HUMAN SERVICES DEPARTMENT

MODELING: WHO, WHAT, WHEN, WHERE, WHY

STUDENT SCIENCE INSTITUTE, JULY 16, 2020

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INVESTING FOR TOMORROW, DELIVERING TODAY.

MODELING DEFINITION

- **Modeling** involves making a representation of something.
- Creating a tiny, functioning volcano is an example of **modeling**. Teachers use **modeling** when they have a class election that represents a larger one, like a presidential election.
- **Modeling** is anything that represents something else, usually on a smaller scale.
- A lot of algebra problems involve modeling.
- In the case of COVID-19, though, we are modeling **the future.**

BUILDING A MODEL FOR COVID-19

Using current data to predict future data.

- What do we know about the virus?
- What do we know about transmission?
  - How many people (on average) does 1 person infect?
  - How much time from infection to symptoms?
  - How much time until one can infect others?
  - Can people without symptoms infect others?
- What percent of patients with COVID-19…
  - Will we know about?
  - Will require hospitalization?
  - Will require an ICU bed?
  - Will require a ventilator?
  - Will die?

BUILDING A MODEL FOR COVID-19

Using current data to predict future data.

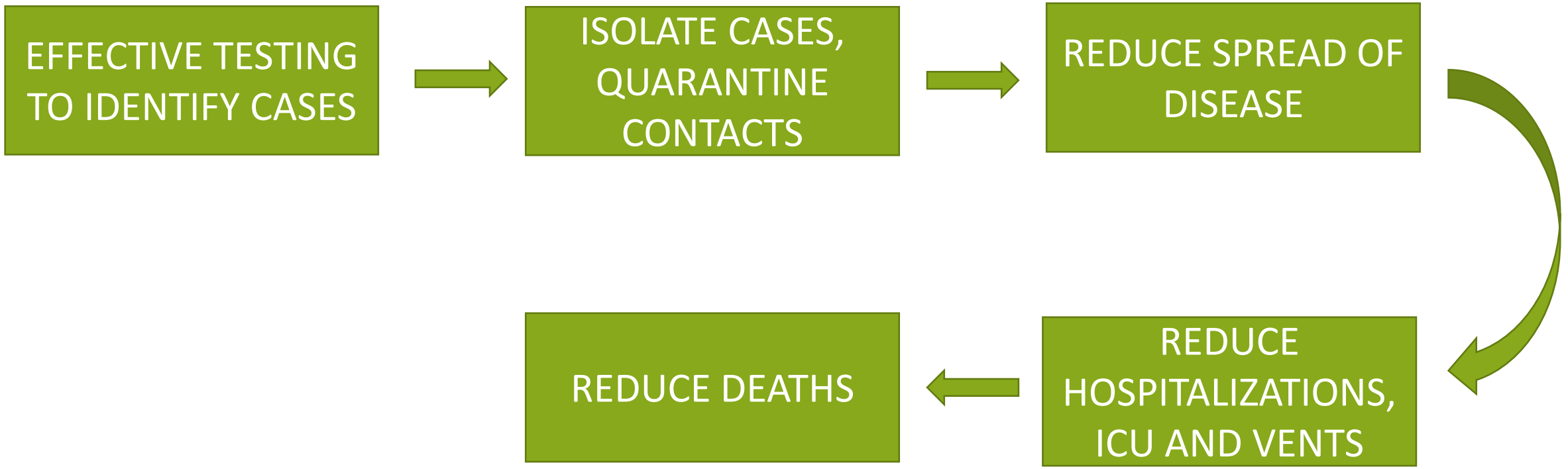
- What do we know about the virus?
- What do we know about transmission?
  - How many people (on average) does 1 person infect? **R_0, R_effective**
  - How much time from infection to symptoms? **Incubation period**
  - How much time until one can infect others? **Pre-infectious period**
  - Can people without symptoms infect others? **Asymptomatic spread**
- What percent of patients with COVID-19…
  - Will we know about? **Multiplier**
  - Will require hospitalization? **Hospitalization rate**
  - Will require an ICU bed? **ICU bed rate**
  - Will require a ventilator? **Ventilation rate**
  - Will die? **Case fatality rate**

BUILDING A MODEL FOR COVID-19 IN NM

Using current data to predict future data.

- What can we do to reduce the spread of the virus?
- What increases transmission?
  - **Closed spaces (particularly with poor ventilation)**
  - **Close contact (within 6 feet)**
  - **Prolonged contact (more than three minutes)**
- What decreases transmission?
  - Social distancing:
    - Stay at home (do NOT go to school if you are sick)
    - If out, always wear a mask (no matter what!)
    - Stay 6 feet away from others
  - Hygiene (hand washing, keep surfaces clean, cough into tissue, etc.)

GOAL OF MODELING

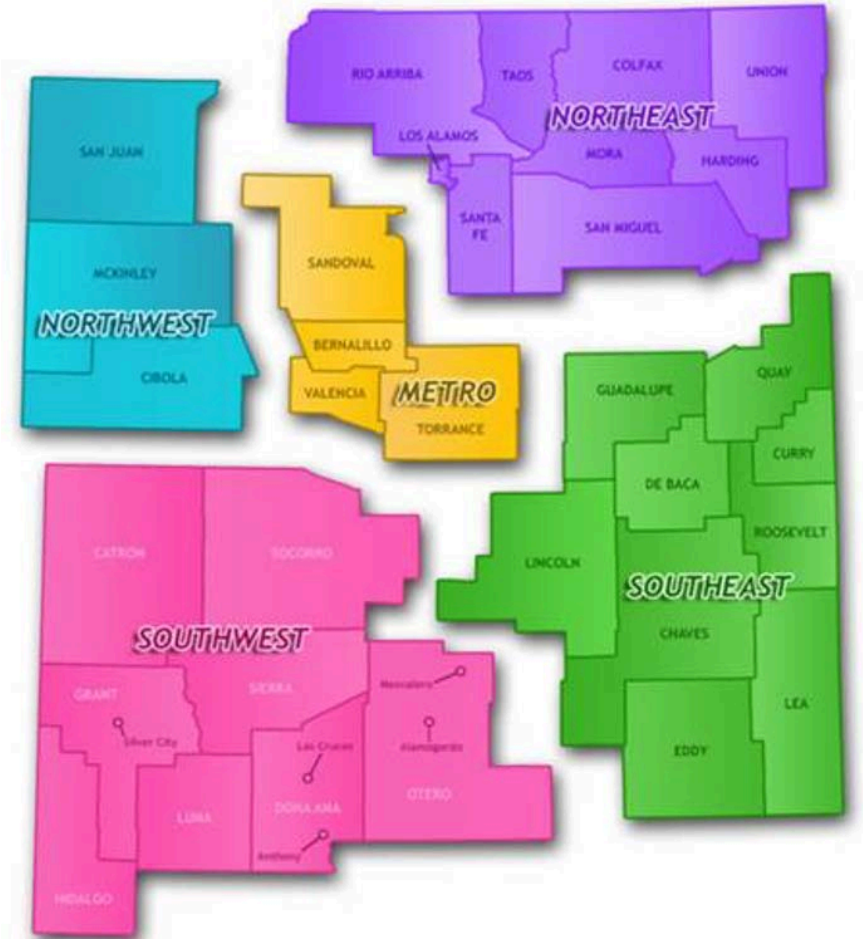


MODELING IMPACT OF COVID-19 IN NM

- NM COVID-19 State model is an Enhanced **SIR Model**, meaning it estimates number of **Susceptible, Infectious, and Recovered** (SIR) COVID-19 individuals over time.
- Model is developed in partnership with Presbyterian Health Services, Los Alamos National Laboratory, and NM Department of Health.
- Model incorporates a variety of near real-time data, including:
  - COVID-19 case information
  - State-wide testing rates
  - Geographic distribution of cases and testing
  - Clinical outcomes
  - Healthcare system resource capacity and demand
  - Differences in disease risk using comprehensive data on social determinants of health, Johns Hopkins Adjusted Clinical Groups, and health plan claims data

MODELING IMPACT OF COVID-19 IN NM: REGIONAL APPROACH

- In counties with smaller number of COVID-19 cases, data points are fewer, which increases likelihood of inaccurate modeling projections
- Therefore, NM modelers adopted a regional approach to modeling COVID-19's impact on the state
- Regions are based on NMDOH's planning regions
- Model is updated each Tuesday and posted online



PUBLIC HEALTH GATING CRITERIA FOR REOPENING NM

- Let's go to the website together

Public Health Gating Criteria for Reopening New Mexico

Home » Public Health Gating Criteria for Reopening New Mexico

The COVID-19 pandemic is a long-term event that requires careful, evidence-based decision making and policy planning that both saves lives, and promotes economic recovery.

Therefore, the State has developed public health **gating criteria** that are part of New Mexico's phased plan for a safe and gradual reopening of the economy and society. Gating criteria are thresholds New Mexico must satisfy before beginning to relax social distancing restrictions and closures.

The criteria are assessed regularly and if the levels meet predetermined, evidence-based targets, the State will assess the ability to move to the next phase. Gating criteria, in conjunction with the COVID Safe Practices Guide for Individuals and Employers (developed by the NM Economic Recovery Council), are designed to promote safety of community members, employees, and customers.

The gating criteria consists of six measures each with an assigned target. In evaluating reopening, officials will consider the State's ability to **achieve a decreasing transmission rate, adequate testing, expansive contact tracing and isolation, and sufficient hospital capacity**.

Public Health Gating Criteria for Reopening NM

Category	Measure	Target	Current Status	Status Updated Each:
Spread of COVID-19	1. Rate of Spread	1.05 or less	1.08	Mon, Wed, Fri
Testing Capacity (general and vulnerable populations)*	2. Number of COVID-19 tests per day (7-day rolling average)	5,000	6,395	Mon, Wed, Fri
Contact Tracing and Isolation Capacity	3. Time from COVID-19 positive test result to case isolation	24 hours or less	53 hours	Tues
Contact Tracing and Isolation Capacity	4. Time from COVID-19 positive test result to quarantine of case contacts	36 hours or less	78 hours	Tues
Statewide Healthcare System Capacity	5. Adult ICU Beds occupied across 7 NM Hub Hospitals**	less than 460	261	Tues
Statewide Healthcare System Capacity	6. 7-day supply of personal protective equipment (PPE) across 7 NM Hub Hospitals**	7-day supply in at least 6 out of 7 Hub Hospitals	7 out of 7 hospitals	Tues

*Per CDC: adults 64+, people with asthma, chronic lung conditions, immune deficiency and those receiving cancer treatment, serious heart disease, diabetes, on dialysis, severe obesity, chronic liver disease, people living in nursing facilities and other congregate settings, people experiencing homelessness

** University of NM (ABQ), Presbyterian (ABQ), Lovelace Medical Center (ABQ), CHRISTUS St. Vincent (Santa Fe), San Juan Regional Medical Center (Farmington), Memorial Medical Center (Las Cruces), Eastern NM Medical Center (Roswell)

THE MODEL ITSELF

What is modeling?

Modeling is a powerful tool to assist health policy development and disease prevention and control. In NM, COVID-19 modeling helps in planning the State's response to COVID-19 by attempting to predict the impact of COVID-19 on health systems and populations. However, models are just one tool and should not be considered in isolation from data and lived experiences in the field.

DOWNLOAD LATEST WEEKLY MODELING UPDATE

Report from July 14, 2020 | View Previous Reports

DOWNLOAD NM SCHOOL REOPENING MODELING SCENARIOS

NM COVID-19 Model is the best for our State

Many COVID-19 models have been developed, including state-based, regional, national, and international models. However, the NM model is the best fit for our state for several reasons.

- The NM model is updated daily based on actual NM data, ensuring projections reflect the most recent information.
- The NM model incorporates social distancing and provides risk adjustment for age, disease burden, and social determinants of health by county.
- The NM model considers the unique characteristics of our state, including geographic, socioeconomic, and demographic information.