

SB658
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Favorable

The proposed Maryland Aviation Infrastructure Impacts Commission is a notable and commendable step towards better understanding and addressing the many adverse impacts of noise pollution from air traffic and airports. The additional public health and economic information presented below should be considered in the evaluation of the impact and importance of the proposed Commission.

Health impacts associated with noise

Noise exposures in America are associated with a host of preventable health impacts. The obvious effect, noise-induced hearing loss may only be the tip of the iceberg, as noise has also been linked to high blood pressure, strokes, and heart attacks (Basner et al, 2013; Faulkner and Murphy, 2022; Wojciechowska et al, 2022), sleep disturbance, diabetes (Baiduc and Helzner, 2019), cognitive impacts (Thompson et al, 2022), mental health impacts (Lan et al, 2020; Stansfeld et al, 2003), and other conditions.

Number of people exposed to noise

Pre-pandemic, the FAA estimated that about half a million people in the US were exposed to aircraft deemed significant by the Federal Aviation Administration (65 dBA DNL or greater) (<https://www.bts.gov/content/number-people-residing-areas-significant-noise-exposure-around-us-airports>). However, what this number does not recognize is that exposures substantially lower than that have been linked to the health outcomes described above (Basner et al, 2013). As one example, sleep disturbance has been shown to occur at levels below the FAA limit (Holt et al, 2015). Our own estimates suggest that more than 100 million Americans are exposed to noise sufficient to cause hearing loss, and the number exposed to levels sufficient to cause cardiovascular disease is even larger (Hammer et al, 2014).

Research by my team conducted as part of our ongoing national Apple Hearing Study (<https://sph.umich.edu/applehearingstudy/>) demonstrated a substantial and statistically significant drop in personal noise exposures across four US states (CA, TX, NY, and FL) during the governmental pandemic lockdowns that took place in early 2020 (Smith et al, 2020). While it is not possible to attribute this reduction directly to changes in air traffic during the period evaluated, that reduction likely contributed to this substantial and unprecedented drop. The reduction in noise exposures in 2020 highlights two important points: 1) that meaningful noise reductions are possible across entire

populations given certain circumstances, and 2) that ongoing research monitoring of large sample sizes of people, as is being done over a 5-year period by the Apple Hearing Study, allows for opportunities to evaluate changes in noise exposures that occur over time. An overview of the methods used in the Apple Hearing Study, all of which are directly relevant to the evaluation of noise exposures and health impacts from aircraft noise, has just been published (Neitzel et al, 2022).

Economic burden of noise exposure

The public health burden associated with the preventable impacts of noise is tremendous, but so is the economic burden. Studies from around the world suggest that the costs of the individual outcomes resulting from noise are staggering. Research from my own team suggests that the costs of noise-induced hearing loss in the US may exceed \$100 billion annually (please see attached paper titled “Economic Impact of Hearing Loss and Reduction of Noise-Induced Hearing Loss in the United States” for details on the methods used to arrive at this estimate). Additionally, research from my team estimates that the cost of cardiovascular disease resulting from noise in the US may exceed \$100 billion annually (please see attached paper titled “Valuing Quiet: An Economic Assessment of U.S. Environmental Noise as a Cardiovascular Health Hazard” for details on how this estimate was derived). Using the results of research conducted in Europe (Dzhambov et al, 2015), and scaling the relevant cost estimates from that study to the US population, the economic value of sleep disturbance alone may be more than a third of a billion dollars annually in the US. Similarly, using relevant cost estimates from Europe and scaling them to the US population, the impacts of outcomes like dementia can add several billion more (Harding et al, 2013). The economic impacts extend beyond health to include things like property values, which may decline by approximately 1% with every 1 dB increase in noise level (Getzner and Zak, 2012). The economic impact of lost productivity is not well understood, but could dwarf the other impacts.

Noise reductions are desirable

When consideration is given to reducing noise levels associated with airports and other transportation sources, implementing noise control measures around airports has been shown to have good cost-effectiveness (Jiao et al, 2017). Research also suggests that people are willing to voluntarily bear an additional economic burden to reduce their annoyance from noise (Kim et al, 2019).

Noise is an environmental justice issue

One final and very important point to consider is that economic costs are not equitably distributed. Research indicates that noise exposures, and subsequently health impacts, may be greater in marginalized, minority, and disadvantaged communities (Casey et al, 2017; Batterman et al, 2021; Simon

et al, 2022). Additionally, regardless of their community makeup, communities located more proximately to airports suffer inequitable exposures (Hauptvogel et al, 2021). This represents a tremendous environmental injustice, and the establishment of the Commission could help to address this injustice.

If you have any questions about this testimony, or need additional information, please do not hesitate to contact me at 734-763-2870 or via email at rneitzel@umich.edu. Thank you for your consideration of this very important issue.

About the author

Richard Neitzel, PhD, CIH, FAIHA is a Professor of Environmental Health Sciences and Global Public Health at the University of Michigan (UM) School of Public Health. He has published >120 peer-reviewed manuscripts focused on exposures to, and impacts of, noise and other occupational and environmental hazards. He is particularly interested in incorporating new methodologies and exposure sensing technologies into research and has a strong interest in translating his research findings into occupational and public health practice. He has created a job-exposure matrix for occupational noise exposures in the U.S. and Canada, available at <http://noisejem.sph.umich.edu/>. He is also the Principal Investigator of the national-scale Apple Hearing Study, <https://sph.umich.edu/applehearingstudy/>. Dr. Neitzel is Chair of the ACGIH® Threshold Limit Values for Physical Agents (TLV®-PA) Committee. He is also a Fellow of the American Industrial Hygiene Association, Past President of the National Hearing Conservation Association and has been a Certified Industrial Hygienist since 2003.

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