Evidential Pluralism in Medicine

The above introduction to Evidential Pluralism distinguishes between an *association study* and a *mechanistic study*, and then appeals to this distinction in order to characterize Evidential Pluralism. According to this characterization, establishing a causal claim typically requires evaluating both association studies and mechanistic studies. In this piece, I will give a brief overview of some of the work discussing this Evidential Pluralism in the context of medicine.

This Evidential Pluralism was first put forward in the context of medicine and the health sciences by Federica Russo and Jon Williamson (2007: Interpreting causality in the health sciences, *International Studies in the Philosophy of Science*, 21(2): 157–70). Among other things, Russo and Williamson appealed to a number of case studies to argue that establishing causal claims in the health sciences requires evaluating both association studies and mechanistic studies. For example, they maintained that tobacco smoking was not established as a cause of lung cancer until both association studies and mechanistic studies had been evaluated (2007: 162-3). (Phyllis Illari later provided some clarification of the commitments of this Evidential Pluralism (2011: Mechanistic evidence: Disambiguating the Russo-Williamson thesis, *International Studies in the Philosophy of Science*, 25(2): 139–57). Brendan Clarke et al. give a more recent defence of this Evidential Pluralism in medicine (2014: Mechanisms and the evidence hierarchy, *Topoi*, 33: 339–60).)

An initial worry is that this Evidential Pluralism represents something of a step backwards in the evolution of evidence appraisal in medicine. Indeed, mistakes have been made in medicine by relying upon mechanistic studies, because the mechanisms at play were often more complicated than was acknowledged. This sort of worry has been pressed by Miriam Solomon (2015: *Making Medical Knowledge*, Oxford). However, these mistakes were arguably the result of relying upon mechanistic studies *alone*. The Evidential Pluralist proposal is to rely upon both association studies and mechanistic studies. The idea is that the limitations of mechanistic studies are compensated for by the strengths of association studies, and the limitations of association studies are compensated for by the strengths of mechanistic studies. (For more on this issue, see Daniel Auker-Howlett and Michael Wilde (2019: Reinforced reasoning in medicine, *Journal of Evaluation in Clinical Practice*, 26: 458–64).)

Another worry is that Evidential Pluralism is just not feasible in contemporary medicine; it is often hard enough to evaluate association studies, let alone evaluate association studies *alongside* mechanistic studies. However, Veli-Pekka Parkkinen et al. put forward guidelines for implementing Evidential Pluralism in medicine in a manageable way (Parkkinen et al. 2018: *Evaluating Evidence of Mechanisms in Medicine: Principles and Procedures*, Springer). Moreover, Jon Williamson has recently argued that Evidential Pluralism is in fact feasible, since something at least very close to Evidential Pluralism is currently implemented by the International Agency for Research on Cancer (2020: The feasibility and malleability of EBM+, *Theoria*, 36(2): 191–209).

One objection to this Evidential Pluralism is that the distinction between association studies and mechanistic studies is too simplistic and clean-cut to do justice to the messy world of medicine. This sort of objection has been pressed by Raffaella Campaner and Maria Carla Galavotti (2012: Evidence and the assessment of causal relations in the health sciences, *International Studies in the Philosophy of Science*, 26(1): 27–45). Campaner and Galavotti argue both that the distinction between association and mechanistic studies misses out the important category of evidence from *manipulations*, and that evidence of association is often entangled with evidence of mechanisms.

Another objection is that the case studies cited in support of this Evidential Pluralism are controversial. In particular, Alex Broadbent has maintained that evaluating association studies alone was sufficient to establish that tobacco smoking was a cause of lung cancer (2011: Inferring causation in epidemiology: mechanisms, black boxes, and contrasts, in P. Illari, F. Russo, and J. Williamson (eds.), *Causality in the Sciences*, Oxford). Moreover, Jeremy Howick appeals to other case studies to argue similarly that sometimes evaluating associations studies alone is sufficient to establish causal claims in medicine (2011: Exposing the vanities—and a qualified defense—of mechanistic reasoning in health care decision making, *Philosophy of Science*, 78(5): 926–40).

Both of these objections have been at least indirectly addressed by Donald Gillies (2019: *Causality, Probability, and Medicine*, Routledge). He responds to the putative cases where associational studies alone established causal claims in medicine, and then argues that at least a modified version of Evidential Pluralism is consistent with the case study of tobacco smoking being established as a cause of lung cancer. Moreover, the notion of *interventional* or *manipulationist* evidence plays a prominent role in Gillies' discussion of Evidential Pluralism.

A residual worry may still remain about oversimplification. Bennett Holman argues that Evidential Pluralism is oversimplified in the sense that ignores the powerful economic forces at play in contemporary medicine (2019: Philosophers on drugs, *Synthese*, 196: 4363–90). And Mattia Andreoletti and David Teira argue that it is an oversimplification to provide only philosophical arguments in favour of Evidential Pluralism; there are costs associated with implementing any method for evaluating

evidence in medicine, and Evidential Pluralism should be implemented only if it does best in the cost-benefit analysis comparing competing methods (2019: Rules versus standards: what are the costs of epistemic norms in drug regulation?, *Science, Technology, and Human Values*, 44(6): 1093 115).

So there remains some controversy surrounding Evidential Pluralism in the context of medicine. In light of this controversy, Jon Williamson has provided a sustained defence of Evidential Pluralism in medicine (2019: Establishing causal claims in medicine, *International Studies in the Philosophy of Science*, 32(1): 33–61).

MICHAEL WILDE
Department of Philosophy and Centre for Reasoning
University of Kent