently the NHS in England manages approximately 1,500 hospitals, and ResPublica (2019) estimates that 94% of NHS Trusts have at least one hospital containing asbestos. The National Audit Office (2023b) has pointed out that the hospital building programme will not meet its objective of building 40 new hospitals this decade, but even if it were to do so, at a rate of 40 new hospitals per year it would take over 350 years to replace all the asbestos in the English NHS estate.

As with the school estate, data from the NHS for Scotland, Wales and Northern Ireland suggests that there are substantial amounts of asbestos in NHS buildings in the other three countries of the UK[17].

Assumption on speed of asbestos removal under 'Business As Usual' scenario

It is assumed that the current 'Business As Usual' DfE scenario for England involves the amount of asbestos in the school and hospital estate reducing by 1/300th each year for the next 50 years. Thus, by 2073 only (50/300) = one-sixth of the total quantity of asbestos in the school and hospital estate in England will have been removed. In the very long run this is probably unrealistic as a substantial proportion of the current school and hospital estate would have collapsed or become too unsafe to work in over a period of 100 years or more. However as a medium-term assumption it seems reasonable, and is in fact fairly generous to the UK Government given the rates of school and hospital building cited above.

We assume that the stock of hospitals and schools in Scotland, Wales and Northern Ireland is rebuilt at the same rate as in England, so the rate of removal of asbestos is set at (1/300th) of the stock per year in all four UK countries.

[16] See for example for Scotland the results of the latest survey of the condition of the Scottish building estate (Scottish Government, 2022) which found that, despite recent improvements, one in 10 schools in Scotland were in 'poor' condition.

[17] See for example Pharmacists' Defence Association (2023) for Scotland, and discussion of asbestos in Northern Ireland in the House of Commons debate from April 2023 (UK Parliament, 2023).

4.3 The speed of asbestos removal under the alternative scenario of a rapid removal programme

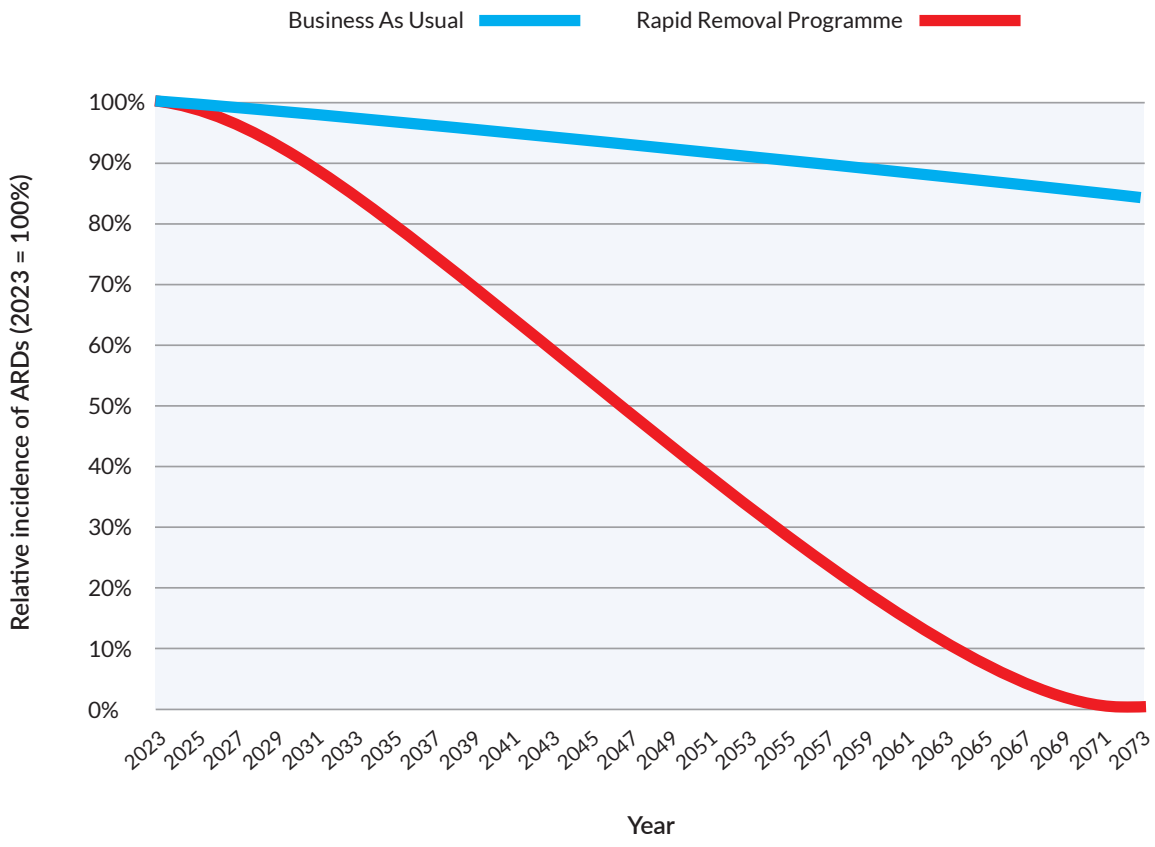
As an alternative to the glacial pace of asbestos removal under Business As Usual (BAU), Mesothelioma UK advocates a Rapid Removal Programme (RRP) for removal of all asbestos in schools and hospitals over a period of 10 years. If started in 2024 this would mean the complete elimination of asbestos from schools and hospitals in the UK by 2034.

4.4 Assumption about the relationship between the amount of asbestos remaining in the UK school and hospital estate and the incidence of ARDs

This analysis assumes that the incidence of ARDs among former school and hospital workers decreases over time under both approaches (BAU and RRP), but much more slowly under BAU. Figure 4.1 shows the modelled incidence of ARDs for former school and hospital workers under the BAU and RRP scenarios over the 50 year period 2023-73. The vertical axis shows the incidence of ARDs in 2023 as 100%, declining to 0% (the background rate of asbestos-related diseases for people not specifically exposed to asbestos in buildings as a result of their work or other activities).

Although the RRP scenario assumes that all asbestos is removed from schools and hospitals by 2034, it takes another four decades for this reduction in asbestos to be fully reflected in the incidence of ARD rates for former school and hospital workers. This is because mesothelioma and asbestos-related lung cancer usually arise several decades after first exposure, and so there is a long lag between exposure and the emergence of the diseases. Nonetheless, this analysis assumes that the incidence of work-related ARDs falls to zero by 2073 under the RRP scenario. By contrast, in the BAU scenario the incidence of ARDs for former school and hospital workers is still forecast to be around 85% of its 2023 level in 2073.

Figure 4.1:
Modelled incidence of ARDs for former school and hospital workers under Business As Usual and Rapid Removal Programme Scenarios relative to 2023 incidence rates: 2024-73



Source: Landman Economics calculations

4.5 Gains to the UK economy and public finances from rapid removal of asbestos from schools and hospitals: Estimates using a 50-year Net Present Value (NPV) approach

This section compares the costs of asbestos-related diseases over the next 50 years using a discounted Net Present Value (NPV) approach whereby costs for future years are discounted using the HM Treasury Green Book discounting factor of 3.5% per year. This is a standard methodology for project appraisal used by the Treasury and other UK government departments (HM Treasury, 2022).

CASE STUDY

Before her diagnosis, Emma, 49, worked as a teaching assistant for children with additional needs.

When her health deteriorated due to mesothelioma, the demands of her job meant that she had to give up the work she loved. She has two sons, and recently became a grandmother for the first time. She has been living with mesothelioma for ten years.

"I don't know where I got exposed. I grew up in a house that had asbestos, I went to primary school that had asbestos, and when I became a teacher, the schools I worked in had asbestos. You're not aware of where asbestos is until it impacts on your life. But it's everywhere."

Table 4.1 presents estimates for the NPV of the overall UK economic and social costs of asbestos-related diseases under the BAY and RRP scenarios, and the reduction in costs under the RRP. Under business as usual the total costs of ARDs are estimated at just over £34.1 billion, discounted over 50 years. By contrast, under the 10-year Rapid Removal Programme the costs of ARDs fall to just under £22.2 billion – a reduction of almost £12 billion in costs.

As with the results for the current cost of ARDs in 2023 in Chapter 3, the largest single component of the reduction in costs is the reduced cost of early death (due to fewer early deaths from ARDs in the RRP scenario) at almost £7.1 billion, followed by the reduction in social care costs at £3.7 billion.

Table 4.1:
50-year Net Present Value of the overall UK economic and social costs of asbestos-related diseases under BAU and RRP scenarios and the reduction in costs under the RRP (£m, 2023 price level)

Total costs	BAU	RRP	Difference in costs
Social care costs	9,179	5,468	-3,712
NHS costs	1,903	1,134	-770
Lost productivity	787	469	-318
Early death (QALYs)	22,255	15,166	-7,090
Total	**34,125**	**22,236**	**-11,889**

Source: Landman Economics calculations

Table 4.2 presents estimates for the NPV of the public finance costs of asbestos-related diseases under both scenarios. Overall the public finance costs are just under £9 billion over 50 years for BAU and just under £5.4 billion under the RRP. A 10-year Rapid Removal Programme of asbestos in schools and hospitals could save the UK and devolved governments around £3.6 billion, discounted and summed over 50 years.

The largest components in the reduction in the public finance costs under the RRP compared to BAU are lower local authority social care costs (a reduction of approximately £2.6 billion) and lower NHS costs (a reduction of almost £800 million).

Table 4.2:
50-year Net Present Value of the public finance costs of asbestos-related diseases under BAU and RRP scenarios and the reduction in costs under the RRP (£m, 2023 price level)

Public finance costs	BAU	RRP	Difference in costs
Social care costs (local authorities)	6,430	3,830	-2,600
NHS costs	1,903	1,134	-770
Reduced tax receipts	315	188	-127
Increased benefit spending	233	159	-74
Compensation payouts	109	65	-44
Total	**8,991**	**5,375**	**3,615**

Source: Landman Economics calculations

4.6 The gains to the UK economy and public finances from removing asbestos from schools and hospitals over 40 years as recommended by the Work and Pensions Select Committee

A report by the House of Commons Work and Pensions Select Committee (2022) recommended a 40-year programme for phased removal of asbestos from schools and hospitals – much faster than the current speed of removal under BAU, but significantly slower than the 10-year Rapid Removal Programme recommended in this report. Appendix C presents results for the gains to the UK economy from a 40-year removal programme as recommended by the Work and Pensions Select Committee, compared to BAU. Overall, the reduction in costs from a 40-year removal programme compared to BAU is around 43% of the cost reduction from the Rapid Removal Programme, while the improvement in the public finances from the 40-year removal programme due to reduced incidence of ARDs is around 45% of the improvement in costs under the 10-year RRP. This shows that committing to a 40-year timeframe for removal of asbestos would provide significant benefits relative to Business As Usual, but a 10-year removal programme would be even better from a cost reduction perspective.

CASE STUDY

Monica, a nurse for almost 46 years, had never heard of mesothelioma until she was diagnosed over six months ago.

Living in Northern Ireland she has recently undergone surgery, which although does not offer a cure, will hopefully improve her symptoms and quality of life.

"All this has come as such a shock to me. Before all of this happened, people much younger than me were starting to retire. My children started joking with me, asking when I was going to retire. But I had no plan to. Nursing has been my whole life, it's something I always wanted to do. For the decision to stop to be taken from me is really hard to come to terms with."

5. The costs of removing asbestos from schools and hospitals

5.1 Introduction

This chapter estimates the cost of removing asbestos from schools and hospitals in the UK.

5.2 Removal costs of asbestos

To establish the costs of removing asbestos from buildings, a survey was distributed to asbestos removal contractor firms. The results suggested a wide range of costs per square metre of asbestos removed, ranging from around £20 per m^2 to £200 per m^2.

Factors affecting the cost included:

- Whether the removal work was licensed or unlicensed[18]
- The type of building which asbestos is being removed from
- The type of asbestos being removed (blue and brown asbestos being more hazardous than white)
- The type of structure which the asbestos is being removed from (e.g. columns, tiles, pipe lagging etc.)

More details of the costs of asbestos removal are given in Appendix D to this report.

5.3 Demolition costs

Although asbestos is present in the majority of schools and hospitals (80% of schools in England and 94% of hospital trusts in England according to research by Morrin *et al*, 2019), some buildings will contain a lot more asbestos than others. In particular, schools built in the post-war period (mostly between the 1950s and the 1970s) using system-build techniques such as CLASP included asbestos as an integral part of the construction of the building (e.g. in ceiling tiles, beams and columns). For most system-built schools, removal of all asbestos in situ while leaving the building intact is simply too difficult and/or expensive to accomplish – a more feasible option would be to remove the asbestos and then demolish the building before rebuilding the school from scratch. The same is true for hospitals constructed using system-build methods in the post-war decades.

[18] HSE (2013, para 2) provides a definition of licensable work with asbestos (basically where the exposure to asbestos of employees is not 'sporadic and low intensity'.

To establish the costs of demolishing buildings, a survey was distributed to demolition contractor firms. The results suggested demolition costs of approximately £100 per m^3, and this has been used as the cost of demolition for the calculations in Appendix D.

5.4 Estimating the costs of removal of asbestos (and where necessary, demolition)

Details of the methodology used for estimation of the costs of removing asbestos are featured in Appendix D.

5.5 The costs of removing asbestos from schools and hospitals in the UK

Table 5.1 shows the estimated costs of removing asbestos from schools and hospitals in the UK (both the 'raw' removal costs and associated demolition costs). Full details of the asbestos removal calculations are set out in Appendix D of this report.

Table 5.1:
Estimated costs of removal of asbestos and demolition of buildings containing asbestos (where too difficult to remove in situ), £m

Type of building	Schools	Hospitals	Total
Total cost of removal of asbestos from buildings	3,168	1,292	4,460
Of which: system-built blocks	1,380	694	2,074
Cost of demolition of system-built blocks	7,973	3,210	11,182
Total cost (asbestos removal plus demolition)	**11,141**	**4,502**	**15,643**

Source: Landman Economics calculations (detailed calculations in Appendix D)

Table 5.1 shows that the estimated costs of asbestos removal are just under £4.5bn at current prices. Just over 70% of this (around £3.2 bn) is the cost of removing asbestos from schools, while the remaining £1.3bn is hospitals. System-built schools and hospitals account for just under £2.1 bn of the total removal costs (about 47%). However, it has been assumed that system-built schools and hospitals will need to be demolished after removing the asbestos, as the asbestos is too integral to the building framework to be removed any other way. This adds an extra demolition cost of just under £11.2 bn, of which just under £8bn (around 71%) is schools.

The total cost of asbestos removal from all the schools and hospitals containing it, plus demolition of system-built schools and hospitals, is estimated at just over £15.6 billion.

6. Comparing the costs of removing asbestos with the benefits of lower incidence of ARDs: A Return on Investment Calculation

6.1 Main results

This chapter combines the estimates for the costs of removing asbestos from Chapter 5 with the estimated benefits of lower incidence of ARDs in Chapter 4 to estimate the return on investment (RoI) from a 10-year Rapid Removal Plan which would eliminate all asbestos from schools and hospitals in the UK by 2034.

Table 6.1 presents the benefits of the RRP compared to BAU in terms of reduced incidence of asbestos-related diseases among school and hospital workers and compares them with the cost of removing asbestos over 10 years (based on the estimates in Chapter 5, adjusted to discount the cost of removal over a 10-year period rather than instantaneously).

The RoI figures are calculated in two ways: (i) based on the asbestos removal costs only, and (ii) based on removal plus demolition costs.

Table 6.1:
Estimated Return on Investment from a 10-year Rapid Removal Programme for Asbestos in Schools and Hospitals, compared to BAU

Variant	Benefit (£bn)	Cost (£bn)	Benefit-cost ratio
Asbestos removal costs only	11.889	3.970	3.00
Asbestos removal and demolition costs	11.889	13.922	0.85

Source: Landman Economics calculations

Table 6.1 shows that considering asbestos removal costs only, the benefit-cost ratio of removing asbestos from all schools and hospitals in the UK is 3.00 – i.e. for each £1 million that asbestos removal costs, the reduced cost of ARDs saves the UK economy £3 million. If demolition costs are also taken into consideration, the benefit-cost ratio falls to 0.85, so that for each £1 million that asbestos removal costs, the reduced costs of ARDs saves the economy around £850,000. This substantial fall in the ratio reflects that demolition plus removal is significantly more expensive than removal of asbestos considered in isolation. However, even when demolition costs are considered, the benefit-cost ratio is not far below 1:1, indicating that the net cost to the UK economy of removing asbestos over a much faster time frame than at the current rate based on school and hospital rebuilding plans is relatively small – approximately £2 billion, or £200 million per year over 10 years.

6.2 Alternative results under a 40-year removal programme

Table C.3 in Appendix C presents the ROI estimates for a programme of removing asbestos from schools and hospitals over 40 years as recommended by the Work and Pensions Select Committee (2022). The benefit-cost ratio under a 40-year removal programme compared to Business As Usual is around 1.3 if only the removal costs of asbestos are considered, and around 0.4 if demolition costs are also taken into consideration. This shows that while a 40-year removal programme is a substantial improvement compared to current government policy, a more rapid removal programme would have sizeable additional net benefits.

7. Other considerations

This chapter contains discussion of factors that are not included in the CBA in the report – mainly due to data limitations – and looks at how the CBA results might change if allowances were made for these extra factors.

7.1 Cases of asbestos-related diseases among former pupils and hospital patients

Ideally it would be useful to include estimates of ARD cases among former school pupils and hospital patients, to add to the estimated number of cases among former school and hospital workers. The problem is that the data on these groups is very limited. The Joint Union Asbestos Committee, a coalition of trade unions (including UNISON and the teacher and headteacher unions) presented some estimates for the number of mesothelioma cases among former school pupils between 1980 and 2017 but these are based mostly on simulations rather than actual data from IIDB claims or any other source (JUAC, 2017). For hospital patients there appears to be no data availble. Clearly the inclusion of ARDs for former school pupils and hospital patients would increase the estimated costs of ARDs as set out in Chapter 4.

7.2 Adding additional categories of former public sector worker

It would be useful to add other categories of former public sector worker who may have worked in buildings containing asbestos. For example:

- Lecturers and other workers in the higher education sector
- Employees working in council offices or the parliamentary estate
- Police officers
- Prison officers
- Employees in law courts

The problem in each of these cases is lack of data on the number of former workers in each of these occupations. As explained in Section 2.2 the HSE statistics on cases of mesothelioma by former occupation severely underestimate the number of cases among former public sector workers, and it is not clear whether the Department for Work and Pensions' IIDB data for claims relating to mesothelioma can be broken down in enough detail to provide estimates for each of these categories of former worker.

An extension of the CBA to other former public sector workers would also need to include an estimate of the costs of removing asbestos from the relevant parts of the public sector estate including university buildings, prisons, police stations, council offices and law courts. The main barrier to producing these estimates is that data on the extent and distribution of asbestos in these buildings is even more limited than for schools and hospitals.

7.3 Adding private sector buildings, workers and residents

It is known that many buildings in the UK private sector (both commercial and residential) also contain asbestos, although (as with public sector buildings) there is no centrally held database on the location and extent of asbestos in the private sector. Ideally this CBA would be extended to include the benefits of reduced cases of mesothelioma and lung cancer among people who have worked in private sector buildings containing asbestos, and those who have lived in domestic residences containing asbestos. The main barrier to including private sector buildings in a CBA of this type is the requirement for an accurate estimate of the costs of removing asbestos from private sector buildings. Due to the heterogeneity and variety of buildings in the commercial and residential private sectors, this would be an extremely difficult undertaking.

7.4 Costs of current HSE guidance on asbestos ('manage in place')

The current HSE guidance is that in most cases it is best to leave asbestos where it is, undisturbed – a 'manage in place' approach (Work and Pensions Select Committee, 2022). This approach leads to extra costs in the short term because schools and hospitals need to devote a certain amount of resources to asbestos management. For example, Manchester University NHS Foundation Trust, which operates 10 hospitals throughout Greater Manchester including over 200 buildings built before the year 2000, operates a five person team for legacy asbestos management and spent around £5 million on asbestos management in the financial year 2022/23 (Rushton and Parker, 2023). Unfortunately, it has not been possible to obtain data on the overall cost of the 'manage in place' policy across hospitals or schools in England or the UK because no centrally collated data on these expenditures exists. Therefore, these costs could not be included in the CBA, but if they had been included this would certainly have increased the estimated RoI figures in Chapter 6.

In the medium term there is a clear risk of schools and hospitals built before 1980, when asbestos and system-build techniques were most prevalent, collapsing (in the worst case scenario) or becoming dilapidated to the point where asbestos is exposed, creating greater risk for the current workforce and pupils/patients of contracting ARDs in future decades. Thus 'manage in place' is not an effective strategy in the medium-to-long-term and will result in higher potential incidence of ARDs and associated costs.

The recent discovery of the risks of Reinforced Autoclaved Aerated Concrete (RAAC) – a lightweight form of concrete used in roof, floor, cladding and wall construction in the UK from the mid-1950s to the mid-1980s (Local Government Association, 2023) underlines the risks of a 'manage in place' approach. RAAC was widely used in school and hospital construction in the post-war period, with 54 schools identified in the county of Essex alone (Essex County Council, 2023). The NHS has identified 42 hospital sites with confirmed RAAC (DHSC, 2023). Most, if not all, of the schools and hospitals containing RAAC also contain asbestos.

7.5 Including the hazards of removing asbestos

In 2022 the UK House of Commons Work and Pensions Committee published a report on the Health and Safety Executive's approach to asbestos management (Work and Pensions Select Committee, 2022). The report recommended that a deadline be set for the removal of asbestos from non-domestic buildings within 40 years, with the Government and HSE developing a strategic plan to achieve this, focusing on removing the highest risk asbestos first, and the early removal from the highest risk settings including schools.

The UK Government's response to the Work and Pensions Committee Report (UK Government, 2022) rejected the proposal for a 40-year deadline for asbestos removal, partially on the basis that an accelerated timescale for removal would expose asbestos removal contractors and workers to unacceptable risks from the asbestos displaced during the removal process:

"The Government could only advocate a proactive course of action in this area if there is compelling evidence that the, undoubted, increase in exposure to asbestos workers that will result from active removal, possibly prematurely, is justified in terms of reducing risk of exposure to building users. At present this evidence is not there" (UK Government, 2022).

While it would be desirable to include the hazards faced by asbestos removal workers in the costs of removing asbestos, the Government's response to the Work and Pensions Select Committee ignores two crucial points. One is that at some point in the next few decades many of the buildings containing asbestos will be so far beyond their original design lifespan that they will have to be demolished anyway, so the costs of demolition (including any hazards relating to asbestos exposure) are unavoidable under a 'Business As Usual' scenario. The other (as pointed out by the Rt. Hon Sir Stephen Timms MP, Chair of the Work and Pensions Committee, in his response to the Government) is that the risk of exposure is likely to increase anyway with the drive towards retrofitting of buildings to meet net zero aspirations.

7.6 Training costs for asbestos removal workers

The adoption of a Rapid Removal Programme for asbestos from schools and hospitals will create significant requirements for trained removal workers to undertake the work, whether it is completed over 10 years as recommended in this report, or over 40 years as recommended by the Work and Pensions Select Committee. Potential costs of training additional workers have not been included in this report but it would be useful to consider them in a future analysis. There would also be a potential additional benefit to training extra asbestos removal workers in that it would then be possible to undertake the removal of asbestos from other types of building in the public and private sectors at a faster rate, with the eventual goal of removing asbestos completely from the vast majority of buildings in the UK sooner rather than later.

8. Conclusions

It is well established that asbestos presents serious health risks to people working in buildings that contain it. This report is the first attempt to quantify the costs of removing asbestos from a particular type of building in the UK (i.e. schools and hospitals) and to compare these costs with the benefits of a lower incidence of asbestos-related diseases among former school and hospital workers, over a 50-year time period.

Importantly, this report shows that asbestos-related diseases for people who have worked in buildings containing asbestos are an ongoing and significant problem. For too many people who have worked in schools and hospitals during their careers, asbestos-related diseases and the associated costs of such diseases are not a historical phenomenon; deaths are occurring now, and will continue to do so as long as asbestos remains present in the public estate. In fact, the increasing age and deteriorating condition of public buildings containing asbestos means that the costs of current government policy of managing the vast majority of asbestos in place – only removing it as part of the current (very slow) school and hospital rebuilding programmes – are likely to increase.

Overall, the results show that the benefits to former school and hospital workers of removing asbestos from schools and hospitals over a period of ten years – approximately thirty times faster than the current speed of progress – outweigh the costs of accelerated removal by a factor of almost three. Even when the costs of demolishing system-built schools and hospitals – where the asbestos is too integral to the structure of the building to be removed by any other means – are factored in, the benefits of removing asbestos make a 'demolition-plus-removal' programme almost cost-neutral with reference to the UK economy as a whole.

These findings suggest that there is a clear cost-benefit case for introducing a programme to remove asbestos from schools and hospitals at a rate even more rapid than the 40-year timescale recommended by the Work and Pensions Select Committee in 2022.

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Appendix A:
More detailed information on care costs for mesothelioma patients

This Appendix presents the more detailed information received from Charlotte Wells and used in the estimates of social care costs set out in Chapter 3 of this report.

Charlotte Wells considered two scenarios – the first being if the client has family who are well and available to contribute to care, with additional support being provided by private carers in the last six months as care needs increase. The second being for a person who has no family available and would therefore be wholly dependent on private carers.

The reason for the difference is that the hourly rate that is considered reasonable for family carers is significantly less than the rate that a private agency would charge. For instance at the moment the average hourly rate used to value family care is £12.87 an hour, whereas the hourly rate for a private healthcare assistant (i.e. that which would be charged to the client) would be between £25-£30 an hour.

Element	Costs if care is shared by family and outside carers	Costs if no family available to provide care
Care during immunotherapy (average of 10 treatments)	£1,865	£5,932
Care during chemotherapy (average of 6 treatments)	£1,620	£3,559
Care and domestic assistance up to last 6 months (assume 6 months at £227.89 per week)	£5,941	£12,864
Care and domestic assistance for penultimate 3 months	£7,339	£12,139
Care and domestic assistance for final 3 months	£48,832	£49,418
Equipment (average costs)	£8,448	£8,448
Total	**£74,045**	**£92,360**

Appendix B:
Information on compensation payouts to former school and hospital workers

This information is supplied by the Mesothelioma UK Research Centre at the University of Sheffield.

B.1 Payouts to former hospital workers

The data used for compensation payouts to former hospital workers are taken from two Freedom of Information (FoI) requests to NHS Resolution (the organisation that deals compensation claims for former NHS workers. The FoI requests (and the URLs for the FoI disclosure logs) are as follows:

FOI 5898 (March 2023)

"I would like to repeat a request I made in 2019 in order to update my information for the charity Mesothelioma UK. I would like the most recent 15 years of data.

1) *How many civil law cases of negligence have been taken against the NHS by current or former NHS employees who have developed mesothelioma and have sued because they believe it is due to asbestos exposure at work? I would like to know on a year-by-year basis*
i) *Number of claims received*
ii) *Number of claims settled with a damages payment resolved in favour of the employee*
iii) *Number of claims settled without a damages payment resolved in favour of the NHS*
iv) *Number of claims resolved at trial with damages approved, set by court*
v) *Number of claims resolved out of court*

I would also like two collated pieces of information (i.e. not broken down year-by-year)
vi) *Number of claims received by gender*
vii) *Number of claims received by occupation type"*

The disclosure log for this request can be found on the NHS Resolution website at https://resolution.nhs.uk/foi-disclosure-log/mesothelioma-asbestos-exposure-foi_5898

FOI 3992 (September 2019)

"I would like to know about civil law cases of negligence that have been taken against the NHS with regard to current or former NHS employees who have developed mesothelioma and have sued because they believe it to be due to asbestos exposure at work. I would be interested to know cases in the last 15 years (or less if information is available but not for that period".

The results from this FOI request are not currently available online.

Most of the information used for hospital workers in Section 2.8 comes from FOI 5898, with a small amount of supplementary information from FOI 3992.

Summary of the following tables:

B.2 Payouts to former school workers

The information on compensation payouts to school workers is more difficult to obtain as there is no centralised equivalent to NHS Resolution and so researcher have to issue FOI requests to each individual local education authority. The situation has become even more complicated in the last two decades as so many schools have been taken out of local authority control and placed into academy chains.

Table B.1 below provides links to some example FOI requests for local education authorities. A large number of these requests were made by the asbestos campaigner Lucie Stephens in 2016. The format of the requests was as follows:

"Dear [insert name of council],
Under the Freedom of Information Act 2000, please provide me with the following information:

1. *The names of the schools in your county that contain asbestos.*
2. *The date and outcome of the last independent audit or inspection of each of these schools Asbestos Management Plans.*
3. *The details of any reported incidents of asbestos exposure in these schools between 2011 and 2016.*
4. *Details of any improvement or prohibition notice served or guidance issued by the HSE in relation to the management of asbestos in schools in your county in the last five years.*
5. *The number of school employees (existing and retired staff to include teaching staff, school support staff and caretakers, etc) and ex-pupils that have pursued a claim against you for exposure to asbestos within a school in your county.*
6. *The number of these claims that have been settled.*
7. *The amount of money that has been paid in settlement of these claims (with and without your authority accepting responsibility)."*

Table B.1:
Selected FOI requests to local education authorities in England & Wales, 2016

Authority and date	URL
Essex	www.whatdotheyknow.com/request/asbestos_in_essex_schools
East Sussex	www.whatdotheyknow.com/request/asbestos_in_east_sussex_schools
Somerset	www.whatdotheyknow.com/request/asbestos_in_somerset_schools
Southend-on-Sea	www.whatdotheyknow.com/request/asbestos_in_southend_on_seas_sch
Redcar and Cleveland	www.whatdotheyknow.com/request/asbestos_in_redcar_and_cleveland
Blackpool	www.whatdotheyknow.com/request/asbestos_in_blackpool_schools
Blackburn	www.whatdotheyknow.com/request/asbestos_in_blackburn_schools
Camarthenshire	www.whatdotheyknow.com/request/asbestos_in_carmarthenshire_scho
Ceredigion	www.whatdotheyknow.com/request/asbestos_in_ceredigion
Rhondda	www.whatdotheyknow.com/request/asbestos_in_rhondda_schools
Torfaen	www.whatdotheyknow.com/request/asbestos_in_torfaen_schools

The results from these FOI requests were collated by researchers at the Mesothelioma UK Research Centre at the University of Sheffield, who analysed the total number of compensation claims and the average cost per claim. This information was communicated to the author by email in October 2023.

Appendix C:
50-year Net Present Value and Return on Investment calculations if asbestos is removed from schools and hospitals on a 40-year timescale

This appendix presents an alternative set of returns for the 50-year Net Present Value calculations if asbestos is removed from schools and hospitals on the 40-year timescale recommended in the report by the Work and Pensions Select Committee (2022), The Health and Safety Executive's approach to asbestos management. Table C.1 compares the 50-year NPV of the overall economic and social costs of the current Business As Usual (BAU) scenario with the Work and Pensions Select Committee's recommendation (WPSC), while Table C.2 shows the NPV of the public finance costs in both scenarios.

Table C.1:
50-year Net Present Value of the overall UK economic and social costs of asbestos-related diseases under BAU and WPSC scenarios and the reduction in costs under the WPSC recommendations (£m, 2023 price level)

Total costs	BAU	WPSC	Difference in costs
Social care costs	9,179	7,487	-1,692
NHS costs	1,903	1,553	-351
Lost productivity	787	642	-145
Early death (QALYs)	22,255	19,232	-3,023
Total	**34,125**	**28,914**	**-5,211**

Table C.2:
50-year Net Present Value of the UK public finance costs of asbestos-related diseases under BAU and WPSC scenarios and the reduction in costs under the WPSC recommendations (£m, 2023 price level)

Total costs	BAU	WPSC	Difference in costs
Social care costs (local authorities)	6,430	5,245	-1,185
NHS costs	1,903	1,553	-351
Reduced tax receipts	315	257	-58
Increased benefit spending	233	201	-32
Compensation payouts	109	89	-20
Total	**8,991**	**7,345**	**-1,646**

Overall, the WPSC recommendations result in costs being about £5.2 billion lower than BAU. This is around 43% the size of the savings from the 10 year Rapid Removal Programme compared to BAU (as shown in table 4.1). Meanwhile, the savings to the public finances from the WPSC recommendations compared to BAU are just over £1.6 billion. This is around 45% the size of the savings from the RRP compared to BAU in table 4.2.

Table C.3 shows the estimated ROI for the 40-year WPSC recommended programme compared to BAU (this is the equivalent of table 6.1 for the 10 year Rapid Removal Programme in the main text). The benefit-cost ratio of a 40-year removal programme compared to BAU is around 1.3 if only asbestos removal costs are considered, and just under 0.4 if asbestos removal and demolition costs are considered.

Table C.3:
Estimated Return on Investment from Work and Pensions Select Committee recommendation for 40-year removal programme for asbestos in schools and hospitals, compared to BAU

Variant	Benefit (£bn)	Cost (£bn)	Benefit-cost ratio
Asbestos removal costs only	5.211	3.970	1.31
Asbestos removal and demolition costs	5.211	13.922	0.37

Appendix D:
Estimating the cost of asbestos removal

This appendix explains the detailed assumptions regarding the cost of asbestos removal used in this report.

D.1 Asbestos removal costs

A questionnaire was sent out to asbestos removal contractors asking how much they would charge for removal asbestos per square metre in different types of public buildings (schools, hospitals, council offices, law courts etc.) The response suggested costs of between £20 and £200 per m^2, depending on the material.

Based on the range of responses included, the average cost of asbestos removal used in the calculations in this report has been set at £80 per m^2 for asbestos in schools, and £100 per m^2 for hospitals.

D.2 Demolition costs

A questionnaire was also sent out to demolition contractors asking how much they would charge for demolition of public buildings (per m^3). The responses received suggested an average demolition cost of £100 per m^3 and this estimate has been used in the calculations for this report.

All the demolition contractors who replied to the survey said that in the event that a building earmarked for demolition contains asbestos, the costs for asbestos removal would be quoted over and above the demolition costs. Therefore, we have summed together the costs of demolition and the costs of asbestos removal for system-built buildings (where we have assumed the asbestos is integral to the structure of the building and demolition is the only economical way to get rid of it).

D.3 Estimating the total number and volume of system-built schools and hospitals in England and the demolition costs of system-built schools

My analysis assumes that asbestos in system-built schools and hospitals needs to be removed by demolition, whereas asbestos in other parts of the school and hospital estate (mostly schools and hospitals built before and after the period when system-building techniques were most likely to be in use, approximately between 1950 and 1980) can be removed without demolition. Therefore, it is important to estimate the number of system-built schools and hospitals in England. (This analysis arrives at an estimate of asbestos removal and demolition costs for England first, and then scales the result up to the whole UK as shown in Section D.5).

System-built schools

A report by the National Audit Office (2023) on the condition of school buildings in England estimates that there are currently 13,800 system-built blocks in England's schools, out of a total of around 63,950 total blocks – a proportion of 21.6%. The Department for Education's Conditions of School Buildings Survey from 2021 reported that the total floorspace of England's schools was 78.7 million m^2 (DfE, 2021).

Assuming that the height of each storey in schoolblocks in England is 4m, my estimate for the total volume of system-built school buildings in England is (78.7 million x 4) = 314.8 million m^3. Applying the estimated percentage of system-built blocks from the NAO report (21.6%) results in a total estimate for the total cost of demolition of system builds of (314.8 million x £100 x 21.6%)

= £6,794 million.

System-built hospitals

It was not possible to find a specific figure for the number or proportion of hospitals in England which were built using system methods so the data from the Naylor review of NHS Property and Estates from 2017 (Department of Health, 2017) has been used. This featured a breakdown of the NHS estate in England by age of buildings. The Naylor review breakdown shows that in 2014-15, 25% of the NHS provider estate was built between 1948 and 1984 (the closest approximation which the age data provides to the period when system building was in vogue).

More recently, estate returns information from NHS Digital shows that in 2021/22, the total floorspace of the NHS estate in England was 27.2 million m^2 (NHS Digital, 2022). Based on the same assumed storey height as for schools, the total volume of hospital space in England has been assumed as (27.2 million x 4) = 108.8 million m^3. Applying the 25% estimate for total number of system-built hospitals in the NHS England estate results in estimated demolition costs of system-built hospitals in England of (108.8 million x £100 x 25%)

= £2,720 million.

D.4 Estimating the total cost of asbestos removal from schools and hospitals in England

To estimate the total cost of removing asbestos from all schools and hospitals in England, it is necessary to estimate the total quantity of asbestos in schools and hospitals in England. This is the most difficult part of the CBA calculation because of the lack of data on the amount of asbestos in each building.

System-built schools

This starts with an estimate of the total quantity of asbestos in the walls and ceiling for each classroom. As a rough estimate, based on the size of an average classroom in England (around 70 m² and the area of walls and ceiling for each classroom, 100 m² of asbestos in each classroom has been assumed. On this basis, removing asbestos from a classroom costs (£80 x 100) = £8,000.

The Department for Education's data hub on 'schools, pupils and their characteristics' (DfE 2023) states that the school system in England contains 9,073,000 pupils with an average class size of 26.7. On this basis the total number of classrooms in England is assumed as approximately (9,073,000/26.7) = 340,000 classrooms.

Based on the finding from Section C.3 above that 21.6% of school buildings in England are system builds, the estimated total cost of asbestos removal from system-build classrooms is:

(340,000 x 21.6% x £8,000)

= £588 million (to the nearest £million).

To produce a rough estimate of the total amount of asbestos in each system-built school the total cost of removing asbestos from classrooms has been doubled (on the basis that there will be large quantities of asbestos in other parts of school buildings – corridors, halls, sports facilities, boiler rooms and pipes, etc.) This leads to a total cost of asbestos removal from system-build schools of £588m x 2

= £1,176 million.

Non system-built schools

The total quantity of asbestos in the non-system built component of the England school estate have also been estimated based on the figure of 80% of schools in England contain asbestos[19]. As a rough approximation, it has been assumed that each non-system built school contains only 35% of the quantity of asbestos as a system-built school (because asbestos is more integral to the structure of the building in system-built schools). This means that the estimate for the total cost of removing asbestos from non-system built schools is: £1,176m x (80%/21.6%) x 0.35

= £1,524 million.

Total: schools

The total estimated cost of removing asbestos from schools is then (£1,176m + £1,524m)

= £2,700 million.

Hospitals

To estimate the cost of removing asbestos from hospitals, it has been assumed that the costs of removing asbestos per m² of floor space are the same for system-built hospitals as for system-built schools, and for non-system-built hospitals as for non-system-built schools.

Based on the estimates above, the cost of removing asbestos per m² of floor space is £1,176m / (78.7million x 21.6%) = £69.18 for system-built schools

and

£1,524m/ (78.7million x 58.4%) = £33.16 for non system-built schools.

The calculations also need to take account of the higher average cost of removing asbestos from hospitals compared to schools (an estimate of £100 per m² for hospitals compared to £80 per m² for schools). Therefore, the estimated cost of removing asbestos per m² of floor space has been multiplied by (100/80) to produce an estimate for hospitals. This produces estimates of £86.48 for system-built hospitals and £41.45 for system-built hospitals.

The amount of floor space for system-built hospitals is assumed to be 27.2 million m² x 25% = 6.8 million m². This means that the estimated cost of removing asbestos from system built hospitals is (6.8 million x £86.48) = £588 million.

[19] Morrin *et al*, 2019

What about non-system built hospitals? Based on the 2017 Naylor review, approximately 26% of the NHS estate in 2014-15 was built after 2000, when asbestos was completely banned in the UK. This percentage has been increased to 30% to take account of new hospital building since 2015. This means that the amount of floor space for non-system built hospitals is assumed to be (27.2 million m^2 x (100% - (30% + 25%)) = 12.24 million m^2. The estimated cost of removing asbestos from non-system built hospitals is £508 million. The total cost of removing asbestos from the NHS England estate is (£588 million + £507 million)

= £1,095 million.

D.5 Adjustment for size of UK population compared to England population

All the calculations in Sections C.1 to C.4 are for England only. To derive an estimate for the UK as a whole, data from the ONS's population projections for 2023 has been used and derived multipliers for the school age population of the UK compared to England (approximately 1.17) and (for hospitals) the all-age population of the UK compared to England (approximately 1.18). These multipliers were used to scale up the England-based estimates of demolition and asbestos removal costs to the UK level.

D.6 Estimating the 50-year Net Present Value of demolition and removal of asbestos under the BAU and RRP scenarios

Finally, the costs for asbestos removal and demolition in the Rapid Removal Program (RRP) scenario are adjusted to reflect the proposed 10-year timescale of the programme. This involves discounting the costs for years two through 10 of the programme by 3.5% per year in line with the Treasury's Green Book guidance (HMT 2022). The result of this cumulative discounting is that the costs of demolition and removal of asbestos are equal to approximately 89% of what they would have been if the demolition and removal had taken place in a single year.

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