Using Advanced Software to Speed Diagnostic Testing

Automating analytical data analysis enables significant increases in sample volume

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***Pallavi Upadhyay, PhD**, is the principal scientist for molecular diagnostics at HealthTrackRx. She joined the organization in 2015. In her present role, she oversees the development and implementation of diagnostic assays, associated laboratory workflow, and data analytics. She also leads the research and development, and scientific publication initiatives in the company. She recently coauthored a study detailing the bacterial and viral coinfections of COVID-19. Dr. Upadhyay holds a PhD in*

molecular biology from Texas Woman's University. Her professional interests include molecular microbiology, advanced data analytics, and scientific writing.

Pallavi Upadhyay, PhD

Q: CAN YOU TELL ME A LITTLE BIT ABOUT HEALTHTRACKRX?

A: HealthTrackRx is a molecular diagnostics company working mainly in the field of infectious diseases. We have an industry leading polymerase chain reaction (PCR)-based diagnostic platform for syndromic testing, which can test for multiple pathogens that might cause one set of symptoms in a single analysis. We also provide actionable antibiotic stewardship for doctors and patients. We have a comprehensive menu that covers a wide range of the most common infections. In addition, at the start of pandemic in 2020, we launched our emergency use authorization (EUA) approved COVID-19 PCR testing.

Q: WHAT TYPES OF DATA-RELATED CHALLENGES DOES YOUR LAB FACE?

A: Traditionally, all of our results are analyzed and approved by analysts, all of whom have earned MS or PhD degrees. Despite the power of instrument software, highly experienced scientists can still interpret some aspects of complex data more accurately than the computer. This has ensured the high quality and accuracy of our reports but put a very tight constraint on our turnaround times. This challenge became more apparent during the pandemic when our sample volume increased dramatically and the timely analysis and reporting for such large numbers became more challenging, even for our highly trained team of analysts.

Q: HOW WERE YOU ABLE TO MAINTAIN YOUR TURNAROUND TIMES DURING THE PANDEMIC?

A: At the height of the pandemic, we were performing more than 45,000 tests per day in our main lab in Denton, TX. By a conservative estimate, within a span of few months, our sample volume grew almost six-fold. To maintain our turnaround time commitments on results, we had to increase our pool of data analysts and implement a number of automation features in our LIMS. Key improvements came from automatically entering data into the software, rather than manual entry, and networking effectively with local colleges and universities to attract more trained scientists.

Q: WHAT WAS THE PRIMARY CHALLENGE THAT INITIALLY PROMPTED YOU TO CONTACT INDIGO BIOAUTOMATION? HOW DID THEIR ARQ ANALYSIS SOFTWARE HELP?

A: HealthTrackRx pivoted very quickly during the early days of the pandemic and launched its own EUA approved test, which drove an unprecedented increase in volume. However, we found ourselves refusing business because we needed to maintain our standards of quality and our promised turnaround time of 24-36 hours. This led to us developing a number of semi-automated in-house solutions and hiring more scientists and analysts. The burden of training new team members and at the same time trying to maintain our result quality and turn-around time led us to approach Indigo BioAutomation.

The ARQ software is a release automation system for real-time, quantitative PCR testing. Its biggest impact has been reducing the time spent on analysis and reporting of results. With no compromise in the accuracy and quality of the analysis, we have observed a 50-60 percent reduction in the time spent on data analysis.

Q: HOW DO YOU PLAN TO FURTHER IMPROVE YOUR LABORATORY'S DATA ANALYSIS AND MANAGEMENT IN THE FUTURE?

A: At present, the ARQ system has been employed for our COVID-19 analysis and reporting. However, lab leadership is now looking into automation-based analysis for other test offerings which includes the highly multiplexed syndromic panels. We anticipate the future will bring smaller, more specific panels to analyze.