FDA Updates of COVID-19 Vaccine Safety Activities

Vaccines and Related Biological Products Advisory Committee
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FDA - Center for Biologics Evaluation and Research (CBER)
US Vaccine Surveillance Programs: Post-Authorization

Passive Surveillance of Vaccines

a. Vaccine Adverse Event Reporting System (VAERS)
   • Management shared by CDC and FDA
   • Discussed by Dr. Shimabukuro - CDC
FDA Vaccine Active Surveillance Programs: Post-Authorization

Active Surveillance Monitoring Programs

a. FDA-CMS Medicare data: Claims data
b. FDA BEST system: Claims and EHR data
FDA-CMS Medicare Data: Active Surveillance

Federal Partners

– Data cover very large population of approximately 34 million elderly US beneficiaries > 65 years of age

– >92% of US elderly use Medicare

– Consists of claims data with access to medical charts
FDA BEST: Active Surveillance
Biologics Effectiveness and Safety Initiative

• Use of claims data for Vaccine Safety:
  • 3 major partners – Optum, CVS Health, HealthCore

• Emphasis on detection of rare vaccine adverse events (<1/100,000 doses)
<table>
<thead>
<tr>
<th>Data Source (Claims)</th>
<th>Update Frequency</th>
<th>Number of Patients Covered, Millions (National)</th>
<th>Status of Rapid Cycle Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS</td>
<td>Daily</td>
<td>105</td>
<td>Initiated early March</td>
</tr>
<tr>
<td>Optum* (Pre-Adjudicated)</td>
<td>Bi-Weekly</td>
<td>22</td>
<td>Initiated mid-May</td>
</tr>
<tr>
<td>CVS Health*</td>
<td>Monthly</td>
<td>26</td>
<td>Initiation: 1&lt;sup&gt;st&lt;/sup&gt; week of June</td>
</tr>
<tr>
<td>HealthCore*</td>
<td>Monthly</td>
<td>76</td>
<td>Initiation: 3&lt;sup&gt;rd&lt;/sup&gt; week of June</td>
</tr>
</tbody>
</table>
## FDA Near Real-Time Surveillance
### COVID-19 Vaccine Dose Totals
#### CMS + BEST Claims Databases

<table>
<thead>
<tr>
<th>Databases</th>
<th>Pfizer</th>
<th>Moderna</th>
<th>Janssen</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CMS</strong> (data cutoff: 05/22/2021)</td>
<td>8,630,677</td>
<td>8,815,039</td>
<td>309,315</td>
</tr>
<tr>
<td><strong>Optum</strong> (Pre-adjudicated) (data cutoff: 05/17/2021)</td>
<td>1,971,547</td>
<td>1,178,754</td>
<td>129,369</td>
</tr>
<tr>
<td><strong>CVS Health</strong> (data cutoff: 04/30/2021)</td>
<td>1,648,417</td>
<td>1,122,970</td>
<td>104,267</td>
</tr>
<tr>
<td><strong>HealthCore</strong> (data cutoff: 05/31/2021)</td>
<td>3,508,200</td>
<td>2,507,711</td>
<td>214,111</td>
</tr>
</tbody>
</table>

*65+ years
FDA COVID-19 Vaccine Safety Signal Detection

Conducting “Near real-time surveillance” of 16 safety outcomes of interest:

• Approach used by US government agencies for H1N1 Monitoring in 2009 & 2010

• Approach routinely used by FDA and CDC annually for vaccines
### FDA Near Real-Time Surveillance of COVID-19 Vaccines

#### Working list of at least 16 possible adverse events of special interest (AESI)

<table>
<thead>
<tr>
<th>Acute myocardial infarction</th>
<th>Bell’s Palsy</th>
<th>Narcolepsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaphylaxis</td>
<td>Encephalomyelitis</td>
<td>Non-hemorrhagic Stroke</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>Guillain-Barré syndrome</td>
<td>Pulmonary Embolism (PE)</td>
</tr>
<tr>
<td>Disseminated intravascular coagulation (DIC)</td>
<td>Hemorrhagic Stroke</td>
<td>Transverse Myelitis</td>
</tr>
<tr>
<td>Deep Vein Thrombosis (DVT)</td>
<td>Myocarditis/Pericarditis</td>
<td>Immune thrombocytopenia (ITP)</td>
</tr>
<tr>
<td></td>
<td>Thrombosis with Thrombocytopenia</td>
<td></td>
</tr>
</tbody>
</table>
Data Coverage of US population

• US government-wide approach provides advantages in covering broader portion of US population

• Primary coverage by three age stratifications

  – ≥ 65 years: FDA-CMS (VSD, VA, BEST)
  – 18 - 64 years: VSD, VA, BEST
  – ≤17 years: VSD, BEST
## FDA BEST Data Coverage of US population:

### Pediatric Population: Number of Enrollees from January 2021-Present

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Age &lt; 12 years</th>
<th>Age 12-17 years</th>
<th>Age 18-64 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVS Health</td>
<td>2,209,147</td>
<td>1,320,594</td>
<td>12,562,033</td>
</tr>
<tr>
<td>Optum (Pre-adjudicated)</td>
<td>1,943,993</td>
<td>1,149,942</td>
<td>10,613,669</td>
</tr>
<tr>
<td>HealthCore</td>
<td>2,688,839</td>
<td>1,694,841</td>
<td>15,630,314</td>
</tr>
</tbody>
</table>
## Initial Results Myocarditis/Pericarditis
Near Real-Time Surveillance in BEST and CMS

<table>
<thead>
<tr>
<th>Database</th>
<th>Vaccine</th>
<th>Vaccine Doses</th>
<th>Myocarditis/Pericarditis Events after Vaccination (42 days risk interval)</th>
<th>Safety Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CMS, ages ≥65 years</strong> (data through 5/22)</td>
<td>Pfizer-BioNTech</td>
<td>8.6 M</td>
<td>636</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Moderna</td>
<td>8.8 M</td>
<td>601</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Janssen</td>
<td>0.31 M</td>
<td>23</td>
<td>No</td>
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## Initial Results Myocarditis/Pericarditis Near Real-Time Surveillance in BEST and CMS

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</thead>
<tbody>
<tr>
<td>Optum Pre-adjudicated, ages 12-64 years (data through 5/17)</td>
<td>Pfizer-BioNTech</td>
<td>1.9 M</td>
<td>63</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Moderna</td>
<td>1.1 M</td>
<td>32</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Janssen</td>
<td>0.13 M</td>
<td>4</td>
<td>No</td>
</tr>
</tbody>
</table>
Next Steps

Epidemiological Studies to follow up on potential signals identified by VAERS and Near Real-Time Surveillance:

- Study Protocols – inferential studies, SCRI, cohort analyses, etc.
  - To follow CVST/TTS and Myocarditis/Pericarditis
  - Focus on subpopulations – pediatric, pregnant persons, elderly and residents of long-term care facilities, comorbidities, etc.
Acknowledgments

- Richard Forshee
- Azadeh Shoaibi
- Hui-Lee Wong
- CBER Surveillance Team
- Manette Niu
- CBER OBE Colleagues
- CDC Colleagues
- CMS Colleagues
- VA Colleagues
- FDA Partners: Acumen, IBM Watson – and new partners in FY2021
Thank you!

Questions?
RESERVE SLIDES
FDA BEST COVID-19 Vaccine Protocols

1. Background Rates of Adverse Events of Special Interest for COVID-19 Vaccine Safety Monitoring Protocol


Learn More on BEST’s Vaccines and Allergenics website
Through multiple contracts and partnerships, CBER works with a diverse group of scientists and clinicians to conduct active surveillance.

Note: CERSI: Centers of Excellence in Regulatory Science and Innovation