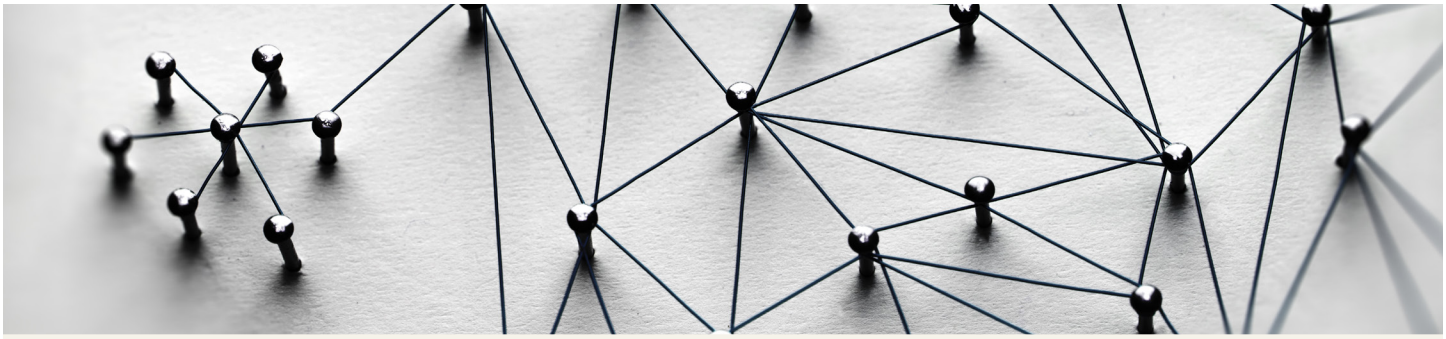
Response Recovery Resilience

Mathematica
Progress Together

When Stakes Are High, Models Matter. Guide Recovery with Mathematica's COVID Simulator



The Mathematica edge features:

- A flexible model that accounts for demographics, risk factors, and people's interactions in workplaces, schools, universities, and communities
- Transparent inputs that are easy to understand
- Results that can predict the impact of different reopening policies at local and state levels
- Ability to run in a secure, scalable, and seamless cloud environment
- Ongoing collaboration that equips leaders with the information they need

Leveraging behavioral science and cutting-edge analytics

Mathematica's scalable solutions offer users the confidence and clarity to address the complex challenges posed by COVID-19. Our evidence-based approach is built on decades of experience to help you quickly scale your response to the current crisis, guide responsible recovery for your community, and strengthen resilience to better meet the evolving challenges moving forward. Learn how the enhanced forecasting capabilities of Mathematica's COVID Simulator can guide responsible recovery from the public health and economic challenges of the COVID-19 pandemic.

Decision makers considering the best path for reopening their communities face daunting uncertainty about the potential impact of different policy options. These decisions are being made at all levels, including schools, universities, businesses, nursing homes, and local and state government officials.

Mathematica's model leads the field because it uses advanced statistical methods and behavioral science to consider the unique characteristics and social networks of a community. Characteristics like demographics and risk factors enable our model to simulate the impact of different policies on vulnerable groups within a community. Social networks are important because the social contacts between people living in the same household, where they go to school or work, their social circles, and their interactions in the broader community matter in the spread of this virus.

Guiding real-world policy choices

Our model can be tailored to simulate the impact of a range of policy choices on exposure, infections, hospitalizations, deaths, and other costs and burdens. It can also forecast impacts on different groups of people within a community. Example policy questions include:

- What is the impact of having a class of 20 students in a K–12 school meet in a room with a capacity of 50 instead of a capacity of 30?
- Are there specific parts of a social network within a community that, once infected, create a runaway effect that would benefit from more targeted contact tracing and testing?

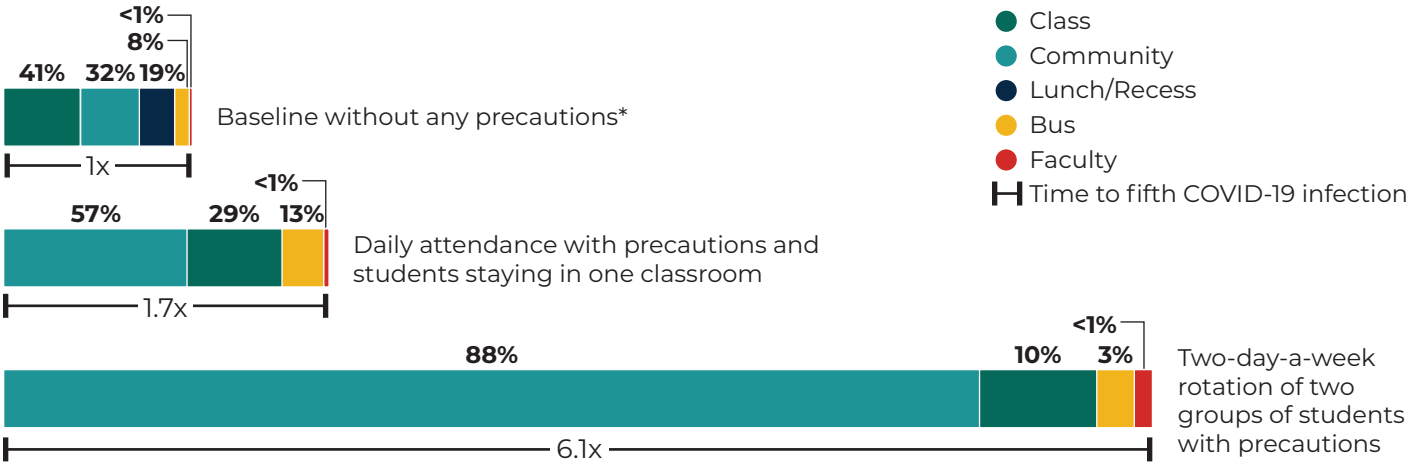
Partnering for recovery

Mathematica's team of statistical and subject matter experts will partner with you to craft your policy options, tailor the model, interpret the simulation results, and make updates as new information comes to light and policies begin to take effect. We are your partners on this journey, equipping you with the tools and understanding you need to have confidence in your decisions.

Applying the model: Forecasting K-12 school reopening scenarios

Through the Regional Educational Laboratory Mid-Atlantic, Mathematica partnered with the Pennsylvania Department of Education to provide insights into the latest evidence on COVID-19 and its impact on reopening elementary and secondary schools. This included simulating the spread of COVID-19 among students, faculty, and staff at K–12 schools under seven different reopening strategies. Below are some of the simulation results, which illustrate the relative differences in the estimated time it takes for the first five infections to occur in the school population and the percentage of COVID-19 infections by mode of transmission. Check out our COVID-19 K–12 Tool to tailor the simulation using different variables.

The relative time to reach five infections and percentage of infections by transmission mode for three reopening scenarios among high school students and staff.



*Precautions include students wear masks on the bus only and staff wear masks at all times outside the classroom; Students interact with other students only in their class(es); Lunch is eaten in classrooms; Recess exists for elementary students only and there is no mixing with other classes.

Source: Gill, B. et al. "Considerations for Reopening Pennsylvania Schools." Princeton, NJ: Regional Educational Laboratory Mid-Atlantic, June 2020. Available at https://ies.ed.gov/ncee/edlabs/regions/midatlantic/pdf/ReopeningPASchools.pdf.

Let's Progress Together. Contact Divya Vohra at dvohra@mathematic-mpr.com or John Hotchkiss at jhotchkiss@mathematic-mpr.com.