



Book review

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Philosophy of Epidemiology, New Directions in the Philosophy of Science

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Philosophy of Epidemiology, New Directions in the Philosophy of Science by Alex Broadbent. Hampshire: Palgrave MacMillan, 2013. 228 pages. ISBN: 978-0-230-35512-5. (Price £55.00).

Although the practice of epidemiology gives rise to many philosophical issues, the discipline has received very little attention from philosophers. Therefore it is important and most welcome that the philosophy of epidemiology has now received its first book-length treatment.

Causes and explanations

Alex Broadbent rightly notes that epidemiologists have theorized about causation and causal inference “in ways that are hard to see as anything other than philosophical”. (p88) He treats epidemiology as a science of causes and claims that “[e]pidemiologists... are more or less exclusively concerned with finding causation.” (p3) This may be exaggerated, but he is right in emphasizing the central role of causal thinking in epidemiology.

Broadbent pays close attention to the distinction between singular and general causation. “His lung cancer was caused by smoking” is a statement about singular causation, ie, causation of a single event. “Smoking causes lung cancer” is a statement about general causation. Epidemiology is characterized, among the medical disciplines, by its focus on general rather than singular causation. Interestingly, Broadbent advocates the view that general causation is always reducible to singular causation. We can, he says, always “reduce general causal claims in epidemiology to quantitative claims about singular causation”. Therefore, “[t]here is no need to suppose that there is any such thing as general causation.” (pp53–54)

However, this view can be challenged with seemingly convincing examples of irreducibly general causation in epidemiology. For instance, radiation exposure is associated with increased incidence of malignant disease, and we have good reasons to conclude that radiation exposure causes the increased morbidity. But in most cases we cannot distinguish, among the exposed cancer patients, some whose disease was caused by the exposure and others who would have contracted the disease anyhow. Therefore, this seems to be a case of general causation without singular causation. (A staunch defender of singular causation might claim that the molecular event that triggered the cancer was either caused or not caused by the exposure in question, although we do not know which. However it is far from clear that carcinogenesis operates with such single-event triggers.)

Broadbent pays close attention to what he calls the “causal interpretation problem” (p30) or the causal interpretation of measures of association. He applies two major philosophical accounts of causation to epidemiology, namely probabilistic and counterfactual accounts. (p32) Having shown convincingly that neither is helpful in solving the causal interpretation problem, he turns to an explanatory approach to causality that he finds more useful. The main conclusion of the whole book is that causal explanation is a more fruitful concept in epidemiology than causality per se. The author advises us to pay more attention to explanation and consequently less attention to causation in epidemiology. (p182)

It seems to me that Broadbent’s emphasis on explanation is less suitable for epidemiology than for most other scientific disciplines. When epidemiologists have discovered or confirmed the presence of an association between a disease and some social or biological factor, it is often the task of specialists in other disciplines to explain that association.

Statistics

Epidemiology relies heavily on statistics, and many of its most important philosophical issues relate to the use of statistical concepts and methodologies. A major example is the level of evidence required for the establishment of an association. The major weakness of this book is that it systematically leaves out the statistical issues in epidemiology. This omission seems to be to some extent ideological. The author claims that “the output of our philosophical analysis might prove more helpful than formal approaches” (p104), thus drawing an artificial line between philosophical and formal work. Some of the most important foundational issues in epidemiology can only be dealt with competently in studies that are at the same time philosophical and formal.

A few lapses should be pointed out. “The notion of a placebo does not stand up to scrutiny since there is no truly causally neutral thing.” (p23) This is a misconstrual; it is certainly not part of the definition of a placebo that it should have no effect. He also claims that randomized clinical trials are not controlled experiments, and describes randomization as “a surrogate for control”. (p5) For an experiment on groups to be controlled, it is not necessary that the individuals are similar. It is the groups that have to be similar in the relevant respects, and randomization is a means to achieve exactly that.

A political agenda

Broadbent has a kind of political agenda that is revealed towards the end of the book. He is critical of epidemiology for being concerned with a too-wide area of ill health and its causes: "Thus epidemiology exerts an expansive force on the scope of medicine and health policy by forcing them to consider kinds of causes that they would not otherwise have considered. Epidemiology exerts its expansive force in a second way, too, by suggesting new kinds of diseases. The clearest example is obesity, which has long been regarded as a personal matter rather than a medical condition." (p146)

We are not told why a personal matter cannot also be a medical condition. Needless to say, inattention to the obesity epidemic would be tantamount to abdication from the most central ethical requirement of medicine, namely to promote health and give advice on how bad health can be avoided.

"Michael Marmot's argument that social inequality is a concern of the physician's because it causes ill health... is fallacious. The mere fact that something causes ill health is not enough for doctors to worry about it." (p147)

If the medical profession does not concern itself with the causes of ill health, who else will then provide decision-makers with reliable information on causes of disease that are potentially amenable to social action?

Or is the connection between inequality and bad health an epistemic taboo, an area where ignorance is better than knowledge?

To prevent an expansion of medicine "almost without limit", (p161) Broadbent promotes a restricted concept of disease and a focus on explanatory rather than causal factors. "The discovery that a certain risk factor is causal is not, in itself, significant. What is significant is the extent to which it promises to explain the disease in question." (p160) It is not obvious what is meant by significance here. Epidemiological knowledge is medically significant if it can guide interventions that prevent, cure, or alleviate disease. From that point of view, the ultimate goal of medical epidemiology is neither causality nor explanation; it is health-improving interventions.

To sum up, Broadbent has done both the philosophical and the epidemiological communities a great and lasting service by opening up a philosophical discussion on central issues in epidemiology. But many such topics remain to be investigated, and it is only to be hoped that he will be followed by many others.

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