Optimizing airport flight patterns take a toll on human health

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Health costs associated with noise from changing flight patterns over populated urban landscapes far outweigh the benefits of reduced flight times, according to a new study conducted at Columbia University's

Mailman School of Public Health and Queens Quiet Skies. The researchers used flights from LaGuardia airport that have historically flown over Flushing Meadows and the U.S. Tennis Center in Queens—known as the TNNIS route—as a case study to explore the trade-offs between more efficient flight routes and suffering on the ground. The findings appear in the *International Journal of Environmental Research and Public Health*.

"Airports in the U.S. have gradually been transitioning to automated flight systems," said Peter Muenning, MD, professor of Health Policy and Management at the Mailman School. "These systems generate new flight paths over populated areas. While they can improve flight efficiency, the increased noise associated with these novel flight patterns potentially pose serious health threats to nearby communities—including cardiovascular disease and anxiety disorder as consequences of noise."

The year-round use of 'TNNIS Climb' at La Guardia implemented in 2012 was a result of flight automation in New York City. No environmental assessment or environmental impact statement was ever performed on the route.

"Flights from LaGuardia airport have historically flown over Flushing Meadows in Queens," noted Muennig, who also leads Global Research Analytics for Population Health at Columbia.

"During U.S. Open tennis matches, the residents of certain neighborhoods in Queens had to endure heavy airplane traffic over their homes, but it only lasted a few weeks. Now, they have to contend with it year-round."

The researchers compared the costs and quality-adjusted life years (QALYs) gained associated with reverting to pre-2012 flight patterns seen prior to the year-round use of TNNIS. The TNNIS climb increased

airplane noise to above 60dB over some of the most densely populated areas of the city.

"Our study focuses on health and economic impacts of a single flight route as a result of flight automation, however, our analysis uses inputs that may be generalizable to other settings," observed Muenning. "The results point to the strong need for careful study of public health impacts of such changes before they are implemented."

More information: Zafar Zafari et al, The Trade-Off between Optimizing Flight Patterns and Human Health: A Case Study of Aircraft Noise in Queens, NY, USA, *International Journal of Environmental Research and Public Health* (2018). DOI: 10.3390/ijerph15081753

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