



COVID-19 Evidence Accelerator Collaborative

Diagnostics Evidence Accelerator #37

Thursday, October 7, 2021, 12-1 PM ET

Call Summary

Introduction to Diagnostics Evidence Accelerator Meeting #37

This week's Diagnostics Evidence Accelerator meeting consisted of 1 presentation:

1. NFL-NFLPA COVID-19 Monitoring Program (Dr. Christina Mack, IQVIA and Dr. Allen Sills, Dr. Gary Solomon, Emily Myers, and Dr. Erin Wasserman, NFL)

As always, thank you to all of the analytic partners, strategic advisors, and scientific advisors that are participating in Project One of Diagnostics Evidence Accelerator.

NFL-NFLPA COVID-19 Monitoring Program (Dr. Christina Mack, IQVIA and Dr. Allen Sills, Dr. Gary Solomon, Emily Myers, and Dr. Erin Wasserman, NFL)

Along with IQVIA, the National Football League Player Association (NFLPA) has been working to understand the pandemic to ensure that the players and staff can return to the game safely. NFLPA's continued daily testing of players and staff has allowed the researchers to create a large database to understand the pandemic and the effects that it has on its players and staff. Additionally, the continued collection of data has allowed the development of a plan for the safe return of players and staff for the 2021 season.

Diagnostics data in the real world is fragmented, however, the NFL-NFLPA program which began in July 2020 is patient centric diagnostics repository. Through this repository, researchers are able to make direct connection to a patient about diagnostic tests, vaccines, exposures, symptoms, and patient outcomes a patient experience. These outcomes are entered routinely into the database due to the daily testing conducted. By having a repository consisting of these outcomes provides the NFL-NFLPA an opportunity to view a complete patient profile in order to better understand diagnostics, vaccines, and transmission of the virus.

The COVID-19 monitoring program has three parts to the program: screening and testing; behavioral protocols; and contact tracing. The data is collected from 12,000 sources and there is complete follow up for all the individuals. The data is longitudinal real-world data (RWD). There is a daily curation of the database, updates of the rosters, and correction of the database, contact traces, and rapid analytic.

Screening and Testing:

During the 2020 seasons, there were over a million PCR tests that were performed among the 12,000 players and staff within the 32 teams. There were 6,500 individuals that were tested per week in the regular seasons. The samples were sent to three different labs. Half of the population's samples are run on a Roche Cobas machine. If the sample is positive, then it is run on a Hologic Panther Machine for confirmation. For 11 club or 30% of the population, samples are run on a Hologic Panther and rerun on a different Hologic Panther for confirmation. For six clubs or 20% of the population, samples are run on a ThermoFisher machine and rerun on the ThermoFisher for confirmation. All routine testing is conducted using a 24-hour COVID-19 Plasma Neutralizing Antibody (NAB) PCR test. Additionally, teams previously used Sofia Antigen Point of Care testing before switching to Mesa RT-PCR Point of Care test if same day results are needed.

Overall, the positivity rate among the population was 0.08. The low positivity rate is due to the testing and behavioral protocols that were put into place by the NFL to mitigate an outbreak. The positive predictive value (PPV) across the 3 machines at the beginning of the season was 73%-82%. Once labs saw high rates of false positives, then confirmatory tests were run to ensure a true positive result. This resulted the PPV to increase to 95%- 100%. Additionally, to account for viral shedding, recovered individuals were placed on a testing holiday for 90 days. However, if a player or staff had a clinical reason to get tested, then they were tested.

Ct values are used as an indicator for positive or negative result. On a Roche Cobas machine, the sample is deemed positive if the virus was detected within 40 spins. If the virus is not detected within the 41st spin, then the sample is considered negative. Additionally, if the virus is detected on the 10th spin, then it is assumed that there is a high viral load in the sample. If the virus is detected on the 39th spin, then it is assumed that there is a low viral load in the sample. The information that is gathered from Ct values proved to be beneficial when evaluating the player or staff. A high Ct value signified that that day could be the first day of infection for that individual, capturing early infection. This led the NFL to change their protocol for the 2021 season to include the Roche Cobas machine in all of their labs since it is able to provide a Ct value to capture early infections.

NFL/IQVIA used Sofia Antigen Point of Care test, however, they transitioned to using Mesa RT-PCR Point of Care test due to a high number of false positive results from the Sofia Antigen Point of Care test. The Sofia Antigen Point of Care test had a sensitivity of 57.7% and a false negative rate of 43% and a false positive rate of 34%. Due to the high rates of false positives and false negatives, NFLPA/IQVIA switched to using Mesa RT-PCR test. The Mesa RT-PCR test proved to be 100% accurate in the pilot program that was deployed within five teams. This accuracy led NFL/IQVIA to update their practice and switch to the Mesa RT-PCR test fully when same day testing was needed. Once fully launched, there were handful of times when there are false positives and false negatives, however, the numbers were lower compared to the Sofia Antigen Point of Care test.

Additionally, IQVIA conducted genomic sequencing on the positive samples to better understand if the positive cases were related to one another at a specific club or if there was transmission among clubs or communities. However, there is a low turnaround time due to the resources available in the US for genomic sequencing.

Screening and testing during the 2021 season are similar, but different. For the 2021 season, there is a greater push to have players and staff vaccinated. 93.5% of the players and 99% of the staff are vaccinated. Medical exceptions were given as needed. NFLPA/IQVIA continues to monitor why players or staff do not want to receive the vaccine. NFLPA has implemented policies for individuals that have not

received their vaccines to ensure that they are safe or say yes to the shot. These individuals have to get daily testing, wear a mask, and isolate when needed. To increase the vaccination rate, individual education sessions were held between players and national medical leaders to address questions about the vaccine. Also, there was a push to have team leaders receive their vaccine. These approaches are pivotal in increasing vaccination rates. With vaccination rate high, there is lower infection rate, however, there are some breakthrough cases emerging. Researchers are seeing higher infection rates among the individuals that are not vaccinated mirroring the national trend in the US. Screening for the 2021 season is reduced to weekly rather than daily since the majority of teams are vaccinated, however individuals that are not vaccinated must continue to get daily testing.

Behavioral protocols:

The behavioral protocols are similar to the 2020 season. The 2021 season has a greater focus on addressing the different variants such as the Delta variant. If individuals encounter a high-risk contact, they do not have to go into isolation, however, they do need to test daily, wear a mask, and have their symptoms monitored. If a team has multiple cases, they are placed in an enhanced mitigation protocol which is similar to the protocol put in place during the 2020 season.

Question/Answer:

- How were false positives defined?
 - The NFL's process is to do a full clinical adjudication. When a positive sample is rerun and it is negative, the NFL considered them potentially positive. The player or staff is linked with a clinician for evaluation and contact traced. Additionally, they are given a point of care test and tested every day after.
- Are there theories on why the staff rates were higher than the player rates?
 - There are more staff than players, therefore the rates were higher.
- Did individuals undergo a "non-recommended" vaccine schedules? Did anyone mix and match vaccines, receive only one dose of mRNA, or a booster/ 3rd dose?
 - Unsure about anyone mixing and matching vaccines, however, the results mirrored the US's results on the availability of vaccine. The researchers are seeing individuals that are taking the booster shot. Additionally, there are a small number of individuals that received one shot in combination with a diagnosis of a prior diagnosis.
- Is return to play for infected personnel based on time from onset or on testing?
 - CDC guidelines are followed if someone is infected. Since players and staff are tested often, the day of their first test is the symptom onset date. If a positive individual continuously tests negative, then those individuals are able to return.
- How are individuals with persistent noninfectious viral particle dealt with?
 - If someone tests positive, then they are allowed to opt out of testing for 90 days. It is possible to test positive after the 90-day mark. In order to ensure that the individual is okay to return to normal activities, they undergo the clinical adjudication process.
- Will genome sequencing continue? I wonder how the transmission/infection parameters you published (e.g. 15 min risk window) will change given vaccine or more infectious variants. Are you going to continue to collect data to answer questions related temporal and spatial factors for transmission/infection?
 - Genomic sequencing will continue to understand if there are clusters in certain clubs and what variants the positive samples are. Currently, when sequencing is conducted, 100% of

the results are Delta variant. This is an area that is important to look into for future pandemics.

Next Steps

- Continue making data connections through the Evidence Accelerator and through www.EvidenceAccelerator.org.

Next Meeting: Thursday, October 21, 2021 12-1 pm ET