

# Public Health Skills Session

## Hierarchy of Evidence

Tuesday 25<sup>th</sup> February 2014

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# By the end of the session...

- Understanding of the hierarchy of evidence.
- Characteristics of key research methodologies.
- Issues and challenges.
- Where to go for more information.

# What is the Hierarchy of Evidence?

- Ranks research methodologies according to their validity.
- Evidence based medicine/practice.
- A variety of grading systems for evidence and recommendations is currently in use. The system used is usually defined at the beginning of any guidelines publication.
- The hierarchy of evidence and the recommendation gradings relate to the strength of the literature.

# Systematic Review

- Defining an appropriate question.
- Searching the literature.
- Assessing the studies for eligibility, quality and findings.
- Combining the results to provide a 'bottom line'.
- Placing the findings in context.

# RCT

- Evaluates the effect of a specific treatment or practice.
- The intervention being tested is allocated to a group of two or more study subjects (individuals, households, communities).
- Subjects are followed prospectively to compare the intervention vs. the control (standard treatment, no treatment or placebo). Randomisation is a key feature.
- Looks for incidence or treatment effect in the two groups.

# Cohort Study

- A group of people are followed over many years to ascertain how variables (such as smoking habits, exercise, occupation and geography) may affect outcome.
- They may be prospective or retrospective. Bias is however an issue with retrospective studies but prospective studies are expensive.
- The incidence of disease in the exposed group is then compared to the incidence of disease in an unexposed group, and a relative risk (incidence risk or incidence rate) is calculated to assess whether the exposure and disease are causally linked.

# Case-Control Study

- Starts with the identification of a group of cases:
  - individuals with a particular health outcome in a given population and;
  - a group of controls (e.g. individuals without the health outcome).
- Participants are matched.
- Good for rare diseases, cost effective but prone to bias.
- The odds ratio (OR) is used in case-control studies to estimate the strength of the association between exposure and outcome.

# Cross Sectional Study

- Data are collected on the whole study population at a single point in time to examine the relationship between disease (or other health related state) and other variables of interest.
- This methodology can be used to assess the burden of disease or health needs of a population, for example, and is therefore particularly useful in informing the planning and allocation of health resources.
- The main outcome measure obtained from a cross-sectional study is prevalence

# Case Reports

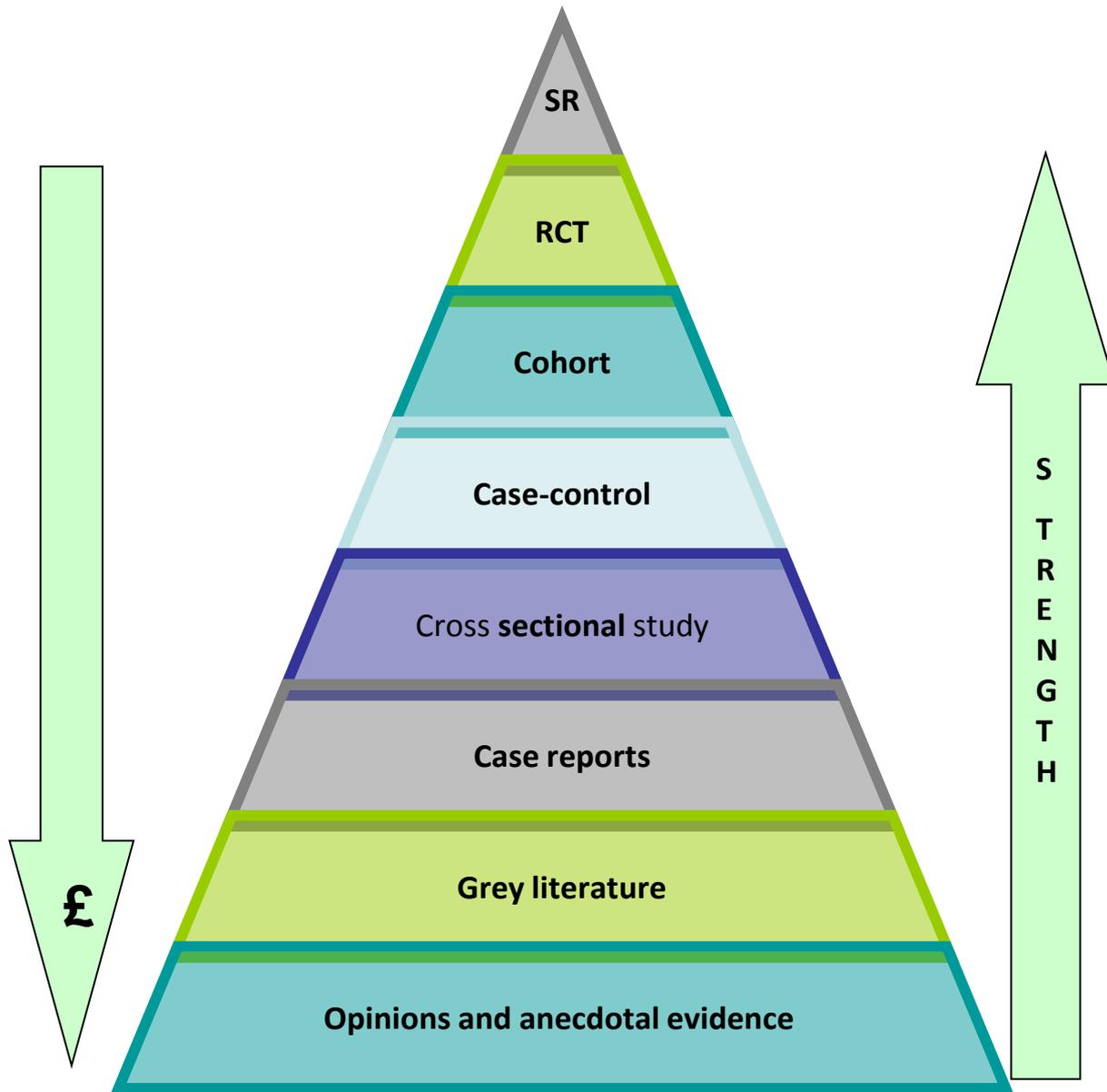
- The case report is a specific type of research design that reports on an aspect of the management of one or two patients or situations.
- Useful in rare cases or for management of cases or situations.
- Multiple case reports may be used to generate case series.

# Grey Literature

- Produced by government, academics, business and industry in print and electronic formats, not controlled by commercial publishers.
- Includes: government publications, reports, statistical publications, newsletters, fact sheets, working papers, technical reports, conference proceedings, policy documents and protocols and bibliographies.

# Opinions and anecdotal evidence

- Expert.
- Organisational.
- Individual (opinion and personal experience).
- Non scientific and non statistical evidence.
- Reports, observations, word of mouth.



# Things to think about.....

- Useful when critiquing evidence base for decision making.
- Ranking of evidence, versus that which is most relevant to practice.
- Bradford Hill criteria: cause and effect.
- 'Publication Bias' e.g. strength of the research literature and those with favourable results.
- Quality of the research.
- Cost, time and feasibility.
- Practical application e.g. ethics.
- The audience and purpose.
- Focus on quantitative research methodologies.
- Useful when critiquing evidence base for decision making.

# More info.....

- Health Knowledge
- The Cochrane Collaboration
- NICE
- Centre for Evidence-Based Medicine
- Bandolier
- Greenhalgh T (1997) How to read a paper; 19, 315.

**Thank you**  
**Any questions?**

**Next session: Interpreting data**  
**Tuesday 25<sup>th</sup> March (Beveridge Room)**