What is evidence? Where to find it, what to do with it? Lessons from chlamydia

Seminar

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1:30 - 2:30pm, Seminar Room A19/20

Tony's background was in psychology and linguistics. He turned to biostatistics in 1980, and worked on infectious disease in the mother, fetus and newborn. He developed an interest in evidence synthesis while working with Andy Briggs and Mark Sculpher on cost-effectiveness of prenatal HIV testing. He noticed that most of the available evidence was on complex functions of the model parameters, but not the parameters themselves. He determined to use Bayesian Markov chain Monte Carlo methods to estimate the model, and soon discovered that the idea of multi-parameter synthesis had already been developed in David Eddy's Confidence Profile Method. Since 2002 Tony has led a programme of work on methods for evidence synthesis in epidemiology and decision making, working with Guobing Lu, Nicky Welton, Debbi Caldwell, Malcolm Price, Aicha Goubar, and Sofia Dias.

What exactly is evidence, and what is it evidence of?

What properties should we expect of "evidence-based" decision making in an accountable democracy?

Based on examples from a project using evidence synthesis to estimate the health consequences of chlamydia trachomatis, we ask a series of questions about the nature of "evidence", and look at the implications for the practice of Systematic Review and for the Hierarchy of Evidence.

We argue that "literature summary" is a misleading idea, and will often lead to meaningless results, because evidence can only be used to estimate parameters under models of the data generation process, which must be explicitly recongised in evidence interpretation and synthesis. We show that the Hierarchy of Evidence is not necessarily correct, and that it fails to mention some important types of evidence. Instead, the value of many kinds of evidence in reducing uncertainty about parameters often depends on the availability of other kinds of evidence. Using all available evidence allows one to check evidence consistency and leads to more robust inference.

Finally, while there is a need for a literature identification protocol, based on models, we question the usefulness of the extensive trawl through 1000s of journal citations based on boolean combinations of search terms, and propose alternatives.