Aug 25, 59

Dear Sir Ronald,

I had no idea you were to be in Australia, you certainly do get around the world — and we wonder you are as demanded.

This whole cigarette-lung cancer business is a mess. There has not been done a single good multi-variate or variance analyses on what is known to be a multi-causal problem. There has not been done even a partial association analyses of the Yule type so far as I know. A regression of mean death rates against groups against amount of cigarette smokes may look like a high association, but if one took 100,000 men at 50 and waited 50 years and plotted age at death against amount smoked, the scatters in the diagonal would be great and the correlation or association would be low. Would it not? And do we not know this for deaths above 50? So the hereditary factor gives a fairly decent correlation?

Your note is OK. So, believe, was mine; they were about different things. Of course, the logic would require that inhaling on the basis of your controls and analysis we would reduce the death rate, and that is probably ridiculous — as is the whole logical situation; or, rather, the lack of logic in the situation. What I was pointing out was that if the controls were those ill of heart trouble who are much more numerous than those ill with lung cancer (I believe, in England and still more so here) and if inhaling hurt the heart more than the lungs, as it will might we do it know), then the controls would be useless in any case for such an inference — and we still should have known it. It has been medical opinion, at least in my environment, for all my life, let's say since I first heard it at around age 10, that nicotine was bad in the heart, and I should think that breathing in volatile nicotine would get it to the heart much better than just having it in the buccal mucosa.
A PROBLEM IN STATISTICS

One of the most important problems in statistics is the estimation of parameters in a statistical model. The problem is to find the best estimate of the parameters given the observed data. The best estimate is typically defined as the one that minimizes a certain loss function.

Estimation methods include maximum likelihood estimation, Bayesian estimation, and minimum variance estimation. Each method has its own advantages and disadvantages, and the choice of method depends on the specific problem at hand.

The problem of estimating parameters is closely related to the problem of hypothesis testing. In hypothesis testing, we are interested in testing whether a certain hypothesis is true or false. The two problems are closely related, and many techniques from estimation theory are also applicable to hypothesis testing.

The study of estimation in statistics is a vast and active area of research. Many important problems in statistics are addressed through the study of estimation theory.

SIR ROBERT FISHER

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What a problem!

The statistical model

The observed data

The parameters

The estimation

Hypothesis testing

Maximum likelihood estimation
Bayesian estimation
Minimum variance estimation

Sir Robert Fisher

Professor Sir Ronald Fisher

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