How do we estimate the benefits of health education programmes? – some methodological insights from the stated preference literature.

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I. Introduction

Health education, provided either through mass media campaigns, community development programmes, group sessions or counselling within health facilities, is widely practised although its evaluation remains a matter of ongoing debate. Numerous authors have highlighted the challenges facing health economists seeking to evaluate the benefits of health education programmes [1,2,3]. Economic evaluations of health education interventions have tended to use intermediate outcomes as their denominator (i.e. behaviour change, changing knowledge, attitude practise [4,5]; degree of health service utilisation or preference for treatment options [6,7]; or level of participation in treatment decision making [8]. Links are sometimes made to final health outcomes if evidence is available or through modelling. This is in line with the traditional view that there is no benefit from the consumption of health care per se, other than the derived benefit from improved health. However, it has been recognised that this narrow measurement of benefits will underestimate the cost-effectiveness of such programmes [9,10[1]]. There is also an expanding body of evidence that suggests that the process of healthcare itself and potentially other aspects of a health service can generate or reduce utility, independently and irrespective of any changes in health status [11]. In the provision of health education this is especially relevant, as the process of knowledge generation has been shown to be important of itself, for the reassurance and well-being it brings, and not just because it may or may not eventually entail behaviour change.

This paper supports the view that an important aspect of benefit is being overlooked in the economic evaluation of these types of intervention with implications for their relative cost-effectiveness compared to other more clinical or curative interventions. However, we propose that the outlook for measuring the full range of benefits is more hopeful than previously acknowledged [2,3] and claim that important insights can be taken from the stated preference literature.

This paper begins by defining the nature and scope of health education programmes and then considers the importance of valuing benefits in economic evaluation, by refining precisely what it is that we as health economists are trying to value. To this end, we define the likely beneficiaries of such programmes as well as the full extent of benefits which may ensue. Subsequently, we review the methods that have been used to quantify these benefits within the discipline of economics and, finally, we suggest a future research agenda and the way forward to measuring the full benefits of health education programmes within economic evaluation.

II. Defining Health Education as a Good or Service

Whilst health education can essentially be seen as the provision of information, there are different interpretations as to exactly how this information impacts on people, and

[1] Who admit that the use of life years-saved from alcohol prevented deaths as outcome measure ignores all other benefits from reduced alcohol consumption to the individual and the 'environmental' effects to society at large, such as improved quality of life, reduced health care costs, crime, violence etc.).

therefore as to its ultimate aim, what it's trying to achieve[2]. Health education can be seen clinically in terms of its contribution to increasing the use of preventive medicine [12] (referred to as the preventive model). Under this model, information is used to make better informed decisions with regards to the appropriate use of health services. It can also be seen as a sociological process of raising critical consciousness through dialogue [13] (referred to as the radical model) which acknowledges the social, cultural and environmental factors which determine health. The focus then is more on achieving lifestyle changes that contribute to better health. Finally, health education can be seen in terms of empowering individuals and communities by encouraging voluntary actions people can take on their own or collectively to look after their own health or the health of others [14]. Health under the last model is promoted in a slightly more indirect way, recalling notions of self-efficacy [15, 16] or self perceptions of efficacy, or self esteem, which are essential to good mental health. We propose here that health education in fact offers all of these things, and that rather than abiding by one or other model, we should rather adopt a more comprehensive definition in line with [17] who defined health education as:

'Any intentional activity designed to achieve health or illness related learning […]. (E)ffective health education may produce changes in knowledge and understanding or ways of thinking, may influence or clarify values, shift beliefs or attitudes, facilitate the acquisition of skills and may even effect changes in behaviour or lifestyle.'

Health education as a good or service can be described as a 'quasi-private' good, as there is the possibility of exclusion as typically programmes are targeting groups with specific risk factors (HIV, heart disease, reproductive age, men, women, children). However, whilst the direct outputs from health education programmes cannot be freely traded in an organised market, information may be transmitted beyond the immediate group, reaching other community members. This is clearly the case for mass media interventions, but also for community-based interventions when the programme messages may be shared with other community members. Viewed from this perspective, health education can be seen as a public good. The implications of this for the valuation of benefits are discussed in section IV.

III. Benefit in Economic Evaluation

Economic analysis first requires the identification of all agents (dis)benefiting from an intervention, then the identification of the full range of benefits, so methods can be chosen that offer the most promising means of benefit measurement. We follow this process with regards to health education.

1. Who Benefits?

[2] Health promotion is often used interchangeably with health education. In this study we prefer the concept of health education rather than promotion, as it clearly encompasses the notion of information provision and knowledge generation which we are interested in valuing. In addition, it has been suggested that health promotion is in fact a combination of health education and health public policy [17].

To provide a framework for this paper a good starting pointing is to question what it is we are trying to measure and value through economic evaluation. The provision of a good or service is said to 'benefit' an economic agent by advantaging or disadvantaging him/her in a unique way, hence increasing/decreasing his/her overall level of well-being or utility [18]. Therefore, in the interests of maximising social welfare we should be interested in capturing all utility changes (either positive or negative) that result from a change in the provision of a good or service. Hence, in theory, it is necessary to identify all agents who might potentially benefit from a health education programme. This will depend to some extent on the nature of the intervention. However, broad categories of beneficiaries are discussed below.

A health education programme essentially involves the target population to whom the message/s is being directed. This may be pregnant mothers in the case of a smoking cessation programme, or a programme to educate mothers about the risks of pregnancy and childbirth in a region where access to health facilities and education levels are low. This may be sex workers or truck drivers or other high-risk groups in an HIV prevention programme. By aiming to change behaviour, many such interventions reach beyond the target population and potentially indirectly affect/ (dis)benefit (assuming behaviour change takes place) the lives of other household or community members. For example, in the case of a programme in West Africa to reduce childhood diarrhoea which educated pregnant mothers to wash their hands after a child had defecated and before preparing food, the benefits accrued not just to the child but also to mothers and other household members [19]. The financial benefits from reduced health care related costs for diarrhoea treatment most probably went to the husband or household head. In the case of a community-based participatory programme in rural Nepal, where mothers are encouraged during educational group meetings to set up strategies within the community to improve access to health facilities, the community more broadly is affected in terms of committing time to developing the strategies that were set up [20].

Depending on the method of transmitting information, the programme may also involve educator/s, who may be volunteers from the community or health workers. This would be the case for example in community-based group sessions or individual health education or counselling sessions in health centres. There is evidence to suggest that volunteers may also benefit from these sessions sometimes seen by them as an opportunity to 'socialise' [21]. Female community health volunteers in Mexico were found to value the experience as an opportunity for 'getting out, serving, learning and women's betterment' [22].

Whilst the scope of potential beneficiaries is large, frequently, cost-effectiveness analysis tends to focus exclusively on outcomes to the target population, overlooking the wider societal effects. Cost-effectiveness analysis requires the measurement of effect in a single measure of health or intermediate (knowledge, attitude, practise) outcome which not only may underestimate the full effect to the individual concerned, but also to the community at large who may be benefiting indirectly in different ways. Whilst cost-benefit analysis offers a means of capturing these broader societal effects these are rarely, comprehensively quantified due to the relative 'intangibility' of some effects, such as

empowerment or those inspired by altruism. However, to better understand this issue, we should consider the full range and nature of benefits resulting from health education programmes, termed as the 'total value' approach [23].

2. Nature of Benefit of Health Education (Process versus Outcome)

With respect to the evaluation of healthcare benefits, Mooney distinguishes between two levels of preferences for health services: those at the micro-level governed by the self interest one has as a potential patient (or a patient's immediate family) and those at the macro-level concerned with changes in the structure of the health system as a social institution [24]. At the individual as well as the community levels, he argues that the processes that patients go through and non-health outcomes can be as important as health outcomes themselves in terms of overall well-being. Therefore, health in itself is not the only attribute entering an individuals utility. Therefore we distinguish between the value of health education in terms of improving people's health and benefit as a broader notion of individual and community level well-being.

2.1 Benefit as Improved Health

Health education programmes are usually conducted with the aim of changing people's perceptions and ultimately their behaviour so as to reduce morbidity and potentially mortality. It is against these aims that these programmes are typically evaluated within economic evaluation. Evidence suggests that more informed and knowledgeable patients seek preventive care and favour health behaviours that improve their health [25,26]. Some examples of studies using cost per disease case averted as the outcome measure include [27] (HIV) and [19] (diarrhoea). Life years gained or QALYs are sometimes estimated especially in the evaluation of HIV prevention and tobacco education programmes [28,29] (QALYs) [30] (LY saved).

However, as the timeframe of the evaluation is often relatively short compared to the time needed to achieve sustained changes in behaviour and impact health, intermediate outcomes are often used in terms of changes in knowledge, attitudes and practise, and ultimately (if observable) in terms of actual or predicted behaviour change. This has limitations in terms of comparability with curative or other interventions targeting the disease/condition. Also, it is not clear to what extent changes in knowledge or behaviour should be valued by society and are actually valued by the individuals concerned. Otherwise stated, it is not because behaviour has changed that there has necessarily been an increase or decrease in welfare (all depends on which activities and expenditure have been displaced and from where). Furthermore, the relation between behaviour and health or the absence of disease is not always clear, although can sometimes be derived though modelling (for example, HIV). There have been few cost benefit analyses of this type of intervention due to the difficulty of placing monetary values on intermediate benefits [31], and the few attempts that have been made focus narrowly on financial benefits (savings) (see for example [32][3] and [33]).

[3] Looking at the effect of a nutrition education programme on food expenditures and nutrient intake, or number of days lost through sickness

Clearly one of the limitations of these studies is that they fail to address the fact that changes in knowledge and behaviour resulting from health education may be of value not just because they do or don't impact on health. Indeed, they may also be of 'consumption value'. The following section seeks to identify a more complete range of possible benefits, in terms of different methods of information provision, as well as to delineate programme outputs which may be valued by society, yet not necessarily contribute to improved health.

2.2. Benefit as Improved Well-being

The Process of Learning – Consumption Value of Education
There is an increasing body of evidence seeking to quantify the value of the process of care independently of health outcomes. The literature can be classified as eliciting preferences as to different ways of providing the same service (see for example [34,35,36]) (sometimes termed 'close substitutes' [37], or as to different organisational structures for health facilities more broadly, teasing out which attributes are most highly valued by patients [38,39]. In the former category, numerous willingness to pay studies have been conducted alongside randomised-controlled trials comparing packages of care which were not anticipated to differ significantly between arms in terms of health outcomes [37,40].

The process of health education programmes has been said to be of critical importance in determining its success and therefore should be considered in the evaluation. The method of information provision is one such example [41]. Whilst considering the preferences for methods of genetic counselling, these authors found that the interpersonal interaction between patient and counsellor and the level of 'connecting' were important determinants of success as was the manner of providing information (degree of clarity and concision). The method of communicating the information can be said to bear intrinsic value to individual recipients.

The Non-Health Outputs
To determine the full range of potential non-health benefits of health education we reviewed evaluations of educational programmes or 'group sessions'. As a result, numerous categories and sub-categories of benefit were identified, as shown in Box 1[4]. Borrowing the taxonomy from Mitchell & Carson we distinguished between benefits in 'use' (directly experienced by programme participants) and in 'existence' or 'non-use' (arising from knowledge of the programme's existence without actually participating) [18].

At the Individual Level
The first most obvious benefit arising to 'users', or programme participants (as well as other community members with whom the information is shared), is the process of information or knowledge generation. This can be valued in different ways. Information

[4] These are not additive separately, but rather offer a means of identification and classification of different types of benefit.

has been valued for its 'decisional'[5] value in terms of changing behaviour and improving health (this is captured in the previous section and so is not considered further here). However, numerous studies also point to the 'non-decisional' value of information, i.e. valued for its own sake. This includes the decrease in anxiety/concern from reassurance and reduced uncertainty resulting from information provision [42,43,21,44]. A study of the evaluation of the benefits of schooling pointed to the 'entertainment' value of knowledge, the joy of learning [45]. Whilst health-related knowledge is not always entertaining in this way, some aspects of knowledge might be perceived as so.

The process of knowledge integration can affect the way people feel within society, their self-image. The contact with the educator, especially in the context of a group session, may also impact on confidence. Hence, improved self-confidence is another category of benefit. Various studies point to improvements in self esteem and life satisfaction [46]; increased confidence [21]; or decreased embarrassment [47] resulting from a health education programme.

Health education programmes can also be seen in terms of promoting social cohesion, or a sense of community, affecting how individuals understand and relate to their social environment [48]. This is especially the case of community development interventions which, through the transmission of information, strengthen the sense of community competence and identity that are an integral part of well-being [2]. This is why the act of participating in group activities of whatever nature can clearly be of value to individuals, as illustrated by people's willingness to pay money to participate in, for example, study groups or book clubs [1].

Recognising the relationship between health education and empowerment, a further category of benefit was included, that of 'self-efficacy' or the ability to make informed choices. This concept relates more to ones relationship with oneself, and deeper mental well-being. Studies have measured the effect of health education on mood states (such as depression) and degree of self-efficacy was used as a measure of outcome in a study by [49].

The existence of these benefits is further supported by sociological literature which demonstrates that they can be influential in determining the demand for health services, suggesting that the demand for certain healthcare interventions may be a derived demand for information [50,51,52].

[5] The terms decisional and non-decisional are borrowed from a study by Berwick & Weinstein of the value of information provided by ultrasound screening [44].

Box 1 A Typology of Possible Benefits

Benefit class	Category	Subcategory
Use	Information obtained	Changing risk perceptions, behaviour change, changing demand for health and willingness to invest in future health. resulting in better health
		Reassurance, anxiety
		Entertainment – the joy of learning
	Social cohesion	Interaction with other group members, with other members of community, with educators – includes diffusion effect
	Self-confidence	Empowerment, self-efficacy,
	Financial	Improved efficiency in household production of health– reduction in 'search' time.
Existence	Altruism/caring	Well-being from knowing the intervention exists and is benefiting people
	Reassurance	Well-being from anticipated benefits (positive externalities) from changes in others behaviour
	Regret/deprivation	From voluntary non-attendees who suffer regret later on, and for the 'deprived' group, those who would like to attend but aren't eligible (Gerard et al. 1992)

Source: Adapted from Mitchell & Carson (1993) Chapter 3, Figure 3.1.

The economics literature of household production points to the value of information in terms of increasing efficiency in the production of health. According to this framework, information is one input into the production of health. The price of obtaining information is time [53]. An intervention which decreases the price of information (by making it more accessible) makes individuals more efficient producers of health and they are therefore predicted to benefit financially from reduced search time spent finding the information [54,55]. Therefore information can also be valued in terms of changes in the underlying budget constraint and technology available to households by reducing input prices and changing their underlying risk perceptions (and therefore willingness to self protect, self insure and use health care).

At the Community Level

Box 1 also points to some 'existence' values, or benefits accruing to households or other community members from the knowledge of the programme's existence, either from an altruistic sense of knowing that others are benefiting, or from the anticipation that others will change their behaviour in a way which is beneficial to their (the non-user's) own well-being. In the case of group health education sessions in developing countries, where community members are closely related and their lives entwined, there is also evidence of a 'social diffusion' effect whereby information carries beyond the group affecting the attitudes and behaviour of individuals in their immediate environment [1]. In some ways this can be seen as a special case of 'existence' benefit unique to educational programmes promoting the dissemination of information and knowledge. Although it has been suggested that similar such benefits arise from all interventions acting at the community level [2]. It is therefore important to explicitly consider the interpersonal effects appearing in each individual's utility function.

Finally, those who decide not to attend or participate in a health education programme may suffer regret as a result of this choice [56]. Participants may also suffer from disappointment, of their expectations not be satisfied. Health education programmes seeking to raise expectations about health services could lead to disappointment if for example facilities can't meet the resulting increase in demand. Similarly, those who are not able to participate (for example, older women in the case of an intervention targeting women of reproductive age) may suffer from deprivation disutility. Whilst one could argue that you cannot feel deprived of something you do not know, non-participants may still feel deprived of an opportunity to be part of a group, or to miss out on an educational opportunity, even if the process itself and the specific content of information provided are unknown to them.

IV. Methods for Measuring Benefits

Having identified the full range of benefits potentially resulting from health education programmes, this paper was also interested in considering methods of their possible measurement and quantification within the framework of an economic evaluation. However, at the time of writing none of the published economic evaluations of health education programmes identified attempted to capture benefits which weren't directly linked to health. Whilst changes in knowledge levels were documented, the estimation of the value of such changes to the individuals concerned, or society more broadly was not attempted. Economic evaluations of mental health interventions have been the most adventurous, using slightly less tangible measures of effect in accordance with the nature of mental illness, such as: the number of anxiety free days due to intervention [57] or depression free days [58].

The general failure of economists to measure the existence benefits of environmental interventions has been explained as the concern arising from the distancing of benefit from the traditional understanding of consumption and possible validation by market behaviour (sometimes termed 'extra-market' benefits) and fear this may lead to an overestimation of benefits [18]. Similar such concerns may be partly responsible for the restriction of health economic research to the valuation of 'use' benefits related to improved health. The value of information is usually overlooked as are the other possible consequences which may be of social value. This section considers the application of stated preference techniques in the literature on the economics of screening and IVF treatment which may be applicable to the evaluation of benefits of health education programmes.

1. Measuring Non-Health Benefits: Lessons from the Stated Preference Literature

During recent years, numerous studies have sought to measure the value of non-health attributes of health services using willingness-to-pay. Willingness to pay (WTP) has been used to measure the intensity/strength of preference or value of a good or a service, by asking the maximum amount of money or other that can be given up [37]. In principle, when deciding their maximum WTP individuals will take account of the characteristics of a good/service 'that are important to them' (p372) both health and non-

health related [37]. Therefore it imposes no restriction on an individual's utility function. This section reviews the methods used to estimate WTP and discusses their advantages and limitations.

1.1. Lessons from the Economics of Screening

Within the economics of screening literature authors have begun questioning the nature of attributes that are included in the screenee's utility function and challenged the convention that the only benefit derived is from being correctly diagnosed and treated. In the case of screening for genetic anomalies (Autosomal dominant polycystic kidney disease) in Denmark, it was hypothesised that women derive benefit over and above the resource savings associated with an aborted foetus, irrespective of the outcome of the screen, from information in terms of reduced uncertainty and knowledge [59]. To try and assess the extent to which information was of value, the authors conducted a survey of people suffering from the disease to determine their WTP for the screen and then determined whether anyone was prepared to pay for the screen just on the basis of the information provided (i.e. they would not choose to abort if the test were positive). They found that over half of those willing to pay something wouldn't abort if the test were positive, suggesting the knowledge in itself was of significant value. Similarly, Grimes explored the value of a negative Pap smear [60]. He asked women with a negative test result whether it had been a waste of time, and if it was of value to them in any way, and if so how much they were willing to pay for it. A majority of those interviewed were WTP more than the cost of providing the test. These studies indicate that information can be of value in itself and that WTP can be used to quantify the extent to which it is valued by individuals in comparison with other aspects of service provision.

Another study sought to quantify the extent to which information is of value in relation to ultrasound screening or diagnostic screening more generally[6] [44]. It distinguished between an understanding of health-related issues that enables medical compared to personal decisions 'such as planning for the future or altering the home environment' with implications for non-health outcomes, and the non-decisional value of information, that people feel better from 'just knowing' and the enjoyment of learning (p883). Focus groups were held to establish the domains of information that were of value. Seven were identified and then women were asked their WTP for each one in terms of its non-medical decisional value on the one hand and then again in terms of its non-decisional value on the other. It was designed in such a way as to estimate the value of obtaining the information rather than the content of information. 26% of the total WTP was for the non-decisional aspects of information and a further 19% was for the non-medical decisional aspects (making a total of 44%). In this example screening can be seen at least in part as an investment to acquire information, although some individuals expressed a WTP to suppress information (they preferred not to know), and so in this minority group a disutility was associated with information.

A similar approach could be used in an evaluation of health education programmes, by separating out the value of the decisional compared to the non-decisional aspects of such

[6] The test was referred to as an 'unnamed diagnostic test' rather than ultrasound, unless specifically questioned by a patient.

programmes (in terms of knowledge generated as well as increased social cohesion and other benefits). The only concern with identifying the individual WTP for each attribute of the programme is that the sum of WTP for each attribute was found to be more than the WTP for the test as a whole. There are various possible explanations for this outlined in the study[7], however, for the purpose of economic evaluation it is only necessary to estimate the total value of an intervention (and to be sure this includes all possible attributes of benefit). WTP is one way of doing this. The next example offers a means of identifying which attributes are most influential in determining WTP which may be useful to decision-makers by indicating the aspects of service provision which are most valued by patients.

1.2. Lessons from the valuation of IVF treatment

In a study by Ryan the value of information along with regret and disappointment was explored in relation to in-vitro fertilisation (IVF) treatment [62]. The author hypothesised that women may benefit from having tried everything they could to get a child even if they leave the process childless. To capture to what extent regret and disappointment influence decisions under uncertainty ('psychological' outcomes) as well as the desire to be better informed (non-health outcomes), patients were asked to evaluate their satisfaction with a range of the attributes using the rating scale technique. Information, counselling and provision of follow-up support and cost, amongst others, were therefore evaluated using a 0-10 scale, and through ordered probit regression their contribution to overall satisfaction was assessed and the extent to which they determine total WTP. However, the results indicated that follow-up and cost were the most important attributes determining WTP, and that those who were most satisfied were not willing to pay more, which was explained by the fact that patients tend to be satisfied with the treatment they receive.

Whilst this is to be expected when the alternative being compared is the 'do-nothing' option, it has been suggested that the 'marginal approach' can be used to overcome a potential problem arising when alternative packages of care are being compared [63]. In this last case, individuals may compare the care they received with no care at all, rather than with the alternative (known as the 'embedding' effect). To avoid this problem they should be presented with both options, asked for their preferences and the extra amount they are WTP for their preferred option over the alternative and why[8]. Therefore, the first set of data to collect is on preferences, and then strength of preference through WTP should be elicited enabling the WTP of the 'gainers' to be compared with that of the 'losers' [37]. This approach has two advantages over the former method: it presents the interviewee with the attribute levels that define each option, and then determines which attributes are influential in defining their WTP.

[7] One explanation is that there is an interdependency between attributes which cancel out when a commodity is considered as a whole compared to if it is broken down into each of its individual attributes. Another, is that people have different mental accounts for different estimates of value and therefore WTP does not reflect the size of a commodity [61].

[8] Donaldson et al. underline the importance of investigating 'what lies behind respondents' values' [37: p9].

This approach could be used to value the benefits from health education programmes, by first asking for individuals' preferred options over alternatives and then for individual WTP for the preferred option as well their ranking of its different attributes[9] of the programme (e.g. method of information provision, extent of knowledge generated, success in changing behaviour, provided reassurance, strengthened social cohesion within community), hypothesised to be (dis)utility generating.

Health promotion studies have devised various scales for quantifying individual and community level changes resulting from community-based programmes. At the individual level, the intrapersonal empowerment scale identifies leadership abilities and extent of political efficacy [64]; an interactional empowerment scale measures knowledge of resources and critical awareness [48]. At the community level the 'sense of community' scale establishes extent of membership, influence, integration and 'shared emotional connectedness' [65,66]; the neighbourhood social interaction scale, measures the number of activities performed with neighbour [67,68]; the perceived neighbourhood control scale measures the perception of influence when acting with neighbours [69]; and an informal social control scale measures neighbours' willingness to intervene. Once the extent of these benefits has been established through measurement scales of this type, individuals can be asked to rank them in order of preference.

As WTP doesn't place restrictions on an individual's utility function, in principle it offers the possibility of capturing all utility-generating aspects of an intervention, including the interpersonal effects described by [2] on the community as a whole.

1.3. Lessons from Conjoint Analysis

Another method of assessing the extent to which different attributes contribute to total utility (or WTP) is conjoint analysis which can be used to establish their relative contribution to overall benefit. The technique, originally developed in mathematical psychology, has been used to establish which aspects of process of care (location, staff attitude etc.) are most valued by patients [70,39]. For example, it was used in one study to establish the value to patients of providing access to patient records and general medical information in the waiting area of health centres in relation to other attributes of general practise (waiting time, and whether or not they are seen by their doctor of choice) [71]. Surveyed patients were then presented with eight scenarios with different attribute levels and asked to rate them in order of preference. Whilst this study didn't capture the specific attributes of the new information system itself, by separating the method of providing information from the value of the information provided, in principle conjoint analysis could be used to do so. Therefore, it could also be used in the evaluation of health education programmes to establish how individuals trade between different attributes of such programmes. Cost can, in principle, be included as one of the attributes, enabling the measurement of WTP for each attribute. However, this is not recommendable for our purpose as we've seen this generates a problem of dealing with the WTP for the service as a whole, versus the sum of WTP for each individual attribute, which inevitably differ.

[9] Determined before hand through focus groups and/or literature review.

2. Whose values to elicit?

There is an ongoing debate within the WTP literature as to whose values to elicit; whose preferences matter? Some have argued that it is the view of the community (i.e. the 'non-user') that matters in the context of priority setting for public services [72]. However, this bears the problem that the community at large are unlikely to have a good understanding of the intervention being valued, especially in the case of health education programmes which are often complex and multidimensional. Also, benefits such as self-efficacy or improved social cohesion are hard to value accurately unless directly experienced. Indeed, it has been acknowledged that the mimicking of a time frame and social setting of a complex decision or intervention may be difficult through the use of stated preference techniques especially when there is little opportunity for questions or social exchange (as there would be in real life) and quick responses are required [73]. It would also be difficult, if not impossible, to present a single representative contingent valuation (CV) scenario to a hypothetical user, as for programmes operating with the intention of community empowerment there is often no single model of what the programme corresponds to, as each strategy is designed and evolves in accordance with the needs and context of individual group members. In addition, there is the danger of cognitive overload if too much detail is provided within a CV scenario [74].

A growing position within the health promotion literature is that communities themselves should be responsible for programme evaluation, especially in the case that communities are required to define their own strategies, as they are better placed to identify and value the outputs of the dynamic process that is community development than decision makers who may have different objectives and aspirations (see for example [75]). It also stands to reason that affected community members should also be responsible for valuing the benefits of such programmes in monetary terms using WTP, rather than a hypothetical user.

Therefore, to avoid the above, the only feasible and acceptable method of eliciting meaningful values for health education programmes is to question users ex-post (that is after they have been exposed to the intervention and after programme evaluation[10]). In practise, this also appears to be the most common form of evaluation used in 20 out of 28 studies [76]. The most relevant question in our context would then be WTP to preserve the intervention.

Despite its advantages, this approach carries the risk that respondents will value their own personal experience rather than the scenario presented to them [74], and may place a higher value than would a typical citizen, because they are directly benefiting from the programme and it is in their interest to do so [77]. However, in the case of health education programmes, it seems that the benefits outweigh the risks of this method of preference elicitation. The elicitation of ex-ante WTP would be recommended in the case that uncertainty be an issue in preference construction, yet with this type of intervention, the divergence between expected (ex-ante) and actual WTP is expected to be nil. Therefore, there is no benefit of eliciting ex-ante over ex-post WTP.

[10] As users are expected to have derived sufficient benefits at this point.

Whilst users can be interviewed to elicit the use values described in Box 1, other community members (non-users) can be questioned as to their willingness to pay for the 'existence' variables previously defined [62]. One concern with the elicitation of this 'public good' type of benefit, is that respondents will have an incentive to 'free ride' [78] and significantly understate their true WTP, on the assumption that others will cover the cost. However, it has been suggested that strategic, dishonest behaviour may jeopardise long term economic gains and therefore is not attractive [79]. The extent of strategic bias was actually tested [80] and it was found that differences in valuation in the case where a free-riding incentive existed, compared to that when it did not were not significantly different, and in all cases 71-85% of true value was captured by the WTP estimate. These findings have been confirmed by free-riding experiments (see for example [81]). Similarly, a study by Araña & León explored individual WTP for an individual flu vaccine compared to a public influenza campaign to estimate the difference between private and social valuations of benefit [82]. They found a significantly higher value for the societal intervention indicating that altruism is influential in determining value. Furthermore the problem of free riding was not encountered. Combined, this evidence suggests that free riding occurs much less than would be predicted by utility maximisation theory [18].

It follows then that willingness to pay can potentially be used to estimate the value of use as well as existence values of health education programmes. We consider next the use of WTP in relation to other possible measures of outcome.

3. Willingness to pay compared to other measures of benefit

WTP has been promoted as a method of measuring benefit as in addition to its sensitivity to measuring small changes in welfare and potentially capturing all attributes in an individuals utility function, it also has the advantage of lying closely within neoclassical economic theory and valuing benefits in the same units as costs, enabling the comparison of efficiency with allocations of resources to different disease areas, or beyond the health sector e.g. [37,83]. However, the last two advantages seem to carry more weight, as Olsen & Smith pointed out:

'The rightness of an evaluation approach is neither to be judged from its disciplinary basis (economics) nor from its theoretical foundation (neoclassical welfare economics). Rather it is to be judged on the basis that value judgements are compatible to those society holds for the health care institution, for which the particular economic evaluation is being undertaken' [83: p 39].

The practical application of WTP within economic evaluation, however, has led to some concerns that should be borne in mind. Donaldson et al. highlight the need to differentiate between cost and value, and ensure people understand we are trying to capture what an intervention is worth to each individual (value) and not how much they think it would cost to provide the service (the more expensive option may be less desirable in terms of preferred attributes) [37]. Concerns have also been raised about the link between WTP and ability to pay. However, the extent of the problem can be assessed by looking at how preferences are distributed across socio-economic groups, and if necessary adjusted for accordingly [37].

With regards to the application of preference-based methods to health education programmes there are some specific concerns. The economic theory underlying stated preference methods assumes that people have complete and stable preferences for a given commodity and its characteristics. However, a health education programme, by nature, aims to inform people with a view to changing their preferences and subsequently behaviour. Consequently, in this context, it would be more realistic to consider preferences as dynamic or context dependent, rather than stable, constructed progressively through the process of social interaction and the integration of information. Therefore, we should recognise the instability of preferences and design elicitation tasks which promote preference construction [61]. Indeed, the elicitation of uninformed preferences may be misleading and lead to suboptimal decisions [84]. This supports the view that it is the WTP of the fully informed individual which is of value and should be included in the estimation of WTP, as it is the end state preferences (ex-post) which should be of interest, as we have already established the difficulty of conveying all necessary information ex-ante to a hypothetical user.

Whilst WTP is not without its problems, it appears to be the most hopeful measure of outcome currently available to economists that could be used to comprehensively capture the non-health benefits of interventions, where these are expected to be substantial. Indeed, the widely used alternative in cost-effectiveness analysis, Quality-Adjusted Life Years (QALYs), can only be used to quantify outcomes affecting health-related quality of life. Whilst QALYs have been shown to have made a significant contribution to outcome measurement of curative care interventions, a number of non-health related outcomes which may be important in the context of health education programmes cannot, as yet, be incorporated into a QALY framework [85]. Furthermore, the use of the QALY would require people to trade between different levels of information and risk of death (standard gamble) or years of life (time trade off) which could be impractical when the risks involved may be very small [37].

Whilst large strides have been made within the health promotion literature to develop measurement scales for less tangible benefits such as empowerment and social cohesion, health economists need a way of combining individual outcome measures into a comprehensive estimate of overall benefit, in order for meaningful comparisons to be made with alternative programmes with a different set of outcomes.

V. Conclusions

In conclusion, this paper was inspired by the challenges in evaluating health education programmes within economic evaluation due to their complex nature and the broad range of intangible non-health benefits at the individual and community levels. We began by exploring the types of programme beneficiaries and confirmed that benefits can stretch beyond the individual to the educators themselves and, through diffusion effects, to the community at large, hence indicating the importance of incorporating 'existence' or 'non-use' benefits within an economic evaluation of this type of programme. The benefits to affected individuals clearly reach beyond health ranging from the value of the process of information provision, to the consumption value of education and non-health 'psycho-social' outputs.

We suggest that willingness to pay offers a way forward for the evaluation of health education programmes, as this method can potentially take account of all the health, as well as the non-health, attributes that are of value to affected individuals. Evidence from the economics of screening and IVF treatment show how WTP can be used to estimate the value of information and reassurance as well as regret and disappointment. We argue that this method could also be used to capture health as well as non-health benefits both at the individual and community levels, such as empowerment and the improved social cohesion resulting from a health education programme. We propose that the 'marginal' approach could be used to elicit the 'use' values of programme participants and the both positive and negative 'existence' values from other community members (non users). To avoid the risk of cognitive overload and potential misunderstanding of the programme to be valued, we suggest that WTP values be elicited ex-post, based on 'informed' preferences, once individuals have had sufficient (direct or indirect) exposure to the intervention. Following on from this approach and in accordance with welfare economic theory, the aggregation of the sum of these values (either positive or negative) compiled from the gainers and losers of the programme would provide a measure of the total value of the intervention in monetary terms. Information should also be derived from satisfaction surveys, or using conjoint analysis, to establish, through rating, ranking or discrete choice exercises, which attributes of the programme are most valuable to users and non-users alike, providing valuable information to policy makers on the optimal design of such programmes.

There is scope for future research in this field to test the validity of this method within an economic evaluation of a health education programme and to explore and refine these tools to enable the quantification of relevant non-health benefits. This would be an essential step in improving our understanding of the true societal worth of these types of interventions.

VI. References

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