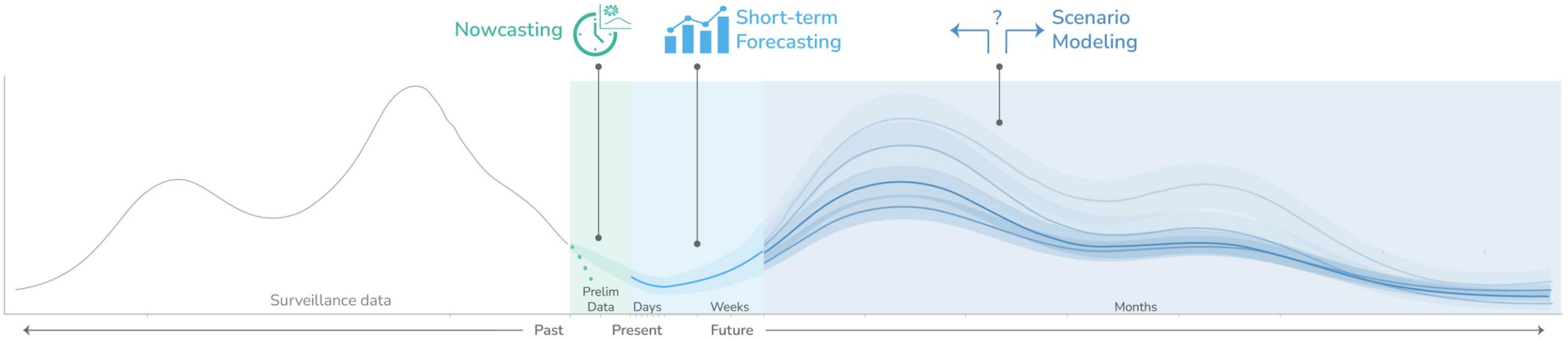
Short-term forecasts

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



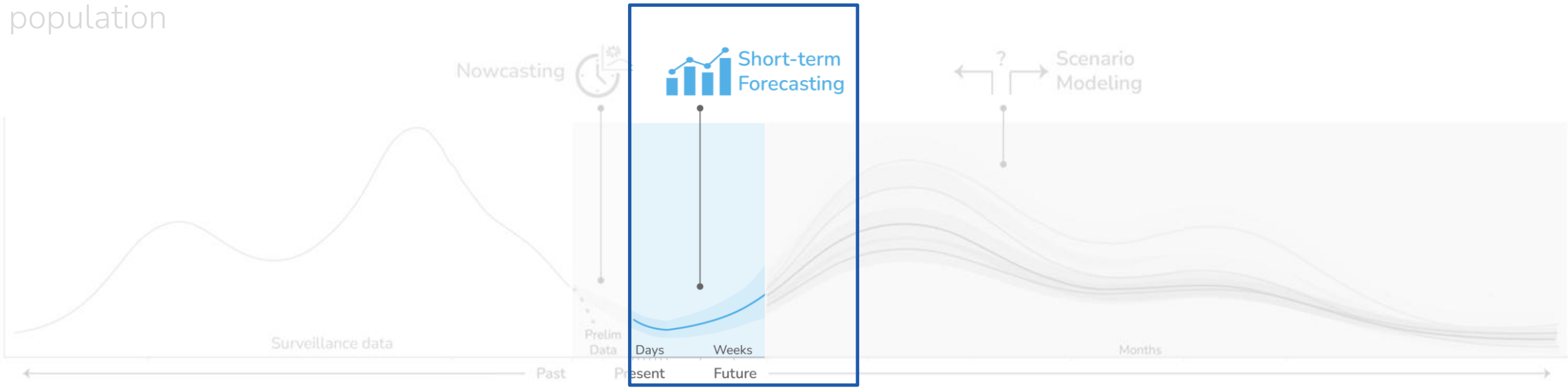
Nowcasts: Estimate real-time disease burden based on partially reported data

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

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

Short-term forecasts

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

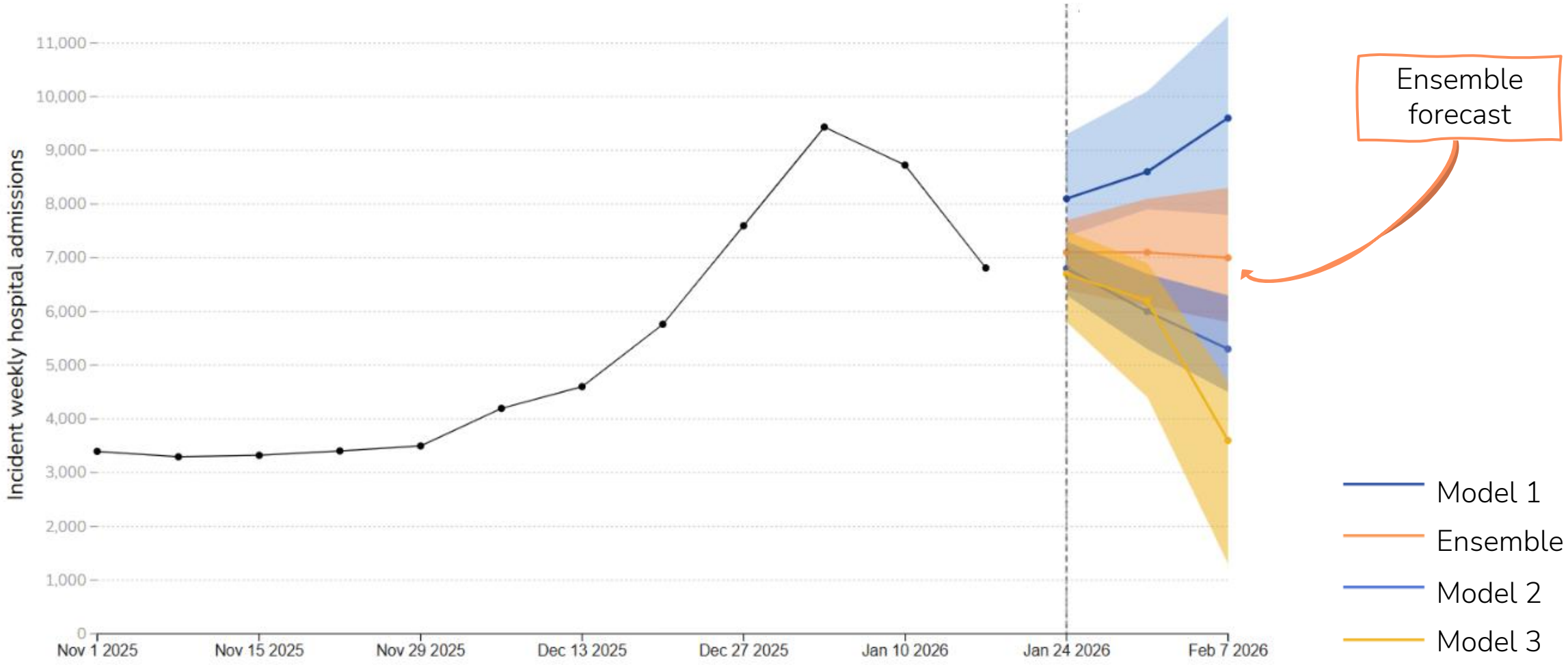
Short-term forecasts

What is it?	Measure of potential short-term disease burden
Why is it useful?	Anticipates burden; useful for communications and resource planning
Example inputs	Surveillance data, R_t (depending on method)

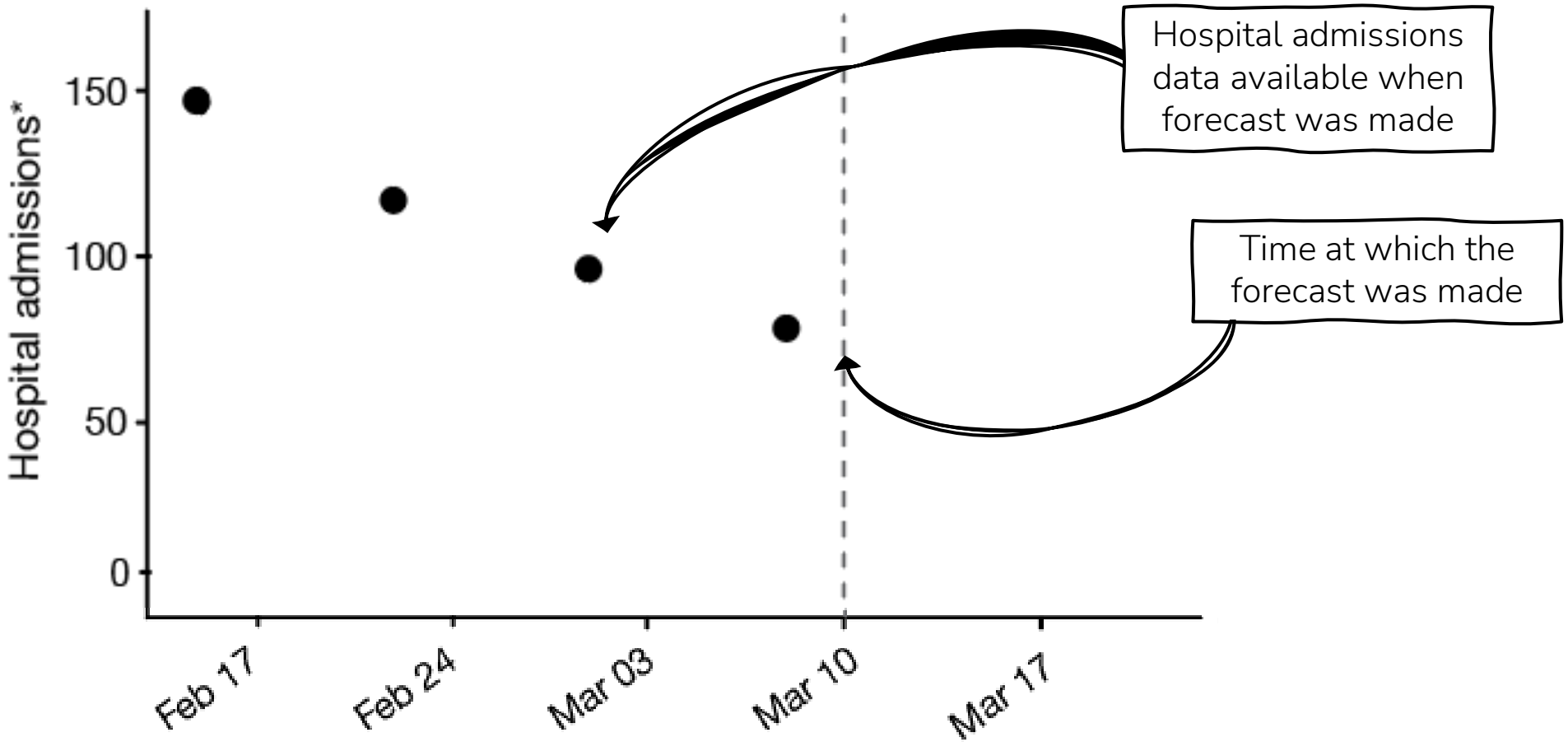
Short-term forecasts project disease burden over weeks

- Forecasts provide estimates, often over a few weeks, with quantified uncertainty.
- Accuracy is usually higher at shorter time intervals.
- Different types of forecasting models are used for acute outbreaks vs. more predictable seasonal diseases.
- Individual forecasting models vary in their methods, parameters, assumptions, and input data – **ensemble models** often have better accuracy, on average, compared to any single model.

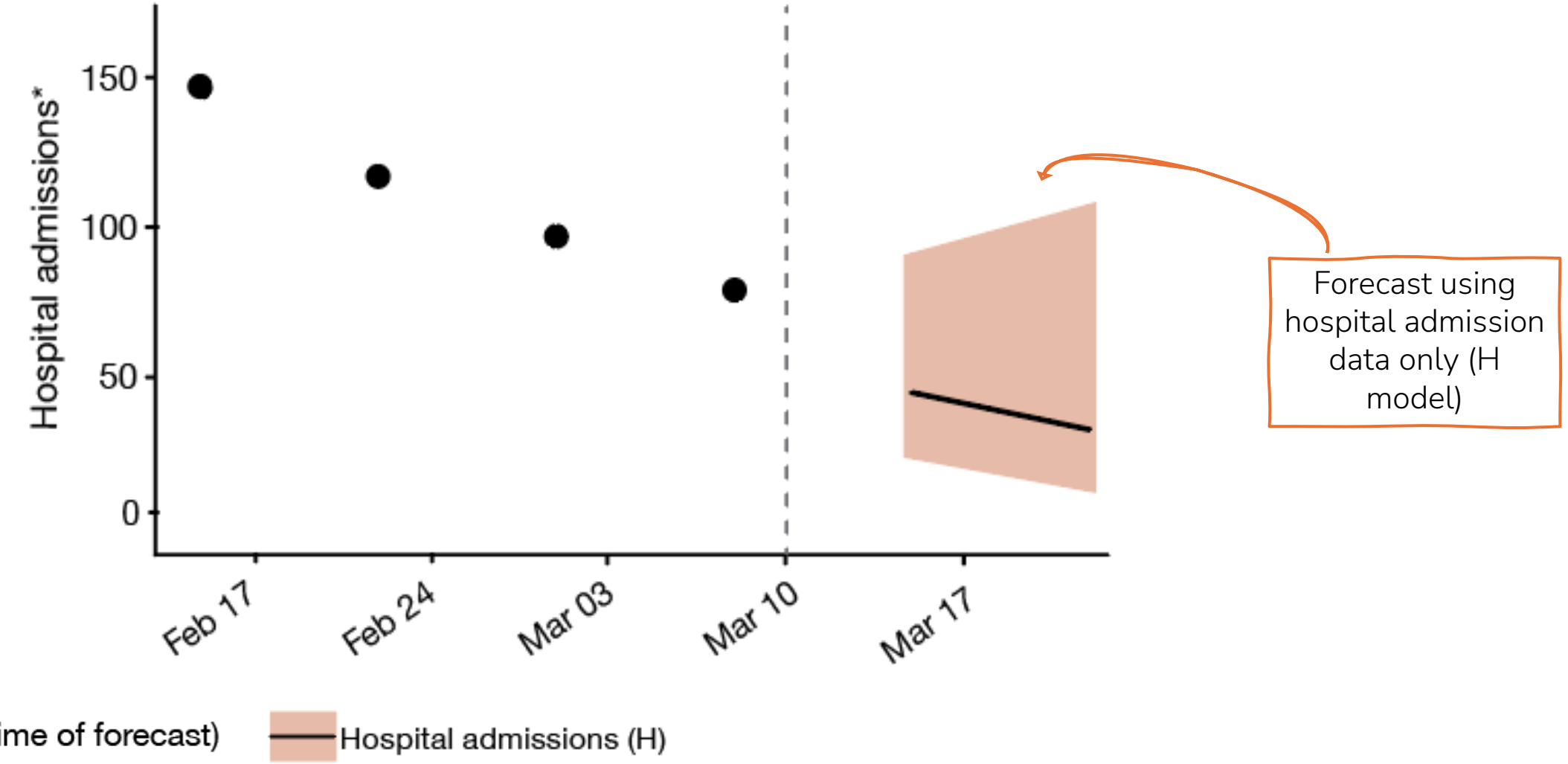
“Hubs” bring together multiple models



Sometimes, incorporating other data inputs can improve short-term forecasts

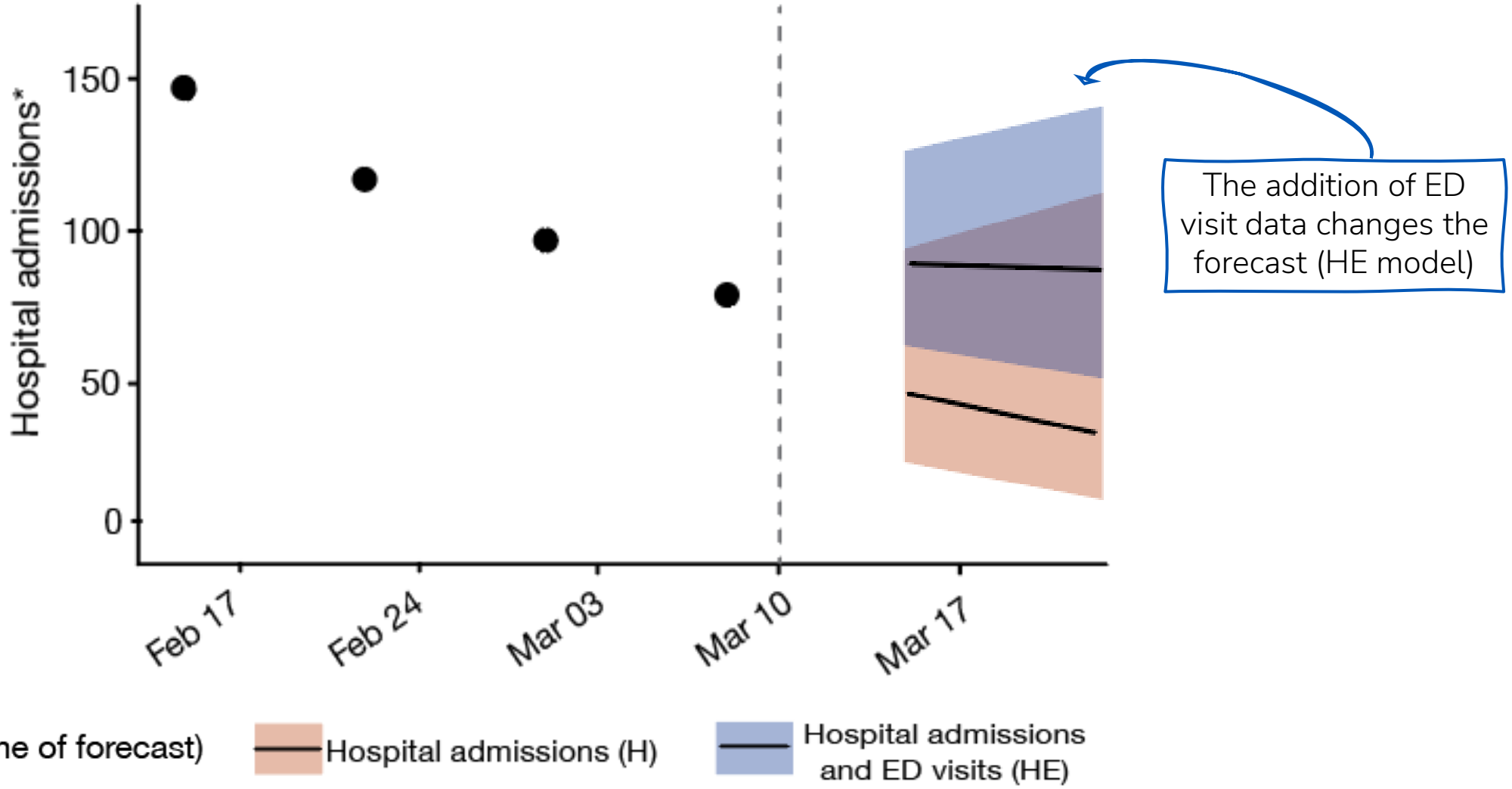


Sometimes, incorporating other data inputs can improve short-term forecasts

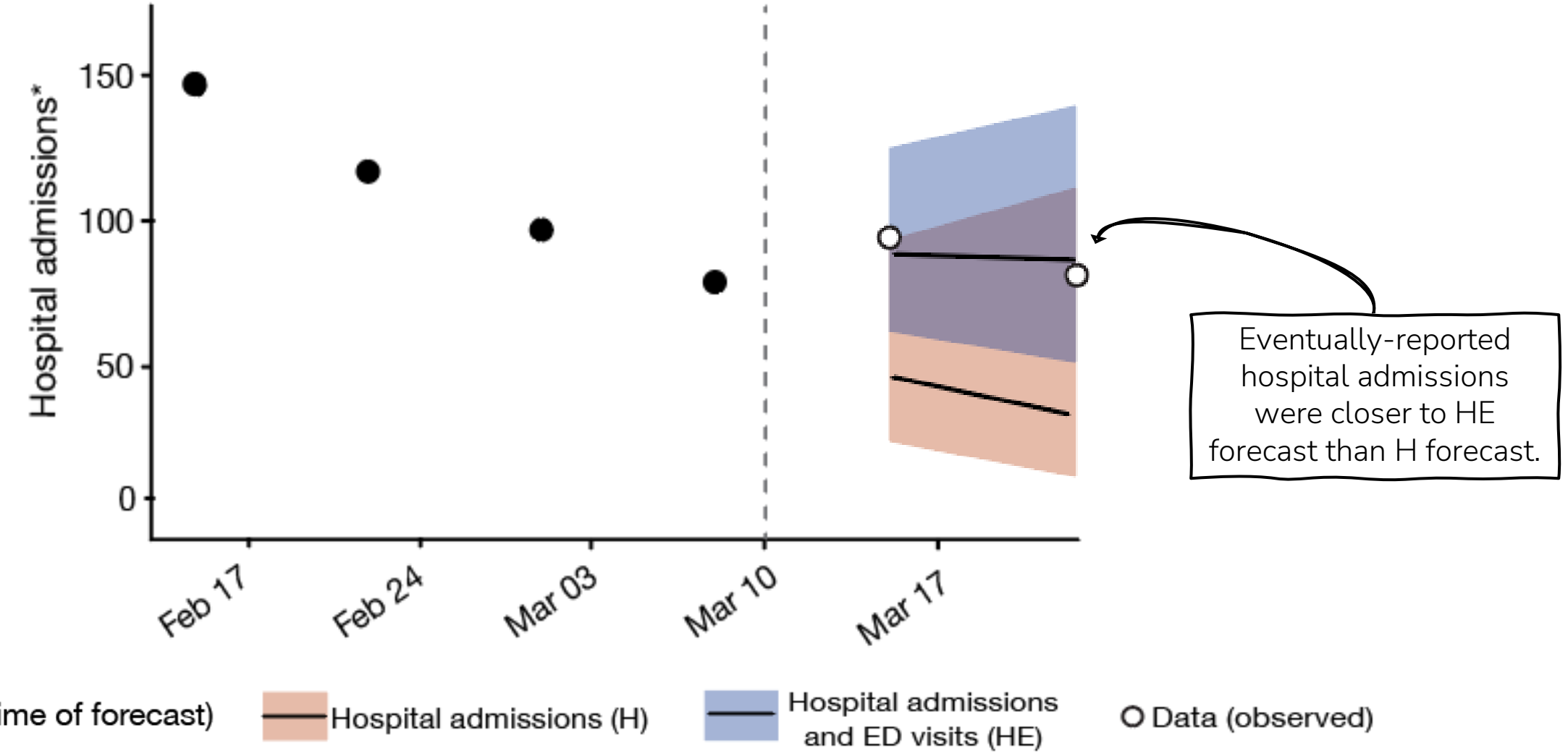


*Influenza hospital admissions forecasts from Nevada, March 2025

Sometimes, incorporating other data inputs can improve short-term forecasts

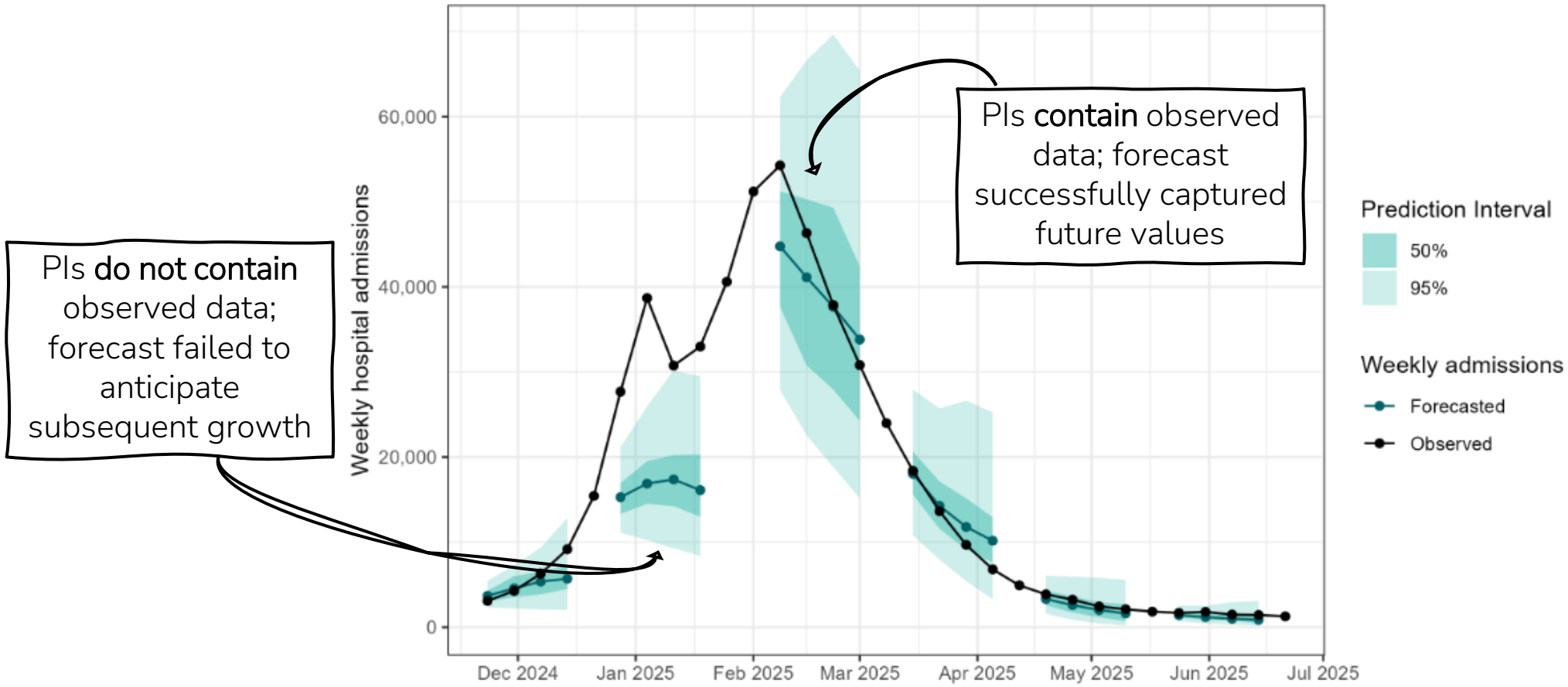


Sometimes, incorporating other data inputs can improve short-term forecasts



Coverage can help us evaluate model performance

This graph depicts the **coverage** of the forecasted prediction intervals – that is, **do the Prediction Intervals (PIs) contain the observed data?**



National median ensemble with 50% and 95% prediction intervals alongside observed weekly hospital admissions for six forecast weeks throughout the season.

Short-term forecasts can predict disease burden over days and weeks, and they can be enhanced by incorporating multiple models and data inputs.

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