#	Question	Answer
1	I am user of DCE. I would like to ask how the division of roles between DALY, QALY, and DCE is considered in health economics recently.	Disability Adjusted Life Years (DALYs) are generally used in low and middle income countries (LMICs), whilst Quality Adjusted Life Years (QALYs) are used in high income countries (HICs) to inform health policy and prority setting. However, some LMICs have explored the use of QALYs, often alongside DALYs. I am less familiar with the use of DALYs. QALYs are still the method of recommendation for many Health Technology Assessment (HTA) in HICs bodies e.g. National Institute for Health and Care Excellence (NICE) in the UK, the Canadian agency for Drugs and Technologies in Health (CADTH) in Canada and the Pharmacetical Benefits Advisory Committee (PBAC). However, DCEs are now used alongside QALYs to provide quantitative evidence on factors important beyond the QALY (e.g. for NICE).. Bodies such as the Food and Drug Administration (FDA) in the States amd the European Medicines Association (EMA) recommend using DCEs to estimate Minimum Acceptable Benefit (MAB - e.g. the smallest benefit that a patient would require to accept a given risk of adverse effects) and Maximum Acceptable Risk (MAR - e.g. maximum risk of adverse effects a patient will accept for a given health benefit). Also, beyond economic evaluations, DCEs have been used to address a broad range of health policy questions (see Webinar slides). Whilst the Person Trade-Off (PTO) method has been commonly used to estimate weights within DALYs, DCEs could potentially be used - I don't think this has been done to date.
2	In other words, does that mean DCE is more likely to be used as resource allocation information?	See response above.
3	Q1. Current researches utilizing DCE frequently assume a linear-in-parameter observable utility function component. I would like to ask the latest findings proposing non-linear alternatives. Q2. Efficiency designs appear effective for relatively small sample sizes because they automatically achieve orthogonality and minimal overlap in addition to utility balance. While orthogonality and utility balance are certainly important, I feel that minimal overlap is crucial for relatively small sample sizes. I would like to ask whether other experimental designs that achieve minimal overlap have been proposed.	Very few studies test for non-linearities in preference parameters. Early research found that the linear model explains a lot of the variation in preferences. It should be noted that if a non-linear model is employed, marginal rates of substitution/trade-offs are not a simple calculation of the ratio of coefficients For an example see the following for non-linear time attributes included in the DCE:. https://rgu-repository.worktribe.com/preview/1385954/RYAN%202014%20Gaining%20pounds%20%28AAM%29.pdf Regarding your experimental design question, orthogonal designs and d-efficient designs are the most commonly used designs. Orthogonal designs ensure orthogonality, efficient designs relax this criteria in favour of minimising the error around parameter estimates (the variance-covariance matrix). Utility balance is not applied with orthogonal designs - this is applied with efficient designs, only when prior information is known about parameters. Minimum overlap may be relaxed in both orthogonal and d-efficient designs. It's worth noting that the criteria of a good design makes for difficult choices... criteria have been relaxed to increased respondent efficiency (presenting choices that can be answered, and not so cognitively challenging).
4	Q3. It appears that effect codes are being used in the analysis, but is this because you want to estimate the constant term for “Opt-in for health check” without confounding?	Yes, we wanted to take the reference levels for dummies out of the constant term, so we could estimate the general preference to have the CVD health check, everything else equal. Whilst dummy variables are most commonly employed in DCEs analysis, effects coding can be very useful. The decision regarding dummy variable coding or effects coding is study specific.

5	It seems that DCE assumes that "individuals" are payers. In many contexts, however, other actors such as govermnents or hospitals make decisions whether to buy health products. Is it still possible to apply DCE to measure WTP of these actors, particularly considering the limited possibility to get a large sample? If not, is there any other way to study these actors's willingness to pay?	The advantage of using experimental designs is that smaller sample sizes can be used to elicit preferences (compared to research that used revealed preference data). Having said that, sometimes the sample size may be too small. Also, see the comment below re the penalised MNL model - this may be useful for such studies. Whilst public/patient studies generally ask individuals to pay out of their pocket, the net-zero example DCE I presented a slide on asked individuals what they would be willing to pay in extra taxation. There is a small literature on preferences of decision-makers; it would be worth doing a search. It is important when thinking about the cost attribute to ensure the concept of opportunity cost is applied. One option is to ask decision makers how much of the NHS budget should be spent on X - but you would need to ensure there is an opportunity cost - if you spend on this procedure, then you cannot do this test...
6	Professor, could you give more details about how to set reasonable levels for each attribute. If the attribute is a continuous one, how we decide if there should be 2 or 3 levels ? how we decided the upper and lower limit, and shoud there be a middle value?	With respect to setting levels for continuous variables, there is no hard and fast rule, and consideration should be given to your study context. Generally levels should re reaslistic and capabale of being traded off. For example, with a risk attribute, levels should be realistic, but also push people to their limit for trading. When using a cost attribute, pilot work should be conducted to elicit monetary values. Often a willingness to pay study is carried out in the developmental work to get maximum willingness to pay (WTP), and help set levels. Levels should extend beyond the maximum elicited in the WTP study. The number of level will depend on the range of possible levels. The wider the range of levels, the larger the number of levels, though four levels if often the maximum. note that the number of choices you have to present to individuals increases with the number of attributes and levels.
7	Could you tell me the title of the paper again?	Sorry, I'm not sure what paper you are referring to. All papers presented in the Webinar have their references on the slides.
8	Great presentation! You mentioned we can estimate population uptake rates based on utility functions, but can we predict individual choice based on their own choices(based on their own DCE answer)? Is there like a standard way to do that?	The DCE model is generally estimated at the aggreagate level, though you can break down into sub-groups. Mixed logit models and latent class models are used to allow for unobserved heterogeneity. There is an econometric model known as the penalised Multinomial Logit Model (pMNL) that has been used in a limited number of studies (and not DCEs in health to date), allowing individual level preferences to be estimated. More research is needed on this method; it is potentially very useful e.g. using a DCE to develop a Decision Aid Tool (DAT) - see the example choice in the Webinar (Slide 44 - Develping a shared decision making tool (pain management in pharmacy). We are exploring using the pMNL model to analyse responses within this study, and generate values in real time. See: https://www.sciencedirect.com/science/article/pii/S1755534518300836
9	How do you usually design a DCE? I heard a software called Ngene.	Ngene is a very popular and user friendly experimental design software. You need to purchase it, it is not free. See https://www.choice-metrics.com/. This is the method studies I have been involved with in recent years have used. There are catalogues and online resources that can be used to generate orthogonal designs - these are free, and can be very useful, especially for studies with larger sample sizes.

10	In the DCE, how does one factor in or think about heterogeneity (age, education, occupation, ses) in preferences across alternatives among respondents in the sample?	Preference heterogenity can be addressed in two ways: **Observed** preference heterogenity where you identify in advance what factors you want to look at e.g. age, education, occupation, ses.. You can either estimate models separately for the groups, or you can estimate within one model using dummy variable interaction terms. **Unobserved** preference heterogeneity is where you let the data identify groups with similar preferences. This is ususally done using Mixed Logit Models/Random Parameter Logit Models and Latent Class Models.
11	Based on my understanding discrete choice experiment may involve qualitative and quantitative amalysis considering also experts opinion.	Qualitative work is used in the DCE to identify attributes and levels (often talking to the target group for the survey), and crucially to test understanding of the survey instrument. Methods like interviews, focus groups, think aloud methods and delphi processes have been used. These may be used with a number of different stakeholders, including patients, the public, health professionals, and policy makers. For example, in the pharmacy case study used in the webinar, qualitative work (interviews) with pharmacists informed decision relevant attributes and levels. Using qualitative methods to develop your survey instrument is crucial for ensuring a good survey instrument that will generate valid responses.
12	The out-of-pocket expenses are included in the attribute, so the result can be converted into monetary value by assuming that the same utility value = the same value? Is this my understanding correct?	If a cost attribute (e.g. out of pocket costs) is included then a monetary measure of value can be estimated by dividing the coefficient on any given attribute by the negative of the coefficient on the cost attribute. This is known as willingness to pay (WTP). This was shown in the pharmacy case study presented in the Webinar. As shown in the Webinar (see slides), monetary values can be estimated for individual attribute levels, and well as different configurations for providing a service.
13	In your opinion, how confident you are with the methametical calculation provided by the DCE presented into the real life aspects?	The validity of responses to DCE questions is one of the key empirical questions - do individuals behave in reality as they state in hypothetical choices. The internal validity is useful here - do the parameters move in the direction we would expect. All studies can check this. Perhaps more imporant is the external validity - do individuals behave in reality as they state in a hypothetical survey. See the following reference for a recent review of external validity testing of DCEs: https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(24)00544-3/fulltext
14	Thank you for your wonderful presentation	Thank you, I am glad you enjoyed it.
15	Q4. DCEs typically involve selecting one option from multiple options, but I believe there are also cases where an same option is selected in multiple times. For example, in the medical and health field, choosing whether to continue seeing the same primary care physician repeatedly or to seek out a new one is also an important topic. I would like to ask whether such cases of discrete-continuous choice have been studied in the field of health economics via such as volmetric choice experiments, which may include the estimation practices of switching cost of the primary care physician.	I am not aware of the use of volumetric choice experiments (VCEs) in health, likely because the decision is often a single discrete choice rather than quantities of a health care intervention. I think VCEs are more commonly used in marketing. You might find this paper useful: https://www.sciencedirect.com/science/article/pii/S175553452200001X. There may be some areas where it could be applied (public health issue of reducing smoking, how many cigarettes would you purchase based on different attributes, like price), but I think its applicability is limited. I don't think it applies to physician choice as we don't make decisions regarding number of visits.

16	Just curious about choices: How much would the public be ready to pay in case the health check is not free of charge (i.e. provided by NHS): The Best Service was 'valued' at GBP 52,-- Pref. choice was Health Check (A) at GBP 15,-- Usual problem in health care is that people don't use a service in case they really have to pay.	Paying for health checks is not unusual in the UK, and the value we estimated is within the range of what pharmacists charge… so it does have some face validity. For health check A, the £15 is not the willingness to pay (WTP), but the cost. Cost and value/WTP are different. Cost is what we have to pay, value is what we are willing to pay. By presenting individuals with many choices at different costs we can infer their value/WTP. For health check A, WTP was £46.29 (from the Table with the utility function parameters: £36.22 - £1.17 + £2.87 +£ 4.80 + £3.57). This is greater than the cost of £15, suggesting individuals would buy it (as benefits outweigh costs). As you note, for most health care individuals don't pay at the point of consumption in the UK NHS (where most of my research has been conducted). This means it is really important to explain the cost attribute i.e. we are interested in value, and one way of estimating this is to know what you would be willing to pay… imagine you lived in a country like the states where you had to pay… my experience is that when the cost attribute is explained well respondents engage with the task.
17	Is it possible to share the slide later?	Yes, the slides will be shared with responses to Q&A session.