Estimating Impact for charities: working out what would have happened anyway

Mike Brewer (Programme Evaluation for Policy Analysis) and Sue Holloway (Pro Bono Economics)

Today’s event is kindly supported by the Economic and Social Research Council as part of the 2012 Festival of Social Science
What is today about?

• We will introduce the basic concepts of impact…
  – Impacts and outcomes are different
  – Outcomes can be measured, but impacts have to be estimated
  – Key to estimating impact is identifying a counter-factual, or a comparison group

• …and show you how these have been put into practice amongst some charities
Overview of the workshop

I. Why do we need a counterfactual, and how can we produce one?
   Mike Brewer

II. Case study 1: Comparison with the national average (Foundation Training Company)
    Fraser Thompson

III. Case study 2: Before and after (Making Every Adult Matter pilots)
     Tim Battrick

IV. Case study 3: Synthetic counterfactual (Barnardo’s)
    Greg Thwaites

V. Q&A
   Lorraine Dearden and Sue Holloway
Why do we need a counterfactual, and how can we produce one?

Mike Brewer
University of Essex and Institute for Fiscal Studies
• Impact evaluation: what difference did the policy make?
  – Alternatively, “what is the causal effect of the policy?”
• Impacts are different from outcomes
  – Compare the health outcomes for those people who visit a GP with the impact of visiting a GP on those health outcomes
• Outcomes can be measured, but impacts can never be measured. Instead, impacts are estimated

• In the rest of this talk, I will assume you have data on outcomes, but want estimates of the programme’s impact
Example

“What is the impact of visiting a GP on your health?”

- To measure the outcome, we simply record someone’s health status some time after the GP visit

- Conceptually, the impact of visiting the GP is the difference between someone’s health having gone to the GP and their (hypothetical) health had they not gone to the GP

- This can never be known, and needs to be estimated
Health if visit GP

Health if not visit GP

= impact of visiting GP
For someone who visits a GP, we
- can observe their health given they visited a GP
- cannot observe their health given they did not visit a GP

For other people, we
- can observe health given they did not visit a GP
- cannot observe health given they visited a GP

We can never measure directly the impact of visiting a GP for a given individual

Instead, we observe an outcome, and need to estimate the counter-factual:
- Counter-factual: “the health status given that they did not visit a GP for those people who actually did”

The key problem in estimating impact is identifying a suitable (plausible) counter-factual
If we could observe everything...

Outcome if visit GP

Causal impact of visit to GP

= 

Outcome if do not visit GP
But we don’t know what would have happened had they not visited the GP

Causal impact of visiting GP =
Use people who did not visit the GP??

People who visit GP

People who did not visit GP

Estimated impact of visiting GP = ???
Impact question: For those people who visited a GP ("patients"), what was the impact on their health?

Can’t directly observe health of patients had they not gone to GP

- Potential solution: use *health of those who did not visit GP* as guide to (unobservable) *health of patients had they not visited a GP*

This implies:
- Estimated impact of GP = health of patients – health of non-patients

But:
- health of patients = health of patients without GP + true impact of GP

So:
- Estimated impact of GP = (health of patients without GP + true impact of GP) – health of non-patients

Or:
- Estimated impact of GP = true impact of GP + (health of patients without GP – health of non-patients)

Nuisance term in brackets called “selection bias”
Use people who did not visit the GP??

People who visit GP

People who did not visit GP

True impact of treatment =

Estimated impact of visiting GP =
Impact question: For those people who visited a GP (“patients”), what was the impact on their health?

Naïve estimate = true impact of GP + (health of patients without GP – health of non-patients)

Estimate will be good only if the term in brackets (“selection bias”) is zero

- ie if health of patients without GP (“underlying health”) same as underlying health of non-patients

How to assess likelihood of selection bias?

- If I tell you someone visited the GP, does that help you guess their underlying health?
- If I tell you someone has not visited the GP, does that help you guess their underlying health?

Ideally, to estimate impact of GP on patients, we want to compare patients with non-patients who have comparable underlying health
Estimating counter-factuals

1. Use a randomised control trial
   - randomise who is allowed to visit a GP (!!)

2. Use previous health outcomes for people who did visit a GP
   - “How did someone’s health change when they visited a GP?”

3. Use actual outcomes for people who did not visit a GP
   - Is it easy to collect this data?
   - Why did these people not visit a GP? Is selection bias going to be a problem?
Summary

- Impact evaluation seeks to determine how outcomes were causally affected by a programme or treatment.

- Key problem: construction of a counter-factual:
  - What outcomes would participants have experienced in the absence of treatment?
  - This is never observed and must be estimated.

- Different methods invoke different assumptions in order to construct a counter-factual (deal with selection bias), and they will differ in their plausibility.
  - A randomised experiment, if implemented properly, should be the most convincing.
An Important Point

• It is much easier to do good impact evaluations if the evaluation is planned before the programme is implemented.

• A well-designed implementation can ensure that there are convincing ways of estimating counter-factual outcomes (e.g., by ensuring there are useful comparison groups).

• Conversely, if implementation means there are no credible comparison groups, then even clever statistical techniques cannot recover the impact of the programme.