The need for standards for vaccine effectiveness studies

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Motivation

Many public health decisions related to vaccines during the COVID pandemic relied upon observational studies.

Public health authorities may not have always realized the risk of misinterpreting observational studies.

Some decisions may have been based on flawed interpretations of observational studies.

However, there also is no doubt that observational studies are absolutely necessary, and in many cases are the sole source of data that could inform important decisions, whether during or between pandemics.

Thus, it is critical that the scientific community consider ways to increase the reliability and interpretability of observational studies.

In this meeting, we’d like to discuss whether standards for design, conduct, analysis, and/or reporting of vaccine efficacy observational studies could decrease the risk that study results are misinterpreted.
Observational studies of vaccine effectiveness are often performed in order to:

- obtain data when randomization is perceived as not feasible or has not been done
- obtain data on rare outcomes
- provide data in real-time
Types of observational studies of vaccine effectiveness

Cohort
  Prospective
  Retrospective

Case control
  Test negative design
Features that make results of observational studies more credible

Large effects
Strategies to reduce bias
Strategies to quantify bias
Strategies to allow further investigation of bias

However, the potential biases in observational studies can be appreciable. Uncertainties in such studies (e.g., if actual effect is little or zero) need to be weighed against potential benefits and harms.
Sources of bias

Confounding
Healthy vaccinee bias
Misclassification
Selection bias
Biases specific to test negative designs
Differential depletion of susceptibles
Waning immunity
Methods to address bias

Design - database selection
Design - strategies to avoid bias

Conduct

Analysis

Potential to use randomization:
  e.g., randomization during deployment
  simple randomized trials
Strategies to assure that trial reporting and synthesis accounts for bias

Results and data sharing

Transparent discussion of limitations

Reproducibility and generalizability considerations
This meeting is organized in order to inspire further discussions that will ensure that future observational studies are as well-designed, conducted, analyzed, and reported as possible.