LAX Community Noise Roundtable

Review of Two Recent Health Studies Related to Aircraft Noise

November 13, 2013
On October 8, 2013, two independent studies examining potential health effects related to aircraft noise exposure were published in the British Medical Journal:

- One study was conducted by researchers in the United States (US Study).
- The other study was conducted by researchers in Great Britain (British Study).
- Both studies associated certain health conditions or outcomes with a range of aircraft noise exposure levels.
The studies’ claims were picked up by US and international media outlets, making headlines in print and video media.

“Airport Noise Linked to Heart Risk” – New York Times

“How living near an airport could shorten your life . . .”
- Daily Mail

After the initial media “buzz”, it is important to take time to understand the strengths and weaknesses of the studies.

Purpose of tonight’s presentation is to introduce the studies, review the results, and examine the strengths/weaknesses of the studies.
US Study

- **Objective:** “To investigate whether exposure to aircraft noise increases the risk of hospitalization for cardiovascular diseases in older people (≥65 years) residing near airports.”

- Examined the year 2000 Medicare records of 6 million residents age 65 or older living near 89 airports

- Associated the year 2009 aircraft noise exposure ≥45 DNL (distributed over zip code zones) with hospital admissions for cardiovascular related diseases

- **Conclusion:** “Long term exposure to aircraft noise is positively associated with hospitalization for cardiovascular disease.”
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Strengths

• The study used a very large population sample in areas known to be exposed to aircraft noise at 89 airports

• The researchers made an effort to account for some of the “confounding” factors (e.g., air quality, traffic noise, ethnicity)

• The aircraft noise data was provided by FAA

• The funding body, FAA, was not involved in conducting the research or the conclusions reached
Weaknesses

- The population was composed of people older than 65
- The study did not account for smoking, poor diet, genetic predisposition to heart disease, or lack of exercise
- The study did not associate the length of time of individuals were exposed to specific aircraft noise levels
- The results for approximately one-third of the airports indicates no risk or reduced for cardiovascular disease
- Zip code zones were the smallest geographic divisions for defining the noise exposure of a set of residents
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Using a Zip Code Zone to Represent a Single Noise Level Introduces Errors

Example for Presentation Purposes Only
Weaknesses (cont.)

• The study utilized aircraft noise exposure levels below 55 DNL where noise model results are generally less accurate than close in to the airport.

• The aircraft noise exposure data could not be associated with health effects on an individual level.

• The medical records were for a different period of time than the aircraft noise exposure data.
From the Researchers:

- “Further research should refine these associations (between aircraft noise and risk of CVD hospitalizations) and strengthen causal interpretation by investigating modifying factors at the airport or individual level.”

Translation:

- More research is needed
Policy Implications of the US Study Results

• The results of the US Study do not provide a solid foundation upon which FAA can make policy changes related to human exposure to aircraft noise
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British Study

- **Objective:** “To investigate the association of aircraft noise with risk of stroke, coronary heart disease, and cardiovascular disease in the general population.”

- **Focused on hospital admission records for 3.6 million residents living in the vicinity of London’s Heathrow Airport**

- **Examined the effects of daytime and nighttime aircraft noise separately**

- **Conclusion:** “Areas with high levels of aircraft noise related to Heathrow airport in London had increased risks of stroke, coronary heart disease, and cardiovascular disease.”
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British Study

Daytime Aircraft Noise Exposure (Leq)

Nighttime Aircraft Noise Exposure (Leq)

2001 Average Daytime (top) and Nighttime (bottom) Aircraft Noise Exposure (Leq) at Heathrow Airport
Strengths:

• Study used a large population in areas around Heathrow Airport known to be exposed to aircraft noise

• The researchers made an effort to account for some of the “confounding” factors conditions (e.g., air quality, traffic noise, ethnicity)

• The aircraft noise data was provided by the Civil Aviation Authority

• The funding bodies were not involved in conducting the research or the conclusions reached
Weaknesses:

• The study was for a single airport; London Heathrow

• Not all confounding factors could be eliminated (e.g., smoking on an individual basis)

• The study did not associate the length of time of individuals were exposed to specific aircraft noise levels

• The accuracy of the noise model at low noise levels

• The medical records were for a different period of time (2001-2005) than the aircraft noise exposure data (2001)
From the Researchers:

• “. . . further studies are needed to test whether aircraft noise causes these increases in risk or if these results can be explained by some other unmeasured (confounding) factors.”

Translation:

• More research is needed
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Full Study Titles and URLs:

• **Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study**
  - [http://www.bmj.com/content/347/bmj.f5432](http://www.bmj.com/content/347/bmj.f5432)

• **Residential exposure to aircraft noise and hospital admissions for cardiovascular diseases: multi-airport retrospective study**
  - [http://www.bmj.com/content/347/bmj.f5561](http://www.bmj.com/content/347/bmj.f5561)
Questions?