

# A Mathematical Model of the Effect of Social Distancing on the Spread of COVID-19

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Social distancing is an effective method of impeding the spread of a novel disease such as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), but is dependent on public involvement and is susceptible to failure when sectors of the population fail to participate. A standard SIR model is largely incapable of modeling differences in a population due to the broad generalizations it makes such as uniform mixing and homogeneity of hosts, which results in lost detail and accuracy when modeling heterogeneous populations. By further compartmentalizing an SIR model, via the separation of people within susceptible and infected groups, we can more accurately model epidemic dynamics and predict the eventual outcome, highlighting the importance of societal participation in social distancing measures during novel outbreaks.