Estimating Quality Adjusted Life Years and Willingness to Pay Values for Microbiological Foodborne Disease

Q&A

1. What is the purpose of the study?

The FSA, with support from FSS, commissioned a phased study with a view to investigate and assess the use of Quality Adjusted Life Years (QALYs) and Willingness to Pay (WTP) metrics. The first phase was an exploratory feasibility study that generated useful recommendations for successful development of valid and reliable QALY estimates across the range of food-related illnesses. This study is the second phase of the research, presenting final estimates of the value of the pain and suffering caused by microbiological foodborne disease (FBD) using both QALYs and WTP metrics.

2. What did the study involve?

The study used a combination of primary research, literature, expert opinion and secondary data sources such as the *Costed extension to the Second Study of Infectious Intestinal Disease in the Community*, to produce QALY values; while surveys were used to elicit individual WTP values to avoid microbiological FBD for a select number of pathogens and their sequelae.

3. Why is food hypersensitivity not included in Phase 2 of the Study?

Given the complexity and scale of the study, the FSA adopted a phased approach. The scope of Phase 2 focused on microbiological FBD with a view to extend this research to include illnesses associated with food hypersensitivity.

4. How would this inform FSA and FSS policy?

Being able to value the pain and suffering caused by microbiological FBD using both QALYs and WTP metrics allows the FSA and FSS to compare the relative effectiveness of interventions from different food policy areas. This information can help to inform both policy decision making within food safety and resource allocation decisions across foodborne disease prevention and control.

5. What does the FSA and FSS plan to do with the outcome of this research?

QALY and WTP metrics will be eventually used in regulatory impact assessments and economic evaluations (post implementation review). Importantly, by pursuing original research into the use of QALYs and WTP to measure food-related illness, the FSA and FSS have the opportunity to advance current research work in the field of food safety regulation. This will enable both agencies to be at the forefront in evaluating food safety risks in the process. The research creates a unique primary data set on the valuation of food safety risks.

6. How were burden of illness estimates obtained and how reliable are they?

The burden of illness is based on both the values of WTP and QALYs from the research scaled up by the numbers of cases, hospitalisations, deaths and sequaele. Therefore the accuracy and size of these estimates depends on the latter - numbers of cases, deaths etc. Estimates of deaths are currently dated while data on sequaele is sparse and often based on international literature, which might not necessarily be applicable for the UK. The FSA and FSS are always looking to improve its estimates for foodborne disease and going forward we will look for ways to improve these estimates.

7. How should pain and grief values for FBD be interpreted?

The study reports its results in terms of:

i. Overall burden – *Total QALYs lost/ Total WTP (monetary) burden*; where pain and grief values per pathogen are aggregated to national levels. Although this measures of the overall burden to the population; it does not reflect the severity of pathogen per case. Therefore, ranking the severity of pathogen based solely on overall burden estimates would be misleading (for example, as per tables 3 and 22 of the report). The results need to be interpreted with *burden per case* estimates (see below).

ii. Burden per case – *QALYs lost per case / WTP burden per case*; where pain and grief values are adjusted per case. A more appropriate measure for ranking pathogens by severity/ burden of illness.

8. How reliable are the predicted number of symptom cases in table 2 of the report?

Estimates are based on patient data obtained from the IID1 & IID2 studies of gastrointestinal infectious disease; the Integrate project and international literature. As discuss in question 6, the underlying data driving these results is currently under review; as the FSA and FSS look to improve its estimates for foodborne disease. This particularly holds for deaths, where estimates are currently dated.

9. Why did the FSA/FSS opt for QALYs over the WHO endorsed DALYs?

Reasons for FSA/FSS to adopt the QALY as a measure of health:

- Compared to QALYs, DALYs provide a far less fine-grained classification of health states, which is often used in cases where data are sparse. QALYs are a more sophisticated generic health outcome measure that would enable the FSA/FSS to compare the burden of illness caused by different foodborne disease, thus enhancing the evidence base upon which the FSA/FSS establishes its priorities (including budgetary and policy) in its work on food safety.

- The National Institute for Health and Care Excellence (NICE) and Department of Health have traditionally used QALYs in economic evaluation to assess the value for money of medical interventions. As guidance for best practice in economic appraisal and evaluation, such the Green Book, continues to evolve; QALYs are being more broadly applied and increasingly used by different UK Government departments.

10. What was the rationale for using EQ-5D health states to elicit WTP values of pain and suffering for FBD?

EQ-5D is entirely generic and potentially not pathogen-specific, in that respondents need not be informed of the cause of the illness, just its consequences; and potentially values all possible EQ-5D states. This means the results would be transferable, which can be used to construct the WTP value of particular pathogen/severity states as required.

11. Was the issue of overstatement of WTP values adequately controlled for in the study?

In the development of the survey design, respondents were constantly reminded to only focus on valuing averted pain and suffering. Materials were developed to remind respondents of their budget constraints; other things their money could be spent on; and that illness was a part of normal life. They were also asked not to include the costs of childcare, lost wages etc.

12. Why use Markov Transition Models for estimating the burden of food borne pathogens and their sequelae?

Traditionally, disease burden has been modelled with the use of disease outcome trees which illustrate the proportion of cases suffering from different symptoms. However, the duration of symptoms were rarely taken into account in such models. Patients who suffer symptoms for longer time periods experience a greater burden of disease. Furthermore, disease outcome trees are linear in nature and do not allow the movement of patients back into previous states.

The use of Markov models mitigates these problems, where a population travels through different health states in a given time period. A probability is associated with moving from each state to a new state in a given time period. Cases also have a probability of remaining in the same state, allowing the duration of symptoms to be taken into account.