



The Two-order risk framework: A spatial assessment of risks associated with Covid-19 in the European Union (EU)

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The fast spread of SARS-CoV-2 made non-pharmaceutical interventions, such as the closure of schools and national lockdowns, necessary. These containment measures are essential to protect the health and safety of the people, while simultaneously posing a potential threat to the functioning of other aspects of society e.g., the economy, social life, or physical and mental health.

The connection of the risks directly imposed by the hazard (in this case a pandemic) and the indirect risks imposed by coping and adaptation measures is not well captured by existing multi/risk frameworks. Additional to the emerging multi-risk frameworks around concepts of cascading, conjoint or compounded risk, a framework is needed that focusses on the socially constructed risk as a direct response to the risk of the natural hazard itself. Building on the first- and second-order of adaptation concept by Birkmann (2011), this paper develops the “Two-order risk framework” for structurally assessing both interconnected risks. This framework can be applied for indicator-based spatial risk analysis of numerous types of disasters that are accompanied by prolonged coping or adaptation phases.

Here, the framework is employed to quantify the risk of COVID-19 for all EU member states. It conceptualises the risk of immediate impacts due to SARS-CoV-2 (first-order risk) as well as the risk of impacts of containment (second-order risk) measures by assessing the hazard/exposure, vulnerability and coping capacity in each order of risk. Both orders of risk are affected and connected by the specific risk management capacities of a country. Higher risk management capacity can decrease the threat of SARS-CoV-2, while poor risk management capacity can increase the threat of harmful containment measures. For assessing risk management capacity, governance-related indicators play a central role. The findings reveal that Malta, Luxemburg, and Denmark have a significantly lower second-order risk than first-order risk. The opposite is true for Latvia, Poland and Ireland. For the goal of reducing the overall risk, the policy advice given to states with a high first-order risk must be substantially different than the one given to those with a higher second-order risk.

The spatial heterogeneity of vulnerabilities in both risks shows that a one-size-fits-all approach in regards to containment measures is not sufficient to minimize risk in the EU. Instead, containment measures need to address country-specific drivers of the disease-spread while considering the vulnerability to second-order risk.