Heartless: Wind Industry Covers Up Health Effects Caused by Low-Frequency Turbine Noise

by stopthesethings
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A couple of years back, STT produced a timeline which highlighted how the wind industry and its pet acoustic consultants managed to set up ‘rules’ which have no relevance to the noise impacts experienced by wind farm neighbours and under which wind power outfits could ride roughshod over rural communities with complete impunity.

That post – Three Decades of Wind Industry Deception: A Chronology of a Global Conspiracy of Silence and Subterfuge – was picked up by not only those wind farm neighbours suffering adverse health effects, but by those in the scientific community involved in establishing the precise mechanism by which incessant, turbine generated low-frequency noise and infrasound causes adverse health effects, including sleep deprivation.

Explaining life with wind turbine noise can’t be done with a picture, so we’ll cut to a selection of videos, for a taste of what’s become a daily torment for thousands:

Thumping and grinding at all hours of the day and night, it’s a soul destroying cacophony. It’s the peaks and troughs in the sound pressure level that drives neighbours insane. What’s referred to as ‘amplitude modulation’.

In a ripping retort to the ‘nocebo’ nonsense peddled by the wind industry’s pet acoustic consultants and pseudo-scientists, Sherri Lange details why wind turbine noise causes so much wholly unnecessary suffering.

Health Effects of Wind Turbines: Testimony of Ben Johnson versus MidAmerican Energy (Madison County, Iowa)
Master Resource
Sherri Lange
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“The annoyance of sight and the heard pulsating wind turbulence creates indirect adverse health effects. This combined with the direct effects of sleep disturbance may activate the body’s autonomic nervous system to increase sympathetic-mediated responses with endocrinological consequences.”

“Increasingly activated, risk factors that promote adverse cardiovascular consequences may then

promote/facilitate/enhance cardiovascular disease – most easily named as hypertension, arteriosclerosis, ischemic heart disease and stroke."

– Ben Johnson, Testimony before the Madison County Board of Health, Madison Country, Iowa.

Individuals and communities are collectively reporting the same NOCEBO effects, heart palpitations, ringing in the ears, dizziness, nausea, disorientation, sleep disorders, and other disorders from nearby industrial wind. There is no global conspiracy, there is only a mountain of data (data is when you have enough anecdotes) contradicting the narrative that such wind power is clean, safe and free.

Pro-developer witnesses lined up recently at the Iowa Madison County Board of Health's hearing into wind turbines and health, led by the Iowa Policy Project and the Iowa Environmental Council. Their nine-page, "Wind Turbines and Health" referenced Fiona Crighton (nocebo effect), and Dr. Robert J. McCunney (known for his voluminous rapid-fire testimonies on behalf of wind companies). Their thesis: *if you are being reimbursed by the wind turbine company, or hosting, you are much less likely to experience health impacts*.

McCunney's critical review of 2014, states that he received funding from the Canadian Wind Energy Association but that it was all nicely arm's length and editorially free of any conflict-of-interest. Other dubious references inside the Iowa Policy Project-sponsored report attempt to validate findings by the Canadian Council of Academies, the book end review of wind turbine impacts to the Health Canada bogus study. Some have called these reference materials, studies, reviews, disingenuous, even fraudulent.

These "findings" by conflicted persons, reporting for government agencies and directly for developers and CanWEA or

AWEA, find their way through the cooperating, often unknowing persons, in policy and permitting systems: in this instance, the Madison County Board of Health hearings.

Dr. Ben Johnson, Cardiologist, IOWA

Enter Iowa Cardiologist Dr. Ben Johnson, testifying *pro bono* on the meticulous research behind the "guidelines" recently provided by the World Health Organization (WHO).

WHO advocates a political and moral standard that encourages the burden of proof to fall upon those advocating for a possible challenge to impacts to health. The burden of proof has never rested with the industry: it has fallen on the victims of wind, and their advocates, to prove and test on their own homes, document health impacts for themselves, livestock, pets, and wildlife. Despite the magnitude of the complaints, the similarity, and the universal nature of the harm, the industry continues to provide "experts," paid consultants whose shabby appearance of scientific endeavor continue to insult not only victims, but also the real science, and true advocates who provide clarity and conscience.

The Board of Health of Madison County, Iowa passed a resolution last week recommending a 1.5-mile setback to protect residences from wind turbine nuisances and harms.

The following excerpts from Dr. Johnson's testimonies (three) relied on his expertise and study of Adverse Health Effects (AHE) based on his specialty, Cardiology. His CV is about electrophysiology – pacing and defibrillator technology, clinical trials, failed implantable lead technology and developing (with industry) new technologies- -particularly optimizing implantable devices to improve heart performance.)

Dr. Johnson provides the following conclusions to MasterResource.

Industrial Wind Turbines and Adverse Health Effects:

High Level Summary of the Issues:

1) Health – defined (WHO – 2001)

Health should be regarded as a "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity." Note that this would include not only serious health disease – cardiovascular disease, hypertension, insulin-resistance – but also most of the described consequences of wind-turbine annoyance that affect mental and social well-being and contribute to physical debilities.

2) Annoyance: By itself, is considered as having adverse health effects

Noise is the principle impactor, but visually mediated and psychological adverse reactions are frequent causing health impacts to people living in the vicinity of wind turbines.

Cognitive effects are also associated with noise exposure. These include reading, concentration, memory and attention issues. Chronic noise exposure impairs cognitive function (reading comprehension and long-term memory) and a dose-response relationship between the two is supported by both laboratory and field studies. Over 20 studies have reported that noise adversely effects children's academic performance.

3) Concept of Noise and Sleep Disturbance

Noise pollution in our towns and cities in increasing. More than a nuisance, excessive noise is a health risk. As stated in the WHO 2018 guidelines, "noise is unpleasant and effects the quality of life." It disturbs and interferes with activities of the individual, including concentration, communication, relaxation and sleep.

Besides the psycho-social effects of community noise, there is concern about the impact of noise on public health,

particularly regarding cardiovascular outcomes. The auditory system is **continuously analyzing** acoustic information, which is filtered and interpreted by different cortical and sub-cortical brain structures.

Arousal of the autonomic nervous system and the endocrine system is associated with repeated temporal changes in biological responses. In the long run, chronic noise stress may affect the homeostasis of the organism due to dysregulation, incomplete adaptation and/or the physiological costs of the adaptation. Noise is considered a nonspecific stressor that may cause adverse health effects in the long run. Such noise may be associated with disordered sleep.

Serious scientific studies of human sleep only began about 50 years ago. According to the restorative theory of sleep, body tissues heal and regenerate during non-REM sleep – particularly stages 3 and 4 associated with predominately slow-wave activity. Brain tissue "heals" during REM sleep and memories of the prior day's events becomes more "permanent". Interruption of the mostly ordered transitioning between/to deeper stage sleep by noise can occur with awakenings (>15 secs – associated with subsequent recollection) or with arousals (<15 seconds that may be repetitive and not acknowledged by affected sleeper).

Such recurrent sleep disruptions lead to non-restorative sleep with subsequent activation of the autonomic nervous system. More-heightened sympathetic activation triggers multiple downstream physiologic consequences – hypertension, insulin resistance and complex atherosclerotic vascular disease which may promote plaque build-up and increase potential consequences of fatal and non-fatal heart attacks, angina, stroke and heart arrhythmias.

Indeed, there has been a surge in the incidence of atrial fibrillation (AF) – a fast, chaotic atrial arrhythmia. AF is very frequently associated with obstructive sleep apnea which

triggers sleep arousals (among a myriad of other consequences) that lead to non-restorative sleep. Untreated patients with sleep apnea commonly have hypertension, various degrees of insulin resistance and a higher incidence of vascular disease. It is truly remarkable how patients may deny any “trouble sleeping” but suffer from severe sleep apnea that may be amenable to treatment. Treatment in an affected population leads both to less AF and is associated with a decrease the prevalence of associated cardiovascular disease.

Sleep disturbance is reported for those who **report hearing** wind turbine sound. IMPORTANTLY, there are other disease states where disrupted sleep is triggered by non-awakening “arousals” (e.g. due to apneic/brief hypoxic events associated with obstructive sleep apnea). Similarly, there are recent pilot studies and now ongoing research measuring the observed physiologic changes of accurately reconstructed sound emissions (frequency and loudness) produced during formal sleep studies. **The pilot studies suggest that the unique properties of wind noise do adversely affect some aspects of normal sleep architecture.** (*Our emphasis)*

4) Infrasound and Low Frequency Noise (ILFN)

It has been established for nearly 35 years, that industrial turbines emit infrasound (<20 Hz) and low-frequency noise (<160 Hz). Analyzed frequency and sound pressure characteristics of industrial wind turbines emission has shown the emitted sound content (noise) to have these frequencies.

Wind turbine noise is complex, highly variable and has unique characteristics. The amount and type of sound emitted by a wind farm at a given time and in a given location is influenced by many variables including topography, temperature , wind speed, turbine design, the extent to which they are maintained, the number of turbines and their mode of operation.

It has also been established via multiple means of evaluation that the brain can “sense” infrasound as a tonal frequency transitions to a perceptible vibratory quality as the sound frequency lessens. Generally 35-40 dB are described as being needed to “sense/hear” those low frequency noises. Interestingly, ILFN “loudness” may be greater indoors than outdoors at the same location and can cause a building to vibrate resulting in resonance.

A significant proportion of the sound emitted by wind turbines is in the lower frequency range, i.e., below 20 Hz. Humans are more sensitive to low frequency noise, and it can therefore cause greater annoyance than higher frequency sound. The dB(A) weighting (filtering) system is not designed to measure these lower frequency sounds and is not an appropriate way of measuring it. The best way to assess ILFN is to through “raw” unweighted measurements which are not averaged across time and then subjected to detailed “narrow-band” analysis.

5) Evolving Quantification of Societal Impact of Noise Emission

With the published October, 2018 WHO statement, **DALYs** (Disability-Adjusted Life-Years – which is the sum of years of life lost due to ill-health, disability or early death) have been calculated. One DALY is equivalent to one year of health life lost.

Given measured sound exposures and their exposures to inhabitants in European Union cities, the WHO estimates that 1-1.6 million health life years are lost from traffic noise. Sleep disturbance and annoyance related to traffic noise comprise the main burden (903,000 DALYs for sleep disturbance; 654,000 DALYs for annoyance; 61,000 for ischemic heart disease and 45,000 for cognitive impairment). *Clear sleep disturbance is the largest mechanism of harm due to environmental noise.*

Rural Iowa does not have significant “background traffic, aviation or train sound emissions,” but could have significant ongoing turbine sound emissions which (although not quantified yet) could, being another environmental noise, reach the impacts like those DALY consequences noted above.

Relatively fewer people are exposed to industrial-size wind turbines, but those individuals would still be experiencing sound emissions with potentially adverse health effects. Unfortunately, the consequences would be greater for the more vulnerable parts of society – the young and elderly.

6) Why don’t we know **for sure r**egarding the health impacts?

Wind Energy has never proven that exposure to industrial wind turbines is safe.

The 2018 WHO statement, for the first time, listed industrial wind turbines as a source of environmental noise and carefully weighed the available data. There were no studies at the time of statement publication to assess the incidence of ischemic heart disease, nor hypertension among other endpoints…. the studies simply had not been done with those studies being quite complex to perform. Indeed, in section 3.4 of the 2018 WHO statement, evidence quality was specifically written as “no studies were available” acknowledging that there was no available data (yet) to confirm an association of sound to adverse cardiovascular outcomes.

The WHO’s turbine noise “conditional” rating of “strength of recommendation” for implementing guidelines reflects a policy-making process with substantial debate and involvement of various stakeholders. Recommendations are rated as either strong or conditional.

In accordance with the prioritization process, the GDG (Guidelines Development Group), set a guideline exposure level of 45 dB L(day-evening-night) average reflective of analysis of an exposure-response curve of four available studies from

"highly annoyed populations" showing significant higher adverse health risks above 45 dB.

They felt unable to specify a lower night sound emissions level (during sleep – where sleep disruption is more critical). *This omission has been widely criticized by anti-wind factions. Indoor/open-window nighttime sleeping sound levels are best at <33 dB) (Our emphasis)*

Another health concern from turbines is the potential harm from radio/electromagnetic exposure emitted by the turbines. This is debated globally. Authors who have voiced their concern of health safety over this have recommended that governmental regulators advise the public of potential risks of exposure and establish limits that incorporate all sources of radio/electromagnetic energy, including wind turbines. They further state: "Until these limits are established, governments should take precautionary and proactive measure to protect public health…"

Similarly, the public and landowners placed at direct and immediate risk of catastrophic turbine failure, have not been provided with recommended radius safety-zone dimensions specific to the Vestas, Model 1100 – which is the turbine model proposed for Madison County.

Despite repeated requests, this critical safety information remains unknown, even in public hearings when MAE (MidAmerican Energy) and Madison County officials who are responsible for public safety are directly questioned. This is relevant in that the last (smaller) model of IWTs (Industrial Wind Turbines) did have guidelines published.

Concerningly, there may be future replacement of existing MAE turbines with larger, more powerful models (on the fixed, existing pedestals). Reportedly, that possibility of up-sizing turbine capacity is reflected in recent Adair County planning minutes for the turbines placed there. Such larger turbines

would likely increase the strength of the emissions and, with that, increase the endpoints of incidence and prevalence of turbine-related adverse health effects.

7) At the second of three Madison County public hearing on the variance request by MAE, comments made by the MAE engineers/representatives included that :

1) they “never” assess sound by means other than A-weighting analysis. Because humans cannot hear sounds <20 Hz.

2) they “never” measure any sounds from within the house – “only to the front door”

3) Sound intensities (pressures) from the proposed turbine sites are “calculated.” Only upon recurrent resident requests, will they come to acquire actual sound measurements.

4) They commented that the WHO publications on environmental noise were “getting crazy”

Their industry-paid consultant neurologist/sleep specialist from Boston also spoke at a BOA (Board of Adjustment) meeting, noting:

1) symptoms of annoyance (depression, hopelessness, nausea, vertigo, etc.) could not be associated with the presence of the turbines alone but likely reflect a non-associated separate medical problem

2) he felt it was impossible that ILFN would travel that far from the turbine to actually cause sleep disruption.

All those points are rejected in the most current medical literature. And these points have been included/itemized in successful legal judgements against Wind Energy defendants when reviewing adverse health effects to affected residents.

8) Indeed, data is accumulating about the pivotal but

insidious connection of environmental noise causing sleep disturbance and cardiovascular disease.

(These studies are included on page #4 of summarizing information I provided to The Madison County Board of Health). In a more detailed description of the impact of environmental sound, Dr. Dominguez noted a "graded response" of objectively measure vascular disease and quantity and quality of sleep. Extensive multivariate analysis was performed to adjust for a wide range of confounding variables. The presenter noted that the more average times an individual awoke per night, the greater number of vascular plaques were documented. Dr. Fountas did a meta-analysis review of 11 prospective studies correlating self-reported daily sleep duration and cardiovascular morbidity and mortality of over one-million patients without clinical baseline cardiovascular disease that were followed an average of 9.3 years. Those sleeping <6 hrs or >8 hrs had a higher risk of fatal or non-fatal cardiovascular disease compared to those sleeping 6-8 hours which is considered a normal amount to achieve restorative sleep. Longer sleep duration was felt by the authors to possibly reflect morning exhaustion prompting additional sleep hours to "catch-up".

With that idea of "sleep catch-up," notable is a *Journal of the American Medical Association* article published about a month ago that suggested that those who attempted "sleep catch-up" on the weekend actually may have even worse outcomes than those who just resume a "normal" sleep pattern. This was measured by tests of insulin resistance that most directly varies with adrenalin responses to stress. (That article was given to the Madison County Board of Health at their most recent every two-month meeting). Elevated serum insulin levels due to adrenergically-driven insulin resistance is felt to be one of the consequences of sleep disturbance.

9) Recognizing that complete data is lacking to definitely link industrial wind turbines with adverse health, I cite Wind

Energy's apparently sponsored University of Iowa expert panel of the scientific evidence regarding various complaints (which) led to several conclusions (Wind Turbines and Health, Thorne, Osterberg, Johannsen):

1) The current evidence is **sufficient** to establish a causal relationship between a person's exposure to wind turbine noise and feelings of annoyance.

2) The current evidence is **limited** for a causal relationship between exposure to wind turbine noise and sleep disturbance. The panel defined "limited" of a causal relationship **as plausible**, but that chance, bias and confounding factors could not be ruled out with reasonable confidence. This is in keeping with the WHO stance noted above.

I would ask you, why would you erect a very expensive, contentious (highly to some), greater than 500 foot high tower– with large moving blades without a stated safety radius by the manufacturer, that reportedly will operate for nearly 40 years *(Editor's Note: turbines rarely survive the stated working life of 20 years, and begin to degrade and require repairs and experience serious lost performance between twelve years and fifteen years)* and that has never been proven to safe nor free of adverse health effects, that **possibly (it is plausible)** will cause sleep disturbance and that will likely contribute to some degree of future cardiovascular disease in the nearby affected citizens who had very little to say about it? This when other technologies are available with essentially no health risk (photovoltaic)?

Finally, recognizing someone who has spent his entire professional career reviewing evidence that Wind Turbines Pose Risks, Jerry Punch, Professor emeritus from Michigan State University who recently wrote a peer-reviewed 72-page article that addressed each of two wind energy claims and positions stated the following:

the available literature, which includes research reported by scientists and other reputable professionals in peer-reviewed journals, government documents, print and web-based media and in scientific and professional papers presented at society meetings, is sufficient to establish a general causal link between a variety of commonly observed adverse health effects and noise emitted by industrial wind turbines.

Returning to the 2001 WHO statement in the first paragraph above defining health, "health" is viewed as beyond an absence of acquired physical disease, it also includes mental and social wellness. The mere presence of these huge turbines placed, as proposed, in close proximity to our county residence creates lasting annoyance in at least 20% of those exposed at the proposed siting distances.

Hopefully you are aware of the social outcry of your county against the intrusion of these unwanted disturbances. The annoyance of sight and the heard pulsating wind turbulence creates indirect adverse health effects. This combined with the direct effects of sleep disturbance may activate the body's autonomic nervous system to increase sympathetic-mediated responses with endocrinological consequences.

Increasingly activated, risk factors that promote adverse cardiovascular consequences may then promote/facilitate/enhance cardiovascular disease – most easily named as hypertension, arteriosclerosis, ischemic heart disease and stroke.

Importantly:

1) Does this **prove** that "wind turbines" cause disease? – **NO**

2) Has Wind Energy ever shown that wind turbines are safe and free of adverse health effects? **Absolutely Not**

3) There is an enormous amount of scientific data to suggest that wind turbines may **possibly** cause adverse health effects.

As noted above, the U of I paper likely paid for by the Wind Energy faction AGREES that there is a plausible causal relationship between exposure to wind turbine noise and sleep disturbance.

The scientific data is rapidly accumulating and getting us closer to absolute confidence that wind turbines "cause disease." It will be an association, like all disease prevalence, that is statistical… the large numbers needed to prove a correlation that are adjusted for confounding variables in exposed populations with highly predictive statistical significance, are hard to obtain…. but the data is coming.

Wind Energy could do the research needed by exposing monitored residence living various distances from the wind turbines in large enough numbers to meet anticipated statistical significance. All disease-markers/endpoints variables would be catalogued and measured consistently over at least 20 years. All these "test (treated) groups" would be compared with matched control groups without wind turbine exposure and monitored for the same disease process in the same method as the actively "treated" groups. This study would require a supervising Investigative Review Board to protect the test subjects. It would require informed consent from the study participants. Having been a Chairman for the Des Moines Area Investigative Review Board where conducted human research proposals are reviewed, approved and monitored, I seriously doubt that such a study could be done. This is because the health consequences are not completely known, but what is known is adverse in nature (thus making informed consent not possible) and the participants may not derive potential benefit from the study (the EXACT situation for the Madison County residents who would be forced to live with turbine presence) among many other considerations.

Such a pattern of increasing possibility/likelihood and linked causality in our scientific, world-wide evaluations

of potential adverse health effects from wind turbine noise and annoyance is impressive. The Oct 2018 WHO report reflects that opening of scientific understanding and the evolving clarification of that risks. The lack of respect for this data by Wind Energy is equally impressive.

I ask you to speak for your neighbors, your family, your community, and for the impacts of Wind Energy will have in future generations, and to those who look to you in your elected position of leadership. Protect the citizens of Madison County against the possibly harmful effects of Wind Energy development as currently proposed by Mid-American Energy.

Respectfully,

W. Ben Johnson, M.D. Cardiologist/Electrophysiologist, Des Moines, Iowa
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