Occupational noise law in New Zealand – Where will it go?

Associate Professor Wyatt Page

School of Public Health, Massey University, Wellington, New Zealand

Email: w.h.page@massey.ac.nz

Abstract

With the introduction of the Health and Safety at Work Act 2015, many of the existing health and safety regulations are being replaced. The first suite of new regulations supporting the Act was released by the Government on 15th February 2016 but this did not include occupational noise regulations. This discussion paper considers the direction that occupational noise law in New Zealand may take over the next few years. This paper identifies some of the issues in the translation of the Australian model regulations into the New Zealand context and identifies other gaps that the author thinks needs addressing. It also considers the approach taken with the new 'Asbestos' regulations and whether or not a similar detailed approach should be taken in addressing occupational noise issues.

Original peer-reviewed article

1. Introduction

Imagine if, in every workplace, in every home, on every street and in every country there was an invisible harm which caused irritation and annoyance at low levels, lost productivity and diminished health at medium levels, and permanent disability at high levels.

Then, you would expect this imaginary harm to be monitored, easily assessed and comprehensively covered by ACC (Accident Compensation Corporation) as well as specified in law.

The harm is real. The harm is Noise Induced Hearing Loss (NIHL).

Yet, for most SMEs[1] in New Zealand, NIHL is not generally monitored. Worksafe NZ barely mentions NIHL it in its 12,500 annual workplace assessments. And the burden of proof is so high that very few people who need support for NIHL actually make a claim.

And when major law reform took place in Health and Safety, leading to the new *Health and Safety at Work Act 2015* which has the stated purpose that workers "*should be given the highest level of protection against harm*", someone forgot to include this particular harm - even though it has been listed in the previous Act for 23 years.

This is a harm that at high noise levels over a period of time causes permanent disability, so by the time you retire to enjoy the good life, you have a severe social handicap, can't hear your grandchildren on Skype and struggle to have a conversation in your favourite café.

So what can be done about it?

2. 2. New regulations due

Regulation 11 of the Health and Safety in Employment Regulations 1995 [1] sets out the current law regarding occupational noise and is due for replacement. Such replacement would likely be drawn from the Australian '*Model Work Health and Safety Regulations 2011*'[2] which have already been referenced in the new Act's regulations.

An example of these regulations is the '*Health and Safety at Work (General Risk and Workplace Management) Regulations 2016*'. This regulation sets out duties and responsibilities for managing general risk in a workplace. A PCBU (a person conducting a business or undertaking) who fails in their duties and responsibilities may be convicted of an offence, leading to a possible fine up to $6,000-10,000 for an individual and $30,000-$50,000 for any other person.

In 2016, these fines are significant - but what about in ten or even twenty years' time? Will they lose their impact, particularly if the regulations remained unamended for a long time? The issue of fines remaining current and relevant has been addressed in Australian regulations where fines are stated in terms of the number of penalty units (PUs)[3]. The value of a PU varies between Australian States and Territories and it is adjusted annually based on the Consumer Price Index. Thus, the value of a fine will maintain its significance. However, although New Zealand has followed the Australian model regulations (which serve as a template for the state and territory versions), New Zealand did not adopt the use of PUs for fines. The reason for this is not clear as over the past few years there have been two Bills (the '*Therapeutic Products and Medicines Bill*' and the '*Patents (Trans-Tasman Patent Attorneys and Other Matters) Amendment Bill*') put forward for consideration and they both include the use of PUs. Also, the New Zealand 'Legislation Design and Advisory

1 Small and Medium-sized Enterprises

2 Model regulations in Australia are the basis for the legally binding regulations enacted or passed by Parliament in each jurisdiction of Australia. This means that each State/Territory in Australia has a slightly different version of the regulations but largely they are the same as the model regulations.

3 Is an amount of money used to compute pecuniary penalties for many breaches of statute law. Fines are calculated by multiplying the value of one penalty unit by the number of penalty units prescribed for the offence.

Committee' whose '*mandate is to promote quality legislation in its guidelines*' states that "*New Zealand has not adopted the inflation-adjusted "penalty unit" system found in many other jurisdictions. Therefore, when comparing offences in different statutes, the penalties may be unduly low simply because of the age of the statute, and not provide an accurate guide*".

In the '*Health and Safety at Work (General Risk and Workplace Management) Regulations 2016*' (HSW-GRWM Regulations 2016), Part 2 'Management of particular risks' identifies a number of specific risks, including: 'Remote or isolated work', 'Raised and falling objects', 'Substances hazardous to health' etc. But occupational noise is not listed in the set of general risks to be managed. Given noise is an issue in many workplaces, it ought to have been included in these general regulations.

Chapter 4 of the Australian model regulations, 'Hazardous work', begins by defining the "*exposure standard for noise*" in Part 4.1, with reference to the joint Australian New Zealand Standard, AS/NZS1269.1:2005 *Occupational noise management–Measurement and assessment of noise immission and exposure* [2]. The next section covers '*Managing risk of hearing loss from noise*' where it is mandatory for a PCBU to manage the risks to health and safety relating to hearing loss associated with noise. However, the appropriate part of the AS/NZS1269 *Occupational noise management, 'Part 2: Noise control management*', is not referenced. The next section covers 'Audiometric testing', but again does not reference the appropriate part of the AS/NZS1269 *Occupational noise management, 'Part 4: Auditory assessment*'. A potential reason for this is these regulations state that audiometric testing must be done "*at least every 2 years*" whereas in the current version (updated in 2014, almost three years after the model regulations were first released) of this standard does not provide clear guidance on the frequency of testing. However, the forward of this standard acknowledges this by saying "*Most jurisdictions have... laws with general requirements for health monitoring workers exposed to hazards and specific regulatory requirements for regular audiometric testing of workers whose noise exposure is such that they need to rely on hearing protectors from risk management*". The final section of Part 4.1 of the Australian model regulations titled '*Duties of designers, manufacturers, importers and suppliers of plant*', is a very worthwhile section as it attempts to address the issue noise at the source by ensuring "*that the plant is manufactured so that its noise emission is as low as is reasonably practicable*".

2.1 Exposure standard for noise

As above, Part 4.1 of the Australian model regulations sets out the "*exposure standard for noise*". As stated, it gives the impression that action should only be taken when the sound level exceeds 85 dB $L_{Aeq,8h}$ or 140 dB $L_{Cpeak,}$ for a worker. Contrast this with the United Kingdom where Section 4 of the '*The Control of Noise at Work Regulations 2005*' [3], has two exposure action values:

1) Lower exposure action values are— a daily or weekly personal noise exposure of 80 dB (A-weighted); and a peak sound pressure of 135 dB (C-weighted).
2) Upper exposure action values are— a daily or weekly personal noise exposure of 85 dB (A-weighted); and a peak sound pressure of 137 dB (C-weighted).

The advantage of having a lower exposure action value is that it provides PCBUs (and workers) with clear guidance on when they must take action. This is more than a practical issue, as often when noise surveys are completed and levels are shown to be in the range 80-84 dB $L_{Aeq,8h}$, the PCBU will say it is less than 85 dB so I don't need to do anything.

This leads to the issue of the accuracy of the sound level measurements in the first place. In AS/NZS1269.1:2005, Section 7 'Instrumentations and calibration', it states that "*if Class 2/Type 2 meter is used, allowance should be made for the reduced accuracy of this type of instrument*". Then in Section 8.4 'Measurement period' it says "*The choice of measurement time intervals shall be such that the measurements result is determined by the desired accuracy and is representative of the person's long-term noise exposure*". Then finally in Section B6 'Evaluation of noise', it says that training courses on noise assessment should include "*standing waves in rooms and their effect on measurement accuracy*". None of this deals directly with the issue of the accuracy of the measurements and provides no real guidance on working out an uncertainly budget for the measurements. Straight out of the box a Class 1 sound level meter is going to have about +/- 1.9 dB (the tolerance on the accuracy at 1 kHz) [4] uncertainty before any measurements are made. Environmental effects are likely to increase this by approximately another 2 dB, producing a tolerance of about +/- 4 dB[4]. The practical impact is that when the measured exposure is say, 83 dB $L_{Aeq,8h}$, the real value could be as high as 87 dB. Knowing that it could be this high puts greater pressure on the PCBU to take action to reduce the noise exposure risk.

2.2 Approved code of practice

The Australian regulations are supported by the Approved Code of Practice (ACoP) from Safe Work Australia, titled '*Managing noise and preventing hearing loss at work* (December 2011)'. The introduction to the ACoP begins in a holistic way by stated that "*Hazardous noise can destroy the ability to hear clearly and can also make it more difficult to hear sounds necessary for working safely, such as instructions or warning signals*". It then goes on to say that managing risks related to noise will assist in:

- protecting workers from hearing loss and disabling tinnitus (ringing in the ears or head);
- improving the conditions for communication and hearing warning sounds, and
- creating a less stressful and more productive work environment.

4 The tolerance would double if extended to a 95% confidence as would normally be the case for environmental noise assessment.

However, the opening sentence in Section 3.1 'How to find noise hazards' says, "*You may not need specialist skills to identify sources of hazardous noise*". The authors interpretation of this is that it gives the impression that any person can do noise risk assessment by simply following the ACoP guidance, which in most cases is unlikely to be true, except perhaps at a 'screening level'.

Later on the ACoP introduces '*noise exposure points*' with 85 dB $L_{Aeq,8h}$ equal to 100 points. It then provides various tables with point values for different combinations of time-averaged sound level ($L_{Aeq,T}$) and their corresponding duration, T. In reality these points are just percentage dose ($L_{Aeq,8h}$ = 1.0 Pa^2h = 100 % dose) and in the authors view, most people would be much more competent and comfortable with idea of percentage noise dose (% dose) than what appears to be a somewhat arbitrary points system. A key advantage with using the % dose or the points system is they are both linear units and can simply be added together to give the total noise dose or exposure.

At this point the question should be asked: Who is the ACoP aimed at? In the ACoP, the answer is clearly the PCBU. But do they have the equipment and expertise to measure the sound pressure levels required in order to use the 'noise exposure points' tables? For most SMEs, the answer will most likely be 'No'. So by following the ACoP, a PCBU would be taking on duties and responsibilities that are likely to be well outside their competence.

3. Where are the gaps?

So assuming we follow the Australian model regulations and address the issues above, what other gaps are there?

3.1 Duty

One of the first regulations released by the Government supporting the HSW Act 2015, is the '*Health and Safety at Work (Asbestos) Regulations 2016*' (HSW-A Regulations 2016), dated 15th February 2016. These regulations are based on the Australian model regulations. The reason this set of regulations needs consideration is as follows, there is a:

1. Duty to ensure it is identified at workplace;
2. Duty to ensure presence and location is indicated;
3. Duty to prepare a management plan;
4. Duty to review the management plan;
5. Duty to provide health monitoring;
6. Duty to ensure that appropriate health monitoring is provided, and;
7. Duty to train workers about the risk.

So rather than having a minimalist section titled something like '*Managing the health risk of asbestos*', they have chosen to, in significant detail, spell-out all the duties this entails. In the author's option, similarly detailed sections should apply to occupational noise.

3.2 Cost

Clearly asbestos is not in every workplace, in fact it is rather uncommon nowadays and issues tend to only arise during renovations, demolition and disposal work. Asbestos has certainly gained prominence as a result of the rebuild work after the Christchurch earthquakes of 2010 and 2011 in particular.

Many of the diseases associated with asbestos exposure do not develop for 15 to 40 years after first exposure and they lead to severe disability through to death. The timeline for NIHL is similar, with early signs of NIHL showing up after about 10 years exposure and severe symptoms occurring after 30-40 years exposure. People do not directly die from NIHL, as noted above, but the severe social handicap that results means that an individual's quality of life is significantly diminished which in turn leads to a significant public health burden.

In regards to asbestos, about 10,000 (0.003%) Americans die each year of asbestos-related diseases and a further 200,000 (0.06%) are living with asbestosis [5]. In contrast with NIHL [6], where in 2007, 10 million (3.1%) people in the United States had NIHL and 22 million (6.8%) workers were exposed to potentially damaging noise each year. Furthermore, reported cases of hearing loss in the United States accounted for 14% of all occupational illness.

"*Worldwide, 16% of the disabling hearing loss in adults (over 4 million DALYs[5]) is attributed to occupational noise, ranging from 7% to 21% in the various subregions*" [7]. Closer to home the Australian authors of the provocatively titled paper '*Occupationally-Acquired Noise-Induced Hearing Loss (ONIHL): A Senseless Workplace Hazard*' [8] states that "*Data suggest that excessive noise attributes to =37% of all adult causes of hearing loss and remains a significant contributor to employment-related morbidity internationally.*" It then it goes on to say that the "*...impact of ONIHL on the global transition toward dominant communication-rich white-collar employment roles is difficult to quantitate, but is likely to be substantive upon the afflicted individual*". Using the Australian author's estimates of the burden associated with hearing loss, the cost of ONIHL is in excess of AU$4.3 billion or about 0.5% of the gross domestic product (GDP) and thus represents a significant burden on health and social services. For New Zealand the cost of ONIHL as a percent GDP is likely to be similar to Australia, meaning the real cost is closer to NZ$900 million per year. Contrast this with the $40 million per year in new claims it costs ACC and the few million dollars per year allocated by Worksafe NZ to occupational noise and you can see there is a huge gap that needs addressing.

3.3 Competent person

Throughout the Australian model regulations the phrase "*competent person*" is used, typically with guidance that jurisdictions will insert in paragraph a reference to a licenced or required authorisations or membership.

5 Disability-adjusted life year (DALY) is a measure of overall disease burden, expressed as the number of years lost due to ill-health, disability or early death.

When the asbestos related sections of these Australian model regulations were enacted in Australia, and in New Zealand turned into the HSW-A Regulations 2016, it was clear that:

1. Focus is on removal of the contaminant by a practitioner holding a current certificate;
2. Licensing of removalists and assessors;
3. Register of removalists and assessors.

This means that professionals working in this area must be certified and registered and probably belong to a professional organisation. The author's opinion is that the same should be required for people working in occupational noise.

3.4 Access to standards

If regulations refer to a Standard (New Zealand Standards in particular) and there is reasonable expectation that in order to meet the regulations the PCBU has read and understood the Standard, then it seems reasonable that access to the standard, like access to the regulations, should be at minimal cost. Currently to purchase the AS/NZS1269 occupational noise management series would cost more than $630 from the Standards New Zealand webstore. However, this might change now that Standards New Zealand is part of Ministry of Business, Innovation and Employment (MBIE) as a result of the new '*Standards and Accreditation Act 2015*', which came into full force on 1st March 2016. One of the stated purposes of the new Act is "*make provision for access to New Zealand Standards*".

4. Conclusions

This discussion paper has attempted to identify where the noise legislation in New Zealand is likely to go over the next year or two. Along the way some issues have been identified in the translation of the Australian model regulations into the New Zealand context as well as identify other gaps that the author thinks needs addressing.

It will be interesting to revisit this in two years' time to reflect on what actually happens to occupational noise law in New Zealand.

References

1. "Health and Safety in Employment Regulations 1995," New Zealand Govenment, [Online]. Available: http://www.legislation.govt.nz/regulation/public/1995/0167/latest/DLM202257.html. [Accessed 20 March 2016].
2. "Standards New Zealand - AS/NZS 1269.1:2005 Occupational noise management - Measurement and assessment of noise immission and exposure," [Online]. Available: https://shop.standards.govt.nz/catalog/1269.1%3A2005%28AS|NZS%29/view. [Accessed 20 March 2016].
3. U. K. Govenment, "The Control of Noise at Work Regulations 2005".
4. "IEC 61672-1:2013 Electroacoustics - Sound level meters - Part 1: Specifications," IEC Webstore, [Online]. Available: https://webstore.iec.ch/publication/5708. [Accessed 20 March 2016].
5. "Mesothelioma - Asbestos Facts and Stats," Mesothelioma Cancer Alliance, [Online]. Available: http://www.mesothelioma.com/asbestos-cancer/asbestos-facts-statistics.htm. [Accessed 20 March 2016].
6. "NIOSH - Noise and Hearing loss prevention," The National Institute for Occupational Safety and Health (NIOSH), [Online]. Available: http://www.cdc.gov/niosh/topics/noise/stats.html. [Accessed 20 March 2016].
7. D. I. Nelson, R. Y. Nelson, M. Concha-Barrientos and M. Fingerhut, "The global burden of occupational noise-induced hearing loss," Amercian Journal of Industrial Medicine - Special Issue: Contribution of Occupational Risks to the Global Burden of Disease, vol. 48, no. 6, pp. 336-458, 2005.
8. A. P. Kurmis and S. A. Apps, "Occupationally-Acquired Noise-Induced Hearing Loss: A Senseless Workplace Hazard," International Journal of Occupational Medicine and Environmental Health, vol. 20, no. 2, pp. 127-136, 2007.
9. "Model Work Health and Safety Regulations," Safe Work Australia, 2014.

Future Events

2016

23rd International Congress on Sound and Vibration [ICSV23]. Athens, Greece. 10-14 July 2016. www.icsv23.org

4th International Conference on The Effects of Noise on Aquatic Life. Dublin, Ireland. 10-16 July 2016. www.aquaticnoise2016.org

Inter-Noise 2016. Hamburg, Germany. 21-24 August 2016. www.internoise2016.org

International Congress of Theoretical and Applied Mechanics [ICTAM]. Montreal, Canada. 21st to 26th August 2016. www.ictam2016.org

22nd International Congress on Acoustics [ICA 2016]. 5-9 September 2016. Buenos Aires, Argentina. www.ica2016.org.ar

International Symposium on Music and Room Acoustics [ISMRA 2016]. La Plata, Argentina. 11-13 September 2016. www.iwrn12.acoustics.asn.au

International Workshop on Rail Noise [IWRN]. Terrigal, NSW, Australia. 12-16 September 2016. www.ica2016.org.ar

2nd Australasian Acoustical Societies Conference. 9-11 November 2016, Brisbane Convention Exhibition Centre, Brisbane Australia. www.acoustics2016.com.au

2017

24th International Congress on Sound and Vibration [ICSV24]. London, UK. 23-27 July 2017. www.icsv24.org

Acoustics 2017 Joint meeting of the Acoustical Society of America and the European Acoustics Association. Boston, USA. 25-29 June 2017. www.acousticalsociety.org

46th International Congress and Exposition on Noise Control Engineering [Inter-Noise 2017]. Hong Kong. 27-30 August 2017. www.internoise2017.org

2017 International Congress on Ultrasonics. Honolulu, Hawaii, USA. 8-10 December 2017. http://www4.eng.hawaii.edu/~icu2017

Publication Dates and Deadlines

New Zealand Acoustics aims to publish quarterly in March, June, September, and December.

The Deadline for material for inclusion in the journal is 1st of each publication month, although long articles should ideally be received at least 4 weeks prior to this.

Advertising

Enquiries regarding advertising are welcome. For a list of current prices and any further information please contact: advertising@acoustics.org.nz

Society Membership

Associate Membership of the Acoustical Society of New Zealand is open to anybody interested in acoustics. Members receive benefits including;

- Direct notification of upcoming local events
- Regular mailing of Noise News International
- Reduced charges for local and national Society events
- Priority space allocation for trade stands at society events
- Discounted rates on selected acoustic products

To join the society, visit www.acoustics.ac.nz or contact the Secretary; secretary@acoustics.org.nz