



## Weekly report of 04-01-2023

**Reporting period:** 01-04-2022 – 01-01-2023

### ABOUT THE WEEKLY REPORT

SUMO is a system that has been developed and implemented at the Robert Koch Institute. It processes and provides health data for surveillance and public health research. The emergency department weekly report presents data from the AKTIN emergency department registry from the routine documentation of selected German emergency departments. The report shows the current utilisation of these emergency departments as part of the emergency department surveillance at the Robert Koch Institute.

#### Data source and inclusion criteria

The inclusion of emergency departments is based on voluntary participation and is determined per quarter, depending on the data availability.

Emergency departments are included in the report, if data gaps where no emergency department admissions are reported are not larger than 6 consecutive days each. Furthermore, to be included in the most recent quarter an emergency department has to report at least one admission for each of the last 7 days. These criteria equally apply to the analyses of triage and chief complaints (according to CEDIS-PCL), but consider the availability of the respective variable. To be included in the analyses for syndromic surveillance, an emergency department has to report at least one case of the respective case definition in the quarter (and at least within the last 21 days).

Because the availability of data can vary by variable and change over time, the number of emergency departments can vary between quarters, between reports and between the different plots. Because the size of the included emergency departments varies, the number of reported cases can vary between quarters with the same number of emergency departments.

#### Variables and case definitions

Emergency departments document triage levels based on the *Emergency Severity Index* (ESI) or the *Manchester Triage System* (MTS). The reported chief complaints were coded according to the *Canadian Emergency Department Information System – Presenting Complaint List* (CEDIS-PCL) and diagnoses according to the *International Classification of Diseases – Version 10* (ICD-10).

Case definitions for acute respiratory illness (ARI) and severe ARI (SARI) were based on a combination of diagnosis, chief complaints and hospitalisation, as described in Boender et al. 2021 (DOI 10.1101/2021.08.19.21262303). The case definition for influenza-like illness (ILI) was based on ICD-10 diagnoses: J09, J10.-, J11.-. Case definitions for respiratory, cardiovascular and neurological complaints were based on CEDIS-PCL codes: RC – respiratory (651-661), CV – cardiovascular (001-012) and NC – neurological (401-411).

#### Baseline calculation

For each category (visits, stratified by age and triage, case definitions) we calculate a baseline and a 95% prediction interval per single emergency department, which is then summed up over all emergency departments to one final baseline and prediction interval, respectively. A negative binomial regression model is used to calculate the baseline. We use a global regression model that is trained on all available emergency departments, allowing the inclusion of emergency departments without full historic data (from 2017-01-01 to 2022-11-04). The regression model includes variables for the respective emergency department, seasonality, a time trend, and pandemic phases. From that we can calculate a pre-pandemic baseline for all emergency departments and points in time. The sum over all included emergency departments yields the depicted total baseline.

## Interpretation of the data

A meaningful interpretation of the data is only possible with knowledge of the processes and structures of the respective emergency departments and after consulting with these. Furthermore, for the interpretation of surveillance data, it is important to consider several limitations:

- The sample of emergency departments is not representative for Germany.
- The number of emergency departments in the current quarter may change weekly, because not every emergency department delivers data every week.
- Population based data such as incidences cannot be derived from the presented numbers.
- Complaints are not equal to clinically confirmed diagnoses. Also diagnoses made in emergency departments are often suspected diagnoses.
- The indicators for the syndromic surveillance are defined by a combination of complaints and ICD-10 diagnoses both of which may have missing values (see Table 1). This can lead to an underestimation of case numbers.
- Changes over time can be caused both by real changes of the emergency department utilisation, as well as several other reasons (e.g. changed documentation practices or care processes). Therefore, the data should not be interpreted without prior direct communication with the emergency departments.

## PARTNERSHIP

The report has been established in close cooperation with the AKTIN Emergency Department Data Registry. We want to especially thank the participating emergency departments for sharing their data.




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## Archive

Previous reports can be found here: [Archive emergency department situation report.](#)

## Suggested citation:

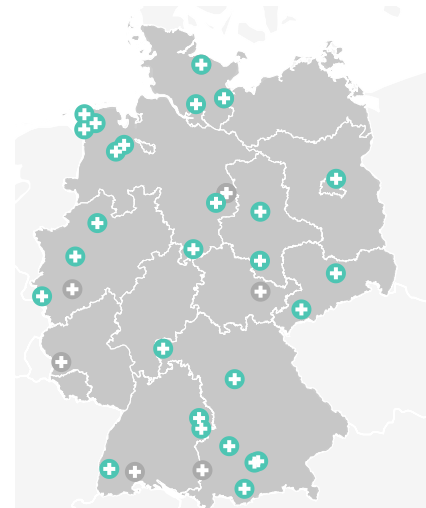
Robert Koch Institute: Routine health data in real-time (SUMO). Emergency Department Surveillance Weekly Report 04-01-2023. DOI 10.25646/10864.

**WEEKLY OVERVIEW**

**Reporting date:** 04-01-2023  
**Reporting period:** 01-04-2022 - 01-01-2023

**Emergency departments:** in total 27 emergency departments in Germany, located in the federal states Baden-Wuerttemberg, Bavaria, Berlin, Lower Saxony, North Rhine-Westphalia, Saxony, Saxony-Anhalt, and Schleswig-Holstein

**Level of care:**  
 Basic emergency care: 4 departments  
 Extended emergency care: 5 departments  
 Comprehensive emergency care: 18 departments



**Figure 1:** Emergency departments included in the current quarter (green) and included in the previous quarters in this report (grey).

**Data quality**

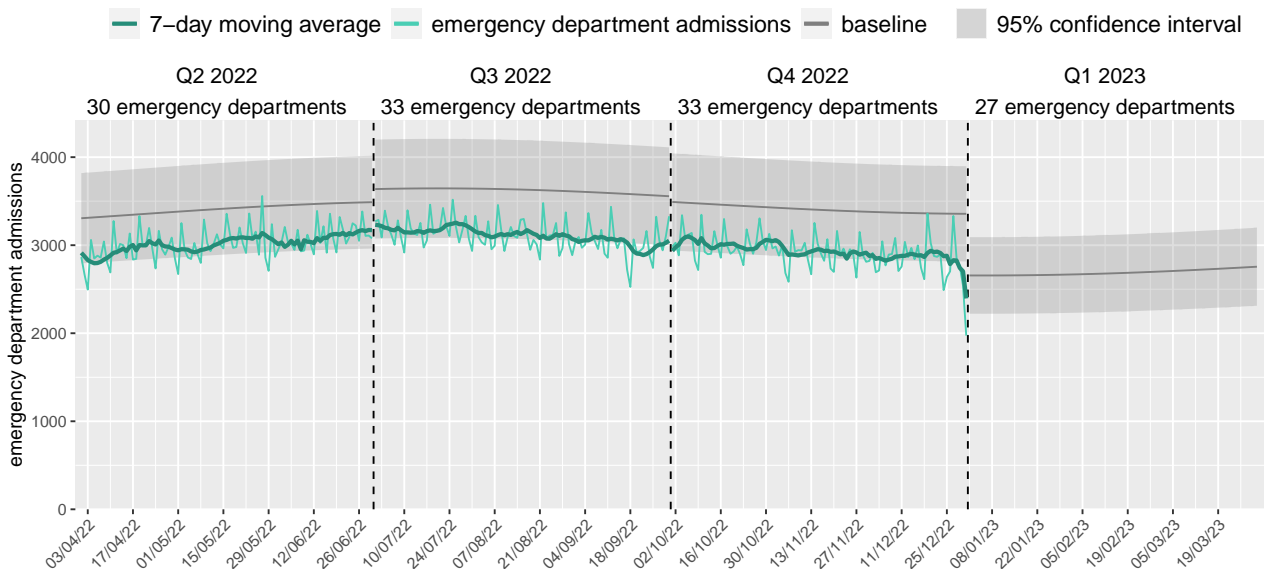
Date	Number of attendances	Average number of attendances per department	Triage available (%)	CEDIS-PCL available (%)	ICD-10 diagnosis available (%)	Disposition available (%)
01-01-2023	2,194	81	98.4	58.8	39.1	60.6
31-12-2022	1,973	73	95.9	57.9	46.6	62.9
30-12-2022	2,401	88	97.4	61.8	53.3	68.8
29-12-2022	2,480	91	97.6	61.3	56.9	67.9
28-12-2022	2,472	91	97.2	61.8	54.6	68.2
27-12-2022	2,900	107	97.7	60.3	59.2	71.2
26-12-2022	2,304	85	99.0	59.7	57.3	66.5

**Table 1:** Number of recorded emergency department attendances and availability of variables for each day of the current week

**EMERGENCY DEPARTMENT ATTENDANCES**

**Figure 2: Emergency department attendances**

Daily emergency department attendances shown as 7-day moving average compared to baseline.

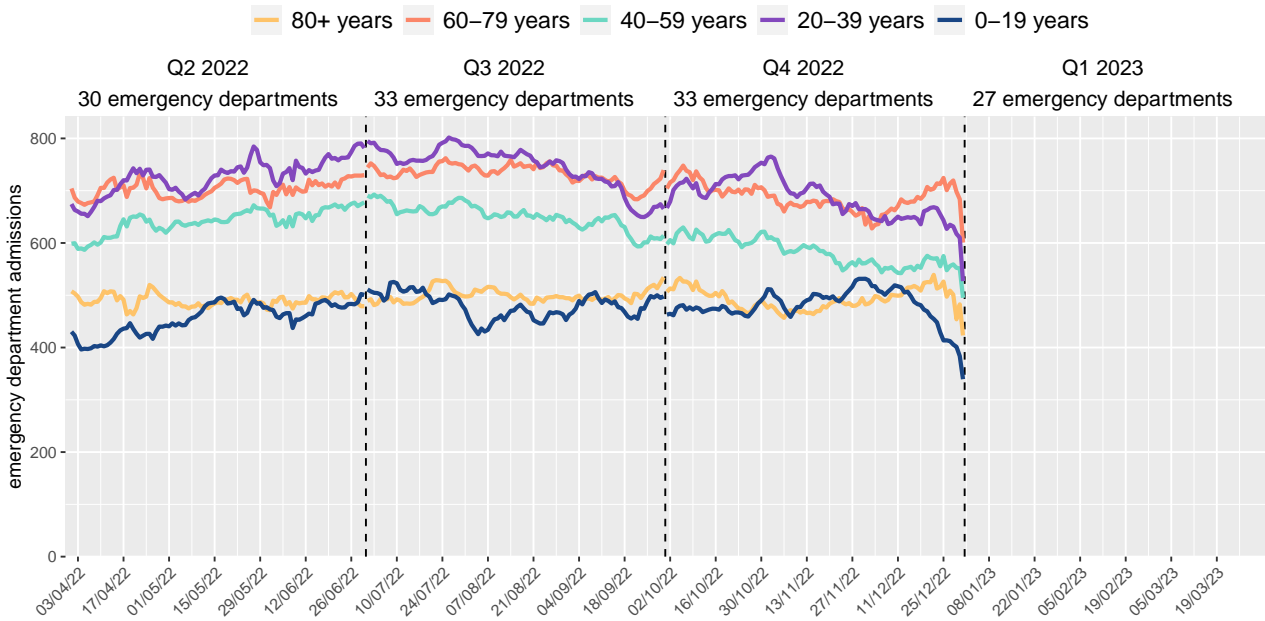


Note: Because the size of the included emergency departments varies, the number of reported cases can vary between quarters with the same number of emergency departments.

**AGE**

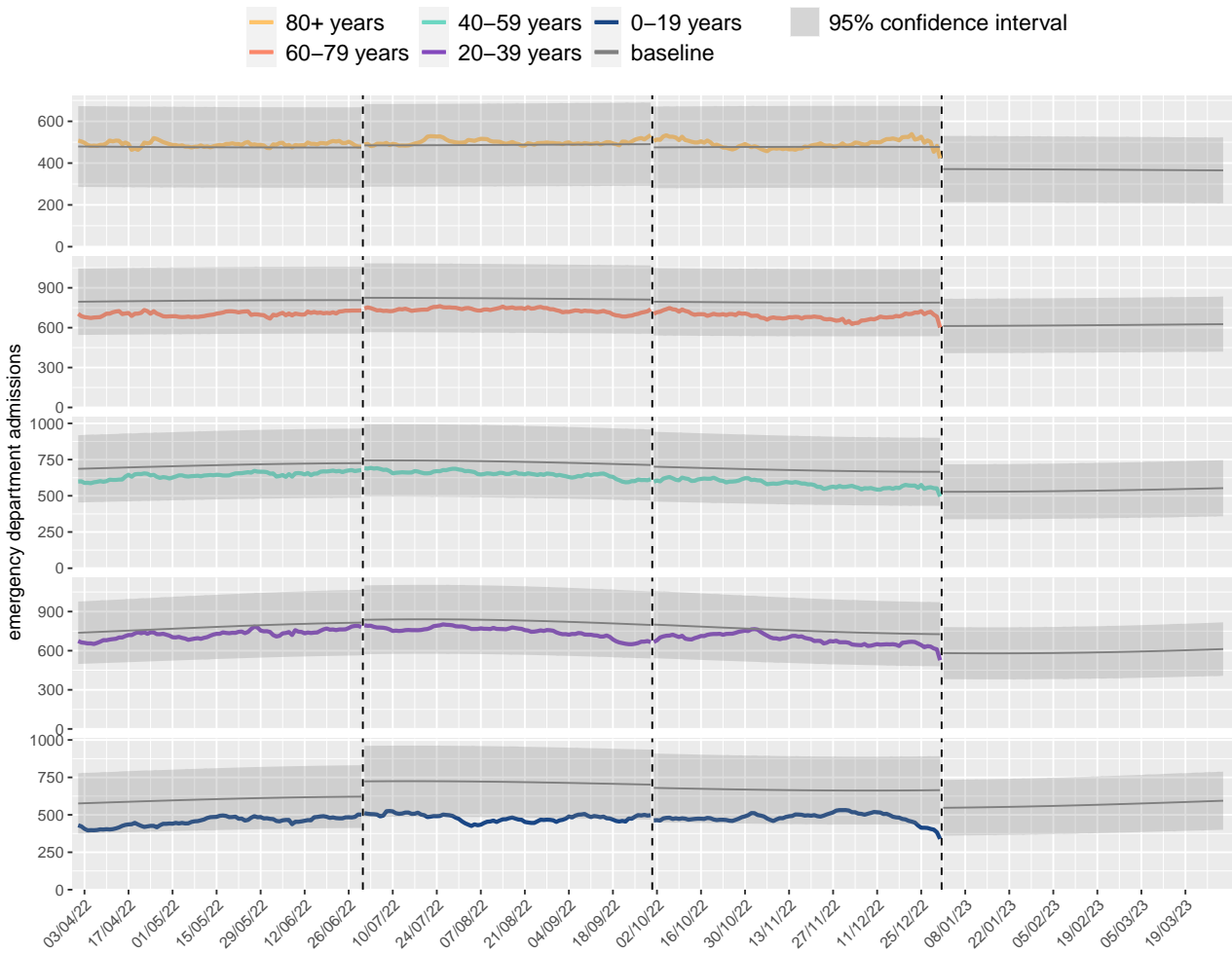
**Figure 3a: Overview of all age groups**

7-day moving average of emergency department attendances stratified by age groups.



**Figure 3b: Attendances per age group compared to baseline**

7-day moving average of emergency department attendances stratified by age groups in comparison to baseline.

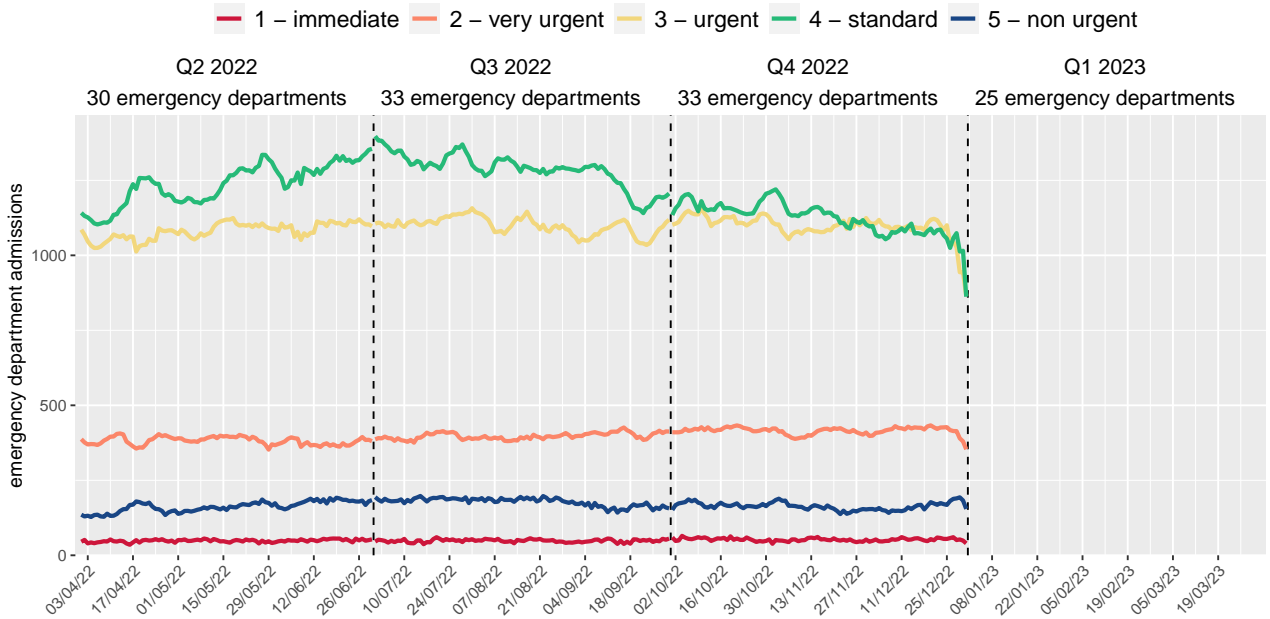


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**TRIAGE**

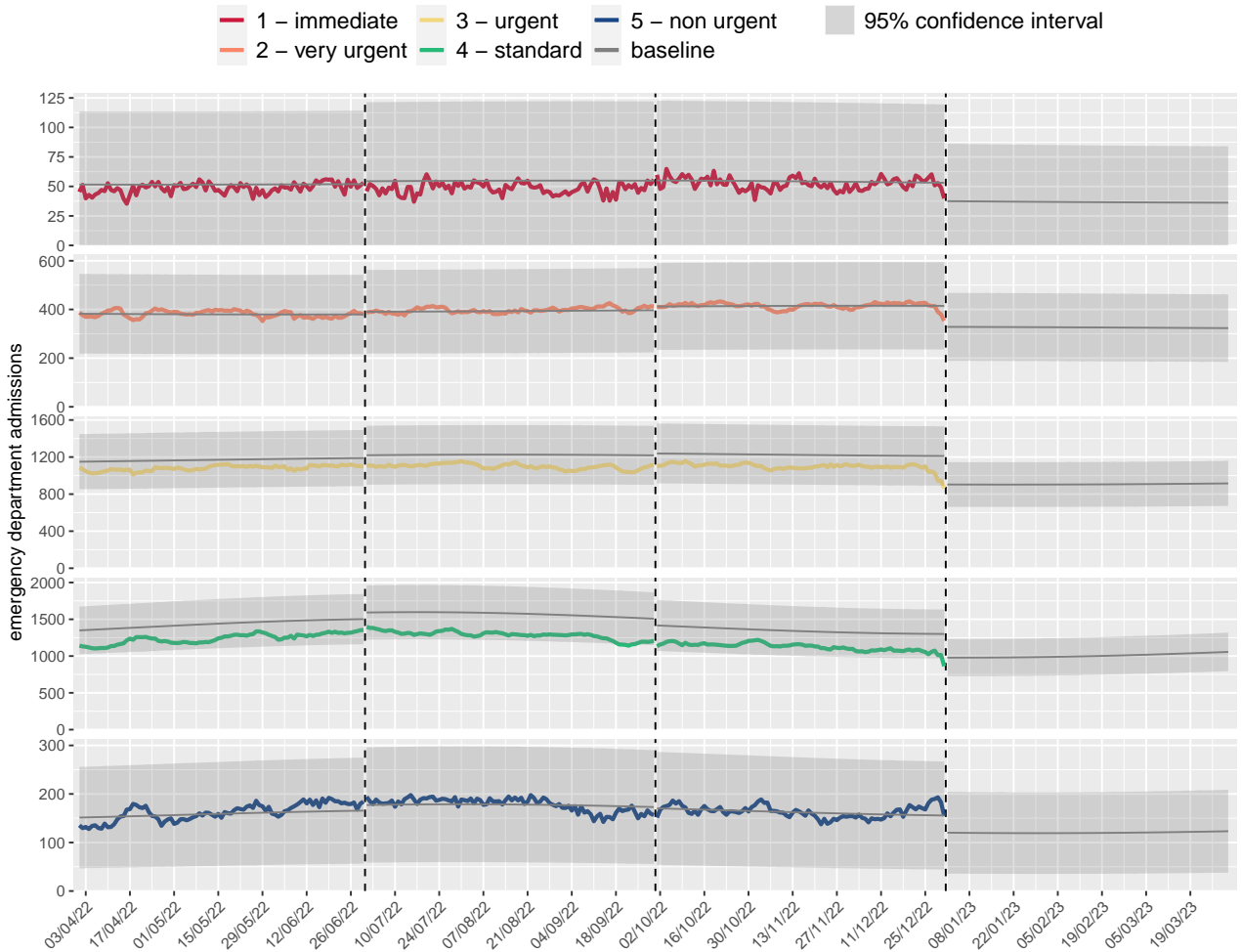
**Figure 4a: Overview of all triage levels**

7-day moving average of emergency department attendances stratified by triage levels.



**Figure 4b: Attendances per triage level compared to baseline**

7-day moving average of emergency department attendances stratified by triage levels in comparison to baseline.

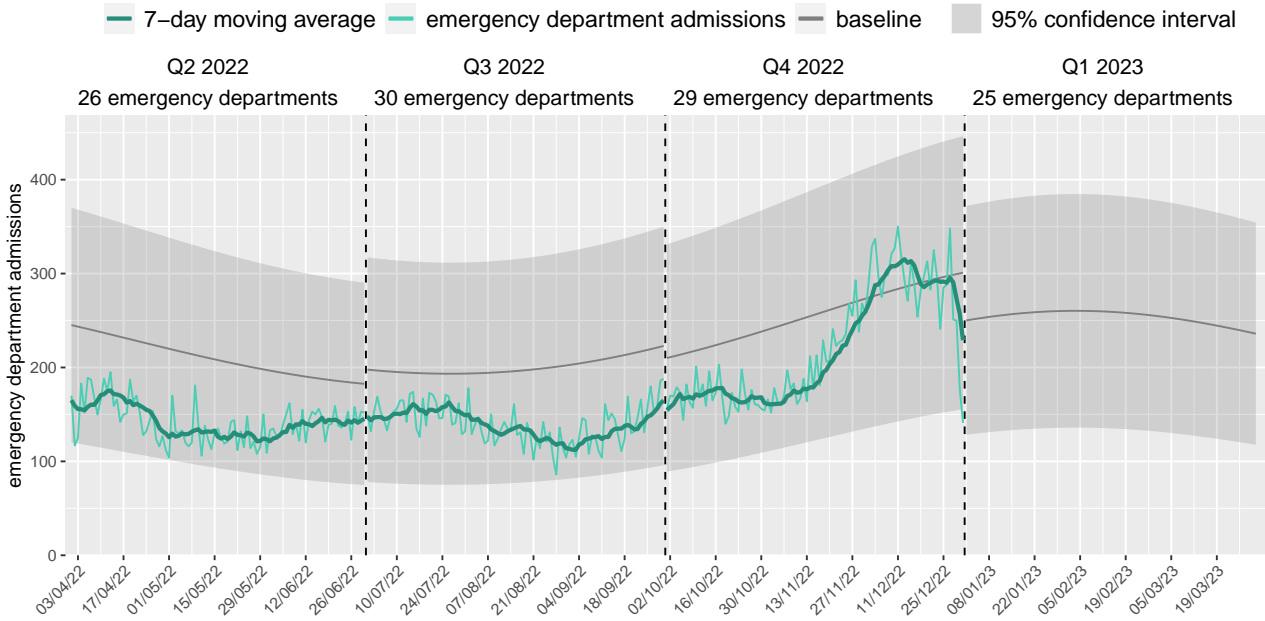


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**SYNDROMIC SURVEILLANCE**

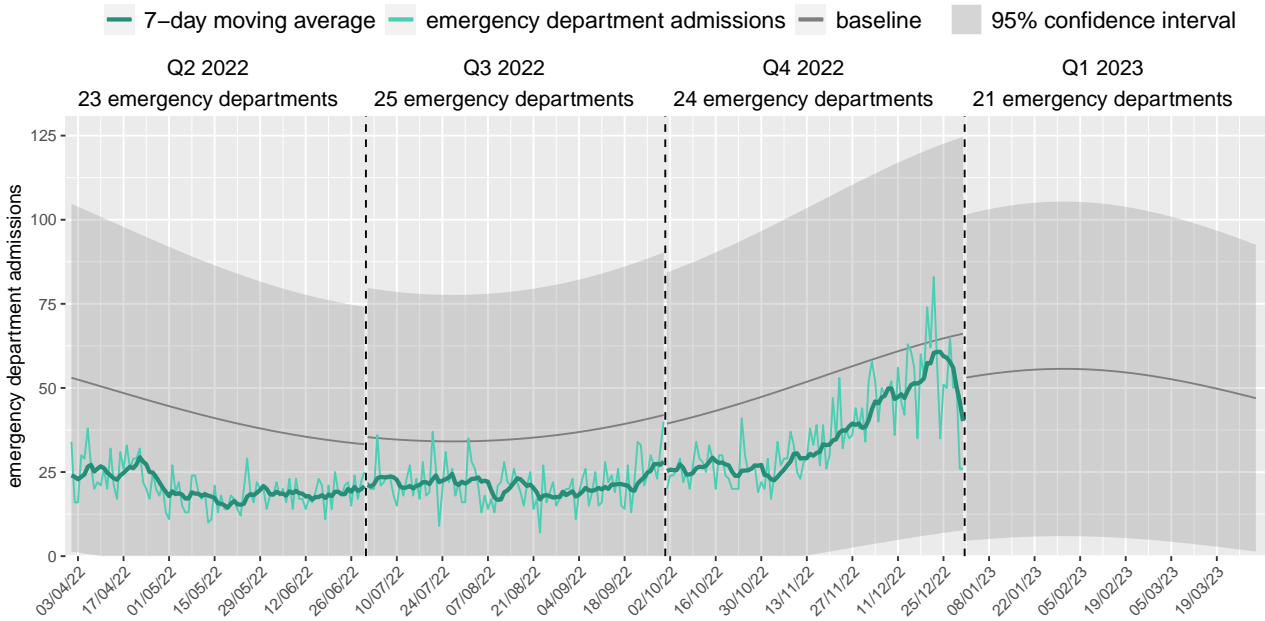
**Figure 5: Acute respiratory infection (ARI)**

Daily emergency department attendances for acute respiratory infection (ARI) and 7-day moving average in comparison to baseline.



**Figure 6: Severe acute respiratory infection (SARI)**

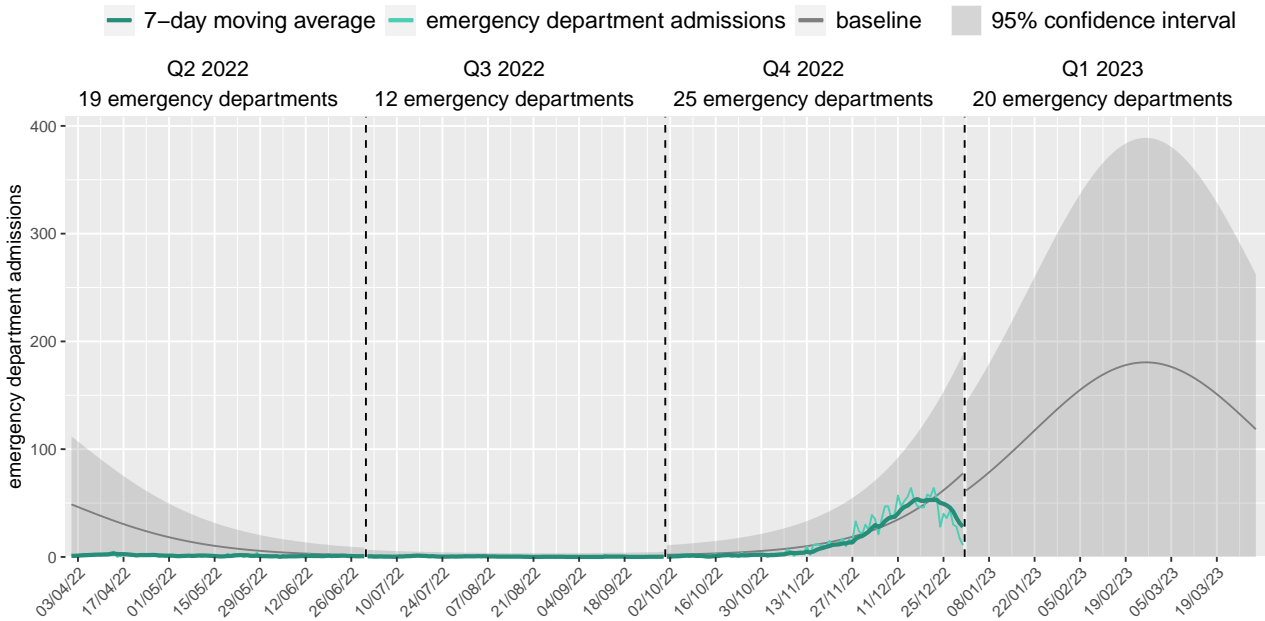
Daily emergency department attendances for severe acute respiratory infection (SARI) and 7-day moving average in comparison to baseline.



Note: Because the size of the included emergency departments varies, the number of reported cases can vary between quarters with the same number of emergency departments.

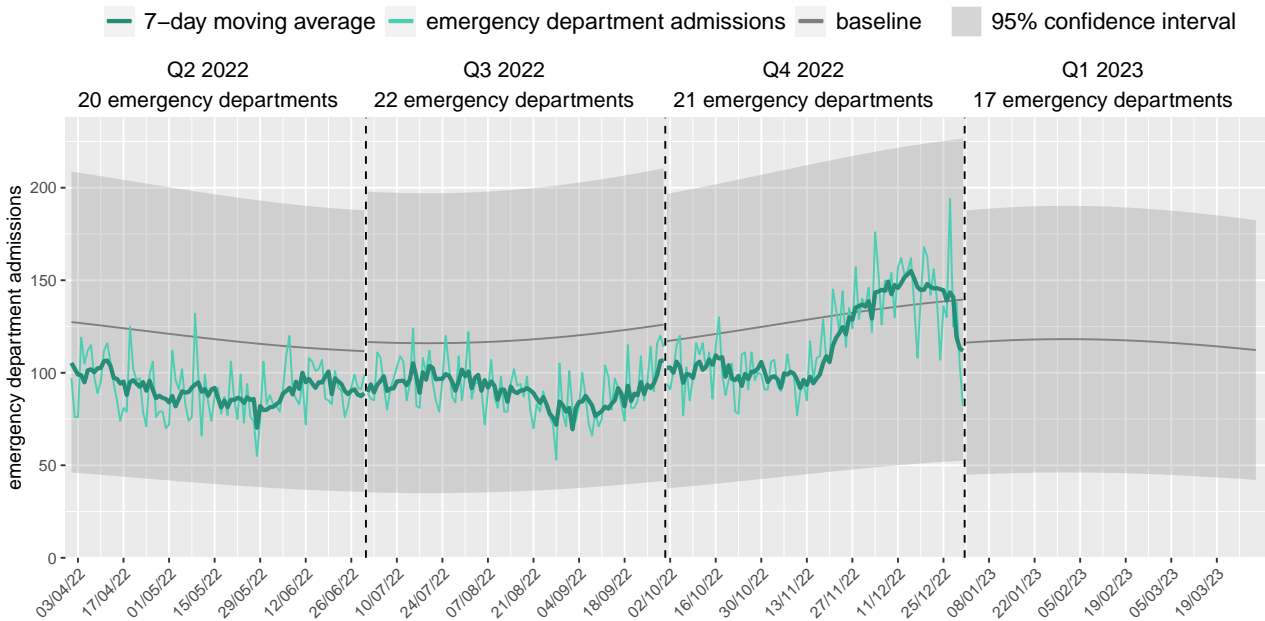
**Figure 7: Influenza-like-illness (ILI)**

Daily emergency department attendances for influenza-like illness (ILI) and 7-day moving average in comparison to baseline.



**Figure 8: Respiratory complaints**

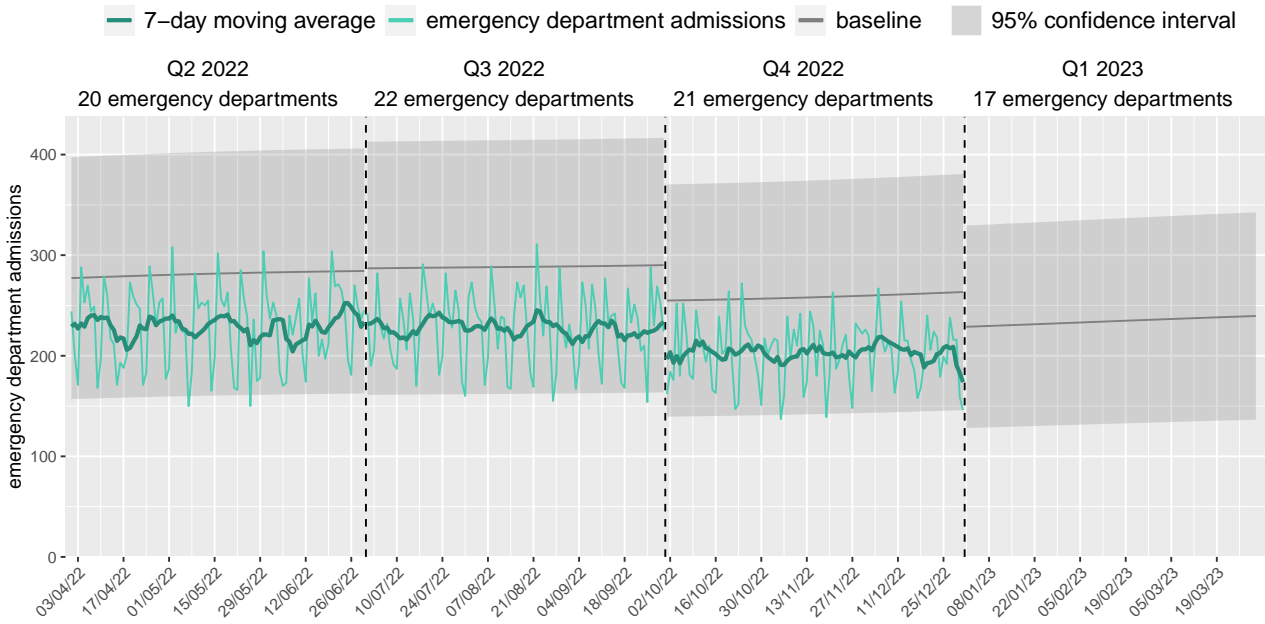
Daily emergency department attendances for respiratory complaints and 7-day moving average in comparison to baseline.



Note: Because the size of the included emergency departments varies, the number of reported cases can vary between quarters with the same number of emergency departments.

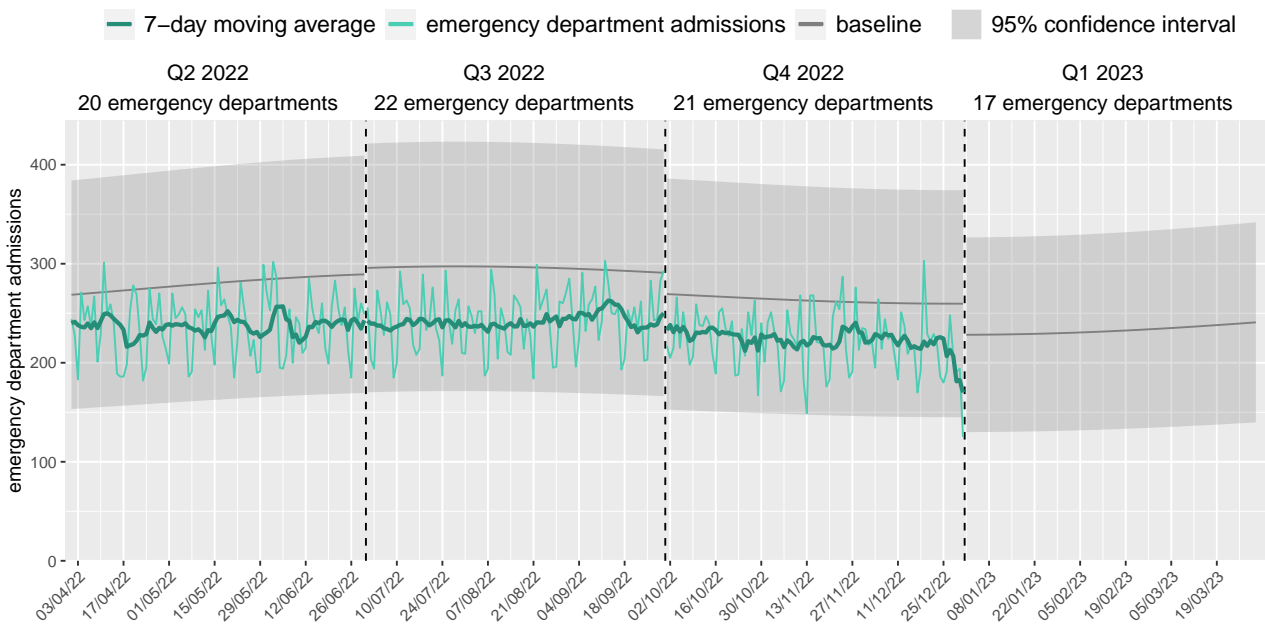
**Figure 9: Cardiovascular complaints**

Daily emergency department attendances for cardiovascular complaints and 7-day moving average in comparison to baseline.



**Figure 10: Neurological complaints**

Daily emergency department attendances for neurological complaints and 7-day moving average in comparison to baseline.



Note: Because the size of the included emergency departments varies, the number of reported cases can vary between quarters with the same number of emergency departments.