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## **A critical analysis of accuracy of the “complaints” data from the Chapman et al “nocebo” research**

### **Background**

The hypothesis that “suggestion” from “anti wind farm activists” (with particular reference to the CEO of the Waubra Foundation) is itself **causing** the symptoms reported by wind turbine residents has recently been claimed by many supporters of renewable energy, wind turbine developers, wind turbine manufacturers and the media, to have been “proven” with a recent research paper accepted for publication from Sydney University researchers led by Professor Simon Chapman.<sup>1</sup>

This research by Chapman et al itself relied heavily on a laboratory experiment by researchers from New Zealand including PhD candidate Fiona Crichton,<sup>2</sup> using very low doses of infrasound at a specific frequency for 10 minutes in healthy volunteers during the daytime. Crichton asserted that her research showed that the symptoms reported by the volunteers in her study were induced by suggestion *and therefore her laboratory work could be extended to apply to wind turbine residents.*

It is not clear why only wind turbine residents were chosen for this extension by Crichton (and Chapman), and not residents affected by other sources of industrial infrasound and low frequency noise from sources such as coal mining, gas fired power stations and coal seam gas field compressors who are reporting many identical symptoms, and in some severe cases, home abandonment.

Both Chapman and Crichton’s research has been heavily criticised by expert peer reviewers with relevant professional and academic experience in the fields of acoustics (Swinbanks<sup>3</sup>), audiology (Punch<sup>4</sup>) and clinical medicine (McMurtry<sup>5</sup>) as well as others familiar with data manipulation by corporate vested interests such as the Tobacco industry (Hartman<sup>6</sup>).

The Crichton and Chapman research both ignore an extensive body of acoustic evidence which clearly shows a direct causal link between exposure to infrasound or low frequency noise and a range of symptoms which have long been accepted by acousticians and scientists working in this area, often given the label of “annoyance”. Some of this research was detailed in Professor Leventhall’s Literature Review for the UK government department DEFRA, in 2003.<sup>7</sup>

The recent rediscovery of acoustic field<sup>8</sup> and laboratory research<sup>9</sup> from the 1980’s, funded by the US Department of Energy and led by Neil Kelley, found that infrasound and low frequency noise from wind turbines can induce resonance within building structures, leading to annoyance symptoms for some of the residents inside. The exposures and frequencies identified by Kelley et al were consistent with previous work by Harvey Hubbard,<sup>10</sup> which identified sound energy from aircraft as being a source of “annoyance” reported by residents. Thus the American field data from wind turbine acoustic emissions and their impact a generation ago was firmly grounded in existing acoustic knowledge at the time.

The Crichton laboratory experiment used exposures of infrasound at doses lower than those being suggested to exert adverse effects, during the day, in young healthy volunteers, for only ten minutes. This exposure

clearly has little relationship to the wide range of wind turbine acoustic frequencies including infrasound and low frequency noise as well as higher frequencies which rural residents living with wind turbines are exposed to 24/7 particularly at night, some for 25 years or more.

The other issue mentioned by both Leventhall<sup>11</sup> and Kelley<sup>12</sup> but ignored by both Crichton and Chapman is the phenomena of “sensitisation” or what Kelley called “conditioning”. What Leventhall and Kelley were referring to is the observed pattern that over time with ongoing exposure people affected by the sound energy became more sensitive to the effects of it; i.e., they did not “get used to it”.

The exposure effect is extremely important from a planning perspective, because it necessitates a more generous buffer distance between wind turbines and homes, in order to adequately protect people from the cumulative effects, which worsen over time.

This pattern of deterioration with ongoing exposure is also entirely consistent with what we know about the cumulative effects of chronic sleep deprivation and chronic stress which are known to result from low frequency noise exposure. Neither of these effects will be captured in a 10 minute exposure to very low doses of infrasound at a single frequency in healthy young volunteers, such as in the Crichton laboratory experiment.

### **Inadequacies of Chapman et al research data sources**

Professor Chapman’s data sources were stated to include media reports, Senate Inquiry submissions (which were public and not confidential), and records of complaints kept by wind developers. It has been asserted that these data sources are representative and sufficient in themselves, and inferred that no one else is either suffering or complaining. There was no serious attempt made by Chapman or his co-authors to test the accuracy of this assertion.

In my experience, from three years working voluntarily with members of these affected rural communities, responding directly to requests for information and assistance, these data sources are not sufficient nor are they an accurate source of information concerning the extent of population impacts for the following reasons.

Firstly, many rural residents do not wish to speak to the media, as they can endure social ostracism and physical and verbal abuse towards themselves or members of their family for doing so. Close interconnected family, work and social relationships also prevent people from speaking out in the media or in their local communities, because of the socially uncomfortable or divisive consequences, which are particularly difficult in tightly knit rural communities.

Secondly, the media do not always wish to hear or report on these stories, particularly those journalists who take an activist approach to environmental issues rather than a more old-fashioned, thorough, fact checking approach to their work.

Thirdly, I am aware of numerous rural residents who put confidential submissions into both Federal senate inquiries on wind turbine noise issues. They did so to avoid the loss of privacy if they were disclosing personal health details, to avoid the ostracism and abuse mentioned earlier, and also because some are unable to legally speak out publicly about their health problems because of the nature of the confidentiality agreements they have signed with the wind developers. Senator Chris Back has referred to some of these agreements in his speech to the Australian Federal Senate on October 30<sup>th</sup>, 2012.<sup>13</sup>

Finally, wind developers have a poor track record for recording complaints from residents. Many residents have advised me that they have lodged complaints over the telephone<sup>14</sup> with no subsequent record being kept by the company concerned. Many residents have told me they did not realise the importance of requesting a complaint number to be given by the wind developer, and of putting their complaint in writing.

## **Cullerin – a case study audit of the accuracy of the Chapman data**

The Chapman et al research data Table 1 lists the names of the wind developments, and other data such as the size of the turbines, the date the development commenced operating, the estimated population, whether there were any health or noise complaints based on the data sources previously mentioned, and whether or not there had been any local or visiting “opposition group” activity. The hypothesis asserted by Chapman et al to be supported by their data, is that complaints *follow* “opposition activity”.

The Waubra Foundation’s experience is in direct contrast to this assertion. We *respond* to requests for information and help from residents *already affected* by infrasound and low frequency noise from a variety of sources including coal seam gas field compressors, gas fired power stations, compressors used for industrial chilling facilities, and mining activities, in addition to wind turbines. On request, we have also attended various community meetings to share our knowledge of the acoustic field research and the relevant literature, or have freely shared our knowledge with others on request so they can educate their communities.

Professor Chapman has publicly and repeatedly<sup>15</sup> asserted for some time before his research was conducted that the symptoms result from “scaremongering” by the Waubra Foundation, which he has also referred to as the “the nocebo effect”.

The longstanding known and accepted peer reviewed published acoustic research into the effects of infrasound and low frequency noise has been discounted by Professor Chapman, who is a sociologist with a PhD examining cigarette advertising, with no clinical training or experience, no training in acoustics, and no direct clinical knowledge of the symptom reports from the sick residents and how they relate directly to exposure to operating wind turbines, or of the acoustic field research.

Page 2 of Table 1 in the Chapman research paper lists Origin Energy ‘s Cullerin wind development. The table states that the development commenced in July 2009, has an approximate population within 5km of 50 people, and states there had been “no health or noise complaints” and that there had been no “opposition” activity.

Whilst the Waubra Foundation is “pro health” and “pro research” into the adverse health effects of infrasound and low frequency noise regardless of the source of the noise, for some years Professor Chapman has chosen to label the Foundation deliberately and misleadingly as “anti wind”, and it would appear that by “opposition” he is in part referring to the Waubra Foundation and its CEO when he refers to “opposition activity” in his research.

I can confirm that the Waubra Foundation has never been invited to the Cullerin community to address a community meeting, nor have we attended a private meeting to discuss health concerns. That part of his data is accurate.

*How accurate is the assertion that there have been “no complaints” from residents living at Cullerin, and by inference that there are therefore no problems?*

With respect to Senate Inquiry submissions I have been advised that confidential submissions were made by Cullerin residents to Federal Senate inquiries. These would not be captured by Professor Chapman’s criteria but this does not mean the residents are not affected – it just means yet again that the adverse impacts are less publicly visible.

With respect to media reports, there have been print media reports referring to one Cullerin resident, a horse trainer, both in the Canberra times, in an article by John Thistleton on 30<sup>th</sup> May, 2012<sup>16</sup> and repeated in The Land on 2<sup>nd</sup> June, 2012<sup>17</sup> in which the resident’s symptoms were listed and were characteristic of those being reported by residents at other wind developments.

There is also a TV media report by Adrienne Francis from ABC 7.30 Canberra,<sup>18</sup> which again featured the Cullerin resident, who clearly recounted some of her symptoms and the concerns of her own medical practitioner.

Not one of these three media articles in significant publications such as the Canberra Times and The Land, and on the ABC 7.30 Canberra program concerning this Cullerin resident were included in the Chapman data analysis, suggesting that the media monitoring for the research project was incomplete. It is therefore inaccurate and misleading to assert as some have done that this data collection by Chapman et al is definitive of all the complaints ever made by residents living near Australian wind developments. Clearly that is not the case.

### **The Cullerin population surveys**

A New South Wales resident with extensive personal knowledge of the consequences of exposure to operating wind turbines because of her contact with residents at numerous wind developments in Australia conducted an anonymous survey in August 2012<sup>19</sup> to investigate the population living near the Cullerin wind development in order to determine how far out the noise and sleep deprivation impacts extended. The 2012 Schneider survey found that 76% of the households who responded (70% response rate) who were living out to 7.5km from the nearest wind turbine, reported sleep disturbance from the wind turbine noise.

A repeat anonymous survey was conducted by Patina Schneider a year later, in July - August 2013,<sup>20</sup> in order to investigate whether or not Professor Chapman's indirect data collection was accurate with respect to "no complaints" from Cullerin residents.

In contrast to Professor Chapman's data stating there had been no complaints, the residents who responded to the second Schneider survey listed episodes of over 300 complaints lodged since 2009 by 20 households (49 affected individuals), including to the wind developer, Origin Energy, the NSW department of Health, the NSW department of Planning, the local council, local politicians, and health care providers. ***In no instance were the problems resolved by any of the responsible authorities.***

However the NSW Department of Planning did conduct a noise audit and a community survey at Cullerin and Capital in mid 2012, ***as a result of the complaints***, in marked contrast to Professor Chapman's data collected *subsequently* stating that there had been "no complaints". No data from the NSW Department of Planning audit has yet been provided to the communities affected, but the data has been made available to the wind developers responsible for Cullerin and Capital who have been able to "comment" on it.

The action by the NSW Department of Planning in commissioning an audit suggests that Professor Chapman's data about complaints at Cullerin is wrong, quite independently of the responses to the Schneider survey questions about complaints in 2013.

The inconsistencies between Professor Chapman's complaints data and the residents' own reports of lodging complaints with the wind developer suggests that the wind developer may not be telling Professor Chapman the facts about the complaints made to them by local residents at Cullerin.

There is no reason to think other wind developers would behave any differently, particularly given the widely reported discrepancies between residents' reports and records kept by developers. This somewhat predictably suggests there is an inherent problem with using wind developer data for the purposes of determining numbers of affected people or episodes of adverse health events or "complaints".

***It also highlights the dangerously misleading consequences of assuming that limited indirect data gathering about complaints bears any relationship to the reality for residents in rural communities living near wind developments and the intrinsic weakness in relying on such indirect, misleading and incomplete data for public health policy purposes.***

***There is no substitute for direct investigation of the problems.*** To date no health authority has bothered to do so in Australia, and with the exception of Professors Colin Hansen<sup>21</sup> and Con Doolan<sup>22</sup> and their research team, and former Masters student Frank Wang,<sup>23</sup> no academic researchers have conducted any research.

### **Other problems with the Chapman data analysis and interpretation**

A fundamental question about the Chapman data analysis results from the apparent lack of understanding of the role that wind turbine size has on generation of acoustic emissions, in particular the shift down to the lower frequencies, which are well known to generate more “annoyance”. The data analysis by Chapman et al is further hampered by the apparent lack of interest in, or perhaps knowledge of, well accepted acoustic research, together with an apparent lack of understanding about the important damaging role chronic sleep deprivation and chronic stress can have on long term health.

Danish acousticians Professors Henrik Moller and Christian Sejer Pedersen documented the increase in the proportion of low frequency noise emissions with increase in power generation and size of wind turbines in a peer reviewed published paper in May 2011.<sup>24</sup> Unfortunately the concept that “size matters” has been not been referred to or considered by by Chapman and his co-authors.

This concept is critical to understanding why the numbers of complaints are rapidly increasing and extending out to greater distances at wind developments with larger wind turbines, for example the two 3 MW wind developments: one at Waterloo in South Australia and the other at Macarthur, in Western Victoria, the 2.3 MW turbines at Glenthompson (Oaklands Hill), and the 1.6 – 2MW turbines at Cape Bridgewater, Cape Nelson and Waubra.

### **The predictable consequences of siting turbines too close to homes**

The other issue not canvassed by Chapman and his co-authors is the issue of siting too many large wind turbines too close to homes. Many of the earlier wind developments were much smaller, used smaller turbines and were sited well away from homes.

One particularly pertinent example is Waubra. The preconstruction noise assessment conducted by Marshall Day Acoustics for Waubra Wind Development stated that 50 wind turbines would have to be operated in “noise reduction mode” in order for the wind development to comply with the noise pollution guidelines. The “problem” turbines are in the locations where many of the residents have reported adverse health effects, especially along Stud Farm Road, where some families have been forced to leave their homes and even their farms.

There is no evidence that the turbines at Waubra have ever been operated in noise reduction mode as stipulated by Marshall Day. There is independent acoustic evidence that the noise regulations are not being adhered to, however that has been ignored by both the Minister for Planning and his department.

The Victorian Chief Health Officer Dr Rosemary Lester has refused to investigate or conduct a health impact assessment despite being asked to do so by the Pyrenees Shire Council (now the Responsible Authority). Recently the Council minutes<sup>25</sup> (19<sup>th</sup> March, 2013) stated the following from page 17:

***“Council has had direct experience in dealing with this issue, and **there can be no doubt that dwellings in close proximity to wind turbines (within 2km) have/will have the potential to be profoundly noise affected** — to a point where the amenity of their occupants will be seriously diminished”***

The current Victorian Planning Minister has still not signed off on the compliance. In spite of this, and knowing the development is not yet considered compliant by the current planning Minister, the Clean Energy Regulator continues to pay renewable energy certificates (RECS) to the wind developer Acciona, which now amount to over \$80 million. The provisions of the Federal Renewable Energy Act are clear – state laws must be adhered to. In the case of Waubra, there is no evidence that the state noise pollution laws have ever been

adhered to, which is why this matter has now been referred to the Australian Federal Police for a fraud investigation.

### Confidentiality clauses

At some wind projects developers have bought out properties both before construction and after start up, presumably on the grounds that these properties would be and/or are unliveable because of noise pollution. Some of these properties have been subsequently bulldozed or left vacant and the residents silenced with confidentiality clauses in those buyout agreements. Former Waubra resident Trish Godfrey<sup>26</sup> is one such example.

Some confidentiality agreements have even extended to the proviso that the person signing the agreement cannot “complain to any government department about the noise impact” – reportedly contained in an Infigen agreement with respect to the Woakwine wind development in South Australia. This further undermines confidence in the accuracy of using complaints data from wind developers as a proxy for accurately assessing the true adverse impact of a wind development.

### “Complainants” vs “Complaints”

Chapman’s table column description is misleadingly labelled as “complaints” when what is meant is “complainants”. Each complainant is a person, in a household. When one member of that household is severely affected, it affects the family, even if they are not symptomatic or sleep deprived themselves. Labelling this column in the table as “complaints” trivialises the true impact. Furthermore labelling people as “complainers” as wind developers have done, has acted as a significant disincentive to some people to publicly report adverse impacts.

### Is the Waubra Foundation CEO *really* responsible for all the complaints because of “scaremongering” by reporting the symptoms and calling for research?

The Waubra Foundation commenced operating in July 2010, with no website, public meeting or media comments until September 2010. As the list of complaints below shows, the first complaints from residents at these wind developments commenced well *before* September 2010.

Capital and Woodlawn	10 (first complaint in December 2009)
Cape Bridgewater	6 (first complaint 2 February, 2010)
Cape Nelson	2 (first complaint 10 February, 2010)
Clements Gap	3 ( “from earlier” but known to be pre July 2010)
Hallett 2	2 (“from earlier” but known to be pre July 2010)
Toora	2 (described as “early” – Dr Iser’s survey was 2004)
Waubra	29 (13 <sup>th</sup> March, 2009)
Windy Hill	1 (“early” – commenced operating Feb 2000)
Wonthaggi	10 (February 2006)

How precisely does Professor Chapman (and his co-authors) explain this inconvenient truth that people were complaining some years *before* the Waubra Foundation commenced operating?

“Retrospective nocebo” perhaps?

### Concluding remarks

Any analysis of the incomplete and unreliable Australian “complaints data” collected by these researchers is essentially a waste of time and certain to lead to poor and not to be relied upon conclusions. The use of such low quality conclusions to rationalise continuing official blessing of seriously harmful wind projects has profound consequences for so many rural residents, including extremely vulnerable groups such as the elderly, young children, and the chronically ill.

The prominent and public role Professor Chapman has played in assisting the wind turbine manufacturer VESTAS<sup>27</sup> in the launch of its global “Act on Facts” campaign to continue to deny the existing known acoustic and clinical science is extremely concerning and raises many questions.

Professor Chapman’s ongoing denial of the existing evidence of harm to health from exposure to operating wind turbines is in stark contrast to the findings of Canadian public health physicians Dr Hazel Lynn and Dr Michael Arra.<sup>28</sup> In their recent literature review, Lynn and Arra found that every single peer reviewed published study showed evidence of what they called “human distress”.

It is also in stark contrast to the findings of the residents own treating health practitioners, including medical practitioners who have known their patients for many years such as Dr David Iser<sup>29</sup> at Toora. Chapman et al dismiss the relevance of the work and insights of Dr David Iser but they are crucially important, because Dr Iser saw patients presenting to him with new health problems which were unfamiliar to both him and his patients, but which coincided with the start-up of the Toora wind project. He decided to investigate further. The study findings and limited publicity came **after** the original data collection.

Those symptoms and presentations were not the result of a nocebo effect, nor indeed a “retrospective nocebo”. They were directly caused by exposure to operating wind turbines, known 25 years ago to the wind industry and the US Department of Energy to be related to infrasound and low frequency noise. Finally, as Dr Michael Nissenbaum<sup>30</sup> stated in his response to a question from the second Australian Federal Senate inquiry:

*“On 'nocebo', if a physician provides the diagnosis of 'nocebo' (a psychologically mediated effect analogous to a 'psychosomatic illness/response'), medical protocols dictate that it be done subsequent to a process of thoroughly excluding the possibility of any pathophysiological pathways that are plausible, more likely, or more important (because of serious downstream implications) to consider”.*

Dr Nissenbaum goes on to state:

*“Finally, **suggesting a diagnosis of 'nocebo' without investigating, 'boots on the ground', for more plausible, better understood, or more logical causes of a medical condition would normally constitute medical malpractice in most Western-based medical systems, including Australia. Individuals who are not physicians are not limited by this professional mandate or even necessarily this conceptual framework.***

***Please bear that in mind when deliberating the opinions (which, when not backed up by the evidence would by definition be superficial - and possibly contrived) - of witnesses or experts who opine on medical matters.”***

It is time the “boots on the ground” direct investigation of the acoustic environment of the residents reporting adverse health effects was properly carried out, inside the homes of sick residents, with multidisciplinary acoustic and medical research, recommended by the Federal Senate in June 2011<sup>31</sup> as “a priority”.

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