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Eliciting societal decisions regarding antimicrobial consumption: can health economic methods help?

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Background

- From an economic market perspective, antibiotic consumption involves patients as consumers with access mediated by the agent (doctors/prescribers), and supplied by companies driven by profit. In some countries consumers have direct access to antibiotics. Consumption leads to the negative externality of antibiotic resistance.
- In England, to tackle antibiotic resistance, antibiotic optimisation policies are in place targeting the agent (prescription reduction targets) and consumer (public awareness campaigns) [1].
- Understanding public behaviour is key to success of these strategies. Quantitative evaluation of public preferences regarding the consumption of antibiotics can be a measure for evaluating such optimisation policies.
- Standard gamble approaches, described here, have previously been used in health economics to elicit public preferences for particular health states [2].

Aims

- Overall aim: investigate the appropriateness/feasibility of using quantitative preference elicitation techniques from the field of health economics to understand the patient antibiotic consumption decision making process.
- Review aim: investigate possible preference elicitation methods and determine which have been used in the area of antibiotic use.
- Pilot study aim: use the standard gamble approach to assess the propensity of individuals to want to take antibiotics in response to a 'flu-like illness' [2].

A Review of Quantitative Preference Elicitation Studies in Antibiotic Use

The main quantitative methods for eliciting public preferences within healthcare have been described as [2]:

1. Ranking exercises (simple or complex)
2. Rating exercises (such as visual analogue or Likert scales)
3. Choice-based exercises (such as Standard Gamble, Time Trade Off or typical Discrete Choice Experiments*)*

*found to meet most of the requirements for health technology assessments and benefit-risk assessments [3]

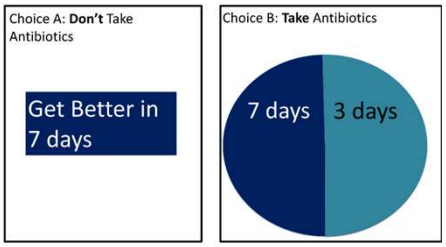
A desk-based search was conducted up to August 2018 to see which of the techniques described above had been used in regards to antibiotic use:

- Qualitative methods were conducted in the majority of the studies found, and not explored further for this study.
- 2 studies conducted in Australia utilised discrete choice experiment techniques; 1 eliciting primary care prescribers' preferences [4] and 1 eliciting antibiotic consumers' preferences [5].
- Discrete choice experiments can be time consuming and complex, with one of the studies having 19 choice sets per patients [4].
- **No standard gamble experiments, or other quantitative methods, were found**.

Using Standard Gamble Approaches: A Pilot Study

The standard gamble approach was adapted to present the following choices [6]:
(i) Not take antibiotics and be in a 'flu-like' illness state for 7 days
(ii) Take antibiotics and have an x% chance be in a 'flu-like' illness for only 3 days, and a 1-x% chance of still being in a in a 'flu-like' illness state for 7 days.
X represented the chance of antibiotic 'effectiveness'; probability (p) =0.75, 0.50, 0.25. This was asked for: Scenario 1: with no public externality (i.e. negative population effects) from taking the antibiotics mentioned and Scenario 2: with externality mentioned.

The scenarios were presented on a poster, similar to this:



Some of the key recommendations from the pilot for future research were as follows [6];

1. *Utilise VALID SAMPLING METHODS*
2. *Calculate SAMPLE SIZE needed for statistical power and utilise STATISTICAL ANALYSES to determine significant differences in decision making, allowing for more concrete conclusions.*
3. *Present scenarios that are more reflective of REAL WORLD AMR ISSUES*

Discussion

- The review (though limited) found only discrete choice experiments used in understanding antibiotic prescribing/consumption.
- Standard gamble could potentially reduce responder burden/experiment cognitive complexity. The pilot found it potentially feasible, highlighting further work needed.
- The theoretical underpinning of the chosen states for comparisons in the standard gamble experiment need to be explored; is the worse state presented consistent with expected utility theory [5]?
- The measures for comparing different techniques need to be investigated and defined [4].
- Additionally, this approach has the potential to act as a knowledge mobilisation tool on an individual basis. This could also be further explored in future studies.

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