Overview of the Community Noise and Health Study

October 2014

Outline

- Background
- Consultation and experts advice
- Study Design
- Questionnaire Content
- Physical measures
- Collection results
- RDC files

Background

- HC approached SC to conduct a study aimed at assessing the possible health effects associated with exposure to wind turbines in Canada
- Symptoms such as anxiety, sleep disorders and headaches often reported
- To investigate relationship between wind turbine proximity and possible impact on health and well-being
- Impact on health of wind turbines has not yet been fully assessed
- Limited scientific research done in Canada

Background

- Evaluate dose response relationship between noise exposure and health outcome (modelling)
- The study will contribute to an area of ongoing global research. It includes both self-reported data and objective health measures.
- This study is innovative since it is the first one to include direct physical measures

Consultation and experts advice

- Working group chaired by HC
- 60 day public consultation
- Design and content reviewed by:
  - Public Health Agency of Canada's Science Advisory Board
  - World Health Organization (WHO)
  - HC's Research Ethics Board (REB)
  - Privacy Impact Assessment
  - Cognitive questionnaire testing
  - Technical committee on household surveys

Study Design Overview

- Parts of rural Ontario and PEI
- Computer Assisted Personal Interview in respondents dwelling (CAPI)
- Sampling frame originating from two sources: Address register and NAVCAN
- Sampled dwellings within 10 km of turbines stratified by estimated distance/sound level
- 2004 dwellings selected (approx.1600 in ON, 400 in PEI)

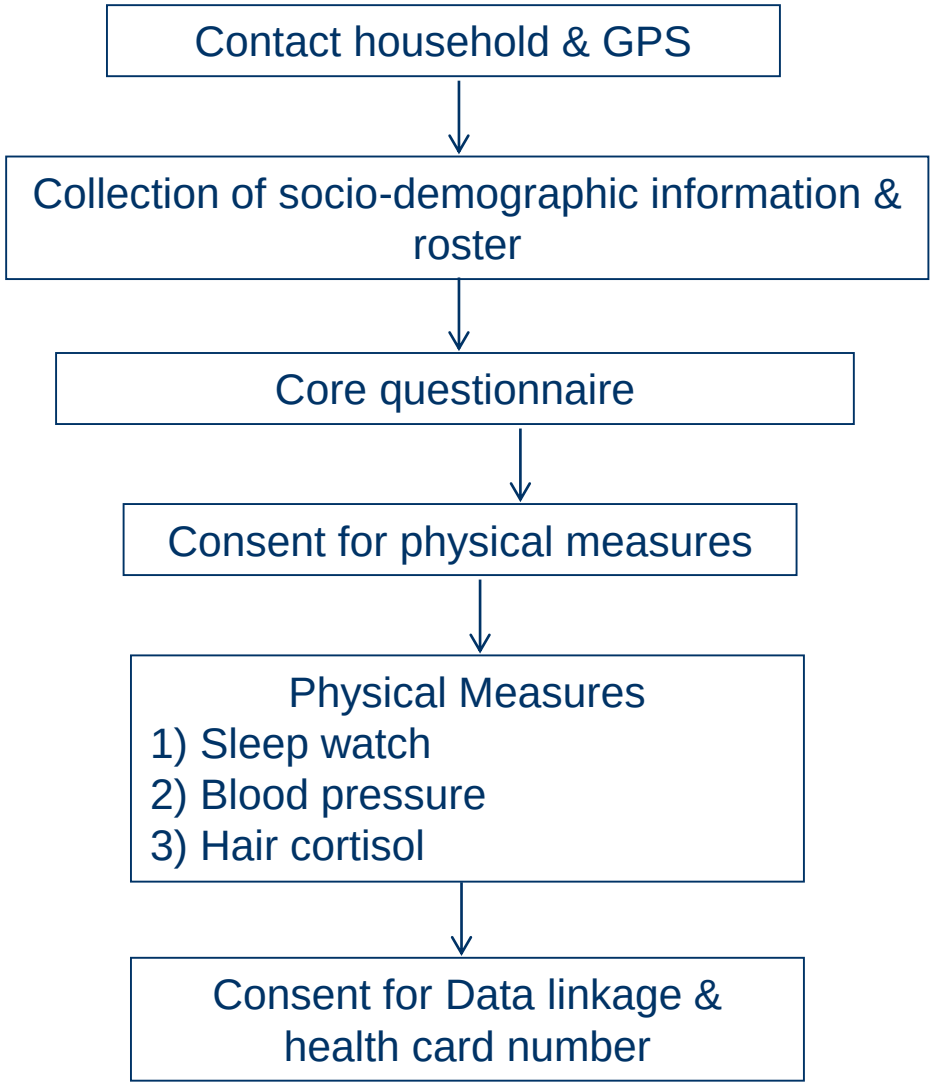
Study Design Overview

- In-scope members included all persons 18-79 years of age that are usual residents
- One eligible member of the household was randomly selected to take part in the study
- May – September 2013 collection
- Supplemental HC study

Flow of interview

35 min

45 min



Questionnaire – Core Content

- The self-reported CAPI portion include questions on:
  - Health status and chronic conditions
  - Stress assessment
  - Cigarette, alcohol and caffeine use
  - Perception of outdoor noise sources (incl. WT, traffic, aircrafts and railways)
  - Quality of life and sleep
  - Housing characteristics
  - Employment, income and socio-demographics

Questionnaire – Validated Scales

- Three widely used modules in epidemiology and psychological studies:
  - quality of life (WHOQOL Bref scale)
  - perceived stress (Cohen's Perceived Stress Scale))
  - sleep quality (Pittsburgh Sleep Quality Index)
- These modules have validated scales and can be used to compare with other similar studies

Questionnaire - Physical Health Measures

- First wind turbine study to use physical measures
- First time at STC physical measures taken in households
- Three measures, administered based on CHMS protocols:
  - Resting blood pressure and heart rate
  - Sleep watch
  - Stress hormone in hair
- Each physical measure will provide objective information on the possible health effects of WT noise

Questionnaire - Physical Health Measures

- Blood pressure
  - Considered an important indicator of overall health
  - Automated resting blood pressure and heart rate
  - Environment and positioning are important
  - Six measurements at one minute intervals

Questionnaire - Physical Health Measures

- Sleep quantity and quality
  - Noise can disturb sleep and lack of sleep can lead to a variety of health effects
  - better understanding of how sleep quantity and quality may be affected by noise from wind turbines

Questionnaire - Physical Health Measures

- Sleep watch
  - Records movement and light levels
  - Worn for 7 days
  - Daily sleep log completed
  - Respondent mails watch and log to STC

Questionnaire - Physical Health Measures

- Stress hormone in hair
  - High levels of stress can have negative effects on health
  - One way we can measure chronic or long-term stress is to measure cortisol in a sample of hair
  - Retrospectively examine up to three months of stress exposure

Questionnaire - Physical Health Measures

- Hair sample
  - Small sample taken from scalp at crown of head
  - Short questionnaire about use of cortisone medications, colouring, and hair washing, etc.
  - Sample sent to laboratory for analysis

Collection results

- A total of 1,238 completed the study yielding a final response rates of 79% (after the removal of out-of-scope units)
- Participation was similar regardless of one's proximity to wind turbines and equally high in both provinces
- Response rates obtained for the physical measures:
  - 87% for blood pressure
  - 57% for cortisol and sleep watch

RDC files

- Core file: Self-reported questions + BP + cortisol
- Per minute sleep watch data file (approx. 9 mil. rec.)
- Per day sleep watch data file (approx. 22K rec.)
- Sleep log file
- The primary intended use of the study was to explore the relationship between noise and health using dose (noise exposure) – response (health status) modelling and multivariate techniques
- Results may not be generalized to areas beyond the study area