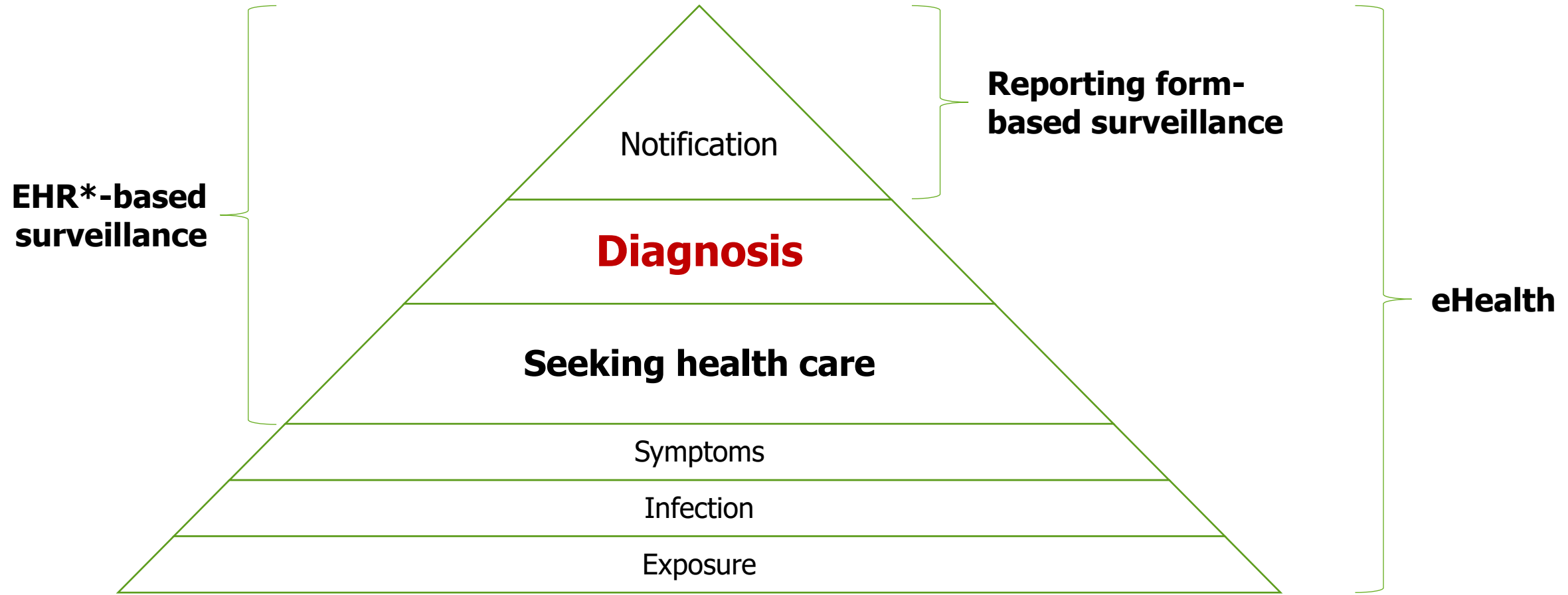


EHR-based SARI surveillance in the EU/EEA updates and plans for the future

Carlos Carvalho, Principal Expert Digital Surveillance
EU/EEA respiratory virus network meeting, Stockholm, 13 June 2024

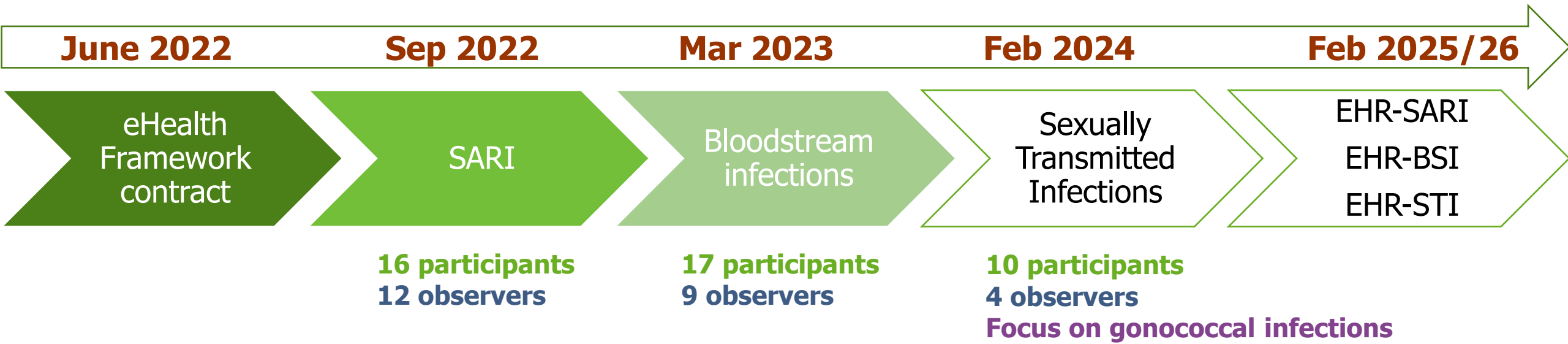
Digital surveillance



*EHR: Electronic Health Records

ECDC eHealth programme

SURveillance from Electronic Health Data (SUREHD) project



External contractor:

E-SURE consortium (Epiconcept, SSI-DK, INSA-PT, NIVEL-NL)


EHR-SARI operational objectives


- Discussion on **case definitions**/proxy case definitions
- Developing generic and country-specific **EHR-based surveillance protocols** (adjusted to the country needs)
- Improving **sensitivity, timeliness, and representativeness** of the national SARI surveillance systems
- Support **evaluation** of surveillance systems at MS and EU levels
- Inform future changes in surveillance **metadata and reporting protocols**

Participant

 Participant EHR-SARI-1

 Participant EHR-SARI-2

 Observer

 Non-participant

EU/EEA member

 Yes

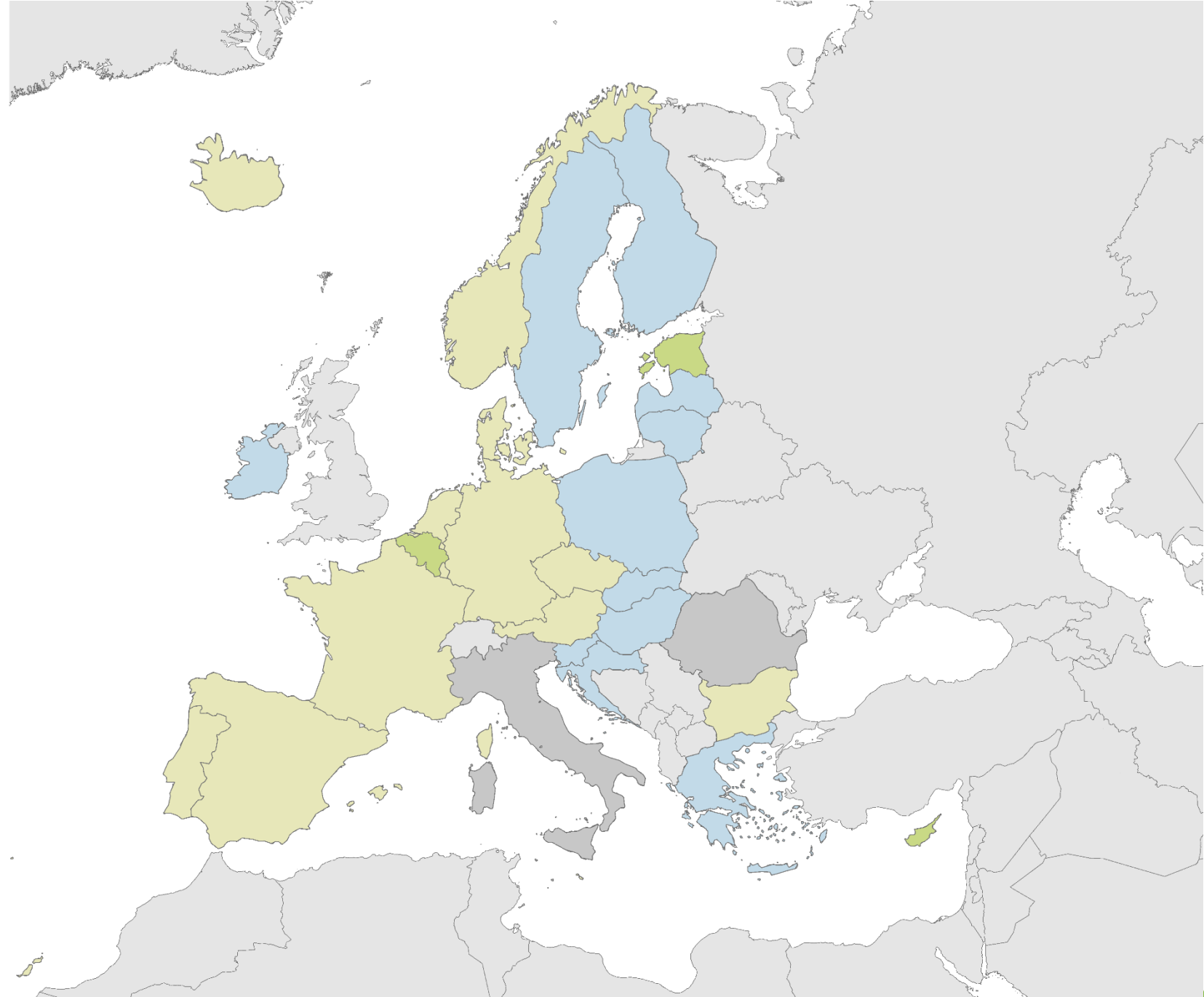
 No

Countries not visible in the main map extent

 Malta

 Luxembourg

 Liechtenstein



EHR-SARI generic surveillance protocol (Nov 2022)

epiconcept

“Design and implementation of multinational surveillance systems using routinely collected electronic health records in EU/EEA.”
(FWC – ECDC/2022/03)

EHR-based
SARI surveillance generic protocol

Version:	1
Date:	18-November-2022
Deliverable	DL 1

4.12.1. Proxy SARI case

As per the 2014 WHO's case definition (11), SARI is defined as an acute respiratory infection that requires hospitalisation with a history of fever or measured fever of $\geq 38\text{ C}^\circ$; and cough, and onset of symptoms within the 10 days before hospital admission.

Electronic systems are not typically set up to collect symptoms on a routine basis, making it difficult to ascertain SARI patients according to the WHO and other symptom-based case definitions. However, routinely collected electronic variables can be indicative of SARI clinical presentations and be used to create proxy case definitions that provide suitable information to meet the surveillance objectives.

A proxy SARI case will be defined as a hospitalised patient “due to” a SARI and identified through disease classification codes created for clinical (e.g., ICD-10 codes) or administrative purposes (e.g., financial/insurance claim codes). The use of primary diagnosis codes or the exclusion of nosocomial infections may allow discriminating between hospitalisation “due to” or “with” SARI. If not possible, countries may define SARI as a hospitalised patient “with” a severe acute respiratory infection identified through electronic codes.

The exact list of codes to identify a proxy SARI case are still under discussion within the E-SARI-NET network; however, the majority of countries using ICD-10 codes include those for (12):

- Lower respiratory infections (J09 – J22)
- COVID-19 (U07: U07.1 and U07.2)

Codes need to be clearly specified in the site-specific protocol, including if they are admission or discharge codes, if they are primary codes, secondary codes or both; as well as the timeliness of data collected. If other electronic variables are used to ascertain proxy SARI cases, these need to be specified as well (e.g., SARI-related laboratory test requests, or clinician request of a respiratory screening). Furthermore, countries may use additional inclusion/exclusion criteria while identifying SARI cases (see section - *SARI patient identification and algorithm SARI patient inclusion*).

Case definitions

- **WHO SARI case definition:**
 - Patient with an acute respiratory infection that requires hospitalisation **AND**
 - Has a history of fever or measured fever of $\geq 38\text{ C}^\circ$ **AND**
 - Cough **AND**
 - Onset within the last 10 days.
- **“EU” ARI case definition (for influenza*):**
 - Sudden onset of cough **OR** sore throat **OR** shortness of breath **OR** coryza **AND**
 - A clinician’s judgement that the illness is due to an infection
 - If hospitalised -> SARI
- **Case definition based on electronic records**
 - Under discussion: best performing ICD-10 codes
 - for SARI-influenza, SARI-COVID-19, and SARI-RSV

Proposal (2024)*

*Subject to change

INFLUENZA IN HUMANS, SEASONAL

INFLUENZA IN HUMANS, ZONOTIC

CORONAVIRUS DISEASE 2019 (COVID-19) IN HUMANS

RESPIRATORY SYNCYTIAL VIRUS (RSV) INFECTION IN HU

Clinical Criteria

At least one of the following:

- ARI
- ILI
- SARI

Laboratory Criteria

At least one of the following:

- Detection of influenza virus nucleic acid in a clinical specimen
- Identification of influenza virus antigen in a clinical specimen
(*Antigen tests used in healthcare and other settings where testing can be performed by trained/professional staff, e.g. pharmacies*)
- Isolation of influenza virus from a clinical specimen

Epidemiological Criteria

Contact with a confirmed human case

Case Classification

A. Possible case:

Any person meeting the clinical criteria (ARI, ILI or SARI)

B. Probable case:

Any person meeting the clinical criteria (ARI, ILI or SARI) and the epidemiological criterion

C. Confirmed case:

Any person meeting the laboratory criteria

Current case classification (2018)

Case Classification

A. Possible case

Any person meeting the clinical criteria (ILI or ARI)

B. Probable case

Any person meeting the clinical criteria (ILI or ARI) with an epidemiological link

C. Confirmed case

Any person meeting the clinical (ILI or ARI) and the laboratory criteria

Important studies to conduct to develop EHR-SARI

- **Validation of ICD-10 diagnostic codes**
 - Accuracy (in progress: led by Epiconcept, 6 participating countries)
 - Timeliness
- Performance comparison of **admission vs. discharge** diagnostic codes
- Completeness/availability of **hospital data** (pathogen, age, comorbidities, vaccination, outcome)
- Exploratory studies including independent (but linkable) EHR data sources
 - **Laboratory** results
 - **Vaccination** registries
 - **Death** registries

EHR-SARI surveillance systems (Epiconcept, Feb 2024)



Table 2. Description of the EHR-based SARI surveillance systems in Europe, February 2024

	Austria	Denmark	Germany	Malta	Norway	Spain
Type of SARI surveillance	Based on EHR	Based on EHR	Based on EHR	Based on EHR Semi-automated (1)	Based on EHR	Based on EHR Semi-automated (1)
Coverage	National	National	National	Sub-National (excl. Gozo) (2)	National	Sub-National (partial coverage of four Autonomous Communities of Catalonia, Galicia, The Basque Country and the Valencian Community)
Catchment pop. (% total pop)	9,104,772 (100%)	~6,000,000 (100%)	4,400,000 (5.2%)	~542,051 (100%)	5,488,984 (100%)	~3,991,737 (8.3%)
System design	Comprehensive	Comprehensive	Sentinel	Comprehensive	Comprehensive	Sentinel
N hospitals	154	NR	70	1	NR (All publicly funded hospitals providing secondary care)	15
Surveillance period	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round
Case definition	ICD-10 code-based	ICD-10 code-based	ICD-10 code-based	Symptom-based	ICD-10 code-based	Diagnostic impression and ICD-10 code based (3)
Format of data collected	Aggregated	Case-based	Case-based	Case-based	Case-based	Case-based
Format of data reported to TESSy	None	None	Aggregated	Case-based	None	Case-based

EU/EEA eHealth surveillance annual meeting

Dates: **11-12 September 2024**

Format: F2F (for the project participants)/Hybrid

Onsite participants:

- 1 expert per project/country (EHR-SARI + EHR-BSI + EHR-STI)
- ESURE consortium
- European Commission/eHealth network
- Invited external experts
- ECDC experts

Thank you

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