

ECDC NORMAL



Influenza and SARS-CoV-2 virus characterisation in the EU/EEA

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ECDC's mission

Identify, assess and communicate current and emerging threats to human health posed by infectious diseases.

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| | |
|---|---|
| Surveillance | Tuberculosis |
| Microbiology | Vaccine-preventable diseases |
| Preparedness | Emerging and vector-borne diseases |
| Country support | Influenza and other respiratory viruses |
| Scientific advice | Food- and waterborne diseases and zoonoses |
| Public health training | HIV, sexually transmitted infections and viral hepatitis |
| Health communication | Antimicrobial resistance and healthcare-associated infections |
| Epidemic intelligence and outbreak response | |



Surveillance systems

The European Surveillance System: TESSy

Disease Monitoring



Cases
collect,
analyse,
interpret

Signal

assess

Alert

investigate

Early Warning and Response System of the European Union: EWRS

Event monitoring



Events
capture,
filter,
validate

disseminate

Communicate and control

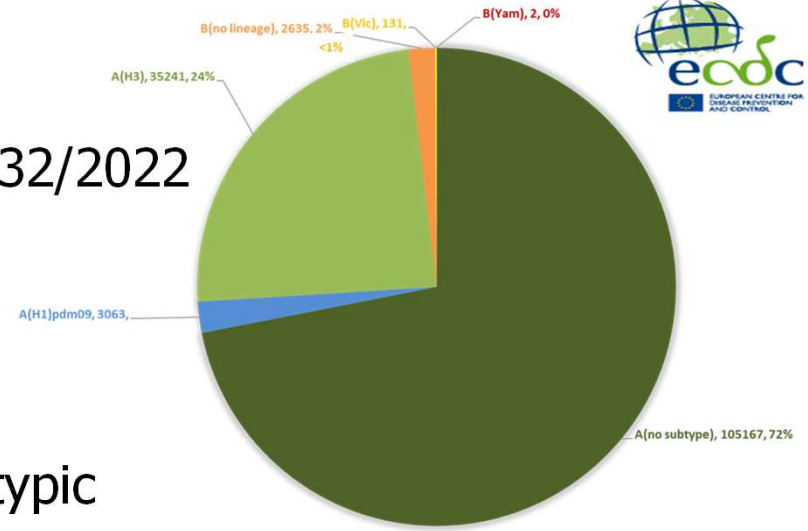
Objectives for influenza virological surveillance

- Describe intensity and spread of influenza during the season
- Describe the seasonality of influenza;
- Signal the start and end of the influenza season;
- Identify locally circulating virus types and subtypes and their relationship to global and regional patterns;
- Assist in developing an understanding of the relationship of virus strains to disease severity;
- Monitor antiviral sensitivity;
- Facilitate vaccine strain selection;
- Provide candidate viruses for vaccine production;
- Describe the antigenic and genetic makeup of circulating viruses

Influenza virological surveillance

Weekly reports from Member States, 40/2021 to 32/2022

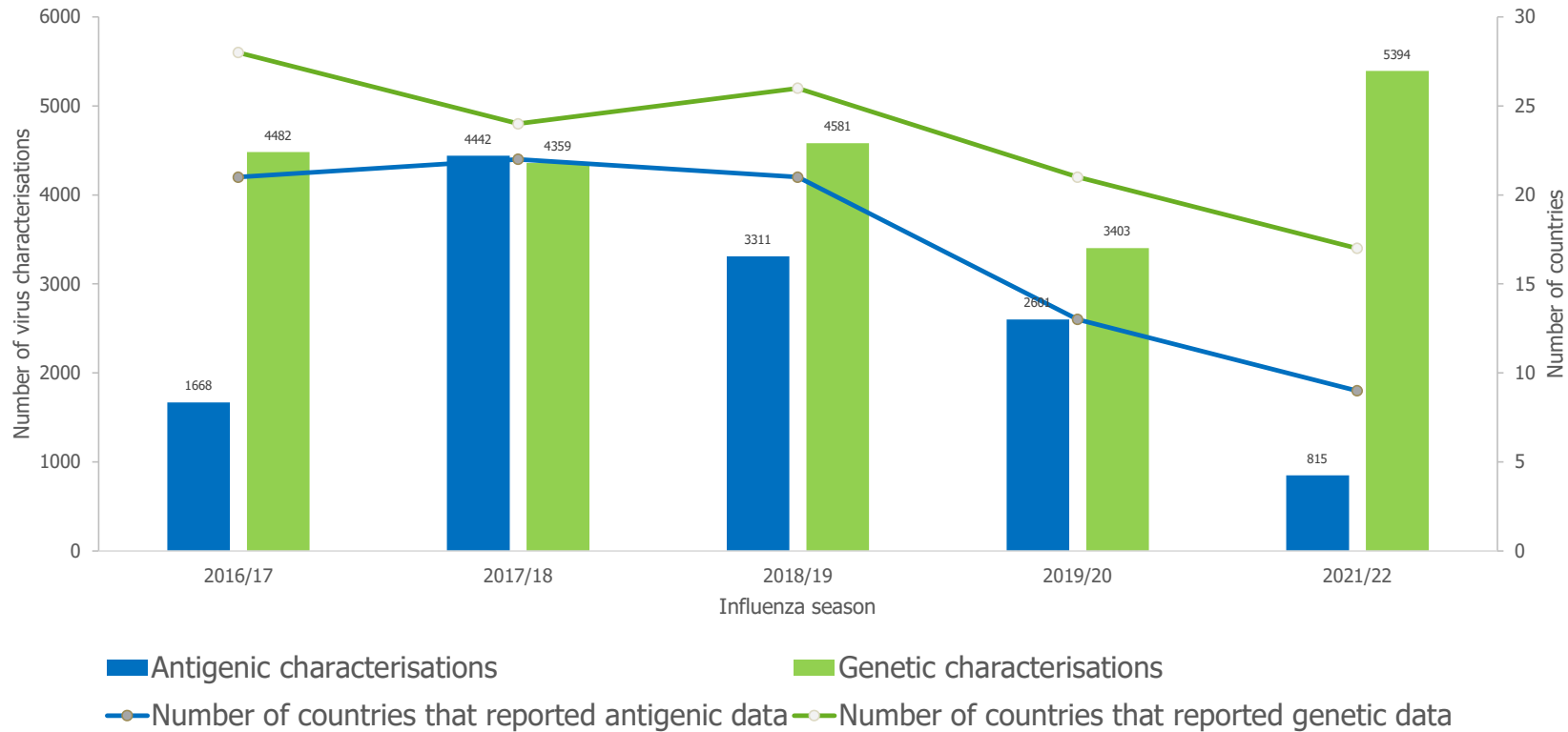
- Detections by (sub)types/lineages
- Antigenic groups
- Genetic clades
- Antiviral susceptibility data: geno- and phenotypic



| Antigenic category/Country | United Kingdom | Italy | North Macedonia | Germany | Russian Federation | Latvia | Switzerland | Slovenia | Portugal | Total |
|--|----------------|-----------|-----------------|------------|--------------------|-----------|-------------|-----------|-----------|------------|
| AH1/Guangdong-Maonan/SWL1536/2019 | 0 | 1 | 0 | 0 | 0 | 2 | 2 | 0 | 3 | 8 |
| AH1/Victoria/2570/2019 ^{1,2,3} | 0 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 10 |
| AH3/Cambodia/e0826360/2020 ¹ | 14 | 0 | 0 | 441 | 65 | 0 | 2 | 0 | 0 | 522 |
| AH3/Darwin/9/2021 ^{2,3} | 12 | 20 | 0 | 0 | 93 | 11 | 25 | 45 | 23 | 229 |
| AH3NOCAT | 0 | 0 | 6 | 0 | 0 | 0 | 4 | 0 | 0 | 10 |
| BVic/Austria/1359417/2021 ^{2,3} | 0 | 0 | 0 | 4 | 26 | 1 | 3 | 0 | 1 | 35 |
| BVic/Washington/02/2019 ¹ | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total | 26 | 21 | 6 | 454 | 185 | 14 | 37 | 45 | 27 | 815 |

| Countries | Finland | Luxembourg | United Kingdom | Denmark | Romania | Italy | Norway | Spain | Sweden | Germany | Greece | Ukraine | Ireland | Netherlands | Switzerland | Slovenia | Portugal | Total |
|---|-----------|------------|----------------|------------|-----------|-----------|------------|-------------|------------|------------|----------|-----------|------------|-------------|-------------|-----------|------------|-------------|
| AH1/Guangdong-Maonan/SWL1536/2019_6B.1A.5 | 0 | 1 | 4 | 10 | 0 | 1 | 0 | 32 | 5 | 8 | 0 | 0 | 0 | 290 | 4 | 0 | 9 | 364 |
| AH1/India/Pun-NIV312851/2021_6B.1A.5a.2 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 13 |
| AH1/Slovenia/1489/2019 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AH1/Victoria/2570/2019_6B.1A.5a.2 (2,3,4,6) | 0 | 0 | 11 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 19 |
| AH1NOClade | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AH1SubgroupNotListed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AH3/Bangladesh/4005/2020_3C.2a1b.2a.2 | 63 | 2 | 275 | 686 | 30 | 34 | 260 | 1119 | 150 | 233 | 4 | 0 | 173 | 1268 | 38 | 29 | 491 | 4855 |
| AH3/Cambodia/e0826360/2020_3C.2a1b.2a.1 (3) | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| AH3/Denmark/3264/2019_3C.2a1b.1a | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 8 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 2 | 20 |
| AH3/Hong Kong/2671/2019 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AH3/Kansas/14/2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AH3NOClade | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AH3SubgroupNotListed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BVic/Austria/1359417/2021_V1A.3a.2 (4,6) | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 4 | 11 | 3 | 0 | 0 | 0 | 25 | 2 | 0 | 6 | 55 |
| BVic/Washington/02/2019_V1A.3 (1,2,3) | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 29 |
| BVicCladeB/Brisbane/60/2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BVicNOClade | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| BVicSubgroupNotListed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BYamb/Phuket/3073/2013_Y3 (5) | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| BYamNOClade | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| BYamSubgroupNotListed | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 63 | 3 | 304 | 699 | 32 | 48 | 263 | 1160 | 175 | 244 | 4 | 26 | 175 | 1616 | 45 | 29 | 508 | 5394 |

Influenza virus characterisation, 2016/17 - 2021/22



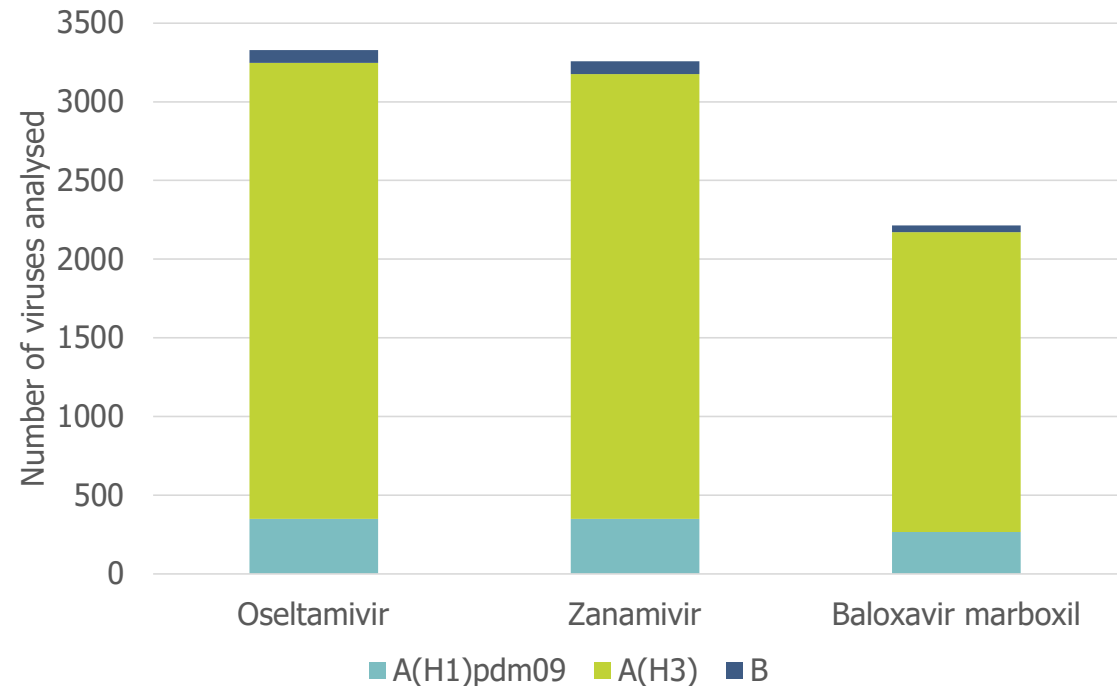
2021/22

- 815 antigenic reports from 9 countries
- 5394 genetic reports from 17 countries

Influenza antiviral susceptibility monitoring

During weeks 40/2021 to 32/2022:

- >3000 viruses assessed in laboratories for oseltamivir and zanamivir and >2000 for baloxavir marboxil
- Genotypically,
 - 1 A(H1)pdm09 virus was found to carry H275Y in NA that is associated with highly reduced inhibition by oseltamivir and
 - 4 A(H3) viruses were carrying S331R in NA that has been reported to be associated with reduced inhibition by both oseltamivir and zanamivir.
- Phenotypically no viruses with reduced susceptibility were identified.



SARS-CoV-2 virological surveillance

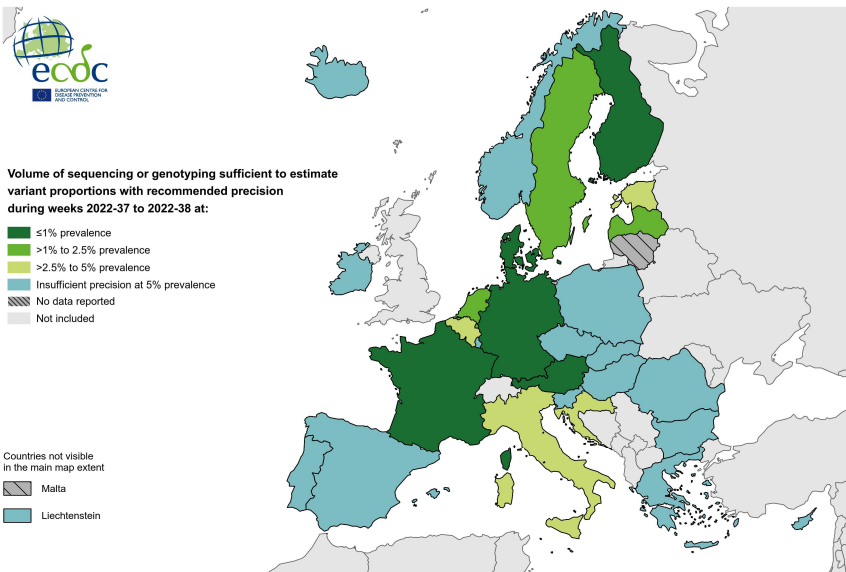
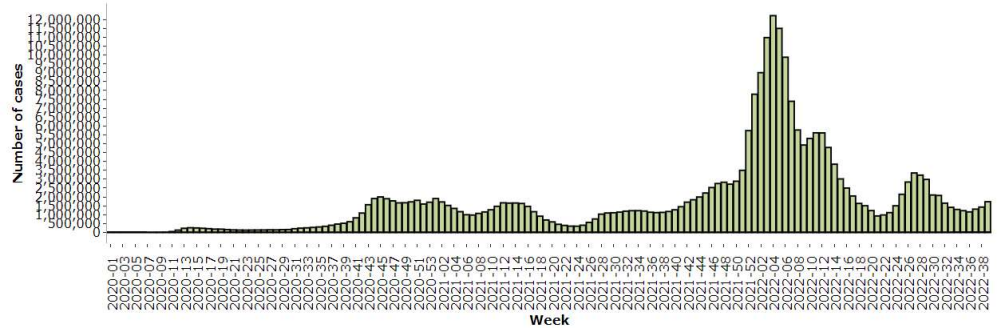
<https://worldhealthorg.shinyapps.io/euro-covid19/>

Weekly reports from Member States

- Detections
- Sequencing data through GISAID
- Variant monitoring

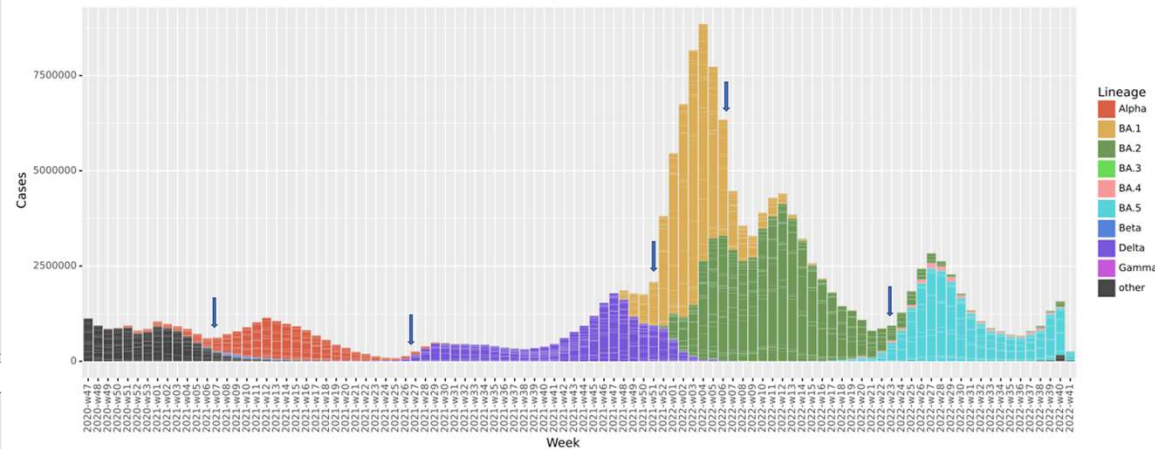


New confirmed COVID-19 cases by week



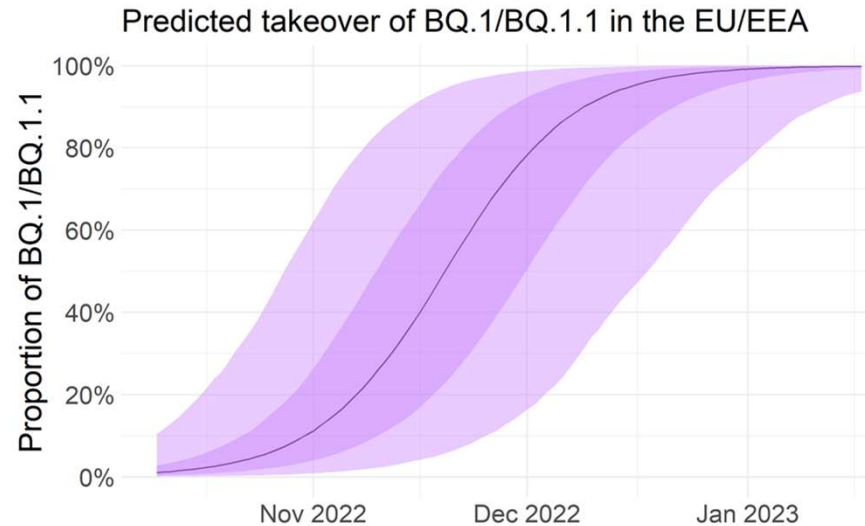
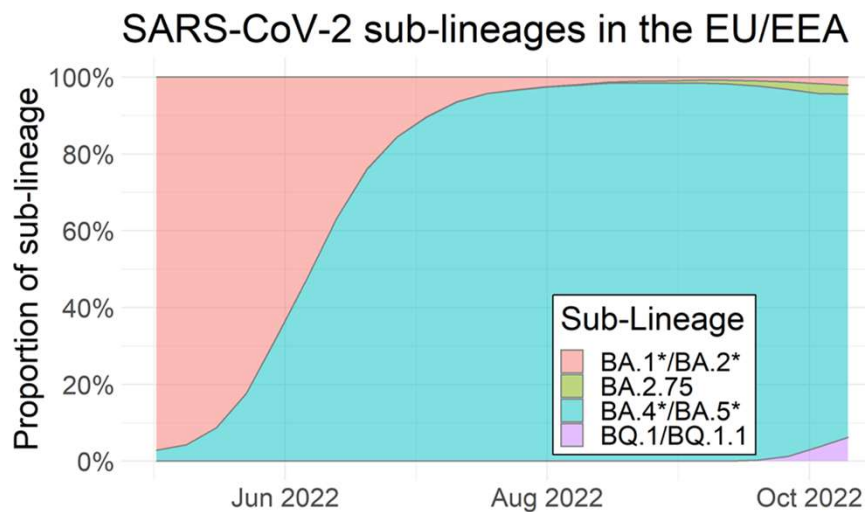
Source: GISAID EpiCoV™ and ECDC TESSy data. Administration boundaries: © Eurographics
The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on 7 October 2022

EU/EEA



Arrows indicate weeks when a new variant became dominant in the EU/EEA

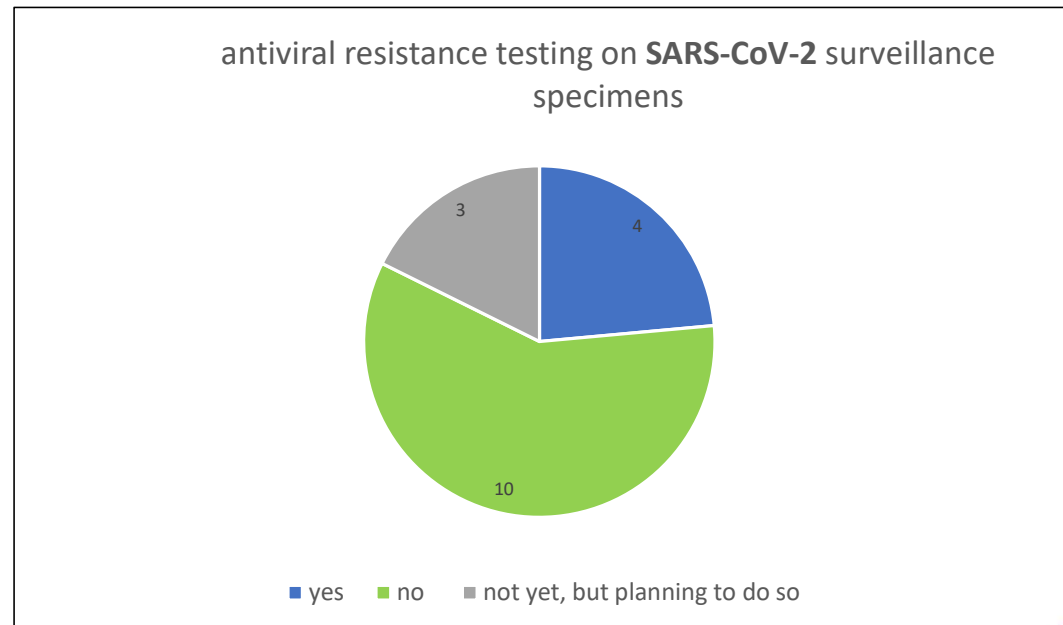
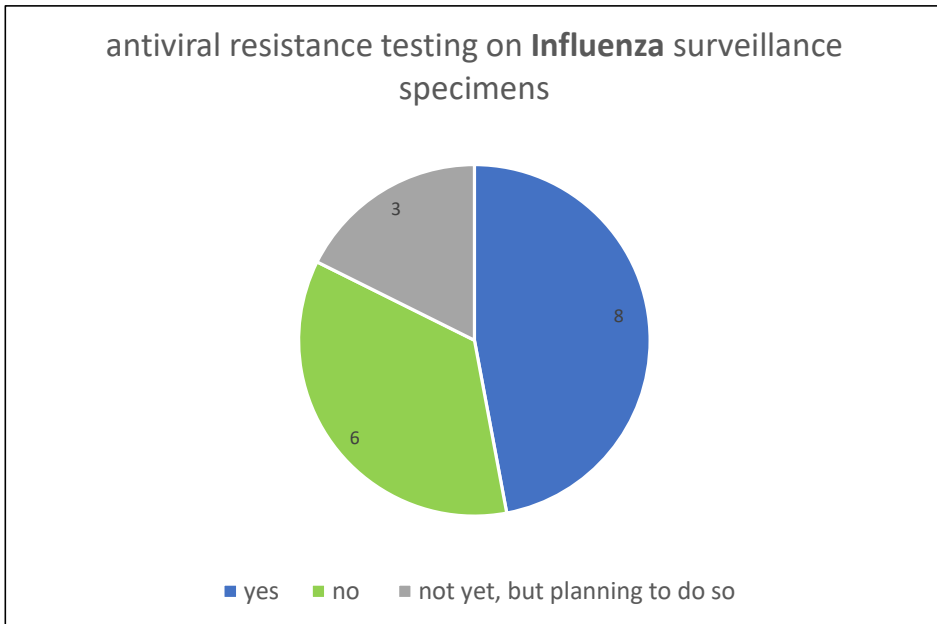
ECDC modelling example on SARS-CoV-2 variants; BQ.1/BQ.1.1 dominant in the EU/EEA by end-2022



- ECDC modelling suggest that by end-November to early December 2022, **more than 50%** of infections due to BQ.1/BQ.1.1
 - Large variation per country, with dominance from early-November to end-December
- Growth rate advantage of BQ.1/BQ.1.1 due to **partial immune evasion** (compared to BA.4/BA.5)
- Takeover of BQ.1/BQ.1.1 **coincides with end-of-year festive season**
 - More social mixing is likely, which may result in **increased transmission** and corresponding burden

Antiviral resistance monitoring capability and capacity for influenza and SARS-CoV-2 within the EU/EEA, 2022

Antiviral resistance testing - What are countries currently doing?

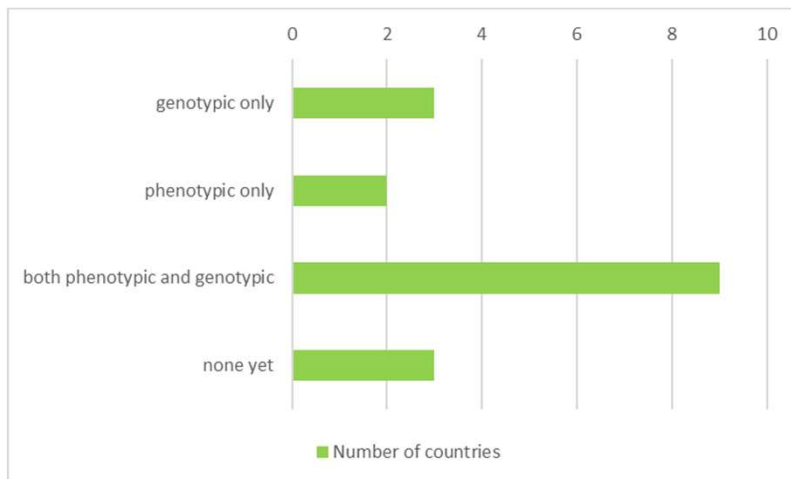


N=17 countries responded

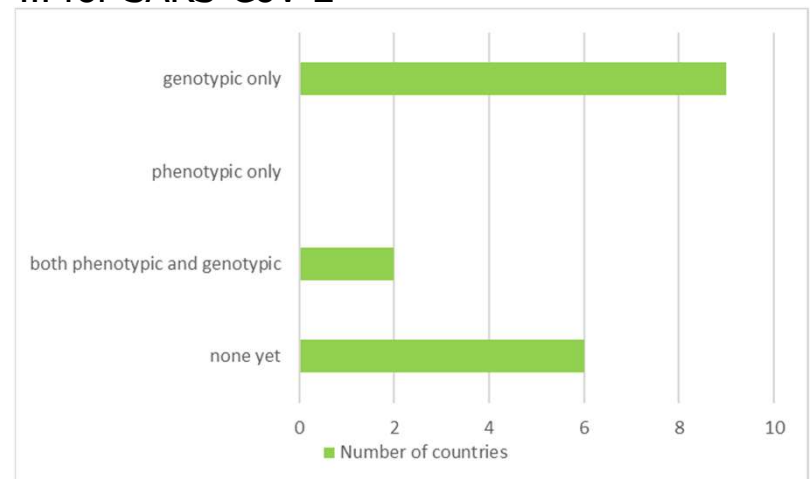
Antiviral resistance monitoring capability and capacity for influenza and SARS-CoV-2 within the EU/EEA

Antiviral resistance monitoring – What kind of analyses are being done?

... for Influenza



... for SARS-CoV-2





Acknowledgements

Country representatives who have responded to the surveys and submit data to TESSy on a weekly basis

ECDC and WHO EURO colleagues working on respiratory pathogens

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Thank you!