

Trends in Multiplexing: Preparing for the Winter Respiratory Epidemic

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The winter respiratory virus season has historically provided challenges for diagnostics and COVID-19 has, and continues to, compound these. Due to interventions and societal behavioural changes, COVID-19 led to a departure of typical viral patterns. This has meant the usual circulation of viruses has been absent for more than a year, only to resurge now possibly in unexpected ways.¹

Most recently, the WHO Regional Director for Europe, Dr Hans Henri P. Kluge, stated that EU member states should start preparing now for a new wave of COVID-19 in autumn and winter amid rising cases and an increase in hospitalisations.² Similarly, the European Commissioner for Health and Food Safety, Stella Kyriakides, warned there is no room for complacency now.³ As the winter virus season looms, how can diagnostic providers respond to the changing viral patterns and prepare for the surge in demand? Here, I explore the key multiplexing trends that can play a role, and all importantly, help providers get future-ready now.

Preparing for an increase in flu and RSV

Since interventions to control COVID-19 were introduced, there has been low levels of respiratory syncytial virus (RSV) activity in Europe.⁴ However, recent research has now shown that the humoral immunity against RSV has significantly reduced because of the lack of exposure.⁵ Now that immunity against RSV has reduced and, in some countries, virus surveillance has dwindled, there is a risk that future RSV epidemics could start outside the usual season and be larger than expected.⁶

While the majority of healthcare providers now have solutions for COVID-19, not all have molecular solutions for other respiratory viruses such as RSV and flu. Given providers must now be ready for all possible future outbreaks, being able to easily discriminate between COVID-19 and other respiratory conditions, many with similar flu-like symptoms, has never been so important.

This is particularly critical when it comes to at-risk or vulnerable patients, such as those already in institutional care or living with a severe illness, as providing a timely diagnosis helps to ensure rapid decisions are made, and swift treatment provided.

Lateral flow tests provide a low-cost solution for COVID-19 testing but utilising more sensitive molecular diagnostics and specifically, multiplex testing, allows providers to test for multiple viruses at once and get fast and high-quality results.

Monitoring and managing different stages of an outbreak

When faced with the unknown, the early decisions made are critical, and this rings particularly true in diagnostics. Providers must now be ready to anticipate all future threats from agents causing severe respiratory tract infections. That's why year-round monitoring and surveillance is key.

When it comes to an influenza outbreak, there are four stages involved - the interpandemic phase (the period between influenza pandemics), the alert phase (when influenza caused by a new subtype has been identified in humans), the pandemic phase (the period of global spread of human influenza caused by a new subtype) and the transition phase when the global risk drops and reductions in response activities may be appropriate.⁷ Similar phases can be seen with epidemics caused by other respiratory viruses.

While monitoring across all stages is critical, syndromic testing can be particularly helpful when it comes to responding and being ready for future outbreaks as it provides an indicator that incidence of one of the specific panel targets is increasing. This enables providers to spot an outbreak and react quickly.

Also, during the transition, or cooling down phase, it becomes critical to identify not only the causative organism responsible for the outbreak, but also other pathogens. As an example, RSV epidemics were observed in France and Iceland during the 2020/21 winter in addition to the epidemic waves of COVID-19.⁸ Being able to identify the outbreak condition quickly can ensure the right decisions are being made moving forward.

Readiness within healthcare, and specifically in diagnostics, has never been so important, especially as the winter respiratory virus season looms. As COVID-19 shifts from pandemic to endemic, or periodic, paired with the uncertainties of viral patterns today, accurate and timely diagnosis of all the main respiratory viruses has become critical. As winter approaches, it is time labs got future-ready today.

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