# Design, calibration, and optimization of pandemic alert systems

**David Morton, Northwestern University**

**Abstract**

During the COVID-19 pandemic, governments worldwide developed staged-alert systems to monitor data streams and trigger changes in intervention policies. However, many tracked unreliable data indicators, used heuristic policy triggers, failed to articulate measurable goals, and were implemented and communicated inconsistently. Beginning in April 2020, we worked closely with local officials in Austin, Texas to develop and maintain the COVID-19 alert system that guided public communications and policy decisions.

Over a two-year period, the system was instrumental in preventing overwhelming healthcare surges, minimizing socioeconomic disruption, and contributing to Austin's significantly lower COVID-19 mortality rate than comparable cities across the US. In this talk, we will describe a data-driven modeling framework, and stochastic optimization model, for designing pathogen alert systems that can ensure consistent situational awareness, provide policy guideposts that reduce uncertainty and decision complexity, and enhance public trust and policy adherence.