Jacob Stegenga. *Medical Nihilism*. Oxford University Press 2018. 256 pp. $40.95 USD (Hardcover ISBN 9780198747048).

This book argues that people should have low confidence in the 'effectiveness of medical interventions' (1). In this way, it is eminently topical, for most people marvel at the accomplishments of modern medicine. What is the origin of our misplaced confidence? One answer has to do with financial incentives that promote confidence in new interventions. Much valuable work has been done to reveal these incentives. Stegenga's focus is different. He analyzes how the methods of evaluation are what he calls 'malleable'. In other words, 'numerous fine-grained choices' (2) have a dramatic effect on the purported effectiveness of a particular medical intervention. Although Stegenga is critical of medical interventions, he explicitly disavows other critical accounts of medicine, including both the antipsychiatry and holistic medical movements. Instead, Stegenga argues for higher scientific standards. Moreover, the book's target is pharmaceuticals, which Stegenga points out is the most prominent medical intervention of contemporary times.

After a useful introduction, which outlines the main arguments of the book and contextualizes medical nihilism throughout history, Chapter 2 argues that in order to develop a satisfactory account of medical 'effectiveness' there needs to be an accurate account of what is a disease. The concept of disease is controversial. Stegenga defends what he calls hybridism, which is the view that there is both a causal and a normative basis of disease and that these are 'necessary and jointly sufficient conditions for a state to be a disease' (34). There are two main problems with stopping at the causal basis, which he calls naturalism. The first problem is determining the reference class for normality. The second, and related, problem is contextualizing harm. Not all deviations from normality are harmful and therefore do not constitute disease. By contrast, normativism defines disease as a state wherein a person is harmed. Normativism is better equipped than naturalism to handle cases like homosexuality. The normativist can claim that homosexuality was once devalued by society, and now it is not. The naturalist does not have this resource to explain the evolution of homosexuality from pathology to normality. The main problem with normativism is that it is too broad and can make unintuitive disease ascriptions. For example, society does not value the state of poverty, but this does not make it a disease. For these reasons, Stegenga argues that hybridism is able to amalgamate what is useful in both accounts. Chapter 3 fleshes out hybridism and examines some potential consequences and objections.

Chapter 4 examines the historical and theoretical role that 'magic bullets' play in medicine. A magic bullet is a metaphor deployed to capture those treatments, which are specific and effective such that they target the causal basis of disease. Examples from the history of medicine include insulin, penicillin, and arsphenamine. Each of these are specific in their action and extraordinarily effective at treating disease. While it is true that penicillin, for example, treats a variety of diseases, it does so selectively. In particular, bacteria sensitive to penicillin share the same enzyme: transpeptidase. Magic bullets are ideal but as should be clear from the examples provided, medicine has developed very few in recent decades. This is so despite the effusive promotion of new drugs by pharmaceutical companies and the medical establishment. Moreover, Stegenga shows how the ideal of specificity is often too high to satisfy. He writes, 'Drugs have a cascading complexity of effects' (65) wherein one drugs binds to many receptors (e.g., aripiprazole or Abilify).

Stegenga critiques the role of evidence hierarchies in Chapter 5. Although they seem to provide a helpful standard for evaluation, there are several troubling issues. For one, these hierarchies are of evidence types, not concrete evidence tokens. For example, randomized trials are often placed

at the top end of evidence hierarchies. But tokens of these trials are far messier than the idealized type would suggest. They can include 'a biased operationalization of the outcome of interest, an unrepresentative selection of subjects, and a misleading analysis and presentation of results' (74). Moreover, different diseases may even demand different hierarchies. Meta-analyses of randomized trials are usually placed at the top of evidence hierarchies, but Stegenga shows that even these are subject to malleability, such that two groups of researchers could theoretically arrive at opposite conclusions.

In Chapter 6, he provides a range of examples where just this has happened: the benefits of acupuncture and homeopathy as well as the use of antibiotics to treat otitis. How is this possible? Stegenga rehearses multiple ways in which subjectivity infiltrates the design and application of meta-analyses. Some examples include the outcome measure, averaging technique, and even the determination of primary evidence. Stegenga grants that meta-analyses are valuable resources when performed soundly, but he is more critical of evidence hierarchies and concludes that they should be abandoned. In the very next chapter, he argues that second-order determinations of evidence like Quality Assessment Tools (QATs) are themselves malleable. The degree of reliability between raters, for example, is low. In science, disagreement about quality of evidence is widespread, even in the application of methodological tools whose purpose is to evaluate the quality of evidence.

Chapter 8 examines problems in measuring effectiveness. One issue is the employment of inadequate measuring instruments. One important feature of instruments is their 'inferential directness'. Take the example of multiple sclerosis. Some evidence suggests that mitigating white lesions will mitigate the symptoms of multiple sclerosis. In this case, the 'use of white legions as a proxy for patient-level symptoms is nonspecific, because it is sensitive to values of a parameters that are only weakly correlated with the measurand of interest' (115). Other issues include an appropriate outcome measure as well as an adequate method extrapolating measurements from the experimental to the broader context. As Stegenga shows, there are often salient differences between real-world patients and subjects in a clinical trial.

In the next chapter, Stegenga illustrates how harms are 'systematically underestimated' (149) at every stage of research and application. For example, the FDA uses language like 'clinical safety' to refer to harms, thereby muddying the harm profile of an intervention. Perhaps a more alarming example is how few phase 1 trials, which are when the prospective intervention is first used on humans, are made public. Approximately 95% of phase 1 trials are not public, which amounts to publication bias. This is the idea that the results of an experiment affect whether or not the trial will be published. Finally, Stegenga shows that trials often exclude people, such as the elderly and the ill, who are more likely to need the particular intervention and also more likely to experience harm and complications through using it.

Stegenga then sketches the varieties of bias that permeate medical research of interventions in Chapter 10. One of the most common is confirmation bias. Stegenga shows that the methodological protections employed to combat this are less successful than we suppose. For example, despite the use of randomized trials, people can sometimes accurately determine which group they are in. If a particular antidepressant affects sexual function, patients judge that they are not in the placebo group. Other biases include design and analysis bias. Finally, Stegenga sketches the conflicts of interest that arise in the funding of research and application.

In Chapter 11, Stegenga contextualizes his argument historically, outlining some of the rejected medical interventions of the past. He also claims that many interventions of today are not supported by the evidence. Examples include Ritalin, antidepressants, and statins. He goes on to engage with some objections. In particular, he distinguishes his position from the widespread 'anti-

science' sentiment currently prevalent. While Stegenga is certainly critical of scientific practices and methodology, his complaint amounts to asking for higher standards and more quality science.

In the final chapter, Stegenga steps back and explores the concept of gentle medicine, which is the modest idea that medicine should intervene less than it does at present, and that improvements to health come through lifestyle and societal changes. For example, he cites Brown (2008) in recommending the elimination of patents for the medical discoveries. In response to the lack of incentives objection, Stegenga recalls that many of the most famous scientific discoveries, including medical interventions, were not protected by patents.

Our best available scientific evidence tells us that antidepressants do not work. Stegenga is clear that he does not advocate readers stop taking their doctor-prescribed medication. Consultation with a medical professional is essential. It is also interesting to note that looking at the population level average might conceal individual cases of marked improvement. But this, in a deeper way, reflects how much more improvement should be made in gathering and interpreting medical evidence.

The book contains an abundance of examples that support and illustrate its claims. It shows the manifold ways in which medical research and interventions are fallible and unsupported by the best evidence. More positively, Stegenga argues for a two-pronged approach. First, he advocates for more stringent standards for medical research into interventions. Second, he argues that we ought to invest more time and energy into non-medical interventions such as alleviations of poverty and active lifestyles.

Aaron Landry, Humber College