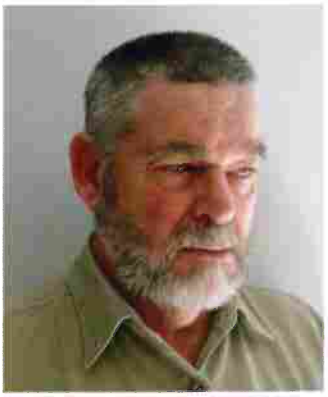
FROM THE EDITOR



IS STATISTICS BORING?

I have often heard it said that statistics is a boring topic in mathematics. I have also heard that statistics is not part of mathematics. I have heard such statements from students and teachers at secondary schools and universities. In this editorial I want to respond to these sentiments.

Statistics is part of mathematics. Indeed, it is one of the most important parts of applied mathematics. One only has to look at the jobs available for mathematics graduates in Australia to see that there is substantial demand for people in a wide variety of industries with skills in statistics.

The theory of statistics is based on probability which in turn is based on calculus (and other branches of mathematics). So, to learn about statistics, a student ought to first study calculus, and then probability. All university students majoring in mathematics today should spend a year studying probability or mathematical statistics. This is why I see statistics as part of mathematics, although there are other pathways to statistics.

In reality, people are in too much of a hurry to get to statistics. For example, in psychology, contemporary students need to learn about factor analysis, but there is no time to learn about calculus, probability and, in this case, linear algebra beforehand. Computer packages and CAS in particular provide an all-too-convenient shortcut. By extension, if you can study statistics at university with no calculus or probability then it may be argued that statistics can be taught in schools without these pre-requisite subjects. Again the modern calculator provides the shortcut. While computers and calculators remove the tedium associated with calculation, they do not remove the need for understanding.

Hence we have many students studying statistics without a reasonable understanding of the underlying mathematics. Students who like mathematics may find this unsatisfying; other students find it confusing. It is difficult for teachers of the subject to present ideas without the level of justification used elsewhere in the mathematics curriculum.

In the past, statistics was often not taught well at universities. Theory was not linked to applications. It is not necessary to devote a lot of time to applications; it is sufficient to convince students that the theory is useful. In service courses, the lecturer may not have had a reasonable background in statistics, and no mathematical justification was provided for many methods presented. Too much material was packed into the syllabus. Calculations were tedious. No wonder students found it boring.

On the other hand, the subject has moved on rapidly. Now we can collect, store and analyse huge sets of data. In many aspects of health care, data analysis is at the heart of decision making. The website of the Australian Institute of Health and Welfare shows the importance of statistics in health care. These developments must affect how we present this subject to the next generation.

Statistics becomes fascinating when you have your own data, and a reason for analysing it. I enjoy using data to tell a story. The people for whom I provide reports are genuinely interested in the results, and often ask questions that require more statistical analysis.

New statistical methods rapidly find their way into applications. My training in mathematics helps me understand the theory in new methods. When I apply new methods, my skills in computing are often stretched. Statistics offers challenges in all sorts of directions: theoretical, applied and computational. It's not at all boring.

There is no royal road to statistics. Applied statistics is a mature age subject and, apart from some trivial concepts, not particularly suited to mathematics in schools.

There are many factors over which we have no control that affect the image of statistics. The best we can do is to strive to increase, and share, our own knowledge and enthusiasm for statistics.

- Terry Mills

Terry Mills is a member of the MAV editorial board. He studied mathematics and statistics at university, before continuing to postgraduate studies in mathematics. Teaching at the tertiary level, he found considerable demand for courses in statistics, at the same time managing to squeeze in some postgraduate work in statistics and computing. He is 67 years old and now works in a hospital applying statistics to problems in health care. He has written this editorial by invitation from the editor of Vinculum, *and wishes to express his thanks to the editor for this opportunity.*

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