Bringing two worlds closer together: addressing methodological challenges in the economic evaluation of public health programs

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Summary
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Economic evaluation studies of health programs provide insights into the costs and benefits of decision alternatives. They are increasingly used to support decisions about health technologies, such as pharmaceuticals, medical devices, diagnostic and surgical procedures. Economic evaluation methods have not yet been much applied to modern public health programs. These programs are challenging for evaluation, because they tend to address multiple determinants of health and behavior, consist of multiple strategies and produce multiple outcomes on the individual and societal or system level.

This research provides insights into the state of the art of applying economic evaluation to public health programs in the area of behavior change and presents potential solutions to overcome key methodological challenges. Seven methodological challenges are addressed in this research: 1) the long time horizon needed to achieve all benefits of public health programs; 2) the impacts public health programs may have on broader domains of individual quality of life or wellbeing that are not captured by the QALY; 3) the outcomes public health programs may produce on a community or societal level; 4) the objective of many public health programs to achieve more health equity; 5) the fact that evidence in public health does not always fit into the hierarchy of evidence adopted for biomedical and clinical health interventions; 6) the non-health sector costs public health programs may produce; and 7) the need for comparing public health programs with interventions in other societal sectors, due to multi-sector collaboration.

Chapter 2 presents a systematic review of existing economic evaluations of lifestyle behavior change programs. It demonstrates that the number of economic evaluations has considerably increased over the past decade. However, methodological quality of the studies shows several weaknesses, including insufficient reporting of essential study details and limited adherence to good practice guidelines. Progress with addressing methodological challenges has also been limited. These shortcomings in the existing evidence impede efficient resource allocation to public health programs.

Chapter 3 reports a study exploring the possibility to use the Value of Statistical Life (VSL) as efficiency parameter in multi-sector comparisons. Our study determined and compared implicit VSL estimates for life saving interventions implemented by the Dutch government in the health, water control, consumer safety and transport sector. The study findings suggest that the VSL is not an ideal parameter to compare public health programs with interventions in other societal sectors, because reduction in risk of premature death is the only outcome it captures. Nevertheless, the cost-benefit framework, on which the VSL is based, may still be a useful approach to encourage multi-sector comparisons.
Chapter 4 provides further insights into outcomes that may be relevant to consider in addition to reductions in risk of premature death. Based on a qualitative study using a combination of focus groups and individual interviews, we identified outcomes experienced by participants of a randomized controlled trial evaluating the effectiveness of a theory-based lifestyle intervention in adults at risk for diabetes mellitus and/or cardiovascular disease. By means of a thematic analysis approach identified outcomes were coded into outcomes that are captured by EQ-5D based QALYs (i.e. changes in life expectancy and health-related quality of life dimensions measured by the EQ-5D instrument) and other outcomes usually not considered in economic evaluations. Other outcomes included direct consequences of the lifestyle intervention (e.g. increased awareness and motivation for behavior change) and consequences of lifestyle behavior change (e.g. increased feeling of control and body satisfaction). The study findings also indicate that lifestyle behavior change may have social spillover effects to other people in participants’ direct social environment.

Chapter 5 describes a discrete choice experiment (DCE), which explores the relative importance health outcomes have to consumers compared to broader outcomes of lifestyle behavior change. Respondents were asked to make a series of binary choices between situations that can be experienced after lifestyle behavior change. The situations were described in terms of ten attributes. Three of these represented health outcomes measured within the QALY framework (i.e. life expectancy, future health state and timing of future health state). Five attributes were based on broader outcomes identified in the qualitative research reported in Chapter 4 (i.e. clothing size above or conform ideal, days with sufficient relaxation, endurance, experienced control over lifestyle choices and lifestyle improvement of partner and/or children). Finally, two attributes were included to reflect the monetary and time costs associated with lifestyle behavior change (i.e. monetary cost per month and time cost per week). With the exception of time cost per week and timing of future health state, all attributes significantly determined consumer choices. Marginal rates of substitution between the monetary cost attribute and the other attributes suggest that respondents attached most value to improvements in endurance, days with sufficient relaxation and future health state value. These findings suggest, that decision-makers, who wish to respond to consumer preferences, should consider both health and non-health outcomes when deciding about lifestyle behavior change interventions.

Chapter 6 presents an application of the contingent valuation (CV) method to support decision-making that requires consideration of both health and non-health outcomes. The CV task asked participants of a lifestyle intervention trial to express their willingness to invest money and time for changes in three benefits of lifestyle change: improved life
expectancy, health-related quality of life and broader quality of life aspects. Our findings indicate that the majority of respondents attached value to all three benefits and that most were willing to invest both money and time. The CV method is controversial, because there is uncertainty regarding the feasibility and ability of the method to derive valid WTP values. In the present research CV has proven to be a feasible approach for monetary valuation of a range of benefits from an individual consumer perspective. Three tests of internal validity produced mixed results, however. Thus, at present CV cannot be recommended as sole base for decision-making.

The overall findings of this research lead to a number of recommendations for economic evaluation practice, decision-making and future research, which are described in the general discussion (see Chapter 7). Recommendations for economic evaluation practice focus on improvement of reporting of studies, increasing adherence with good practice guidelines and existing methods that can be used to deal with challenges caused by the long-time horizon of public health programs, non-health sector costs, and broader benefits or equity outcomes they may produce. For decision-making two recommendations are made: a) broadening the scope of scientific evidence produced and examined during technology assessments in the field of public health, and b) establishing better infrastructure to support systematic use of evidence. This research also highlights several areas for future research, including: the identification and definition of broader outcomes in different application areas of public health; developing validated instruments or measures that allow for consideration of impacts on wider domains of wellbeing; development of methods to capture community or system-level changes; further testing of the feasibility and validity of the CV method; producing input data for modeling, testing new approaches for modeling of complex processes; developing methodological guidance regarding how to deal with non-health sector costs; further testing of methods for equity weighting analysis; defining equity outcomes for economic evaluation; establishing best practices for producing context-sensitive evidence; and developing methods to synthesize diverse forms of quantitative and qualitative evidence for use in technology assessment and economic evaluation. Finally, in order to develop innovative solutions to overcome remaining challenges in the economic evaluation of public health programs, it is essential to increase dialogue and collaboration between health economics, public health researchers and decision-makers. The development and regular update of good practice guidelines for the economic evaluation of public health programs is a key task ahead, which requires collaborative action.