Can decision making be improved by sharing information?

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Making decisions about which healthcare interventions to make available or to fund from limited budgets requires an assessment of their costs and effectiveness. This in turn relies on the availability of good evidence. However, there is often only limited direct evidence on the effects of new treatments on specific patient groups, due to a lack of data or to the limitations of existing studies.

Our research explored potential ways of addressing these gaps by incorporating indirectly-related evidence into health technology assessments (HTAs). For instance, a sparse evidence base in children could "borrow strength" from studies undertaken in adults.

Traditionally in HTA, indirect evidence has either been disregarded ('splitting' – no information sharing) or been incorporated without accounting for differences ('lumping' – full information sharing). However, advanced evidence synthesis methods allow for moderate degrees of information sharing.

First, we identified and classified information-sharing methods. We reviewed 89 publications and identified four main types of relationships used for sharing information: functional, exchangeability-based, prior-based and multivariate. These technical methods for combining information rely on different assumptions about the relationships between the direct and indirect evidence. While more than one relationship may be relevant, the degree of information sharing will differ between methods.

Next, we applied the alternative information-sharing methods to a real case study of intravenous immunoglobulin (IVIG) treatment for sepsis. In this case, we added data from studies of the intervention undertaken in the paediatric population to evidence arising from adults. We showed that the method used to combine the information significantly affected estimates of treatment effectiveness, cost effectiveness and the estimated value of future clinical trials. Cost-effectiveness estimates ranged widely, from £16,000 to £52,000 per quality-adjusted life year gained, depending on the method used.

Our research concludes that when direct evidence on the costs and effectiveness of an intervention is limited, incorporating indirect information can be valuable, but that how it is done influences the results significantly. Researchers and decision-makers should therefore explore the full range of information-sharing methods and carefully evaluate their underlying assumptions before incorporating them into HTAs.

We have shown that decision making can indeed potentially be improved and made more robust by information sharing, but this requires a thorough understanding and thoughtful selection of appropriate methods for doing so.

Read the full papers, funding sources and disclaimers in BMC Medical Research Methodology and in Research Synthesis Methods.

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