

The effects of the COVID-19 pandemic on Hungarian surveillance

David Kuti

Head of National Influenza Center, Hungary

The aims of the respiratory viral surveillance

In general, the mission of the surveillance is to monitor and analyze the incidence, spread and impact of respiratory viruses such as influenza, RSV and SARS CoV-2

This monitoring system helps public health authorities to:

Early Detection of Outbreaks: identify and respond to outbreaks
Monitor Disease Trends: Track the patterns of respiratory infections
Provide data to guide public health policies (for example vaccination strategies)
Assess the impact of interventions (for example vaccination)
Enhance preparedness to a new emerging pathogen

In Hungary:

The surveillance provides the input for the reference laboratory activities



History of Hungarian surveillance

HISTORY OF DATA COLLECTION ON INFLUENZA LIKE ILLNESSES IN HUNGARY

- Since 1931 ILI with complications were registered
- Laboratory confirmation has been also performed since 1937 (R.M. Taylor, then Gy. Takátsy inventors of the microplate technique)
- Sentinel **general practitioners** and **institutions** reported the number of ILI during the influenza season
- All GPs reported weekly clinical ILI during influenza epidemics

Reported data before 2002



Number of ILI Number of patients visiting GPs Number of persons unable to work (absences) Number of patients hospitalized with the diagnosis of ILI Age groups of patients (1-14, 15-24, 25-34, 35-59, >60 years) Number of complicated cases (clinical forms and years of age) Number and age of ILI with lethal outcome Results of laboratory examinations Other (geographical distribution, vaccination history etc.)



History of Hungarian surveillance

2002: Improvement of Epidemiological Surveillance for Respiratory pathogens

Operational period: Week 40 to Week 15 of the following year
 Focus: Monitoring and analyzing respiratory disease incidence and spread

 weekly reporting → data broken down by day
 reporting only epidemiological data (example: ILI patients, age groups, number of samples sent to

the lab.)

Case definition: ILI

2005: Expansion to Laboratory and Epidemiological Surveillance

Enhanced Operational period: Week 40 to week 20 of the following year Improvements: Lab surveillance → sentinel doctors sending samples weekly from patients with ILI Virus detection was done with Direct Immunofluorescence and conventional PCR

Comprehensive approach \rightarrow combining epidemiological and laboratory data, and input to the reference lab activities \rightarrow vaccine development



History of Hungarian surveillance

After the H1N1 pandemic in 2009:

Operational period: Week 40 to Week 20 of the following year Improvements: More healthcare providers included to the network → 20% of family doctors and pediatricians Virus detection with Real Time RT-PCR method, including molecular subtyping

Detection of 4 pathogens in the panel: Influenza A&B, RSV and Adenovirus (*during the COVID-19 pandemic Adenovirus was changed to hMPV in the surveillance PCR Panel***) Number of specimen sending sentinel doctors:** approximately 100 **Case definition:** ILI

2022: Introduction of Hospital surveillance (RESPISEVERE)

Surveillance was suitable for monitoring the **intensity** and the **nature** of the influenza season, however it was not suitable for determining the **severity** of the season.

Because the case definition of ILI was not suitable to monitor SARS-CoV-2 and RSV \rightarrow Case Def. Of ARI From 2022 Hospital surveillance was introduced involving hospitals that provides intensive care \rightarrow at first it was an epidemiological surveillance but lab. Surveillance was added soon.



After the introduction of the Hospital surveillance:

- According to the international trends, there had been formed a need for a laboratory confirmed monitoring of other respiratory pathogens as well (for example.: **RSV**)



From the **2022/2023** season there operates a Severe Acute Respiratory Infections (**SARI**) surveillance including **sample sharing sentinel**





hospitals

Reported Data: patients with SARI, admitted to hospital on given week broken down by age groups and pathogens (Inf A&B, RSV, SC2)

Source of image: https://innovativegenomics.org/covid-19/free-covid-19-illustrations/

Surveillance in Hungary before and during the COVID-19 pandemic



Many difficulties:

- Due to the sudden increase in the number of cases, the healthcare system has been overloaded
- HR problems at the diagnostic site as well

Lab. capacity problems

- Dedicated laboratory for SARS CoV-2
- The case definition of ILI was too specific for influenza → ARI and SARI is better for SC2 (and RSV)

Surveillance in Hungary after the COVID-19 pandemic

SARI surveillance 400 1000,0 200 350 900,0 180 800,0 160 2023/2024 300 száma 700,0 140 250 SARI miatt kórházba felvettek Morbiditás (‱) 600,0 120 200 500,0 100 150 80 400,0 300,0 60 100 200,0 40 50 100,0 20 hét lét lét hét hét 0.0 2023.40. I 2023.41. I 2023.43.1 2023.44.1 2023.46.1 2023.47.1 2024.04.1 2024.07.1 2024.10.1 2024.11.1 024.12.1 2024.13.1 2024.14.1 2024.16.1 2024.17.1 2024.18.1 2023.42. 2023.45. 2023.48. 2023.49. 2023.50. 2023.51. 2023.52. 2024.01. 2024.03. 2024.05. 2024.06. 2024.08. 024.09. 024.15. 2024.19. 2024.20. 2024.02. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. hetek hetek Infl. A(H3) 📖 Influenza B - Járványküszöb Influenza A (NT) Infl. A(H1) 2023/2024 ■ Egyéb / nem ismert ■ Influenza pozitív ■ RSV pozitív ■ SARS-CoV-2 pozitív

	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
Number of Sentinel doctors	100	100	97	100	150	151
Samples sent by sentinels	758	608	214	895	2 647	5 659
Samples from conventional sampling	544	682	105	622	1 743	1 519
Summa [samples from surveillance]	1 302	1 290	319	1 517	4 390	7 178
SARI (RESPISEVERE)	NO	NO	NO	NO	Yes	Yes

Conclusions:

- Because of the decrease of the pandemic load, the routine activity of the dedicated COVID-19 laboratory slowly integrated into the daily tasks of the respiratory virus laboratory (NIC).
- We are using one-step multiplex respiratory panels to the virus detection
- There still remains some HR and structural changes \rightarrow the further investigation of the SC2+ samples (sequencing, virus isolation of SC2...etc.) is done by another workgroup
- The influenza related reference activities done by the NIC, but there are many connection points with another workgroups.
- The team of the NIC produces the VTM and the sampling packages to the surveillance, and provide (limited amount) respiratory combi Ag rapid test for sentinel doctors for screening



The respiratory surveillance is a constant system that we have to constantly improve!



Thank you for your attention!

