Kentucky uses immunization registry bulk import to detect breakthrough cases and vaccine hesitancy

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Although Kentucky Department for Public Health (KDPH) had integrated their immunization system with their disease surveillance system, querying had to be done manually for each individual case. This proved burdensome, so KDPH implemented an automated querying process to bulk import and associate vaccines to cases. This helped to more quickly and accurately detect breakthrough cases of COVID-19. This bulk import feature was also leveraged to support the mpox response and is being evaluated for more broad use across reportable conditions.

The "What"

As soon as the first COVID-19 vaccines were distributed during the pandemic, it became imperative to integrate immunization registry and disease surveillance systems. In 2021, the Kentucky Department for Public Health (KDPH) integrated their instance of the National Electronic Disease Surveillance System (NEDSS) Base System (NBS) with the KY Immunization Registry (KYIR) to allow for manual query of vaccination records by end users for each case. This quickly become

burdensome on end users (disease investigators, public health nurses, and epidemiologists), so the Kentucky informatics/NBS team established a contract with the NBS vendor team to develop a process that allows for the NBS to conduct an automated query of KYIR for vaccination records and associate those records with investigations created in NEDSS. This process would hopefully reduce burden of manual queries and allow for custom configurations for each condition, providing a great deal of flexibility.

The "So What"

After the initial implementation of this automated querying process, KDPH was able to quickly acquire vaccination records from KYIR via multiple mechanisms (manual query, manual entry, automated bulk import). Bulk import was found to reduce the burden of manual entry and query burden and resulted in more complete data on vaccinations during disease investigations.

Prior to bulk import functionality, an average of 200 COVID-19 vaccine records per month were electronically imported via manual query. After bulk import functionality went live, an average of 8,311 COVID vaccine records per month were electronically imported via manual and bulk query – an average change of 4055.5%.

This also resulted in faster and more accurate detection of breakthrough cases of COVID-19, which was shared with Centers for Disease Control and Prevention (CDC) to help evaluate vaccine effectiveness. This process also allowed for more complete reporting of COVID-19 case vaccination status to CDC by sending these data elements through the full COVID-19 Message Mapping Guide (MMG). This method of bulk import was subsequently utilized during the mpox outbreak response to link case investigation data to JYNNEOS vaccination data for understanding areas of vaccination hesitancy. Finally, because this enhancement was made in NBS, it can hopefully be shared in the future to all NBS jurisdictions (about half of those in the U.S.) for their use.

The "Now What"

The KDPH informatics/NEDSS teams are working with the NBS vendor team to expand on this functionality to further improve vaccination record completeness on disease investigations. Both teams are currently testing KYIR bulk import phase 2 that will allow for integration of this enhancement independent from the core NBS code, leading to easier implementation and maintenance during system upgrades. Phase 2 will also incorporate user-defined timeframes for batch-processing, configuration of an investigation from date within the query, and the ability to re-query after the investigation is created. This will allow for vaccination records that do not yet exist in KYIR upon investigation creation to be added later based on configurations.

Key contributors to this project include NEDSS Technical Team, NBS Vendor Team, KDPH Informatics Team