Scientific and Technical Support – Modeling

Legislative Finance Committee

Santa Fe, NM [Hybrid Meeting]
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Los Alamos NATIONAL LABORATORY EST.1943

NNSA National Nuclear Security Administration

Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

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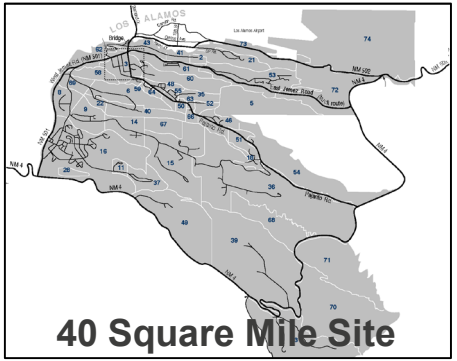
As a large science & technology (S&T) organization, the Laboratory leverages S&T to manage COVID-19 response

- **Safe accomplishment of critical missions**
  - Maintained operations
  - 20 to 50% of staff onsite during workweek
  - Telework maximized
  - Laboratory testing approach designed by occupational medicine
    - Workforce testing based on assignment
    - Focused on asymptomatic testing and self-screening to come onsite
  - Epidemiological modeling
- **Twice weekly meetings with the State since March**
  - Sara Del Valle, Paul Fenimore, Carrie Manore, Kirsten McCabe



The Laboratory:

40 square miles	47 technical areas	1,280 buildings/9M sq ft	11 nuclear facilities	268 miles of roads
8,900 career employees/13,000 workers on site	2,500 R&D staff	1,100 veterans	460 postdocs	1,860 students
$2.9B budget	11 Directorates	60 Divisions		

Modeling provides a framework to evaluate forecasts, potential actions, and specific scenarios

Decision Makers
- Situational assessment
- Scenarios / options
- Metrics evaluations
- Confidence assessment

Data
- Availability
- Quality/Key inputs
- Assumptions
- Model performance

MODELING

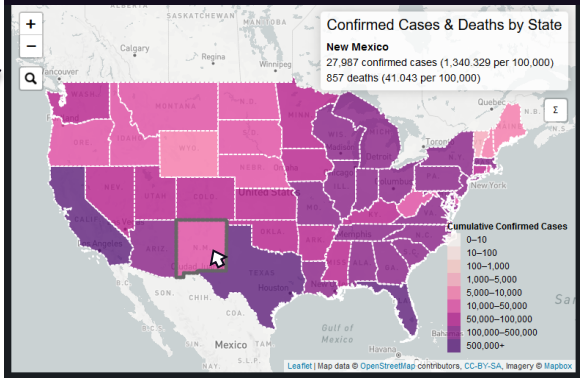
Forecasts up to 6 weeks
- Statistical approach
- Publicly available
- Originally validated with influenza

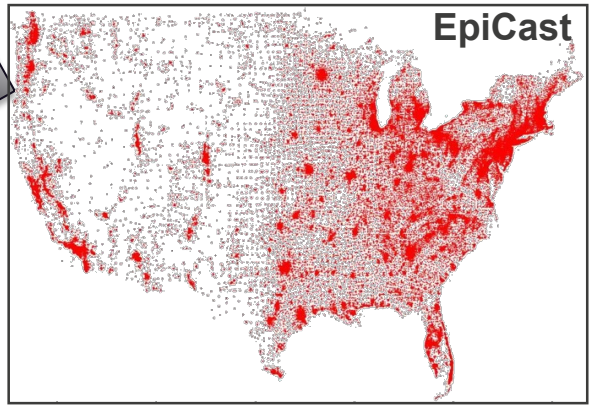
Simulation of different scenarios
- More computing required
- Designed for scenario
- Two LANL approaches
  - EpiGrid: Geographically-segregated SEIR+
  - EpiCast: Agent-based

Forecast

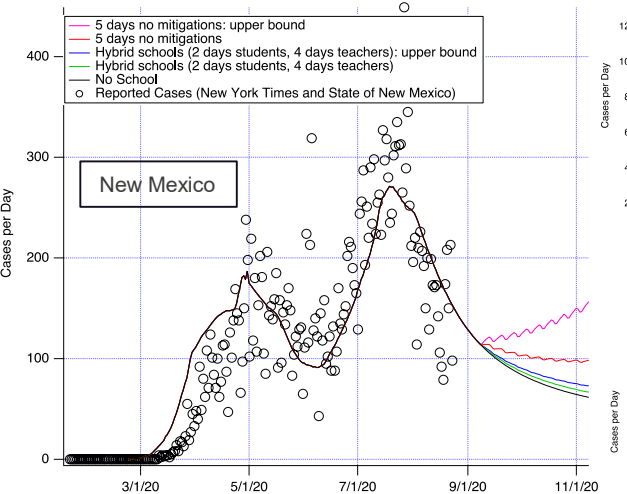
Prediction

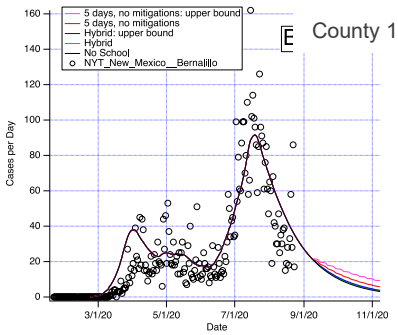
Cases and Deaths Forecasts
Based on data as of 2020-09-23
covid-19.bsvgateway.org

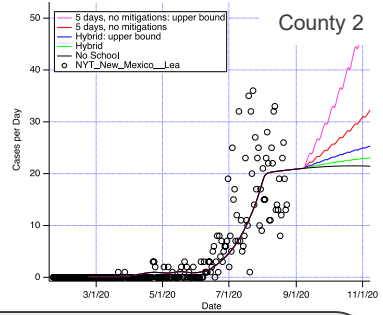




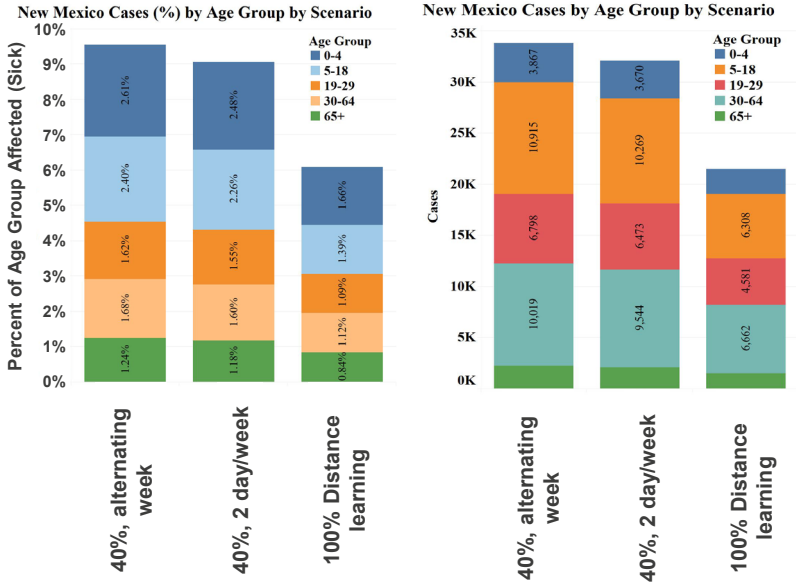
Example: Modeling school re-opening using EpiGrid – a geographically-segregated, SEIR+, differential equation model







Total number of cases from August 2020 to March 2021



The hybrid school model in EpiGrid assumes particular in school transmission levels due to behavior of students, teachers, and staff.

Re-opening criteria for schools are critical as results are driven by initial conditions per county (cases, demographics).

* Key assumptions can be found at https://cvmodeling.nmhealth.org/

- K-8: 40%+40% onsite (each alternating weeks) & 9-12: 100% distance learning
- K-8: 40%+40% onsite (each 2 days/week) & 9-12: 100% distance learning
- K-12: 100% distance learning

Results inform expected cases per scenario, testing capacity needed, and population as risk by age group.

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