

# Surveillance sentinelle hospitalière du COVID-19

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***État des données au: 17 avril 2023***

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# 1. Rapport mensuel du CH-SUR – introduction :

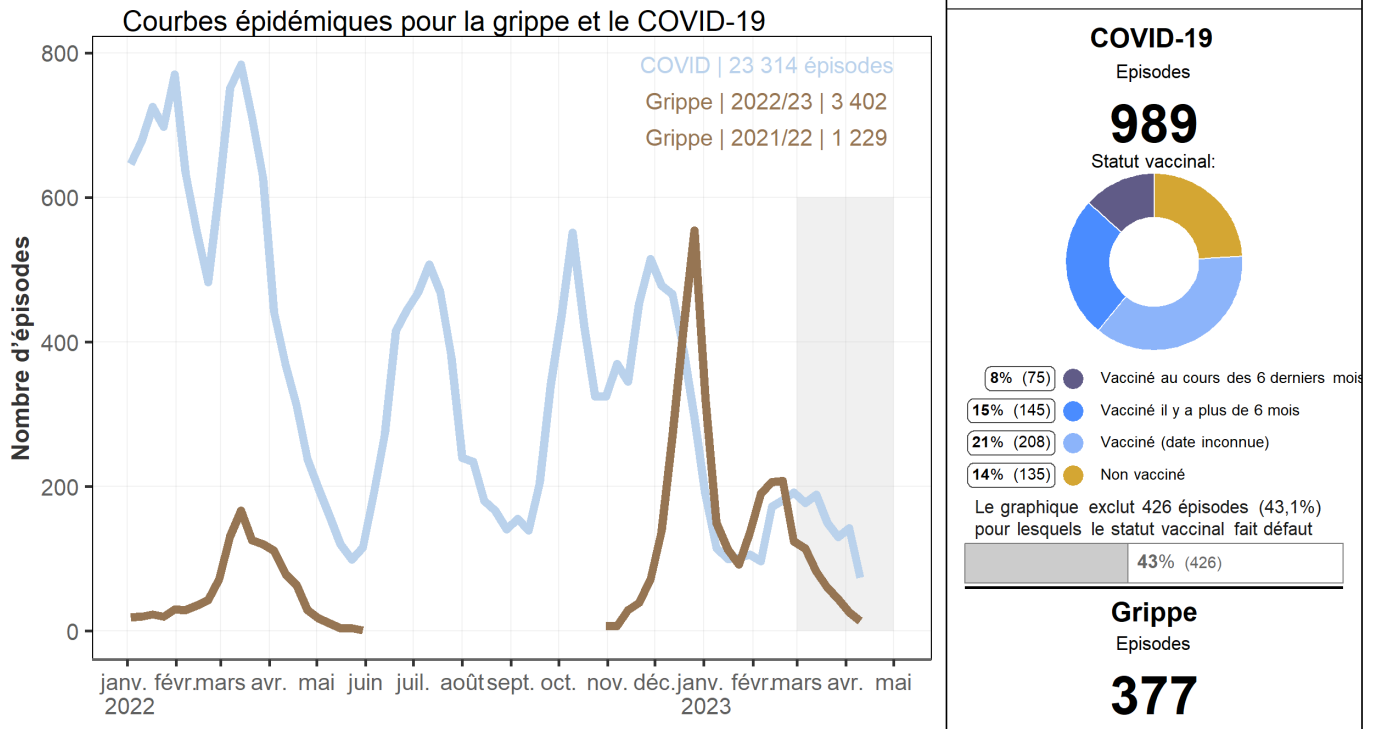
Le *système sentinelle de surveillance hospitalière pour l'influenza* a été mis en place en 2018 pour compléter les systèmes de déclaration obligatoire des cas de grippe en Suisse et combler les lacunes dans le monitoring des maladies. Quatre jours après l'annonce du premier cas confirmé de COVID-19 en Suisse, il a été adapté pour enregistrer les hospitalisations liées à cette maladie.

Actuellement, **18 hôpitaux** situés partout en Suisse participent activement au **système sentinelle de surveillance hospitalière du COVID-19 (CH-SUR)**. Le CH-SUR a pour objectif principal de récolter des données cliniques et épidémiologiques complètes sur la charge de morbidité. Les données recueillies renseignent entre autres sur le nombre et la durée des **hospitalisations** ainsi que sur les séjours en **unité de soins intensifs (USI)**. Il enregistre également si le patient est **décédé du (ou avec le) COVID 19 ou de la grippe** pendant l'hospitalisation. Pour plus de définitions et de détails sur les données, veuillez consulter **le glossaire et les informations complémentaires** à la fin de ce rapport.

Le présent rapport couvre la période allant du moment où le variant Omicron est devenu dominant (1er janvier 2022), à la dernière date d'extraction des données (16 avril 2023). Durant cette période, les données ont été récoltées à partir de 23 314 **épisodes** d'hospitalisation pour le COVID-19 et 4 631 pour la grippe. Un aperçu des données collectées au cours des deux derniers mois est présenté dans les figures **1** et **2**.

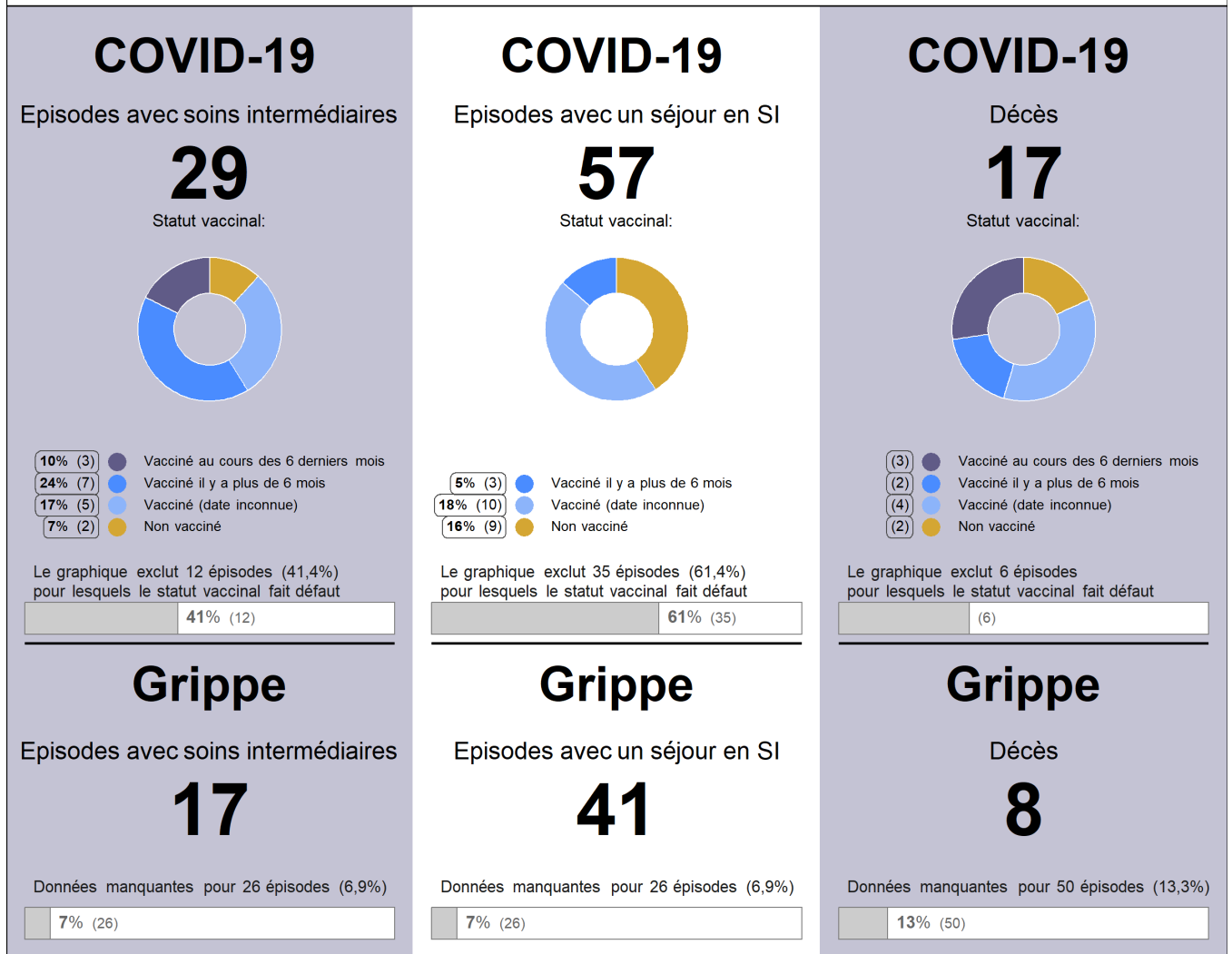
Synthèse de l'évolution au cours des deux derniers mois (du 1.3.2023 au 17.4.2023) :

- Au total, 989 épisodes de COVID-19 ont été enregistrés dans le système de surveillance sentinelle hospitalière (CH-SUR), dont 337 (34,0%) étaient associés à des infections nosocomiales (fig. **4** et section **2.1**).
- Au total, 57 épisodes de COVID-19 (6.1 %) ont nécessité au moins un séjour en USI et 29 (3.1 %) au moins un séjour en unité de soins intermédiaires. Ces proportions sont restées relativement stables depuis le 1er janvier 2022 (section **4.1**).
- Le taux global de létalité pour les épisodes de COVID-19 a atteint 2,2 %, un niveau inférieur aux 4,2 % enregistrés entre janvier 2022 et janvier 2023 (section **3.1**).
- Au total, 377 épisodes d'influenza ont été enregistrés, dont 46 (12.2 %) étaient associés à des infections nosocomiales (section **6**).



**Figure 1:** Aperçu des données les plus récentes sur les épisodes d'hospitalisation. Les données issues des deux derniers mois sont considérées comme provisoires en raison des retards dans l'enregistrement, raison pour laquelle elles n'ont pas été prises en compte. Pour la saison grippale 2021/22 : seuls les épisodes commençant après janvier 2022 sont inclus. Nombre d'hôpitaux participants pour la grippe : 19 pour la saison 2021/22, 18 pour la saison 2022/23. Ce graphique exclut les épisodes d'un hôpital en raison de données incomplètes pour COVID-19.

Aperçu CH-SUR des épisodes, des admissions en SI et des décès du 01 Mars 2023 au 17 Avril 2023



**Figure 2:** Aperçu des données les plus récentes sur les épisodes d'hospitalisation. Ce graphique exclut les épisodes d'un hôpital en raison de données incomplètes pour COVID-19.

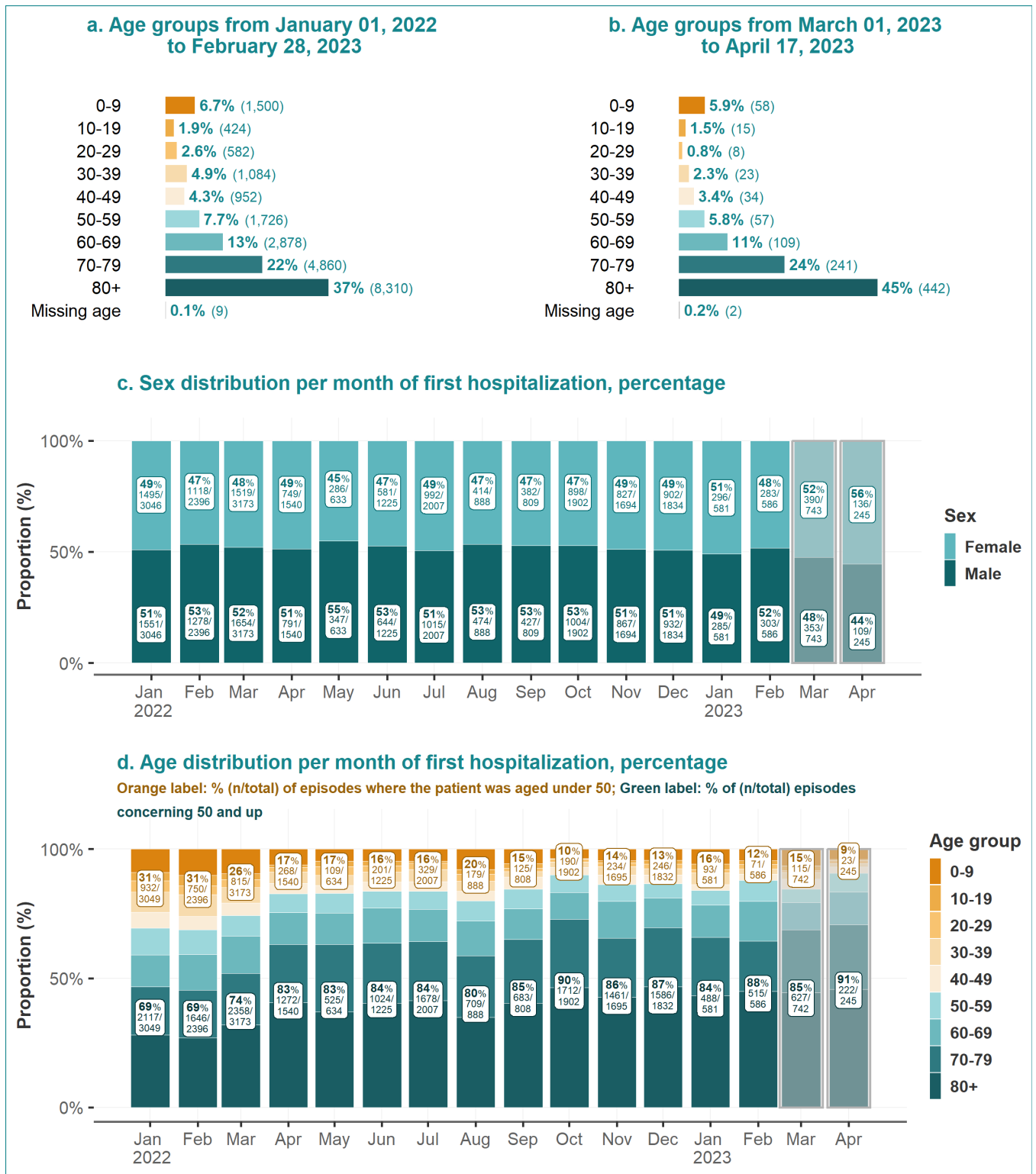
## 2. Hospitalizations and patient characteristics

Between January 01, 2022 and April 17, 2023 and among the 18 hospitals actively participating in CH-SUR, 23,314 **episodes** were registered, accounting for a total of 23,864 hospitalizations. There were more hospitalizations than **episodes** because some episodes include multiple **hospitalizations** (for more details see section **glossary and supplemental information**).

From January 01, 2022 to April 17, 2023, most patients (97.8% (22,804 of 23,314)) were hospitalized only once during an episode, while 2.2% of the registered episodes (510 of 23,314) included two to four hospitalizations. Only one episode included five hospitalizations.

Among all episodes, 51.6% (12,034 of 23,314) of the episodes concerned male patients and 48.3% (11,268 of 23,314) episodes concerned female patients. Sex type was defined as *other* for 12 patients. The age distribution was skewed towards older persons (Figure 3a and b). The largest age category corresponded to patients aged 80 and above (45.0% [442]).

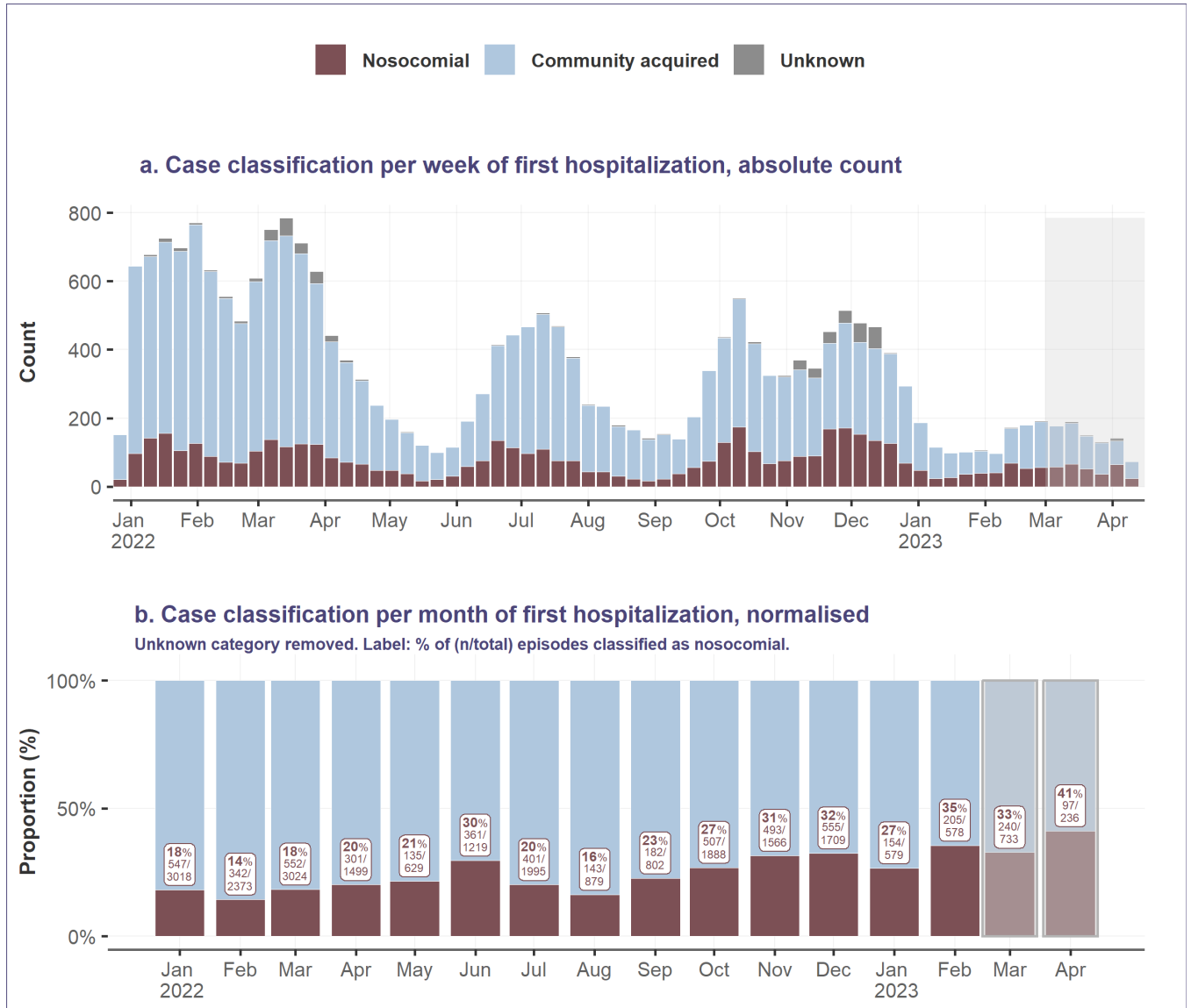
Figures 3c and 3d show the sex and age distribution ratio over time. During most months, more men than women were admitted. During the period of observation, the proportion of episodes concerning patients aged 50 years old and above was the lowest in February 2022 with 68.7% (1,646 of 2,396). In October 2022, 90% (1,712 of 1,902) of episodes concerned patients 50 years old and above (Figure 3d).



**Figure 3: Demographic characteristics: sex and age distribution of hospitalized patients, overall and per month. For episodes with multiple hospitalizations, the admission date of the first hospitalization was used. Data from the last two months (highlighted gray) is considered provisional due to entry delays. The 'other' sex category was removed from panel c, and the missing age group was removed from panel d.**

## 2.1. Origin of infection

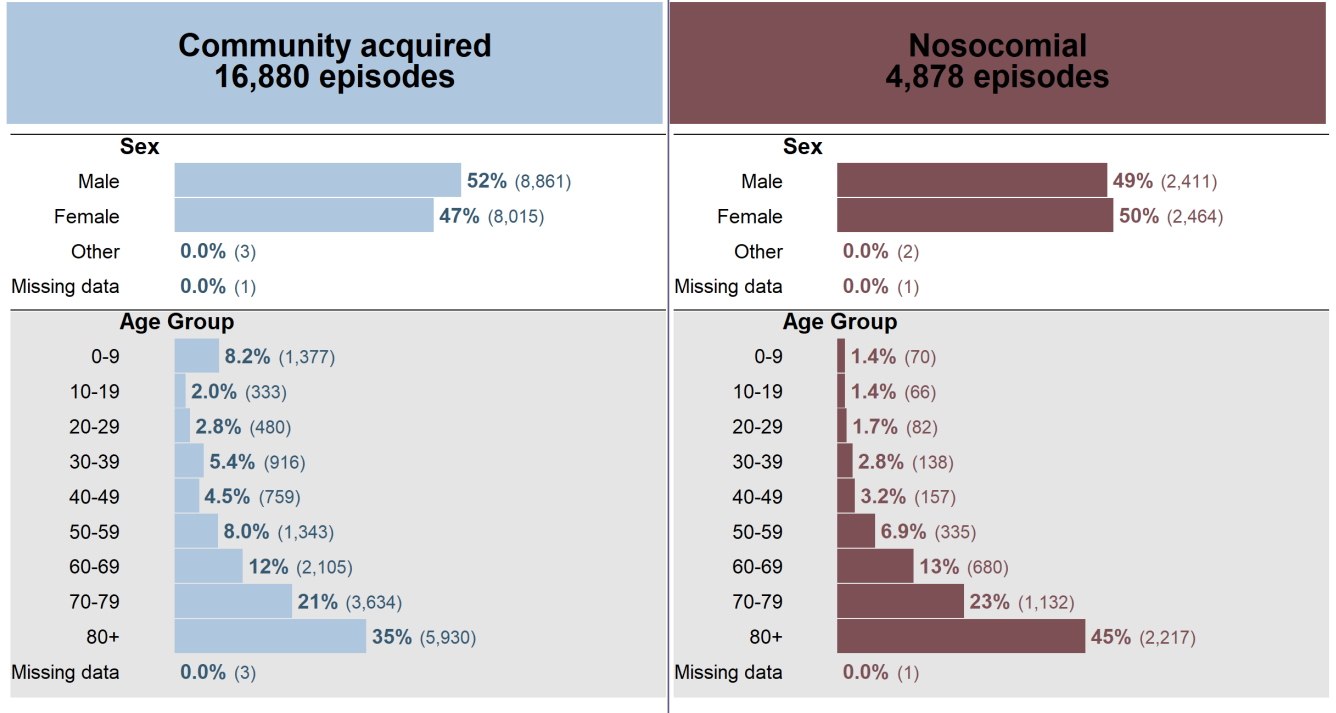
From January 01, 2022 to April 17, 2023, the overall percentage of nosocomial infections among all documented episodes was 22.4% (5,215 of 23,314) while episodes linked to community acquired infections accounted for 75.2% (17,512 of 23,314) (Figure 4). For 2.5% of the episodes, it is unknown if the infection was nosocomial or community acquired.



**Figure 4:** Case classification (origin of infection) of the episodes. The absolute count of episodes over time (panel a) and the proportion (normalized in %) of episodes by origin of infection (panel b). For episodes with multiple hospitalizations, the case classification of the first hospitalization was considered. Data from the last two months (highlighted gray) are considered provisional due to data entry delays.

Compared to other age groups, patients aged 80 years and above were most affected by nosocomial infections, accounting for 2,217 (45.4%) of the nosocomial episodes from January 01, 2022 to February 28, 2023. Furthermore, patients aged 80 years and above also account for a majority of community-acquired infections with 5,930 (35.1%) episodes from January 01, 2022 to February 28, 2023 (Figure 5a).

a. Community acquired and nosocomial episodes from Jan 2022 to Feb 2023



b. Community acquired and nosocomial episodes from Mar 2023 to Apr 2023

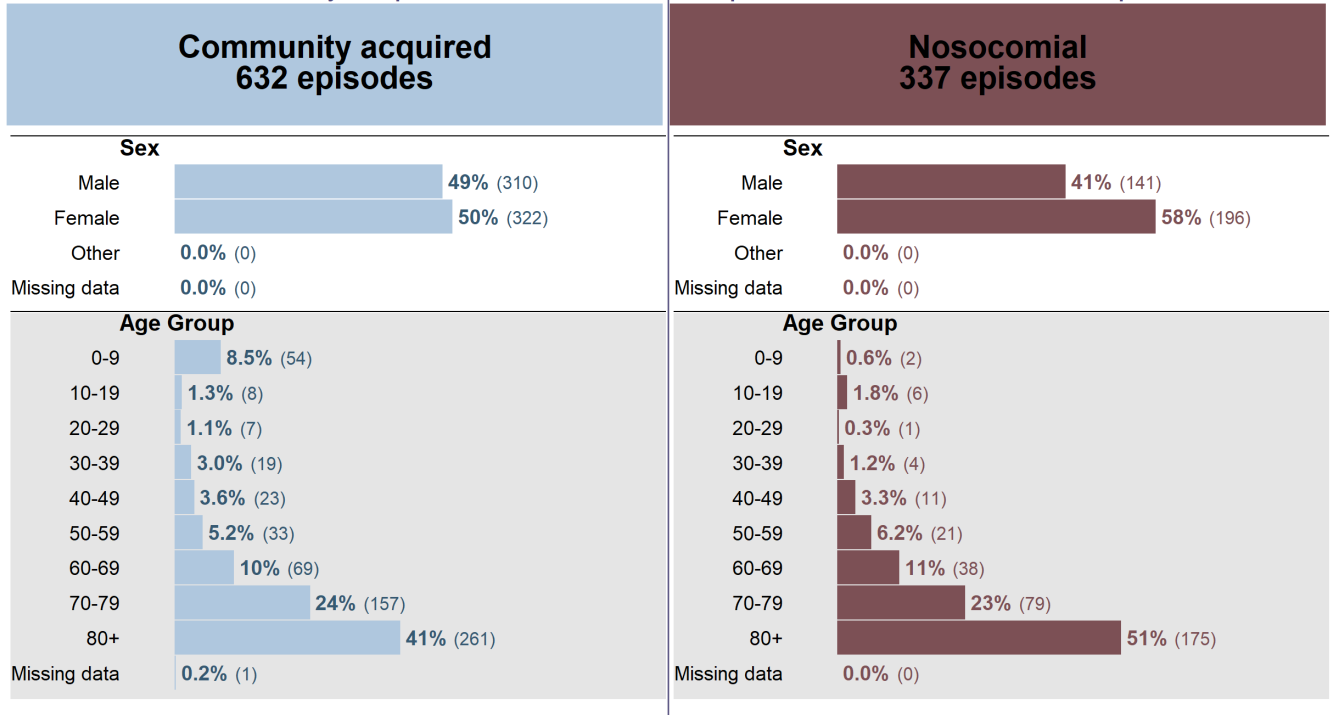


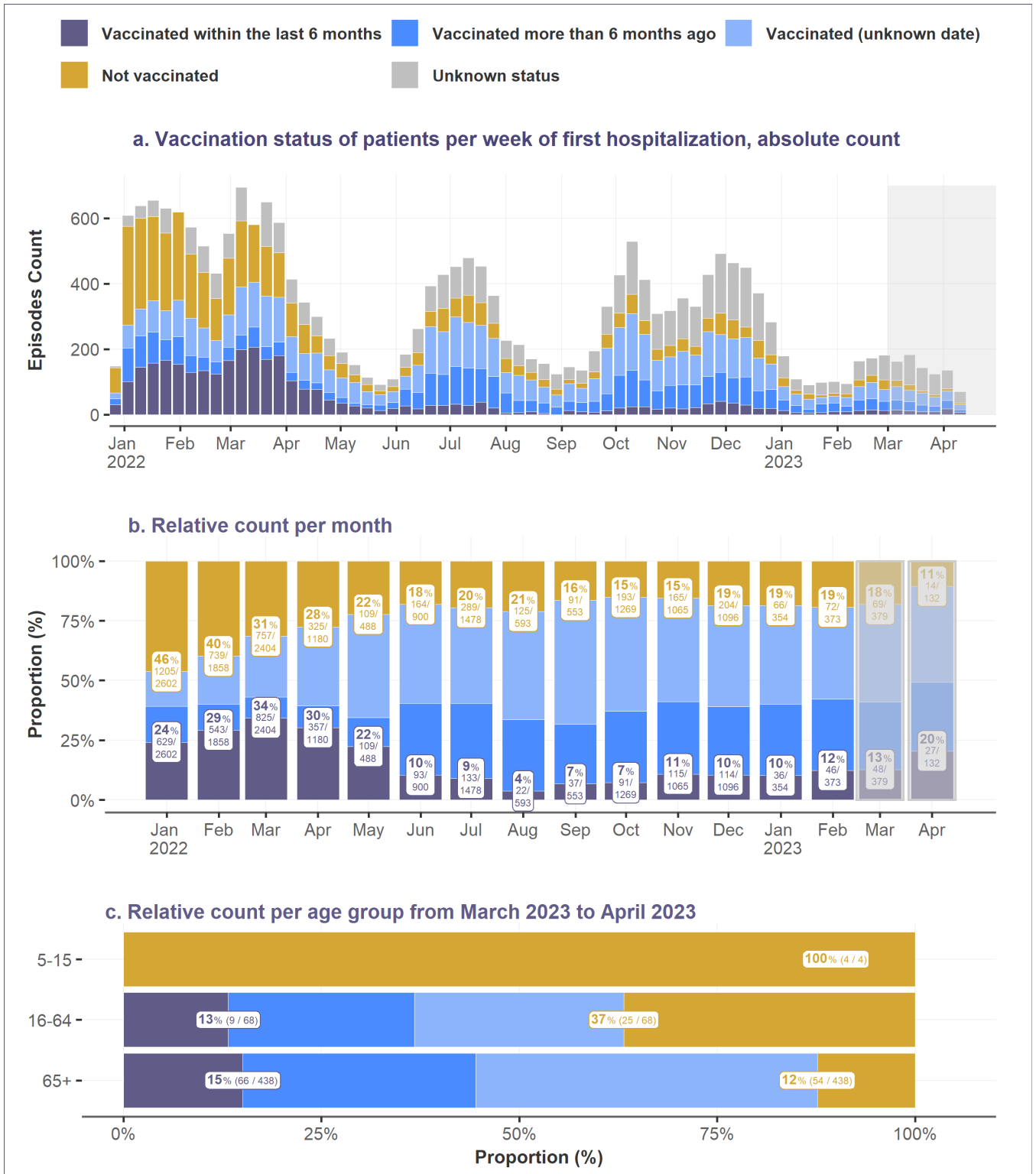
Figure 5: Comparison of community acquired and nosocomial cases by demographic characteristics.



## 2.2. Vaccination status at admission over time

For these analyses, the **vaccination status** of a patient considers the vaccine doses received up to the time of a positive COVID-19 test, specifically up to the time when the sample for the test was collected.

On April 17, 2023, 72.6% of the Swiss population was vaccinated with at least one dose ([FOPH, COVID-19 Dashboard](#)). In April 2023, 20.5% of episodes in CH-SUR concerned individuals who were vaccinated within the last 6 months. It is important to note that we can know the percentage of the population which is vaccinated (through administrative records), but only approximate the proportion of the population which is immunized. Recent studies from [Corona Immunitas](#) are indicating that **the population immunization (by vaccination and/or previous infection) is nearing 100%**.

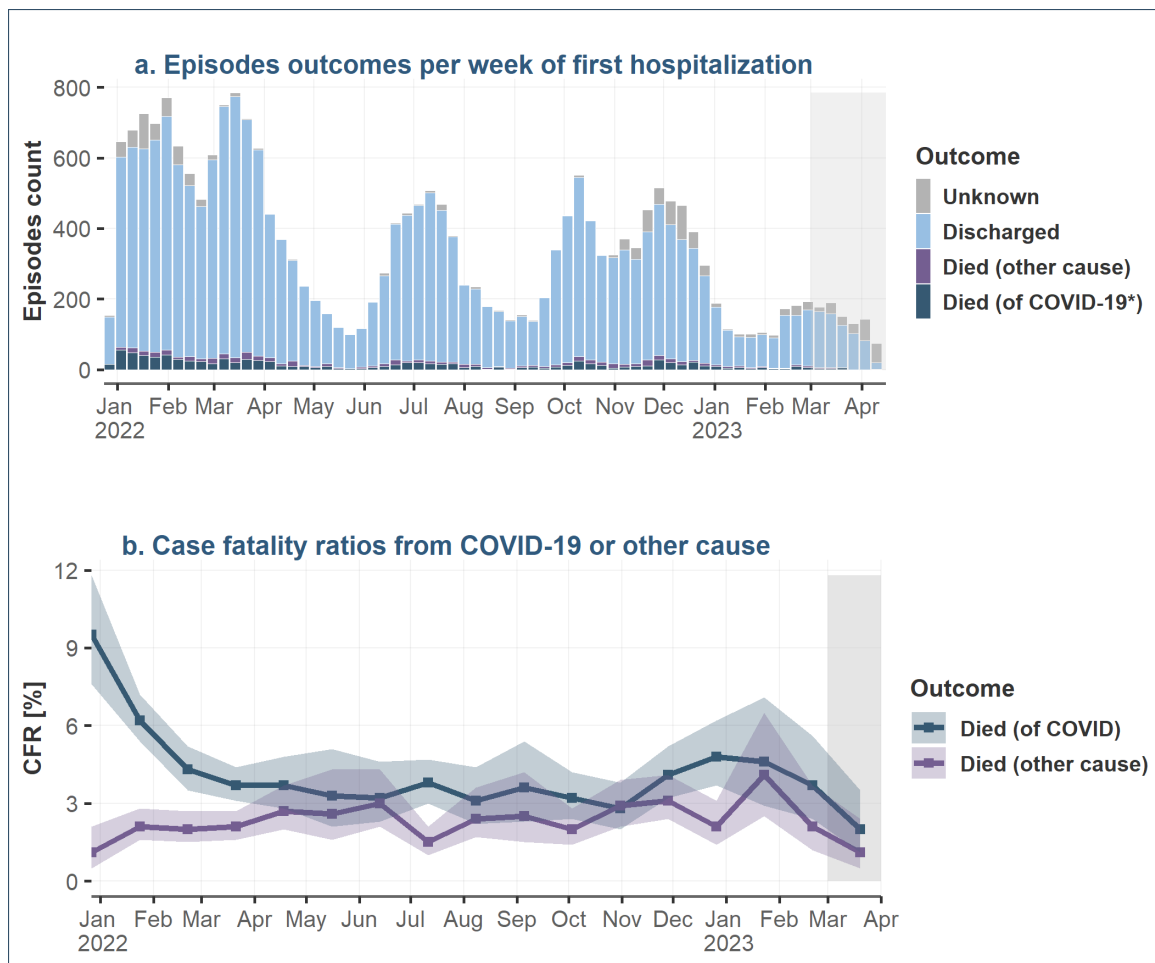


**Figure 6:** Episodes by vaccination status over time and by age group. For episodes with multiple hospitalizations, the vaccination status for the first hospitalization was considered. Episodes with first admission date after February 28, 2023 were excluded due to data completeness considerations. For Figure 5c only: Episodes with missing ages and children between 0 to 4 years old (following vaccination recommendations) were excluded from the analysis.

## 3. Outcomes

### 3.1. Outcomes over time

Figure 7 shows the final outcomes of episodes over time (Figure 7a & 7b). Episodes resulting in in-hospital death, for which COVID-19 was the **cause of death** (died of COVID-19) are shown separately from those with an alternative cause of death (died *with* COVID-19, but not *of* COVID-19). A medical doctor at the hospital for each CH-SUR participating center determined whether a patient died of COVID-19 or another cause during the COVID-19 hospitalization. Episodes where the cause of death was not certain, but there was a COVID-19 diagnosis (in conformity with inclusion criteria for CH-SUR) were counted as died of COVID-19 or suspected death of COVID-19. The outcome “discharged” includes patients who were transferred out of the CH-SUR system. Episodes with “pending or missing outcomes” correspond to either patients who were still hospitalized or whose outcomes were not yet recorded in the database at the date of data extraction. Because of the higher proportion of incomplete data during the most recent months, case fatality rates from these months should be interpreted with caution.



**Figure 7:** Outcomes for COVID-19 related episodes over time. Includes records up to April 17, 2023. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays. Episodes where the cause of death was not certain, but there was a COVID-19 diagnosis (in conformity with inclusion criteria for CH SUR) were counted as Died of COVID-19 or suspected death of COVID. (\* Died of COVID-19 as a confirmed or suspected cause of death). The coloured bands on this plot indicate the 95% confidence interval around the estimated CFR.

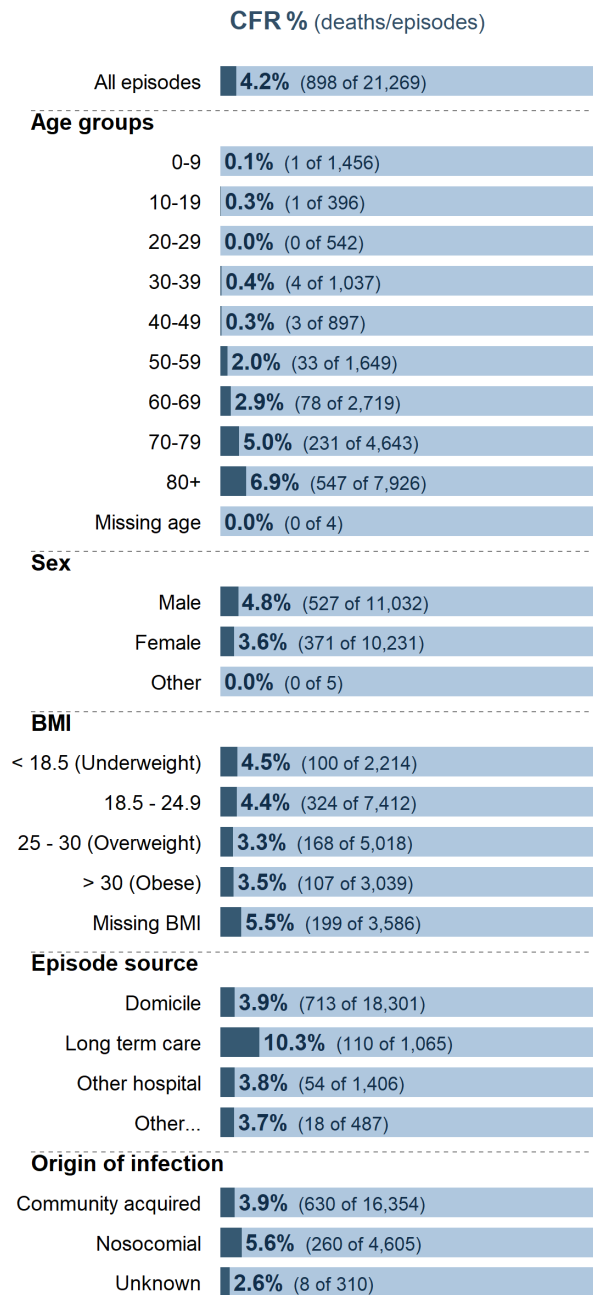
## 3.2. Case fatality rate (CFR) across demographic and risk groups

Since January 2022 until February 2023, the case fatality rate (CFR) increased with increasing age, from 0.1% (1 of 1,456) in episodes of patients aged 0-9, to 2.0% (33 of 1,649) in episodes of patients aged 50-59, and to 6.9% (547 of 7,926) in episodes of patients aged 80+. CFR% was greater in men than in women: 4.8% (527 of 11,032) vs 3.6% (371 of 10,231) respectively. (Figure 8a)

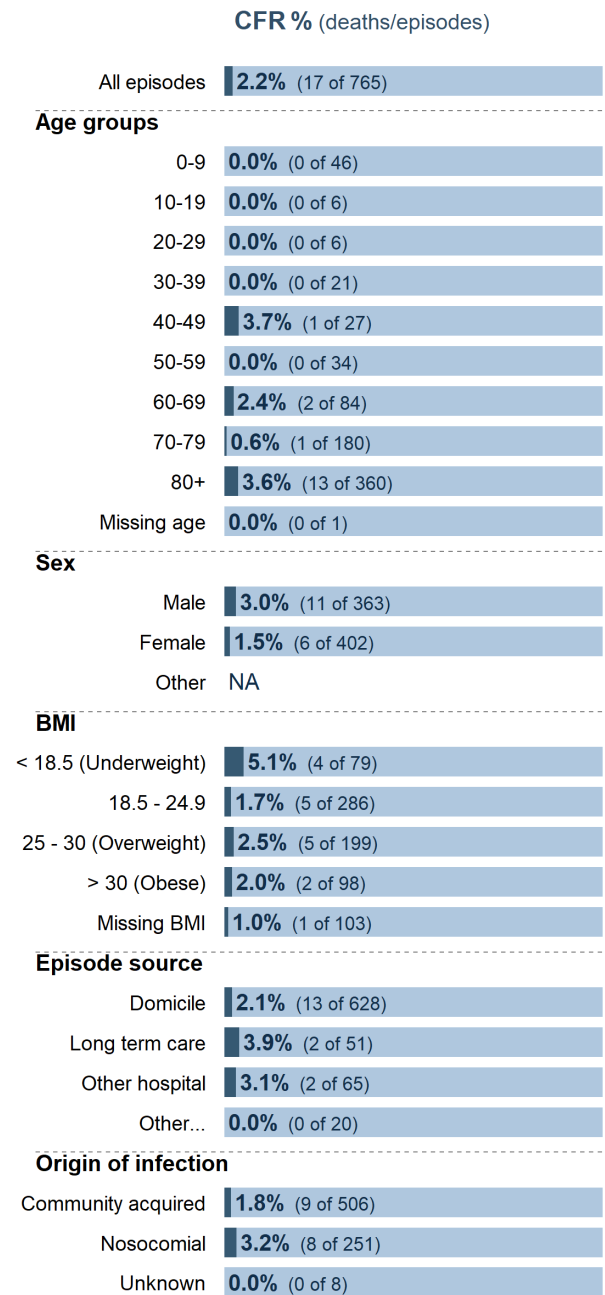
The overall CFR% of the most recent period for which enough data is available (months March 2023 and April 2023, Figure 8b) was 2.2% compared to 4.2% from January 2022 until February 2023.

Data regarding CFR% and vaccination status can be found in section 3.3.

**a. CFR % : 21,269 episodes with first hospitalization between January 2022 and February 2023**



**b. CFR % : 765 episodes with first hospitalization between March 2023 and April 2023**

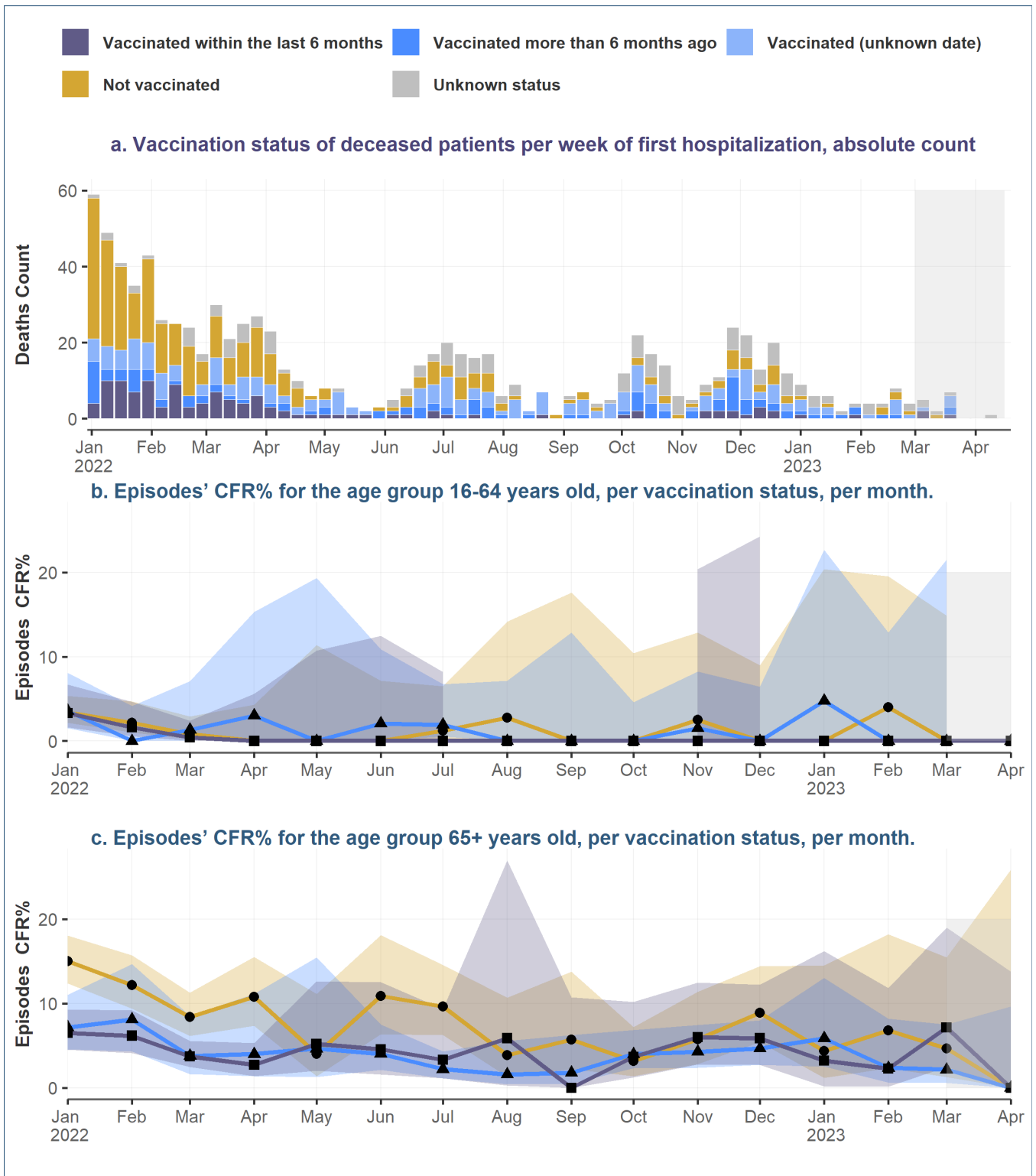


**Figure 8:** Case fatality rate (CFR) % among demographic and risk groups: percentage of hospitalization episodes, which ended in the death of the patient of COVID-19 in hospital. Records with incomplete data (ongoing hospitalization episodes or with a pending outcome in the database) were not included.

### 3.3. CFR by age group and vaccination status

For the most recent time period for which reliable data is available, the case fatality rate is displayed by age group and vaccination status (Figure 9).

The data should be interpreted with caution, as local peaks most often result from a small number of cases (for example, the peak in CFR% concerning patients vaccinated within the last 6 month in the age group of 80 and above patients in August 2022 is due to 1 death out of 6 episodes).



**Figure 9:** Case fatality rate (CFR%) by age and by vaccination status over time: percentage of episodes, which ended in the death of the patient of COVID-19 in hospital. Records with incomplete data were not included. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays. The coloured bands on this plot indicate the 95% confidence interval around the estimated CFR. A gap in the coloured band means that the confidence interval goes beyond the displayed range of the plot.

## 4. Intensive care unit (ICU) admission

### 4.1. ICU, IMCU admission and use of ventilation over time

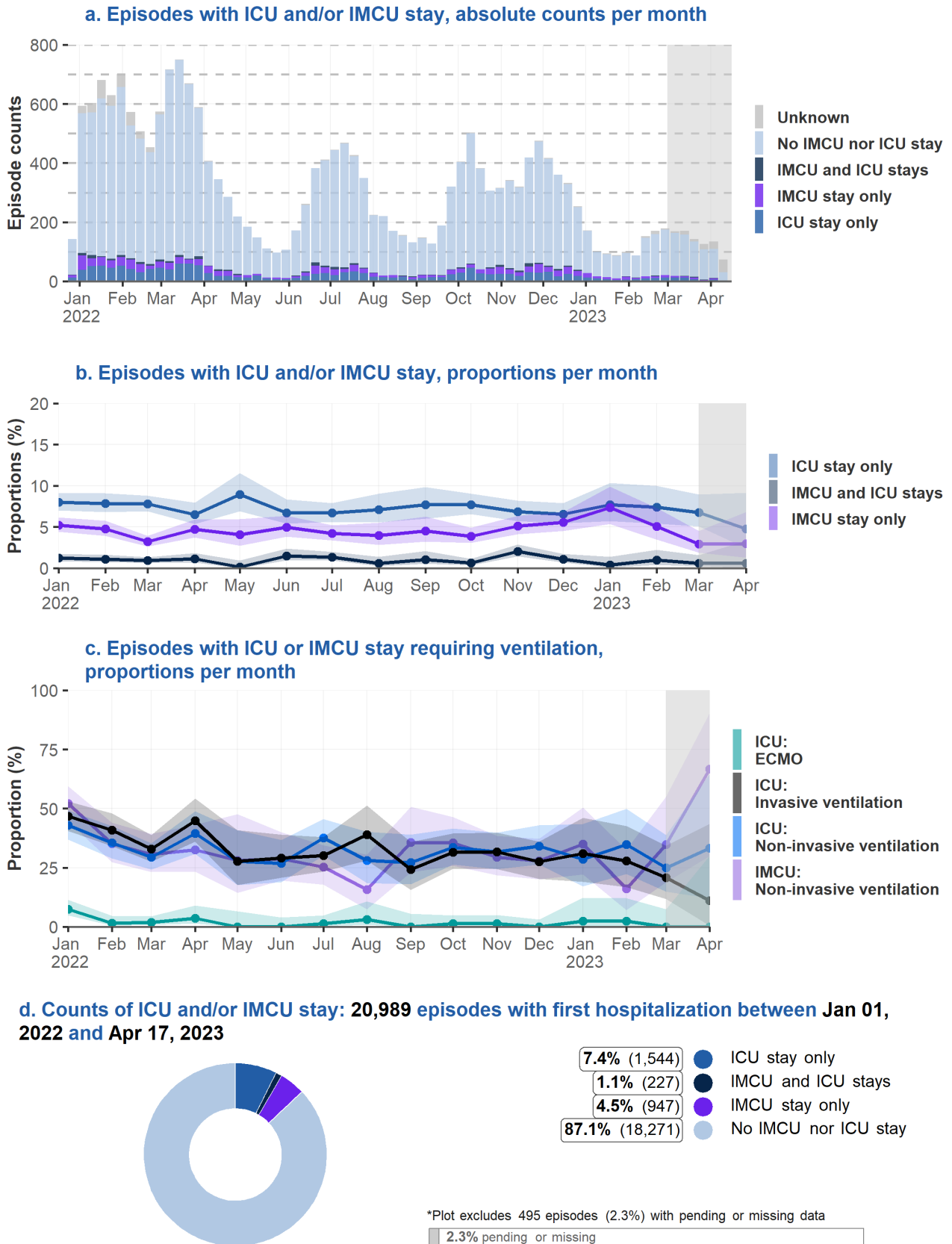
ICU and intermediate care unit (IMCU) admissions include patients that were hospitalized *because* of COVID-19 as well as *with* COVID-19.

Figure 10 shows the distribution of episodes over time which required ICU, IMCU admissions or both, as well as the type of ventilation used.

Figure 10b only includes episodes with known information on ICU and IMCU stay. Figure 10b shows that the proportion (in %) of ICU admission has remained relatively stable over time since January 2022. A total of 1,544 (7.2%) episodes required ICU admission, 947 (4.4%) episodes required IMCU admission and 227 (1.1%) episodes required both ICU and IMCU admission. For 18,271 episodes no ICU nor IMCU admission was required. It is unknown if ICU, IMCU admissions or both was required for 495 episodes.

Figure 10c only includes episodes with known information on ICU and IMCU stay requiring ventilation. From January 01, 2022 to April 17, 2023 a total of 392 (33.4%) episodes with an IMCU stay, required non-invasive ventilation. For 465 episodes with IMCU stay, it is unknown if non-invasive ventilation was required. Among episodes with ICU admissions, a total of 40 (2.3%) episodes required ECMO ventilation, 611 (34.5%) episodes required invasive ventilation, and 598 (33.8%) episodes required non-invasive ventilation. For 502 episodes with ICU stay, it is unknown if any ventilation was required.

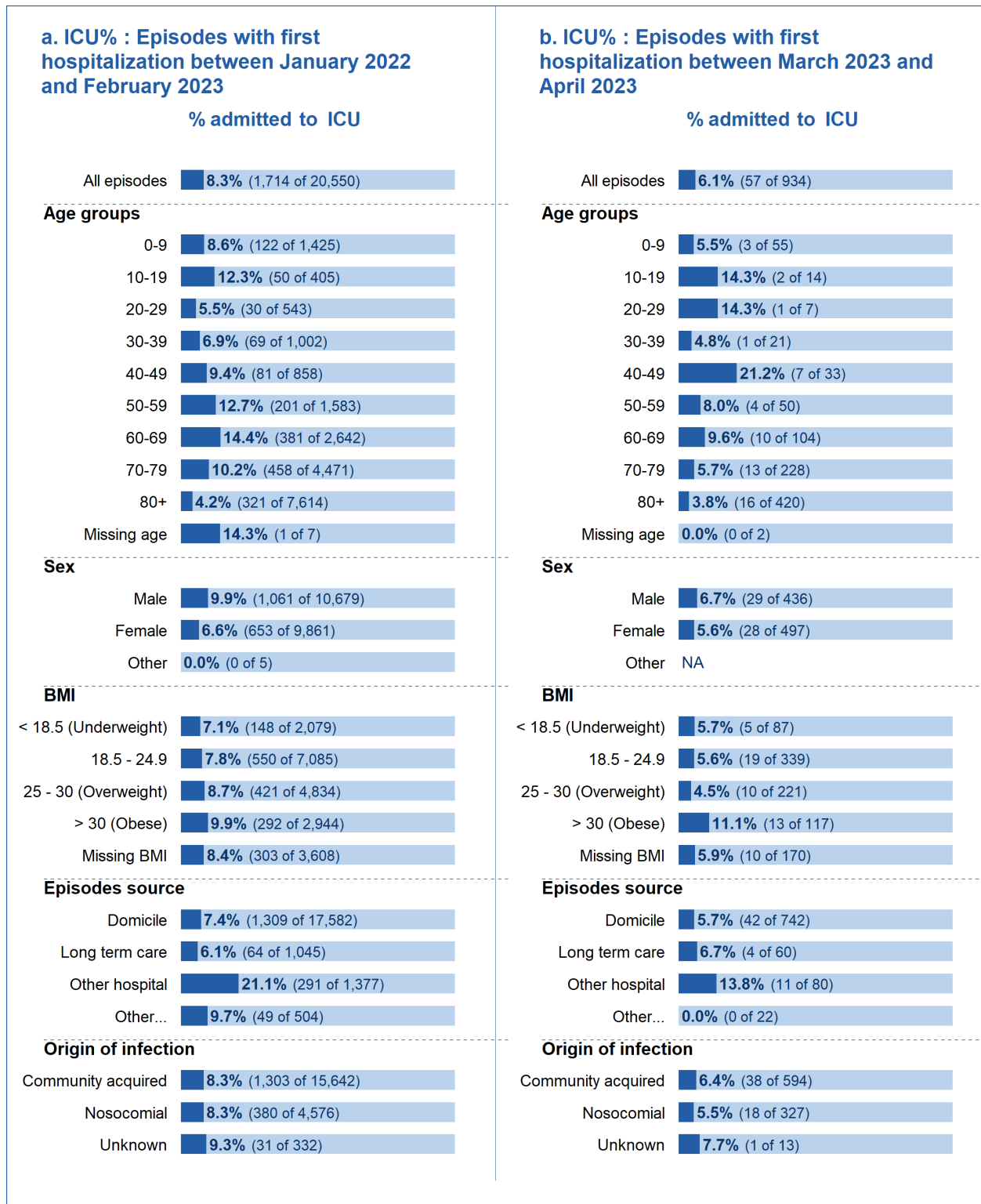




**Figure 10:** Counts and proportion of episodes with at least one ICU or IMCU admission over time. Evolution over time of the use of invasive, non-invasive and ECMO for ICU or IMCU admissions. Data from the last two months (highlighted gray) are considered provisional due to data entry delays.

## 4.2. ICU admission across demographic and risk groups

From January 2022 to February 2023, ICU admission probability across ages was roughly bimodal with a peak for the 10-19-year age group and for the 60-69 age group. The 60-69 age group had the highest probability of admission to the ICU, with 14.4% (381 of 2,642) of episodes including at least one ICU admission. During the same period, individuals aged 80 and above were least likely to be admitted to the ICU, with 4.2% (321 of 7,614) of the episodes including at least one ICU admission. Males were more likely to be admitted to the ICU than females. Overall, admissions to the ICU were registered for 9.9% of the episodes concerning males, compared to 6.6% of the episodes concerning females. Episodes of patients transferred from other hospitals had a high probability of ICU admission: 21.1% of such episodes (291 of 1,377) required at least one ICU admission, compared to an overall admission rate of 8.3% (Figure 11a).



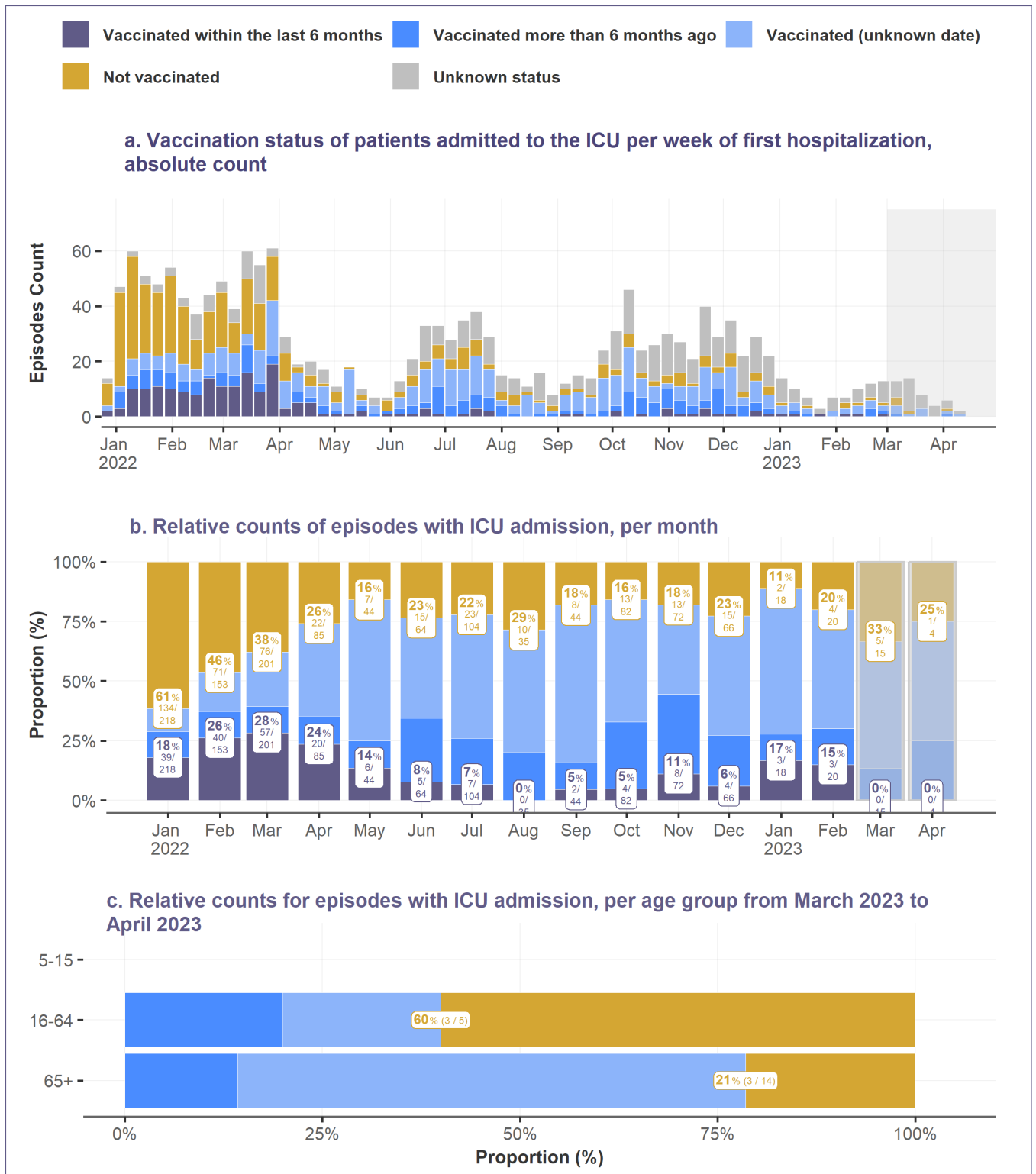
**Figure 11:** Percentage of hospitalization episodes with at least one ICU admission, grouped by demographic and risk factors, over two time intervals. For episodes with multiple hospitalizations, we considered whether they were admitted to the ICU during any of their hospitalizations. Records with incomplete data were not included.

### 4.3. ICU admission rate by vaccination status

Figure **12** shows the ICU admission rate, which is the number of episodes requiring an admission to the ICU over all episodes registered, stratified by vaccination status.

The percentage of not vaccinated patients among episodes with ICU stay decreased sharply from January 2022 to April 2022 from 61.5% to 25.9% and has fluctuated since then. (Figure **12b**)

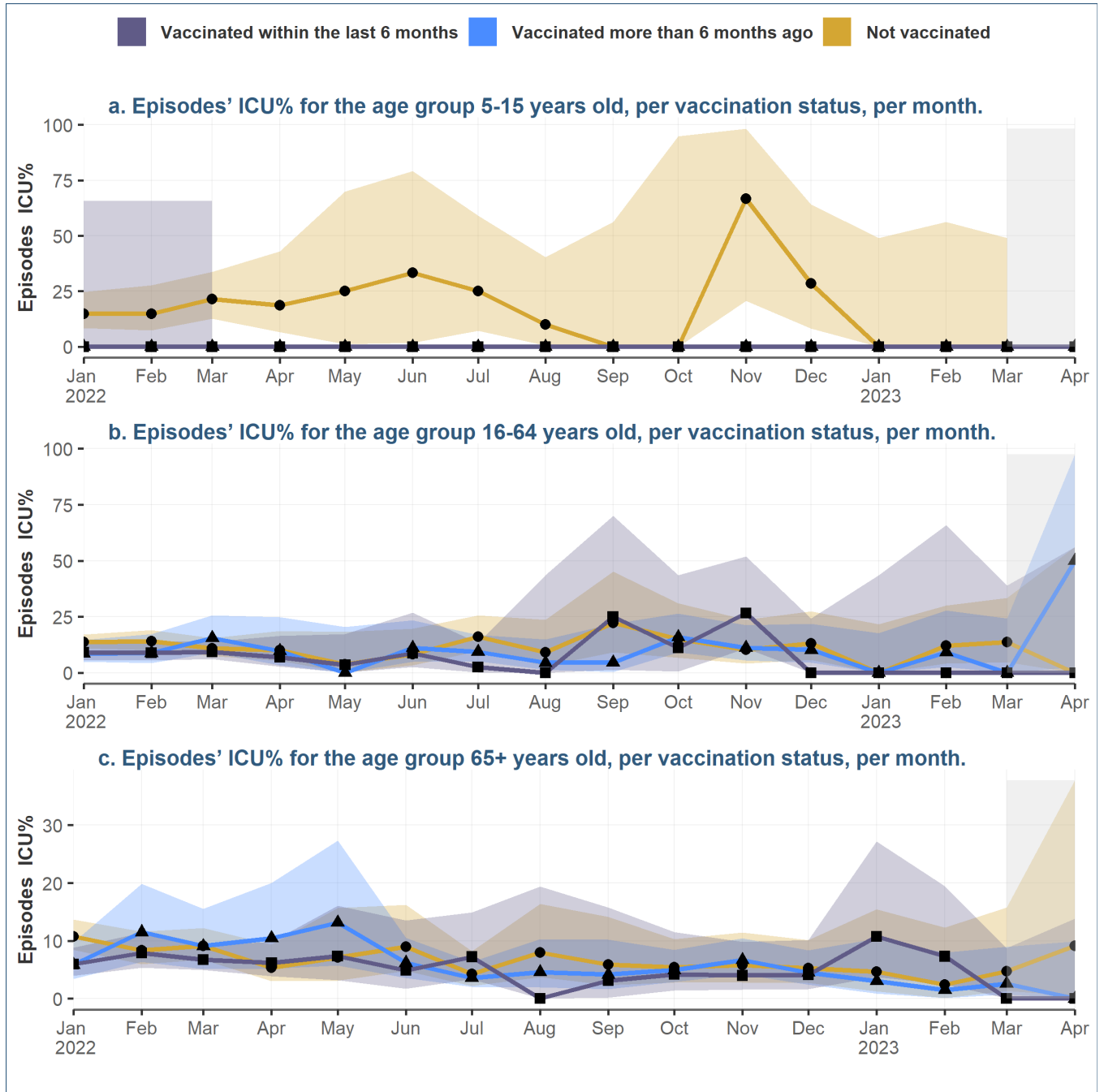
The relative counts for the age groups of 5-15 must be interpreted with caution due to the small number of cases. During the period of March 2023 to April 2023, 0 episodes were recorded for this age group (Figure **12c**).



**Figure 12:** Demographic characteristics of hospitalized patients by immune status and immune status of patients over time. For episodes with multiple hospitalizations, the immune status for the first hospitalization was considered. For Figure 5c only: Episodes with missing ages and children between 0 to 4 years old (following vaccination recommendations) were excluded from the analysis.

#### 4.4. ICU admission rate by age group and vaccination status

Figure 13 shows the ICU admission rate age group and by vaccination status. Plots for the 5-15 age group should be interpreted with caution, as the ICU% is calculated using a small number of episodes. The same caution applies in recent months, where peaks may be due to the small number of episodes.



**Figure 13:** ICU admission rate (ICU%) by age and by vaccination status over time: percentage of episodes, which resulted in ICU admission. Records with incomplete data were not included. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays. The coloured bands on this plot indicate the 95% confidence interval around the estimated ICU%. A gap in the coloured band means that the confidence interval goes beyond the displayed range of the plot.

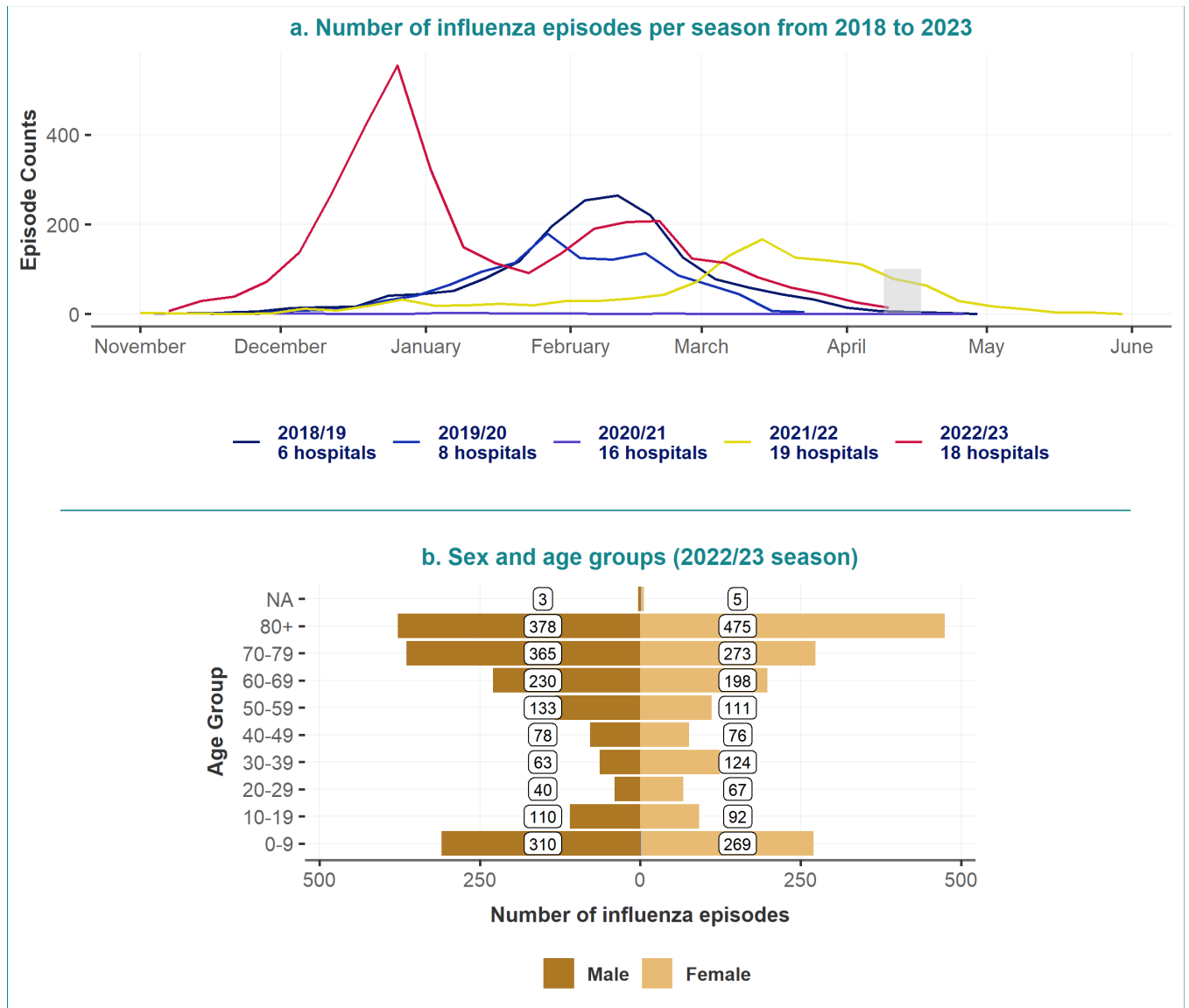
## 5. Influenza

**Data status: April 17, 2023**

### 5.1. Influenza epidemic curves

The influenza's seasonal data collection within CH-SUR begins each November. In Figure 14, the current influenza epidemic curve is represented in light of the past seasons' epidemic curves. Epidemic curves should be compared with caution, due to a varying number of hospitals which reported data over each specific season. Essential demographic information for the ongoing influenza season is also displayed. For additional weekly updates about the current influenza season please refer to [Saisonale Grippe – Lagebericht Schweiz](#).

This data is not representative for the whole nation of Switzerland, but represents the situation among CH-SUR participating hospitals.



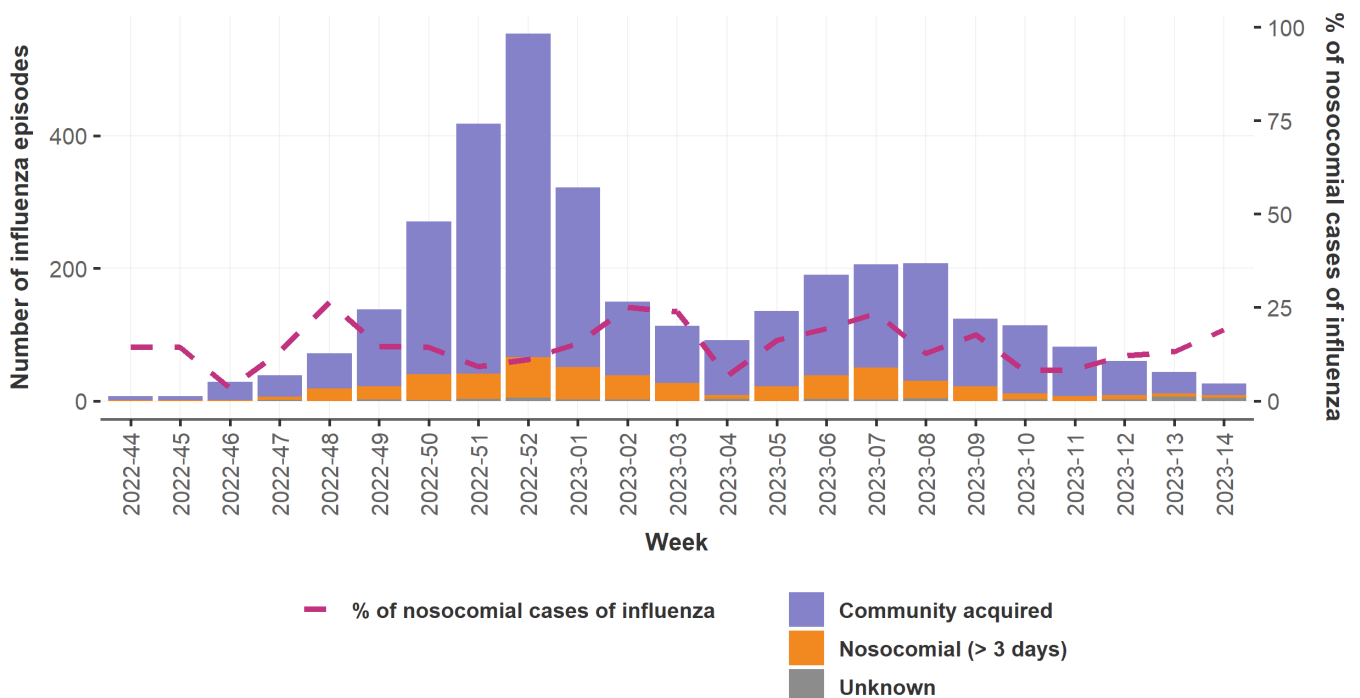
**Figure 14:** Number of episodes per influenza seasons, with the age and sex demographic characteristics of the ongoing season. Data from the last two weeks (highlighted gray) is considered provisional due to entry delays.

## 5.2. Summary of influenza episodes for the season 2022-2023:

### Important note:

Given the limited number of patients and events, all epidemiological and clinical data included in this report are to be interpreted with caution. **Additional registrations are expected.**

- From week 2022-44 to week 2023-14, we registered a total of 3402 influenza episodes including 490 (14%) nosocomial infections among CH-SUR hospitals. For 43 influenza episodes, it is unknown if the infection is nosocomial (Figure 15).
- At this stage of the season, influenza type A virus was detected in 2842 (84%) episodes, and influenza type B virus in 546 (16%) episodes. Influenza type was unknown for 14 episodes.
- Information regarding the patient's vaccination status is available for 945 out of the 3402 influenza episodes (2457 unknowns). Among those, 793 (84%) influenza episodes occurred among non-vaccinated patients.
- A total of 234 (7%) influenza episodes concerned patients admitted to intermediate care (72 unknowns). Among those, 90 (38%) required non-invasive ventilation.
- A total of 355 (11%) influenza episodes concerned patients admitted to ICU (75 unknowns). Among those, 150 (42%) required non-invasive ventilation, 131 (37%) required invasive ventilation and 17 (5%) required ECMO.
- A total of 73 influenza episodes resulted in death during the hospitalization in this season.



**Figure 15:** Number of influenza episodes per week according to the origin of infection.



## 6. Glossary and supplemental information

**Hospitals participating to data collection / Hôpitaux participant à la collecte de données :** La liste des hôpitaux suisses participant actuellement au système CH-SUR, est disponible à l'adresse suivante : [Hospital-based surveillance of COVID-19 in Switzerland website](#).

**[Critères d'inclusion / Inclusion criteria] :**

Le CH-SUR recueille les données des patients hospitalisés pendant au moins 24 heures avec une infection au SARS-CoV-2 documentée. Sont considérés comme des confirmations de l'infection un résultat positif à un test PCR (polymerase chain reaction) ou à un test rapide antigénique ainsi qu'un diagnostic clinique pour le COVID 19. Les **infections nosocomiales** au SARS-CoV-2 sont également enregistrées dans la base de données et sont décrites dans une section spécifique à la fin de ce rapport.

**Hospitalization / Hospitalisation:**

Il s'agit de l'unité d'analyse la plus petite ; elle équivaut à la période écoulée entre l'admission et la sortie de l'un des hôpitaux participant à CH-SUR, cet intervalle de temps doit être supérieur à 24 heures pour être pris en compte. Une nouvelle hospitalisation est enregistrée chaque fois qu'une personne est admise à l'hôpital. Étant donné la fréquence des réadmissions au cours d'un même épisode de la maladie (dû à une seule infection), ce rapport fonde son analyse sur le nombre d'épisodes et non sur le nombre d'hospitalisations.

**Episode / Épisode:**

Un numéro d'épisode est attribué à chaque nouvelle admission à l'hôpital pour plus de 24 heures, qui est séparée d'au moins 30 jours d'une hospitalisation antérieure, que le patient soit hospitalisé une seule fois ou plusieurs fois pendant une période de 30 jours. Deux hospitalisations différentes du même patient, séparées par 30 jours, donnent lieu à deux numéros d'épisodes différents. Si un patient est transféré entre deux hôpitaux participant au CH-SUR dans la période de 30 jours suivant sa dernière sortie, alors ces hospitalisations comptent pour le même épisode. Un épisode peut donc inclure plusieurs hospitalisations et chaque hospitalisation peut inclure plusieurs admissions en unité de soins intensifs.

**Reason for the hospitalization / Raison d'hospitalisation:**

- *Hospitalisation en raison du COVID-19:* sur la base des informations disponibles au moment de l'admission, le patient est hospitalisé parce qu'il présente des symptômes dus au COVID-19 ou qu'il souffre de la décompensation d'une maladie chronique manifestement causée par le COVID-19.
- *Hospitalisation avec une infection au SARS-CoV-2:* sur la base des informations disponibles au moment de l'admission, le patient a un test positif pour le SARS-CoV-2 mais est hospitalisé sans symptômes de COVID 19 pour un problème autre que le COVID 19. En d'autres termes, le problème prédominant est un accident ou une maladie autre que le COVID 19.

**Origin of the infection / Origine de l'infection:**

- *Infection acquise dans la communauté:* le COVID 19 a été détecté avant l'admission à l'hôpital ou dans les 5 premiers jours suivant l'admission.
- *Infection nosocomiale:* l'épisode est enregistré comme "nosocomial" si le SARS-CoV-2 est détecté au moins cinq jours après l'admission à l'hôpital.

**Intermediate care unit (intermediate care or IMCU) / Unité de soins intermédiaires (U-IMC):** unité de soins prenant en charge des patients qui présentent une défaillance d'une fonction vitale ou dont la charge en soins ne permet pas un retour dans une unité d'hospitalisation normale. Ces unités constituent le lien entre une unité de soins intensifs et une unité de soins normale.

**Intensive care unit (ICU) / Unité de soins intensifs (USI):** unité de soins prenant en charge des patients présentant une défaillance grave d'une ou plusieurs fonctions vitales ou risquant de développer des complications sévères.

**Statut vaccinal / Vaccination status:**

La définition du statut vaccinal se fonde sur la dernière dose reçue, le cas échéant. Il distingue les catégories suivantes :

- a) *Vacciné au cours des 6 derniers mois* : patients ayant reçu leur dernière dose de vaccin au cours des 6 mois précédant le test positif au SARS-CoV-2
- b) *Vacciné il y a plus de 6 mois* : patients ayant reçu leur dernière dose de vaccin plus de 6 mois avant le test positif au SARS-CoV-2
- c) *Vacciné (date inconnue)* : patients ayant reçu au moins une dose des vaccins **approuvés par l'OMS** avant le test positif, mais dont on ne sait pas quand la dernière dose a été administrée
- d) *Non vacciné* : patients n'ayant reçu aucune dose d'un des vaccins **approuvés par l'OMS** au moment du test positif au SARS-CoV-2
- e) *Statut inconnu* : patients pour lesquels on ne dispose d'aucune information sur la vaccination

**Remarque : populations spéciales** Les enfants de moins de 5 ans ne sont pas inclus dans les analyses spécifiques à l'âge concernant le statut vaccinal, étant donné que la vaccination ne leur est pas recommandée.

**Discharge / Sortie:** lorsque le patient quitte l'hôpital vivant, le départ est qualifié de « sortie » si le patient se rend :

1. à son domicile,
2. dans un établissement de soins de longue durée,
3. dans un autre hôpital,
4. dans une autre institution ne participant pas à la surveillance du CH-SUR,
5. dans un établissement de réadaptation, ou
6. vers une destination inconnue.

**Reason of death / Raison du décès:** : les patients pour lesquels le COVID 19 était la cause du décès (décédés du COVID 19) sont présentés séparément des patients ayant le COVID 19 qui sont morts d'autres causes (décédés avec le COVID 19, non du COVID 19). Cette détermination de la cause du décès d'un patient, du COVID ou d'une autre cause, est faite par un médecin de l'hôpital concerné pour chaque centre participant au CH-SUR. Les cas, où la cause du décès n'est pas certaine mais où il y a eu un diagnostic de COVID 19 (en conformité avec les critères d'inclusion du CH-SUR) sont comptés comme des décès du COVID ou des décès suspectés du COVID.

**Dealing with missing data / Traitement des données manquantes:** lorsque cela est mentionné dans le texte, les données manquantes sont exclues de l'analyse. Sinon, les enregistrements avec des données manquantes sont inclus dans les nombres totaux et analysés en conséquence. Cela peut conduire à la situation où les dénominateurs des différentes catégories analysées ne donnent pas le même total. Lorsque cela est indiqué, les données des deux derniers mois sont considérées comme provisoires en raison des délais de saisie et sont mises en évidence en gris dans certaines illustrations.

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