



# Aircraft Noise and Public Health

Noise is often considered a subjective issue because individuals react to noise differently and reactions are context-dependent. However, annoyance can impact daily activities, increase stress, and have severe effects on well-being and health.<sup>1</sup>

Reviews by WHO and others show that there is **sufficient evidence** to demonstrate that **aircraft noise leads to cardiovascular impacts, sleep disturbance, annoyance, and impairment to the cognitive development in children**<sup>2</sup>. Some **emerging evidence** also suggests relationships **between long-term noise exposure and mental health** issues.<sup>2</sup>

## Cardiovascular diseases:

- A 2010 Swiss study<sup>3</sup> involving 4.6 million residents found that heart attacks increased with greater exposure to aircraft noise, especially for exposures over 15 years.
- The large-scale 2015 German study NORAH found statistically significant associations between aircraft noise and heart attacks.
- A 2013 UK study<sup>4</sup> covering 3.6 million people found higher chances of hospital admissions for stroke (24% higher chance), coronary heart disease (21% higher chance), and cardiovascular disease (14% higher chance) for people exposed to aircraft noise over 63 dBA Leq.
- A 2013 US study<sup>5</sup> involving 6 million older people found a 3.5% increase in risk of cardiovascular disease per 10 dBA increase in aircraft noise, above 55 dBA Ldn.

**Sleep:** Time spent in Rapid Eye Movement (REM), which is the restorative part of the sleep cycle, may be reduced due to aircraft noise<sup>6</sup>.

**Annoyance:** Annoyance increases with noise exposure, changes to pitch, and the regularity of being subjected to noise<sup>7</sup>. Non-acoustical factors also contribute to annoyance, such as one's ability to control the intrusions and personal attitude to the noise source<sup>8</sup>.

**Impairment of learning in children:** children are vulnerable to noise given their cognitive and physical development.

**Mental health:** Aircraft noise is associated with decreased quality of life but there is not enough evidence to conclude that aircraft noise is causing psychological ill-health through annoyance<sup>6,9</sup>. However, the recent NORAH study identified significant associations between aircraft noise and depression<sup>10</sup>: risk of depression increased by 8.9% per 10 dBA increase in noise (association was particularly strong for people who were psychologically sensitive).

<sup>1</sup> Basner, M., et al. (2014) Auditory and non-auditory effects of noise on health. *Lancet*, 383 9925:1325-1332.

<sup>2</sup> Aviation Environment Federation (2016) Aircraft noise and public health the evidence is loud and clear <http://www.aef.org.uk/uploads/Aircraft-Noise-and-Public-Health-the-evidence-is-loud-and-clear-final-reportONLINE.pdf>

<sup>3</sup> Huss, A., Spoerri, A., Egger, M., & Röösl, M. (2010) Aircraft noise, air pollution, and mortality from myocardial infarction. *Epidemiology*. 21, 829-836

<sup>4</sup> Hansell, A., et al. (2013) Aircraft noise and cardiovascular disease near Heathrow airport in London: small area study. *BMJ*. 347, 5432-5442.

<sup>5</sup> Corriera et al. (2013) *BMJ* 2013;347:f5561

<sup>6</sup> Clark (2015) Aircraft noise effects on health. Prepared for the Airports Commission.

<sup>7</sup> Berry, B., and Flindell, I. (2009) Estimating dose response relationships between noise exposure and human health. BEL Report 2009-2 Technical Report July 2009

<sup>8</sup> World Health Organisation Europe (2011) Burden of disease from environmental noise: qualification of healthy life years lost in Europe.

<sup>9</sup> Health Protection Agency (2010) Environmental noise and health in the UK. A report by the Ad Hoc Expert Group on Noise and Health. Didcot, Oxfordshire, UK

<sup>10</sup> NORAH (2015) Knowledge no.14: NORAH noise impact study: overview of results. Noise-Related Annoyance, Cognition, and Health. Airport and Region Forum.