

A System Dynamics-based spatial model to explore pandemic preparedness and response

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With the convergence of risk factors driving disease emergence, amplification and dissemination of pandemic prone pathogens, emerging diseases pose a greater threat to mankind now than ever before. This presentation presents findings from the EU-funded PANDEM project, which seeks to identify viable innovative concepts to strengthen capacity building for pandemic risk management in the EU. As part of pandemic preparedness, system dynamics modelling can be used to assess capacity resources such as hospital beds, anti-virals and ventilators, and the talk presents an exploratory model that addresses the EU context. Official statistical data is integrated within an R-based framework, which also supports web-based exploration of scenarios, and GIS interfaces.

Dr. Jim Duggan is a Senior Lecturer in Information Technology in the College of Engineering and Informatics at the National University of Ireland Galway. He has also worked as a software engineer, specializing in the design and implementation of decision support systems, and in the application of systems engineering principles to improve process efficiency and effectiveness. He has extensive experience in system dynamics teaching and research, and collaborates on interdisciplinary projects using system dynamics to enhance decision making, with applications in health systems planning, behavior change, and pandemic planning.