

## Ph 458 Evidence and Policy

### WEEK 7: What's so good about randomization? (II) – randomization and causes

(Non-deterministic) causal hypotheses, like 'Smoking causes Cancer', 'Speed Kills' etc, are different from ordinary statistical hypotheses. One of the arguments often cited for the special evidential power of RCTs is that results from such trials, and only from such trials, can provide compelling evidence for causal connections (as opposed to 'mere' associations). I will explain in the lecture why this amounts in the end simply to another version of the 'RCTs control for all possible confounders, known *and unknown*' argument.

I do hope that at least some of you will find the time to read the Papineau article and my reply to him (and to Cartwright and Pearl) – cited in the 'Further Readings'. In the seminar, however, we should discuss an alternative approach presented by Austin Bradford Hill (who is often regarded as the founder of RCT methodology, though he had a much more nuanced view of what RCTs do and don't do than many of those in Evidence Based Medicine who regard themselves as his followers).

### Reading and Study questions

#### **Required Reading:**

- (a) John Worrall notes on 'Testing Causal Hypotheses'
- (b) Austin Bradford Hill 'The Environment and Disease: Association or Causation'
- (c) John Worrall 'Causality in Medicine: Getting Back to the Hill Top'

**Further Reading:** See list in Moodle

### Study Questions

1. What are the differences between 'Causal' and 'Statistical' Hypotheses?
2. Is the claim that 'only RCT results underwrite causes' just a re-expression of the claim that 'only RCTs control for *all possible* confounders'?
3. What is Hill's basic approach to causation?
4. What are his 'criteria' for causation and how does Hill want them to be interpreted?
5. Although Hill is here concentrating on causation and disease, his general approach seems clearly to generalise to other cases where we have some possibly multi-factorial phenomenon: e.g. the coalition instituted a particular economic policy and the economy (eventually, and pro tem) improves, but is the connection causal? How might his 'criteria' translate to other cases, e.g. from social science?