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The Economic Impact of a Psychosocial Utility Benefit Associated with Pre-Exposure Prophylaxis (PrEP) for COVID-19 in Individuals Who Are Immunocompromised (IC) – a Case Study for Future PrEP Evaluations

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Introduction

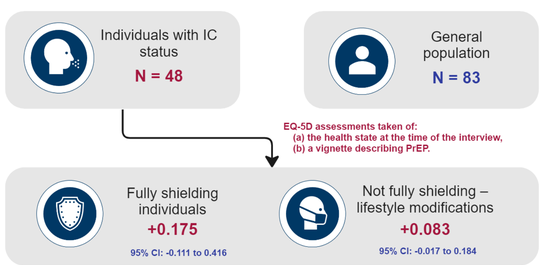
- Despite the availability of COVID-19 vaccines, individuals with immunocompromised (IC) status remain at increased risk of severe COVID-19.
- In the UK, approximately 82% of individuals with IC status continue to modify their lifestyle to avoid SARS-CoV-2 infection, with 13% fully shielding and 69% making lifestyle modifications due to the fear and anxiety of COVID-19.[1]
- Previous economic evaluations accepted by the National Institute of Health and Care Excellence (NICE) for other pre-exposure prophylactic (PrEP) interventions have considered improvements in health-related quality of life (HRQoL) through a reduction in psychosocial anxiety of adverse outcomes (NICE TA246, TA769).[2,3]
- However, an improvement in HRQoL due to a perceived reduction in the risk of adverse clinical outcomes is not considered in traditional economic evaluations.
- A recently published vignette study reported a significant psychosocial benefit of PrEP on HRQoL in individuals with IC status at risk of severe COVID-19;[4] however, these benefits have not been previously considered in the economic evaluations for COVID-19.
- A cost utility analysis was therefore developed to incorporate the utility gain expected through a reduction in the psychosocial anxiety and fear of COVID-19 conferred through PrEP and to understand how this contributes to the overall economic evaluation of PrEP therapies.

Methods

Overview of the vignette study

A utility study was designed to estimate the HRQoL benefit (mean EQ-5D utility gain) associated with PrEP through EQ-5D-5L interviews.[4]

Figure 1: Mean ED-5D utility gain – individuals with IC status

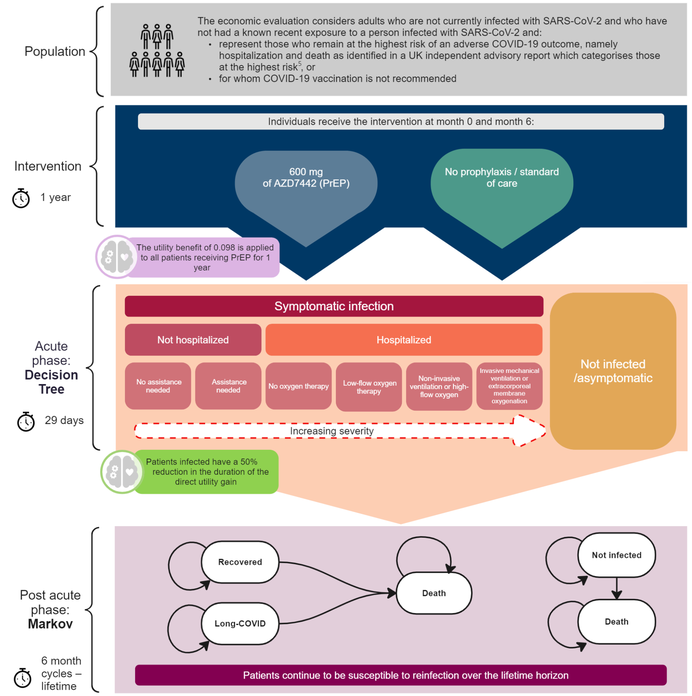


This study was, to our knowledge, the first to report the impact that COVID-19 continues to have on the HRQoL of individuals with IC status and the positive impact that a PrEP could have. It is therefore critical to consider these previously uncaptured benefits in healthcare decision-making.

Overview of the model

A combined decision tree and Markov model were used to evaluate the cost-effectiveness of tixagevimab-cilgavimab PrEP vs. standard of care over a lifetime horizon in the UK, from the National Health Service and personal social services perspective. Costs and health outcomes are discounted annually at 3.5%.

Figure 2: Model schematic – cost-effectiveness of AZD7442 PrEP vs. standard of care



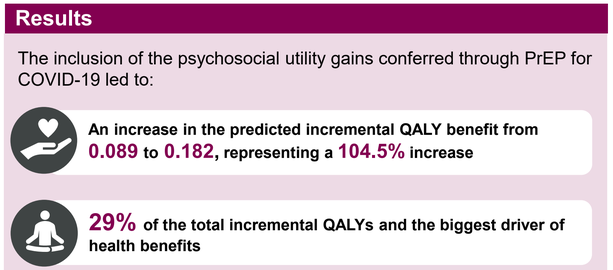
Tixagevimab-cilgavimab PrEP affects the total costs and quality-adjusted life years (QALYs) through:

- An expected direct psychosocial utility gain due to the reduction in the fear and anxiety of COVID-19
- Reductions in the risk of symptomatic COVID-19 and adverse clinical outcomes, including hospitalization and/or death
- Costs associated with reductions in healthcare resource use due to improvements in health outcomes, including the risk of and management of long-COVID
- Costs associated with drug acquisition and management of adverse events

Modelling the psychosocial utility benefit

The vignette study quantified the psychosocial utility benefit associated with PrEP which was applied to all patients treated with PrEP tixagevimab-cilgavimab in the model.

Figure 3: Weighted average calculation of utility gain



Based on evidence collected from a sample of the general UK population, this utility gain may be considered **conservative** because:[4]

- an EQ-5D anticipated utility gain of **0.324** was estimated between the post-intervention and shielding health states in the general UK population,
- an EQ-5D anticipated utility gain of **0.156** was estimated between the post-intervention and modified behaviour health states in the general UK population.

Additional Content

- Further details with regards to the methods and results for the utility study[4] and the cost-effectiveness study[6] can be found on their respective posters.

Results

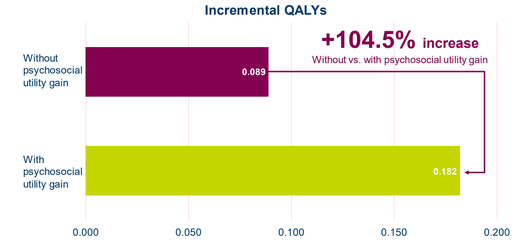
The inclusion of the psychosocial utility gains conferred through PrEP for COVID-19 led to:

An increase in the predicted incremental QALY benefit from 0.089 to 0.182, representing a 104.5% increase

29% of the total incremental QALYs and the biggest driver of health benefits

A 51% reduction in the incremental cost-effectiveness ratio (ICER) and the third largest driver of cost-effectiveness

Figure 4: Impact of psychosocial utility on incremental QALYs



Conclusions

- Despite the availability of COVID-19 vaccines, there remains an urgent unmet need for a preventative therapy for individuals who continue to remain at the highest risk of severe infection for whom vaccination is not suitable or does not provide sufficient protection.
- Many traditional health economic evaluations do not typically consider the psychosocial benefits of PrEP interventions; thus, there are large uncaptured benefits leading to a significant underestimation of economic value to health systems. However, the psychosocial benefits offered by PrEP interventions are only beginning to be considered in health technology assessments. NICE have previously accepted these benefits in two other economic evaluations (TA246 and TA746).[2,3]
- A recent utility study quantified the psychosocial utility benefit associated with PrEP for COVID-19 and reported a utility gain of 0.083 and 0.175 in those who were shielding or making other lifestyle modifications, respectively.
- The inclusion of a psychosocial utility gain within the economic evaluation of tixagevimab-cilgavimab resulted in an increase of 104.5% (0.089 to 0.182) in total QALYs and a 51% reduction in the ICER.
- This study demonstrates the significant uncaptured benefits in health economic evaluations when not considering the psychosocial impact of PrEP interventions, and the need for psychosocial utilities to be a fundamental consideration for the evaluation of PrEP interventions.

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Disclosures
DS, MW, SA and AJ are employed by AstraZeneca and may hold stocks. TH, JJ and TH are employed by FIECON Ltd – who were commissioned by AstraZeneca to conduct this study. This study was funded by AstraZeneca.

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