

When traveling on public transport, you may want to cover your ears

November 22 2017



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The noise levels commuters are exposed to while using public transport or while biking, could induce hearing loss if experienced repeatedly and over long periods of time, according to a study published in the open



access *Journal of Otolaryngology - Head & Neck Surgery*. Efforts to control noise should focus on materials and equipment that provide a quieter environment, researchers at the University of Toronto suggest. Hearing protection while using public transport should also be promoted.

Dr. Vincent Lin, the corresponding author said: "This study is the first to look at and quantify the amount of noise people are exposed to during their daily commute, specifically on the Toronto Transit System. We now are starting to understand that chronic excessive <u>noise exposure</u> leads to significant systemic pathology, such as depression, anxiety, increased risk of chronic diseases and increased accident risk. Short, intense noise exposure has been demonstrated to be as injurious as longer, less intense noise exposure."

Dr Lin said: "We were surprised at the overall average noise exposure commuters experience on a daily basis, especially the peak noise intensity not only on trains but also on buses. Planners need to be more considerate of noise exposure in future planning of public spaces and public transit routes. Toronto in particular, as the transit network expands, needs to consider ways to reduce noise exposure as a preventative measure for future health risks."

Measuring noise exposure on public (subways, trams and buses) and private (cars, bike, walking) transport in Toronto, the researchers found that while noise on average was within the recommended levels of safe exposure, bursts of <u>loud noise</u> on both public and private modes of transportation could still place individuals at risk of noise-induced hearing loss.

According to thresholds recommended by the US Environmental Protection Agency (EPA), exposure to 114 A-weighted decibels (dBA) for longer than four seconds, exposure to 117dBA for longer than two seconds and exposure to 120 dBA for longer than 20 seconds may put



people at risk of noise-induced hearing loss. A-weighted decibels express the relative loudness of sounds experienced by the human ear; taking into account that sensitivity to noise differs depending on noise frequency. Peak noise levels in dBa across both public and personal transport exceeded the EPA recommended thresholds. The average noise levels by bike were greater than any level caused by modes of public transit.

To measure noise exposure, the researchers used noise dosimeters, which they carried on their shirt collars about two inches away from their ears. The researchers collected 210 measurements in total, comparing the noise on subways, buses, and streetcars, while driving a car, cycling, and walking. They measured in-vehicle noise and outside or boarding platform noise for all modes of private and public transportation.

The authors found that 19.9% of the loudest noises (peak noise) measured on the subway were greater than 114 dBA, while 20% of the loudest noises inside streetcars were greater than 120 dBA. 85% of peak noise measurements from bus platforms were greater than 114 dBA, while 54% were greater than 120 dBA. All peak noise exposures while riding a bike exceeded 117 dBA, with 85% being greater than 120 dBA.

When the authors extrapolated the EPA recommended noise thresholds for an average Toronto commuter who uses public transport, the recommended level of noise exposure was exceeded in 9% of subway, 12% of bus, and 14% of biking measurements but not when using streetcars, cars or when walking.

The authors caution that the number of measurements taken for individual modes of transport is relatively low and that the crosssectional nature of the study does not allow for conclusions about cause and effect. Further studies are needed to investigate other factors that



may contribute to <u>noise</u> exposure such as use of music players and lengthy transit times.

More information: Noise exposure while commuting in Toronto - a study of personal and public transportation in Toronto, Yao et al. *Journal of Otolaryngology - Head & Neck Surgery* 2017, DOI: 10.1186/s40463-017-0239-6

Provided by BioMed Central

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