Case Study

IQVIA Supports the CBER BEST Initiative

Surveillance system detected and evaluated a myocarditis/pericarditis safety signal with COVID-19 vaccines

Situation

The Biologics Effectiveness and Safety (BEST) Initiative is an active surveillance program run by the Center for Biologics Evaluation and Research (CBER) at the U.S. Food and Drug Administration (FDA). BEST monitors the safety of all CBER-regulated biologics — including vaccines, blood-derived products, human cells and tissue products, allergenics, gene therapies, and xenotransplantations (that is, use of non-human cells, tissues, or organs to treat medical conditions in people). The BEST initiative uses real-world data (RWD) to help inform CBER's regulatory decision making. In doing so, it leverages a federated data network of administrative insurance claims from multiple data partners. IQVIA Government Solutions participates in the BEST Initiative as a data partner and scientific advisor.

Challenge

Since the emergency use authorization of COVID-19 vaccines, CBER has monitored the rates of various adverse events of special interest (AESIs) following vaccination in near real time. Active monitoring of safety outcomes following COVID-19 vaccination provides early detection of rare outcomes not identified in pre-licensure trials. Thus, such monitoring is critical for ensuring vaccine safety. BEST active surveillance is key to CBER's ability to evaluate potential associations between vaccine exposure and AESIs. It also provides timely information to support regulatory decision-making processes.

Solution

IQVIA Government Solutions partners with several contributing commercial insurance data partners to provide administrative claims data to CBER for near-real-time health outcome surveillance.

Active monitoring started in 2021 for 17 AESIs following COVID-19 vaccinations among individuals aged 12-64 years. To monitor for potentially increased risk of AESIs following COVID-19 vaccination, IQVIA uses the Poisson Maximized Sequential Probability Ratio Test for sequential hypothesis testing. This test identifies safety signals by comparing the observed rate of each outcome to its control/historical baseline (that is, expected) rate. If a signal is detected, more extensive analyses are conducted to better understand the relationship between COVID-19 vaccination and the outcome.

PHASE 1: SIGNAL DETECTION	PHASE 2: SIGNAL EVALUATION
Myocarditis/pericarditis safety signal detected following both BNT162b2 and mRNA-1273 vaccination, occurring 1–7 days post-vaccination.	Retrospective cohort study in administrative claims data examining myocarditis/pericarditis observed vs. expected incidence and comparing rates of BNT162b2 to mRNA-1273 vaccines.

Results

IQVIA Government Solutions supported the BEST Initiative in conducting this study — one of the largest observational studies of individuals who have received mRNA vaccines in the United States at the time. Results were published in *The Lancet*, a peer-reviewed medical journal, on June 11, 2022.[1] What follows are highlights of the study's findings.

Across all data partners, a total of 411 myocarditis/pericarditis events were observed among 15,148,369 people aged 18-64 years who received 16,912,716 doses of BNT162b2 (the Pfizer-BioNTech COVID-19 vaccine) and 10,631,554 doses of mRNA-1273 (the Moderna COVID-19 vaccine).

The occurrence of myocarditis/pericarditis after receipt of each COVID-19 mRNA vaccine (BNT162b2 or mRNA-1273) was rare but increased compared with pre-COVID-19 background rates. The highest risk was among men aged 18-25 years after their second dose of either vaccine.

The results did not indicate a statistically significant difference in the risk of myocarditis/pericarditis between mRNA-1273 and BNT162b2. However, it should not be ruled out that a difference might exist.

Figure 1. Observed-to-expected (O/E) ratios of myocarditis/pericarditis in men in the first 1–7 days of receipt of any dose by age group and sex in three large health plan databases (DPs)

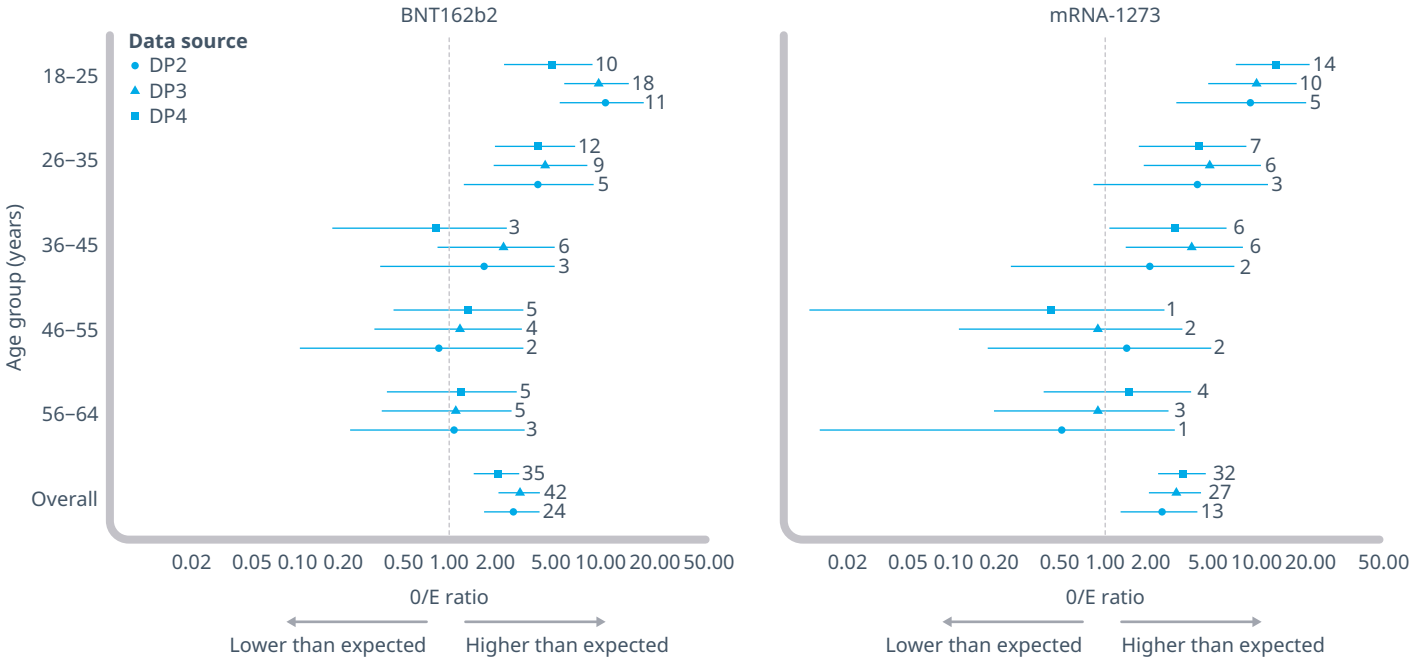

Figure 2. Direct head-to-head comparison of incidence rates of mRNA-1273 and BNT162b2 for myocarditis/pericarditis for men aged 18–25 years by type, dose number, and database

META-ANALYSIS	MRNA-1273	BNT162B2	MRNA-1273 VS BNT162B2	
	Incidence rate per 100k person-days (95% confidence interval)	Incidence rate per 100k person-days (95% confidence interval)	Incidence rate ratio (95% confidence interval)	Excess risk (Cases per million doses)
Any dose	1.27 (0.88 to 1.84)	0.88 (0.67 to 1.15)	1.43 (0.88 to 2.34)	27.80 (-21.88 to 77.48)
Dose 1	0.62 (0.35 to 1.10)	0.30 (0.17 to 0.53)	2.07 (0.91 to 4.71)	22.72 (-6.27 to 51.70)
Dose 2	2.17 (1.55 to 3.04)	1.71 (1.31 to 2.23)	1.25 (0.80 to 1.94)	32.20 (-33.90 to 98.30)

Ongoing collaboration

IQVIA's participation in this large observational study of COVID-19 vaccine safety is the latest in an ongoing collaboration with the BEST Initiative. IQVIA has supported the program since its inception in 2017. In addition to being a data partner (working with Carelon Research) and scientific advisor, IQVIA has served as a coordinating center and supported the program's innovative methods with its offerings of strong domain expertise in pharmacoepidemiology and drug safety, as well as data quality assessment services and access to distributed data networks.

[1] Wong et al; Risk of myocarditis and pericarditis after the COVID-19 mRNA vaccination in the USA: a cohort study in claims databases; Lancet; 2022; 399:2191-99