

Over exposure

Assessments made by EHPs may be underestimating the impact of neighbourhood noise. **Daniel Baker** explains

Research into adverse health effects from environmental noise mainly focuses on transport sources, including road, rail and air traffic. Transport noise is ubiquitous and expected in all localities, albeit in varying levels over time. Its sources are considered anonymous and are present in all communities. They are homogenous, benign and not generally associated with any particular operation, premises or person.

In contrast, 'neighbourhood' noise can vary markedly in character, level, exposure and time. Sources are heterogeneous and include animals, church bells, recycling plants, clay pigeon ranges and amplified music.

Perhaps because of this variety and the differing characters of the areas neighbourhood noise affects, there is a clear absence of scientific evidence on exposure and health outcomes related to specific sources.

The use of legislation and guidance is bread and butter to EHPs. In many cases, it is not about knowing the legislation and guidance inside out but knowing where to find the relevant legislation or guidance and how to interpret and use it.

There now appears to be an increase in the number of assessments that use guidelines suitable for anonymous noise – as considered in the WHO Guidelines for Community Noise 1999 and BS8233 2014 guidance on sound insulation and noise reduction for buildings – but applied to neighbourhood noise sources. The WHO and BS8233 guidance documents are frequently used to justify town planning for proposed new commercial or residential sites or applied to noise impact in nuisance assessments from existing sites with specific noise characteristics.

The guidance allows sound to be measured and assessed, irrespective of locale or context. But whether sound is perceived as noise also depends on the sensitivity of the listener and importantly the context in which the sound is received. The application of guidance in this way therefore ignores a variety of factors that affect perception and reaction to a particular sound in the context of a home environment. The result is reduced protection from neighbourhood noise for new and existing residents in the UK.

To simplify the point, consider the daily average food intake requirement. It is

recommended that women should consume approximately 2,100kcal per day. This can be achieved by consuming a diet of doughnuts and ice cream rather than a balanced variety of foods.

However, the inherent characteristics of doughnuts and ice cream would result in an increased likelihood of unfavourable health outcomes. It is not the food itself but the inherent characteristics of the food that are significant and increase the likelihood of adverse effect.

The same can be said for noise and character. It is irrelevant whether or not the noise meets the recommended upper limits of the WHO guidelines because it is the characteristics and not the absolute level that leads to negative outcomes, as perceived by the listener.

In February, I published a technical note in the *Journal of Applied Acoustics*. The note compared four sources of industrial sound with character against noise guidelines for steady anonymous noise (WHO and BS8233) and BS4142 2014 methods for rating and assessing industrial sound. Context-related observations

of noise impact were also considered. My findings demonstrate why an approach using guidance for steady anonymous noise (WHO and BS8233) is erroneous and ultimately to the detriment of UK industry and residential amenity.

In all four cases, when applying typical worst case noise levels, the sources were found to comply with criteria set out in BS8233 and WHO 1999. However, the difference between the rated specific sound level and the background sound level according to the BS4142 assessment ranged from +14dB to +16dB for daytime noise and +19dB to +25dB for night-time noise, indicating significant adverse impact. Subjective and context-related observations of noise impact supported a view of unreasonable noise in all cases.

Professionals working in acoustics who apply this type of methodology may be allowing more noise than is reasonable, contrary to national noise policy. In my experience of investigating nuisance, neighbourhood noise is a common source of annoyance and complaint to local authorities. But while housing developers and acoustic consultants move on, residents, local businesses and local authorities remain and are left to deal with conflicts as they arise. **E**

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