Review of Sutherland, Spiegelhalter and Burgman by Morag Findlay

It is not often I find myself perusing articles in Nature, but when I heard an item on BBC Radio 4's Inside Science programme about twenty tips for interpreting scientific claims I was hooked. Particularly when I realised that the article is only three pages long.

Understanding the Nature of Science is a key goal in secondary science curricula across the United Kingdom. One of the reasons for teaching about the nature of science is so that all citizens can participate in policy decisions about science in an informed way. According to this article "civil servants, politicians, policy advisers and journalists" in particular would benefit from acquiring interpretative skills about the limitations of science and the sort of questions which could be asked about scientific evidence. Providing a toolkit to politicians to ask good questions about scientific data is a viable alternative to teaching science to politicians.

The authors' suggested toolkit begins with "differences and chance cause variation" and ends with "extreme measures may mislead." Although it would be possible to suggest a number of different or additional concepts for the toolkit, it does provide a useful starting point for considering how non-scientists can evaluate scientific data. Of particular relevance to science teacher education is the discussion about the last point, exemplified by the use of quantitative school data. It is also particularly relevant in the light of the public discussions about the recently released results of the 2012 PISA study, mainly focusing on mathematics education.

One of the benefits of the paper for science teacher education is that it provides a starting point to discuss some of the basic concepts which scientists take for granted, but which do not always feature prominently in school and university science or social science courses, or perhaps even science teacher education! A useful feature of the examples given is their explanation of the concepts in terms of scientific contexts and how they can be applied to areas where science influences public policy. The discussion of genuine replication in sufficiently different populations rather than "pseudoreplication" with very similar populations is exemplified by a discussion about educational research using groups of pupils who are too similar and the familiar collapse of the cod fisheries off Canada's Grand Banks.

The twenty concepts in this paper could provide a useful starting point to help student teachers of science to think about the limitations of scientific evidence, or any other kind of quantitative data. Beyond this, it could help these student science teachers to encourage their pupils to think critically about the strengths and weakness of scientific evidence as it applies to real world situations. In terms of the four capacities in the Scottish Curriculum for Excellence, science teachers can help to prepare their pupils to become "effective contributors" to the debate about using science to inform public policy.

Sutherland, W. J., Spiegelhalter, D., & Burgman, M. (2013). Policy: Twenty tips for interpreting scientific claims. *Nature, 503*, 335-337.