Economic evaluation methods in social care: A scoping review

Helen Weatherly, Rita Faria, Bernard Van den Berg, Mark Sculpher, Peter O’Neill, Kay Nolan, Julie Glanville, Jaana Isojarvi, Erin Baragula,Mary Edwards.

Introduction

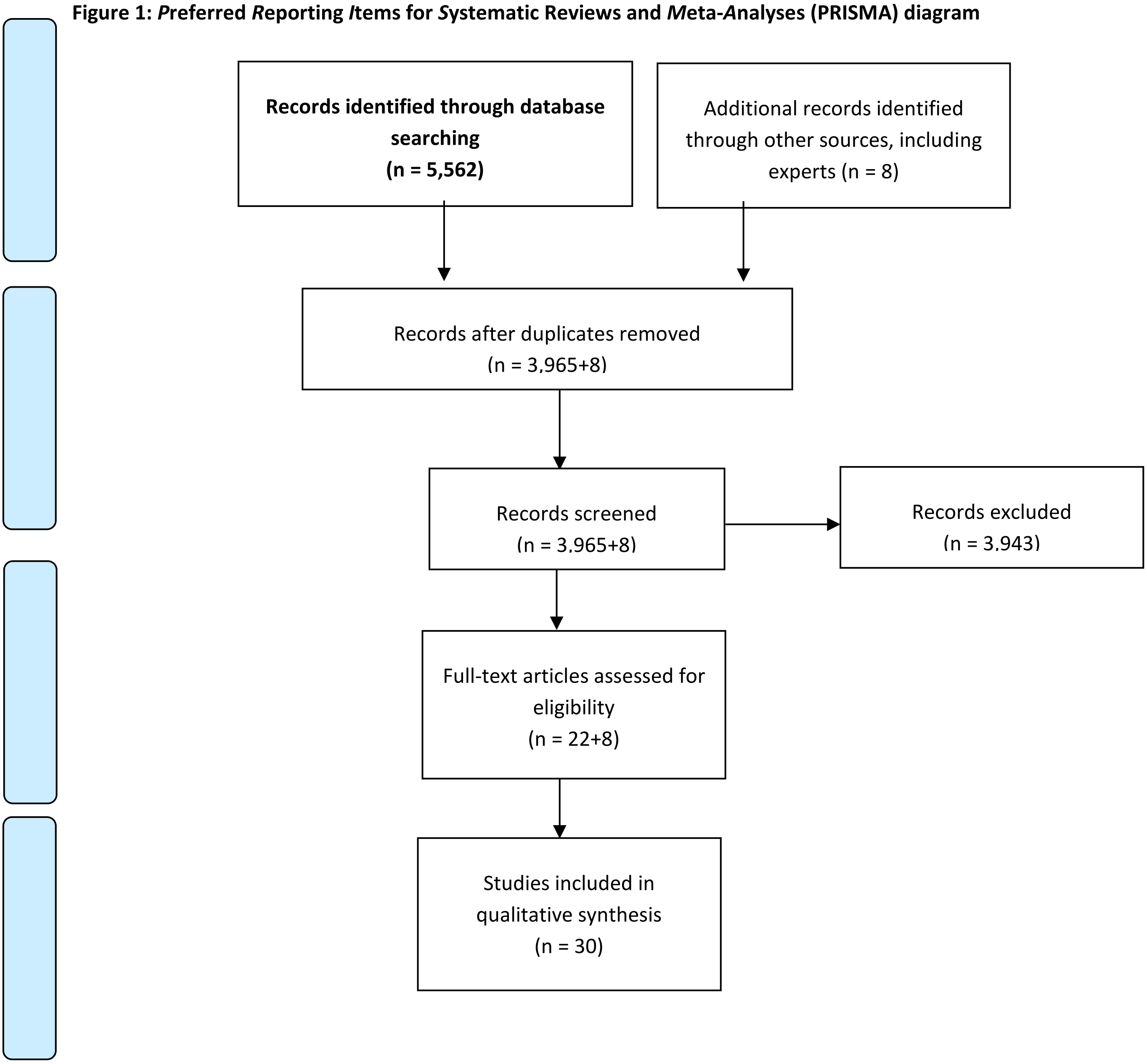
The purpose of economic evaluation is to inform decisions as to the relative value of different courses of action, in a systematic, transparent way. Cost-effectiveness analysis involves assessing the costs and effects of two or more competing, alternative interventions against other uses if the same resources were used elsewhere. Applied to the social care context, a commissioner with a constrained budget might use this information to consider whether to invest public funds in a new intervention, programme or service or whether standard care represents the optimal choice of provision.

In the context of the UK, the National Institute for Health and Care Excellence (NICE) has provided methods guidance for the economic evaluation of social care interventions (NICE, 2013 & 2014). In practice, there remains considerable uncertainty on methods for social care economic evaluation; for example, in the relevant perspective, inclusion of informal care, appropriate cost-effectiveness threshold, etc. To help resolve this uncertainty, NICE commissioned a scoping review to support developing a long-term strategy for how to consider social care economics in NICE guidelines. Full details for this study are available online (see Weatherly et al., 2017). This article summarises the methods used in published economic evaluations of social care interventions, briefly noting some recent methods developments, and it highlights key methods issues and gaps for addressing in the future.

Methods

A narrative synthesis explored the methods used in peer-reviewed publications of economic evaluations of adult social care interventions written in the English language and published between 2010 and 2016. The search strategy involved searching eight social care and economic bibliographic databases between 16 November 2016 and 18 November 2016. To select studies, two reviewers (HW, RF) screened the abstracts and full texts. Any disagreements were resolved through discussion between them and a third reviewer (MJS). Each study was assessed for key requirements for economic evaluation (Drummond et al., 2015) comprising; perspective, comparators, evidence, opportunity costs, uncertainty, equity. Experts in the field (see acknowledgements) informed the review by suggesting studies relevant for inclusion in the review, giving feedback on the methods issues raised by the review, and assisting in identifying additional methods issues and gaps beyond those identified in the review.

Figure 1: *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses (PRISMA) diagram



Results

As reported in the PRISMA diagram (Figure 1), abstracts for almost 4,000 unique references were screened. Thirty studies were included in the review. Sixteen studies (63%) were UK-based and the other studies were based in Australia, Denmark, Finland, the Netherlands, Norway, Taiwan and the USA. The type of economic evaluation undertaken varied widely. Eight (27%) studies included more than one type, and not all studies specified the type of economic evaluation undertaken. Cost-effectiveness analysis (CEA) using measures of effect specific to the interventions under evaluation was the most common approach (16, 53%), followed by CEA based on quality-adjusted life years (QALYs) (10, 33%) and cost-consequence analysis (CCA) (9, 30%). One study used Cost Benefit Analysis (CBA) methods by including outcomes monetised to reflect individual preferences. The other two (7%) studies calculated outcomes in monetary units by multiplying a relevant health-related quality of life preference weight by the cost-effectiveness threshold of £20,000/QALY typically used by NICE, to derive an estimate of net benefit.

Perspective

Whilst some studies referred to methods guidelines e.g. the NICE, England (https://www.nice.org.uk/), the Dutch manual (Oostenbrink et al., 2002), the Gold Panel (Gold et al., 1996, Neumann et al., 2017) (now updated http://2ndcep.hsrc.ucsd.edu/) and Drummond et al. (2015), few stated the decision maker that the evaluation was intended to inform. Twenty-four (80%) studies stated the perspective of the analysis with some studies using multiple perspectives. Perspectives stated included the societal perspective (9, 30%), health and social care perspective (6, 20%), the public payer perspective (6, 20%), the carer perspective (2, 7%), the social care perspective (1, 3%) and the home agency perspective (1, 3%). Fourteen (47%) studies left the perspective of the analysis unstated, or the perspective that was stated did not appear consistent with the inferred perspective, based on the costs included in the evaluation. All studies evaluated interventions that appeared to have cost impacts across multiple parts of the public sector and the broader economy, and many studies measured multiple outcomes although these were not necessarily included in the economic evaluation.

Interventions and Comparators

All studies compared two interventions. Most studies compared an intervention, such as a new service, to usual care. It was not always clear if the intervention was used in addition to usual care, although in six (20%) studies this was stated to be the case. Where a rationale for selected interventions was given this included: improving management and provision of services to an expanding population of users with complex and long term care needs, improving a range of outcomes e.g. the quality of care and health-related/social care-related/quality of life and wellbeing/happiness of users, reducing or saving resource use and cost.

Evidence

Most analyses were based on primary studies (27, 90%) collecting individual client level data, whether for the effectiveness data, the resource use data or both, and three (10%) studies used mainly survey data. Fourteen (47%) studies involved an economic evaluation within a randomised controlled trial (RCT). The remaining studies used observational survey data, quasi-experimental study designs or decision modelling using a mixture of data from the literature and data direct from the services they were evaluating. Five (17%) studies included a simple decision model based on secondary evidence. Rarely did studies make it clear about the expected duration of the impacts on resource use/cost and effects of the interventions compared, or the rationale for the time horizon of the study.

QALYs were calculated for use in a CEA in ten (33%) studies and were the primary outcome in eight (27%) of these. Where more than one outcome was included in a CEA, results across the CEAs could differ (e.g. in statistical significance as in Jones et al., 2013). Social care-related quality of life was estimated in six (20%) studies, with four (13%) studies using ASCOT and two (7%) of studies using ICECAP. Other outcomes included process outcomes (e.g. quality of care or assessment satisfaction), resource-related outcomes (e.g. carer time), mortality outcomes (e.g. life years saved), outcomes focusing on function (e.g. Barthel Index or ADL), outcomes measuring anxiety and depression (e.g. HAD or GHQ) and broad outcomes (e.g. happiness and subjective wellbeing).

Informal unpaid carer contribution was included in ten (33%) studies. Informal carer time was measured using carer hours, and valued using various approaches: the proxy good method, the opportunity cost method, QALY, carer burden and subjective wellbeing. In one study, outcomes for the informal carer only were evaluated, whilst for the other nine studies outcomes for the care recipient were assessed separately from those of the carer. In one of these studies, outcomes for the care recipient and the carer were combined. Of the studies that costed informal carer time, two studies undertook an analysis with and without informal carer costs, and two studies compared the use of different methods of costing informal care, to assess the impact on results.

In most studies, resource use was reported separately from unit costs (19, 63% of studies). Approaches to collecting data included asking direct questions at interview or via self-completed questionnaire. Resource use data collection tools used included use or adaptation of the Client Service Receipt Inventory (CSRI) (Beecham and Knapp, 2001) in seven (23%) studies, and the Resource Utilization in Dementia questionnaire (RUD (Wimo and Nordberg, 2007)) in one study. The remaining studies appeared to utilise resource use questionnaires bespoke to the study. Resource use data were obtained from the service user in most studies, although in a number of studies the data were obtained from the professional delivering the service or a relevant informal carer e.g. if the care recipient had cognitive impairment. In twenty-seven (90%) studies, resource use and costs falling on more than one sector of the economy were evaluated. Twenty-seven (90%) studies reported health care sector costs, with primary care costs being more commonly reported than secondary care sector costs. Typically, costs falling on different sectors were reported separately, by service and sector, and all studies aggregated these costs to calculate a total cost across all sectors covered in the study.

Opportunity costs

Across the studies, a range of approaches was undertaken to examine cost-effectiveness and these involved different decision rules. Eight of the ten CEA studies that used QALYs reported the cost-effectiveness threshold, and in six of these studies the NICE threshold was referred to and used to reflect opportunity cost. As expected, the CEAs reported an incremental cost and effect, and an incremental cost-effectiveness ratio (ICER). Typically, the ICER included aggregated costs across sectors despite the fact that costs (and savings) falling on different sector budgets are likely to generate different opportunity costs (and benefits) given that different sectors are likely to differ in their productivity and financial arrangements (Drummond et al., 2015). In the CEAs that did not include a QALY, a variety of methods were used to determine the cost-effective intervention. These included: comparing the ICER to a range of hypothetical threshold values, benchmarking the ICER to the ICERs of interventions evaluated in other published cost-effectiveness studies, or reporting the threshold at which the intervention might be considered cost-effective. In a few studies, there was no conclusion offered as to whether one intervention was cost-effective (i.e. generated greater benefits than opportunity costs – positive net benefit); as expected, based on the methods used, this was always the case for the CCA studies. For the CBA study, the cost of the intervention was subtracted from the WTP for the intervention (there was no comparator intervention involved) to calculate overall welfare gain/loss. The remaining two studies did not consider opportunity costs imposed by budgetary arrangements. Instead, they calculated a ‘net benefit economic value’ by subtracting the economic consequences of the intervention from the costs of the intervention. Some studies undertook more than one CEA within the evaluation thus estimating several ICERs/net benefits.

Uncertainty

Fifteen CEA studies (whether based on QALYs or not) calculated cost-effectiveness acceptability curves, and fourteen undertook univariate sensitivity analyses to test the robustness of the study findings to changes in parameter estimates used within the evaluation. No studies discussed sources of structural uncertainty. No studies undertook value of information analysis to establish whether the value of undertaking additional research might be expected to outweigh its costs, and to assess the implications of this for funding and resource prioritisation decisions. Generalisability of the results was considered in a few of the studies. Typically, authors suggested that the study findings had restricted relevance due to the specific context and heterogeneity of the intervention e.g. that there were different models of a service, which might not be easily replicable in other parts of the jurisdiction, or reflect current practice elsewhere. In a few studies, heterogeneity in cost-effectiveness between sub-groups was anticipated, but this was not formally assessed. A few studies noted that results might be different if the follow-up of service users was extended, suggesting that the time horizon of the economic analysis may have been insufficient.

Equity

In relation to equity, although some interventions targeted vulnerable groups, none of the studies examined the equity implications associated with the interventions evaluated. The assumption (always implicit) was that a unit of outcome such as the QALY was of equal social value, no matter who received them. This is consistent with NICE health and social care and technology assessment reference cases (NICE, 2013), although variation is permitted in technology assessment in the cases of patients with very short expected survival and those with very rare diseases.

Summary

The scoping review highlights the range of methodological approaches used to undertake economic evaluations of social care interventions. Within the constraints of this review, it was not possible to give full expression to the approaches that are available for evaluation.

Economic evaluation is increasingly used to evaluate social care interventions, as evidenced by the ESSENCE project, which is an Economics of Social Care Compendium https://essenceproject.uk/ led by Professor Martin Knapp. The expanding implementation and use of economic evaluations of social care interventions highlights the need to develop the methods and guidance further. The recommendations below cover key methods issues and gaps identified by the review for further research, as well as relevant ongoing research.

Methods issues and gaps

- Agreement on the objectives of the social care sector, the appropriate outcome measures, systematic and relevant measurement and valuation of resource use, and the implications of these for the perspective of the economic evaluation and accounting for costs and benefits impacting different sectors. Ongoing research includes Walker et al., (2019) on cross-sectoral evaluation, methods to extend QALYs to a broader measure of wellbeing (https://mrc.ukri.org/documents/pdf/improving-cross-sector-comparisons-using-qalys-and-other-measures-a-review-of-alternative-approaches-and-future-research/), and increasing use of ASCOT (Netten et al., 2012) and ICECAP (Coast et al., 2008) outcome measures.
- Agreement on a cost-effectiveness threshold in social care given the opportunity cost of new interventions to decision-makers, the agreed outcome measures, and the appropriate perspectives. Ongoing research includes Longo et al. (2020) on the marginal productivity of the long term/social care.
- Development and use of methods for when evidence is sparse in the context of social care (e.g. decision analytic modelling (Briggs et al., 2006), expert elicitation (Bojke et al., 2019), value of information (Fenwick et al., 2020).
- Guidance on the methods to measure and value the contribution of informal care in the provision of social care, given the chosen perspectives; ongoing research includes outcome measurement in informal carers (Al-Janabi et al., 2011) and methods to incorporate carer outcomes in economic evaluations (Al-Janabi et al., 2016).
- Development of guidance on the scoping of economic evaluations of social care interventions to ensure that all the relevant alternatives are compared.
- Extending of methods to consider equity in economic evaluations of social care interventions given recent developments on the topic (Cookson et al., 2020).

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