COVID-19 Evidence Accelerator Collaborative

Lab Meeting 49

Thursday, February 17th, 2022, 3 - 4 pm ET

Call Summary

Overview of Lab Meeting 49

During Lab Meeting 49 we heard three presentations on evaluating COVID-19 vaccine effectiveness (VE). First, Dr. Minal Patel of the World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC) provided an overview of guidance, tools, and other resources available to help ensure VE studies are appropriately designed to help answer pressing questions. Next, Dr. Jeff Brown and Jennifer Stacey of TriNetX presented on how their aggregated data from health systems across the world are used by partners to gain insights on VE. Finally, Dr. Sara Tartof of Kaiser Permanente's Division of Research provided a preview of results from a study looking at the effectiveness of Pfizer-BioNTech against Omicron and Delta variants.

Global Vaccine Effectiveness and Impact

Minal Patel, MD, CDC/WHO

If accelerators are interested in viewing the slide deck presented for this topic, then they can do so by following this link.

Guidance & Tools

Evaluation of COVID-19 Vaccine Effectiveness (VE) – Interim Guidance, March 17, 2021

- Unique context of COVID means VE studies are not like for other vaccines
  - Vaccine coverage is rapidly increasing
  - Disease epidemiology constantly changing
  - Non-pharmaceutical interventions impact risk
  - Vaccine strategy prioritizes highest risk populations → confounding
- Highlights of guidance
  - Guidance intended for lower- and middle-income countries but can apply in any setting
  - Guidance advises against traditional pre/post-impact studies
  - Test-negative design most practical/easiest in most settings
  - Every participant should have PCR-based outcome
  - Covariates to collect
  - Vaccination history should be documented, not just reported
  - Biases need to be carefully considered in study design (bias) and analysis (confounding)
  - Updated STROBE reporting requirements (e.g., report on variant of concern (VOC) in study population)
- Resource – Sample size calculator tool, WHO and CDC protocols available on WHO's website

Addendum: VE in the Setting of Variants – Interim Guidance

- Screening method for early triggers of reduced vaccine effectiveness against new variants
- Case only analysis – comparison of variant prevalence in unvaccinated/vaccinated, Sieve analysis (like influenza clade analysis)
- "Traditional" methods – genomic characterization of all/some cases
- Analytic considerations – e.g., representative characterization
- Biases – e.g., variant changes ability of RT-PCR to detect infection or results in different clinical spectrum
- Resource – R-code for calculating crude VE with CI, presentations on integrating genomic sequencing into VE analyses

Monitoring and Summarizing VE Study Literature

- Partnering with Johns Hopkins' International Vaccine Access Center to conduct systematic literature search for VE, impact, and neutralization studies and monitoring media for relevant government reports
- Methods for VE and Impact studies – published or preprint, has confidence intervals around VE, includes persons with and without infection or disease and with and without vaccination, no modeled comparison groups, etc.
- View-Hub – online resource where information on the studies collected through the literature search of VE studies can be searched/filtered, data can be downloaded, etc.
- Weekly email of summary of literature review results (email covidve@who.int if interested in subscribing)
- WHO's Weekly Epidemiologic Update – forest plot and table summarizing VE and neutralization findings for each vaccine and each VOC

Policy Questions

- Synthesizing data to answer relevant policy questions/make recommendations
- For each vaccine in use – What is the VE in different populations? Against different outcomes? Against transmission? Duration of protection as it related to the different outcomes? etc.

Mapping Exercise

- Reviewing literature and engaging with stakeholders about planned/ongoing studies to create a global "map" of studies related to VE
    - Goal to avoid having many studies answering 1 question and 0 studies for other questions
- Data made available on View-Hub and summarized on WHO website

Gaps in VE Studies in Different Populations

- Many studies on Health Care Workers and older age for AZ, Moderna, Pfizer vaccines
- Gap in planned and completed studies of vaccines not used in high-income countries/ non-Emergency Use Listing (EUL) vaccines (Novavax, Sinopharm, Sinovac)
- Gap in studies on pregnant women – studies from pre-Delta, but none with Delta/Omicron
- Gap in pediatric studies – most vaccines not authorized in children
- Post-Delta/Omicron Studies – duration of protection against disease, severe disease, and death for all vaccines, transmission studies

TriNetX & COVID-19

Jennifer Stacey & Jeff Brown, PhD, TriNetX

TriNetX – 190+ Healthcare Organizations (HCOs) across 30 countries providing access to >290 million patients for 40+ industry clients.

Overall Network Counts of COVID-19 and Vaccinated Patients

- COVID-19 patients identified by diagnosis code, lab results, or both
  - Global 3.4+ million
  - USA 2.7+ million
  - EMEA 599k+
- COVID-19 vaccinated patients identified by procedure code or medication (includes brand for both sources)
  - Global 3.4+ million
  - USA 3.2+ million
  - EMEA 178k+

COVID-19 Chart Abstracted Data

- Clinically enriched, regulatory-grade dataset from an in-depth retrospective medical records review on a sample of US hospitalized COVID-19 patients.
- Randomly selected medical records from patients who were hospitalized with lab-confirmed COVID-19 infection and had at least 29 days of follow-up post-admission
- Data Elements – mortality (date/cause of death), medications, treatment procedures, chest radiology, medical encounters, symptoms and complications
- 409 patient charts from HCOs who are in the TriNetX network
  - Mean age 62.5 years old
  - 57% male
  - 17 unique labs collected, average of 14.4 unique labs per patient during enrollment
  - Mean 5.6 chest x-rays per patient with 5.3 having abnormal results
  - 21% patients died during data collection window, 70% of deaths attributed to COVID-19

Publication Activity Across TriNetX Users

- 43 abstracts, 117 articles, including authors from academic or clinical institutions, representing over 100 different healthcare institutions
- 6 abstracts, 4 articles including co-authors from 8 companies

Investigating COVID-19 Outcomes in TriNetX

- Matched analysis of severe vs. non-severe COVID-19 patients comparing inpatient admissions within 1 month following infection
  - Severe patients had 4x risk of hospitalization post-infection compared to non-severe patients
  - Severe patients also had longer hospital stays compared to non-severe COVID patients

Durability of Pfizer mRNA COVID-19 Vaccine Against Omicron-Related Emergency Department (ED) and Hospital Admission in a Large US Health System

Sara Y. Tartof, PhD, Kaiser Permanente Department of Research & Evaluation

The summary of Dr. Tartof presentation is being withheld pending publication of results. Once the results are published, the summary will be made public.

Data Visualization of the Week

Amar Bhat, PhD, Reagan-Udall Foundation for the FDA

- Figure from WHO's dashboard of interactive data visualizations showing the number of doses of each vaccine for COVID-19 procured globally.