

Press release. Embargoed until 12.00 noon 18th July 2016.

The European office of the World Health Organisation (WHO) is in the process of developing Environmental Noise Guidelines for the European Region as a regional update to the WHO Community Noise Guidelines.

The new Guidelines will be based upon a review of evidence of the health effects of environmental noise in the light of significant research carried out in the last few years.

For the first time the panel is investigating adverse health issues in local residents following the construction of wind turbines, the health benefits of noise mitigation and possible government intervention to decrease noise levels.

It will look at adverse affects such as: sleep disturbance, annoyance, cognitive impairment, mental health and wellbeing, cardiovascular diseases, hearing impairment and tinnitus and adverse birth outcomes.

A number of experts, and concerned individuals who have gained some expertise in this field have sent an Open Letter to members of the panel welcoming the investigation. (1)

Christine Metcalfe, U.K. spokesperson for the group said today:

‘Complaints of adverse health impacts from those forced to live close to wind turbines continue to rise. These involve both audible noise including low frequency noise, and inaudible noise below 20 Hz, known as **infrasound**. Both audible and inaudible lower frequency noise can cause unpleasant sensations including pressure and vibration, at sound levels which may not be audible. Complaints of severe sleep deprivation, severe chronic stress, and disabling vestibular dysfunction symptoms (dizziness, vertigo etc..) abound, with problems varying from site to site depending upon local topography, height and number of turbines, inter-turbine distances, and the distance between turbines and homes. The common thread to the reported symptoms (known as "noise annoyance") is the activation of the **startle reflex**, which can be triggered by acoustic, vestibular, and tactile stimuli - which if activated together can have a synergistic effect (2). ***To argue that the sleep disturbance, physiological stress and vestibular dysfunction symptoms and their serious long term adverse health consequences don't exist or are caused by scaremongering is neither scientifically correct, nor morally or ethically defensible. This is particularly the case on the part of medical or acoustical professionals, in view of both their training, and their respective professional obligations to protect the health and safety of the public.***

Despite mounting anecdotal and academic evidence, no health monitoring is underway nor mitigation against adverse health effects following the construction of wind turbines which remains shockingly absent from planning guidelines in many European countries. It is imperative that new guidelines encourage governments better to safeguard the health of their citizens.

We remain hopeful that the panel's deliberations will result in tough new European guidelines which in turn will prompt a serious worldwide examination of all aspects of this problem, including the widely-reported effects on animals. Although not part of the current WHO remit, there is an urgent need for governments not to abrogate responsibility for examining rising numbers of reported effects on wildlife and domestic animals.

We also trust and hope that the panel will issue stringent guidelines to European governments to ensure that those whose health is currently badly affected can look forward to some

workable mitigation or removal of implicated turbines. Only then can future populations be protected from suffering the hell that has been inflicted upon some wind farm neighbours.’

Overview of some of the academic reports on human health:

A former Consultant in Sleep Disorders Medicine highlighted in his article in the 2014 issue of the *British Medical Journal*, amongst other warnings, the particular sleep deprivation dangers to children (3):

‘Sleep disturbance may be a particular problem in children, and it may have important implications for public health. When seeking to generate renewable energy through wind, governments must ensure that the public will not suffer harm from additional ambient noise’ His co-author wrote in *Principia Scientific International* in 2014 (4):

‘The current guideline on separation distance is based on ETSU-R-97 and is manifestly out of date. It is only relevant to the small turbines of that era. The vastly increased scale of today’s turbines means that the current recommendation on turbine separation is grossly inadequate.’

Salt and Lichtenhan of the Washington School of Medicine published an article in the British periodical *Acoustics Today* in 2014 which concluded:

‘Given the present evidence, it seems risky at best to continue the current gamble that infrasound stimulation of the ear stays confined to the ear and has no other effects on the body. For this to be true, all the mechanisms we have outlined (low-frequency-induced amplitude modulation, low frequency sound-induced endolymph volume changes, infrasound stimulation of type II afferent nerves, infrasound exacerbation of noise-induced damage and direct infrasound stimulation of vestibular organs) would have to be insignificant. We know this is highly unlikely and we anticipate novel findings in the coming years that will influence the debate. (5)

In Australia in 2013 the Waubra Foundation issued what it described as an *explicit warning notice* to Planning Authorities, Departments of Health, Environmental Protection Agencies, Federal, State and Local Governments, Wind Industry Developers and Acoustic Consultants. These included references to the 1985 and 1987 Kelly evidence on wind turbine noise and infrasound, the need for regularly updating latest evidence on dose exposure, plus multidisciplinary acoustic & physiological research needs. (6)

At an International Congress on Sound and Vibration in Florence, Italy in 2015, a paper presented by Dr. Christian Koch demonstrated findings on investigations of perception at infrasound frequencies via the use of fMRI and MEG methods. (7)

The German Medical Assembly meeting in Frankfurt last year called on the German government to conduct urgent scientific research into reported noise issues.

It is crucial to stress the wind turbine's specific noise character. It is already known that the so called ‘annoyance’ level at 40 dBA from wind farms is comparable to 55 dBA from traffic noise, and this has recently been attributed in part to amplitude modulation by experienced acousticians such as Dr Geoff Leventhall (UK), (8) Dr Paul Schomer (USA, former Director of Acoustic Standards) and Steven Cooper (Australia). Wind turbine noise emissions comprise a number of features including a complex and vibrant sound mix, cylindrical sound propagation and refraction from the high levels, distinct peaks at the blade pass frequency, high proportion of infrasound and low frequency noise, and the sharp noise level in quiet areas especially during nights and cold seasons. ***It highlights strongly that wind power sound has a very characteristic sound profile, and that this must be specifically considered in the new regulations.***

And on animals:

A study of badgers notes the paucity of data existing with which to assess the effects of wind turbines noise on terrestrial wildlife, despite growing concern about the impact of infrasound from wind farms on human health and well-being. It features the stress hormone cortisol levels of badgers living in close proximity to wind turbines:

‘We suggest that the higher cortisol levels in affected badgers is caused by the turbines’ sound and that these high levels may affect badgers’ immune systems, which could result in increased risk of infection and disease in the badger population’. (9)

Another study on effects on pig-rearing in Poland was conducted to assess the effect of rearing pigs at three different distances from a wind turbine (50, 500 and 1000 m) on the physicochemical properties and fatty acid composition of loin and neck muscles. Avoiding noise-induced stress is important not only for maintaining meat quality but also for improving animal welfare. (10)

Dr Mariana Alves-Pereira of the Lusofona University in Portugal has been researching vibroacoustic disease since 1980 initially focussed on the low frequency noise (LFN) that impacted aeronautical technicians. Late in 2013, she presented a case study from Portugal where a family had been exposed for seven years to LFN caused by the operation of nearby wind turbines. Testing showed the increase in LFN inside the home was associated with turbine operation. Medical tests showed the people who were living inside the home had impaired brain function in relation to responding to stimuli as well as their control of breathing. The syndrome is known as Vibro-Acoustic Disorder. (11)

Notes for Editors

For more information contact Christine Metcalfe
email luanam@btinternet.com and phone 01866 844220

1.

Open Letter to the members of the panel developing the WHO Environmental Noise Guidelines for the European Region.

Marie-Eve Héroux
Wolfgang Babisch.
Goran Belojevic.
Mark Brink.
Sabine Janssen.
Peter Lercher.
Jos Verbeek.

Marco Paviotti.
Göran Pershagen
Kerstin Persson Wayne.
Anna Preis.
Stephen Stansfield.
Martin van den Berg.

Ladies and Gentlemen,

We understand that you are currently in the process of developing the WHO Environmental Noise Guidelines for the European Region as a regional update to the WHO Community Noise Guidelines. We also understand that:

1. The new Guidelines will be based upon a review of evidence on the health effects of environmental noise in the light of significant research carried out in the last few years.
2. The guidelines will review evidence on the health benefits of noise mitigation and interventions to decrease noise levels.
3. The evidence will be systematically reviewed to assess likely effects such as: sleep disturbance, annoyance, cognitive impairment, mental health and wellbeing, cardiovascular diseases, hearing impairment and tinnitus and adverse birth outcomes.
4. One of the sources of noise you are investigating is that from wind turbines which was not addressed in previous guidelines.

We welcome your review because, despite mounting anecdotal and academic evidence, for too long mitigation against adverse health effects following the construction of wind turbines has been absent from planning guidelines **and noise pollution regulations** in many European countries, **especially with respect to sound below 200 Hz.**

There is a pressing need for new guidelines to encourage governments better to safeguard the health of their citizens.

You will be aware that these problems are not confined to Europe. Neither are they confined to human beings.

We are hopeful that your deliberations will result in tough new European guidelines which in turn will prompt a serious worldwide examination of all aspects of this problem, including the widely-reported effects on animals.

Yours sincerely,

The undersigned:

N.B. 118 and rising, full copy available. Signatories to the letter to the World Health Organisation Expert Panel revising the Environmental Noise guidelines include the following health professionals and scientists: **Medical Practitioners:** Dr Mauri Johansson & Per Fisker (**Denmark**), Dr. Sarah Laurie (**Australia**) Dr. Hakan Enbom (**Sweden**), Professor Alun Evans (**Ireland**), Dr Angela Armstrong and Dr Rachel Conner (**Scotland**), Professor Dr Zuhail Okuyan and Professor Dr Ali Osman Karababa (**Turkey**), Dr Robert McMurtry (**Canada**), and Dr David Lawrence (**USA**), **Osteopath** Dr Johannes Meyer (**Germany and USA**), **Psychologist** Professor Arline Bronzaft, (**USA**) **Nursing Practitioner** Norma Schmidt (**Canada**), **Physiotherapist** Virpi Polkolainen (**Finland**), **Audiologist** Professor Jerry Punch, (**USA**), **Medical Physicist** Dr Mireille Oud (**The Netherlands**), Professor of Otolaryngology and **Neurophysiologist** Alec Salt (**USA**), **Physicist** Dr John Harrison (**Canada**) and **Scientist** Dr Bruce Rapley, (**New Zealand**).

Engineers who signed the Open Letter include **Biomedical Engineer** Dr Mariana Alves Pereira (**Portugal**), **Acoustical Engineers** Sven Johannsen and Erik Brunner (**Germany**), Steven Cooper (**Australia**), Emeritus Professor Colin Hansen (**Australia**) Rick James, Rob Rand, Steven Ambrose and Bill Acker (**USA**) Nicholas Kouwen, PhD., P.Eng., FASCE. Distinguished Professor Emeritus and Adjunct Professor Department of Civil and Environmental Engineering. University of Waterloo. (**Canada**) and other engineers including Ove Bjorklund (**Sweden**) and Peter Mitchell (**Australia**).

2. [Neurosci Biobehav Rev](#). 2002 Jan;26(1):1-11. Tactile, acoustic and vestibular systems sum to elicit the startle reflex. [Yeomans JS](#)¹, [Li L](#), [Scott BW](#), [Frankland PW](#).
<http://www.ncbi.nlm.nih.gov/pubmed/11835980>

3. *Wind Turbine Noise*, *British Medical Journal*, 3 Oct 12
Authors: Christopher D Hanning, honorary consultant in sleep medicine, Sleep Disorders Service, University Hospitals of Leicester, Leicester General Hospital, Leicester LE5 4PW, UK and Alun Evans, professor emeritus, Centre for Public Health, Queen's University of Belfast, Institute of Clinical Science B, Belfast, UK
<http://nieuwerustnoisewatch.org/wp-content/documents/peer-reviewed-articles/15-B-M%20J-Noise.pdf>

4. *Wind Farms and Health*, *Principia Scientific International*, 3 April 14
Author: Alun Evans Professor Emeritus Belfast University
<http://docs.wind-watch.org/Evans-wind-farms-health.pdf>

5. *How Does Wind Turbine Noise Affect People?*, *Acoustics Today*, winter 2014
Authors: Alec N. Salt and Jeffery T. Lichtenhan, Department of Otolaryngology, Washington University School of Medicine, St. Louis, MO 63110
<http://www.windturbinesyndrome.com/wp-content/uploads/2014/04/Salt-et-al.-on-Wind-Turbine-Syndrome.pdf>

6. *Explicit warning notice*, Waubra Foundation, 22 November 13
http://waubrafoundation.org.au/wp-content/uploads/2013/11/Explicit_Warning_Notice_Final_22_November_2013.pdf

7. http://en.friends-against-wind.org/doc/Full_paper_Koch_V2.pdf

8. http://parlinfo.aph.gov.au/parlInfo/download/committees/commsen/076b72db-0da0-4ca6-bffe-b0a0cea05550/toc_pdf/Senate%20Select%20Committee%20on%20Wind%20Turbines_2015_06_23_3580_Official.pdf;fileType=application%2Fpdf#search=%22committees/commsen/076b72db-0da0-4ca6-bffe-b0a0cea05550/0000%22

9. *Wind turbines cause chronic stress in badgers (Meles Meles)* *Journal of Wildlife Diseases*, 52(3), 2016, pp. 000–000 _ Wildlife Disease Association. June 2016
Roseanna C. N. Agnew,^{1,2,4} Valerie J. Smith,³ and Robert C. Fowkes¹
www.jwildlifedis.org/doi/abs/10.7589/2015-09-231

10. *The effect of varying distances from the wind turbine on meat quality of growing-finishing pigs*. *Ann. Anim. Sci.*, Vol. 15, No. 4 (2015) 1043–1054 DOI: 10.1515/aoas-2015-0051
Małgorzata Karwowska, Jan Mikołajczak, Zbigniew Józef Dolatowski, Sylwester Borowski, Department of Meat Technology and Food Quality, University of Life Sciences in Lublin, Skromna 8, 20-704 Lublin, Poland
www.wind-watch.org/documents/page/4

11. Vibroacoustic disease: Biological effects of infrasound and low-frequency noise explained by mechanotransduction cellular signalling. *Progress in Biophysics and Molecular Biology*, Volume 93, Issues 1–3, January–April 2007, Pages 256-279
Mariana Alves-Pereira, Nuno A.A. Castelo Branco
www.sciencedirect.com/science/article/pii/S0079610706000927

