

Whole Genome Sequencing Mandate and the Need for Electronic Ordering Capabilities in Colorado

Innovations in Informatics: Laboratory Success Stories

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The situation

In the midst of the COVID-19 pandemic, Colorado's governor issued a mandate requiring the public health laboratory to perform whole genome sequencing (WGS) on every single positive molecular test in the state. While an important advancement in surveillance for COVID-19, this placed an incredible burden on medical providers submitting orders as well as the lab staff receiving them. Providers were already reporting positive cases to the ELR team via a direct connection through patients' electronic medical record, but the laboratory had no way of electronically accessing that data. In short, providers had to fill out and manually submit a paper requisition form to the lab staff to process for WGS, and the lab staff then had to manually enter the data from the form into their LIMS. It was a case of double data entry for everyone involved during a time when the volume of data was already nearly insurmountable.

Additionally, because the providers were submitting paper order forms to the lab they often left out critical pieces of information (as opposed to electronic ability to require fields, etc) or included typos, standard human error elements. And because the data they submitted via the ELR and then via the paper requisition form didn't align all of the time, patient matching in the end was not possible and there were several results essentially lost. The onus was on the laboratory to try and fill in data gaps, or, more often than not, for the sake of time, forego and move to the next.

The status quo at the lab was not sustainable. The time being spent on double data entry and the total lack of data quality had to be resolved.

The solution

Within two or three months, the laboratory developed an interface to receive electronic orders from providers directly into their LIMS by intercepting the positive case reports going from the EMR to the ELR team. In the event of a positive COVID-19 case, the result was sent to the ELR team, as normal, but there was an additional trigger in place to reflexively send the WGS test request to the lab, with all of the necessary data passed along as well.

Impact

More than 116,000 WGS tests came through the interface. If a paper order form previously required seven minutes of data entry per order (three to four minutes on both the provider side and the lab side), that equates to a savings of 812,000 minutes, or 13,533 hours of data entry.

When COVID-19 was at its peak and staff were working around the clock to manage testing, **13,533 hours was worth its weight in gold.**

In the end, over 18,000 positive results were reported to CDC through the interface.

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Reflections

Collaboration

This was absolutely a collaborative effort between the lab team, the ELR team, the Rhapsody team. They also had to listen to their customers and gain their buy-in. But the data entry demands and lack of data quality were so overarching and impactful to everyone that they had to figure something out together. They needed a comprehensive overhaul to the standard process because it wasn't working.

Challenges

The biggest challenge with building this interface was just to operationalize it and getting customers to use it properly. They used a team of lab testing coordinators to coordinate with all of the customers, who worked really hard to clarify the message and demonstrate the benefit of doing this correctly.

It was very clear early on though how much time this would save everyone if used correctly, which helped with adoption.

Suggestions for others

This was a lot of effort up front and it's important to go into a project like this with realistic expectations about the work it will take. But for us, the time saved, the quality improvements, and the compliance improvements were so worth the effort. You really have to weigh the effort against the benefits and make sure it's a win for everyone putting in the effort.

Up next

Colorado is working now to expand that interface to other reportable conditions. The added impact of this initiative was that it gave them a potential model for other types of testing. That pipeline is in place. Infrastructure doesn't have to be rebuilt or reinvented; the heavy lift has already been done. This could theoretically be used for any number of scenarios where hospitals required follow up testing based on diagnostic results, decreasing the level of effort and required data entry for the lab, the ELR team and providers.

It's truly a three-way-win.

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*The **Innovations in Informatics: Laboratory Success Stories** series from the Association of Public Health Laboratories (APHL) showcases innovations and enhancements in informatics, made possible by recent funding opportunities related to COVID-19, data modernization and public health infrastructure. It highlights the critical need for ongoing, targeted and sustainable informatics funding, while celebrating the progress that has been made.*