

**European Centre for Disease Prevention and Control** 

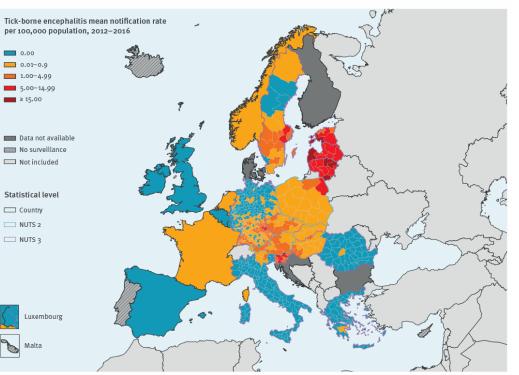
# **COVID-19 surveillance at ECDC**

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 surveillanc*e: 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

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

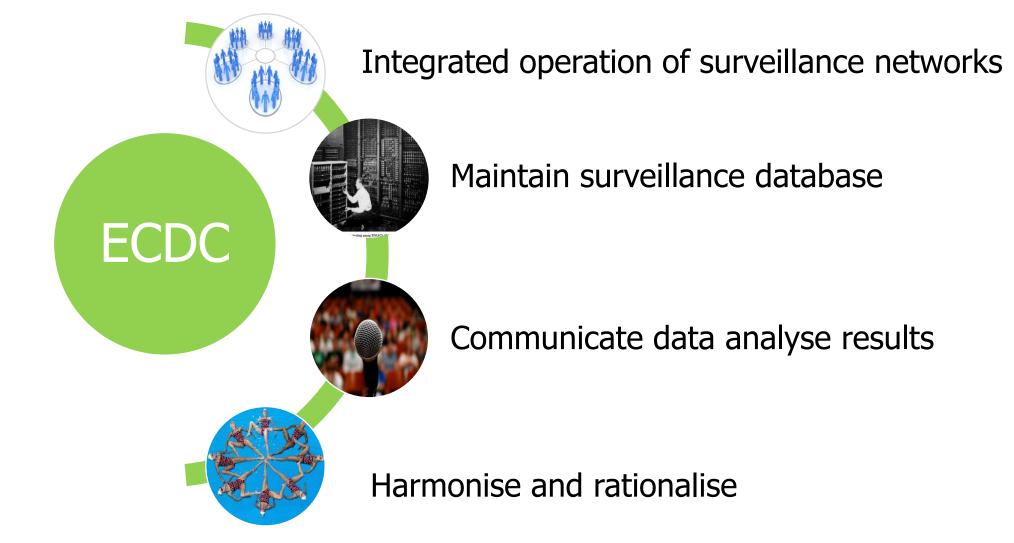




https://www.ecdc.europa.eu/en/about-ecdc/what-we-do/ecdc-activities-surveillance

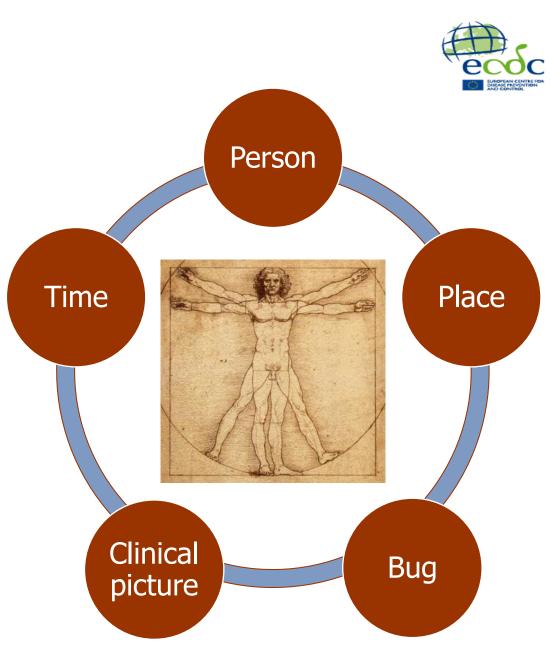
# **Role of ECDC** (as per founding regulation)





## 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)
- GISAID
- EuroMOMO

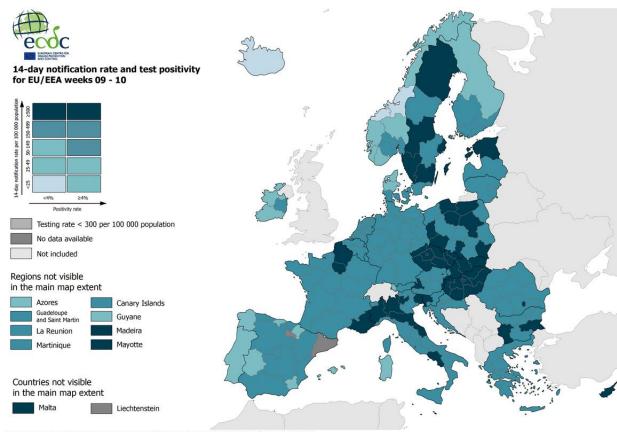
## **Public ECDC surveillance outputs**



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

## Other outputs based on surveillance data



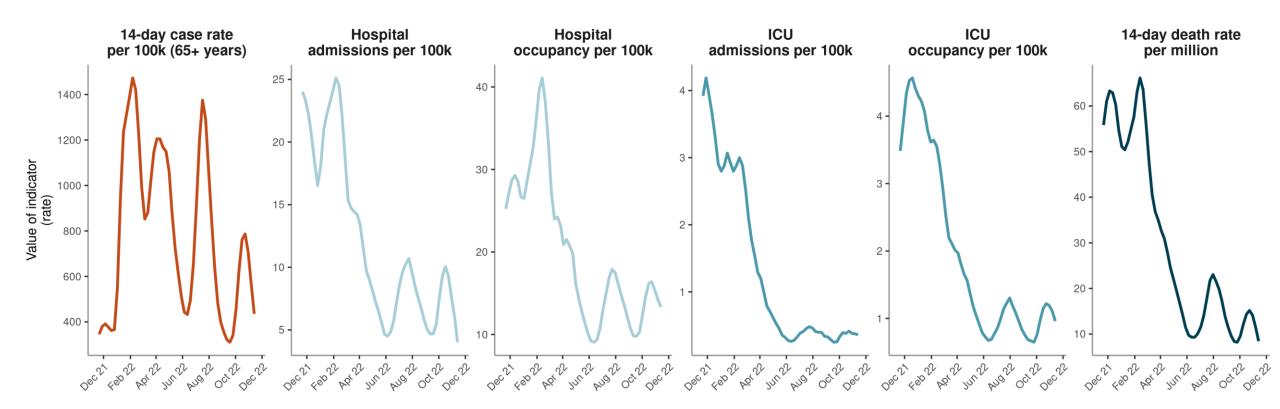


Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat.©Kartverket©Instituto Nacional de Estatística - Statístics Portugal. The boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on: 17 Mar 2021

- 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





Reporting week

ECDC. Figure produced 18 November 2022

Source: GISAID: Austria, Belgium, Croatia, Czechia, Iceland, Italy, Liechtenstein, Lithuania, Poland, Portugal, Spain and Sweden

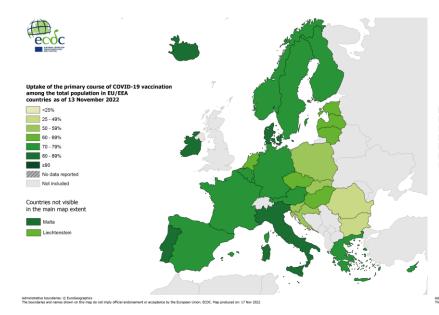
TESSy: Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Luxembourg, Malta, Netherlands, Norway, Romania, Slovakia and Slovenia

### 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)

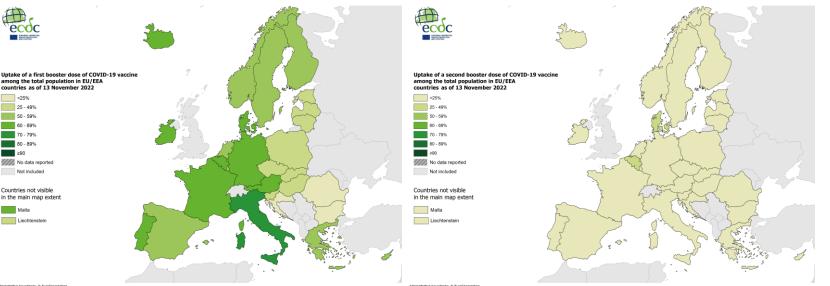


#### **1st booster/additional dose:**

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)



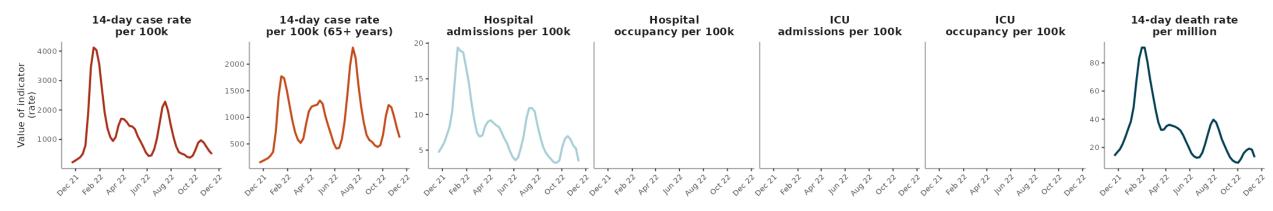
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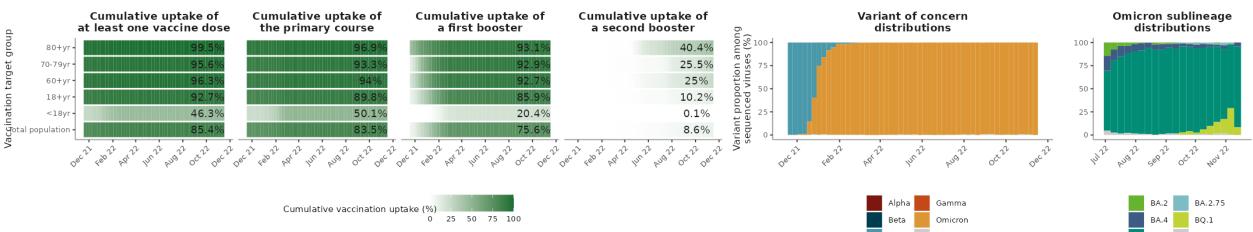
dministrative boundaries: () EuroGeographics he boundaries and names shown on this map do not imply official endorsement or acceptance by the European Union. ECDC. Map produced on: 17 Nov 2022

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

ELECTRON CENTRE RECEIPTION RECEIPTION

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

ECDC. Figure produced 18 November 2022

Other

Delta

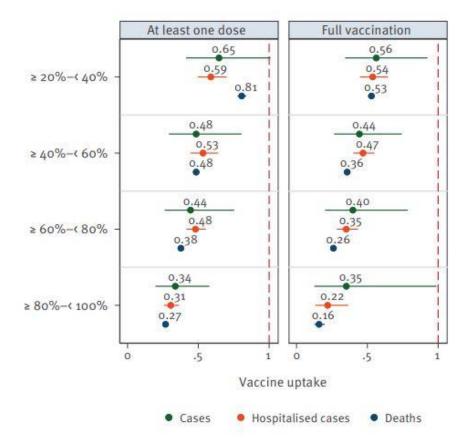
Other

## **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



Nicolay N, et al. Initial assessment of the COVID-19 vaccination's impact on case numbers, hospitalisations and deaths in people aged 80 years and older, 15 EU/EEA countries, December 2020 to May 2021. Euro Surveill. 2021 Dec;26(48) Available at: <a href="https://www.ncbi.nlm.nih.gov/pubmed/34857068">https://www.ncbi.nlm.nih.gov/pubmed/34857068</a>

## 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	%	aRRª	95% CI	All outcomes	Deaths	%	aRR∗	95% CI
Total	431,137	19,652	4.6		NA	562,289	8,590	1.5	1	NA
Sex									164 164	
Women	225,683	9,715	4.3		Ref.	290,468	3,992	1.4	F	lef.
Men	205,454	9,937	4.8	1.30	1.18-1.44	271,821	4,598	1.7	1.63	1.61-1.6
Age at diagnosis (yea	irs)		15							
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
Underlying medical co	ondition(s)									
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
Vaccination status		-			· · · · ·					
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

Marrone G, et al. Risk reduction of severe outcomes in vaccinated COVID-19 cases: an analysis of surveillance data from Estonia, Ireland, Luxembourg and Slovakia, January to November 2021. Euro Surveill. 2022 Feb;27(7) Available at: <u>https://www.ncbi.nlm.nih.gov/pubmed/35177166</u>

## Challenges



Variable completeness (% not UNK or missing): TESSy case-based data

- Travel-associated cases •
- Testing indicators and ۲ testing strategies
- Data quality  $\bullet$
- Hospital data  $\bullet$
- Mortality data  $\bullet$

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Increasingly complex  $\bullet$ epidemiological situation

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Cypus (123 54)100			0	94	57	59	57	100	25	56	100	100	100	100	Austria (831 079) -
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Denmark (382 711)TwoTwoSee			94	100	100	100	100	100	95	72	100	90	100	100	Cyprus (123 546) -
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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 guality

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## The future of COVID-19 surveillance





ECDC TECHNICAL REPORT

#### **COVID-19** surveillance guidance

Transition from COVID-19 emergency surveillance to routine surveillance of respiratory pathogens

October 2021

#### **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, objectivedriven, 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"

https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-surveillance-guidance.pdf https://www.ecdc.europa.eu/sites/default/files/documents/Operational-considerations-respiratory-virus-surveillance-euro-2022.pdf