

## **The time-distributional effects of night-time aviation noise exposure on annoyance and sleep disturbance**

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### **ABSTRACT**

This paper will report on the methodology for a new United Kingdom (UK) study of aviation night-noise exposure on health. Funded by the UK Department for Transport (DfT), the study is examining the effects of aviation night-noise exposure for a range of night-time periods on sleep disturbance and annoyance. The study involves a cross-sectional survey of 4,000 participants living near eight UK airports to assess associations of aircraft noise exposure at night and subjective sleep disturbance and annoyance, as well as an objective sleep disturbance study of 200 participants, where physiological assessments of sleep disturbance will be linked to aircraft noise exposure at the participant's home. The study will deliver exposure-response functions showing how time-averaged metrics such as  $L_{Aeq,8h}$ ,  $L_{Aeq,1h}$ ,  $N60$  relate to subjective and objective sleep disturbance, and annoyance, which could be used to inform updates to the DfT's Transport Analysis Guidance (TAG) and subsequently aviation night-noise policy in the UK. It will also explore if a relationship for objective sleep disturbance can be estimated for event-related metrics such as  $L_{Amax}$  and Sound Exposure Level. Effect modification will be investigated; quantifying whether some population groups may be more vulnerable to the effects of aviation night-noise on sleep disturbance and annoyance.

Keywords (3-6): Aviation, Sleep, Annoyance, Exposure-response