Testimony by Lori Menold, RN

Wind Turbines and Human Health: Why the Concern

My name is Lori Menold. I am a Registered Nurse and live in rural Nemaha County with my husband and our three boys. I am writing this testimony on behalf of the medical professionals in Nemaha County. I am a proponent and in favor of this bill, as the language and setback distances of this bill align with science, and will protect the health, safety, and welfare of Kansas citizens.

Is there research to support health claims that IWT (Industrial Wind Turbines) adversely impact health?

- Yes, there is a large body of good quality, often peer reviewed literature, by many reputable professionals that believe there is enough scientific evidence to establish a causal link between IWTs (Industrial Wind Turbines) and detrimental health effects. In the 2016 peer reviewed, Punch and James article, that looks at four decades of evidence that Wind Turbines pose risk, they state that the "reviewed evidence overwhelmingly supports the notion that acoustic emissions from IWTs is a leading cause of adverse health effects in a substantial segment of the population." Jerry Punch is a health expert in this field, with a four-decade career as an audiologist and is a Professor Emeritus in the Department of Communicative Sciences and Disorders at Michigan State University. Richard James is an acoustical engineer and acoustician with expertise in the field of sound including noise, low frequency noise, sounds emitted from industrial wind turbines and human response to noise. This declaration matches the testimonies of individuals living near IWT, not in just a few isolated areas, but around the United States and around the world. (1)

Does IWT cause adverse health effects for everyone?

- No, it does not impact everyone. Dr. John P. Harrison, an expert in the properties of matter at low temperatures with emphasis on high frequency sound waves concluded that IWTs cause annoyance in about 20% of residents living with in a distance considered acceptable by most regulatory authorities. For many of the 20%, the annoyance and sleep disturbance lead to adverse health effects. (2)
- **Also, to note** is the fact that those that have signed leased contracts, often can't speak out negatively about the IWT. This makes it difficult to gather and collect all pertinent data. In lease agreements in Nemaha county, the contract for the landowner to sign has an Effects Easement that includes all the following: "audio, visual, view, light, flicker, noise, shadow, vibration, air turbulence, wake, electromagnetic, electrical, and radio frequency interference, and any other effects attributed to the Wind Farm." At the end of the contract, it notes that complaints can't come before a jury trial. This creates great pause, as I have heard the wind companies deny health issues, but it seems they are painfully aware of health effects that have been suffered and may impact people even with the standard industry setbacks. In my job as a diabetes educator, I often review how medications are intended to work and review side effects. Never do we have a patient sign a document that they can't speak or report side effects. It must be reported. That is best practice, to help medical care for all patients, even after drugs have been FDA approved and are deemed safe.

What are the mechanisms of the IWT that would cause these symptoms?

- This stems from the **audible**, **inaudible** (or infrasound noise), and the **vibratory impact or sensations** that reach and stimulate the inner ear, both the hearing organ, and the vestibular (where balance and motion are detected). Wind Turbine noise has been described as having a character that makes it far more annoying and stressful than other sources of noise at the same A-weighted level, including traffic and industrial noise. (1) Infrasound is the noise emissions below the audible hearing threshold. Quoting from Punch and James in that, "Infrasound and Low Frequency Noise from any source including wind turbines is well known to penetrate walls and other barriers; is typically more disruptive indoors than outdoors; and is not easily masked by atmospheric sounds, including road traffic noise, and other sources of infrasound." (1)

- Also noted in Dr. Bray's letter, she writes that "Research has demonstrated how various forms of pollutant from IWTs can adversely affect human health. These include noise, infra-sound, dirty electricity and ground current which can each, along with shadow flicker, contribute to ill-health among those who live near wind turbines." (5)

What are the reported adverse health effects?

- **Most Common:** The most common reported core symptoms and complaints include sleep disturbance, headache, dizziness, vertigo, ear pressure or pain. It is noteworthy that these are remarkedly common worldwide near wind farms. The most undisputed health effect in addition to annoyance is sleep disturbance. (1) Sleep disturbance sounds so minor, but it has been documented that it can be serious if it leads to sleep deprivation, which is associated with a gamut of Cardiovascular Diseases, obesity, diabetes and poor memory. (3)
- **Other Symptoms and Concerns:**
    - Chest Pain/Pressure, heart palpitations, depression, irritability, aggressiveness, cognitive dysfunction, and fatigue are other symptoms along with the more common symptoms as noted by Havas and Colling in the 2011 Bulletin of Science Technology and Society journal. (6)
    - Photosensitive Epilepsy Concern – In a 2008 Epilepsia Journal, it characterizes the flashing that may precipitate seizures and optimizing guidelines and optimal setback distances to prevent them. (7)
    - Cellular damage from exposure to infrasonic and lower frequency airborne pressure waves which can cause cellular damage to the eye, stomach, lung, liver, lung, heart, and vessels that supply the heart muscle- This is from a recent 2019 publication from a chapter in the Acoustics and Biologic Structures Book – authored by Dr. Maria-Alves Pereina, et al. Dr. Pereina and her colleagues have been conducting epidemiological studies over the last 20 years of people chronically exposed to low-frequency noise and infrasound (including IWT impact). Exposure to infrasonic and lower frequency airborne pressure waves can cause cellular and tissue damage depending on frequency, decibel-level, and exposure time. This is complex but involves widespread vascular involvement. The authors note that this vascular response may (unsuspectingly) be the underlying cause of many symptomatic complaints. (7) This is supported by a paper from the 2018 Thoracic and Cardiovascular Surgeon journal that states that "infrasound can induce direct effects on human myocardium (the muscular tissue of the heart) in the given experimental setting." (9)
- **Recent Physician Response:** In a letter dated, **November 28th 2018** to the Canadian government officials and colleagues, Dr. Riina Bray (BASC, MSc, FCFP, MHSc) Medical Director of the Environmental Health Clinic at Women's College Hospital, Associate Professor, and Environmental Health Consultant wrote, "*I am writing to express concern about the potential for harm for human health represented by Ontario's Industrial Wind Turbines (IWTs) and their supporting infrastructure. Research has demonstrated how various forms of pollutant from IWTs can adversely affect human health.* She cited research and literature describing the adverse health effects and reviewed recommendations that need to be implemented to decrease risks as she concluded her letter with the following. "*The risks for the short and long-term health of Ontarians of not undertaking such mitigating and remediating steps is significant."* (5) One of her reasons for the letter, is that health complaints by residents living near wind turbines were not getting addressed which is outlined in the WCO 2017 Report – Response to Wind Turbine Noise Complaints. (4)
- **Ultimately:**
    - It is documented by various researchers that families that are affected have had to leave their homes permanently to get relief response. (10) Consider what this does to a community.

What can be done to minimize the health risk?

- Have safe setbacks and appropriate noise level regulations to dramatically decrease these adverse health effects.
- Adverse Health Effects are occurring in industry standard setback distances, which is not appropriate or safe. It is also stated in the Punch and James article that most of the reported health symptoms have been observed at distances much greater than the standard setback distances of 1500 feet. Due to all the variables (terrain, number

and size of turbines, etc.) distance is the only practical means of achieving acceptable sound levels. Controlling the noise through the erections of barriers or enclosures near the source are not feasible or effective. This is because infrasound and its impact from the industrial wind turbines, travel inside of residences. (1)

- Most Scientists support a *minimum* setback distance of 1.2 miles, but greater is preferred for optimal health and safety. (1)
- The Centre for Public Health, Queen's University paper, supports this, and notes that some countries are opting for setback distances of 1.9 miles and more. (3)

In terms of wind energy, when the pros and cons are evaluated, the adverse effect on people's health is far from small. These adverse health effects can be significantly minimized if there are safe setbacks distances that are enforced. While the wind companies protect themselves in their lease agreements from all citizen complaints about noise, flicker and EVERY effect attributed to the wind farms… the health, safety, and wellness of Kansas residents need protecting, and HB2273 will help do just that.

References

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