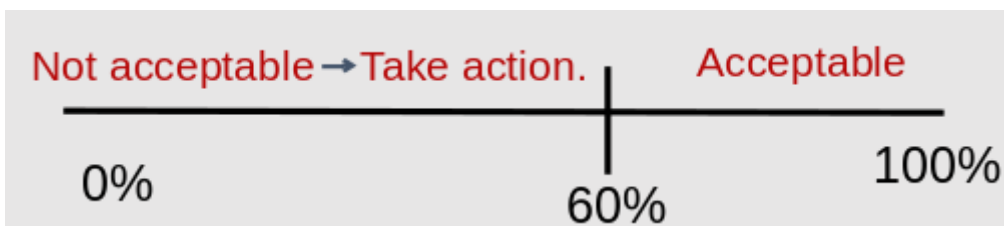


Sampling Strategy

We could determine if an intervention is meeting the target through a census, sampling plan, or LQAS.

LQAS

- LQAS is a primary classification tool
 - Lots are classified as performing "acceptable, unacceptable, low or high"
- The goal is to shift resources with unacceptable coverage and study best practice with acceptable coverage
- Classification is based on the sample from the population
- We just need 19 households to sample, a much smaller sample than most population estimates
- To classify as high or low we need to define a target, or decision threshold
 - We to choose a threshold that makes the chance of a mistake very small
 - We want at least $1 - \alpha$ chance to be in the upper category based on probability for being in the upper (chance of is type 1 error is alpha)



As always increasing sample size decreases error. Also we can decrease the size of alpha.

LQAS classifies whether something is likely to meet the threshold or not. It does not measure prevalence or probability.

Time Series

A time series is a set of data points collected over time. These might be measurements of a daily process and are quite common in surveillance. Statistical models for time series are indexed by time (X or y) and may or may not be independent or identically distributed.

Collection tools and methods

- Regression methods for modeling trends
- Fourier/wavelet analysis for modeling seasonality

- ARIMA modeling for correlation

When modeling a time series we can choose to use a retrospective or prospective approach to analysis. This allows use to use times series for event detection, interpretation of past results, forecasting or decision making.

General Approach

1. Plot the series and examine the main features
 - Trend
 - Seasonal component
 - Any apparent changes in behavior
 - Any outlying observations
2. Model trend and seasonal components to get stationary residuals
 - Regression methods are useful for this
3. Choose a model to fit the residuals
4. In some settings, forecasting can be performed by forecasting the residuals and then adding on predicted trend and seasonal component

Once we have a time series model we can apply it to a retrospective or prospective application.

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