

High Consequence Decisions with Severe Uncertainty: An Info-Gap Approach to Policy Prioritization

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Abstract

History is full of surprises: the Fukushima tsunami and nuclear disaster (March 2011), the Arab Spring and fall of Ben Ali in Tunisia and Mubarak in Egypt (January to April 2011), Russian annexation of Crimea (March 2014), diagnostic contact lenses and 3D printed cars are just a few recent examples. Uncertainty, ignorance, and the potential for surprise are all unbounded, and the unknown future is a major challenge in strategic planning and policy prioritization.

There is a moral imperative to do one's best when making high-consequence decisions. However, our understanding is often wrong and we are frequently surprised by innovations and events. Using our faulty models in trying to optimize policy outcomes is infeasible, even irresponsible. The practical implication of severe uncertainty is that we must ask: What outcomes are required? What performance is essential? How can we be robust against surprise? We consider two examples: the paradox of optimal monitoring and surveillance, and the US decision to invade Iraq in 2003.