Tracking COVID-19 Vaccines: U.S. Data Systems and Related Issues

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The U.S. Food and Drug Administration (FDA) has granted Emergency Use Authorizations (EUAs) for two Coronavirus Disease 2019 (COVID-19) vaccines, sponsored by Pfizer-BioNTech and Moderna, and millions of vaccine doses are being distributed nationwide. Both vaccines require two doses, which are generally not interchangeable. Key to this effort, several existing and new data systems are in use to track, specifically,

- **where the vaccines supply is:** for example, whether vaccines are in a storage center or at a provider site, through the Vaccine Tracking System (VTrckS);

- **who has received a vaccine:** that is, recipients who have received one or both doses of which vaccine, through jurisdiction-based Immunization Information Systems (IIS); and

- **if any new safety issues occur:** several monitoring systems aim to identify new safety issues and inform public health recommendations or FDA actions.

The federal government has long supported data capabilities for vaccines, primarily through the Centers for Disease Control and Prevention (CDC). As with public health data generally, vaccine data systems use both federal and nonfederal (e.g., state-based) systems. For a number of years, 64 state, territorial, and local jurisdictions have received Immunization Cooperative Agreements (commonly referred to as "Section 317 grants") administered by CDC. Among other functions, this flexible grant program has supported implementation of VTrckS for vaccine supply tracking and IISs for vaccine recipient tracking.

IISs (commonly referred to as immunization registries) enable both (1) consolidated immunization histories for a given individual, and (2) tracking of administered vaccines across the population. IISs also aid with vaccine reminders, including second-dose reminders. Most, but not all, jurisdictions have had IISs. New Hampshire created one for the COVID-19 vaccination program.

Recent reports indicate gaps in vaccine recipient data. Policy issues related to vaccine data have been highlighted for many years. Inadequate immunization history data and limitations with cross-jurisdictional data sharing have hindered prior public health emergency response efforts. In addition, existing vaccine data systems, like other public health data systems, sometimes use outdated technology or processes.

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To mitigate these and other issues for COVID-19 vaccine distribution, several federal efforts have aimed to create, improve, and integrate vaccine data systems, including the following:

- the Vaccine Administration Management System (VAMS) for managing vaccine clinics and allowing providers without existing capabilities to report to CDC and IISs,
- an IZ Data Clearinghouse to encrypt and store data shared by IISs with CDC,
- an Immunization Data Lake to enable data summaries and analytics of both supply and recipient data, and
- Tiberius, a platform to integrate all types of vaccine data for use by federal agencies and the 64 jurisdictions to manage their vaccine programs.

This Insight presents data systems in use at the time of publication that may be subject to change. They represent a mix of systems that predate the COVID-19 pandemic and systems developed specifically for pandemic response. The Biden Administration has identified improving vaccine data systems a part of its pandemic strategy; goals are broad at this time.

Implementation

State and territorial public health officials have voiced concerns about inadequate pilot testing of new systems. Other new data systems implemented during the pandemic, such as those for hospital data, have also faced implementation challenges.

CDC requires COVID-19 vaccine providers to report several types of data, including daily supply to VaccineFinder and daily recipient data (including demographic information) to IIS, which then report to CDC within 72 hours of vaccine receipt. Resource constraints may have hindered jurisdictional public health programs' ability to implement new systems and reporting procedures. New funding—both broad immunization and data-sharing specific grants—may help address this, though it is unclear if funding can be leveraged in time for wider vaccine availability. Surges in COVID-19 hospitalizations may also affect public health and health care resources available to implement new systems and report new data types.

Privacy, Data Sharing, and Integration

Limitations with cross-jurisdictional immunization data sharing have affected prior public health emergency responses. To address this, some personally identifiable information (PII) on recipients is to be collected, encrypted, and secured in CDC's IZ Data Clearinghouse to enable data sharing between jurisdictions and federal agencies through the IZ Gateway. (CDC typically collects de-identified data. PII held by CDC and other federal agencies is generally subject to the Privacy Act of 1974 [5 U.S.C. §552a]). Submitted data are encrypted with "privacy-preserving record linkage (PPRL)," where PII is redacted and replaced with unique tokens that allow for records sharing without PII.

State and territorial public health officials have expressed concern that "many states have laws prohibiting or limiting data sharing with other entities, including the federal government." As communicated to CRS by CDC, all 64 jurisdictions have signed data-sharing agreements with CDC that respond to jurisdictions' unique concerns; CDC is still in the process of rolling out PPRL, and it has not been implemented in jurisdictions at this time.

Combining different data types (e.g., both supply and recipient data) through the Immunization Data Lake and Tiberius can enable program monitoring and decisionmaking at the federal and subfederal levels. Given that these systems are new, their implementation and usefulness for jurisdictions remains to be seen.

Availability and Communication

CDC publishes aggregate vaccine data in its Data Tracker. HealthData.gov maintains datasets for Moderna and Pfizer vaccine allocations by jurisdiction. It is unclear what additional vaccine data may be made available to the public; the Biden Administration has made expanding publicly available datasets a key goal.

For safety data, commentators have noted that timely and accurate public information on newly identified safety issues linked to the vaccines is important. CDC's recent press briefing on severe allergic reactions linked to the vaccines highlighted this.

Locating Providers and Vaccination Sites

There is no one federal system for patients to access information on where to get vaccinated. The VaccineFinder is intended to help patients locate providers when vaccines are more widely available, though providers are not required to make their information publicly available. Some jurisdictions use VAMS to manage vaccine appointments. For mass distribution events, some states have turned to unofficial platforms for promotion; some fraudulent event listings have been posted on these sites. The Biden Administration pandemic response plan mentions vaccination appointment scheduling technology as a part of its data improvement goals.

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