New decision model shapes strategies for dealing with public health emergencies

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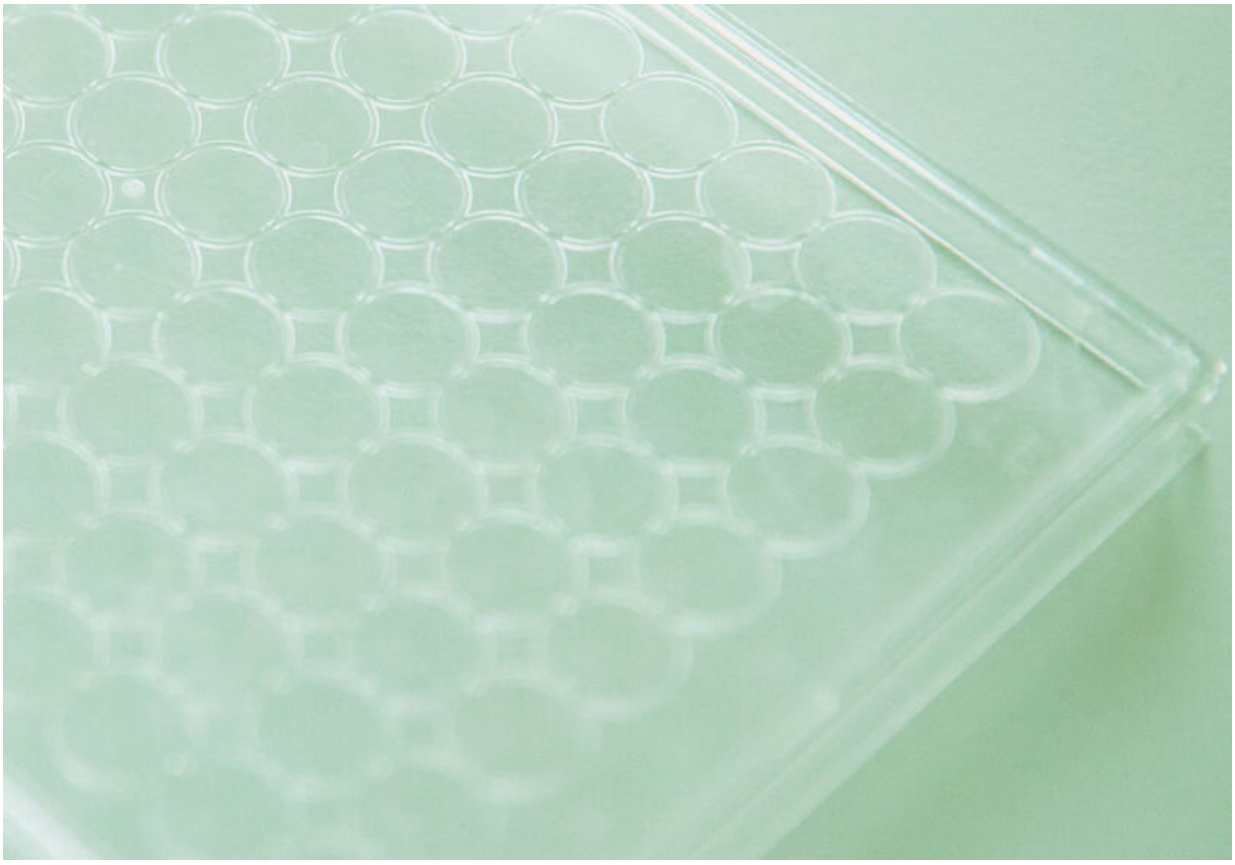

Credit: Aalto University

The efficient allocation of medical resources can be modelled mathematically, as shown by Finnish researchers. The study, which started a few years before coronavirus appeared, offers timely insights

for governments and organizations who are faced with an unprecedented healthcare crisis. Specifically, it presents a comprehensive decision model for optimizing the use of alternative tests and treatments on specific population groups, and suggests that even less-than-perfect tests can help improve effective spending limited healthcare resources.

Decision scientists have developed models to help governments and policymakers allocate limited healthcare resources. The decision model developed by Aalto researchers accounts for differences between population segments and shows that segment-specific strategies for tests and treatments are crucial for attaining positive health outcomes, especially when there is limited capacity for treatments. "When we were revising the paper just a few months ago, we never thought how soon the framework would become so relevant," says Professor Ahti Salo Director of the Systems Analysis Laboratory at Aalto University.

All health outcomes benefit from stopping the disease spreading

The paper, published in the journal *Decision Sciences*, shows how healthcare resources can be spent to achieve different population-level objectives, such as the 'utilitarian' objective (which focuses on maximizing the aggregate health of the whole population) and the 'egalitarian' objective (which gives priority to the neediest while limiting differences between segments). The decision model helps policymakers balance these two objectives, and shows how they can be attained by allocating resources accordingly.

The research was carried out before the COVID-19 outbreak and the data for illustrating the model is actually about coronary heart disease. As a result, the model is not directly adapted to contagious diseases, although the group will consider this in their future work. However,

contagiousness does not alter the relevance of the model regarding testing. "Adding contagion into our model most likely increases the value of all forms of testing, as all health outcomes benefit from stopping the disease spreading," said Professor Salo.

More information: Yrjänä Hynninen et al, Operationalization of Utilitarian and Egalitarian Objectives for Optimal Allocation of Healthcare Resources, *Decision Sciences* (2020). DOI: 10.1111/deci.12448

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