

Introduction to Evidence based health

... Details of the course and details of evidence based health

Arindam Basu, 19th July, 2021

Introduction to HLTH301

- We will cover:
 - Framing research questions
 - Searching literature
 - Critical Appraisal and summary
 - Theory
- Assessments:
 - Critical appraisal of a single study (20%, deadline:)
 - Critical appraisal and summary of a body of evidence (45%, deadline:)
 - Multiple Choice test (35%, deadline:

Teaching philosophy and grading

- You will learn hands-on mostly except for the theory
- You will NOT fail in this course as long as you submit the assignments
 - The course is based on learning most useful things first
 - I have decoupled assessment from grading
 - I will assess and provide feedback, you grade yourself and write to me in details as to what grade you deserve in your best opinion and why
 - I can still override your grade recommendation
- Keep asking and answering questions in the class

What is Evidence Based Health

Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence based medicine means integrating individual clinical expertise

- Conscientious
- Explicit
- Judicious
- Decision Making

Main Needs and Elements

- Medicine as was practiced in the last century
 - Biology driven (Anatomy, Physiology, Pathology, Pharmacology)
 - Experience Driven (Clinical signs and symptoms, individual experiences)
- Biology and individual experiences are not enough
- Empirical research: rise of RCTs and Meta-analyses in 1970s
- Too much literature: need to digest and make things simple

Elements of Evidence Based Health

- Frame Answerable Questions
- Search Literature
- Critically Appraise Single Studies to assess quality of evidence
- Synthesise and combine multiple studies
- Critically appraise a body of evidence based on outcomes

Frame answerable questions

- Background questions - common knowledge
- Foreground questions - questions that emerge from background information
- Framework of PICO
- P = patients/person/participants, I = Intervention (also E = Exposure), C = Comparator, O = Outcomes
- Sets the scene and the entry point of Evidence Based Practice

Search Literature

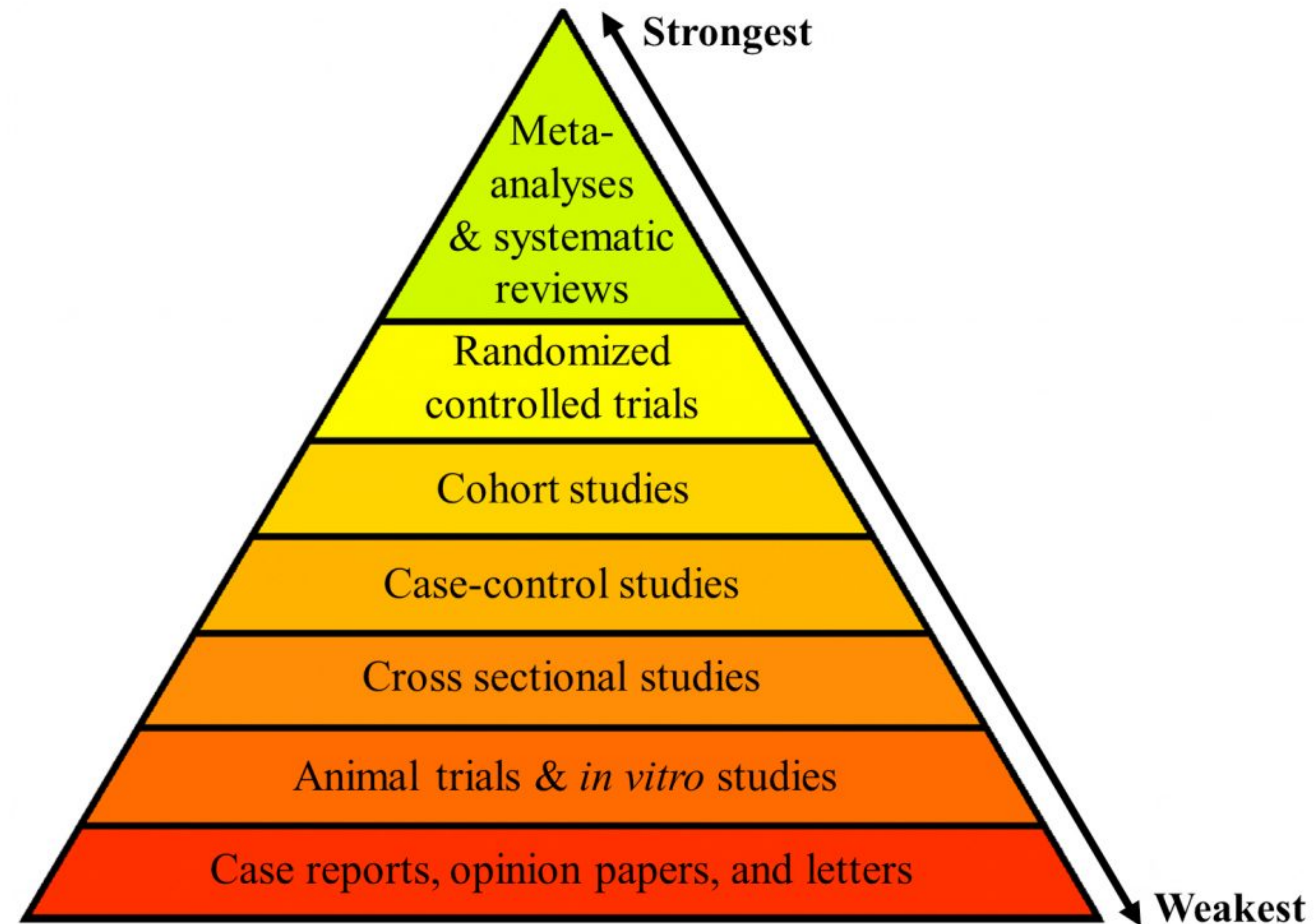
- Use Boolean Logic (AND, OR, NOT)
- Use Fuzzy Logic
- Identify databases to search
- Primary studies and discipline specific databases (Medline/Pubmed, PsycInfo, CINAHL)
- Secondary studies and others (Cochrane Collaboration, ACCESSSS)
- Retrieval and storing of literature data in Bibliography management software

Critical Appraisal of Single Primary Study

- Basic Skill is to critically appraise single study
- Critical Appraisal:
 - Read the key question and construct hypotheses from the Introduction
 - Read the methods section and understand what kind of study was conducted
 - Assess whether the sample size and power was adequate (ante-ex power)
 - Assess whether the study had uncontrolled confounding
 - Assess whether the study has issues with bias
 - Assess whether the study has Issues with external validity

Hierarchy of Evidence

Hierarchy of Scientific Evidence



Critical Appraisal of observational studies

- Which population was studied
- How was the exposure assessed?
- What was the risk of selection bias?
- What was the risk of response bias?
- Did they have sufficient number of participants?
- What do the results tell us?
- How can I apply the study findings to another population of interest?

Critical Appraisal Checklists for Observational Studies (STROBE statements)



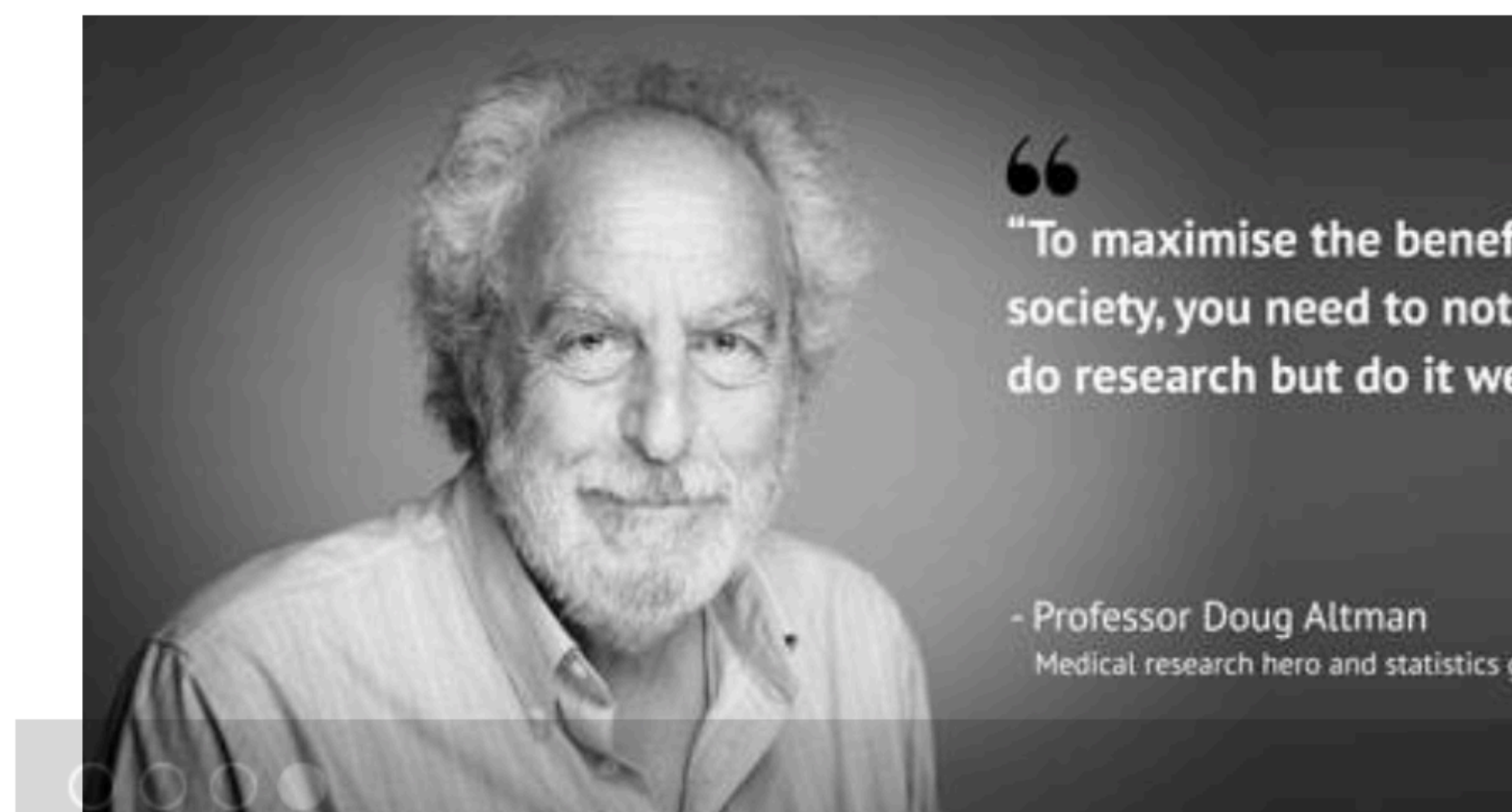
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STROBE checklists

Version 4 as published in Oct / Nov 2007!

- STROBE checklist for **cohort, case-control, and cross-sectional studies** (combined)
download [PDF](#) / [Word](#)
- STROBE checklist for **cohort, case-control, and cross-sectional studies**
download [PDF](#) / [Word](#)
- Checklist for **cohort studies**
download [PDF](#) / [Word](#)
- Checklist for **case-control studies**

Critical Appraisal of Randomised Controlled Trials (CONSORT statement)



Welcome to the CONSORT Website

CONSORT stands for Consolidated Standards of Reporting Trials and encompasses various initiatives developed by the

CONSORT 2010 Key Documents



CONSORT 2010
Checklist



CONSORT 2010
Flow Diagram



CONSORT 2010
Statement



CONSORT 2010
Explanation
and Elaboration

Synthesise Evidence from multiple studies

- Learn how to synthesise evidence from observational studies using systematic review
- Learn how to synthesise evidence from RCTs using meta-analysis

Steps of Systematic Review of studies

- Start with PECO or PICO questions
- Search Literature
- Filter studies on titles and abstracts using Inclusion/Exclusion criteria
- Code and abstract full length of studies
- Summarise and synthesise themes and contents of such studies

Steps of meta-analysis

- Start with PICO question
- Search Scholarly Literature Databases
- Filter studies using titles, abstracts, and later using their full texts
- Code and abstract information from studies
- Statistically pool results from individual studies
- Conduct sensitivity analyses and meta-regression
- Test that you have not missed small equivocal and negative studies to rule out publication bias

Quality appraisal of many studies

- Use outcomes as your basis
- One study may have many outcomes
- One outcome may be covered by many studies
- Use GRADE mechanism to assess summary of findings and appraise quality scores
- GRADE helps to understand whether the current evidence on hand is sufficient or whether more studies are needed

GRADE and GRADEpro

GRADEpro | GDT



GRADE your
evidence
and
improve your
guideline
development
in health
care



Understand the theory: study designs and causality

- Measures of Association and Association is not causation
- Valid Association is based on three entities:
 - Rule out play of chance
 - Control for Confounding
 - Elimination of Biases

Understand the theory: Causality

- Causal Inference between an intervention or an exposure and an outcome is based on:
 - Criteria based assessment of Causal Inference
 - Bradford Hill's Criteria
 - Assessing Necessary and Sufficient Causal Criteria
 - Rothman's Pie to account for Causality
 - Assessing Causal associations with Directed Acyclic Graphs (DAGs)

Understanding the theory: Study Designs

- Correct epidemiological study designs are essential for good science
- Meta analyses and Systematic reviews
- Randomised Controlled Trials
- Prospective and Retrospective Cohort Studies
- Case Control Study Design
- Case series and Cross-sectional surveys
- Ecological Study designs

Summary

- This course will cover a lot of grounds
- Most of the course will be hands-on
- Theory will be covered in Term 4
- All lectures will be made available over Learn
- PDFs of slide decks will be made available on Fridays
- Deadlines are non-negotiable hard deadlines!
- Good luck studying as NO ONE FAILS this course

