Public Health Association of Australia submission on the prohibition of the use of engineered stone

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Preamble

The Public Health Association of Australia

The Public Health Association of Australia (PHAA) is recognised as the principal non-government organisation for public health in Australia working to promote the health and well-being of all Australians. It is the pre-eminent voice for the public's health in Australia.

The PHAA works to ensure that the public's health is improved through sustained and determined efforts of the Board, the National Office, the State and Territory Branches, the Special Interest Groups and members.

The efforts of the PHAA are enhanced by our vision for a healthy Australia and by engaging with like-minded stakeholders in order to build coalitions of interest that influence public opinion, the media, political parties and governments.

Health is a human right, a vital resource for everyday life, and key factor in sustainability. Health equity and inequity do not exist in isolation from the conditions that underpin people's health. The health status of all people is impacted by the social, cultural, political, environmental and economic determinants of health. Specific focus on these determinants is necessary to reduce the unfair and unjust effects of conditions of living that cause poor health and disease. These determinants underpin the strategic direction of the Association.

All members of the Association are committed to better health outcomes based on these principles.

Vision for a healthy population

A healthy region, a healthy nation, healthy people: living in an equitable society underpinned by a well-functioning ecosystem and a healthy environment, improving and promoting health for all.

The reduction of social and health inequities should be an over-arching goal of national policy and recognised as a key measure of our progress as a society. All public health activities and related government policy should be directed towards reducing social and health inequity nationally and, where possible, internationally.

Mission for the Public Health Association of Australia

As the leading national peak body for public health representation and advocacy, to drive better health outcomes through increased knowledge, better access and equity, evidence informed policy and effective population-based practice in public health.

Introduction

PHAA welcomes the opportunity to provide input to Safe Work Australia's consultation paper on the prohibition on the use of engineered stone (ES) (March 2023) and to contribute to improving workplace safety in Australia.

The rise in silicosis cases in ES workers in Australia is a significant public health issue. Australia has a legislative responsibility under Section 17 of the Work Health Safety Act to eliminate or minimise occupational health harms as far as is reasonably practicable.[1]

Silica has a myriad of industrial applications, and the prohibition of ES alone is unlikely to eliminate all the risks of silica. However, there is increasing evidence that ES silicosis is associated with higher disease incidence, severity, and mortality. Therefore, PHAA strongly supports the prohibition of ES, especially as its primary use as vanity/discretionary product does not justify risking the lives of workers.

PHAA acknowledges that given ES is a relatively novel product, evidence is evolving, and areas of scientific uncertainty remain. The following recommendations adopt a precautionary principle based on the available evidence, which is sufficient to support prohibition of ES. We believe this is an effective strategy to ensure less Australians suffer a preventable workplace disease.

Recommendations

1. **Prohibition on the use of all ES regardless of silica content,** to prevent ongoing disease from a non-essential product.
2. **Adopt a strong broad silica regulation** for all silica materials across all industries.
3. The only considerable alternative to recommendation 1, is the prohibition on the use of ES containing 10% or more crystalline silica. As there is no 'safe' silica percentage, this threshold is guided by a **harm minimisation approach** and is contingent on:
    - **Further investigation** into the potential health impacts of components of low-silica ES,
    - **Strict regulation and licensing** of the use, manufacture and import of ES containing less than 10% crystalline silica, and
    - **Built in 3 yearly review of reform measures**, with a commitment to take additional protective steps if measured benefits are insufficient or new evidence emerges.
4. **Shortest possible transitional periods** to minimise cumulative exposure.
5. **Robust disease surveillance** including targeted screening of high-risk industries and collection of long term data through a national registry.

Background

What is respirable crystalline silica (RCS)?

Silica, or silicon-dioxide, is a major component of the earth's crust and the world's most abundant mineral. Silica exists in crystalline and amorphous (non-crystalline) forms.[2] Crystalline forms of silica (e.g. quartz, tridymite and cristobalite) occur naturally in rocks such as sandstone and granite. Crystalline silica is prevalent in many industries such as construction, metallurgy, mining/quarrying, and the manufacture of cement, glass, and ceramics.[3, 4]

Crystalline silica becomes a risk to health when the particles are small enough to be inhaled and reach the lower airways and gas exchange zones.[2, 4] These "respirable" crystalline silica (RCS) particles are usually less than 5-10µm in diameter and are generated when materials containing crystalline silica are mechanically manipulated. Industrial activities like cutting, demolishing, grinding, and polishing also give the crystals electrical polarity. This increases the toxic potential of RCS, especially if the particles have been freshly generated. As RCS is colourless, odourless, and initially non-irritating, it may go unnoticed in a workplace.[5, 6]

Estimates of the Australian working population in 2013 deemed that 6.4% of workers were exposed to RCS at work and 3.3% were exposed at high levels.[5, 7] Recent reports have suggested every year up to 600,000 Australian workers could be exposed to RCS across various industries.[3] Lifetime cumulative dose of RCS is the primary predictor in the development, progression, and mortality of silica-related lung disease including silicosis and lung cancer.[8-12]

Health impacts of RCS

In 2019, occupational silica exposure was responsible for the loss of 24.1 Disability Adjusted Life Years (DALYs) per 100,000 population due to lung cancer and 1.14 DALYs per 100,000 population due to silicosis in Australia.[13]

Silicosis

The most recognised outcome of RCS exposure is silicosis, an irreversible and potentially fatal interstitial lung disease.[2, 13] Once inhaled, RCS particles deposit in the lower respiratory tract and trigger an inflammatory response which can lead to lung damage.[2, 4] The mechanism by which RCS causes silicosis varies according to its classification as acute, accelerated, and chronic disease. **Acute silicosis** occurs weeks to 5 years after an initial very high intensity RCS exposure. **Accelerated silicosis** occurs 5-10 years after an initial moderate to high intensity RCS exposure. **Chronic silicosis** occurs greater than 10 years after low to moderate intensity RCS exposure. Disease severity, rate of disease progression and mortality rate is generally highest for acute silicosis, followed by accelerated disease and chronic disease.[5, 8-10, 14] The presence of progressive massive fibrosis (PMF) in accelerated and chronic silicosis is an indicator of severe disease and poorer outcomes, occurring in 18-37% of cases over an average of 5 years.[6]

Cancer

RCS has been globally recognised by the International Agency for Research on Cancer as a human carcinogen since 1997.[5] RCS exposure is associated most strongly with lung cancer, followed by possible associations with gastric, oesophageal and several other malignancies.[4, 5]

Other diseases

RCS exposure significantly increases the risk of other diseases including chronic obstructive pulmonary disease (COPD), chronic kidney disease, autoimmune diseases and infections such as tuberculosis, even in the absence of silicosis.[5, 6] The risks of autoimmune conditions such as rheumatoid arthritis and systemic sclerosis were 2.3-5.2 and 1.2-15.0 times more likely, respectively, in those exposed to RCS. Systemic lupus erythematous, scleroderma, ANCA-associated vasculitis, Sjogren's syndrome and sarcoidosis risk is also increased due to RCS exposure.[5]

What is Engineered Stone (ES)?

ES is a discretionary product with increasing popularity as an affordable countertop material in Australia and worldwide.[2, 3, 15] ES is a composite material, with the main component being crystalline silica.[5, 9, 15]

Safe Work Australia defines ES as:

a) an artificial product that:
   i) contains crystalline silica; and
   ii) is created by combining natural stone materials with other chemical constituents such as water, resin or pigments; and
   iii) undergoes a process to become hardened; but
b) does not include any of the following:
   i) concrete and cement products
   ii) blocks, bricks, and pavers
   iii) ceramic and porcelain wall and floor tiles
   iv) roof tiles
   v) grout, mortar and render
   vi) plasterboard.[6]

ES products have a significantly higher silica content compared to natural stone alternatives such as granite and marble. ES generally contains 90-97% silica by mass, however a low silica (9%) ES option has recently been developed. In comparison, the silica content of granite is typically 30% (range 25-40%) and marble is 2-3%.[2-5, 9, 14-16]

ES dust particles can be smaller than 1µm, which is substantially finer than natural stone dust. RCS in the form of quartz and cristobalite is generally present at higher proportions in ES dust, with the smaller particles able to travel further into the airways and cause more damage. Unlike natural stone dust, ES dust also contains resin and transition metals, which can also be toxic to humans.[6, 8, 10, 15, 17]

PHAA Response to the Safe Work Australia Consultation Paper Terms of Reference

Q1: Do you support a prohibition on the use of engineered stone?

PHAA strongly supports a prohibition on the use of all ES as described in Option 1 of the consultation paper.

Complete elimination of all silica risk is unlikely, as many natural stone products, concrete and other products containing silica will not be restricted by this action. Nevertheless, prohibiting non-essential products such as ES will minimise cumulative exposure to silica and help reduce risks to the lowest possible level.

Silicosis from ES is more common and severe.

Occupational silica exposure is one of the oldest known causes of lung disease.[18] However, there has been a recent surge in global silicosis cases following the introduction and growing popularity of ES benchtops.

Since Italy reported the first case of silicosis associated with ES in 2010, the number of observed cases has grown rapidly across countries including Israel, Spain, China, and the United States.[2, 5, 16, 19] The unusually high incidence in ES workers across the world with comparable occupational histories indicates a causal relationship and lessons can be translated to the Australian context.[2, 20]

Australia has seen a similar re-emergence of silicosis driven by the increasing popularity of ES since the early 2000s.[3] The Australian National Dust Disease Taskforce estimates there were a total of 477 Australians living with silicosis in 2021, with most of these cases diagnosed in the preceding 3 years and linked to exposure from ES.[3] There is no good reason to continue putting Australia's stone workers in harm's way for the sake of a vanity product.

The recent outbreaks of ES silicosis have a clinical picture consistent with acute or accelerating silicosis. ES silicosis is more aggressive than chronic silicosis, which has historically been the most common form of the disease seen in older workers after over 10 years of low-moderate RCS exposure.[4] In comparison to natural stone silicosis, ES silicosis has been widely characterised in the literature by shorter latency periods, younger age at diagnosis, accelerated disease progression, higher rates of disabling loss of lung function, increased requirements for lung transplantation and higher mortality rates.[2, 5, 7, 10, 18, 19] Countertops are not worth subjecting young workers to such severe sickness, disability and death.

Prohibiting the use of ES is the only way to effectively address this evolving public health disaster.

Current control methods are falling short, and compliance is poor.

Current outbreaks of ES silicosis highlight a failure of regulation in response to emerging evidence.

Australia's workplace exposure standard for RCS is a time weighted average of 0.05 mg/m^3 over an 8 hour day. This does not meet international standards of 0.025mg/m^3.[1, 12] 15-40% of people still risk developing silicosis, other lung conditions or dying from lung cancer after being exposed to silica dust at the current Australian occupational standard over their working life.[4] Adding to this disease burden for discretionary products is unjustified.

These exposure standards for RCS do not adequately quantify the health risks of ES dust. RCS particles from ES dust are smaller, making them more damaging and difficult to measure. Current practices also neglect other potentially toxic components of ES dust and the inherently higher intensity exposures associated with countertop manufacture.[2] Short, high-intensity exposures of up to 44 mg/m^3 of RCS over 30 minutes while dry-cutting ES, has three times the effect of equivalent lower-intensity exposure over longer periods.[5, 7]

Safety techniques like wet-cutting can reduce RCS exposure by up to 90%. However, even when combined with other strategies such as local exhaust ventilation, RCS levels remain above workplace standards.[3, 10, 18]

Furthermore, evidence suggests workplace exposure standards, dust control measures, health monitoring and occupational health and safety laws are not always adhered to in practice.[2, 5, 10, 15] With 75% of Australian stonemason businesses employing 5 employees or less and no formal stonemasonry training required to work with ES, the structure of the industry makes compliance and enforcement of safety practices difficult.[3]

Regulation has been tried and has failed. Government must take decisive action against preventable workplace illness and death.

Recommendations

- **Prohibit the use of all ES**, as per option 1 of the consultation paper.
- **Strengthen broad silica regulation** for all silica materials across all industries as agreed by WHS Ministers.
- **Reduce occupational RCS exposure limits** to align with international best practice targets of 0.025mg/m^3 where practicable.

Q2: If yes, do you support a prohibition on the use of all engineered stone irrespective of its crystalline silica content?

PHAA strongly supports a prohibition on the use of all ES irrespective of its crystalline silica content.

The only percentage of silica content we would consider is 10% or below, with the tightest licensing applied and a three yearly review of the policy conducted. As stated above, prohibiting the non-essential product irrespective of its crystalline silica content is the only way to truly minimise the risks of death and disease.

There is no 'safe' level of silica content.

There is a significant ongoing risk of silica associated lung disease at current workplace standards.[4] PHAA acknowledges that complete elimination of silica is unlikely, but every effort should be made to reduce the excess risk from non-essential products such as ES.

Currently, there is no evidence to suggest a 'safe' percentage of silica content in stone. We have put forward a "less than 10%" suggestion as a harm minimisation attempt. We wish to highlight that this threshold is guided by an existing ES product containing 9% silica, rather than PHAA supporting its safety. In terms of RCS exposure, effects of reform will likely be seen in 3-5 years, but there is insufficient evidence to predict the potential harms of other components of low-silica ES.[17, 21] As such, stringent monitoring and three yearly reviews are needed, with a commitment to ban ES entirely should concerning trends arise in the meantime.

The 40% threshold put forward in Options 2 and 3 of the consultation paper is based on the maximum silica level in natural stone benchtop materials rather than a risk based threshold. However, the argument for reducing the silica content of ES to match that of natural stone alternatives ignores key differences in other physical and chemical properties which contribute to varying disease presentations.[6, 17] We believe that 10% is an upper limit, however 0% is the only truly acceptable outcome.

If this option was to proceed, we make three accompanying and inseparable policy suggestions: the health impacts of this policy must be reviewed after three years, the government must be wary of what alternative material is used in silica's place and if workers are to continue working with silica, the toughest licensing, regulations, and training must be legislated to protect workers.

Recommendations

- **A prohibition on the use of all ES regardless of silica content**
- The only considerable alternative is an amended version of option 3 of the consultation paper- allowing the use of ES with 10% silica content as an upper limit, provided there is:
    - **Further investigation** into the safety of other components of low silica ES products
      AND
    - **Strict enforcement of licensing and regulation** on the use of ES, as outlined in Option 3 of the consultation paper. Additionally, strict penalties should apply to the purchase, acquisition, or installation of ES products from unlicensed importers, manufacturers, and fabricators. An ES-specific occupational exposure standard could also be considered.
      AND
    - **Inbuilt monitoring and review process every three years,** with a commitment to ban ES entirely if reform is not effective or concerning health trends emerge.

Q10: Should there be a transitional period for a prohibition on engineered stone? If so, should it apply to all options and how long should it be?

PHAA recommends the transitional period for the prohibition of ES be as short as possible for all options. More robust regulation and health surveillance will be needed during this period and after the prohibition of high-risk silica products.

As discussed previously, there is a strong dose-response relationship in the risk of developing RCS associated silicosis, lung cancer and autoimmune conditions.[5] A prolonged transitional period increases workers' cumulative exposure to RCS and therefore, risk of severe disease and death.

Recommendation

- A **minimal transition period** should apply for all reform options.

Q11: Do you have any evidence or data on the number of cases of the other silica-related diseases attributed to exposure to crystalline silica from engineered stone?

Australia's first case of ES silicosis was reported in 2015, following which there has been a rapid growth in the number of cases reported, with one report detecting 98 cases in just 4 months.[18] In 2018, silicosis was detected in more than 12% of ES workers Australia wide, with 15% of these cases having PMF.[21] In 2021, Workcover QLD reported 5% of ES workers had a respiratory disease other than silicosis and 21.4% had silicosis, 14% of whom had features of PMF.[3]

Health surveillance must be a key feature of any ongoing national effort, targeted to high risk industries and conducted by appropriately trained clinicians. PHAA supports continuing and strengthening the national registry to build an evidence base and monitor long term outcomes. However, primary prevention should always remain the focus of governments.

Recommendation

- **Robust disease surveillance** including targeted screening of high-risk industries and collection of long term data through a national registry.

Q12. Do you have any additional evidence or information on the impacts of silicosis or silica related diseases?

Australia spent $1 million annually from 2019-2020 on the treatment of silicosis.[22] The 2019 Global Burden of Disease study estimated the age-standardised incidence rate for silicosis in Australia was 0.24 cases per 100,000 population and occupational silica exposure was responsible for the loss of 279 DALYs in 2019.[13] The Australian Burden of Disease Study estimated 0.01 DALYs lost per 1,000 population in 2022 due to silicosis.[22] This represents a 268% increase since 2018, mostly driven by increases in younger age groups. 77.3% of the silicosis burden was fatal, leading to 103 Years of Life Lost (YLL) per 1,000 people due to silicosis.[22]

Lung cancer cost the Australian Government $634 million in 2019 and $664 million in 2020.[22] Occupational silica exposure is responsible for 230 Australians developing lung cancer each year and the loss of 5,922 DALYs due to lung cancer in 2019.[12, 13] The Cancer Council estimated almost 1% of Australians exposed to silica dust in 2011 would develop lung cancer over the course of their life, though this estimate was made prior to the widespread emergence of ES related harms.[12] There is strong evidence to support a dose-response relationship, with the risk of cancer increasing with long term or repeated high-level exposure, even in the absence of silicosis.[7, 11, 12]

Feedback from affected workers highlights the terrible impact an occupational respiratory dust disease has on all aspects of people's lives. Financial and psychological support is minimal, as is social support for the families of affected workers who share the burden.[3]

Conclusion

PHAA supports the broad directions of Safe Work Australia's agenda to improve occupational safety for ES workers. However, we wish to ensure that the precautionary principle in line with this submission is of utmost consideration to the committee. We are particularly keen that the following points are highlighted:

- Risking workers developing a preventable occupational disease from a discretionary product such as ES is not justifiable and a violation of Australia's obligations under the WHS Act.
- Prohibition of all forms of ES is the best way to minimise the risks to the lowest possible level.
- Strong regulation for all silica materials across all industries is desperately needed.
- If Work Safety Australia chooses to not prohibit all ES, then allowing ES with an upper limit of 10% silica content could be considered as a harm minimisation approach. This option would require:
    - further investigation into alternative components of low silica ES products,
    - strict regulation and licensing of ES use, manufacture, and import, and
    - a built in 3 yearly review of reform measures and emerging evidence, with a commitment to take remedial actions as needed.
- The shortest possible transition period must be legislated to prevent ongoing exposures and risks.
- Robust disease surveillance will allow monitoring of the longer term impacts of ES.

The PHAA appreciates the opportunity to make this submission and the opportunity to contribute to preventing Australians from succumbing to occupational diseases.

Please do not hesitate to contact me should you require additional information or have any queries in relation to this submission.

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6th April 2023

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