**COVID-19 Excess Mortality and the Cost-Effectiveness of Treatment Options**

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**Purpose:** Mexico has experienced one of the worst COVID-19 epidemics worldwide, with high hospitalization and case fatality rates. There is limited evidence to guide treatment decisions aimed at mitigating these disease burdens. We aim to evaluate the cost-effectiveness of different treatments that reduce mortality in COVID-19 hospitalized patients in Mexico using a microsimulation model.

**Methods:** We developed a decision-analytic microsimulation model that simulates cohorts of intubated and non-intubated hospitalized COVID-19 patients. We used this model to evaluate various treatments that have shown effectiveness in reducing mortality among COVID-19 patients. The main outcomes were quality-adjusted life years (QALYs), lifetime healthcare costs (Mexican pesos [$]), and incremental cost-effectiveness ratios. We assumed a willingness-to-pay (WTP) threshold of Mexico’s per-capita GDP. We compared three treatments for non-intubated patients: 1) Remdesivir; 2) Remdesivir and Baricitinib, and 3) no treatment. For intubated patients, we compared two treatments: 1) Dexamethasone; 2) no treatment. Focusing on those hospitalized, we used publicly available data for COVID-19 deaths and background age- and sex-specific mortality rates to estimate the COVID-19-specific mortality for Mexico’s population aged 45 years and older using relative survival methods. We quantified and propagated the uncertainty of model parameters through a probabilistic sensitivity analysis (PSA).

**Results:** The COVID-19-specific mortality rate increases with age (438 per 100,000 in patients 45-54 years-old to 1,009 per 100,000 in patients aged 70 and older)). Men face higher mortality rates than women (794 vs. 665 per 100,000). The non-intubated cohort lives 5.27 discounted QALYs and experiences costs of $250,000 without COVID-19 treatment, 5.97 QALYs and $332,000 with Remdesivir alone, and 6.70 QALYs and $401,300 with Remdesivir and Baricitinib. At the per-capita GDP WTP, Remdesivir and Baricitinib is cost-effective – robustly so with respect to parameter uncertainty (**Figure, upper panel**). For intubated hospitalized patients, Dexamethasone yields 2.73 discounted QALYs with lifetime costs of $719,500, while no COVID-19 treatment yields 1.45 QALYs and costs of $684,900. Dexamethasone is highly likely to be cost-effective at the per-capita GDP WTP (**Figure, lower panel**).

**Conclusions:** TreatingCOVID-19 hospitalized patients in Mexico is cost-effective. Remdesivir and Baricitinib is a high-value strategy for non-intubated patients as is Dexamethasone for intubated patients.



