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Frequently Asked Questions

NHMRC Review of Wind Farms and Human Health

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WORKING TO BUILD A HEALTHY AUSTRALIA

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Frequently Asked Questions: NHMRC Review of Wind Farms and Human Health

Question	Answer
What are wind turbines?	• Wind turbines use rotating blades attached to towers to convert wind energy into electricity. A group of wind turbines is known as a wind farm and may be located on land or offshore. • Wind farms have been promoted as an alternative to traditional, non-renewable forms of energy production. • Since the introduction of the *Renewable Energy Act 2000*, the number of wind farms in Australia has grown substantially. At the end of 2013, there were 68 wind farms across the country and more were being constructed or planned. • NHMRC's review focused on large-scale commercial wind farms, rather than small wind turbine installations.
Do wind farms affect human health?	• NHMRC's review of wind farms and human health found a lack of high quality evidence investigating possible relationships between wind farm emissions and health outcomes. • There is currently no evidence that exposure to wind farms directly affects a person's physical or mental health. • There is some poor quality evidence to suggest that wind farm noise or living in close proximity to a wind farm may be linked to annoyance and, to a lesser extent, with disturbed sleep and poorer quality of life. • Given the poor quality of current evidence and concern expressed by some members of the community, NHMRC supports further high quality research in this area.
How does NHMRC explain the symptoms that some people experience?	• Some members of the community have reported adverse health effects as a result of living in close proximity to a wind farm. It is not clear as to the cause of these symptoms. • There may be broader social and environmental circumstances that influence the reporting of health effects by people living near wind farms. • NHMRC recognises that lack of evidence that wind farms affect human health may not mean that wind farms have no health effects in humans within close proximity. • NHMRC recommends that people who experience health problems consult their General Practitioner.
Will NHMRC support further research on potential health effects of wind farms?	• NHMRC funds independent high-quality health and medical research on behalf of the Australian Government, ensuring the best and most relevant research applications are funded on a competitive basis. • The majority of research supported by NHMRC is investigator-initiated, with the research conceived, developed and carried out by independent researchers. • Given the review identified a paucity of scientific evidence on the potential health effects of wind farms, NHMRC has developed a Targeted Call for Research to address gaps in the evidence. • This aligns with the Government's commitment to establish a research program to examine and determine if there are any actual or potential health effects of wind turbines (*Coalition's Policy for Resources and Energy*, September 2013).

Question	Answer
What is the purpose of NHMRC's *Information Paper: Evidence on Wind Farms and Human Health*?	• The Information Paper is intended for use by any person or group interested in wind farms. • It provides a summary of evidence from research published from 1981 up to May 2014, identified by two comprehensive independent reviews commissioned by NHMRC. • NHMRC followed internationally recognised processes to direct the identification, assessment and collation of the evidence. • Areas for further research have been identified in the Information Paper to inform NHMRC's Targeted Call for Research on this issue. • NHMRC's review of wind farms and human health may assist governments and planning authorities to make evidence-based decisions about the regulation of wind farms.
Why did NHMRC review the evidence on wind farms and human health?	• One of NHMRC's functions is to ensure the Australian community has access to reliable evidence-based advice to improve health and prevent disease. • Investigations into wind farms and human health by NHMRC commenced in 2009, in response to health concerns raised by some members of the community living near wind farms. • In 2010 NHMRC published a *Public Statement: Wind Turbines and Health* and the supporting *Wind Turbines and Health: A rapid review of the evidence*, which identified limited published scientific literature on the possible health effects of wind farms. NHMRC committed to conducting a more extensive search of the evidence. • This commitment was reiterated in response to the 2011 Senate inquiry into the Social and Economic Impact of Rural Wind Farms. • NHMRC's review of wind farms and human health aligns with one of the major health issues identified in NHMRC's Strategic Plan 2013-2015, to investigate new and emerging health threats, infectious diseases, environmental hazards, and changes in the human environment.
Why did NHMRC choose to look at possible effects of wind farm noise, shadow flicker and electromagnetic radiation?	• In 2011, NHMRC held a scientific forum to discuss the latest international scientific evidence and to engage with stakeholders over the range of issues. The scientific forum identified that various emissions from wind farms were of concern to the community, including noise, infrasound, shadow flicker and electromagnetic radiation. • Further information about the forum can be found on the NHMRC website at: http://www.nhmrc.gov.au/media/events/2011/wind-farms-and-human-health-scientific-forum-7-june-2011. • The independent evidence reviews searched for all of the scientific evidence on health and health-related effects specifically related to exposure to any emission from wind farms. The search for literature was kept broad to make sure that no relevant evidence was missed.
Why were only a small number of studies included in NHMRC's review?	• In conducting evidence reviews and developing advice, NHMRC takes into account the level, quality, strength and relevance of the evidence. This approach is consistent with an internationally accepted standard for assessing evidence. • Internationally, there is little research evidence regarding the health effects of wind farms. Over 4,000 papers were identified in the independent evidence reviews but, of these papers, only 13 studies were found that compared different levels of wind farm exposure (either by measuring wind farm noise or proximity to a wind farm) and measured participants' health outcomes (direct evidence). Only one of these studies was conducted in Australia. • Supporting evidence was also reviewed to gain greater understanding of the characteristics of wind farm emissions, their likely effects on the human body and whether any health effects have been observed from other sources producing similar emissions. • For information to be considered as direct evidence, it had to be publicly available; look at exposure to wind farm emissions; not choose only participants who had reported health effects they attributed to wind farm emissions; compare two or more groups with different levels of exposure to wind farms (for example, a "near" group and a "far" group); explain how the data were collected; assess health outcomes in the groups studied; and analyse the results.

Question	Answer
Why weren't case reports, medical records and personal testimonies considered?	• NHMRC promotes the development of health advice that is based on the best available evidence. As some research designs provide stronger evidence than others, NHMRC uses internationally recognised processes to assess the strength, quality and relevance of the evidence when conducting reviews. • Case reports were excluded from the evidence review on the advice of the Reference Group, as they do not provide the evidence needed in order to make reliable conclusions about the causes of health effects. • Personal stories, opinions, medical records, legal findings and raw data are not considered scientific evidence, and as such were not included in the evidence review. • While individual experiences can raise the possibility of health effects from wind farms, only systematic research can provide the necessary evidence to determine whether reported health effects result from exposure to wind farms.
What was the role of the Wind Farms and Human Health Reference Group?	• The Wind Farms and Human Health Reference Group was established to oversee the development of the evidence review. The Reference Group had expertise in public and environmental health, research methodology, acoustics, psychology, sleep and consumer issues. • The Reference Group assisted the independent evidence reviewers to develop research questions, considered independent review reports, provided scientific advice on interpretation of the evidence and considered expert review comments and public consultation submissions. • The Reference Group was also asked to consider the outcomes of the review to inform the CEO and Council of any updates to NHMRC's 2010 *Public Statement: Wind Turbines and Human Health*. In addition, the Reference Group guided the development of the Information Paper. • The Reference Group considered the outcomes of the review to identify critical gaps in the current evidence base and identified a number of areas for further research. These gaps were provided to the CEO and assisted in informing the parameters of the Targeted Call for Research. • Information on the membership and declared interests of the Reference Group is available at: http://www.nhmrc.gov.au/your-health/wind-farms-and-human-health/wind-farms-and-human-health-reference-group.
What was the role of observers appointed to the Reference Group?	• Two observers were appointed to the Reference Group for transparency purposes. • The observers were selected given their background and knowledge of the wind farm industry in Australia, and their understanding of concerns raised by some individuals living in close proximity to a wind farm. • The observers were not appointed to represent their respective organisations. Instead, the Reference Group included an independent consumer advocate with responsibility for ensuring that community interests were considered. • The observers' contributions to Reference Group meetings were limited to offering factual information or providing it at the request of Reference Group members at the discretion of the Chair. The observers did not engage in the scientific discussions or decision-making processes.

Question	Answer
How did NHMRC ensure a rigorous process was undertaken for considering the evidence?	• NHMRC has established policies for considering and managing real or perceived conflicts of interests of the experts involved in the development of NHMRC advice. Further information on NHMRC's approach is available at: http://www.nhmrc.gov.au/_files_nhmrc/file/about/committees/managing_coi_committee_members_130531.pdf; and http://www.nhmrc.gov.au/guidelines-publications/information-guideline-developers/guideline-development-and-conflicts-interes. • For this review, other quality measures included a methodological review of the systematic review of the literature by an independent expert group, public consultation, and independent expert review of the draft Information Paper by Australian and international experts. • The final Information Paper was considered by the Council of NHMRC which has a broad range of experience and expertise in health and in medical research. Council's final approval ensures that all the checks and balances at all stages of the process have been met and that any material issued by NHMRC is evidence-based, robust and meets international standards.
How did NHMRC manage any declared interests that were raised by Reference Group members?	• As part of their formal appointment to the Reference Group, each member and observer was required to disclose any factors that may cause or be perceived to cause a conflict of interest. The Reference Group Chair and NHMRC Senior Executive reviewed each prospective member's declared interests and no unmanageable conflicts were identified. • In accordance with NHMRC policy, Reference Group members must declare any new interests as they arise. Members are reminded to declare any new interests at the beginning of each meeting. • The declared interests of all Reference Group members and observers are published on NHMRC's website, which is regularly updated to reflect any changing circumstances. • The composition of the Reference Group was given careful consideration to ensure the group had an appropriate balance of expertise and could provide a thorough and robust examination of the evidence from a range of perspectives. NHMRC must balance the value of each member's expertise against any declared interests that may arise. • While some members of the Reference Group had relevant interests, most members did not. All discussions of the group were robust and open. A consensus-based approach was used during deliberations to ensure that no one member had undue influence over the decision making process.
How are wind turbines regulated in Australia?	• In Australia, responsibility for regulating the planning, development and operation of wind farms lies with state, territory and local governments. The approach to regulation of wind farms varies across jurisdictions. • Assessment of wind farm development applications is typically made by the responsible state planning authority. However, in some areas of Australia, the local government has the responsibility of assessing applications for wind farms. • Noise from established wind farms is regulated at the state or local government level depending on where the wind farm is located within Australia. Some jurisdictions use environmental guidelines in the monitoring of background noise levels, whereas others rely on Australian or New Zealand noise standards. • Generally, health-related complaints due to wind farms are managed by state health departments and noise-related complaints are investigated by state environment authorities. In some jurisdictions, local governments have responsibility for managing complaints. Wind farm operators may be required to maintain a noise complaint register or operate a telephone complaints line as a condition of their planning permit or licence.

Question	Answer
How close should a wind farm be situated to a house?	• NHMRC does not develop policy on the planning or approval of wind farm developments as this is the responsibility of state and territory planning authorities. • Current scientific knowledge indicates that noise from wind turbines, including its content of low-frequency noise and infrasound, is similar to noise from many other natural and human-made sources. • Evidence examining health effects of emissions from other sources of environmental noise (such as road traffic) suggests that significant health effects are unlikely beyond 1,500 metres from a wind farm. • At 1,500 metres from a wind farm, the noise level is usually below 30–35 A-weighted decibels (dBA), which is similar to noise levels in a quiet residential area. • Further research is required to characterise wind turbine noise (including audible noise, low frequency noise and infrasound) at distances ranging from 500 metres to 3 kilometres and beyond, in different terrains and under varying weather conditions.