

# Surveillance sentinelle hospitalière du COVID-19

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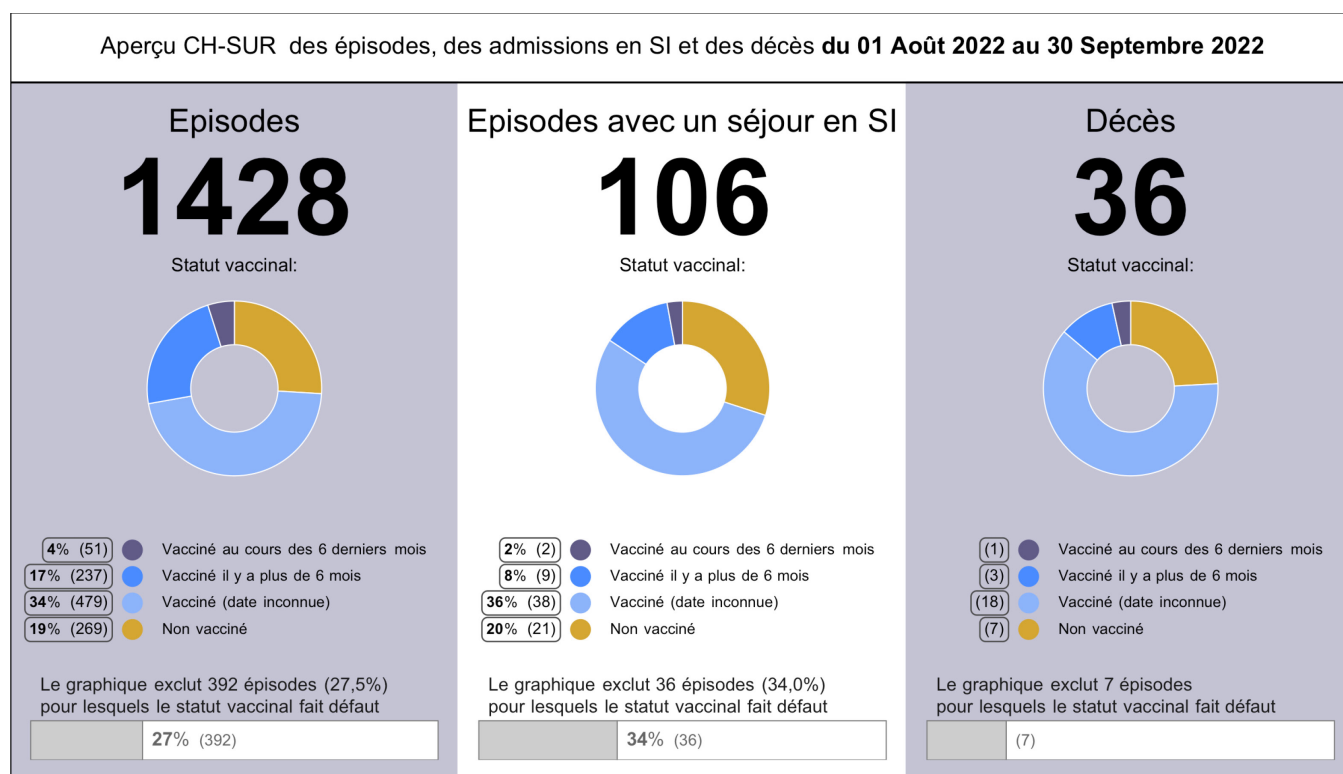
***État des données au: 21 novembre 2022***

## 1. Résumé introductif

Le système sentinelle de surveillance hospitalière (CH-SUR) a été mis en place en 2018 afin de recenser les hospitalisations liées à la grippe. Le 1er mars 2020 déjà, soit quatre jours après l'annonce du premier cas confirmé de COVID 19 en Suisse, sa version adaptée pour COVID 19 était prête à enregistrer également les séjours hospitaliers en lien avec une infection au SARS-CoV-2, confirmée en laboratoire.

Actuellement, 19 hôpitaux participent activement à ce système de surveillance ; la plupart sont des hôpitaux cantonaux ou universitaires qui couvrent une grande proportion des patients, enfants et adultes, hospitalisés en Suisse. Les statistiques du CH-SUR informent, entre autres, sur le nombre et la durée des hospitalisations ainsi que des séjours en **unité de soins intensifs**. Le CH-SUR enregistre également si le patient est **décédé du COVID 19 ou avec le COVID 19** 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 1er janvier 2022, lorsque le variant Omicron est devenu dominant, au 20 novembre 2022. Durant cette période, les données ont été récoltées à partir de 16 223 épisodes d'hospitalisation. Pendant le même laps de temps, 20 949 épisodes d'hospitalisation dus à une infection au SARS-CoV-2 confirmée en laboratoire ont été déclarés à l'OFSP dans le cadre du système de déclaration obligatoire en vigueur au niveau national, **Lien Dashboard OFSP**. Le système CH-SUR a ainsi couvert près de 77,4 % de toutes les hospitalisations dues au SARS-CoV-2 déclarées en Suisse. La figure 1 offre un aperçu des données enregistrées durant les deux mois les plus récents pour lesquels un nombre suffisant de données était disponible.



**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.

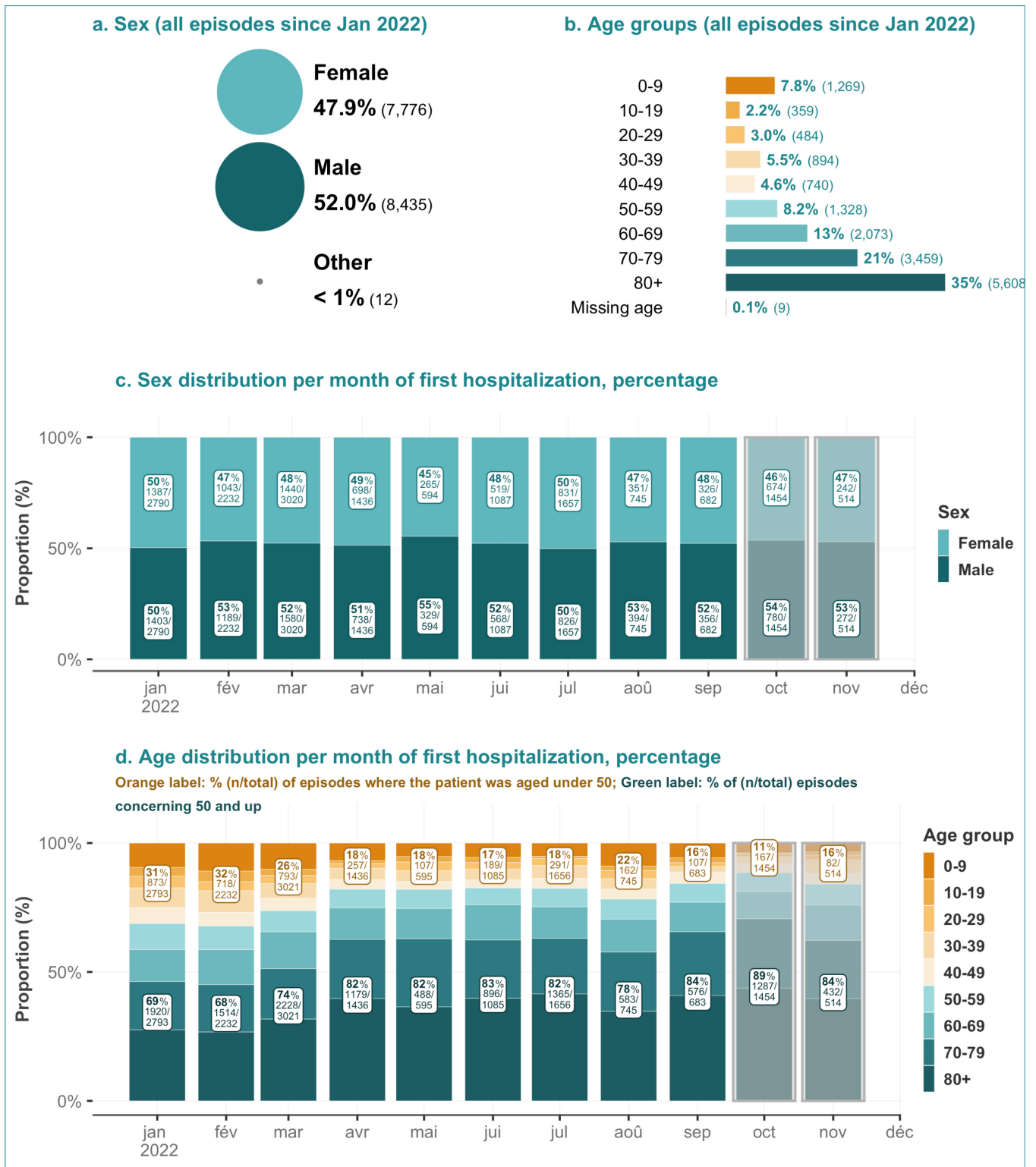
## 2. Hospitalizations and patient characteristics

Between January 01, 2022 and November 20, 2022 and among the 19 hospitals actively participating in CH-SUR, 16,223 **episodes** were registered, accounting for a total of 16,640 hospitalizations. There were more hospitalizations than **episodes** because some episodes include multiple **hospitalizations** (for more details see section **glossary and supplemental information**).

Most patients (97.6% [15,840 of 16,223]) were hospitalized only once during an episode, while 2% of the registered episodes (383 of 16,223) included two to four hospitalizations. Only one episode included five hospitalizations.

Among all episodes, the majority (52% [8,435 of 16,223]) of the episodes concerned male patients (Figure 2a), and the age distribution was skewed towards older persons (Figure 2b). The largest age category corresponded to patients aged 80 and above (35.0% [5,608]).

Figures 2c and 2d 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 67.8% (1,514 of 2,232) and was relatively constant from April to September 2022, ranging between 82.1% (1,179 of 1,436) and 84.3% (576 of 683). In October 2022, 88.5% (1,287 of 1,454) of episodes concerned patients 50 years old and above (Figure 2d).

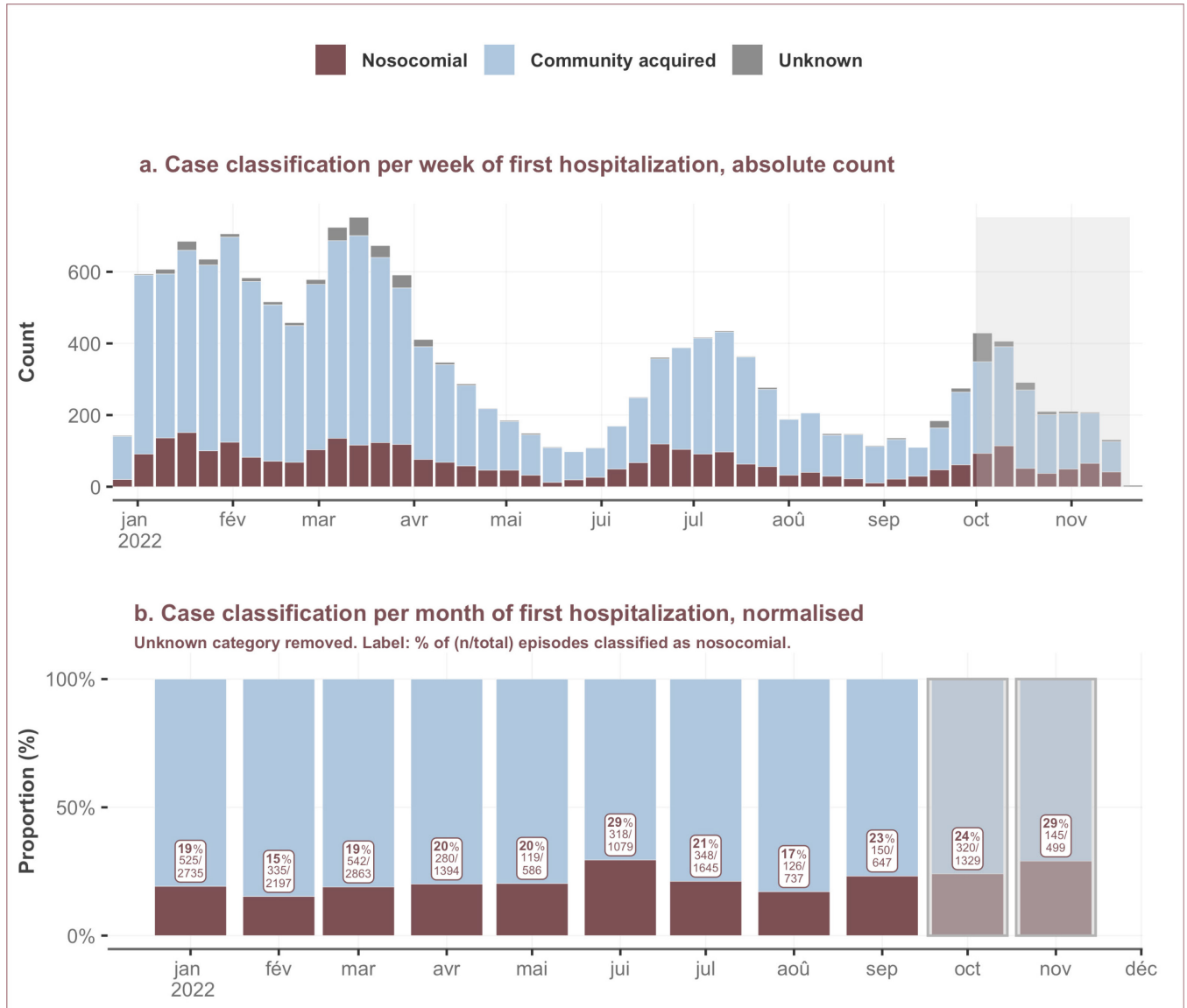


**Figure 2: Demographic characteristics: sex and age distribution of admitted hospitalized patients, overall and per month.** For episodes with multiple hospitalizations, the admission date of the first hospitalization was used. Data from the last two months (highlighted gray) is considered provisional due to entry delays. The 'other' sex category was removed from panel c, and the missing age group was removed from panel d.



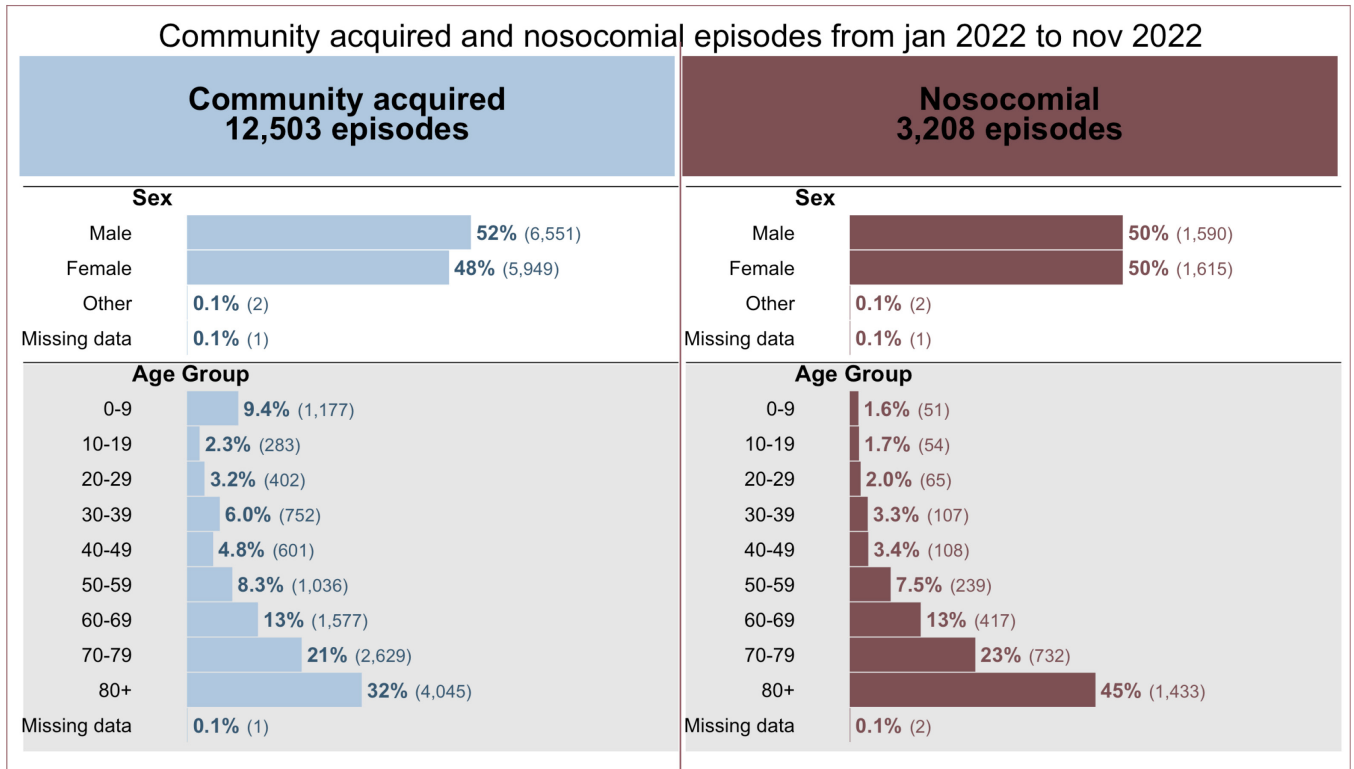
## 2.1. Origin of infection

From January 01, 2022 to November 20, 2022, the overall percentage of nosocomial infections among all documented episodes was 19.8% (3,208 sur 16,223) while episodes linked to community acquired infections accounted for 77.0% (12,503 sur 16,223) (Figure 3). 3.1% of the episodes could not be classified either as nosocomial or community acquired.



**Figure 3:** Case classification (infection source) of the episodes. The absolute count of episodes over time (panel a) and the proportion (normalized in %) of episodes by infection source (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 the other age groups, the nosocomial infections affected the patients aged 80 years and above the most, accounting for 1,433 (45%) of the nosocomial episodes. In comparison, 4,045 (32%) of episodes with community-acquired infections corresponded to patients aged 80 years and above (Figure 4).

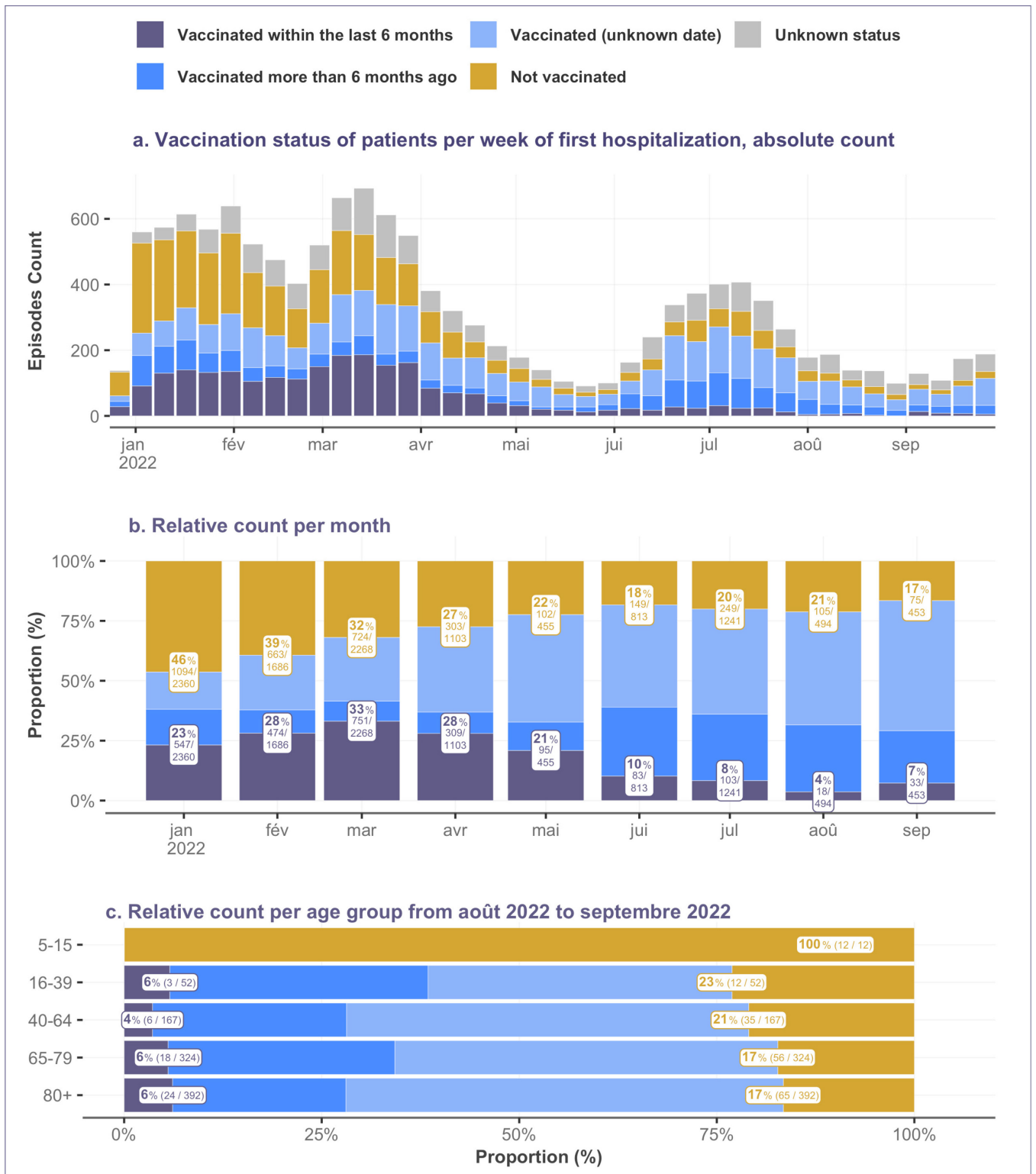


**Figure 4:** Comparison of community acquired and nosocomial cases by demographic characteristics.

## 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.

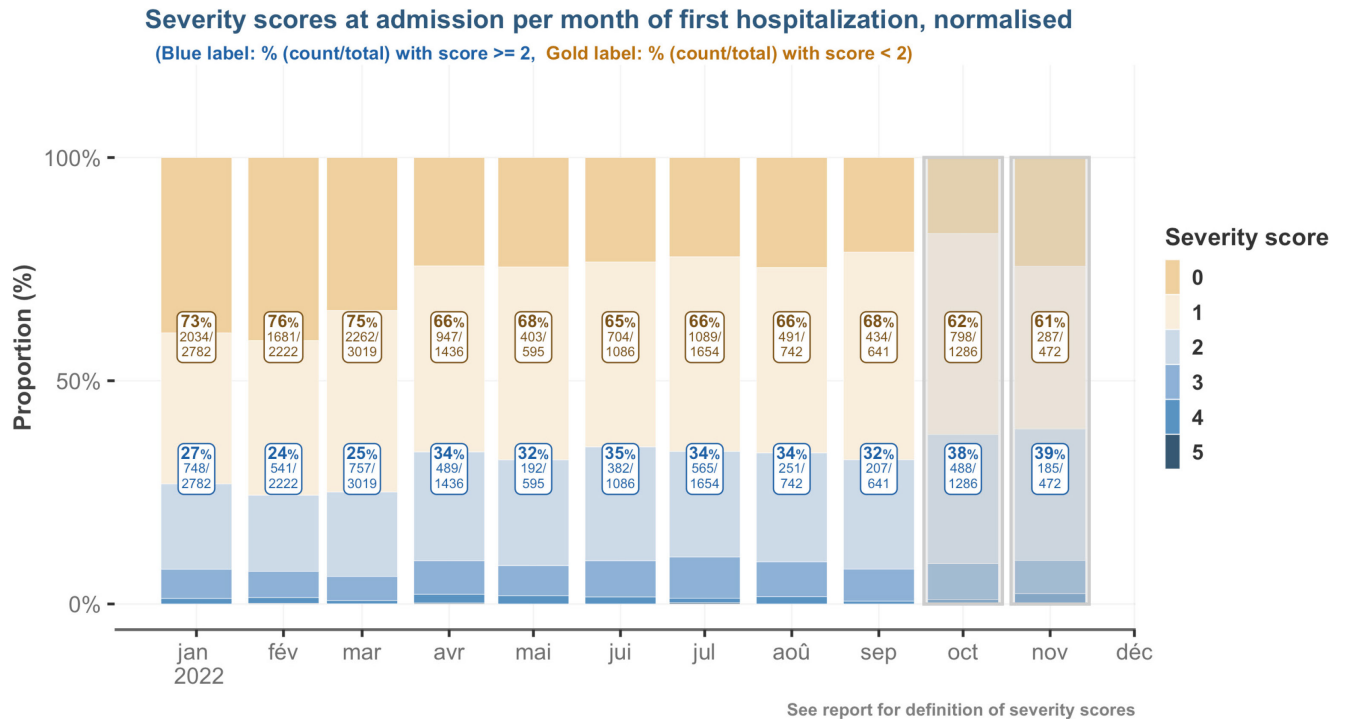
As of November 20, 2022, 69.7% of the Swiss population was vaccinated with at least one dose and 10.7% were vaccinated within the last 6 months. It is important to note that we can know the percentage of the population which is vaccinated (through administrative records), but only approximate the proportion 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%**.



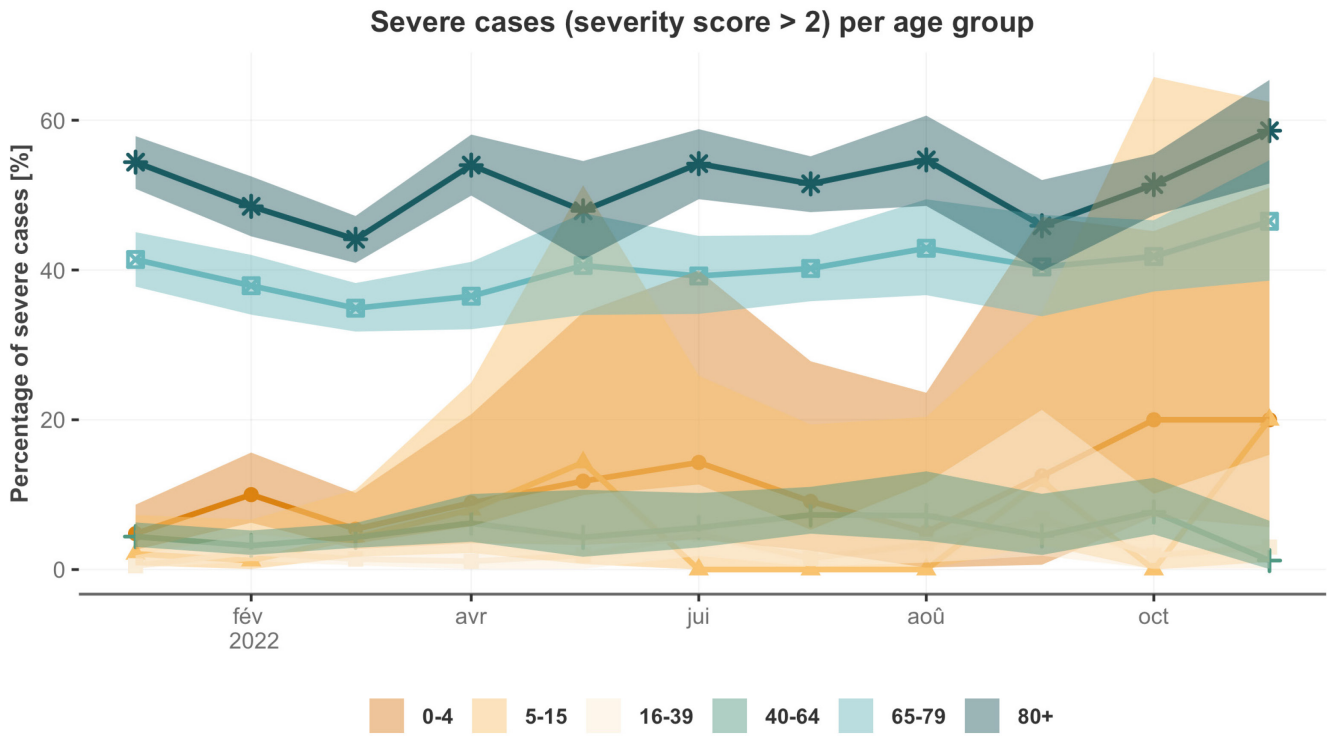
**Figure 5:** Episodes by vaccination status over time and by age group. For episodes with multiple hospitalizations, the vaccination status for the first hospitalization was considered. Episodes with first admission date after septembre 30, 2022 were excluded due to data completeness considerations. For Figure 5c only: Episodes with missing ages and children between 0 to 4 years old (following vaccination recommendations) were excluded from the analysis.

### 2.3. Severity at admission

During the period of observation, the percentage of episodes with a **severity scores** of 2 and more ranged between 24.3% (541 of 2,222) (Feb 2022) and 32.3% (207 of 641) (Sep 2022). The periods with higher severity scores (Figure 6) are mirrored by older patients' ages (Figure 2d) during these periods. This may be partly due to the nature of the CURB-65 score, which attributes one point for those aged 65 and above. Figure 7 highlights the more frequent occurrence of severe cases in older age groups. Among those aged 65 and above, the percentage of severe cases decreased from January to March 2022 and tended to increase again slightly in the more recent months.



**Figure 6:** Episodes' severity scores at admission for COVID-19 hospitalizations over time. Includes records up to novembre 20, 2022. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays.

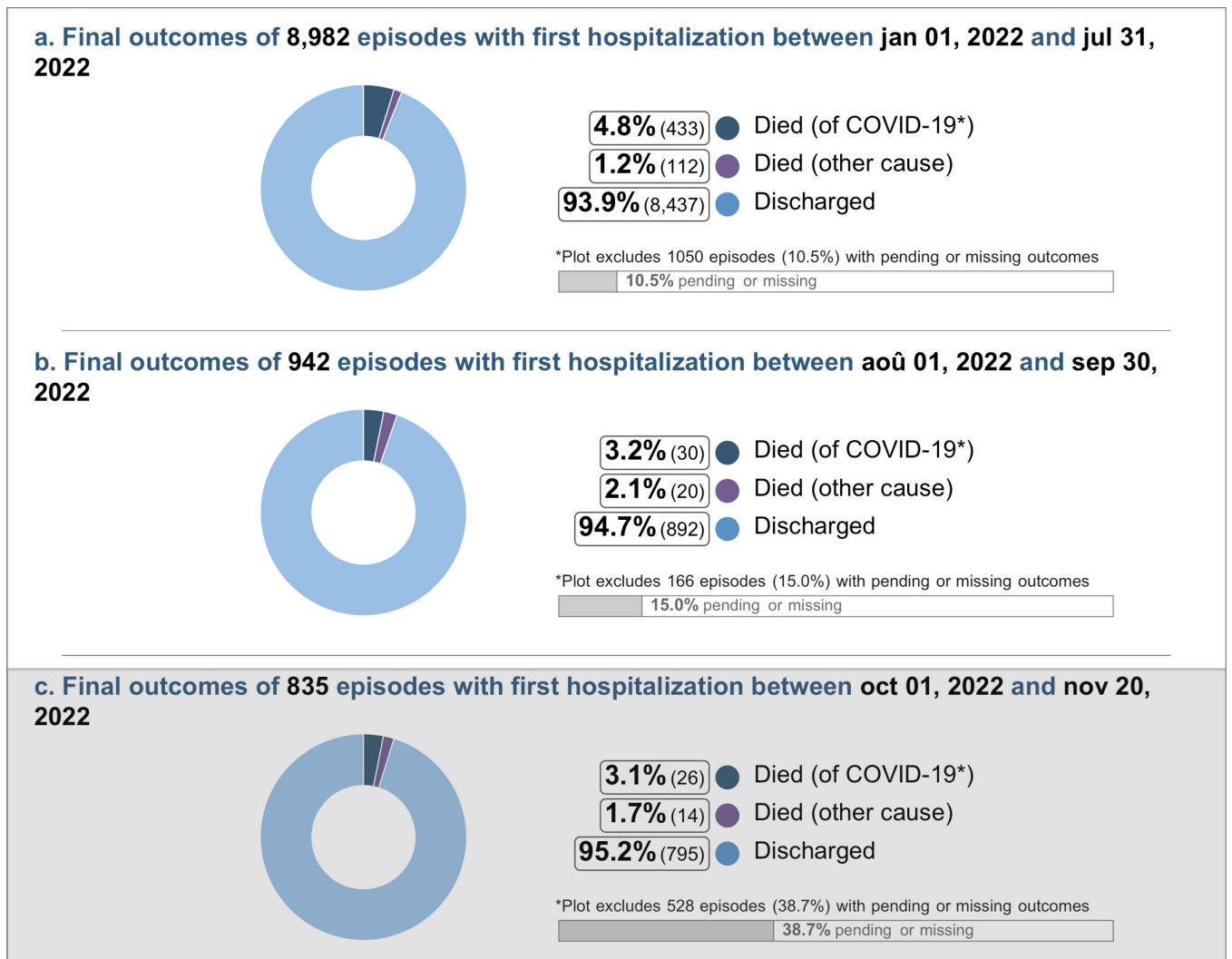


**Figure 7:** Percentage of episodes with severity score two and above at admission over time by age groups.

## 3. Outcomes

### 3.1. Outcomes overview

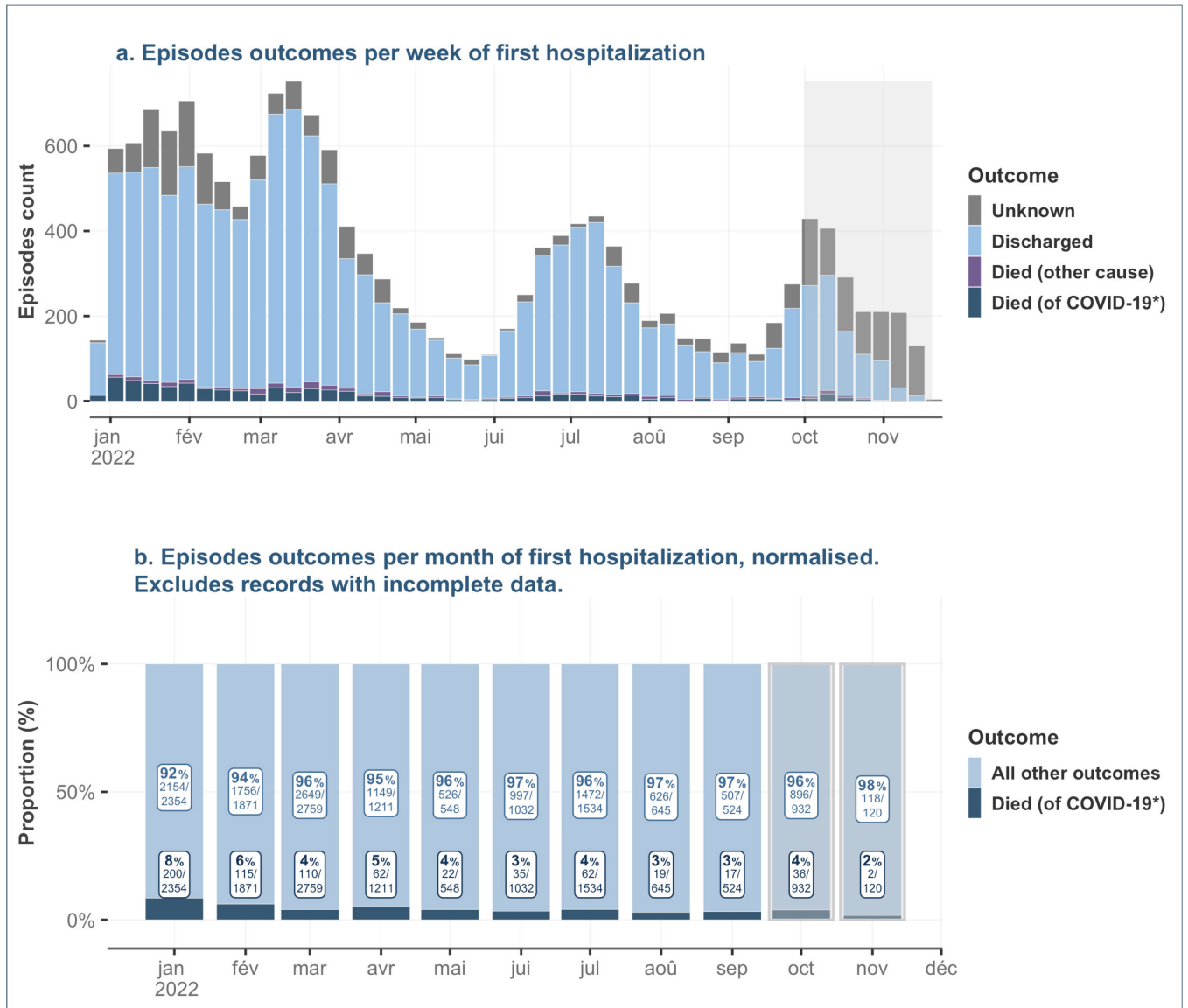
Figure 8 shows the final outcomes of CH-SUR episodes over three time intervals. Episodes resulting in death, for which COVID-19 was the **cause of death** (died of COVID-19) are shown separately from those with an alternative cause of death (died *with* COVID-19, but not *of* COVID-19). A medical doctor at the hospital for each CH-SUR participating center determined whether a patient died of COVID-19 or another cause. 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 8:** Outcomes for COVID-19 related episodes in CH-SUR hospitals. Includes records up to novembre 20, 2022. For episodes with multiple hospitalizations, only the final outcome is considered. Patients 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. Data from the last two months (highlighted gray) is considered provisional due to entry delays. (\* Died of COVID-19 as a confirmed or suspected cause of death)

### 3.2. Outcomes over time

Figure 9 shows the final outcomes of episodes over time (Figure 9a & 9b). Since the month of March 2022, mortality has remained at low levels: 5% of episodes or less resulted in death each month.



**Figure 9:** Outcomes for COVID-19 related episodes over time. Includes records up to novembre 20, 2022. 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)



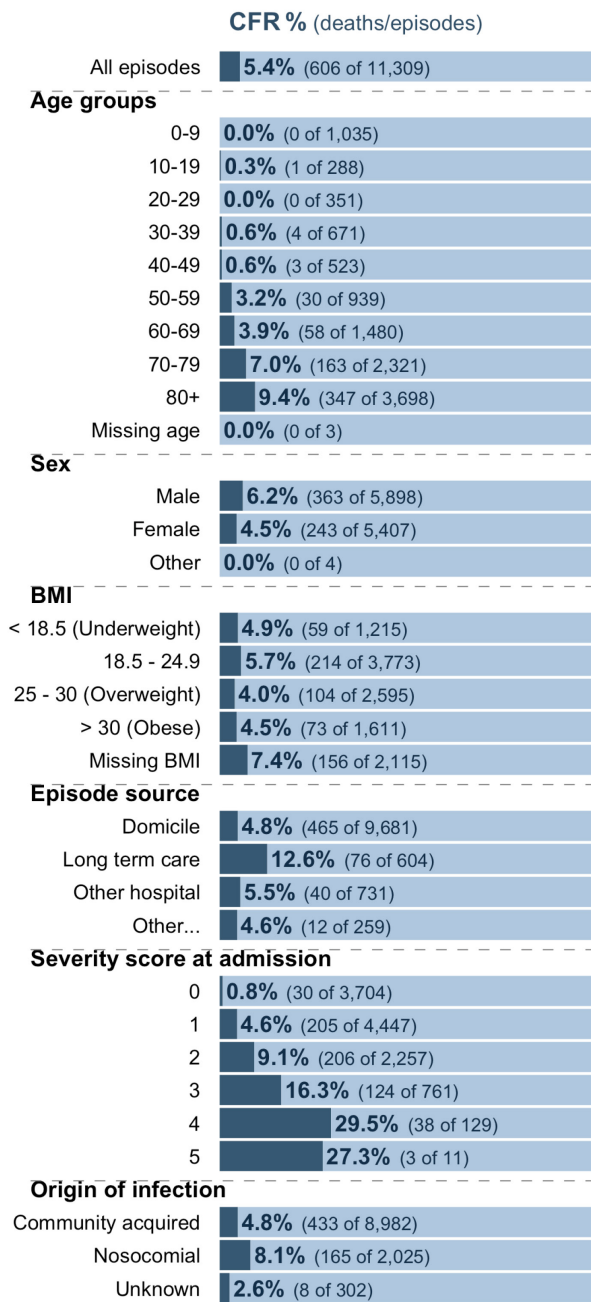
### 3.3. Case fatality rate (CFR) across demographic and risk groups

Since janvier 2022 and until septembre 2022, the case fatality rate (CFR) increased with increasing age, from 0% (0 of 1,035) in episodes of patients aged 0-9, to 3.2% (30 of 939) in episodes of patients aged 50-59, and to 9.4% (347 of 3,698) in episodes of patients aged 80+. CFR% was greater in men than in women: 6.2% (363 of 5,898) vs 4.5% (243 of 5,407) respectively. In addition, the CFR% was greater for episodes with higher severity scores at admission: 0.8% (30 of 3,704) of the episodes with severity score 0 resulted in death of COVID-19, while 27.3% (3 of 11) of the episodes with severity score 5 resulted in death of COVID-19 (Figure 10a).

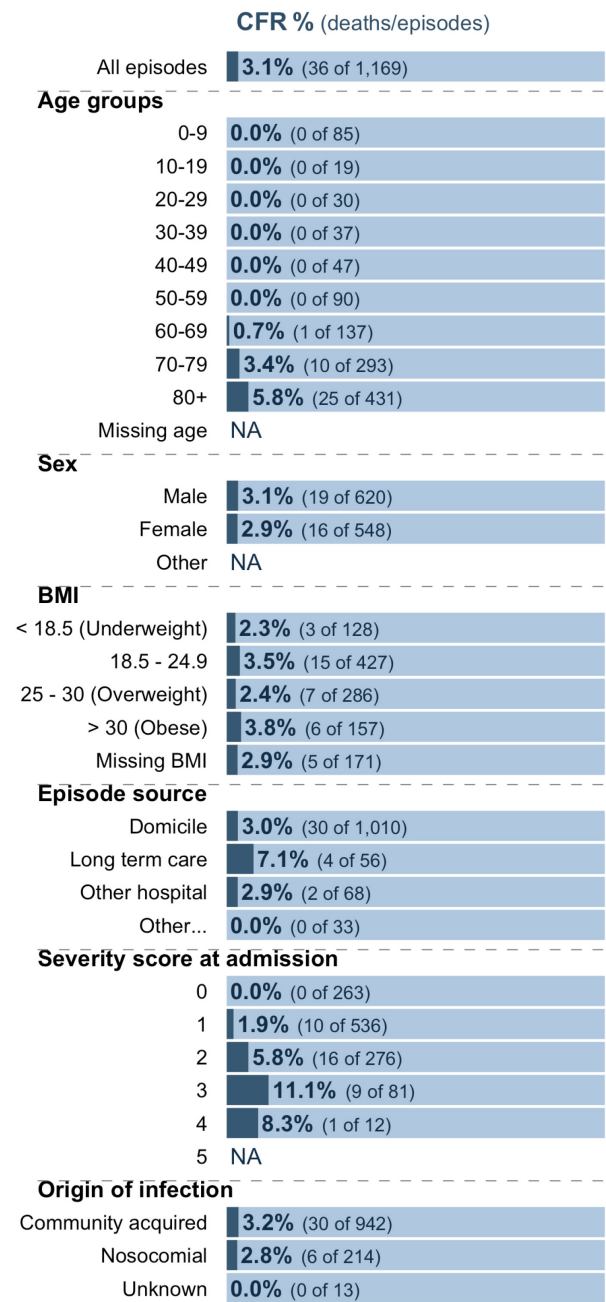
The overall CFR% of the most recent period for which enough data is available (months août and septembre 2022, Figure 10b) was lower than the CFR% from janvier 2022 until septembre 2022 (3.1% vs. 5.4%). The CFR% of the age groups 70-79 and 80 and above in the most recent period compared to the previous months (Figure 10).

Of note, there was no clear mortality difference across different BMI groups. Data regarding CFR% and vaccination status can be found in section 4.

**a. CFR % : 11,309 episodes with first hospitalization between janvier 2022 and juillet 2022**



**b. CFR % : 1,169 episodes with first hospitalization between août 2022 and septembre 2022**

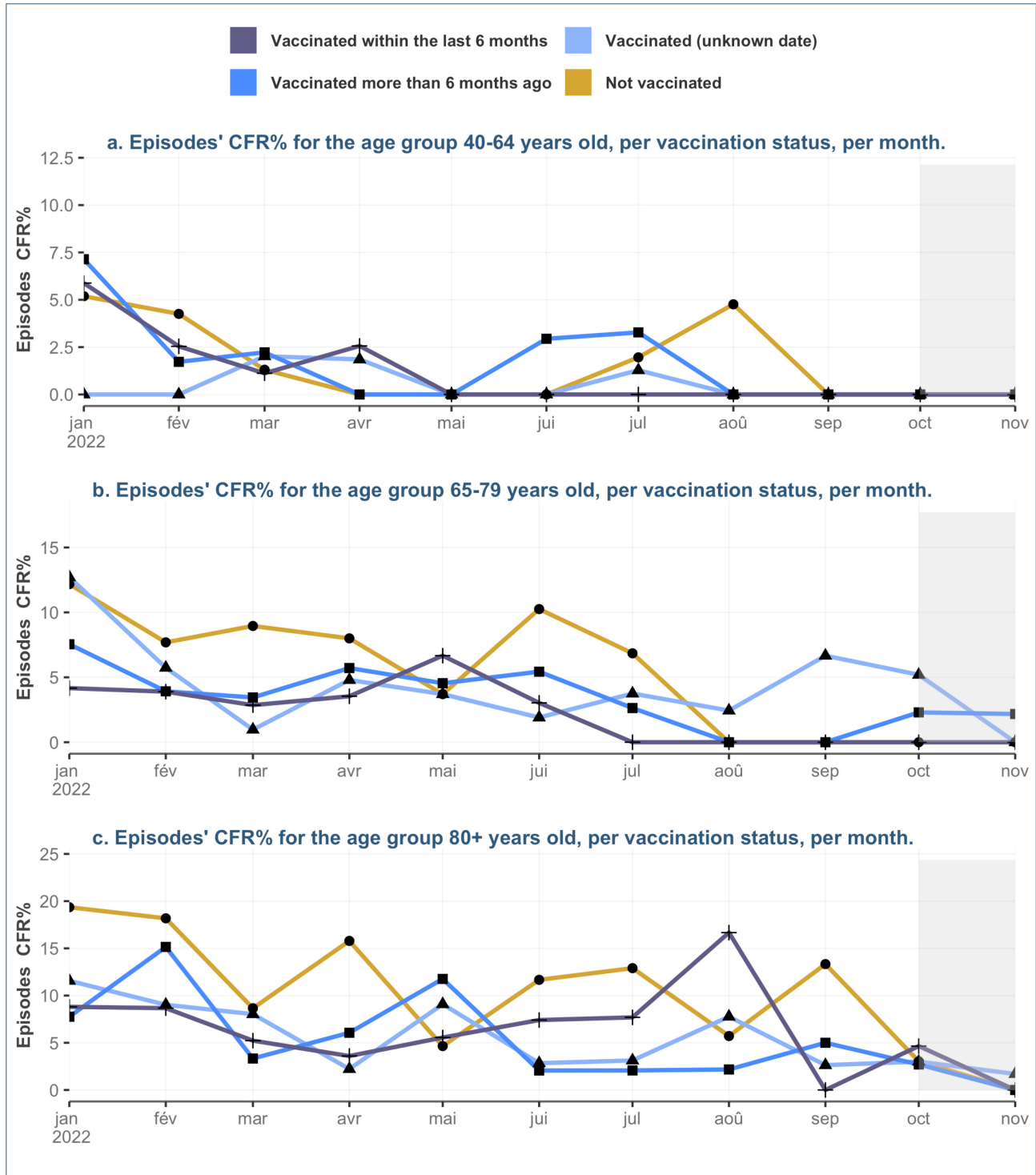


**Figure 10:** Case fatality rate (CFR) % among demographic and risk groups: percentage of hospitalization episodes, which ended in the death of the patient of COVID-19 in hospital. Both figures include records up to septembre 30 2022 but records with incomplete data (ongoing hospitalization episodes or with a pending outcome in the database) were not included.

### 3.4. Case fatality rate 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 11).

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 80 and above patients in August 2022 is due to 1 death out of 6 episodes).

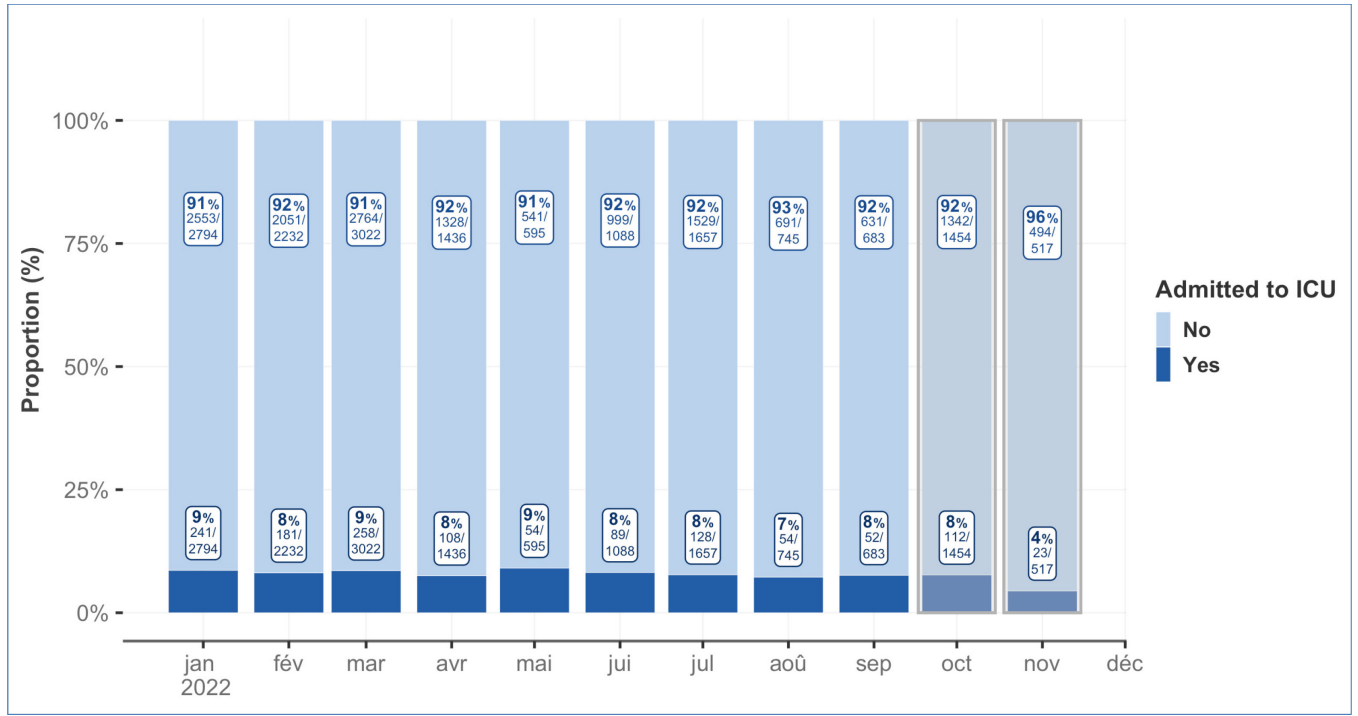


**Figure 11:** Case fatality rate (CFR%) by age and by vaccination status over time: percentage of episodes, which ended in the death of the patient of COVID-19 in hospital. Records with incomplete data were not included. Includes records up to November 20, 2022. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays.

## 4. Intensive care unit (ICU) admission

### 4.1. ICU admission over time

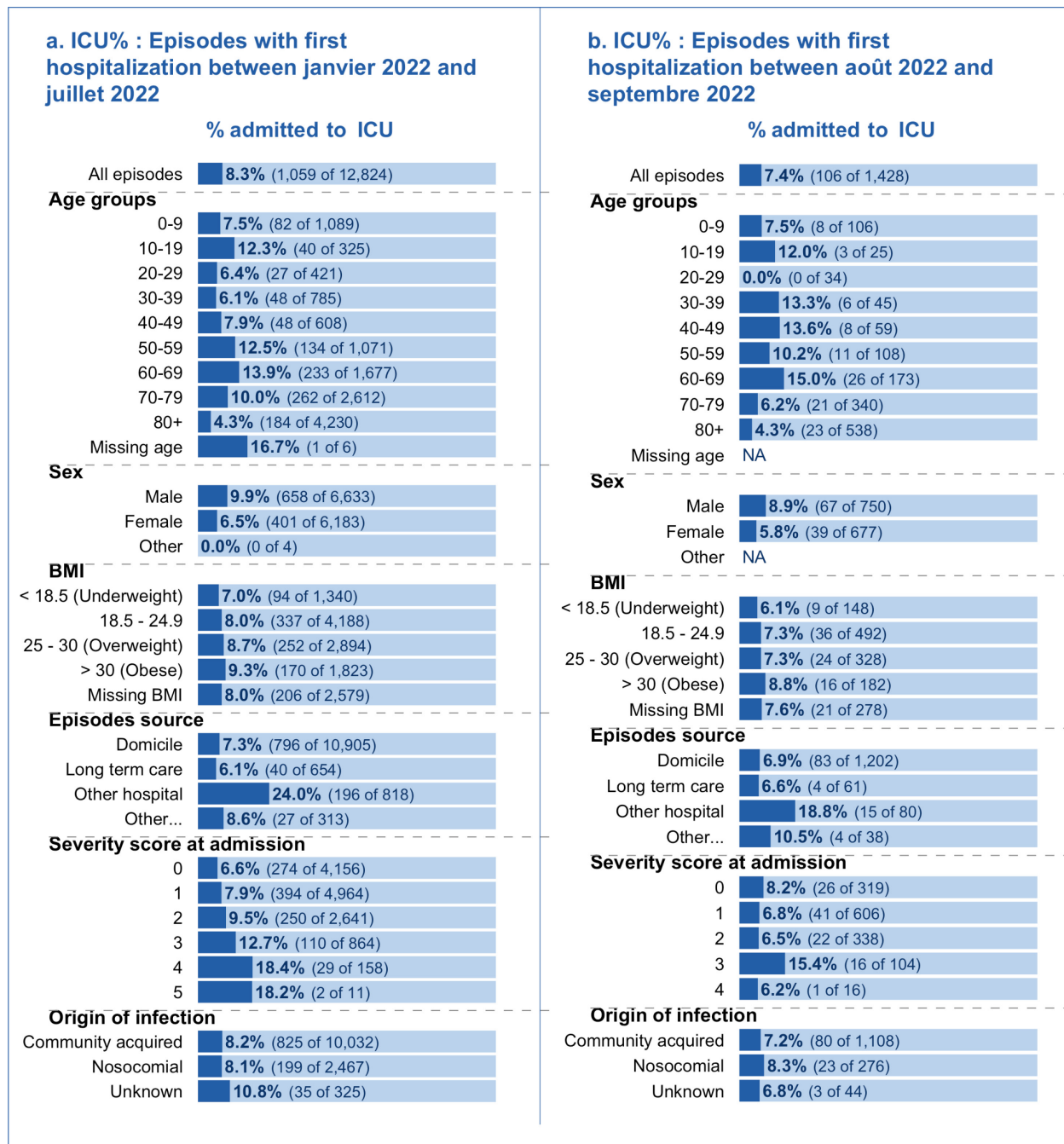
Figure 12 shows that the proportion (in %) of ICU admission has remained relatively stable over time since janvier 2022.



**Figure 12:** Percentage and proportion of episodes with at least one ICU admission over time. Records with incomplete data (ongoing episodes or with a pending outcome in the database) were not included. 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 janvier 2022 to septembre 2022, 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 13.9% (233 of 1,677) 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 4.3% (184 of 4,230) 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 6.5% of the episodes concerning females. Episodes of patients transferred from other hospitals had a high probability of ICU admission: 24% of such episodes (196 of 818) required at least one ICU admission, compared to an overall admission rate of 8.3%. ICU admission probability also increased with increasing admission severity scores (Figure 13a).



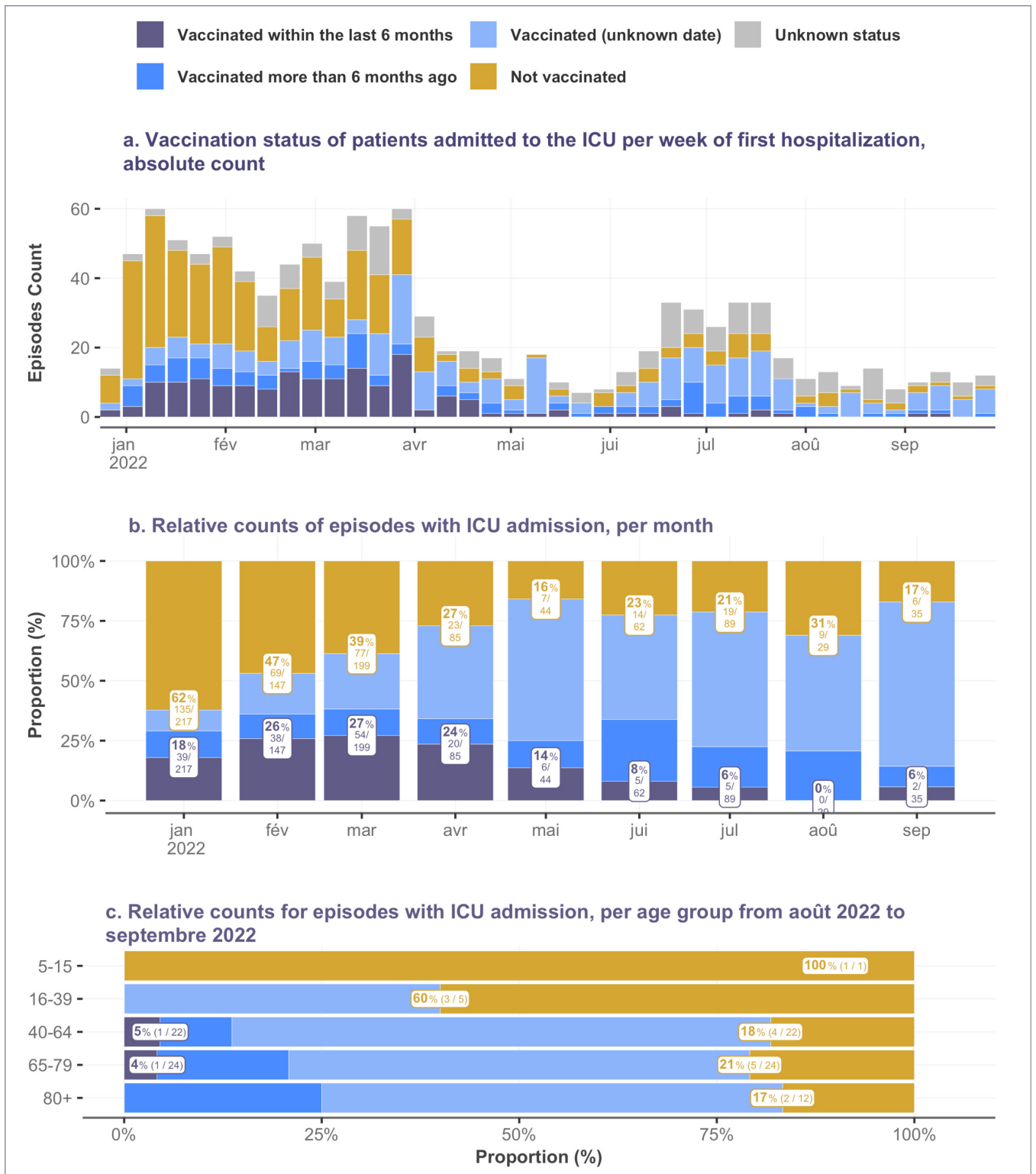
**Figure 13:** Percentage of hospitalization episodes with at least one ICU admission, grouped by demographic and risk factors, over two time intervals. For episodes with multiple hospitalizations, we considered whether they were admitted to the ICU during any of their hospitalizations. Both panels include records up to sep 30, 2022 due to data completeness considerations. Records with incomplete data were not included.

### 4.3. ICU admission rate by vaccination status

Figure 14 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 to April from 62% to 27% and has fluctuated since then. In the beginning of 2022 (January-March) the percentage of not vaccinated patients was clearly higher among those with ICU stay compared to all episodes at admission. This difference seems no longer apparent since April 2022. In recent months, the distribution of patients by vaccination status in ICU seems to be similar to all episodes at admission. (Figure 14b)

The relative counts for the age groups of 5-15 and 16-39 have to be interpreted with caution due to low numbers. (Figure 14b)

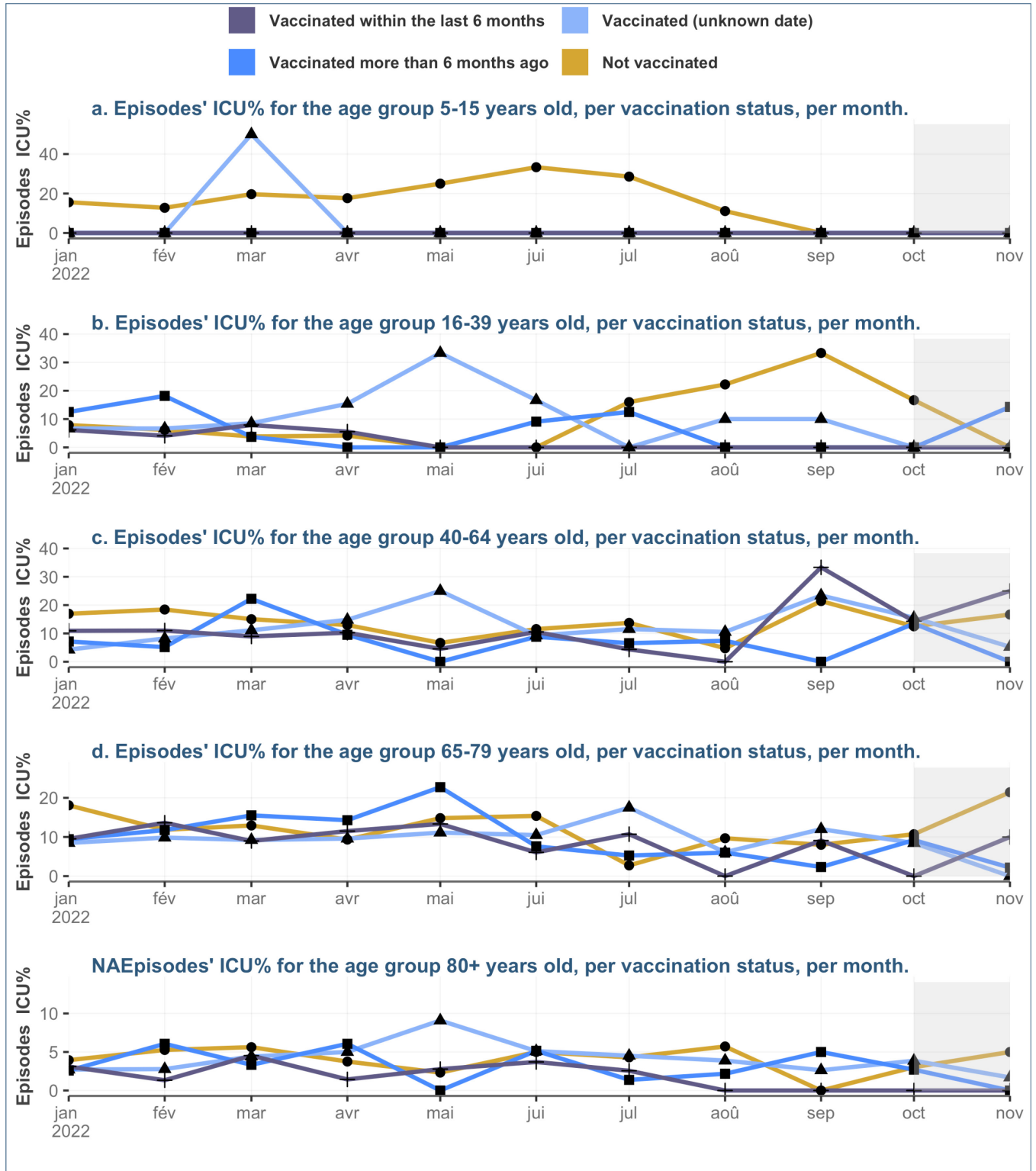


**Figure 14:** Demographic characteristics of hospitalized patients by immune status and immune status of patients over time. For episodes with multiple hospitalizations, the immune status for the first hospitalization was considered. Episodes with first admission date after sep 30, 2022 were excluded 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.



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

For the most recent time period where reliable data is available, the ICU admission rate is displayed by age group and by vaccination status (Figure 15). Plots for the age groups 5-15 and 16-39 should be interpreted with caution, as the ICU% is calculated on a small number of episodes. The same caution applies in recent months, where peaks may be due to low number of episodes.



**Figure 15:** ICU admission rate (ICU%) by age and by vaccination status over time: percentage of episodes, which resulted in ICU admission of the patient in hospital. Records with incomplete data were not included. Includes records up to November 20, 2022. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays.



## 5. Treatments

Several treatments have been used since the beginning of the pandemic and guidelines for COVID-19 treatment evolve according to the current state of knowledge. Therapeutic strategies may vary across centers, contributing to the heterogeneity of data. For clarity purpose, the treatments were classified into three categories: antivirals <sup>1</sup>, monoclonal antibodies <sup>2</sup> and immune-modulating strategies <sup>3</sup>. In this section, combinations of treatments are explored: combinations are defined as the co-administration or the sequential administration of treatments during the same episode. Over all episodes (14218) from janvier 2022 to septembre 2022, 6.6% received monoclonal antibodies, 26.1% were administered immune-modulating strategies, and 15.7% were treated with antivirals.

Figure 16 represents the categories of treatments (including combinations) over time, starting February 2020. This figure illustrates the changes in the overall treatment strategy as well as the increasing proportion of episodes during which no anti-COVID treatment was administered. This may be in line with the increasing proportion of non-severe cases over time.

In the Figure 17, treatments are analyzed at the drug-level. The most commonly used drugs and their different combinations are presented.

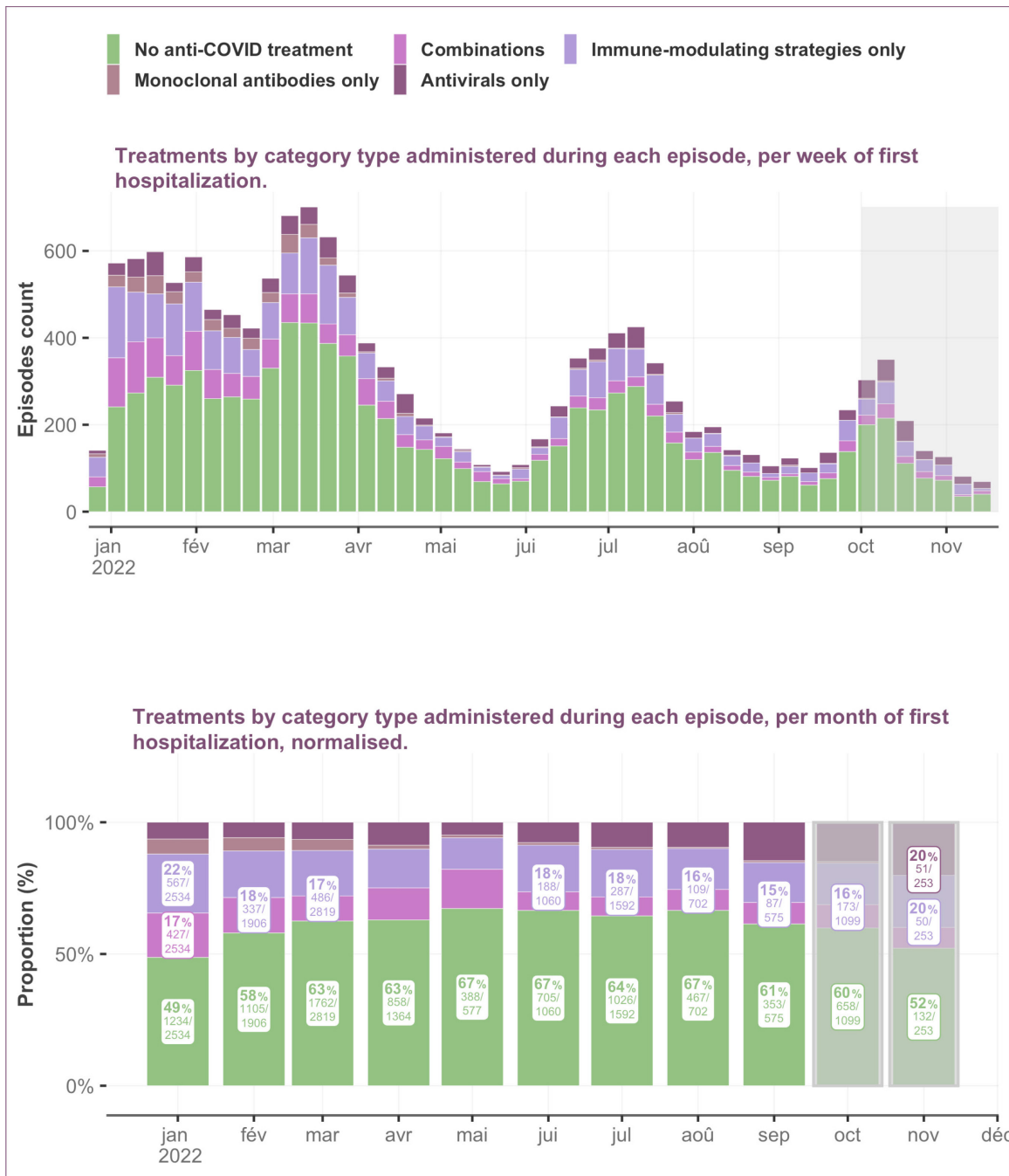
Figure 18 represents the use of treatments across different patient groups from janvier 2022 to septembre 2022.

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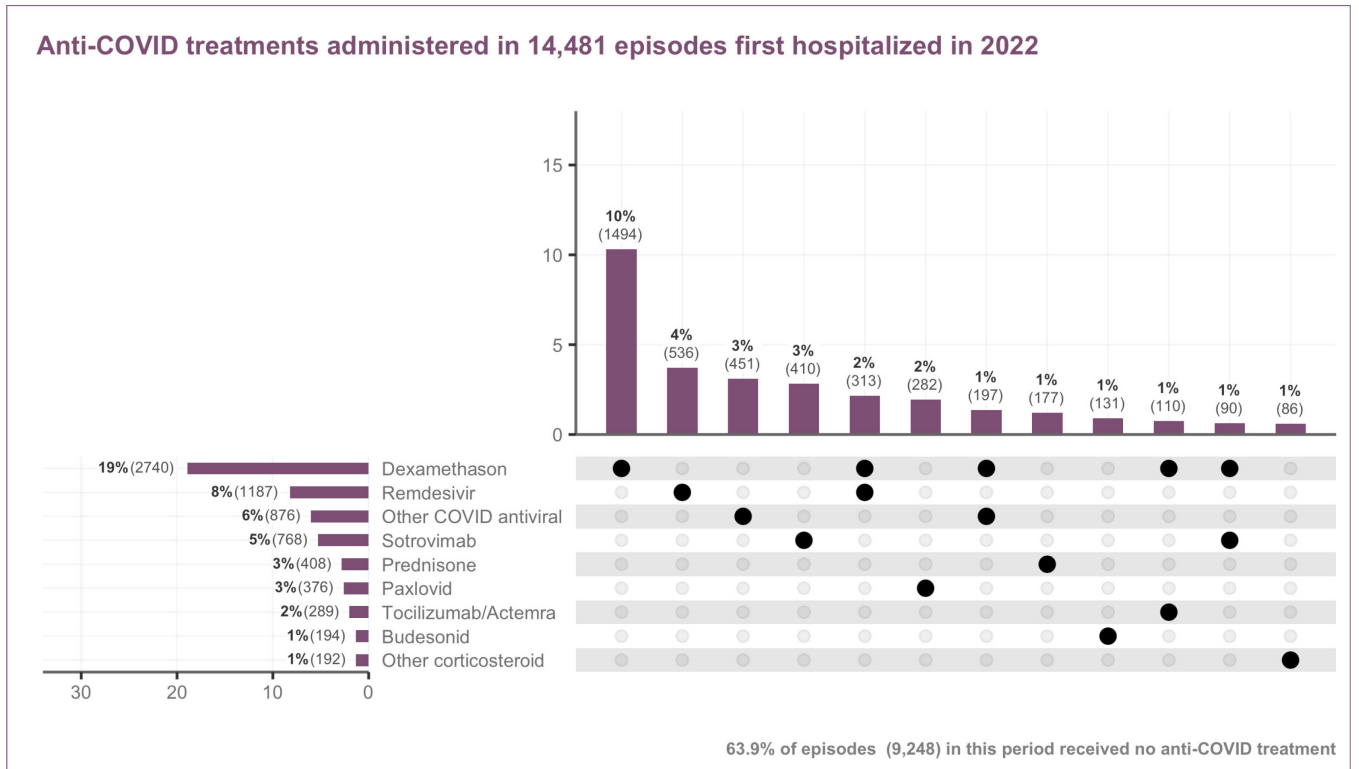
<sup>1</sup> Antivirals comprise: nirmatrevir/ritonavir, remdesivir and other antivirals (chloroquine, lopinavir/ritonavir, ribavirin, tenofovir, etc.).

<sup>2</sup> Monoclonal antibodies comprise: tixagevimab/cilgavimab, sotrovimab, casirivimab/imdevimab, bamlanivimab/etesevimab, and others (convalescent plasma, etc.).

<sup>3</sup> Immune-modulating strategies comprise: corticoids (dexamethasone, prednisone), inhaled corticoids (budesonide), tocilizumab, baricitinib, and others (interferon, etc.).



**Figure 16:** Anti-COVID treatments administered over time. Absolute counts are displayed per week of first hospitalization. Relative counts are presented by month of first hospitalization. Only treatment categories accounting for above 15% are displayed. Incomplete records were excluded.



**Figure 17:** Anti-COVID treatments administered. Horizontal bars to the left represent the % of episodes who received a specific drug. Vertical bars show the % of episodes who received the combination of drugs indicated with the black dot(s) directly below the bar. Only the top 12 combinations are shown for each time period.

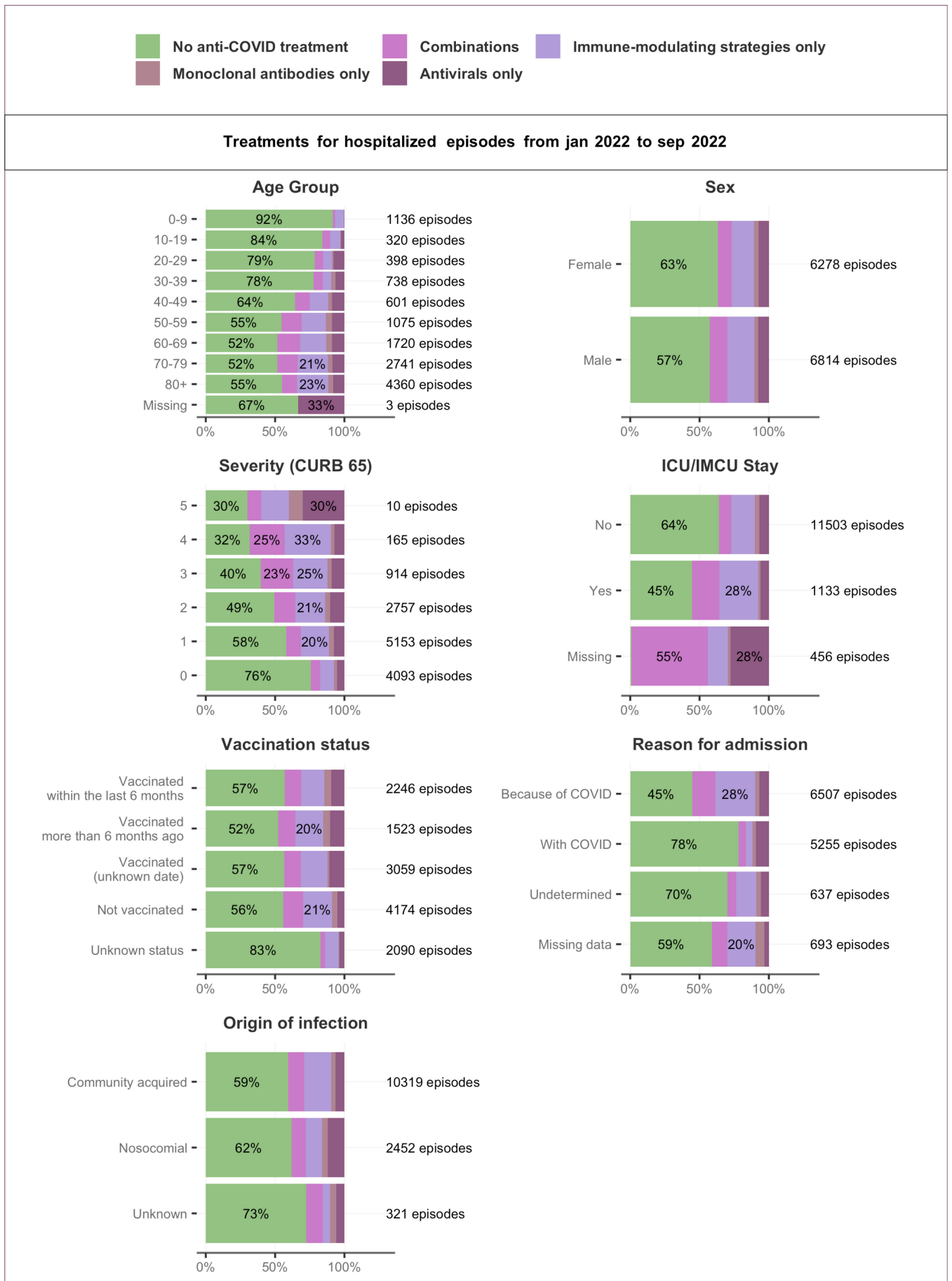
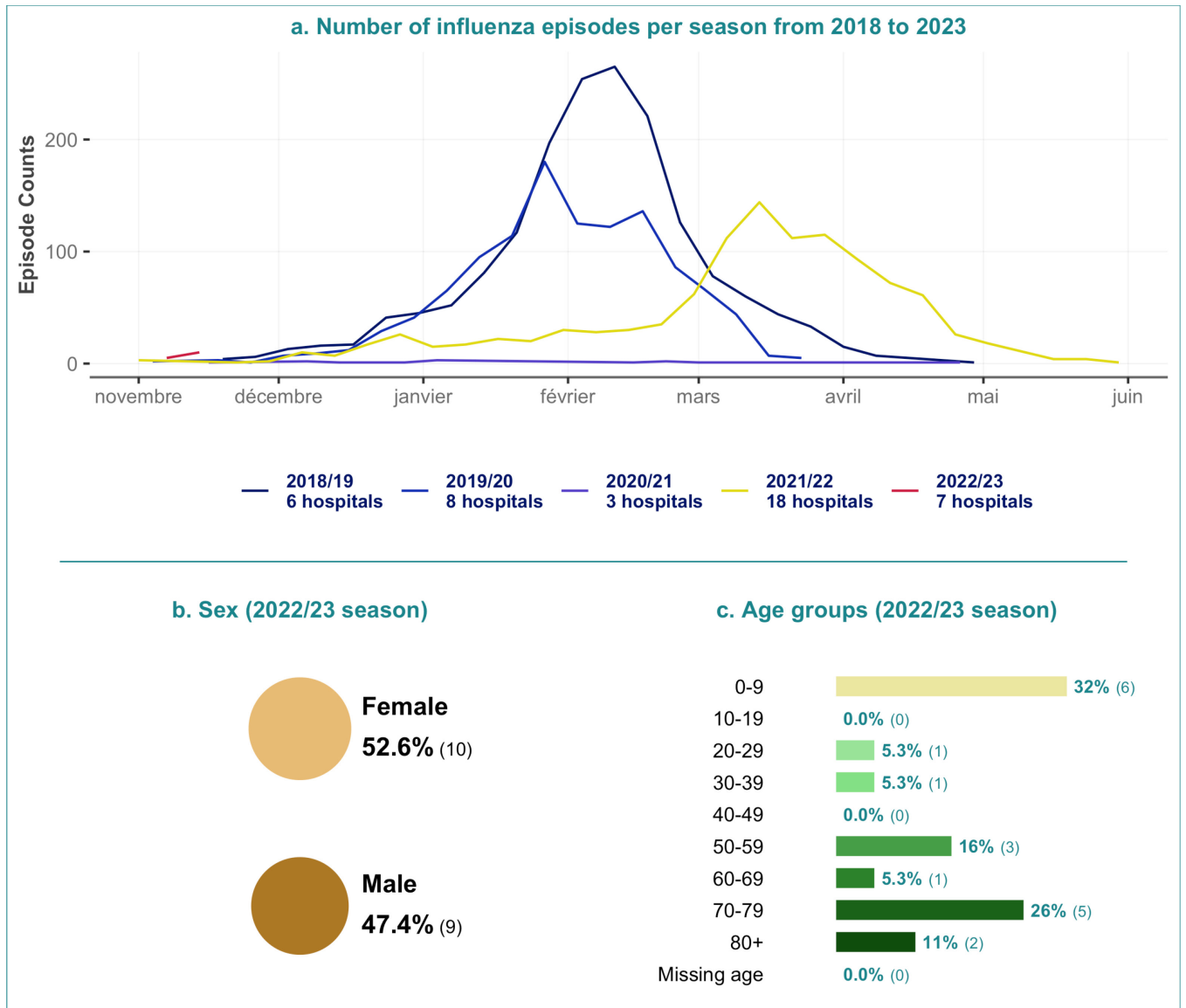


Figure 18: Anti-COVID treatments administered stratified across different demographic and risk groups.

## 6. Influenza

The influenza's seasonal data begins its collection each November. In the Figure 19, the current, developing influenza epidemic curve can be compared and contrasted with past seasons' epidemic curves. Essential demographic information for the ongoing influenza season is also displayed. Epidemic curves should be compared with caution, due to a varying number of hospitals which reported data over each specific season. For additional weekly updates about the current influenza season please refer to [Saisonale Grippe – Lagebericht Schweiz](#).



**Figure 19:** Number of episodes per influenza seasons, with the age and sex demographic characteristics of the ongoing season.

## 7. Glossary and supplemental information

### [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 considéré comme "nosocomial" si le COVID 19 est détecté 5 jours après l'admission à l'hôpital.

### Severity score at admission / Score de gravité à l'admission:

Pour les adultes, le score de gravité utilisé est le score CURB-65. Un point est attribué pour chacun des symptômes suivants : confusion (score abrégé du test mental < 9), urémie > 19 mg/dl, fréquence respiratoire > 30/mn, pression artérielle basse (diastolique < 60 ou systolique < 90 mmHg), âge > 65 ans. Pour les enfants, un point est attribué pour chacun des éléments suivants : détresse respiratoire, saturation en oxygène < 92 %, évidence clinique d'une déshydratation grave ou d'un choc clinique, altération de l'état de conscience. Le score de gravité correspond à la somme des points donnés.

**Intermediate care unit (intermediate care or IMC) / 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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