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Aligning health economics methods to fit with the changing world of public health

Running title: Health economics and public health

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Over the last 5 years the public health function in England has undergone rapid organizational change, and been subject to unprecedented financial pressure. Health economics can offer support but standard methods may need to evolve to fit with the rapidly changing context.

In April 2013, responsibility for public health in England moved away from the National Health Service to local authorities (LAs). Financial support was provided through ring-fenced public health budgets for LAs to work with providers of health and non-health services, as well as community organisations to improve population health and wellbeing [1]. More recently however, budgets have been cut. In 2015/6, the LA public health budget was cut by 7% (£200 million)[2], and it will be further cut by 3.9% annually over the next five years – amounting to a long term reduction in real-terms of £600 million by 2020/21[3, 4]. Alongside these cuts, in October 2015, the Government announced that by the end of Parliament (May 2020), LA's will be able to keep 100% of business rates they raise locally and the public health budget will no longer be ring-fenced.

Moving public health into LAs has provided opportunity to integrate public health with other LA functions such as education, planning, housing, and crime. There has also been a move towards place-based activities, aligning providers of care to achieve common objectives that are about meeting the needs of local populations. Financial sustainability is a key priority for these initiatives, breaking down budget silos with an emphasis on achieving value for money using the 'public pound'. Dismantling the organizational barriers will take time but will be supported by the Sustainability and Transformation Plans and combined authority working that merge LAs together to pull resources and collaborate across council boundaries[5].

Economic evaluation offers a formal toolkit to assess both the costs and consequences of competing services. The 'reference case' approach applied to a traditional Health Technology Assessment takes an 'extra-welfarist' perspective using outcomes expressed in Quality Adjusted Life Years (QALYs). Here, the agreed objective is to maximise health (measured using QALYs) subject to an exogenous (health) budget constraint[6]. Whilst this cost-utility approach offers an evidence base for allocating health and social care budgets, and assists with the aim of maximizing health gains, it offers limited support for public health decision makers with a wider remit to improve population health and wellbeing, and to reduce inequalities. Within the health economics community, efforts are being made to adapt methodology to account for inequalities[7], and to consider broader outcomes going beyond health[8], but these methods have yet to be applied in routine practice.

The UK Treasury guidance for the evaluation of (usually non health) public sector projects, recommends methods such as cost-benefit analysis (CBA) that allows for inclusion of costs and benefits from multiple sectors[9]. Projects can then be compared according to their net present value that incorporates 'social value' so includes the social, environmental and economic value. CBA has its foundations in welfare theory[10], designed to measure and value the desirability of a particular policy change. Relative efficiency is judged according to whether a change is Pareto-improving, defined as a state of the world where after the gainers have compensated the losers, no-one is worse off[11]. Applying this method to health care is fraught with methodological challenges as in the context of health care, market failure exists and so preferences are not revealed through 'normal' price signals and quantity demanded.

Furthermore, public health interventions are often described as complex in nature, being made up of "a number of components, which may act both independently, and inter-dependently"[12]. Whilst the evaluation of complex interventions requires careful thought, the economist is less focused on *why* or *how* interventions work but more interested on identifying and valuing all inputs and outputs[13]. The methodological challenge for the economic analysis arises when the *system* is complex and the consequences of the intervention are affected by possible interactions between groups; any multiplier effects; and possible non-linearity of outcomes. This is the case for the vast majority of public health interventions that are often implemented in community settings. Food growing in schools is an example where the main objective is to teach nutrition skills but as well as accruing health benefits, can produce wider benefits through connecting schools with local businesses; and encouraging enterprising

skills for children. The interaction between the local schools can also produce multiplier effects [14].

Public health interventions are not always developed using a phased, theory-based approach and in fact often within LA settings, initiatives can be ‘tried out’ in local populations just to see if they ‘work’. As research resources are so limited within LAs, an initial assessment to assess if an intervention is ready to be evaluated is always worthwhile. Ogilvie et al propose five questions to assess the ‘evaluability’, linked to: the intervention development stage; the likely impact upon policy; the size and distribution of impact; scope to add value to existing evidence; and time available for evaluation (see [15] for a more detailed description). Overall, the judgment on the evaluability should be as part of a wide discussion between the economist, funders and the decision makers.

The challenges inherent within economic evaluation of public health interventions are not new. Many authors have reported on the difficulties [16-18] and a recent literature review reports on the theoretical underpinnings of the various guidance that is available [19]. However the recent re-organisation of the public health function into local government, and the impending removal of the ring-fenced budget has changed the terms of reference for many decision makers working in this context, and the question is whether this changes the design of the economic evaluation.

It is generally accepted that the economic evaluation approach should fit with the priorities of the decision makers. At the organisational level, LAs strive to achieve strong local economies; safety and opportunity for children; a future for young people; thriving local communities; and a healthy and happy population [20]. The public health function is embedded across all LA functions, and the budget available for public health services going forward will be from a LA-budget. Thus, the objectives for spend are about empowering the local community and providing equal opportunity to all citizens, and to strengthen the economy and future for young people. At the core of all these objectives is financial sustainability. A commensurate unit is therefore required to draw comparisons of ‘value’ or relative efficiency from competing resource allocations across all these functions.

Furthermore, LAs are adopting innovative approaches to achieving these aims by ensuring that the use of community assets are maximized. For example, school buildings can offer kitchen facilities to teach cooking skills or provide healthy foods to the community after the school day; school playgrounds can be opened up at the weekend to offer a space for families to be physically active. This approach is about maximizing the efficiency of these previously under-utilised community assets, and assigning ‘value’ (or opportunity cost) to these resources needs careful thought.

The financial austerity faced by LA’s means that a common objective for commissioners is to explore innovative ways to fund services. ‘Crowdfunder’ for example is an online platform that offers the opportunity for LAs to pledge money for community services that are part-funded by the LA, and by the community[21]. This approach offers two advantages: first, the LA can offer financial support but is not solely responsible for providing all funds; and second, by the community being part of the fund-raising effort this leads to them having more ownership which enhances long term sustainability. However, by having multiple funders in place this creates challenges with assigning opportunity cost for the intervention. Also working with varying stakeholder expectations around programme priorities, aligning time cycles, and variable reporting requirements further complicates the evaluation.

A key goal for LAs is to transfer leadership to the community, and reduce the future resource requirements on the LA. Careful thought needs to be given to how an economic evaluation incorporates these objectives – economic modeling can extrapolate findings over varying time-cycles and capture the uncertainty linked to any assumptions made or type of evidence used. The key priority at the outset is to decide with all stakeholders on the primary objectives, and over what time cycles, and to identify metrics to measure these objectives that fit within an economic framework. Some of these metrics will have market prices to reflect the opportunity cost; others will require shadow prices and the analysis needs to reflect the evidence strength for these inputs and desired outcomes.

A crucial issue for LAs is to understand impact upon key population groups. The ‘ease’ of service implementation can vary across cohorts so an important consideration is understanding how an intervention can be fitted around current services and systems in different areas, or a measure of the resources required for an intervention to be set up and in place – these are key resource requirements for LAs and economic evaluations need to incorporate these implementation costs. The economist can assist with using evidence to model different scenarios where perhaps changing the design of an

intervention can reduce these implementation costs, without affecting the outcomes.

Of course, economics is not just about the application of economic evaluation. It is a behavioural science that has a lot to offer for support to LA decision makers. For example it can be used to understand how people interact in the market place; for modeling the impact of financial incentives; and for analysing how small changes to the environment can have substantial effects on population behavior - seeing the world through an economics lens provides a unique perspective that can influence thinking and inform policy.

Compliance with Ethical Standards

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2. The author has no conflicts of interest.

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