# 'Something is wrong': The forgotten disease that's become a silent killer

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VIEW PROFILE

**Kiwi tradies are sickened with an incurable disease caused by dust from artificial stone that dominates the kitchen bench-top market. Nicholas Jones investigates.**

Shane O'Neill spent 14 years cutting, grinding and fitting kitchen benchtops, before being told the job he loved could be killing him.

Inhaling dust particles created when the artificial stone in thousands of Kiwi homes is dry-cut can cause silicosis, an incurable, preventable and sometimes fatal disease that scars the lungs.

Tradies overseas have died horrible deaths. Others, New Zealanders among them, are disabled by debilitating symptoms including severe shortness of breath.

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Growing awareness of the issue here prompted O'Neill to get tested, including a CT scan of his lungs in January 2021.

That revealed three nodules, possibly formed by inflammation from tiny particles of crystalline silica dust.

A meeting with a specialist followed.

"The way he worded it was, 'Yes, it looks like silicosis is inside of you'.

"'We can't work out how bad it is [but] if it starts to get aggressive, you've got two options - get in for a lung transplant, or start digging yourself a hole'."

O'Neill was 29. He and his partner were expecting their first child.

"We all broke down," he says.

"Life pretty much changed from then on.

“I said to the missus, ‘I’m gonna be getting out of this pretty quick’ - as fast as I could.”

Other tradies remain vulnerable, because of gaps in regulation and safety measures by some businesses working with a product compared to asbestos, but which still dominates the market.

Government documents obtained by the *Weekend Herald* reveal the risk has spread outside the kitchen and bathroom fit-out industry, with an unknown number of carvers using off-cuts of engineered stone.

WorkSafe has warned it doesn’t have the resources to keep monitoring engineered stone fabricators, and an industry leader says the watchdog “is seen as a bit impotent”.

Health experts want urgent change. Dr Alexandra Muthu, a leading occupational physician, says a flawed government response means only a fraction of those at high risk have been tested.

“There is no system to protect workers.”

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Dr Alexandra Muthu, an expert on lung related diseases, explains the links between silicosis and tradies working on engineered stone bench-tops. Video / NZ Herald ...

## A deadly dust

Silica is found in stone, rock, sand, clay and many building materials. When its dust is inhaled, it causes scars in the lungs which makes it difficult to take in oxygen. The dust is also absorbed, causing damage around the body.

Silicosis, lung cancer, chronic obstructive pulmonary disease, kidney disease, autoimmune disorders and cardiovascular damage can be caused by silica dust.

The symptoms of silicosis may include a persistent cough, shortness of breath, fatigue and weight loss. These develop after exposure has already done significant damage.

The health risks from dust created during stonemasonry, tunnelling and concreting have been known for more than a century.

However, more dangerous is dust from engineered stone (sometimes called artificial or reconstituted stone), which is a man-made composite of different materials held together by polymer resin.

This is because it contains up to 95 per cent silica, compared to 2 to 50 per cent in most natural stones.

That concentration has fuelled an alarming rise in silicosis cases where the onset of symptoms is faster, sometimes within a year of exposure. (Silicosis developing within 10 years after first exposure is defined as accelerated silicosis.)

Among the first to make the connection were doctors working for Israel's National Lung Transplantation Programme.

A remarkable number of patients with life-threatening lung problems had worked with engineered stone, they realised, which was then a new product rapidly gaining in popularity, including because it was cheaper than natural alternatives.

"We had almost forgotten about this disease," says Professor Mordechai Kramer, a world-leading expert in lung disease, who directs the Institute of Pulmonary and Allergy Medicine at Beilinson Hospital in Israel.

"But then we had a cumulation of cases - one after the other - and we said, 'Something is wrong'."

Their 2012 research paper sounded the alarm about "an outbreak of end-stage silicosis leading to LTX (lung transplantation), a disease epidemic caused by dust generated through dry cutting engineered decorative stone with very high silica content".

"Strict enforcement of occupational safety and health regulations could have prevented this needless tragedy," the doctors concluded.

The warning did little to slow the global rise of engineered stone, which saturates the market here and overseas.

As well as being budget-friendly, the material is easier than granite or marble to acquire and fit, and more durable. It is safe for householders, provided it's left in place.

As its use expanded, so too did the number of tradies breathing in silica dust - often with little understanding about the time bomb set ticking in their lungs.

Big numbers are at risk: already in Australia, more than 600 people have been diagnosed with silicosis as a result of exposure to dust from engineered stone.

In addition, the same exposure could cause up to 100 lung cancer cases, conservative modelling by Curtin University in Perth estimates.

More than 70 silicosis-related court cases have been filed by Aussie stonemasons, who claim their employers failed to keep them safe.

Some are also targeting manufacturers for what they say were inadequate warnings.

They include Caesarstone, an industry pioneer headquartered in Israel, which Kramer says threatened legal action after his 2012 paper was published, resulting in the publishing journal removing the company's name from the original title.

(Caesarstone says its objection to the paper was because it targeted the company. It has warned about the quartz silica content of its slabs since the 1990s, it says, and added a "prominent" warning about silicosis since 2010 when it says it became aware workers were contracting the disease.)

In Israel, Kramer submits reports to support workers' legal cases, which he says usually settle out of court with minimal compensation. He regularly lobbies for a ban on engineered stone.

"It doesn't help. They continue. There are advertisements for the stone on TV - it looks very nice in your kitchen at home, but the price is too high," he says.

"It is a terrible stone. It is like the asbestos epidemic. Initially, nobody believed that asbestos can cause disease… it came up 30 years later."

Shortly before talking to the *Weekend Herald*, Kramer operated on another stonemason stricken with silicosis.

Stone work is often a family business, and his patients have included a father and his two sons.

“The father died, he was in the hospital and he said, ‘You are not going back home until you shut the factory’. One son is sick but is still okay. The other son got a lung transplantation, which was also not so successful,” Kramer says.

“It is a very, very difficult operation. The stone in the lung makes it very difficult to remove. And you bleed a lot, it is a very long operation, it causes complications.”

The crisis was brought to public attention in Australia in 2018 when the first stonemasons with silicosis went public. The following year a 36-year-old died from the disease.

Authorities there are moving towards banning high silica-engineered stone.

Tony Burke, the federal workplace relations minister, has told reporters that officials first need to determine at what silica concentration a product should be forbidden.

Some engineered stone could have a silica content of 95 per cent, Burke noted, while other products had as little as 40 per cent.

“But wherever that line is drawn, it has to be drawn on the side of people being able to go to work and come home without a terminal illness.”

## Widespread safety failures

A decision is due later this year. The New Zealand Government is considering a similar ban.

Confidential ministerial briefings obtained by *Weekend Herald* under the Official Information Act show reform is badly needed.

The documents, which haven’t been previously released, paint a troubling picture of a local industry that began in 1998 and now imports tens of thousands of engineered stone slabs annually, mostly from Europe, China, India and Brazil.

WorkSafe has identified 130 businesses that then cut, grind and polish them into bench and vanity tops. Most are small, with only three to four workers who fabricate stone.

Inspections have been carried out in three rounds since 2019, to check vital safety measures like mask and PPE wearing, ventilation and cutting stone only when it is wet.

All but a handful of workplaces were checked as of the start of this year, and problems of varying seriousness were found at about 90 per cent.

It took officials years to find all engineered stone businesses - around 20 were visited only in the second half of 2022. Inspectors gave prior warning but still found alarming problems, including unsafe disposal of slurry, and a worker sweeping dry dust.

At particular risk are migrants from China, India, the Philippines, Brazil and the Pacific, who are badly under-represented in the already paltry number of workers getting checked for disease.

Anecdotally, inspectors noted “a higher proportion of Chinese and Indian-run” businesses in South and East Auckland, “where they have tended to bring the work practices and culture of the country they migrated from, rather than those expected in New Zealand,” warned a February 1 briefing to Workplace Relations and Safety Minister Michael Wood.

“Inspectors have noticed cultural differences in the approach to work health and safety and the levels of comfort in raising health and safety concerns by some migrant workers.”

There’s “growing evidence that fabricating engineered stone is causing serious disease in relatively young workers,” Wood was told in a December 2022 briefing, with about one in 10 stonemasons who have lodged a claim to be assessed later diagnosed with a form of silicosis.

WorkSafe says its inspections have raised awareness and reduced the most serious problems like dry-cutting. However, it lacks the resources to keep this going.

“It is not sustainable to continue the intensive inspection regime because of the high resource and opportunity cost of focusing inspector time on these businesses compared to other high-risk businesses,” a memo to Wood from last December warned.

“The current approach of intensive inspections and the voluntary industry accreditation programme is not providing WorkSafe with adequate assurance that risks are being addressed effectively by duty holders.”

Some fabricators had good practices in place, the briefing noted, but at others "significant unmanaged risks to worker health" were uncovered, which "required more than one assessment visit to ensure effective controls were in place".

"Inspectors also found instances in even better performing businesses where risks were not always managed appropriately, and repeat visits showed that the rigour applied to control measures can lapse over time."

Last year WorkSafe became aware that engineered stone is being used "quite widely" by traditional and contemporary carvers, another briefing document reveals. It's now urgently working to determine how many carvers may be at risk of dust exposure.

## 'Holy crap, what did I do?'

Stonemasonry was Shane O'Neill's first job out of school. The 17-year-old learnt fast, and in the following years was sent across much of the country to fit kitchens.

"I absolutely loved it… seeing a big 3.5-metre bench go into a house, knowing, 'I measured that, it's perfectly made' - it's quite cool."

When he started out, bench-tops were mostly granite and marble, but engineered stone rapidly took over.

"It just got bigger and bigger and bigger, to the point where the old boss had a factory full of his own stone that we could just pick up a sheet, take off and start cutting."

O'Neill knew nothing about the deadly risk the new product posed. However, all cutting in the workshop was done wet - a vital step to stop dust - and there was good ventilation.

Cutting the stone when it was dry did occasionally happen, however, when he was fitting a benchtop at a house.

"You could be 300km away from work - you're not gonna drive back and cut a little bit of bench out and then drive back."

O'Neill believes his health problems can be traced to his time at a subsequent employer. There, he'd dry cut in an old barn with little ventilation.

By the end of a shift his face and hair would be caked in grey dust, save for a pink circle of skin that had been covered by a cheap disposable mask.

“You would have 2-3mls worth of dust on the walls, the tools, the benches.

“I look back and I’m like, ‘Holy crap, what did I do?’ If I knew what I do now… it was just that ‘she’ll be right’ attitude. Rush it out, get it done.”

(The particles of respirable crystalline silica that enter the lungs are so tiny as to be invisible. They are present along with visible dust, but can also be in the air when no dust is apparent to the naked eye.)

The last company he worked for was safer, with wet-cutting in a workshop that had an advanced ventilation system. Fitted, state-of-the-art electronic masks were mandatory.

Still, there was occasional dry polishing and cutting for more fiddly jobs.

He and others would sometimes opt to go mask-less when room and visibility were limited.

“If you think of the area underneath a sink in a bench - you’ve got to sit in there, and try to polish, with a grinder right in front of your face.”

He didn’t hear about silicosis until 2019.

Thankfully, recent tests show the nodules in his lungs haven’t grown. He’s been told he no longer needs annual scans.

O’Neill has a new dream job building motor homes, and this month watched his daughter blow out two candles on her birthday cake.

He feels lucky, but can still taste the grit of dust, and worries about its legacy - especially when unable to shake frequent, weeks-long colds, and coughs that wheeze and rattle in his chest.

“You think, ‘Maybe it’s getting worse, maybe they’ve missed something?’” he says.

“It plays on your mind.”

## A shift from suppliers

Major suppliers of engineered stone have formed the NZ Engineered Stone Advisory Group, and run a voluntary accreditation programme for fabricators, with the help of a $300,000 ACC grant.

Minimum safety guidelines include wet-cutting of stone with appropriate PPE and dust-extraction systems.

The group won a WorkSafe award in 2021 for “best initiative to address a work-related health risk”, but only 13 companies are audited and actively accredited - about 10 per cent of the known industry.

Another 13 are awaiting audit or audit results, and 11 fabricators have had their accreditation lapse.

“Obviously it is disappointing,” says Lou Cadman, chief executive of NZ Panels Group, a founding member of the advisory group, and one of the country’s biggest importers of engineered stone.

“If you spend the money to look after people and then see the bloke down the road not bothering, there’s a bit of, ‘I’ve done all this, I’ve got myself in a higher cost structure, why aren’t these people forced to comply?’”

NZ Panels Group, headquartered in Auckland’s East Tāmaki, has now warned customers it won’t sell to anyone not accredited by year-end.

When the company’s sales team visits workshops they check safety measures, Cadman says, and some are so lacking that “we just won’t entertain supplying them at all”.

Moving to ensure all their clients are accredited means, “we don’t have to be the policeman”.

Their big customers are already accredited, he says, and for others, signing up shouldn’t be difficult as their safety standards are in place.

As an official watchdog over the industry WorkSafe “is seen as a bit impotent”, Cadman says.

“We know that it is resourcing… they’re probably more reactive to accidents and those sorts of things.”

Engineered stone isn't made in Aotearoa. NZ Panels imports from China, and is now placing all orders for a new type of low-silica engineered stone, which uses recycled glass instead of quartz.

Most of these products have silica content under 30 per cent, with a handful up to 40 per cent. That's comparable to natural stone products like granite, Cadman says.

Their aim is to sell only low-silica stone by February next year.

The new range costs about $100 per slab imported - "not material in terms of the grand scale of a kitchen", and looks and performs as well as high-silica products.

The technology to manufacture low-silica stone has advanced only in the last few years, Cadman says, and there hasn't previously been a demand for stone with lower silica levels.

He acknowledged the shift had nonetheless come too late.

"Yes, probably it is [too late] when you think about it from people's lives being affected.

"I liken it to many other industrial sort of processes [that] require the correct PPE and machinery, to process things safely… with the right PPE, I think this probably could have been avoided from the outset."

Other suppliers are moving to lower-silica products. Laminex NZ, a division of Fletcher Building which has distributed Caesarstone here since 2000, expects products with more than 40 per cent silica to be banned in Australia and says it understands the New Zealand Government is considering similar changes.

"We support this… our supplier, Caesarstone, has undertaken to update our entire engineered stone range to low silica content over the next 12 months.

"It's important to note the requirements and controls to cut, process and fabricate engineered stone will remain the same high standard, regardless of silica content."

***Read a full statement by Laminex NZ by clicking here***

Caesarstone's website promotes its commitment to "symbiotic sustainability", "which is the art of living together, where our Earth is shared by all, nature and people, as one greater ecosystem".

Shoppers are reassured that “our products and practices drive human responsibility towards the environment and society by creating a connection with nature from the heart of the home”.

The multinational has disclosed that, as of December 31 2022, it is subject to pending lawsuits “with respect to 163 injured persons globally”, including 56 in Australia.

In addition, “23 of our employees, out of which 12 were employed in our plants in Israel as of [December 31 2022], were banned by occupational physicians from working in a workplace with dust due to a diagnosis or suspected diagnosis of silicosis or other lung diseases”.

There were four outstanding lawsuits filed against the company by former employees.

Caesarstone declined to comment on current proceedings but says its efforts to improve industry safety “are ongoing and have increased over the years”, including product warnings and an online safety course.

“It is a tragedy that stonemasons, many of them young, have contracted silicosis in the stone industry. No one should get sick or die by simply doing their job,” the company says.

“Engineered stone is entirely safe to consumers in its installed form and silica only presents a risk to workers if stone is handled incorrectly. Efforts to improve safety standards have been hampered historically by non-compliance with product handling requirements, a lack of regulatory enforcement and the absence of national standards.

“While Caesarstone provided extensive and repeated instructions and warnings, it was not within its powers or authority to supervise, audit or control fabrication processes. This is the work of safety regulators.”

***Read a full statement by Caesarstone by clicking here***

Caesarstone rejects the comparison of engineered stone to asbestos. Silicosis is an occupational disease and the result of prolonged exposure to dust created in an unsafe environment, it says.

“There are no safe asbestos products and no safe levels of exposure. Engineered stone is absolutely safe in situ and can be handled safely using proper techniques and

equipment.”

## People ‘have gone to ground’

In 2018 Dr Alexandra Muthu was at an international meeting when a colleague from Queensland asked if New Zealand was discovering the same wave of silicosis among stonemasons.

She alerted government ministers, and a “dust diseases taskforce” was formed, bringing together clinicians and WorkSafe, ACC and the Ministry of Health.

The group - co-chaired by Muthu - considered how to identify and test the workforce and prevent ongoing dangerous exposure.

They had the advantage of looking to Australia, where, Muthu says, only some states had early success finding and supporting exposed workers - those that funded occupational health experts to visit workplaces, talk to, enrol and assess workers, book off-site tests and assessments, and follow workers over time.

“The best outcomes occur by going to the workers to provide an easy and seamless way to get into the programme,” Muthu says of the response she and other taskforce clinicians strongly advocated for.

“But that key recommendation was not followed. Against all the experts’ advice.”

Instead, the model relies on WorkSafe educating employers, and asking anyone concerned about dust exposure to get their GP to lodge an application with ACC for possible assessment.

There are too many barriers to that happening, Muthu says, including businesses with other priorities, workforce turnover, workers without a GP, pressure on primary care, and a reluctance by some stonemasons to get tested.

She’s assessed members of family businesses who have advanced disease, including some with young children. At least one needs oxygen to survive.

“You can imagine the sense of guilt that they feel, that they have exposed their children and their extended family - but at the time they didn’t know the risks from silica dust.

“There are other people who we have diagnosed with extensive disease who have gone to ground and won’t come and see a respiratory physician. We believe this is partly denial and partly because this is the only profession they know, they want to keep working and they don’t want anyone to tell them they can’t.”

Only 124 people lodged claims for assessment of accelerated silicosis, as of January last year.

Sixteen of these claims were accepted by ACC, including for probable and confirmed silicosis, and non-silicosis related diagnoses.

The median age of those diagnosed is 47, with most aged between 30 and 49.

There have been no attributable deaths.

Reasons for declined claims include insufficient information. ACC says it reviewed the pathway last year “and we found no major issues”. However, Muthu and other clinicians want more transparency, to check people aren’t unfairly excluded.

She believes there are around 1000 current and former stonemasons at risk. If accurate, that would mean only one in nine have lodged an ACC claim, let alone been tested.

“It’s pretty clear to us that the majority of people with moderate to high silica exposure from engineered stone will develop disease over time. If you look at Australia, in Victoria, one in four engineered stone workers who have been assessed have silicosis, and one in five in Queensland,” she says.

“We don’t have any reason to believe that our work behaviours and safety features were any different in Aotearoa. They have done much more complete assessments.”

There should be an official registry of people with workplace silica dust exposure, as there was with asbestos, Muthu says, and strict licensing of engineered stone importers and fabricators.

“Rather than banning all engineered stone, a reasonable option could be to acknowledge that some companies have spent many thousands of dollars on CNC machines which completely enclose the fabrication process in robotic equipment, with careful removal of silica dust, minimising exposure to the workers.

“We should consider letting them continue to import as long as they are confirmed to be following the safety processes.”

This would drive many from the market and increase prices, she acknowledges. However, ethical shopping choices are an increasing focus of consumers, she says, and this should be the case in construction.

WorkSafe treated all questions by the *Weekend Herald* as a new Official Information Act, which allows 20 working days for a response. Questions unanswered included the progress of a pilot study, in which an occupational health nurse was funded to visit South Auckland fabricators.

Workplace Relations and Safety Minister Michael Wood also declined to be interviewed.

He is waiting on advice, including on a potential ban or tighter controls. WorkSafe “responded quickly to this emerging issue”, he said in a statement.

“Under law, it is the responsibility of engineered stone businesses to do the right thing. As regulator Worksafe’s role is to educate, support, and where necessary to enforce. Even a very active regulator cannot be in every site to monitor all risks, so it is essential to get the industry to take leadership if they want to continue.”

WorkSafe has dedicated “significant resource” to the sector, Wood says, with “limited change”.

“The efforts taken by some engineered stone businesses have been encouraging, but it is a sector that is on notice that a stronger enforcement approach is now underway, with consideration of further regulatory attention under way.”

Muthu says a ban on high-silica engineered stone should be considered, but cautioned that the risk from new lower-silica alternatives is not yet properly understood. Keeping workers safe from dust remains critical, she says, as there’s also silica exposure from other tasks like tunnelling.

People within WorkSafe, ACC and Te Whatu Ora - Health NZ care about these issues and do good work, Muthu says, but there’s no agency to protect and provide a health response for workers.

She wants this to change through the establishment of a national occupational health service.

Currently, occupational health is largely an employer's responsibility. They contract private companies to provide it, which Muthu says works for known issues like health surveillance for noise exposure or graduated return to work.

"It doesn't work when you have an emerging, significant disease like silicosis from engineered stone.

"This link was first recognised in Israel more than 10 years ago, and because we don't have a national service with responsibility for horizon scanning, nobody picked it up at that time. And then when we became aware, the systems were not in place."

That meant a late realisation for stonemasons like O'Neill. He acknowledges his own fault for not always wearing a mask and doesn't blame his old bosses for safety failures.

They were also in the dark about silicosis, he says, and often picked up dusty tools themselves.

Anger rises, however, when the 32-year-old sees overseas media reports about stonemasons his age dying horrible, slow deaths.

Manufacturers and regulators should have sounded the alarm louder and earlier, he believes.

"It could have been avoided."