Submission No 6

INQUIRY INTO 2024 REVIEW OF THE DUST DISEASES SCHEME

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Executive Summary

The majority of all tunnelling in Australia occurs in NSW. With the exception of Snowy Hydro 2.0, all tunnelling projects in NSW are funded to some extent by the NSW state government.

The most prevalent work-related disease reported in tunnel workers globally is silicosis. The main factor that determines the risk of contracting silicosis is cumulative exposure to respirable crystalline silica (RCS).

Legal obligations exist that require tunnelling contractors to collect samples of RCS in air from the breathing zone of workers while they perform their work activities. Occupational hygienists are engaged by tunnelling contractors to collect these samples. While information on the level of RCS exposure of tunnel workers exists in the form of RCS in air monitoring reports or spreadsheets, it is challenging to access. Over the past year, I have been applying for and seeking access to data on RCS in air from tunnel projects for the purposes of research. I have done this through freedom of information requests and through direct requests to stakeholders who hold this information. I have received RCS in air data from NSW tunnel projects. Those projects primarily use tunnel boring machines (TBMs) to construct their tunnels.

The information provided demonstrates that tunnel workers were exposed to RCS at very high concentrations, including having exposures greater than 1 mg/m^3. RCS exposures measured during the construction of tunnels were higher than has been reported from measurements collected from engineered stone workers. These tunnel workers were not protected by adequate respiratory protection (i.e. "*masks*") and therefore breathed in a large amount of RCS.

From reviewing the data received, the highest exposures occurred when "*mined tunnelling*" was used. This is a specific tunnelling method which uses equipment such as roadheaders and surface miners (rather than TBMs). The number of workers involved in mined tunnelling on TBM tunnel projects is small in comparison to the large workforce sizes that worked or are working on Sydney's road tunnels where mined tunnelling is the primary method of construction.

Requests over the past year to obtain data on RCS in air on projects which used mined tunnelling as their primary tunnelling method have not yet been successful. In most cases, the NSW government agency that holds this information has decided that it is not in the public interest to release the information.

There are no current reliable data on the number of tunnel workers in NSW with silica-related disease. The risk of disease development relates directly to the concentration of RCS that is breathed in and the length of time that workers are exposed. In order to understand the **future** burden of disease of silicosis and lung cancer as a result of building Sydney's tunnels, it would require the release of RCS in air data collected during the construction of those tunnels.

My research has involved estimating the number of cases of silicosis and lung cancer expected to occur in tunnelling workforces based on RCS in air data. Using three Queensland tunnel projects as an example, modelling estimated that 1 in every 10 workers were predicted to develop silicosis over their lifetime as a result of their exposure to RCS. While data from Queensland is used as an example, I emphasise to the Committee that the NSW tunnelling industry is more than double the size, and some of the RCS exposures reported in NSW are not significantly different.

In order to have an informed view of the **current** prevalence of silica-related disease, I recommend that the Committee consider active case-finding and introducing a requirement for NSW State-government funded projects to use the services of icare NSW for health monitoring/screening for crystalline silica.

Disclosures

In addition to undertaking my PhD, I am an occupational hygienist who has worked in industry for decades on the prevention of dust diseases. This has included working on tunnel projects for various tunnel contractors in addition to Sydney Metro and other government agencies commissioning and overseeing the construction of tunnel projects (tunnelling clients). I have also worked as an expert witness in relation to claims related to dust diseases in tunnel workers and engineered stone workers.

I am a past president of the Australian Institute of Occupational Hygienists (AIOH), the Chair of the AIOH External Affairs Committee, a past co-chair for the National Silicosis Prevention Strategy Expert Steering Committee, the past chair of the Australian Tunnelling Society (ATS) Air Quality Working Group, and I am a member of the NSW Dust Diseases Board. I have also previously given evidence at the 2021 review of the Dust Diseases scheme on behalf of the AIOH and I contributed to the AIOH submission for this 2024 review.

This submission relates solely to my work as a PhD candidate and in no other capacity.

Scope of research

My research involves the following areas:

- Describing work-related disease in tunnel workers
- Describing the level of RCS exposure to tunnel workers in Australia
- Identifying the barriers and enablers that support the implementation of good dust control, regulatory intervention, air monitoring, and health screening in the tunnelling sector
- Estimating the prevalence and burden of silica-related disease in tunnel workers

Methods of tunnel construction

The magnitude of silica dust exposure differs relative to the tunnel construction method selected. The main methods used in Australia are:

1. **Tunnel Boring Machine** (TBM) tunnelling, where one or more TBMs are used along with pre-cast concrete segments to line a tunnel wall.

   e.g.: https://www.youtube.com/watch?v=wPbVuuLz5DQ

2. **Mined tunnelling**, where road headers, rockbreakers and surface miners are used in conjunction with bolt, mesh, and shotcrete, and also commonly used to construct declines, station boxes, and cross passages which are common to most tunnel projects.

   e.g.: https://www.youtube.com/watch?v=uUzIyVxK_68

3. **Cut and cover,** where a shaft or decline is excavated to the required depth, and then an overhead roof support system is installed, which may be backfilled over, such us the case on most tunnelling projects.

   e.g.: https://www.youtube.com/watch?v=xQGToQ95clE

4. **Drill and blast**, where the controlled use of explosives is used to break rock for excavation.

   e.g.: https://www.facebook.com/watch/?v=2431081800409651

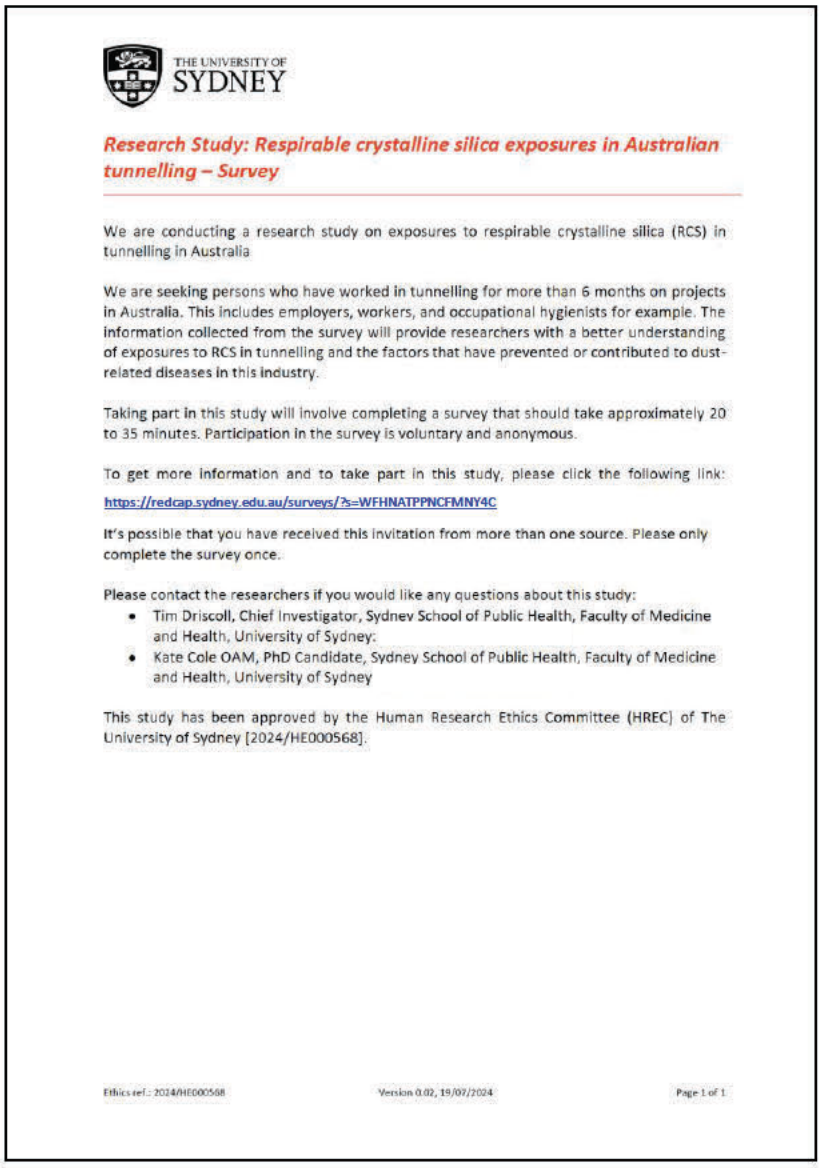
Of all the tunnelling methods, TBM tunnelling is likely to result in lower overall exposures to RCS. In contrast, mined tunnels (including cut & cover) constitute the highest risk.

Hearing from those who work in the tunnelling industry

I am currently undertaking a research study on persons' experiences in the tunnelling sector. The research aims to better understand the risk of RCS exposure in Australian tunnelling and the barriers and enablers to prevent or control exposure from the perspective of those with experience in the industry. These perspectives are being captured through surveys and interviews.

This research is anticipated to provide valuable insights to inform future policies related to protecting the health of those who work in the tunnelling industry. At present the research is in progress.

Information on the survey is provided below.



THE UNIVERSITY OF SYDNEY

Research Study: Respirable crystalline silica exposures in Australian tunnelling – Survey

We are conducting a research study on exposures to respirable crystalline silica (RCS) in tunnelling in Australia

We are seeking persons who have worked in tunnelling for more than 6 months on projects in Australia. This includes employers, workers, and occupational hygienists for example. The information collected from the survey will provide researchers with a better understanding of exposures to RCS in tunnelling and the factors that have prevented or contributed to dust-related diseases in this industry.

Taking part in this study will involve completing a survey that should take approximately 20 to 35 minutes. Participation in the survey is voluntary and anonymous.

To get more information and to take part in this study, please click the following link:

https://redcap.sydney.edu.au/surveys/?s=WFHNATPPNCFMNY4C

It's possible that you have received this invitation from more than one source. Please only complete the survey once.

Please contact the researchers if you would like any questions about this study:

- Tim Driscoll, Chief Investigator, Sydney School of Public Health, Faculty of Medicine and Health, University of Sydney.
- Kate Cole OAM, PhD Candidate, Sydney School of Public Health, Faculty of Medicine and Health, University of Sydney

This study has been approved by the Human Research Ethics Committee (HREC) of The University of Sydney [2024/HE000568].

Ethics ref.: 2024/HE000568 Version 0.02, 19/07/2024 Page 1 of 1