Assessing the Distribution of Excessive Noise Exposure and the Risk of Tinnitus Onset in Opera, Orchestra, and High School Musicians

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Tinnitus is the perception of sound that has no source outside of the head and, as presently understood, lacks any universally accepted quantifiability. Noise-induced hearing loss (NIHL) often additionally results in the development of tinnitus and can instead be quantified by analyzing an individual's exposure to excessive occupational and non-occupational noise. This study employed the Noise Exposure Questionnaire (NEQ) to examine the noise exposure risks of musicians of varying practices and ages. The NEQ was used to survey high school musicians (n=39), orchestral musicians (n=34), and opera singers (n=23) to identify individuals at risk of NIHL due to their harsh occupational noise conditions, and to identify what practices are causing such exposure. Opera musicians were selected for their practice of unamplified singing, creating harmfully loud noise directly next to one's ears through regular practice. A significant difference in NIHL risk was found between orchestral musicians and opera singers ($p<0.05$).No outliers in activity participation existed, indicating that all participants faced the greatest annual noise exposure through musical instrument, speaker, and earphone usage. To amateur and professional musicians alike, practice and performance contribute disproportionately more to risk of hearing loss than other activities more commonly understood to require hearing protection, such as power tool use. The novel findings of this research demonstrate the necessity that musicians and their employers acknowledge and accommodate the risk of their noisy environments and provide hearing protection accordingly.