Wind Turbines and health fact sheet

Prepared by Mount Alexander Community Wind, 2013. www.macwind.org

Wind energy has been widely established for several decades across many countries and populations, yet there have been relatively few reports of health problems in the scientific literature.

Recently, increased media attention has focused on alleged adverse health effects.

Most concerns focus on noise – audible and non-audible noise. Some concerns have also been expressed about Vibration, Shadow flicker, Electromagnetic fields and Ice throw.

What does the research say?

We have explored the current literature in order to reach a conclusion as to whether there is evidence to support health concerns.

We rely on scientific, peer-reviewed, published studies. This includes studies with the following features. The authors are usually experts in the field with many peer-reviewed publications and numerous citations. The study will have gone through a review process before publication, which includes being peer reviewed by independent experts for significance, relevance, sound research design, accurate presentation, clarity. The studies are evidence based, using rigorous methodologies and representative samples, and are published in reputable indexed journals.

There have been several major health reviews of wind turbines. These are reviews of all studies, not single pieces of research. The most recent ones are:

2013: Victorian Department of Health, Wind farms, sound and health, http://docs.health.vic.gov.au/docs/doc/03C56A16FC34F658CA257B5E00164599/$FILE/1212016_wind_turbine_community_WEB.pdf
2012: Findings of the Senate Committee on Environment and Communications enquiry into Excessive Noise from Wind Farms, http://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bId=s882
2010: National Health & Medical Research Council, Public Statement: Wind Turbines and Health, http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/new0048_public_statement_wind_turbines_and_health.pdf
2012: Massachusetts Department of Environmental Protection. Independent Expert Science Panel Releases Report on Potential Health Effects of Wind Turbines http://www.mass.gov/dep/public/press/0112wind.htm
2012: Oregon Wind Energy Health Impact Assessment. http://www.public.health.oregon.gov/HealthyEnvironments/TrackingAssessment/HealthImpactAssessment/Documents/Oregon Wind Energy HIA Public comment.pdf

What do these reviews of studies conclude?

These reviews have all reached similar conclusions: “the evidence does not support any direct causal link between wind turbines and pathological effects in humans”.

Specifically:

- no risk of hearing loss
- no evidence of ‘wind turbine syndrome’
- no harm from infrasound at the sound pressures that are relevant to wind turbines

“To date, no peer reviewed scientific journal articles demonstrate a causal link between people living in proximity to modern wind turbines, the noise (audible, low frequency noise, or infrasound) they emit and resulting physiological health effects.” Source: Knopper&Ollson review http://www.ehjournal.net/content/pdf/1476-069X-10-78.pdf

A more comprehensive summary of these documents has been prepared by Professor Simon Chapman, School of Public Health and Teresa Simonetti, Sydney University Medical School, and is available here.

What are the health concerns, then, and how can we understand them?

The list of self-reported health effects is quite long, and seems to keep growing. Many of these problems are extremely common in the community (such as sleeping problems, headache, anxiety, hypertension). These health complaints are commonly referred to as medically unexplained non-specific symptoms (NSS).

The source of these claims?

The source of many of these claims is from anecdotal reports, the internet, and popular literature.

In science, anecdotal evidence has been defined as:

- information that is not based on facts or careful study
- reports or observations of usually unscientific observers
- casual observations or indications rather than rigorous or scientific analysis
- information passed along by word-of-mouth but not documented scientifically

Anecdotal evidence is considered the least certain type of scientific information. Researchers may use anecdotal evidence for suggesting new hypothesis, but never as validating evidence.

Anecdotal evidence is important in that it can be the indicator that triggers a full investigation; but it is not the proof in and of itself.

What is 'wind turbine syndrome' and is there any evidence of it?

Wind Turbine Syndrome (WTS) is a term coined by Nina Pierpont to describe a cluster of non-specific symptoms, including sleep disturbance, headache, tinnitus, dizziness, joint pain, and memory loss. This theory was based on a series of case studies of 10 families who lived in proximity to wind turbines.

Other studies have found no evidence for WTS. It is also worth noting that many of the symptoms described are common symptoms in the community (eg. Headaches, sleeplessness, etc.) and that there is no evidence that such symptoms are more common in people living near wind turbines.

The Pierpont study has not subjected to rigorous scientific peer review and has been critqued on the grounds that:

- the methodology was too limited to lead to any valid conclusions: there were no noise measurements, the process of choosing people to study was biased, some people were excluded from the study, there was no control group and it involved only small numbers of people.
- It had no external validation: the self-report symptoms in the people it studied were not checked, there was no physical examinations by independent doctors and no consideration of pre-existing medical records.

There is not a single mention of "wind turbine syndrome" in PubMed, and world wide database of published medical studies. The World Health Organisation does not recognise it as a disease. Further, there is no mention of "wind turbine syndrome" in the United States National Library of Medicine's 23 million research papers.

Can wind farms be annoying?

There is a strong link between annoyance and people's attitude to turbines. If people do not like wind turbines, feel nervous about them or feel like they have been imposed, then people are more likely to be annoyed by the look or sound of a turbine.

Feeling annoyed and anxious about the possible health effects may contribute to some distressing symptoms. These symptoms are not, however, caused by the wind farms.

"Associated stress from annoyance, exacerbated by the rhetoric, fears, and negative publicity generated by the wind turbine controversy, may contribute to the reported symptoms described by some people living near rural wind turbines." 2009: Colby et al. Wind Turbine Sound and Health Effects: An Expert Panel Review. http://199.88.77.35/EFiles/docs/CD/PlanCom/10_0426_IT_100416160206.pdf

WTS: a 'communicated' disease?

Although there is still no scientific evidence that wind turbines themselves make people sick, there is a substantial base of evidence that anti-wind farm activism can have an adverse impact on the health of communities.

Recently, a leading American psychology journal published an experimental study by University of Auckland researchers showing that people 'exposed' to anti-wind messages available online were more likely to experience symptoms. The New Zealand researchers were studying the 'nocebo effect' (latin for "I will harm"), the counterpart to the more widely known placebo effect. The nocebo effect occurs when an individual's negative expectations result in adverse health effects and has played a significant role in many psychogenic medical scares related to unfamiliar technology.

In the New Zealand study, 60 subjects were 'exposed' to a period of infrasound and another period of fake infrasound (without knowing which was which). Half of the subjects ('high expectancy' subjects) viewed information from the internet that attributed symptoms to in infrasound. The study found that the presence of infrasound had no impact on reported well-being, but that the expectation of adverse impacts resulted in the increased symptom reporting.

Similarly, Chapman (2013) found that reports of ill-health were far more common where there had been a strong anti-wind campaign.

Overall conclusions

- The health impacts reported by a minority of people living in close proximity to turbines are common stress reactions.
- Reported health impacts most likely due to anxiety (about a possible health threat or negative impact from the turbines), and annoyance (about the sound, sight, or imposition of the turbines).
- Illness, created by anxiety, would perhaps be more correctly attributed to those organisations putting out misinformation which people find distressing.

References:

2013: Victorian Department of Health, Wind farms, sound and health, http://docs.health.vic.gov.au/docs/doc/03C56A16FC34F658CA257B5E00164599/$FILE/1212016_wind_turbine_community_WEB.pdf

2012: Massachusetts Department of Environmental Protection. Independent Expert Science Panel Releases Report on Potential Health Effects of Wind Turbines http://www.mass.gov/dep/public/press/0112wind.htm

2012: Oregon Wind Energy Health Impact Assessment. http://public.health.oregon.gov/HealthyEnvironments/TrackingAssessment/HealthImpactAssessment/Documents/Oregon%20Wind%20Energy%20HIA%20Public%20comment.pdf

2011: Fiumicelli D. Windfarm noise dose-response: a literature review. Acoustics Bulletin 2011; Nov/Dec:26-34 [copies available from simon.chapman@sydney.edu.au)

2011: Bolin K et al. Infrasound and low frequency noise from wind turbines: exposure and health effects. Environmental Res Let 2011; http://iopscience.iop.org/1748-9326/6/3/035103/

2010: Knopper LD, Ollsen CA. Health effects and wind turbines: a review of the literature. Environmental Health 2010; 10:78 http://www.ehjournal.net/content/10/1/78

2010: Findings of the Senate Committee on Environment and Communications enquiry into Excessive Noise from Wind Farms, http://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bId=s882 2010: National Health & Medical Research Council, Public Statement: Wind Turbines and Health, http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/new0048_public_statement_wind_turbines_and_health.pdf

2010: UK Health Protection Agency Report on the health effects of exposure to ultrasound and infrasound http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1265028759369

2010: UK Health Protection Agency. Environmental noise and health in the UK. A report by the Ad Hoc Expert Group on Noise and Health. (this report is about all environmental noise) http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1279888026747

2010: NHMRC Rapid Review of the evidence
http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/new0048_evidence_review_wind_turbines_and_health.pdf

2010: Chief Medical Officer of Health in Ontario
http://www.health.gov.on.ca/en/public/publications/ministry_reports/wind_turbine/wind_turbine.pdf

2009: Minnesota Department of Health. Environmental Health Division. Public Health Impacts of Wind Turbines.
http://www.health.state.mn.us/divs/eh/hazardous/topics/windturbines.pdf

2009: Colby et al. Wind Turbine Sound and Health Effects: An Expert Panel Review.
http://199.88.77.35/EFiles/docs/CD/PlanCom/10_0426_IT_100416160206.pdf

2009: Context and Opinion Related to the Health Effects of Noise Generated by WindTurbines. Agence Française de Sécurité Sanitaire de l'Environnement et du Travail (Affset).
http://www.inspq.qc.ca/pdf/publications/1015_EoliennesSantePublique.pdf

2008: Chatham-Kent Public Health Unit. http://www.harvestingwindsupport.com/blog/wp-content/uploads/2011/03/Chatham-KentHealth-and-Wind-.pdf

2007: National Research Council (USA): Impact of wind energy development on humans (Chapter 4: pp97-120) of: Environmental Impacts of Wind-Energy Projects. http://www.vawind.org/assets/nrc/nrc_wind_report_050307.pdf

2005: Jakobsen J. Infrasound emission from wind turbines. *J Low Frequency Noise, Vibration and Active Control* 2005; 24(3):145-155

2004: Leventhall G. Low frequency noise and annoyance. *Noise & Health 2004;*.6(23):59-72 **http://tinyurl.com/4yc3oht**

2003: Eja Pedersen's Review for the Swedish EPA http://www.naturvardsverket.se/Documents/publikationer/620-5308-6.pdf