World Health Organization Methodology to Prioritize Emerging Infectious Diseases in Need of Research and Development

Technical Appendix 4

Multicriteria Decision Analysis

MCDA techniques can be compensatory or non-compensatory (I). Compensatory MCDA allow trade-offs between criteria whereas non-compensatory do not. According to Baltussen and Niessen 2006, MCDA compensatory methods are more suitable for use for public health purpose (2). Several MCDA compensatory techniques have been used for the prioritization of infectious diseases (3–11). One such technique is the Analytic Hierarchy Process (AHP) developed by Thomas Saaty (12).

AHP uses pair-wise comparisons based on expert judgement that directly incorporates expert knowledge (13). Saito et al. 2015 highlighted the ability of the AHP to enable an expert group “to make trade-off and establish priorities among qualitative and quantitative inputs”. This is particularly useful in animal and human health where many characteristics remain unclear or unknown (13).

Five past disease prioritization studies used AHP for criteria weighting but used different approaches for disease scoring (8–11,14). Zoonoses prioritization in Japan made use of a rating mode with absolute measures (11). A classical AHP scoring by pair-wise comparison was used for prioritization of animal infectious diseases in Chile (9). A decision tool to score diseases through a set of qualitative questions in the absence of expert opinion was developed by the CDC (8), and used recently in Kenya (10) and Ethiopia (14).

None of the past implementations of AHP were a good fit for the specific needs of the R&D Blueprint disease scoring. As a result, the WHO methodology includes a tailored
implementation of the AHP, using pair-wise comparisons for weighting criteria, but makes use of a different disease scoring process.

References


   http://dx.doi.org/10.1371/journal.pone.0161576

   http://dx.doi.org/10.1017/S0950268814002246


   http://dx.doi.org/10.1016/j.onehlt.2016.09.001