

# Cost-effectiveness of COVID-19 vaccination by modeling a counterfactual scenario: a case study of the Basque Country

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Vaccination has played a vital role in mitigating the impact of the COVID-19 pandemic. In this presentation, we will share the results of a retrospective analysis examining the cost-effectiveness of the initial phase of COVID-19 vaccination in the Basque Country, spanning January to December 2021. Employing a deterministic framework, we describe several phases of COVID-19 dynamics in the Basque Country, incorporating estimates of biological parameters such as transmission and mortality rates during the one-year vaccination rollout. Our model is calibrated using real-world data on hospitalizations, Intensive Care Unit (ICU) admissions, and deaths. We compare the results with a scenario without vaccination to calculate the quality of life years (QALYs) preserved due to vaccination. Subsequently, we consider the costs related to infection, vaccination, hospitalization, and ICU admission to assess the incremental cost-effectiveness ratio (ICER) from the healthcare system's perspective. This ratio, expressed in euros per QALY gained, is a commonly used metric in decision-making for resource allocation.