Clinical epidemiology and psychiatric disorders

Community and Research Module
Advanced Trainee Seminars

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Definitions.
- Epidemiology
- Clinical Epidemiology
- Evidence Based Mental Health

Types of paper.
- RCT
- Systematic review
- Economic review.
- Guidelines.
- Policy, protocols.
Definitions.

Epidemiology is the study of diseases within populations.
- Surveys,
- Case control studies.

Clinical epidemiology is the study of diseases within patients.
- Patient surveys, outcome measures.
- Quality assurance and monitoring adverse outcomes.
- Analysis of clinical literature.
  - Systematic reviews
  - Economic analysis.
  - Guidelines.

Evidence based is either a description or a term of approval.
Epidemiology papers.

- Survey.
- Case control study,
What is the population?
- Inclusion e.g. “All persons living the community over the age of 16...”
- Exclusion e.g. “...that were fluent in English”.

How was the population sampled?
- Random “from phone book/electoral roll”
- Stratified random “random person from random house in random area”
- Screened. “all persons with GHQ score of 12 and sample of those below”

How was the data acquired?
- Survey instruments reliability and validity.

How was the survey done?
- When was the survey done?
- What is the response rate?
To estimate the 12 month prevalence of DSM-IV disorders in New Zealand, and associated interference with life and severity.

A nationally representative face-to-face household survey carried out in 2003–2004.

A fully structured diagnostic interview, the World Health Organization World Mental Health Survey Initiative version of the Composite International Diagnostic Interview (CIDI 3.0) was used.

There were 12,992 completed interviews from participants aged 16 years and over. The overall response rate was 73.3%

The prevalence of any disorder in the past 12 months was 20.7%.

The prevalences for disorder groups were: anxiety disorders 14.8%, mood disorders 7.9%, substance use disorders 3.5%, eating disorders 0.5%.

The highest prevalences for individual disorders were for specific phobia (7.3%), major depressive disorder (5.7%) and social phobia (5.1%).

Overall, only 31.7% of cases were classified as mild with 45.6% moderate and 22.7% serious.
Need number of cases and matched controls.

Cannot identify rates of events. Can identify associations.

Analysis

How were cases identified?
How were controls chosen?
   And how were they matched?
What is the strength of the association?
   Is it clinically significant.
Suicide safety barriers were removed in 1996 after having been in place for 60 years.

The bridge is a known suicide site and is located adjacent to the region's largest hospital, which includes an acute inpatient psychiatric unit.

Case history data about each suicide death by jumping in the metropolitan area in question, from 1994 to 1998, were abstracted from coronial files held by a national database.

In the 4 years following the removal of the barriers (compared with the previous 4 years) the number of suicides increased substantially, from three to 15 ($\chi^2 = 8$, df = 1, $p < 0.01$); the rate of such deaths increased also ($\chi^2 = 6.6$, df = 1, $p < 0.01$).

The majority of those who died by jumping from the bridge following the removal of the safety barriers were young male psychiatric patients, with psychotic illnesses.

Following the removal of the barriers from the bridge the rate of suicide by jumping in the metropolitan area in question did not change but the pattern of suicides by jumping in the city changed significantly with more suicides from the bridge in question and fewer at other sites.
Clinical epidemiology papers.

- Controlled Trials
  - Open
  - Blind
  - Double Blind
- Other types of trials
  - Patient as own control
  - N=1 trial
- Systematic reviews
- Economic analysis
- Guidelines
Effect size = the proportion of change (shift in treatment mean) with intervention.

- Standardised to a normal distribution, (Z score)
- Thus
  - Effect size of one = 34% change in mean
  - Effect size of two = 47.5% change in mean

Effect size can be increased by
- Not using an intention to treat analysis.
- Poor concealment randomization.
- Poor blinding
- No blinding
- No randomization.

Thus the better the quality of the paper, the poorer the result.
Patient as own control

A – B design
- Participants randomized to treatment A, then treatment B, or vice versa.
- Need to be able to
  - Safely change from one treatment to another.
  - Know treatments will not interfere with each other.

N=1
- Repetitive blinded A – B trials with one patient.
- Need
  - Chronic stable condition.
  - Inability to find best treatment
  - Reasonable alternatives.
Efficacy & Effectiveness.

Efficacy (control all variables)
- This treatment works in ideal situations.
- Long list of exclusions.
- Small proportion of potential patients participate.
  - Participants less likely to have poor outcome
    - Able to consent
    - No comorbidity.
- Maximizes potential effect size thus lower numbers patients.

Effectiveness (allow all variables)
- Trial in real life situations
- No exclusions.
- Control by statistical methods.
- Need much larger numbers.

Treatments that are efficacious need effectiveness trials
Economic analysis.

- Rely on good data.
  - Rate of disorder
  - Risk of disability associated with disorder.
  - Effectiveness of interventions.
  - Cost of interventions.

- Analysis:
  - Good papers do not have *many*
    - Estimates with not data (guesstimates)
    - Expert opinion driving data (group guesstimates)
  - Expert opinion is biased by what the clinician sees and groupthink. It is another form of guesstimate.
Build on good trials

Analysis
- Can I do the search as described?
- When was it done?
- Was it complete
  - Analysis of bias (funnel plot)
  - Grey literature
    - Abstracts conferences
    - Registers of controlled trials
    - Writing to authors.
- Is the analysis design reasonable?
- Do the conclusions make sense?
- All authors have biases: if the review is not systematic it will ignore the literature the author is less comfortable with.
Rely on

- Systematic reviews.
  - Range of effective treatments.
  - Ideally, comparing effective treatments
- Economic analysis.
  - Of the treatments.
  - Acknowledgments of implications resources (funding, people)/

Will not work if:

- Impractical
  - Too long
  - No resources
- Unavailable
- Unacceptable
  - To patients, families, and wider community.
I have experience at the coal face and in interaction with policy makers.

In my view, the coal face is more truthful.

The following is rather:

- Cynical
- Offensive
- Politically inappropriate.
Ideally it is like a pyramid.

- Many RCTs
- Some systematic reviews.
- Few economic analyses.
- One or two guidelines.
- Clear policy.
  - Evidence based and SMART
    - Specific
    - Measurable
    - Achievable
    - Relevant.
    - Timed.

Mexico, Yucatan Peninsula, Maya peoples, *El Castillo*, pyramid at Chichen Itza, c. 9th century.
Often it is more like...

- Confused, implicit agendas.
- Lack of:
  - Evidence
  - Belief that evidence exists, or that evidence is inappropriate.
  - Resources to fund evidence.
- Surfeit of
  - Ideology
  - Rhetoric
  - Learned opinion.
  - Consumer perspective.
Policy makers.

- Division funders and providers.
  - Funders.
    - Decide policies, goals and resources.
    - Close relationship to political bodies.
    - No accountability to patients and caregivers.
  - Providers.
    - Implement policies, insufficient resources.
    - Clinically accountable.
    - Close relationship to patients and caregivers.
What to do?

- We have some knowledge about effective treatments.
  - But this is often partial.

- We have a duty to advocate for our patients.
  - But this can lead to conflict
  - There are limitations on resources, even in the best funded systems.

- We have a duty to provide effective care
  - If we can access it
  - Or the most effective care we can access.

- We live in an imperfect society and system.
  - But we can inform those who can change it.