Got ear plugs? You may want to sport them on the subway and other mass transit

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The U.S. mass transit system, the largest in the world, provides affordable and efficient transportation to more than 33 million riders each weekday. The system is generally considered one of the safest modes of travel. But recent public health studies have identified several sources of environmental hazards associated with mass transit, including excessive noise, a large and growing problem in urban settings.

Now, a team of researchers from the University of Washington and Columbia University have found that Metropolitan Transit Authority (MTA) subways had the highest average noise levels of all mass transit in New York City, with levels high enough to potentially increase the risk of noise induced hearing loss. Researchers studied the risk of excessive exposure to noise related to mass transit ridership, and conducted an extensive set of noise measurements of New York City mass transit systems. The findings are available online today in the *American* Journal of Public Health and will be published in the August 2009 issue.

Noise induced hearing loss, a permanent, irreversible health problem, is estimated to affect more than 30 million people worldwide, and as many as 10 million in the U.S. alone.

Using sensitive noise dosimeters, the team of researchers, led by exposure scientist Richard Neitzel from the School of Public Health at the University of Washington and Robyn Gershon, DrPH, an environmental and occupational health scientist and faculty member at the Columbia University Mailman School of Public Health, conducted

hundreds of measurements of noise levels at platforms and stations, as well as inside of vehicles on New York City subways (MTA and PATH), buses (MTA), ferries (Staten Island), commuter railways (LIRR, SIRR and Metro North), and the Roosevelt Island tramway.

The scientists found that on average, the MTA subways had the highest noise levels, at 80.4 decibels (dBA), followed by the Path trains, at 79.4 dBA, and the tram, at 77.0 dBA. The lowest average levels measured, 74.9 dBA and 75.1 dBA, were obtained from the LIRR and Metro-North trains, respectively. The very highest levels measured in the study were found on an MTA subway platform (102.1dBA) and at a bus stop (101.6 dBA).

In contrast, the noise level of a whisper is 30 dBA, normal conversation is 60 to 70 dBA, a chainsaw is 100 dBA, and gunfire is 140 dBA.

In general, noise levels were significantly higher at platforms compared to inside vehicles for all forms of mass transit, except for ferries and the tram. The borough with the highest mass transit noise levels was Manhattan, followed by Queens and the Bronx. Major hubs were noisier than local stops and underground trains and stations were significantly louder than those aboveground. According to Dr. Gershon, of all mass transit, subways had the highest noise levels, with roughly half of the maximum levels exceeding 90 dBA. "At some of the highest noise levels we obtained (ex. 102.1 dBA on the subway platforms), as little as two minutes of exposure per day would be expected to cause hearing loss in some people with frequent ridership, based upon the International Organization for Standardization models for predicting hearing impairment from noise."

"Even though compared to subways, lower levels were obtained for commuter rail, buses, ferries and the tramway, chronic exposure to noise from these other forms of transit could also present a risk of noise

induced hearing loss given sufficient exposure duration," notes Mr. Neitzel. "The risk rises quickly with even small increases in noise levels. For example, 95 dBA is 10 times more intense than 85 dBA and 100 times more intense than 75 dBA."

The U.S. Environmental Protection Agency and the World Health Organization recommend daily exposures of no more than 70 dBA for a 24 hour average. Noises that register below 70 dBA generally have no impact on hearing health and don't cause people to exceed the daily recommendations.

But as Dr. Gershon points out, "For many people, unless the noise is also considered to be a nuisance, such as noisy neighbors late at night, exposure to most loud noise levels is often not perceived as potentially hazardous, and precautions are rarely taken." Further, she states , "People do not necessarily pay attention, for example, to excessive noise from attending concerts, riding motorcycles or even listening to MP3 players at high volume for extended periods," Additionally, as Mr. Neitzel notes, "Transit-related noise levels are high enough to potentially present a risk of noise-induced hearing loss to some frequent transit riders, and this risk could increase substantially when we account for riders' other noise exposures from work and recreational activities." Another important and often overlooked fact, according to Dr. Gershon, is that in addition to impacting your hearing health, excessive noise exposure is linked to hypertension, heart disease, disruptions in stress hormones, sleep disorders and it has been shown to adversely affect learning in children.

For these reasons, the scientists said that noise control efforts, including increased transit infrastructure maintenance and the use of quieter equipment should be a priority. What's more, the use of personal protection will also be helpful. Music headphones and earbuds generally do little to reduce noise exposures, and in fact often increase exposures,

as users turn the volume of MP3 players up even higher than normal to drown out surrounding noise.

But a variety of earplugs and earmuffs are commercially available, most of which would be sufficient to reduce transit noise exposures to below the recommended limits. "A loss of just 10 decibels in your hearing acuity can damage your ability to hear other people talking," Neitzel said. "Therefore protection - and, even better, avoidance of high noise exposure when possible - is the best way to preserve your hearing."

The research team is currently following up this study with a large, community -based study of noise exposures from multiple sources to develop accurate predictions of noise-induced hearing loss in urban populations.

Source: Columbia University's Mailman School of Public Health (news : web)