GAKKOTOSHO
TOKYO JAPAN

CONTAINMENT POLICIES, BEHAVIOUR AND DYNAMICS OF THE PANDEMIC

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Abstract. The aim of this paper is to develop an integrated model of pandemics to study effectiveness of public health policies in controlling infections, taking into account

the response of people to these policies. A causal framework is developed to explain the interaction of disease prevalence, containment policies and population response with the status of the pandemic. An information-related framework is applied to analyse the design and conduct of public policies and the response of individuals to them. In this framework, the government applies a Markov decision process to decide on optimal containment polices. Using risk perception into a cost-benefit analysis, we explain how people decide to respond to public health policies. These frameworks are introduced into an SIR model to analyse how interaction between public health policies and individuals' response to these policies affect dynamics of disease transmission. The model is calibrated and simulated for the province of Ontario in Canada. The results show that government policies to control contact numbers and people response to policies, effectively decrease the rate of transmission within age-groups. Our findings highlight that risk perception plays a significant role in the response of people to policies and outcomes of the pandemic.