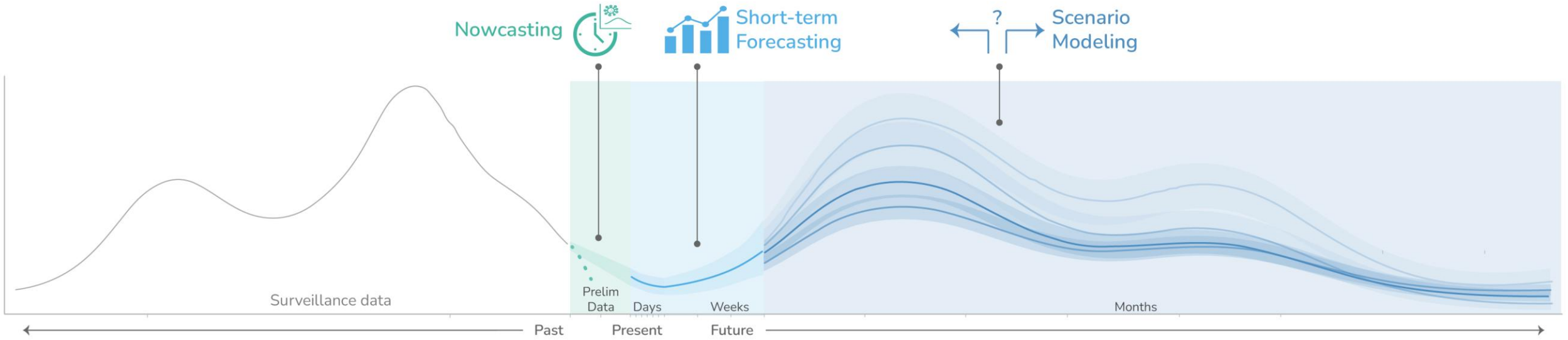
Nowcasts

Practical Modeling Concepts for Public Health

Different types of qualitative assessments and modeling outputs are useful at different horizons

Qualitative assessments: Rapid, early evaluations of potential outbreak trajectory and risk posed to a population



Nowcasts: Estimate real-time disease burden based on partially reported data

Short-term forecasts: Predict disease burden in the coming days and weeks

Scenario models: Compare different potential futures (or pasts) under varied assumptions

Nowcasts

Qualitative assessments: Rapid, early evaluations of potential outbreak trajectory and risk posed to a population

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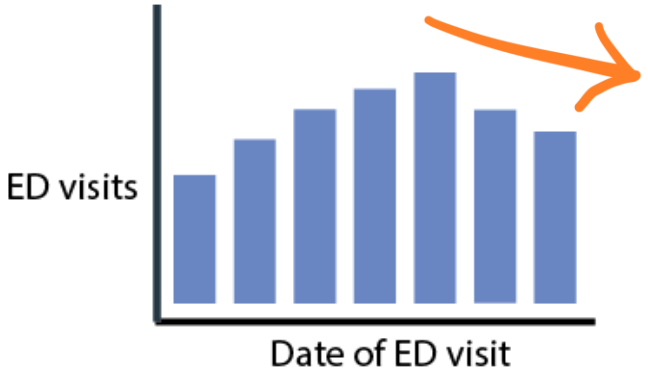
Nowcasts

What is it?	Nowcasts estimate current disease burden
Why is it useful?	Nowcasts adjust for delays, such as in disease reporting, to improve situational awareness
Example inputs	Surveillance data, disease reporting delays

*Nowcasts are most accurate for signals with stable, predictable reporting delays.

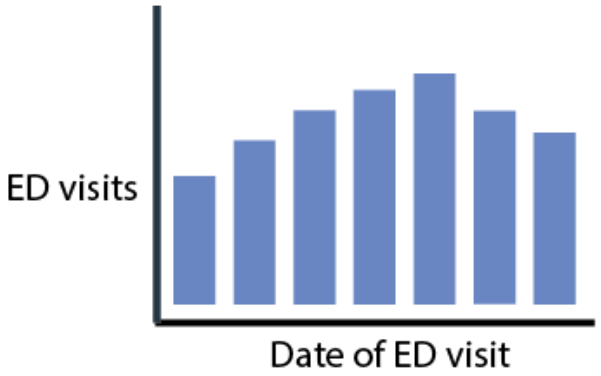
Often, early in an outbreak when data collection systems are still being established or refined, this lack of stability and predictability make nowcasting challenging.

Real-time estimates can be misleading when there is a reporting lag



First data batch

Real-time estimates can be misleading when there is a reporting lag



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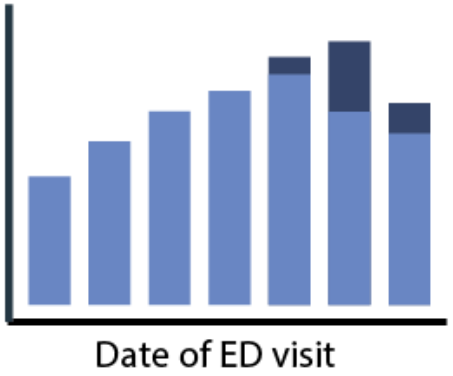
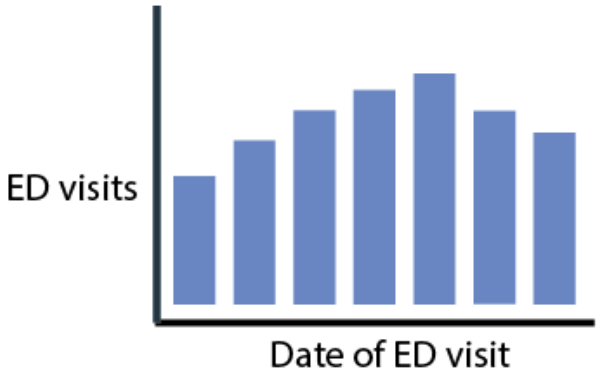


Second data batch

Real-time estimates can be misleading when there is a reporting lag



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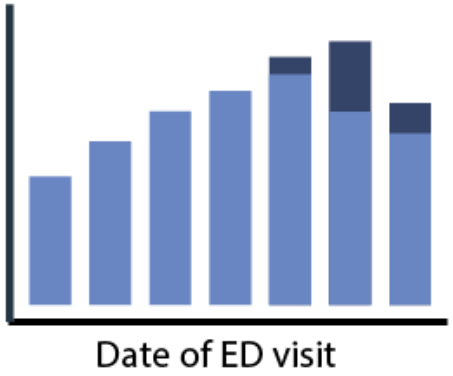
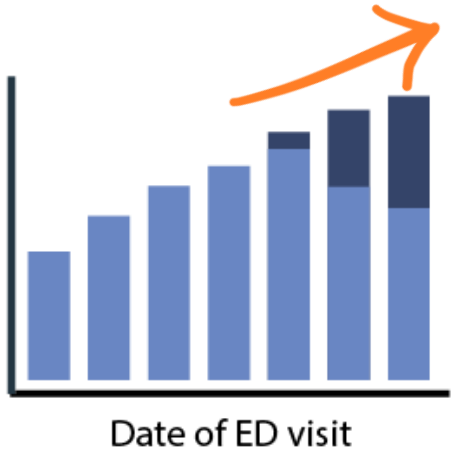
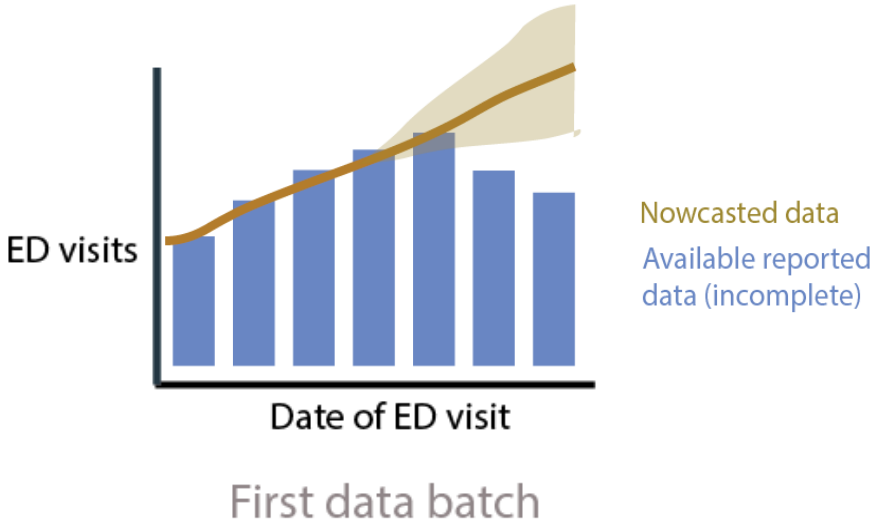


Second data batch



Third data batch

Nowcasts provide real-time estimates when data are lagging



Nowcasts can be made without additional data batches and adjust for partial reporting by “filling in” the incomplete data based on historic reporting patterns, to provide better situational awareness.

Nowcasting models are effective when trends are reliable

- Nowcasts rely on stable surveillance data and well-understood reporting delays
  - Trends may not be straightforward and delays can vary over time
  - Trends can vary by facility, or location, too
- Adjustments can be made to try and account for these challenges
  - Weekend and holiday reporting delay adjustments are possible, but unexpected disruptions are harder to adjust for
  - When there is more uncertainty, this is reflected in wider prediction intervals

Nowcasting for real-time estimates

- What does nowcasting do?
  - Produces real-time estimates based on currently available but incomplete reported data and historical reporting patterns
  - Can potentially reveal changes in disease transmission dynamics before they would otherwise be detected
  - Methods can be applied to many different metrics:
    - Case counts
    - Emergency department visits
    - Hospitalizations
    - Deaths

Nowcasts can help provide a picture of current disease trends while there are data reporting lags or gaps.

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.