A Larger Perspective

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EXCERPTS

As academic statisticians, we are missing the boat. We are barking up the wrong tree. We do not see what is plainly before us. We are kidding ourselves when we think that "our" kind of statistics is vital to the welfare of the nation and the world.

More and more, despite occasional appearances otherwise, we as academic statisticians are talking to ourselves. Even at this symposium we talk about how to do the old things better and more broadly, not about what we could offer to society, and what most needs to be done. Think about the whole range of the really big problems of the day: violence, crime and criminal justice, education and industrial productivity in the broadest senses, unemployment, the balance of trade, federal deficits, the health and welfare of millions of disadvantaged persons, urban rot, racial and ethnic tensions, homelessness, and many others.

The kinds of statistics that we teach in undergraduate and especially in graduate programs have almost nothing to contribute to anything that matters on the scale of these problems. Instead, we teach about new abstractions in statistical theory, or we teach about new applications of theory to what are, in this context, tiny problems with tiny generalizations and tiny implications.

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We teach what we enjoy teaching and what we know how to teach, not what the world needs. Think about that litany of problem areas I just recited. The solutions to those problems could profit enormously from sound statistical data, soundly analyzed. But the difficulties that block our understanding on these problems have little to do with probability models or random variation, and everything to do with all those other good things that make up uncertainties, that is, what we broadly call bias. Bias dominates randomness almost everywhere. Think about your own past training and the training that many of you now deliver to new generations of students. What fraction of that training is or was devoted to bias? What fraction deals in any direct way with the big problems of this year?

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… it has been epidemiologists, rather than statisticians, who have spent much effort in recent years on two areas critical to statistical analysis. One is understanding the nature of confounding and the effects of efforts to reduce its influence. The other is developing a taxonomy of bias. This taxonomy has some very important, big, practical implications. Their work in both of these areas seems to be almost unknown to academic statisticians.

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One thing we should do in the academic setting is to focus far more than at present on inference in the face of bias, sometimes serious bias. <snip> In such risk assessment, uncertainties commonly range over three or more orders of magnitude. That is real uncertainty, and it is virtually all from bias.

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