

# The impact of airspace change on noise sensitivity and how static SoNA results compare to other International Noise Studies

Dave Gilbert and Stephen Clark TAG  
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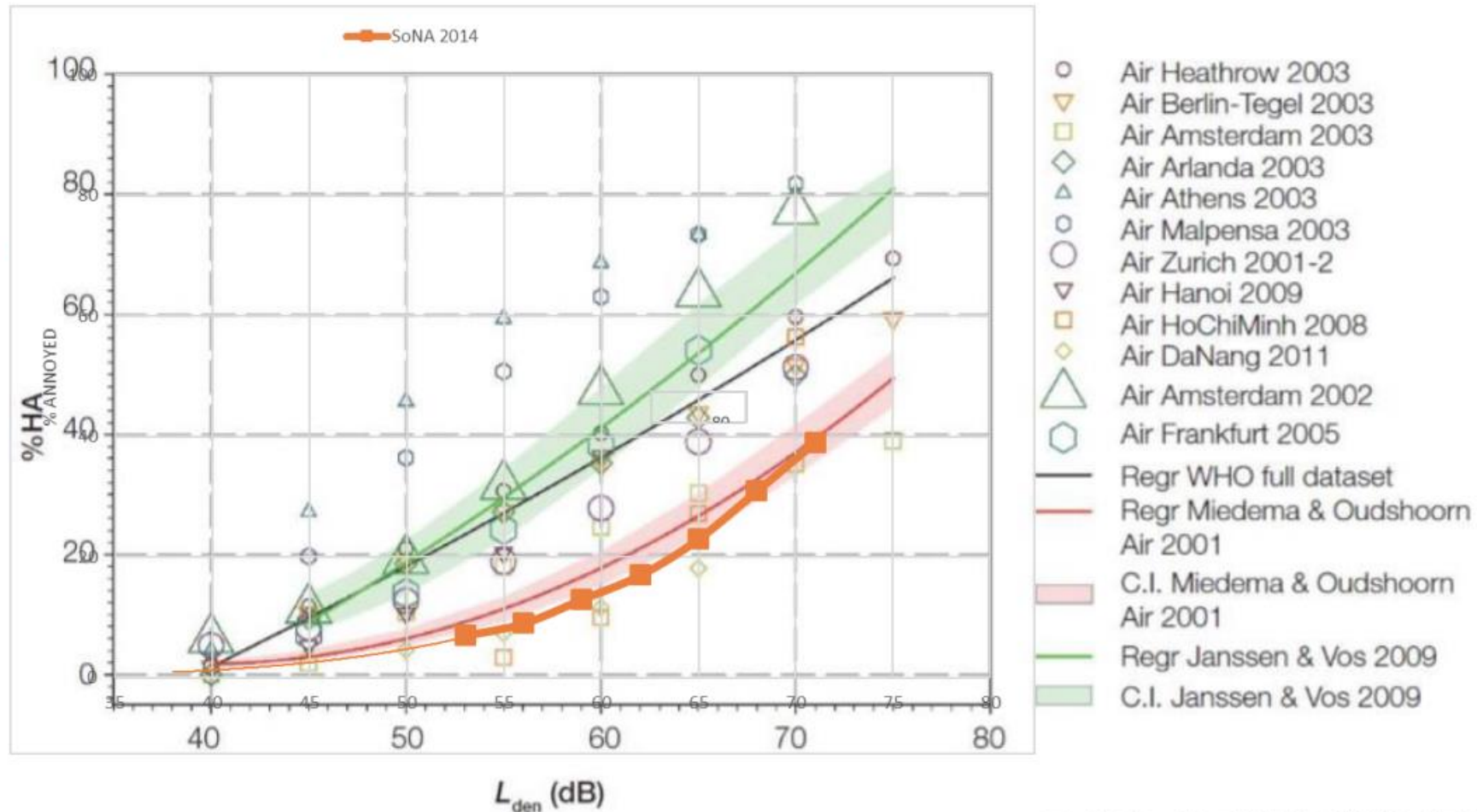
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# WHO 2018 – aviation vs SoNA 2014

A comparison of WHO guidance and SoNA

The SoNA 2014 annoyance curve (orange squares) superimposed on WHO studies

The WHO annoyance curve is shown by the 'Black line'

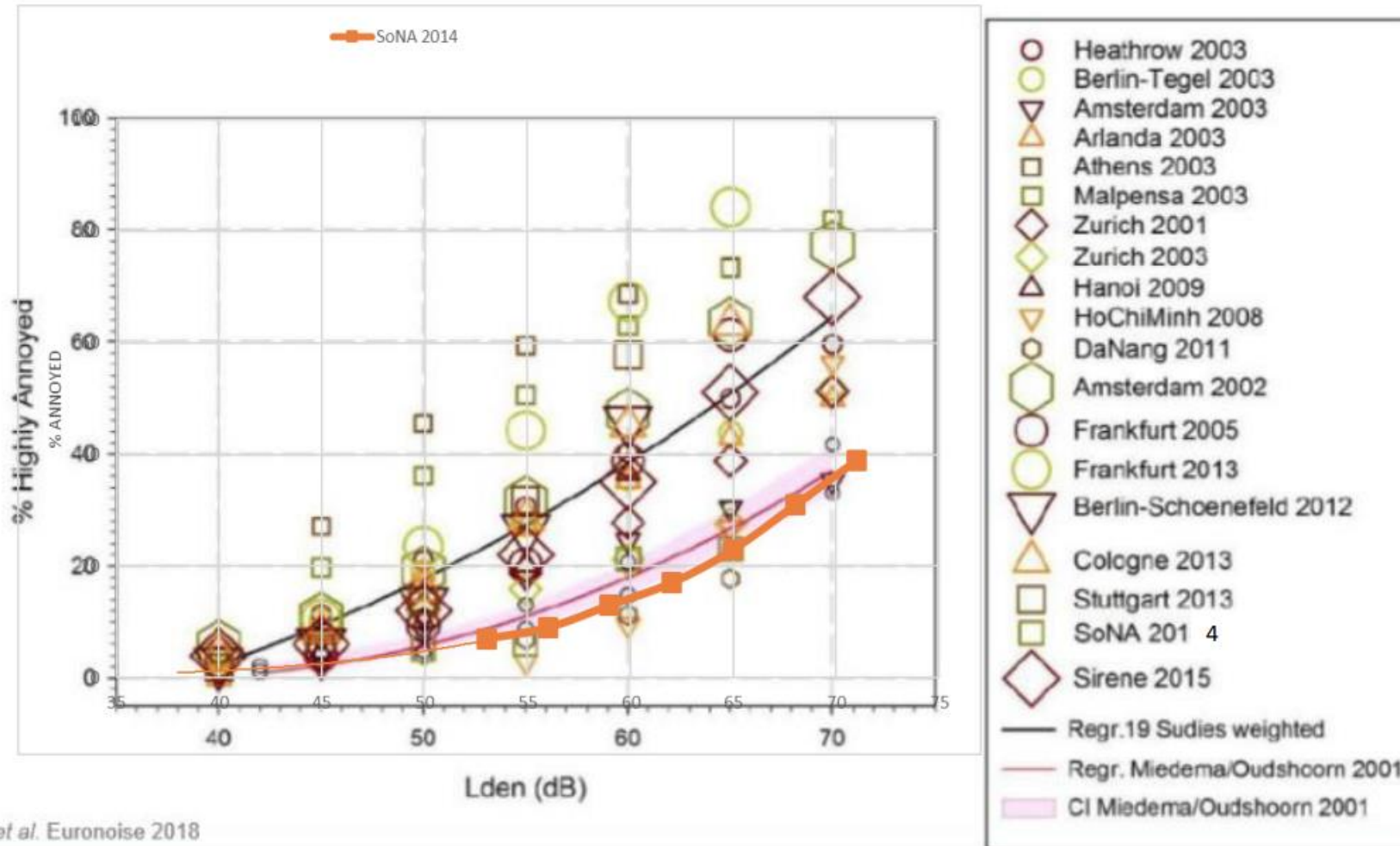


Int. J. Environ. Res. Public Health 2017, 14, 1539

# Aviation – additional studies incl SoNA 2014

The most recent evidence (including post WHO sources) shows the divergence between SoNA and current international research even more markedly.

SoNA is an outlier (the mauve curve is based on a 20 year old research)



Guski *et al.* Euronoise 2018

# How does SoNA compare with high and low rate of change research?

This graph compares studies based on low and high change scenarios

The red line shows high rate of change surveys, the black low rate scenarios

SoNA (which lies very close to the 20yr old green line) is way out of step with all current research – even for low rate of change scenarios - which of course the ANPS and Aviation 2050 are definitely not

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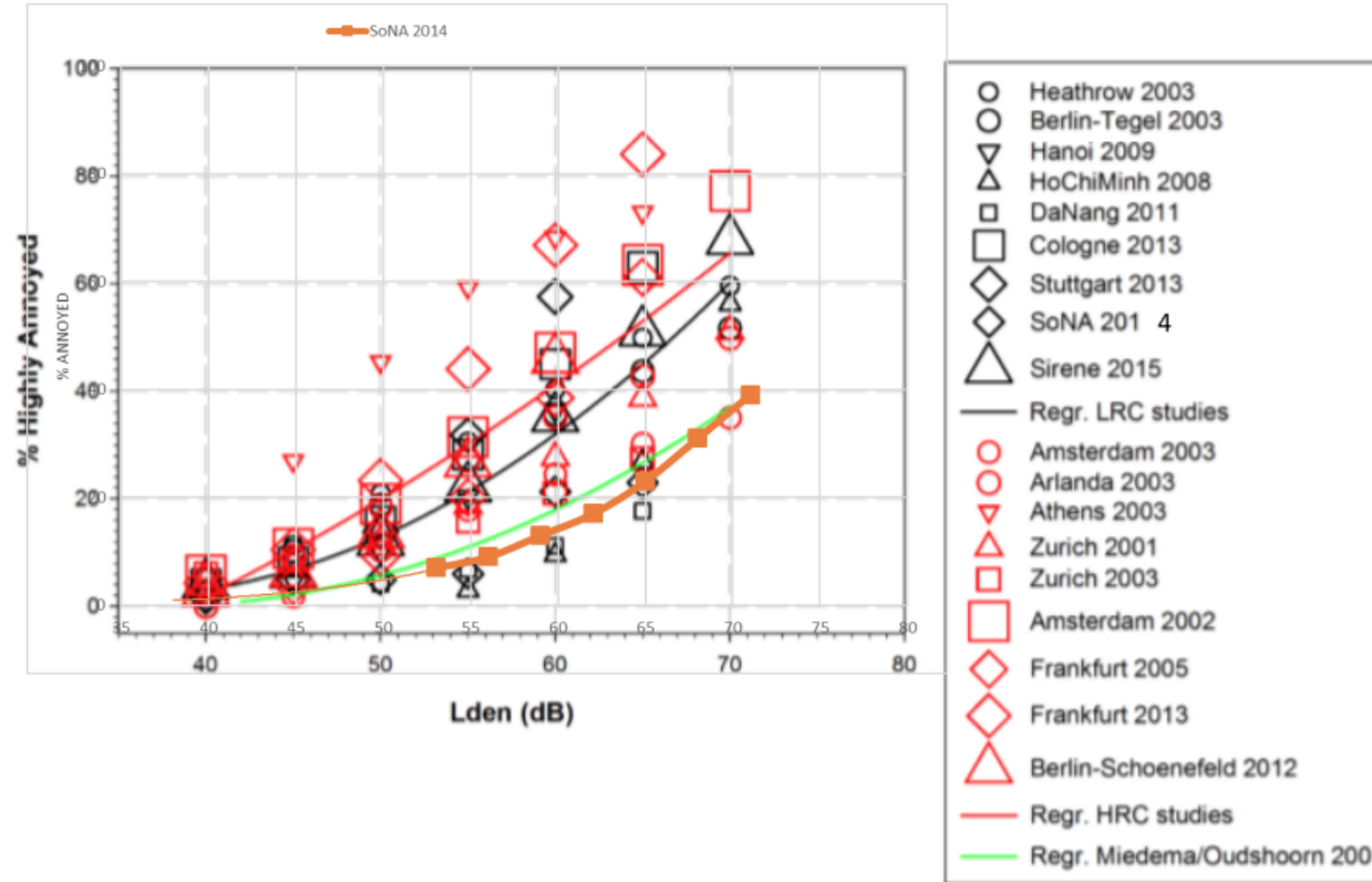


Figure 2. Exposure-response data from %HA and Lden from 9 HRC studies. The black curve represents the quadratic fit for LCR studies, the red curve represents the quadratic fit for HRC studies. For comparison, the general EU-standard curve [2] is shown (green).

Diagram from Aircraft noise annoyance - Present exposure response relations R Guski, Rudolf Schuemer, Dirk Schreckenber, Euronoise 2018



# Academics agree that change increases noise sensitivity

Quote from International Journal of Environmental Research and Public Health 'A Systematic Review of the Basis for WHO's New Recommendation for Limiting Aircraft Noise Annoyance' December 2018 Truls Gjestland SINTEF DIGITAL, N-7465 Trondheim, Norway; truls.gjestland@sintef.no; Tel.: +47-932-05-516

*'Gelderblom et al. [20] have applied this "high-rate/low-rate" classification to 62 aircraft noise annoyance studies conducted over the past half century. They show that there is a difference in the annoyance response between the two types amounting to about 9 dB. To express a certain degree of annoyance people at a high-rate change (HRC) airport on average "tolerate" 9 dB less noise than people at a low-rate change (LRC) airport. Guski et al. [2] report a similar but somewhat smaller, 6 dB, difference. Any attempt to develop an average dose–response curve from a set of studies will therefore be highly dependent on the types of airports that are included.'*

Ref 2 Guski, R.; Schreckenberg, D.; Schuemer, R. 'WHO Environmental Noise Guidelines for the European Region. A systematic review on environmental noise and annoyance' Int. J. Environ. Res. Public Health 2017, 14(12), 1539

Ref 20 Gelderblom, Femke B.; Gjestland, Truls; Fidell, Sanford; Berry, Bernard 'On the Stability of Community Tolerance for Aircraft Noise' Acta Acustica united with Acustica, Volume 103, Number 1, January/February 2017, pp. 17-27(11)

**A 6dB difference (in  $L_{Aeq}$ ) is equivalent to 4x more flights of the same loudness, a 9dB difference 8x more**

# The UK Govt does not seem to have included change impacts in its development of airspace policy by only using SoNA

“...It is therefore not possible to determine the “exact value” of %HA for each exposure level in any generalized situation. Instead, data and exposure–response curves derived in a **local context** should be applied whenever possible to assess the specific relationship between noise and annoyance **in a given situation**. If, however, local data are not available, general exposure–response relationships can be applied, assuming that the local annoyance follows the generalized average annoyance.”

From WHO (2018) Environmental Noise Guidelines for the European region

SoNA (2014) is a UK based survey with 75% of respondents from around Heathrow it could be considered ‘local’. However SoNA (2014) provides a **static (LRC) measure** of annoyance.

**The ANPS and ‘Aviation 2050’ are expansion scenarios, each involving an extremely high rate of change (HRC)**

It is not appropriate to apply SoNA to either the ANPS or airspace modernisation. In reality annoyance levels will occur 6-9dB lower and in consequence the **significant adverse impacts will be far higher than recognised in UK aviation policy**.

**The Government needs to re-evaluate its decisions on the basis of this clearly proven academic research.  
Heathrow as a responsible corporation needs to apply latest understanding of airspace impacts in its planning.**

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# Questions

- **Who is responsible for protecting the public – who has the duty of care? DEfRA, DfT, Public Health England, Heathrow or the CAA?**
- **Leading researchers accept that change increases sensitivity**
  - **What does Heathrow understand and how is it being incorporated into their planning? What advice have they received from their noise expert's on this?**
  - **What is the CAA's position on this? How long do they advise that change impact will last?**
  - **What is the DfT's position on this and how has it been incorporated into Government Strategy?**
- **SoNA gives a static measure of annoyance, it should not be used for high rate of change situations**
  - **What is the CAA's position on this? How should SoNA be adapted for change situations?**
  - **What is the DfT's position on this and how have they included change impacts in their thinking?**