



European Centre for Disease Prevention and Control

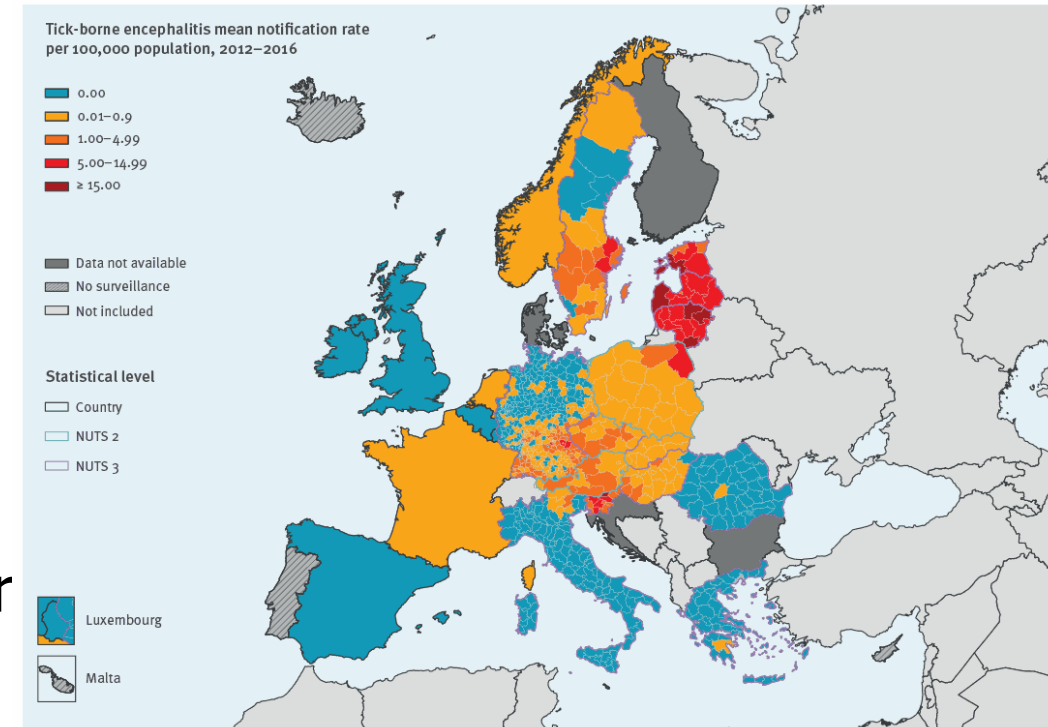
# COVID-19 surveillance at ECDC

Julien Beauté

24 November 2022

# ECDC activities on surveillance

- Data on some 60 communicable diseases and related health issues from 30 EU/EEA countries
- *Indicator-based surveillance*: systematic ongoing collection, analysis, interpretation and dissemination of structured information
- *Event-based surveillance*: detection, verification, analysis, assessment and further investigation of potential public health threats
- General vs. disease-specific objectives

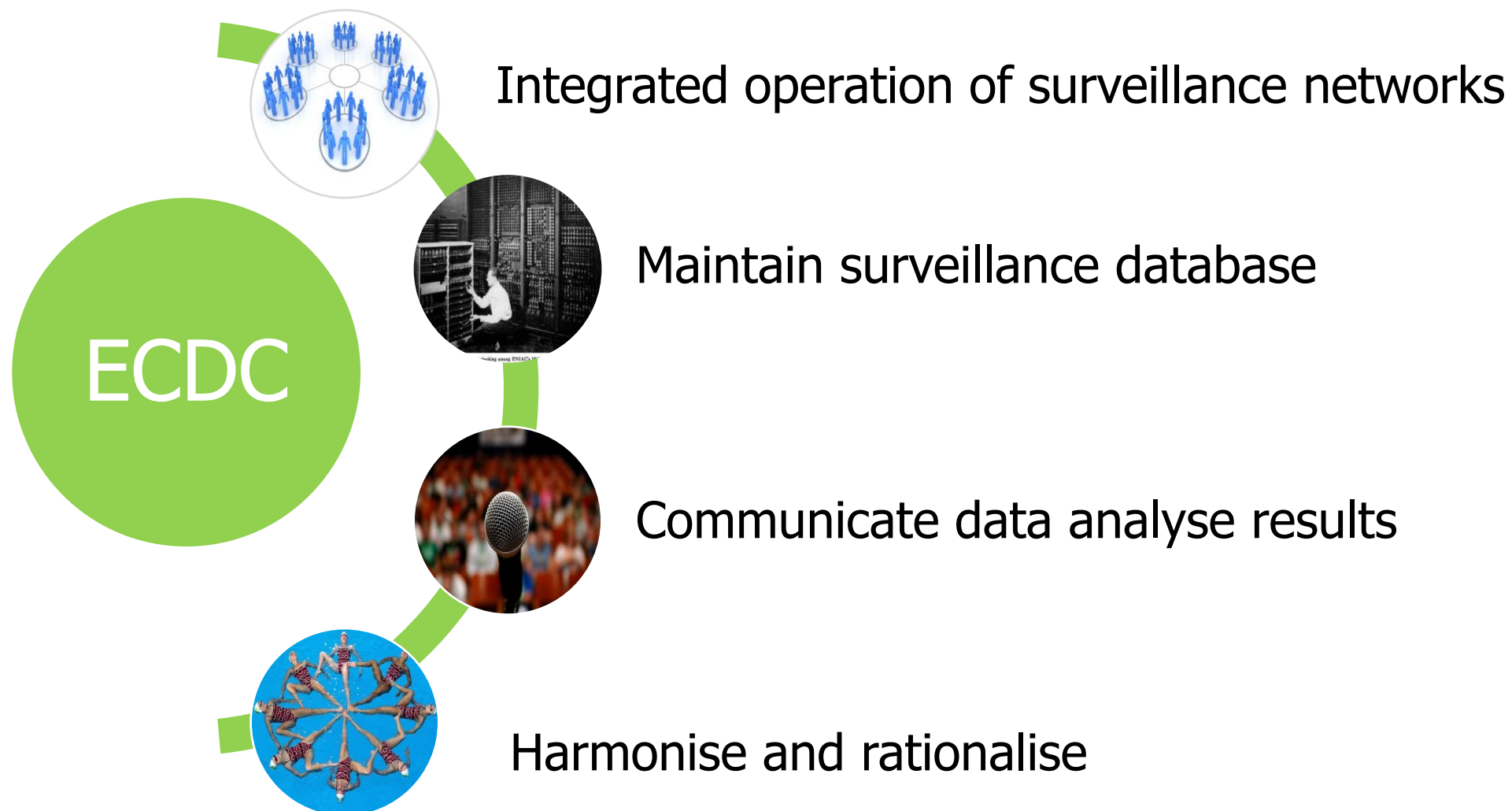


<https://www.ecdc.europa.eu/en/about-ecdc/what-we-do/ecdc-activities-surveillance>

Beauté J, Spiteri G, Warns-Petit E, Zeller H. Tick-borne encephalitis in Europe, 2012 to 2016. Euro Surveill. 2018;23(45).

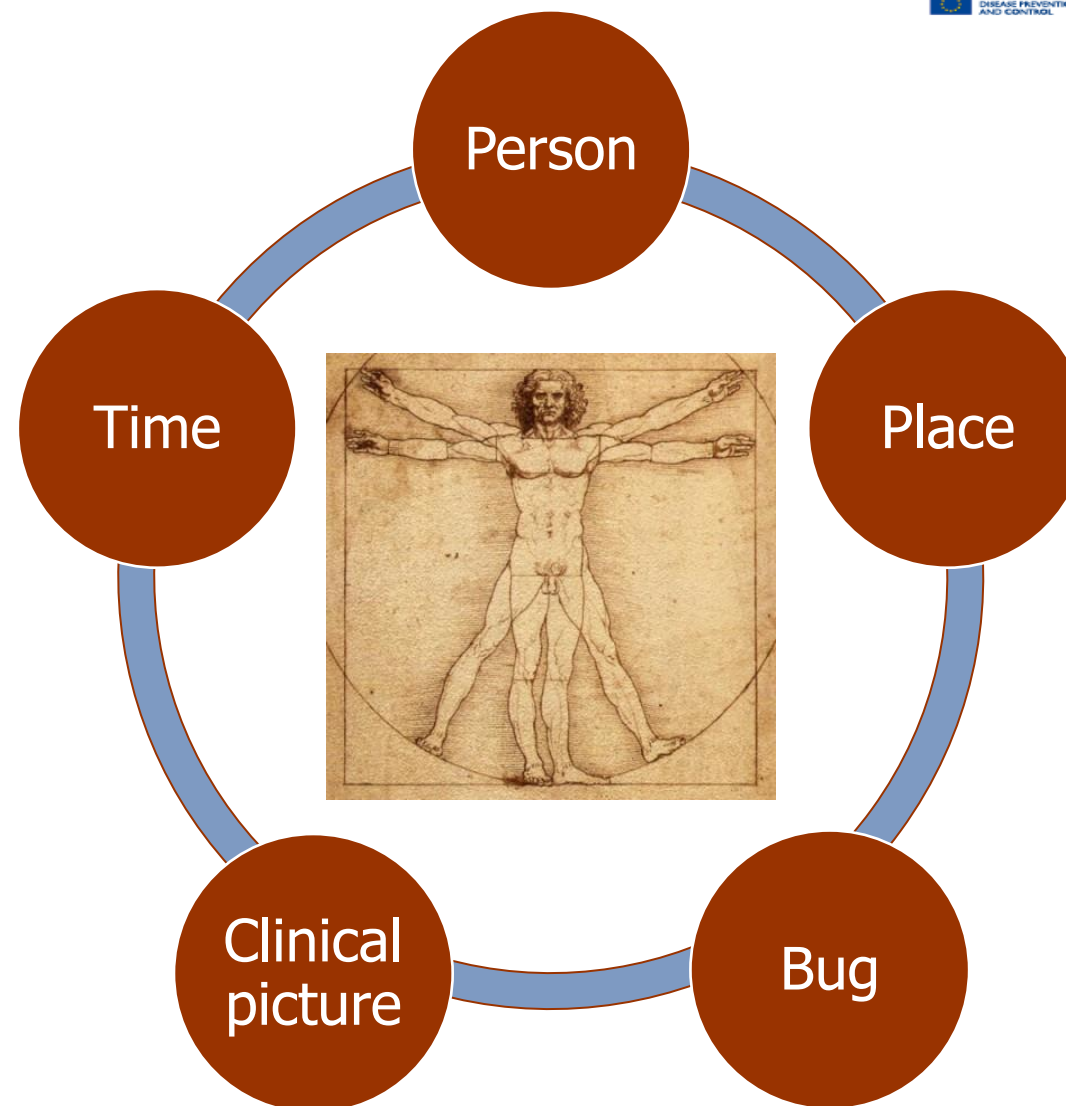
# Role of ECDC

(as per founding regulation)



# Metadata

- List of variables and values for each disease under surveillance
- Agreed with Member States
- Binding for data providers
- Updates max. once per year



# Data sources used for COVID-19 surveillance

## TESSy

- NCOV: case-based reporting (17/30 countries doing this)
- NCOVAGGR: weekly aggregate data
- NCOVVACC: vaccine uptake and administration
- NCOVTEST: weekly testing by age/subnational region/test type
- NCOVCLASSIFICATION: self-reported transmission status
- NCOVLTCF: long-term care facility surveillance

## Other (where possible official) sources

- Daily total cases/deaths (national) and weekly cases (subnational) (Epi intelligence) (**stopped**)
- New/current hospital ICU (automated web-scraping)
- Public health response database (manual routine collection)
- GISAIID
- EuroMOMO

# Public ECDC surveillance outputs

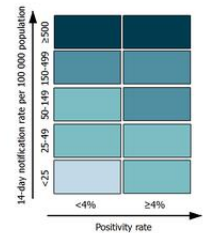
- Country overview report <https://covid19-country-overviews.ecdc.europa.eu/>
- Weekly surveillance report (retired) <https://covid19-surveillance-report.ecdc.europa.eu/>
- COVID-19 vaccine tracker <https://vaccinetracker.ecdc.europa.eu/public/extensions/COVID-19/vaccine-tracker.html>
- COVID-19 Vaccine roll-out overview <https://www.ecdc.europa.eu/en/covid-19/vaccine-roll-out-overview>
- ECDC COVID-19 dashboard (retired) <https://qap.ecdc.europa.eu/public/extensions/COVID-19/COVID-19.html>
- Daily and weekly datasets in open data format <https://www.ecdc.europa.eu/en/covid-19/data>



# Other outputs based on surveillance data



14-day notification rate and test positivity for EU/EEA weeks 09 - 10



Testing rate < 300 per 100 000 population  
 No data available  
 Not included

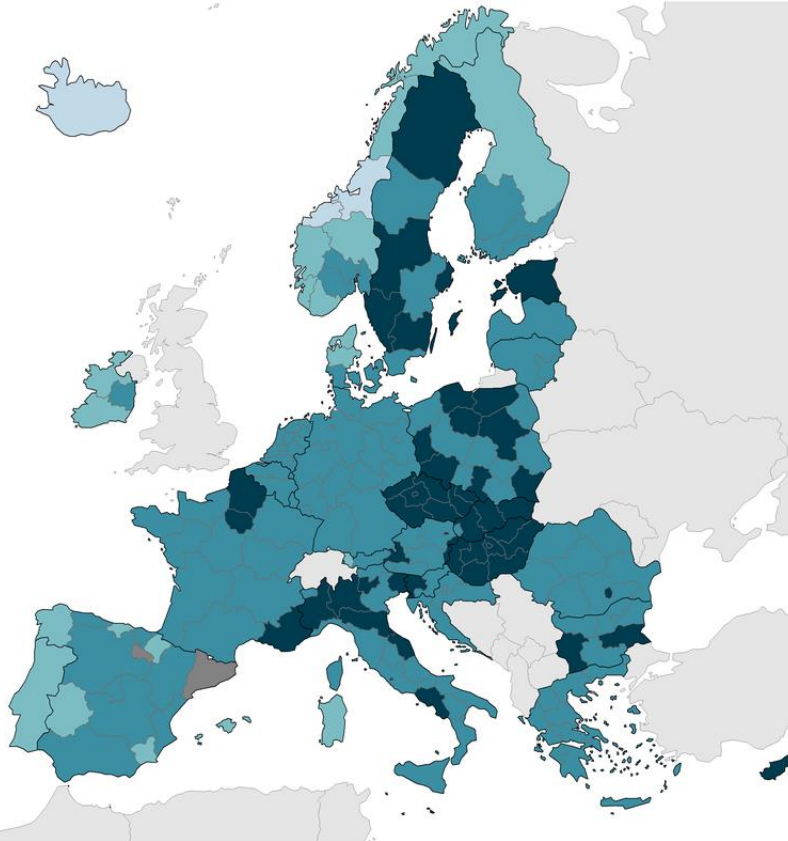
Regions not visible in the main map extent

<span style="display: inline-block; width: 10px; height: 10px; background-color: #add8e6; border: 1px solid #000;"></span> Azores	<span style="display: inline-block; width: 10px; height: 10px; background-color: #4682b4; border: 1px solid #000;"></span> Canary Islands
<span style="display: inline-block; width: 10px; height: 10px; background-color: #4682b4; border: 1px solid #000;"></span> Guadeloupe and Saint Martin	<span style="display: inline-block; width: 10px; height: 10px; background-color: #add8e6; border: 1px solid #000;"></span> Guyane
<span style="display: inline-block; width: 10px; height: 10px; background-color: #4682b4; border: 1px solid #000;"></span> La Reunion	<span style="display: inline-block; width: 10px; height: 10px; background-color: #000000; border: 1px solid #000;"></span> Madeira
<span style="display: inline-block; width: 10px; height: 10px; background-color: #4682b4; border: 1px solid #000;"></span> Martinique	<span style="display: inline-block; width: 10px; height: 10px; background-color: #000000; border: 1px solid #000;"></span> Mayotte

Countries not visible in the main map extent

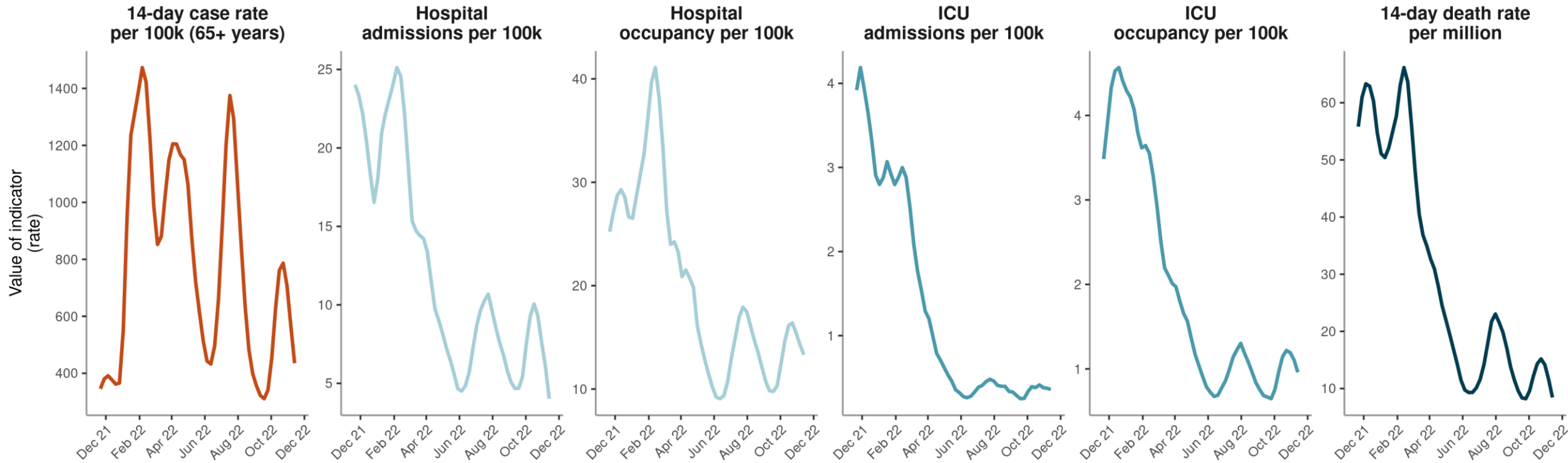
<span style="display: inline-block; width: 10px; height: 10px; background-color: #000000; border: 1px solid #000;"></span> Malta	<span style="display: inline-block; width: 10px; height: 10px; background-color: #808080; border: 1px solid #000;"></span> Liechtenstein
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Administrative boundaries: © EuroGeographics © UN-FAO © Turstat © Kartverket © Instituto Nacional de Estadística - Statistics Portugal. The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on: 17 Mar 2021



- Maps in response to Council Recommendation on travel measures
- Information for IPCR and HSC
- Briefing EU Commissioner and President
- Rapid risk assessments
- EC requests
- *Ad-hoc* queries from scientists and public
- Focused reports (e.g. schools)

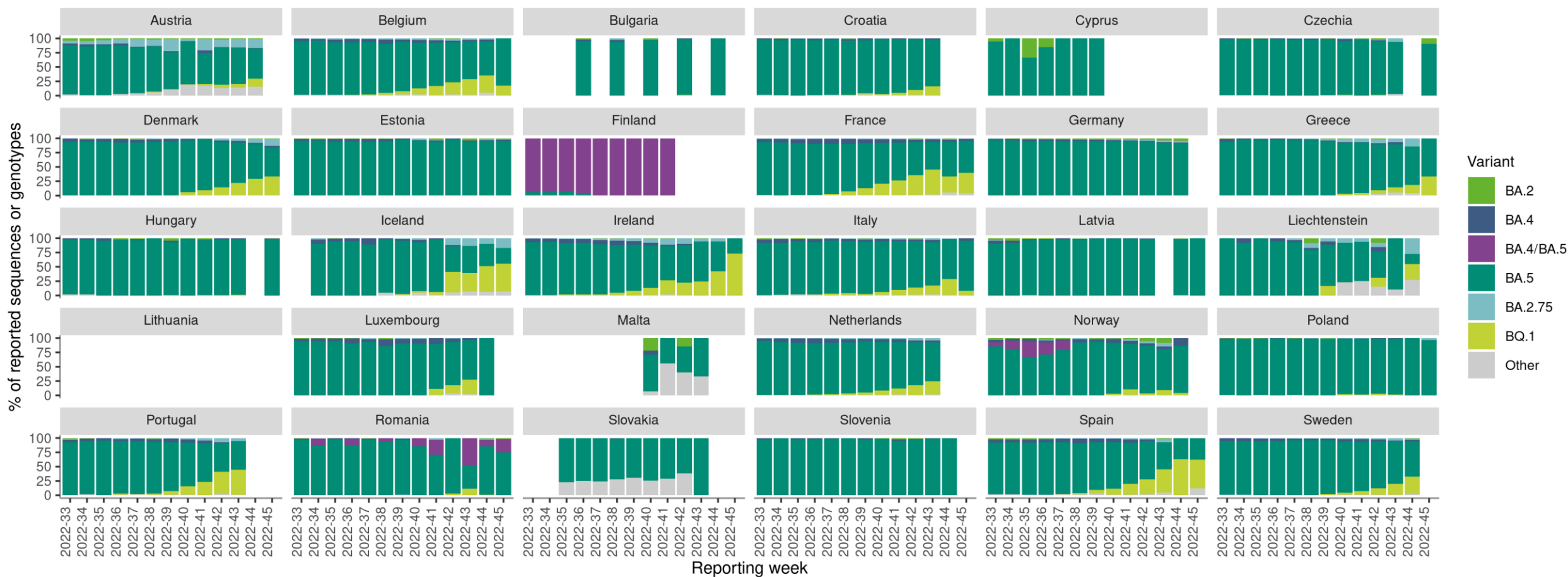
# EU/EEA: epidemiological indicators, last 52 weeks to 13 Nov 2022



ECDC. Figure produced 18 November 2022  
 Epidemic intelligence national data and TESSy COVID-19: 14-day death rate;  
 Pooled data from Member States (n = 12 for week 45): ICU admissions;  
 Pooled data from Member States (n = 16 for week 45): Hospital occupancy;  
 Pooled data from Member States (n = 17 for week 45): Hospital admissions;  
 Pooled data from Member States (n = 18 for week 45): ICU occupancy;  
 TESSy COVID-19 (n = 26 for week 45): 14-day case rate



# Weekly country variant distribution to 13 November 2022



ECDC. Figure produced 18 November 2022

Source: GISAID: Austria, Belgium, Croatia, Czechia, Iceland, Italy, Liechtenstein, Lithuania, Poland, Portugal, Spain and Sweden  
 TESSy: Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Luxembourg, Malta, Netherlands, Norway, Romania, Slovakia and Slovenia

# Vaccination uptake, EU/EEA to 13 November 2022

## Primary course:

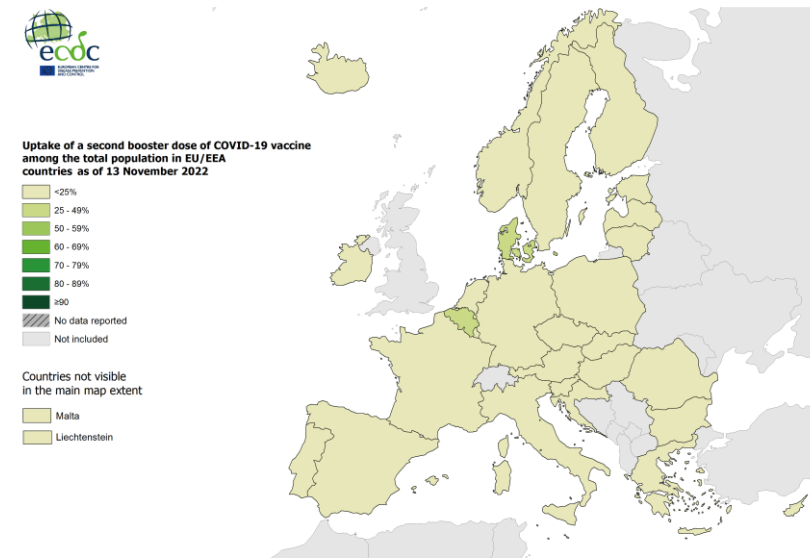
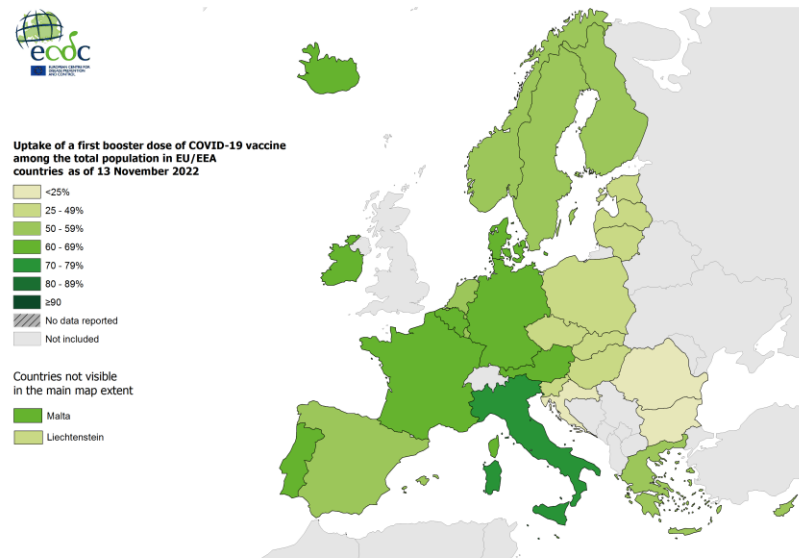
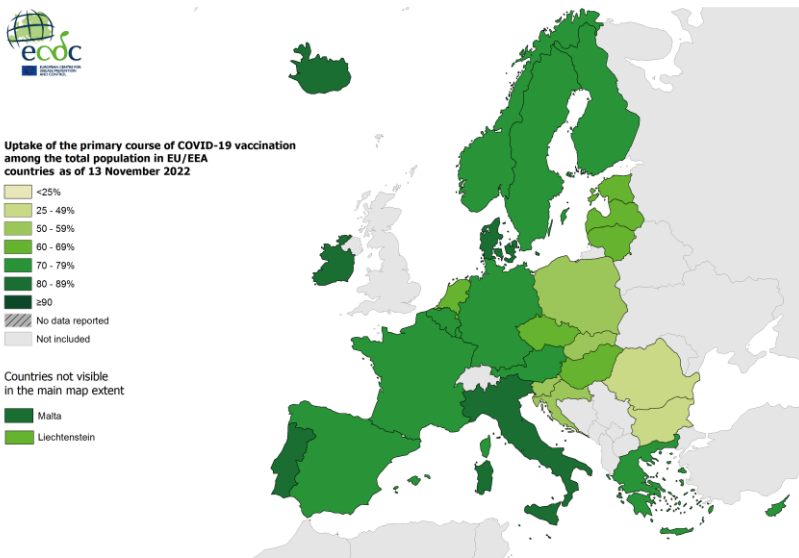
73.1% (total population)  
 83.6% (18+yr)  
 90.9% (60+yr)  
 94.0% (80+yr)

## 1st booster/additional dose:

54.5% (total population)  
 65.5% (18+yr)  
 84.5% (60+yr)  
 83.8% (80+yr)

## 2nd booster/additional dose:

11.0% (total population)  
 13.5% (18+yr)  
 28.6% (60+yr)  
 38.2% (80+yr)



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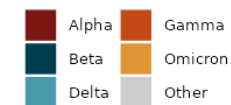
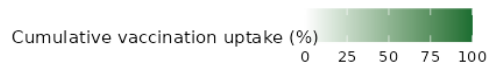
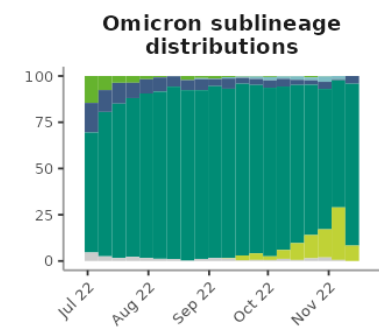
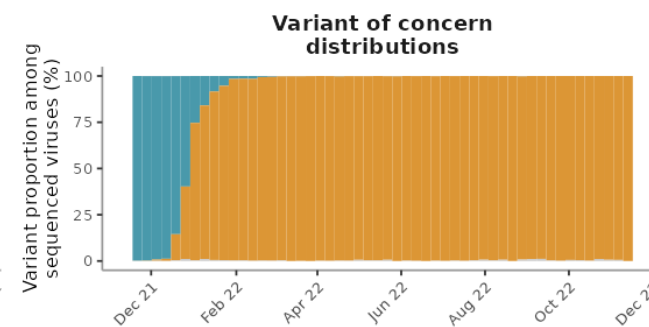
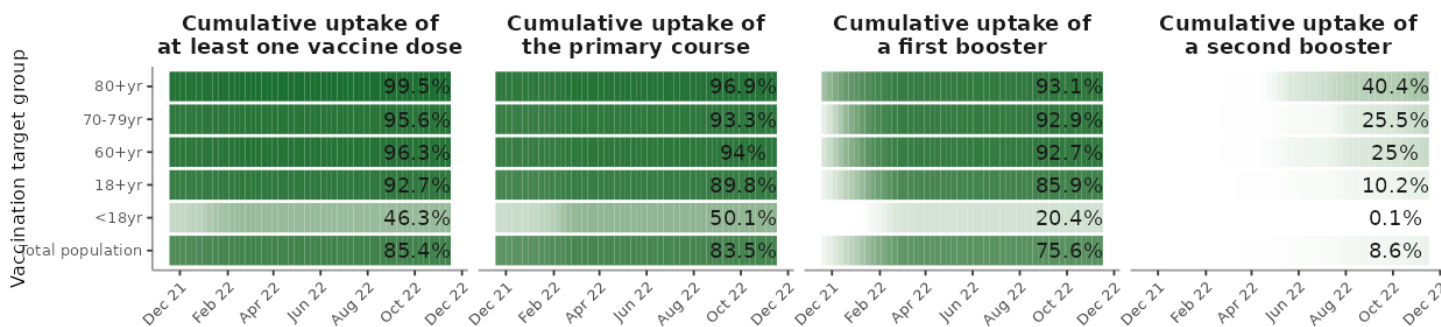
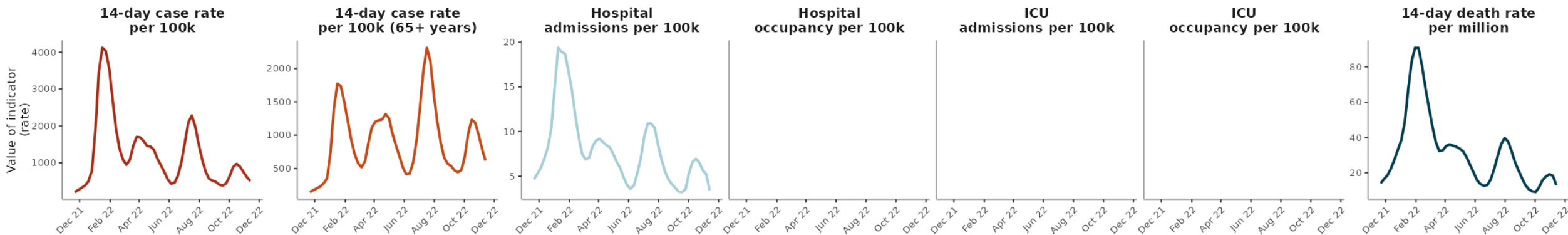
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# Italy: epidemiological indicators, vaccination uptake by age group and weekly variant distribution, last 52 weeks to 13 November 2022

Italy: epidemiological indicators, vaccination uptake by age group and weekly variant distribution

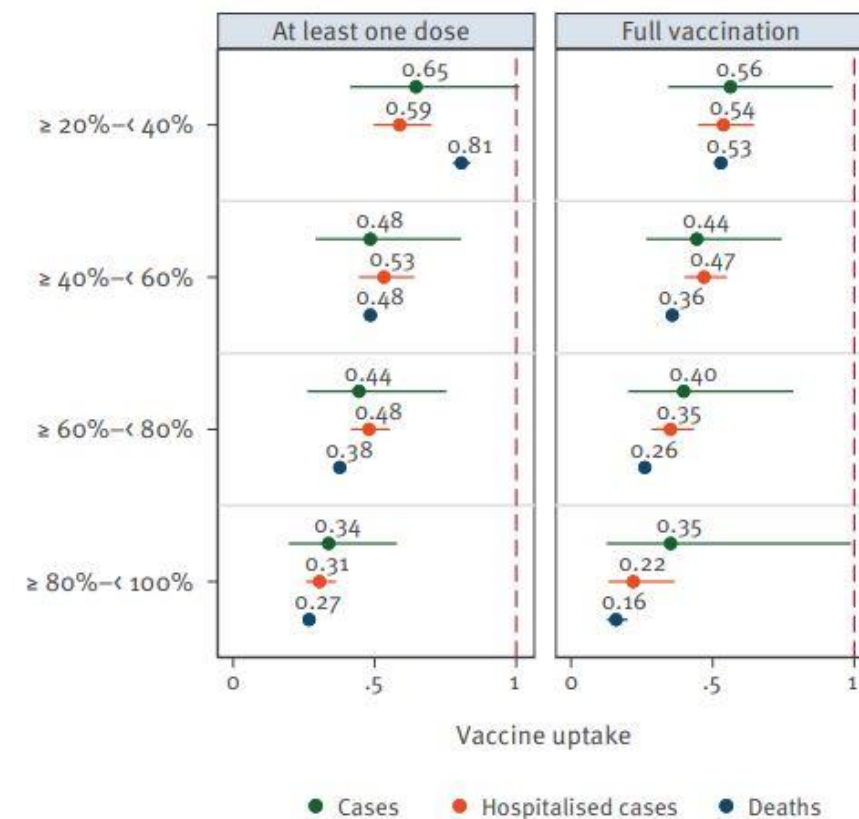


Source: GISAID: Variants, Omicron sublineages; TESSy COVID-19: 14-day case notification rate, 14-day case rate, Hospital admissions, 14-day death rate, Vaccination uptake

# Initial assessment of the COVID-19 vaccination's impact

**FIGURE 2**

Adjusted incidence rate ratios for those 80 years and older versus 25–59-year-olds for case, hospitalisation and death notification rates, 15 EU/EEA countries<sup>a</sup>, week 48 2020–week 20 2021



# Risk reduction of severe outcomes in vaccinated COVID-19 cases



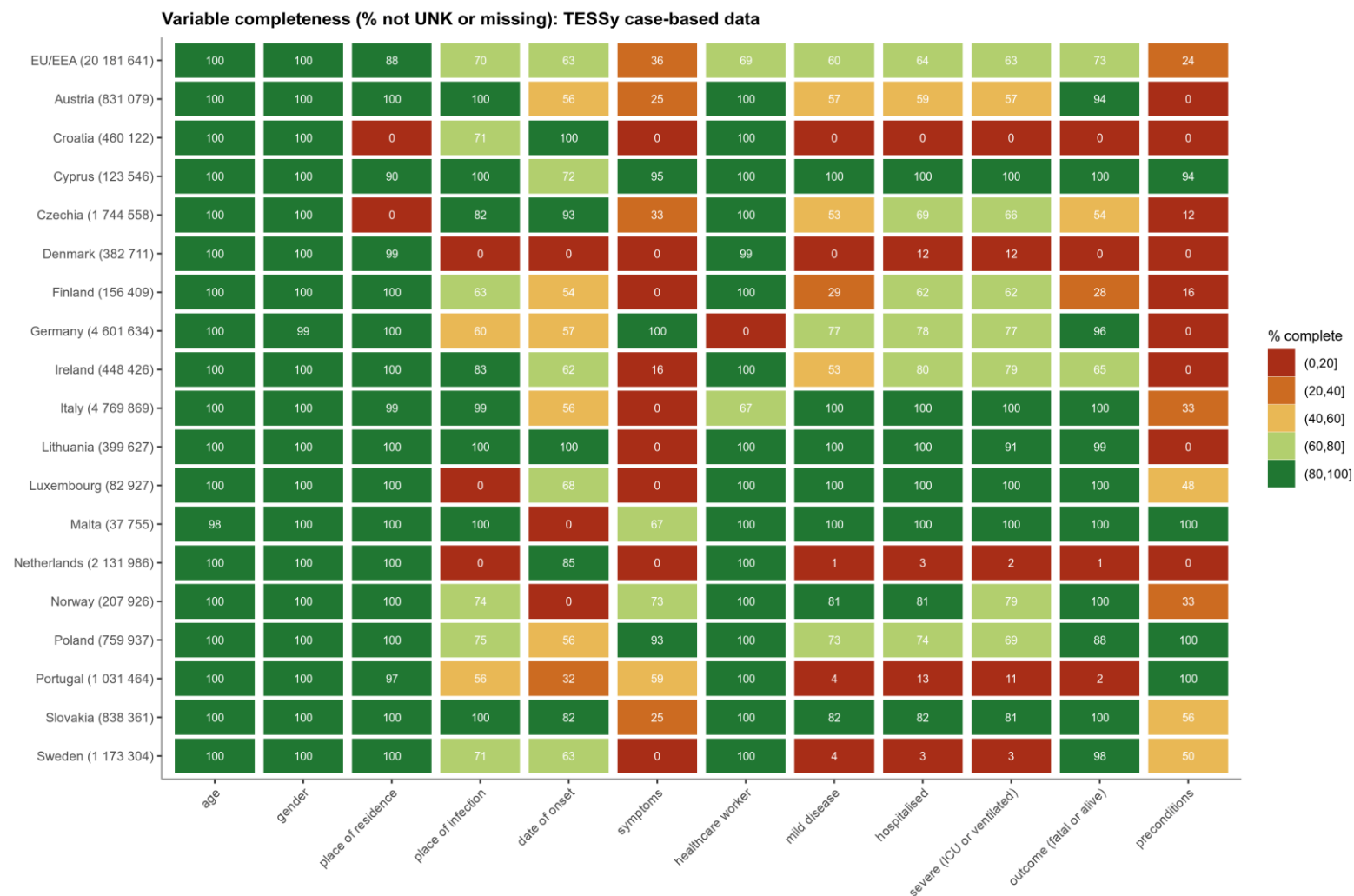
**TABLE 2**

Characteristics and relative risk of hospitalisations and deaths among COVID-19 cases reported to The European Surveillance System (TESSy), Estonia, Ireland, Luxembourg and Slovakia, weeks 1–45 2021

Characteristics	All records	Hospitalisations	%	aRR <sup>a</sup>	95% CI	All outcomes	Deaths	%	aRR <sup>a</sup>	95% CI
Total	431,137	19,652	4.6		NA	562,289	8,590	1.5		NA
<b>Sex</b>										
Women	225,683	9,715	4.3		Ref.	290,468	3,992	1.4		Ref.
Men	205,454	9,937	4.8	1.30	1.18–1.44	271,821	4,598	1.7	1.63	1.61–1.65
<b>Age at diagnosis (years)</b>										
18–49	278,364	3,675	1.3		Ref.	365,379	337	0.1		Ref.
50–64	99,419	4,898	4.9	3.94	3.52–4.40	129,965	1,638	1.3	13.31	11.17–15.84
65–79	43,265	7,521	17.4	13.94	11.57–16.79	54,858	4,050	7.4	77.28	63.28–94.39
≥ 80	10,089	3,558	35.3	29.09	26.23–32.27	12,087	2,565	21.2	225.70	174.83–291.37
<b>Underlying medical condition(s)</b>										
No	8,854	197	2.2		Ref.	8,854	5	0.1		Ref.
Yes	7,134	2,057	28.8	4.27	3.94–4.62	7,146	1,006	14.1	23.07	20.77–25.63
Other	218,603	11,162	5.1	1.59	1.49–1.67	221,168	4,690	2.1	9.00	8.20–9.90
Unknown	196,546	6,236	3.2	0.92	0.82–1.03	221,168	2,889	0.9	4.79	4.40–5.22
<b>Vaccination status</b>										
Unvaccinated	364,526	17,908	4.9		Ref.	487,445	8,260	1.7		Ref.
Fully vaccinated	66,611	1,744	2.6	0.32	0.26–0.39	74,844	330	0.4	0.20	0.13–0.29

# Challenges

- Travel-associated cases
- Testing indicators and testing strategies
- Data quality
- Hospital data
- Mortality data
- Increasingly complex epidemiological situation
- ...



Beauté J, Spiteri G. Travel-associated COVID-19: a challenge for surveillance? Euro Surveill. 2020 Sep;25(37) Available at: <https://www.ncbi.nlm.nih.gov/pubmed/32945253>

Beauté J, Adlhoch C, Bundle N, Melidou A, Spiteri G. Testing indicators to monitor the COVID-19 pandemic. Lancet Infect Dis. 2021 Oct;21(10):1344-5. Available at:

<https://www.ncbi.nlm.nih.gov/pubmed/34450053>

[https://covid19-surveillance-report.ecdc.europa.eu/#4\\_TESSy\\_data\\_quality](https://covid19-surveillance-report.ecdc.europa.eu/#4_TESSy_data_quality)



# The future of COVID-19 surveillance



## Key messages

Most European Union/European Economic Area (EU/EEA) countries have established comprehensive surveillance systems for COVID-19 with a large proportion reporting all positive cases regardless of indication for testing. Furthermore, testing policies have been different across countries, thus affecting data comparability at EU/EEA level. This guidance encourages countries to transition from emergency surveillance to more sustainable, objective-driven, surveillance systems according to the following key points:

- Systems should allow for integrated surveillance of COVID-19, influenza and other respiratory pathogens that are likely to co-circulate in the population.
- Current influenza surveillance systems are not sufficiently sensitive and representative to enable joint COVID-19 surveillance, thus countries should consider expanding the coverage of sentinel providers to improve sensitivity and to collect sufficient specimens for further characterisation.
- Countries should focus on reporting symptomatic cases, i.e. cases that have been tested because of experiencing COVID-19 compatible symptoms, as this will improve comparability.
- If comprehensive testing of all those presenting with symptoms is not feasible, a representative subset of symptomatic cases should be tested, preferably by PCR.
- A representative subset of SARS-CoV-2 positive specimens should be sequenced. Genomic surveillance of representative samples should be coupled with targeted comprehensive sampling in special settings or populations.
- Monitoring of vaccine effectiveness should be carried out through ad hoc studies, possibly embedded in surveillance systems.
- Countries should continue mortality monitoring and consider sero-epidemiological surveys among complementary systems which will help meet the main surveillance objectives.



## Operational considerations for respiratory virus surveillance in Europe

18 July 2022

*"During the 2022/23 winter season, there will be considerable disparity in the level of implementation of integrated respiratory surveillance among countries"*