
PANEL ON STATISTICAL INFERENCE, University of Toronto

Big Ideas in Statistical Reasoning

H.G. Wells is often quoted as saying that "Statistical thinking will one day be as necessary a qualification for efficient citizenship as the ability to read and write." Yet we're also told that there are three types of lies: "lies, damned lies and statistics". As citizens, we are bombarded with data representations, measures of central tendency, and probabilistic statements through websites, blogs, print media, and broadcast media. Students will encounter statistics and probability in virtually every avenue of their academic careers, be it in the social sciences, the humanities, or the natural sciences.

Like mathematical reasoning, statistical reasoning requires clear, logical thought. But in contrast to the certainty prevalent in mathematical arguments, statistical reasoning requires the use of rational thought to make sense of uncertainty. We will explore issues relating to integrating stochastic thinking—both process and content—into the mathematics curriculum across all grades, from K–14. Questions might be based on the relative importance of intuitive, experimental, and theoretical probability; the difference between causality and correlation; understanding randomness; or teacher preparedness in terms of understanding and embracing uncertainty and how to best teach the concepts and processes.