COVID-19 Vaccine Safety
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Safety is not the absence of risk…. it is an acceptable balance of benefits and risks.
2 Independent Advisory Committees Review Safety

Vaccines and Related Biological Products Advisory Committee (VRBPAC)

- To provide advice to the Commissioner of FDA
- To evaluate data concerning safety, effectiveness and appropriate use of vaccines...for which the FDA has regulatory responsibility.

Advisory Committee on Immunization Practices

- To provide advice and guidance to the Director of the CDC
- To provide recommendations on use of vaccines in the U.S. civilian population based on disease epidemiology, vaccine safety, vaccine efficacy and effectiveness, quality of evidence reviewed, economic analyses, and implementation issues.
ACIP - Vaccine Safety

• Vaccine safety data is *routinely* considered by ACIP workgroups and the role of ACIP is to deliberate about benefit-risk balance and recommendations for use

• ACIP is *routinely* updated on post-market safety and effectiveness data for vaccines, and modifies recommendations as needed

• For COVID-19 vaccines, a separate safety group was assembled in June 2020 to support the COVID-19 Vaccine Workgroup and the full ACIP on the safety of COVID-19 vaccines in development and post-authorization or post-licensure
COVID-19 Vaccine Safety Technical (VaST) Subgroup

- ACIP members
  - Grace Lee
  - Beth Bell
  - Keipp Talbot
- Consultants
  - Ed Belongia
  - Matthew Daley
  - Kathy Edwards
  - Martin Kulldorff
  - Laura Riley
  - Stanley Perlman
  - Vish Viswanath

- CDC Lead
  - Tom Shimabukuro
- Ex Officio Members
  - CDC
  - FDA
  - DoD
  - VA
  - IHS
  - HRSA
  - HHS
  - NIH
  - BARDA
VaST - Terms of Reference
-As of May 2020

Serve as the central hub for technical subject matter experts to:

1) Review and interpret pre-authorization/pre-licensure SARS-CoV-2 vaccine candidate safety data
2) Review and interpret post-authorization/post-licensure SARS-CoV-2 vaccine safety data
3) Provide advice and guidance on presenting post-authorization/post-licensure SARS-CoV-2 vaccine safety data to the COVID-19 Vaccines Work Group, the full ACIP, and the general public
COVID-19 Vaccine Safety Planning
VaST Meetings

Jun 8
Kickoff Meeting

Jul 2
Global safety initiatives

Aug 3
CMS, FDA

Aug 31
NHSN, V-SAFE

Jun 22
VAERD overview

Jul 20
VAERS, VSD CISA

Aug 17
VA, DOD, IHS

Sep 14
Communication framework
Key Statements

1. Should safety monitoring for Phase III clinical trials be harmonized (e.g. definitions for AESIs, duration of follow-up)?

**YES, critical for timely evaluation**

- Can *combine* data, if appropriate; maximizes sample size for any given adverse event of special interest (AESI)
- Can *compare* safety across different vaccine platforms and trials, if appropriate; enables dynamic assessment of benefit-risk balance
- Harmonizing with international standards (e.g. Brighton) is preferred

Similar to FDA guidance on COVID-19 vaccine efficacy, FDA guidance needed on vaccine safety standards
COVID-19 Clinical Trials and Vaccine Safety

• COVID-19 clinical trials in progress or planned include 30,000-50,000 participants per trial
  • Trials are designed for efficacy, but can also be designed for safety, if sufficient follow-up is allowed (e.g. rotavirus vaccine trials*)

• Minimum duration of follow-up needed to assess safety (i.e. benefit-risk balance) depends on the types of adverse events and associated risk intervals

*Heyse et al., Clin Trials 2008
2. Should safety monitoring for post-authorization or post-licensure safety surveillance systems be harmonized?

**YES, critical for timely evaluation**

- Common protocols, outcome definitions, risk windows, and approaches to severity grading can support rapid evaluation of statistical signals
- However, different systems have different capabilities; may need to align, rather than harmonize

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**Capability for timely evaluation of statistical signals is crucial for vaccine confidence**

**Coordination across post-market safety surveillance systems is recommended**

*Salmon et al., Pediatrics, 2011*
Near real-time safety surveillance systems – designed for sensitivity

<table>
<thead>
<tr>
<th>Statistical signals should be expected in a robust monitoring program</th>
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<tbody>
<tr>
<td><strong>Syndromic Surveillance in 4 states</strong></td>
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<tr>
<td>• 62 alerts corresponding to 17 distinct signals</td>
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<tr>
<td>• 2 <em>true</em> clusters of illness detected</td>
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<tr>
<td><strong>Vaccine Safety Datalink experience</strong></td>
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<tr>
<td>• 5 vaccines monitored for 5-7 AESIs each</td>
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<tr>
<td>• 10 <em>statistical</em> signals occurred</td>
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<tr>
<td>• 9 were spurious</td>
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<tr>
<td>• 1 was a <em>true</em> signal that led to a revised ACIP rec for MMRV vaccine</td>
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Timely and thorough investigations of statistical signals are needed to distinguish *true* associations

Yih et al., Public Health Rep, 2010; Yih et al., Pediatrics 2011
Adverse Events of Special Interest (AESI)

General AESI

Platform-specific AESI
- mRNA
- Viral vector
- Adjuvanted
- Etc.

Population-specific AESI
- Children
- Pregnant women
- Elderly
- Multiple co-morbidities

*Safety Platform for Emergency Vaccines (SPEAC) classification of AESI*
VaST Transition Plans
- As of Sept 2020

Pre-authorization or Pre-licensure

- Discuss prioritized AESI, including standardized definitions (e.g. Brighton), risk intervals, severity grading
- Discuss common protocols for enhanced passive surveillance and active surveillance
- Discuss approaches to signal refinement and signal evaluation
- Review and refine membership of data review group

Post-authorization or Post-licensure

- Prospectively review, evaluate and interpret post-authorization or post-approval vaccine safety data from
  - Ongoing clinical trials
  - Passive, enhanced passive and active surveillance systems
- Advise on signal refinement and signal evaluation
- Advise on data presentation to ACIP and public
6 conditions for success

1) Ability to capture vaccine exposure in vaccine safety surveillance systems
2) Ability to define background rates in general population and among those with COVID-19 disease
3) Minimize conflicts of interest among members of the data review group
4) Shared review and shared learning across all vaccine safety surveillance systems
5) Ability for data review group to discuss findings independently
6) Well-developed communication plan on safety issues
We have designed our systems to detect safety signals; it’s how we collectively handle those signals that will define our country’s ability to respond to COVID.