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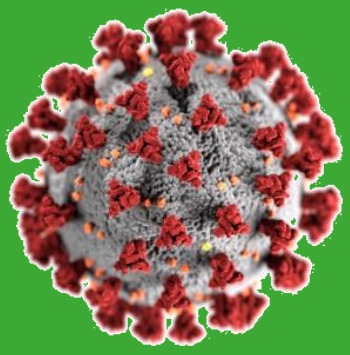
COVID-19 CLINICAL HOSPITAL SURVEILLANCE REPORT



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Epidemiology and public health – Epidemiology of infectious diseases

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KEY FINDINGS

TRENDS OVER TIME

1. INTRODUCTION

The surveillance of COVID-19 hospitalized patients is based on 2 components:

- The Surge Capacity Surveillance: This exhaustive surveillance collects daily aggregated information on COVID-19: such as number of hospital admissions, hospital discharges, hospital-wide and intensive care unit (ICU) bed occupancy, and mortality. Reporting to this surveillance is compulsory. Its aim is to describe the occupancy levels of hospitals and intensive care by patients with COVID-19.
- The Clinical Hospital Surveillance: This non-exhaustive surveillance collects clinical data on patient level upon hospital admission, hospital discharge and ICU discharge. These data are collected in three separate forms. The ICU discharge form was only implemented from the 14th of September 2020. The aim of this surveillance is to study the demographics and outcomes of hospitalized patients with COVID-19.

This automated periodical report describes the findings of the Clinical Hospital Surveillance from the beginning of the epidemic in February 2020 up to the present. Included patients are diagnosed by polymerase chain reaction (PCR) test, chest computed tomography (CT) scan or rapid antigen test. When presenting the patient demographics and outcomes, they are stratified into two groups: all hospitalized patients and a subgroup of patients admitted to ICU.

The Clinical Hospital Surveillance is not exhaustive, but does capture approximately 2/3rds of all hospitalized Belgian COVID-19 patients. The surveillance system collects detailed information through an admission, discharge and ICU form, which takes time to fill in (1 week). Delays in data registration lead to incomplete data for the most recent weeks. Clinical information is obtained through forms separately filled in at admission and at discharge. This means that demographic information (age, sex, comorbidities) is registered earlier than clinical outcomes (ICU transfer, invasive ventilation, death), because the patient has yet to complete their hospitalization. Demographic information on hospitalized patients is registered after approximately 1-2 weeks. Clinical outcomes, such as ICU admission or death, are only registered at hospital discharge, approximately 2-4 weeks after hospital admission.

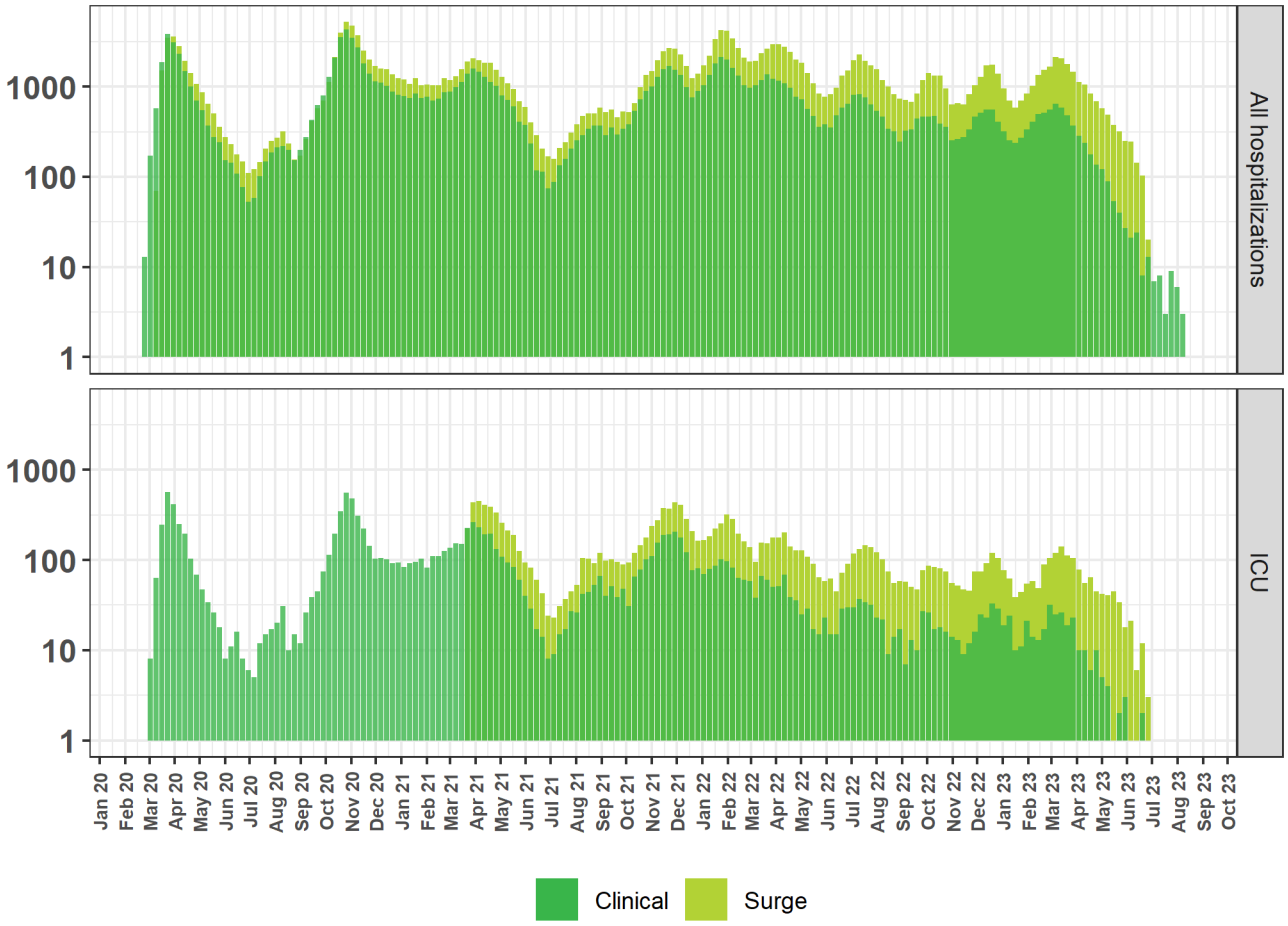
Whether the patient was admitted into ICU is registered in the discharge form. Because of this, demographic information on ICU patients is only available at the moment of hospital discharge. Furthermore, as ICU patients remain hospitalized for 2-3 weeks, their profile may only be available approximately 4 weeks after their initial hospital admission. To avoid misinterpretation of trends over time we do not report ICU data for the most recent 3 weeks. Caution should be exercised when interpreting the most recent reported weeks as they are liable to change as more data is registered over time.

Because this clinical data is received with a delay, the results for the most recent weeks are liable to change as more data is collected. Furthermore, specific data (such as ICU transfer, complications, outcomes and death) are only available when the patient is discharged from the hospital. This can bias the results of the most recent weeks since either patients that die earlier or are discharged alive earlier are represented.

The time periods have been divided into a first wave (February to June 21st 2020), first interwave (June 22nd 2020 – 31st of August 2020), second wave (August 31st 2020 to February 14th 2021), third wave (February 15th 2021 - 27th June 2021), second interwave (28th June 2021 - 3rd October 2021), fourth wave (4th October 2021 - 26th December 2021), fifth wave (27th December 2021 – 27th February 2022), sixth wave (28th February 2022 - 29th May 2022), seventh wave (30th May 2022 - 12th September

2022), eight wave (12th September 2022 - 20th November 2022), ninth wave (21st November 2022 - 22nd January 2023), and tenth wave (23 January 2023 - onward)

Figure 1: Sample sizes in the database based on admission date (i.e. number of daily admissions).[1]



[1] The Surge Capacity Surveillance started collecting the new number of ICU admissions only from 25-03-2021 onwards.

Table 1: Sample sizes in the database based on admission date (i.e. number of daily admissions).

Week	All hospitalizations	ICU
2023-01-30	337	21
2023-02-06	405	14
2023-02-13	493	13
2023-02-20	514	17
2023-02-27	558	32
2023-03-06	645	25
2023-03-13	584	26
2023-03-20	482	19
2023-03-27	368	23
2023-04-03	285	10
2023-04-10	239	10
2023-04-17	178	<10
2023-04-24	136	10
2023-05-01	121	<10
2023-05-08	89	<10
2023-05-15	54	<10
2023-05-22	40	<10
2023-05-29	27	<10
2023-06-05	21	<10
2023-06-12	24	<10
2023-06-19	<10	<10
2023-06-26	13	
2023-07-03	<10	
2023-07-10	<10	
2023-07-17	<10	
2023-07-24	<10	<10
2023-07-31	<10	
2023-08-07	<10	

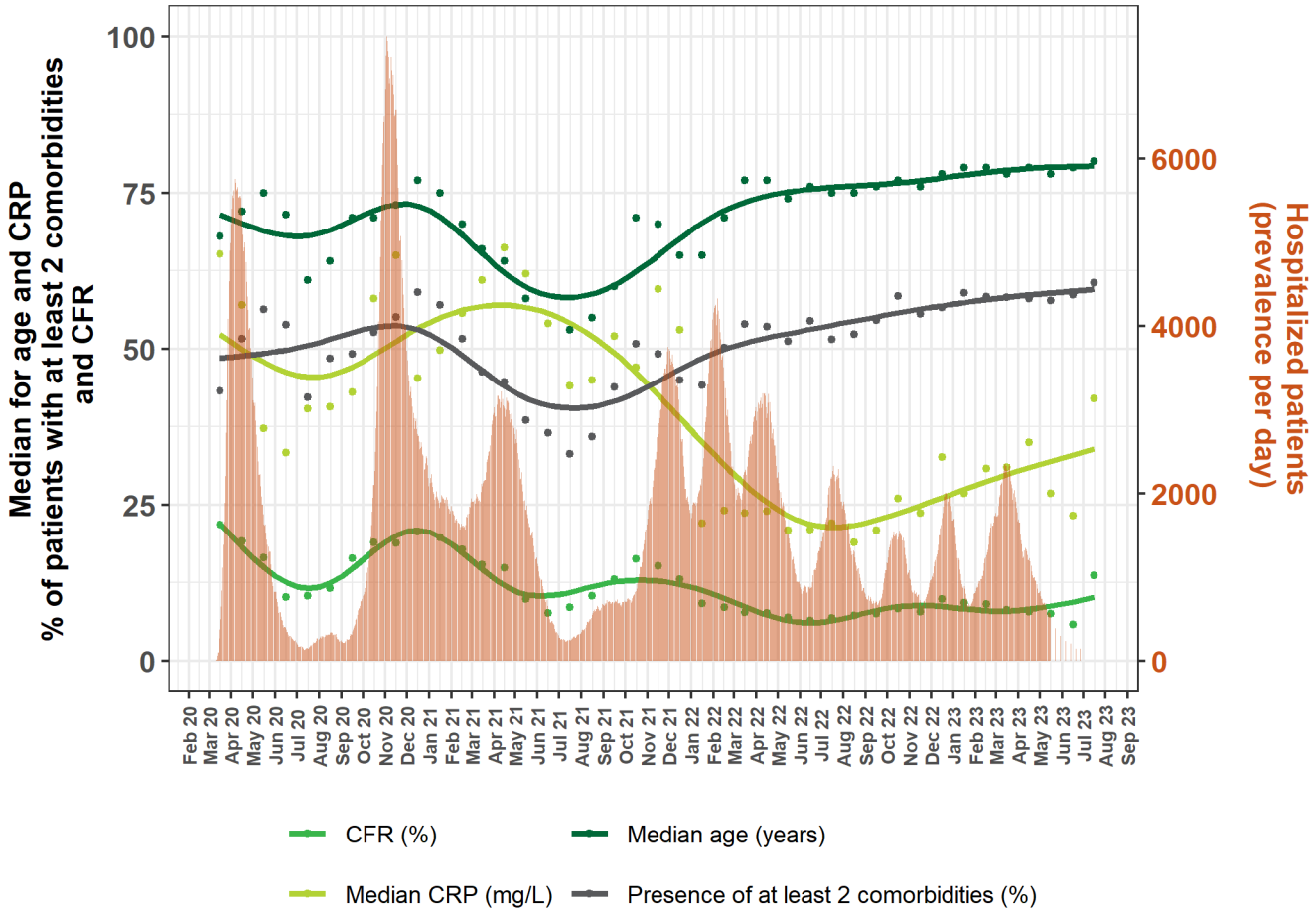
2. HOSPITALIZED PATIENTS

2.1. HOSPITAL AT A GLANCE

Figure 2: Hospital at a glance.

This 'At a glance' figure provides an overview of the crude case fatality rate and its relation to specific markers over time:

- Hospital occupancy in Belgium
- Median age of patients at hospital admission
- Serum C-reactive protein (CRP) at admission as a marker of inflammation
- Proportion of admitted patients with at least 2 comorbidities at admission
- Case-fatality rate (CFR)



2.2. HOSPITALIZED PATIENT DEMOGRAPHICS

Figure 3: Gender distribution (all hospitalized patients), per week.

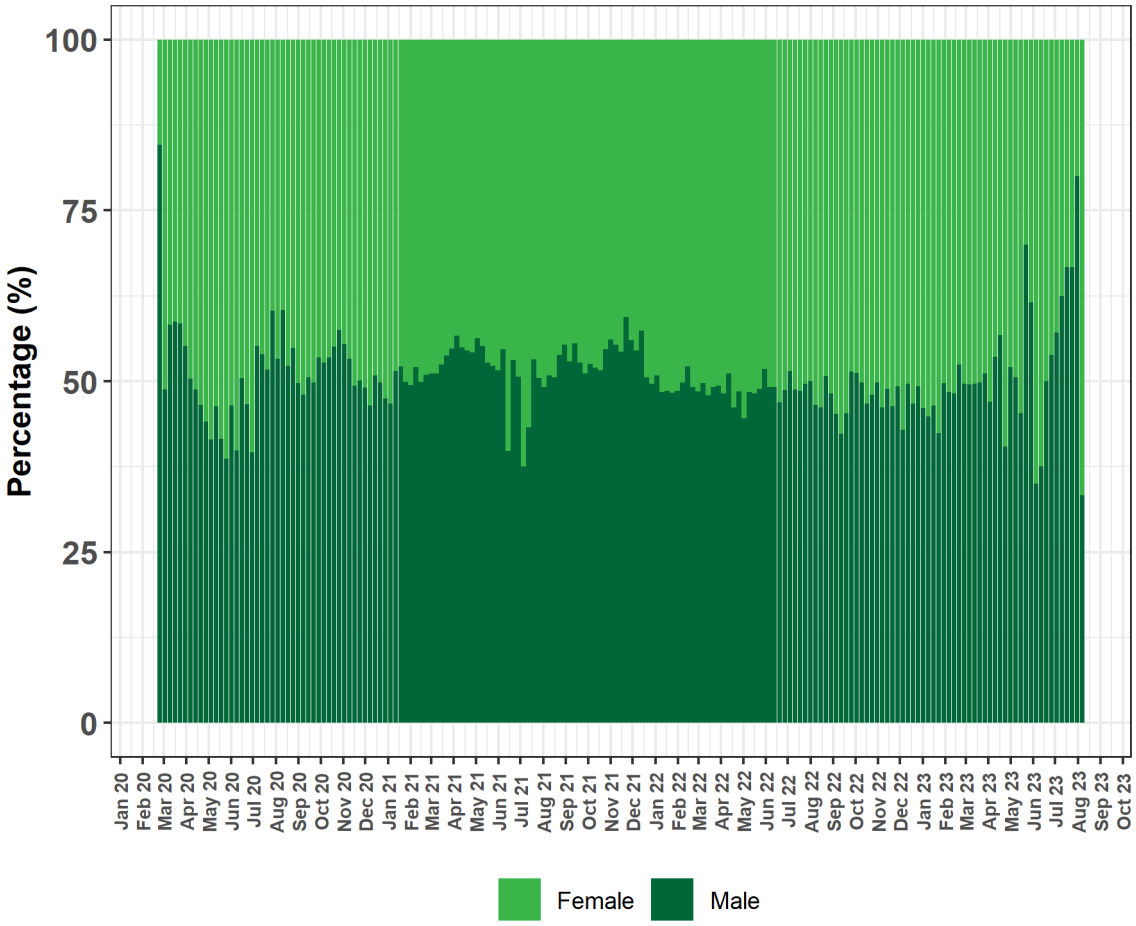


Figure 4: Distribution of age categories (all hospitalized patients), proportionally, per week.

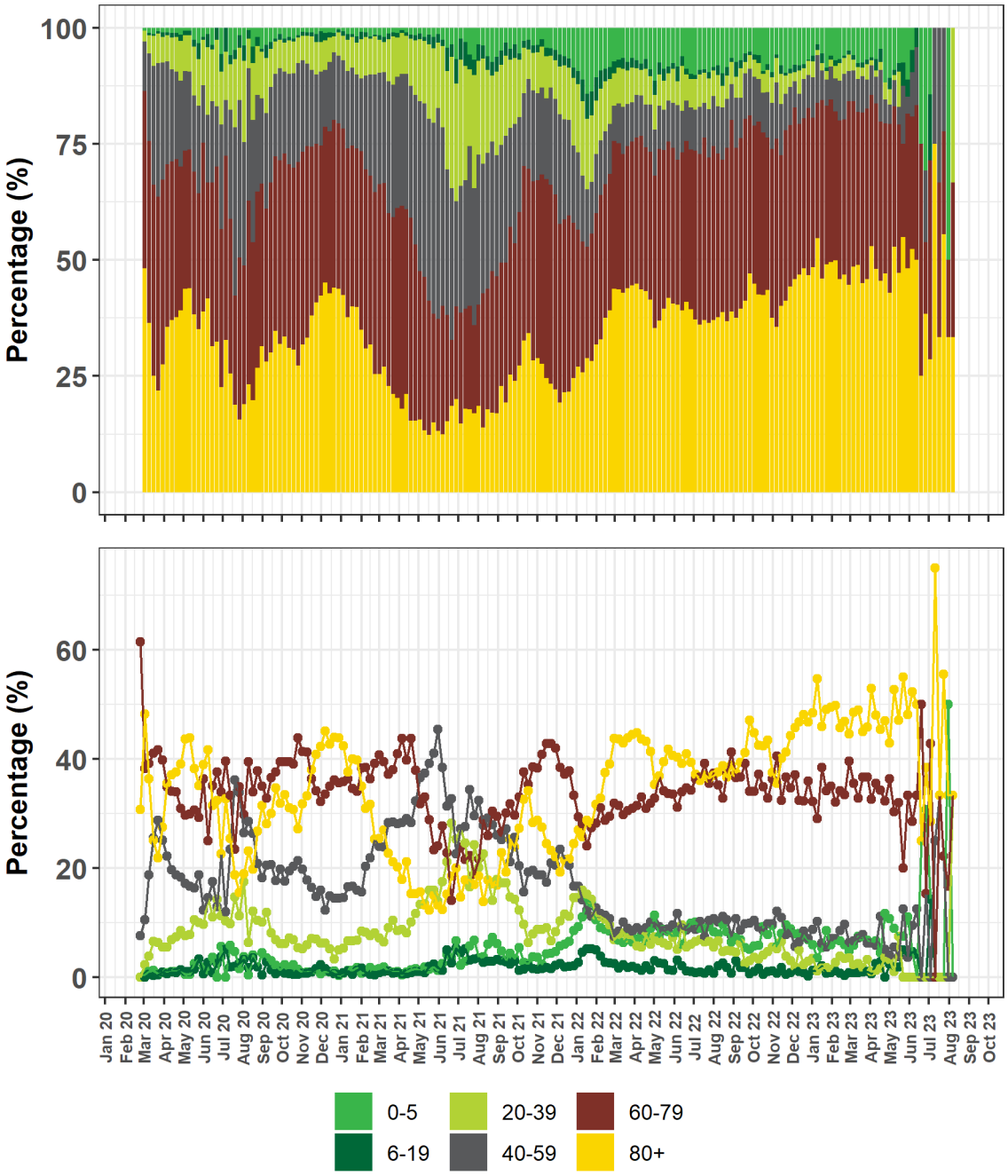
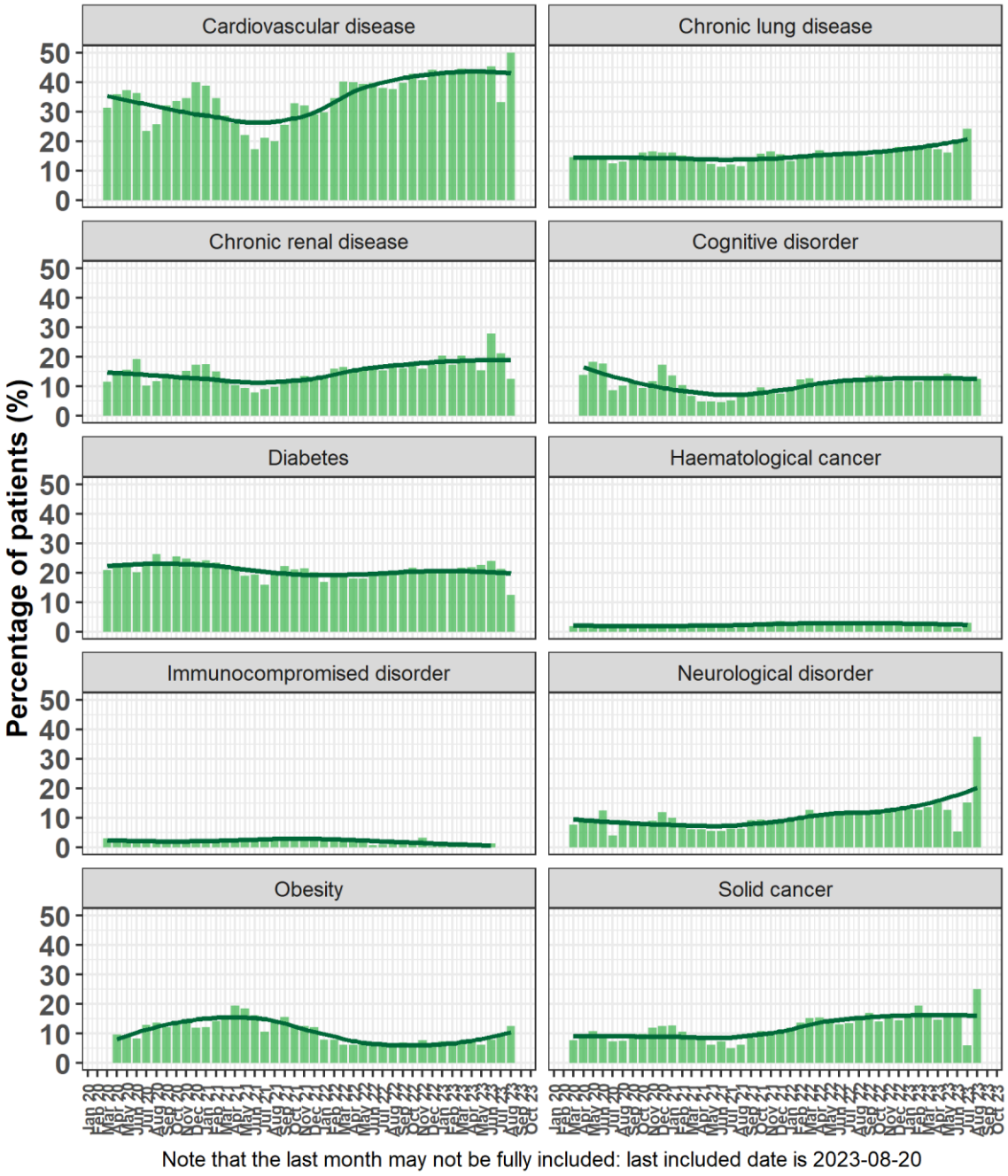


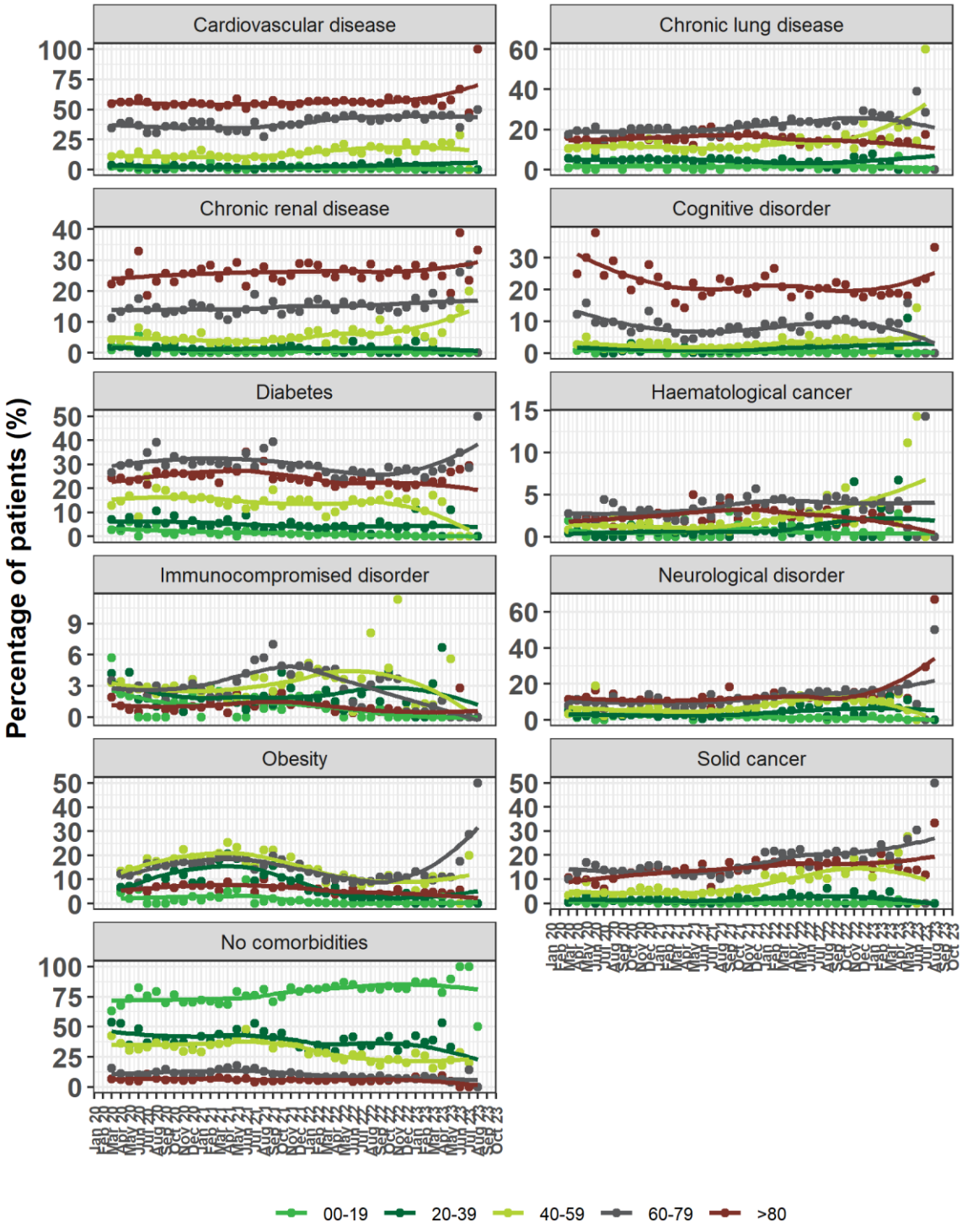
Figure 5: Distribution of age categories (all hospitalized patients), in numbers of patients, per week. These patient numbers are calculated based on the proportional age distribution (above), projected on the number of patients reported in the surge capacity surveillance.

Figure 5: Comorbidities distribution (all hospitalized patients), per month.[2]



[2] The trend line is based on a smoothing function, and thus does not represent the observed data. Comorbidity trends per month can be viewed individually in the interactive EpiStat COVID-19 dashboard (https://epistat.wiv-isp.be/covid/covid-19.html)

Figure 6: Comorbidities distribution (all hospitalized patients) per age category, per month.

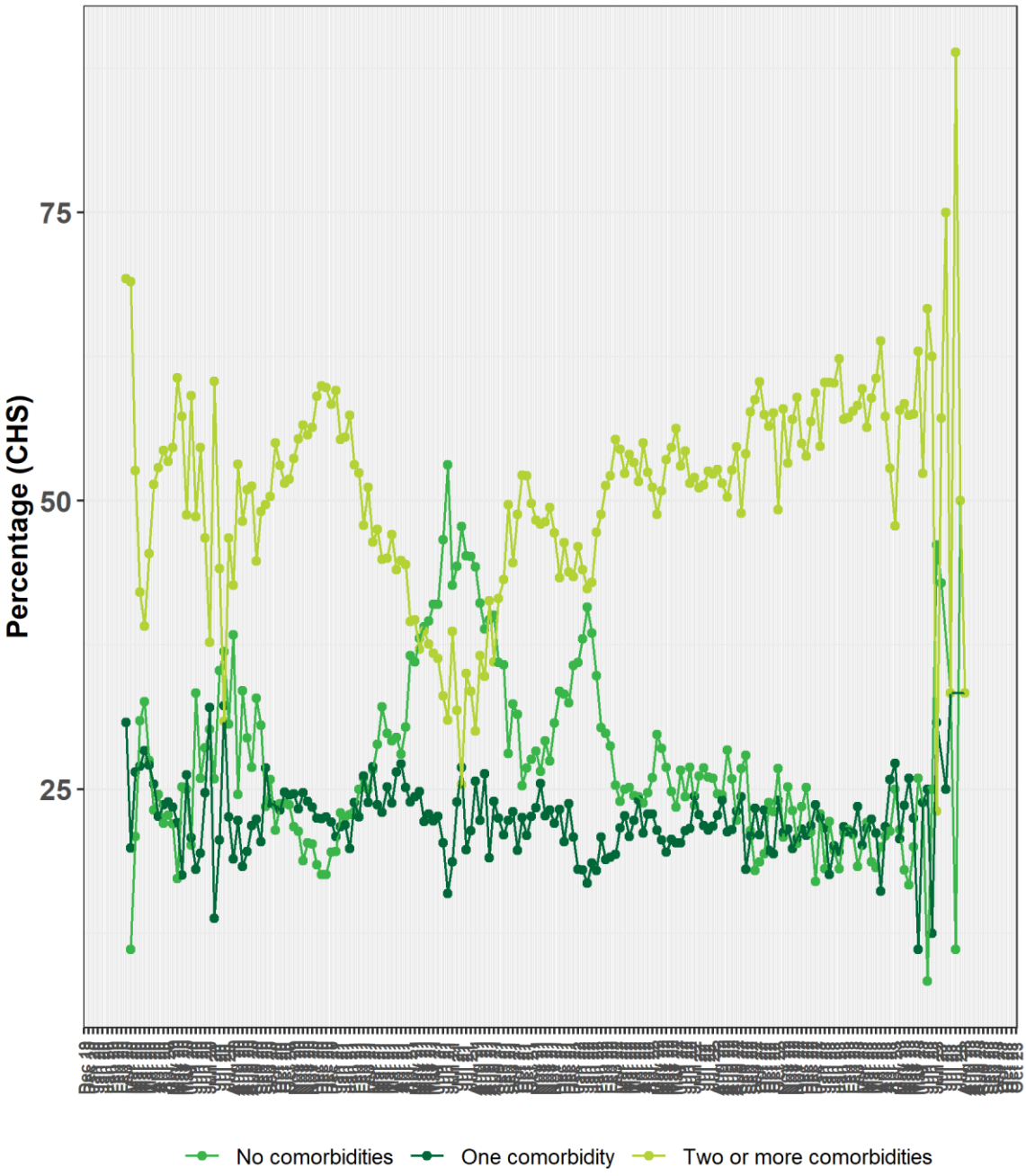


Note that the last month may not be fully included: last included date is 2023-08-20

2.3. PATIENT PROFILE

Patient profile per vaccination status i.e. figures on hospitalized breakthrough cases were omitted from this report. Information on the impact of vaccination has been centralized in section 3.4 Vaccination of the COVID-19 weekly report (In Dutch: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_Weekly_report_NL.pdf, in French: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_Weekly_report_FR.pdf). Here, a more stable estimate for vaccine effectiveness is reported in addition to vaccine coverage in Belgium. Please refer to sections 10.7 and 10.8 of the FAQ document to inquire about the methodology (in Dutch: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_FAQ_NL_final.pdf, in French: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_FAQ_FR_final.pdf).

Figure 7: The proportion of number of comorbidities per hospitalised patient, from the Clinical Hospital Surveillance (CHS) and the projection of these proportions on the total number of hospitalised patients reported in the Surge Capacity Surveillance (SCS).[3]



[3] The following comorbidities are considered in this plot: cardiovascular disease, high blood pressure, diabetes, chronic renal disease, chronic liver disease, neurological disorder, cognitive disorder, immunocompromised disorder, chronic lung disease, solid cancer, haematological cancer, transplant, obesity.

Figure 8: Distribution of nursing home vs non-nursing home residents (all hospitalized patients), per week.

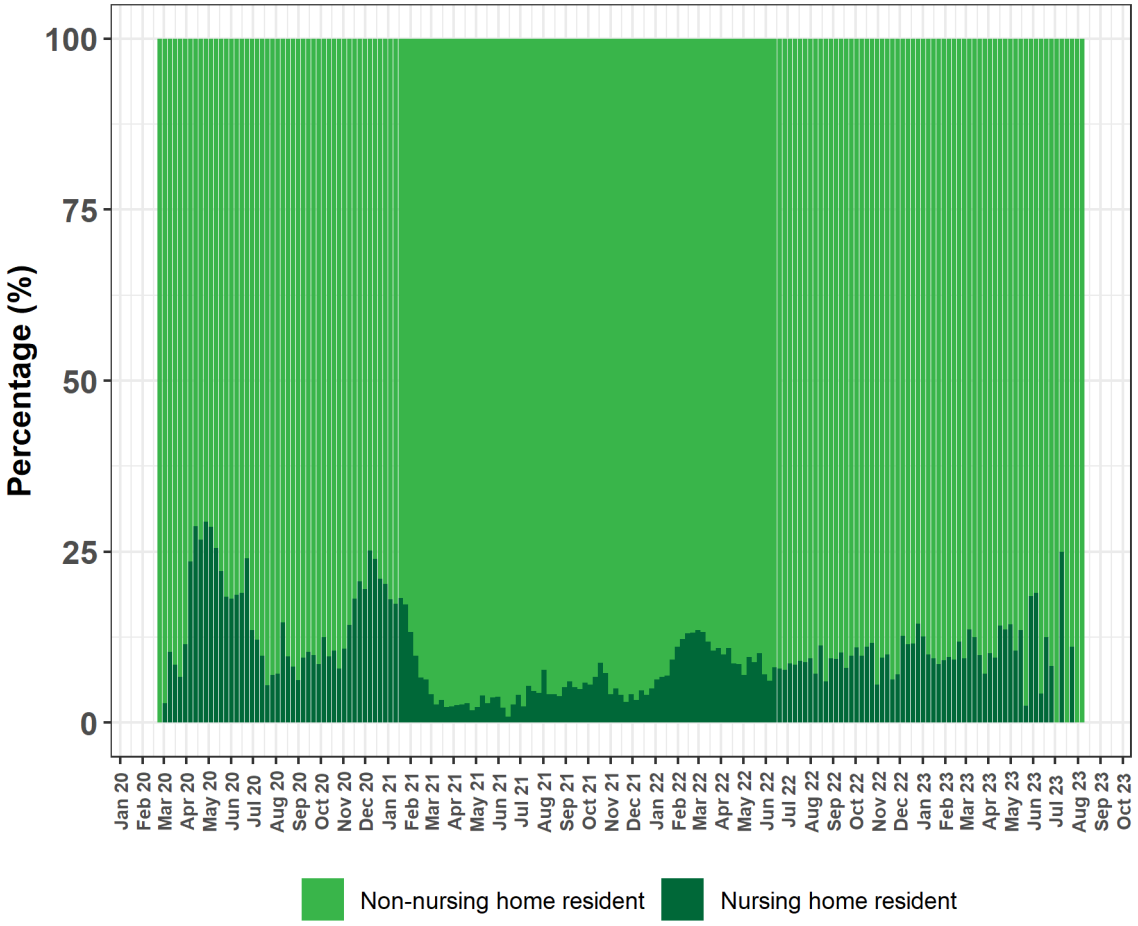
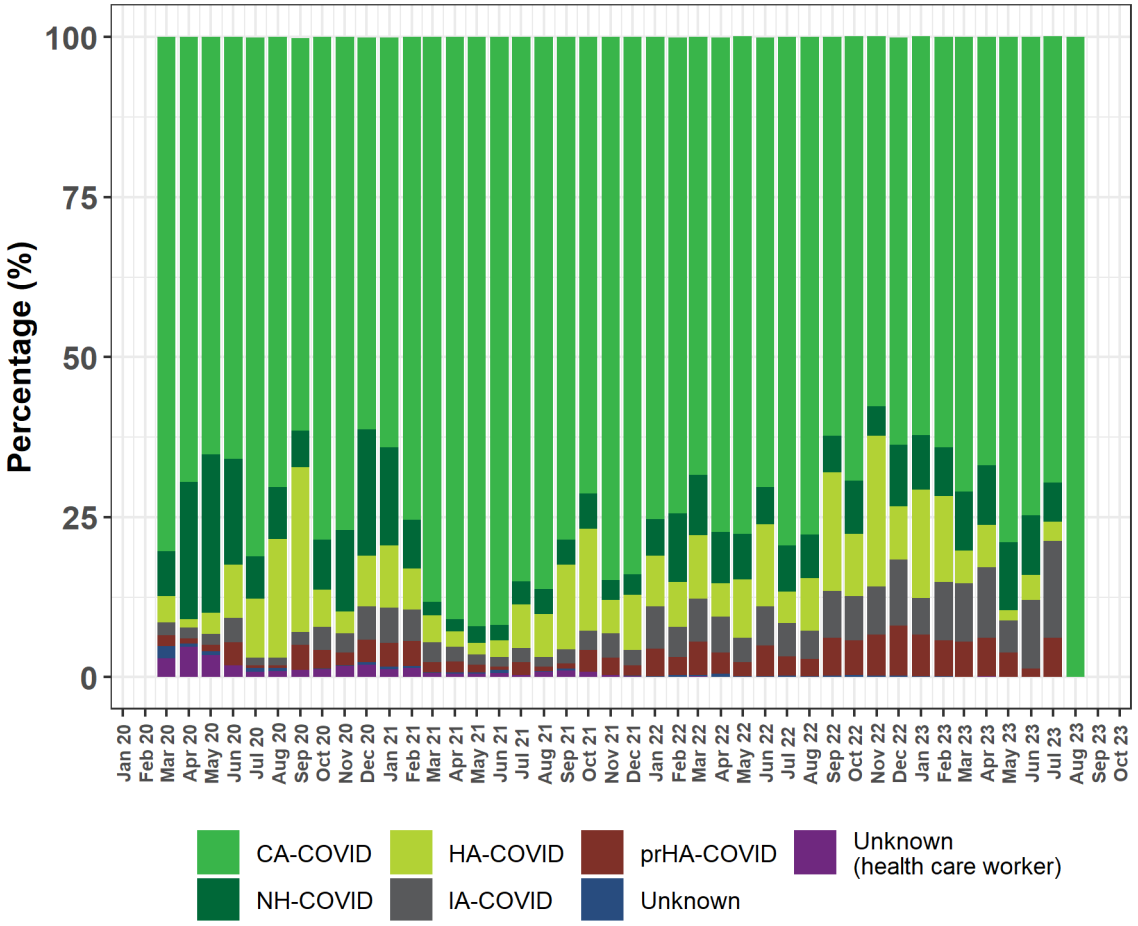


Figure 9: Distribution of healthcare-associated SARS-CoV-2 infections (all hospitalized patients), per week.[4]



Time-to-infection after hospitalization was defined as days between hospital admission and date of symptom onset. In a small minority of cases the date of symptom onset was missing, in which case the date of diagnosis was used instead.

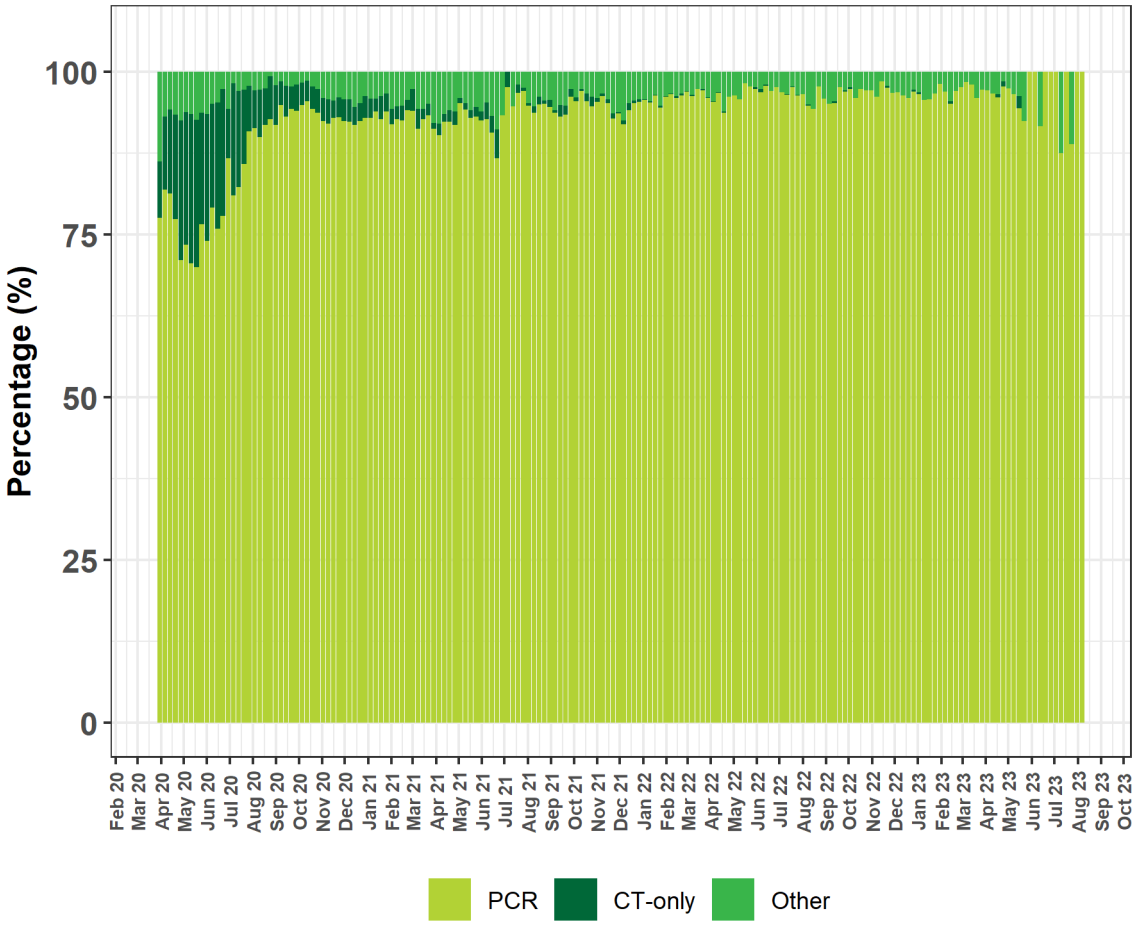
- CA-COVID: Community-associated COVID: up to 2 days after admission.
- NH-COVID: Nursing home-associated COVID: nursing home resident with symptom onset up to 2 days after admission.
- HA-COVID: Definite healthcare-associated COVID infection: >14 days after admission.
- prHA-COVID: Probable HA-COVID: on days 8-14 after admission.
- IA-COVID: Indeterminate-association COVID: on days 3-7 after admission.

These definitions are based on the European Centers for Disease Control and Prevention classification criteria (https://www.ecdc.europa.eu/en/covid-19/surveillance/surveillance-definitions). At the moment of writing these are pragmatic definitions that account for a median incubation period of 6 days (interquartile range 4 – 9 days). However, the validity of this classification system has not yet been extensively researched.

Because the surveillance does not ask whether there was a strong suspicion in case of COVID infections that develop at days 3-7 after hospital admission, these cannot be classified as community or healthcare-associated.

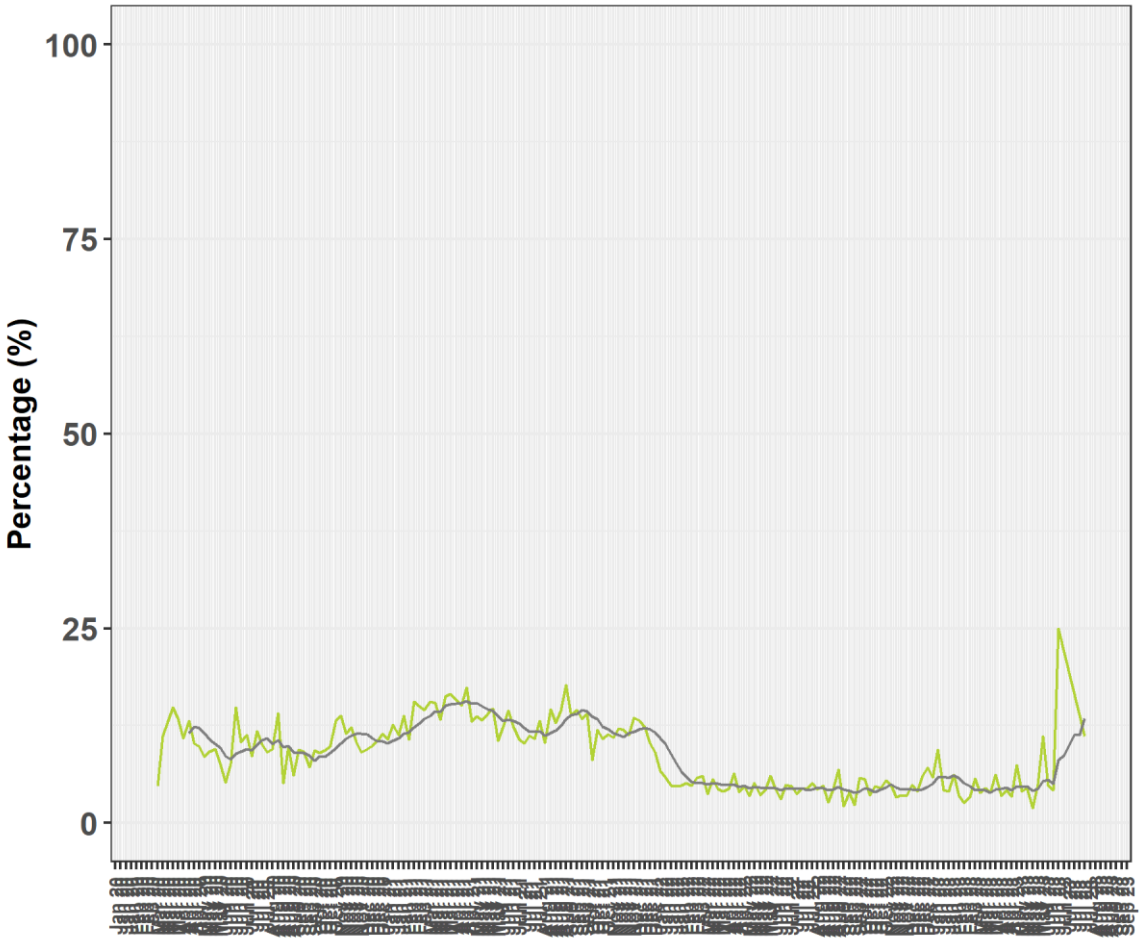
[4] The data collection of infections in health care workers has been discontinued since 14-11-2021. This explains why the percentage appears as 0 for the 'Unknown (health care worker)' category since that time point.

Figure 10 : Method of COVID-19 diagnosis, per week.[5]



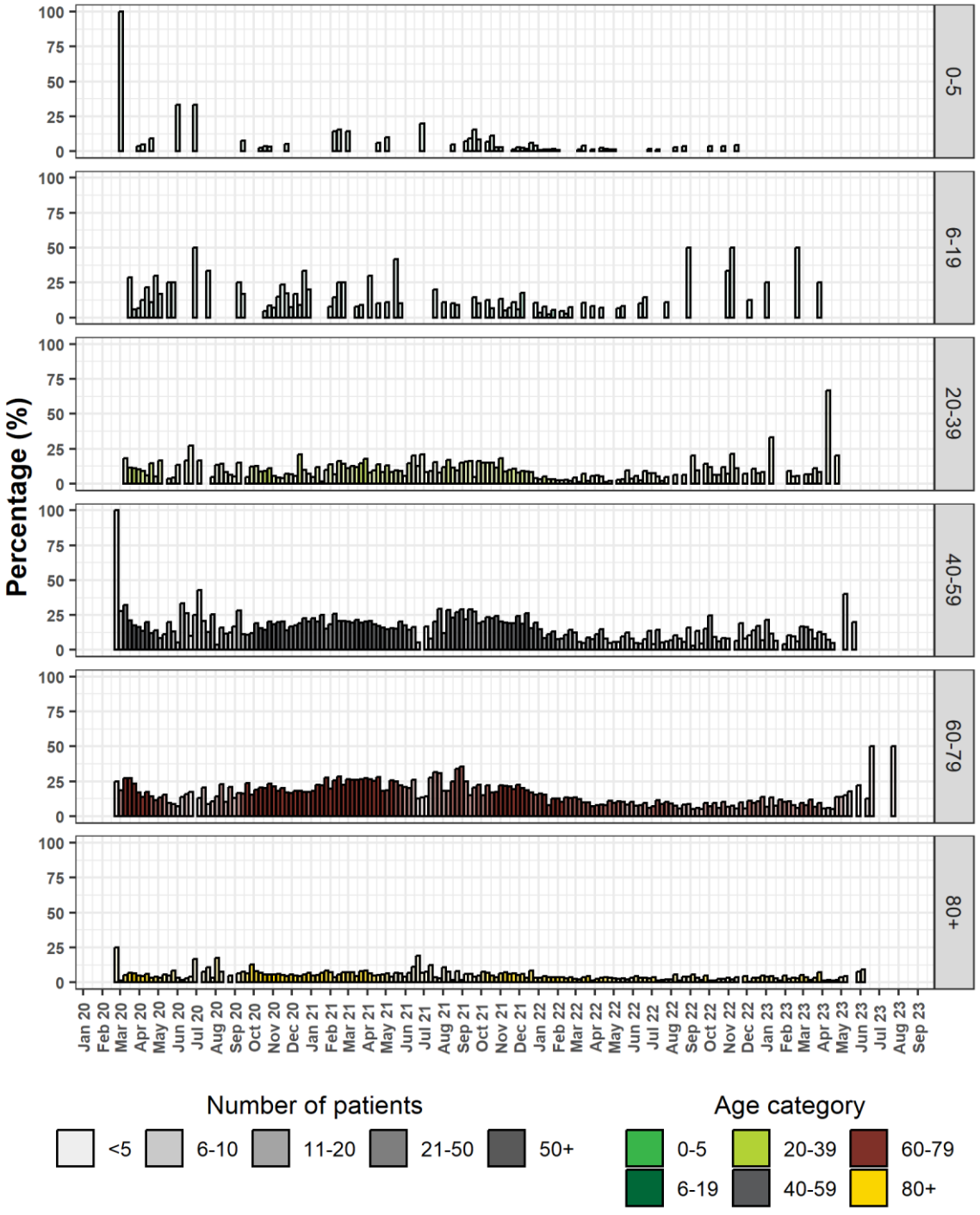
[5] PCR includes all patients that were diagnosed by PCR, CT-only includes patients that were only diagnosed with CT, and other includes patients diagnosed by rapid Ag test in combination with or without CT.

Figure 11: ICU admissions among all hospitalized patients over time.



The COVID Clinical Hospital Surveillance (CHS) does not collect information in real-time, which leads to a bias towards lower % ICU admission rates in the most recent weeks. On top of this, the inclusion criteria are different compared to the Surge Capacity Surveillance (SCS) which leads to different proportions of ICU admissions. The Surge Capacity includes only those patients that are hospitalised due to a SARS-CoV-2 infection and not those that were identified due to systematic screening.

Figure 12: ICU admissions among all hospitalized patients per age category over time.



The most recent weeks are biased towards lower % ICU admissions because ICU patients require time to be discharged and registered in the surveillance.

Figure 13: Time between hospital admission and transfer to ICU, per week.

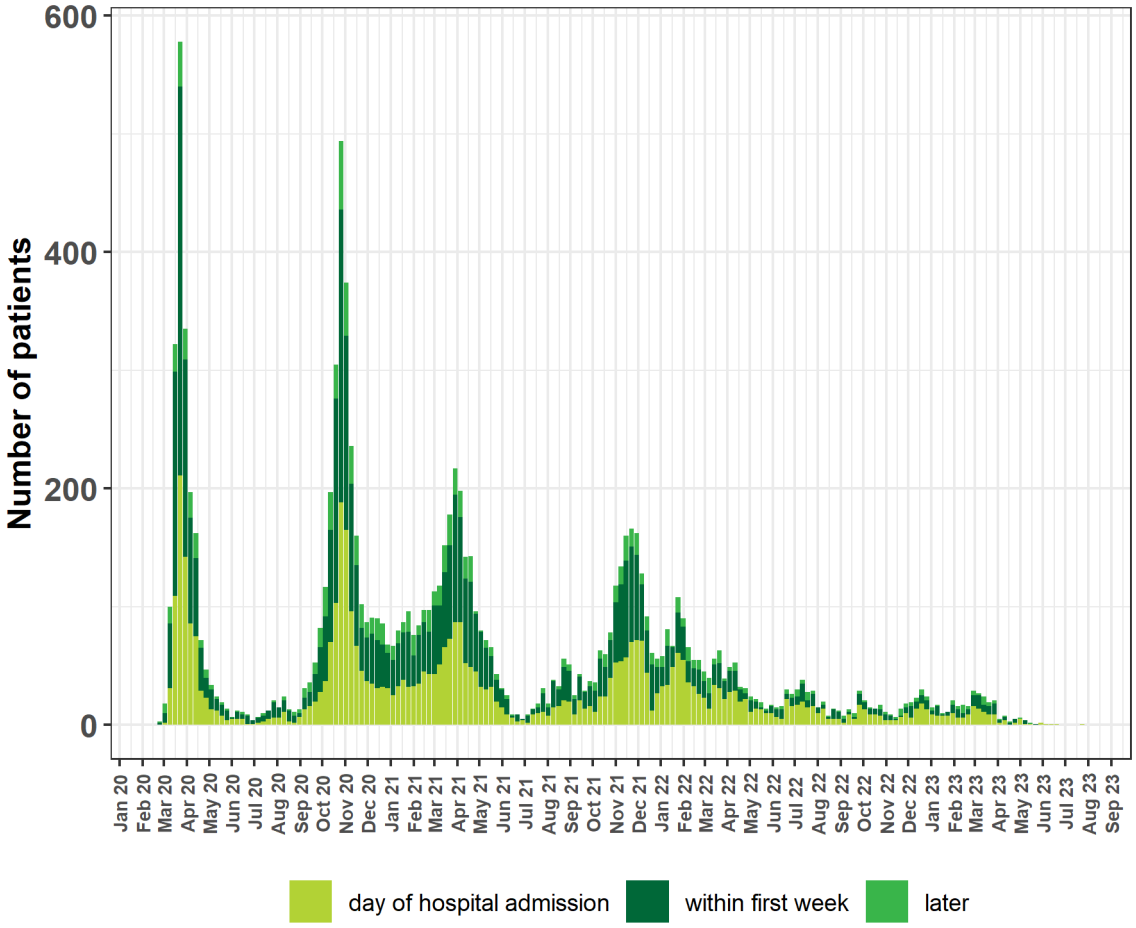
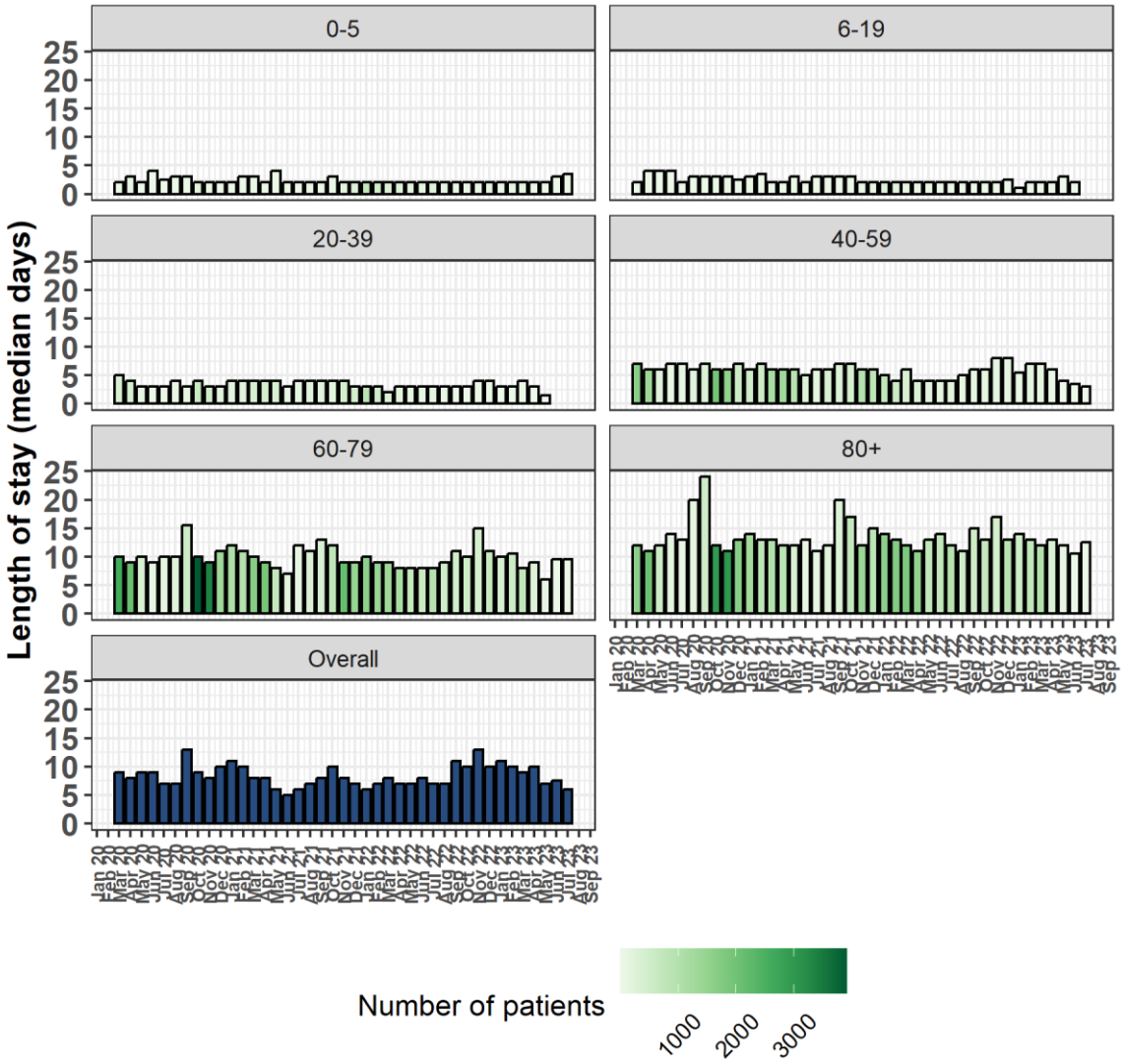


Figure 14: Length of hospital stay, per month.



Note that the last month may not be fully included: last included date is 2023-08-20

The most recent weeks are biased towards shorter length of stay because patients that are discharged or die earlier are registered sooner in the surveillance.

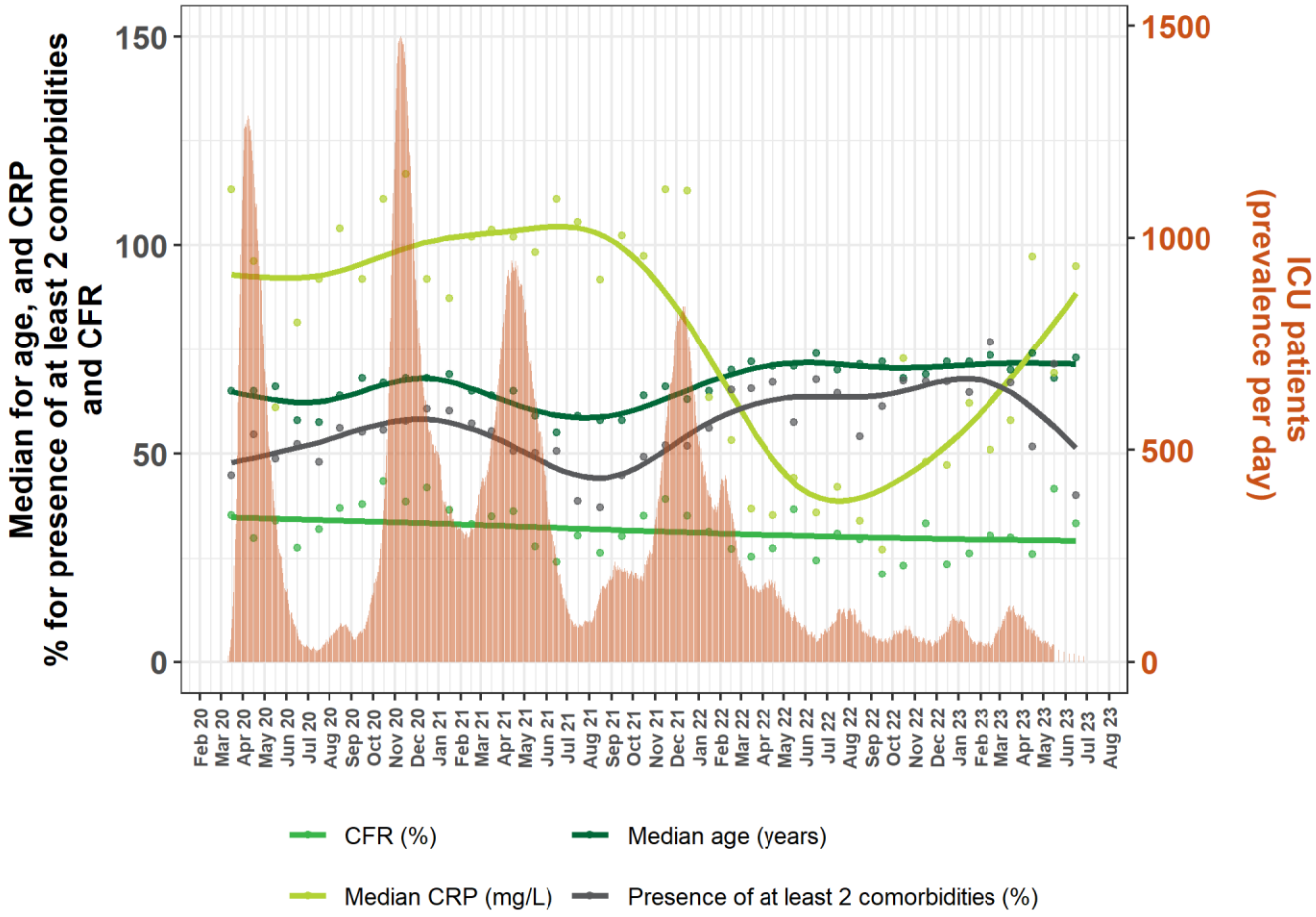
3. PATIENTS IN INTENSIVE CARE (ICU)

3.1. ICU AT A GLANCE

Figure 15: ICU at a glance.

This 'At a glance' figure provides an overview of the crude case fatality rate among ICU-admitted patients and its relation to specific markers over time:

- Number of ICU patients in Belgium
- Median age of patients at hospital admission
- Serum C-reactive protein (CRP) at hospital admission
- Proportion of admitted patients with at least 2 comorbidities at admission
- Case-fatality rate (CFR)



3.2. ICU PATIENT DEMOGRAPHICS

Figure 16: Gender distribution (ICU patients), per week.

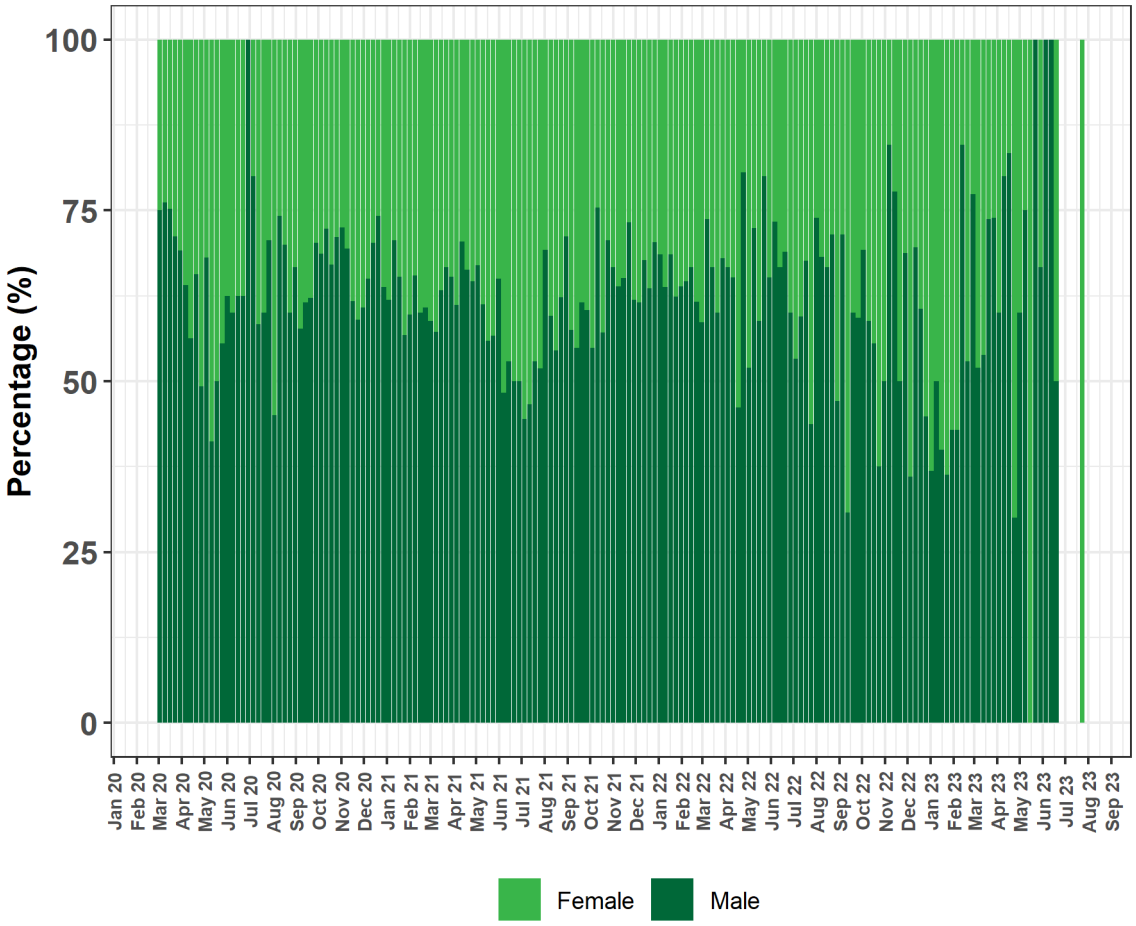


Figure 17: Distribution of age categories (ICU patients), per week.

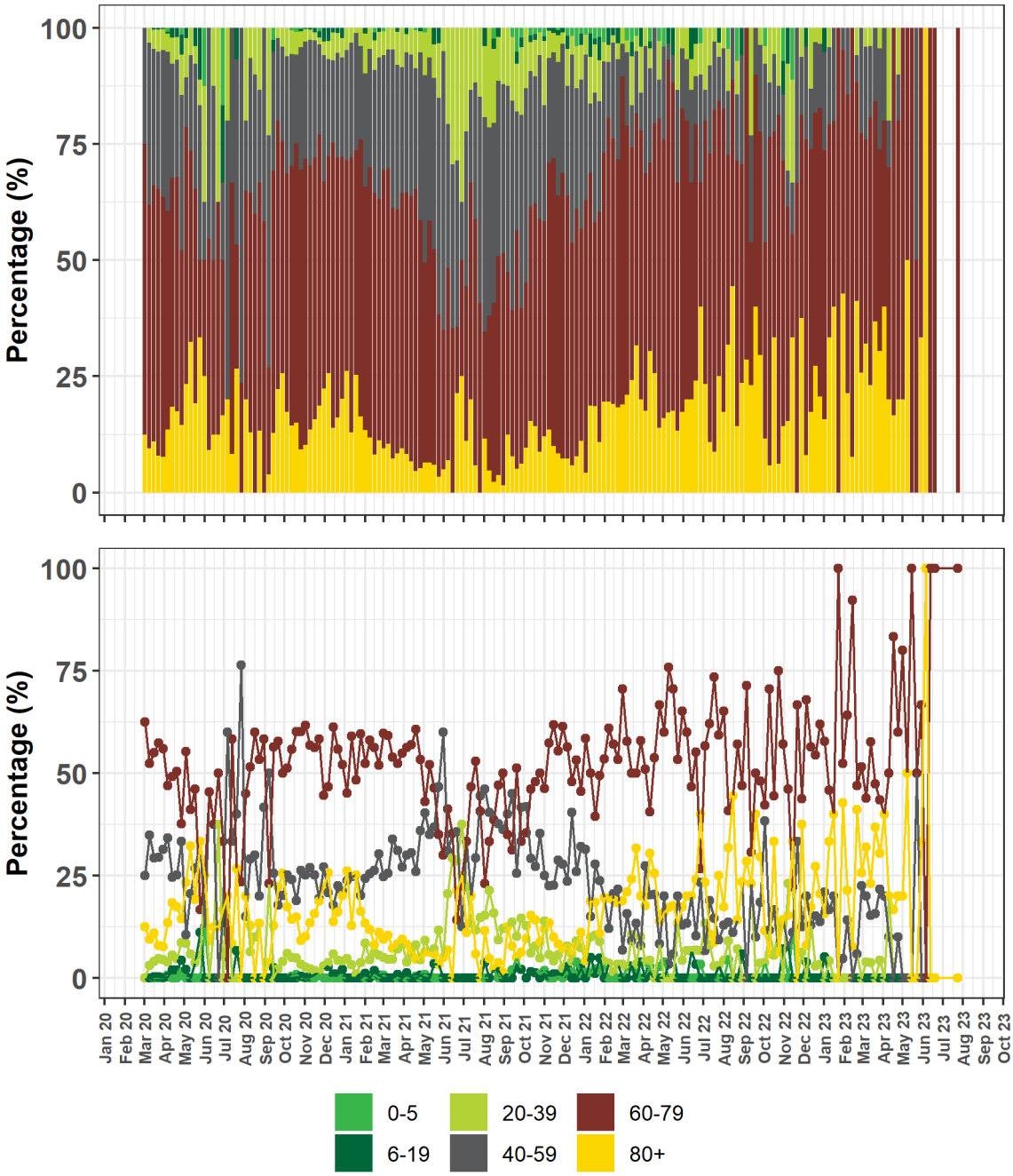


Figure 18: Comorbidities distribution (ICU patients), per month.

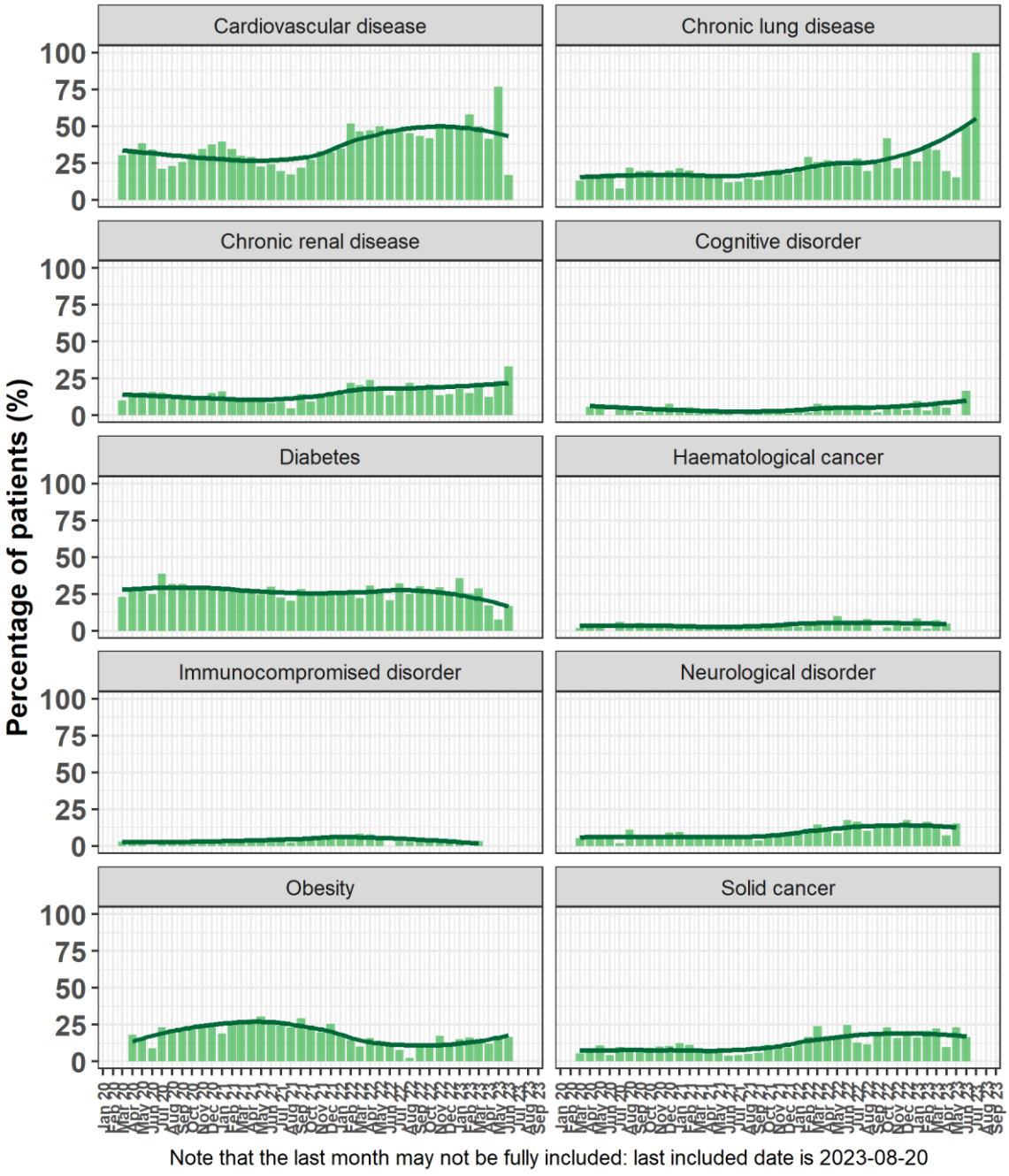
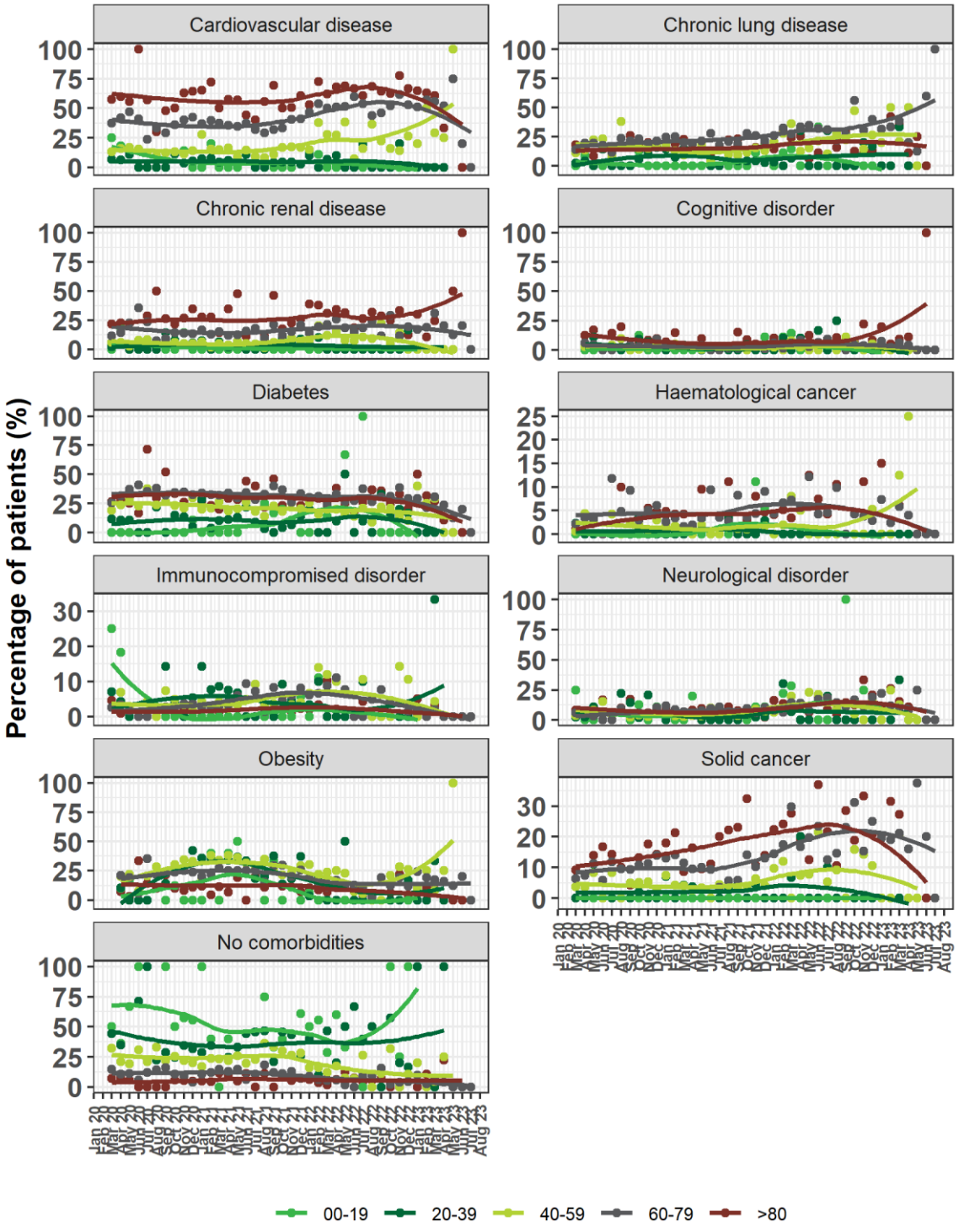
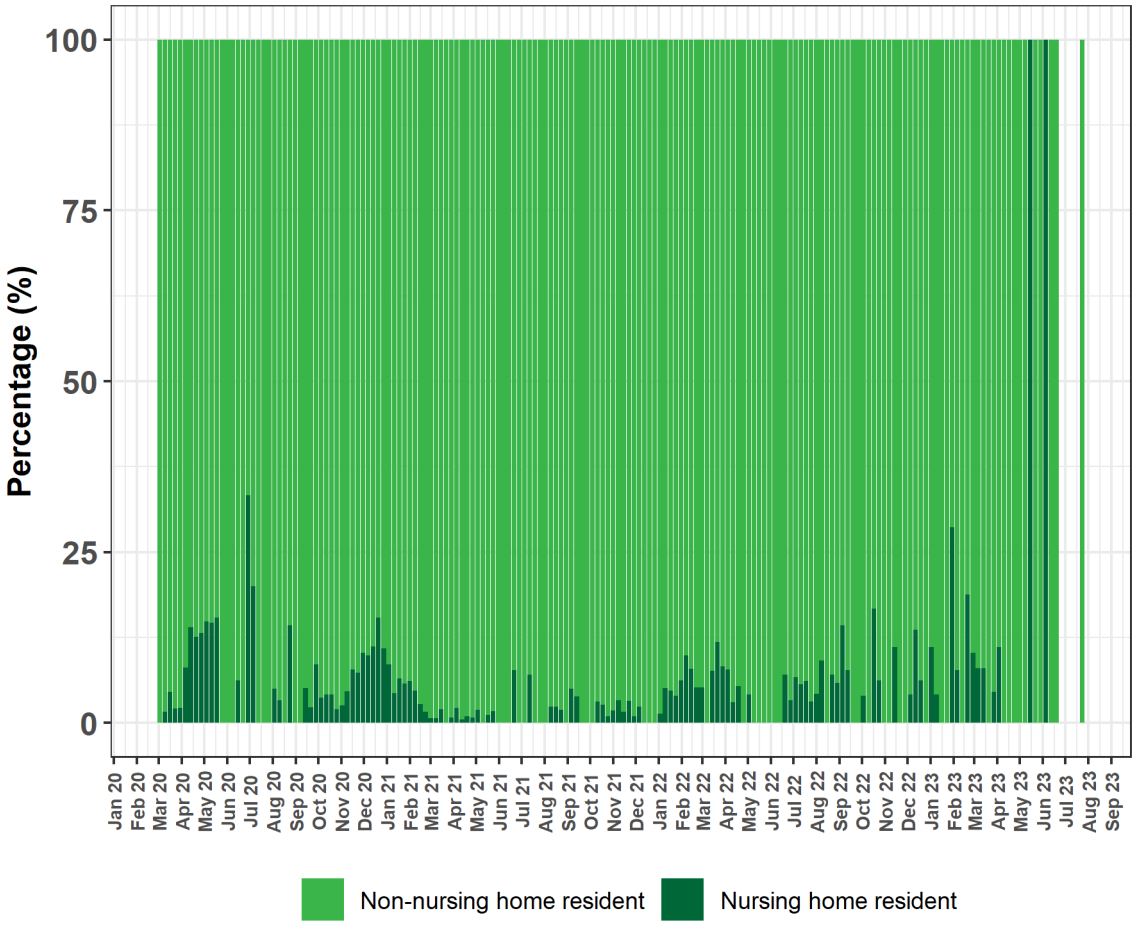


Figure 19: Comorbidities distribution (ICU patients), per age group, per month.



Note that the last month may not be fully included: last included date is 2023-08-20

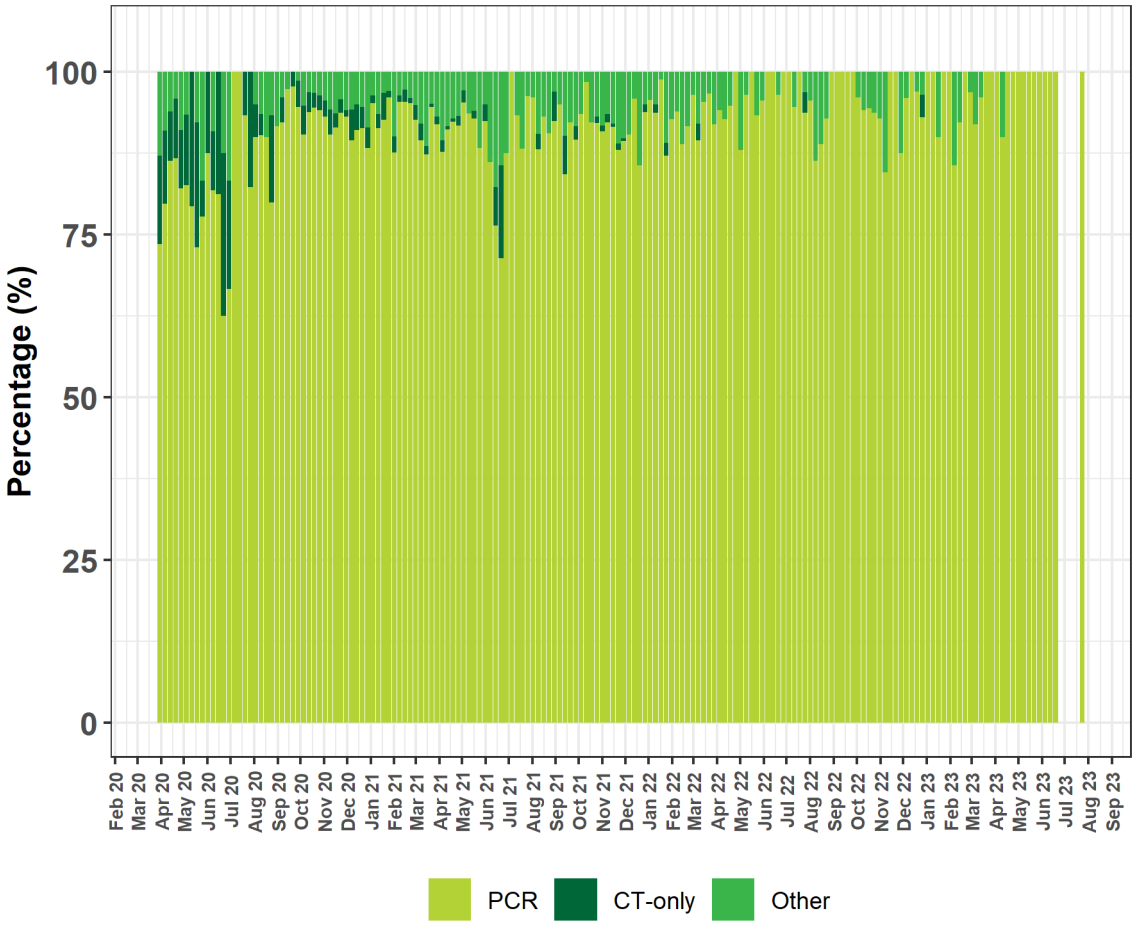
Figure 20: Distribution of nursing home vs non-nursing home residents (ICU patients), per week.



3.3. PROFILE OF ICU PATIENTS

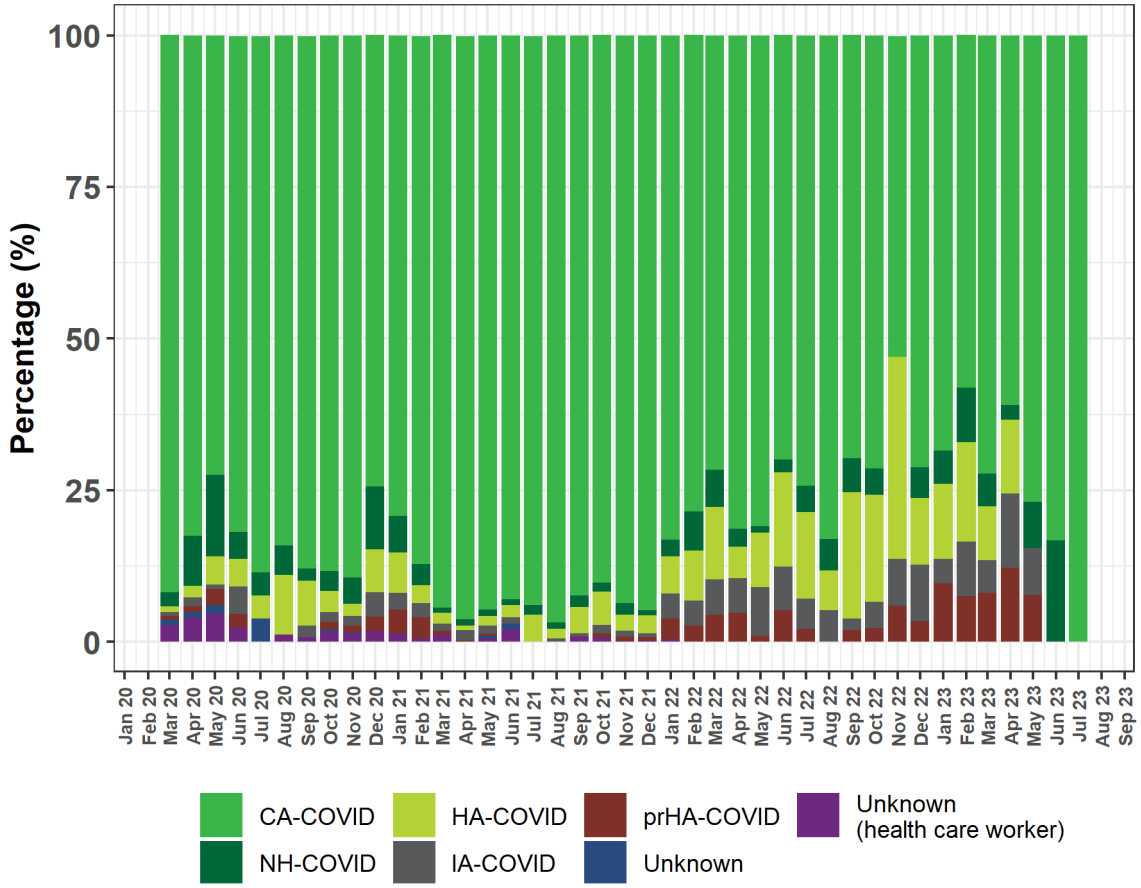
ICU patient profile per vaccination status i.e. the figure on breakthrough cases in the ICU was omitted from this report. Information on the impact of vaccination has been centralized in section 3.4 Vaccination of the COVID-19 weekly report (In Dutch: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_Weekly_report_NL.pdf, in French: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_Weekly_report_FR.pdf). Here, a more stable estimate for vaccine effectiveness is reported in addition to vaccine coverage in Belgium. Please refer to sections 10.7 and 10.8 of the FAQ document to inquire about the methodology (In Dutch: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_FAQ_NL_final.pdf, in French: https://covid-19.sciensano.be/sites/default/files/Covid19/COVID-19_FAQ_FR_final.pdf).

Figure 21 : Method of COVID-19 diagnosis, per week.[6]



[6] PCR includes all patients that were diagnosed by PCR, CT-only includes patients that were only diagnosed with CT, and other includes patients diagnosed by rapid Ag test in combination with or without CT.

Figure 22: Distribution of healthcare-associated SARS-CoV-2 infections among ICU patients, per month.[7]



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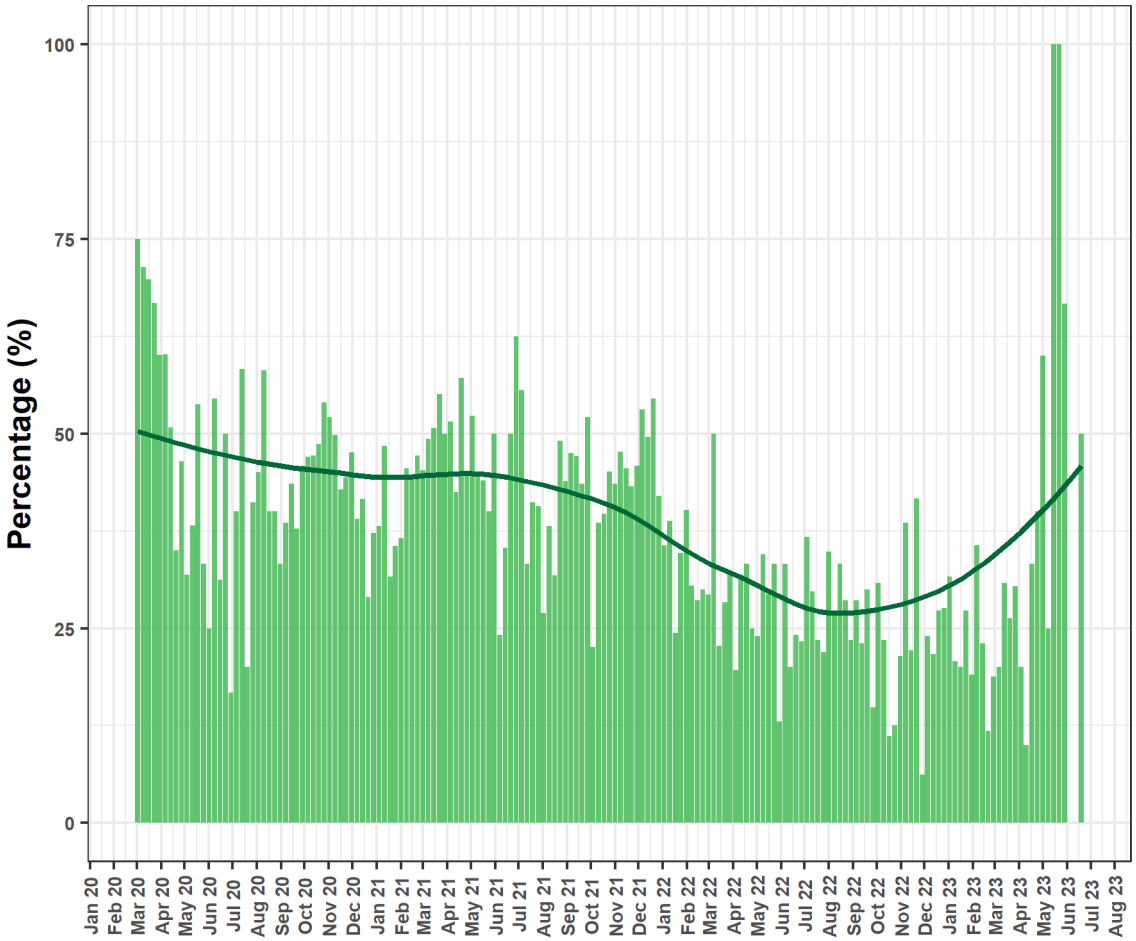
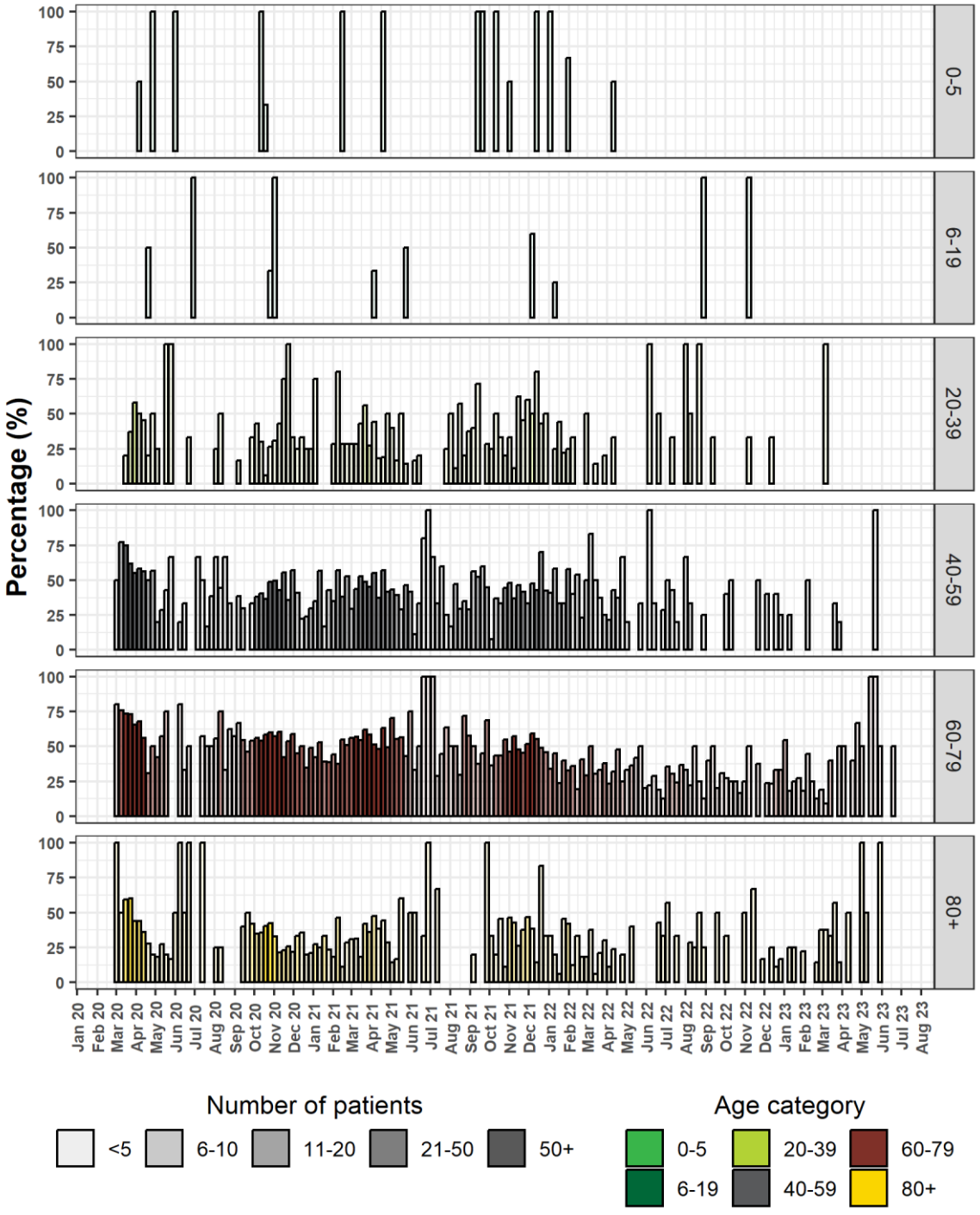
[7] The data collection of infections in health care workers has been discontinued since 14-11-2021. This explains the percentage of 0 for the 'Unknown (health care worker)' category since that time point.

Figure 23: Invasive ventilation among all ICU patients over time, per week



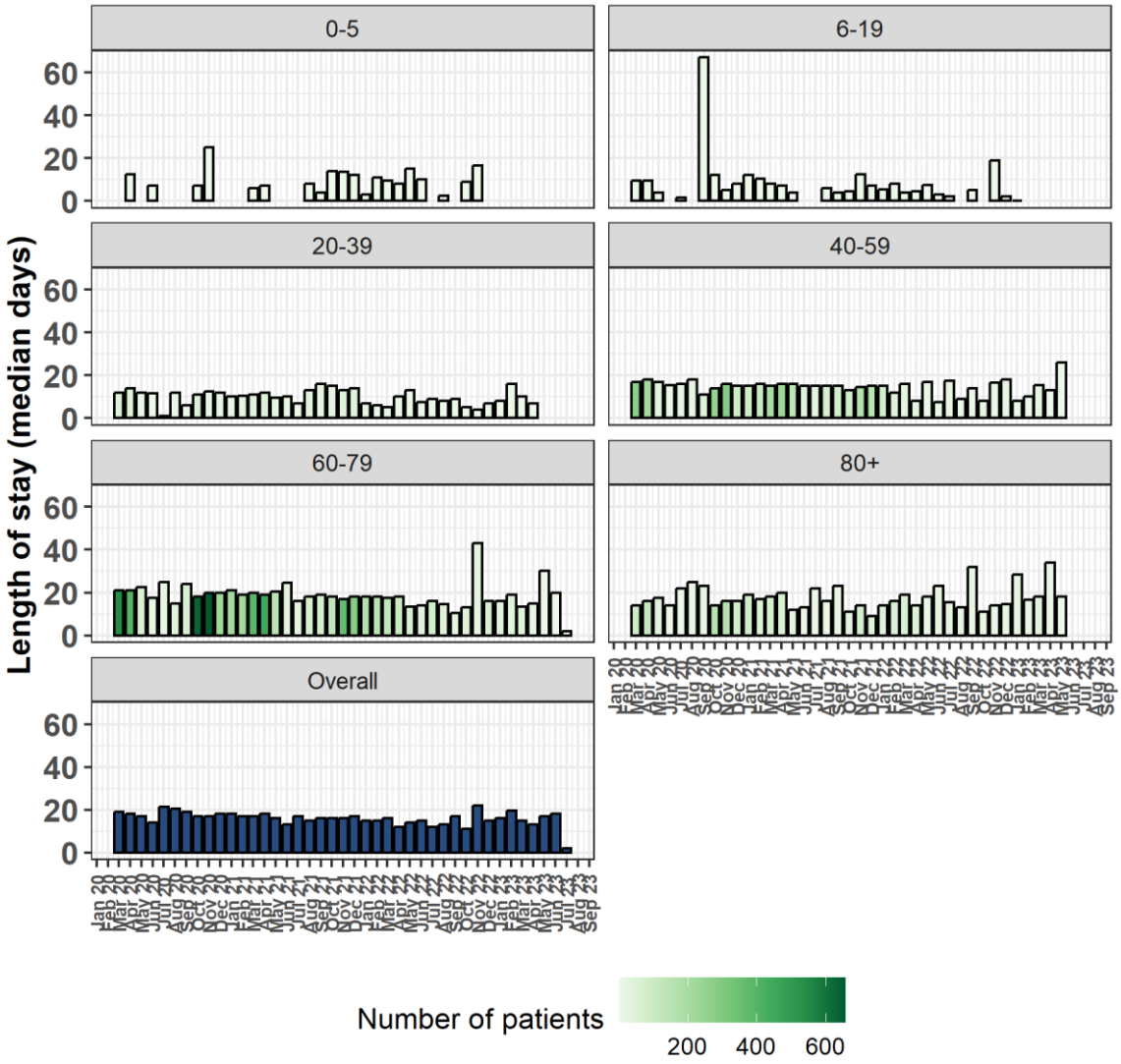
The most recent weeks are biased towards lower % invasive ventilation because these patients remain hospitalized longer compared to non-invasively ventilated patients, which means it takes longer for them to be registered in the surveillance.

Figure 24: Invasive ventilation among all ICU patients by age category over time.



The most recent weeks are biased towards lower % invasive ventilation because these patients remain hospitalized longer compared to non-invasively ventilated patients, which means it takes longer for them to be registered in the surveillance.

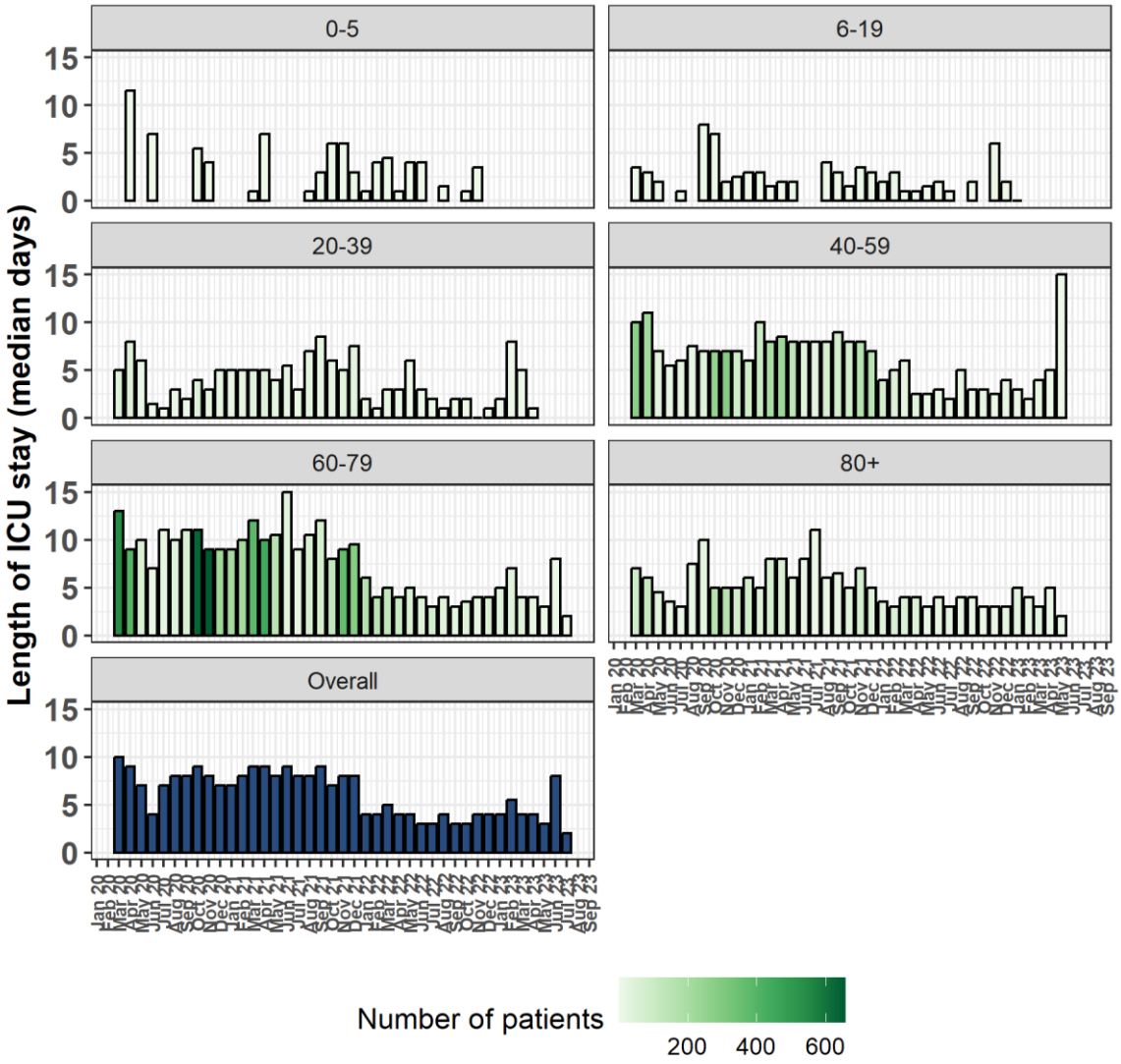
Figure 25: Length of total hospital stay among ICU-admitted patients, per month.



Note that the last month may not be fully included: last included date is 2023-08-20

The most recent weeks are biased towards shorter length of stay because patients that are discharged or die earlier are registered sooner in the surveillance.

Figure 26: Length of ICU stay among ICU-admitted patients, per month.



Note that the last month may not be fully included: last included date is 2023-08-20

The most recent weeks are biased towards shorter length of stay because patients that are discharged or die earlier, are registered sooner in the surveillance.

ACKNOWLEDGEMENTS

We sincerely thank all the health professionals for the registration of patient data, and we hope that this report will provide them with useful information for their work.

More information :

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https://covid-19.sciensano.be/

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