

Science for Environment Policy

How does living with aircraft noise affect wellbeing? A study of UK airports

Airports are associated with air and noise pollution and may, therefore, reduce the quality of life of local people. This study assessed the link between aircraft noise and subjective wellbeing, using data from 17 English airports. The authors conclude that living under flight paths has a negative effect on people's overall wellbeing, equivalent to around half of the effect of being a smoker for some indicators.

Air traffic in Europe is expected to increase between 1.4 and 2.2 times by 2030¹, due to increasing demand for air travel and trade links with emerging international markets. To cope with this increase in demand, proposals for airport expansion have been made. In the UK, for example, three airport expansions have been suggested, and are currently being assessed in terms of economic, environmental² and human health impacts. Airport expansion is a contentious issue, with environmental groups and scientists citing the potential [climate](#) impacts and local residents fearing economic consequences, such as loss of property value.

This study focused on the impact of aircraft noise on subjective measures of wellbeing. Transportation noise has been linked to adverse effects on quality of life, wellbeing and [health](#), due to factors such as stress, anxiety and raised blood pressure. [Noise](#) is a leading environmental complaint in the EU, regulated by the [Environmental Noise Directive](#). Although there are well-established links between noise and physical health, evidence on the link to subjective measures of wellbeing, such as life satisfaction and happiness, is lacking.

The UK-based researchers assessed how living near to airports (or underneath flight paths) explained variation in people's responses to questions on subjective measures of wellbeing in a large national survey. They combined household data on subjective wellbeing (measured by questions on happiness, life satisfaction, sense of worthwhile/purpose in life, anxiety and positive 'affective balance' — based on happiness minus anxiety) with geographical data on airport proximity (within 5 km) and measures of aviation noise in decibels. This is the first time these datasets have been used to study household-level aviation impacts.

The major data source used for the study was the [Annual Population Survey](#), an annual survey of around 155 000 households and 360 000 people in the UK. Using postcodes, data from the survey was matched to noise-measurement maps compiled by [DEFRA](#) and provided by the Cabinet Office. Noise data included day- and night-time noise, measured between June and September 2012. In total, the data includes a two-year sample of almost 190 000 households (over 20 times that of previous similar studies) with information on noise and proximity for 17 airports in England.

The researchers created models for: airport proximity; presence of daytime aircraft noise; and presence of night-time aircraft noise. Airport proximity was not significantly associated with any of the subjective wellbeing variables, suggesting that living close to an airport alone (i.e. without noise pollution) does not have a noticeable impact on subjective wellbeing.

Continued on next page.

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1. [EuroControl \(2013\) Challenges of Growth 2013 Summary Report](#). European Organisation for the Safety of Air Navigation, Brussels, Belgium.

2. For more information on the environmental impact of aviation in Europe, see the 2016 European Aviation Environmental Report: <http://ec.europa.eu/transport/modes/air/aviation-strategy/documents/european-aviation-environmental-report-2016-72dpi.pdf>

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Living within a daytime aircraft noise path (with noise at or above 55 decibels), however, was negatively associated with all measures of subjective wellbeing: lower life satisfaction, lower sense of worthwhile, lower happiness, lower positive affect balance, and increased anxiety. The authors found consistently negative and significant results across all five variables. The researchers could also predict the effect on subjective wellbeing associated with each decibel increase in noise, which they say has potential for modelling the possible wellbeing impacts due to changes in aircraft noise.

Although there were consistent negative impacts from daytime noise across all measures of wellbeing, the magnitude of these associations were small compared to other common drivers of wellbeing, such as unemployment, poor health and smoking (the negative effects of which are at least twice that of aviation noise).

The researchers found no evidence that night-time noise affects subjective wellbeing. There is a possibility, however, not explored in the study, that the noise had a physiological effect on the individuals. Furthermore, the sample of residences affected by night-time noise at or above 50 decibels was 50% lower than for daytime noise, which may affect the significance of the results.

This is the first study to merge national household-level data with geographic location data on airport proximity and objective measures of noise in England, enabling the authors to assess how aviation influences quality of life on a sample over 100 times bigger than the most prominent previous [study](#). Based on their results, the researchers conclude that living under air-traffic flight paths may have a negative impact on subjective wellbeing. These findings support lower real-estate market demand in areas where there is aviation noise.

