

To understand causal effects and how to mitigate (or maximise) their influence, epidemiologists should put more effort into organizing large-scale randomized trials instead of traditional observational studies, which are inevitably crippled by confounding and other biases

Konrad Jamrozik
School of Population Health
University of Queensland

The last part of the accepted definition of epidemiology refers to 'the application of this study to the control of health problems'. This commitment to action not only does much to explain epidemiologists' obsession with bias and confounding – we want to be sure that we are right before we try to change the world - it also gives us a licence, even an obligation, to experiment with the interventions that flow from our observational work.

This might fly in the face of Copernicus, Galileo, Darwin, Einstein and Freud, none of whom was in a position to do anything but observe carefully, but appropriate experiments generating supportive data strongly reinforce the robustness of non-interventional findings. They also tell us much about how change can be brought about, the extent of the changes that can be achieved, and the degree and speed of reversibility of risk.

In the area of cardiovascular disease alone, there are some notable examples of discordance between observational and experimental data, but surely one would rely on the evidence from good randomised controlled trials rather than base clinical and public policy on data from studies open to bias from unmeasured and even unknown confounders?

The scientific method is best served by regarding all observational data as ultimately hypothesis-generating. Where the phenomenon is large and complex, the challenge is to break it into parts that can be meaningfully tested via experiments of demonstrable internal and external validity. It is then that we see epidemiology at its creative best.