Pandemic planning: Government should embrace uncertainty rather than confront it or shy away from it

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New research shows the UK's COVID-19 management decisions were based on an outdated pandemic modeling structure and suggests a more resilient approach would have been more effective.

In the initial months of the pandemic, regular updates using graphs showing how the R number was behaving was the mainstay of the Government's strategy for tackling COVID-19.

This type of infection transmission is usually mathematically-based on dividing the population into 'compartments'. Such an approach has been criticized for its limited scope and inability to capture critical factors, such as the effects of testing, contact tracing and isolation. In addition, these existing models tend to look back at what the outcomes were, rather than look forward at future outcomes.

Professor Ashraf Labib, Professor of Operations and Decision Analysis in the Faculty of Business and Law at the University of Portsmouth, is the author of a new paper published this month in the journal of *Safety Science.* He urges Governments to use a more holistic approach, which provides a much richer modeling and in-depth decision analysis that can lead to better decision making.

Professor Labib has developed a hybrid model—a combination of resilience triangle modeling, which, provides a specific time of 'when' to act and the bowtie modeling that deals with the question of 'how' to act. He then added five guiding principles which together provide an improved model from which lessons for the future can be learnt.

Professor Labib explains that "resilience-based modeling with the five proposed principles can enhance public policy decisions. The aim of such modeling is to provide a learning environment on how to absorb failure and provides an opportunity to achieve quick recovery."

"Resilience modeling can offer the answer to 'when' to do things, whereas the bowtie modeling deals with causal analysis and can provide information on the 'how' questions. By combining the two, a balance is achieved in terms of dealing with a disaster, such as the Covid-19 pandemic, at both strategic and operational levels respectively."

"At a strategic level, the phases of prevention of the cause, response and mitigation of the consequences are visualized and strategic milestones can be set accordingly. Whereas, through bowtie modeling more operational details of causal factors and barriers analysis are achieved. Such analysis helps to improve knowledge related to assessing existing barriers and the need for new or improved ones. In addition, the bowtie modeling provides insight to visualize

and communicate the complexity of risks in a concise form."

The paper also suggests it is vital that public health simulation exercises are extended to include not just policies related to health, but also include different economic scenarios caused by pandemics.

Professor Labib says that "given the complex nature of a pandemic and the experiences with COVID-19 in terms of multiple waves, emerging variants and the variety of available vaccines, the main lesson learnt from all of this is to embrace uncertainty rather than to confront it or shy away from it. This is the way we will learn and prepare for future pandemics."

"Resilience as a conceptual idea is profound and considered to have a key role in dealing with disasters such as pandemics. However, there is little research on modeling resilience and integrating it with other approaches in order to systematize its operation. This paper aimed to contribute to this gap through the proposed hybrid enriched model of resilience and bowtie approaches."

Professor Labib urges policy makers to shift the way they approach things. Firstly, a shift in focus of decision making from efficiency to resilience and secondly to embrace the unknown and learn from it.

More information: Ashraf Labib, Towards a new approach for managing pandemics: Hybrid resilience and bowtie modelling, *Safety Science* (2021). DOI: 10.1016/j.ssci.2021.105274