Will Statistics still be here in 2025?

Peter J Diggle

CHICAS, Lancaster University Medical School

RSS President, 2014 to 2016

RSS/ORS Meeting, London, December 2015

Welcome to ORS colleagues

Meeting the challenge

- **data science: what can statisticians offer...and what can they learn?**
- **statistical science and statistical mathematics...both important but not the same**
- **we are what we teach**

And my apologies for not joining you on the day.

Diggle, P.J. (2015). Statistics: a data science for the twenty-first century. *Journal of the Royal Statistical Society*, **178, 793–813.**

What can we offer?

- **that probability theory is the correct way to deal with uncertainty**
  - **in our data ... stochastic models**
  - **in our conclusions ... probabilistic inference**
- **that design matters**
- **that context matters**

And what can we learn?

- **that a published article is not a complete solution to a practical problem.**
- **that reproducibility of computationally driven research findings should be a minimum standard**

Statistical mathematics or statistical science?

Oxford English Dictionary

Statistics: the branch of science or mathematics concerned with the analysis and interpretation of numerical data and appropriate ways of gathering such data

Both variants are valid, but they are not the same thing

- **statistical mathematics is generic**
- **statistical science is context-dependent**

Working together: RSS, LMS, IMA, ORS, BCS,...

"making the case for the fundamental importance of the mathematical sciences to the future health and wealth of UK society"

PJD, RSS Presidential Address, June 2015

We are what we teach

Fewer lectures, more projects (problem-based learning?)

Building on a solid mathematical foundation

- **Design**
- **Probability and stochastic processes**
- **Likelihood-based inference**
- **Computation...numerical methods, programming**
- **Communication...scientific writing, including protocol/ethics**
- **Scientific method...core concepts in at least one substantive science discipline**