

## Executive summary for Willingness To Pay

This project concerns the impacts of food hypersensitivity on people's quality of life and the monetary value people assign to the removal of those impacts.

Food hypersensitivities (FHS) are, in this report, defined as comprising food allergy, Coeliac coeliac disease and food intolerance.

The aims of the research reported here were to:

- A. estimate the economic value to people (their 'willingness to pay') of removing the symptoms and limitations of their conditions.
- B. identify the impacts of living with food hypersensitivity which most affect people's quality of life.

Regarding (A), the economic value to people of removing the symptoms and limitations of their food hypersensitivity was estimated using a stated preference (SP) survey in which people completed a discrete choice experiment (DCE).

Stated preference willingness to pay (WTP) is a measure of economic value, derived from survey responses. Stated preference methods are a set of established (see HMT's Green Book for policy guidance ([footnote 1](#))) valuation methods (for example, contingent valuation, DCEs) used to estimate non-market values for policy. WTP is the maximum amount of money an individual is willing to give up in exchange for some improvement (a good, service, change in policy etc). In this case the improvement is the removal of the individuals' food hypersensitivity for a period of time. The average WTP across the survey sample is obtained by statistical analysis of DCE survey responses ([footnote 2](#)).

In the DCE people made repeated choices between two options:

- the food hypersensitivity unchanged, at no cost
- the food hypersensitivity removed for a specified period, at a cost.

The duration of the period for which the food hypersensitivity was removed, and the associated cost, were systematically varied in the choice scenarios.

The DCE choice sets were designed to be answered by adults regarding their own food hypersensitivity or by parents/carers regarding their child's food hypersensitivity. The survey design was informed by 5 focus groups run online with adults with FHS or parents/carers of children (aged 1-17) with a food hypersensitivity.

The surveys were conducted online between July and December 2021. The sample sizes achieved were 1426 adults (385 allergy, 601 coeliac, 440 intolerance) and 716 parents (496 allergy, 73 coeliac, 147 intolerance).

Extensive testing of the questionnaire in the focus groups had facilitated design of an instrument which the vast majority of respondents understood and were willing and able to complete, including the DCE tasks involving the offer of temporary removal of the food hypersensitivity at a

cost.

Low levels (<4.5%) of protest behaviour (prompted by, for example, the need to pay for removal of the condition in the context of NHS provision of healthcare free at the point of use) were observed. Another measure of the validity of the responses is the proportion of respondents who found the questionnaire too difficult. In this study few reported that the DCE choice sets were “very difficult” to understand (1.1% in adult survey; 3.9% in child survey;), see Tables 5 and 6 in Appendix O for more details).

Statistical analysis of the DCE choice data indicates significant effects of the cost and duration of food hypersensitivity removal, indicating most respondents were making the trade-offs envisaged when designing the DCE.

WTP results are shown in Table ES1. The average WTP for the removal of an adult’s FHS for a year, pooled across all conditions was £718. For models estimated separately by condition, the WTP values for food allergy, coeliac disease and food intolerance were £1064, £1342 and £540 respectively.

In models estimated on DCE data from parents regarding their children’s FHS conditions, the WTP values were: £2766 for food allergy; £1628 for coeliac disease; £1689 for food intolerance. Parents’ WTP for children with a food allergy is significantly higher than the case for the other two conditions – this ordering is intuitive given the potentially fatal impacts of an allergic reaction.

**Table ES1: WTP Results in Aggregate and by condition, for adults and children**

Category	Condition	WTP, Adults (£ and year)	WTP, Children (£ and year)
Aggregate Models	-	718	2501
Models by condition	Allergy	1064	2766
Models by condition	Coeliac	1342	1628
Models by condition	Intolerance	540	1689

Respondents rated their (child’s) health and the impacts of their (child’s) FHS using several established generic instruments (including EQ5D and Visual Analogue Scale, VAS). They also completed condition-specific instruments (Food Allergy Quality of Life Questionnaire, FAQLQ; Food Intolerance Quality of Life Questionnaire, FIQLQ; Coeliac Disease Quality of Life Questionnaire, CDQ).

Statistical Tests were conducted to identify whether these self-assessments of health and FHS severity affected WTP. In the adult allergy and intolerance models we find robust evidence of effects of condition severity on WTP – the higher people’s FAQLQ and FIQLQ scores, the more they are willing to pay to remove their food hypersensitivity. There was no effect of variation in the CDQ score on WTP to remove the condition in the adult coeliac disease sample.

In the child WTP results we find condition-severity effects in the coeliac sample: the worse the child’s CDQ score the higher the parents’ WTP to remove the condition. In the allergy and intolerance models the FAQLQ and FIQLQ scores affect the degree of aversion to moving away from the status quo option – the more severe the child’s condition the less averse the parent is to choosing the option to remove their condition.

Regarding (B), food hypersensitivities have diverse impacts on people’s health and quality of life. This is apparent in the high number of questions/items which comprise the FHS-specific measures; the FAQLQ comprises 29 impacts, the FIQLQ 22 impacts and the CDQ includes 20 impacts, all of which respondents with those conditions score.

The project investigated the relative importance of those different impacts to people with those conditions. Understanding this relative importance can inform policy and practice, allowing

targeting of measures at those impacts which are considered the most important by people living with those food hypersensitivities.

The relative importance of the impacts comprising the FAQLQ, FIQLQ and CDQ impacts were elicited by including them in a Best Worst Scaling (BWS) exercise in the survey. This method presents repeated subsets of the full set of 'items' (in this case, FHS impacts) and respondents select the impacts which have the greatest and least impacts on their quality of life. The technique provides a ranking and estimates of the magnitude of the differences in importance.

The BWS results indicate that people assign very different levels of importance to the impacts comprising the FAQLQ, FIQLQ and CDQ instruments. This unequal prioritisation contrasts with the equal weighting used when constructing the FAQLQ, FIQLQ and CDQ measures.

The three impacts which were indicated to have the greatest impacts on people's quality of life, for each condition, are shown in Table ES2. The embarrassment or fear related to eating out or social situations feature in the top three impacts for all the conditions.

## **ES2: FHS impacts with greatest effect on quality of life, by condition, from BWS results.**

### **Food Allergy:**

1. The fear of an allergic reaction
2. The fear of an allergic reaction when eating out
3. The trouble from always being alert as to what you are eating

### **Coeliac Disease:**

1. Feeling afraid to eat out because my food may be contaminated
2. The concern that my long-term health will be affected
3. The concern that this disease will cause other health problems

### **Food Intolerance:**

1. The worry that you experience physical distress because of symptoms during a reaction
2. The trouble from having to always be alert as to what you are eating
3. The worry that you will be embarrassed by the symptoms of a reaction in social situations.

## **Uses of the Results**

The FSA has developed a Cost of Illness (COI) model, [the Burden of Foodborne disease in the UK](#) which it currently uses to identify and measure the annual, social, cost of foodborne disease.

The research reported here contributes to the FSA's assessment of the scale of the economic costs imposed on society by food hypersensitivities and, more specifically, the FSA's intention to extend the FSA's Cost of Illness (COI) model to include food hypersensitivities as well as foodborne disease.

The WTP values reported here are estimates of the combined annual costs associated with

- intangible costs including the pain, anxiety, inconvenience and anxiety caused by FHS
- additional incurred costs (time and money) and lost earnings

These costs can be incorporated into the COI model.

The BWS results indicate that people assign very different levels of importance to the impacts comprising the three instruments. This unequal prioritisation contrasts with the equal weighting used in the construction of the FAQLQ, FIQLQ and CDQ measures.

1. [The Green Book: appraisal and evaluation in central government](#)
2. [HMT Valuation Techniques for Social Cost-Benefit Analysis](#)