

# Monitoring COVID-19 and Influenza: the added-value of a Severe Acute Respiratory Infection surveillance system in Portugal

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## Abstract

**Background** Severe Acute Respiratory Infections (SARI) surveillance is recommended to assess severity of respiratory infections disease. In 2021, the National Institute of Health Doutor Ricardo Jorge, in collaboration with two central hospitals, implemented a SARI sentinel surveillance system based on electronic health registries. We describe its application in the 2021/2022 season and compare the evolution of SARI cases with the COVID-19 and influenza activity in two regions of Portugal. **Methods** We identified SARI cases based on ICD-10 codes for influenza-like illness, cardiovascular diagnosis, respiratory diagnosis and respiratory infection. Pearson correlation and cross-correlations between weekly SARI cases, weekly COVID-19 cases and the number of weekly positive samples for influenza were estimated. **Results** A high correlation between SARI cases or hospitalizations due to respiratory infection and COVID-19 incidence was obtained ( $\rho = 0.78$  and  $\rho = 0.82$ , respectively). Weekly SARI hospitalizations detected the COVID-19 epidemic peak a week earlier. A weak correlation was observed between SARI cases and the number of positive samples for influenza ( $\rho = -0.20$ ). However, if restricted to hospitalizations due to cardiovascular diagnosis, a moderate correlation was observed ( $\rho = 0.37$ ). Moreover, hospitalizations due to cardiovascular diagnosis detected the increase of influenza epidemic activity a week earlier. **Conclusion** In the 2021/2022 season, the Portuguese SARI sentinel surveillance system pilot was able to early detect the 5th COVID-19 epidemic wave and the increase of influenza activity. Establishing complementary virological inpatient surveillance is vital to aid in understanding the relationship between respiratory virus epidemics and disease severity.

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