

Knowledge Synthesis Methods

11. Multiple expert consultation with formal consensus method such as Delphi¹

Summary of method

This method is a subset of expert consultation, representing the most rigorous approach to eliciting expert knowledge. It combines the knowledge of multiple, carefully selected experts into either quantitative or qualitative assessments, using formal consensus methods such as the Delphi process (described and reviewed by Mukherjee *et al.* 2016), or other elicitation techniques, including Cooke's method of weighting experts for their accuracy, described in Martin *et al.* (2012).

Such approaches have been empirically demonstrated to generate estimates for ecological parameters that are more accurate than the estimates of the best-regarded expert in the group (Burgman *et al.* 2011).

Burgman, M.A., McBride, M., Ashton, R., Speirs-Bridge, A., Flander, L., Wintle, B., Fidler, F., Rumpff, L., Twardy, C. (2011). *Expert status and performance*. PLoS ONE 6, e22998.

Key references

Martin, T.G., Burgman, M.A., Fidler, F., Kuhnert, P.M., LOW-CHOY, S., McBride, M., Mengersen, K. (2012). *Eliciting expert knowledge in conservation science*. Conservation Biology 26, 29-38.

Mukherjee, N., Hugé, J., Sutherland, W.J., McNeill, J., Van Opstal, M., Dahdouh-Guebas, F., Koedam, N. (2015). *The Delphi technique in ecology and biological conservation: applications and guidelines*. Methods in Ecology and Evolution 6, 1097-1109.

Slocum, N. (2003). *Participatory Methods Toolkit. A practitioner's manual*. United Nations University, King Baudouin Foundation and the Flemish Institute for Science and Technology Assessment.

Available from: http://archive.unu.edu/hq/library/Collection/PDF_files/CRIS/PMT.pdf Accessed 29/01/2017.

Examples of application

Many examples of the use of Delphi to address environmental issues are described in Mukherjee *et al.* (2015).

¹ A guidance note from Dicks LV, Haddaway N, Hernández-Morcillo M, Mattsson B, Randall N, Failler P, Ferretti J, Livoreil B, Saarikoski H, Santamaria L, Rodela R, Velizarova E, and Wittmer H. (2017). *Knowledge synthesis for environmental decisions: an evaluation of existing methods, and guidance for their selection, use and development – a report from the EKLIPSE project*.

Multiple expert consultation with formal consensus method such as Delphi

Cost	Higher than expert consultation. Takes more time from the experts, but does not have to involve travelling. 1 week – 1 month FTE organising time
Time required	1 week – 2 months. Takes longer than expert consultation because at least two rounds of consultation are usually required
Repeatability	Moderate. Slightly higher than expert consultation
Transparency	Moderate. Can be increased by good reporting of method and elicitation process
Risk of bias	Moderate. Depends on expert selection, but combining expert opinions balances out biases. Biases associated with group decision-making are avoided or reduced by anonymous scoring
Scale (or level of detail)	All scales, level of detail much higher than simple expert consultation
Capacity for participation	Moderate. Can be done with a mixed group of stakeholders with very different areas of expertise
Data demand	Good overview of expertise/experts in the field needed for adequate selection; can depend on experts' access on data
Types of knowledge	Scientific, technical, opinion-based; explicit or tacit
Types of output	Judgements, forecasting, risk assessment
Specific expertise required	Good knowledge of the procedure required, including supporting software etc.

Strengths

Relatively fast
Relatively low cost
Applicable to several types of knowledge
More rigorous, repeatable and transparent than basic expert consultation
Reduced risk of bias, compared to other forms of expert judgement

Weaknesses

Demands quite a bit of expert time
Usually no documentation of the evidence or studies used, but can be combined with summaries or systematic map
Subject to bias from individual experts with strong unsubstantiated opinions, but much less than basic expert judgement