

Surveillance sentinelle hospitalière du COVID-19

État des données au: 24 octobre 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, 20 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. Un patient peut être hospitalisé à plusieurs reprises ou nécessiter plusieurs admissions en unité de soins intensifs (USI) au cours d'un même épisode d'hospitalisation. Le CH-SUR enregistre également si le patient est décédé du COVID 19 ou avec le COVID 19 pendant l'hospitalisation.

Critères d'inclusion : 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.

Les données collectées entre le début de l'épidémie et le 23 octobre 2022 portent sur 39 498 épisodes d'hospitalisation. Durant cette même période, 58 869 épisodes avec une infection au SARS-CoV-2 confirmée en laboratoire ont été déclarés à l'OFSP dans le cadre du système de déclaration obligatoire pour toute la Suisse [Lien Dashboard OFSP](#). Le système de surveillance CH-SUR a donc couvert environ 67,1% de toutes les hospitalisations liées au SARS-CoV-2 déclarées en Suisse.

Depuis mars 2022, ce rapport se concentre sur les épisodes liés aux infections acquises hors de l'hôpital, décrites dans les sections 2 à 6, tandis que les infections nosocomiales sont traitées séparément dans la section 7. Le pourcentage global d'infections nosocomiales parmi tous les épisodes documentés était de 15,2% (5 994 sur 39 498), tandis que les épisodes liés à des infections acquises hors de l'hôpital représentaient 82,0% (32 393 sur 39 498) (fig. 1) ; 2,8% des épisodes n'ont pu être classés dans aucune des deux catégories.

Sur les épisodes liés à une infection acquise hors de l'hôpital, pour ceux ayant des données complètes, 13,8% comprenaient un traitement dans une unité de soins intensifs (4 317 de 31 218 épisodes, du 26 Février 2020 au août 31, 2022) et 8,8% ont résulté en un décès (2 627 de 29 893 épisodes, 26 Février 2020 au October 23, 2022).

Au cours de la période allant du 01 juillet 2022 au 31 août 2022, la période la plus récente pour laquelle suffisamment de données sont disponibles, 1 890 épisodes d'hospitalisation faisant suite à une infection acquise hors de l'hôpital ont été enregistrés. Parmi les patients concernés, 391 (20,7%) n'étaient pas immunisés et 625 (33,1%) étaient complètement immunisés avec un seul booster et 64 (3,4%) avec plusieurs boosters (fig. 2). Au cours de la même période, 127 épisodes ont comporté un séjour en unité de soins intensifs. Parmi les patients concernés, 24 (18,9%) n'étaient pas immunisés, 43 (33,9%) l'étaient complètement avec un seul booster et 6 (4,7%) avec plusieurs boosters. 47 épisodes ont entraîné le décès (2,5% de tous les épisodes enregistrés dont l'issue est connue), dont 10 chez des patients non immunisés, 15 chez des patients complètement immunisés avec un seul booster et 1 avec plusieurs boosters.

Le 1er Avril 2022, la Suisse est revenue à une situation épidémiologique normale. Depuis lors, la stratégie de dépistage dans les hôpitaux a évolué d'un dépistage global vers un dépistage ciblé (voir les recommandations actuelles de [Swissnoso recommandations](#)). Ce changement dans la stratégie de dépistage pourrait engendrer une réduction du nombre total de cas détectés, ne permettant d'identifier que les patients infectés démontrant des symptômes typiques du COVID-19. Pour plus de définitions et de détails sur les données, veuillez consulter [le glossaire et les informations complémentaires](#) à la fin de ce rapport.

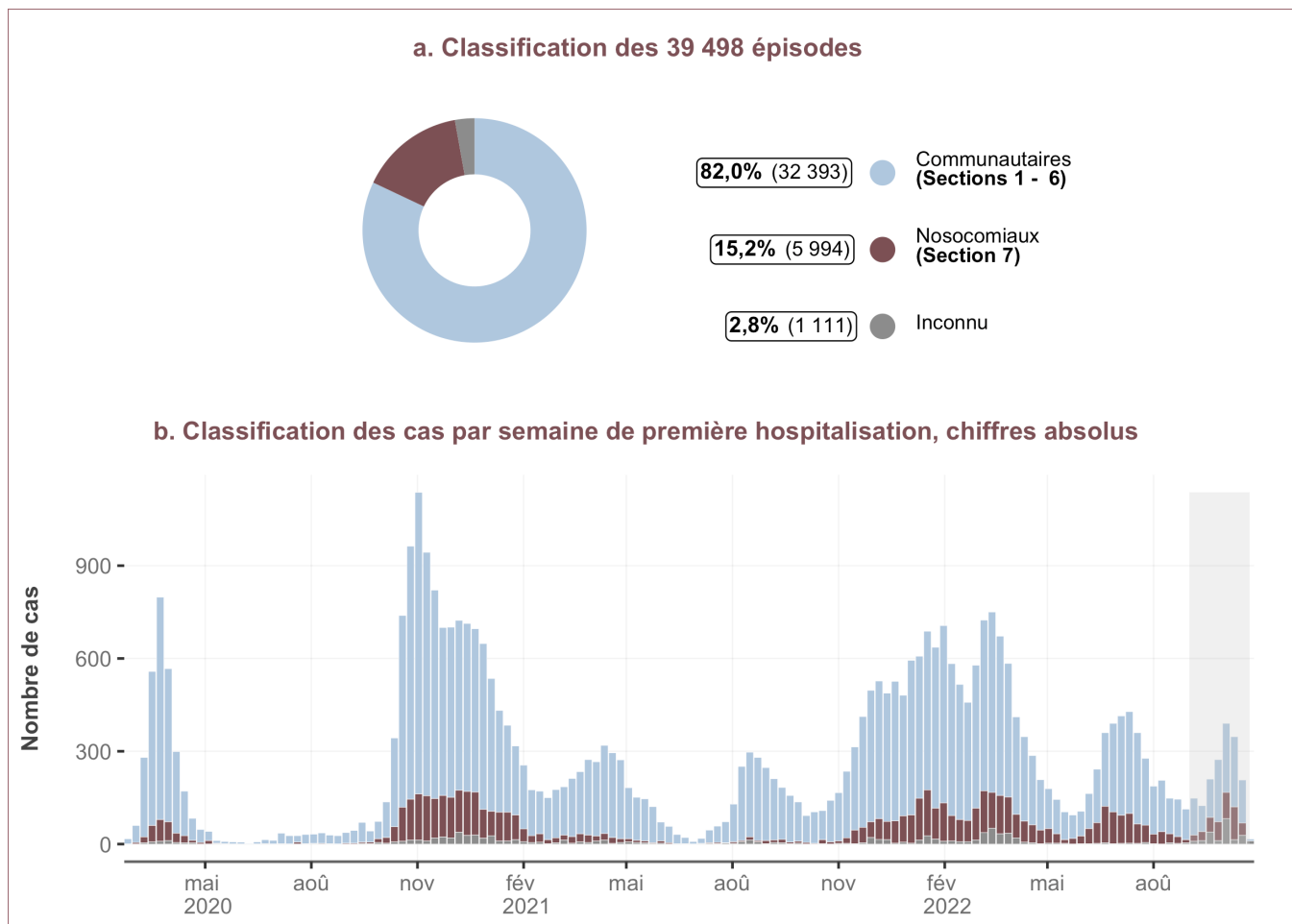


Figure 1: Classification des cas (source de l'infection) des épisodes dans le temps. Proportion (normalisée en %) de tous les épisodes ayant entraîné des infections nosocomiales (panneau a) et tendance dans le temps (panneau b). Pour les épisodes entraînant plusieurs hospitalisations, la classification s'est faite sur la base de la première hospitalisation. Les données recueillies au cours des deux derniers mois (surlignées en gris) sont considérées comme provisoires du fait des délais dans la saisie des données.

Aperçu CH-SUR des épisodes, des admissions en SI et des décès du 01 Juillet 2022 au 31 Août 2022

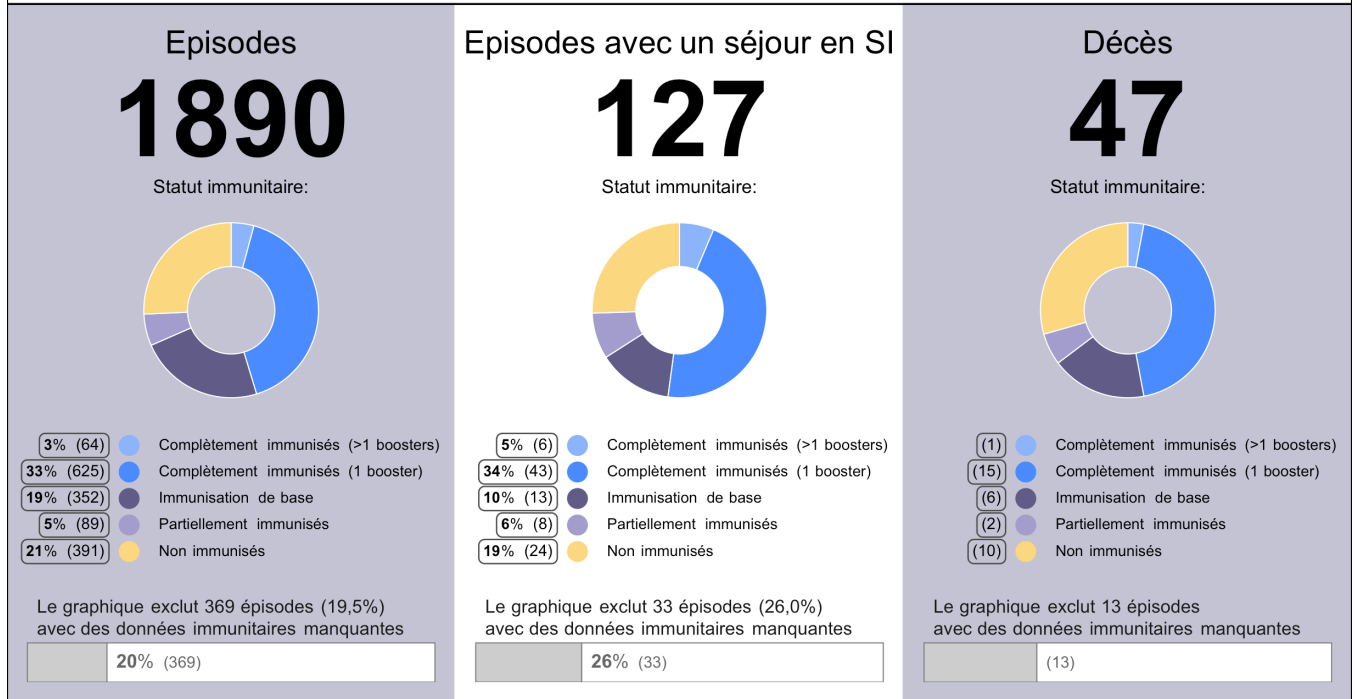


Figure 2: Vue d'ensemble des données les plus récentes concernant les épisodes d'hospitalisation liées à des infections acquises hors de l'hôpital. Les données des deux derniers mois sont considérées comme provisoires à cause des délais dans la saisie des données : elles ont donc été omises.

1. Hospitalizations and demographic characteristics

Between the start of the epidemic in Switzerland and October 23, 2022 and among the 19 hospitals actively participating in CH-SUR, 32,393 **episodes** linked to community acquired infections were registered, accounting for a total of 33,596 hospitalizations. There were more hospitalizations than **episodes** because some episodes include multiple **hospitalizations** (for more details see section [glossary and supplemental information](#)). An overview of these rehospitalizations is shown in Figure 3.

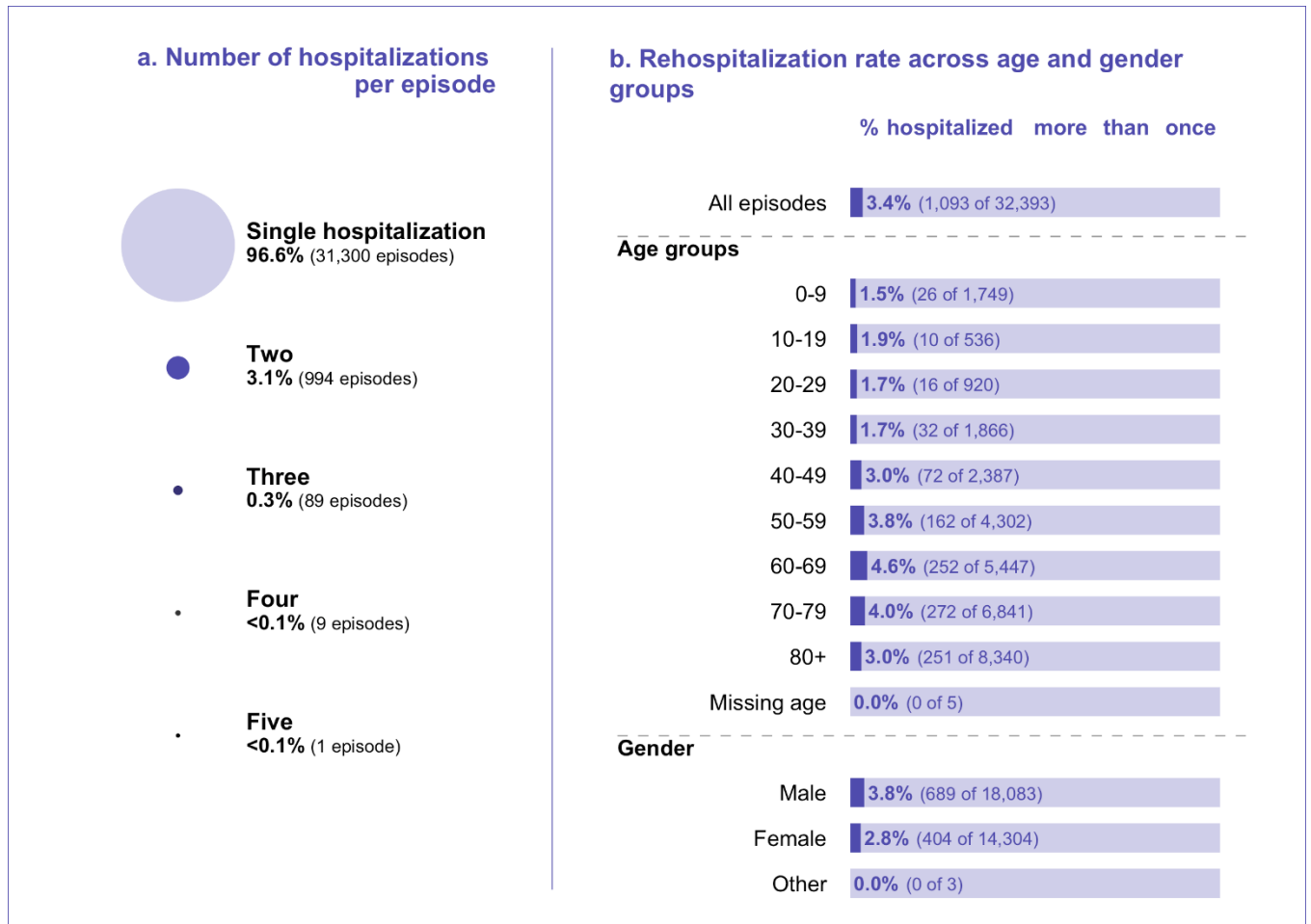


Figure 3: Hospitalizations per episode of hospitalization and rehospitalization rate across demographic groups. Includes records between March 2020 and October 23, 2022.

Most patients (96.6% [31,300 of 32,393]) were hospitalized only once during an episode, while 3% of the registered episodes (1,092 of 32,393) included two to four hospitalizations. Only one episode included five hospitalizations (Figure 3b).

The overall rate of rehospitalization within the same episode was 3.4% (1093 of 32,393) (Figure 3b). The 60-69 age group and the 70-79 age group had the highest rate of rehospitalization at respectively 4.6% (252 of 5,447) and 4.0% (272 of 6,841). Men had a higher rehospitalization rate than women, 3.8% (689 of 18,083) vs 2.8% (404 of 14,304) respectively.

Among all episodes, the majority (55.8% [18,083 of 32,393]) of the episodes concerned male patients (Figure 4a), and the age distribution was skewed towards older persons (Figure 4b). The largest age category corresponded to patients aged 80 and above (26.0% [8,340]).

Figures 4c and 4d show the gender and age distribution ratio over time. Except for January 2022, more men than women were admitted in each month for the entire period of observation. The proportion of episodes concerning patients aged 50 and above was notably high between October 2020 and January 2021, with a peak in November 2020: 88.3% (2,823 of 3,197) of the episodes of patients admitted in this month concerned patients 50 years old and above (Figure 4d). This peak in older age admissions mirrors a similarly-timed peak in admission severity and case fatality ratios described later. An increase in the percentage of episodes of patients aged 50 and above was

observed again from September 2021 to November 2021, reaching a local peak of 75.2% (840 of 1,117) in November 2021. Since April 2022 the percentage of episodes concerning patients aged 50 years old and above has surpassed the level of November 2021 again. Over the month of August 2022, 81.3% (361 of 444) of episodes concerned patients aged 50 and above. Notably, in this last period, we are seeing an increase in the oldest age groups being admitted with 27.5% [122 of 444] of episodes pertaining to patients aged between 70 and 80 years old and 37.1% [408 of 1,101] of episodes pertaining to patients over 80 years old in the month of August 2022.

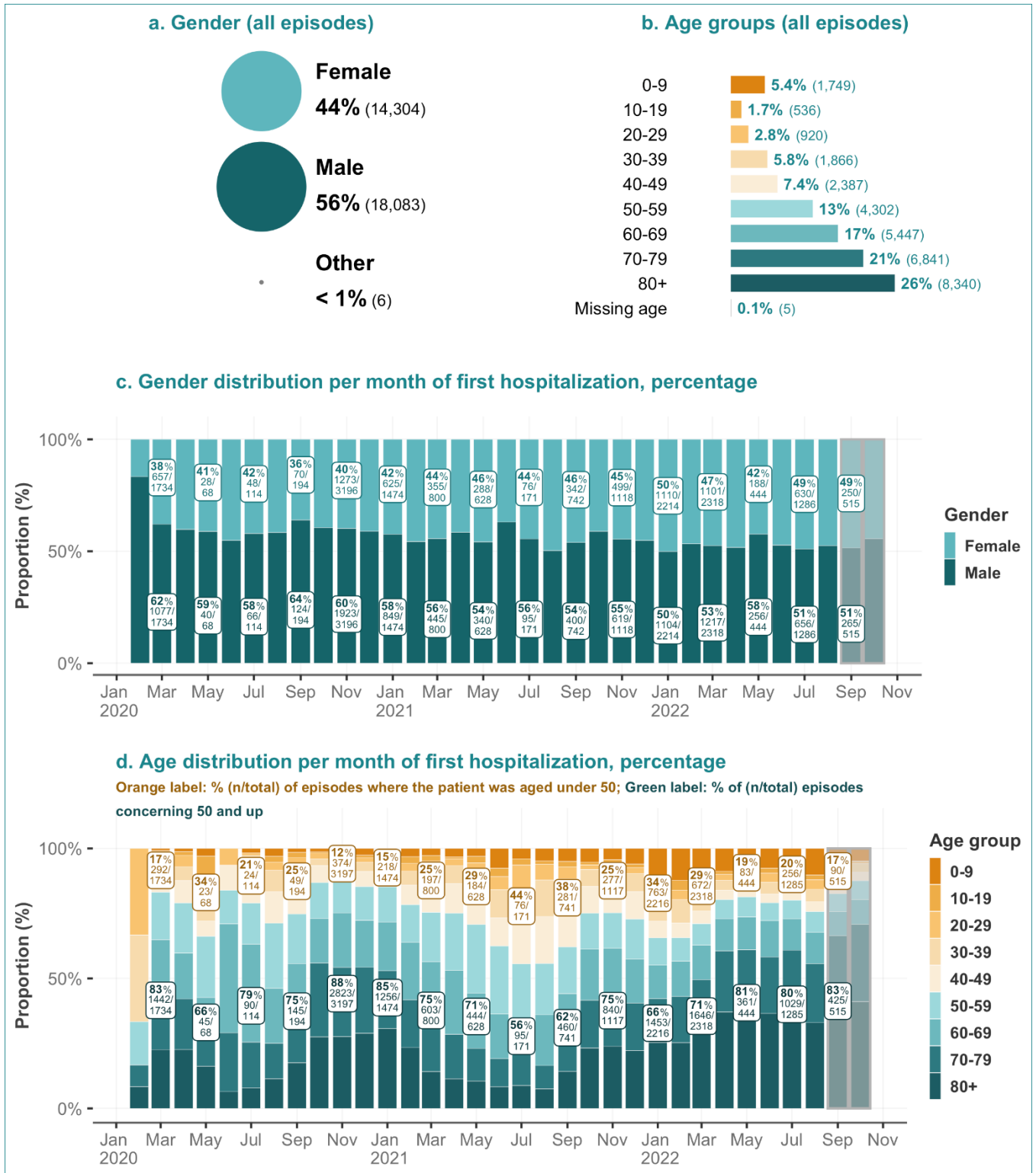


Figure 4: Demographic characteristics: gender and age distribution of admitted hospitalized patients, overall and per month. For episodes with multiple hospitalizations, the admission date of the first hospitalization was used. Data from the last two months (highlighted gray) is considered provisional due to entry delays. The 'other' gender category was removed from panel c, and the missing age group was removed from panel d.

2. Outcomes

2.1. Outcomes overview

Figure 5 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 or another cause. Episodes where the cause of death was not certain, but there was a COVID-19 diagnosis (in conformity for complete inclusion criteria for CH-SUR) were counted as died of COVID or suspected death of COVID. 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.

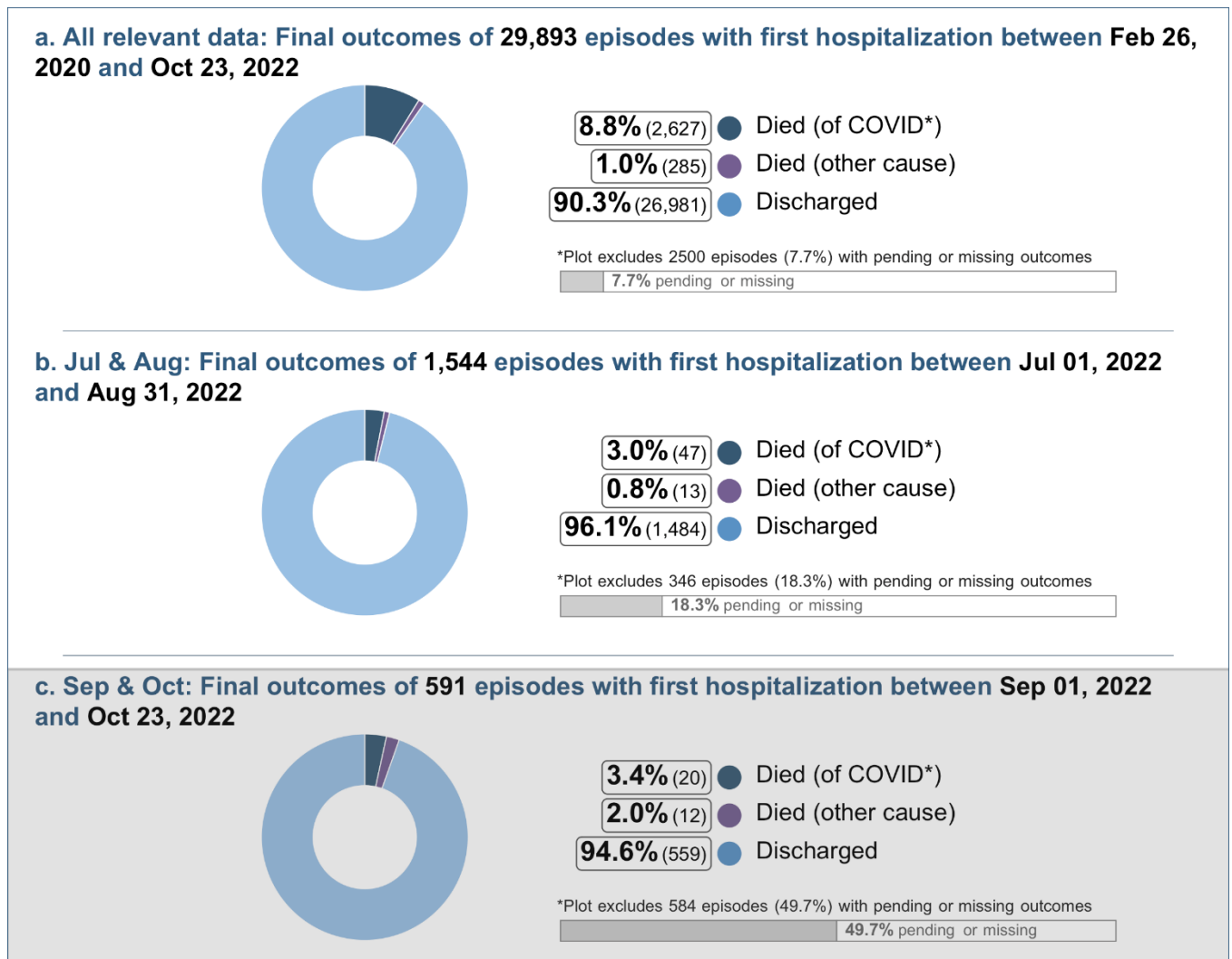


Figure 5: Outcomes for COVID-19 related episodes of hospitalization in CH-SUR hospitals. Includes records up to October 23, 2022. For episodes with multiple hospitalizations, only the final outcome is considered. Patients where the cause of death was not certain, but there was a COVID-19 diagnosis (in conformity for complete inclusion criteria for CH SUR) were counted as Died of COVID or suspected death of COVID. Data from the last two months (highlighted gray) is considered provisional due to entry delays. (* Died of COVID as a confirmed or suspected cause of death)

2.2. Outcomes over time

Figure 6 shows the final outcomes of [episodes](#) over time (Figure 6a & 6b) and the disease severity score at admission as a function of time (Figure 6c).

The first mortality peak was observed for patients admitted around the beginning of the epidemic: 15.1% (262 of 1,732) of episodes of patients first admitted in March 2020 resulted in death of COVID-19. Mortality decreased after March 2020, but rose again between October 2020 and January 2021, with a peak in December 2020: 13.9% (330 of 2,374) of episodes of patients first admitted in December 2020 resulted in death. An additional peak of mortality was observed during the month of October 2021, when 12.2% (53 of 433) of episodes resulted in death of COVID-19. Since the month of February 2022, mortality has remained at low levels: less than 5% of episodes resulted in death each month.

The high case fatality rates of patients with episodes of hospitalization in March 2020, between October 2020 and January 2021 and during October 2021, are mirrored by the higher admission [severity scores](#) (Figure 6c) and older patients' ages (Figure 4c) during these periods. Overall, in 31.7% (550 of 1,734) of the episodes with admission date in March 2020, the severity score was above 2. Over the months of October 2020 to January 2021, the proportion of episodes with severity scores of 2 and above was higher as over the rest of the epidemic, representing more than 40% (958 of 2,394) of the admissions in that period. Most recently, during August 2022, 33.3% (201 of 604) of the episodes had a severity score above 2, but this is not mirrored by higher case fatality rates (Figure 5)

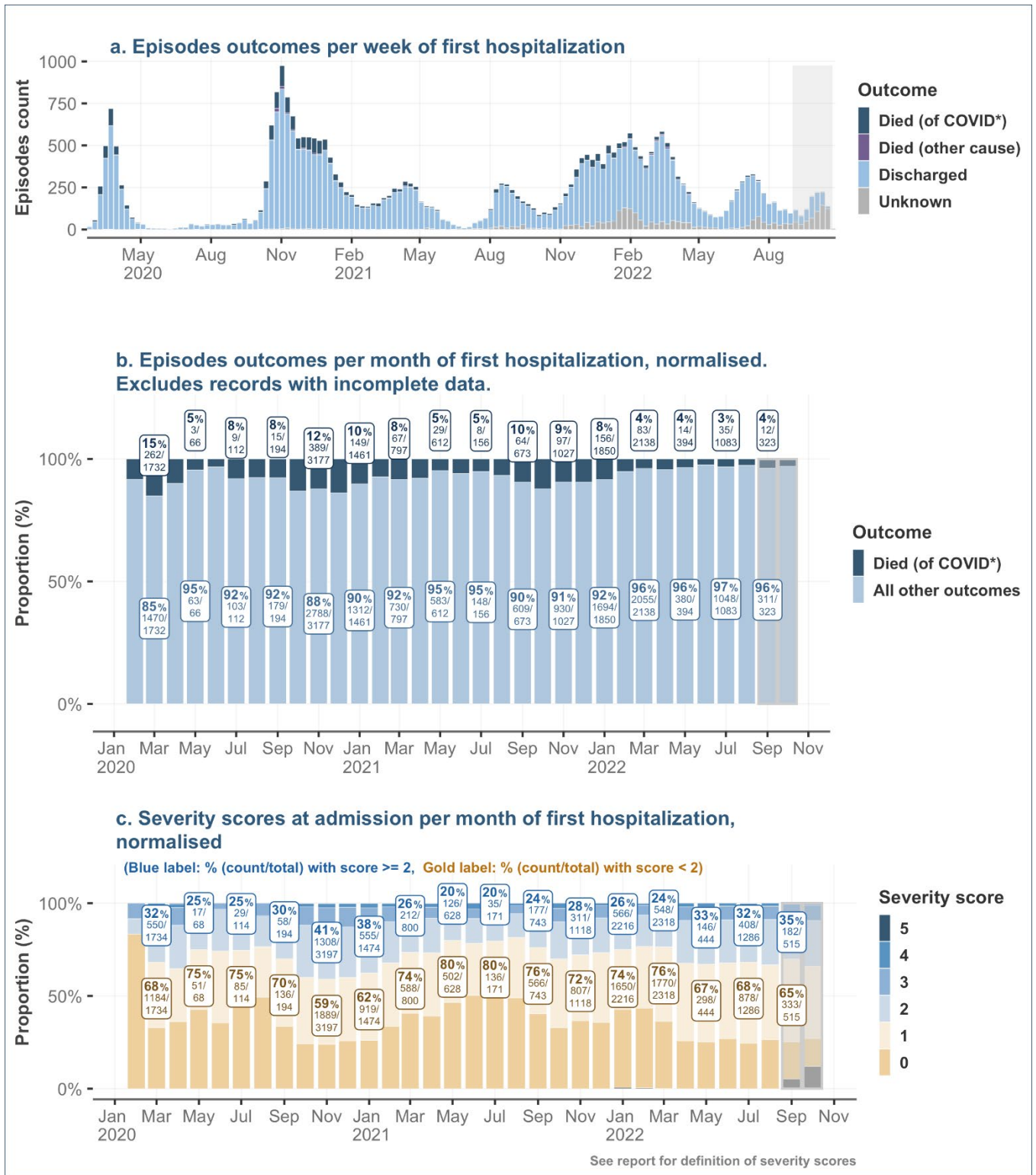


Figure 6: Epidemic curve, episodes' outcomes and severity scores at admission for COVID-19 hospitalizations over time. Includes records up to October 23, 2022. Data from the two last months (highlighted in gray) are considered provisional due to data entry delays. Episodes where the cause of death was not certain, but there was a COVID 19 diagnosis (in conformity for complete inclusion criteria for CH SUR) were counted as Died of COVID or suspected death of COVID. (* Died of COVID as a confirmed or suspected cause of death)

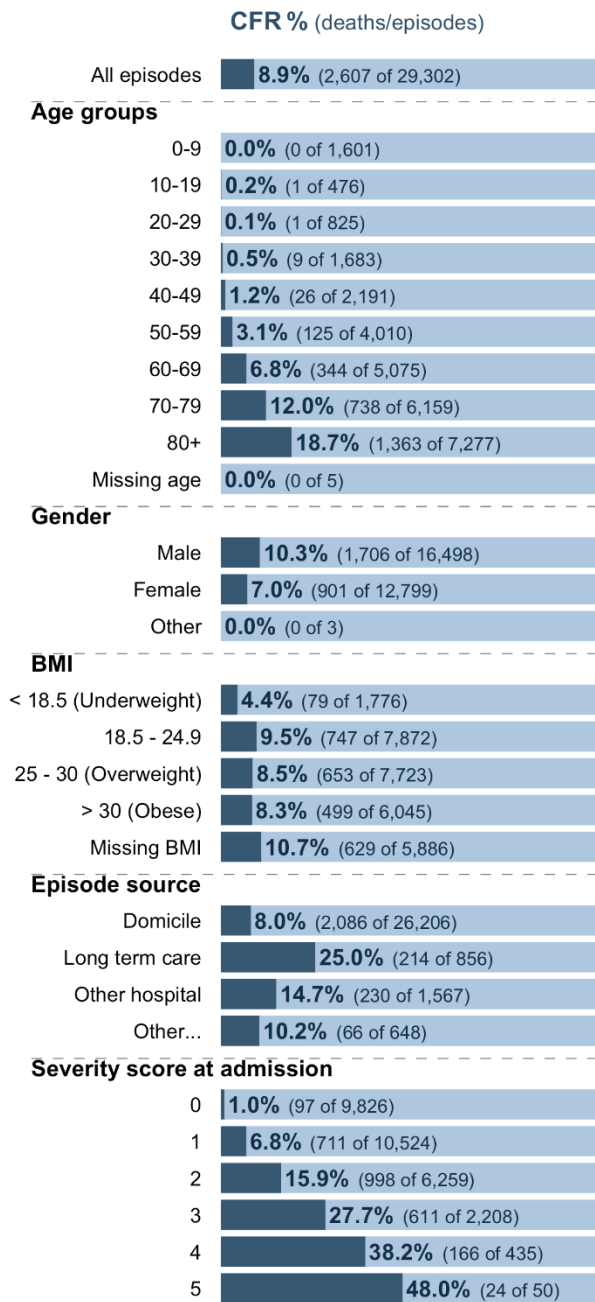
2.3. Case fatality rate (CFR) across demographic and risk groups

Since the beginning of the epidemic and until August 31, 2022, the case fatality rate (CFR) increases with increasing age, from 0% (0 of 1,601) in episodes of patients aged 0-9, to 3.1% (125 of 4,010) in episodes of patients aged 50-59, and to 18.7% (1,363 of 7,277) in episodes of patients aged 80+. CFR% was greater in men than in women: 10.3% (1,706 of 16,498) vs 7% (901 of 12,799) respectively. In addition, the CFR% was greater for episodes with higher severity scores at admission: 1% (97 of 9,826) of the episodes with severity score 0 resulted in death of COVID-19, while 48% (24 of 50) of the episodes with severity score 5 resulted in death of COVID-19 (Figure 7a).

The overall CFR% of the most recent period for which enough data is available (months July and August 2022, Figure 7b) was lower than the CFR% of the whole epidemic period (3.0% vs. 8.9%). The CFR% of the age groups 70-79 and 80+ were also lower than over the whole epidemic (Figure 7).

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

a. All data: CFR % for 29,302 episodes with first hospitalization between Feb 26 2020 and Aug 31 2022



b. July & August: CFR % for 1,544 episodes with first hospitalization between Jul 01 2022 and Aug 31 2022

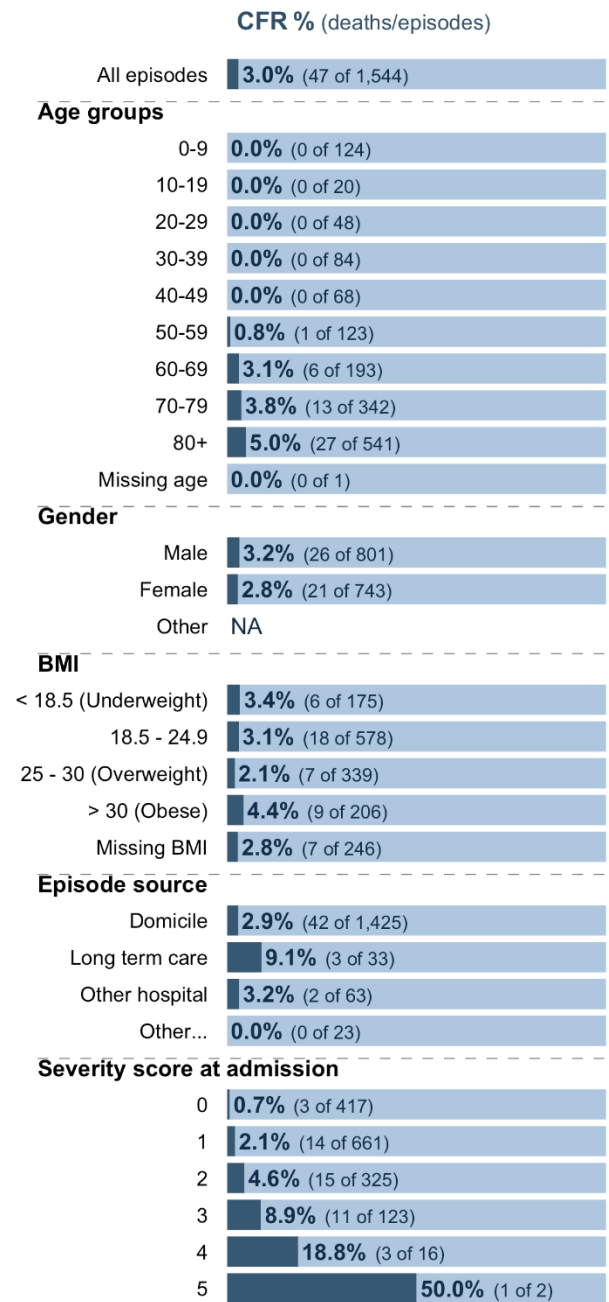


Figure 7: Case fatality rate (CFR) % among demographic and risk groups: percentage of hospitalization episodes in different demographic groups, which ended in the death of the patient of COVID-19 in hospital. Both figures include records up to Aug 31 2022 but records with incomplete data (ongoing hospitalization episodes or with a pending outcome in the database) were not included. Blank rows indicate a count of zero.

3. Immune/vaccination status

3.1. Immune status over time

For these analyses, the **immune status** of a patient considers the previous COVID-19 infections and 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.

The proportion of **fully immunized** patients (with one booster) rose gradually after January 2021 (Figure 8b). This is expected, given the rise in the proportion of the fully vaccinated Swiss population (see [FOPH Dashboard](#)).

As of October 25, 2022, 69.7% of the Swiss population was vaccinated (Figure 8c). 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 the 100%**. The higher percentage of base immunized, fully immunized (with one booster), and fully immunized (with additional boosters) of recent months (23.1%, 41.1% and 4.2% respectively) within the episodes recorded in CH-SUR (Figure 8b), may therefore be partly linked to the decreasing number of non-immunized persons in the population.

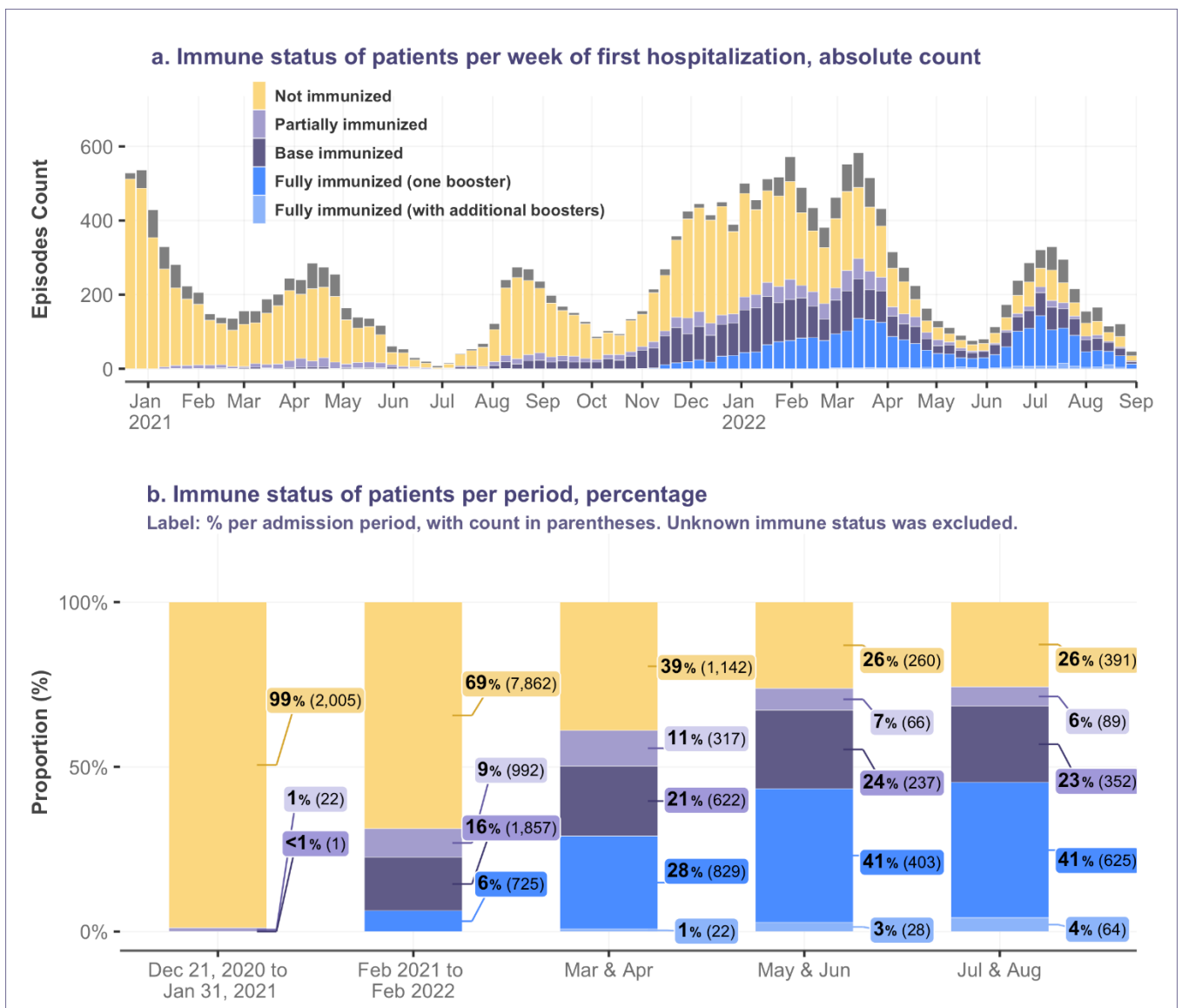


Figure 8: Immune status of patients over time. See glossary for definitions of immune status categories. For episodes with multiple hospitalizations, the immune status for the first hospitalization was considered. Episodes are included since the week vaccination began, Dec 21, 2020. (Vaccination began on Dec 23, 2020, but we include

Dec 22 and 21 to cover a full week.) Episodes with first admission date after Aug 31, 2022 were excluded, as a large proportion of these records have not been completely filled in the database.

3.2. Demographic characteristics by immune status

Fully immunized and fully immunized (with additional boosters) hospitalized patients were disproportionately older. Since vaccination initiation, respectively 47% and 47% of the episodes of fully immunized patients (one/additional boosters) corresponded to patients aged 80 and above (Figure 9a, right panels). In contrast, only 18% (2,078 of 11,492) of the episodes of non-immunized patients corresponded to patients aged 80 and above (Figure 9a, left panel).

However, in more recent data, we observe an increase in the proportion of older (aged 80+) as well as younger patients (0 to 9 years old) among the non-immunized episodes. From May 2022 to June 2022, among the episodes of non-immunized patients, 32% (82 of 260) concerned patients aged 0 to 9 years old and 27% (69 of 260) concerned patients aged 80 and above. In the most recent data, from July 2022 to August 2022, 34% (132 of 391) of non-immunized episodes involved patients aged 0 to 9 years and 25% (98 of 391) involved patients aged 80 years and above.

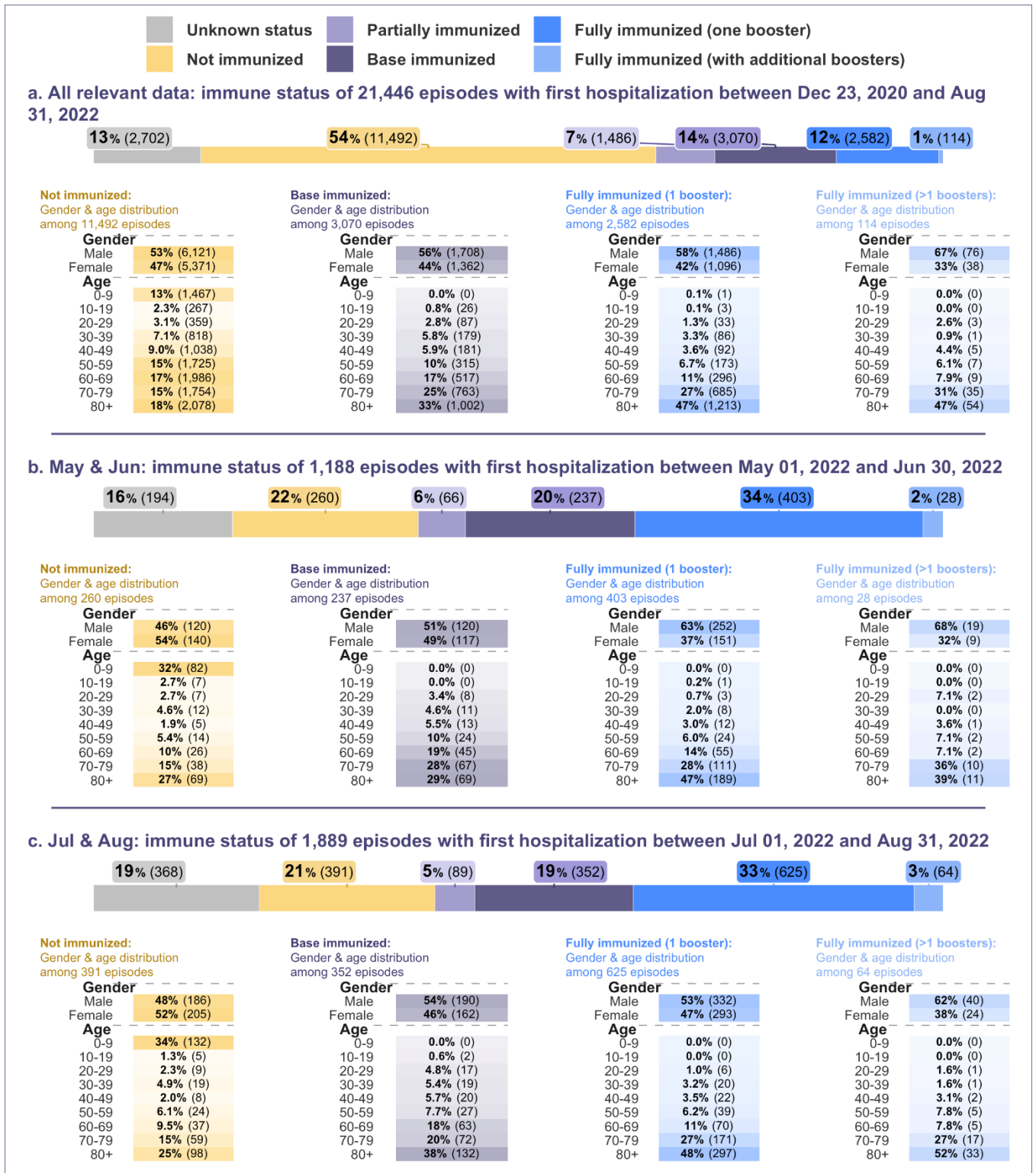


Figure 9: Demographic characteristics of hospitalized patients by immune status, over three different periods. Some patients may be counted more than once, as a single patient can have several episodes. Episodes with first admission date after Aug 31 2022 were excluded, as a large proportion of these records have not been completely filled in the database. Episodes with missing ages or gender are not included in the analysis.

3.3. Outcomes by immune status

Since the date vaccinations began, December 23, 2020, among the 2,208 episodes of fully immunized patients (with one booster), CH SUR registered 91 deaths because of COVID-19 (Figure 10a, right panels: fully immunized). 59 of them corresponded to patients aged 80 years old and above. Within the episode of fully immunized patients with additional boosters episodes, 4 deaths occurred because of COVID as an outcome, all concerned patients over 80 years old. Since vaccination start, 820 episodes ended in COVID-caused deaths among non-immunized patients (Figure 10a, left panel).

During the months of July and August, CH-SUR registered 34 deaths because of COVID-19 of which the immune status was known. Of these, 10 (29.4%) happened among non-immunized patients, 2 deaths (5.9%) among partially immunized patients, 6 deaths (17.6%) among base immunized patients, and 15 deaths (44.1%) among fully immunized patients (with one booster) (Figure 10). The relatively high proportion of fully immunized patients among the deaths compared to non-immunized patients, may be linked to the increasingly low number of non-immunized persons in the population (see section 4.1.)

However, the CFR values by age show that the risk of death for the limited number of people who are hospitalized despite full immunization (with one booster) is generally lower than that of unvaccinated hospitalized people across all age groups. This is specifically true for episodes concerning patients aged over 80 years and above (9.6% CFR for non-immunized episodes compared to 3.9% for fully immunized episodes and 4.3% for fully immunized (with additional boosters) episodes) (Figure 10c, left and right panel). This reflects the protective effect of vaccination on the risk of death.

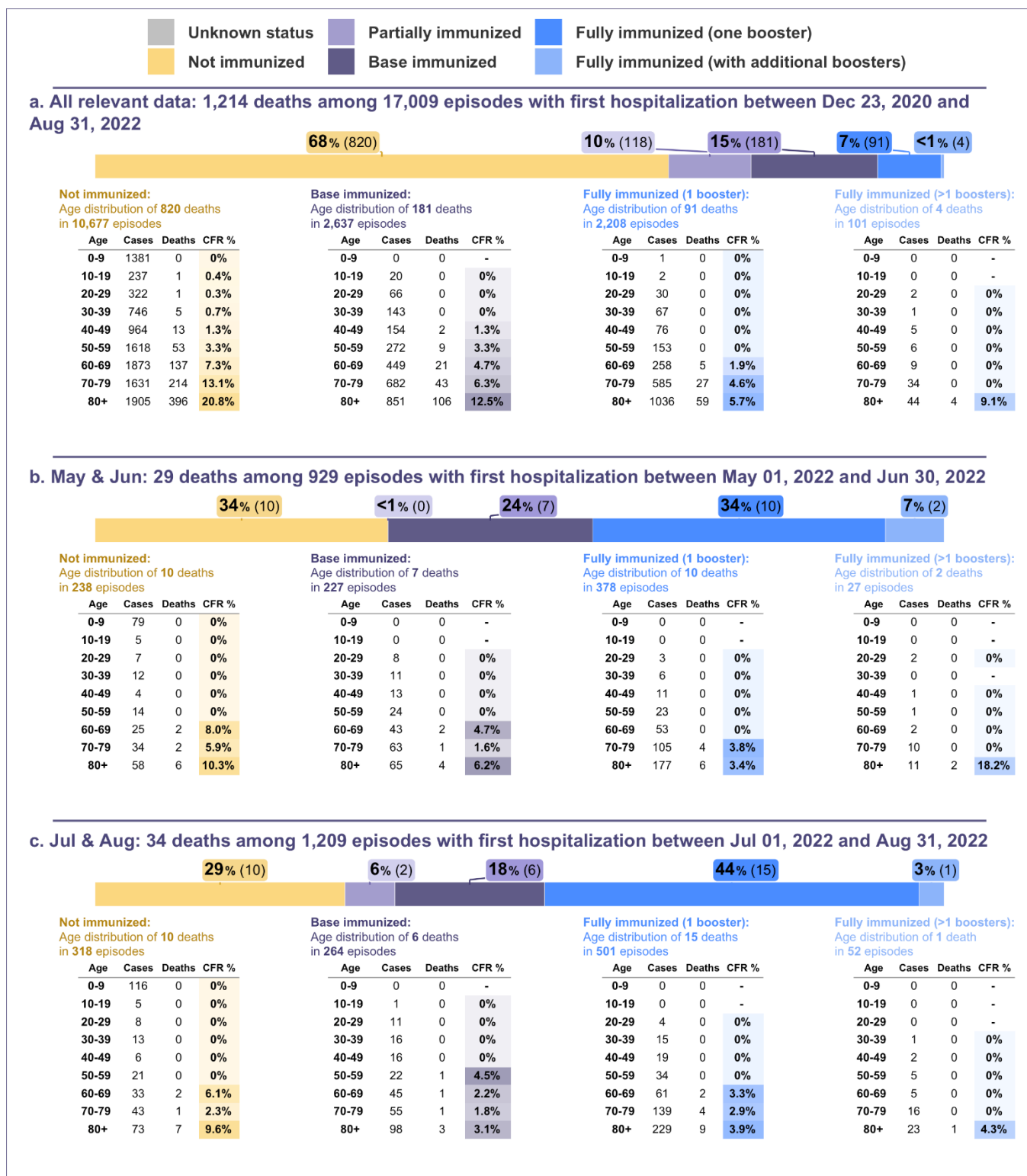


Figure 10: Mortality of CH-SUR hospitalized patients by immune status, age group and hospitalization episode, over three different periods. For partially immunized patients, only number of deaths is shown in the horizontal bar but not the detailed table showing CFR% by age group. The total counts of episodes include episodes with a final patient outcome known (discharged, died of any cause, or transferred out of CH-SUR), and where the patient's immune status was known. Episodes with missing age, missing gender, or missing immune status were not included in the analysis. Counts of deaths only include episodes resulting in death because of COVID-19 (including those with COVID as suspected cause of death). Case-fatality rate (CFR), especially for the fully immunized (with additional booster) category, should be interpreted with caution due to small sample sizes.

4. Intensive care unit (ICU) admission

4.1. ICU admission over time

Figure 11 shows the proportion (in %) of ICU admission over time. The proportion of episodes with ICU admissions peaked between May and July 2020. Notably, this was during a period of low overall hospitalizations. In contrast, the lowest proportion was observed in most recent months since January 2022.

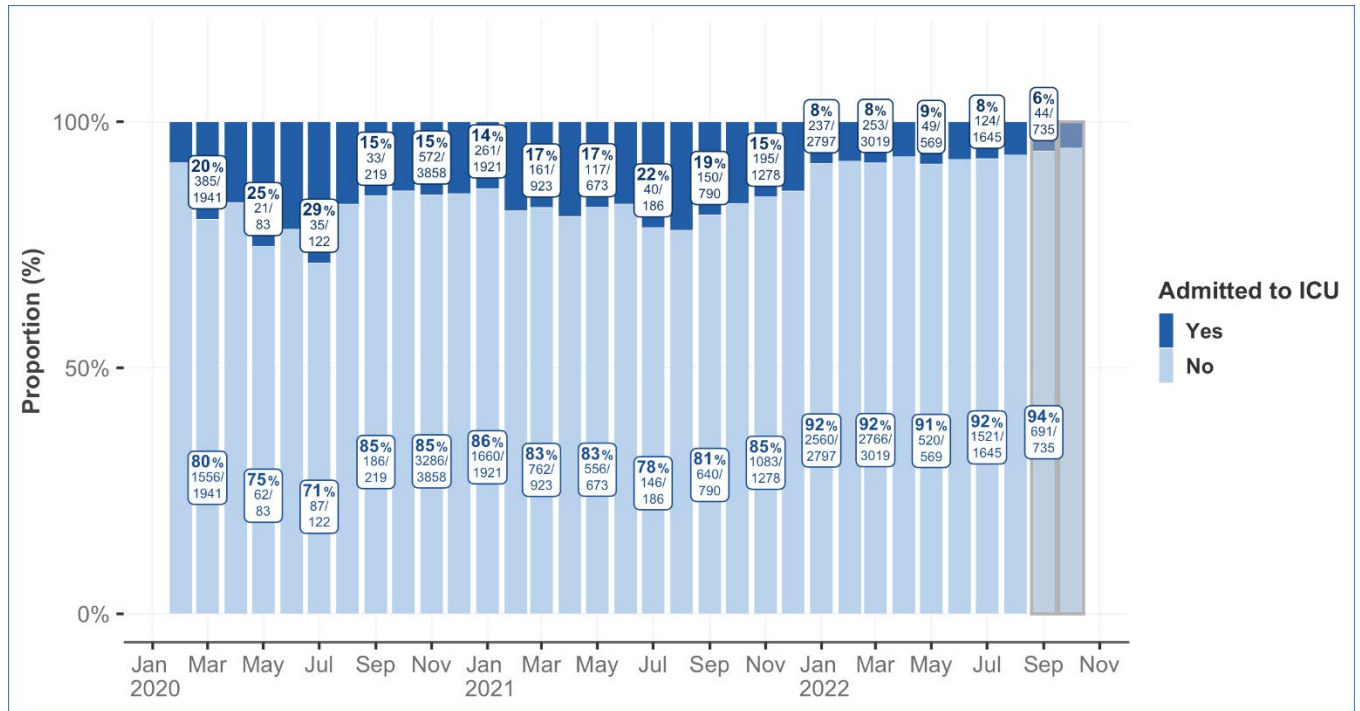


Figure 11: Percentage and proportion of episodes with at least one ICU admission over time. Records with incomplete data (ongoing episodes or with a pending outcome in the database) were not included. Data from the last two months (highlighted gray) are considered provisional due to data entry delays.

4.2. ICU admission across demographic and risk groups

Over the whole period of observation, **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 (Figure [12a](#)). The 60-69 age group had the highest probability of admission to the ICU, with 23.1% (1,230 of 5,336) of the episodes including at least one ICU admission. Notably, individuals aged 80 and above were least likely to be admitted to the ICU, with 5.2% (408 of 7,861) 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 16.8% of the episodes concerning males, compared to 10.1% of the episodes concerning females.

Episodes of patients transferred from other hospitals had a high probability of ICU admission: 49.4% of such episodes (826 of 1,673) required at least one ICU admission (Figure [12a](#)), compared to an overall admission rate of 13.8%.

ICU admission probability also increased slightly with increasing BMI and steeply with increasing admission **severity scores** (Figure [12a](#)).

Figure [12b](#) shows the ICU admissions for the most recent period with available data (July 2022 and August 2022). The distribution of ICU admissions across different population groups during the latest period was roughly similar to the frequencies observed for the whole observation period. However, differences across BMI groups seem to have largely disappeared. Moreover, the relation between ICU admission and increasing severity at admission only shows for patients with severity scores of 3 and above. Given the smaller sample size of this period of observation, larger oscillations in the percentages are expected, making the real trends difficult to identify. For the overall frequency of admission to ICU and all population groups observed, the frequency of admission to ICU was smaller for the months of July and August than for the full epidemic period (Figure [12](#)).

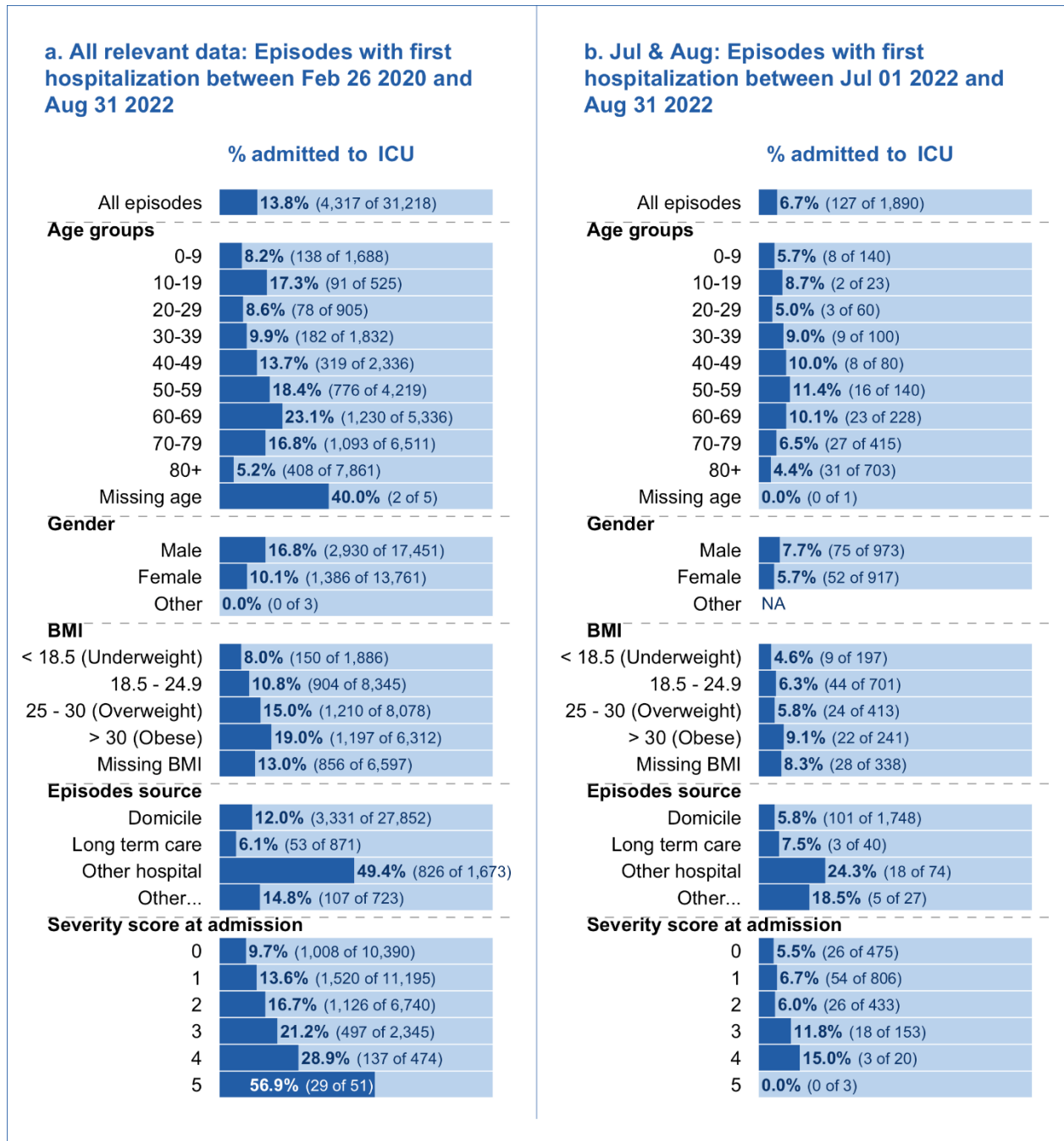


Figure 12: Percentage of hospitalization episodes with at least one ICU admission, grouped by demographic and risk factors, over two time intervals. For episodes with multiple hospitalizations, we considered whether they were admitted to the ICU during any of their hospitalizations. Both panels include records up to Aug 31, 2022 due to data completeness considerations. Records with incomplete data (ongoing episodes or with a pending outcome in the database) were not included. A blank row indicates a count of zero.

4.3. ICU admission rate by immune status

Figure 13 shows the ICU admission rate (number of episodes requiring an admission to the ICU over all episodes registered), stratified by age.

In recent data, from July and August, although episodes include 36.1% of people aged over 80 years old (see section 2 for more information on age distribution), these episodes did not have a high ICU rate (i.e. not many included an ICU stay).

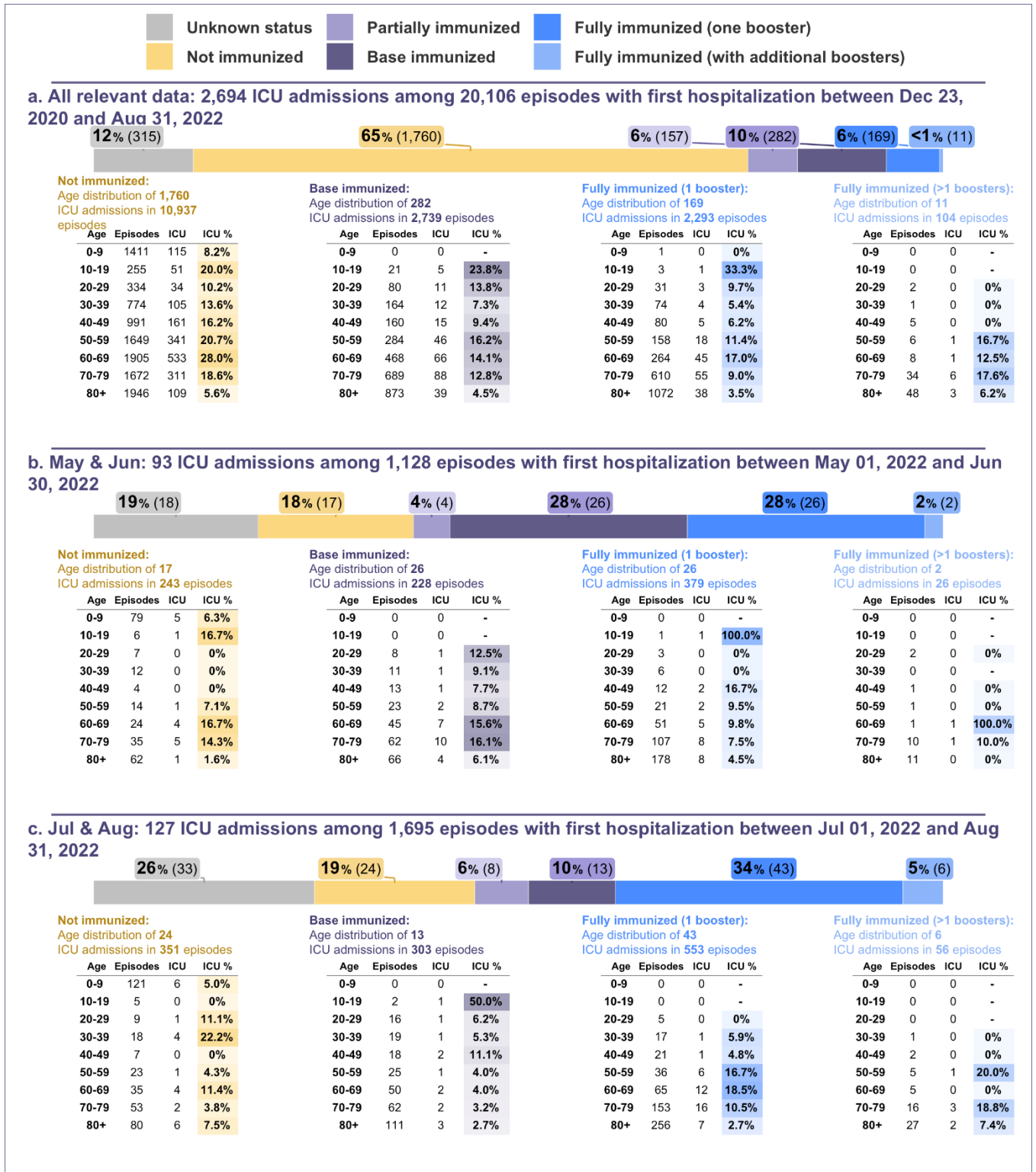


Figure 13: ICU admission over all episodes of CH-SUR hospitalized patients by immune status and age group over three different periods. For partially immunized patients, only number of ICU admissions is shown in the horizontal

bar but not the detailed table showing ICU% by age group. Episodes with missing age, or missing ICU stay were not included in the analysis. ICU admission rates (ICU%), especially for the fully immunized (with additional boosters) category, should be interpreted with caution due to small sample sizes.

4.4. ICU admissions contrasted by immune status

Due to a variance in vaccine coverage, only the recent evolution is represented. Data for September and October 2022 are not meaningful due to their incompleteness and are therefore not yet shown.

In both periods considered, the largest group of episodes with an ICU admission concerned fully immunized patients (with one booster) (28% and 34% of all episodes with ICU admissions in each of the described periods respectively). For most immune status categories shown and in both periods considered, there were more men than women admitted to the ICU (Figure 14).

For episodes of fully immunized patients (with one or more boosters), there is a skew towards older age groups being admitted to the ICU (between May 2022 and Aug 2022 around 93% of these episodes concerned patients aged 50+). In the two time periods, 89.3% (May, Jun) and 95.9% (Jul, Aug) of these episodes concerned patients aged 50+.

In comparison, episodes of non-immunized patients admitted to the ICU included proportionally more patients from younger age groups, as only 64.8% (May, Jun) and 54.5% (Jul, Aug) of the episodes corresponded to patients aged 50 years and above.

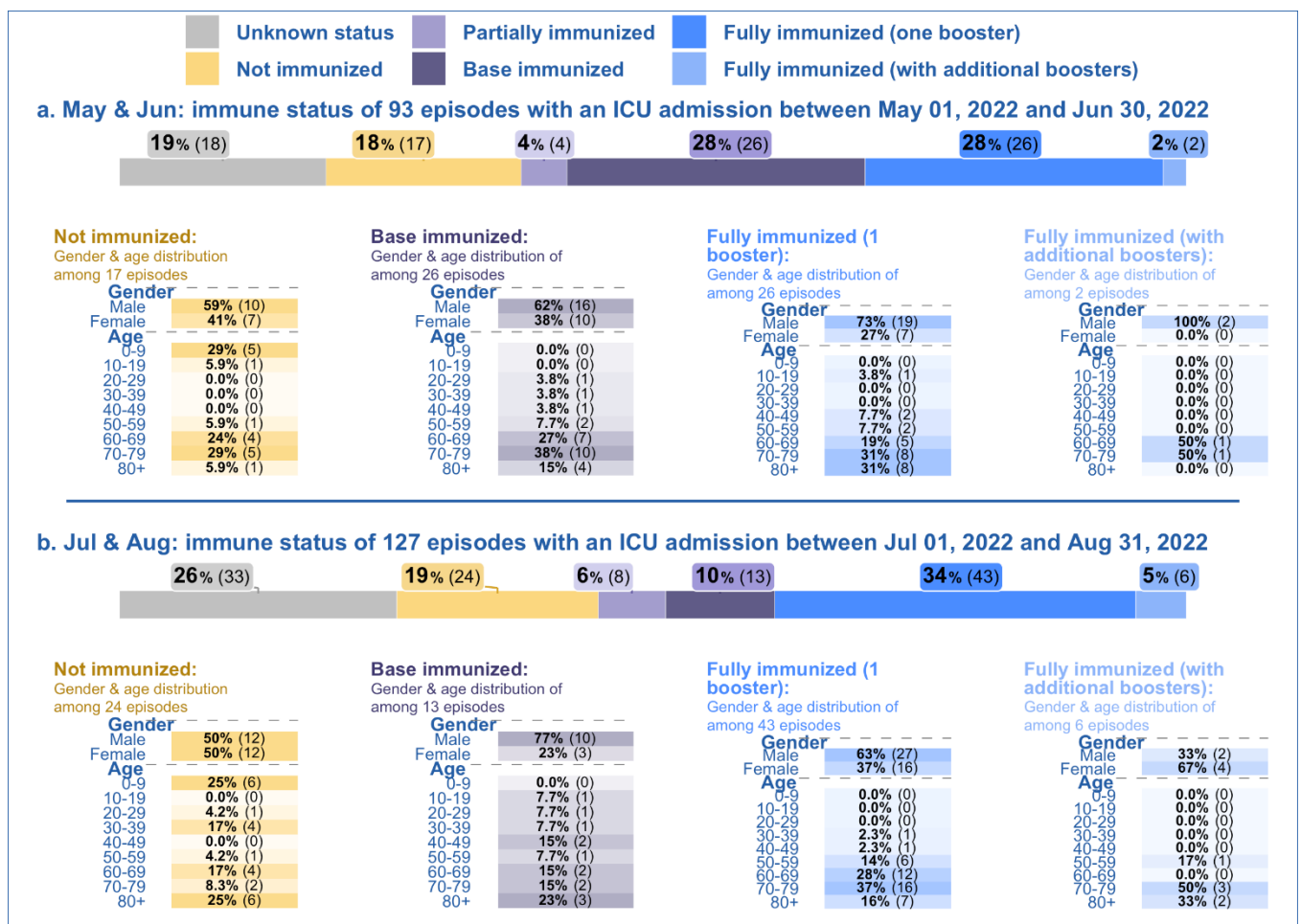


Figure 14: Demographic characteristics of patients in ICU by immune status and episode, over two different periods. Episodes with a first admission date after Aug 31, 2022 were excluded, as a large proportion of these records have not been completely filled in the database. Episodes with missing ages or gender marked as 'Other' are not shown. Data on ICU admissions for the fully immunized (with additional boosters) should be interpreted with caution due to small sample sizes.

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 ¹, monoclonal antibodies ² and immune-modulating strategies ³. Combinations of treatments were explored: combinations are defined as the co-administration or the sequential administration of treatments during the same episode.

Figure **15** 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 **16**, treatments are analysed at the drug-level. The most commonly used drugs and their different combinations are presented.

Figure **17** represents the use of treatments across different patient groups. The global period from December 2020 to November 2021 is compared to the more recent period from December 2021 to October 2022 when the Omicron variant was predominant. In the more recent period, the proportion of patients who did not receive any anti-COVID treatment increased across all groups.

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

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

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

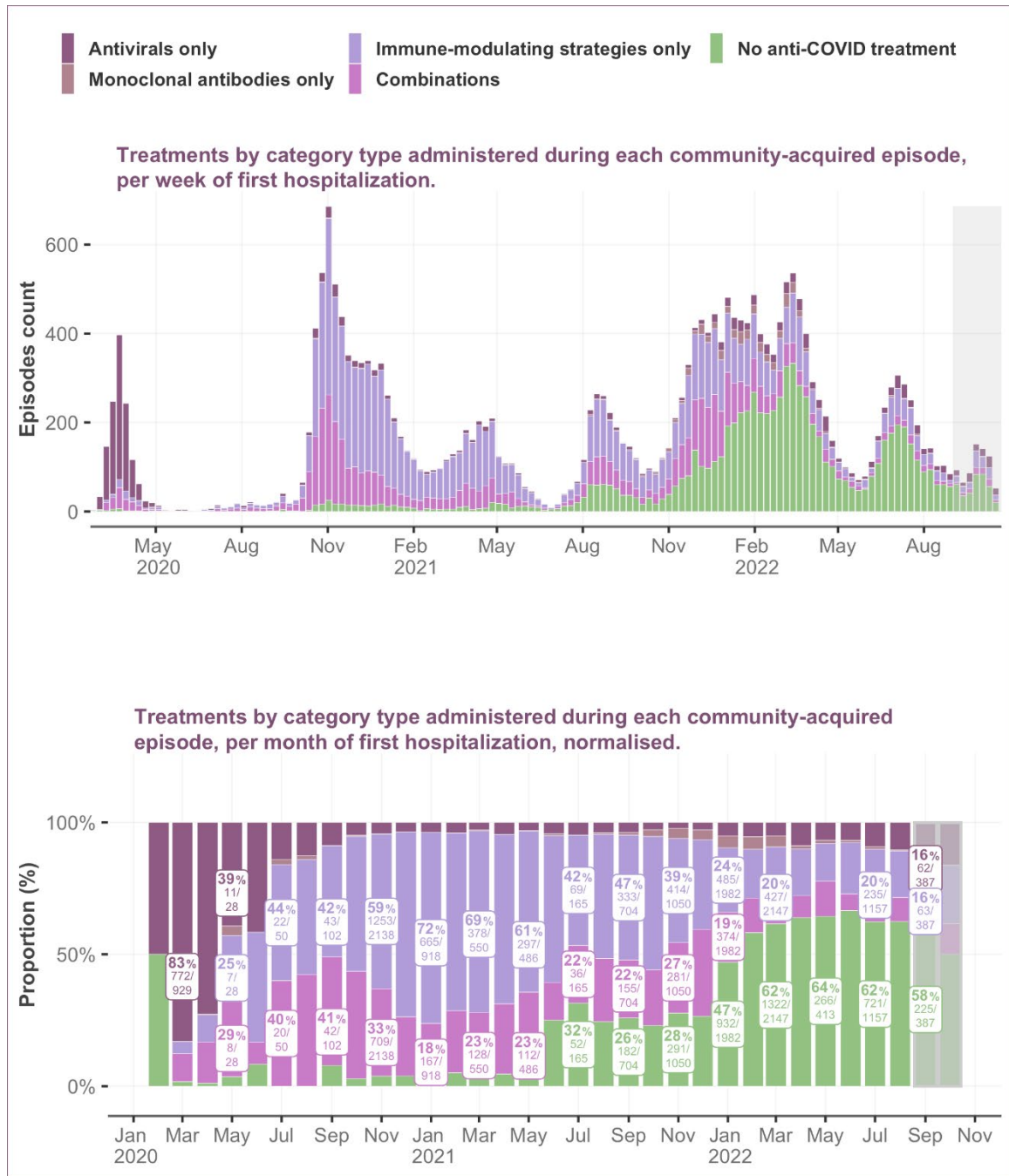
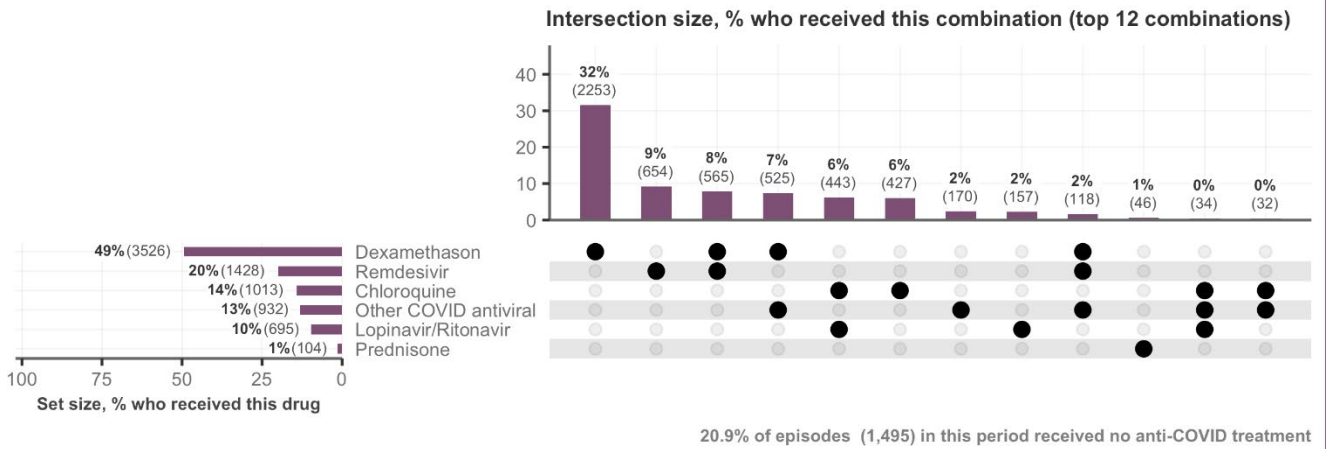
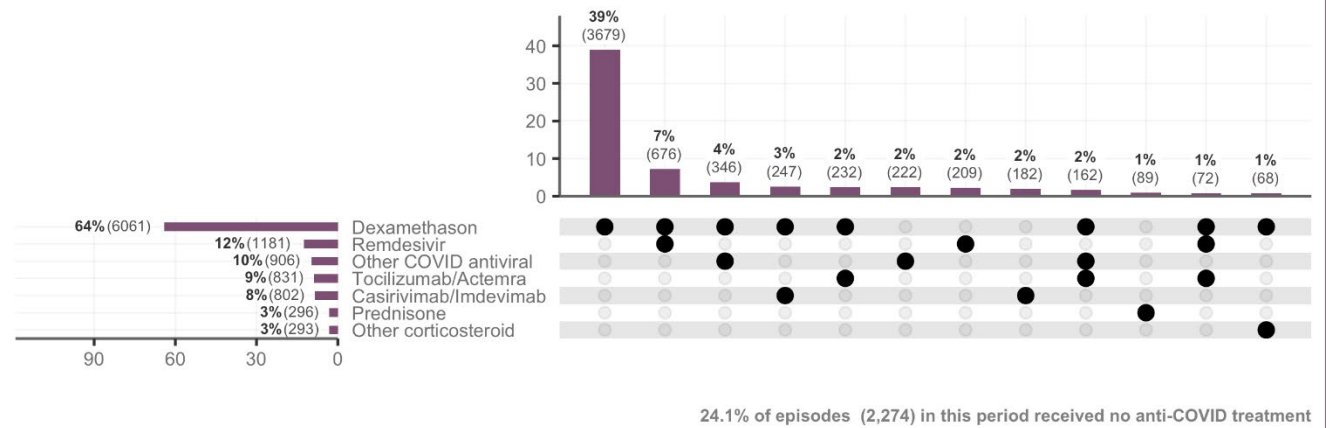


Figure 15: Anti-COVID treatments administered over time. Absolute counts are displayed per week of first hospitalization. Relative counts are presented by month of first hospitalization. Incomplete records were excluded.

a. 7,137 episodes first hospitalized in 2020



b. 9,452 episodes first hospitalized in 2021



c. 13,104 episodes first hospitalized in 2022

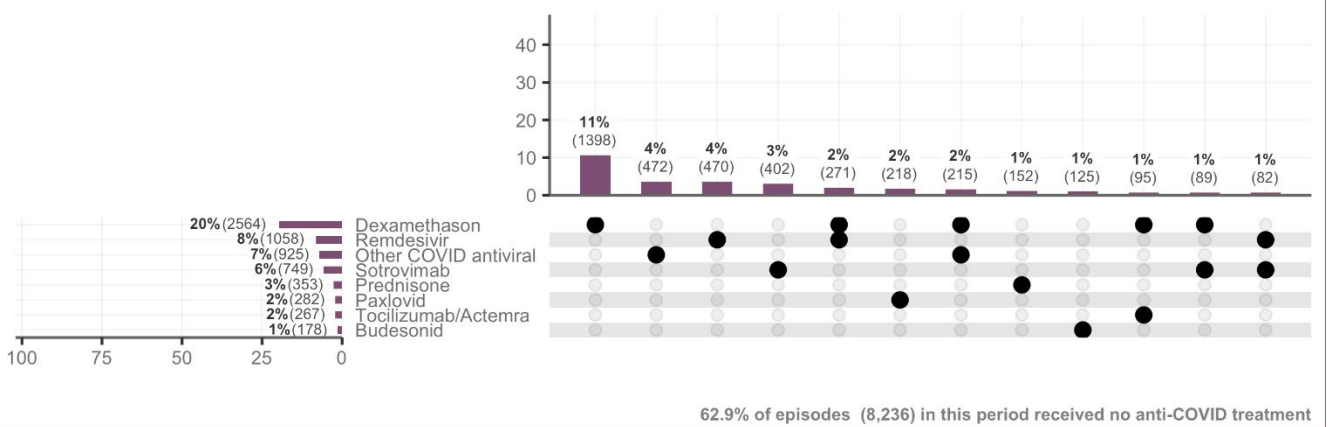
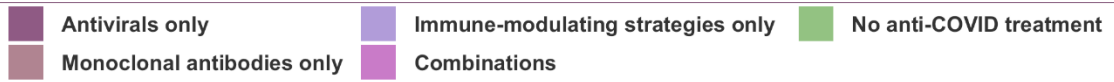
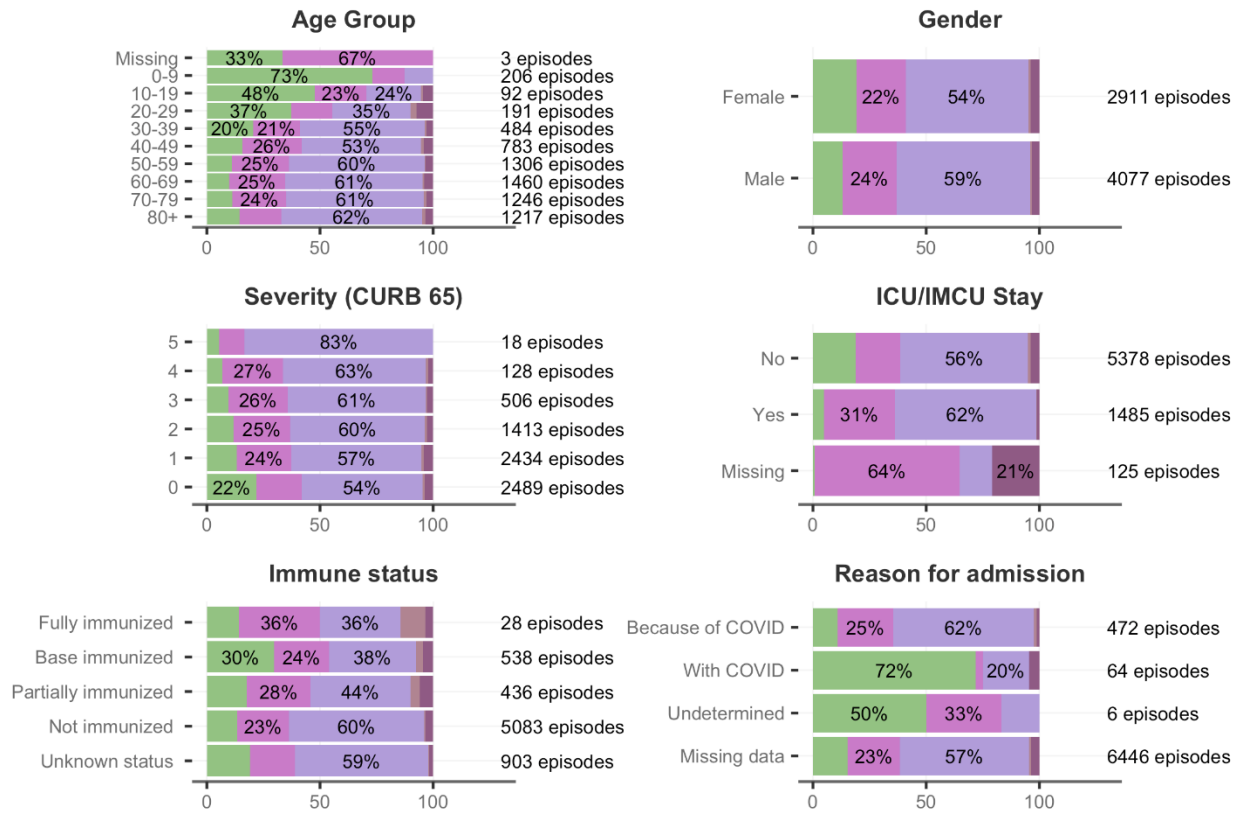


Figure 16: Anti-COVID treatments administered over three periods. Horizontal bars to the left represent the % of episodes who received a specific drug. Vertical bars show the % of episodes who received the combination of drugs indicated with the black dot(s) directly below the bar. Only the top 12 combinations are shown for each time period.



Treatments for community acquired episodes from Dec 2020 to Nov 2021



Treatments for community acquired episodes from Dec 2021 to Oct 2022

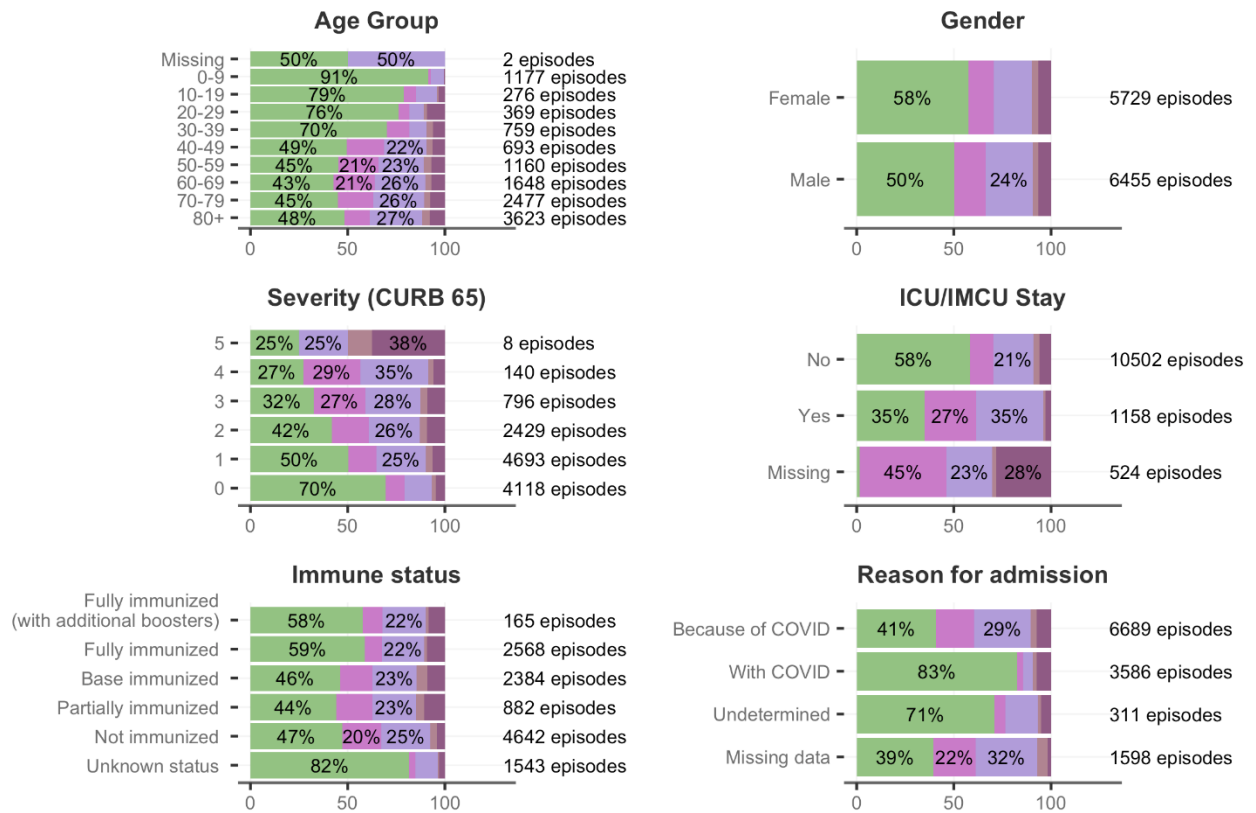


Figure 17: *Anti-COVID treatments administered stratified across different demographic groups. Two time periods are represented: a time period since vaccination began until November 2021, and a recent timeframe since the Omicron variant became dominant (Dec 2021) until the most recent data.*

6. Nosocomial cases

The proportion of **episodes** with nosocomial infections peaked in January 2021 and again in July 2022 with 30% or more of the episodes in this latter period linked to infections of nosocomial origin (Figure 18c). In recent months, this proportion rose since September 2022, accounting for 22.4% of the episodes registered in CH-SUR over the month of September 2022 and 27.2% in October 2022. The peaks in 2022 might be partially explained by periods of higher virus circulation and temporary increases in nosocomial systematic testing in some hospitals. As testing strategies vary across hospitals and over time, these data should be interpreted with caution.

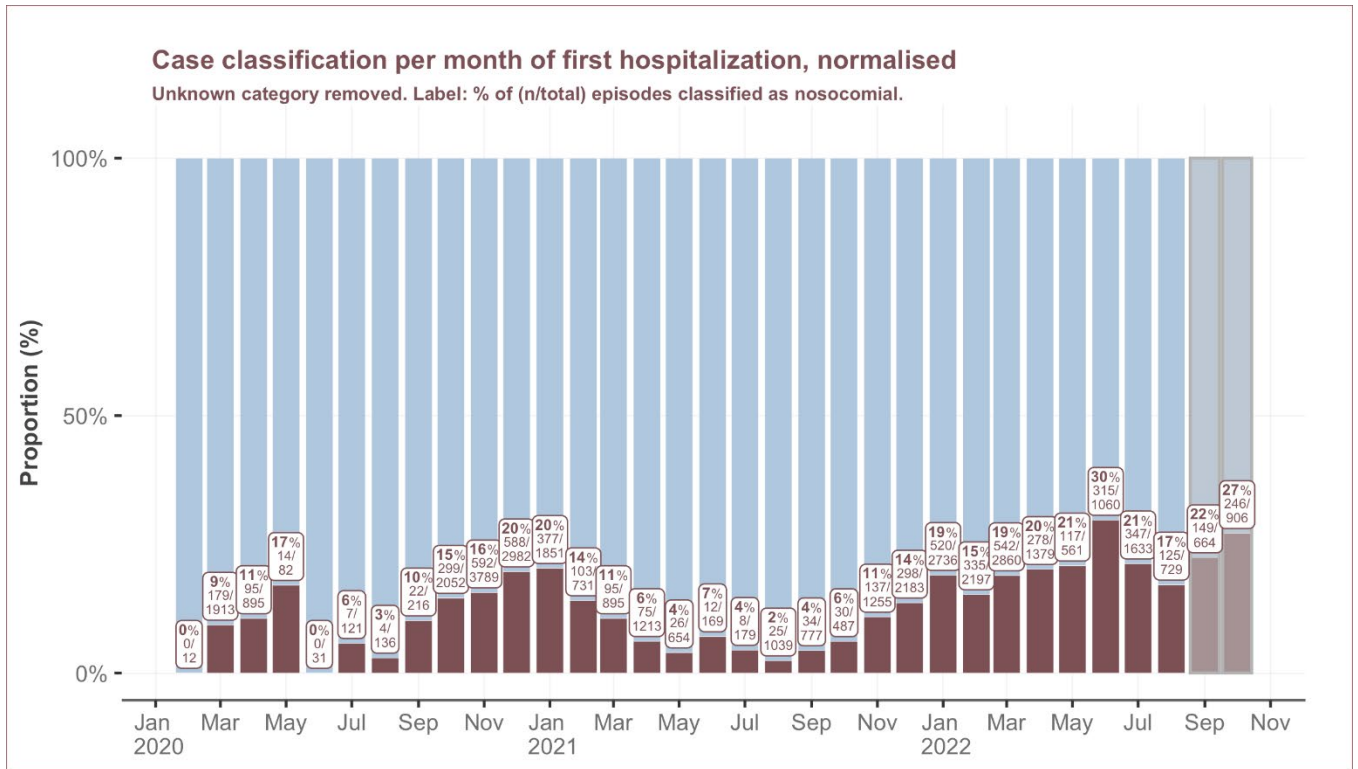


Figure 18: Classification (infection source) of hospitalization episodes over time. Data from the last two months (highlighted gray) are considered provisional due to data entry delays.

Over the full course of the epidemic, the **nosocomial** infections affected principally an elderly population, with patients aged 80 years and above, accounting for 2,826 (47%) of the nosocomial episodes. In comparison, 8,298 (26%) of episodes with **community-acquired** infections corresponded to patients aged 80 years and above.

Community acquired and nosocomial episodes from Feb 2020 to Oct 2022

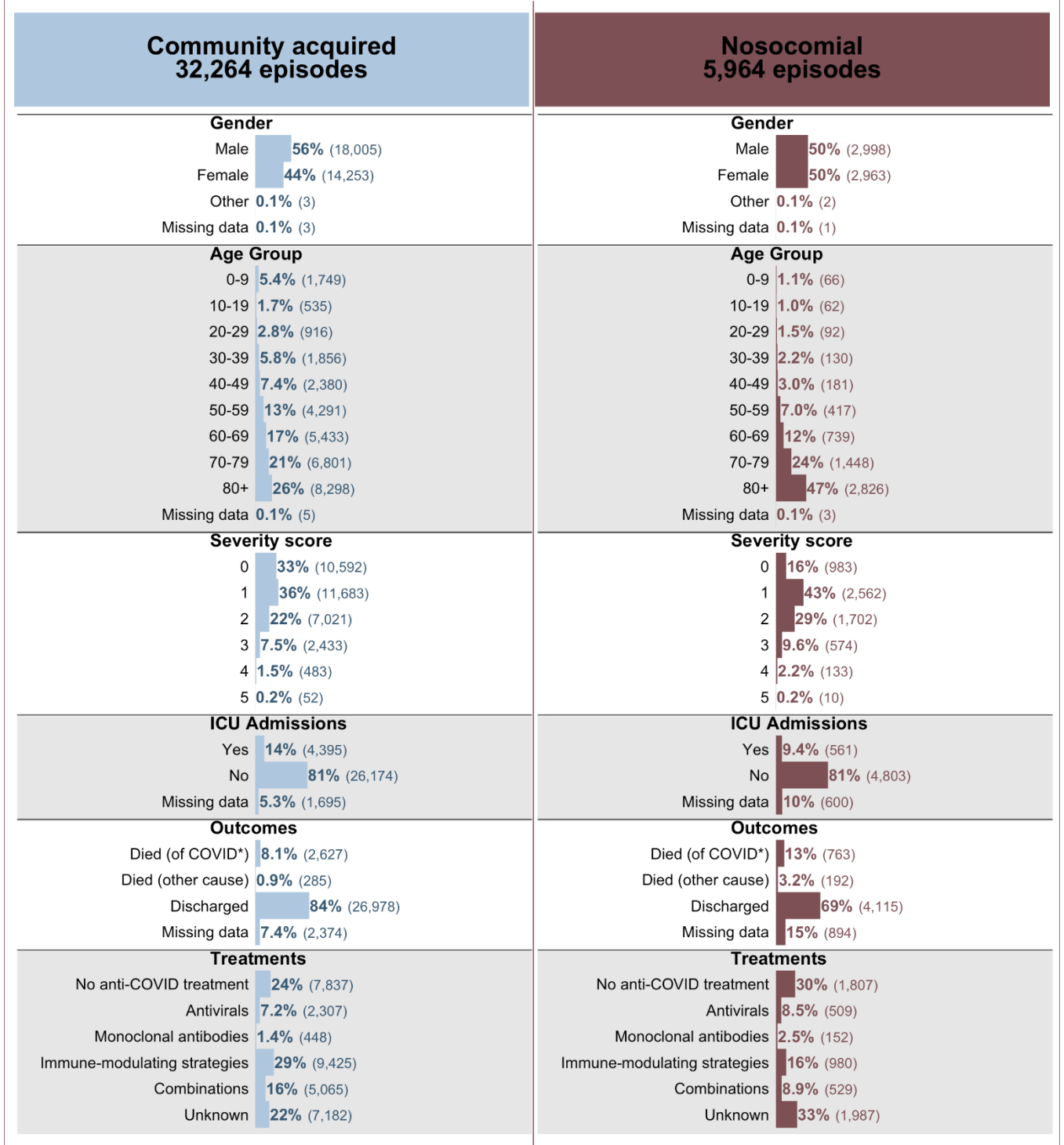


Figure 19: Comparison of community acquired and nosocomial cases by demographics, severity score, ICU, outcomes and treatments.

7. Glossary and supplemental information

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.

Immune status / Status immunitaire ou vaccinal:

La définition du statut immunitaire prend en considération à la fois la vaccination et les infections antécédentes, confirmées de SARS-CoV-2. Le statut immunitaire est défini comme suit:

a) *Non immunisés*: Patients n'ayant reçu aucune dose d'un quelconque vaccin contre SARS-CoV-2 au moment du test positif et n'ayant aucune preuve d'une infection au virus SARS-CoV-2, antérieure à cette hospitalisation.

b) *Partiellement immunisés:*

1. Patients ayant reçu une dose des vaccins de Moderna (Spikevax®), Pfizer/BioNTech (Comirnaty®), AstraZeneca (Vaxzevria®), Sinopharm®, Sinovac (CoronaVac®) ou COVAXIN® avant le test positif et n'ayant aucune preuve d'une infection antérieure au SARS-CoV-2.
2. Patients chez qui une infection antérieure au SARS-CoV-2 a été confirmée, qu'elle ait nécessité ou non une hospitalisation dans le passé, et n'ayant reçu aucune dose de vaccin. ATTENTION : de nombreux patients guéris ne sont pas identifiés comme tels dans la base de données (informations recueillies uniquement depuis juin 2021, infection non diagnostiquée, informations manquantes dans le dossier médical).

c) *Avec immunisation de base:*

1. Patients ayant reçu une dose du vaccin de Johnson & Johnson (Janssen®) ou deux doses des vaccins Spikevax®, Comirnaty®, Vaxzevria®, Sinopharm®, CoronaVac® ou COVAXIN® (recommandations pour la vaccination OFSP-Commission fédérale pour les vaccinations).
2. Patients ayant une infection antérieure documentée ou un test positif (nécessitant ou non une hospitalisation) et ayant reçu une dose d'un des vaccins énumérés ci-dessus. Sont exclus les patients ayant reçu une vaccination de rappel supplémentaire (Voir catégorie « Complètement immunisés »).

d) *Complètement immunisés (un seul booster):* Patients ayant reçu la vaccination de base et une dose supplémentaire de vaccins (rappel), avec un minimum de 4 mois depuis la dernière injection pour la vaccination de base.

e) *Complètement immunisés (plusieurs boosters):* Patients ayant reçu la vaccination de base et plusieurs doses supplémentaires de vaccins (rappel), avec un minimum de 4 mois depuis le rappel précédent

f) *Status immunitaire inconnu:* Patients pour lesquels aucune information vaccinale et immunitaire n'est disponible.

Notes importantes: populations spéciales

Les patients immunosupprimés sont considérés immunisés de base s'ils ont reçus une dose supplémentaires que celle prescrite dans la définition ci-dessus. Un exemple: une personne immunosupprimée est comptée comme immunisé de base si la personne a reçu trois doses d'un des vaccins Comirnaty®, Spikevax® ou Vaxzevria® (à la place de deux doses pour les personnes non-immunosupprimées) ou si la personne a reçu deux doses d'un des vaccins Comirnaty® et Spikevax® ou Vaxzevria® et s'est rétablie d'une infection au SARS-CoV-2. Si ces doses n'ont pas été administrée alors le patient est considéré comme partiellement immunisé.

Pour être complètement immunisé (avec un ou plusieurs boosters), la même définition s'applique que pour les personnes non-immunosupprimées.

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 suspects 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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