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NHMRC Advice on Wind Farms and Human Health

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Administrative Report: NHMRC Advice on Wind Farms and Human Health

This administrative report refers to the development of the following documents:

- Information Paper: Evidence on Wind Farms and Human Health;
- NHMRC Statement: Evidence on Wind Farms and Human Health; and
- background documents relating to evidence on wind farms and human health.

Background

Wind farms and human health aligns with Priority Area 8 in the *NHMRC Strategic Plan 2013-15: New and emerging health threats – infectious diseases, environmental hazards, changes in the human environment*.

In 2009, the growing number of reports from residents of possible adverse health effects from wind farms was raised as an issue at the Council of NHMRC. The Office of NHMRC conducted a rapid review of the published scientific literature that specifically examined the potential health impacts of infrasound, noise, electromagnetic energy, shadow flicker and blade glint produced by wind turbines.

On Council's advice, in June 2010 NHMRC released a public statement on the potential adverse effects of wind turbines and a rapid review of the evidence on wind turbines and health. The 2010 *Public Statement: Wind Turbines and Health* concluded that "there is currently insufficient published scientific evidence to positively link wind turbines with adverse health effects".

NHMRC committed to continue to monitor the issue given the limited amount of published literature at the time. This approach was further endorsed following a Senate Committee recommendation in early 2011 that NHMRC continue to review the evidence. A scientific forum was hosted by NHMRC in June 2011, providing stakeholders with an opportunity to present the latest international scientific evidence and canvass issues of public concern.

In 2012, NHMRC commissioned an independent review to evaluate the existing scientific evidence, and a further independent review of additional evidence was commissioned in early 2014. The *Information Paper: Evidence on Wind Farms and Human Health* was finalised in late 2014 following consideration of the body of evidence, along with public consultation and expert review comments.

Contributors

Wind Farms and Human Health Reference Group

The Wind Farms and Human Health Reference Group was established in February 2012 to oversee the evidence review. The Reference Group was also asked to consider the outcomes of the review to inform any updates of NHMRC's 2010 Public Statement and to identify any critical gaps in the current evidence base.

Terms of Reference

1. The Wind Farms and Human Health Reference Group will guide the development of a systematic review to determine if new evidence exists in the peer reviewed scientific literature on possible health effects of wind farms, by providing advice to the Office of NHMRC on the:
 - a. scope and questions the systematic review will address;
 - b. methods to identify relevant published guidelines and systematic reviews; and
 - c. methods to evaluate relevant published guidelines and systematic reviews.
2. The Wind Farms and Human Health Reference Group will consider the outcomes of the review and use these findings to:
 - a. inform updating NHMRC's Public Statement: Wind Turbines and Human Health; and
 - b. identify critical gaps in the current evidence base.
3. The Wind Farms and Human Health Reference group will provide NHMRC's Prevention and Community Health Care Committee with a report on Wind Farms and Human Health which is to include advice on the systematic review outcomes, updating the Public Statement and, possible need for further research, for consideration before recommendation to Council.

Membership

Members were originally appointed until June 2013 and appointments were subsequently extended to 31 January 2015. The Reference Group comprised experts in environmental epidemiology, sleep, social psychology, acoustics, sound engineering and consumer issues. The members were:

- Professor Bruce Armstrong (Chair) – Emeritus Professor, School of Public Health, The University of Sydney.
- Professor Michael Abramson – Professor of Clinical Epidemiology, Epidemiology and Preventive Medicine, School of Public Health & Preventive Medicine, Monash University.
- Dr Norm Broner – Principal, Broner Consulting. (Previously Practice Leader, Acoustics, Noise and Vibration, Jacobs.)
- Professor Ronald Grunstein – Professor of Sleep Medicine, Woolcock Institute of Medical Research Central Clinical School, The University of Sydney and Royal Prince Alfred Hospital.
- Dr Elizabeth Hanna – Fellow, National Centre for Epidemiology and Population Health, ANU College of Medicine, Biology and Environment.
- Anne McKenzie – Consumer Advocate, The University of Western Australia's School of Population Health and the Telethon Kids Institute.
- Professor Debra Rickwood – Professor of Psychology, Faculty of Health, University of Canberra. Chief Scientific Advisor, headspace National Youth Mental Health Foundation.
- Professor Wayne Smith – Director, Environmental Health Branch, NSW Health. Conjoint Professor of Epidemiology, University of Newcastle. Honorary Professor of Public Health, The University of Sydney.

Observers

Two observers were appointed to the Reference Group to ensure transparency of processes. The observers were not appointed to 'represent' their respective organisations. Their contributions were limited to providing factual information at the discretion of the Chair. The observers were:

- Russell Marsh – Policy Director, Clean Energy Council; and
- Peter Mitchell – Honorary Chairman, Waubra Foundation. Member of Board of Governors, Florey Neuroscience Institute. Patron, Children First Foundation.

Declaration of conflict of interest process

Members of the Reference Group were required to declare their interests in writing prior to appointment, in accordance with NHMRC's Declaration of Interest policy. Following review by the Chair and Office of NHMRC, no interests were identified that required a formal management plan.

Throughout the project, members were reminded of their obligation to consider any interest that may have arisen since the last meeting or with any particular agenda items. A record of interests was managed by the Office of NHMRC and updates were made to the NHMRC website as required.

There was one instance in the development process where the Reference Group agreed that one member needed to leave the room during the discussion to address any perceived conflict of interest, as the member worked at the same university as the contractor whose work was under discussion.

Meetings

The Reference Group met three times by teleconference in 2012, three times by teleconference in 2013, and four times in person in 2013 to develop the draft Information Paper and consider the results of the evidence review and methodological review. Following release of the draft document for public consultation in February 2014, the Reference Group met in person for two days in July 2014 to discuss additional evidence along with public consultation and expert review comments. Six teleconferences were held in 2014 to finalise the Information Paper and related documents. In addition, a sub-group assisted with the development of areas for further research.

All discussions of the Reference Group were robust and open, and decision-making was consensus-based.

NHMRC Project Team

The project was undertaken by a small team within the Environmental Health Section of Research and Operations Group.

Evidence Evaluation

Internationally, there is little research evidence regarding the health effects of wind farms. In total, over 4,000 papers were identified and of these, only 13 studies considered possible relationships between wind turbine emissions and health outcomes (direct evidence). Only one of these studies was conducted in Australia.

Independent systematic review of the evidence

In September 2012, Adelaide Health Technology Assessment (AHTA) was contracted to conduct an independent review of the existing scientific evidence on the health impacts of wind farms.

The independent review was undertaken in accordance with a review protocol approved by the Reference Group.

The independent reviewers conducted extensive searches of peer-reviewed and grey literature published up to October 2012. To ensure that emerging evidence was captured, the systematic reviewers also considered literature provided to NHMRC through a public submission process which occurred in September 2012.

2,848 papers were identified in the literature search for the systematic review and 506 references were submitted from members of the public for consideration. Only seven studies met the inclusion criteria for the systematic component of the review examining possible health effects from direct exposure to emissions from wind turbines (direct evidence).

A background literature review was also conducted to establish whether the type and level of emissions coming from wind farms might affect healthy functioning of the human body (mechanistic evidence) and whether health effects have been observed from similar emissions from sources other than wind farms (parallel evidence).

Full details are provided in the *Systematic review of the human health effects of wind farms* undertaken by AHTA.

Independent methodological review

Independent reviewers examined the methodological quality of the review to ensure the systematic and rigorous approach prescribed in the review protocol had been followed. The Reference Group considered points raised by the methodological reviewers and provided instruction to the systematic reviewers to further clarify procedures and processes. The systematic review was determined to be of 'high quality' based on the Assessing the Methodological Quality of Systematic Reviews (AMSTAR) rating.

The methodological review was undertaken by the Canadian National Collaborating Centre for Environmental Health (NCCEH). The NCCEH focuses on the health risks associated with the physical environment and identifies evidence-based interventions to reduce those risks.

Independent review of additional evidence

A further independent systematic review was conducted to identify direct evidence published after the cut-off date for the first independent review (October 2012). In March 2014, a collaborative team from the Australasian Cochrane Centre (ACC) and the Monash Centre for Occupational and Environmental Health (MonCOEH) at Monash University was contracted to undertake this review and critically appraise the additional literature, including 249 references that were submitted during public consultation and expert review.

The review of additional evidence covered literature published to May 2014 and identified six additional direct evidence studies, along with further studies for the background, mechanistic and parallel evidence components of the review.

Full details are provided in the *Review of additional evidence for NHMRC Information Paper: Evidence on Wind Farms and Human Health* by ACC and MonCOEH.

Publication of new studies on wind farms and human health

While new evidence will continue to be published, a cut-off date (May 2014) for consideration of the evidence through the review of additional evidence process was required to allow NHMRC to prepare its advice in a timely manner.

Development of the Information Paper

The *Information Paper: Evidence on Wind Farms and Human Health* provides Australians with a summary of the evidence on the possible health effects of wind farms in humans (with a particular focus on noise, shadow flicker and electromagnetic radiation) and explains how NHMRC developed its summary based on the findings of independent reviews of the evidence.

Technical writing of the Information Paper was contracted by the Office of NHMRC to Ampersand Health Science Writing.

Public consultation

A draft Information Paper: Evidence on Wind Farms and Human Health was released for public consultation, as required under the *National Health and Medical Research Council Act 1992 (NHMRC Act 1992)*, for a period of 45 days from 24 February 2014 to 11 April 2014. The draft Information Paper noted that “there is no reliable or consistent evidence that wind farms directly cause adverse health effects in humans.” The independent systematic review of the evidence undertaken by AHTA was released at the same time as background information.

A media release was issued by NHMRC on 24 February 2014 and information on the public consultation process was provided on the NHMRC website. Invitations were also sent to various key stakeholders.

A total of 36 submissions were received by NHMRC raising a number of issues, most of which related to wind farm noise, although some related to noise-induced vibration from wind farms. Other comments related to the scope of public consultation and the small number of studies that were included in the first independent review. The document *Public Consultation: Summary of key issues* provides further information in relation to how key issues were addressed by the Reference Group in the final Information Paper.

Full submissions from respondents who agreed to publish their comments are available on the NHMRC Public Consultation website.

Independent Expert Review

Six experts (three Australian and three international) in the fields of acoustics, engineering, mental health and sleep, epidemiology, and environmental health provided comment on the draft Information Paper to ensure that the evidence had been appropriately interpreted and synthesised. Expert reviewers were required to declare any interests as per NHMRC standard processes.

The reviewers raised a number of issues, most of which related to wind farm noise. The document *Expert review: Summary of key issues* provides further information in relation to how key issues were addressed in the Information Paper by the Reference Group.

NHMRC acknowledges the time and expertise provided by the expert reviewers Dr Mathias Basner (Pennsylvania, United States of America), Associate Professor Cornelius Doolan (Adelaide, Australia), Emeritus Professor Colin Hansen (Adelaide, Australia), Professor Lin Fritschi (Perth, Australia), Professor Takayuki Kagayama (Ōita, Japan) and Dr Frits van den Berg (Amsterdam, The Netherlands).

Additional expert advice was also sought from Emeritus Professor Donald Robertson in relation to a key animal study by Salt et al (2013). NHMRC acknowledges Professor Robertson’s efforts in assisting the Reference Group on this issue.

Development of NHMRC Statement

In response to its Terms of Reference, the Reference Group guided the development of the Information Paper to underpin revisions to the 2010 *Public Statement: Wind Turbines and Health*. The updated NHMRC Statement was prepared on the advice of Council in light of the comprehensive review of the evidence. It provides advice to the community and to policy makers utilising evidence in the Information Paper.

As the NHMRC Statement has policy implications for jurisdictions, input on issues of significance was sought from planning and environment departments through Chief Health/Medical Officers represented on the Council of NHMRC and incorporated into the Statement where possible. Input from NHMRC's Community and Consumer Advisory Group on key issues to be addressed in the NHMRC Statement from a community and consumer perspective was also considered.

While NHMRC is responsible for developing health advice, it is the responsibility of individual jurisdictions to determine how NHMRC advice is incorporated into planning and development approval processes.

Governance

Throughout the project, the Reference Group provided advice to Council and the Chief Executive Officer (CEO) of NHMRC through the Prevention and Community Health Committee (PCHC). The final Information Paper was considered by PCHC at its meeting on 24 October 2014 and by Council at its meeting on 27 November 2014. The NHMRC Statement was considered by Council out of session in December 2014 and finalised in early 2015.

Council has a broad range of experience and expertise in health and medical research. Council's final approval and recommendation to the CEO ensures that material issued by NHMRC is evidence-based, robust and meets international standards.

The CEO issued the Information Paper and NHMRC Statement under Section 7(1)(a) of the *NHMRC Act 1992*.