PH458

Evidence-Guided Policy: What is it? Why Do we Need it?

Dr. Ioannis Votsis
LAK3.01 (Lakatos Building)
Office hours: Tuesdays 15:00-16:00
i.votsis@lse.ac.uk
www.votsis.org

Introduction to the Course

What's expected of you coming in

- Pre-requisite: none.
- Mathematical skills: minimal.

  * a little algebra

  * a little probability

  * a little decision theory

- Logical skills: moderate.

Topics

1. Evidence-Based Policy: What is it? Why do we need it?
2. Public Understanding Science
3. Epistemic Autonomy
4. Evidence and Values
5. Aggregating Judgment
6. The Precautionary Principle.
7. Case study: Medicine
8. Case study: Climate Science
9. Case study: Politics
10. Case study: Economics

Seminars

- PH458:

  Seminar 1: Thursdays 17:00-18:30 (Location: NAB.1.19)

  Seminar 2: Thursdays 15:00-16:30 (Location: NAB.2.08)

Readings

- Main (but not required) reading source:

  Cartwright, N. and J. Hardie (2012) *Evidence-Based Policy: A Practical Guide to Doing it Better*, Oxford: Oxford University Press

- Weekly readings (and much more) listed on Moodle.

Assessment

- **Formative**:

  - *One* 2000-word essay.
  due: Monday 8 January 2018 at 17:00.

  - *Weekly* sets of *three* short-answer questions.

- **Summative**:

  - *One* 2000-word essay that counts for 33% of total mark.
  due: Friday 26 January 2018 at 17:00.

  - *One* end-of-year exam that counts for 67% of mark.

Introduction (to the lecture)

The good, the bad and the downright ugly

- There are all sorts of policies. Those that work. Those that don't. And those that make a mess of things.

  Examples:
  Railing against the consumption of eggs because they presumably lead to a substantial rise in cholesterol levels.

  Blanket-sponsoring biofuels (to reduce greenhouse gases) failed to take deforestation and soil erosion into account.

- Now, it goes without saying, that nobody wants bad policy; at least not for itself.

The road to better policy

- How can we improve policy design and implementation?
- Surely, one (almost trivially true) answer is by being:

  (i) more informed

  (ii) avoiding or minimising mistakes in reasoning
- Evidence-based policy is an approach that seeks to:

  (a) inform policy through evidence

  (b) avoid/minimise mistakes through rational deliberation

Why do we need it?

- Evidence-based policy is meant to give better answers to questions like the following:

  Will mass mammography decrease the number of deaths from breast cancer?

  Will making a drug available on the NHS have (as a rule) a positive effect on patients?

  Will smaller class sizes enhance scholastic achievement?

First things first

- Before we proceed to consider such questions, it is important to first understand what we mean by:

  * policy

and

  * evidence

What Do we Mean by ‘Policy’?

Narrow and broad construals

- According to the Oxford dictionary:

  Policy: "A course or principle of action adopted or proposed by a government, party, business, or individual".

  https://en.oxforddictionaries.com/definition/us/policy

  NB: There is also a more narrow conception that relates only to governmental or semi-governmental organisations.

- What is key in the idea of policy is *the intension to consistently pursue* a course or principle of action.

Policy domains

- Policies may concern any one of a number of domains, e.g.:
  - climate
  - conservation
  - education
  - electoral systems
  - health
  - international development

What Do we Mean by ‘Evidence’?

Evidence: General characteristics

- Evidence is central to our endeavours to understand the world around us.
- It is meant to be an *objective* and *neutral* adjudicator.
- We use it to construct, modify, confirm, disconfirm, establish and refute hypotheses.
- It informs science, the police, intelligence agencies, investigative journalists, courts of law, policy-makers, etc.
- Without it, we are left with… uninformed opinion, random guesses and, worst of all, dogma.

Many forms, one function: Reducing uncertainty

- Obviously, evidence comes in variety of forms.

  Examples:

* temperature readings
* bubble chamber photographs
* Geiger counter audible clicks
* fossilised imprints
* drawings made by surgeons
* the absence of broken windows

- In spite of this variety, evidence plays the same function. Its informational content is meant to *reduce uncertainty*.

Evidence in propositional form

- Williamson (2000) argues, correctly in my view, that any true proposition can serve as evidence.
- On this view, not only are all true propositions evidential but also any evidence can be put into propositional form.
- Why is this important?
- Because it allows us to gauge the strength of evidence-theory relations in terms of powerful tools like:

  LOGIC: Does p_2 follow from p_1?

  PROBABILITY: Is $Pr\ (p_4/p_3) > Pr\ (p_4)$?

Orders of evidence

- Epistemologists, e.g. Christensen (2010), often distinguish between first and higher-order evidence:

- **First-order:** Evidence that is meant to bear directly on the hypothesis under test.

- **Higher-order:** Evidence concerning the quality of lower-order evidence or how subjects rationally react to it.

  Example: Suppose *H* is the hypothesis 'The global average temperatures will rise by 1° C in the next 20 years'

  1st order evidence: meteorological data *D* about *H.*
  2nd order evidence: the meteorologist's reaction to *D*.

Boosting confirmation

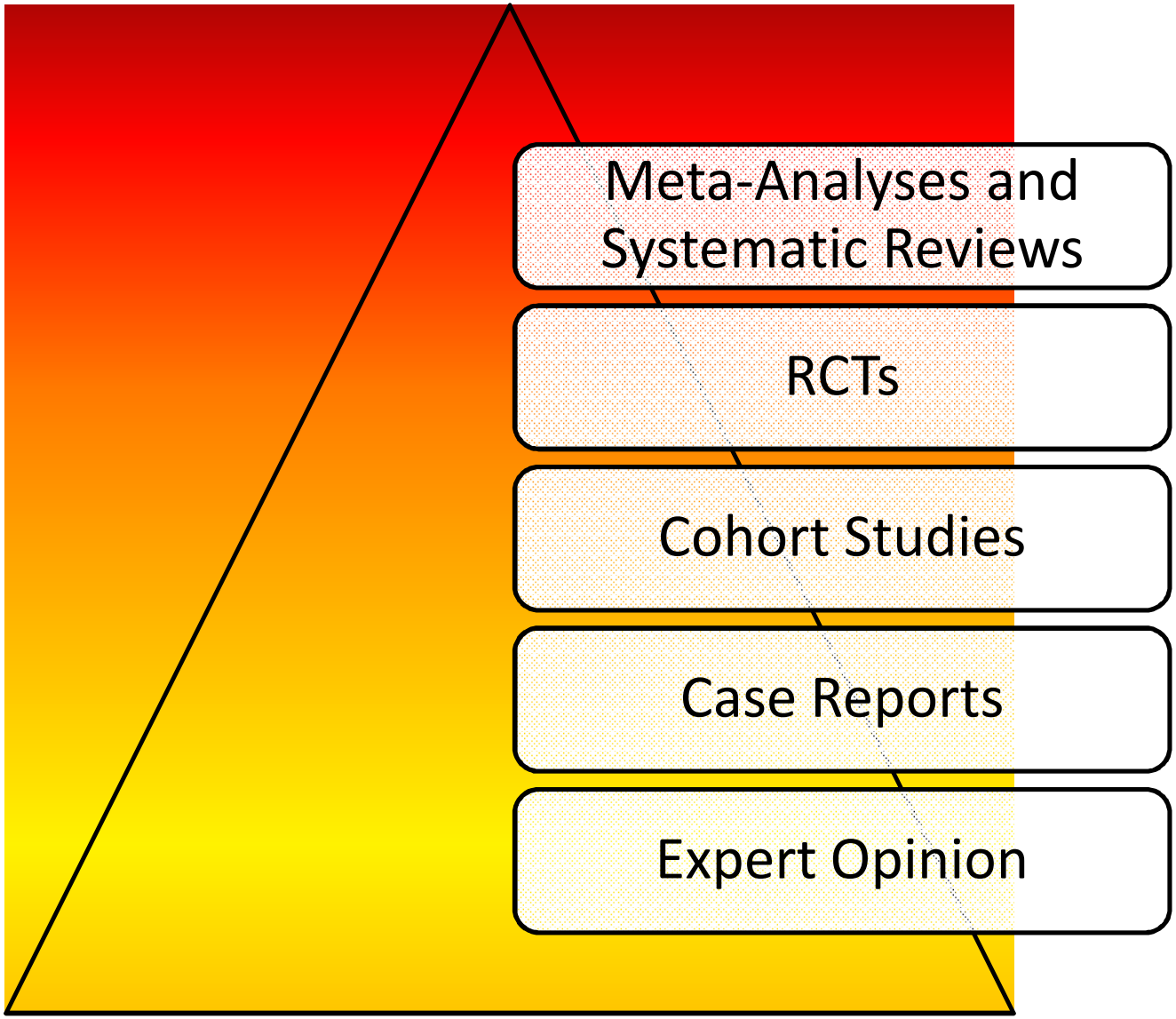
- Hempel (1966) identifies a number of criteria that boost the confirmation hypotheses receive from evidence.
- They include:
    * Quantity of evidence
    * Diversity of evidence
    * Precision of evidence

Evidence hierarchies

- In recent years, the evidence-based movement has championed the use of evidence hierarchies.
- Some sources of evidence are meant to be epistemically privileged to others & hence are ranked higher than them.
- What determines which ranks higher?
- Generally speaking, but by no means always, this is fixed strictly by imposing further constraints on the source.

  Example: RCTs are CTs with randomisation.

Evidence hierarchies: An example



Weighing evidence

- Once one agrees that there are different properties and sources of evidence a question arises:

  How exactly do we make a combined judgment?

- Ranking sources provides an order of preferences but does not actually tell us how to weigh them.

- For example, ranking makes clear that RCTs are more desirable than CTs but does not tell us how much more.

- Assigning weights to evidence allows us to do that. The only trouble is determining weights in a non-arbitrary way.

Current Practice

From there to here via RCTs

- Cartwright and Hardie (2012) identify the main problem in EBP as determining when to make inferences:

  from 'it worked there' *to* 'it will work here'.

- At present, the most common advice is that such inferences should only be made when efficacy is shown through RCTs.

- That is to say, for policy to count as evidence-based, the 'it worked there' must be backed by one or more RCTs.

Internal vs. external validity

- The problem of determining when to make such inferences can be framed in terms of the notion of external validity.

- **Internal validity**

  That is, when the study's results are valid for the population being studied (and hence for some population).

- **External validity**

  That is, when the study's results are also valid for the general population.

Why (R)CTs?

- Why RCTs? Before we answer this question, we first need to fathom why CTs?

- In any study, we want to ensure that any effect is attributed to a specific action.

- **Problem**: It's not easy to know what would happen to *the same* objects or subjects *in the absence* of that action.

- To overcome this problem we use a comparison group which is not subjected to that specific action.

Group composition

- We call the group subjected to the specific action the *treatment group* and the other one the *control group*.

- Objects or subjects in the two groups must:

  * possess the same condition under study

  * be differentially subjected to actions

Confounding factors

- Suppose the groups contain subjects with some illness and the specific action applied is a treatment (vs. a placebo).

- If those in the treatment group recover or at least recover faster, have we proven that the treatment is successful?

- The answer is NO! All sorts of *confounding* factors, other than the treatment, could have led to that positive effect.

  Examples:
  * Individuals in the control group may have been suffering from a harsher form of that medical problem.

  * Individuals in the control group may be more frail.

Other things must be made equal!

- Only if the two groups are *equal in all relevant respects*, do we know that the treatment is the only difference.
- Various ways to mitigate this problem. For example:

  * Remove from the study subjects with confounding factors.

  * Equally distribute these factors by hand.

- A number of problems arise in the context but we can single out one in particular: *unknown confounding factors*.
- Randomisation is meant to solve this problem by blindly distributing the subjects into the two groups.

Randomisation: Quotations

"[Presumably t]he strongest argument for the epistemic superiority of randomized trials... is precisely that RCTs are alleged to solve the problem of 'unknown factors': a randomized trial is – allegedly – controlled for all factors known and unknown" (Worrall 2007, p. 1004).

"In a randomized trial, the only difference between the two groups being compared is that of most interest: the intervention under investigation" (M. Clarke, Director, Cochrane Centre).

Reading

Cartwright, N. and J. Hardie (2012) *Evidence-Based Policy: A Practical Guide to Doing it Better*, Oxford: Oxford University Press, Ch. I.A.

The End