**Development of sentinel respiratory virus surveillance systems in the WHO European Region following two pandemics, 2008-2023**

**Authors**

Mook P, Fielding J, Hegermann-Lindencrone M, Jorgensen P, Katz M, Leroy M, Mesle M, Nahapetyan K, Pebody RG, Widdowson MA

**Affiliations**

1World Health Organization Regional Office for Europe

**Abstract (300 words max)**

**Introduction**

Sentinel surveillance provides objective measures of respiratory disease activity, risk factors and severity, a source of viruses to inform vaccine composition, and a platform for vaccine effectiveness and burden estimation. Such systems designed for influenza were challenged by the A(H1N1)pdm09 and SARS-CoV-2 pandemics. We reviewed the evolution of respiratory virus surveillance over 15 years among 54 countries, areas and territories (CATs) in the WHO European Region.

**Methods**

We summarized indicators of respiratory surveillance capacity in 2008 and 2023 using surveys completed by CATs and complemented with counts of CATs with National Influenza Centres (NIC) and total number of specimens from outpatient sentinel sites tested annually.

**Results**

Between 2008 and 2023, the number of CATs with outpatient or inpatient sentinel respiratory surveillance sites increased from 27 to 50 and 4 to 33, respectively. Of 30 CATs with a start date of inpatient surveillance systems, 4 developed systems before the 2009 pandemic, 17 CATs (predominantly non-European Union (EU)) developed systems between 2009 and 2016 and 9 CATs (predominantly EU) developed systems after the COVID-19 pandemic began. As of 2023, 40/50 CATs tested outpatient specimens for SARS-CoV-2 and 40/50 for RSV, while 24/33 and 27/33 CATs tested inpatient specimens for SARS-CoV-2 and RSV, respectively. The number of CATs with a designated NIC increased from 38 in 2008 to 47 in 2023. The annual number of outpatient specimens tested for influenza ranged from ∼36,000 to ∼56,000 except for the 2009/2010 and 2021/2022 winters (67,608 and 120,164, respectively).

**Conclusions**

Sentinel surveillance capacity in the WHO European Region increased substantially over 15 years. However, consideration of surveillance gaps and challenges (e.g. case definitions, target populations and testing algorithms) and opportunities for expansion, enhancement and integration of sentinel and complementary systems to address surveillance objectives for influenza, SARS-CoV-2, RSV and a respiratory Disease X remains necessary.