

Cardiovascular Disease and Airport Noise Exposure Project 03

Project manager: N. Sizov, FAA
Lead investigator: J. Peters, Boston University School of Public Health

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Linkage to AEE Roadmap

- Health Impacts of Aviation Noise
 - To investigate the risks of cardiovascular outcomes associated with noise-related exposures

Goal of the Project

- Aims to evaluate the relationship between aircraft noise exposure and cardiovascular health by linking with an existing national longitudinal health cohort (Women's Health Initiative) for which detailed individual data and high geographical resolution are available.

Schedule and Status



- Fall 2014: Determine airports and time points for estimating noise exposure
 - Applications and forms for linking to WHI data completed
 - Noise data availability for airports and time points determined
- March 2015: Obtain noise estimates for 2000-2014 for 94 airports
 - Contract in place with Volpe and Wyle
 - Data Use Agreements with WHI and FAA in place
 - New projected date: April 2016
- May 2015: Develop methods to estimate pre-2000 noise exposure for WHI; Explore link with an additional cohort
 - Method development and discussion with the Nurses Health Study and Health Professional Follow-up Study in progress.
- August 2015: Link noise exposure with cohort data
 - New projected date: August 2016

Approach and Accomplishments



- Completed procedural steps related to accessing WHI data for linkage with noise data
 - Obtained approval from Boston University and University of North Carolina Human Subjects Review Boards
 - Entered into Data Use Agreement with WHI
- Coordinated with FAA regarding noise data
 - Determined data format for linking with geocoded residential addresses
 - Determined potentially available data for 2000-2015
 - Entered into a Data Use Agreement
 - Obtained and linked test noise data to determine potential issues with data linking in WHI

Approach and Accomplishments (cont)



- Worked with colleagues at Volpe and Wyle to determine optimal noise metrics from AEDT that could connect with WHI participant information
 - DNL
 - Leq
 - Time above threshold
 - Leq – Lamb
 - Possibly in future: SEL, LAmax

Approach and Accomplishments (cont)



- Obtained NIH funding (R01) to complete the multi-year study in WHI, including aircraft noise, traffic noise, and air pollution
 - ASCENT support for Project 3 provided pilot data and infrastructure necessary to successfully land large award
- New direction for Project 3 intended to provide insight about health effects of noise not available from WHI cohort
 - Evaluate the relationship among aircraft noise exposure, noise perception and stress response in the Nurses' Health Study (NHS) and the Health Professional Follow-up Study (HPFS)
 - Investigate whether there are gender differences in the relationship between noise and health in the NHS & HPFS

Summary



- Summary statement
 - We are obtaining noise data and will be assigning longitudinal aircraft noise exposures within the large cohort of WHI (N>160,000) with 1) participant-level exposures, 2) systematically ascertained, physician-reviewed outcomes, and 3) individual-level risk factors.
 - We are developing a collaboration to also conduct a noise-health study with the NHS/HPFS (another well-established cohort with individual data).
- Next steps
 - With NIH funding, we will evaluate the health effects of aircraft noise exposure in WHI.
- Key challenges/barriers
 - Historical modelling - spatially and temporally interpolating noise exposure particularly prior to 2000.
 - Procedures/applications involved in working with NHS & HPFS.

Publications

- N/A

Contributors

- BUSPH: Junenette Peters, Jonathan Levy
- UNC: Eric Whitsel (WHI Sponsor)
- Brown: Gregory Wellenius

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- Hansell AL, Blangiardo M, Fortunato L, et al. Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study. *BMJ* 2013;347:f5432.
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Collaboration



- Between Noise PIs
 - Pennsylvania State University with NIH funding

- With Advisory Board
 - Wyle

- Other
 - Volpe Transportation Center