Mathematical Modeling of the COVID-19 Pandemic

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Since the beginning of the COVID-19 pandemic, members of the CIDMA research unit have been engaged on the construction of adequate mathematical models, with the objective of preventing and estimating the spread of the SARS-CoV-2 virus and to develop strategies to control and mitigate COVID-19. The assumptions of the models are based on epidemiological, socioeconomic, cultural and educational publicly available data. The models are adjusted to fit the COVID-19 spread evolution of different regions/countries, namely, Portugal, Spain, Wuhan (China) and Morocco. In a second stage, these models have been used to find optimal strategies for the minimization of the number of active infected cases with less social and economical cost, by applying the mathematical theory of optimal control to the developed epidemic models. This investigation was the basis of the research project "Optimal Control and Mathematical Modeling of the Covid-19 Pandemic: contributions to a systemic strategy for community health intervention", supported by the Portuguese Foundation for Science and Technology (FCT), in the scope of the "RESEARCH 4 COVID-19" call RESEARCH 4 COVID-19 (1ª Edição) created by FCT and by the Agência de Investigação Clínica e Inovação Biomédica (AICIB) and coordinated by Cristiana J. Silva. The scientific papers are available via CIDMA's official web page at: https://cidma.ua.pt/covid_19

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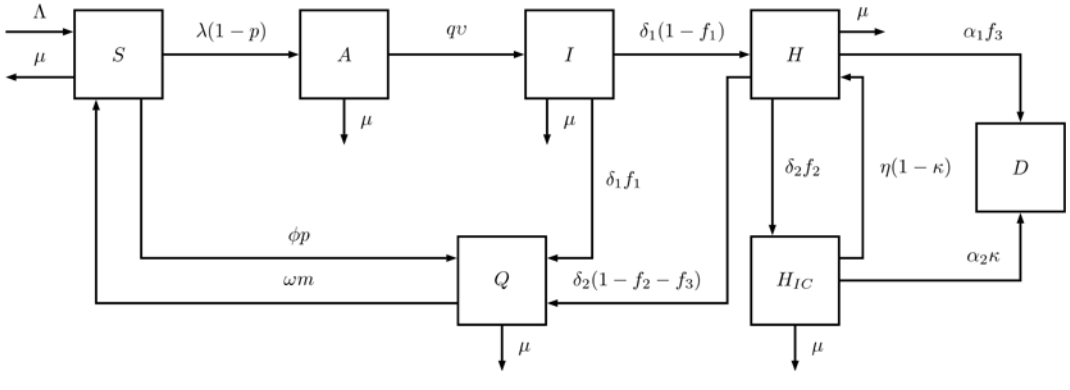

FIGURE 1
Diagram of COVID-19 mathematical model.