Estimating Quality Adjusted Life Years and Willingness to Pay Values for Microbiological Foodborne Disease (Phase 2)

Area of research interest: Foodborne pathogens
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Conducted by: Economics for the Environment Consultancy Ltd

Background

Actions to reduce the burden associated with microbiological foodborne disease (FBD) are likely to involve costs and hence their evaluation should include estimates of both the costs and benefits, the latter being the value of averted disease. This project was commissioned to estimate the value of the pain and suffering caused by microbiological FBD using both Quality Adjusted Life Year (QALY) and Willingness to Pay (WTP) metrics.

Research Approach

Aims and Objectives

Objectives of the study:

- Developed Decision Analytic Models for a set of foodborne pathogens and their sequelae;
- Revised preliminary QALY values for the disease states within the Decision Analytic Models using a combination of literature, expert opinion and patient values;
- Produced QALY estimates for sequelae relevant to the set of foodborne pathogens such as Guillain–Barré Syndrome (GBS), Reactive Arthritis (RA), Irritable Bowel Syndrome (IBS), Hemolytic Uremic Syndrome (HUS).;
- Established how the age of onset of a patient impacts the QALY loss associated with a set of foodborne pathogens;
- Conducted primary research using a stated preference survey design to elicit individual willingness to pay Willingness to Pay (WTP) values to avoid microbiological FBD pertaining specifically to the selected pathogens and their sequelae;
- Used an established Quality of Life (QoL) survey questionnaire - *EuroQol 5* within a stated preference valuation WTP instrument to estimate the monetary value of a QALY gain; and
- Aggregated the QALY and WTP value estimates to the national level for the set of pathogens.

Approach

The geographical scope of the project was the UK. The costs considered were the pain and suffering associated with microbiological foodborne disease (FBD) caused by 10 pathogens. These pathogens were selected as the most material for us in terms of (i) the extent of FBD by

the pathogen; (ii) the severity of the FBD and (iii) the cost of the FBD to the UK.

The research used Decision Analytic Models to analyse the flow of people through the various health states which characterise foodborne disease for a set of pathogens using both secondary and primary data. These Decision Analytic Models include short, mild and long term conditions associated with all the modelled pathogens.

Decision Analytic Models were used to estimate the QALY burden of selected foodborne pathogens over two time frames, one-year and a life-time. The life-time horizon incorporated the burden of illness as a result of sequelae from the foodborne pathogen.

A stated preference (SP) survey was designed and employed to elicit WTP measures to avoid illness caused by the set of foodborne pathogens. The short term and long term conditions are represented in two forms in parallel approaches: Vignette descriptions and Quality of Life (QoL) survey based on the EuroQol 5 (EQ-5D) dimension, 3 level health questionnaire (EQ5D-3L).

The EQ-5D component is one of very few studies which have sought to include a payment vehicle (using WTP) alongside EQ-5D attributes and a duration term. Thus, this study was a test case for this approach. An attraction of such an approach is the possibility of estimating the monetary value of a QALY.

Results

Key findings from the research were:

- The largest QALY burden of illness is attributable to Campylobacter spp. whilst Shigella spp. has the lowest burden. Listeria monocytogenes has the largest burden per case. This is four times the size of the expected burden of the next most severe pathogen Giardia lamblia.
- Age-disaggregated analysis indicate that for Campylobacter spp., Norovirus and Salmonella, the age profile of the burden of illness was similar across four age groups (0-4, 5-15, 16-64 and 65+). For VTEC O157 the highest burden was associated with the elderly, followed by children (5-15).
- The results indicate that it is possible to successfully implement WTP (Stated Preference) surveys concerning the value of pain and suffering associated with foodborne disease.

The key recommendations based on this research include the following:

- The results can be used for impact assessments and evaluations by the us
- We could consider commissioning work on the gradual decline in the quality of life associated with IBS given the high disease burden it poses
- We should use the output from this project to help prioritise different of foodborne disease pathogens

The underlying data to the report will be published as soon as it is available.

Research report

England, Northern Ireland and Wales

PDF
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England, Northern Ireland and Wales

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