COVID, Rapid Science and Statistics

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Abstract

The COVID pandemic has attracted a significant number of scientists, leading to the emergence of new challenges. The usual process of scientific workflow, temporarily producing inconsistencies but finally leading to a consensus, has resulted in public mistrust, particularly when scientists from fields different from epidemiology made beginner errors. Even statisticians, who specialize in "correlation," but are novices in "causality," have encountered this issue.

In the first part of the lecture we will review Hill's criteria, which are considered a definitive standard for identifying causation in epidemiology. We will then use these criteria to examine the ongoing and disputed issue of whether lockdowns are effective. We also mention the surprising point of the story of Ivermectin, allegedly being a miraculous medicine against COVID.

Next we touch phenomena such as the normativity of predictions (predicted human behavior is influenced by the prediction), preliminary caution (is it legitimate to include "worse" parameter values in the models?), model selection ("more accurate" models may give worse predictions due to over-parametrization), and the question at what stage of incompleteness and imperfection a model can be applied, all illustrated by the lecturer's personal experience, including specific results

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