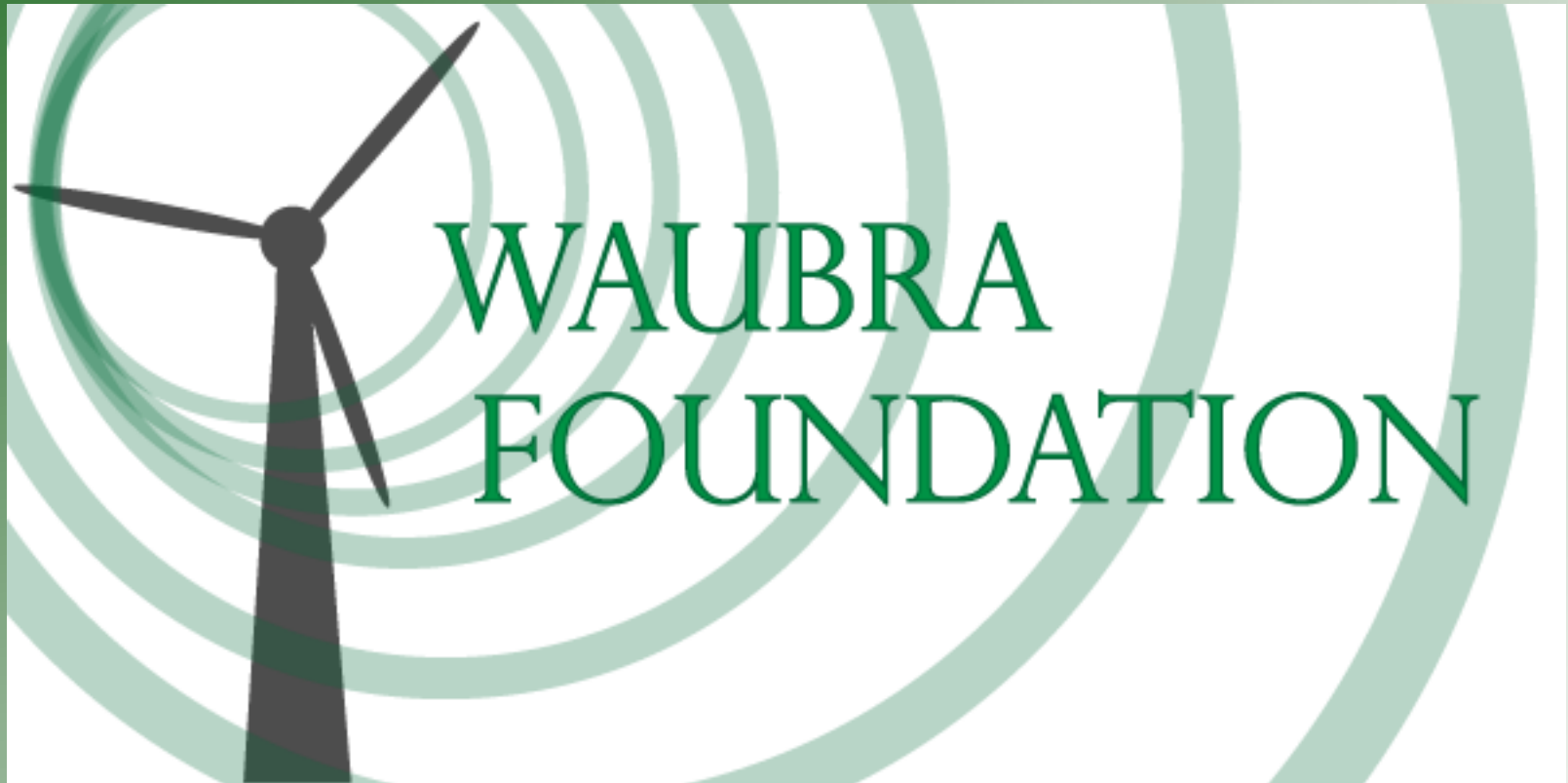


Dr Sarah Laurie CEO (BMBS Flinders, 1995)

“Cutting through the Spin”

Presentation 19<sup>th</sup> September, 2012

Farmer’s Health Conference, Hamilton



[www.waubrafoundation.com.au](http://www.waubrafoundation.com.au)

# “Cutting through the Spin”

- Do wind turbines cause adverse health effects?  
What are the mechanisms?  
Out to what distance?
- What is the existing evidence?
  - Peer reviewed and published in journals, based on data rather than “reviews”
  - Peer reviewed
- What is the wind industry (and its many supporters and paid experts) saying?
- How can we move forward?

# Do Wind turbines cause Adverse Health Effects?

- YES!! Reported by clinicians and residents (including turbine “hosts”), workers and visitors around the world
- Clear patterns of exposure to operating wind turbines leading to a characteristic range of health problems, variably expressed depending on individual susceptibility
- Not everyone is affected, and onset of symptoms varies
- If affected, cumulative exposure worsens symptoms. Always improve with cessation.

# Do Wind turbines cause Adverse Health Effects?

- First reported by “front line” clinicians – Rural physicians
  - Dr Amanda Harry (UK) 2003
  - Dr David Iser, Toora, Victoria, Australian 2004
  - Dr Nina Pierpont, US Paediatrician 2009
- Others now investigating/reporting include:
  - Professor Robert McMurtry, Ontario 2010
  - Dr Chris Hanning, Sleep Physician, UK
  - Dr Mauri Johansson, Danish Occupational Physician
  - Dr Eckhardt Kuck, German Oral Surgeon

# What are the mechanisms?

- KNOWN to cause harm to health from other sources
  - Low Frequency noise (20 – 200Hz)
  - Infrasound (0 – 20 Hz)
- Other possible mechanisms suggested by researchers:
  - Ground borne (seismic) vibrations
  - Rapid changes in barometric pressure
  - Electromagnetic fields

# Known mechanisms - LFN

- Leventhall, 2003 literature review for UK's DEFRA
  - LFN exposure caused range of symptoms identical to “wind turbine syndrome” in a case control study – source of LFN was compressors
  - LFN also reported to cause a PHYSIOLOGICAL stress response (eg in sleeping children exposed to truck LFN – elevated cortisol
  - People appear to become “sensitised”
  - Symptoms worsen with ongoing exposure
  - Denial of symptoms and lack of understanding by clinicians results in increased PSYCHOLOGICAL stress

# Known mechanisms - Infrasound

- No data on long term human exposure in the public domain, (but used acutely as a “non-lethal weapon”)
- Short term exposure (1 hour) in young fit adults resulted in elevated blood pressure, nausea, ear pressure,
- Chronic exposure in rats (1 study)
  - Oxidative stress mechanism (rats fed antioxidants showed less damage)
  - Focal organ damage (eg liver, brain, kidneys, testes, heart muscle)
- Adrenaline and Cortisol release measured in animal gut

# Acoustic Field Evidence

- Infrasound and low frequency noise from wind turbines is being measured inside the homes and workplaces of sick people by the following acousticians (some have themselves become sick):
  - Mr Rick James, USA
  - Mr Rob Rand, USA
  - Mr Steven Ambrose, USA
  - Mr Steven Cooper, Australia
  - Dr Bob Thorne, Australia
  - Mr Les Huson, Australia
  - Professor Colin Hansen, Dr Con Doolan, Adelaide University



# Over what distances are adverse health effects reported?

- Characteristic symptoms of “body vibrations” and the “waking repeatedly at night in a panicked state” out to 10km from Waterloo wind development in South Australia (VESTAS V90 wind turbines, rated at 3MW – size matters)
- Frenchman severely affected after 3 years of exposure at 11.5km, but 2MW turbines at 4,000 ft altitude. Does altitude affect sound energy transmission?? (wind turbine infrasound measured at Hubert’s home)
- Other reports of “sensitised” people affected out to 35km and more (US, Wales, Australia - “the HUM”)

# Distance Effect of Wake Turbulence



# Peer reviewed published DATA

## Wind turbine Health specific Research Data

- Dr Daniel Shepherd “Noise & Health”
  - Confirmed sleep disturbance and adverse impact on health related quality of life in cross sectional study,
- Dr Michael Nissenbaum (publication in Oct 12)
  - Data described beginnings of a dose response curve
- Krogh, et al WindVOICE survey Ontario confirmed Dr Amanda Harry’s findings from UK

# Peer reviewed published DATA

- Moller & Pedersen 2011 (Size Matters – larger turbines emit more proportional LFN)
- Professor Alec Salt – physiologist “inner ear reacts very differently to infrasound where there is very low background noise (eg quiet rural environments)” and at 60dBG will provoke a vestibular response and the “alerting mechanism” or “fight flight response” (levels of 60dBG are commonly being measured)

# Peer Reviewed Published Data

- “Vibro acoustic disease” with prolonged LFN exposure eg in aviation workers, now being identified in German residents exposed to wind turbines long term (Alves Pereira, and Chao)
  - Pericardial thickening
  - Mitral and tricuspid valve abnormalities
  - Thickened wall of blood vessels
  - Dramatic increase in late onset epilepsy

# Summary of current hypotheses

- Acute responses
  - activation of vestibular dysfunction via inner ear
  - Headache symptoms possibly LFN via eyes, or EMF
- Chronic response
  - Repetitive physiological stress
  - Chronic cumulative severe sleep deprivation
  - Psychological stress because of lack of response of responsible authorities, and hostile community
- Long term tissue damage (Vibroacoustic disease)

# What do the Wind Developers Say?

- It varies!! **Privately** employees from Origin, Suzlon have admitted they know people get sick
- Some categorically deny any health problems anywhere (Infigen, in Senate testimony)
- Some admit some people get “stressed” and infer or openly state this is because of “scaremongering” (Acciona in Senate testimony).
- Professor Wittert, paid expert for Acciona in the Paltridge case, admitted people were “sick” and “stressed” but blamed scaremongering

# What is the evidence for “Scaremongering” causing the symptoms at existing wind projects?

- First reports from medical doctors:
  - 2003 Dr Amanda Harry, UK (Rural GP)
  - 2004 Dr David Iser, Toora, Victoria (Rural GP)
  - 2009 Dr Nina Pierpont, USA (Paediatrician)
- First reports by Waubra residents in Victoria to media and health authorities were in 2009
- **I first spoke out publicly in July 2010**



# What do Wind developers and others eg SA EPA say about Infrasound?

- “there is no infrasound at a well maintained wind farm” (SA EPA guidelines) BUT
- Infrasound measured and reported by NASA in 1989 at “upwind” turbines in Hawaii
- Dr Frits Van Den Berg reported it in 2004
- Since measured at multiple developments in Australia and the US by James, Rand, Ambrose, Cooper, Huson, & Thorne

# How can we move forward?

- RESEARCH – multidisciplinary, done by those with no vested interests in the outcome
- LEGAL – cases are currently underway in a number of different parts of the world (especially in Ontario and Australia)

# July 2011 Judgment in Canada

- This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. *The evidence presented to the Tribunal demonstrates that **they can, if facilities are placed too close to residents.** The debate has now evolved to one of degree."* (p. 207) (Emphasis added)[i]
- *Environmental Review Tribunal, Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment, Dated this **18th day of July, 2011** by Jerry V. DeMarco, Panel Chair and Paul Muldoon, Vice-Chair,*
- <http://www.ert.gov.on.ca/english/decisions/index.htm>

# Outcome - Home Abandonment

