

# APPG Report

## Improving Silicosis Outcomes in the UK



January 2023



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All Party Parliamentary Group  
for Respiratory Health

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### All-Party Parliamentary Group for Respiratory Health

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### Acknowledgements

The All Party Parliamentary Group wishes to thank all those who contributed evidence for the compiling of this report. We all wish to thank all those who gave so generously of their time to provide further assistance at our request.

This is an independent report produced by the APPG for Respiratory Health and is dedicated to all those who suffer from silicosis and their families.



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# APPG Report

## Improving Silicosis Outcomes in the UK

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# Recommendations

## Clinical

- ▶ We recommend that silicosis is included as a notifiable disease in the Health Protection (Notification) Regulations 2010
- ▶ We recommend that any notification of previous RCS exposure is accessible within secondary care, specifically on presentation at the lung health checks and the community diagnostic centres
- ▶ We recommend that occupational health services are introduced into GP surgeries to allow for occupational histories to be taken where RCS work-related ill health is suspected
- ▶ We recommend that patient records should record if a person has been subject to health surveillance due to exposure to silicosis and occupational health providers undertaking surveillance should be required to notify the GP
- ▶ We recommend that where health surveillance has been discontinued because of change of employment, a flag should be available for primary care staff at health check ups and appointments as a possible symptoms referral trigger for further investigation for silicosis

## Regulatory

- ▶ We recommend that the Department for Education considers the inclusion of silica related risk as a compulsory syllabus item for all building and construction modules in government funded apprenticeship schemes and further education courses
- ▶ We recommend that the HSE undertakes an industry awareness campaign on the dangers of respirable crystalline silica in order to improve compliance with the existing Work Exposure Limits (WEL)
- ▶ We recommend that the Health and Safety Executive (HSE) assesses and determines the data and technology needed to allow the UK to reduce the WEL for work with silica to 0.05 mg/m<sup>3</sup>
- ▶ We recommend that the HSE takes active steps to look into real time monitoring systems as a matter of some urgency, to determine and share the data sets that they deem to be necessary to take this forward and liaise with industry to speed the process and introduction of real time monitoring systems
- ▶ We recommend that the HSE actively considers and consults with industry on the position of real time monitoring to complement the hierarchy of control

# Introduction

It has been a difficult two years for us all. When we launched our first report on silicosis “Silica – The Next Asbestos” in the House of Commons in 2020 in partnership with B&CE,<sup>1</sup> it contained a number of recommendations designed to prevent silicosis deaths and improve workers’ health.

That report was in response to the concerns within industry about the disproportionate effect of dust on workers’ respiratory health and in particular, respirable crystalline silica (RCS) and the impact on their lives. The intention of the APPG was to highlight the recommendations to bring about real change in silicosis outcomes.

However, the impact and consequences of the COVID-19 outbreak had a devastating effect throughout the country and the pandemic led to significant disruptions in respiratory disease care and management, compounding many existing issues with chronic airways disease management. We saw a big impact on central respiratory care capacity and clinicians in the time of crisis. It also diverted any meaningful discussion on prevention and risk reduction strategies related to silicosis.

Following the publication of the report, we were contacted by a number of industry experts who suggested that there was an incomplete consideration of the risk reduction strategies within the report. We were advised that there had been significant developments within risk reduction and that the rise of real time monitoring of dust particulates was particularly promising.

Underlying our wish to explore these new prevention strategies was the understanding that chronic airway disease prevention and management has a vital role to play in relieving pressure on hard pressed healthcare systems and ultimately, in saving lives.

As we enter the COVID-19 endemic period, the lessons learned during the pandemic must serve to transform the diagnosis, treatment and management of respiratory diseases and ensure silicosis has a place in prevention policies, using the latest evidence and key recommendations on best practice.

We have looked again at the current situation regarding risk reduction strategies around silicosis and we have raised a number of straightforward recommendations to enable the Department of Health and Social Care (DHSC), NHS England and Improvement, the HSE and the industry communities to have greater confidence in these strategies and the delivery of silicosis prevention initiatives.

The reality is that silicosis is entirely preventable and, in all our considerations, the wellbeing and safety of workers and those exposed to RCS is paramount.

To assist us, we renewed our engagement with the HSE, industry experts, individuals and senior clinicians and they have added their expert advice on the transition to better prevention. We have taken their views into careful consideration and we have revisited a number of issues that were identified in our initial inquiry as being of particular importance.

We received written submissions from a large number of individuals and organisations. We heard from industry experts that the scale of the problem is unknown, that there is enormous variation in the approach and management of risk reduction strategies and varied solutions to the problem of keeping workers safe.

We heard positive comments on the role and work of the HSE in carrying out their statutory duties within the silicosis related industries and we also received overwhelming support for a public information campaign on silicosis, the need for greater compliance and understanding of the regulations and a transition to more up to date technologies, including real time monitoring.

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<sup>1</sup> <https://bandce.co.uk/corporate-responsibility/our-purpose/influencing-change/silica-the-next-asbestos/>

We also believe that a re-classification of silicosis as a notifiable disease with the NHS and industry regulations is essential to enable better understanding of the scale of the problem, to better manage diagnosis and treatment and for future strategies for the prevention of silicosis. Without this re-classification, patients with silicosis could find themselves excluded from essential primary care diagnosis.

We also heard of the need for support in primary care for hard pressed GPs and for silicosis related data and work history to be shared within the referral pathways.

It is apparent from the evidence we received for both this and our previous report that industry views silicosis as a major issue that needs to be addressed. It is also apparent that simple, cost-effective changes at policy level can have far reaching benefits for patients, their families and the NHS.

We received a comprehensive response from the HSE to our enquiry and we are enormously and especially grateful to them for their engagement. We would go further and welcome and commend their work across the breadth and depth of all the silicosis related industries, often in very trying circumstances.

We are very encouraged that there has been such an impressive range of opinion and evidence and we hope that this report can increase the level of public knowledge and discussion surrounding silicosis.

We are indebted to all those who have helped us to put this report together and we were impressed by the ongoing work of individual companies and other organisations which work tirelessly to raise awareness and promote good working practices to minimise the risks of silicosis and we commend their ongoing work.

This report is dedicated to all those individuals and their families, who suffer needlessly from silicosis.

## Silica

Silica (Silicon dioxide) is found naturally around the world in the form of minerals including quartz, tridymite and cristobalite. It is found in stone, rocks and sand and is a major component of construction materials including concrete, bricks, tiles and mortar. These forms of silicon dioxide have a crystal structure. Other forms, known as 'amorphous silica' (including silica gel and diatomaceous earth) are much less hazardous than the crystalline forms.<sup>2</sup>

RCS is the most toxic form when it is freshly 'fractured' through processes such as stonecutting, drilling and polishing. When broken down in this way, it is a fine enough dust to reach deep inside the lungs when inhaled. Respirable silica dust particles are invisible to the naked eye in normal light,<sup>3</sup> so high concentrations can be inhaled without the worker being aware of it.

“Silica (Silicon dioxide) is found naturally around the world in the form of minerals including quartz, tridymite and cristobalite.”

<sup>2</sup> IOSH *Respirable Crystalline Silica: The Facts. No Time To Lose* (2015) Available at: [https://www.notimetolose.org.uk/wp-content/uploads/2018/03/Factsheet\\_Respirable\\_crystalline\\_silica\\_the\\_facts\\_MKT2730.pdf](https://www.notimetolose.org.uk/wp-content/uploads/2018/03/Factsheet_Respirable_crystalline_silica_the_facts_MKT2730.pdf) Last accessed 12/12/2019

<sup>3</sup> IOSH *Respirable Crystalline Silica: The Facts. No Time To Lose* (2015) Available at: [https://www.notimetolose.org.uk/wp-content/uploads/2018/03/Factsheet\\_Respirable\\_crystalline\\_silica\\_the\\_facts\\_MKT2730.pdf](https://www.notimetolose.org.uk/wp-content/uploads/2018/03/Factsheet_Respirable_crystalline_silica_the_facts_MKT2730.pdf) Last accessed 12/12/2019



## Where silica is found<sup>4</sup>

In their evidence, the Stone Federation of Great Britain pointed out that not all stone types contain high levels of silica, those that do include sandstones, gritstones and similar. Limestones contain very little or no free silica<sup>5</sup> and there is an important variation in different types of stone.

The amount of silica contained in various types of stone is variable and is detailed in Table 1:

**Table 1: Silica concentration in different types of stone<sup>6</sup>**

Types of natural stone or other mineral-based materials	Crystalline silica content (% w/w)
Sandstone, gritstone, quartzite	Above 70%
Mortar, concrete	25-70%
Shale	40-60%
China Stone	Up to 50%
Granite	20-45% (typically 30%)
Slate	20-40%
Ironstone	Up to 15%
Basalt, dolerite	Up to 5%
Limestone, chalk	Up to 5% (typically less than 2%)
Marble	Up to 5% (but can contain veins of crystalline silica so the overall content may be a lot higher)

<sup>4</sup> <http://www.hse.gov.uk/lung-disease/silicosis.htm> Last accessed 12/12/2019

<sup>5</sup> ISFGB evidence to the 2022 APPG inquiry

<sup>6</sup> HSG201: Controlling exposure to stone dust - Publications - HSE

# Silicosis

Silicosis is considered to be the most common chronic occupational lung disease worldwide.<sup>7</sup> It is a form of pneumoconiosis and is a progressive, degenerative clinical respiratory condition which causes crippling health conditions and co-morbidities and can lead to death.

The NHS defines silicosis as “a long-term lung disease caused by inhaling large amounts of crystalline silica dust, usually over many years”,<sup>8</sup> while the HSE refers to silica as “the biggest risk to construction workers after asbestos”.<sup>9</sup> An estimated 600,000 workers are exposed to silica in the UK each year. The Institution of Occupational Safety and Health (IOSH) estimate that in Europe as a whole, 81% of those exposed are employed in construction or in manufacturing products used in that industry.<sup>10</sup>

**Those who work in the following industries are particularly at risk:**

- ▶ Construction and demolition
- ▶ Stone masonry and stone cutting – especially sandstone
- ▶ Mining and quarrying
- ▶ Worktop manufacturing and fitting
- ▶ Sand blasting
- ▶ Pottery, ceramics and glass manufacturing



Silicosis is progressive; even if the worker is no longer exposed, the effects of silicosis are irreversible.<sup>11</sup>

It presents predominantly as an upper lung condition and symptoms can take many years to emerge. After very heavy exposure, however, the condition can develop more quickly – after only a few months or years.<sup>12</sup> As the condition progresses, the symptoms increase. Ultimately, silicosis can be fatal but there may be extensive damage to the lungs before any symptoms appear.

Silicosis is rarely the recorded reason for death but it causes significant co-morbidities – it increases the likelihood of developing other health issues such as tuberculosis, chest infections, heart failure, arthritis, kidney disease, chronic bronchitis, chronic obstructive pulmonary disease (COPD) and lung cancer.<sup>13, 14</sup>

Gordon Sommerville, a silicosis sufferer following a long career in a silica based industry, in a very moving and personal submission, asked that the government acknowledges these other co-morbidities and that The Industrial Injuries Advisory Council (IIAC) include these diseases on their compensable occupational diseases list.<sup>15</sup>

The tragedy is that silicosis is entirely preventable and yet it still affects hundreds of workers every year.<sup>16</sup>

<sup>7</sup> M. Nola and S. Dotlić ‘The Respiratory System’ in Damjanov, I (ed) *Pathology Secrets* Philadelphia: Mosby Elsevier (2009) p203

<sup>8</sup> <https://www.nhs.uk/conditions/silicosis/>

<sup>9</sup> <https://www.hse.gov.uk/construction/healthrisks/cancer-and-construction/silica-dust.htm#:~:text=Silica%20is%20the%20biggest%20risk,500%20construction%20workers%20in%202005.>

<sup>10</sup> IOSH Respirable Crystalline Silica: The Facts. No Time To Lose (2015) Available at: [https://www.notimetolose.org.uk/wp-content/uploads/2018/03/Factsheet\\_Respirable\\_crystalline\\_silica\\_the\\_facts\\_MKT2730.pdf](https://www.notimetolose.org.uk/wp-content/uploads/2018/03/Factsheet_Respirable_crystalline_silica_the_facts_MKT2730.pdf)

<sup>11</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683176/>

<sup>12</sup> A. Seaton, et al Accelerated Silicosis in Scottish Stonemasons *The Lancet* 337:8737 (1991) p341-344 Available at: <https://www.sciencedirect.com/science/article/pii/S014067369190956P>

<sup>13</sup> NHS (2018) *Silicosis* available at <https://www.nhs.uk/conditions/silicosis/>

<sup>14</sup> American Thoracic Society *Breathing in America: Diseases, Progress, and Hope* chapter 13 2015 Available at: <https://www.thoracic.org/patients/patient-resources/breathing-in-america/resources/chapter-13-occupational-lung-diseases.pdf>

<sup>15</sup> Gordon Sommerville evidence to the APPG inquiry 2022

<sup>16</sup> M. Nola and S. Dotlić ‘The Respiratory System’ in Damjanov, I (ed) *Pathology Secrets* Philadelphia: Mosby Elsevier (2009) p203



# The scale of the problem

Our respondents were unanimous in their view that the scale of the problem is unknown.

There are approximately 1.36 million people employed in the UK construction industry,<sup>17</sup> with an additional 850,000 workers classified as self-employed.<sup>18</sup> A number of respondents provided evidence that many of these could be exposed to the dangers of RCS, but the precise number affected remains unclear.

The Civil Engineers Contractors Association (CECA) told us that the extent of exposure to RCS is most likely to be under reported due to the make up of the industry and that it is highly likely that the number of workers exposed to RCS is far more than documented.<sup>19</sup>

Under-reporting, the fragmented nature of the industry and poor diagnostic ability in the lag time to diagnosis are all contributing factors. In addition, silicosis is no longer a notifiable disease under the Health Protection (Notification) Regulations 2010, which requires the reporting of specific diseases to Public Health England.<sup>20</sup>

“ Longer working lives give the potential for higher cumulative silica exposures – HSE ”

Respondents overwhelmingly told us that the true picture of silicosis is unknown. It isn't clear whether the number of cases is increasing over time, or whether it is better diagnosed.

Silicosis is a preventable disease but as long as clinicians are working blind to the numbers of patients who may have silicosis, the scale of the problem is unknown and we do not believe that this is ideal. We believe that there is strong case for silicosis to be re-registered as a notifiable disease.

## Recommendation

- We recommend that silicosis is included as a notifiable disease in the Health Protection (Notification) Regulations 2010

<sup>17</sup> <https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/articles/constructionstatistics/2018#employment-and-earnings>

<sup>18</sup> <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/selfemploymentjobsbyindustryjobs04>

<sup>19</sup> CECA evidence to APPG report 2022

<sup>20</sup> Great Britain *Reporting of injuries, diseases and Dangerous Occurrences Regulations 1995* Elizabeth II (1995) London: The Stationary Office Available at: <http://www.legislation.gov.uk/ukxi/1995/3163/schedule/3/made>

# Clinical context

## Lung disease in the UK

- ▶ Overall, lung diseases are responsible for over 700,000 hospital admissions each year in the UK<sup>21</sup> and around 10,000 people are diagnosed with a lung condition every week<sup>22</sup>
- ▶ Around 1.2 million people in the UK are living with Chronic Obstructive Pulmonary Disease (COPD)<sup>23</sup> and there are approximately 25,000 COPD deaths each year, the majority of which are among smokers<sup>24</sup>
- ▶ A study in the BMJ in 2017 found that the burden of COPD due to occupation was just under 20%<sup>25</sup>
- ▶ The cost of all respiratory disorders to the economy is around £11.1bn a year<sup>26</sup> (0.6% of the UK's GDP in 2014). Of this, £10bn is direct cost to the NHS; the remainder is working time lost<sup>27</sup>
- ▶ The NHS estimates that there are 2,000 – 4,000 new diagnoses of interstitial lung disease (ILD) each year,<sup>28</sup> of which a proportion will be due to silicosis

The tragedy of the health impact of silicosis on workers is that it is 'entirely preventable'.<sup>29</sup> Yet the risk of silicosis remains a challenge in a number of UK industries, with an estimated 600,000 workers exposed to silica.<sup>30</sup> According to a study published by Loughborough University, the consequences of the disease costs employers in the construction industry almost £1 billion per year (excluding compensation claims and occupational cancer).<sup>31</sup>

RCS was first classed as a human carcinogen by the International Agency for Research on Cancer in 1997.<sup>32</sup> In January 2019, the EU reclassified RCS as a carcinogen and implemented the same occupational exposure limit as already existed in GB; 0.1 mg/m<sup>3</sup>.

**Overall, lung diseases are responsible for over 700,000 hospital admissions each year in the UK<sup>21</sup>**

<sup>21</sup> N. Snell et al Burden of lung disease in the UK: findings from the British Lung Foundation's "respiratory health of the nation" project European Respiratory Journal Vol 48 suppl 60 (2016) Available at: [https://erj.ersjournals.com/content/48/suppl\\_60/PA4913](https://erj.ersjournals.com/content/48/suppl_60/PA4913)

<sup>22</sup> Lung disease in the UK | British Lung Foundation (blf.org.uk)

<sup>23</sup> <https://statistics.blf.org.uk/copd>

<sup>24</sup> <https://psnc.org.uk/services-commissioning/essential-facts-stats-and-quotes-relating-to-copd/>

<sup>25</sup> [https://oem.bmj.com/content/74/Suppl\\_1/A114.2](https://oem.bmj.com/content/74/Suppl_1/A114.2)

<sup>26</sup> British Lung Foundation and Pro Bono Economics *Estimating the economic burden of respiratory illness in the UK* (2014). Available at: [https://www.probonoeconomics.com/sites/default/files/files/British%20Lung%20Foundation%20full%20report%2015032017\\_0.pdf](https://www.probonoeconomics.com/sites/default/files/files/British%20Lung%20Foundation%20full%20report%2015032017_0.pdf)

<sup>27</sup> British Lung Foundation and Pro Bono Economics *Estimating the economic burden of respiratory illness in the UK* (2014). Available at: [https://www.probonoeconomics.com/sites/default/files/files/British%20Lung%20Foundation%20full%20report%2015032017\\_0.pdf](https://www.probonoeconomics.com/sites/default/files/files/British%20Lung%20Foundation%20full%20report%2015032017_0.pdf)

<sup>28</sup> NHS England *Interstitial Lung Disease Service Adult, Service Specification, Schedule 2* NHS England (2018) Available at: <https://www.england.nhs.uk/wp-content/uploads/2018/08/Interstitial-lung-disease-service-adult.pdf>

<sup>29</sup> Editorial: The world is failing on silicosis *The Lancet* 7.4 (2019) p283 Available at [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(19\)30078-5/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(19)30078-5/fulltext)

<sup>30</sup> C. C. Leung, I. T. S. Yu and W. Chen Silicosis *The Lancet* 379:9830 (2012) p2008–2018 Available at: <https://www.sciencedirect.com/science/article/pii/S0140673612602359>

<sup>31</sup> Gibb, A., Drake, C. and Jones, W. (2018) *Costs of occupational ill-health in construction*. Loughborough University / ICE available at <https://www.ice.org.uk/ICEDevelopmentWebPortal/media/Documents/Disciplines%20and%20Resources/Briefing%20Sheet/Costs-of-occupational-ill-health-in-constructionformattedFINAL.pdf>

<sup>32</sup> WHO IARC *Monographs on the evaluation of carcinogenic risks to humans: Silica and some silicates* Vol 42 (1987) Available at: <https://publications.iarc.fr/Book-And-Report-Series/Iarc-Monographs-On-The-Identification-Of-Carcinogenic-Hazards-To-Humans/Silica-And-Some-Silicates-1987>

Since 1997 there have been many studies reviewing the evidence base and following up large silica-exposed cohorts.<sup>33, 34</sup>

There are a number of challenges around the diagnosis and treatment of silicosis – the main symptoms, which are common to many other disorders, include a persistent cough, shortness of breath and weakness or fatigue.<sup>35</sup> The symptoms can take some years to develop and can also progress long after exposure has ceased, while many people do not notice the symptoms until after they stopped working with silica dust.<sup>36</sup>

It can take time and numerous tests to accurately diagnose patients presenting with typical silicosis symptoms, which can increase pressure on already hard pressed GPs.

The current system does not easily allow for particularly speedy diagnosis. The similarity of silicosis symptoms to a range of other respiratory illnesses does not help in determining a specific silicosis diagnosis.

However, the benefit gained from diagnosing the condition before symptoms develop is considered by the World Health Organisation (WHO) to outweigh the risk.<sup>37</sup>

Robert Bradford from Bam Nuttall felt that a specific set of silica regulations (similar to asbestos) were justified given the health risks and lack of awareness of these risks.<sup>38</sup>

We also looked at the role of x-rays and CT scans in diagnosis as a means of driving earlier referral and we found some studies that suggest that chest x-rays may not be enough as the primary means of diagnosis.

Numerous studies have shown that chest x-rays are not as sensitive as CT scans<sup>39</sup> and can result in individuals having to return for follow-up scans, which could delay diagnosis, while some studies stated that x-rays to investigate patients with suspected lung cancer (from any cause) may even be harmful<sup>40</sup> and some studies have found that the changes in chest X-rays of patients with silicosis are not identified in around half of those with the disease.<sup>41</sup>

Current HSE guidance offers an example of a health surveillance protocol which includes an annual symptom questionnaire and lung function test, which we strongly support.

**It can take time and numerous tests to accurately diagnose patients presenting with typical silicosis symptoms, which can increase pressure on already hard pressed GPs**

<sup>33</sup> K. Steenland et al Pooled exposure-response analyses and risk assessment for lung cancer in 10 cohorts of silica-exposed workers: an IATC multicentre study *Cancer Causes & Control* Vol 12 (2001) pp 773-784 Available at: <https://link.springer.com/article/10.1023/A:1012214102061>

<sup>34</sup> Y. Liu et al Exposure-response analysis and risk assessment for lung cancer in relationship to silica exposure: A 44 year cohort study of 34,018 workers *American Journal of Epidemiology* vol 178 (2013) pp1424-1433 Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4522915/pdf/nihms710075.pdf>

<sup>35</sup> <https://www.actionpf.org/information-support/what-is-silicosis>

<sup>36</sup> <https://www.nhs.uk/conditions/silicosis/>

<sup>37</sup> World Health Organisation *Early Detection of Occupational Diseases* Geneva: WHO (1986) Available at: <https://apps.who.int/iris/bitstream/handle/10665/37912/924154211X.pdf;jsessionid=798C079FFBDC6AD2BCDE37ABC241F7B0?sequence=1>

<sup>38</sup> BAM Nuttall evidence to APPG inquiry

<sup>39</sup> <https://bjgp.org/content/69/689/e827>

<sup>40</sup> Robert W. Foley, & Vanessa Nassour & Helen C. Oliver, Chest X-ray in suspected lung cancer is harmful, *European Radiology* (2021) 31:6269–6274. <https://pubmed.ncbi.nlm.nih.gov/33517491/>

<sup>41</sup> T. Sato, T. Shimosato and D. M. Klinman Silicosis and lung cancer: current perspectives *Lung Cancer: Targets and Therapy* Vol 9 (2018) pp 91-101 Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6207090/pdf/lctt-9-091.pdf>

The HSE also recommends consideration of a baseline chest X-ray on entry to the industry. Thereafter, chest X-rays are required every three years from 15 years of exposure onwards. To date there has not been a review of the efficacy of the current requirements for chest X-rays.

Although there is limited clinical evidence that a baseline chest X-ray would be beneficial, it would enable a baseline comparison for future chest X-rays and would also reinforce to the worker and employer the risk to respiratory health if RCS exposure is not adequately controlled and protective measures are not followed.

The Royal Australian and New Zealand College of Radiologists considered that occupational lung diseases such as silicosis are more reliably diagnosed using CT scans, rather than X-rays and one study showed that X-rays overlooked disease in more than 40 per cent of workers.<sup>42</sup>

We were told by a number of clinicians that very early lung disease can be missed on x-rays, giving false reassurance to patients who typically will wait longer before presenting again following the initial results. This appears to support a “CT first” approach and the evidence overwhelmingly endorses this.

We agree that this merits further research and propose that to improve early stage disease, the use of low dose CT should be considered as the first-line investigation for primary care patients with suspected silicosis.

Greater access to low dose CT scanning for all those at risk of silicosis or other lung diseases in general is probably the most important factor in early diagnosis.

It is not for us to make recommendations on clinical decisions but the evidence on straight to low dose CT scanning appears to be very strong and we support its widespread introduction through the CDCs and the primary care network where appropriate symptoms appear alongside a history of working in an RCS environment in the past.

**The HSE recommends consideration of a baseline chest X-ray on entry to the industry**



<sup>42</sup> <https://blog.gorillajobs.com.au/2019/11/11/ct-scanning-and-risk-detection/#:~:text=CT%20Scanning%20is%20strongly%20recommended,the%20traditional%20chest%20X%20Dray>

## Policy context

Acknowledgment of the consequences of silicosis and the drive for improvements in silicosis outcomes has proven challenging for successive UK Governments. It is typically characterised by the inclusion of silicosis in wider respiratory health and safety policy, rather than as a stand-alone issue. Consequently, there is very limited focus on silicosis itself within government initiatives across the relevant departments. As a result of this, there has been very little parliamentary activity on silicosis in past years.

Instead, Government policy in relation to silicosis and the dangers of silica dust is largely contained in HSE Codes of Practice and guidance and for many years, successive Governments have tended to rely on the outcomes and strategies by executive, regulatory and other bodies, such as the HSE, industry and patient advocacy groups.

It is, however, apparent that in recent policy initiatives the government recognises the importance of respiratory health in general and the greater need for prevention strategies.

In The Long Term Plan, the government confirmed respiratory health as a priority: “Mental health, respiratory and musculoskeletal conditions are responsible for a substantial amount of poor health, and place a substantial burden on the NHS and other care services” and pledged to “intensify the NHS’ focus on...respiratory conditions”.<sup>43, 44</sup>

The Plan also committed the new primary care networks to support the diagnosis of respiratory conditions. It promised more staff in primary care would be trained to provide specialist input.

Although the Prevention Green Paper made little mention of respiratory health it did identify it as the fifth leading cause of years lived with disability in England in 2017 and it also associated air pollution with respiratory diseases.<sup>45</sup>

**Acknowledgment of the consequences of silicosis and the drive for improvements in silicosis outcomes has proven challenging for successive UK Governments**

Currently, there is no specific National Institute for Healthcare Excellence (NICE) guidance for the treatment and management of silicosis, although it is mentioned as a differential diagnosis in the guidance for TB.<sup>46</sup>

On the 1st October, 2021 the Government announced 40 new Community Diagnostic Centres (CDCs), which are set to open across England in a range of settings from local shopping centres to football stadiums and will offer new earlier diagnostic tests closer to patients’ homes.<sup>47</sup>

In the Budget, delivered on the 28th October 2021, the Chancellor announced an additional £5.9 billion to tackle the backlog of diagnostic tests to deliver more checks, scans and treatment. The intention is to increase the number of centres to “at least” 100.<sup>48</sup>

<sup>43</sup> <https://www.longtermplan.nhs.uk/publication/nhs-long-term-plan/>

<sup>44</sup> Stafford, M., Steventon, A., Thorlby, R., Fisher, R., Turton, C. & Deeny, S. (2018) Understanding the health care needs of people with multiple health conditions. The Health Foundation. Available from: <https://www.health.org.uk/publications/understanding-the-health-care-needs-of-people-with-multiple-health-conditions>

<sup>45</sup> <https://www.gov.uk/government/consultations/advancing-our-health-prevention-in-the-2020s/advancing-our-health-prevention-in-the-2020s-consultation-document>

<sup>46</sup> <https://cks.nice.org.uk/topics/tuberculosis/diagnosis/differential-diagnosis/>

<sup>47</sup> <https://www.gov.uk/government/news/40-community-diagnostic-centres-launching-across-england>

<sup>48</sup> <https://www.gov.uk/government/topical-events/budget-2021>



The Minister also confirmed during the Budget debate that the community diagnostic centres are designed to help to clear the backlog of people waiting for clinical tests such as Magnetic Resonance Imaging (MRI), ultrasounds and Computed Tomography (CT) scans, together with £2.9 billion alone to be used on diagnostic scanning equipment such as CT, MRI, and ultrasound scanners.

In their response to the 'Health is Everyone's Business' consultation in 2019, the Government confirmed that it 'believes occupational health (OH) has an important role to play in supporting job retention and enabling staff to thrive in work'. It also points out that there is a wide variation in access to OH services, with large employers five times more likely to offer OH than small employers.<sup>49</sup>

**...the Government confirmed that it 'believes occupational health (OH) has an important role to play in supporting job retention and enabling staff to thrive in work'**

**The government also highlighted a number of challenges in the commercial OH market:**

- ▶ Cost as a key barrier to procuring OH
- ▶ Shortages in the OH workforce, particularly clinical staff, which risk the future capacity of the OH providers to deliver services
- ▶ Potential for more rapid innovation particularly targeted at SMEs and self-employed people
- ▶ Lack of awareness/understanding of the full range of OH services

The government intends to test a subsidy which would aim to gather evidence on whether targeted financial incentives improve access to OH and employment outcomes which will inform the case for a potential fixed term roll-out in the future.

The NHS Getting It Right First Time programme (GIRFT), which is delivered in partnership with the Royal National Orthopaedic Hospital and NHS England and NHS Improvement, has a major role to play in improving OH. Their experience, data use and outcomes metrics support sharing of best practice in the NHS.

As a first step, the government is working with GIRFT to pilot a best-practice methodology for collection of outcome metrics and to consider solutions to implement, build on and scale this methodology, as well as explore how employers might use data and outcomes to understand the value of occupational health.<sup>50</sup>

The government also identified the two main challenges as legal consent and the General Data Protection Regulation (GDPR) limiting OH providers' ability both to share information easily between organisations and generate returns from SMEs and the self-employed due to the difficulties in trying to achieve economies of scale.

<sup>49</sup> <https://www.gov.uk/government/consultations/health-is-everyones-business-proposals-to-reduce-ill-health-related-job-loss/outcome/government-response-health-is-everyones-business#chapter-4-helping-employers-access-quality-occupational-health-oh-support>

<sup>50</sup> <https://www.gov.uk/government/consultations/health-is-everyones-business-proposals-to-reduce-ill-health-related-job-loss/outcome/government-response-health-is-everyones-business#chapter-4-helping-employers-access-quality-occupational-health-oh-support>





**Among the solutions to these issues, the government further proposes to:**

- ▶ Address shortages within the OH workforce, ensuring the right training and support helps build a sustainable workforce for the future
- ▶ Work towards building a sufficient supply within the market for new or existing OH providers to service future demand
- ▶ Reduce the public purse burden through an improved commercial market partnership

We warmly welcome this initiative and agree with the potential solutions proposed by the government's response. We also call on the NHS to consider the data within patient records to record work-related exposure to RCS.

The recent policy document "Our Plan for Patients", pledged to increase the number of Community Diagnostic Centres (CDCs) to 160 and to introduce other professionals at primary care level.<sup>51</sup>

The CDCs will allow certain categories of patients access to planned diagnostic care nearer to home rather than undergo, in some cases, numerous hospital visits. Removing lung testing from primary care should result in shorter waiting times and a reduced risk of cancellation. It has also been suggested that they should improve equity of access and inclusion, supporting the NHS Long Term Plan commitment to narrowing health inequalities.<sup>52</sup>

We strongly welcome the announcement, the introduction of the CDC and the clear commitment to increase diagnostic capability across the country, especially for respiratory conditions and we believe this is a significant development.

The centres will introduce greater consistency, awareness and timely treatment options which will benefit patients for whom referrals are necessary.

It appears to us from the evidence we have received on the role and function of the CDC that they would be ideal for referral for scans and tests to determine the presence of silicosis. However, it is difficult to understand how that would work for the benefit of patients while silicosis remains a non-notifiable disease.

## Recommendation

- ▶ We recommend that any notification of previous RCS exposure is accessible within secondary care, specifically on presentation at the lung health checks and the community diagnostic centres

<sup>51</sup> <https://www.gov.uk/government/publications/our-plan-for-patients/our-plan-for-patients>

<sup>52</sup> <https://uclpartners.com/work/community-diagnostic-centres/>

# The role of occupational health



The Aggregates Industries told us that access to competent occupational hygiene advice in guidance for Management of Health and Safety at Work Regulations Regulation 7(1) or guidance for COSHH Regulation 10 would better protect workers.<sup>56</sup>



Clinicians who responded to our previous report were in agreement that some form of national occupational health service for industries generating RCS exposure was more appropriate than increasing the burden on primary care. Due to the strong feelings expressed by them we decided to look further into the role of occupational health and the benefits for worker safety.

The British Occupational Hygiene Society (BOHS) told us that they felt it was important for primary healthcare providers to be aware of the risk of dust exposure for more accurate diagnosis and effective treatment and management. They felt it was most important in sectors such as construction or where the risk of high levels of exposure may be perceived as being below the threshold.<sup>54</sup>

They also pointed out the challenges of fractured continuity of employment over the years and pointed out that health surveillance in itself was insufficient to deal with whole life exposures.

They told us that they thought RCS exposure should be a marker in healthcare systems, like smoking, which would lead to a better risk-based approach to ongoing health monitoring strategies. Without the engagement and education of nurses and GPs in the understanding of RCS exposure, the potential for supporting the health of workers exposed to RCS may be limited.

They also supported Occupational Health professionals prioritising systematic, risk-based monitoring and feed back to employers and occupational hygienists, as well as forwarding such data to and forwarded to primary care.

While this could be delivered via the NHS, the majority of workers exposed are working in private companies, and a significant number of occupational health professionals work outside the NHS. All our respondents who addressed the issue acknowledged that any form of national occupational health service would be fundamentally challenged by the significant shortage of occupational health professionals in the UK.<sup>55</sup>

The Aggregates Industries told us that access to competent occupational hygiene advice in guidance for Management of Health and Safety at Work Regulations Regulation 7(1) or guidance for COSHH Regulation 10 would better protect workers.<sup>56</sup>

The British Ceramic Confederation (BCC) produced sector guidance for the ceramics industry in 2018, in association with the HSE, trade unions and occupational health specialists entitled: Respirable Crystalline Silica – A Guide to the Actions Needed which included an industry-wide commitment to engage in a process of continuous improvement in health and safety.<sup>57</sup>

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<sup>53</sup> Evidence to APPG inquiry 2020

<sup>54</sup> BOHS evidence to APPG inquiry 2022

<sup>55</sup> <https://www.som.org.uk/som-response-government-consultation-health-everyones-business> Last accessed 12/11/2022

<sup>56</sup> Aggregates Industries evidence to APPG 2022

<sup>57</sup> <http://www.ceramfed.co.uk/key-topics/health-and-safety/>

We commend the BCC for their initiative and encourage other industry sectors to follow their lead in producing industry-specific guidance. We also recognise the efforts of the European social dialogue NEPSI which includes its good practice guide, training and awareness materials.

Robert Bradford from BAM Nuttall highlighted the limited use of occupational hygienists to monitor levels of dust produced but pointed out that such oversight is unusual and this is infrequently encountered and limited to larger organisations or projects as opposed to where the bulk of exposure is occurring.<sup>58</sup>

Robert also told us that take up and implementation of occupational health surveillance is not as widespread as it should be in their sector and there is significant non-compliance with existing regulatory requirements.<sup>59</sup>

A key point raised by our respondents was the demands on GPs' time, as this often prevents them from being able to take a detailed occupational history. Workers presenting to their GP with breathing problems may not link their occupational exposure and their symptoms, and GPs operating under time constraints may miss the opportunity to ask workers about their employment background. Sufficient time is needed to discuss the patient's occupational history and exposure.

In our previous report, Dr Gareth Walters and colleagues from the University Hospitals Birmingham NHS Foundation Trust told us that the UK 'remains very bad' at diagnosing silicosis, as the diagnosis depends on the identification of significant RCS exposure rather than simply finding radiological changes.<sup>60</sup>

The problem is compounded by the nature of the industries associated with RCS. With so many workers self-employed or employed by small or micro businesses, or self-employed, they are less likely to have access to an occupational health programme.

The Health in Construction Leadership Group stated that as a result, large numbers of workers are at risk of not receiving an early diagnosis.<sup>61</sup>

They further suggested that workers could hold their own occupational health records, either alongside or within their GP records, so that there is a record of exposure available. The CECA suggested that occupational health teams send records to the worker's GP when the worker leaves the industry.

BOHS went further on continuity of care and stressed the importance of health professionals being aware of interventions to support health management. The current model of health surveillance places the obligation on an employer to maintain records and make a risk assessment. Modern working practices mean that workers are seldom employed for long periods or solely by one employer.

This is particularly true in construction. Silica exposure over long periods of time is a crucial factor in causing disease. Therefore, the approach to health surveillance currently in place leaves the worker at risk of under surveillance for some periods but not others.<sup>62</sup>

We commend the government on the actions they have taken so far on measures outlined in the 2021 Budget, the Spending Review of 2021 and Our Plan for Patients, which have the potential to reduce current pressures on primary care.

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<sup>58</sup> Robert Bradford evidence to the APPG 2022

<sup>59</sup> Robert Bradford Evidence to the APPG 2022

<sup>60</sup> University Hospitals Birmingham NHS Trust evidence to 2020 report

<sup>61</sup> Health in Construction Leadership Group evidence 2020

<sup>62</sup> BOHS evidence to APPG inquiry 2022

Whilst we support the increased use of occupational health within the industries associated with RCS, we are conscious of the need not to increase these pressures. We are also aware of the lack of this support in many parts of the industries associated with RCS that either cannot afford the services or do not see a particular need for them.

We also believe that allowing other professionals to sit within primary care is an opportunity to realise the ambitions contained within 'Health is Everyone's Business' by aligning OH services alongside GPs surgeries.

There are no easy solutions to this, but we believe that a start needs to be made to enable the advantages of occupational health services to become more widespread throughout industries associated with RCS.



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## Recommendations

- ▶ We recommend that occupational health services are introduced into GP surgeries to allow for occupational histories to be taken where RCS work-related ill health is suspected
- ▶ We recommend that patient records should record that a person has been subject to health surveillance and occupational health providers undertaking surveillance should be required to notify the GP
- ▶ We recommend that where health surveillance has been discontinued because of change of employment, a flag should be available for primary care staff at health check ups and appointments as a symptoms referral trigger for further tests on silicosis

# Risk reduction strategies

To be able to meaningfully take recommendations forward on workers' health and assess the impact of RCS within industry, we looked at the current state of risk prevention strategies, how dust exposure is monitored, the overall position regarding the hierarchy of controls and the potential of new technology.

## Increasing awareness of risk

ARCO suggested that the most effective ways of reducing exposure can be achieved by following the hierarchy of control and by eliminating, substituting, isolating or introducing engineering controls to extract crystalline silica dust from the manufacturing and construction process.<sup>63</sup>

They also stated that dust monitoring is vital. They pointed out new technology advances which mean that new methods of real-time exposure level monitoring are now possible which can be used to support existing monitoring methods. Knowing what the actual exposure levels are is important as exposure will depend on the actual task (e.g. cutting concrete is higher risk than breaking concrete, and the actual exposures depend on the concrete mixture).

We agree with ARCO and believe that there is significant benefit to measuring exposure in real-time to prove that exposure levels are within the WEL.

The new Code of Practice for Tunnelling was published by the British Standards Institute in November 2019 and has been updated to include real time dust monitoring and control.<sup>64</sup> This requires the use of new technology and gives an instantaneous measurement.

**Good design is the cornerstone of reducing exposure to silica dust'**

**BOHS**

One of the critical issues that was identified was the levels of awareness of the risks of RCS among employers and workers. As part of our inquiry, we asked what more could be done to raise awareness within the relevant industries.

The general consensus was an educational or information campaign, either direct throughout the industries themselves, or run more centrally by an overseeing organisation, such as the HSE, would be of great benefit.

A number of our respondents called for an industry publicity campaign on the dangers of RCS. The British Aggregates Association (BAA), on behalf of the minerals extractive industries, told us that a properly funded and effective publicity and education campaign is probably the best way to increase awareness at all levels.<sup>65</sup>

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<sup>63</sup> ARCO evidence to the APPG inquiry 2022

<sup>64</sup> <https://www.bsigroup.com/en-GB/about-bsi/media-centre/press-releases/2019/february/bsi-calls-for-input-to-develop-a-revision-to-bs-61642011-code-of-practice-for-health-and-safety-in-tunnelling-in-the-construction-industry/>

<sup>65</sup> British Aggregates Association evidence to the APPG 2022



This was supported by the Stone Federation of Great Britain, HILTI, the CECA, the Aggregates Industries and the BOHC.

HILTI told us that they would prefer to see professional education and information campaigns that address specifically all levels of different stakeholders (from the worker to the company owner). These campaigns would:

- ▶ Avoid the creation of fears
- ▶ Motivate to be “part of something good” and to take greater accountability<sup>66</sup>

The Stone Federation suggested a properly funded and effective cross industry publicity campaign to increase awareness at all levels, backed up by effective enforcement from the regulator who must also be properly funded.<sup>67</sup>

The CECA stated that whilst new legislation is one obvious way, they suggested an educational campaign aimed at the school age children (primary and secondary) to increase their awareness of a healthy working environment.<sup>68</sup>

The Aggregates Industries also supported the outreach to schools and would like to see it extended to universities and colleges. They also reminded us of the Construction Dust Partnership which they claim has been successful in reaching employers and workers. They further suggested that other industrial leaders could benefit from this model.<sup>69</sup>

They also raised a crucial point that some of these workers in SMEs, along with self-employed, transient workforce & agency workers have knowledge and awareness gaps in how their exposures are measured and health surveillance undertaken and they continue to need support to access information and affordable solutions.<sup>70</sup>

The BAA, on behalf of the minerals extractive industries, state that even where awareness amongst employers and employees is very high a properly funded and effective publicity campaign was probably the best way to increase awareness at all levels.<sup>71</sup>

Tilbury Douglas felt that the link between exposure and long latency illnesses needs to be communicated to the workforce and why the controls need to be implemented. Communicating the longer term health effects, with real life information around the effects of health hazard in the early career period and teaching the correct methods of protection would benefit the new entries into the industry.<sup>72</sup>



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<sup>66</sup> HILTI evidence to APPG inquiry 2022

<sup>67</sup> Stone Federation evidence to APPG inquiry 2022

<sup>68</sup> CECA evidence to APPG inquiry 2022

<sup>69</sup> Aggregates Industries evidence to APPG inquiry 2022

<sup>70</sup> Aggregates Industries evidence to APPG inquiry 2022

<sup>71</sup> British Aggregates Association evidence to APPG inquiry 2022

<sup>72</sup> Tilbury Douglas evidence to APPG inquiry 2022



The BOHS believe that risk reduction to RCS exposure would benefit from a national strategy, focused regulatory, educational and information support, while Trolex felt that awareness could be improved through example by the major companies. They both also felt that many large construction companies must begin to raise awareness, change culture and invest in the future health of their people.<sup>73,74</sup>

BOHS also told us that where workers receive information about their exposure and appropriate control measures, the exposure can drop by 20-30%.<sup>75</sup>

The CECA and the Aggregates Industries proposal that the awareness of the risks should extend beyond the industry and be taken to schools, colleges and universities was well made.

We were very supportive of this suggestion and feel there is great merit to it. We support their views and feel that they made a strong case.

We agree that there is great merit in a focussed and delivered awareness campaign. The dust campaign conducted by the HSE, which included silica exposure from September to November 2021 was very successful but although it contained references to silicosis, the main content in the campaign was dust related in general.

We think there is merit in the HSE running a specific awareness initiative on silicosis in its own right, given the widespread exposure, serious clinical consequences of the disease and the fact that it is entirely preventable.

## Recommendations

- ▶ We recommend that the Department for Education considers the inclusion of silica related risk as a compulsory syllabus item for all building and construction modules in government funded apprenticeship schemes and further education courses
- ▶ We recommend that the HSE undertakes an industry awareness campaign on the dangers of respirable crystalline silica dust



<sup>73</sup> BOHS evidence to APPG inquiry 2022

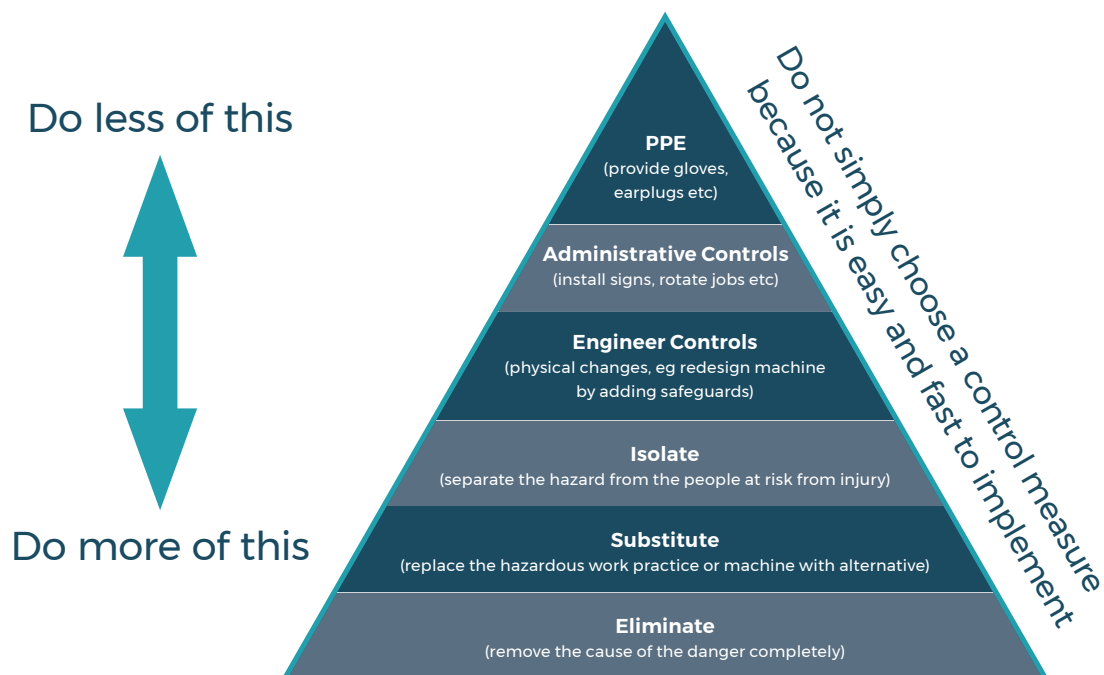
<sup>74</sup> Trolex evidence to APPG inquiry 2022

<sup>75</sup> BoH evidence to APPG inquiry 2022

## Health surveillance and WELs

Under the Control of Substances Hazardous to Health Regulations (2002 as amended), occupational health surveillance is required for those exposed to hazardous substances, including RCS.<sup>76</sup>

COSHH sets out the hierarchy of control options that must be implemented and, if managed appropriately, should result in achieving a level below the Work Exposure Limit (WEL) as detailed in HSE Guidance EH40/2005, Workplace exposure limits.<sup>77</sup>



## Hierarchy of Control

The Mineral Products Association (MPA) reminded us that it is important to note that the primary legal requirement is for employers to apply the Hierarchy of Controls to reduce exposure, so they are not driven simply by the need to comply with the WEL but to reduce exposures through the adoption of good dust control practices where they can, even if they are already below the WEL.<sup>78</sup>

BOHS told us that they consider it important to obtain evidence from occupational hygienists where they have measured before and after implementation of engineering controls.<sup>79</sup> Trolex suggest that real-time monitoring can have a very significant impact on the design, implementation, and development of engineering controls through the provision of immediately available data.<sup>80</sup>

The Stone Federation of Great Britain, with all of our other responders, felt that the COSHH regulations worked well. The Federation reminded us that COSHH requires control to be in line with the principles of good practice and exposure needs to be controlled to a level that is proportionate to the health risks and “in any case to below the WEL”.<sup>81</sup>

<sup>76</sup> Great Britain The Control of Substances Hazardous to Health Regulations 2002 Elizabeth II (2002) London: The Stationary Office Available at: <http://www.legislation.gov.uk/ukxi/2002/2677/contents/made>

<sup>77</sup> <https://www.hse.gov.uk/pubns/books/eh40.htm>

<sup>78</sup> MPA evidence to APPG inquiry 2022

<sup>79</sup> BOHS evidence to APPG inquiry 2020

<sup>80</sup> Trolex evidence to APPG inquiry 2022

<sup>81</sup> Stone Federation of Great Britain evidence to the APPG inquiry 2022

### According to the regulations, with regard to RCS, employers are required to:

- ▶ Carry out a risk assessment
- ▶ Keep a record of the assessment (if they employ more than five people)
- ▶ Where practicable, consider substituting material with a lower RCS content
- ▶ Prevent or control exposure to RCS
- ▶ Explain the risks of RCS and how to avoid them
- ▶ Provide the worker with respiratory protective equipment<sup>82</sup>

In addition, if employers are exposing their workforce to hazards and risks (including RCS) where there is a disease associated with the substance, they are also obliged to provide health surveillance. Regulation 6 of the Management of Health and Safety at Work Regulations 1999 states that:

*'Every employer shall ensure that his workers are provided with such health surveillance as is appropriate having regard to the risks to their health and safety which are identified by the [risk] assessment.'*<sup>83</sup>

Health surveillance is required where there is a specific health condition caused by the hazardous substance, there is a valid test to identify the health condition and the workplace or working conditions mean that the condition may occur.

In addition, the Construction Skills Certification Scheme and accompanying card system could be modified to ensure RCS is more prominent. In particular the Construction Industry Training Board (CITB) Health, safety and environment (HS&E) test should invariably ensure that awareness of RCS risks are included.<sup>84</sup>

The HSE reminded us that employers must not only ensure that the WEL of 0.1 mg/m<sup>3</sup> is not exceeded, but also that exposure is controlled to as low a level as can be achieved regardless of any WEL set. COSHH should drive duty holders to reduce exposures further than to just the WEL.

They recognised the need for exposure limits to be based on the best available science and with sufficient evidence that any new level will reduce ill-health relating to RCS exposure. They stated that they review any relevant, peer reviewed evidence on exposure levels that show tangible health benefits relevant to workers.

If evidence is presented for a new workplace exposure limit, there would be a full consultation and cost benefit as part of introducing any change.<sup>85</sup>

The HSE confirmed that they do not currently intend to review the GB WEL in this area.

We accept the process necessary to reduce the WEL and although the UK has a higher WEL than some other countries, we believe that the HSE's approach is right. We would however, encourage them to go further and assess the reduction in other countries to try to determine the data and technology that would enable the HSE to consider reducing the WEL in an acceptable and safe way.

## Recommendation

- ▶ We recommend that the Health and Safety Executive (HSE) assesses and determines the data and technology needed to allow the UK to reduce the WEL for work with silica to 0.05 mg/m<sup>3</sup>

<sup>82</sup> Great Britain The Control of Substances Hazardous to Health Regulations 2002 Elizabeth II (2002) London: The Stationary Office Available at: <http://www.legislation.gov.uk/ukxi/2002/2677/contents/made>

<sup>83</sup> Great Britain The Control of Substances Hazardous to Health Regulations 2002 Elizabeth II (2002) London: The Stationary Office Available at: <http://www.legislation.gov.uk/ukxi/2002/2677/contents/made>

<sup>84</sup> BOHS evidence to APPG inquiry 2022

<sup>85</sup> HSE evidence to APPG inquiry

## Real time monitoring

Since our last report we have heard from a number of organisations regarding real time monitoring. As a result we have looked closely at the monitoring of RCS and the methods that are presently conducted within the industry. We had two major concerns regarding current monitoring methods:

- ▶ The amount of time taken to deliver exposure results
- ▶ The limitations of average exposure data

Tilbury Douglas told us that manual measures of exposure were always reliant on gravimetric assessment, in line with Methods for the Determination of Hazardous Substances (MDHS) 14/3, which required technical equipment which needed to be calibrated and the availability of pre-weighed filters and along with a pump and sampling head in the respirable zone.

The sample has to be sent away to a laboratory for analysis and would only give results days or weeks post analysis.

Recent technological developments have introduced automatic real time dust monitoring, although these are not a recognised standard of measurement. The advantages of real time dust monitoring include their consistency and repeatability of results, their small size and ease of use and their ability to they provide real time analysis and alerts.<sup>86</sup>

BOHS referred to HSE's MDHS 14/4 and 101, which outlines how dust/silica exposure samples are taken and compared to the Workplace Exposure Limit. Developments since the report in 2020 have seen the launch of static and personal real time monitoring systems. The investment and innovation into these systems are to be welcomed and the deployment of any technology to further reinforce controls is also welcome.<sup>87</sup>

Real time monitors can offer real-time feedback so that quick actions can be taken under these circumstances. This can even form part of a control strategy if linked to alarm triggers or a system to slow/stop a dust-generating mechanism should set levels be breached.

ARCO stated that in order to make sure that the WEL is adhered to, they confirmed that dust monitoring is vital. Advances in technology mean that new methods of real-time exposure level monitoring are now possible which can be used to support existing monitoring methods.<sup>88</sup>

“ Since our last report we have heard from a number of organisations regarding real time monitoring ”

<sup>86</sup> Tilbury Douglas evidence to APPG inquiry 2022

<sup>87</sup> BOHS evidence to the APPG inquiry 2022

<sup>88</sup> ARCO evidence to the APPG inquiry 2022



Trolex told us that health and safety should be at the heart of all operations and processes and the goal in RCS generating industries should initially be the elimination of fatalities, followed by a movement towards a goal of zero harm from these particulates.

They suggested that there are a number of ways that this can be achieved including better awareness and education, stronger internal business policies and procedures, improved local or on-machine dust controls, better ventilation, suppression, extraction and containment systems, improving or changing dust generating processes, and more robust hierarchies of control.

They also told us that British Standard BS 6164:2019 Health and Safety in Tunnelling in the Construction Industry: Code of Practice, came into effect end of October 2019. This British Standard is a full revision of the now-superseded BS6164:2011. It paved the way for a construction industry that focuses on the continuous monitoring of dust; and real-time data is at the pinnacle of achieving this in different RCS generating workplaces. They felt that this move by the British Standards is highly significant and serves as the first leap towards a real-time, data-driven workplace which relies on 'right now' information.<sup>89</sup>

They also outlined that the limitations of gravimetric sampling as a silica detection methodology is in the requirement for post-shift laboratory analysis.



They confirmed the point made by Tilbury Douglas that results are obtained days or even weeks after the monitoring takes place rendering the methodology limited as a safety warning device. The recent introduction of on-site laboratory-style testing of samples has made it possible to obtain results a few hours after collection but this has resulted in further levels of inaccuracy, as staff are often not as proficient in the measurement as dedicated test houses, and it still does not provide real-time information to businesses.

Trolex believe that the most obvious and immediate benefit of real-time monitoring is in improving safety for those potentially exposed to silica in the workplace. By providing warnings in real-time either through local alarms or via networked systems, real time monitoring provides an immediate, actionable incentive to respond instantly to the hazard, in exactly the same way that the majority of workers are trained and willing to respond to a fire alarm or a gas detection system.

When allied with clear HR controls and procedures, and linked directly to regulated exposure levels for silica, backed-up by training and high levels of awareness around the potential dangers, real-time Open Path – Optical Refraction Technology (OP-ORT) instruments will be able to drive a change in safety standards.<sup>90</sup>

The MPA told us that there is increasing use of innovative, real-time measurement technology to help with identification of dust emission sources and to bring early detection of abnormal exposure situations.<sup>91</sup>

They also stated that they believe that real time monitoring devices are an excellent tool to complement traditional exposure monitoring techniques when assessing the extent of exposure to RCS. Therefore, we would welcome more up to date guidance from HSE on the use of real time monitoring devices.

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<sup>89</sup> Trolex submission to the APPG inquiry 2022

<sup>90</sup> Trolex evidence to the APPG inquiry, 2022

<sup>91</sup> MPA evidence to the APPG inquiry, 2022

The MPA also felt that there appears to be increasing use of real-time monitoring equipment to measure respirable dust levels in recent years, both for early detection of fault conditions and to improve understanding of sources and hot spots.

As a potential improvement, the ACOP and guidance to the COSHH Regulations could provide more up to date information on the use of real time monitoring devices for early detection of abnormal RCS exposure situations, as may occur when machinery is in a fault condition. This technology has developed considerably since the ACOP was last updated, with real time monitoring devices now being smaller and more affordable.<sup>92</sup>

DustCanary agreed with the introduction of real time monitoring and went further, stating that there was a place within the engineering and administrative elements of the hierarchy of controls.

In their evidence, they stated: "In well controlled work places, real time qualitative and indicative monitors may form part of the engineering and administrative controls by providing feedback that these controls are working as designed and reduce the risk of an undetected incident which would otherwise increase worker exposure".<sup>93</sup>

The HSE however highlighted their published Science and Evidence Strategy and an associated Science and Evidence Delivery Plan, which set out HSE's planned science and research activity to underpin its regulatory activity. This includes commitments during 2020-2023 relating to advancing the measurement of occupational exposure to RCS. They stated that they will continue to publish the findings in scientific journal papers and the HSE Research Reports series when new findings are available.

Within COSHH essentials: General guidance – G409 – Exposure measurement: Air sampling, they state however that "other measurement methods include the use of electronic real-time monitors or colorimetric detector tubes to see if there is a problem with your controls".<sup>94</sup>

They also stated that they will continue to monitor developments as validation data to confirm accuracy currently remains limited. As with all advances in technology claims made for any of these instruments would need to be examined further and substantiated with robust data.<sup>95</sup>

We were interested to note that both the Environment Agency and DEFRA, responsible for industrial emissions and air quality in the UK have seen value in real time monitoring and been proactive in dealing with the quality of data coming from real time monitors by developing standards and a certification scheme – MCERTS – for UK Particulate Matter and for stack emissions monitoring equipment at industrial installations.<sup>96, 97</sup>

The MPA also felt that there appears to be increasing use of real-time monitoring equipment to measure respirable dust levels in recent years, both for early detection of fault conditions and to improve understanding of sources and hot spots.

<sup>92</sup> MPA evidence to the APPG inquiry 2022

<sup>93</sup> DustCanary evidence to the APPG inquiry 2022

<sup>94</sup> <https://www.hse.gov.uk/pubns/guidance/g409.pdf>

<sup>95</sup> HSE evidence to the APPG inquiry 2022

<sup>96</sup> <https://uk-air.defra.gov.uk/networks/monitoring-methods?view=mcerts-scheme>

<sup>97</sup> <https://www.gov.uk/government/publications/mcerts-for-stack-emissions-monitoring-equipment-at-industrial-installations/mcerts-for-stack-emissions-monitoring-equipment-at-industrial-installations>



The regulations require that organisations minimise exposure of their employees to RCS and not just meet WELs. In these scenarios, real time monitors can give visibility to changes in exposure and importantly have the resolution to give insight to dust exposure at concentration levels below gravimetric techniques.

We agree with our respondents that the future of regulation in the industry on RCS exposure limits lies in innovative technologies on real time monitoring. In our opinion real time monitoring is a step change ahead of the current system, which is limited due to the lag time for the data. To have to wait days or weeks to be told whether the RCS limits were exceeded or not cannot be ideal – for workers, or employers.

We see advances in real time technology as the inevitable future for the industry and we urge the HSE to look into this in more detail. Some respondents were unclear what data sets were necessary to demonstrate the effectiveness of real time monitors against existing control measures and we feel that this needs to be clarified by the HSE.

We also urge the HSE to go further and consider where real time monitoring could be positioned within the hierarchy of controls.

## Recommendations

- ▶ We recommend that the HSE takes active steps to look into real time monitoring systems as a matter of some urgency, to determine and share the data sets that they deem to be necessary to take this forward and liaise with industry to speed the process and introduction of real time monitoring systems
- ▶ We recommend that the HSE actively considers and consults with industry on the position of real time monitoring to complement the hierarchy of control

**We see advances in real time technology as the inevitable future for the industry and we urge the HSE to look into this in more detail**



## Conclusion

Our previous report was heavily impacted by COVID which presented us all with enormous and daunting challenges and NHS respiratory services were one of the hardest hit in the NHS. We felt then that it was not appropriate to progress or raise the recommendations with Ministers at a time of national emergency.

As we enter the COVID endemic period, we are looking for straightforward solutions to an increasing problem which has the potential to increase the pressures on the NHS.

We have sought to outline the problem and the impact on workers' health from RCS and the tremendous work that is being undertaken throughout the industries associated with RCS and the outstanding work of the HSE.

We recognise that difficult decisions will need to be made within the DHCS and we have drafted our recommendations with that in mind to minimise the impact on the NHS while still offering suggestions for behavioural change that will make a real difference to silicosis outcomes.

Implementing changes at primary care level, complemented by industry initiatives through the HSE and looking to accelerate the introduction of real time monitoring, allow us to have great optimism about the future protection of workers health from RCS.

We call on the relevant government departments to embrace the promise of the new technologies and implement our recommendations as quickly as possible to enable the processes of change to begin as soon as possible.



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All Party Parliamentary Group  
for Respiratory Health

# APPG Report

## Improving Silicosis Outcomes in the UK

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**January 2023**

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