

Entertainment noise in Western Australia

Guo, J. and Gunn, P.

WorkSafe Division, Department of Consumer and Employment Protection, Government of Western Australia, Westcentre 1260 Hay Street, West Perth WA 6005, Australia

ABSTRACT

Noise exposure to people working in the music entertainment industry has long been recognized as a workplace hazard in Western Australia. The Occupational Health, Safety, and Welfare Commission of Western Australia first issued a Code of Practice "Control of Noise in the Music Entertainment Industry" in 1992. This has been updated several times, most recently in 2003. To promote the use of this Code of Practice and noise control in the music entertainment industry, an inspection project was carried out in late 2004/early 2005 by WorkSafe. This was a follow-up of a previous project conducted in 2000. In this present study, a total of 17 music entertainment venues were visited, 3 of which had been inspected during the previous project. In each venue, employees' noise exposures were assessed and noise-related information was collected via a questionnaire. Information on noise control, hearing protectors and the Code of Practice were provided to management at each venue and some law-enforcement actions were taken where required. Results were analysed and compared to those obtained in 2000. It has been found from this study that although the awareness of noise and need for hearing protection has increased in the industry, noise is still a major hazard. More work is required to promote practical noise controls, select suitable hearing protectors and ensure that these are worn.

INTRODUCTION

Exposure to high levels of music in the entertainment industry has long been an important concern to those interested in hearing conservation. With the introduction of new and affordable powerful music equipment, the concern about noise-induced hearing loss due to loud music is increasing. Most previous studies on music noise in the music entertainment industry have focused on the public or the musicians. Due to much longer exposures to loud music, it is reasonable to believe that the hearing of employees working in the music entertainment industry is at much greater risk. Therefore, noise-induced hearing loss among employees working in the music entertainment industry is a more important concern that needs to be studied.

An excellent review of noise levels and noise exposure to workers in pubs and clubs was conducted by the United Kingdom Health and Safety Laboratory (2002). This reviewed published studies in this area from 1985. All these previous studies indicated that noise levels were very high in almost all of the studied entertainment venues. In the 15 studies that assessed daily noise exposure levels ($L_{Aeq,8h}$), the levels ranged from 89-100 dB(A). In the majority of cases employees were subjected to daily noise exposure levels greater than 90 dB(A).

Noise-induced hearing loss among employees has also been investigated previously. A recent study (Sadhra et al. 2002) looked at the noise exposure and hearing loss among 14 students working in a university entertainment venue. Their noise exposure levels ranged from 89 to 98 dB(A). The hearing of these part-time bar and security staff working up to 16 hours a week was examined. It was found that 29% of the young student employees showed permanent hearing loss of more than 30 dB at either low or high frequencies.

The number of employees working in the music entertainment industry has been constantly increasing. It was estimated that Britain's pubs, bars and nightclubs employed about 568,000 people in 2002, an increase of more than 153,800 compared to 1992 (RNID 2004). Australia also has

a large number of people working in this industry. Our 4627 pubs, taverns and nightclubs employed around 84,000 people in 2001 (ABS 2001), which was 7% more than at the end of June 1998. It is important to protect the hearing of this group of young employees.

The risk of people working in the music entertainment industry suffering noise-induced hearing loss and tinnitus has long been recognised by WorkSafe Western Australia. It was the first jurisdiction in Australia to develop and issue a Code of Practice, *Control of Noise in the Music Entertainment Industry*, in 1992. This was reviewed and updated in 1999, and again in 2003. The Code of Practice aims to give practical guidance on reducing noise exposure in music venues and how to meet legal obligations.

To promote this Code of Practice and the principal Code, *Managing Noise at Workplaces*, and to increase the industry's awareness of its responsibilities to control noise exposure of the employees, WorkSafe Western Australia conducted an inspection project in music entertainment venues in 2000. 13 music venues were investigated in the project. During the investigation, noise levels in the venues and noise exposure levels of the employees were measured and assessed. A noise assessment report was prepared for each venue. Law enforcement actions were also taken by issuing 25 improvement notices to the workplaces. Among these, 12 required employers to provide their employees with appropriate information, instruction, training and supervision in accordance with the Code of Practice for *Managing Noise at Workplaces*. Seven improvement notices required employers to provide adequate personal hearing protectors (HP) and 6 improvement notices required employers to introduce control measures to reduce noise exposure of their employees.

It was concluded in the project that compliance with the noise aspects of occupational safety and health legislation was very low in the music entertainment industry. The music entertainment industry, in general, was not fully aware of its responsibilities under the occupational safety and health legislation. It was recommended in the project report that a

repeat study be conducted after a period of time (MacMillan and Gunn 2000).

This is the follow-up study. The objective of this study is to investigate the current noise situation and control practices in the music entertainment industry and to check the improvements since the previous project.

METHODOLOGY

With the help of the Western Australia Department of Racing, Gaming and Liquor (DRGL) Inspectors, 17 licensed nightclubs, pubs and taverns with different music types were randomly selected for the study. Among them, three had been investigated before in the 2000 project.

Music types in these 17 venues during the study were live bands, disc jockeys (DJ) and recorded background music. Noise information from the music venues was obtained through site visits, a questionnaire and noise assessment reports from consultants.

Site visits

In the company of DRGL Inspectors, the investigations were conducted between 9:00 pm and mid-night - 6 venues were visited on a Friday night in August 2004, and 11 were visited on two Friday nights in January 2005. Friday nights were selected as they are one of the busiest nights of the week. Venues open longer hours and normally are full with patrons on Friday nights. The music type at each venue was identified and classified.

During the visits, screening noise levels at various working locations were measured using a precision sound level meter and noise dose meters. The estimations of daily noise exposure levels of employees were calculated using estimated working times, according to methods given by AS/NZS 1269.1 (1998). Workplaces were issued with improvement notices, requiring detailed noise assessments to be done if the screening results indicated that the noise exposure level was excessive and no recent (within 5 years) noise assessment had been done.

The noise management system of each venue, such as policies or procedures regarding music noise, noise education and provision of hearing protectors, was checked during the visits.

A questionnaire was also distributed to staff in each venue. Noise exposure related information, such as the length of employment in the industry; work shift pattern; work task; availability of HP; use of HP; hearing problems; and hearing tests, was collected through the questionnaire.

Noise information and law enforcement

According to the Western Australian Occupational Safety and Health Regulations, when employees are likely to be exposed to excessive noise, the person in control of the workplace has the responsibility to control the noise. A proper noise management system shall be put in place, including: noise assessment; provision of noise and hearing protection information to the employees; implementation of practical measures to reduce the noise; and provision of suitable hearing protectors.

Excessive noise, according to the Occupational Safety and Health Regulations, is any noise exposure level higher than the noise exposure standard $L_{Aeq,8h}$ of 85 dB(A) or $L_{C,peak}$ of 140 dB(C).

For those venues where a proper noise management system was not in place, law enforcement actions were taken. These actions included issuing Improvement Notices, which gave the workplace a specified time to fix the problem, and giving Verbal Directions to the venue if the problem could be remedied immediately.

Training and information materials on reducing employees' noise exposure, such as WorkSafe Western Australia's Codes of Practice – *Managing Noise at Workplaces* and *Control of Noise in the Music Entertainment Industry* and other relevant information on noise assessment and hearing loss prevention, were provided to each venue during the project.

Site revisits

Fifteen of the 17 venues were visited again in March and April 2005. The purpose of the revisit was to verify the improvement the workplace had achieved.

Questionnaire forms and copies of noise assessment reports conducted by consultants were also collected at that time. The data and information from these reports were assessed and analysed.

RESULTS

Results of daily noise exposure level measurements

During the nights of the investigation, 9 venues had live band music, 6 had DJs playing amplified music, and 2 had recorded background music. Although the daily noise exposure levels with different employees and in different venues varied significantly, all measured levels exceeded 85 dB(A), and ranged from 85 to 103 dB(A). Most of the measured exposure levels were higher than 90 dB(A).

The overall averaged daily noise exposure levels with three different music types and with different work tasks are listed in Table 1.

Table 1. Averaged daily noise exposure levels ($L_{Aeq,8h}$) associated with different work tasks under different music types. (dB(A))

Music type	Bartender	Glassie	Security	Manager	DJ
Recorded Background Music	86	87	85	87	
Amplified Music with DJ	92	93	93	92	96
Live Band	96	98	93	98	

Peak noise levels were generally measured below 140 dB(C), though a couple of readings exceeding 140 dB(C) were recorded in two noise assessment reports prepared by consultants. These two extreme readings were not supported by the site screenings and most other detailed measured data. Because these two extreme readings were recorded by dose meters, it is very likely that they were due to mishandling the dose meter, such as an impact on the microphone.

Noise exposure levels of the two DRGL inspectors were also measured using dose meters during the inspections. The results of about 3 hours of noise exposure are given in Fig. 1. During this 3-hour monitoring, the inspectors inspected 6 venues, with about half of the time exposed to music entertainment noise. The analysis indicated that in this short

period of time, the daily noise exposure level of the two inspectors already exceeded 90 dB(A).

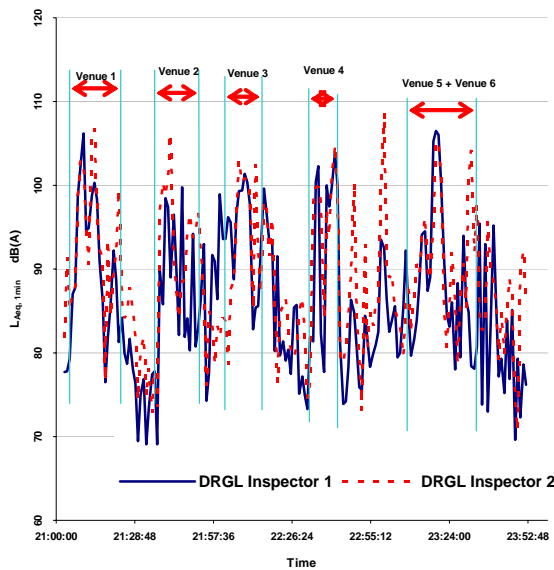


Figure 1. Noise exposures of the two DRGL inspectors during the inspections.

Law enforcement actions

It was found during the visits that 13 venues had not had a proper noise assessment done, 14 venues had not provided noise and hearing loss information and hearing protection training to the staff, and 8 venues had not supplied any hearing protectors to their employees. Consequently, 35 improvement notices were issued to 16 venues. The workplaces were given information and directions, as well as a period of time, to make the improvements.

All 16 venues confirmed to WorkSafe Western Australia that improvements were achieved within the given time. This was checked and verified during the revisits.

Results from noise questionnaire

Altogether 106 employees working as bartenders, DJs, security, glass collectors, and floor managers, responded to the survey. It was found that about 85% of them were either part-time or casual staff. They typically worked 6-12 hours a shift.

Figure 2 shows the length of employment in this industry of the responding employees. Although most of them had worked in this industry for no more than three years, over 17% had stayed for over 5 years. Also Fig. 2 shows that over 27% of employees joined the industry less than one year ago.

The majority of staff (>95%) knew neither their noise exposure levels, nor the exposure standard for noise at workplaces. Nor did they understand the risk of hearing loss when exposed to excessive noise.

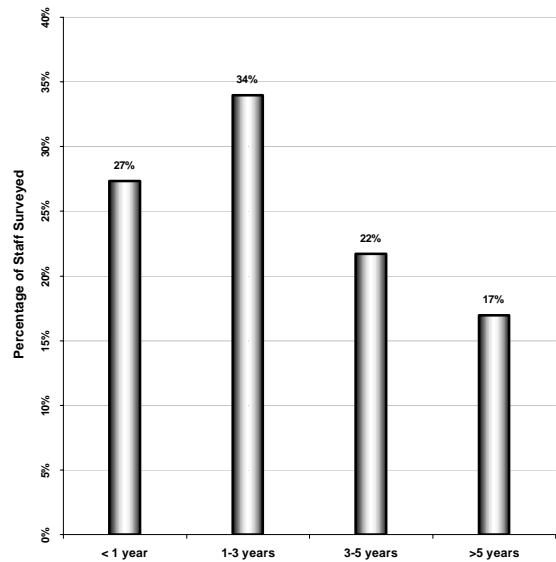


Figure 2. Length of employment with the industry.

Findings of hearing problems, hearing tests and availability and use of hearing protectors are shown in Fig. 3. It can be seen that although most employees admitted that hearing protectors were available for use in the workplace, only a small percentage (28%) used them frequently or occasionally when working with high music levels. 12% claimed that their ears rang either during or after their work. About 9% claimed that they sometimes had trouble hearing conversations after their shifts. Only 11% had recently had their ears or hearing checked.

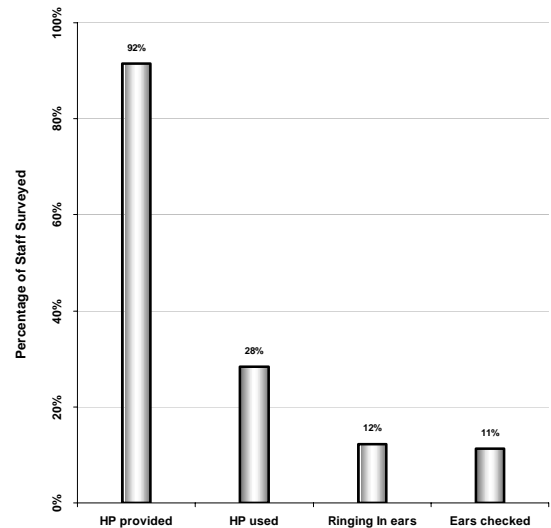


Figure 3. Questionnaire results on hearing problems and hearing protectors.

DISCUSSION

Noise exposure levels

Compared with the noise exposure levels measured in the 2000 project, staff are exposed to higher music levels, as shown in Table 2. Taking all comparable music types and work tasks, noise exposure levels are 1-9 dB(A) higher on average than 5 years ago.

Table 2. Differences between averaged daily noise exposure levels measured in 2004/2005 and 2000. (dB(A))

Music type	Bartender	Glassie	Security	Manager	DJ
Recorded Background Music	+2	-	-	-	
Amplified Music with DJ	+2	+1	+6	+1	+3
Live Band	+3	+4	-	+9	

The average daily noise exposure levels of bar staff, floor staff, security staff, managers, and DJs, working with live band music or amplified music with DJ, are compared with those measured in the 2000 project, and those averaged from 15 previous studies (HSE 2002). The results are shown in Fig 4.

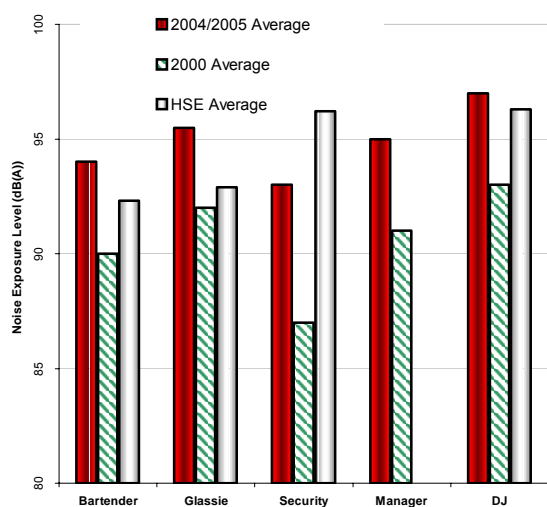


Figure 4. Comparison of averaged staff daily noise exposure levels with live band music or DJ.

It can be seen from Fig. 4 that noise and employees' noise exposures in Western Australian music entertainment venues are at very high levels. The noise exposure levels of employees with different work tasks have all increased significantly from 2000. Except for the noise exposure of the security staff, noise exposure levels of our bar staff, floor staff, and DJs are all higher than those levels averaged from 15 previous overseas studies.

Industry's awareness of noise responsibilities

Compared to the situation in 2000, the industry's awareness of its responsibilities in managing excessive noise exposures has increased, as shown by Fig. 5.

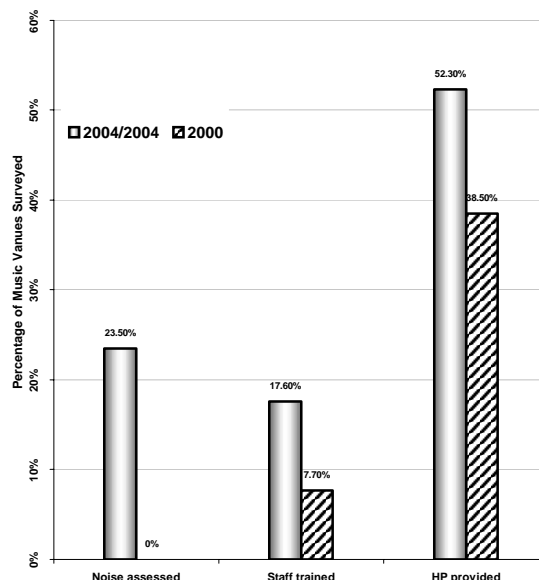


Figure 5. Percentage of venues that complied with noise management requirements.

About 23% of venues had done a proper noise assessment, compared to none in 2000. About 18% of venues had developed a noise control policy and provided information and training on noise and hearing protection to their employees. Only about 8% of venues did that in 2000. Just over half of the venues provided hearing protectors to their staff, up from about 38% in 2000.

However, Fig. 5 also demonstrates that the industry's awareness of its noise control responsibilities and compliance with the legislation are still very low. Site visits indicated that many employers had no idea of occupational noise standards and regulations. Some of them even confused their responsibilities of employees' noise exposure levels with their responsibilities for limiting environmental noise emissions, as many of the venues have environmental noise limitations on their licences.

Employees' awareness of the need to protect their own hearing is also very low. The majority of staff chose not to use hearing protectors even when they were provided. The reasons given for not using HP are various, such as: HP affects my conversation with patrons; do not know any risk for not using HP; or want to take the risk if any. For most of those venues in which HPs are provided, use of HP is only an option determined by employees themselves.

CONCLUSIONS

It is recognised that the problem of noise exposure in the music entertainment industry is special and difficult. Unlike other industries, where noise is a hazardous by-product that should be eliminated, noise is actually the desired product of the music entertainment industry. Clearly nightclub owners are in a difficult situation. On one hand they have to run a commercially viable business offering music desired by customers, on the other hand they have a legal obligation to provide a working environment which will not damage the hearing of the employees.

The evidence from this study and all previous studies show that there is no doubt that the daily noise exposure levels of workers in pubs and clubs exceed the noise exposure standard of $L_{Aeq,8h} = 85$ dB(A) in the majority of cases. However, enforcement of noise control has been made difficult in this

industry due to the “so far as is reasonably practicable” in the statement regarding the reduction of the noise level in the Regulations. It is very important that some specific guidance is developed, which ensures that employees are to be protected whilst maintaining commercial viability for the club, such as WorkSafe Western Australia’s Code of Practice – *Control of Noise in the Music Entertainment Industry*.

Results from this study indicate that employees’ daily noise exposure levels in Western Australian pubs, nightclubs and taverns have increased significantly since 2000. With the increasing number of people working in this industry, the need to target and solve this problem is becoming more important.

Currently, the industry’s awareness of music noise risk – the employers’ responsibilities for reducing employees’ noise exposures and the employees’ responsibilities for protecting their own hearing – is still very low, though it has increased since the last project in 2000. Continuous efforts to increase the industry’s awareness are very important.

It was found in this study that the three venues that were visited in the 2000 project had much better noise management systems. They all provided hearing protectors to their employees, and had policies to reduce employees’ risk of noise-induced hearing loss. It is proof that some employers in the music entertainment industry are willing to take responsibility to protect their employees’ hearing once they are aware of their legal obligations.

FUTURE DIRECTIONS

Continuing to increase the industry’s awareness of their legal obligations under the Occupational Safety and Health Regulations is still a very effective approach to the problem in the current situation. This will be done by providing the owners of pubs and clubs with information, education and training that explain the reasons for enforcement of the legislation, methods of compliance and practical methods of reducing the employees’ noise exposure levels. It will also be done by taking law enforcement action. WorkSafe Western Australia has already planned to inspect 20 more music entertainment venues in the next 12 months.

Informing the general public about the possible risks of hearing loss associated with frequent attendance at places that play loud amplified music can also be useful in changing the noisy culture of the industry. As a result, the noise exposure levels of the employees would also be reduced. This information needs to be provided in a manner that does not sensationalise the problem but informs of practical steps that can be taken to avoid the possibility of hearing damage.

Research and development on new, effective and economically practicable technologies or devices for reducing the employees’ noise exposure levels in the industry are also necessary. Most of the venues started considering the control measures after an inspection. However, most common engineering control measures taken were relocating or redirecting loudspeakers. Though these measures could reduce the noise exposures of the staff, due to the indoor reverberant environment, their effects are very limited.

WorkSafe Western Australia is following with interest a project being carried out in Sweden by the National Institute for Working Life. This project is investigating the possibility of designing sound environments in rock music clubs that reduce the risk of hearing impairments of musicians, sound technicians, employees and audiences whilst maintaining an acceptable entertainment experience (Working Life 2005).

ACKNOWLEDGEMENT

The authors would like to acknowledge the support from Inspectors of Department of Racing, Gaming and Liquor, Government of Western Australia.

REFERENCES

- Australian Bureau of Statistics 2001, *Clubs, Pubs, Taverns and Bars, Australia*, <http://www.abs.gov.au>.
- AS/NZS 1269.1 (1998), *Occupational noise management – Part 1: Measurement and assessment of noise immersion and exposure*, Standards Australia and Standards New Zealand.
- Fleming C. 1996, *Assessment of noise exposure level of bar staff in discotheques*, Appl Acoust., Vol. **49** (1), pp. 85-94.
- Health and Safety Laboratory 2002, *Noise levels and noise exposure of workers in pubs and clubs – a review of the literature*, Research Report **026**, Health and Safety Executive, UK.
- MacMillan R. and Gunn P. 2000, *Noise control in the music entertainment industry project – Summary report*, WorkSafe Western Australia.
- Sadhra S., Jackson C.A., Ryder T. and Brown M.J. 2002, *Noise exposure and hearing loss among student employees working in university entertainment venues*, Ann. Occup. Hgy., Vol. **46** (5), pp. 455-463.
- TUC/RNID Health and Safety Report 2004, *Noise overload – employee noise exposure in pubs, bars and clubs*, Organisation and Services Department, UK.
- Working Life 2005, *Good sound environment possible at rock clubs*, National Institute for Working Life, <http://www.arbetslivsinstitutet.se/workinglife/05-2/05.asp>
- WorkSafe Western Australia Commission 2002, *Code of Practice – Managing Noise at Workplaces*, Government of Western Australia.
- WorkSafe Western Australia Commission 2003, *Code of Practice – Control of Noise in the Music Entertainment Industry*, Government of Western Australia.