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Cost-effectiveness analysis of molnupiravir against standard care for treating mild to moderate COVID-19 infection in Singapore

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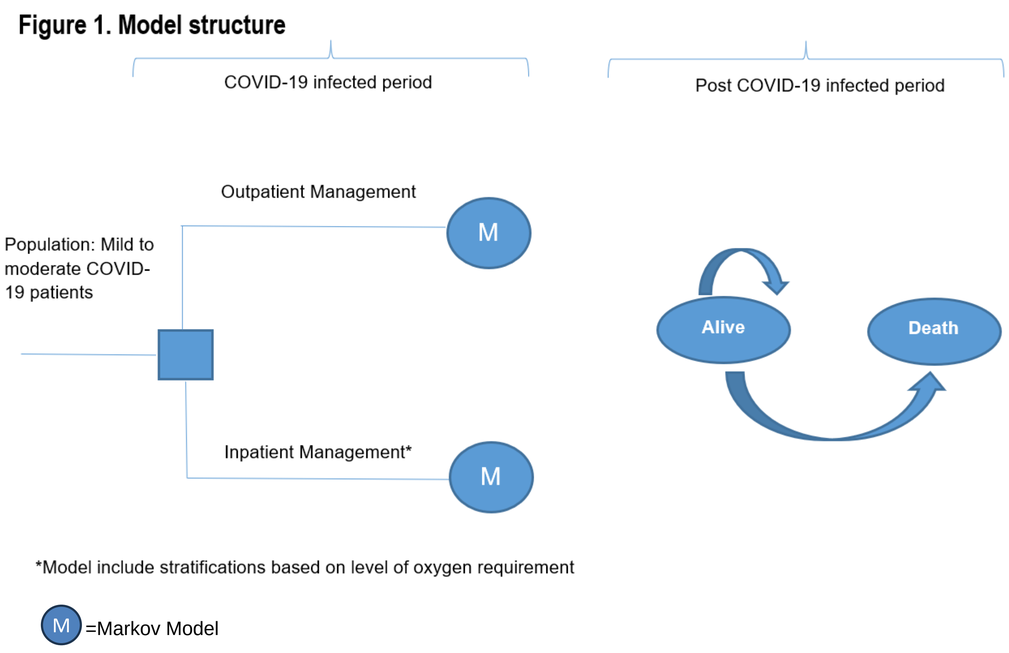
INTRODUCTION & OBJECTIVE

- The phase III MOVe-OUT trial demonstrated that early treatment with molnupiravir reduced the risk of hospitalisation or death in at-risk, unvaccinated adults with COVID-19 infection. The risk of hospitalisation or death through day 29 was lower in the molnupirvair group than in the placebo group (6.8% vs. 9.7%; difference, −3.0 percentage points; 95% CI, −5.9 to −0.1).
- The Agency for Care Effectiveness (ACE) is the national health technology assessment (HTA) agency in Singapore to guide health policy, drive appropriate use of treatments and inform technology funding decisions. Considering the clinical need of molnupiravir for COVID-19 treatment, we assessed its cost-effectiveness versus placebo from the Singapore healthcare system's perspective.

METHODS

- A hybrid model comprising a decision tree followed by a life-time Markov model was developed to assess the cost-effectiveness of molnupiravir against placebo for the treatment of patients with mild-to-moderate COVID-19 infection. (Figure 1).
- Patients were assumed to enter the model in acute phase (decision tree) where they would either receive inpatient or outpatient management. Patient who survived the acute phase would then enter the lifetime Markov model.
- The transition probabilities across health states were informed by data from the MOVe-OUT trial and real-world data obtained from Ministry of Health COVID-19 statistics and National Centre for Infectious Diseases (NCID) data.
- Health state utilities were obtained from published literature and direct costs were sourced from public healthcare institutions in Singapore.
- In the MOVe-OUT trial, molnupiravir led to a relative risk reduction (RRR) of 30% compared with placebo for hospitalisation. The model assumed that the RRR observed for molnupiravir would be similar in a vaccinated population.
- One-way deterministic sensitivity analyses (OWSA) and scenario analyses were conducted to assess parameter and model uncertainties.

Figure 1. Model structure



RESULTS

- The base case resulted in an incremental cost-effectiveness ratio (ICER) of S$105,580 per quality-adjusted life-year (QALY) gained.
- The ICER was most sensitive to the hazard ratio (HR) for hospitalisation of molnupiravir (Figure 2). The ICER increased to more than S$300K/QALY gained when the HR of 0.9 was applied. The ICER remained above S$60K/QALY gained when the HR was at the lower limit of 0.48.
- Scenario analyses were conducted to examine how the base-case result changed with alternative values of hospitalisation and death probabilities. When the probability of death from COVID-19 infection specific to the population vaccinated with booster was used, the resulting ICER increased to S$211,025/QALY gained.

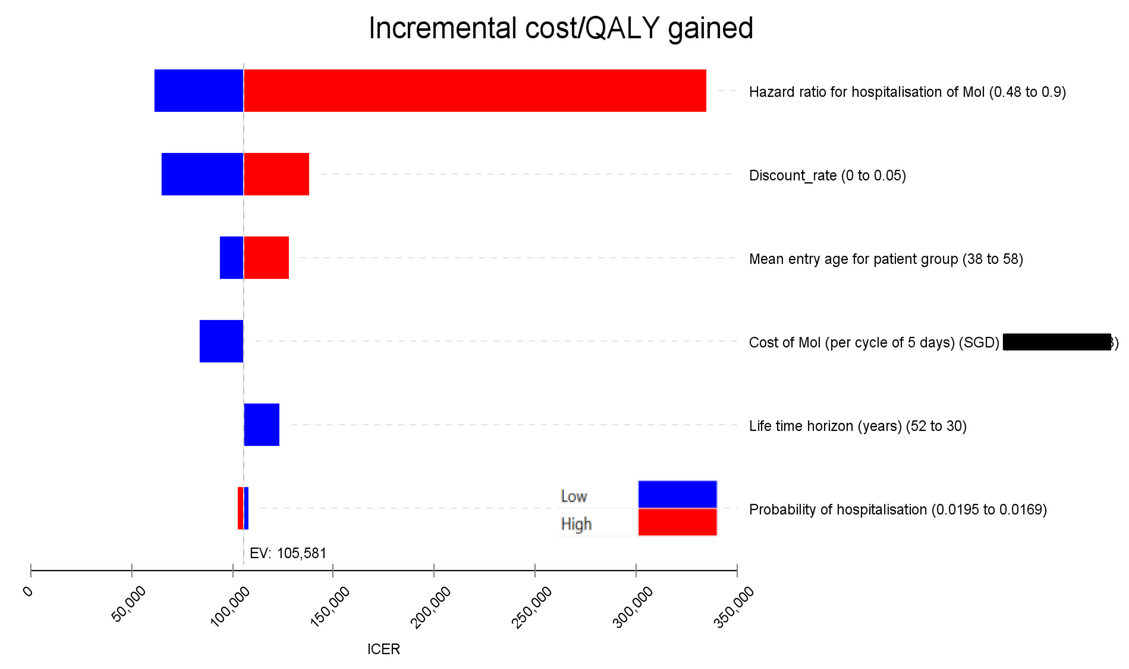


Figure 2. OWSA tornado diagram for molnupiravir versus placebo

CONCLUSION

- In conclusion, at the current price, molnupiravir is unlikely to represent a cost-effective treatment option in Singapore, given that most of the population had completed the COVID-19 vaccination with an additional booster dose.