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March 6, 2015

Dear Prime Minister Harper, Hon. Minister of Health, Hon. Minister of Justice and Attorney General and members of the Health Canada Wind Turbine Noise and Health Study,

Re: Preliminary Results Pamphlet: Wind Turbine Noise and Health Study

On November 6, 2014 Health Canada posted on their website *Wind Turbine Noise and Health Study: Summary of Results*¹ [the Study]

In early 2015, Health Canada initiated public distribution of a pamphlet entitled *Wind Turbine Noise and Health Study: Summary of Key Findings*. [Scanned version available on request]

The purpose of this letter is to raise concerns regarding the Health Canada pamphlet and share observations conveyed to me by some of those reporting adverse health effects associated with the start up of wind turbine operations.

I am requesting that the current pamphlet be redacted and replaced in order to enhance public disclosure relating to statistically related effects.

In addition, I am requesting that ongoing concerns about the impact of policy oversight of the Study be clarified including that of an industry-led:government-supported Wind Technology Roadmap.²

I declare no potential conflicts of interest and have received no financial support with respect to the research and authorship of this commentary.

This commentary is public and may be shared.

A brief bio and list of references for which I am an author/co-author is provided in the Appendix.

1. Health Canada Pamphlet

Health Canada has distributed a pamphlet which is being placed in numerous mail boxes. The envelope has Health Canada's logo. It is addressed to the householder/occupant and includes the home owner's mailing address.

A scanned copy of the brochure being distributed appears identical in content to the brochure published on the web site. [Attached web version]

The contents emphasize what was not found:

Stress*

No association was found between the multiple measures of stress (such as hair cortisol, blood pressure, heart rate, self-reported stress) and exposure to wind turbine noise.

Sleep*

The results of this study do not support an association between wind turbine noise and self-reported or measured sleep quality.

* While some people reported some of the health conditions above, their existence was not found to change in relation to exposure to wind turbine noise.

It indicates a finding of very or extremely annoyance without defining annoyance as an adverse health effect and without indicating context including disclosure of statistical findings obtained by objective and subjective measurements:

Annoyance and quality of life

An association was found between increasing levels of wind turbine noise and individuals reporting to be very or extremely annoyed.

No association was found with any significant changes in reported quality of life, or with overall quality of life and satisfaction with health. This was assessed using the abbreviated version of the World Health Organization's Quality of Life Scale.

The preliminary results published by Health Canada, Page 4 Section 5 states statistical findings relating to wind turbine noise annoyance by subjective and objective measurements.

A few excerpts:

“WTN annoyance was found to be statistically related to several self-reporting health effects including, but not limited to, blood pressure, migraines, tinnitus, dizziness, scores on the PSQI, and perceived stress ” as well as related to “measured hair cortisol, systolic and diastolic blood pressure.”

“A statistically significant increase in annoyance was found when WTN levels exceeded 35 dBA.”³

This is a relevant finding. For example, the Ontario Ministry of Environment wind turbine noise guidelines model for 40 dBA i.e., 5 dBA more than the Health Canada findings. A limit of up to 51 dBA with increased wind speed is allowed. [Excerpt of an Ontario Renewable Energy Approval]

RENEWABLE ENERGY APPROVAL

NUMBER 2484-8RQUS4
Issue Date: March 16, 2012

Wind Speed (m/s) at 10 m height	4	5	6	7	8	9	10
Sound Level Limits, dBA	40.0	40.0	40.0	43.0	45.0	49.0	51.0

Annoyance may seem of little consequence in general parlance; however, in respect of health, annoyance is acknowledged by a number of authorities including Health Canada and the World Health Organization as an adverse health effect.^{4, 5, 6, 7, 8}

Several studies published by the World Health Organization have revealed findings related to the serious nature of annoyance including increased morbidity:

“The result confirms the thesis that for chronically strong annoyance a causal chain exists between the three steps health – strong annoyance – increased morbidity.”⁹

“... confirmed, on an epidemiological level, an increased health risk from chronic noise annoyance.”¹⁰

Regarding noise induced annoyance the US Environmental Protection Agency states:

“...“annoyance” can have major consequences, primarily to one’s overall health.”¹¹

Additional references regarding the effects of chronic noise annoyance are available on request.

In my opinion, the emphasis on the lack of findings while not disclosing to the public statistically related findings adds credence to the premise of an “...industry-led, government supported initiative that has developed a long-term vision for the Canadian wind energy industry and identified the major technology gaps and priorities to achieve a major increase in deployment of wind energy in Canada.”¹²

On November 14, 2014, NRCan announced the Pan-Canadian Wind Integration Study and the contribution of \$1,755,000 through the NRCan ecoEII for which it is reported to be “the first national, system-level study of high wind energy penetration in Canada.”¹³ [Attached]

The Prime Minister of Canada’s website comments:

“... we are continuing to expand Canada’s international trade and to create the green jobs befitting our growing stature as a clean energy superpower.”¹⁴

Typically, regarding the concept of clean energy, wind energy is considered part of the energy mix. It is unclear whether industrial wind turbines are included in the context of a “clean energy superpower.”

2. The Role of Policy Oversight

Based on an Access to Information and Privacy request (ATIP), it appears there is policy oversight associated with the Health Canada Study.

An excerpt of an Access to Information Privacy (ATIP) states:

2. Tara Bower M.Sc. , Director of Policy within ERHSD, HECS, is a co-author, member of the Expert Committee and principle policy advisor on HC’s Wind Turbine Noise and Health Study. Ms Bower is responsible for general oversight of the Wind Turbine Noise file for Health Canada including the recently accepted assessment by the Canadian Council of Academies and FPT work on the same. Ms. Bower’s last trips included Quebec City, Quebec, September 2012 wherein she

Health Canada has engaged the Council of Canadian Academies (CCA) which has assembled an expert Panel to review the existing scientific evidence which would help address the following question:

“Is there evidence to support a causal association between exposure to wind turbine noise and development of adverse health effects?”¹⁵

Based on correspondence, the Council of Canadian Academies’ review of a causal association between wind turbines and adverse health will not be providing policy recommendations.¹⁶

Typically, an assessment or literature review precedes a study design phase to assist with ensuring up to date information which can be incorporated into the design. It can be a useful tool for summarizing the information available at a point in time. However, an assessment has limitations as it cannot be equated to an investigation. By definition, an assessment will not have investigated those that are reporting harm.

3.0 Research Issues

The Health Canada study is based on a random sample of: wind turbine sites, homes and individuals.

"All homes within 600m of a wind turbine are identified for recruitment with random sampling procedures applied to all remaining dwellings up to a distance of 10 km away from the wind turbine.

Upon confirmation of the number and ages of all people residing in the home and in order to mitigate the risk of self-selection bias, a computer assisted random selection method is applied to select one eligible individual per household between the ages of 18-79 who is then asked to participate in a personal interview, i.e. questionnaire, and physical measures collection.”¹⁷

Health Canada states “... up to a distance of 10 km away from the wind turbine.”

It is not clear how this method will be applied if a home has more than one turbine nearby.

A randomized study has limitations. By definition, it will not necessarily select affected individuals, some of whom are reporting serious adverse health effects including those who have left their homes.

Health Canada’s preliminary results indicate that:¹⁸

- § 1570 of 2004 potential dwellings identified were valid addresses
- § 434 were coded out-of-scope
- § 1238 of 1570 dwellings participated

Correspondence from Health Canada dated February 12, 2015 provided a break-down of the out-of-scope dwellings.¹⁹

Type of out-of-scope location	Total number
Demolished for unknown reasons	82
Vacant for unknown reasons	138
Unoccupied seasonal	107
>79 years of age	96
Other ^c	11

*Please note that *other* refers to homes under construction, institution, participant unavailable to participate. These specific data were suppressed here to protect the identify of individual participants.

In 2013, Health Canada indicated a target of 2000 dwellings:

“The targeted sample will consist of 2000 dwellings at setback distances ranging from less than 500 metres to distances of up to 10 kilometers randomly selected from communities in the vicinity of 8 to 12 wind turbine installations.”²⁰

A request to confirm whether there was the capability to replace the out-of-scope dwellings in order to maintain the target of about 2,000 dwellings received this response:²¹

“The study required a sample size of approximately 1100 participants--not 2000, as suggested in your comment. In order to achieve this sample size Statistics Canada built a sampling frame with 2000 "potential" addresses. This was partially based on previous research by Statistics Canada (unrelated to wind turbines) that about 20-25% of these potential addresses on the address registry would not be valid locations (i.e. out of scope for a number of reasons). The number of targeted dwellings was also based on an a-prior assumption that the study's final estimated response rate would be approximately 70% (i.e. from the identified valid dwellings). The final response rate was actually higher at 78.9%. Out-of-scope dwellings were identified in both the Ontario and PEI sampling areas.”

Reports of residents abandoning their homes are compelling and which can be measured. It would have been helpful to capture these associations. It is a lost opportunity to investigate the out-of-scope homes by various methods such as consulting with neighbours and township records.

Health Canada also confirmed that:²²

“... all members of the household would have been outside the age range when a potential dwelling was coded as out-of-scope (age) by Statistics Canada field interviewers, i.e. over 79 years.”

The World Health Organization indicates that the elderly and children are vulnerable population groups

“Who is most affected?”

Some groups are more vulnerable to noise. As children spend more time in bed than adults, they are more exposed to night noise. Chronically ill and elderly people are more sensitive to disturbance. Shift workers are at increased risk because their sleep structure is under stress. In addition, the less affluent who cannot afford to live in quiet residential areas or have adequately insulated homes, are likely to suffer disproportionately.²³

It is unclear whether vulnerable population groups were considered for inclusion during the Study design phase.

4. Summary

The following observations are drawn from comments I have received and are being shared with those on this list.

Residents trusted that the Health Canada Study would assist with documenting the relationship between exposure to industrial wind energy facilities and reported adverse health effects.

Health Canada advised that the results would not be definitive on their own and the November 6, 2014 results are preliminary. However, the circulation of a pamphlet in the zones where many are reporting adverse health effects and incomplete disclosure is now a sensitive topic.

In addition, the process to randomize sites and participants and to not take the opportunity to investigate out-of-scope dwellings is disappointing.

For several years the Government of Canada Ministers associated with this file have stated to residents seeking resolution that the Government of Canada is committed to protecting the health of Canadians with respect to renewable energy sources but at the same time stating the provinces are responsible for the generation and distribution of electricity.

In my view, these two concepts need to be urgently reconciled.

Health Canada states its mission of “helping Canadians maintain and improve their health, while respecting individual choices and circumstances”²⁴ For those who report their health has declined with the onset of industrial wind turbine operations, the Government’s commitment to protecting health has lost credibility.

In the case of industrial wind energy facilities, non-participating Canadians have no choice – the wind turbines are imposed without consent.

Furthermore, this response is now met with scepticism and residents look to the Government of Canada to take action and provide protection as promised.

Requests:

- § Please advise what initiatives will be taken to ensure Canadians receive full disclosure of the Health Canada Wind Turbine Noise and Health Study preliminary results including that related to the pamphlet being distributed to households.
- § Please advise how the NRCan initiatives, the Wind Technology Roadmap and Pan-Canadian Wind Integration Study, will be reconciled with Health Canada's mission to maintain or improve the health of Canadians while respecting individual choices.

Respectfully submitted,

Carmen Krogh, BScPharm
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Attachments

Pan-Canadian Wind Integration Study
Web posting of Health Canada pamphlet

Appendix

Brief Bio

I am an independent, full time volunteer and published researcher regarding health effects and industrial wind energy facilities and share information with: communities; individuals; federal, provincial and public health authorities, wind energy developers; the industry; and others. I am an author or co-author of peer reviewed articles and conference papers presented at wind turbine noise scientific conferences.

I have held senior executive positions at a teaching hospital, as a drug information researcher, a professional organization and Health Canada (PMRA). I am a former Director of Publications and Editor in Chief of the *Compendium of Pharmaceuticals and Specialties (CPS)*, the book used by physicians, nurses, and health professionals for prescribing information in Canada.

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- ²⁵ Carmen Krogh (retired), is a peer reviewed IWT health researcher and former Director of Publications and Editor-in-Chief of the CPS.
- ²⁶ Dr. McMurtry is Professor Emeritus (Surgery) of Western University (formerly University of Western Ontario). Dr. McMurtry was also an ADM at Health Canada 2000-02