

2025 Lane Lecture

The Artificial Stone Silicosis Epidemic: Lessons Learned for More Effective Prevention

Prof Emeritus Malcolm Sim AM

**Centre for Occupational & Environmental Health
School of Public Health & Preventive Medicine
Monash University, Australia**

1 October 2025



My presentation will cover:

- What is artificial (engineered) stone?
- Health effects
- Epidemic of artificial stone silicosis in Australia
- Journey to the ban in Australia in 2024 and beyond
- International experience
- Lessons learned
- A call to action in the UK

Artificial (engineered) stone

Engineered, agglomerated or reconstituted stone and quartz conglomerate

Various tradenames – Caesarstone (52% of the market in Australia), Essa Stone, Silestone.

Developed in the late 1980s and available in Australia since 2001

Rapid increase in use for kitchen and bathroom benchtops

Cheaper than marble and other natural stones

Wider range of colours

Non-porous, scratch and stain resistant

4 times flexural strength of granite

Up to 95% crystalline silica

Importantly: contains polymer resin binders, pigments, metals and other additives





- Small workshops
- Immigrant workers
- Under the OHS radar
- Poor hazard control
- Poor health surveillance

Finishing tasks in houses

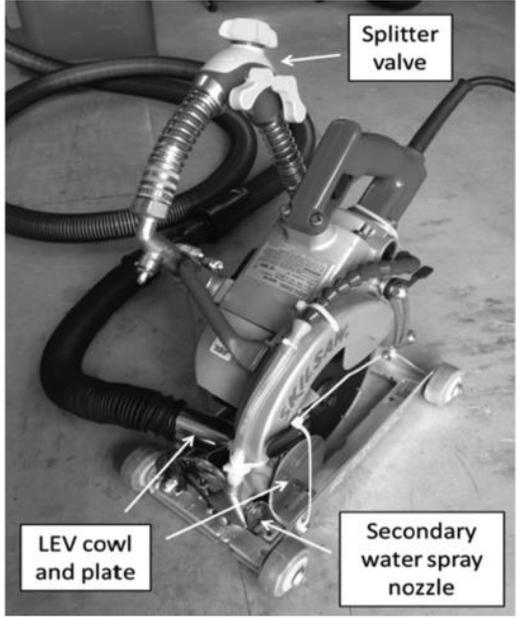


Respirable Silica Dust Suppression During Artificial Stone Countertop Cutting

Jared H. Cooper, David L. Johnson* and Margaret L. Phillips

Table 2. Respirable silica dust concentrations (mg m⁻³) averaged over nominal 30-min sampling period

Replicate	Wetted blade only	Wetted blade + water curtain	Wetted blade + LEV	Dry
1	4.846	2.944	ND ^a	44.37
2	2.563	0.920 ^b	0.139 ^b	
3	1.874	3.405	0.201 ^b	
4	2.209	1.373	0.669	
Mean	4.934	3.813	0.604	
SEM	0.923	1.018	0.225	

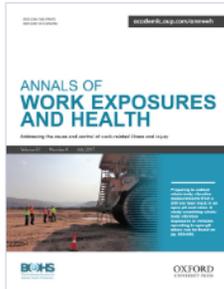


1 A secondary water flow provided a fan-shaped water curtain sprayed normal to the path of the ejected stone dust. The secondary flow could be shut off during LEV and wetted-blade-only trials. The LEV cowl was attached only during LEV trials.

Recommended limit:
 30 minute exposure 0.3mg/m³
 Single short term exposure not to exceed 0.5mg/m³
 8 hour TWA 0.1 mg/m³

Dry cutting associated with levels **150 times the 30 limit** and extrapolated over 8 hours **1700 times** the 8 hour TWA

ND, not detected.
^aMeasured silica mass from which this concentration was calculated was < LOD.
^bMeasured silica mass from which this concentration was calculated was < LOQ.



Volume 61, Issue 6
July 2017

Article Contents

Abstract

Introduction

Materials and Methods

JOURNAL ARTICLE

Experimental Evaluation of Respirable Dust and Crystalline Silica Controls During Simulated Performance of Stone Countertop Fabrication Tasks With Powered Hand Tools



David L. Johnson ✉, Margaret L. Phillips, Chaolong Qi, Anthony T. Van, Danielle A. Hawley

Annals of Work Exposures and Health, Volume 61, Issue 6, July 2017, Pages 711–723, <https://doi.org/10.1093/annweh/wxx040>

Published: 06 July 2017 **Article history** ▼

**Wet methods
most effective**

**LEV may hinder
effectiveness of
wet methods**

Diseases associated with Respirable Crystalline Silica

Acute silicosis

Accelerated silicosis

Chronic silicosis

PMF

Chronic bronchitis

Emphysema

Lung cancer IARC Group 1 human carcinogen

Tuberculosis

Scleroderma

Lupus

Rheumatoid arthritis

Chronic kidney disease



The science

Original Research

Occupational and Environmental Lung Diseases

Artificial Stone Silicosis: Disease Resurgence Among Artificial Stone Workers

Mordechai R. Kramer MD, FCCP^a, Paul D. Blanc MD, MSPH, FCCP^d, Elizabeth Fireman PhD^c, Anat Amital MD, FCCP^a, Alexander Guber MD, FCCP^b, Nader Abdul Rhahman MD^a, David Shitrit MD^b  

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<https://doi.org/10.1378/chest.11-1321> ↗

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Background

Silicosis is a progressive, fibrotic, occupational lung disease resulting from inhalation of respirable crystalline silica. This disease is preventable through appropriate workplace practices. We systematically assessed an outbreak of silicosis among patients referred to our center for lung transplant.

2015 – First Australian case report



EUROPEAN RESPIRATORY *journal*

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LATE-BREAKING ABSTRACT: Complicated silicosis in an Australian worker from cutting engineered stone countertops: An embarrassing first for Australia

Anthony Frankel, Lucinda Blake, Deborah Yates

European Respiratory Journal 2015 46: PA1144; DOI: 10.1183/13993003.congress-2015.PA1144

[Article](#)

[Figures & Data](#)

[Info & Metrics](#)

Abstract

Regulations to control of exposure to silica have existed in Australia since the 1930s, but hazard awareness is imperfect. To highlight the dangers of exposure to respirable silica dust, we describe a case of silicosis in a 52 year man whose exposure to silica was cutting and polishing engineered stone kitchen and bathroom countertops. The man presented with breathlessness, later complicated by bilateral spontaneous pneumothoraces requiring tube thoracostomies, and now requires lung

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SHORT REPORT

Artificial stone-associated silicosis: a rapidly emerging occupational lung disease

Ryan F Hoy,¹ Timothy Baird,² Gary Hammerschlag,³ David Hart,⁴ Anthony R Johnson,⁵ Paul King,⁶ Michael Putt,² Deborah H Yates⁷

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⁷Department of Thoracic Medicine, St Vincent's Hospital, Sydney, New South Wales,

ABSTRACT

Introduction Artificial stone is an increasingly popular material used to fabricate kitchen and bathroom benchtops. Cutting and grinding artificial stone is associated with generation of very high levels of respirable crystalline silica, and the frequency of cases of severe silicosis associated with this exposure is rapidly increasing.

Aim To report the characteristics of a clinical series of Australian workers with artificial stone-associated silicosis.

Methods Respiratory physicians voluntarily reported cases of artificial stone-associated silicosis identified in their clinical practices. Physicians provided information including occupational histories, respiratory function tests, chest radiology and histopathology reports, when available.

Results Seven male patients were identified with a median age of 44 years (range 26–61). All were employed in small kitchen and bathroom benchtop fabrication businesses with an average of eight employees (range 2–20). All workplaces primarily used

What this paper adds

- ▶ Fabrication of benchtops from artificial stone may result in workers being exposed to high levels of respirable crystalline silica.
- ▶ The frequency of reported cases of silicosis associated with artificial stone work is increasing significantly.
- ▶ Artificial stone-associated silicosis is characterised by a shorter latency and more rapid loss of lung function than chronic silicosis.
- ▶ More cases of silicosis are likely to be diagnosed, and urgent action is required to increase awareness of the risk of silicosis in the benchtop fabrication industry. Better measures are needed to control dust levels, monitor and protect workers in this industry.

Artificial stone is then sold to benchtop fabricators, who use slabs to create benchtops based

Patient	Age at presentation	Duration of exposure prior to symptoms	Smoking status	Health surveillance at work	Dry cutting performed	Number of employees at workplace	Overseas born
1	26	7 years	Non smoker	No	Yes	5-10	No
2	44	6 years	Ex smoker	No	Yes	2-3	Yes
3	57	10 years	Non smoker	No	Yes	10-20	Yes
4	54	9 years	Ex smoker	No	Yes	10	Yes
5	26	4 years	Non smoker	No	Yes	10	No
6	37	8 years	Ex smoker	No	Yes	3-10	No
7	61	7 years	Ex smoker	No	Yes	10	Yes

Alarming spike in tradies hit by deadly condition caused by 'the new asbestos'

THIS man was fit and healthy before a shocking diagnosis last year. Now, he's fighting for his life. **WARNING: Distressing content.**

Alexis Carey

news **COM.BU** JULY 24, 2018 3:40PM



Anthony White has been diagnosed with silicosis. Image: The Sunday Project

36 Years old



Gold Coast stonemason Anthony White is almost unrecognisable since he was struck down by silicosis. Picture: Supplied Source: Supplied

National dust disease taskforce established in 2019

Proposed by the Royal Australasian College of Physicians and its Faculty of Occ and Environ Med – **Silicosis expert group**

Aim to review:

1. Actions that have been taken to date to address occupational dust disease.
2. Existing policy and regulatory arrangements in Australia and how these are applied and monitored.
3. Opportunities for improvement across the system.
- 4. Options for sustainable approaches for the future prevention, detection and management of occupational dust diseases.**
5. Options for potential new research required.

The taskforce included several clinicians and engaged with a broad range of Medical professional bodies, OHS regulators, industry trade unions and consumers.

WorkSafe Victoria Free Stonemason Health Assessment Program

Protocol developed in conjunction with Monash University Centre for Occupational and Environmental Health (MonCOEH)

Open to any current or former stonemason in State of Victoria

Focus on the **stone benchtop industry**

Aims:

- Provide comprehensive health assessments to identify all forms of silica-associated disease
- Baseline data for future health assessments,
- Provide individualised patient management and
- Basis for research to better understand silica-associated diseases.
- **Cases referred to the silica-associated disease registry**

Available at: <https://www.worksafe.vic.gov.au/resources/silica-associated-lung-disease-health-screening-research-project-phase-two-final-report>



2021 – Preliminary screening results – 86 affected workers

Methodology

Original research

Identification of early-stage silicosis through health screening of stone benchtop industry workers in Victoria, Australia

Ryan F Hoy , Deborah C Glass , Christina Dimitriadis, Jessy Hansen, Fiona Hore-Lacy, Malcolm R Sim 

► Additional material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/oemed-2020-106897>).

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Accepted 2 October 2020
Published Online First
28 October 2020

ABSTRACT

Objectives The popularity of high silica content artificial stone has been associated with emergence of severe, progressive silicosis as a major health issue affecting workers in the stone benchtop industry. This population-based health assessment programme has been implemented with the aim of identification of silica-associated disease at a preclinical stage.

Methods All current and former workers from the stone benchtop industry in the State of Victoria are offered free health assessments. Primary evaluations include a standardised questionnaire, physical examination, spirometry and gas transfer assessment and International Labour Organisation-categorised chest X-ray. Secondary evaluations include high-resolution CT chest, blood tests and a respiratory physician evaluation.

Results At the end of the first 12 months, 86/239 (36%) workers who had completed secondary evaluation were diagnosed with silicosis (65 simple silicosis and 21 complicated silicosis). 22 had worked in the industry for less than 10 years at the time of diagnosis. Of those with simple silicosis, 80% of workers reported breathlessness only with strenuous exercise (modified Medical Research Council score of 0) and lung function was well preserved

Key messages

What is already known about this subject?

► Artificial stone is a modern, high-silica content material which is commonly used for the fabrication of domestic kitchen benchtops. Silicosis has rapidly emerged as a major occupational health issue in this industry, with several reported cases of workers presenting with late-stage disease and requiring lung transplantation.

What are the new findings?

► This comprehensive, population-based health assessment programme for workers in the stone benchtop industry has identified 86 workers with silicosis during the first 12 months. Seventy-six per cent were identified with early-stage, simple silicosis and 37% with detectable antinuclear antibodies.

How might this impact on policy or clinical practice in the foreseeable future?

► This health assessment programme has already



- d. Commence the processes required to implement a full ban on the importation of some or all engineered stone products if, by July 2024:**
- There is no measurable and acceptable improvement in regulatory compliance rates for the engineered stone sector as reported by jurisdictions; and
 - Evidence indicates preventative measures are not effectively protecting those working with engineered stone from silicosis and silica-associated diseases.

**Final Report
to Minister for
Health and Aged Care**

JUNE 2021

Screening results – 25% had silicosis

Workplace



OPEN ACCESS

Original research

Prevalence and risk factors for silicosis among a large cohort of stone benchtop industry workers

Ryan F Hoy ^{1,2}, Christina Dimitriadis,¹ Michael Abramson,³ Deborah C Glass ¹, StellaMay Gwini ¹, Fiona Hore-Lacy,^{1,2} Javier Jimenez-Martin,¹ Karen Walker-Bone ¹, Malcolm R Sim ¹

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/oemed-2023-108892>).

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ABSTRACT

Objectives High silica content artificial stone has been found to be associated with silicosis among stone benchtop industry (SBI) workers. The objectives of this study were to determine the prevalence of and risk factors for silicosis among a large cohort of screened SBI workers, and determine the reliability of respiratory function testing (RFT) and chest x-ray (CXR) as screening tests in this industry.

Methods Subjects were recruited from a health screening programme available to all SBI workers in Victoria, Australia. Workers undertook primary screening, including an International Labour Office (ILO) classified CXR, and subject to prespecified criteria, also underwent secondary screening including high-resolution CT (HRCT) chest and respiratory physician assessment.

Results Among 544 SBI workers screened, 95% worked with artificial stone and 86.2% were exposed to dry processing of stone. Seventy-six per cent (414) required secondary screening, among whom 117 (28.2%) were diagnosed with silicosis (median age at diagnosis 42.1 years (IQR 34.8–49.7)), and all were male. In secondary

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ High silica content artificial (engineered) stone has rapidly become a popular material used for domestic and commercial benchtops production in many countries and has been associated with increasingly frequent reports of silicosis. Comprehensive screening of stone benchtop industry (SBI) workers including CT chest imaging has demonstrated the ability to detect early-stage disease.

WHAT THIS STUDY ADDS

⇒ This study reports outcomes from real-world protocolised health assessments of a large cohort of SBI workers and confirms an alarmingly high prevalence of silicosis. The study demonstrates that dry processing of artificial stone has been extremely common. Also, the sensitivity and positive predictive values of respiratory function tests and chest X-ray as screening tests to detect silicosis in this

76% had very high exposures putting them at risk of later silicosis

86% used dry cutting

Hoy RF, Dimitriadis C, Abramson M, SIM MR et al. *Occup Environ Med* 2023;80:439–446.

Late 2022 – Estimate of 579 cases across Australia

Correspondence

Correspondence on 'Demographic, exposure and clinical characteristics in a multinational registry of engineered stone workers with silicosis' by Hua *et al*

In 2018, we reported in this journal seven cases of artificial (engineered) stone silicosis in Australia and described it as a 'rapidly emerging' occupational lung disease.¹ Last year, also in OEM, we reported a further 86 workers with silicosis identified during the first year of a targeted health assessment programme for stone benchtop industry workers in Victoria, Australia.² There is now ample evidence that an epidemic of silicosis in the stone benchtop industry is no longer 'emerging', but has now occurred Australia, and is highly likely

Table 1 Number of identified silicosis cases in Australia associated with work in the stone benchtop industry as of May 2022

Jurisdiction	Number of silicosis cases	Work, health and safety agency source
Queensland	238	https://www.worksafe.qld.gov.au/claims-and-insurance/work-related-injuries/types-of-injury-or-illness/work-related-respiratory-diseases/silicosis
Victoria	175	https://www.worksafe.vic.gov.au/resources/silica-associated-lung-disease-health-screening-research-project-phase-two-final-report
New South Wales	121	https://www.nsw.gov.au/customer-service/publications-and-reports/silica-dashboard https://www.nsw.gov.au/sites/default/files/2021-08/case-finding-study-respirable-crystalline-silica-exposure-nsw-manufactured-stone-industry.pdf
Western Australia	24	https://www.commerce.wa.gov.au/sites/default/files/atoms/files/silica_compliance_report.pdf
South Australia	18	https://www.safework.sa.gov.au/workplaces/chemicals-substances-and-explosives/documents/Silicosis-Health-Screening-Program-Baseline-Findings.pdf
Tasmania	3	https://www.worksafe.tas.gov.au/topics/laws-and-compliance/enforcement-and-prosecutions/prosecutions/court-summaries
Northern Territory		No publicly available data
Australian Capital Territory		No publicly available data

Hoy RF, Sim MR. Occup Environ Med September 2022: 79(9); 647-8

RESEARCH ARTICLE OPEN ACCESS

The Rapid Rise of Silicosis in Victoria, Australia Associated With Artificial Stone Countertop Industry Work

Ryan F. Hoy^{1,2} | Dunya Tomic¹ | StellaMay Gwini¹ | Christina Dimitriadis¹ | Michael Abramson³ | Alex Collie^{3,4} | Hayley Barnes^{1,2} | Deborah C. Glass¹ | Fiona Hore-Lacy¹ | Natasha Kinsman¹ | Malcolm R. Sim¹ | Karen Walker-Bone¹

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Received: 12 October 2024 | **Revised:** 1 December 2024 | **Accepted:** 1 January 2025

Funding: The Monash Silica-associated Disease Registry is funded by WorkSafe Victoria.

Keywords: occupational lung disease | screening | silica exposure | Silicosis

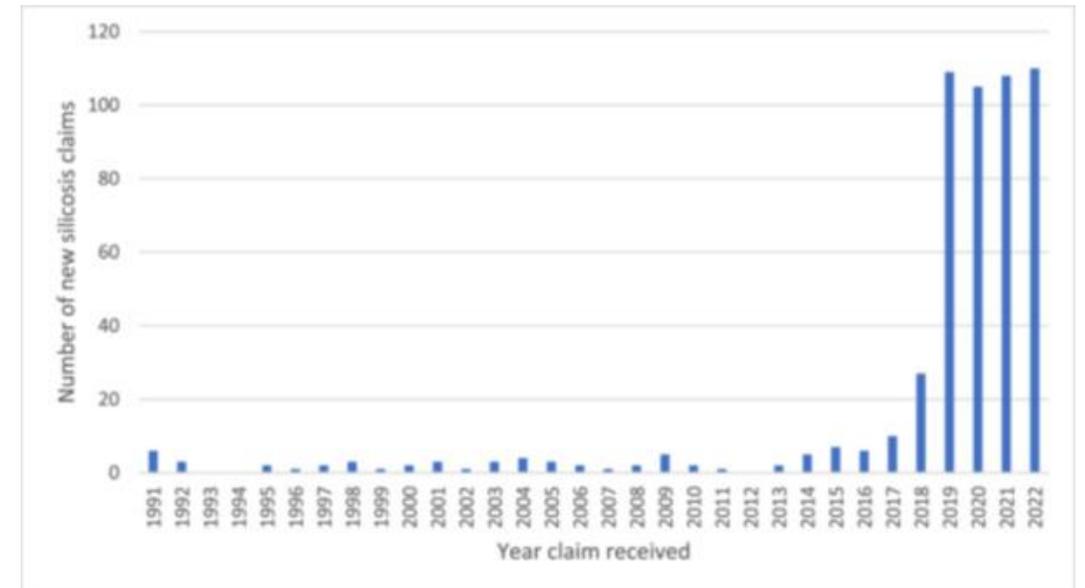
ABSTRACT

Background: The fabrication and installation of artificial (engineered) stone countertops is a relatively new cause of silicosis. Our aim was to investigate silicosis rates in Victoria, Australia, and the association with stone countertop industry work.

Methods: Workers' compensation claims for silicosis from January 1, 1991 to December 31, 2022 were analyzed across 8-year time periods. Incidence rates per 100,000 persons were calculated by time period, age, and sex. Additionally, incident silicosis cases were reported to a clinical registry by respiratory physicians from May 1, 2019 to December 31, 2022, and analyzed by referral source and occupational history.

Results: Over 32 years, there were 536 workers' compensation claims for silicosis (98.9% male, median age 40 years). In total, 482 (89.9%) were received between 2015 and 2022, a 27-fold increase from the previous 8-year period. The incidence rate for silicosis claims in the adult population increased from 0.12 per 100,000 in 1991–1998 to 2.38 per 100,000 in 2015–2022. In the clinical registry there were 210 incident cases between 2019 and 2022; 97% worked in the countertop industry, 95% with artificial stone. Almost all (89%) cases had been referred following participation in a government screening program for stone countertop industry workers.

Conclusion: There has been a major rise in compensation claims for silicosis in Victoria. Active screening of stone countertop workers led to the diagnosis of almost all registered incident silicosis cases. This underscores the risk to stone countertop workers and highlights the potential for under-recognition of silicosis without screening at-risk workers, especially in countries where artificial stone has become popular.



Original research

Autoimmune diseases, autoantibody status and silicosis in a cohort of 1238 workers from the artificial stone benchtop industry

Dunya Tomic ¹, Ryan F Hoy ^{1,2}, Jesselyn Sin,¹ Javier Jimenez Martin,¹ Stella May Gwini ¹, Hayley Barnes,^{1,2} Mandana Nikpour,^{3,4} Kathleen Morrisroe,^{3,4} Yuan Z Lim,⁵ Karen Walker-Bone ^{1,6}

► Additional supplemental material is published online only. To view, please visit the journal online (<https://doi.org/10.1136/oemed-2024-109526>).

For numbered affiliations see end of article.

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Received 12 March 2024

Accepted 29 July 2024

ABSTRACT

Objectives Autoimmune disorders are multifactorial but occupational exposures have long been implicated, including respirable crystalline silica (RCS). A modern epidemic of silicosis is emerging internationally, associated with dry processing of engineered stone with high (>90%) RCS content. We aimed to investigate the prevalence of clinical autoimmune disease and common autoantibodies in exposed workers.

Methods Stone benchtop industry workers in Victoria, Australia were offered free screening for silicosis and related disorders. Symptoms or diagnoses of autoimmune disease were evaluated by questionnaire and blood tests taken for rheumatoid factor (RF), antinuclear antibodies (ANAs) and extractable nuclear antigens (ENAs).

Results Among 1238 workers (93.3% male) screened from 2019 to 2021, 0.9% were confirmed with autoimmune disease. Among those without clinical disease, 24.6% had detectable ANAs (93.5% male), 4.6% detectable ENAs and 2.6% were positive for RF. Silicosis was diagnosed in 253 workers (24.3% of those with diagnostic information available). Of those with ANA readings, 54 (6.6%) had ANA titre >1:320. The likelihood of positive autoantibodies increased with age; smoking; higher exposure to RCS and silicosis diagnosis.

Conclusion The proportion of workers with detectable ANAs or ENAs was considerably higher than the 5%–9% expected in the general population. Some of the antibodies detected (eg, Scl-70, CENPB) have high sensitivity and specificity for systemic sclerosis. Long-

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ International research is increasingly reporting adverse health outcomes in artificial stone benchtop industry workers exposed to respirable crystalline silica (RCS), most notably silicosis. Cases of autoimmune disease have also been described in these workers. However, the prevalence of autoantibodies and autoimmune diseases in these workers has not been comprehensively studied.

WHAT THIS STUDY ADDS

⇒ This study describes the autoimmune diseases and autoantibody status in a large cohort of artificial stone benchtop industry workers exposed to RCS. The most notable findings include a high prevalence of antinuclear antibodies and associations between autoantibodies and age, smoking, silicosis and intensity of RCS exposure.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Screening programmes for RCS-exposed workers should consider including autoantibody testing and those with positive readings require longitudinal follow-up for the development of autoimmune disease.

0.9% autoimmune disease

24.6% +ve ANA

4.6% +ve extractable nuclear antigens

2.6% +ve for RF

Considerable media interest!

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Analysis

Damning silicosis report calls for world-first ban on deadly engineered stone — will governments listen?

By Adele Ferguson
Posted Sun 29 Oct 2023 at 6:00pm

The Sydney Morning Herald
INDEPENDENT. ALWAYS.

Revealed: the benchtops killing our young tradies



Precious art needs \$360m protection fix

Dumped Elliott makes his case for a comeback

Strong union lobbying





safe work australia

Work Health and Safety Ministers asked SWA for advice 2022

Safe Work Australia

Decision Regulation Impact Statement: Prohibition on the use of engineered stone

August 2023



“However, it is tolerably clear that historically there has been insufficient compliance activities in respect of the engineered stone industry for the level of risk. Further, there has been, and continues to be, non-compliance with the obligations imposed by the model WHS laws, by both PCBUs and workers.”

Recommended option:

Option 1: Prohibition on the use of all engineered stone.

Bunnings to remove engineered stone products from shelves by end of 2023

By the Specialist Reporting Team's [Jessica Haynes](#)

Posted Tue 14 Nov 2023 at 4:56am, updated Wed 15 Nov 2023 at 12:11am



Major retailer Bunnings has announced the product will no longer be sold at its stores. (AAP: Dan Himbrechts)

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Australia news

🕒 This article is more than 7 months old

Ikea joins Bunnings in banning engineered stone products linked to silicosis

Swedish giant's move comes after Safe Work Australia report that called for ban on composite material commonly used in kitchen benchtops

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Raging Rishi - or maybe his avatar - gave us an object

Australia makes world-first decision to ban engineered stone following surge in silicosis cases

By the Specialist Reporting Team's [Leonie Thorne](#) and national consumer affairs reporter [Michael Atkin](#)

Posted Yesterday at 5:20pm, updated Yesterday at 9:33pm



Decision in Dec 2023

Ban took effect from 1 July 2024

Caesarstone disagrees with Australian engineered stone ban

By George Dean / 14 December, 2023

Caesarstone has issued a statement saying it disagrees with the Australian government's decision to outlaw engineered stone products.

The company's position was outlined in a business update dated December 13, in which Caesarstone states that "the safety of Caesarstone's installed products to its end consumer was never an issue", and stresses that "the products are safe to fabricate under safe working practices".

Australia's work health and safety ministers recently agreed to prohibit the use, supply and manufacture of all engineered stone products containing crystalline silica within the country, which includes Caesarstone's quartz-based products.

The decision was made following concerns around the long-term health risks associated with the manufacture of the products. The ban is expected to come into effect on July 1, 2024.



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latest col



Ten new

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Caesarstone launches game-changing Mineral Crystalline Silica-Free surfaces

Caesarstone

Title: Counting the costs of silicosis in Victoria, Australia, 2019-2024 with projections to 2031

Authors: Dunya Tomic, PhD¹, Ryan F Hoy, PhD^{1,2}, Janneke Berecki-Gisolf, PhD¹, Win Wah, PhD¹, Stella May Gwini, PhD¹, Malcolm R Sim, PhD¹, Karen Walker-Bone, PhD¹

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In Press: American Journal of Industrial Medicine

- From 2019-2024, there were 663 silicosis compensation claims
- Estimated cumulative costs totalled **AU \$111.78 million**
- Annual cost projections suggest a total of **AU \$29.88 million per year** by 2031

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10,000 Aussie workers set to develop lung cancer from silica dust: study

Tuesday 12 July 2022 | By Yasmine Phillips



As many as 10,000 Australians are predicted to develop lung cancer in their lifetime from being exposed to silica dust, new Curtin University modelling has found amid warnings more than half a million Australian workers are currently exposed to the harmful dust.

Engineered stone – used mainly for kitchen benchtops – is a particularly potent source of silica dust.

Many other Australian programs to reduce the burden of silica-related diseases



National Silicosis Prevention Strategy 2023-2028 and accompanying National Action Plan

The Asbestos and Silica Safety and Eradication Agency (ASSEA) has been tasked with implementing and monitoring the Action Plan.

Australian Government launches first national registry to combat silicosis

Australia's first National Occupational Respiratory Disease Registry launched on 22 May 2024. It collects data to support the prevention of dangerous occupational respiratory diseases like silicosis.



 Interim
Australian
Centre for
Disease
Control

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Delivering on the Australian Centre for Disease Control

The Australian Government has introduced legislation to deliver on its commitment to establish an independent Australian Centre for Disease Control.



The Hon Mark Butler MP
Minister for Health and Ageing
Minister for Disability and the National Disability Insurance Scheme

Media event date: 3 September 2025

Date published: 3 September 2025

Media type: Media release

Audience: General public

The Australian Government has introduced legislation to deliver on its commitment to establish an independent Australian Centre for Disease Control.

The Australian CDC will be an independent statutory agency that brings together critical information and experts to protect Australia from diseases and other threats to public health.

The Australian CDC will provide high-quality analysis and advice on public health risks to governments and the Australian community. It will also promote and coordinate action to prepare for, and respond to, these risks.

The Australian CDC will be led by a director-general, and following the passing of legislation, will be operational from 1 January 2026.

Before we came to Government, Australia was the only OECD country without a CDC equivalent.



Australian Government
Department of Health

National Guidance for doctors assessing workers exposed to respirable crystalline silica dust

with specific reference to the occupational
respiratory diseases associated with engineered stone



Ongoing uncertainties

1. Managing the asymptomatic worker with imaging changes (eg hilar lymphadenopathy)
2. Screening methods and frequency of screening
3. Associated diseases
4. RTW options

Currently being revised

Chest x-ray has low sensitivity to detect silicosis in artificial stone benchtop industry workers

Ryan F. Hoy^{1,2}  | Catherine Jones^{1,3} | Katrina Newbigin^{3†} |
Michael J. Abramson^{2,4}  | Hayley Barnes^{1,2,5}  | Christina Dimitriadis¹ |
Samantha Ellis⁶ | Deborah C. Glass¹  | Stella M. Gwini¹  | Fiona Hore-Lacy¹  |
Javier Jimenez-Martin¹ | Sundeep S. Pasricha³ | Janu Pirakalathanan³ |
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⁵School of Translational Medicine, Monash

Abstract

Background and Objective: Chest x-ray (CXR) remains a core component of health monitoring guidelines for workers at risk of exposure to crystalline silica. There has however been a lack of evidence regarding the sensitivity of CXR to detect silicosis in artificial stone benchtop industry workers.

Methods: Paired CXR and high-resolution computed tomography (HRCT) images were acquired from 110 artificial stone benchtop industry workers. Blinded to the clinical diagnosis, each CXR and HRCT was independently read by two thoracic radiologists from a panel of seven, in accordance with International Labour Office (ILO) methodology for CXR and International Classification of HRCT for Occupational and Environmental Respiratory Diseases. Accuracy of screening positive (ILO major cate-



The Royal Australian and New Zealand
College of Radiologists®

MEDIA STATEMENT

11 October 2019

RANZCR UNVEILS GUIDELINES FOR THE DIAGNOSIS AND MONITORING OF SILICOSIS

The Royal Australian and New Zealand College of Radiologists (RANZCR) today released its position statement, *Imaging of Occupational Lung Disease*, outlining the central role clinical radiologists play in the diagnosis and monitoring of silicosis.

Silicosis is an emerging public health crisis affecting workers who have been exposed to the dust within manufactured stone commonly found in kitchen, bathroom and laundry stone benchtops.

Within the statement, RANZCR recommends that CT is the primary imaging modality for screening exposed workers as it can detect disease earlier and with greater accuracy.

Silicosis research priorities for health care, research, and health and safety professionals, and for people exposed to silica in Australia: a research priority setting exercise

Hayley Barnes^{1,2,3} , Sharna Mathieu^{4,5}, Deborah C Glass¹, Malcolm R Sim², Lin Fritschi⁶, Joanne L Dickinson⁷, Daniel C Chambers^{8,9}, Tim R Driscoll¹⁰, Graeme Edwards^{11,12}, Nikky LaBranche¹³, Catherine Jones¹⁰, Jane E Bourke¹⁴, Ryan F Hoy^{1,3}, Christine R Jenkins^{10,15} , Simon Apte^{8,9}, Anne Holland^{2,3}, Gabriella Tikellis²

The known: The incidence of silicosis in young workers in Australia is rising. Improving knowledge of how silicosis can be prevented and managed is urgently needed for research, funding, and policy decisions.

The new: Both people at risk of silicosis and those involved in their care or silicosis research regard eliminating exposure to silica, early diagnosis and better treatments, and reducing the personal and social impact of silicosis as priorities.

The implications: We have identified the research priorities of people directly affected by silicosis or involved in its prevention and management in Australia. They should guide future research, funding, and policy decisions.

Silicosis is a debilitating and potentially fatal parenchymal lung disease caused by the inhalation of respirable crystalline silica dust. There are no effective treatments,^{1,2} and people with silicosis experience reduced quality of life, reduced exercise tolerance, chest pain, impaired mental health, inability to work, and financial stress, and it also has an impact on their families and caregivers.^{3,4} Exposure to silica dust at work can also lead to chronic obstructive pulmonary disease,⁵⁻⁸ autoimmune conditions,⁹⁻¹³ an increased risk of lung cancer,¹⁴ and respiratory infections.¹⁵

Abstract

Objectives: To identify the silicosis research priorities of people living with silicosis, workers at risk of silicosis, their partners and caregivers, and of health professionals and researchers.

Study design: Research priority setting exercise; modified James Lind Alliance framework for research priority setting partnerships, comprising an online survey followed by two forums in which thematic analysis and nominal group analysis were used to establish a list of research priorities.

Setting, participants: People with or at risk of silicosis, their partners or caregivers (survey, online forum) and health care professionals, researchers, health and safety professionals (survey, in-person forum), recruited 14 April – 19 December 2023.

Main outcome measures: Research priorities in four pre-identified areas: prevention, screening and diagnosis, treatment, and living with and managing the impact of silicosis.

Results: A total of 164 survey respondents (105 medical or research professionals, 34 workers currently or formerly at risk of silicosis, eleven people with confirmed silicosis, and fourteen partners or caregivers) identified 47 key research topics. Fifty-three health care professionals and thirteen people with or at risk of silicosis and their caregivers then ranked the research topics and developed research questions at the two forums. The highest ranked research priorities were research into assessment and optimisation of the hierarchy of controls, compliance and regulation, establishing minimum standards and developing innovative screening methods,

Original Article

Characterizing and Comparing Emissions of Dust, Respirable Crystalline Silica, and Volatile Organic Compounds from Natural and Artificial Stones

Samantha Hall^{1,*}, Peter Stacey^{1,○}, Ian Pengelly¹, Stephen Stagg¹, John Saunders¹ and Susan Hambling²

¹Science Division, Health and Safety Executive, Science and Research Centre, Harpur Hill, Buxton, Derbyshire SK17 9JN, UK; ²Field Operations Directorate, Health and Safety Executive, Redgrave Court, Merton Road, Bootle, Merseyside L20 7HS, UK

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Submitted 5 March 2021; revised 4 June 2021; editorial decision 4 July 2021; revised version accepted 16 July 2021.

Abstract

The frequency of cases of accelerated silicosis associated with exposure to dust from processing artificial stones is rapidly increasing globally. Artificial stones are increasingly popular materials, commonly used to fabricate kitchen and bathroom worktops. Artificial stones can contain very high levels of crystalline silica, hence cutting and polishing them without adequate exposure controls represents a significant health risk. The aim of this research was to determine any differences in the emission profiles of dust generated from artificial and natural stones when cutting and polishing. For artificial stones containing resins, the nature of the volatile organic compounds (VOCs) emitted during processing was also investigated. A selection of stones (two natural, two artificial containing resin, and one artificial sintered) were cut and polished inside a large dust tunnel to characterize the emissions produced. The inhalable, thoracic, and respirable mass concentrations of emissions were measured gravimetrically and the amount of crystalline silica in different size fractions was determined by X-ray diffraction. Emissions were viewed using scanning electron microscopy and the particle size distribution was measured using a wide range aerosol spectrometer. VOCs emitted when cutting resin-artificial stones were also sampled. The mass of dust emitted when cutting stones was higher than that emitted when polishing. For each process, the mass of dust generated was similar whether the stone was artificial or natural. The percentage of crystalline silica in bulk stone is likely to be a reasonable, or conservative, estimate of that in stone dust generated by cutting or polishing. Larger particles were produced when cutting compared with when polishing. For each process, normalized particle size distributions were similar whether the stone was artificial or natural. VOCs were released when cutting resin-artificial stones. The higher the level of silica in the bulk material, the higher the level of silica in any dust emissions produced when processing the stone. When

For each process, normalized particle size distributions were similar whether the stone was artificial or natural.

VOCs were released when cutting resin-artificial stones.

The higher the level of silica in the bulk material, the higher the level of silica in any dust emissions produced when processing the stone.

When working with new stones containing higher levels of silica, existing control measures may need to be adapted and improved in order to achieve adequate control.

Understanding the pathogenesis of engineered stone-associated silicosis: The effect of particle chemistry on the lung cell response

Chandnee Ramkissoon¹  | Yong Song²  | Seiha Yen² | Katherine Southam² | Simone Page² | Dino Pisaniello¹ | Sharyn Gaskin¹ | Graeme R. Zosky² 

¹Adelaide Exposure Science and Health, School of Public Health, University of Adelaide, Adelaide, South Australia, Australia

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Funding information

Medical Research Future Fund, Grant/Award Number: MRF2006261

Associate Editor: Darryl Knight; Senior Editor: Lutz Beekert

Abstract

Background and Objective: The resurgence of severe and progressive silicosis among engineered stone benchtop industry workers is a global health crisis. We investigated the link between the physico-chemical characteristics of engineered stone dust and lung cell responses to understand components that pose the greatest risk.

Methods: Respirable dust from 50 resin-based engineered stones, 3 natural stones and 2 non-resin-based materials was generated and analysed for mineralogy, morphology, metals, resin, particle size and charge. Human alveolar epithelial cells and macrophages were exposed in vitro to dust and assessed for cytotoxicity and inflammation. Principal component analysis and stepwise linear regression were used to explore the relationship between engineered stone components and the cellular response.

Results: Cutting engineered stone generated fine particles of <600 nm. Crystalline silica was the main component with metal elements such as Ti, Cu, Co and Fe also present. There was some evidence to suggest differences in cytotoxicity ($p = 0.061$) and IL-6 ($p = 0.084$) between dust samples. However, IL-8 (CXCL8) and TNF- α levels in macrophages were clearly variable ($p < 0.05$). Quartz explained 11% of the variance ($p = 0.019$) in macrophage inflammation while Co and Al accounted for 32% of the variance ($p < 0.001$) in macrophage toxicity, suggesting that crystalline silica only partly explains the cell response. Two of the reduced-silica, non-engineered stone products induced considerable inflammation in macrophages.

Conclusion: These data suggest that silica is not the only component of concern in these products, highlighting the caution required as alternative materials are produced in an effort to reduce disease risk.

Quartz explained 11% of the variance ($p = 0.019$) in macrophage inflammation while Co and Al accounted for 32% of the variance ($p < 0.001$) in macrophage toxicity, suggesting that crystalline silica only partly explains the cell response. **Two of the reduced-silica, non-engineered stone products induced considerable inflammation in macrophages.**

Rapid detection and response protocol for emerging hazards



Occupational Respiratory Disease Risk | Early Detection and Response Protocol

September 2025

Draft updated to incorporate targeted stakeholder consultation feedback and further ESC feedback and advice



Centre for Occupational
and Environmental Health

Multiple sources to
detect early signals

Suitable pathway(s) for
early action

Review of workplace exposure standard



[Consultation hub](#) > Upcoming consultation on the workplace exposure limits for 9 chemicals

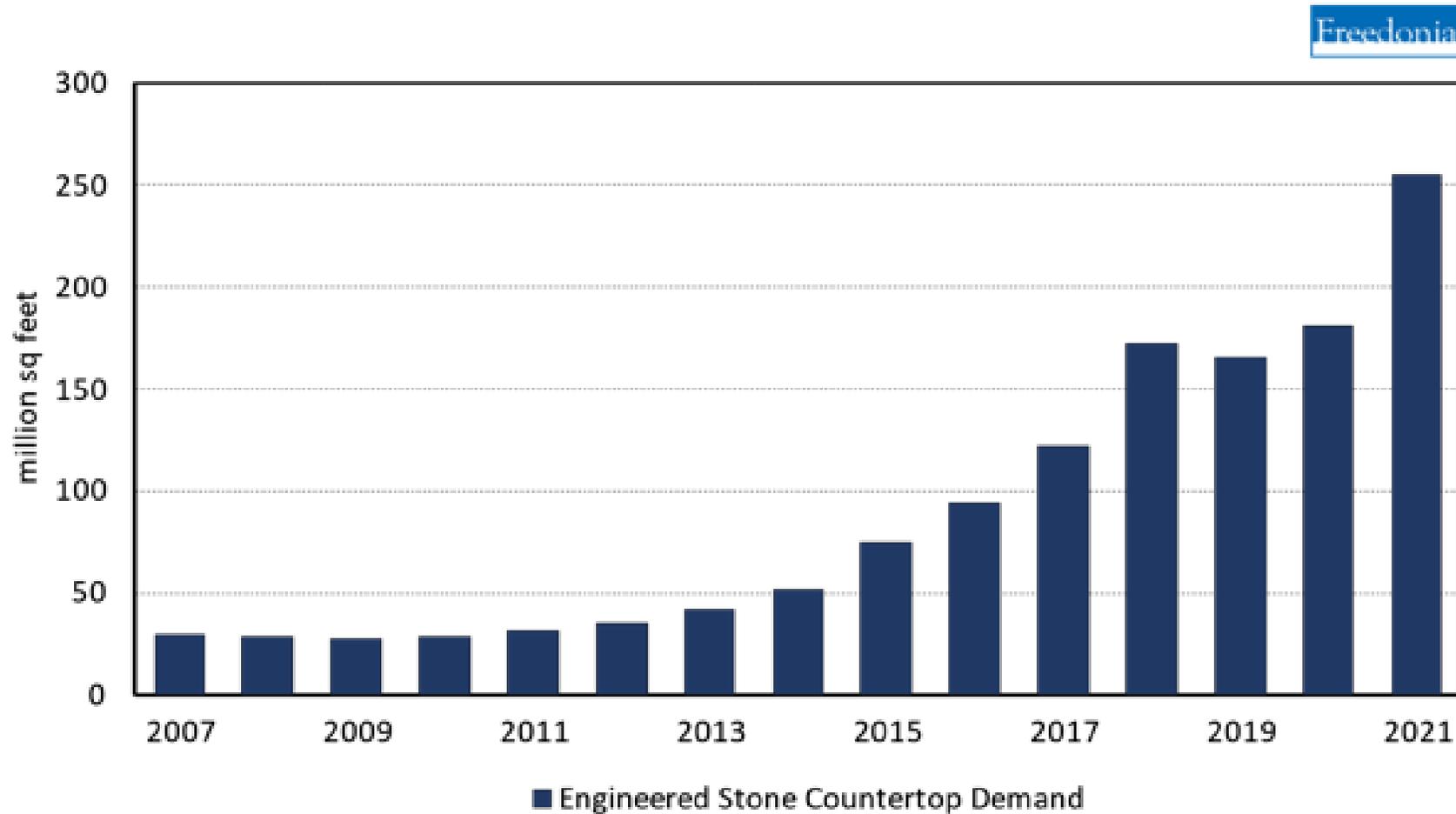
Upcoming consultation on the workplace exposure limits for 9 chemicals

Resp crystalline silica: Proposal to reduce TWA from 0.05 to 0.025 mg/m³

WES in the UK is 0.1 mg/m³

Experience in other countries?

Engineered Stone Countertop Demand, 2007 – 2021 (million square feet)



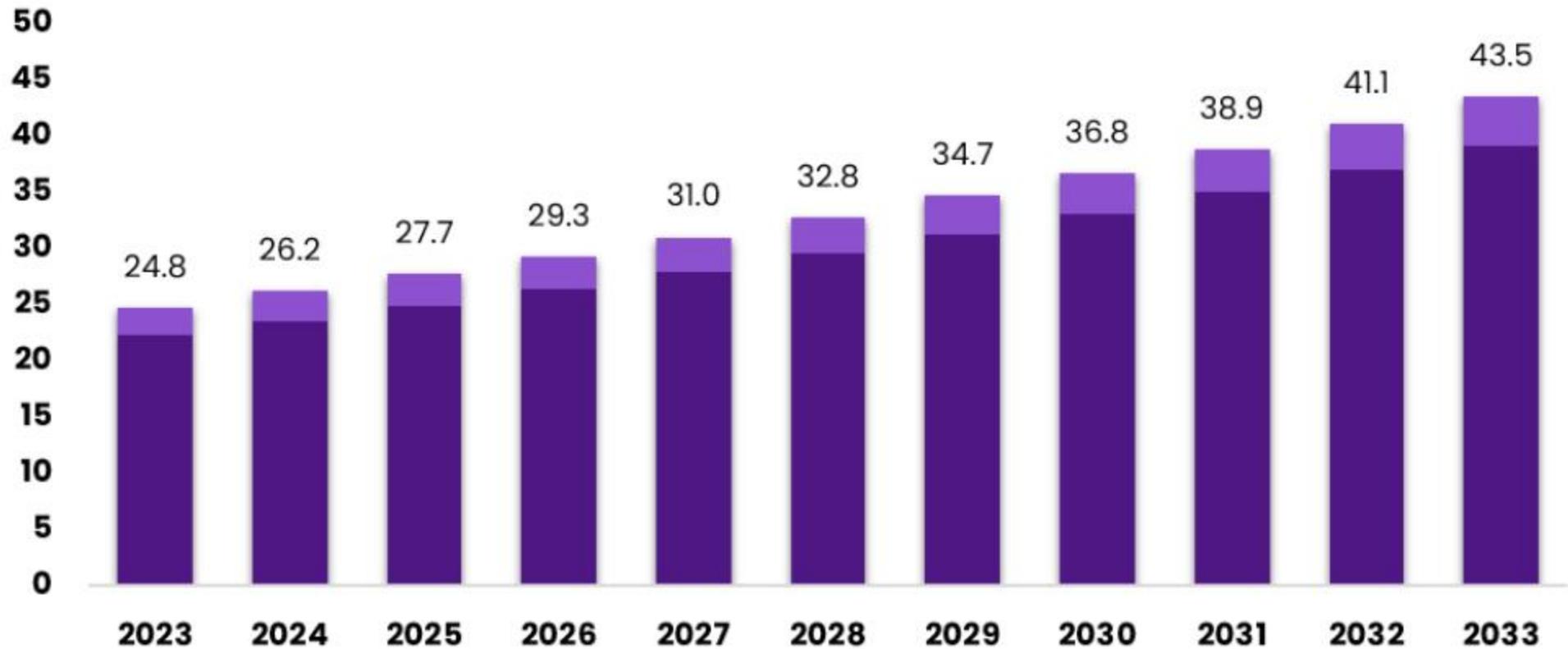
Source: The Freedonia Group

Global Engineered Stone Market

Size, by Component, 2023-2033 (USD Billion)

■ Blocks & Slabs

■ Tiles



The Market will Grow

At the CAGR of:

13.5%

The Forecasted Market
Size for 2033 in USD:

\$43.5B



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July 24, 2023

Silicosis Among Immigrant Engineered Stone (Quartz) Countertop Fabrication Workers in California

Jane C. Fazio, MD^{1,2,3}; Sheiphali A. Gandhi, MD, MPH^{2,4}; Jennifer Flattery, MPH²; et al

[» Author Affiliations](#)

JAMA Intern Med. 2023;183(9):991-998. doi:10.1001/jamainternmed.2023.3295

Editorial Comment

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Key Points

Question What are the characteristics of patients in California with silicosis from occupational exposure to dust from engineered stone (quartz), a popular material that is high in silica content and that is used to fabricate countertops?

Findings In this case series of 52 patients, the median age was 45 years at diagnosis, and nearly all were Latino immigrant men. Diagnosis was delayed in 58%, with 38% presenting with advanced disease (progressive massive fibrosis), and 19% died.

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Los Angeles Times

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CALIFORNIA

California workers who cut countertops are dying of an incurable disease



Leobardo Segura Meza, 27, of Pacoima suffers from silicosis, an incurable lung disease that has been afflicting workers who cut and polish engineered stone high in crystalline silica. (Mel Melcon / Los Angeles Times)

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Behind the stunning job losses in Hollywood: 'The audience has moved on'

Silicosis Among Immigrant Engineered Stone (Quartz) Countertop Fabrication Workers in California

Jane C. Fazio, MD; Sheiphali A. Gandhi, MD, MPH; Jennifer Flattery, MPH; Amy Heinzerling, MD, MPH; Nader Kamangar, MD, MS; Nawal Afif, DO; Kristin J. Cummings, MD, MPH; Robert J. Harrison, MD, MPH

IMPORTANCE Silicosis associated with inhalation of respirable crystalline silica among engineered stone countertop fabrication workers is an emerging health concern.

OBJECTIVE To describe clinical, socioeconomic, and occupational characteristics of patients diagnosed with silicosis associated with engineered stone in California.

DESIGN, SETTING, AND PARTICIPANTS This case series included reported cases of silicosis associated with fabrication of engineered stone countertops, as identified by statewide surveillance by the California Department of Public Health (2019-2022). Data analysis was performed from October 2022 to March 2023.

EXPOSURES Patient interviews and medical record abstractions were used to assess occupational exposure to respirable crystalline silica, including duration of work tenure and preventive measures undertaken.

MAIN OUTCOMES AND MEASURES Demographics, clinical characteristics, health care utilization, and clinical outcomes were obtained, including vital status, hypoxia, and lung transplant.

RESULTS This case series identified 52 male patients meeting inclusion criteria; median (IQR) age was 45 (40-49) years, and 51 were Latino immigrants. Ten (19%) were uninsured, and 20 (39%) had restricted-scope Medi-Cal; 25 (48%) presented initially to an emergency department. A delay in diagnosis occurred in 30 (58%) patients, most commonly due to alternative initial diagnoses of bacterial pneumonia (9 [30%]) or tuberculosis (8 [27%]). At diagnosis, 20 (38%) patients had advanced disease (progressive massive fibrosis) with severely or very severely reduced forced expiratory volume in 1 second in 8 (18%) and 5 (11%), respectively. Of the cases, 10 (19%) were fatal; median (IQR) age at death was 46 (38-51) years, and 6 patients (12%) were alive with chronic resting hypoxia. Eleven were referred for lung transplant: 3 underwent transplant with 1 fatality; 7 were declined

[← Editorial page 908](#)

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- 52 cases, almost all Latino immigrants
- 38% with PMF
- 19% fatal (mean age at death 46 yrs)
- A **delay in diagnosis** occurred in 30 (58%) patients, most commonly due to alternative initial diagnoses of bacterial pneumonia (9 [30%]) or tuberculosis (8 [27%])

JAMA Intern Med. 2023;183(9):991-998.

doi:10.1001/jamainternmed.2023.3295 Published online July 24, 2023.

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SILICOSIS EPIDEMIC

California Issues Emergency Rule to Address Silicosis Epidemic

by [Jim Morris](#) and [Leslie Berestein Rojas](#) December 14, 2023



Juan Gonzalez Morin died at 37 in April after cutting and grinding artificial-stone countertops in

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And in Spain

Outbreak of silicosis in Spanish quartz conglomerate workers

**Aránzazu Pérez-Alonso¹, Juan Antonio Córdoba-Doña^{2,3},
José Luis Millares-Lorenzo⁴, Estrella Figueroa-Murillo¹, Cristina García-Vadillo⁵,
José Romero-Morillo⁵**

¹Servicio de Medicina Preventiva, Hospital Universitario de Puerto Real, Cádiz, Spain, ²Servicio de Salud Pública, Delegación Territorial de Salud y Bienestar Social de Cádiz, Spain, ³Department of Public Health and Clinical Medicine, Unit of Epidemiology and Global Health, Umeå University, Sweden, ⁴Servicio de Epidemiología y Salud Laboral, Consejería de Salud y Bienestar Social, Sevilla, Spain, ⁵Servicio de Neumología, Hospital Universitario de Puerto Real, Cádiz, Spain

Objectives: To describe the epidemiological and clinical characteristics of an outbreak of occupational silicosis and the associated working conditions.

Methods: Cases were defined as men working in the stone cutting, shaping, and finishing industry in the province of Cádiz, diagnosed with silicosis between July 2009 and May 2012, and were identified and diagnosed by the department of pulmonology of the University Hospital of Puerto Real (Cádiz). A census of workplaces using quartz conglomerates was carried out to determine total numbers of potentially exposed workers. A patient telephone survey on occupational exposures and a review of medical records for all participants were conducted.

Results: Silicosis was diagnosed in 46 men with a median age of 33 years and a median of 11 years working in the manufacturing of countertops. Of these cases, 91.3% were diagnosed with simple chronic silicosis, with an abnormal high-resolution computerized tomography (HRCT) scan. One patient died during the study period. Employer non-compliance in prevention and control measures was frequently reported, as were environmental and individual protection failures.

Conclusions: The use of new construction materials such as quartz conglomerates has increased silicosis incidence due to intensive occupational exposures, in the context of high demand fuelled by the housing boom. This widespread exposure poses a risk if appropriate preventive measures are not undertaken.

Keywords: Silicosis, Quartz conglomerates, Respirable crystalline silica, Marble works, Occupational disease

**46 cases
mean age 33 yrs**

And in Italy

^{1a} Medicina del Lavoro

Med Lav 2020; 111, 2: 99-106
DOI: 10.23749/mdl.v111i2.9115

Silicosis in finishing workers in quartz conglomerates processing

GABRIELLA GUARNIERI¹, SALASNICH MAURO², PAOLO LUCERNONI², MARTA SBARAGLIA³, MARIA GRAZIA PUTZU⁴, PAOLO ZULIANI⁴, FEDERICA ROSSI⁴, STEFANIA VIO⁵, LEONARDO BIANCHI¹, ANDREA MARTINELLI¹, OTTORINO GOTTARDO⁶, ROSANA BIZZOTTO⁶, PIERO MAESTRELLI¹, PAOLA MASON¹, MARIELLA CARRIERI¹

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KEY WORDS: Silica dust; pneumoconiosis; quartz conglomerates; occupational exposure; artificial stones

PAROLE CHIAVE: Silice; pneumoconiosi; conglomerati di quarzo; esposizione professionale; materiali lapidei artificiali

SUMMARY

Introduction: Outbreaks of silicosis have been recently reported in artificial stone workers. **Aim:** To describe the features of silicosis in quartz conglomerate workers in North-Eastern Italy. **Methods:** Active search of pneumoconiosis was performed in 11 companies of North-Eastern Italy involved in the fabrication of quartz conglomerate countertops. Occupational history, lung function tests, chest X-ray and high resolution computed tomography (HRCT) were performed. In selected cases, trans-bronchial biopsies were taken for histological evaluation and identification of silica crystals in the tissue. Cumulative exposure to crystalline silica was estimated. **Results:** We recruited 45 workers and 24 cases of silicosis were diagnosed. Mean age at diagnosis was 43 years and duration of exposure to quartz conglomerate dust was 3.5 to 20 years. The average silica cumulative exposure was 4.3 mg/m³/y. Abnormal findings were detected in 42% of chest X-rays, in 33% of spirometry and 50% of carbon monoxide lung diffusion (DL_{co}). HRCTs were abnormal in all cases showing well-defined rounded opacities, irregular/linear intralobular opacities and bilateral enlarged mediastinal lymph-nodes. Histological findings consistent with silicosis were observed in 24 cases. Numerous silica particles (diameter 0.1–5 μm) were identified in lung tissue. **Conclusions:** We reported an unexpected high incidence of silicosis in Italian workers exposed to quartz conglomerate dust. The results suggest that chest HRCT is indicated for screening of workers with high exposure to silica and DL_{co} should be added to spirometry in health surveillance. More rigorous application of safety regulations and more effective preventive interventions at work are necessary.

We recruited 45 workers and 24 cases of silicosis were diagnosed

The results suggest that chest HRCT is indicated for screening of workers with high exposure to silica and DL_{co} should be added to spirometry in health surveillance.

More rigorous application of safety regulations and more effective preventive interventions at work are necessary.

And in China

American Journal of Respiratory and Critical Care Medicine

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Artificial Stone-related Silicosis in China

L. Mao¹, L. Huang², S. Zhou¹, Z. Chen¹, L. Bian¹, J. Shi¹, M. Liu¹,
+ Author Affiliations



<https://doi.org/10.1164/ajrccm.2025.211-Abstracts.A1024> PubMed:

Abstract

PDF

Abstract

Introduction:Artificial stone-related silicosis, a type of silicosis that has emerged globally in recent years, caused by the inhalation of dust containing high levels of crystalline silica.**Method:**Demographic information, lung function, chest CT scans, and follow-up data were collected for 865 patients with artificial stone-related silicosis in Shanghai Pulmonary Hospital between January 2014 and October 2024. Additionally, a comparative analysis was conducted on the chest CT and lung function changes observed in 189 silicosis patients before and after undergoing antifibrotic therapy.**Result:**The average dust concentration in the air of five artificial quartz stone plate processing and installation sites in Anhui, China, was as high as $351.0 \pm 30.76\text{mg/m}^3$ and $127.6 \pm 17.36\text{mg/m}^3$.Among the 424 patients who underwent CT reexamination within 24 months, a remarkable 90% (381/424) demonstrated significant progression. This progression was evident in at least one of the following: an increase in small nodules, enlarged masses, and exacerbation of emphysema or bullae. Additionally, the average yearly decrease in FVC was $725.6 \pm 77.24\text{ml}$.Among all patients, 14.6% (125/865) were complicated with pneumothorax, of which 16.0% (20/125) were recurrent or refractory pneumothorax. Additionally, 5% (48/865) were positive for *Mycobacterium tuberculosis* or non-tuberculosis mycobacteria (NTM), determined through bacteriology or Molecular Biology tests. Within this group, 62.5% (30/48) were positive for *Mycobacterium tuberculosis*, while 37.5% (18/48) were positive for NTM. Following a 2-year standardized treatment, 79.2% (38/48) of these patients achieved negative status and completed the course of treatment, with 37 of them specifically being treated for *Mycobacterium tuberculosis* infection.Among 189 patients who underwent tetrandrine treatment for anti-fibrosis, there was an average decrease in FVC of $75.6 \pm 17.46\text{ml}$ per year over a two-year period. Additionally, CT scans indicated progression in 40.2% (76 out of 189) of these patients. In comparison, patients who received standard treatment for six years had a CT progression rate of 61.3% (28 out of 46), with an average FVC decrease of $54.4 \pm 12.24\text{ml}$ per year.**Conclusion:**Artificial stone-related silicosis is an accelerated silicosis with a poor prognosis, often complicated by pneumothorax and mycobacterial infection. However, anti-fibrosis treatment with tetrandrine can effectively slow down the progression of fibrosis in this condition.

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L. Mao, L. Huang, S. Zhou, Z. Chen, L. Bian, J. Shi, and M. Liu. Artificial Stone-related Silicosis in China [abstract]. *Am J Respir Crit Care Med* 2025;211:A1024. <https://doi.org/10.1164/ajrccm.2025.211-Abstracts.A1024>

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Among the 424 patients who underwent CT reexamination within 24 months, a remarkable 90% (381/424) demonstrated significant progression.

REVIEW

Open Access



A review of silicosis and other silica-related diseases in the engineered stone countertop processing industry

Jane C. Fazio^{1,2*}, Karoly Viragh³, Jenny Houlroyd⁴ and Sheiphali A. Gandhi^{5,6}

Abstract

Background Engineered stone (ES), a material that has become widespread for its use in kitchen and bathroom countertops since the 1980s, is composed of over 90% crystalline silica by weight, significantly exceeding the silica content of natural stones such as granite (40–50%) and marble (< 10%). Workers fabricating ES are exposed to dangerously high levels of respirable crystalline silica (RCS) and other toxic chemicals, which increases the risk of developing silicosis and other lung and systemic diseases. The purpose of this review is to explore the epidemiology, occupational risks, regulatory gaps, diagnostic evaluation, and clinical challenges associated with ES dust exposure.

Main body ES silicosis was first described in the early 2010s among ES countertop workers in Spain, Italy, and Israel. Since then, hundreds of cases have emerged worldwide, namely in China, Australia, the United States, the United Kingdom, and Belgium. Silicosis from ES dust is accelerated and diagnosed after 7–19 years of exposure, often affecting young individuals (median age 33–55 years) from marginalized or immigrant communities. Morbidity and mortality are poor, with high rates of lung transplantation and death. Industrial hygiene air sample monitoring data shows that despite engineering controls such as wet saws and exhaust ventilation, exposure to respirable crystalline silica when cutting ES frequently exceeds safe exposure levels. Diagnostic evaluation and treatment are clinically challenging due to delayed medical screening, misdiagnosis, and lack of treatment options.

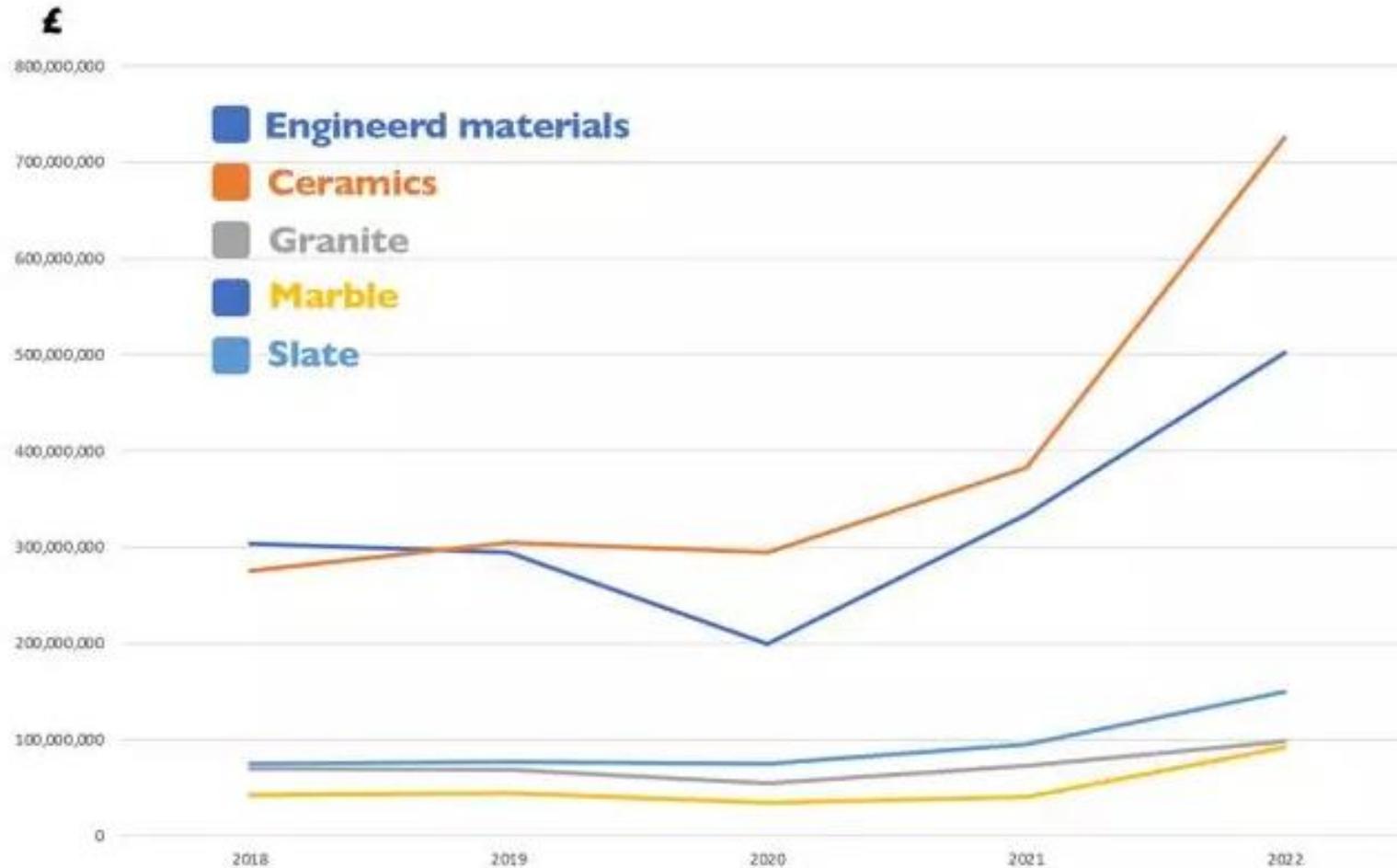
Conclusions This review underscores the urgent need for enhanced occupational safety regulations, active screening, and healthcare support to address the rising burden of ES silicosis among vulnerable worker populations globally.

Even with wet cutting and other methods, RCS levels often exceed the exp standard

This review underscores the urgent need for enhanced occupational safety regulations, active screening, and healthcare support to address the rising burden of ES silicosis among vulnerable worker populations globally.

What is the situation in the UK?

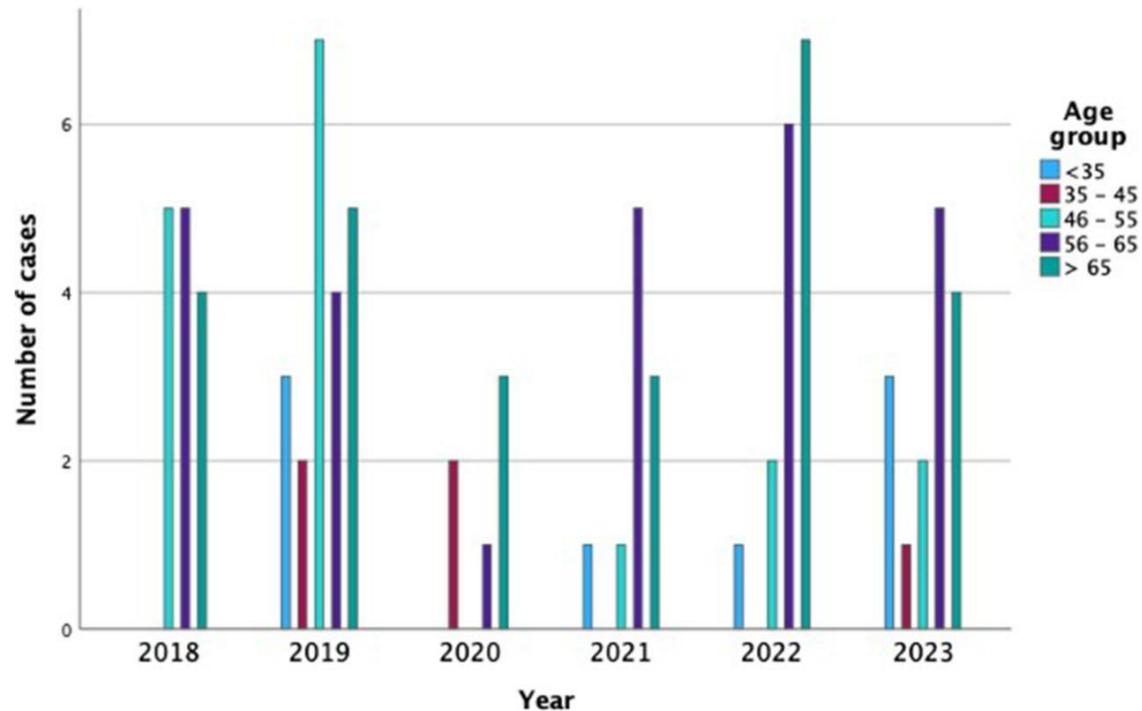
Growth of imports (£ current)



S21 Epidemiology of silicosis in the UK: an update from the SWORD scheme 2018–2023

R Wiggins¹, L Byrne¹, D Fishwick¹, M Van-Tongeren¹, CM Barber²

Thorax 2024;79(Suppl 2):A1–A332



19 cases in stonemasons. **Four** cases were reported in benchtop fabricators using artificial stone.

“Though cases of silicosis continue to occur in traditionally high-risk jobs **artificial stone silicosis** is an emerging risk in the UK.”

Sept 2025 update: 43 cases (4 of these are hilar lymphadenopathy)

Artificial stone silicosis: a UK case series

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ABSTRACT

Silicosis due to artificial stone (AS) has emerged over the last decade as an increasing global issue. We report the first eight UK cases. All were men; median age was 34 years (range 27–56) and median stone dust exposure was 12.5 years (range 4–40) but in 4 cases was 4–8 years. One is deceased; two were referred for lung transplant assessment. All cases were dry cutting and polishing AS worktops with inadequate safety measures. Clinical features of silicosis can closely mimic sarcoidosis. UK cases are likely to increase, with urgent action needed to identify cases and enforce regulations.

to a UK specialist centre were reviewed at a multi-disciplinary meeting over 8 months. A descriptive analysis was undertaken.

RESULTS

Silicosis attributed to AS was identified in 8 men with median age 34 years (range 27–56) at time of diagnosis, 75% were born outside the UK and 88% were current or previous smokers (table 1). All initially presented with respiratory symptoms but, for some, this was attributed to causes—including sarcoidosis—other than silicosis (based on limited

Feary J, et al. *Thorax* 2024;79:979–981. doi:10.1136/thorax-2024-221715

Update Sept 2025: 34 cases seen at the Brompton – ad hoc referrals

Young age, immigrant, small workplaces, short exposure period, poor controls



Kent

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Doctors call for ban on cutting artificial stone after reporting first UK cases of silicosis

Jacqui Wise

Experts have called on the UK government to follow Australia's lead in banning artificial stone worktops, after the first UK cases of silicosis linked to their manufacture were reported.

Since 2010, cases of silicosis due to artificial stone have been reported from Israel, Spain, Italy, the US, China, Australia, and Belgium. Although artificial stone has been used in the UK for a similar length of time the country reported no cases until mid-2023, when eight men were referred to the occupational lung disease department at the Royal Brompton Hospital in London.

A case series report published in the journal *Thorax*¹ says that the eight men had a median age of 34 (range 27 to 56) and had been dry cutting and polishing artificial stone worktops (also called countertops) with inadequate safety measures. Most of the men were migrant workers and were vulnerable to exploitation in the workplace, the study authors reported, and all worked for small companies with fewer than 10 employees.

The average time of exposure to stone dust was 12.5 years but in four cases was between four and eight years. All the workers initially presented with respiratory symptoms, but in some this was attributed to other causes, including sarcoidosis. One man has since died, and two have been assessed for lung transplantation.

Engineered stone, which is made with crushed rocks bound together with resins and pigments, has become increasingly popular for kitchen worktops over the past two decades. It has a higher silica content (over 90%) than marble (3%) or granite (30%), and it generates very fine particles when cut.

who often don't seek medical attention for what they might perceive to be mild symptoms such as a cough or breathlessness."

She added that current safeguards were not adequate. She told *The BMJ*, "We need to know how many people work with artificial stone, how many people already have silicosis, more about the workplaces, and indeed if artificial stone can be used safely in the UK. What is certain is that we need urgent action to tackle the subject and to try to prevent the same disaster unfolding here as it has in Australia and California."

Concerted effort

The study authors said that current UK guidance recommended monitoring workers in the industry after 15 years but that this was likely to miss cases and failed to account for the intensity, not just the length, of exposure. They said that a legal requirement to report cases of artificial stone silicosis must now be considered, along with a UK ban on artificial stone and implementation of health and safety regulation, with a focus on small companies.

They wrote, "A concerted effort is required in the UK to prevent the epidemic seen in other countries. The cases we present illustrate the failure of the employer to take responsibility for exposure control in their workplaces. National guidelines are urgently needed, as well as work to enumerate the at-risk population and identify cases early."

They said that a legal requirement to report cases of artificial stone silicosis, implementation of health and safety regulation with a focus on small companies, and a UK ban on artificial stone must all now be considered.

HSE spokesperson: "Great Britain has a robust and well established regulatory framework in place to protect workers from the health risks associated with exposure to hazardous substances. We continue to work with industry to raise awareness of managing the risks of exposure to respirable crystalline silica, and we are **considering options for future interventions** to ensure workers are protected."

Dad of three dies from lung disease after cutting stone for kitchen revamps

Calls have risen in the UK to consider a ban on quartz based work top, which when cut, produces large amounts of silica dust



Marek Marzec, a father-of-three originally from Poland, but living in London, was diagnosed with silicosis in April this year (Photo: Supplied)

Joe Duggan, Euan O'Byrne Mulligan

December 19, 2024 12:15 am (Updated 2:10 pm)

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A stonemason has died from a chronic lung disease after [spending his last](#)

Calls renew for ban on artificial stone worktops

August 7, 2024



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Scientists have urged the UK government to reconsider a ban on artificial stone worktops after a rise in cases of silicosis in workers after a short period of exposure

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Kitchen company Herringbone was the [first in the UK to implement a ban](#) on the sale of high-silica quartz worktops, reasoning that the risks of working with artificial stone “are not necessary when there are alternatives on the market.”

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June 17, 2024

BOHS Issues Urgent Guidance to Prevent Kitchen Worktop Manufacture Disease Outbreak

The British Occupational Hygiene Society, a leading scientific body and the UK's Chartered body for Workplace Health Protection has issued specific guidance for anyone working with stone worktops on how to stay safe, healthy and legal.

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Artificial stone and the rise of silicosis

By Tim Turney, Casella on 23 September 2025

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With concerns rising that workers who manufacture and install artificial stone kitchen worktops are at high risk of early-onset fatal lung disease, it is vital employers take steps to prevent and control exposure to respirable crystalline silica found in engineered stone materials.

Engineered stone has hit the headlines over the past year as doctors in the UK have expressed concerns about the role the silica-containing material appears to be playing in driving an increase in cases of the lung disease silicosis, prompting industry experts to call for a ban on stone products with a high silica content.

With luxury stone kitchen worktops, such as those made from marble and granite, often prohibitively expensive for homeowners, stonecutters and kitchen worktop manufacturing workers are increasingly using more affordable materials like engineered stone; a man-made composite material, primarily composed of crushed natural stone (containing quartz) and resin, formed into slab. Quartz is a naturally occurring mineral found in many types of rock, but some types of quartz contain over 90 per cent silica.

Respirable crystalline silica (RCS) is a fine dust created by the cutting, grinding or polishing of materials containing silica. The dust is fine enough to permeate the lungs and can cause a number of serious and sometimes fatal lung diseases, including silicosis, chronic obstructive pulmonary disease (COPD) and lung cancer.



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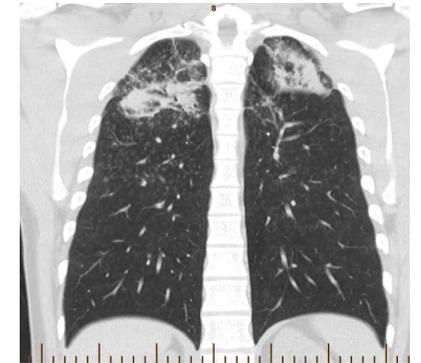
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Lessons learned and call to action

- Beware old hazards returning in new guises
- Take note of early signals and act
- Develop a research evidence base
- Advocacy needs a broad coalition of support
- Apply the hierarchy of controls (elim/subs)
- Need active screening using sensitive methods
- Regular review of exposure standards
- Governments need to invest and act early



Avoid complacency/BAU

What would Professor Lane do?



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