Safety Monitoring of COVID-19 Vaccines
FDA BEST Initiative

2022 OHDSI Symposium
October 14, 2022

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FDA CBER
Active Surveillance Program Collaborative

Biologics Effectiveness and Safety (BEST) Initiative

Federal Partners
- Veterans Administration (VA)
- Centers for Medicare and Medicaid Services (CMS)
- Centers for Disease Control and Prevention (CDC)
- Academic Partners

Academic Partners
- Acumen
- Columbia University & OHDSI
- IBM
- RTI
- Aetna
- CVS Health
- United Health Group (UHG)
- Optum
- Anthem HealthCore/IQVIA
- Columbia University & OHDSI
- IBM
- RTI
- Aetna
- CVS Health
- United Health Group (UHG)
- Optum
- Anthem HealthCore/IQVIA
## BEST Data Sources

### BEST Initiative Data Source*

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Database Type</th>
<th>No. Patients Covered (Millions)</th>
<th>Time Period Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS – Medicare</td>
<td>Claims</td>
<td>105</td>
<td>2005 - present</td>
</tr>
<tr>
<td>MarketScan Commercial and Medicare Supplemental</td>
<td>Claims</td>
<td>254</td>
<td>1999 - 2019</td>
</tr>
<tr>
<td>MarketScan Medicaid</td>
<td>Claims</td>
<td>48</td>
<td>1999 - 2019</td>
</tr>
<tr>
<td>Blue Health Intelligence</td>
<td>Claims</td>
<td>33.6</td>
<td>2012 - present</td>
</tr>
<tr>
<td>Optum – Adjudicated</td>
<td>Claims</td>
<td>66</td>
<td>1993 - present</td>
</tr>
<tr>
<td>Optum – Pre adjudicated</td>
<td>Claims</td>
<td>22</td>
<td>2017 - present</td>
</tr>
<tr>
<td>HealthCore</td>
<td>Claims</td>
<td>76</td>
<td>2006 - present</td>
</tr>
<tr>
<td>CVS Health</td>
<td>Claims</td>
<td>26</td>
<td>2014 - present</td>
</tr>
<tr>
<td>OneFlorida Clinical Research Consortium – Medicaid</td>
<td>Claims</td>
<td>6.7</td>
<td>2012 - present</td>
</tr>
<tr>
<td>OneFlorida Clinical Research Consortium – EHR</td>
<td>EHR</td>
<td>5.6</td>
<td>2012 – present</td>
</tr>
<tr>
<td>Optum EHR</td>
<td>EHR</td>
<td>102</td>
<td>2007 - 2020</td>
</tr>
<tr>
<td>MedStar Health Research Institute</td>
<td>EHR</td>
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</tr>
<tr>
<td>PEDSnet</td>
<td>EHR</td>
<td>6.2</td>
<td>2009 - present</td>
</tr>
<tr>
<td>IBM CED</td>
<td>Linked EHR Claims</td>
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<td>2000 - present</td>
</tr>
<tr>
<td>OneFlorida Clinical Research Consortium – Linked EHR Claims</td>
<td>Linked EHR Claims</td>
<td>1.5</td>
<td>2012 - present</td>
</tr>
</tbody>
</table>

*Data lag varies for different databases from a few days to a few months.*
COVID-19 Vaccines Safety Signal Detection

https://bestinitiative.org/vaccines-and-allergenics

BEST Program website provides the active monitoring master protocol and related addendums.
COVID-19 Vaccine Safety Monitoring

- FDA-CMS Medicare
  - >92% of US elderly use Medicare
  - Data cover very large population of >50 million US beneficiaries > 65 years of age
  - Consists of claims data with access to medical charts

- FDA Biologics Effectiveness and Safety (BEST) Initiative
  - Use of commercial claims data for vaccine safety:
    - 3 major partners: Optum, CVS Health, HealthCore
  - Data includes individuals aged 0 – 64 years
  - Emphasis on detection of rare vaccine AEs (<1/100,000 doses)
# COVID-19 Vaccine Safety Monitoring

## List of Potential Adverse Events*

<table>
<thead>
<tr>
<th>Adults</th>
<th>Pediatrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Myocardial Infarction (AMI)</td>
<td>Acute Myocardial Infarction (AMI)</td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>Anaphylaxis</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>Appendicitis</td>
</tr>
<tr>
<td>Disseminated Intravascular Coagulation (DIC)</td>
<td>Disseminated Intravascular Coagulation (DIC)</td>
</tr>
<tr>
<td>Deep Vein Thrombosis (DVT)</td>
<td>Deep Vein Thrombosis (DVT)</td>
</tr>
<tr>
<td>Bell’s Palsy</td>
<td>Bell’s Palsy</td>
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<tr>
<td>Encephalomyelitis/Encephalitis</td>
<td>Encephalomyelitis/Encephalitis</td>
</tr>
<tr>
<td>Guillain-Barré Syndrome (GBS)</td>
<td>Guillain-Barré Syndrome (GBS)</td>
</tr>
<tr>
<td>Hemorrhagic Stroke</td>
<td>Hemorrhagic Stroke</td>
</tr>
<tr>
<td>Myocarditis/Pericarditis</td>
<td>Myocarditis/Pericarditis</td>
</tr>
<tr>
<td>Narcolepsy</td>
<td>Narcolepsy</td>
</tr>
<tr>
<td>Non-hemorrhagic Stroke (NHS)</td>
<td>Non-hemorrhagic Stroke (NHS)</td>
</tr>
<tr>
<td>Pulmonary Embolism (PE)</td>
<td>Pulmonary Embolism (PE)</td>
</tr>
<tr>
<td>Transverse Myelitis</td>
<td>Transverse Myelitis</td>
</tr>
<tr>
<td>Immune Thrombocytopenia (ITP)</td>
<td>Immune Thrombocytopenia (ITP)</td>
</tr>
<tr>
<td>Thrombosis with Thrombocytopenia Syndrome (TTS) (unusual, common site)</td>
<td>Thrombosis with Thrombocytopenia Syndrome (TTS) (unusual, common site)</td>
</tr>
</tbody>
</table>

* These AESIs have not been associated with COVID-19 vaccines based on available pre-licensure evidence.
COVID-19 Vaccine Safety Monitoring
Signal detection and/or Rapid Cycle Analysis (RCA)

- Primary series RCA (Medicare ≥ 65 years); initiation date: Feb 2021
- Primary series RCA (12-64 years); initiation date: Jun 2021
- Primary series pediatric RCA (6 month-17 years); initiation date: Jun 2022
- Monovalent Booster Analysis (Medicare ≥ 65 years); initiation date: Mar 2022
- Monovalent Booster Analysis (18-64 years); initiation date: Jun 2022
- Bivalent Booster RCA; initiation date: Nov 2022
COVID-19 Vaccine Safety Monitoring
Signal evaluation and/or fully adjusted studies

- Vascular outcomes, primary series, self-controlled design; completion date: Aug 2022
- Myocarditis/pericarditis; completion date: Dec 2021
- Monovalent Booster Self-Controlled Case Series (SCCS); In progress
COVID-19 Vaccine Safety Studies

Key outcomes and communication

Vascular outcomes (RCA)¹

- Four potential AESIs detected
- Adults 65 years and older
- Post-vaccination with Pfizer-BioNTech COVID-19 vaccines
- FDA safety communication – Jul 2021

Myocarditis/Pericarditis²

- Potential signal in young, male adults
- Post-vaccination with mRNA COVID-19 vaccines
- Study completion – Dec 2021

RCA in adolescents and adults aged 12-64 years³

- 17 outcomes monitored in 3 databases
- Myocarditis/pericarditis signaled in 2 of 3 databases
- Anaphylaxis signaled in all databases
- Study completion – Apr 2022

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2. Wong, Hui-Lee et al., Risk of myocarditis and pericarditis after the COVID-19 mRNA vaccination in the USA: a cohort study in claims databases. The Lancet, Volume 399, Issue 10342, 2191 – 2199
Thank you

Website: https://bestinitiative.org/
Email: fdabest@fda.hhs.gov