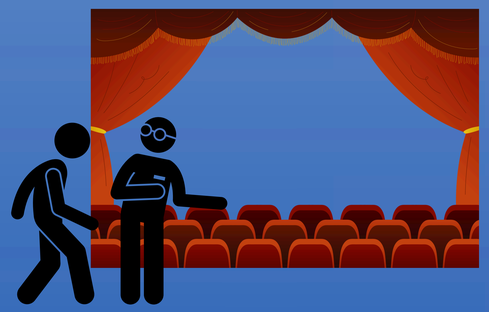


NOISE EXPOSURE AND PERCEPTION OF USHERS IN A LIVE ENTERTAINMENT VENUE

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1. Background

- Noise can be defined as unwanted sound produced by vibrations that create fluctuations in air pressure that are detected by the human ear (OSHA Occupational Noise Exposure Overview, n.d.).
- Health effects of noise exposure include tinnitus, acoustic trauma, temporary threshold shifts (TTS), permanent threshold shifts (PTS), and noise-induced hearing loss (NIHL).
- Under (O. Reg. 381/15: Noise) The maximum allowable exposure limit for an 8-hour work day (Lex 8) is 85 dBA.
- Studies in live entertainment venues and concert venues have documented high noise levels among concert-goers, musicians, and venue staff, with reported levels ranging 85.5 to 99.4 dBA (Trostad & Gelderblom, 2014), upwards of 106.84 dBA (Opperman et al., 2005)
- Through administered questionnaires, concert-goers, musicians, and venue staff alike report temporary threshold shifts, tinnitus, and low use of hearing protection devices (HPDs).

2. Objectives

- Assess the measured and percieved noise exposure amoung ushers across various shows at a more intimate venue.
- Aims to stregthen understanding of underexamined worker population and inform recommendations related to common noise-related health effects and worker education and attitude toward occupational noise exposure.

3. Methodology

Noise Assessment

- Two integrating sound level meters (SLMs) were used to collect area measurements near the stage for the duration of each show.
- SLMs were placed approximately 7.5-8 feet away from the main speakers and 35 feet away from centre stage.

Post-Show Questionnaire

- A post-show questionnaire was adapted and developed from previous tools assessing worker perception on occupational noise (Timmins & Granger, 2010; Purdy & Williams, 2002; Yadav, 2021).
- Participants responded to general information questions, perception's of the show, hearing ability, use of PPE, and attitudes toward occupational hearing loss using descriptive ordinal rating.

4. Results

Table 1.0 Characteristics of Respondents

Characteristics of Respondents (N = 65)	Subcategory	%
Variable		
Age	<30	49.23%
	30-49	12.31%
	50+	38.46%
Sex	Male	45.31%
	Female	54.69%
	Intersex	0%
Worked >1 shift in past 5 days	Yes	67.69%
	No	32.31%
Shift Length	<4 hours	32.31%
	4 hours +	67.69%

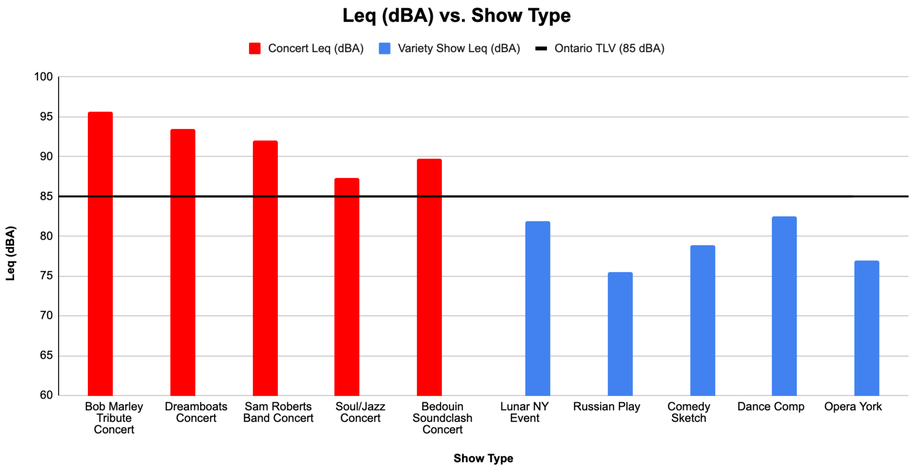


Figure 1.0 compares the measured Leq levels for concerts and variety shows relative to the Ontario TLV of 85 dBA.

- Concerts consistently exceeded the 85 dBA threshold, with an overall average of 91.61 dBA. The Bob Marley Tribute Concert recorded the highest Leq at 95.6 dBA.
- Variety shows averaged 79.15 dBA, remaining below the TLV. The Russian Play had the lowest measured Leq at 75.55 dBA.

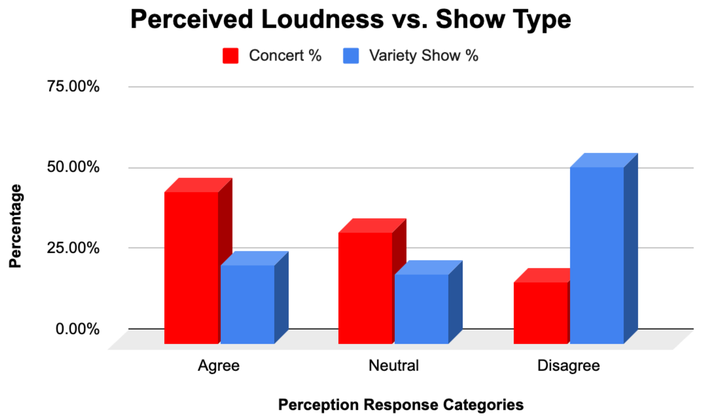


Figure 2.0 Percieved loudness (too loud) by show type.

- Almost half of participants who worked concerts agreed that the noise level was too loud compared to those that agreed and worked variety shows.
- Over half of those that worked variety shows did not find the noise level to be too loud.

5. Discussion

- Concerts were typically louder than variety shows, and exceeded the Ontario TLV. Usher perceptions confirmed this based on the fact that more participants felt concerts were louder in general.
- Integrating both objective measurements and subjective perceptions in a live entertainment workplace provides a more complete understanding of noise exposure, along with the effects workers experience. Together, these methods can be used to inform proactive and protective measures against occupational noise.

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