



HEALTH and wind turbines

The World Health Organization's (WHO) definition of health is a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

Most health-related wind turbine research has focused on whether there is a direct relationship between exposure to industrial wind turbines and disease. To date research hasn't identified specific diseases, cancers or syndromes caused by exposure to industrial wind turbines, however, there is evidence that frequent exposure to turbines negatively impacts the basic elements of health: physical, mental, and social well-being as defined by the WHO and ascribed to by our government. Even though a wind turbine disease, cancer, or syndrome, hasn't been identified, many people exposed to industrial wind turbines will experience a significant deterioration in overall health and quality of life.

Gaps in research and knowledge about the effects of wind turbines on health and social well-being are acknowledged. There is need for more unbiased, and long-term research with better assessment techniques to really understand how low-level noise, flicker, and environmental disruption impact mental and physical health, sleep, and social well-being. Furthermore, occupational health and safety standards reflective of the true risks of wind turbine exposure need to be established.^{1,2}

People exposed to industrial wind turbines on a regular basis, report the following impacts on mental and physical health and social well-being:

- Negative impact on mental health: high levels of annoyance and irritability, increased level of stress, low mood, anxiety, panic attacks, depression
- Negative impact on physical health: poor sleep, headaches- new and exacerbation of existing headache conditions e.g., migraines, low energy, dizziness, palpitations, blurred vision
- Loss of productivity: daytime sleepiness, poor concentration, deterioration in memory

The negative impact wind turbine exposure has on quality of life and overall health is consistently reported to be related to the following issues:

- Irregular and unpredictable noise created by wind turbine blades and motors

¹ Copes, Ray, et.al. Report B.C. Centre for Disease Control Report. Western Medical Officers of Health Meeting Report June 2009.

www.ncceh.ca

² Horner, B., et.al., Literature Reviews on Wind turbines and Health: Are they enough? Bulletin of Science, Technology & Society 31(5) 399–413 © 2011 SAGE Publications Reprints and

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- Loss of natural view plane and/ or industrialization of one's environment
- Light flicker or flicker effect caused by rotation of turbine blades and lights atop turbines
- Negative Impact on social determinants of health: loss of financial and housing security, impact on chronic disease

Noise Impact:

The most frequent complaints are related to the impact of irregular and unpredictable noise on sleep, and concentration. Noise produced by turbine blades and motors has been described as "piercing, preoccupying and continually surprising".. In 2010 the Ontario Ministry of Health concluded "the audible sounds from wind turbines, at the levels experienced at typical receptor distances in Ontario, is nonetheless expected to result in a **non-trivial** percentage of persons being highly annoyed... Research has shown that annoyance associated with sound from wind turbines can be expected to contribute to stress related health impacts in some persons." ³ Other studies in 2010 by Nissenbaum et. al. documented that the sleep disturbance caused by wind turbines for those living within 1.4 km of 2 IWTs, resulted in daytime fatigue and deterioration in mental health. ⁴

Flicker Effect:

Flicker effect caused by irregular and unpredictable movement of the arms of the turbines and lighting atop the turbines is most impactful during periods of low light such as early morning and at dusk.

Natural View Plane:

A major source of irritation and loss of quality of life for others is the abrupt and industrial change to their view plane. Those unfortunate enough to experience an irrevocable loss of natural vista when unwanted, unnatural, and industrial appearing structures are erected within their sight report similar negative effects on mental health, and sense of well being. ⁵

Social Determinants of Health:

Housing and financial security are basic components of the social determinants of health. Wind turbines have a negative impact on property values. Homeowners living near wind turbines report difficulty in selling homes or being forced to sell their homes at significantly reduced prices. Furthermore, there are reports of homeowners, unable to sell their property and so impacted by the experience of living near wind turbines, abandoning their homes. Financial losses, loss of housing

³ 1] Jeffrey, R., et.al. Adverse Effects of Wind Turbines. Canadian Family Physician • Le Médecin de famille canadien | Vol 59: MAY • MAI 2013. pp 473-475

⁴ Nissenbaum M., et.al., Effects of industrial wind turbine noise on sleep and health.Noise & Health, September-October 2012, Volume 14

⁵ Knopper and Ollson .Health effects and wind turbines: A review of the literature Environmental Health 2011, 10:78 <http://www.ehjournal.net/content/10/1/78>

security, loss of community and employment are directly linked to quality of life, mental and physical health, and impact on chronic diseases, over the lifespan and for future generations.

Health and our Natural Environment:

Regular exposure to natural environments, such as forests and parks, has been shown to be protective for our mental and physical health.

Regular physical activity is recognized as being a key component in maintaining good physical health and preventing chronic diseases such as diabetes and cardiovascular disease.

Regular exposure to the natural environment: forests, parks, and wild spaces, is now recognized as being equally important to maintaining good mental health, reducing stress and anxiety, and improving mood.^{6,7,8}

It is important that we maintain and capitalize on our wild spaces for the well-being of our communities and for the generations yet to come.

Links and References:

Copes, Ray, et.al. Report B.C. Centre for Disease Control Report. Western Medical Officers of Health Meeting Report June 2009.

www.ncceh.ca

²Horner, B., et.al., Literature Reviews on Wind turbines and Health: Are they enough? Bulletin of Science, Technology & Society 31(5) 399–413 © 2011 SAGE Publications Reprints and permission: sagepub.com/journalsPermissions.nav

4] Jeffrey, R., et.al. Adverse Effects of Wind Turbines. Canadian Family Physician • Le Médecin de famille canadien | Vol 59: MAY • MAI 2013. pp 473-475

5] Nissenbaum M., et.al., Effects of industrial wind turbine noise on sleep and health. Noise & Health, September-October 2012, Volume 14

6] Knopper and Ollson. Health effects and wind turbines: A review of the literature Environmental Health 2011, 10:78 <http://www.ehjournal.net/content/10/1/78>

⁷Bowler et al. A systematic review of evidence for the added benefits to health of exposure to natural environments. BMC Public Health 2010, 10:456 <http://www.biomedcentral.com/1471-2458/10/456>

⁸Meredith, G., et.al. Minimum Time Dose in Nature to Positively Impact the Mental Health of College-Aged Students, and How to Measure It: A Scoping Review SYSTEMATIC REVIEW published: 14 January 2020 doi:10.3389/fpsyg.2019.02942

⁶ Bowler et al. A systematic review of evidence for the added benefits to health of exposure to natural environments. BMC Public Health 2010, 10:456 <http://www.biomedcentral.com/1471-2458/10/456>

⁷ Meredith, G., et.al. Minimum Time Dose in Nature to Positively Impact the Mental Health of College-Aged Students, and How to Measure It: A Scoping Review SYSTEMATIC REVIEW published: 14 January 2020 doi:10.3389/fpsyg.2019.02942

⁸ White, M., et.al., Spending at least 120 minutes a week in Nature is associated with good health and wellbeing. Scientific Reports | (2019) 9:7730 | <https://doi.org/10.1038/s41598-019-44097->

79] White, M., et al., Spending at least 120 minutes a week in Nature is associated with good health and wellbeing. Scientific Reports | (2019) 9:7730 | <https://doi.org/10.1038/s41598-019-44097->

Other:

Report: STRATEGIC HEALTH IMPACT ASSESSMENT ON WIND ENERGY DEVELOPMENT IN OREGON. Prepared by Health Impact Assessment Program Research and Education Services
Office of Environmental Public Health Public Health Division Oregon Health Authority