

## **A picture is worth a thousand numbers: communicating uncertainties following statistical analyses**

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Subtle statistical analyses are increasingly used to analyse large and complex datasets with the intention of influencing public perceptions and government policy. And yet the level of risk literacy in society appears to remain low, with communication officers and the media often showing a general lack of understanding of statistical arguments that express uncertainty about current parameters, future events, or underlying scientific understanding. The Gapminder initiative of Hans Rosling has led the way in showing how large datasets can be animated using modern programming techniques, with changes in time being represented by smooth animated movement. Inspired by this, we will describe attempts by ourselves and others to explicitly represent uncertainty in the conclusions of statistical analyses. Simple interval bounds over-emphasise arbitrary limits, and so we focus on graphics that display levels of confidence or probability as a continuum. Animation can be used to represent changes over time, with multiple paths indicating possible futures. These ideas will be illustrated with applications drawn from applications including finance, gambling, sport, lifestyle risks to survival, drug safety and teenage pregnancy. This work forms part of the Winton Programme for the Public Understanding of Risk at the University of Cambridge.