

# Health and Safety Risk Assessments with 4D BIM

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INTERNATIONAL CONVENTION CENTRE

**SYDNEY**

10-12 March 2022

## CONTENTS

- Statistics & Culture
- Identifying Hazards
- The Risk Assessment
- Controlling the Risk
- Workshop vigilance test
  - Using the green laser pointer on selected still-frames from the video  
! the 5mW lasers are to be pointed at the screen not at people !

DBEI Insight

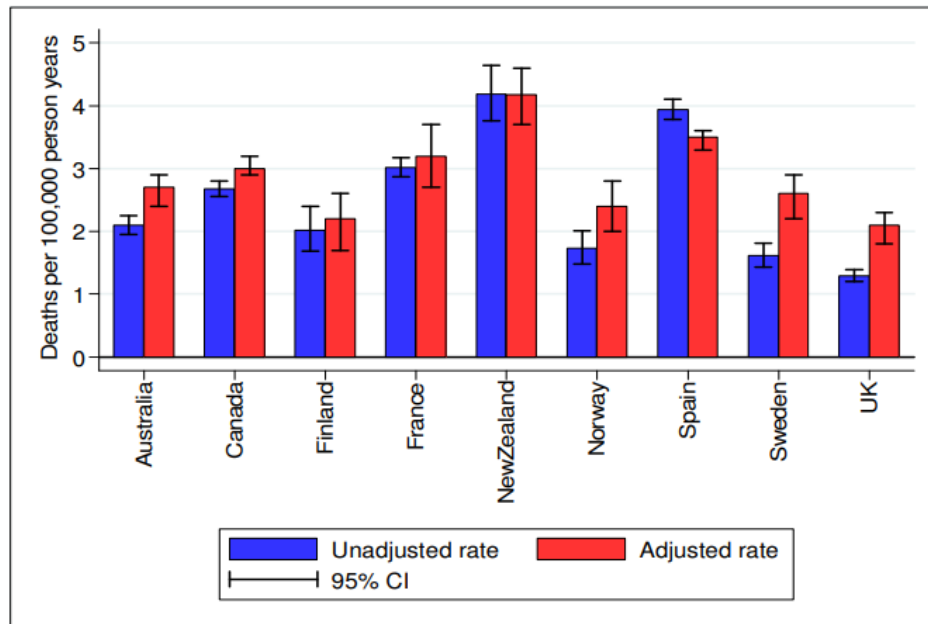
### Industries with highest numbers of fatalities

From Jun 2020 to May 2021

Total	Rate**	Industry
13	11.37	<b>Agriculture</b> →
8	3.21	<b>Construction</b> →
6	5.47	<b>Transport, Postal and Warehou...</b> →
4	64.23	<b>Forestry and Logging</b> →
4	1.63	<b>Health Care and Social Assista...</b> →

Industry of workplace	Worker deaths year-to-date, 2 September 2020	Preliminary worker deaths year-to-date, 2 September 2021
Transport, postal & warehousing	38	32
Construction	21	11
Agriculture, forestry & fishing	25	9
Manufacturing	10	8
Arts & recreation services	3	5
Public administration & safety	13	4
Electricity, gas, water & waste services	0	3
Mining	5	2
Other services	2	2
Accommodation & food	1	1

# Fatal Occupational Injury Stats



New Zealand had the highest **average annual rate (4.2/100 000)**

- New Zealand ranked last for overall occupational safety performance with an average rate of 4.2 occupational fatal injuries per 100,000 person years. The best rates (below 2.0 occupational fatal injuries per 100,000 person years) were reported in Finland, Sweden, Norway and the UK.

Injury Prevention Research Unit  
Department of Preventive and Social Medicine  
Dunedin School of Medicine  
University of Otago

International comparison of International  
Labour Organisation published occupational  
fatal injury rates:

How does New Zealand compare  
internationally?

Commissioned report for the Independent Taskforce  
on Workplace Health and Safety

Dr Rebecca Lilley, Dr Ari Samaranayaka, Professor Hank Weiss



# Shocking work death toll revealed in report

Rob Stock • 05:00, Sep 16 2012



The number of people harmed at work each year in New Zealand would fill Eden Park four times, a national discussion has revealed.

It is four times as dangerous as driving a car, and counting people injured was

## Otago Daily Times

Dunedin 13 | 6 Friday, 24 June 2022 Send us news & photos Search

### NZ workplace death rate 'appalling'

By John Gibb

News > Dunedin



University of Otago researcher Dr Rebecca Lilley is optimistic about cutting the country's high workplace death toll. Photo by Gregor Richardson.

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#### EDITORS' PICKS

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- Trust adjusts to suit market's uncertainty



nzherald.com

THE FRONT PAGE: Stacey Morrison pushes back at suggestion Matariki public holiday is bad for business

voyager WEBSITE OF THE YEAR APP OF THE YEAR

#### BUSINESS

### 'Woeful' record sparks safety law reform

24 Mar, 2016 04:32 PM

7 minutes to read

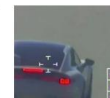


Pike River was one of the catalysts for the reformed health and safety law. Photo / NZPA.

NZ Herald  
By Mark Fryer



#### Most Popular



Spanish police chopper busts Porsche 911 at huge speed  
24 Jun 05:09 PM

Failings prompted change to the legal landscape, writes Francis Cook.

Every year, more than 50 New Zealanders die on the job.

A further 600 to 900 die from work-related diseases. New Zealand's health and safety record

REALLY?

Re: Reports on fatal injury rates (international comparison)

Rebecca Lilley <rebecca.lilley@otago.ac.nz>  
To: Joshua Lumley  
Thu 23/06/2022 8:25 am

Kia ora Joshua,  
Thank you for your email. You are correct there is no update of our work comparing occupational fatalities across OECD nations. It is a difficult area to get support for the work that is needed to make robust comparisons across countries.

Nga mihi  
Rebecca Lilley (MPH PhD)

Senior Research Fellow  
University of Otago

Ngā mihi  
Rebecca

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## Comparison of work related fatal injuries in the United States, Australia, and New Zealand: Method and overall findings

April 2001 · [Injury Prevention](#) 7(1):22-8  
Source: [PubMed](#)

Authors:

 **A M Feyer**  
This person is not on ResearchGate, or hasn't claimed this research yet.

 **Ann Williamson**  
UNSW Sydney

 **N Stout**

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Citations (88) References (24) Figures (5)

### Abstract and Figures

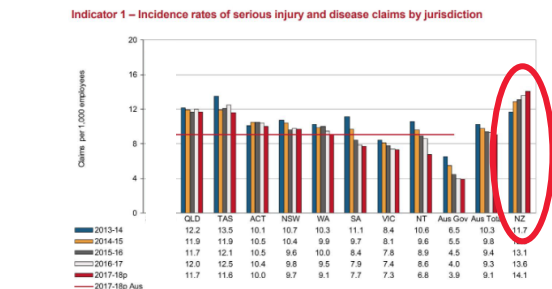
To compare the extent, distribution, and nature of fatal occupational injury in New Zealand, Australia, and the United States. Workplaces in New Zealand, Australia, and the United States. Data collections based on vital records were used to compare overall rates and distribution of fatal injuries covering the period 1989-92 in Australia and the United States, and 1985-94 in New Zealand. Household labour force data (Australia and the United States) and census data (New Zealand) provided denominator data for calculation of rates. Case definition, case inclusion criteria, and classification of occupation and industry were harmonised across the three datasets. New Zealand had the highest average annual rate (4.9/100,000), Australia an intermediate rate (3.8/100,000), and the United States the lowest

## An Insight Into Our Neighbouring Nation

As an Australian-owned company, we share a strong bond with our partners in New Zealand. With so many cultural and geographical similarities between us, you wouldn't be mistaken for assuming that our statistics and trajectories around safety were similar too. However, when you take a look into the safety data in New Zealand, the results paint a very different picture.

Despite our similarities, the safety trends in Australia have been indicating a positive downward trend towards reduced major safety incidents. But unfortunately, in New Zealand, the data indicates that safety performance is actually getting worse.

Especially when looking at serious injury and disease claims, New Zealand has been on a steady upward trajectory towards larger numbers of claims while in Australia, we've been seeing the opposite result.



Source: Safe Work Australia. (2020). *Comparative Performance Monitoring Report: Part 1 – Work Health & Safety Performance.*

Article

PDF Available

## Lessons from Pike River: Regulation, Safety and Neoliberalism

January 2015 · *SSRN Electronic Journal* 26(4):736-758

DOI: [10.2139/ssrn.2685444](https://doi.org/10.2139/ssrn.2685444)

Authors:



**Neil Gunningham**

Australian National University



Download citation



Copy link

Citations (4)

References (53)

### Abstract

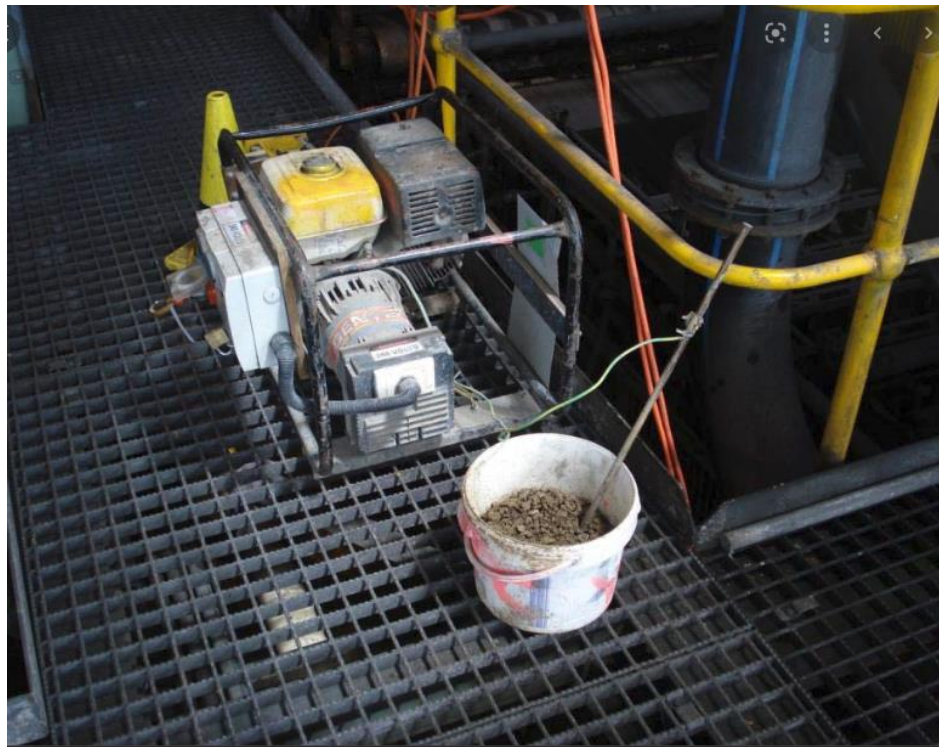
This article draws on the findings of the Pike River Royal Commission and other investigations, on the wider international literature on Work Health and Safety (WHS) regulation and on the writer's own interviews with mining industry stakeholders, to develop a composite picture of what went wrong at Pike River and how best to prevent such disasters in the future. It argues that there are four pillars of effective WHS management and regulation: appropriately designed regulation; effective implementation and enforcement; a competent

# NEOLIBERALISM?





**DON'T WORRY  
SHE`LL BE RIGHT MATE**



# Culturally And Linguistically Diverse=CALD

## Lessons about national culture and its impact on workplace health and safety in New Zealand

Mai Chen shares insights into how a superdiversity framework can be applied to policy, legislation, and regulation



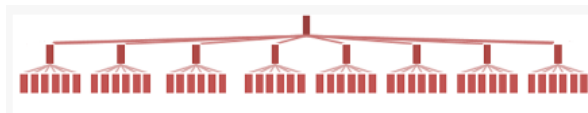
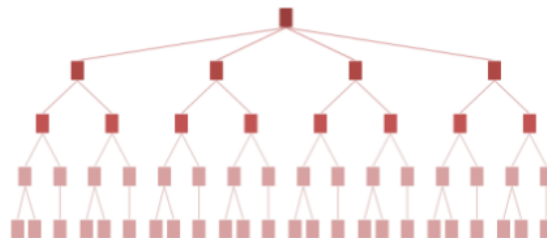
National Culture and its Impact on Workplace Health and Safety and Injury Prevention for Employers and Workers

AQ has recognised that current and increasing superdiversity will affect how

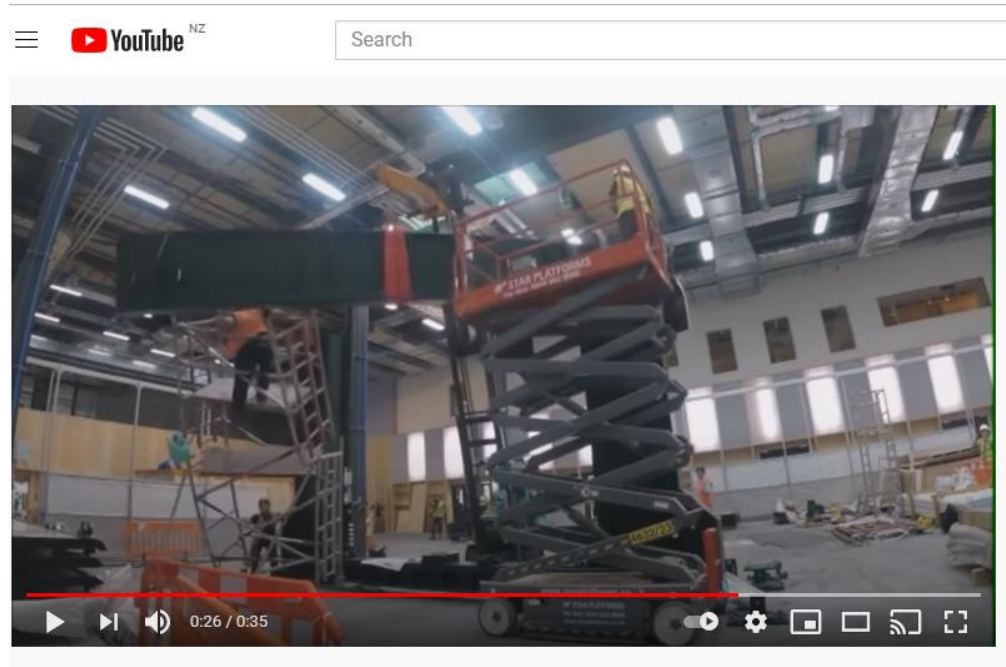


Health and Safety at Work Act 2015  
Public Act 2015 No 70

?? “so far as is reasonably practicable” ??



<https://www.youtube.com/watch?v=Hu-85KcevRI>





## RISK ASSESSMENT MATRIX

### CONSIDER THE LIKELIHOOD OF A HAZARDOUS EVENT OCCURRING

### CONSIDER THE SEVERITY OF INJURY/ILLNESS

	Very unlikely to happen	Unlikely to happen	Possibly could happen	Likely to happen	Very likely to happen
Catastrophic (e.g. fatal)	Moderate	Moderate	High	Critical	Critical
Major (e.g. permanent disability)	Low	Moderate	Moderate	High	Critical
Moderate (e.g. hospitalisation/short-term or long-term disability)	Low	Moderate	Moderate	Moderate	High
Minor (e.g. first aid)	Very low	Low	Moderate	Moderate	Moderate
Superficial (e.g. no treatment required)	Very low	Very low	Low	Low	Moderate

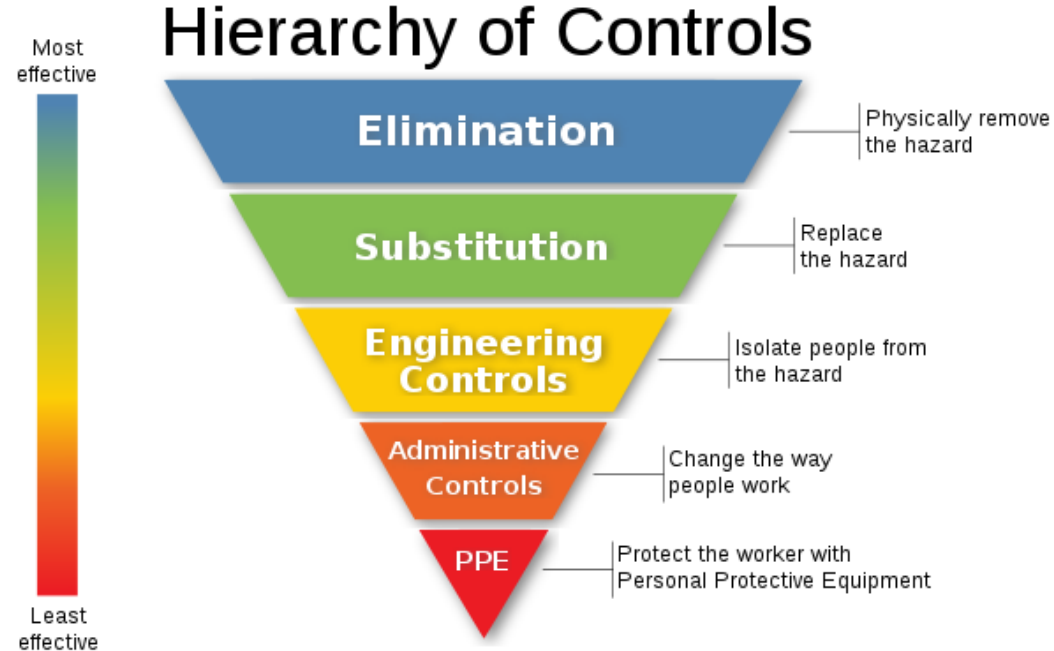
<https://www.youtube.com/watch?v=6txuP7am6kQ>

**Workplace accident:  
an example of NO  
consideration.**



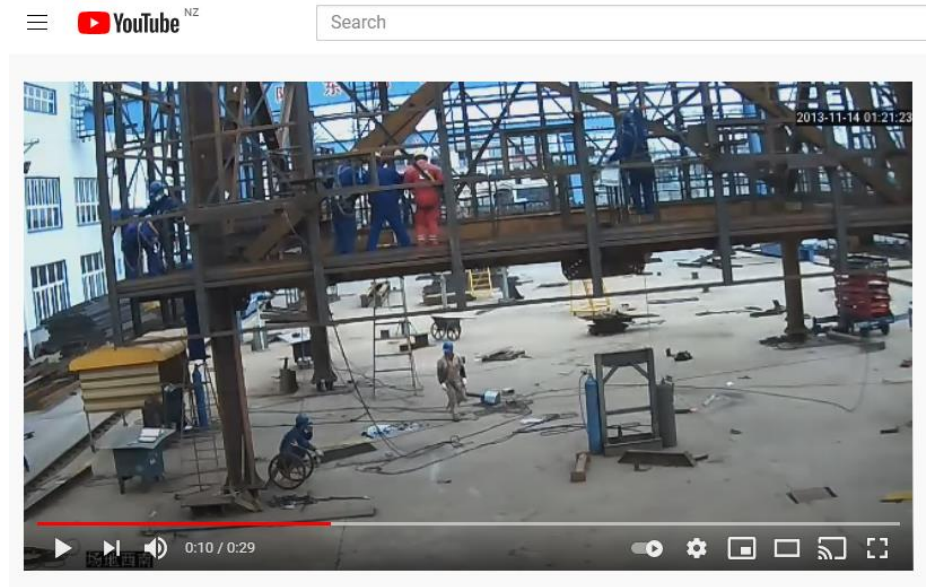
# CONTROLLING THE RISK

HIERARCHY OF CONTROLS		
<div> MOST EFFECTIVE </div> <div> ↓ </div> <div> LEAST EFFECTIVE </div>	<b>ELIMINATE:</b>	
	<b>Eliminate the hazard</b> remove it completely from your workplace	If this isn't reasonably practicable, then...
	<b>MINIMISE:</b>	
	<b>Substitute the hazard</b> (wholly or partly) with a safer alternative	Minimise the risk, so far as reasonably practicable, by taking one or more of these actions that is the most appropriate
	<b>Isolate the hazard</b> using physical barriers, time or distance	
	<b>Use engineering controls</b> adapt tools or equipment to reduce the risk	
	<b>Use administrative controls</b> develop methods of work, processes and procedures	If a risk then remains, you must minimise the remaining risk, so far as reasonably practicable
	<b>Use personal protective equipment (PPE)</b> this is the last option after you have considered all the other options for your workplace	If a risk then remains, you must minimise the remaining risk by using PPE



8 people in frame can you spot who is about to be injured.

Stop at 0:13



<https://www.youtube.com/watch?v=bCM0s2uqTz0>

A pipe has come loose from load.



= 1 click

