



Analysis of Hybrid Epidemiological-Economic Models of COVID-19 Mitigation Policies

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Abstract

Some studies have examined the tension between public health benefits and economic costs of interventions in the United States for the COVID-19 pandemic by merging epidemiological and economic models. We extract from these studies a data set consisting of lives saved and the associated costs for each intervention. Our analysis calculates cost–benefit ratios that allow the effectiveness of intervention types to be compared against each other and against the value of the statistical life and the value of the statistical life year. This work identifies patterns in the cost–benefit ratios that illuminate the strengths and weaknesses of different intervention strategies and thereby enhances the practical application of complex theoretical analyses.

Keywords COVID-19 · Health policy interventions · Value of a statistical life · Models

JEL Classification I18

Introduction

The COVID-19 pandemic initially caused policymakers and the public to question whether the costs of disease mitigation strategies in terms of foregone national income outweighed the benefits of intervention in terms of lives saved (Hilsenrath and Armour 2020; Qin 2020). This question was complicated by a large degree of uncertainty regarding disease parameters, the health effects on individuals, and the consequences of restricting parts of the economy. Economists were invited to conduct research bridging the disciplines of economics and epidemiology (Avery et al. 2020; Murray 2020), but warned against naively adopting epidemiological methods (Murray 2020). From January 2020 to August 2021, around 15% of economics working papers in some of the major series, such as the National Bureau of

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