

GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

**Report
PROSAFE project**

Year 2020

National report for general ICUs (127 ICUs)

ITALY

PROSAFE project - National report for general ICUs (127 ICUs)

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use within the Intensive Care Units of the Local Health Authorities.

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The project

The PROSAFE project was conceived as an observational project for the continuous electronic collection of data on patients admitted to intensive care units (ICUs). The objectives of the project are to:

- standardize the procedures for collecting data on admitted patients;
- analyse the activity carried out in terms of both clinical results achieved and resources used;
- gather information on the collected case series for research and/or routine clinical management purposes;
- promote comparison among ICUs, on the basis of detailed epidemiological research work, with a view to improving the quality of the care provided.

In addition to these general objectives, the PROSAFE project provides a tool that serves as the operating base for all research projects undertaken by the individual ICUs, both under the umbrella of the GiViTI group and at local level. The PROSAFE program, by virtue of its modular structure, is designed to smoothly integrate the collection of basic data (the PROSAFE 'core') with the collection of specific data for research projects focused on various different topics (the PROSAFE 'petals').

The Petals functioning in 2020 in Italy were:

- the Infections Surveillance Petal, designed to describe the epidemiology of infections in ICUs in Italy, focusing specifically on the identification and study of the main risk and prognostic factors for infections, with a view to comparing the various ICUs in terms of incidence of infections and their severity, prevalent bacterial flora and multiresistant germs;
- the Infections Light Petal, which aim is the description of the epidemiology of infections in ICUs, in order to allow a comparison between the different departments (in terms of incidence/severity/resistance of infections);
- the Full Infections Petal, aiming at the study of the severity of the infections and the use of antibiotics;
- the Colonisation Petal, designed to collect detailed information on active surveillance cultures in individual ICUs and the isolated germs;
- the MUSE Petal, that collects clinical and epidemiological data on patients colonised and/or infected by CRE (carbapenem-resistant Enterobacterales);
- the Cardiosurgical Petal, whose aim is to describe in detail the characteristics of patients admitted to the ICU and subject to cardiosurgical procedures;
- the StART Petal, whose objective is to assess the appropriateness of ICU bed utilization by comparing the level of care required by admitted patients with the level of care that can be provided using available resources;
- the CReACTIVE (Collaborative REsearch on ACute Traumatic brain Injury in intensiVe care medicine in Europe) and CAF (Creactive Ambulatory Follow-up) Petals, that aim to collect relevant information to better characterize patients admitted to the ICU for a traumatic brain injury (european collaborative project FP7-HEALTH-2013-INNOVATION-1);
- the BIO-AX-TBI Petal, whose aim is to identify biological and imaging biomarkers that best characterize axonal injury in traumatic brain injury;
- the Liver Transplantation Petal, a specialist petal containing variables on the perioperative period, early outcomes and one-year survival in patients who have undergone liver transplantation.

The information currently collected in the program 'core' refers to personal patient data, information on origin, reason for admission and whatever else GiViTI has, over the years, determined to be needed to best describe patients admitted to intensive care.

Data collection

The PROSAFE software is distributed free of charge to all ICUs taking part in the project. To date 252 ICUs collected data during 2020, 238 Italian and 14 foreign ICUs, for a total of 76343 patients registered in PROSAFE. Only the ICUs that collected valid data (0) for a period of over 4 months were included in the aggregate analyses. On the whole, therefore, the assessment was based on a total of 0 patients admitted to intensive care during 2020.

The reports

The Coordinating Centre (GiViTI) produces the following reports (only for subgroups composed of at least 5 ICUs):

1. The (Italian) national report on the general (medical/surgical) ICUs. This first report includes the logistic regression model to assess performance in the various ICUs taking part in the project. The statistics for the most representative regions can be downloaded from the GiViTI website (www.giviti.marionegri.it).
2. The (Italian) national report on the surgical ICUs.
3. The personalized report for each individual centre, in Italian or English, which has different sections according to type of ICU and a similar structure to the national report, is designed to foster precise but user-friendly interpretation of the various values for predicting hospital mortality.

All reports (except for the personalized reports, sent to the project Contact person and the Director of the ICU) can be downloaded from the PROSAFE Project section of the GiViTI website (www.giviti.marionegri.it). The participating ICUs can access an online tool, the Analyzer (<http://givitiweb.marionegri.it/Analyzer/>), to perform analyses both on their own data and on the whole national dataset.

Description of the statistics

Project participation and location of Italian participating ICUs

The table on page 17 summarizes the participation in the project of the 0 ICUs which collected valid data in 2020 for a period of at least 4 months.

The map on page 19 shows the geographical location of the Italian ICUs assessed in the report.

Description of the hospitals and ICUs

This section presents the organizational-structural features of the ICUs included in the report. The information (except for the information shown on page ??, which is the result of joint analysis of structural data and those collected during the year via the software) is taken from the 'Structural Data' form (available on the GiViTI portal at <https://givitiweb.marionegri.it/>). Absolute numbers, percentages and the number of missing data are reported for the categorical variables; the mean, standard deviation, median and Q1 (first quartile: the value below which lie 25% of the population) and Q3 (third quartile: the value below which lie 75% of the population) serve as indicators for the continuous variables. Below are a few tips on how to correctly interpret the statistics.

Number of accredited beds Number of beds officially accredited.

Number of available beds Number of beds actually available in ICU. This number is the sum of the beds declared in each single room ('Structural Data' form, section 'Icu rooms'). This number is used for computing utilization indicators.

ICU Structure We define as 'OPEN-SPACE' a ward where each room can be 'monitored' from any other. A room can be 'monitored' from another room when all the beds located in the other room can be visually and instrumentally controlled.

Available beds per physician (average) e Available beds per nurse (average) The mean is computed taking into account the differences between daily shifts of personnel.

Indicators of utilization Data on the number of available beds, total admissions in 2020 and ICU stay days were used to calculate indicators of utilization, i.e. indicators able to measure utilization levels and healthcare facility activity levels.

- The bed **occupation rate** expresses bed occupancy as a percentage value, by dividing total ICU stay days recorded at a given time by the total number of days in the period in question multiplied by the number of staffed beds. The product corresponds to the ICU's total availability for admissions (daily number of available beds); the closer total ICU stay days are to total availability, the more the occupation rate tends towards 100%. Occupation rate can even exceed 100% when a new patient is admitted to a bed that became vacant on the same day.

$$\text{Occupation rate} = \frac{\text{ICU stay days}}{\text{Days} \times \text{Number of beds}} \quad (1)$$

- The **rotation index** expresses the mean number of patients 'staying' in a bed in one year. It is calculated by dividing the number of admissions by the number of beds. Data collected for less than one year have to be extrapolated.

$$\text{Rotation index} = \frac{\text{Number of patients}}{\text{Number of beds}} \quad (2)$$

- The **turnover interval** expresses the period of time in which a bed remains vacant between two consecutive patients. It is calculated by dividing the number of days with vacant beds by the number of patients admitted during the period in question, giving mean unoccupied time per bed. It is calculated by dividing the number of days with unoccupied beds by the number of patients admitted in the period in question. This gives the mean unoccupied time per bed. This indicator is expressed in hours.

$$\text{Turnover} = 24 \times \frac{(\text{Number of beds} \times \text{Days}) - \text{ICU stay days}}{\text{Number of patients}} \quad (3)$$

Occupied beds per physician (average) e Occupied beds per nurse (average) The mean is computed taking into account the differences between daily shifts of personnel. Daily occupied beds are considered in the calculations. This number is obtained by multiplying the average number of beds available per operator for the occupation rate (preliminarily divided by 100).

Study flow-chart

The flow chart, or tree diagram, on page 23 presents the various subgroups of analysed patients. PROSAFE has a very accurate indicator of the completeness and validity of the data entered on each patient, i.e. status.

The program envisages 5 status levels:

- status 1 - the patient record presents errors or unsolved warnings;
- status 2 - the record is incomplete, there are still missing data;
- status 3 - the patient has been discharged from the ICU, the clinical data are all entered and have undergone congruency checks; only hospital outcome is missing;
- status 4 - record complete and free of errors;
- status 5 - record free of errors but incomplete; the missing data are irretrievable.

Patients with status 1, 2 and 5 data are clearly incomplete.

It would be wrong to omit only patients with incomplete data (in status 1, 2 and 5) from the analyses since this could skew the estimates because of a so-called 'selection bias'. Patients with incomplete data may instead represent a special population subgroup. If only these patients were omitted from the analysed group, the statistics would no longer represent the whole group. It is plausible to assume, for example, that the majority of the patients for whom hospital outcome is missing were discharged alive from hospital, since it is much easier and quicker to retrieve information on hospital outcome when a patient has died. Calculating statistics on hospital mortality in the whole group of patients would result in mortality being incorrectly overestimated.

To address this problem it was decided to omit from each individual ICU's data any patients recruited during months when the validity percentages were below a high threshold (approximately 90%). Another check performed to reduce the risk of selection bias is to analyse the number of patients admitted per month. If the number of patients admitted in one or more months differs significantly from the mean number of monthly admissions (with a threshold arbitrarily set at a mean of ± 2 trimmed SD), or if the variability in the number of admissions is too high (variation coefficient above 40%), a warning message will appear asking for the entered data to be checked. To correctly participate in the PROSAFE project, all patients consecutively admitted to the ICU must be registered in the software on a continuous basis throughout the year; any marked swings in the number of admissions should suggest that there may be patient registration 'gaps'. It is, however, impossible to distinguish between registration 'gaps' and periods in which there is a real reduction/increase in admissions. Hence our objective is to draw attention to potential problems by asking each individual centre for feedback.

To more clearly illustrate the selection methods used in the choice of valid data, we present an extract from the data validity report of a randomly selected, anonymized ICU.

From January to December, Centre XX000 recruits a total of 619 patients. The first table and the bar graph show the number of monthly admissions to intensive care. In this case, a warning will appear at the bottom of the bar graph asking for confirmation of the entered data.

Centre XX000 - Year 2014

Data validity

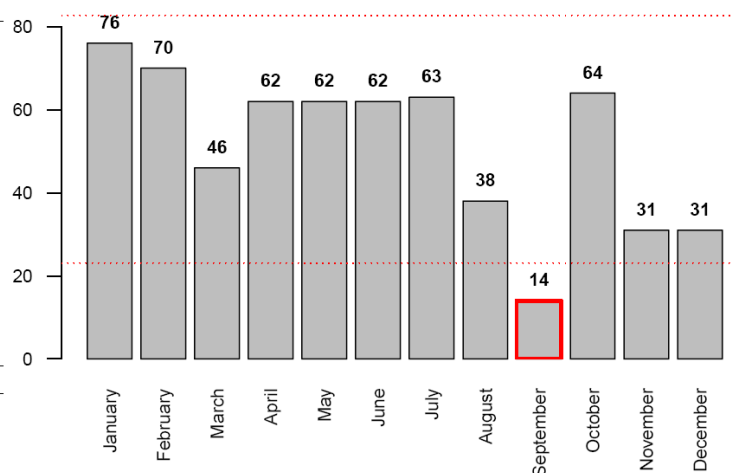
Patients admitted: 619

Admissions

Month	N	%
January	76	12.3
February	70	11.3
March	46	7.4
April	62	10.0
May	62	10.0
June	62	10.0
July	63	10.2
August	38	6.1
September	14	2.3
October	64	10.3
November	31	5.0
December	31	5.0

Admissions

Mean	51.6
Median	62.0
SD	19.1
VC	37.1



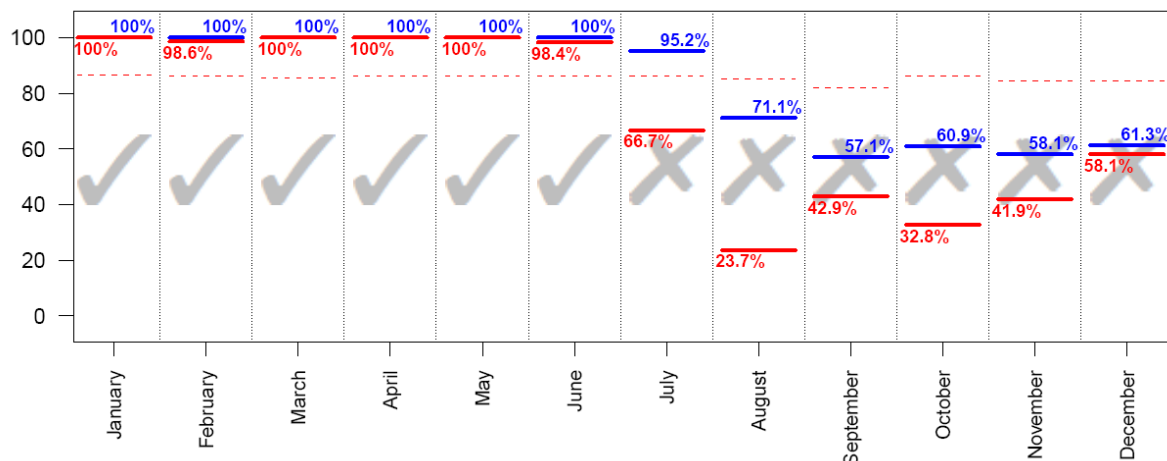
WARNING! The highlighted months have a number of patients quite different from the average. Please verify the correctness of the data and, particularly, that all consecutive patients have been registered in the Prosafe software.

The second table divides the recruited patients by admission month and form completion status. Overall, the ICU in question presents complete data for 485 patients. 134 patients still present incomplete data.

Status (N)								
Month	1	2	3	4	5	Total	% Pts. in status 3/4	% Pts. in status 4
January	0	0	0	76	0	76	100.0	100.0
February	0	0	1	69	0	70	100.0	98.6
March	0	0	0	46	0	46	100.0	100.0
April	0	0	0	62	0	62	100.0	100.0
May	0	0	0	62	0	62	100.0	100.0
June	0	0	1	61	0	62	100.0	98.4
July	0	3	18	42	0	63	95.2	66.7
August	0	11	18	9	0	38	71.1	23.7
September	0	6	2	6	0	14	57.1	42.9
October	4	21	18	21	0	64	60.9	32.8
November	0	13	5	13	0	31	58.1	41.9
December	0	12	1	18	0	31	61.3	58.1
Total	4	66	64	485	0	619	88.7	78.4

The final graph shows level of data completeness in the various months. Percentages of patients with records in status 3 or 4 and in status 4 are shown in blue and red respectively.

According to our elimination criterion, the overall analysis will exclude those patients admitted in the months of August, September, October, November and December since they present a validity percentage below the defined threshold (dashed line). Accordingly, 441 patients have valid data for the analysis. Regarding analysis of hospital mortality, patients admitted in July will also be excluded (in that month the % of patients with record not in status 4 is still too high). Hence, the analysis on hospital outcome will involve 378 patients on 619 admitted.



Patients admitted in months with % of patients in status 3 or 4 over the threshold (drawn in the graph with a dashed line): **441**; patients in status 4: **378**.

Description of patients

These sections of the report present the results of the analyses conducted on the group of patients with valid data. Patients admitted in the months with This part presents patient characteristics at ICU admission and during ICU stay, severity scores, process indicators, and outcomes for the various patient subgroups.

Absolute number, percentage and number of missing data are reported for the categorical data, while mean, standard deviation, median, interquartile range (Q1-Q3) and minimum and maximum range are reported for continuous variables. The acronym 95% CI indicates the 95% confidence interval of the estimate.

Below are a few tips on how to correctly interpret the analyses.

BMI The calculation of Body Mass Index is based on weight and height values, with the following formula:

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2} \quad (4)$$

The categories of underweight, overweight and obese are determined according to the following criteria: underweight if $\text{BMI} < 20$ (males) or $\text{BMI} < 19$ (females); normal weight if $20 \leq \text{BMI} \leq 25$ (males) or $19 \leq \text{BMI} \leq 24$ (females); overweight if $25 < \text{BMI} \leq 30$ (males) or $24 < \text{BMI} \leq 29$ (females); obese if $\text{BMI} > 30$ (males) or $\text{BMI} > 29$ (females).

Stay before ICU Days spent between admission to hospital and admission to ICU.

Reason for transfer from other ICU The reported items refer to the following reasons:

- Specialist expertise -> specialist expertise within the hospital;
- Step-up care -> management of high complexity critical patient;
- Logistical/organizational reasons -> continuation of treatment in stabilized patient (transfer for logistic/ organizational reasons);
- Step-down care -> continuation of treatment in a non-specialist environment.

Surgical interventions on admission (top 10) This lists the top 10 surgical interventions, divided by elective surgery and emergency surgery patients, operated between 7 days prior to and one day after admission to the ICU. Each

single intervention (even more than one per patient) is counted.

Timing of surgical interventions on admission The timing of surgical interventions on admissions is specified. Each single intervention (even more than one per patient) is counted. It may happen that the percentages exceed the threshold of 100 % if patients underwent more than one intervention in the specified time periods.

Multiple trauma The category multiple trauma is defined by the presence of trauma in two or more regions.

SAPSII The score cannot be calculated if GCS (first 24 hours) is unassessable.

The SAPSII score for individual patients can become the probability of dying in hospital. This is performed by the following formula:

$$\text{Predicted hospital mortality} = \frac{e^{\text{Logit}}}{1 + e^{\text{Logit}}} \quad (5)$$

where

$$\text{Logit} = -7.763 + 0.074 \times \text{SAPSII} + 0.997 \times \ln(\text{SAPSII} + 1) \quad (6)$$

PELOD The PELOD score for individual pediatric patients can become the probability of dying in ICU. This is performed by the following formula:

$$\text{Predicted ICU mortality} = \frac{1}{1 + e^{7.64 - 0.30 \times \text{PELOD}}} \quad (7)$$

PIM 2/PIM 3 The PIM score for individual pediatric patients can become the probability of dying in ICU. This is performed by the following formula:

$$\text{Predicted ICU mortality} = \frac{e^{\text{PIM}}}{1 + e^{\text{PIM}}} \quad (8)$$

Severity evolution (of infections) The severity of infection on admission is shown in the rows. Maximum severity reached during ICU stay is indicated in the columns. The table reports the absolute numbers and row percentages by which to assess the evolution of infection severity. For example, in the case below, the severity of the infection did not worsen during ICU stay in 15 out of the 17 patients admitted with SEPSIS (15/17=88.2%). Conversely, the condition of SEPSIS developed into SEPTIC SHOCK in 2 patients (2/17=11.8%).

Severity evolution		During the stay				
		N (R %)	None	Infection without SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	173 (93.0%)	9 (4.8%)	1 (0.5%)	3 (1.6%)	186
	Infection without SEPSIS	-	19 (95.0%)	0 (0.0%)	1 (5.0%)	20
	SEPSIS	-	-	15 (88.2%)	2 (11.8%)	17
	SEPTIC SHOCK	-	-	-	36 (100.0%)	36
	TOT	173	28	16	42	259

VAP Forms of pneumonia associated with invasive ventilation are defined as VAP (pneumonia onsetting after the 2nd day of ventilation and developing within 2 days of the end of ventilation).

Incidence of VAP Two different incidence rates are presented:

$$\text{Incidence of VAP} = \frac{\text{Number of patients with VAP during stay}}{\text{Mechanical ventilation days pre VAP}} \times 1000 \quad (9)$$

where the variable *mechanical ventilation days pre-VAP* corresponds to the total number of mechanical ventilation days pre-VAP of all patients admitted to the ICU. It is equal to the total duration of mechanical ventilation for patients who do not develop VAP and to the difference between the date of onset of VAP and the start date of mechanical ventilation for infected patients. The mechanical ventilation days in patients who were discharged or died within 2 days of the start of ventilation are excluded from the denominator.

$$\text{Incidence of VAP} = \frac{\text{Number of patients with VAP during stay}}{(\text{Mechanical ventilation days pre VAP})/8} \times 100 \quad (10)$$

The second rate is only a reworking of the previous one, to simplify interpretation of the data. It answers the question: 'Out of 100 patients ventilated for 8 days in the ICU, how many develop VAP?'. The 8-day cut off has been set by convention. The rates are accompanied by 95% confidence intervals.

Incidence of CR-BSI Just like VAP, two incidence rates are presented for catheter-related blood stream infections:

$$\text{Incidence of CRBSI} = \frac{\text{Number of patients with CRBSI during stay}}{\text{CVC days pre CRBSI}} \times 1000 \quad (11)$$

$$\text{Incidence of CRBSI} = \frac{\text{Number of patients with CRBSI during stay}}{(\text{CVC days pre CRBSI})/12} \times 100 \quad (12)$$

The second one responds to the question 'Out of 100 theoretical patients catheterized for 12 days in the ICU, how many will develop catheter-related blood stream infections?'.

Invasive ventilation (approach) The reported items refer to the following scenarios:

- Due to pulmonary failure -> invasive ventilation in a patient with hypoxic and/or hypercapnic respiratory failure;
- For airway maintenance -> invasive ventilation in a patient without respiratory failure, to support airways (e.g. coma patient);
- In weaning -> final part of invasive ventilation in a patient admitted for weaning from ventilation.

Non invasive ventilation (approach) The reported items refer to the following scenarios:

- Non invasive ventilation only -> non-invasive ventilation as the only ventilatory approach to the patient;
- Non invasive ventilation failed -> non-invasive ventilation immediately followed by patient intubation;
- For weaning -> non-invasive ventilation started within one day of the end of invasive ventilation.

Surgical interventions during stay (top 10) The surgical interventions performed from the second day of stay.

Reason of transfer to other ICU See the item 'Reason of transfer from other ICU'.

Hospital mortality Statistics on hospital outcome (indicated with an asterisk, where necessary) involve the subgroup of patients with valid data for this variable or patients admitted during the months when over a defined % of patients were in status 4, after excluding readmissions from another hospital ward.

Last hospital mortality For patients transferred to other ICU or to rehabilitation/high dependency care unit in other hospital, is the outcome at the last hospital discharge.

Readmissions Only readmissions from other hospital wards are considered.






ICU stay (days) Length of pre-ICU, post-ICU and hospital stay are simply calculated as the difference between dates. Calculation of ICU stay can be optimized by using time of patient admission and discharge. The difference between the discharge date and the admission date is calculated. 1 is added if the patient is admitted before 12:00 and discharged after this time. Conversely, 1 is subtracted if the patient is admitted after midday and discharged before midday. If the length of stay in the ICU is equal to 0, length of stay is entered as 1.

Analysis of mortality: This section presents indicators or graphs useful for a detailed analysis of mortality. The diagram lists the reference models used for the calculation of expected mortality according to the type of patients evaluated. All the predictive models involve the subgroup of patients admitted during the months when over a defined % of patients were in status 4. Analyses involving adult patients exclude cardiac surgery patients, patients admitted for diagnosis of death/organ donation and readmissions.

Patients	Model	Mortality
Adults non CS - NON-COVID	GiViTI 2019	Last hospital mortality
Adults non CS - COVID	GiViTI 2020 COVID	Last hospital mortality
Pediatric	PIM 2	ICU mortality
	PIM 3	ICU mortality
	PELOD	ICU mortality

Analysis of mortality: forest plot The graph shows the various O/E scores of the ICUs involved in the project. The O/E score is given by the ratio between the total number of observed deaths and the total number of expected deaths (according to the indicated reference model). The dotted line, in correspondence to the value of 1, separates the ICUs with lower or higher mortality than predicted by the model. Each estimate is accompanied by a 95% confidence interval.

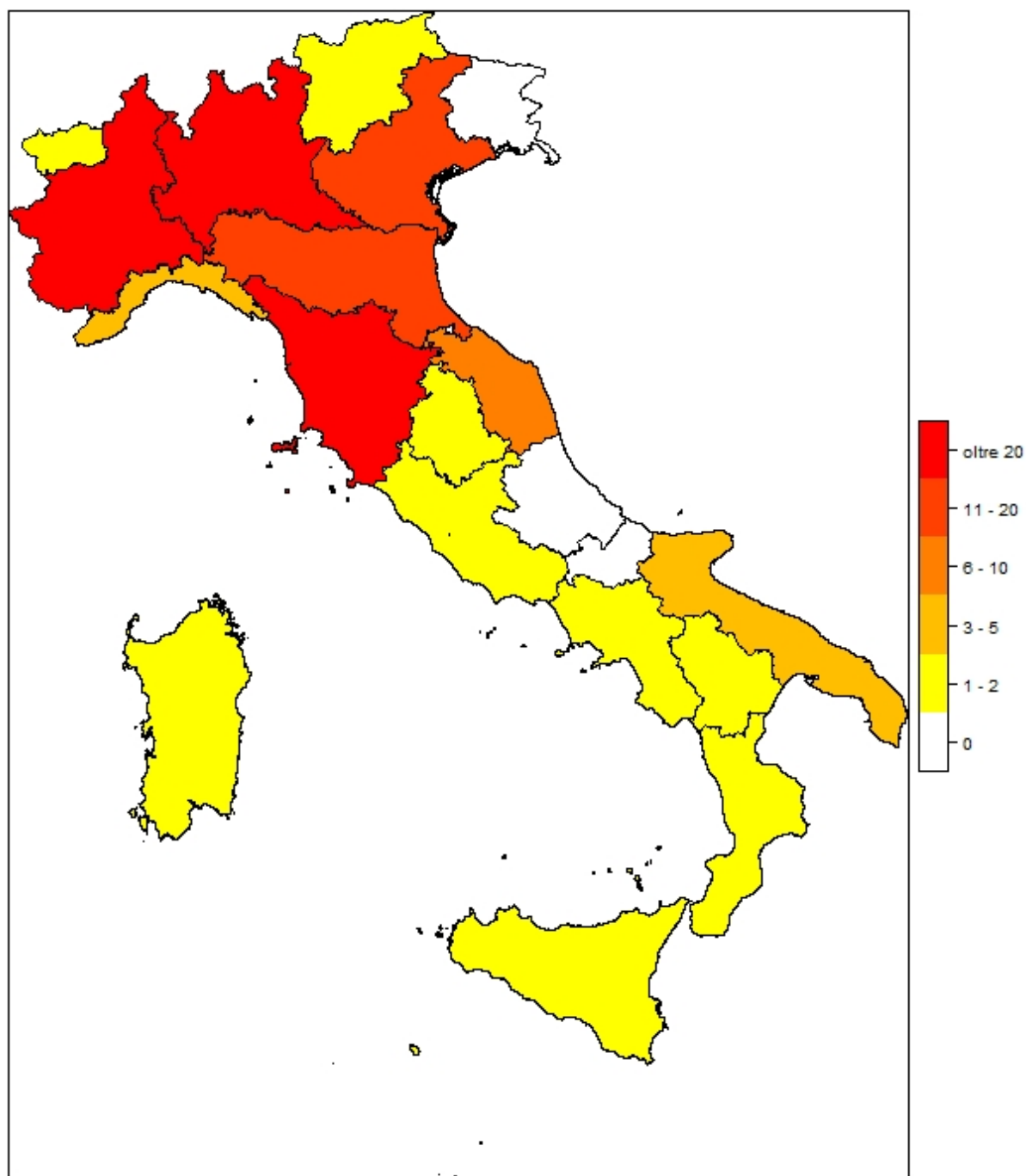
Statistics

Nation	TYPE							Total
	General	Cardiosurgical	Surgical	Neurosurgical	Pediatrics	HDC	Other	
 Greece	1 ICU 435 patients							1 ICU 435 patients
 Hungary				1 ICU 347 patients				1 ICU 347 patients
 Israel					1 ICU 643 patients			1 ICU 643 patients
 Italy	127 ICU 43597 patients	13 ICU 7263 patients	6 ICU 2893 patients	4 ICU 1853 patients	3 ICU 1096 patients	3 ICU 995 patients	10 ICU 4034 patients	166 ICU 61731 patients
 Slovenia	1 ICU 336 patients		4 ICU 1062 patients					5 ICU 1398 patients
Total	129 ICU 44368 patients	13 ICU 7263 patients	10 ICU 3955 patients	5 ICU 2200 patients	4 ICU 1739 patients	3 ICU 995 patients	10 ICU 4034 patients	174 ICU 64554 patients

* Are considered as adhering the ICUs with at least 4 months of valid compilation.

Location of Italian participating ICUs (N=127)

ICUs per region



Region	N	%
Abruzzo	0	0
Basilicata	1	0.8
Calabria	1	0.8
Campania	2	1.6
Emilia Romagna	15	11.8
Friuli Venezia Giulia	0	0
Lazio	1	0.8
Liguria	4	3.1
Lombardia	33	26
Marche	7	5.5
Molise	0	0
Piemonte	21	16.5
Puglia	3	2.4
Sardegna	1	0.8
Sicilia	2	1.6

Region	N	%
Toscana	21	16.5
Trentino Alto Adige	1	0.8
Umbria	1	0.8
Valle d'Aosta	1	0.8
Veneto	12	9.4

Geographical area	N	%
Northern Italy	87	68.5
Central Italy	30	23.6
Southern Italy	10	7.9

Description of hospitals (N=127) - Year 2020

Number of beds in hospital	N	%
< 300 beds	52	45.2
300 - 800 beds	52	45.2
> 800 beds	11	9.6
Missing	12	

Type of ICUs present in hospital	N	%
General	116	91.3
Medical	1	0.8
Surgical	3	2.4
Neurological/neurosurgical	9	7.1
Cardiosurgical	22	17.3
Burns	7	5.5
Post-transplantations	4	3.1
Other	35	27.6

Type of subICUs present in hospital	N	%
General	21	16.5
Surgical	5	3.9
Cardiological	83	65.4
Respiratory	21	16.5
Neurological (stroke unit)	49	38.6
Other	14	11.0

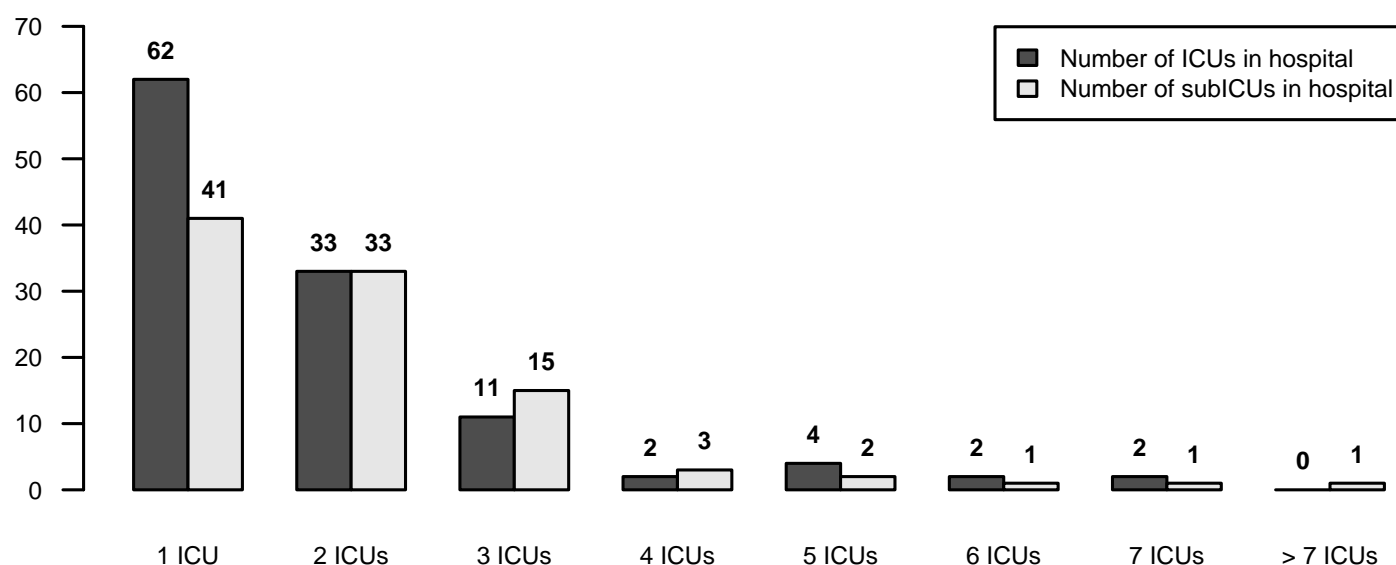
Non surgical specialties	N	%
Cardiology	111	95.7
Pulmonology	60	51.7
Nephrology	95	81.9
Infection disease	42	36.2
Pediatric	91	78.4
Neonatology	64	55.2
Neurology	84	72.4
Haematology	47	40.5
Emergency room	115	99.1
Traumatology	81	69.8
Emergency medical	70	60.3

Surgical specialties (independent ward)	N	%
Neurosurgery	35	27.6
Cardiosurgery	24	18.9
Major vascular surgery	51	40.2
Thoracic surgery	35	27.6
Pediatric surgery	21	16.5
Transplantation activities	12	9.4

Surgical specialties (procedures only)	N	%
Neurosurgery	6	4.7
Cardiosurgery	2	1.6
Major vascular surgery	20	15.7
Thoracic surgery	29	22.8
Pediatric surgery	24	18.9
Transplantation activities	14	11.0

Services/activities available in H (h24)	N	%
Neuroradiology	45	35.4
Interventional neuroradiology	31	24.4
Interventional vascular radiology	42	33.1
CT scan	116	91.3
MRI	59	46.5
Interventional hemodynamic	72	56.7
Endoscopy	77	60.6
Bronchoscopy	48	37.8
Hyperbaric chamber	10	7.9

Services/activities available in H (rep.)	N	%
Neuroradiology	13	10.2
Interventional neuroradiology	5	3.9
Interventional vascular radiology	25	19.7
CT scan	0	0.0
MRI	45	35.4
Interventional hemodynamic	5	3.9
Endoscopy	39	30.7
Bronchoscopy	44	34.6
Hyperbaric chamber	0	0.0



Description of ICUs (N=127) - Year 2020

Number of activable beds		
Mean (SD)	10.0 (5.1)	
Median (Q1–Q3)	9 (6.5-12)	
Missing	12	

Number of beds declared to hospital		
Mean (SD)	17.2 (49.9)	
Median (Q1–Q3)	8 (6-12)	
Missing	11	

University affiliation	N	%
Yes	40	34.5
No	76	65.5
Missing	11	

Square meter per bed		
Mean (SD)	15.9 (22.9)	
Median (Q1–Q3)	12 (10-17.7)	
Missing	12	

Clinical psychologist	N	%
No	85	73.3
For relatives	30	25.9
For patients	25	21.6
For personnel	19	16.4

ICU Structure	N	%
NON OPEN-SPACE	63	54.3
OPEN-SPACE (or alike)	53	45.7
Missing	11	

Physicians	N	%
Dedicated to ICU only	18	15.5
Dedicated to ICU on a rotation basis	19	16.4
Dedicated to ICU only and on a rotation basis	79	68.1
Missing	11	

Declared beds per physician (average)		
Mean (SD)	10.8 (37.1)	
Median (Q1–Q3)	4.8 (3.8-6)	
Missing	11	

Nurses	N	%
Dedicated to ICU only	69	59.5
Dedicated to ICU on a rotation basis	5	4.3
Dedicated to ICU only and on a rotation basis	42	36.2
Missing	11	

Declared beds per nurse (average)		
Mean (SD)	4.2 (12.9)	
Median (Q1–Q3)	2.1 (2-2.4)	
Missing	12	

Number of hours conceded for relatives' visits	N	%
0-1	21	18.3
2	15	13.0
3-4	15	13.0
5-12	57	49.6
13-20	2	1.7
>20	5	4.3
Missing	12	

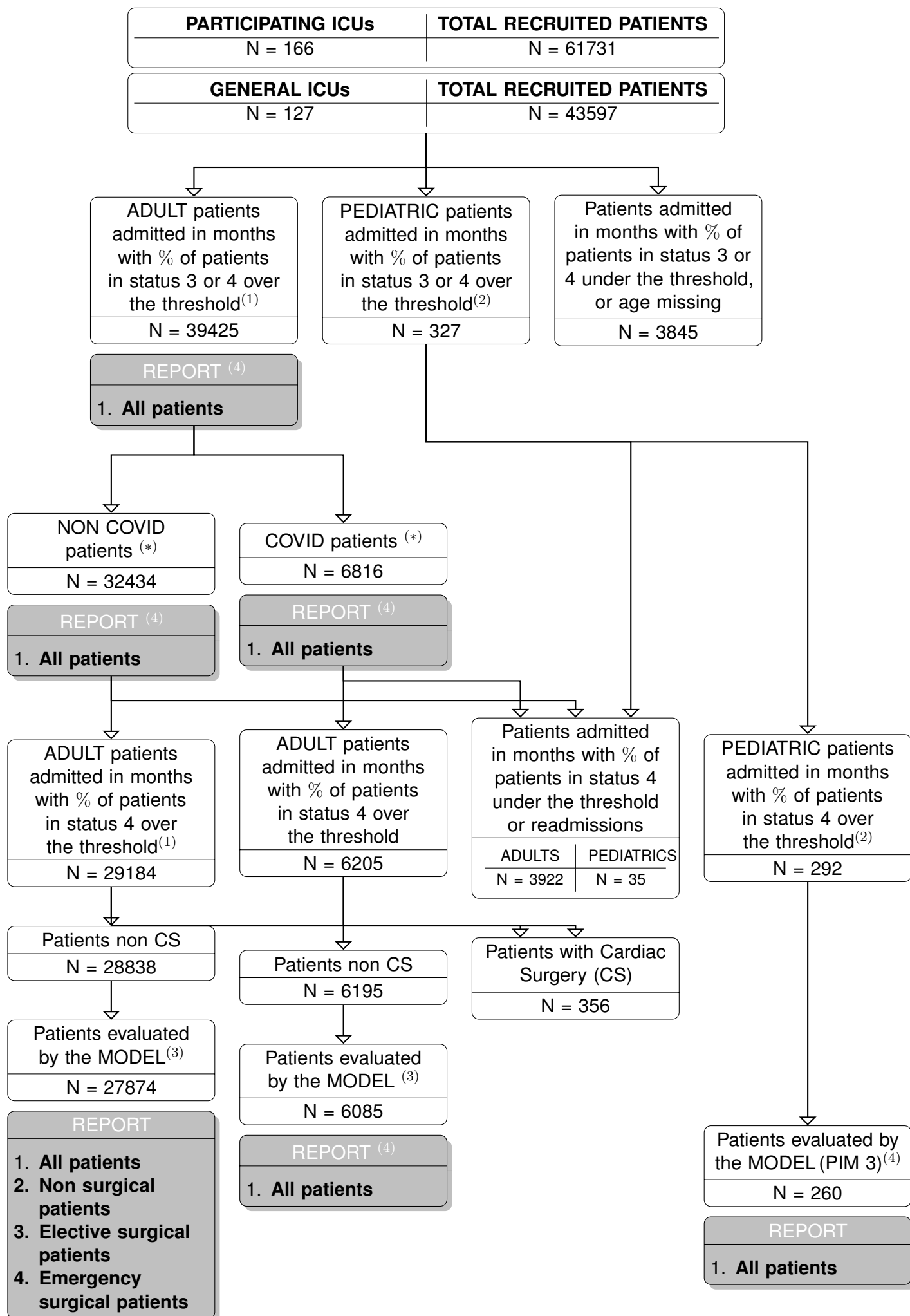
Maximum number of visitors per patient	N	%
One	62	53.9
Two	49	42.6
Three or more	4	3.5
Missing	12	

Biomedical devices per declared bed	Median	Q1-Q3	<5 Years (mean %)
Total available monitors (excluding those dedicated to transport)	1.1	1.0–1.3	65.1
of which only for basic monitoring (without transducers detection of invasive pressure, pic, pvc, ...)	0.0	0.0–0.0	76.2
Invasive monitoring of cardiac output (Swan-Ganz)	0.1	0.0–0.4	72.6
Invasive monitoring of cardiac output (PiCCO)	0.2	0.1–0.2	82.0
Invasive monitoring of cardiac output (Vigileo)	0.1	0.0–0.2	75.5
Non-invasive monitoring of cardiac output (impedentiometry)	0.0	0.0–0.0	88.9
Defibrillators	0.2	0.2–0.3	72.7
Both invasive and non invasive ventilators	1.2	1.0–1.4	74.7
Non invasive ventilators	0.0	0.0–0.3	70.3
Syringe pumps	4.4	3.1–6.2	77.2
Peristaltic pumps	2.0	1.3–2.8	80.3

Biomedical equipment in ICU	N	%
Transoesophageal echo	49	42.6
Basic ultrasounds	114	99.1
Advanced ultrasounds	103	89.6
Blood-gas analyzer	115	100.0
Haemodialysis - Haemofiltration	104	90.4
Transport ventilator	112	97.4
Fiberscope	115	100.0
Extracorporeal circulation system	22	19.1

Routine microbiological surveillance cultures	N	%
Yes	110	95.7
No	5	4.3
Missing	12	

National report for general ICUs (127 ICUs) - Year 2020
Study flow-chart



- (1) *Patients older than 17 years are considered ADULT patients.*
- (2) *Patients under 17 years of age are considered PEDIATRIC patients.*
- (3) *Patients evaluated by the GiViTI model of hospital mortality are those with all the variables of the model completed, including the hospital outcome. Patients admitted for diagnosis of death/organ donation and readmissions are excluded.*
- (4) *Statistics produced for groups with more than 20 patients (bold).*
- (5) *Patients transferred to other ICU are excluded.*
- (*) *Sono esclusi dall'analisi tutti i pazienti per cui le informazioni relative al COVID sono assenti.*

National report for general ICUs - Year 2020

Characteristics on admission - Adult patients

Patients (N): 39425

Sex	N	%
Male	24639	62.8
Female	14623	37.2
Missing	163	

Age (years)	N	%
17-45	3835	9.7
46-65	12338	31.3
66-75	11200	28.4
>75	12052	30.6
Missing	0	
Mean	66.3	
SD	15.1	
Median	69	
Q1–Q3	58-77	
Min–Max	17–102	

Body mass Index (BMI)	N	%
Underweight	1741	4.5
Normal	16033	41.3
Overweight	12695	32.7
Obese	8305	21.4
Missing	651	

Pregnancy status	N	%
Females (N=14623)		
Not fertile	7396	50.7
Not pregnant/Unknown	6915	47.4
Currently pregnant	45	0.3
Post partum	234	1.6
Missing	33	

Comorbidities	N	%
No	6206	15.8
Yes	33063	84.2
Missing	156	

Comorbidities (top 10)	N	%
Hypertension	21286	54.2
Arrhythmia	5802	14.8
Diabetes Type II without insulin tr.	5375	13.7
Moderate COPD	5083	12.9
Myocardial infarction	4600	11.7
Any tumour without metastasis	4366	11.1
Cerebrovascular disease	3661	9.3
NYHA class II-III	3585	9.1
Peripheral vascular disease	3478	8.9
Antiplatelet therapy	3460	8.8
Missing	156	

Stay before ICU (days)		
Mean	4.7	
SD	10.9	
Median	1	
Q1–Q3	0-4	
Missing	164	

Source of admission	N	%
Same hospital	33696	85.7
Other hospital	5451	13.9
Long-term chronic care hospital	157	0.4
Directly from the community	2	0.0
Missing	119	

Ward of admission	N	%
Hospital (N=39147)		
Medical ward	8228	21.0
Surgical ward	13582	34.7
Emergency room	12857	32.8
Other ICU	3069	7.8
High dependency care unit	1403	3.6
Missing	8	

Reason for transfer from	N	%
Other ICU (N=3069)		
Specialist expertise	626	20.4
Step-up care	473	15.4
Logistical/organizational reasons	1914	62.4
Step-down care	56	1.8
Missing	0	

Ward of admission	N	%
Same hospital (N=33696)		
Medical ward	7332	21.8
Surgical ward	13397	39.8
Emergency room	10860	32.2
Other ICU	862	2.6
High dependency care unit	1238	3.7
Missing	7	

Ward of admission	N	%
Other hospital (N=5451)		
Medical ward	896	16.4
Surgical ward	185	3.4
Emergency room	1997	36.6
Other ICU	2207	40.5
High dependency care unit	165	3.0
Missing	1	

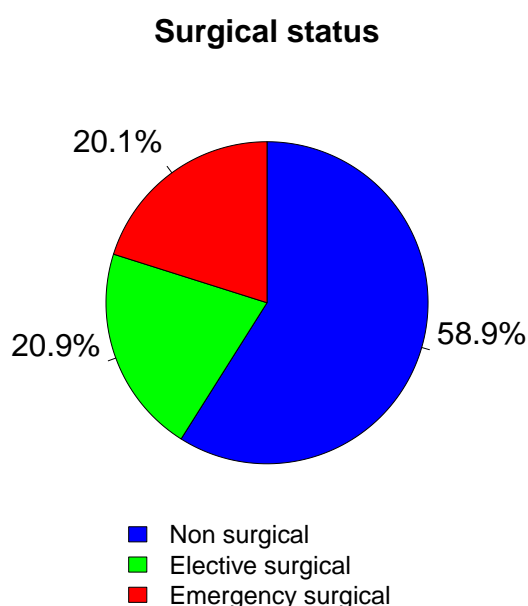
Scheduled admission	N	%
No	32500	82.8
Yes	6770	17.2
Missing	155	

National report for general ICUs - Year 2020

Characteristics on admission - Adult patients

Trauma	N	%
No	35379	90.1
Yes	3897	9.9
Multiple trauma	1567	4.0
Missing	149	

Surgical status	N	%
Non surgical	23152	58.9
Elective surgical	8221	20.9
Emergency surgical	7904	20.1
Missing	148	



Source of admission	N	%
Surgical pt. (N=16125)		
Operating theatre of surgical ward	11728	72.9
Operating theatre of emergency room	1577	9.8
Surgical ward	737	4.6
Other	2043	12.7
Missing	40	

Surgical interventions (top 10)	N	%
Elective surgical (N=8221)		
Gastrointestinal surgery	2236	27.2
Nephro/Urological surgery	986	12.0
Neurosurgery	978	11.9
Orthopaedic surgery	870	10.6
Gynaecological surgery	487	5.9
Thoracic surgery	480	5.8
ENT surgery	460	5.6
Hepatic surgery	333	4.1
Pancreatic surgery	316	3.8
Abdominal vascular surgery	249	3.0
Missing	826	

Timing	N	%
Elective surgical (N=8221)		
From -7 to -3 days	131	1.6
From -2 to -1 days	240	2.9
On ICU admission day	8331	101.3
The day after ICU admission	94	1.1
Missing	29	

Surgical interventions (top 10)	N	%
Emergency surgical (N=7904)		
Gastrointestinal surgery	3455	43.7
Neurosurgery	1229	15.5
Orthopaedic surgery	976	12.3
Nephro/Urological surgery	373	4.7
Biliary tract surgery	286	3.6
Abdominal vascular surgery	284	3.6
Peripheral vascular surgery	281	3.6
ENT surgery	221	2.8
Thoracic surgery	187	2.4
Obstetric surgery	172	2.2
Missing	440	

Timing	N	%
Emergency surgical (N=7904)		
From -7 to -3 days	230	2.9
From -2 to -1 days	875	11.1
On ICU admission day	6889	87.2
The day after ICU admission	384	4.9
Missing	37	

Non surgical interventions	N	%
None	36164	92.1
Elective	476	1.2
Emergency	2627	6.7
Missing	158	

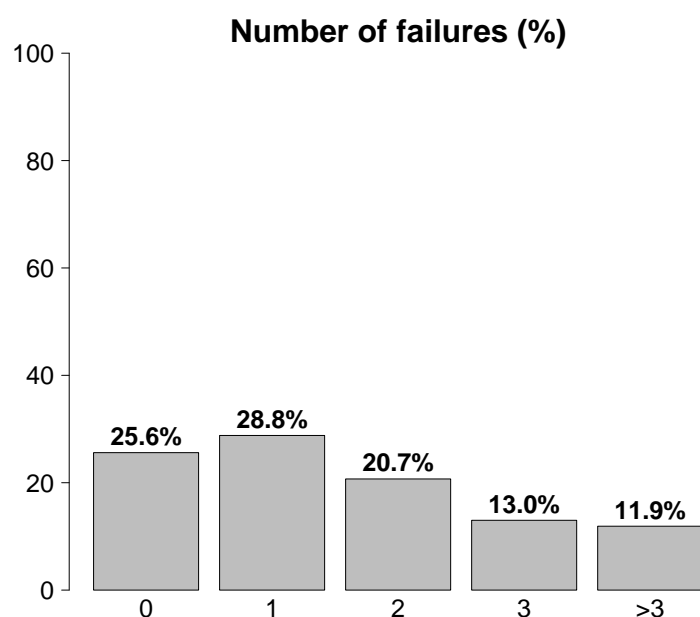
Non surgical interventions	N	%
Elective (N=476)		
Interventional endoscopy	162	34.0
Interventional cardiology	111	23.3
Interventional radiology	91	19.1
Interventional neuroradiology	71	14.9
Missing	41	

Non surgical interventions	N	%
Emergency (N=2627)		
Interventional cardiology	988	37.6
Interventional endoscopy	572	21.8
Interventional radiology	563	21.4
Interventional neuroradiology	475	18.1
Missing	29	

National report for general ICUs - Year 2020

Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	13498	34.4
Post surgical weaning	4366	11.2
Surgical monitoring	5350	13.7
Post interventional weaning	139	0.4
Interventional monitoring	616	1.6
Non surgical monitoring	2841	7.3
Missing	186	
Admission for procedures/treatments	0	0.0
Intensive Treatment	25472	64.9
Only ventilatory support	14200	36.2
Only cardiovascular support	1558	4.0
Ventilatory and cardiovascular support	9710	24.7
Missing	4	
Palliative Sedation	171	0.4
Diagnosis of death/Organ donation	126	0.3
Missing	158	



Failures on admission	N	%
No	10103	25.6
Yes	29322	74.4
A: Respiratory failure	23909	60.6
B: Cardiovascular failure	11268	28.6
C: Neurological failure	4463	11.3
D: Hepatic failure	248	0.6
E: Renal failure	13298	33.7
F: Acute skin failure	18	0.0
G: Metabolic failure	9364	23.8
H: Coagulation failure	408	1.0
Missing	0	

Failures on admission (top 10)	N	%
A	8078	20.5
ABEG	2713	6.9
AB	2576	6.5
AE	2046	5.2
E	2045	5.2
ABE	1462	3.7
AC	1344	3.4
AEG	1092	2.8
ABCEG	831	2.1
EG	786	2.0
Missing	0	

Respiratory failure	N	%
None	15515	39.4
Only hypoxic failure	11482	29.1
Only hypercapnic failure	741	1.9
Hypoxic-hypercapnic failure	2495	6.3
Intubation for airway maint.	9191	23.3
Missing	1	

Cardiovascular failure	N	%
None	28157	71.4
Without shock	2871	7.3
Cardiogenic shock	1739	4.4
Septic shock	3131	7.9
Haemorrhagic/hypovolemic shock	1244	3.2
Hypovolemic shock	874	2.2
Anaphylactic shock	21	0.1
Neurogenic shock	322	0.8
Other shock	507	1.3
Mixed shock	557	1.4
Missing	2	

Neurologic failure	N	%
None	27960	86.2
Cerebral coma	2398	7.4
Metabolic coma	827	2.6
Postanoxic coma	1041	3.2
Toxic coma	194	0.6
Missing or not evaluable	7005	

Renal failure (AKIN)	N	%
None	25811	66.0
Mild	6714	17.2
Moderate	3082	7.9
Severe	3502	9.0
Missing	316	

Metabolic failure	N	%
None	29744	76.1
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	2446	6.3
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	6918	17.7
Missing	317	

National report for general ICUs - Year 2020

Characteristics on admission - Adult patients

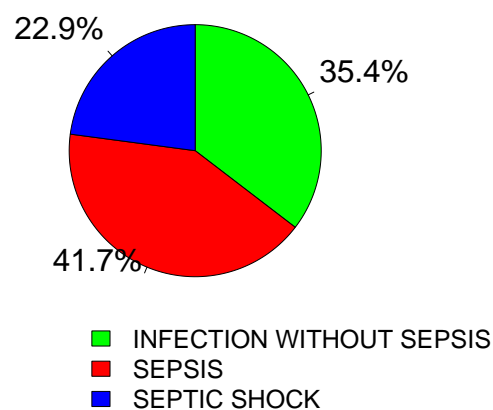
Clinical conditions on admission	N	%
Respiratory	8774	22.4
Moderate ARDS	1816	4.6
Severe ARDS	1719	4.4
Acute exacerbation of COPD	1144	2.9
Pleural effusion	1140	2.9
Aspiration pneumonia	668	1.7
Cardiovascular	6092	15.5
Cardiac arrest	1476	3.8
Left heart failure with pulmonary edema	1019	2.6
Left heart failure without pulm. edema	771	2.0
Acute severe arrhythmia: tachycardias	638	1.6
Acute myocardial infarction	575	1.5
Neurological	5353	13.6
Spontaneous Intraparenchymal bleeding	1132	2.9
Brain tumour	935	2.4
Cerebral artery stroke	860	2.2
Seizures	753	1.9
Spontaneous Subarachnoid haemorrhage	576	1.5
Gastrointestinal and hepatic	6781	17.3
Digestive tract malignancy	1921	4.9
Gastrointestinal perforation	1092	2.8
Intestinal occlusion	967	2.5
Gastrointestinal bleeding: upper tract	507	1.3
Bowel ischaemia	473	1.2
Trauma (anatomical districts)	3895	9.9
Pelvis/bone/joint & muscle	1819	4.6
Head	1592	4.1
Chest	1464	3.7
Spine	857	2.2
Abdomen	632	1.6
Major vessels injury	116	0.3
Miscellaneous	65	0.2
Other	7419	18.9
Nephrourologic disease	1666	4.2
Metabolic disorder	1590	4.1
Other disease	1543	3.9
Acute intoxication	672	1.7
ENT/maxillofacial disease	623	1.6
Post transplantation	190	0.5
Liver transplantation	94	0.2
Renal transplantation	60	0.2
Infections	15728	40.1
Pneumonia	8411	21.4
COVID-19	6816	17.4
NON-surgical secondary peritonitis	936	2.4
NON-surgical urinary tract infection	880	2.2
L.R.T.I. other than pneumonia	638	1.6
Post-surgical peritonitis	515	1.3
Primary bacteraemia of unknown origin	496	1.3
NON-surgical skin/soft tissue infection	425	1.1
Cholecystitis/cholangitis	418	1.1
Primary peritonitis	302	0.8
Missing	175	

Trauma (anatomical districts)	N	%
Head	1592	4.1
Traumatic subarachnoid haemorrhage	586	1.5
Maxillofacial fracture	537	1.4
Cerebral contusion/laceration	534	1.4
Traumatic Subdural haematoma	534	1.4
Skull fracture	393	1.0
Spine	857	2.2
Vertebral fracture, without deficit	699	1.8
Cervical injury, incomplete deficit	54	0.1
Tetraplegia	42	0.1
Chest	1464	3.7
Other injuries of the chest	859	2.2
Traum. haemothorax/pneumothorax	586	1.5
Severe lung contusion/laceration	335	0.9
Abdomen	632	1.6
Minor injuries of the abdomen	189	0.5
Spleen: Moderate-Severe laceration	174	0.4
Liver: Moderate-Severe laceration	129	0.3
Pelvis/bone/joint & muscle	1819	4.6
Long bone fracture	1496	3.8
Multiple fracture of the pelvis	438	1.1
Very severe or open fracture of the pelvis	85	0.2
Major vessels injury	116	0.3
Proximal limbs vessels: transection	40	0.1
Aorta: rupture/dissection	25	0.1
Neck vessels: dissection/transection	24	0.1
Miscellaneous	65	0.2
Burns (>30% BSA)	47	0.1
Inhalation injury	20	0.1
Missing	175	

Infection severity on admission	N	%
None	23522	59.9
INFECTION WITHOUT SEPSIS	5565	14.2
SEPSIS	6559	16.7
SEPTIC SHOCK	3601	9.2
Missing	178	

Infection severity on admission

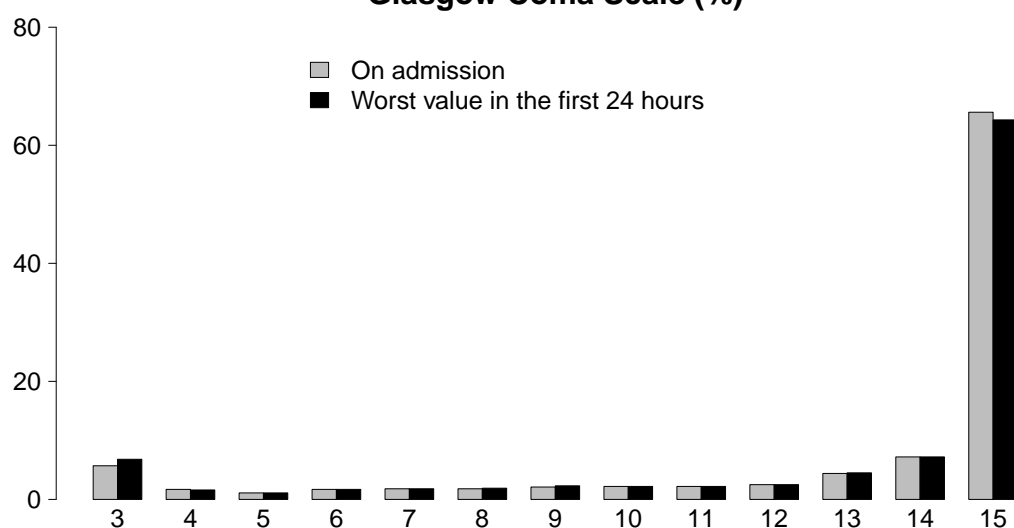
Patients infected (N=15725)



National report for general ICUs - Year 2020

Severity scores - Adult patients

Glasgow Coma Scale (%)



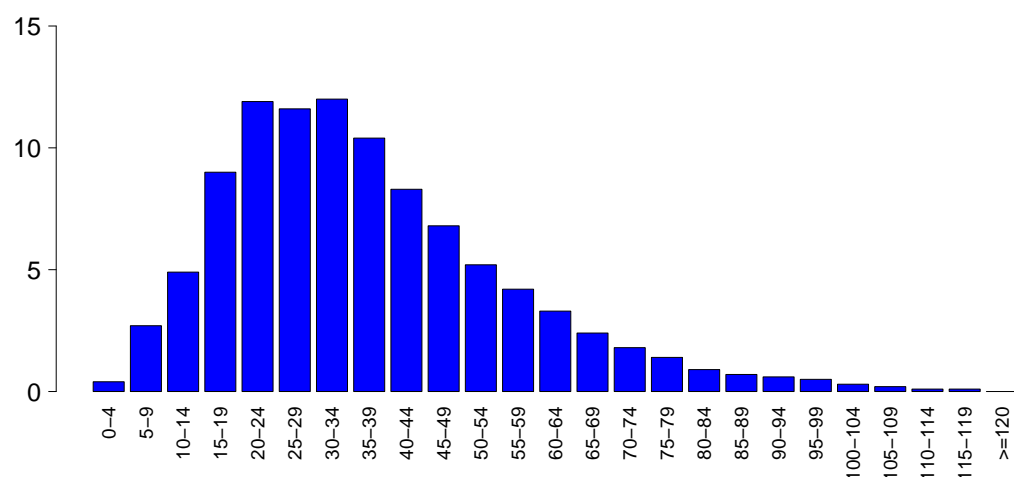
GCS (admission)

Median	15
Q1–Q3	13-15
Not evaluable	6788
Missing	217

GCS (worst in first 24 hours)

Median	15
Q1–Q3	13-15
Not evaluable	7051
Missing	285

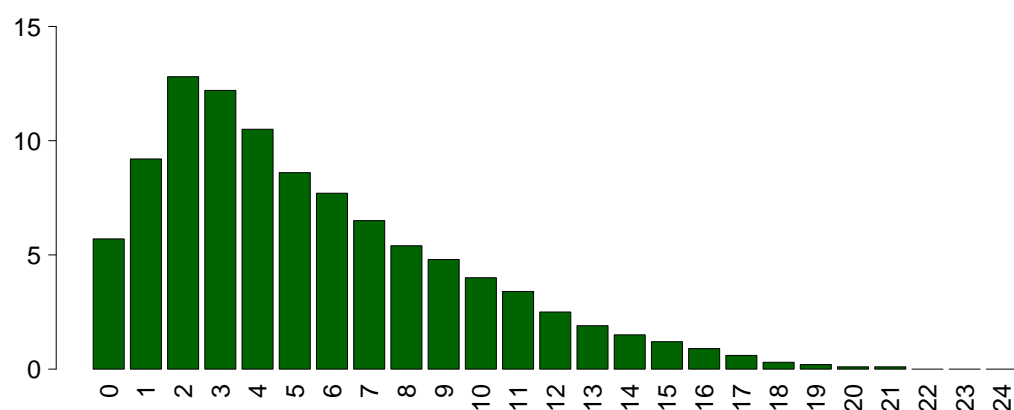
SAPS II (%)



SAPSII

Mean	37.0
SD	19.4
Median	33
Q1–Q3	23-47
Not evaluable	7051
Missing	313

SOFA (%)



SOFA

Mean	5.4
SD	4.0
Median	4
Q1–Q3	2-8
Not evaluable	7051
Missing	311

National report for general ICUs - Year 2020

Characteristics during the stay - Adult patients

Complications during the stay	N	%
No	25583	65.4
Yes	13547	34.6
Missing	295	

Failures during the stay	N	%
No	32748	83.1
Yes	6677	16.9

A: Respiratory failure	3069	7.8
B: Cardiovascular failure	3225	8.2
C: Neurological failure	381	1.0
D: Hepatic failure	130	0.3
E: Renal failure (AKIN)	2130	5.4
F: Acute skin failure	7	0.0
G: Metabolic failure	498	1.3
H: Coagulation failure	228	0.6
Missing	0	

Failures during the stay (top 10)	N	%
A	1680	4.3
B	1523	3.9
E	828	2.1
AB	635	1.6
BE	442	1.1
ABE	272	0.7
G	266	0.7
AE	193	0.5
C	131	0.3
AC	46	0.1
Missing	0	

Respiratory failure occurred	N	%
None	36061	92.2
Intubation for airway maint.	693	1.8
Hypoxic failure	2347	6.0
Hypercapnic failure	451	1.2
Missing	295	

Cardiovascular failure occurred	N	%
None	35905	91.8
Cardiogenic shock	716	1.8
Hypovolemic shock	337	0.9
Haemorrhagic/hypovolemic shock	237	0.6
Septic shock	1558	4.0
Anaphylactic shock	3	0.0
Neurogenic shock	121	0.3
Other shock	420	1.1
Missing	295	

Neurological failure occurred	N	%
None	38749	99.0
Cerebral coma	201	0.5
Metabolic coma	107	0.3
Postanoxic coma	77	0.2
Missing	295	

Renal failure occurred (AKIN)	N	%
None	37000	94.6
Mild	265	0.7
Moderate	328	0.8
Severe	1537	3.9
Missing	295	

Complications during the stay	N	%
Respiratory	2694	6.9
Severe ARDS	702	1.8
Pleural effusion	658	1.7
Pneumothorax/Pneumomediastinum	517	1.3
Atelectasis	445	1.1
Pulmonary embolism	259	0.7
Cardiovascular	2932	7.5
Acute severe arrhythmia: tachycardias	1076	2.7
Cardiac arrest	962	2.5
Deep venous thrombosis	247	0.6
Acute severe arrhythmia: bradycardias	186	0.5
Pulmonary edema	183	0.5
Neurological	2418	6.2
Drowsiness/agitation/delirium	1263	3.2
Seizures	371	0.9
Intracranial hypertension	347	0.9
Brain edema	312	0.8
CrIMyNe	152	0.4
Gastrointestinal and hepatic	981	2.5
Gastrointestinal bleeding: upper tract	169	0.4
Gastrointestinal bleeding: lower tract	147	0.4
Bowel ischaemia	138	0.4
Paralytic Ileus	110	0.3
Liver Dysfunction Syndrome	105	0.3
Other	1050	2.7
Metabolic disorder	498	1.3
Nephrourologic disease	261	0.7
Other disease	206	0.5
Category/Stage II: Partial Thickness Skin Loss	47	0.1
Other skin and/or soft tissue pathology	47	0.1
Category/Stage III: Full Thickness Skin Loss	30	0.1
Extremity compartment syndrome (severe)	22	0.1
Infections	4963	12.7
Pneumonia	2080	5.3
L.R.T.I. other than pneumonia	1139	2.9
Primary bacteraemia of unknown origin	774	2.0
NON-surgical urinary tract infection	755	1.9
Catheter-related bacteremia (CR-BSI)	625	1.6
Other fungal infections	135	0.3
Clinical sepsis	121	0.3
COVID-19	113	0.3
Upper respiratory tract infection	106	0.3
Post-surgical peritonitis	104	0.3
Missing	295	

National report for general ICUs - Year 2020
Characteristics during the stay - Adult patients

Infections	N	%
None	21542	55.1
Only on admission	12621	32.3
On admission and during ICU stay	3054	7.8
Only during ICU stay	1909	4.9
Missing	299	

Maximum severity of infection	N	%
None	21542	55.1
INFECTION WITHOUT SEPSIS	5403	13.8
SEPSIS	7363	18.8
SEPTIC SHOCK	4813	12.3
Missing	304	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	21542 (91.9%)	1023 (4.4%)	698 (3.0%)	187 (0.8%)	23450
	INFECTION WITHOUT SEPSIS	-	4379 (79.0%)	858 (15.5%)	306 (5.5%)	5543
	SEPSIS	-	-	5806 (88.8%)	732 (11.2%)	6539
	SEPTIC SHOCK	-	-	-	3587 (100.0%)	3588
	TOT	21542	5403	7363	4812	39120

Ventil. Associat. Pneumonia (VAP)	N	%
No	37451	95.2
Yes	1883	4.8
Missing	91	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	11.5
CI (95%)	11.0–12.1

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	9.2%
CI (95%)	8.8–9.7

Catheter Bacteraemia (CR-BSI)	N	%
No	38505	98.4
Yes	625	1.6
Missing	295	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	2.6
CI (95%)	2.4–2.8

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	3.1%
CI (95%)	2.8–3.3

National report for general ICUs - Year 2020
Process indicators - Adult patients

Procedures and/or treatments (Missing=188)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	37945	96.7										
Invasive ventilation	26980	68.8	18710	47.7	7571	19.3	3	1-9	104	0	0-0	5
Non invasive ventilation	7691	19.6	2558	6.5	1954	5	2	1-4	22	0	0-3	1
Tracheostomy	5380	13.7	1312	3.3	4316	11	11	5-21	23	9	5-14	4
iNO (inhaled nitric oxide)	355	0.9	12	0	86	0.2	4	2-6	1	4	1-9	1
Central Venous Catheter	27442	69.9	12126	30.9	21969	56	5	2-12	124	0	0-0	7
PICC	1112	2.8	453	1.2	948	2.4	4	2-9	1	6	1-20	0
Arterial Catheter	33943	86.5	16308	41.6	10904	27.8	4	1-10	123	0	0-0	7
Vasoactive drugs	15567	39.7	6251	15.9	4285	10.9	2	1-6	48	0	0-1	4
Antiarrhythmics	2717	6.9	749	1.9	1437	3.7	3	1-8	7	1	0-4	1
IABP	208	0.5	167	0.4	65	0.2	2	1-3	0	0	0-1	0
Invasive monitoring of C.O.	1248	3.2	168	0.4	324	0.8	5	2-9	7	0	0-2	0
Continuous monitoring of ScVO2	56	0.1	23	0.1	14	0	4	1-9	0	1	0-4	0
Temporary pacing	163	0.4	115	0.3	81	0.2	1	1-4	1	0	0-2	0
Ventricular assistance	7	0.0	3	0	2	0	2	0-4	0	1	1-2	0
DC-shock	534	1.4								0	0-2	0
CPR	927	2.4								0	0-1	1
Massive blood transfusion	323	0.8								0	0-0	0
ICP monitoring without CSF drainage	274	0.7	103	0.3	43	0.1	6	3-9	1	0	0-1	0
ICP monitoring with CSF drainage	298	0.8	183	0.5	145	0.4	6	3-13	0	0	0-1	0
External ventricular drainage without ICP	115	0.3	74	0.2	70	0.2	6	3-13	0	0	0-1	0
Haemofiltration	1593	4.1	156	0.4	470	1.2	4	2-10	3	1	0-5	1
Haemodialysis	1060	2.7	199	0.5	473	1.2	3	1-9	3	1	0-6	2
ECMO	136	0.3	36	0.1	68	0.2	10	3-20	0	4	1-9	0
Hepatic clearance techniques	5	0.0										
Clearance techniques during sepsis	322	0.8	31	0.1	94	0.2	2	1-5	3	2	0-7	2
IAP (intra-abdominal pressure)	424	1.1										
Hypothermia	180	0.5	42	0.1	13	0	1	1-1	0	0	0-0	0
Enteral nutrition	15872	40.5	2994	7.6	11159	28.4	8	4-16	45	1	0-2	10
Parenteral nutrition	6719	17.1	1055	2.7	3863	9.8	5	2-10	22	1	0-2	2
SDD (Topical, Topical and systemic)	464	1.2										
Patient restraint	851	2.2										
Peridural catheter	1082	2.8	944	2.4	908	2.3	1	1-2	0	0	0-1	0
Electrical cardioversion	277	0.7								2	1-7	0
Vacuum therapy	157	0.4										

National report for general ICUs - Year 2020
Process indicators - Adult patients

Procedures and/or treatments (Missing=188)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	24928	63.5										
Antibiotic prophylaxis	9356	23.8	6792	17.3	4102	10.5	1	1–2	20	0	0–0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	8501	21.7	3791	9.7	2835	7.2	4	2–6	17	0	0–2	1
Empirical antibiotic therapy (infection diagnosis unconfirmed)	4697	12.0	2208	5.6	2902	7.4	3	2–6	10	0	0–1	0
Targeted antibiotic therapy	7430	18.9	1400	3.6	4197	10.7	7	4–11	22	5	2–10	7
Antifungal in empirical therapy	994	2.5	292	0.7	442	1.1	5	2–9	4	1	0–10	0
Antifungal in targeted therapy	990	2.5	135	0.3	525	1.3	9	5–15	0	9	4–16	0
Pre-emptive antifungal	490	1.2	228	0.6	282	0.7	5	2–11	1	1	0–6	0

Antibiotic therapy

Pt. infected in ICU only (N=1909)				Antifungal therapy			
Pt. infected in ICU only (N=1909)				Pt. infected in ICU only (N=1909)			
	N	%			N	%	
No therapy	255	13.4		No therapy	1730	90.6	
Only empirical	337	17.7		Only empirical	75	3.9	
Only targeted	568	29.8		Only targeted	93	4.9	
Targeted after empirical	585	30.6		Targeted after empirical	9	0.5	
Other	164	8.6		Other	2	0.1	
Missing	0			Missing	0		

National report for general ICUs - Year 2020

Process indicators - Adult patients

Invasive ventilation (N=26980)	N	%	Length (days)				
			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	12130	40.4	10.9	12.9	7	2–15	45
For airway maintenance	8908	29.7	5.7	8.4	2	1–7	36
In weaning	4591	15.3	0.4	0.5	0	0–1	0
Not evaluable	4359	14.5	4.7	9.9	1	0–4	2950
Reintubation within 48 hours	391	1.3	9.4	12.7	5	2–11.75	1

Non invasive ventilation (N=7691)	N	%
Non invasive ventilation only	3775	49.1
Non invasive ventilation failed	1756	22.8
For weaning	1873	24.4
Other	287	3.7
Missing	0	

Tracheostomy not present on admission (N=4068)	N	%
Surgical	707	17.4
Percutwist	377	9.3
Ciaglia	631	15.5
Monodil. Ciaglia	1706	41.9
Fantoni	30	0.7
Griggs	472	11.6
Other Kind	87	2.1
Unknown	52	1.3
Missing	6	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=4036)

Mean	10.0
SD	7.3
Median	9
Q1–Q3	5-13
Missing	6

Invasive monitoring of C.O. (N=1248)	N	%
Swan Ganz	193	15.5
PICCO	863	69.2
LIDCO	3	0.2
Vigileo-PRAM	115	9.2
Other	68	5.4
Missing	6	

SDD (N=464)	N	%
Topical	463	99.8
Topical and systemic	0	0.0
Missing	1	

Surgical interventions	N	%
No	37670	96.1
Yes	1548	3.9
Missing	207	

Number of surgical interventions	N	%
0	37670	96.1
1	1226	3.1
2	195	0.5
3	72	0.2
>3	55	0.1
Missing	207	

Surgical interventions

Days from admission

Mean	10.6
SD	19.6
Median	6
Q1–Q3	3-12
Missing	9

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	644	1.6
Orthopaedic surgery	393	1.0
ENT surgery	276	0.7
Neurosurgery	207	0.5
Other surgery	103	0.3
Thoracic surgery	97	0.2
Maxillo-Facial surgery	58	0.1
Nephro/Urological surgery	55	0.1
Plastic surgery	44	0.1
Organ donation	44	0.1
Missing	207	

Non surgical interventions	N	%
No	38520	98.3
Yes	675	1.7
Missing	230	

Non surgical interventions

Days from admission

Mean	14.1
SD	16.4
Median	8
Q1–Q3	4-17
Missing	10

Non surgical interventions	N	%
Interventional endoscopy	471	1.2
Interventional radiology	176	0.4
Interventional cardiology	118	0.3
Interventional neuroradiology	43	0.1
Missing	230	

National report for general ICUs - Year 2020

Outcome indicators - Adult patients

ICU outcome	N	%
Dead	8117	20.7
Transferred to same hospital	26645	68.1
Transferred to other hospital	3973	10.2
Discharged home	221	0.6
Disch. terminally ill	163	0.4
Missing	306	

Transferred to (N=30618)	N	%
Ward	23883	78.0
Other ICU	2995	9.8
High dependency care unit	2741	9.0
Rehabilitation	846	2.8
Day hospital or Long-term care	151	0.5
Missing	2	

Reason of transfer to Other ICU (N=3076)	N	%
Specialist expertise	914	29.7
Step-up care	244	7.9
Logistical/organizational reasons	1867	60.7
Step-down care	50	1.6
Missing	1	

Transferred to Same hospital (N=26645)	N	%
Ward	23051	86.5
Other ICU	874	3.3
High dependency care unit	2543	9.5
Rehabilitation	133	0.5
Day hospital or Long-term care	43	0.2
Missing	1	

Transferred to Other hospital (N=3973)	N	%
Ward	832	20.9
Other ICU	2121	53.4
High dependency care unit	198	5.0
Rehabilitation	713	18.0
Day hospital or Long-term care	108	2.7
Missing	1	

ICU mortality	N	%
Alive	30839	78.8
Dead	8280	21.2
Missing	306	

Timing of ICU mortality (N=8280)	N	%
Daytime (08:00AM - 07:59PM)	5836	70.5
Nighttime (08:00PM - 07:59AM)	2439	29.5
Weekdays (Monday - Friday)	6112	73.8
Weekend (Saturday - Sunday)	2167	26.2
Missing	5	

C.A.M. activation (N=8280)	N	%
Yes, with organ donation	353	4.4
Yes, without organ donation	319	3.9
No, with organ donation	17	0.2
No, without organ donation	7424	91.5
Missing	167	

Tissue removal (N=8280)	N	%
Yes, with C.A.M. activation	200	2.4
Yes, without C.A.M. activation	212	2.6
No	7868	95.0
Missing	0	

Hospital mortality *	N	%
Dead	9377	26.6
Transf. to other acute-care hospital	4028	11.4
Transf. to other type of hosp. stay	5228	14.9
Nursing home	542	1.5
Voluntary discharge	243	0.7
Discharged home	15781	44.8
Missing	304	

To other type of H stay* (N=5228)	N	%
Rehabilitation in the same institute	860	16.5
Rehabilitation in other institute	3231	61.8
DH/long-term care, same inst.	299	5.7
DH/long-term care, other inst.	834	16.0
Missing	4	

Disch. terminally ill* (N=25822)	N	%
Yes	447	1.7
No	25361	98.3
Missing	14	

Hospital mortality *	N	%
Alive	25361	72.1
Dead	9824	27.9
Missing	318	

Timing of hosp. mortality * (N=9824)	N	%
In ICU	7493	76.3
Within 24 hours after ICU	145	1.5
24-47 hours after ICU	145	1.5
48-71 hours after ICU	142	1.4
72-95 hours after ICU	148	1.5
After 95 hours after ICU	1751	17.8
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=2331)		
Mean		15.8
SD		18.5
Median		10
Q1–Q3		4-21
Missing		0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=35503).

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Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	24854	70.9
Dead	10222	29.1
Missing	427	

Readmission from ward	N	%
No	38277	97.2
Yes	1109	2.8
Missing	39	

Number of readmissions (N=1109)	N	%
1	1037	93.5
2	62	5.6
>2	10	0.9
Missing	0	

Timing of readmission (N=1109)	N	%
Within 48 hours	288	26.5
48-71 hours	108	9.9
72-95 hours	85	7.8
After 95 hours	607	55.8
Missing	21	

Timing readmission (days)	N	
Mean	1108	
SD	9.3	
Median	17.5	
Q1–Q3	4.5	
	1.7-11	

ICU stay (days)		
Mean	7.6	
SD	11.3	
Median	3	
Q1–Q3	1-9	
Missing	310	

ICU stay (days) Alive (N=30839)		
Mean	7.1	
SD	11.0	
Median	3	
Q1–Q3	1-8	
Missing	13	

ICU stay (days) Dead (N=8280)		
Mean	9.4	
SD	12.0	
Median	5	
Q1–Q3	1-13	
Missing	2	

Stay after ICU (days) *		
Alive (N=27820)		
Mean	12.3	
SD	15.8	
Median	8	
Q1–Q3	3-16	
Missing	123	

Hospital stay (days) *		
Mean	20.3	
SD	21.0	
Median	14	
Q1–Q3	7-26	
Missing	310	

Hospital stay (days) *		
Alive (N=25361)		
Mean	21.7	
SD	21.3	
Median	15	
Q1–Q3	8-28	
Missing	6	

Hospital stay (days) *		
Dead (N=9824)		
Mean	16.6	
SD	19.8	
Median	11	
Q1–Q3	4-22	
Missing	3	

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=35503).

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Characteristics on admission - NON COVID patients

Patients (N): 32434

Sex	N	%
Male	19407	60.1
Female	12888	39.9
Missing	139	

Age (years)	N	%
17-45	3473	10.7
46-65	9411	29.0
66-75	8650	26.7
>75	10900	33.6
Missing	0	
Mean	66.6	
SD	15.8	
Median	70	
Q1–Q3	58-78	
Min–Max	17–102	

Body mass Index (BMI)	N	%
Underweight	1670	5.2
Normal	13937	43.6
Overweight	9947	31.1
Obese	6448	20.1
Missing	432	

Pregnancy status	N	%
Females (N=12888)		
Not fertile	6682	51.9
Not pregnant/Unknown	5934	46.1
Currently pregnant	40	0.3
Post partum	229	1.8
Missing	3	

Comorbidities	N	%
No	4606	14.2
Yes	27815	85.8
Missing	13	

Comorbidities (top 10)	N	%
Hypertension	17494	54.0
Arrhythmia	5248	16.2
Moderate COPD	4543	14.0
Diabetes Type II without insulin tr.	4338	13.4
Any tumour without metastasis	4008	12.4
Myocardial infarction	3948	12.2
Cerebrovascular disease	3347	10.3
NYHA class II-III	3316	10.2
Peripheral vascular disease	3164	9.8
Antiplatelet therapy	3101	9.6
Missing	13	

Stay before ICU (days)		
Mean	4.5	
SD	11.3	
Median	1	
Q1–Q3	0-4	
Missing	33	

Source of admission	N	%
Same hospital	28195	86.9
Other hospital	4099	12.6
Long-term chronic care hospital	137	0.4
Directly from the community	2	0.0
Missing	1	

Ward of admission	N	%
Hospital (N=32294)		
Medical ward	4618	14.3
Surgical ward	13442	41.6
Emergency room	11009	34.1
Other ICU	2431	7.5
High dependency care unit	793	2.5
Missing	1	

Reason for transfer from	N	%
Other ICU (N=2431)		
Specialist expertise	507	20.9
Step-up care	301	12.4
Logistical/organizational reasons	1570	64.6
Step-down care	53	2.2
Missing	0	

Ward of admission	N	%
Same hospital (N=28195)		
Medical ward	4129	14.6
Surgical ward	13266	47.1
Emergency room	9398	33.3
Other ICU	692	2.5
High dependency care unit	709	2.5
Missing	1	

Ward of admission	N	%
Other hospital (N=4099)		
Medical ward	489	11.9
Surgical ward	176	4.3
Emergency room	1611	39.3
Other ICU	1739	42.4
High dependency care unit	84	2.0
Missing	0	

Scheduled admission	N	%
No	25678	79.2
Yes	6751	20.8
Missing	5	

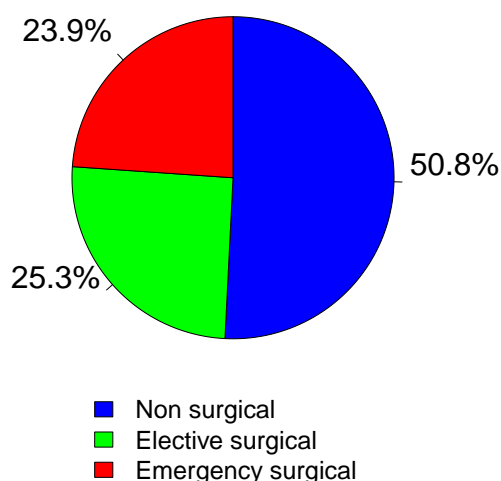
National report for general ICUs - Year 2020

Characteristics on admission - NON COVID patients

Trauma	N	%
No	28584	88.1
Yes	3849	11.9
Multiple trauma	1559	4.8
Missing	1	

Surgical status	N	%
Non surgical	16473	50.8
Elective surgical	8196	25.3
Emergency surgical	7765	23.9
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=15961)		
Operating theatre of surgical ward	11678	73.3
Operating theatre of emergency room	1554	9.8
Surgical ward	726	4.6
Other	1965	12.3
Missing	38	

Surgical interventions (top 10)	N	%
Elective surgical (N=8196)		
Gastrointestinal surgery	2229	27.2
Nephro/Urological surgery	985	12.0
Neurosurgery	973	11.9
Orthopaedic surgery	867	10.6
Gynaecological surgery	487	5.9
Thoracic surgery	479	5.8
ENT surgery	459	5.6
Hepatic surgery	333	4.1
Pancreatic surgery	316	3.9
Abdominal vascular surgery	248	3.0
Missing	820	

Timing	N	%
Elective surgical (N=8196)		
From -7 to -3 days	129	1.6
From -2 to -1 days	237	2.9
On ICU admission day	8315	101.5
The day after ICU admission	93	1.1
Missing	25	

Surgical interventions (top 10)	N	%
Emergency surgical (N=7765)		
Gastrointestinal surgery	3402	43.8
Neurosurgery	1210	15.6
Orthopaedic surgery	966	12.4
Nephro/Urological surgery	367	4.7
Biliary tract surgery	283	3.6
Abdominal vascular surgery	277	3.6
Peripheral vascular surgery	273	3.5
ENT surgery	213	2.7
Thoracic surgery	179	2.3
Obstetric surgery	171	2.2
Missing	424	

Timing	N	%
Emergency surgical (N=7765)		
From -7 to -3 days	221	2.8
From -2 to -1 days	858	11.0
On ICU admission day	6783	87.4
The day after ICU admission	372	4.8
Missing	34	

Non surgical interventions	N	%
None	29433	90.8
Elective	471	1.5
Emergency	2523	7.8
Missing	7	

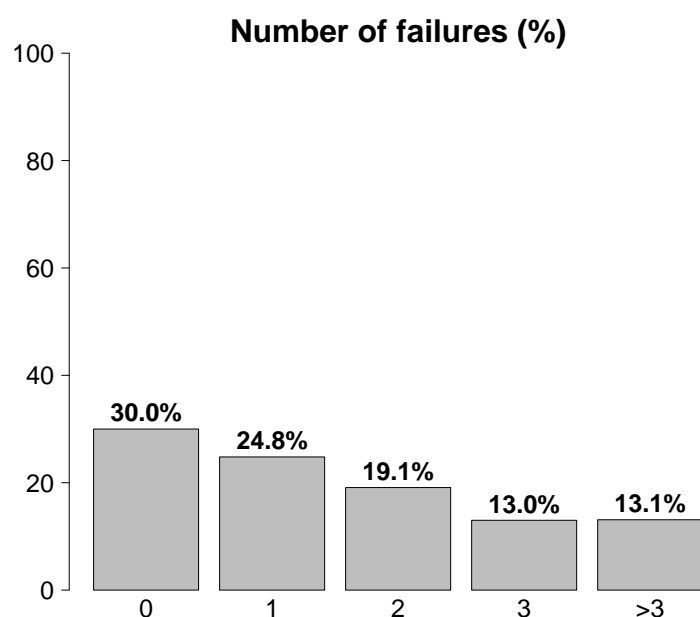
Non surgical interventions	N	%
Elective (N=471)		
Interventional endoscopy	162	34.4
Interventional cardiology	108	22.9
Interventional radiology	90	19.1
Interventional neuroradiology	70	14.9
Missing	41	

Non surgical interventions	N	%
Emergency (N=2523)		
Interventional cardiology	934	37.0
Interventional endoscopy	557	22.1
Interventional radiology	538	21.3
Interventional neuroradiology	465	18.4
Missing	29	

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Characteristics on admission - NON COVID patients

Reason for admission	N	%
Monitoring/Weaning	13180	40.6
Post surgical weaning	4356	13.5
Surgical monitoring	5323	16.5
Post interventional weaning	135	0.4
Interventional monitoring	574	1.8
Non surgical monitoring	2628	8.1
Missing	164	
Admission for procedures/treatments	0	0.0
Intensive Treatment	18959	58.5
Only ventilatory support	9551	29.5
Only cardiovascular support	1527	4.7
Ventilatory and cardiovascular support	7877	24.3
Missing	4	
Palliative Sedation	165	0.5
Diagnosis of death/Organ donation	126	0.4
Missing	4	



Failures on admission	N	%
No	9723	30.0
Yes	22711	70.0
A: Respiratory failure	17427	53.7
B: Cardiovascular failure	9404	29.0
C: Neurological failure	4261	13.1
D: Hepatic failure	239	0.7
E: Renal failure	11329	34.9
F: Acute skin failure	17	0.1
G: Metabolic failure	8132	25.1
H: Coagulation failure	385	1.2
Missing	0	

Failures on admission (top 10)	N	%
A	4849	15.0
ABEG	2352	7.3
E	1986	6.1
AB	1679	5.2
AE	1351	4.2
AC	1292	4.0
ABE	1135	3.5
ABCEG	796	2.5
EG	762	2.3
AEG	728	2.2
Missing	0	

Respiratory failure	N	%
None	15006	46.3
Only hypoxic failure	5898	18.2
Only hypercapnic failure	707	2.2
Hypoxic-hypercapnic failure	1870	5.8
Intubation for airway maint.	8952	27.6
Missing	1	

Cardiovascular failure	N	%
None	23030	71.0
Without shock	1871	5.8
Cardiogenic shock	1609	5.0
Septic shock	2700	8.3
Haemorrhagic/hypovolemic shock	1209	3.7
Hypovolemic shock	746	2.3
Anaphylactic shock	21	0.1
Neurogenic shock	318	1.0
Other shock	408	1.3
Mixed shock	520	1.6
Missing	2	

Neurologic failure	N	%
None	22474	84.1
Cerebral coma	2305	8.6
Metabolic coma	756	2.8
Postanoxic coma	1011	3.8
Toxic coma	187	0.7
Missing or not evaluable	5701	

Renal failure (AKIN)	N	%
None	20976	64.9
Mild	5596	17.3
Moderate	2613	8.1
Severe	3120	9.7
Missing	129	

Metabolic failure	N	%
None	24171	74.8
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	1995	6.2
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	6137	19.0
Missing	131	

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Characteristics on admission - NON COVID patients

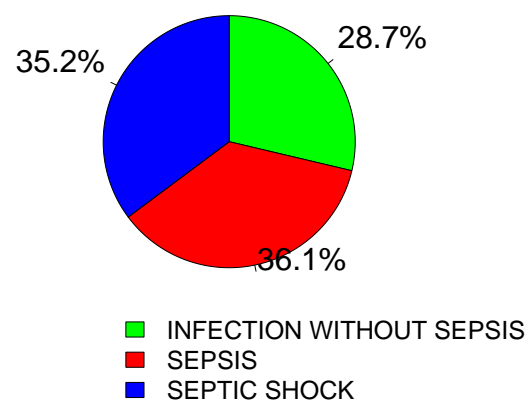
Clinical conditions on admission	N	%
Respiratory	5789	17.8
Acute exacerbation of COPD	1126	3.5
Pleural effusion	1103	3.4
Aspiration pneumonia	656	2.0
Atelectasis	599	1.8
Moderate ARDS	502	1.5
Cardiovascular	5798	17.9
Cardiac arrest	1440	4.4
Left heart failure with pulmonary edema	969	3.0
Left heart failure without pulm. edema	730	2.3
Acute severe arrhythmia: tachycardias	588	1.8
Acute myocardial infarction	544	1.7
Neurological	5238	16.1
Spontaneous Intraparenchymal bleeding	1118	3.4
Brain tumour	927	2.9
Cerebral artery stroke	834	2.6
Seizures	725	2.2
Spontaneous Subarachnoid haemorrhage	567	1.7
Gastrointestinal and hepatic	6682	20.6
Digestive tract malignancy	1916	5.9
Gastrointestinal perforation	1076	3.3
Intestinal occlusion	957	3.0
Gastrointestinal bleeding: upper tract	491	1.5
Bowel ischaemia	465	1.4
Trauma (anatomical districts)	3849	11.9
Pelvis/bone/joint & muscle	1799	5.5
Head	1572	4.8
Chest	1457	4.5
Spine	851	2.6
Abdomen	628	1.9
Major vessels injury	116	0.4
Miscellaneous	63	0.2
Other	7232	22.3
Nephrourologic disease	1615	5.0
Metabolic disorder	1516	4.7
Other disease	1516	4.7
Acute intoxication	662	2.0
ENT/maxillofacial disease	617	1.9
Post transplantation	177	0.5
Liver transplantation	93	0.3
Renal transplantation	51	0.2
Infections	8912	27.5
Pneumonia	3739	11.5
NON-surgical secondary peritonitis	924	2.8
NON-surgical urinary tract infection	792	2.4
L.R.T.I. other than pneumonia	593	1.8
Post-surgical peritonitis	509	1.6
Cholecystitis/cholangitis	414	1.3
NON-surgical skin/soft tissue infection	407	1.3
Primary bacteraemia of unknown origin	404	1.2
Primary peritonitis	295	0.9
Clinical sepsis	281	0.9
Missing	0	

Trauma (anatomical districts)	N	%
Head	1572	4.8
Traumatic subarachnoid haemorrhage	579	1.8
Maxillofacial fracture	533	1.6
Traumatic Subdural haematoma	528	1.6
Cerebral contusion/laceration	526	1.6
Skull fracture	389	1.2
Spine	851	2.6
Vertebral fracture, without deficit	694	2.1
Cervical injury, incomplete deficit	53	0.2
Tetraplegia	42	0.1
Chest	1457	4.5
Other injuries of the chest	854	2.6
Traum. haemothorax/pneumothorax	584	1.8
Severe lung contusion/laceration	334	1.0
Abdomen	628	1.9
Minor injuries of the abdomen	188	0.6
Spleen: Moderate-Severe laceration	172	0.5
Liver: Moderate-Severe laceration	128	0.4
Pelvis/bone/joint & muscle	1799	5.5
Long bone fracture	1480	4.6
Multiple fracture of the pelvis	433	1.3
Very severe or open fracture of the pelvis	83	0.3
Major vessels injury	116	0.4
Proximal limbs vessels: transection	40	0.1
Aorta: rupture/dissection	25	0.1
Neck vessels: dissection/transection	24	0.1
Miscellaneous	63	0.2
Burns (>30% BSA)	45	0.1
Inhalation injury	20	0.1
Missing	0	

Infection severity on admission	N	%
None	23522	72.5
INFECTION WITHOUT SEPSIS	2560	7.9
SEPSIS	3212	9.9
SEPTIC SHOCK	3137	9.7
Missing	3	

Infection severity on admission

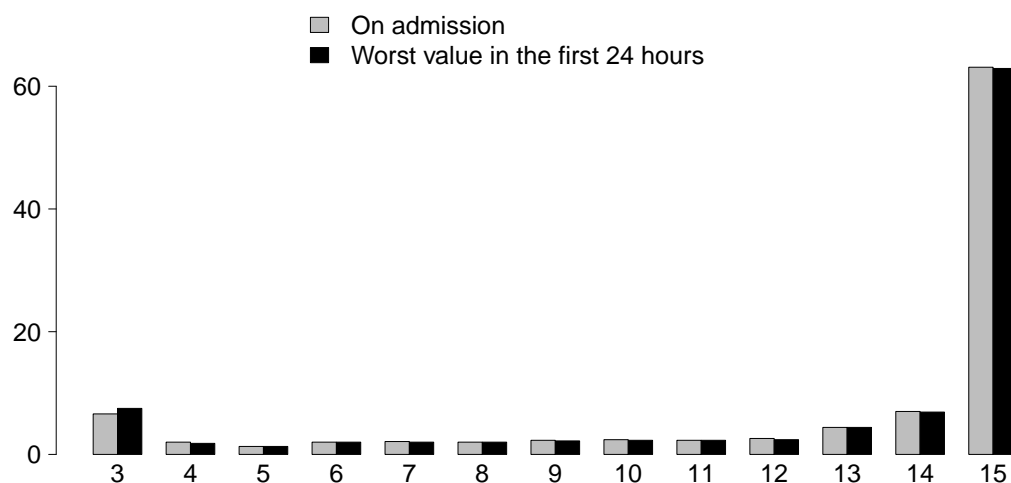
Patients infected (N=8909)



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Severity scores - NON COVID patients

Glasgow Coma Scale (%)

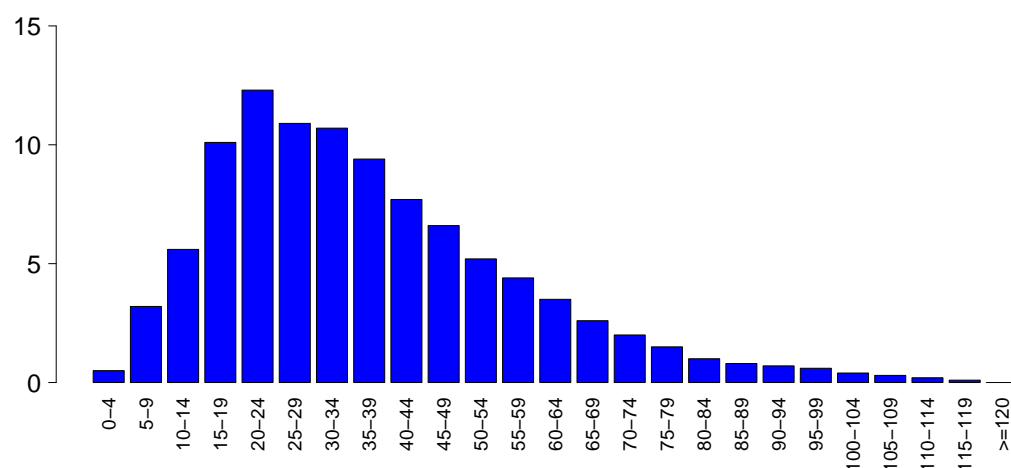
**GCS (admission)**

Median	15
Q1–Q3	12-15
Not evaluable	5658
Missing	43

GCS (worst in first 24 hours)

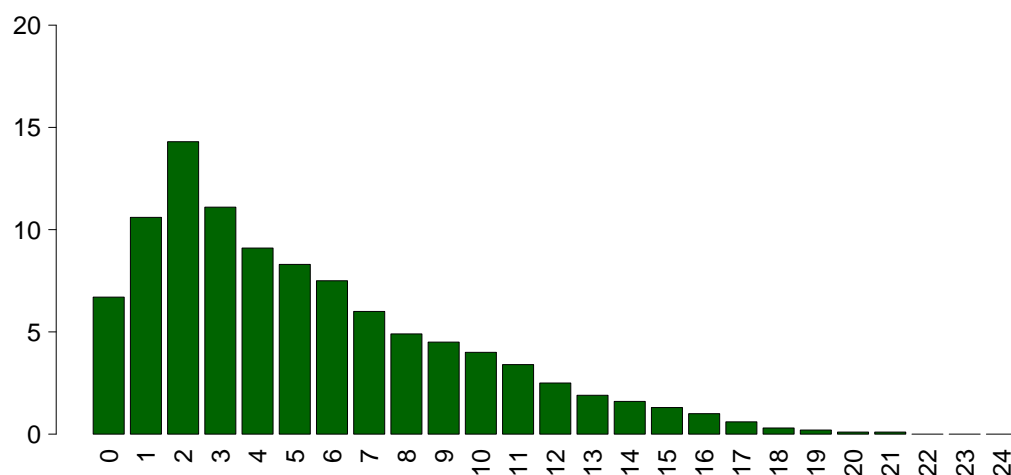
Median	15
Q1–Q3	12-15
Not evaluable	5156
Missing	102

SAPS II (%)

**SAPSII**

Mean	36.9
SD	20.2
Median	33
Q1–Q3	22-48
Not evaluable	5156
Missing	126

SOFA (%)

**SOFA**

Mean	5.3
SD	4.2
Median	4
Q1–Q3	2-8
Not evaluable	5156
Missing	125

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Characteristics during the stay - NON COVID patients

Complications during the stay	N	%
No	22898	70.8
Yes	9428	29.2
Missing	108	

Failures during the stay	N	%
No	28193	86.9
Yes	4241	13.1
A: Respiratory failure	1948	6.0
B: Cardiovascular failure	1805	5.6
C: Neurological failure	333	1.0
D: Hepatic failure	110	0.3
E: Renal failure (AKIN)	1284	4.0
F: Acute skin failure	6	0.0
G: Metabolic failure	365	1.1
H: Coagulation failure	183	0.6
Missing	0	

Failures during the stay (top 10)	N	%
A	1141	3.5
B	900	2.8
E	549	1.7
AB	315	1.0
G	214	0.7
BE	186	0.6
ABE	149	0.5
C	124	0.4
AE	120	0.4
AC	42	0.1
Missing	0	

Respiratory failure occurred	N	%
None	30378	94.0
Intubation for airway maint.	610	1.9
Hypoxic failure	1318	4.1
Hypercapnic failure	312	1.0
Missing	108	

Cardiovascular failure occurred	N	%
None	30521	94.4
Cardiogenic shock	490	1.5
Hypovolemic shock	200	0.6
Haemorrhagic/hypovolemic shock	193	0.6
Septic shock	716	2.2
Anaphylactic shock	2	0.0
Neurogenic shock	117	0.4
Other shock	187	0.6
Missing	108	

Neurological failure occurred	N	%
None	31993	99.0
Cerebral coma	184	0.6
Metabolic coma	82	0.3
Postanoxic coma	71	0.2
Missing	108	

Renal failure occurred (AKIN)	N	%
None	31042	96.0
Mild	174	0.5
Moderate	194	0.6
Severe	916	2.8
Missing	108	

Complications during the stay	N	%
Respiratory	1510	4.7
Pleural effusion	536	1.7
Atelectasis	342	1.1
Severe ARDS	219	0.7
Pneumothorax/Pneumomediastinum	216	0.7
Moderate ARDS	101	0.3
Cardiovascular	2172	6.7
Cardiac arrest	786	2.4
Acute severe arrhythmia: tachycardias	762	2.4
Acute severe arrhythmia: bradycardias	143	0.4
Pulmonary edema	142	0.4
Left heart failure w/o pulm. edema	135	0.4
Neurological	1979	6.1
Drowsiness/agitation/delirium	925	2.9
Seizures	349	1.1
Intracranial hypertension	344	1.1
Brain edema	302	0.9
New ischaemic stroke	117	0.4
Gastrointestinal and hepatic	806	2.5
Gastrointestinal bleeding: upper tract	136	0.4
Bowel ischaemia	122	0.4
Gastrointestinal bleeding: lower tract	104	0.3
Anastomotic dehiscence	94	0.3
Liver Dysfunction Syndrome	89	0.3
Other	779	2.4
Metabolic disorder	365	1.1
Nephrourologic disease	208	0.6
Other disease	146	0.5
Other skin and/or soft tissue pathology	42	0.1
Category/Stage II: Partial Thickness Skin Loss	25	0.1
Extremity compartment syndrome (severe)	21	0.1
F.U.O. fever of unknown origin	19	0.1
Infections	2878	8.9
Pneumonia	1080	3.3
L.R.T.I. other than pneumonia	690	2.1
NON-surgical urinary tract infection	419	1.3
Primary bacteraemia of unknown origin	356	1.1
Catheter-related bacteremia (CR-BSI)	312	1.0
Post-surgical peritonitis	101	0.3
Post-surgical skin/soft tissue infection	81	0.3
Upper respiratory tract infection	73	0.2
Clinical sepsis	64	0.2
NON-surgical skin/soft tissue infection	64	0.2
Missing	108	

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Characteristics during the stay - NON COVID patients

Infections	N	%
None	21542	66.6
Only on admission	7906	24.5
On admission and during ICU stay	969	3.0
Only during ICU stay	1909	5.9
Missing	108	

Maximum severity of infection	N	%
None	21542	66.7
INFECTION WITHOUT SEPSIS	3220	10.0
SEPSIS	3967	12.3
SEPTIC SHOCK	3588	11.1
Missing	117	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	21542 (91.9%)	1023 (4.4%)	698 (3.0%)	187 (0.8%)	23450
	INFECTION WITHOUT SEPSIS	-	2196 (86.3%)	297 (11.7%)	52 (2.0%)	2545
	SEPSIS	-	-	2971 (93.0%)	224 (7.0%)	3196
	SEPTIC SHOCK	-	-	-	3124 (100.0%)	3125
	TOT	21542	3220	3967	3587	32316

Ventil. Associat. Pneumonia (VAP)	N	%
No	31424	97.1
Yes	941	2.9
Missing	69	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	9.6
CI (95%)	9.0–10.2

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	7.7%
CI (95%)	7.2–8.2

Catheter Bacteraemia (CR-BSI)	N	%
No	32014	99.0
Yes	312	1.0
Missing	108	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	2.0
CI (95%)	1.8–2.2

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	2.4%
CI (95%)	2.2–2.7

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Process indicators - NON COVID patients

Procedures and/or treatments (Missing=27)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	31144	96.1										
Invasive ventilation	21559	66.5	16233	50.1	5110	15.8	2	1-6	85	0	0-0	2
Non invasive ventilation	4831	14.9	1222	3.8	1183	3.7	2	1-3	15	0	0-2	1
Tracheostomy	3675	11.3	1169	3.6	3161	9.8	10	4-19	15	7	4-12	2
iNO (inhaled nitric oxide)	95	0.3	8	0	20	0.1	3	2-6	0	1	0-5	0
Central Venous Catheter	21293	65.7	10344	31.9	17360	53.6	4	1-9	100	0	0-0	2
PICC	931	2.9	415	1.3	801	2.5	3	1-8	1	4	0-15	0
Arterial Catheter	27384	84.5	14395	44.4	7687	23.7	3	1-7	101	0	0-0	2
Vasoactive drugs	11869	36.6	5643	17.4	2929	9	2	1-4	36	0	0-0	0
Antiarrhythmics	2126	6.6	662	2	1154	3.6	3	1-7	6	1	0-2	1
IABP	203	0.6	164	0.5	65	0.2	2	1-3	0	0	0-1	0
Invasive monitoring of C.O.	996	3.1	150	0.5	233	0.7	4	2-8	4	0	0-1	0
Continuous monitoring of ScVO2	42	0.1	22	0.1	9	0	2	1-5	0	0	0-1	0
Temporary pacing	153	0.5	112	0.3	79	0.2	1	1-4	1	0	0-1	0
Ventricular assistance	7	0.0	3	0	2	0	2	0-4	0	1	1-2	0
DC-shock	454	1.4								0	0-1	0
CPR	787	2.4								0	0-1	1
Massive blood transfusion	307	0.9								0	0-0	0
ICP monitoring without CSF drainage	267	0.8	97	0.3	41	0.1	6	4-9	1	0	0-1	0
ICP monitoring with CSF drainage	291	0.9	180	0.6	142	0.4	6	3-13	0	0	0-1	0
External ventricular drainage without ICP	113	0.3	72	0.2	68	0.2	6	3-13	0	0	0-1	0
Haemofiltration	1167	3.6	129	0.4	316	1	3	2-8	2	1	0-2	0
Haemodialysis	842	2.6	170	0.5	373	1.2	3	1-7	2	1	0-3	1
ECMO	57	0.2	22	0.1	25	0.1	7	2-12	0	2	0-5	0
Hepatic clearance techniques	5	0.0										
Clearance techniques during sepsis	197	0.6	26	0.1	48	0.1	2	1-4	1	1	0-3	0
IAP (intra-abdominal pressure)	399	1.2										
Hypothermia	179	0.6	42	0.1	12	0	1	1-1	0	0	0-0	0
Enteral nutrition	10716	33.1	2153	6.6	7703	23.8	7	3-14	33	1	0-2	3
Parenteral nutrition	5175	16.0	850	2.6	3216	9.9	4	2-9	15	1	0-2	0
SDD (Topical, Topical and systemic)	321	1.0										
Patient restraint	643	2.0										
Peridural catheter	1079	3.3	943	2.9	906	2.8	1	1-2	0	0	0-1	0
Electrical cardioversion	192	0.6								2	1-4	0
Vacuum therapy	153	0.5										

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Process indicators - NON COVID patients

Procedures and/or treatments (Missing=27)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	19949	61.6										
Antibiotics												
Antibiotic prophylaxis	8551	26.4	6328	19.5	3746	11.6	1	1–2	19	0	0–0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	5462	16.9	2512	7.8	1912	5.9	3	2–5	12	0	0–1	1
Empirical antibiotic therapy (infection diagnosis unconfirmed)	4234	13.1	2017	6.2	2713	8.4	3	1–6	10	0	0–0	0
Targeted antibiotic therapy	5142	15.9	1106	3.4	3042	9.4	6	3–11	14	4	2–7	1
Antifungal in empirical therapy	769	2.4	265	0.8	356	1.1	4	2–8	3	0	0–4	0
Antifungal in targeted therapy	572	1.8	106	0.3	323	1	9	4–15	0	6	3–13	0
Pre-emptive antifungal	197	0.6	70	0.2	107	0.3	4	2–9	1	1	0–6	0

Antibiotic therapy

Pt. infected in ICU only (N=1909)			
	N		%
No therapy	255		13.4
Only empirical	337		17.7
Only targeted	568		29.8
Targeted after empirical	585		30.6
Other	164		8.6
Missing	0		

Antifungal therapy

Pt. infected in ICU only (N=1909)			
	N		%
No therapy	1730		90.6
Only empirical	75		3.9
Only targeted	93		4.9
Targeted after empirical	9		0.5
Other	2		0.1
Missing	0		

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Process indicators - NON COVID patients

Invasive ventilation (N=21559)	N	%	Length (days)				
			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	7076	29.2	8.2	11.2	4	1–10	32
For airway maintenance	8683	35.9	5.6	8.2	2	1–7	34
In weaning	4572	18.9	0.4	0.5	0	0–1	0
Not evaluable	3868	16.0	3.6	8.6	1	0–3	2658
Reintubation within 48 hours	308	1.3	8.2	11.9	5	2–9	0

Non invasive ventilation (N=4831)	N	%
Non invasive ventilation only	2570	53.2
Non invasive ventilation failed	785	16.2
For weaning	1297	26.8
Other	179	3.7
Missing	0	

Tracheostomy not present on admission (N=2506)	N	%
Surgical	430	17.2
Percutwist	186	7.4
Ciaglia	387	15.4
Monodil. Ciaglia	1013	40.4
Fantoni	24	1.0
Griggs	366	14.6
Other Kind	59	2.4
Unknown	39	1.6
Missing	2	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=2482)

Mean	8.7
SD	6.8
Median	7
Q1–Q3	4–12
Missing	4

Invasive monitoring of C.O. (N=996)	N	%
Swan Ganz	171	17.2
PICCO	662	66.5
LIDCO	2	0.2
Vigileo-PRAM	101	10.1
Other	57	5.7
Missing	3	

SDD (N=321)	N	%
Topical	320	99.7
Topical and systemic	0	0.0
Missing	1	

Surgical interventions	N	%
No	31022	95.8
Yes	1374	4.2
Missing	38	

Number of surgical interventions	N	%
0	31022	95.8
1	1067	3.3
2	183	0.6
3	70	0.2
>3	54	0.2
Missing	38	

Surgical interventions
Days from admission

Mean	9.4
SD	15.5
Median	6
Q1–Q3	3–11
Missing	9

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	621	1.9
Orthopaedic surgery	385	1.2
Neurosurgery	205	0.6
ENT surgery	171	0.5
Other surgery	93	0.3
Thoracic surgery	78	0.2
Maxillo-Facial surgery	55	0.2
Nephro/Urological surgery	50	0.2
Organ donation	44	0.1
Plastic surgery	43	0.1
Missing	38	

Non surgical interventions	N	%
No	31794	98.2
Yes	586	1.8
Missing	54	

Non surgical interventions
Days from admission

Mean	12.3
SD	14.6
Median	8
Q1–Q3	4–15
Missing	8

Non surgical interventions	N	%
Interventional endoscopy	397	1.2
Interventional radiology	152	0.5
Interventional cardiology	105	0.3
Interventional neuroradiology	42	0.1
Missing	54	

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Outcome indicators - NON COVID patients

ICU outcome	N	%
Dead	5535	17.1
Transferred to same hospital	23359	72.3
Transferred to other hospital	3060	9.5
Discharged home	198	0.6
Disch. terminally ill	146	0.5
Missing	136	

Transferred to (N=26419)	N	%
Ward	21229	80.4
Other ICU	2244	8.5
High dependency care unit	2093	7.9
Rehabilitation	705	2.7
Day hospital or Long-term care	146	0.6
Missing	2	

Reason of transfer to Other ICU (N=2314)	N	%
Specialist expertise	804	34.8
Step-up care	152	6.6
Logistical/organizational reasons	1313	56.8
Step-down care	44	1.9
Missing	1	

Transferred to Same hospital (N=23359)	N	%
Ward	20507	87.8
Other ICU	732	3.1
High dependency care unit	1959	8.4
Rehabilitation	118	0.5
Day hospital or Long-term care	42	0.2
Missing	1	

Transferred to Other hospital (N=3060)	N	%
Ward	722	23.6
Other ICU	1512	49.4
High dependency care unit	134	4.4
Rehabilitation	587	19.2
Day hospital or Long-term care	104	3.4
Missing	1	

ICU mortality	N	%
Alive	26617	82.4
Dead	5681	17.6
Missing	136	

Timing of ICU mortality (N=5681)	N	%
Daytime (08:00AM - 07:59PM)	3977	70.1
Nighttime (08:00PM - 07:59AM)	1700	29.9
Weekdays (Monday - Friday)	4235	74.6
Weekend (Saturday - Sunday)	1445	25.4
Missing	4	

C.A.M. activation (N=5681)	N	%
Yes, with organ donation	353	6.4
Yes, without organ donation	306	5.5
No, with organ donation	16	0.3
No, without organ donation	4857	87.8
Missing	149	

Tissue removal (N=5681)	N	%
Yes, with C.A.M. activation	200	3.5
Yes, without C.A.M. activation	205	3.6
No	5276	92.9
Missing	0	

Hospital mortality *	N	%
Dead	6758	23.3
Transf. to other acute-care hospital	3133	10.8
Transf. to other type of hosp. stay	4289	14.8
Nursing home	489	1.7
Voluntary discharge	232	0.8
Discharged home	14114	48.6
Missing	169	

To other type of H stay* (N=4289)	N	%
Rehabilitation in the same institute	677	15.8
Rehabilitation in other institute	2576	60.1
DH/long-term care, same inst.	274	6.4
DH/long-term care, other inst.	758	17.7
Missing	4	

Disch. terminally ill* (N=22257)	N	%
Yes	420	1.9
No	21830	98.1
Missing	7	

Hospital mortality *	N	%
Alive	21830	75.3
Dead	7178	24.7
Missing	176	

Timing of hosp. mortality * (N=7178)	N	%
In ICU	5109	71.2
Within 24 hours after ICU	124	1.7
24-47 hours after ICU	135	1.9
48-71 hours after ICU	125	1.7
72-95 hours after ICU	127	1.8
After 95 hours after ICU	1558	21.7
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=2069)		
Mean		16.1
SD		18.9
Median		10
Q1-Q3		4-21
Missing		0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=29184).

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Outcome indicators - NON COVID patients

Last hospital mortality *	N	%
Alive	21529	74.4
Dead	7394	25.6
Missing	261	

Readmission from ward	N	%
No	31410	97.0
Yes	988	3.0
Missing	36	

Number of readmissions (N=988)	N	%
1	924	93.5
2	56	5.7
>2	8	0.8
Missing	0	

Timing of readmission (N=988)	N	%
Within 48 hours	252	25.9
48-71 hours	95	9.8
72-95 hours	77	7.9
After 95 hours	548	56.4
Missing	16	

Timing readmission (days)	N	988
Mean	9.7	
SD	17.9	
Median	4.8	
Q1–Q3	1.8-11.1	

ICU stay (days)		
Mean	6.0	
SD	9.5	
Median	2	
Q1–Q3	1-7	
Missing	134	

ICU stay (days) Alive (N=26617)		
Mean	5.7	
SD	9.1	
Median	2	
Q1–Q3	1-6	
Missing	5	

ICU stay (days) Dead (N=5681)		
Mean	7.3	
SD	11.3	
Median	3	
Q1–Q3	1-9	
Missing	1	

Stay after ICU (days) *		
Alive (N=23994)		
Mean	12.2	
SD	16.1	
Median	8	
Q1–Q3	3-15	
Missing	97	

Hospital stay (days) *		
Mean	18.8	
SD	20.4	
Median	13	
Q1–Q3	7-24	
Missing	172	

Hospital stay (days) *		
Alive (N=21830)		
Mean	20.0	
SD	20.5	
Median	14	
Q1–Q3	8-25	
Missing	4	

Hospital stay (days) *		
Dead (N=7178)		
Mean	15.4	
SD	20.0	
Median	9	
Q1–Q3	3-20	
Missing	0	

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=29184).

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Characteristics on admission - NON COVID adult patients evaluated in the GiViTI model

Patients (N): 27874

Sex	N	%
Male	16581	59.8
Female	11167	40.2
Missing	126	

Age (years)	N	%
17-45	3083	11.1
46-65	8016	28.8
66-75	7330	26.3
>75	9445	33.9
Missing	0	
Mean	66.5	
SD	16.0	
Median	70	
Q1–Q3	57-79	
Min–Max	17–102	

Body mass Index (BMI)	N	%
Underweight	1396	5.0
Normal	12061	43.5
Overweight	8632	31.1
Obese	5659	20.4
Missing	126	

Pregnancy status	N	%
Females (N=11167)		
Not fertile	5802	52.0
Not pregnant/Unknown	5124	45.9
Currently pregnant	37	0.3
Post partum	204	1.8
Missing	0	

Comorbidities	N	%
No	3998	14.3
Yes	23876	85.7
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	14988	53.8
Arrhythmia	4551	16.3
Moderate COPD	3917	14.1
Diabetes Type II without insulin tr.	3715	13.3
Any tumour without metastasis	3436	12.3
Myocardial infarction	3378	12.1
NYHA class II-III	2873	10.3
Cerebrovascular disease	2862	10.3
Peripheral vascular disease	2702	9.7
Antiplatelet therapy	2611	9.4
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.0	10.2	1	0-3	0

Source of admission	N	%
Same hospital	24257	87.0
Other hospital	3617	13.0
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=27874)		
Medical ward	3817	13.7
Surgical ward	11352	40.7
Emergency room	9936	35.6
Other ICU	2127	7.6
High dependency care unit	642	2.3
Missing	0	

Reason for transfer from	N	%
Other ICU (N=2127)		
Specialist expertise	437	20.5
Step-up care	266	12.5
Logistical/organizational reasons	1373	64.6
Step-down care	51	2.4
Missing	0	

Ward of admission	N	%
Same hospital (N=24257)		
Medical ward	3393	14.0
Surgical ward	11197	46.2
Emergency room	8522	35.1
Other ICU	571	2.4
High dependency care unit	574	2.4
Missing	0	

Ward of admission	N	%
Other hospital (N=3617)		
Medical ward	424	11.7
Surgical ward	155	4.3
Emergency room	1414	39.1
Other ICU	1556	43.0
High dependency care unit	68	1.9
Missing	0	

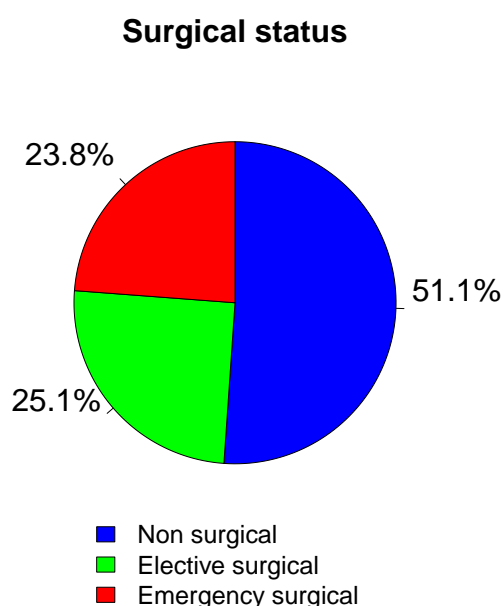
Scheduled admission	N	%
No	22144	79.4
Yes	5730	20.6
Missing	0	

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Characteristics on admission - NON COVID adult patients evaluated in the GiViTI model

Trauma	N	%
No	24373	87.4
Yes	3501	12.6
Multiple trauma	1419	5.1
Missing	0	

Surgical status	N	%
Non surgical	14231	51.1
Elective surgical	7002	25.1
Emergency surgical	6641	23.8
Missing	0	



Source of admission	N	%
Surgical pt. (N=13643)		
Operating theatre of surgical ward	10037	73.6
Operating theatre of emergency room	1433	10.5
Surgical ward	562	4.1
Other	1611	11.8
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=7002)		
Gastrointestinal surgery	2009	28.7
Neurosurgery	907	13.0
Nephro/Urological surgery	855	12.2
Orthopaedic surgery	788	11.3
Thoracic surgery	409	5.8
ENT surgery	398	5.7
Gynaecological surgery	394	5.6
Hepatic surgery	308	4.4
Pancreatic surgery	288	4.1
Abdominal vascular surgery	223	3.2
Missing	423	

Timing	N	%
Elective surgical (N=7002)		
From -7 to -3 days	90	1.3
From -2 to -1 days	194	2.8
On ICU admission day	7114	101.6
The day after ICU admission	70	1.0
Missing	15	

Surgical interventions (top 10)	N	%
Emergency surgical (N=6641)		
Gastrointestinal surgery	2898	43.6
Neurosurgery	1071	16.1
Orthopaedic surgery	893	13.4
Nephro/Urological surgery	328	4.9
Biliary tract surgery	250	3.8
Abdominal vascular surgery	244	3.7
Peripheral vascular surgery	239	3.6
ENT surgery	174	2.6
Obstetric surgery	151	2.3
Thoracic surgery	150	2.3
Missing	243	

Timing	N	%
Emergency surgical (N=6641)		
From -7 to -3 days	161	2.4
From -2 to -1 days	735	11.1
On ICU admission day	5804	87.4
The day after ICU admission	300	4.5
Missing	23	

Non surgical interventions	N	%
None	25212	90.4
Elective	396	1.4
Emergency	2266	8.1
Missing	0	

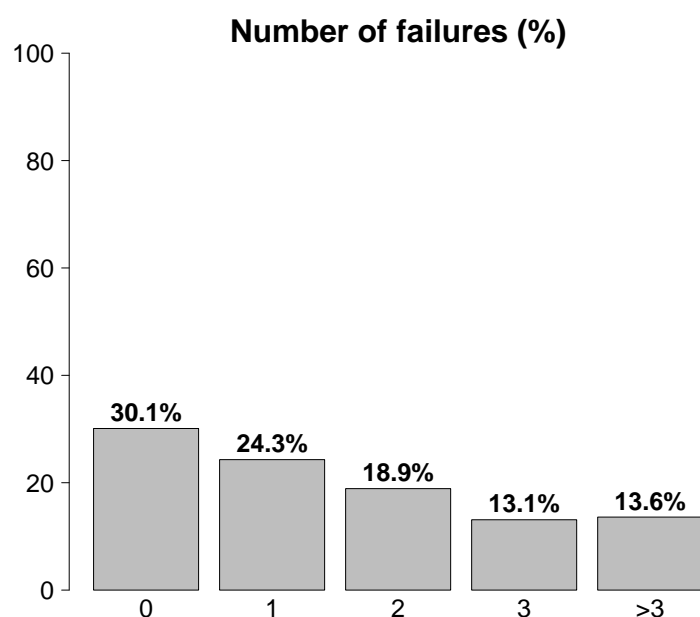
Non surgical interventions	N	%
Elective (N=396)		
Interventional endoscopy	137	34.6
Interventional cardiology	87	22.0
Interventional radiology	78	19.7
Interventional neuroradiology	62	15.7
Missing	32	

Non surgical interventions	N	%
Emergency (N=2266)		
Interventional cardiology	862	38.0
Interventional endoscopy	485	21.4
Interventional radiology	463	20.4
Interventional neuroradiology	430	19.0
Missing	26	

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Characteristics on admission - NON COVID adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	11469	41.2
Post surgical weaning	3578	12.9
Surgical monitoring	4813	17.4
Post interventional weaning	115	0.4
Interventional monitoring	519	1.9
Non surgical monitoring	2302	8.3
Missing	142	
Admission for procedures/treatments	0	0.0
Intensive Treatment	16402	58.8
Only ventilatory support	8186	29.4
Only cardiovascular support	1302	4.7
Ventilatory and cardiovascular support	6914	24.8
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	3	



Failures on admission	N	%
No	8393	30.1
Yes	19481	69.9
A: Respiratory failure	15100	54.2
B: Cardiovascular failure	8216	29.5
C: Neurological failure	3651	13.1
D: Hepatic failure	212	0.8
E: Renal failure	9830	35.3
F: Acute skin failure	16	0.1
G: Metabolic failure	7071	25.4
H: Coagulation failure	331	1.2
Missing	0	

Failures on admission (top 10)	N	%
A	4086	14.7
ABEG	2082	7.5
E	1725	6.2
AB	1433	5.1
AE	1168	4.2
AC	1142	4.1
ABE	984	3.5
ABCEG	722	2.6
EG	630	2.3
AEG	629	2.3
Missing	0	

Respiratory failure	N	%
None	12774	45.8
Only hypoxic failure	5065	18.2
Only hypercapnic failure	596	2.1
Hypoxic-hypercapnic failure	1637	5.9
Intubation for airway maint.	7802	28.0
Missing	0	

Cardiovascular failure	N	%
None	19658	70.5
Without shock	1627	5.8
Cardiogenic shock	1425	5.1
Septic shock	2327	8.3
Haemorrhagic/hypovolemic shock	1058	3.8
Hypovolemic shock	647	2.3
Anaphylactic shock	19	0.1
Neurogenic shock	297	1.1
Other shock	358	1.3
Mixed shock	458	1.6
Missing	0	

Neurologic failure	N	%
None	19398	84.2
Cerebral coma	1935	8.4
Metabolic coma	661	2.9
Postanoxic coma	890	3.9
Toxic coma	165	0.7
Missing or not evaluable	4825	

Renal failure (AKIN)	N	%
None	18044	64.7
Mild	4917	17.6
Moderate	2254	8.1
Severe	2659	9.5
Missing	0	

Metabolic failure	N	%
None	20803	74.6
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	1717	6.2
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	5354	19.2
Missing	0	

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Characteristics on admission - NON COVID adult patients evaluated in the GiViTI model

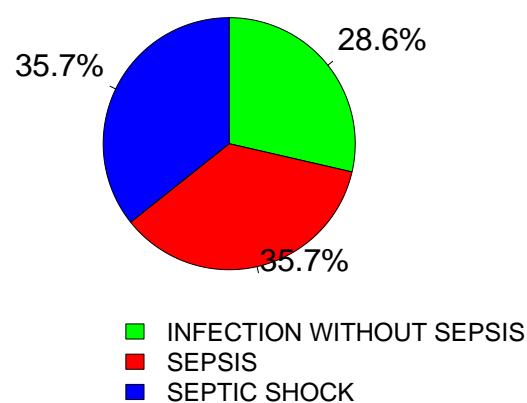
Clinical conditions on admission	N	%
Respiratory	4908	17.6
Acute exacerbation of COPD	998	3.6
Pleural effusion	924	3.3
Aspiration pneumonia	573	2.1
Atelectasis	468	1.7
Lung cancer	417	1.5
Cardiovascular	4792	17.2
Cardiac arrest	1283	4.6
Left heart failure with pulmonary edema	848	3.0
Left heart failure without pulm. edema	637	2.3
Acute severe arrhythmia: tachycardias	509	1.8
Acute myocardial infarction	459	1.6
Neurological	4570	16.4
Spontaneous Intraparenchymal bleeding	956	3.4
Brain tumour	854	3.1
Cerebral artery stroke	723	2.6
Seizures	636	2.3
Spontaneous Subarachnoid haemorrhage	481	1.7
Gastrointestinal and hepatic	5767	20.7
Digestive tract malignancy	1700	6.1
Gastrointestinal perforation	914	3.3
Intestinal occlusion	839	3.0
Gastrointestinal bleeding: upper tract	418	1.5
Bowel ischaemia	392	1.4
Trauma (anatomical districts)	3501	12.6
Pelvis/bone/joint & muscle	1652	5.9
Head	1406	5.0
Chest	1326	4.8
Spine	780	2.8
Abdomen	560	2.0
Major vessels injury	99	0.4
Miscellaneous	62	0.2
Other	6319	22.7
Nephrourologic disease	1421	5.1
Other disease	1356	4.9
Metabolic disorder	1351	4.8
Acute intoxication	602	2.2
Orthopaedic disease	519	1.9
Post transplantation	114	0.4
Liver transplantation	43	0.2
Renal transplantation	43	0.2
Infections	7551	27.1
Pneumonia	3170	11.4
NON-surgical secondary peritonitis	802	2.9
NON-surgical urinary tract infection	694	2.5
L.R.T.I. other than pneumonia	526	1.9
Cholecystitis/choolangitis	369	1.3
NON-surgical skin/soft tissue infection	359	1.3
Post-surgical peritonitis	351	1.3
Primary bacteraemia of unknown origin	350	1.3
Primary peritonitis	261	0.9
Clinical sepsis	253	0.9
Missing	0	

Trauma (anatomical districts)	N	%
Head	1406	5.0
Traumatic subarachnoid haemorrhage	516	1.9
Maxillofacial fracture	480	1.7
Cerebral contusion/laceration	466	1.7
Traumatic Subdural haematoma	465	1.7
Skull fracture	344	1.2
Spine	780	2.8
Vertebral fracture, without deficit	630	2.3
Cervical injury, incomplete deficit	52	0.2
Tetraplegia	42	0.2
Chest	1326	4.8
Other injuries of the chest	778	2.8
Traum. haemothorax/pneumothorax	538	1.9
Severe lung contusion/laceration	292	1.0
Abdomen	560	2.0
Minor injuries of the abdomen	168	0.6
Spleen: Moderate-Severe laceration	157	0.6
Liver: Moderate-Severe laceration	119	0.4
Pelvis/bone/joint & muscle	1652	5.9
Long bone fracture	1367	4.9
Multiple fracture of the pelvis	383	1.4
Very severe or open fracture of the pelvis	78	0.3
Major vessels injury	99	0.4
Proximal limbs vessels: transection	38	0.1
Neck vessels: dissection/transection	21	0.1
Aorta: rupture/dissection	17	0.1
Miscellaneous	62	0.2
Burns (>30% BSA)	44	0.2
Inhalation injury	20	0.1
Missing	0	

Infection severity on admission	N	%
None	20323	72.9
INFECTION WITHOUT SEPSIS	2161	7.8
SEPSIS	2698	9.7
SEPTIC SHOCK	2692	9.7
Missing	0	

Infection severity on admission

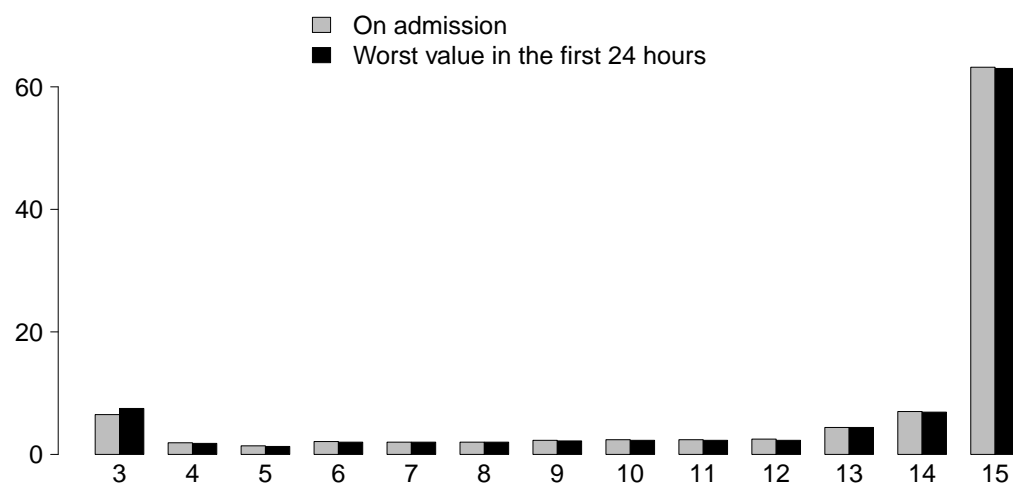
Patients infected (N=7551)



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Severity scores - NON COVID adult patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



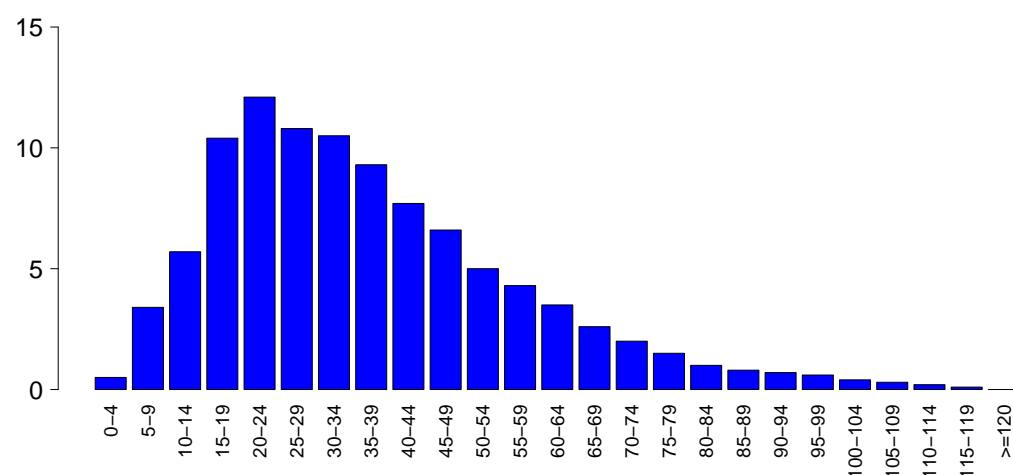
GCS (admission)

Median	15
Q1–Q3	12-15
Not evaluable	4825
Missing	0

GCS (worst in first 24 hours)

Median	15
Q1–Q3	12-15
Not evaluable	4448
Missing	0

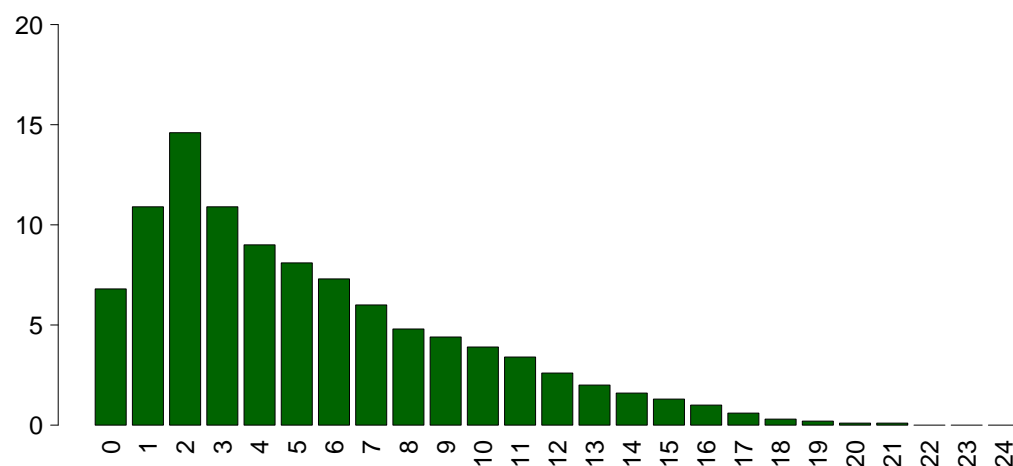
SAPS II (%)



SAPSII

Mean	36.7
SD	20.3
Median	33
Q1–Q3	22-48
Not evaluable	4448
Missing	0

SOFA (%)



SOFA

Mean	5.3
SD	4.2
Median	4
Q1–Q3	2-8
Not evaluable	4448
Missing	0

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Characteristics during the stay - NON COVID adult patients evaluated in the GiViTI model

Complications during the stay	N	%
No	19762	70.9
Yes	8109	29.1
Missing	3	

Failures during the stay	N	%
No	24222	86.9
Yes	3652	13.1

A: Respiratory failure	1670	6.0
B: Cardiovascular failure	1533	5.5
C: Neurological failure	297	1.1
D: Hepatic failure	98	0.4
E: Renal failure (AKIN)	1094	3.9
F: Acute skin failure	5	0.0
G: Metabolic failure	318	1.1
H: Coagulation failure	160	0.6
Missing	0	

Failures during the stay (top 10)	N	%
A	991	3.6
B	777	2.8
E	474	1.7
AB	254	0.9
G	189	0.7
BE	147	0.5
ABE	132	0.5
C	116	0.4
AE	100	0.4
D	36	0.1
Missing	0	

Respiratory failure occurred	N	%
None	26201	94.0
Intubation for airway maint.	517	1.9
Hypoxic failure	1136	4.1
Hypercapnic failure	268	1.0
Missing	3	

Cardiovascular failure occurred	N	%
None	26338	94.5
Cardiogenic shock	421	1.5
Hypovolemic shock	181	0.6
Haemorrhagic/hypovolemic shock	161	0.6
Septic shock	594	2.1
Anaphylactic shock	1	0.0
Neurogenic shock	96	0.3
Other shock	162	0.6
Missing	3	

Neurological failure occurred	N	%
None	27574	98.9
Cerebral coma	162	0.6
Metabolic coma	73	0.3
Postanoxic coma	65	0.2
Missing	3	

Renal failure occurred (AKIN)	N	%
None	26777	96.1
Mild	149	0.5
Moderate	166	0.6
Severe	779	2.8
Missing	3	

Complications during the stay	N	%
Respiratory	1286	4.6
Pleural effusion	458	1.6
Atelectasis	297	1.1
Pneumothorax/Pneumomediastinum	187	0.7
Severe ARDS	181	0.6
Pulmonary embolism	85	0.3
Cardiovascular	1869	6.7
Acute severe arrhythmia: tachycardias	680	2.4
Cardiac arrest	672	2.4
Pulmonary edema	122	0.4
Acute severe arrhythmia: bradycardias	120	0.4
Left heart failure w/o pulm. edema	116	0.4
Neurological	1687	6.1
Drowsiness/agitation/delirium	782	2.8
Seizures	306	1.1
Intracranial hypertension	291	1.0
Brain edema	244	0.9
New ischaemic stroke	99	0.4
Gastrointestinal and hepatic	693	2.5
Gastrointestinal bleeding: upper tract	118	0.4
Bowel ischaemia	109	0.4
Gastrointestinal bleeding: lower tract	99	0.4
Liver Dysfunction Syndrome	79	0.3
Paralytic Ileus	71	0.3
Other	660	2.4
Metabolic disorder	318	1.1
Nephrourologic disease	180	0.6
Other disease	126	0.5
Other skin and/or soft tissue pathology	32	0.1
Category/Stage II: Partial Thickness Skin Loss	21	0.1
Extremity compartment syndrome (severe)	19	0.1
F.U.O. fever of unknown origin	16	0.1
Infections	2486	8.9
Pneumonia	921	3.3
L.R.T.I. other than pneumonia	616	2.2
NON-surgical urinary tract infection	370	1.3
Primary bacteraemia of unknown origin	319	1.1
Catheter-related bacteremia (CR-BSI)	273	1.0
Post-surgical peritonitis	76	0.3
Post-surgical skin/soft tissue infection	66	0.2
Upper respiratory tract infection	66	0.2
Clinical sepsis	60	0.2
NON-surgical skin/soft tissue infection	56	0.2
Missing	3	

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Characteristics during the stay - NON COVID adult patients evaluated in the GiViTI model

Infections			Maximum severity of infection		
	N	%		N	%
None	18643	66.9	None	18643	66.9
Only on admission	6742	24.2	INFECTION WITHOUT SEPSIS	2739	9.8
On admission and during ICU stay	807	2.9	SEPSIS	3406	12.2
Only during ICU stay	1679	6.0	SEPTIC SHOCK	3073	11.0
Missing	3		Missing	13	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	18643 (91.7%)	886 (4.4%)	635 (3.1%)	158 (0.8%)	20322
	INFECTION WITHOUT SEPSIS	-	1853 (86.0%)	255 (11.8%)	46 (2.1%)	2154
	SEPSIS	-	-	2515 (93.4%)	178 (6.6%)	2693
	SEPTIC SHOCK	-	-	-	2691 (100.0%)	2692
	TOT	18643	2739	3406	3073	27861

Ventil. Associat. Pneumonia (VAP)	N	%
No	27065	97.1
Yes	806	2.9
Missing	3	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	9.5
CI (95%)	8.8–10.2

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	7.6%
CI (95%)	7.1–8.1

Catheter Bacteraemia (CR-BSI)	N	%
No	27598	99.0
Yes	273	1.0
Missing	3	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	2.0
CI (95%)	1.8–2.3

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	2.4%
CI (95%)	2.2–2.8

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Process indicators - NON COVID adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)		Use		On admission		On discharge		Length (days)		Days from admission			
		N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)		26739	95.9										
Invasive ventilation		18256	65.5	13747	49.3	4279	15.4	2	1-6	6	0	0-0	0
	Non invasive ventilation	4169	15.0	1041	3.7	1009	3.6	2	1-3	1	0	0-2	1
Tracheostomy		3154	11.3	949	3.4	2711	9.7	10	5-19	2	7	4-12	1
	iNO (inhaled nitric oxide)	79	0.3	4	0	16	0.1	3	1-5	0	2	0-5	0
Central Venous Catheter		18066	64.8	8426	30.2	14788	53.1	4	2-10	5	0	0-0	0
PICC		799	2.9	346	1.2	689	2.5	4	1-8	0	4	0-16	0
Arterial Catheter		23561	84.5	12316	44.2	6596	23.7	3	1-7	4	0	0-0	0
Vasoactive drugs		10167	36.5	4850	17.4	2475	8.9	2	1-4	3	0	0-0	0
Antiarrhythmics		1853	6.6	574	2.1	1006	3.6	3	1-7	0	1	0-2	0
IABP		179	0.6	148	0.5	57	0.2	2	1-3	0	0	0-1	0
Invasive monitoring of C.O.		807	2.9	96	0.3	195	0.7	4	2-8	1	0	0-1	0
Continuous monitoring of ScVO2		32	0.1	14	0.1	8	0	2	1-8	0	1	0-1	0
Temporary pacing		95	0.3	64	0.2	47	0.2	1	1-4	0	0	0-2	0
Ventricular assistance		7	0.0	3	0	2	0	2	0-4	0	1	1-2	0
DC-shock		413	1.5								0	0-1	0
CPR		685	2.5								0	0-1	0
Massive blood transfusion		277	1.0								0	0-0	0
ICP monitoring without CSF drainage		240	0.9	87	0.3	36	0.1	6	4-10	0	0	0-1	0
ICP monitoring with CSF drainage		255	0.9	154	0.6	123	0.4	6	3-13	0	0	0-1	0
External ventricular drainage without ICP		94	0.3	60	0.2	53	0.2	6	3-13	0	0	0-1	0
Haemofiltration		1002	3.6	108	0.4	268	1	3	2-8	0	1	0-2	0
Haemodialysis		720	2.6	139	0.5	312	1.1	3	1-7	0	1	0-3	0
ECMO		46	0.2	15	0.1	20	0.1	7	2-14	0	2	0-5	0
Hepatic clearance techniques		2	0.0										
Clearance techniques during sepsis		171	0.6	21	0.1	44	0.2	2	1-4	0	1	0-2	0
IAP (intra-abdominal pressure)		296	1.1										
Hypothermia		166	0.6	42	0.2	12	0	1	1-1	0	0	0-0	0
Enteral nutrition		9249	33.2	1766	6.3	6617	23.7	7	3-14	4	1	0-2	0
Parenteral nutrition		4457	16.0	683	2.5	2783	10	4	2-9	0	1	0-2	0
SDD (Topical, Topical and systemic)		174	0.6										
Patient restraint		595	2.1										
Peridural catheter		947	3.4	838	3	796	2.9	1	1-2	0	0	0-1	0
Electrical cardioversion		170	0.6								2	1-4	0
Vacuum therapy		138	0.5										

National report for general ICUs - Year 2020
Process indicators - NON COVID adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	17067	61.2										
Antibiotic prophylaxis	7345	26.4	5331	19.1	3160	11.3	1	1–2	0	0	0–0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	4664	16.7	2109	7.6	1620	5.8	3	2–5	0	0	0–1	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	3665	13.1	1710	6.1	2318	8.3	3	1–6	0	0	0–0	0
Targeted antibiotic therapy	4379	15.7	892	3.2	2553	9.2	6	3–11	1	4	2–7	0
Antifungal in empirical therapy	599	2.1	188	0.7	261	0.9	4	2–8	0	0	0–4	0
Antifungal in targeted therapy	463	1.7	76	0.3	249	0.9	8	5–15	0	7	3–13	0
Pre-emptive antifungal	154	0.6	46	0.2	80	0.3	4	2–10	0	1	0–6	0

Antibiotic therapy			
Pt. infected in ICU only (N=1679)			
	N	%	
No therapy	233	13.9	
Only empirical	284	16.9	
Only targeted	497	29.6	
Targeted after empirical	516	30.7	
Other	149	8.9	
Missing	0		

Antifungal therapy			
Pt. infected in ICU only (N=1679)			
	N	%	
No therapy	1525	90.8	
Only empirical	61	3.6	
Only targeted	82	4.9	
Targeted after empirical	9	0.5	
Other	2	0.1	
Missing	0		

National report for general ICUs - Year 2020**Process indicators** - NON COVID adult patients evaluated in the GiViTI model

		Length (days)					
Invasive ventilation (N=18256)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	6106	29.8	8.2	11.1	4	1–11	2
For airway maintenance	7562	36.9	5.6	8.3	2	1–7	3
In weaning	3786	18.5	0.4	0.5	0	0–1	0
Not evaluable	3060	14.9	3.8	8.2	1	0–3	2258
Reintubation within 48 hours	265	1.3	8.4	12.3	5	2–9	0

Non invasive ventilation (N=4169)	N	%
Non invasive ventilation only	2218	53.2
Non invasive ventilation failed	675	16.2
For weaning	1118	26.8
Other	158	3.8
Missing	0	

Tracheostomy not present on admission (N=2205)	N	%
Surgical	362	16.4
Percutwist	160	7.3
Ciaglia	343	15.6
Monodil. Ciaglia	896	40.6
Fantoni	23	1.0
Griggs	339	15.4
Other Kind	50	2.3
Unknown	31	1.4
Missing	1	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=2184)

Mean	8.8
SD	6.8
Median	7
Q1–Q3	4-12
Missing	2

Invasive monitoring of C.O. (N=807)	N	%
Swan Ganz	112	13.9
PICCO	562	69.6
LIDCO	2	0.2
Vigileo-PRAM	79	9.8
Other	51	6.3
Missing	1	

SDD (N=174)	N	%
Topical	174	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	26706	95.8
Yes	1168	4.2
Missing	0	

Number of surgical interventions	N	%
0	26706	95.8
1	905	3.2
2	161	0.6
3	61	0.2
>3	41	0.1
Missing	0	

Surgical interventions Days from admission	Mean	SD	Median	Q1–Q3	Missing
	8.8	9.5	5	3-11	7

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	509	1.8
Orthopaedic surgery	347	1.2
Neurosurgery	182	0.7
ENT surgery	148	0.5
Other surgery	72	0.3
Thoracic surgery	61	0.2
Maxillo-Facial surgery	52	0.2
Nephro/Urological surgery	43	0.2
Plastic surgery	41	0.1
Organ donation	37	0.1
Missing	0	

Non surgical interventions	N	%
No	27370	98.2
Yes	504	1.8
Missing	0	

Non surgical interventions Days from admission	Mean	SD	Median	Q1–Q3	Missing
	12.7	15.3	8	4-15	7

Non surgical interventions	N	%
Interventional endoscopy	349	1.3
Interventional radiology	121	0.4
Interventional cardiology	92	0.3
Interventional neuroradiology	40	0.1
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators - NON COVID adult patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	4602	16.5
Transferred to same hospital	20337	73.0
Transferred to other hospital	2621	9.4
Discharged home	183	0.7
Disch. terminally ill	131	0.5
Missing	0	

Transferred to (N=22958)	N	%
Ward	18469	80.4
Other ICU	1905	8.3
High dependency care unit	1840	8.0
Rehabilitation	623	2.7
Day hospital or Long-term care	121	0.5
Missing	0	

Reason of transfer to Other ICU (N=1971)	N	%
Specialist expertise	689	35.0
Step-up care	131	6.6
Logistical/organizational reasons	1113	56.5
Step-down care	38	1.9
Missing	0	

Transferred to Same hospital (N=20337)	N	%
Ward	17824	87.6
Other ICU	642	3.2
High dependency care unit	1732	8.5
Rehabilitation	105	0.5
Day hospital or Long-term care	34	0.2
Missing	0	

Transferred to Other hospital (N=2621)	N	%
Ward	645	24.6
Other ICU	1263	48.2
High dependency care unit	108	4.1
Rehabilitation	518	19.8
Day hospital or Long-term care	87	3.3
Missing	0	

ICU mortality	N	%
Alive	23141	83.0
Dead	4733	17.0
Missing	0	

Timing of ICU mortality (N=4733)	N	%
Daytime (08:00AM - 07:59PM)	3298	69.7
Nighttime (08:00PM - 07:59AM)	1435	30.3
Weekdays (Monday - Friday)	3537	74.7
Weekend (Saturday - Sunday)	1196	25.3
Missing	0	

C.A.M. activation (N=4733)	N	%
Yes, with organ donation	268	5.8
Yes, without organ donation	251	5.5
No, with organ donation	13	0.3
No, without organ donation	4069	88.4
Missing	132	

Tissue removal (N=4733)	N	%
Yes, with C.A.M. activation	156	3.3
Yes, without C.A.M. activation	179	3.8
No	4398	92.9
Missing	0	

Hospital mortality	N	%
Dead	6330	22.7
Transf. to other acute-care hospital	2988	10.7
Transf. to other type of hosp. stay	3961	14.2
Nursing home	481	1.7
Voluntary discharge	226	0.8
Discharged home	13888	49.8
Missing	0	

To other type of H stay (N=3961)	N	%
Rehabilitation in the same institute	500	12.6
Rehabilitation in other institute	2459	62.1
DH/long-term care, same inst.	264	6.7
DH/long-term care, other inst.	736	18.6
Missing	2	

Disch. terminally ill (N=21544)	N	%
Yes	415	1.9
No	21129	98.1
Missing	0	

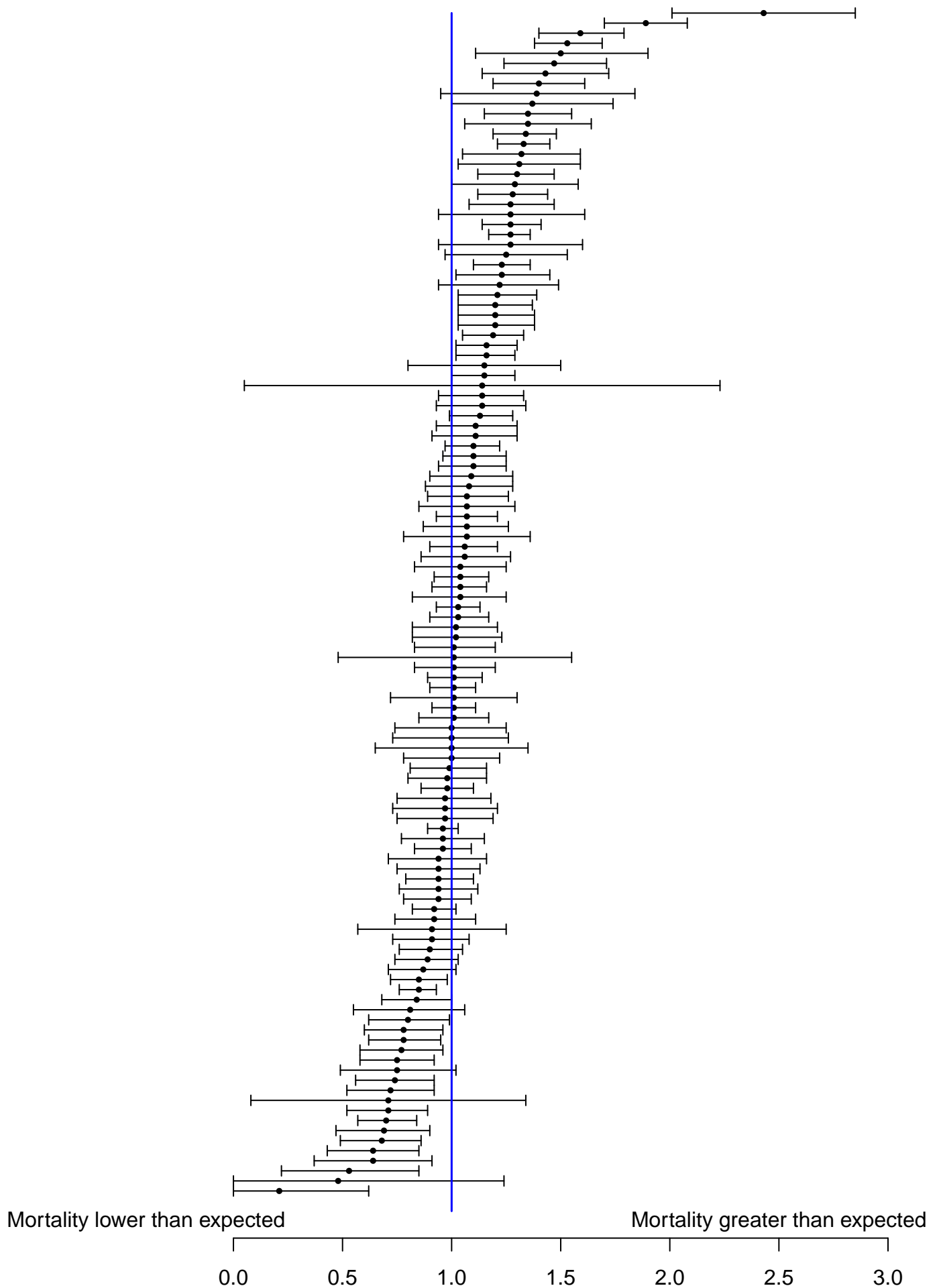
Hospital mortality	N	%
Alive	21129	75.8
Dead	6745	24.2
Missing	0	

Timing of hosp. mortality (N=6745)	N	%
In ICU	4733	70.2
Within 24 hours after ICU	118	1.7
24-47 hours after ICU	130	1.9
48-71 hours after ICU	121	1.8
72-95 hours after ICU	125	1.9
After 95 hours after ICU	1518	22.5
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=2012)		
Mean		16.1
SD		19.0
Median		10
Q1–Q3		4-21
Missing		0

National report for general ICUs - Year 2020**Outcome indicators** - NON COVID adult patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%			
Alive	20913	75.0		Mean	6.0
Dead	6961	25.0		SD	9.4
Missing	0			Median	2
				Q1–Q3	1-7
				Missing	0
			ICU stay (days)		
			Alive (N=23141)		
				Mean	5.7
				SD	9.1
				Median	2
				Q1–Q3	1-6
				Missing	0
			ICU stay (days)		
			Dead (N=4733)		
				Mean	7.4
				SD	10.8
				Median	3
				Q1–Q3	1-9
				Missing	0
			Stay after ICU (days)		
			Alive (N=23141)		
				Mean	12.3
				SD	16.1
				Median	8
				Q1–Q3	3-15
				Missing	4
			Hospital stay (days)		
				Mean	19.0
				SD	20.4
				Median	13
				Q1–Q3	7-24
				Missing	3
			Hospital stay (days)		
			Alive (N=21129)		
				Mean	20.1
				SD	20.5
				Median	14
				Q1–Q3	8-25
				Missing	3
			Hospital stay (days)		
			Dead (N=6745)		
				Mean	15.7
				SD	19.8
				Median	9
				Q1–Q3	3-21
				Missing	0

National report for general ICUs - Year 2020**Analysis of hospital mortality** NON COVID adult patients evaluated in the GiViTI modelPredictive model: **GiViTI 2019**

National report for general ICUs - Year 2020

Characteristics on admission - Adult NON COVID non surgical patients evaluated in the GiViTI model

Patients (N): 14231

Sex	N	%
Male	8768	61.9
Female	5395	38.1
Missing	68	

Age (years)	N	%
17-45	1634	11.5
46-65	4262	29.9
66-75	3786	26.6
>75	4549	32.0
Missing	0	
Mean	65.8	
SD	15.9	
Median	69	
Q1–Q3	57-78	
Min–Max	17–102	

Body mass Index (BMI)	N	%
Underweight	684	4.8
Normal	6061	42.8
Overweight	4474	31.6
Obese	2944	20.8
Missing	68	

Pregnancy status	N	%
Females (N=5395)		
Not fertile	2823	52.3
Not pregnant/Unknown	2533	47.0
Currently pregnant	15	0.3
Post partum	24	0.4
Missing	0	

Comorbidities	N	%
No	1963	13.8
Yes	12268	86.2
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	7534	52.9
Arrhythmia	2379	16.7
Diabetes Type II without insulin tr.	2052	14.4
Moderate COPD	2013	14.1
Myocardial infarction	1743	12.2
NYHA class II-III	1727	12.1
Cerebrovascular disease	1691	11.9
Antiplatelet therapy	1374	9.7
Moderate or severe renal disease	1356	9.5
Peripheral vascular disease	1271	8.9
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.4	12.0	1	0-3	0

Source of admission	N	%
Same hospital	11253	79.1
Other hospital	2978	20.9
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=14231)		
Medical ward	3249	22.8
Surgical ward	753	5.3
Emergency room	7895	55.5
Other ICU	1806	12.7
High dependency care unit	528	3.7
Missing	0	

Reason for transfer from	N	%
Other ICU (N=1806)		
Specialist expertise	315	17.4
Step-up care	189	10.5
Logistical/organizational reasons	1258	69.7
Step-down care	44	2.4
Missing	0	

Ward of admission	N	%
Same hospital (N=11253)		
Medical ward	2869	25.5
Surgical ward	696	6.2
Emergency room	6807	60.5
Other ICU	412	3.7
High dependency care unit	469	4.2
Missing	0	

Ward of admission	N	%
Other hospital (N=2978)		
Medical ward	380	12.8
Surgical ward	57	1.9
Emergency room	1088	36.5
Other ICU	1394	46.8
High dependency care unit	59	2.0
Missing	0	

Scheduled admission	N	%
No	14130	99.3
Yes	101	0.7
Missing	0	

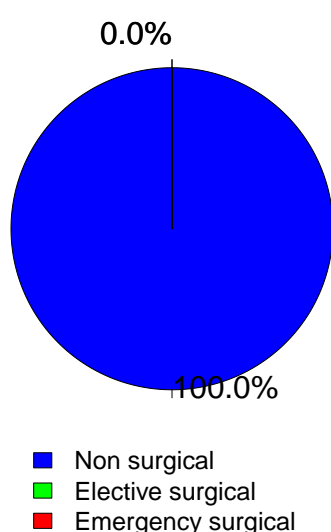
National report for general ICUs - Year 2020

Characteristics on admission - Adult NON COVID non surgical patients evaluated in the GiViTI model

Trauma	N	%
No	12607	88.6
Yes	1624	11.4
Multiple trauma	753	5.3
Missing	0	

Surgical status	N	%
Non surgical	14231	100.0
Elective surgical	0	0.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=0)		
Operating theatre of surgical ward	0	0.0
Operating theatre of emergency room	0	0.0
Surgical ward	0	0.0
Other	0	0.0
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=0)		
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Timing	N	%
Elective surgical (N=0)		
From -7 to -3 days	0	0.0
From -2 to -1 days	0	0.0
On ICU admission day	0	0.0
The day after ICU admission	0	0.0
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=0)		
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Timing	N	%
Emergency surgical (N=0)		
From -7 to -3 days	0	0.0
From -2 to -1 days	0	0.0
On ICU admission day	0	0.0
The day after ICU admission	0	0.0
Missing	0	

Non surgical interventions	N	%
None	12136	85.3
Elective	265	1.9
Emergency	1830	12.9
Missing	0	

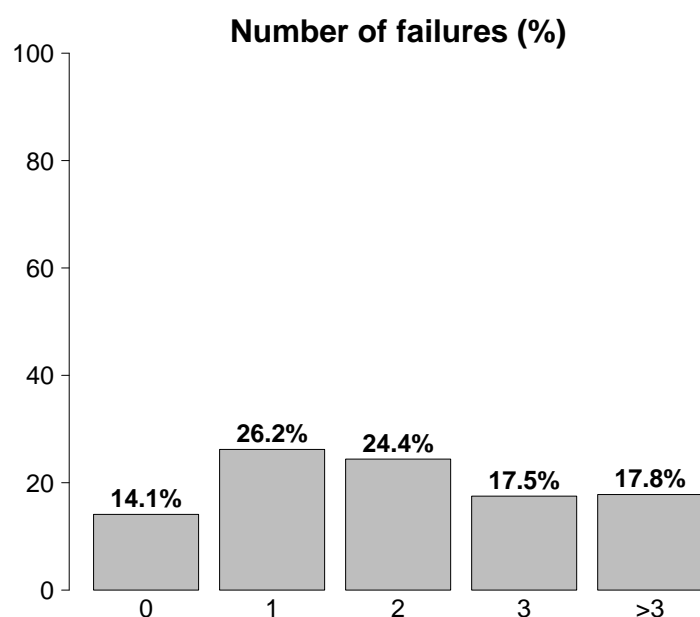
Non surgical interventions	N	%
Elective (N=265)		
Interventional endoscopy	94	35.5
Interventional cardiology	76	28.7
Interventional radiology	50	18.9
Interventional neuroradiology	47	17.7
Missing	0	

Non surgical interventions	N	%
Emergency (N=1830)		
Interventional cardiology	839	45.8
Interventional endoscopy	394	21.5
Interventional neuroradiology	311	17.0
Interventional radiology	300	16.4
Missing	0	

National report for general ICUs - Year 2020

Characteristics on admission - Adult NON COVID non surgical patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	3042	21.4
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	103	0.7
Interventional monitoring	506	3.6
Non surgical monitoring	2302	16.3
Missing	131	
Admission for procedures/treatments	0	0.0
Intensive Treatment	11186	78.6
Only ventilatory support	6141	43.2
Only cardiovascular support	747	5.3
Ventilatory and cardiovascular support	4298	30.2
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	3	



Failures on admission	N	%
No	2011	14.1
Yes	12220	85.9
A: Respiratory failure	10439	73.4
B: Cardiovascular failure	5045	35.5
C: Neurological failure	2945	20.7
D: Hepatic failure	182	1.3
E: Renal failure	5840	41.0
F: Acute skin failure	14	0.1
G: Metabolic failure	4421	31.1
H: Coagulation failure	216	1.5
Missing	0	

Failures on admission (top 10)	N	%
A	2897	20.4
ABEG	1172	8.2
AC	915	6.4
AE	873	6.1
AB	816	5.7
ABCEG	580	4.1
ABE	574	4.0
AEG	495	3.5
E	469	3.3
BEG	346	2.4
Missing	0	

Respiratory failure	N	%
None	3792	26.6
Only hypoxic failure	3850	27.1
Only hypercapnic failure	537	3.8
Hypoxic-hypercapnic failure	1472	10.3
Intubation for airway maint.	4580	32.2
Missing	0	

Cardiovascular failure	N	%
None	9186	64.5
Without shock	1081	7.6
Cardiogenic shock	1288	9.1
Septic shock	1340	9.4
Haemorrhagic/hypovolemic shock	323	2.3
Hypovolemic shock	305	2.1
Anaphylactic shock	15	0.1
Neurogenic shock	151	1.1
Other shock	265	1.9
Mixed shock	277	1.9
Missing	0	

Neurologic failure	N	%
None	8907	75.2
Cerebral coma	1407	11.9
Metabolic coma	556	4.7
Postanoxic coma	826	7.0
Toxic coma	156	1.3
Missing or not evaluable	2379	

Renal failure (AKIN)	N	%
None	8391	59.0
Mild	2606	18.3
Moderate	1394	9.8
Severe	1840	12.9
Missing	0	

Metabolic failure	N	%
None	9810	68.9
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	1084	7.6
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	3337	23.4
Missing	0	

National report for general ICUs - Year 2020**Characteristics on admission - Adult NON COVID non surgical patients evaluated in the GiViTI model**

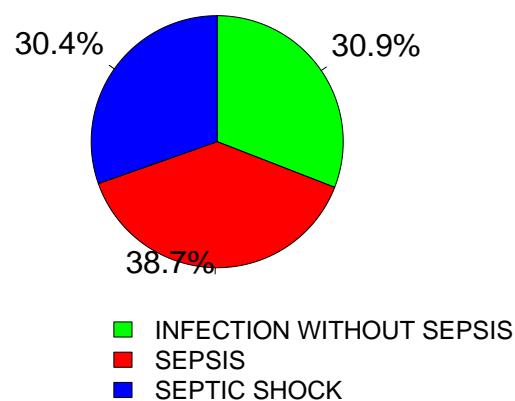
Clinical conditions on admission	N	%
Respiratory	3800	26.7
Acute exacerbation of COPD	962	6.8
Pleural effusion	725	5.1
Aspiration pneumonia	491	3.5
Moderate ARDS	388	2.7
Atelectasis	339	2.4
Cardiovascular	3531	24.8
Cardiac arrest	1166	8.2
Left heart failure with pulmonary edema	803	5.6
Left heart failure without pulm. edema	549	3.9
Acute myocardial infarction	429	3.0
Acute ischaemia	381	2.7
Neurological	2914	20.5
Spontaneous Intraparenchymal bleeding	673	4.7
Cerebral artery stroke	619	4.3
Seizures	583	4.1
Metabolic/postanoxic encephalopathy	445	3.1
Spontaneous Subarachnoid haemorrhage	289	2.0
Gastrointestinal and hepatic	1022	7.2
Gastrointestinal bleeding: upper tract	292	2.1
Acute pancreatitis	157	1.1
Liver Dysfunction Syndrome	116	0.8
Acute bile-duct disease	96	0.7
Ascites	94	0.7
Trauma (anatomical districts)	1624	11.4
Head	837	5.9
Chest	834	5.9
Pelvis/bone/joint & muscle	441	3.1
Spine	398	2.8
Abdomen	236	1.7
Miscellaneous	53	0.4
Major vessels injury	32	0.2
Other	2611	18.3
Metabolic disorder	1085	7.6
Acute intoxication	578	4.1
Nephrourologic disease	467	3.3
Other disease	445	3.1
Coagulation disorder	216	1.5
Post transplantation	56	0.4
Renal transplantation	22	0.2
Liver transplantation	14	0.1
Infections	5116	35.9
Pneumonia	2892	20.3
NON-surgical urinary tract infection	507	3.6
L.R.T.I. other than pneumonia	477	3.4
Primary bacteraemia of unknown origin	296	2.1
Clinical sepsis	227	1.6
NON-surgical skin/soft tissue infection	198	1.4
Cholecystitis/choolangitis	187	1.3
NON-surgical CNS infection	152	1.1
Catheter-related bacteremia (CR-BSI)	93	0.7
NON-surgical endocarditis	87	0.6
Missing	0	

Trauma (anatomical districts)	N	%
Head	837	5.9
Traumatic subarachnoid haemorrhage	330	2.3
Cerebral contusion/laceration	300	2.1
Maxillofacial fracture	271	1.9
Traumatic Subdural haematoma	249	1.7
Skull fracture	202	1.4
Spine	398	2.8
Vertebral fracture, without deficit	355	2.5
Cervical injury, incomplete deficit	17	0.1
Tetraplegia	14	0.1
Chest	834	5.9
Other injuries of the chest	506	3.6
Traum. haemothorax/pneumothorax	333	2.3
Severe lung contusion/laceration	169	1.2
Abdomen	236	1.7
Minor injuries of the abdomen	88	0.6
Spleen: Moderate-Severe laceration	65	0.5
Liver: Moderate-Severe laceration	58	0.4
Pelvis/bone/joint & muscle	441	3.1
Long bone fracture	276	1.9
Multiple fracture of the pelvis	207	1.5
Very severe or open fracture of the pelvis	21	0.1
Major vessels injury	32	0.2
Neck vessels: dissection/transection	8	0.1
Proximal limbs vessels: transection	8	0.1
Major abdominal vessels: transection	6	0.0
Miscellaneous	53	0.4
Burns (>30% BSA)	39	0.3
Inhalation injury	16	0.1
Missing	0	

Infection severity on admission	N	%
None	9115	64.1
INFECTION WITHOUT SEPSIS	1583	11.1
SEPSIS	1978	13.9
SEPTIC SHOCK	1555	10.9
Missing	0	

Infection severity on admission

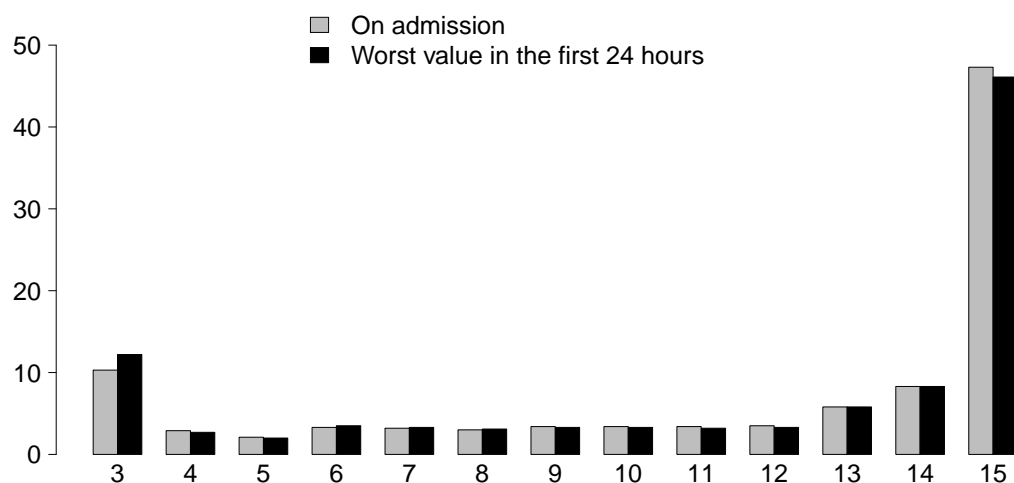
Patients infected (N=5116)



National report for general ICUs - Year 2020

Severity scores - Adult NON COVID non surgical patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



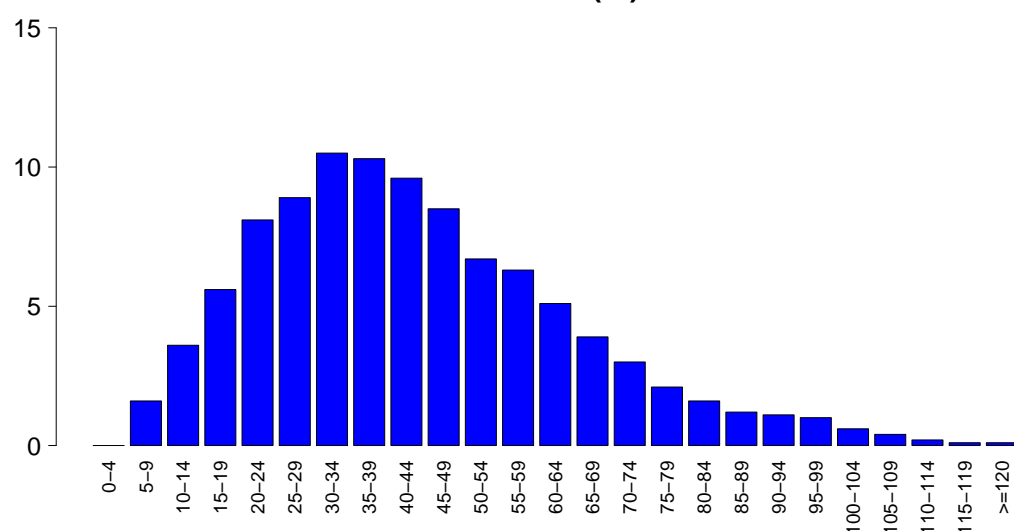
GCS (admission)

Median	14
Q1–Q3	9-15
Not evaluable	2379
Missing	0

GCS (worst in first 24 hours)

Median	14
Q1–Q3	8-15
Not evaluable	2644
Missing	0

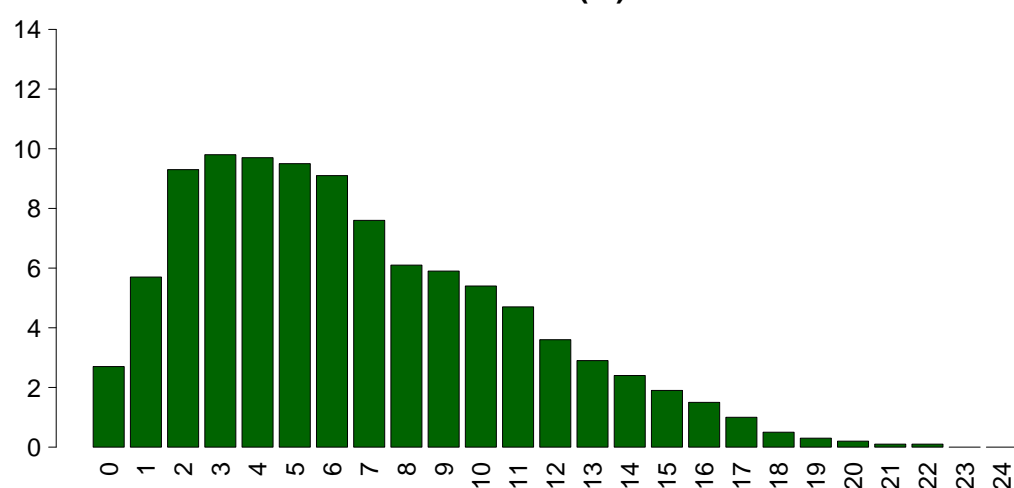
SAPS II (%)



SAPSII

Mean	43.3
SD	20.8
Median	40
Q1–Q3	28-56
Not evaluable	2644
Missing	0

SOFA (%)



SOFA

Mean	6.6
SD	4.3
Median	6
Q1–Q3	3-9
Not evaluable	2644
Missing	0

National report for general ICUs - Year 2020**Characteristics during the stay - Adult NON COVID non surgical patients evaluated in the GiViTI model**

Complications during the stay	N	%
No	8804	61.9
Yes	5424	38.1
Missing	3	

Failures during the stay	N	%
No	11735	82.5
Yes	2496	17.5
A: Respiratory failure	1153	8.1
B: Cardiovascular failure	1066	7.5
C: Neurological failure	230	1.6
D: Hepatic failure	67	0.5
E: Renal failure (AKIN)	697	4.9
F: Acute skin failure	5	0.0
G: Metabolic failure	207	1.5
H: Coagulation failure	100	0.7
Missing	0	

Failures during the stay (top 10)	N	%
A	689	4.8
B	547	3.8
E	287	2.0
AB	181	1.3
G	117	0.8
C	99	0.7
BE	97	0.7
ABE	82	0.6
AE	70	0.5
BC	25	0.2
Missing	0	

Respiratory failure occurred	N	%
None	13075	91.9
Intubation for airway maint.	333	2.3
Hypoxic failure	803	5.6
Hypercapnic failure	215	1.5
Missing	3	

Cardiovascular failure occurred	N	%
None	13162	92.5
Cardiogenic shock	344	2.4
Hypovolemic shock	105	0.7
Haemorrhagic/hypovolemic shock	74	0.5
Septic shock	402	2.8
Anaphylactic shock	1	0.0
Neurogenic shock	76	0.5
Other shock	120	0.8
Missing	3	

Neurological failure occurred	N	%
None	13998	98.4
Cerebral coma	121	0.9
Metabolic coma	56	0.4
Postanoxic coma	56	0.4
Missing	3	

Renal failure occurred (AKIN)	N	%
None	13531	95.1
Mild	82	0.6
Moderate	86	0.6
Severe	529	3.7
Missing	3	

Complications during the stay	N	%
Respiratory	869	6.1
Pleural effusion	282	2.0
Atelectasis	184	1.3
Severe ARDS	147	1.0
Pneumothorax/Pneumomediastinum	130	0.9
Upper resp. tract disease	65	0.5
Cardiovascular	1315	9.2
Cardiac arrest	531	3.7
Acute severe arrhythmia: tachycardias	423	3.0
Pulmonary edema	108	0.8
Acute severe arrhythmia: bradycardias	87	0.6
Left heart failure w/o pulm. edema	86	0.6
Neurological	1103	7.8
Drowsiness/agitation/delirium	508	3.6
Seizures	217	1.5
Intracranial hypertension	185	1.3
Brain edema	162	1.1
New ischaemic stroke	58	0.4
Gastrointestinal and hepatic	318	2.2
Gastrointestinal bleeding: upper tract	80	0.6
Gastrointestinal bleeding: lower tract	63	0.4
Liver Dysfunction Syndrome	57	0.4
Paralytic Ileus	32	0.2
Bowel ischaemia	31	0.2
Other	404	2.8
Metabolic disorder	207	1.5
Nephrourologic disease	104	0.7
Other disease	76	0.5
Category/Stage II: Partial Thickness Skin Loss	15	0.1
Other skin and/or soft tissue pathology	15	0.1
F.U.O. fever of unknown origin	12	0.1
Category/Stage III: Full Thickness Skin Loss	8	0.1
Infections	1644	11.6
Pneumonia	601	4.2
L.R.T.I. other than pneumonia	424	3.0
NON-surgical urinary tract infection	292	2.1
Primary bacteraemia of unknown origin	217	1.5
Catheter-related bacteremia (CR-BSI)	190	1.3
Upper respiratory tract infection	50	0.4
Other fungal infections	39	0.3
NON-surgical skin/soft tissue infection	37	0.3
Clinical sepsis	34	0.2
Post-surgical skin/soft tissue infection	27	0.2
Missing	3	

National report for general ICUs - Year 2020

Characteristics during the stay - Adult NON COVID non surgical patients evaluated in the GiViTI model

Infections	N	%
None	8070	56.7
Only on admission	4514	31.7
On admission and during ICU stay	600	4.2
Only during ICU stay	1044	7.3
Missing	3	

Maximum severity of infection	N	%
None	8070	56.7
INFECTION WITHOUT SEPSIS	1902	13.4
SEPSIS	2429	17.1
SEPTIC SHOCK	1824	12.8
Missing	6	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	8070 (88.5%)	565 (6.2%)	395 (4.3%)	84 (0.9%)	9114
	INFECTION WITHOUT SEPSIS	-	1337 (84.6%)	209 (13.2%)	34 (2.2%)	1580
	SEPSIS	-	-	1824 (92.3%)	152 (7.7%)	1976
	SEPTIC SHOCK	-	-	-	1554 (99.9%)	1555
	TOT	8070	1902	2429	1824	14225

Ventil. Associat. Pneumonia (VAP)	N	%
No	13695	96.3
Yes	533	3.7
Missing	3	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	8.6
CI (95%)	7.9–9.4

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	6.9%
CI (95%)	6.3–7.5

Catheter Bacteraemia (CR-BSI)	N	%
No	14038	98.7
Yes	190	1.3
Missing	3	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	2.0
CI (95%)	1.8–2.4

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	2.5%
CI (95%)	2.1–2.8

National report for general ICUs - Year 2020
Process indicators - Adult NON COVID non surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	13832	97.2										
Invasive ventilation	9607	67.5	6148	43.2	3222	22.6	4	1-9	6	0	0-0	0
	3118	21.9	819	5.8	723	5.1	2	1-4	1	0	0-2	1
Non invasive ventilation	2192	15.4	690	4.8	1857	13	11	6-19	2	8	5-12	1
Tracheostomy	69	0.5	4	0	14	0.1	3	1-5	0	2	0-5	0
iNO (inhaled nitric oxide)	10747	75.5	3748	26.3	8390	59	5	2-12	5	0	0-0	0
Central Venous Catheter	505	3.5	174	1.2	430	3	5	2-10	0	6	1-17	0
PICC	12341	86.7	3939	27.7	4389	30.8	4	2-10	4	0	0-0	0
Arterial Catheter	6144	43.2	2324	16.3	1817	12.8	2	1-5	3	0	0-0	0
Vasoactive drugs	1236	8.7	389	2.7	664	4.7	3	1-8	0	1	0-3	0
Antiarrhythmics	175	1.2	145	1	55	0.4	2	1-3	0	0	0-1	0
IABP	484	3.4	43	0.3	133	0.9	4	2-8	1	0	0-1	0
Invasive monitoring of C.O.	20	0.1	3	0	8	0.1	5	3-9	0	1	0-1	0
Continuous monitoring of ScVO2	88	0.6	60	0.4	45	0.3	1	1-4	0	0	0-2	0
Temporary pacing	7	0.0	3	0	2	0	2	0-4	0	1	1-2	0
Ventricular assistance	369	2.6								0	0-1	0
DC-shock	580	4.1								0	0-0	0
CPR	94	0.7								0	0-0	0
Massive blood transfusion	76	0.5	13	0.1	10	0.1	8	5-10	0	0	0-1	0
ICP monitoring without CSF drainage	32	0.2	17	0.1	17	0.1	8	2-14	0	0	0-2	0
ICP monitoring with CSF drainage	11	0.1	4	0	5	0	7	4-12	0	0	0-1	0
External ventricular drainage without ICP	728	5.1	92	0.6	202	1.4	3	2-8	0	0	0-2	0
Haemofiltration	543	3.8	98	0.7	226	1.6	3	1-7	0	1	0-3	0
Haemodialysis	42	0.3	13	0.1	18	0.1	7	2-14	0	1	0-4	0
ECMO	2	0.0										
Hepatic clearance techniques	102	0.7	10	0.1	23	0.2	2	1-5	0	1	0-3	0
Clearance techniques during sepsis	103	0.7										
IAP (intra-abdominal pressure)	154	1.1	41	0.3	12	0.1	1	1-1	0	0	0-0	0
Hypothermia	6873	48.3	1446	10.2	4794	33.7	7	3-14	4	1	0-2	0
Enteral nutrition	2225	15.6	382	2.7	1196	8.4	5	2-10	0	1	0-2	0
Parenteral nutrition	128	0.9										
SDD (Topical, Topical and systemic)	341	2.4										
Patient restraint	50	0.4	11	0.1	32	0.2	4	1-6	0	1	0-1	0
Peridural catheter	114	0.8								2	0-4	0
Electrical cardioversion	22	0.2										
Vacuum therapy												

National report for general ICUs - Year 2020

Process indicators - Adult NON COVID non surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	7952	55.9										
Antibiotics												
Antibiotic prophylaxis	1403	9.9	472	3.3	613	4.3	2	1-4	0	0	0-0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	2996	21.1	1205	8.5	860	6	3	2-5	0	0	0-1	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	2329	16.4	907	6.4	1325	9.3	3	2-6	0	0	0-0	0
Targeted antibiotic therapy	3172	22.3	702	4.9	1807	12.7	7	4-11	1	4	1-7	0
Antifungal in empirical therapy	282	2.0	81	0.6	99	0.7	4	2-8	0	1	0-7	0
Antifungal in targeted therapy	311	2.2	57	0.4	161	1.1	9	5-15	0	7	3-13	0
Pre-emptive antifungal	73	0.5	23	0.2	34	0.2	5	2-12	0	1	0-6	0

Antibiotic therapy

Pt. infected in ICU only (N=1044)			
	N		%
No therapy	160		15.3
Only empirical	162		15.5
Only targeted	310		29.7
Targeted after empirical	309		29.6
Other	103		9.9
Missing	0		

Antifungal therapy

Pt. infected in ICU only (N=1044)			
	N		%
No therapy	962		92.1
Only empirical	21		2.0
Only targeted	56		5.4
Targeted after empirical	3		0.3
Other	2		0.2
Missing	0		

National report for general ICUs - Year 2020**Process indicators** - Adult NON COVID non surgical patients evaluated in the GiViTI model
Length (days)

Invasive ventilation (N=9607)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	4700	43.9	8.5	10.9	5	2–11	2
For airway maintenance	4429	41.3	6.0	8.6	3	1–8	3
In weaning	229	2.1	0.5	0.5	0	0–1	0
Not evaluable	1360	12.7	7.1	11.1	4	1–8	1110
Reintubation within 48 hours	147	1.4	9.5	14.0	5	3–10.5	0

Non invasive ventilation (N=3118)	N	%
Non invasive ventilation only	1736	55.7
Non invasive ventilation failed	594	19.1
For weaning	683	21.9
Other	105	3.4
Missing	0	

Tracheostomy not present on admission (N=1502)	N	%
Surgical	240	16.0
Percutwist	123	8.2
Ciaglia	258	17.2
Monodil. Ciaglia	586	39.0
Fantoni	18	1.2
Griggs	214	14.2
Other Kind	42	2.8
Unknown	20	1.3
Missing	1	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=1489)

Mean	9.0
SD	6.8
Median	7
Q1–Q3	4-12
Missing	2

Invasive monitoring of C.O. (N=484)	N	%
Swan Ganz	80	16.5
PICCO	337	69.6
LIDCO	0	0.0
Vigileo-PRAM	40	8.3
Other	26	5.4
Missing	1	

SDD (N=128)	N	%
Topical	128	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	13664	96.0
Yes	567	4.0
Missing	0	

Number of surgical interventions	N	%
0	13664	96.0
1	488	3.4
2	56	0.4
3	17	0.1
>3	6	0.0
Missing	0	

Surgical interventions
Days from admission

Mean	8.5
SD	8.6
Median	6
Q1–Q3	3-11
Missing	6

Surgical interventions (top 10)	N	%
Orthopaedic surgery	174	1.2
Gastrointestinal surgery	111	0.8
ENT surgery	109	0.8
Neurosurgery	57	0.4
Thoracic surgery	44	0.3
Organ donation	34	0.2
Maxillo-Facial surgery	29	0.2
Other surgery	28	0.2
Plastic surgery	24	0.2
Nephro/Urological surgery	20	0.1
Missing	0	

Non surgical interventions	N	%
No	13853	97.3
Yes	378	2.7
Missing	0	

Non surgical interventions
Days from admission

Mean	12.3
SD	16.5
Median	7
Q1–Q3	4-14
Missing	3

Non surgical interventions	N	%
Interventional endoscopy	275	1.9
Interventional radiology	80	0.6
Interventional cardiology	79	0.6
Interventional neuroradiology	9	0.1
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators - Adult NON COVID non surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	3484	24.5
Transferred to same hospital	8415	59.1
Transferred to other hospital	2081	14.6
Discharged home	138	1.0
Disch. terminally ill	113	0.8
Missing	0	

Transferred to (N=10496)	N	%
Ward	7130	67.9
Other ICU	1487	14.2
High dependency care unit	1321	12.6
Rehabilitation	456	4.3
Day hospital or Long-term care	102	1.0
Missing	0	

Reason of transfer to Other ICU (N=1549)	N	%
Specialist expertise	574	37.1
Step-up care	113	7.3
Logistical/organizational reasons	834	53.8
Step-down care	28	1.8
Missing	0	

Transferred to Same hospital (N=8415)	N	%
Ward	6589	78.3
Other ICU	502	6.0
High dependency care unit	1228	14.6
Rehabilitation	72	0.9
Day hospital or Long-term care	24	0.3
Missing	0	

Transferred to Other hospital (N=2081)	N	%
Ward	541	26.0
Other ICU	985	47.3
High dependency care unit	93	4.5
Rehabilitation	384	18.5
Day hospital or Long-term care	78	3.7
Missing	0	

ICU mortality	N	%
Alive	10634	74.7
Dead	3597	25.3
Missing	0	

Timing of ICU mortality (N=3597)	N	%
Daytime (08:00AM - 07:59PM)	2516	69.9
Nighttime (08:00PM - 07:59AM)	1081	30.1
Weekdays (Monday - Friday)	2684	74.6
Weekend (Saturday - Sunday)	913	25.4
Missing	0	

C.A.M. activation (N=3597)	N	%
Yes, with organ donation	225	6.5
Yes, without organ donation	208	6.0
No, with organ donation	9	0.3
No, without organ donation	3041	87.3
Missing	114	

Tissue removal (N=3597)	N	%
Yes, with C.A.M. activation	122	3.4
Yes, without C.A.M. activation	126	3.5
No	3349	93.1
Missing	0	

Hospital mortality	N	%
Dead	4425	31.1
Transf. to other acute-care hospital	2244	15.8
Transf. to other type of hosp. stay	2389	16.8
Nursing home	275	1.9
Voluntary discharge	166	1.2
Discharged home	4732	33.3
Missing	0	

To other type of H stay (N=2389)	N	%
Rehabilitation in the same institute	288	12.1
Rehabilitation in other institute	1500	62.8
DH/long-term care, same inst.	170	7.1
DH/long-term care, other inst.	430	18.0
Missing	1	

Disch. terminally ill (N=9806)	N	%
Yes	271	2.8
No	9535	97.2
Missing	0	

Hospital mortality	N	%
Alive	9535	67.0
Dead	4696	33.0
Missing	0	

Timing of hosp. mortality (N=4696)	N	%
In ICU	3597	76.6
Within 24 hours after ICU	57	1.2
24-47 hours after ICU	85	1.8
48-71 hours after ICU	78	1.7
72-95 hours after ICU	68	1.4
After 95 hours after ICU	811	17.3
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=1099)		
Mean		15.3
SD		17.9
Median		9
Q1–Q3		3-20
Missing		0

National report for general ICUs - Year 2020**Outcome indicators** - Adult NON COVID non surgical patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	9355	65.7
Dead	4876	34.3
Missing	0	

ICU stay (days)		
	Mean	7.9
	SD	10.4
	Median	4
	Q1–Q3	2-10
	Missing	0

ICU stay (days)		
Alive (N=10634)		
	Mean	8.1
	SD	10.4
	Median	4
	Q1–Q3	2-10
	Missing	0

ICU stay (days)		
Dead (N=3597)		
	Mean	7.3
	SD	10.4
	Median	3
	Q1–Q3	1-9
	Missing	0

Stay after ICU (days)		
Alive (N=10634)		
	Mean	12.0
	SD	15.7
	Median	8
	Q1–Q3	1-16
	Missing	2

Hospital stay (days)		
	Mean	19.2
	SD	20.6
	Median	13
	Q1–Q3	6-25
	Missing	2

Hospital stay (days)		
Alive (N=9535)		
	Mean	21.6
	SD	21.0
	Median	16
	Q1–Q3	8-28
	Missing	2

Hospital stay (days)		
Dead (N=4696)		
	Mean	14.4
	SD	18.9
	Median	8
	Q1–Q3	2-19
	Missing	0

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Characteristics on admission - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Patients (N): 7002

Sex	N	%
Male	4012	57.6
Female	2959	42.4
Missing	31	

Age (years)	N	%
17-45	525	7.5
46-65	2066	29.5
66-75	2049	29.3
>75	2362	33.7
Missing	0	
Mean	67.8	
SD	14.2	
Median	70	
Q1–Q3	60-78	
Min–Max	17–100	

Body mass Index (BMI)	N	%
Underweight	364	5.2
Normal	2958	42.4
Overweight	2083	29.9
Obese	1566	22.5
Missing	31	

Pregnancy status	N	%
Females (N=2959)		
Not fertile	1401	47.3
Not pregnant/Unknown	1535	51.9
Currently pregnant	4	0.1
Post partum	19	0.6
Missing	0	

Comorbidities	N	%
No	717	10.2
Yes	6285	89.8
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	4010	57.3
Any tumour without metastasis	1766	25.2
Moderate COPD	1134	16.2
Arrhythmia	1068	15.3
Myocardial infarction	918	13.1
Diabetes Type II without insulin tr.	875	12.5
Peripheral vascular disease	722	10.3
Metastatic cancer	680	9.7
Antiplatelet therapy	608	8.7
NYHA class II-III	582	8.3
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	3.6	7.6	1	0-3	0

Source of admission	N	%
Same hospital	6937	99.1
Other hospital	65	0.9
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=7002)		
Medical ward	135	1.9
Surgical ward	6733	96.2
Emergency room	45	0.6
Other ICU	66	0.9
High dependency care unit	23	0.3
Missing	0	

Reason for transfer from	N	%
Other ICU (N=66)		
Specialist expertise	24	36.4
Step-up care	14	21.2
Logistical/organizational reasons	25	37.9
Step-down care	3	4.5
Missing	0	

Ward of admission	N	%
Same hospital (N=6937)		
Medical ward	131	1.9
Surgical ward	6709	96.7
Emergency room	41	0.6
Other ICU	34	0.5
High dependency care unit	22	0.3
Missing	0	

Ward of admission	N	%
Other hospital (N=65)		
Medical ward	4	6.2
Surgical ward	24	36.9
Emergency room	4	6.2
Other ICU	32	49.2
High dependency care unit	1	1.5
Missing	0	

Scheduled admission	N	%
No	1391	19.9
Yes	5611	80.1
Missing	0	

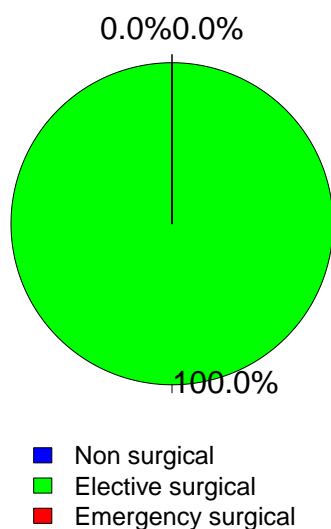
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Characteristics on admission - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Trauma	N	%
No	6621	94.6
Yes	381	5.4
Multiple trauma	50	0.7
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	7002	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=7002)		
Operating theatre of surgical ward	6473	92.4
Operating theatre of emergency room	12	0.2
Surgical ward	260	3.7
Other	257	3.7
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=7002)		
Gastrointestinal surgery	2009	28.7
Neurosurgery	907	13.0
Nephro/Urological surgery	855	12.2
Orthopaedic surgery	788	11.3
Thoracic surgery	409	5.8
ENT surgery	398	5.7
Gynaecological surgery	394	5.6
Hepatic surgery	308	4.4
Pancreatic surgery	288	4.1
Abdominal vascular surgery	223	3.2
Missing	423	

Timing	N	%
Elective surgical (N=7002)		
From -7 to -3 days	90	1.3
From -2 to -1 days	194	2.8
On ICU admission day	7114	101.6
The day after ICU admission	70	1.0
Missing	15	

Surgical interventions (top 10)	N	%
Emergency surgical (N=0)		
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Timing	N	%
Emergency surgical (N=0)		
From -7 to -3 days	0	0.0
From -2 to -1 days	0	0.0
On ICU admission day	0	0.0
The day after ICU admission	0	0.0
Missing	0	

Non surgical interventions	N	%
None	6878	98.2
Elective	88	1.3
Emergency	36	0.5
Missing	0	

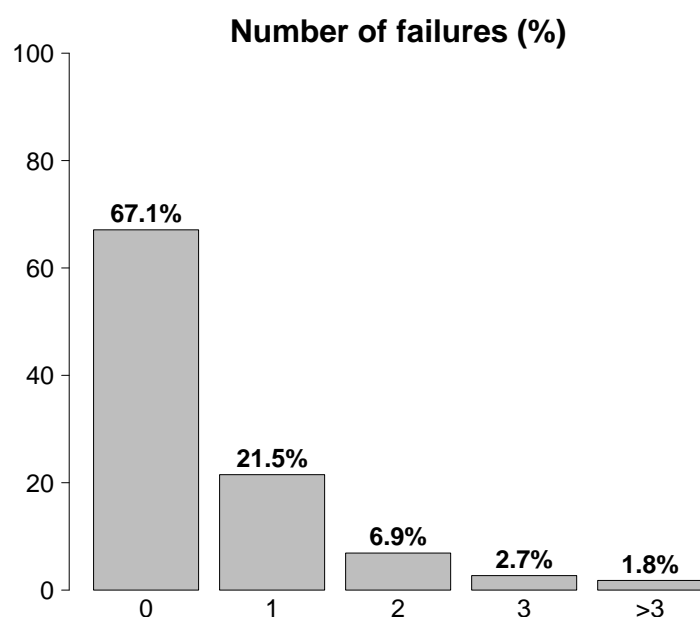
Non surgical interventions	N	%
Elective (N=88)		
Interventional radiology	22	25.0
Interventional endoscopy	22	25.0
Interventional neuroradiology	9	10.2
Interventional cardiology	7	8.0
Missing	28	

Non surgical interventions	N	%
Emergency (N=36)		
Interventional radiology	12	33.3
Interventional endoscopy	8	22.2
Interventional cardiology	7	19.4
Interventional neuroradiology	4	11.1
Missing	5	

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Characteristics on admission - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	5878	83.9
Post surgical weaning	2403	34.3
Surgical monitoring	3460	49.4
Post interventional weaning	7	0.1
Interventional monitoring	5	0.1
Non surgical monitoring	0	0.0
Missing	3	
Admission for procedures/treatments	0	0.0
Intensive Treatment	1124	16.1
Only ventilatory support	606	8.7
Only cardiovascular support	190	2.7
Ventilatory and cardiovascular support	328	4.7
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	4699	67.1
Yes	2303	32.9
A: Respiratory failure	934	13.3
B: Cardiovascular failure	518	7.4
C: Neurological failure	77	1.1
D: Hepatic failure	10	0.1
E: Renal failure	1311	18.7
F: Acute skin failure	0	0.0
G: Metabolic failure	697	10.0
H: Coagulation failure	24	0.3
Missing	0	

Failures on admission (top 10)	N	%
E	765	10.9
A	418	6.0
G	229	3.3
EG	160	2.3
AB	107	1.5
ABEG	87	1.2
AE	78	1.1
B	78	1.1
ABE	53	0.8
ABG	42	0.6
Missing	0	

Respiratory failure	N	%
None	6068	86.7
Only hypoxic failure	196	2.8
Only hypercapnic failure	19	0.3
Hypoxic-hypercapnic failure	47	0.7
Intubation for airway maint.	672	9.6
Missing	0	

Cardiovascular failure	N	%
None	6484	92.6
Without shock	117	1.7
Cardiogenic shock	47	0.7
Septic shock	63	0.9
Haemorrhagic/hypovolemic shock	143	2.0
Hypovolemic shock	82	1.2
Anaphylactic shock	3	0.0
Neurogenic shock	9	0.1
Other shock	26	0.4
Mixed shock	28	0.4
Missing	0	

Neurologic failure	N	%
None	6053	98.7
Cerebral coma	44	0.7
Metabolic coma	11	0.2
Postanoxic coma	20	0.3
Toxic coma	2	0.0
Missing or not evaluable	872	

Renal failure (AKIN)	N	%
None	5691	81.3
Mild	950	13.6
Moderate	220	3.1
Severe	141	2.0
Missing	0	

Metabolic failure	N	%
None	6305	90.0
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	202	2.9
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	495	7.1
Missing	0	

National report for general ICUs - Year 2020**Characteristics on admission - Adult NON COVID elective surgical patients evaluated in the GiViTI model**

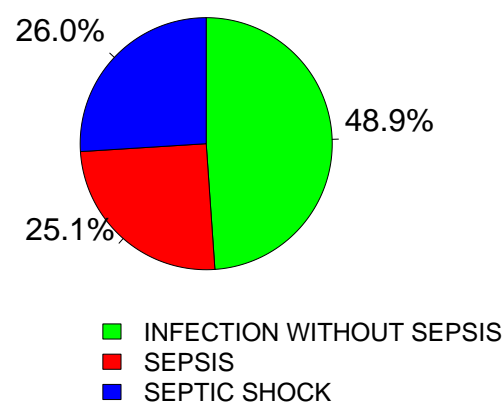
Clinical conditions on admission	N	%
Respiratory	646	9.2
Lung cancer	292	4.2
Upper respiratory tract disease	109	1.6
Pleural effusion	65	0.9
Atelectasis	56	0.8
Acute asthma/bronchospasm	41	0.6
Cardiovascular	595	8.5
Non-ruptured aneurysm	187	2.7
Peripheral vascular disease	148	2.1
Acute severe arrhythmia: tachycardias	55	0.8
Cardiac arrest	42	0.6
Left heart failure without pulm. edema	39	0.6
Neurological	886	12.7
Brain tumour	698	10.0
Neuropathy/myopathy	51	0.7
Cerebral Aneurysm	33	0.5
Cerebral artery stroke	30	0.4
Seizures	27	0.4
Gastrointestinal and hepatic	2180	31.1
Digestive tract malignancy	1389	19.8
Hepatic malignancy	267	3.8
Pancreatic malignancy	263	3.8
Acute bile-duct disease	100	1.4
Intestinal occlusion	62	0.9
Trauma (anatomical districts)	381	5.4
Pelvis/bone/joint & muscle	341	4.9
Chest	36	0.5
Spine	35	0.5
Head	32	0.5
Abdomen	5	0.1
-	0	0.0
-	0	0.0
Other	2747	39.2
Other disease	763	10.9
Nephrourologic disease	757	10.8
ENT/maxillofacial disease	378	5.4
Orthopaedic disease	378	5.4
Gynaecological disease	349	5.0
Post transplantation	19	0.3
Renal transplantation	9	0.1
Liver transplantation	5	0.1
Infections	315	4.5
Pneumonia	62	0.9
NON-surgical urinary tract infection	36	0.5
Post-surgical peritonitis	22	0.3
Cholecystitis/choolangitis	21	0.3
NON-surgical skin/soft tissue infection	20	0.3
NON-surgical secondary peritonitis	18	0.3
Post-surgical skin/soft tissue infection	17	0.2
Primary bacteraemia of unknown origin	16	0.2
Pleurisy/Pleural empyema	16	0.2
Orthopaedic prosthesis infection	15	0.2
Missing	0	

Trauma (anatomical districts)	N	%
Head	32	0.5
Maxillofacial fracture	16	0.2
Traumatic subarachnoid haemorrhage	10	0.1
Cerebral contusion/laceration	6	0.1
Skull fracture	5	0.1
Traumatic diffuse injury without oedema	3	0.0
Spine	35	0.5
Vertebral fracture, without deficit	27	0.4
Cervical injury, incomplete deficit	3	0.0
Tetraplegia	2	0.0
Chest	36	0.5
Other injuries of the chest	28	0.4
Severe lung contusion/laceration	6	0.1
Traum. haemothorax/pneumothorax	4	0.1
Abdomen	5	0.1
Minor injuries of the abdomen	4	0.1
Spleen: Moderate-Severe laceration	1	0.0
-	0	0.0
Pelvis/bone/joint & muscle	341	4.9
Long bone fracture	332	4.7
Multiple fracture of the pelvis	19	0.3
Very severe or open fracture of the pelvis	2	0.0
Major vessels injury	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	6687	95.5
INFECTION WITHOUT SEPSIS	154	2.2
SEPSIS	79	1.1
SEPTIC SHOCK	82	1.2
Missing	0	

Infection severity on admission

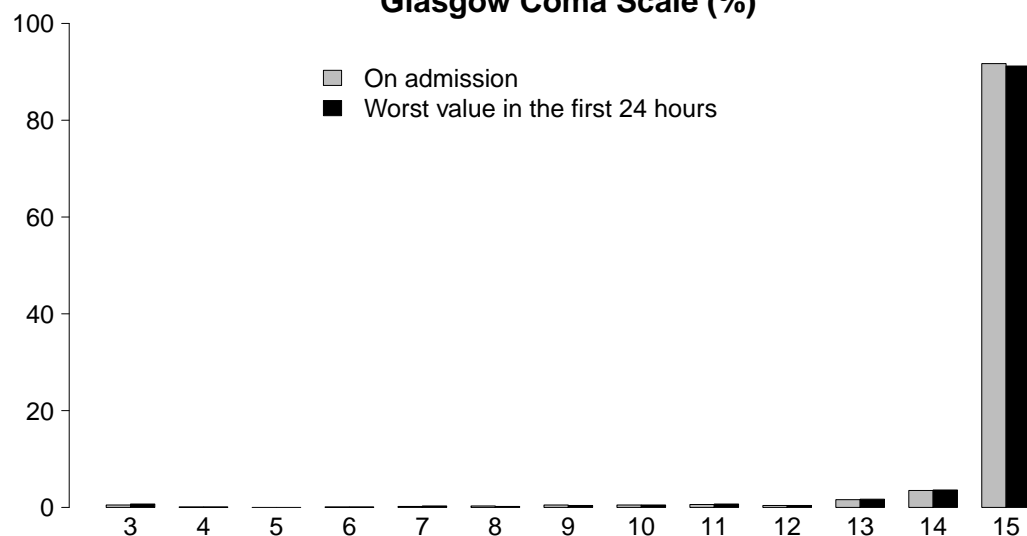
Patients infected (N=315)



National report for general ICUs - Year 2020

Severity scores - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



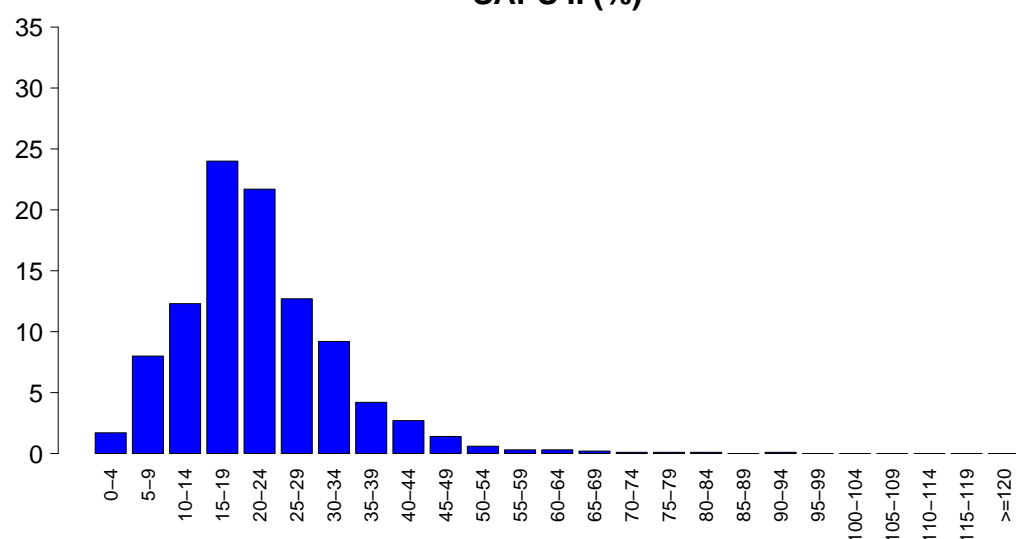
GCS (admission)

Median	15
Q1–Q3	15-15
Not evaluable	872
Missing	0

GCS (worst in first 24 hours)

Median	15
Q1–Q3	15-15
Not evaluable	516
Missing	0

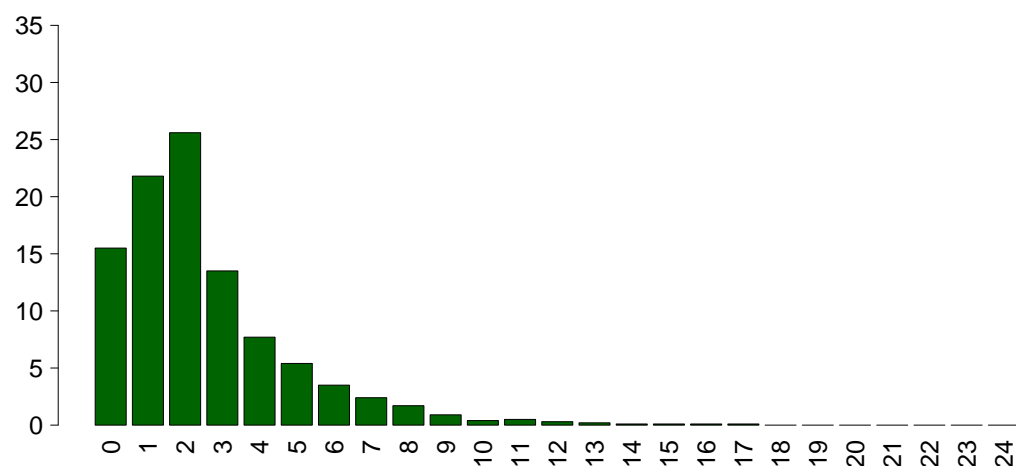
SAPS II (%)



SAPSII

Mean	21.9
SD	11.1
Median	21
Q1–Q3	15-27
Not evaluable	516
Missing	0

SOFA (%)



SOFA

Mean	2.5
SD	2.4
Median	2
Q1–Q3	1-3
Not evaluable	516
Missing	0

National report for general ICUs - Year 2020

Characteristics during the stay - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Complications during the stay	N	%
No	6450	92.1
Yes	552	7.9
Missing	0	

Failures during the stay	N	%
No	6762	96.6
Yes	240	3.4
A: Respiratory failure	150	2.1
B: Cardiovascular failure	80	1.1
C: Neurological failure	13	0.2
D: Hepatic failure	3	0.0
E: Renal failure (AKIN)	68	1.0
F: Acute skin failure	0	0.0
G: Metabolic failure	18	0.3
H: Coagulation failure	10	0.1
Missing	0	

Failures during the stay (top 10)	N	%
A	91	1.3
B	33	0.5
E	32	0.5
AB	19	0.3
ABE	15	0.2
G	14	0.2
AE	7	0.1
AC	5	0.1
BE	3	0.0
ABCE	2	0.0
Missing	0	

Respiratory failure occurred	N	%
None	6852	97.9
Intubation for airway maint.	59	0.8
Hypoxic failure	91	1.3
Hypercapnic failure	15	0.2
Missing	0	

Cardiovascular failure occurred	N	%
None	6922	98.9
Cardiogenic shock	15	0.2
Hypovolemic shock	11	0.2
Haemorrhagic/hypovolemic shock	19	0.3
Septic shock	31	0.4
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.0
Other shock	5	0.1
Missing	0	

Neurological failure occurred	N	%
None	6989	99.8
Cerebral coma	7	0.1
Metabolic coma	3	0.0
Postanoxic coma	3	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	6934	99.0
Mild	18	0.3
Moderate	15	0.2
Severe	35	0.5
Missing	0	

Complications during the stay	N	%
Respiratory	96	1.4
Pleural effusion	32	0.5
Atelectasis	26	0.4
Pneumothorax/Pneumomediastinum	13	0.2
Pulmonary embolism	9	0.1
Acute asthma/bronchospasm	8	0.1
Cardiovascular	140	2.0
Acute severe arrhythmia: tachycardias	77	1.1
Cardiac arrest	26	0.4
Peripheral vascular disease	12	0.2
Left heart failure w/o pulm. edema	9	0.1
Hypertensive crisis	7	0.1
Neurological	110	1.6
Drowsiness/agitation/delirium	58	0.8
Seizures	26	0.4
New ischaemic stroke	11	0.2
Intracranial hypertension	9	0.1
Post-surgical intracranial bleeding	7	0.1
Gastrointestinal and hepatic	71	1.0
Anastomotic dehiscence	15	0.2
Intrabdominal bleeding	12	0.2
Gastrointestinal bleeding: upper tract	9	0.1
Bowel ischaemia	7	0.1
Retroperitoneal bleeding	7	0.1
Other	53	0.8
Metabolic disorder	18	0.3
Nephrourologic disease	16	0.2
Other disease	16	0.2
Other skin and/or soft tissue pathology	5	0.1
Graft vascular thrombosis	1	0.0
Category/Stage II: Partial Thickness Skin Loss	1	0.0
Category/Stage III: Full Thickness Skin Loss	1	0.0
Infections	130	1.9
Pneumonia	37	0.5
L.R.T.I. other than pneumonia	24	0.3
Primary bacteraemia of unknown origin	18	0.3
Post-surgical peritonitis	18	0.3
NON-surgical urinary tract infection	16	0.2
Post-surgical skin/soft tissue infection	7	0.1
Clinical sepsis	6	0.1
Upper respiratory tract infection	6	0.1
Catheter-related bacteremia (CR-BSI)	5	0.1
Post-surgical urinary tract infection	5	0.1
Missing	0	

National report for general ICUs - Year 2020

Characteristics during the stay - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Infections	N	%
None	6583	94.0
Only on admission	289	4.1
On admission and during ICU stay	26	0.4
Only during ICU stay	104	1.5
Missing	0	

Maximum severity of infection	N	%
None	6583	94.0
INFECTION WITHOUT SEPSIS	181	2.6
SEPSIS	130	1.9
SEPTIC SHOCK	108	1.5
Missing	0	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	6583 (98.4%)	48 (0.7%)	41 (0.6%)	15 (0.2%)	6687
	INFECTION WITHOUT SEPSIS	-	133 (86.4%)	13 (8.4%)	8 (5.2%)	154
	SEPSIS	-	-	76 (96.2%)	3 (3.8%)	79
	SEPTIC SHOCK	-	-	-	82 (100.0%)	82
	TOT	6583	181	130	108	7002

Ventil. Associat. Pneumonia (VAP)	N	%
No	6976	99.6
Yes	26	0.4
Missing	0	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	9.4
CI (95%)	6.1–13.8

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	7.5%
CI (95%)	4.9–11.0

Catheter Bacteraemia (CR-BSI)	N	%
No	6997	99.9
Yes	5	0.1
Missing	0	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	0.6
CI (95%)	0.2–1.5

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	0.8%
CI (95%)	0.2–1.8

National report for general ICUs - Year 2020
Process indicators - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission	
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3
Procedures (antibiotics excluded)	6486	92.6								
Invasive ventilation	3485	49.8	3217	45.9	148	2.1	0	0-1	0	0-0
Non invasive ventilation	455	6.5	145	2.1	173	2.5	1	1-2	0	0-1
Tracheostomy	259	3.7	168	2.4	247	3.5	2	1-6	7	1-11
iNO (inhaled nitric oxide)	1	0.0	0	0	0	0	1	1-1	5	5-5
Central Venous Catheter	2666	38.1	2048	29.2	2461	35.1	1	1-3	0	0-0
PICC	139	2.0	102	1.5	127	1.8	1	1-2	1	0-3
Arterial Catheter	5514	78.7	4607	65.8	686	9.8	1	1-2	0	0-0
Vasoactive drugs	879	12.6	568	8.1	95	1.4	1	0-2	0	0-0
Antiarrhythmics	197	2.8	65	0.9	126	1.8	1	1-3	1	0-2
IABP	2	0.0	2	0	1	0	2	2-3	0	
Invasive monitoring of C.O.	45	0.6	18	0.3	5	0.1	2	1-6	1	0-2
Continuous monitoring of ScVO2	1	0.0	0	0	0	0	24	24-24	4	4-4
Temporary pacing	3	0.0	2	0	1	0	2	2-3	9	9-9
Ventricular assistance	0	0.0								0
DC-shock	9	0.1							0	0-0
CPR	26	0.4							0	0-0
Massive blood transfusion	34	0.5							0	0-0
ICP monitoring without CSF drainage	2	0.0	0	0	1	0	5	5-5	1	0-2
ICP monitoring with CSF drainage	22	0.3	17	0.2	14	0.2	2	1-6	1	0-1
External ventricular drainage without ICP	10	0.1	8	0.1	8	0.1	4	2-6	0	0-1
Haemofiltration	29	0.4	0	0	7	0.1	5	2-17	3	0-5
Haemodialysis	42	0.6	10	0.1	22	0.3	1	0-3	1	1-2
ECMO	1	0.0	1	0	0	0	0	0-0		
Hepatic clearance techniques	0	0.0								
Clearance techniques during sepsis	5	0.1	0	0	0	0	1	1-3	2	1-7
IAP (intra-abdominal pressure)	33	0.5								
Hypothermia	3	0.0	0	0	0	0	1	0-2	0	0-0
Enteral nutrition	438	6.3	77	1.1	347	5	3	1-8	1	0-3
Parenteral nutrition	711	10.2	111	1.6	559	8	2	1-3	0	0-1
SDD (Topical, Topical and systemic)	9	0.1								
Patient restraint	112	1.6								
Peridural catheter	786	11.2	754	10.8	689	9.8	1	1-2	0	0-0
Electrical cardioversion	17	0.2							1	0-2
Vacuum therapy	9	0.1								

National report for general ICUs - Year 2020

Process indicators - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	4038	57.7										
Antibiotics												
Antibiotic prophylaxis	3565	50.9	3131	44.7	1506	21.5	1	1-1	0	0	0-0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	172	2.5	75	1.1	88	1.3	3	2-5	0	0	0-2	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	253	3.6	158	2.3	194	2.8	2	1-4	0	1	0-2	0
Targeted antibiotic therapy	193	2.8	74	1.1	129	1.8	4	1-8	0	4	2-7	0
Antifungal in empirical therapy	21	0.3	9	0.1	11	0.2	6	1-11	0	2	0-4	0
Antifungal in targeted therapy	24	0.3	5	0.1	14	0.2	5	4-12	0	5	4-12	0
Pre-emptive antifungal	11	0.2	3	0	4	0.1	4	2-12	0	3	1-10	0

Antibiotic therapy

Pt. infected in ICU only (N=104)			
	N	%	
No therapy	14	13.5	
Only empirical	33	31.7	
Only targeted	30	28.8	
Targeted after empirical	21	20.2	
Other	6	5.8	
Missing	0		

Antifungal therapy

Pt. infected in ICU only (N=104)			
	N	%	
No therapy	94	90.4	
Only empirical	5	4.8	
Only targeted	5	4.8	
Targeted after empirical	0	0.0	
Other	0	0.0	
Missing	0		

National report for general ICUs - Year 2020**Process indicators** - Adult NON COVID elective surgical patients evaluated in the GiViTI model
Length (days)

Invasive ventilation (N=3485)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	252	5.9	5.8	10.9	2	1–6	0
For airway maintenance	629	14.8	2.3	4.7	1	0–2	0
In weaning	2381	56.0	0.3	0.5	0	0–1	0
Not evaluable	991	23.3	1.9	5.2	1	0–1	768
Reintubation within 48 hours	32	0.8	5.2	6.4	3	1–6.5	0

Non invasive ventilation (N=455)	N	%
Non invasive ventilation only	275	60.4
Non invasive ventilation failed	33	7.3
For weaning	136	29.9
Other	11	2.4
Missing	0	

Tracheostomy not present on admission (N=91)	N	%
Surgical	31	34.1
Percutwist	3	3.3
Ciaglia	7	7.7
Monodil. Ciaglia	38	41.8
Fantoni	1	1.1
Griggs	8	8.8
Other Kind	2	2.2
Unknown	1	1.1
Missing	0	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=89)

Mean	7.6
SD	7.3
Median	7
Q1–Q3	1–11
Missing	0

Invasive monitoring of C.O. (N=45)	N	%
Swan Ganz	2	4.4
PICCO	25	55.6
LIDCO	0	0.0
Vigileo-PRAM	14	31.1
Other	4	8.9
Missing	0	

SDD (N=9)	N	%
Topical	9	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	6939	99.1
Yes	63	0.9
Missing	0	

Number of surgical interventions	N	%
0	6939	99.1
1	53	0.8
2	6	0.1
3	0	0.0
>3	4	0.1
Missing	0	

Surgical interventions
Days from admission

Mean	9.5
SD	10.9
Median	6
Q1–Q3	3–10.8
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	34	0.5
Orthopaedic surgery	12	0.2
ENT surgery	9	0.1
Neurosurgery	8	0.1
Nephro/Urological surgery	4	0.1
Pancreatic surgery	3	0.0
Other surgery	3	0.0
Maxillo-Facial surgery	2	0.0
Plastic surgery	2	0.0
Peripheral vascular surgery	2	0.0
Missing	0	

Non surgical interventions	N	%
No	6979	99.7
Yes	23	0.3
Missing	0	

Non surgical interventions
Days from admission

Mean	15.4
SD	14.4
Median	11.5
Q1–Q3	4.8–21.2
Missing	1

Non surgical interventions	N	%
Interventional endoscopy	12	0.2
Interventional radiology	11	0.2
Interventional cardiology	5	0.1
Interventional neuroradiology	1	0.0
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators - Adult NON COVID elective surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	137	2.0
Transferred to same hospital	6751	96.4
Transferred to other hospital	77	1.1
Discharged home	35	0.5
Disch. terminally ill	2	0.0
Missing	0	

Transferred to (N=6828)	N	%
Ward	6640	97.2
Other ICU	53	0.8
High dependency care unit	115	1.7
Rehabilitation	16	0.2
Day hospital or Long-term care	4	0.1
Missing	0	

Reason of transfer to Other ICU (N=53)	N	%
Specialist expertise	19	35.8
Step-up care	2	3.8
Logistical/organizational reasons	31	58.5
Step-down care	1	1.9
Missing	0	

Transferred to Same hospital (N=6751)	N	%
Ward	6612	97.9
Other ICU	23	0.3
High dependency care unit	110	1.6
Rehabilitation	5	0.1
Day hospital or Long-term care	1	0.0
Missing	0	

Transferred to Other hospital (N=77)	N	%
Ward	28	36.4
Other ICU	30	39.0
High dependency care unit	5	6.5
Rehabilitation	11	14.3
Day hospital or Long-term care	3	3.9
Missing	0	

ICU mortality	N	%
Alive	6863	98.0
Dead	139	2.0
Missing	0	

Timing of ICU mortality (N=139)	N	%
Daytime (08:00AM - 07:59PM)	101	72.7
Nighttime (08:00PM - 07:59AM)	38	27.3
Weekdays (Monday - Friday)	109	78.4
Weekend (Saturday - Sunday)	30	21.6
Missing	0	

C.A.M. activation (N=139)	N	%
Yes, with organ donation	1	0.7
Yes, without organ donation	9	6.6
No, with organ donation	0	0.0
No, without organ donation	127	92.7
Missing	2	

Tissue removal (N=139)	N	%
Yes, with C.A.M. activation	4	2.9
Yes, without C.A.M. activation	9	6.5
No	126	90.6
Missing	0	

Hospital mortality	N	%
Dead	390	5.6
Transf. to other acute-care hospital	174	2.5
Transf. to other type of hosp. stay	502	7.2
Nursing home	93	1.3
Voluntary discharge	21	0.3
Discharged home	5822	83.1
Missing	0	

To other type of H stay (N=502)	N	%
Rehabilitation in the same institute	70	14.0
Rehabilitation in other institute	293	58.5
DH/long-term care, same inst.	35	7.0
DH/long-term care, other inst.	103	20.6
Missing	1	

Disch. terminally ill (N=6612)	N	%
Yes	47	0.7
No	6565	99.3
Missing	0	

Hospital mortality	N	%
Alive	6565	93.8
Dead	437	6.2
Missing	0	

Timing of hosp. mortality (N=437)	N	%
In ICU	139	31.8
Within 24 hours after ICU	30	6.9
24-47 hours after ICU	8	1.8
48-71 hours after ICU	12	2.7
72-95 hours after ICU	17	3.9
After 95 hours after ICU	231	52.9
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=298)		
Mean	18.8	
SD	23.7	
Median	11	
Q1–Q3	4.2-24	
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators** - Adult NON COVID elective surgical patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%		Mean	1.9
Alive	6562	93.7		SD	3.9
Dead	440	6.3		Median	1
Missing	0			Q1–Q3	1-1
				Missing	0
			ICU stay (days)		
			Alive (N=6863)		
				Mean	1.8
				SD	3.2
				Median	1
				Q1–Q3	1-1
				Missing	0
			ICU stay (days)		
			Dead (N=139)		
				Mean	9.5
				SD	13.8
				Median	4
				Q1–Q3	1-12
				Missing	0
			Stay after ICU (days)		
			Alive (N=6863)		
				Mean	10.7
				SD	13.5
				Median	7
				Q1–Q3	4-13
				Missing	2
			Hospital stay (days)		
				Mean	16.0
				SD	17.1
				Median	11
				Q1–Q3	7-20
				Missing	1
			Hospital stay (days)		
			Alive (N=6565)		
				Mean	15.5
				SD	16.3
				Median	11
				Q1–Q3	7-19
				Missing	1
			Hospital stay (days)		
			Dead (N=437)		
				Mean	24.5
				SD	24.9
				Median	18
				Q1–Q3	9-34
				Missing	0

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Characteristics on admission - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Patients (N): 6641

Sex	N	%
Male	3801	57.5
Female	2813	42.5
Missing	27	

Age (years)	N	%
17-45	924	13.9
46-65	1688	25.4
66-75	1495	22.5
>75	2534	38.2
Missing	0	
Mean	66.6	
SD	17.6	
Median	71	
Q1–Q3	56-80	
Min–Max	17–100	

Body mass Index (BMI)	N	%
Underweight	348	5.3
Normal	3042	46.0
Overweight	2075	31.4
Obese	1149	17.4
Missing	27	

Pregnancy status	N	%
Females (N=2813)		
Not fertile	1578	56.1
Not pregnant/Unknown	1056	37.5
Currently pregnant	18	0.6
Post partum	161	5.7
Missing	0	

Comorbidities	N	%
No	1318	19.8
Yes	5323	80.2
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	3444	51.9
Arrhythmia	1104	16.6
Diabetes Type II without insulin tr.	788	11.9
Moderate COPD	770	11.6
Myocardial infarction	717	10.8
Peripheral vascular disease	709	10.7
Any tumour without metastasis	696	10.5
Cerebrovascular disease	631	9.5
Antiplatelet therapy	629	9.5
Moderate or severe renal disease	572	8.6
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	3.4	8.2	1	0-3	0

Source of admission	N	%
Same hospital	6067	91.4
Other hospital	574	8.6
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=6641)		
Medical ward	433	6.5
Surgical ward	3866	58.2
Emergency room	1996	30.1
Other ICU	255	3.8
High dependency care unit	91	1.4
Missing	0	

Reason for transfer from	N	%
Other ICU (N=255)		
Specialist expertise	98	38.4
Step-up care	63	24.7
Logistical/organizational reasons	90	35.3
Step-down care	4	1.6
Missing	0	

Ward of admission	N	%
Same hospital (N=6067)		
Medical ward	393	6.5
Surgical ward	3792	62.5
Emergency room	1674	27.6
Other ICU	125	2.1
High dependency care unit	83	1.4
Missing	0	

Ward of admission	N	%
Other hospital (N=574)		
Medical ward	40	7.0
Surgical ward	74	12.9
Emergency room	322	56.1
Other ICU	130	22.6
High dependency care unit	8	1.4
Missing	0	

Scheduled admission	N	%
No	6623	99.7
Yes	18	0.3
Missing	0	

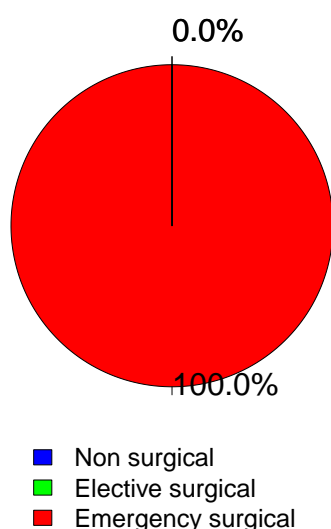
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Characteristics on admission - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Trauma	N	%
No	5145	77.5
Yes	1496	22.5
Multiple trauma	616	9.3
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	6641	100.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=6641)		
Operating theatre of surgical ward	3564	53.7
Operating theatre of emergency room	1421	21.4
Surgical ward	302	4.5
Other	1354	20.4
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=0)		
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Timing	N	%
Elective surgical (N=0)		
From -7 to -3 days	0	0.0
From -2 to -1 days	0	0.0
On ICU admission day	0	0.0
The day after ICU admission	0	0.0
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=6641)		
Gastrointestinal surgery	2898	43.6
Neurosurgery	1071	16.1
Orthopaedic surgery	893	13.4
Nephro/Urological surgery	328	4.9
Biliary tract surgery	250	3.8
Abdominal vascular surgery	244	3.7
Peripheral vascular surgery	239	3.6
ENT surgery	174	2.6
Obstetric surgery	151	2.3
Thoracic surgery	150	2.3
Missing	243	

Timing	N	%
Emergency surgical (N=6641)		
From -7 to -3 days	161	2.4
From -2 to -1 days	735	11.1
On ICU admission day	5804	87.4
The day after ICU admission	300	4.5
Missing	23	

Non surgical interventions	N	%
None	6198	93.3
Elective	43	0.6
Emergency	400	6.0
Missing	0	

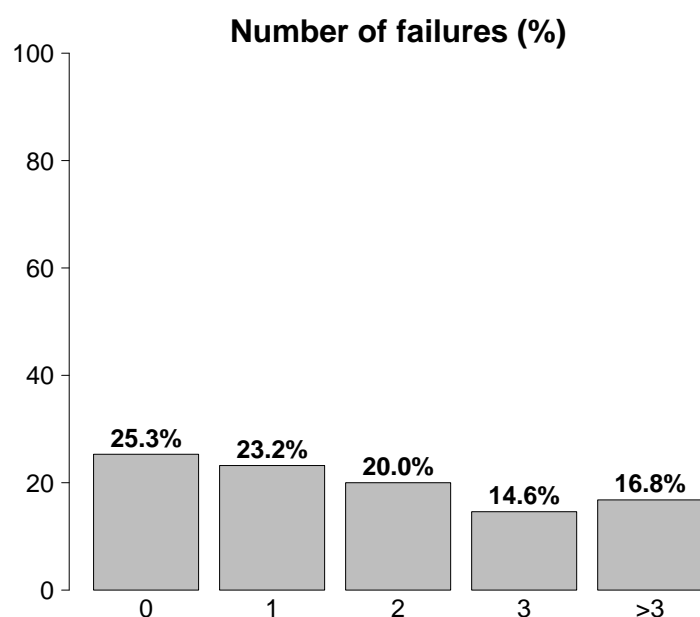
Non surgical interventions	N	%
Elective (N=43)		
Interventional endoscopy	21	48.8
Interventional radiology	6	14.0
Interventional neuroradiology	6	14.0
Interventional cardiology	4	9.3
Missing	6	

Non surgical interventions	N	%
Emergency (N=400)		
Interventional radiology	151	37.8
Interventional neuroradiology	115	28.7
Interventional endoscopy	83	20.8
Interventional cardiology	16	4.0
Missing	35	

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Characteristics on admission - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	2549	38.4
Post surgical weaning	1175	17.7
Surgical monitoring	1353	20.4
Post interventional weaning	5	0.1
Interventional monitoring	8	0.1
Non surgical monitoring	0	0.0
Missing	8	
Admission for procedures/treatments	0	0.0
Intensive Treatment	4092	61.6
Only ventilatory support	1439	21.7
Only cardiovascular support	365	5.5
Ventilatory and cardiovascular support	2288	34.5
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	1683	25.3
Yes	4958	74.7
A: Respiratory failure	3727	56.1
B: Cardiovascular failure	2653	39.9
C: Neurological failure	629	9.5
D: Hepatic failure	20	0.3
E: Renal failure	2679	40.3
F: Acute skin failure	2	0.0
G: Metabolic failure	1953	29.4
H: Coagulation failure	91	1.4
Missing	0	

Failures on admission (top 10)	N	%
ABEG	823	12.4
A	771	11.6
AB	510	7.7
E	491	7.4
ABE	357	5.4
AE	217	3.3
ABG	206	3.1
EG	197	3.0
AC	194	2.9
G	145	2.2
Missing	0	

Respiratory failure	N	%
None	2914	43.9
Only hypoxic failure	1019	15.3
Only hypercapnic failure	40	0.6
Hypoxic-hypercapnic failure	118	1.8
Intubation for airway maint.	2550	38.4
Missing	0	

Cardiovascular failure	N	%
None	3988	60.1
Without shock	429	6.5
Cardiogenic shock	90	1.4
Septic shock	924	13.9
Haemorrhagic/hypovolemic shock	592	8.9
Hypovolemic shock	260	3.9
Anaphylactic shock	1	0.0
Neurogenic shock	137	2.1
Other shock	67	1.0
Mixed shock	153	2.3
Missing	0	

Neurologic failure	N	%
None	4438	87.6
Cerebral coma	484	9.6
Metabolic coma	94	1.9
Postanoxic coma	44	0.9
Toxic coma	7	0.1
Missing or not evaluable	1574	

Renal failure (AKIN)	N	%
None	3962	59.7
Mild	1361	20.5
Moderate	640	9.6
Severe	678	10.2
Missing	0	

Metabolic failure	N	%
None	4688	70.6
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	431	6.5
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	1522	22.9
Missing	0	

National report for general ICUs - Year 2020**Characteristics on admission - Adult NON COVID emergency surgical patients evaluated in the GiViTI model**

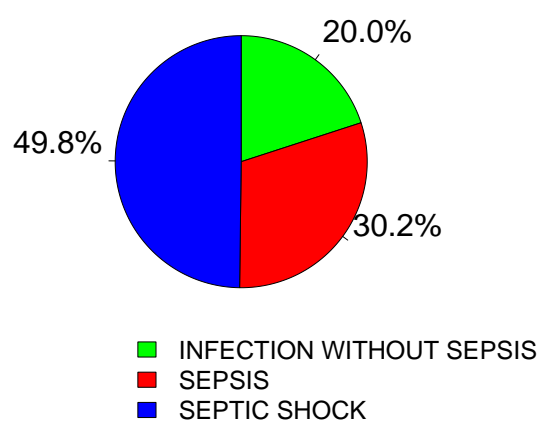
Clinical conditions on admission	N	%
Respiratory	462	7.0
Pleural effusion	134	2.0
Atelectasis	73	1.1
Aspiration pneumonia	67	1.0
Upper respiratory tract disease	61	0.9
Pulmonary embolism	45	0.7
Cardiovascular	666	10.0
Ruptured or fissured aneurysm	193	2.9
Peripheral vascular disease	143	2.2
Acute severe arrhythmia: tachycardias	92	1.4
Cardiac arrest	75	1.1
Left heart failure without pulm. edema	49	0.7
Neurological	770	11.6
Spontaneous Intraparenchymal bleeding	272	4.1
Spontaneous Subarachnoid haemorrhage	185	2.8
Cerebral Aneurysm	143	2.2
Brain tumour	82	1.2
Cerebral artery stroke	74	1.1
Gastrointestinal and hepatic	2565	38.6
Gastrointestinal perforation	849	12.8
Intestinal occlusion	723	10.9
Bowel ischaemia	332	5.0
Digestive tract malignancy	276	4.2
Acute bile-duct disease	189	2.8
Trauma (anatomical districts)	1496	22.5
Pelvis/bone/joint & muscle	870	13.1
Head	537	8.1
Chest	456	6.9
Spine	347	5.2
Abdomen	319	4.8
Major vessels injury	67	1.0
Miscellaneous	9	0.1
Other	961	14.5
Nephrourologic disease	197	3.0
Metabolic disorder	184	2.8
Other disease	148	2.2
Orthopaedic disease	98	1.5
Coagulation disorder	91	1.4
Post transplantation	39	0.6
Liver transplantation	24	0.4
Renal transplantation	12	0.2
Infections	2120	31.9
NON-surgical secondary peritonitis	729	11.0
Post-surgical peritonitis	301	4.5
Pneumonia	216	3.3
Primary peritonitis	215	3.2
Cholecystitis/choolangitis	161	2.4
NON-surgical urinary tract infection	151	2.3
NON-surgical skin/soft tissue infection	141	2.1
L.R.T.I. other than pneumonia	40	0.6
Primary bacteraemia of unknown origin	38	0.6
Pleurisy/Pleural empyema	35	0.5
Missing	0	

Trauma (anatomical districts)	N	%
Head	537	8.1
Traumatic Subdural haematoma	213	3.2
Maxillofacial fracture	193	2.9
Traumatic subarachnoid haemorrhage	176	2.7
Cerebral contusion/laceration	160	2.4
Skull fracture	137	2.1
Spine	347	5.2
Vertebral fracture, without deficit	248	3.7
Cervical injury, incomplete deficit	32	0.5
Tetraplegia	26	0.4
Chest	456	6.9
Other injuries of the chest	244	3.7
Traum. haemothorax/pneumothorax	201	3.0
Severe lung contusion/laceration	117	1.8
Abdomen	319	4.8
Spleen: Moderate-Severe laceration	91	1.4
Minor injuries of the abdomen	76	1.1
Liver: Moderate-Severe laceration	61	0.9
Pelvis/bone/joint & muscle	870	13.1
Long bone fracture	759	11.4
Multiple fracture of the pelvis	157	2.4
Very severe or open fracture of the pelvis	55	0.8
Major vessels injury	67	1.0
Proximal limbs vessels: transection	30	0.5
Neck vessels: dissection/transection	13	0.2
Aorta: rupture/dissection	12	0.2
Miscellaneous	9	0.1
Burns (>30% BSA)	5	0.1
Inhalation injury	4	0.1
Missing	0	

Infection severity on admission	N	%
None	4521	68.1
INFECTION WITHOUT SEPSIS	424	6.4
SEPSIS	641	9.7
SEPTIC SHOCK	1055	15.9
Missing	0	

Infection severity on admission

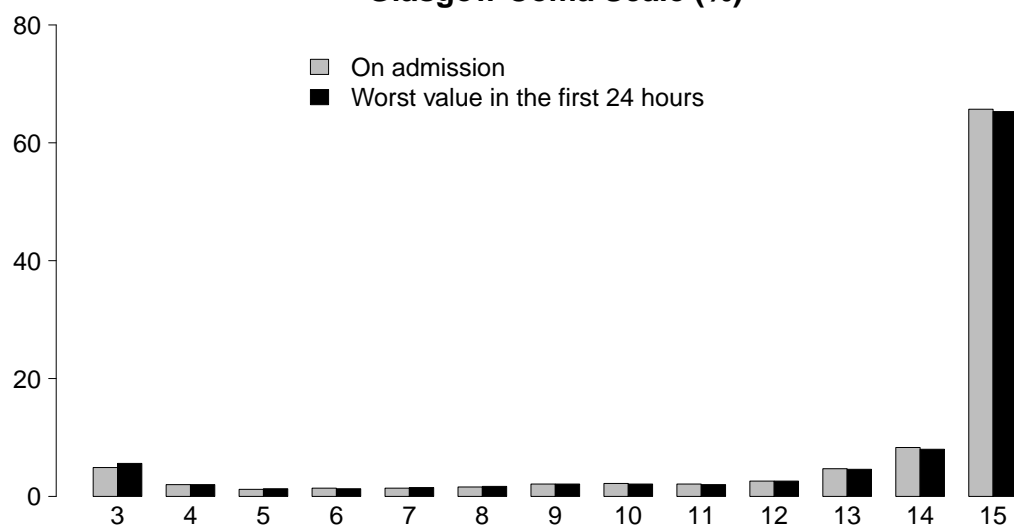
Patients infected (N=2120)



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Severity scores - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



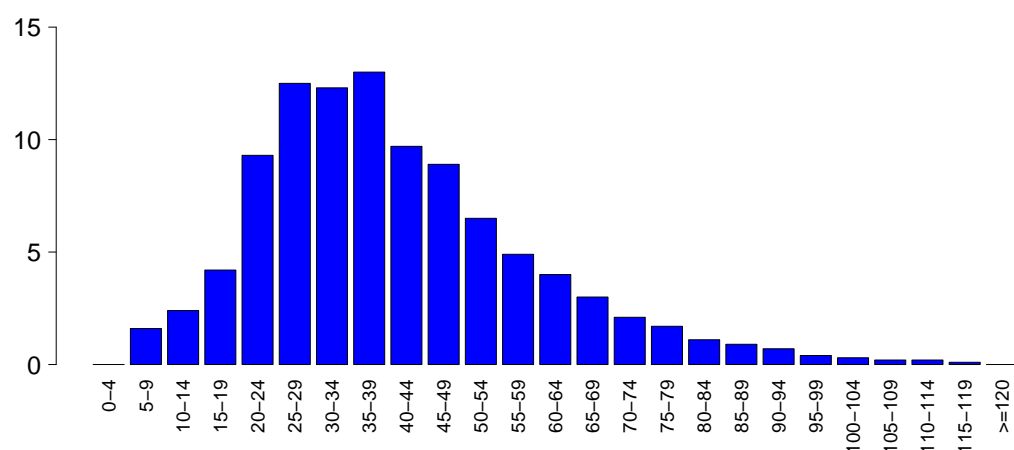
GCS (admission)

Median	15
Q1–Q3	13-15
Not evaluable	1574
Missing	0

GCS (worst in first 24 hours)

Median	15
Q1–Q3	13-15
Not evaluable	1288
Missing	0

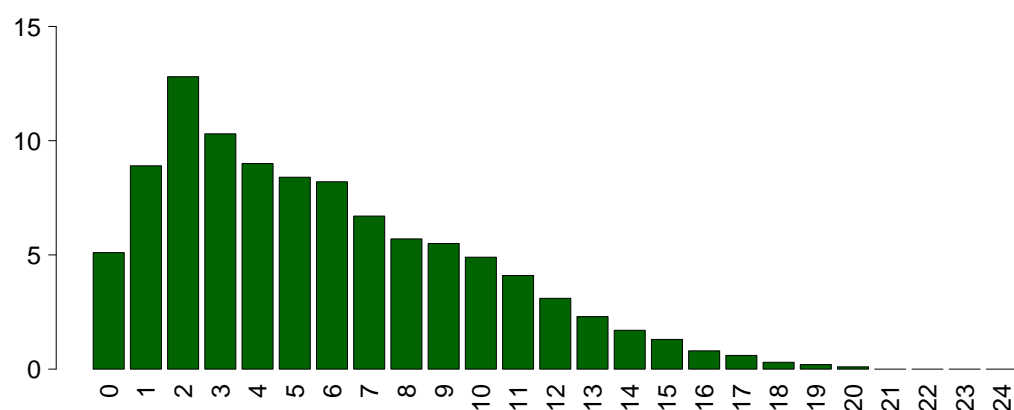
SAPS II (%)



SAPSII

Mean	40.5
SD	18.5
Median	38
Q1–Q3	27-50
Not evaluable	1288
Missing	0

SOFA (%)



SOFA

Mean	5.7
SD	4.1
Median	5
Q1–Q3	2-8
Not evaluable	1288
Missing	0

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Characteristics during the stay - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Complications during the stay	N	%
No	4508	67.9
Yes	2133	32.1
Missing	0	

Failures during the stay	N	%
No	5725	86.2
Yes	916	13.8
A: Respiratory failure	367	5.5
B: Cardiovascular failure	387	5.8
C: Neurological failure	54	0.8
D: Hepatic failure	28	0.4
E: Renal failure (AKIN)	329	5.0
F: Acute skin failure	0	0.0
G: Metabolic failure	93	1.4
H: Coagulation failure	50	0.8
Missing	0	

Failures during the stay (top 10)	N	%
A	211	3.2
B	197	3.0
E	155	2.3
G	58	0.9
AB	54	0.8
BE	47	0.7
ABE	35	0.5
AE	23	0.3
C	17	0.3
BEH	11	0.2
Missing	0	

Respiratory failure occurred	N	%
None	6274	94.5
Intubation for airway maint.	125	1.9
Hypoxic failure	242	3.6
Hypercapnic failure	38	0.6
Missing	0	

Cardiovascular failure occurred	N	%
None	6254	94.2
Cardiogenic shock	62	0.9
Hypovolemic shock	65	1.0
Haemorrhagic/hypovolemic shock	68	1.0
Septic shock	161	2.4
Anaphylactic shock	0	0.0
Neurogenic shock	19	0.3
Other shock	37	0.6
Missing	0	

Neurological failure occurred	N	%
None	6587	99.2
Cerebral coma	34	0.5
Metabolic coma	14	0.2
Postanoxic coma	6	0.1
Missing	0	

Renal failure occurred (AKIN)	N	%
None	6312	95.0
Mild	49	0.7
Moderate	65	1.0
Severe	215	3.2
Missing	0	

Complications during the stay	N	%
Respiratory	321	4.8
Pleural effusion	144	2.2
Atelectasis	87	1.3
Pneumothorax/Pneumomediastinum	44	0.7
Severe ARDS	29	0.4
Pulmonary embolism	22	0.3
Cardiovascular	414	6.2
Acute severe arrhythmia: tachycardias	180	2.7
Cardiac arrest	115	1.7
Deep venous thrombosis	31	0.5
Acute severe arrhythmia: bradycardias	28	0.4
Peripheral vascular disease	25	0.4
Neurological	474	7.1
Drowsiness/agitation/delirium	216	3.3
Intracranial hypertension	97	1.5
Brain edema	76	1.1
Seizures	63	0.9
Hydrocephalus	37	0.6
Gastrointestinal and hepatic	304	4.6
Bowel ischaemia	71	1.1
Anastomotic dehiscence	47	0.7
Gastrointestinal perforation	46	0.7
Paralytic Ileus	33	0.5
Gastrointestinal bleeding: lower tract	31	0.5
Other	203	3.1
Metabolic disorder	93	1.4
Nephrourologic disease	60	0.9
Other disease	34	0.5
Other skin and/or soft tissue pathology	12	0.2
Extremity compartment syndrome (severe)	11	0.2
Category/Stage II: Partial Thickness Skin Loss	5	0.1
F.U.O. fever of unknown origin	4	0.1
Infections	712	10.7
Pneumonia	283	4.3
L.R.T.I. other than pneumonia	168	2.5
Primary bacteraemia of unknown origin	84	1.3
Catheter-related bacteremia (CR-BSI)	78	1.2
NON-surgical urinary tract infection	62	0.9
Post-surgical peritonitis	52	0.8
Post-surgical skin/soft tissue infection	32	0.5
Clinical sepsis	20	0.3
NON-surgical secondary peritonitis	17	0.3
NON-surgical skin/soft tissue infection	16	0.2
Missing	0	

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Characteristics during the stay - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Infections	N	%
None	3990	60.1
Only on admission	1939	29.2
On admission and during ICU stay	181	2.7
Only during ICU stay	531	8.0
Missing	0	

Maximum severity of infection	N	%
None	3990	60.1
INFECTION WITHOUT SEPSIS	656	9.9
SEPSIS	847	12.8
SEPTIC SHOCK	1141	17.2
Missing	7	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	3990 (88.3%)	273 (6.0%)	199 (4.4%)	59 (1.3%)	4521
	INFECTION WITHOUT SEPSIS	-	383 (91.2%)	33 (7.9%)	4 (1.0%)	420
	SEPSIS	-	-	615 (96.4%)	23 (3.6%)	638
	SEPTIC SHOCK	-	-	-	1055 (100.0%)	1055
	TOT	3990	656	847	1141	6634

Ventil. Associat. Pneumonia (VAP)	N	%
No	6394	96.3
Yes	247	3.7
Missing	0	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	12.1
CI (95%)	10.6–13.7

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	9.7%
CI (95%)	8.5–10.9

Catheter Bacteraemia (CR-BSI)	N	%
No	6563	98.8
Yes	78	1.2
Missing	0	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	2.3
CI (95%)	1.8–2.9

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	2.8%
CI (95%)	2.2–3.5

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Process indicators - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	6421	96.7										
Invasive ventilation	5164	77.8	4382	66	909	13.7	1	1–5	0	0	0–0	0
Non invasive ventilation	596	9.0	77	1.2	113	1.7	1	1–3	0	1	0–3	0
Tracheostomy	703	10.6	91	1.4	607	9.1	11	5–22	0	7	4–12	0
iNO (inhaled nitric oxide)	9	0.1	0	0	2	0	3	2–5	0	1	0–4	0
Central Venous Catheter	4653	70.1	2630	39.6	3937	59.3	4	2–9	0	0	0–0	0
PICC	155	2.3	70	1.1	132	2	3	2–8	0	2	0–16	0
Arterial Catheter	5706	85.9	3770	56.8	1521	22.9	3	1–7	0	0	0–0	0
Vasoactive drugs	3144	47.3	1958	29.5	563	8.5	2	1–4	0	0	0–0	0
Antiarrhythmics	420	6.3	120	1.8	216	3.3	2	1–5	0	1	0–2	0
IABP	2	0.0	1	0	1	0	2	2–2	0	4	4–4	0
Invasive monitoring of C.O.	278	4.2	35	0.5	57	0.9	4	2–8	0	0	0–1	0
Continuous monitoring of ScVO2	11	0.2	11	0.2	0	0	1	1–2	0			
Temporary pacing	4	0.1	2	0	1	0	2	2–3	0	0	0–1	0
Ventricular assistance	0	0.0										
DC-shock	35	0.5								1	0–1	0
CPR	79	1.2								0	0–1	0
Massive blood transfusion	149	2.2								0	0–0	0
ICP monitoring without CSF drainage	162	2.4	74	1.1	25	0.4	6	3–9	0	0	0–1	0
ICP monitoring with CSF drainage	201	3.0	120	1.8	92	1.4	7	3–13	0	0	0–1	0
External ventricular drainage without ICP	73	1.1	48	0.7	40	0.6	6	3–14	0	0	0–1	0
Haemofiltration	245	3.7	16	0.2	59	0.9	3	2–8	0	1	0–2	0
Haemodialysis	135	2.0	31	0.5	64	1	3	1–8	0	2	0–5	0
ECMO	3	0.0	1	0	2	0	7	4–16	0	10	7–12	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	64	1.0	11	0.2	21	0.3	2	1–4	0	1	0–2	0
IAP (intra-abdominal pressure)	160	2.4										
Hypothermia	9	0.1	1	0	0	0	3	1–4	0	0	0–2	0
Enteral nutrition	1938	29.2	243	3.7	1476	22.2	6	3–14	0	1	0–3	0
Parenteral nutrition	1521	22.9	190	2.9	1028	15.5	4	2–9	0	1	0–2	0
SDD (Topical, Topical and systemic)	37	0.6										
Patient restraint	142	2.1										
Peridural catheter	111	1.7	73	1.1	75	1.1	2	1–4	0	2	0–4	0
Electrical cardioversion	39	0.6								2	1–3	0
Vacuum therapy	107	1.6										

National report for general ICUs - Year 2020
Process indicators - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	5077	76.4										
Antibiotic prophylaxis	2377	35.8	1728	26	1041	15.7	1	1–2	0	0	0–0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	1496	22.5	829	12.5	672	10.1	3	2–5	0	0	0–3	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	1083	16.3	645	9.7	799	12	3	1–5	0	0	0–0	0
Targeted antibiotic therapy	1014	15.3	116	1.7	617	9.3	6	3–10	0	5	2–8	0
Antifungal in empirical therapy	296	4.5	98	1.5	151	2.3	4	2–8	0	0	0–2	0
Antifungal in targeted therapy	128	1.9	14	0.2	74	1.1	8	5–14	0	6	3–14	0
Pre-emptive antifungal	70	1.1	20	0.3	42	0.6	4	2–9	0	1	0–5	0

Antibiotic therapy			
Pt. infected in ICU only (N=531)			
	N	%	
No therapy	59	11.1	
Only empirical	89	16.8	
Only targeted	157	29.6	
Targeted after empirical	186	35.0	
Other	40	7.5	
Missing	0		

Antifungal therapy			
Pt. infected in ICU only (N=531)			
	N	%	
No therapy	469	88.3	
Only empirical	35	6.6	
Only targeted	21	4.0	
Targeted after empirical	6	1.1	
Other	0	0.0	
Missing	0		

National report for general ICUs - Year 2020**Process indicators** - Adult NON COVID emergency surgical patients evaluated in the GiViTI model
Length (days)

Invasive ventilation (N=5164)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	1154	20.8	7.5	11.9	3	1–9	0
For airway maintenance	2504	45.2	5.7	8.1	2	1–7	0
In weaning	1176	21.2	0.5	0.5	0	0–1	0
Not evaluable	709	12.8	2.5	6.5	1	0–1	380
Reintubation within 48 hours	86	1.6	7.8	10.6	4	1.25–8	0

Non invasive ventilation (N=596)	N	%
Non invasive ventilation only	207	34.7
Non invasive ventilation failed	48	8.1
For weaning	299	50.2
Other	42	7.0
Missing	0	

Tracheostomy not present on admission (N=612)	N	%
Surgical	91	14.9
Percutwist	34	5.6
Ciaglia	78	12.7
Monodil. Ciaglia	272	44.4
Fantoni	4	0.7
Griggs	117	19.1
Other Kind	6	1.0
Unknown	10	1.6
Missing	0	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=606)

Mean	8.4
SD	6.8
Median	7
Q1–Q3	4-12
Missing	0

Invasive monitoring of C.O. (N=278)	N	%
Swan Ganz	30	10.8
PICCO	200	71.9
LIDCO	2	0.7
Vigileo-PRAM	25	9.0
Other	21	7.6
Missing	0	

SDD (N=37)	N	%
Topical	37	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	6103	91.9
Yes	538	8.1
Missing	0	

Number of surgical interventions	N	%
0	6103	91.9
1	364	5.5
2	99	1.5
3	44	0.7
>3	31	0.5
Missing	0	

Surgical interventions
Days from admission

Mean	8.9
SD	10.1
Median	5
Q1–Q3	3-11
Missing	1

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	364	5.5
Orthopaedic surgery	161	2.4
Neurosurgery	117	1.8
Other surgery	41	0.6
ENT surgery	30	0.5
Maxillo-Facial surgery	21	0.3
Nephro/Urological surgery	19	0.3
Thoracic surgery	17	0.3
Plastic surgery	15	0.2
Hepatic surgery	10	0.2
Missing	0	

Non surgical interventions	N	%
No	6538	98.4
Yes	103	1.6
Missing	0	

Non surgical interventions
Days from admission

Mean	13.2
SD	10.2
Median	11
Q1–Q3	5.5-18.5
Missing	3

Non surgical interventions	N	%
Interventional endoscopy	62	0.9
Interventional radiology	30	0.5
Interventional neuroradiology	30	0.5
Interventional cardiology	8	0.1
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators - Adult NON COVID emergency surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	981	14.8
Transferred to same hospital	5171	77.9
Transferred to other hospital	463	7.0
Discharged home	10	0.2
Disch. terminally ill	16	0.2
Missing	0	

Transferred to (N=5634)	N	%
Ward	4699	83.4
Other ICU	365	6.5
High dependency care unit	404	7.2
Rehabilitation	151	2.7
Day hospital or Long-term care	15	0.3
Missing	0	

Reason of transfer to Other ICU (N=369)	N	%
Specialist expertise	96	26.0
Step-up care	16	4.3
Logistical/organizational reasons	248	67.2
Step-down care	9	2.4
Missing	0	

Transferred to Same hospital (N=5171)	N	%
Ward	4623	89.4
Other ICU	117	2.3
High dependency care unit	394	7.6
Rehabilitation	28	0.5
Day hospital or Long-term care	9	0.2
Missing	0	

Transferred to Other hospital (N=463)	N	%
Ward	76	16.4
Other ICU	248	53.6
High dependency care unit	10	2.2
Rehabilitation	123	26.6
Day hospital or Long-term care	6	1.3
Missing	0	

ICU mortality	N	%
Alive	5644	85.0
Dead	997	15.0
Missing	0	

Timing of ICU mortality (N=997)	N	%
Daytime (08:00AM - 07:59PM)	681	68.3
Nighttime (08:00PM - 07:59AM)	316	31.7
Weekdays (Monday - Friday)	744	74.6
Weekend (Saturday - Sunday)	253	25.4
Missing	0	

C.A.M. activation (N=997)	N	%
Yes, with organ donation	42	4.3
Yes, without organ donation	34	3.5
No, with organ donation	4	0.4
No, without organ donation	901	91.8
Missing	16	

Tissue removal (N=997)	N	%
Yes, with C.A.M. activation	30	3.0
Yes, without C.A.M. activation	44	4.4
No	923	92.6
Missing	0	

Hospital mortality	N	%
Dead	1515	22.8
Transf. to other acute-care hospital	570	8.6
Transf. to other type of hosp. stay	1070	16.1
Nursing home	113	1.7
Voluntary discharge	39	0.6
Discharged home	3334	50.2
Missing	0	

To other type of H stay (N=1070)	N	%
Rehabilitation in the same institute	142	13.3
Rehabilitation in other institute	666	62.2
DH/long-term care, same inst.	59	5.5
DH/long-term care, other inst.	203	19.0
Missing	0	

Disch. terminally ill (N=5126)	N	%
Yes	97	1.9
No	5029	98.1
Missing	0	

Hospital mortality	N	%
Alive	5029	75.7
Dead	1612	24.3
Missing	0	

Timing of hosp. mortality (N=1612)	N	%
In ICU	997	61.8
Within 24 hours after ICU	31	1.9
24-47 hours after ICU	37	2.3
48-71 hours after ICU	31	1.9
72-95 hours after ICU	40	2.5
After 95 hours after ICU	476	29.5
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=615)		
Mean		16.3
SD		18.1
Median		10
Q1–Q3		4-22
Missing		0

National report for general ICUs - Year 2020**Outcome indicators** - Adult NON COVID emergency surgical patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%		Mean	6.2
Alive	4996	75.2		SD	10.0
Dead	1645	24.8		Median	2
Missing	0			Q1–Q3	1-7
				Missing	0
			ICU stay (days)		
			Alive (N=5644)		
				Mean	6.0
				SD	9.6
				Median	2
				Q1–Q3	1-6
				Missing	0
			ICU stay (days)		
			Dead (N=997)		
				Mean	7.4
				SD	11.7
				Median	3
				Q1–Q3	1-9
				Missing	0
			Stay after ICU (days)		
			Alive (N=5644)		
				Mean	14.7
				SD	19.0
				Median	9
				Q1–Q3	5-18
				Missing	0
			Hospital stay (days)		
				Mean	21.8
				SD	22.7
				Median	15
				Q1–Q3	8-28
				Missing	0
			Hospital stay (days)		
			Alive (N=5029)		
				Mean	23.2
				SD	23.3
				Median	17
				Q1–Q3	10-29
				Missing	0
			Hospital stay (days)		
			Dead (N=1612)		
				Mean	17.2
				SD	20.3
				Median	10
				Q1–Q3	3-22
				Missing	0

National report for general ICUs - Year 2020

Characteristics on admission - COVID adult patients

Patients (N): 6816

Sex	N	%
Male	5131	75.5
Female	1662	24.5
Missing	23	

Age (years)	N	%
17-45	348	5.1
46-65	2869	42.1
66-75	2506	36.8
>75	1093	16.0
Missing	0	
Mean	65.0	
SD	11.1	
Median	66	
Q1–Q3	58-73	
Min–Max	17–93	

Body mass Index (BMI)	N	%
Underweight	68	1.0
Normal	2079	30.9
Overweight	2739	40.7
Obese	1849	27.5
Missing	81	

Pregnancy status	N	%
Females (N=1662)		
Not fertile	674	40.6
Not pregnant/Unknown	977	58.8
Currently pregnant	5	0.3
Post partum	5	0.3
Missing	1	

Comorbidities	N	%
No	1599	23.5
Yes	5216	76.5
Missing	1	

Comorbidities (top 10)	N	%
Hypertension	3773	55.4
Diabetes Type II without insulin tr.	1036	15.2
Myocardial infarction	643	9.4
Arrhythmia	549	8.1
Moderate COPD	538	7.9
Diabetes Type II with insulin treatment	368	5.4
Antiplatelet therapy	357	5.2
Any tumour without metastasis	354	5.2
Peripheral vascular disease	311	4.6
Cerebrovascular disease	309	4.5
Missing	1	

Stay before ICU (days)		
Mean	5.3	
SD	8.7	
Median	3	
Q1–Q3	1-6	
Missing	6	

Source of admission	N	%
Same hospital	5456	80.1
Other hospital	1339	19.6
Long-term chronic care hospital	20	0.3
Directly from the community	0	0.0
Missing	1	

Ward of admission	N	%
Hospital (N=6795)		
Medical ward	3599	53.0
Surgical ward	120	1.8
Emergency room	1833	27.0
Other ICU	635	9.3
High dependency care unit	607	8.9
Missing	1	

Reason for transfer from	N	%
Other ICU (N=635)		
Specialist expertise	117	18.4
Step-up care	172	27.1
Logistical/organizational reasons	344	54.2
Step-down care	2	0.3
Missing	0	

Ward of admission	N	%
Same hospital (N=5456)		
Medical ward	3194	58.6
Surgical ward	111	2.0
Emergency room	1453	26.6
Other ICU	170	3.1
High dependency care unit	527	9.7
Missing	1	

Ward of admission	N	%
Other hospital (N=1339)		
Medical ward	405	30.2
Surgical ward	9	0.7
Emergency room	380	28.4
Other ICU	465	34.7
High dependency care unit	80	6.0
Missing	0	

Scheduled admission	N	%
No	6803	99.8
Yes	13	0.2
Missing	0	

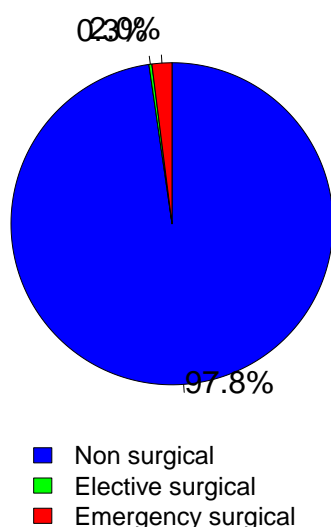
National report for general ICUs - Year 2020

Characteristics on admission - COVID adult patients

Trauma	N	%
No	6770	99.3
Yes	46	0.7
Multiple trauma	8	0.1
Missing	0	

Surgical status	N	%
Non surgical	6663	97.8
Elective surgical	18	0.3
Emergency surgical	135	2.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=153)		
Operating theatre of surgical ward	44	28.8
Operating theatre of emergency room	23	15.0
Surgical ward	8	5.2
Other	78	51.0
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=18)		
Neurosurgery	5	27.8
Gastrointestinal surgery	4	22.2
Orthopaedic surgery	3	16.7
Obstetric surgery	2	11.1
Acquired valv. heart dis. surgery	1	5.6
Nephro/Urological surgery	1	5.6
ENT surgery	1	5.6
Thoracic surgery	1	5.6
Abdominal vascular surgery	1	5.6
-	0	0.0
Missing	0	

Timing	N	%
Elective surgical (N=18)		
From -7 to -3 days	1	5.6
From -2 to -1 days	3	16.7
On ICU admission day	15	83.3
The day after ICU admission	0	0.0
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=135)		
Gastrointestinal surgery	52	38.5
Neurosurgery	19	14.1
Orthopaedic surgery	10	7.4
ENT surgery	8	5.9
Thoracic surgery	8	5.9
Peripheral vascular surgery	8	5.9
Abdominal vascular surgery	7	5.2
Nephro/Urological surgery	6	4.4
Other surgery	4	3.0
Biliary tract surgery	3	2.2
Missing	10	

Timing	N	%
Emergency surgical (N=135)		
From -7 to -3 days	9	6.7
From -2 to -1 days	17	12.6
On ICU admission day	103	76.3
The day after ICU admission	12	8.9
Missing	1	

Non surgical interventions	N	%
None	6708	98.4
Elective	5	0.1
Emergency	103	1.5
Missing	0	

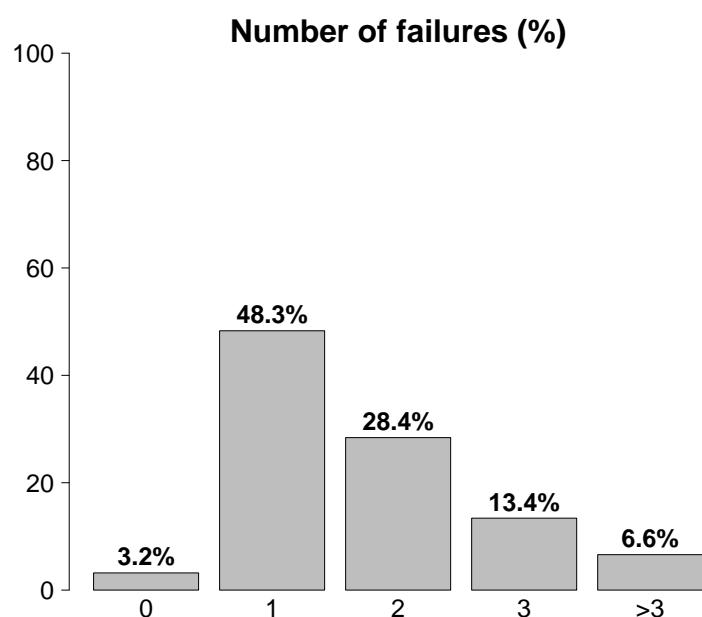
Non surgical interventions	N	%
Elective (N=5)		
Interventional cardiology	3	60.0
Interventional radiology	1	20.0
Interventional neuroradiology	1	20.0
Interventional endoscopy	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=103)		
Interventional cardiology	54	52.4
Interventional radiology	25	24.3
Interventional endoscopy	15	14.6
Interventional neuroradiology	10	9.7
Missing	0	

National report for general ICUs - Year 2020

Characteristics on admission - COVID adult patients

Reason for admission	N	%
Monitoring/Weaning	310	4.5
Post surgical weaning	9	0.1
Surgical monitoring	26	0.4
Post interventional weaning	4	0.1
Interventional monitoring	42	0.6
Non surgical monitoring	213	3.1
Missing	16	
Admission for procedures/treatments	0	0.0
Intensive Treatment	6500	95.4
Only ventilatory support	4639	68.1
Only cardiovascular support	31	0.5
Ventilatory and cardiovascular support	1830	26.8
Missing	0	
Palliative Sedation	6	0.1
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	219	3.2
Yes	6597	96.8
A: Respiratory failure	6469	94.9
B: Cardiovascular failure	1861	27.3
C: Neurological failure	201	2.9
D: Hepatic failure	9	0.1
E: Renal failure	1967	28.9
F: Acute skin failure	1	0.0
G: Metabolic failure	1231	18.1
H: Coagulation failure	23	0.3
Missing	0	

Failures on admission (top 10)	N	%
A	3220	47.2
AB	895	13.1
AE	695	10.2
AEG	364	5.3
ABEG	360	5.3
ABE	327	4.8
AG	254	3.7
ABG	132	1.9
E	58	0.9
AC	51	0.7
Missing	0	

Respiratory failure	N	%
None	347	5.1
Only hypoxic failure	5579	81.9
Only hypercapnic failure	32	0.5
Hypoxic-hypercapnic failure	623	9.1
Intubation for airway maint.	235	3.4
Missing	0	

Cardiovascular failure	N	%
None	4955	72.7
Without shock	999	14.7
Cardiogenic shock	130	1.9
Septic shock	430	6.3
Haemorrhagic/hypovolemic shock	35	0.5
Hypovolemic shock	128	1.9
Anaphylactic shock	0	0.0
Neurogenic shock	4	0.1
Other shock	99	1.5
Mixed shock	36	0.5
Missing	0	

Neurologic failure	N	%
None	5481	96.5
Cerebral coma	92	1.6
Metabolic coma	71	1.2
Postanoxic coma	30	0.5
Toxic coma	7	0.1
Missing or not evaluable	1135	

Renal failure (AKIN)	N	%
None	4830	71.1
Mild	1118	16.4
Moderate	467	6.9
Severe	382	5.6
Missing	19	

Metabolic failure	N	%
None	5567	81.9
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	451	6.6
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	780	11.5
Missing	18	

National report for general ICUs - Year 2020

Characteristics on admission - COVID adult patients

Clinical conditions on admission	N	%
Respiratory	2985	43.8
Severe ARDS	1315	19.3
Moderate ARDS	1314	19.3
Mild ARDS	193	2.8
Pulmonary embolism	143	2.1
Pneumothorax/Pneumomediastinum	102	1.5
Cardiovascular	294	4.3
Left heart failure with pulmonary edema	50	0.7
Acute severe arrhythmia: tachycardias	50	0.7
Left heart failure without pulm. edema	41	0.6
Cardiac arrest	36	0.5
Acute ischaemia	34	0.5
Neurological	115	1.7
Seizures	28	0.4
Cerebral artery stroke	26	0.4
Neuropathy/myopathy	16	0.2
Spontaneous Intraparenchymal bleeding	14	0.2
Metabolic/postanoxic encephalopathy	12	0.2
Gastrointestinal and hepatic	99	1.5
Gastrointestinal bleeding: upper tract	16	0.2
Gastrointestinal perforation	16	0.2
Intestinal occlusion	10	0.1
Retroperitoneal bleeding	10	0.1
Intrabdominal bleeding (non traumatic)	9	0.1
Trauma (anatomical districts)	46	0.7
Head	20	0.3
Pelvis/bone/joint & muscle	20	0.3
Chest	7	0.1
Spine	6	0.1
Abdomen	4	0.1
Miscellaneous	2	0.0
-	0	0.0
Other	187	2.7
Metabolic disorder	74	1.1
Nephrourologic disease	51	0.7
Other disease	27	0.4
Coagulation disorder	23	0.3
Haematological disease	13	0.2
Post transplantation	13	0.2
Renal transplantation	9	0.1
Bone marrow transplantation	3	0.0
Infections	6816	100.0
COVID-19	6816	100.0
Pneumonia	4672	68.5
Primary bacteraemia of unknown origin	92	1.3
NON-surgical urinary tract infection	88	1.3
L.R.T.I. other than pneumonia	45	0.7
Other fungal infections	41	0.6
Catheter-related bacteremia (CR-BSI)	29	0.4
NON-surgical skin/soft tissue infection	18	0.3
NON-surgical secondary peritonitis	12	0.2
Gastroenteritis	10	0.1
Missing	0	

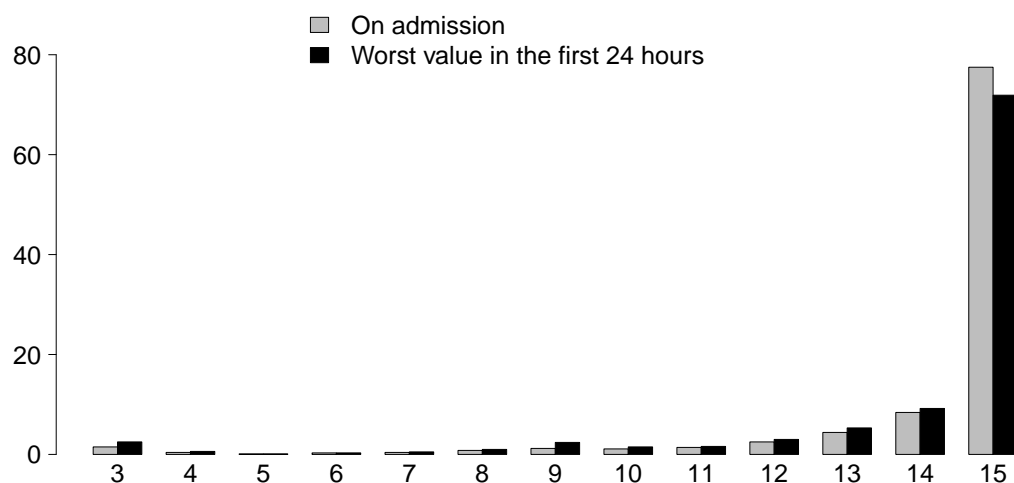
Trauma (anatomical districts)	N	%
Head	20	0.3
Cerebral contusion/laceration	8	0.1
Traumatic subarachnoid haemorrhage	7	0.1
Traumatic Subdural haematoma	6	0.1
Traumatic intraparenchymal bleeding	4	0.1
Skull fracture	4	0.1
Spine	6	0.1
Vertebral fracture, without deficit	5	0.1
Cervical injury, incomplete deficit	1	0.0
-	0	0.0
Chest	7	0.1
Other injuries of the chest	5	0.1
Traum. haemothorax/pneumothorax	2	0.0
Severe lung contusion/laceration	1	0.0
Abdomen	4	0.1
Spleen: Moderate-Severe laceration	2	0.0
Liver: Moderate-Severe laceration	1	0.0
Minor injuries of the abdomen	1	0.0
Pelvis/bone/joint & muscle	20	0.3
Long bone fracture	16	0.2
Multiple fracture of the pelvis	5	0.1
Very severe or open fracture of the pelvis	2	0.0
Major vessels injury	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Miscellaneous	2	0.0
Burns (>30% BSA)	2	0.0
-	0	0.0
Missing	0	

PaO2/FiO2 (100*mmHg%) (prime 24h)	N	%
>=400 >=53.2 (0)	48	0.7
300-399 39.9-53.1 (1)	162	2.4
200-299 26.6-39.8 (2)	572	8.4
100-199 13.3-26.5 (3)	2979	43.8
<100 <13.3 (4)	3037	44.7
Missing	18	

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Severity scores - COVID adult patients

Glasgow Coma Scale (%)



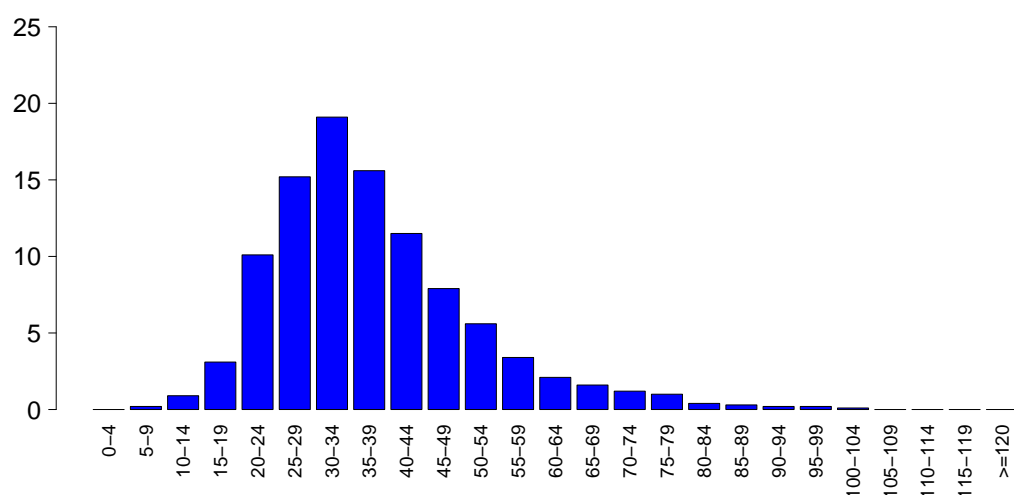
GCS (admission)

Median	15
Q1–Q3	15-15
Not evaluable	1124
Missing	11

GCS (worst in first 24 hours)

Median	15
Q1–Q3	14-15
Not evaluable	1891
Missing	19

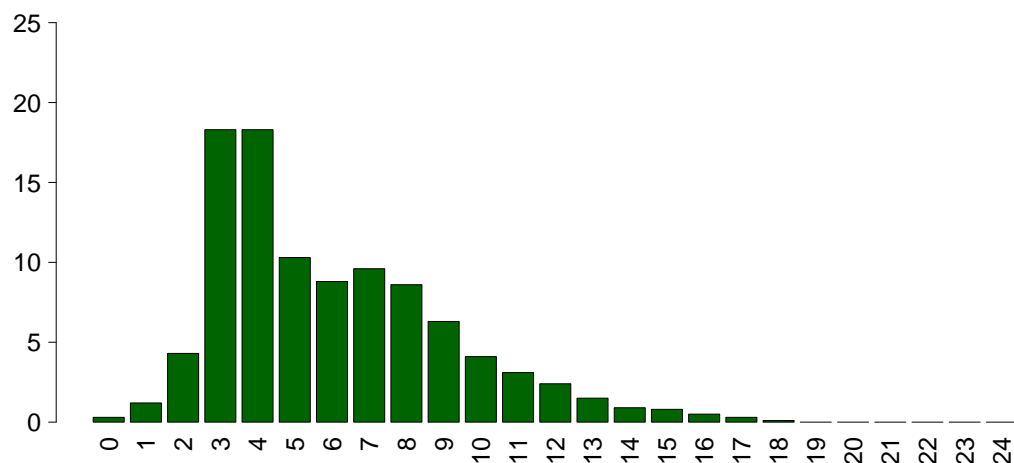
SAPS II (%)



SAPSII

Mean	37.7
SD	13.9
Median	35
Q1–Q3	29-44
Not evaluable	1891
Missing	20

SOFA (%)



SOFA

Mean	6.0
SD	3.2
Median	5
Q1–Q3	4-8
Not evaluable	1891
Missing	20

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Characteristics during the stay - COVID adult patients

Complications during the stay	N	%
No	2682	39.4
Yes	4118	60.6
Missing	16	

Failures during the stay	N	%
No	4380	64.3
Yes	2436	35.7

A: Respiratory failure	1121	16.4
B: Cardiovascular failure	1420	20.8
C: Neurological failure	48	0.7
D: Hepatic failure	20	0.3
E: Renal failure (AKIN)	846	12.4
F: Acute skin failure	1	0.0
G: Metabolic failure	133	2.0
H: Coagulation failure	45	0.7
Missing	0	

Failures during the stay (top 10)	N	%
B	623	9.1
A	539	7.9
AB	320	4.7
E	279	4.1
BE	256	3.8
ABE	123	1.8
AE	73	1.1
G	52	0.8
EG	23	0.3
BEG	12	0.2
Missing	0	

Respiratory failure occurred	N	%
None	5679	83.5
Intubation for airway maint.	83	1.2
Hypoxic failure	1029	15.1
Hypercapnic failure	139	2.0
Missing	16	

Cardiovascular failure occurred	N	%
None	5380	79.1
Cardiogenic shock	226	3.3
Hypovolemic shock	137	2.0
Haemorrhagic/hypovolemic shock	44	0.6
Septic shock	842	12.4
Anaphylactic shock	1	0.0
Neurogenic shock	4	0.1
Other shock	233	3.4
Missing	16	

Neurological failure occurred	N	%
None	6752	99.3
Cerebral coma	17	0.2
Metabolic coma	25	0.4
Postanoxic coma	6	0.1
Missing	16	

Renal failure occurred (AKIN)	N	%
None	5954	87.6
Mild	91	1.3
Moderate	134	2.0
Severe	621	9.1
Missing	16	

Complications during the stay	N	%
Respiratory	1184	17.4
Severe ARDS	483	7.1
Pneumothorax/Pneumomediastinum	301	4.4
Pulmonary embolism	161	2.4
Moderate ARDS	123	1.8
Pleural effusion	122	1.8
Cardiovascular	760	11.2
Acute severe arrhythmia: tachycardias	314	4.6
Cardiac arrest	176	2.6
Deep venous thrombosis	114	1.7
Hypertensive crisis	62	0.9
Pulmonary hypertension	51	0.8
Neurological	438	6.4
Drowsiness/agitation/delirium	337	5.0
CrI/MyNe	79	1.2
Seizures	22	0.3
New ischaemic stroke	17	0.2
Non-surgical intracranial bleeding	15	0.2
Gastrointestinal and hepatic	175	2.6
Gastrointestinal bleeding: lower tract	43	0.6
Gastrointestinal bleeding: upper tract	33	0.5
Paralytic Ileus	28	0.4
Bowel ischaemia	16	0.2
Liver Dysfunction Syndrome	16	0.2
Other	271	4.0
Metabolic disorder	133	2.0
Other disease	60	0.9
Nephrourologic disease	53	0.8
Category/Stage II: Partial Thickness Skin Loss	22	0.3
Category/Stage III: Full Thickness Skin Loss	15	0.2
Category/Stage I: Nonblanchable Erythema	6	0.1
Category/Stage IV: Full Thickness Tissue Loss	6	0.1
Infections	2085	30.7
Pneumonia	1000	14.7
L.R.T.I. other than pneumonia	449	6.6
Primary bacteraemia of unknown origin	418	6.1
NON-surgical urinary tract infection	336	4.9
Catheter-related bacteremia (CR-BSI)	313	4.6
COVID-19	86	1.3
Other fungal infections	72	1.1
Clinical sepsis	57	0.8
Upper respiratory tract infection	33	0.5
Catheter-related local infection	23	0.3
Missing	16	

National report for general ICUs - Year 2020

Characteristics during the stay - COVID adult patients

Infections	N	%
None	0	0.0
Only on admission	4715	69.3
On admission and during ICU stay	2085	30.7
Only during ICU stay	0	0.0
Missing	16	

Ventil. Associat. Pneumonia (VAP)	N	%
No	5861	86.2
Yes	942	13.8
Missing	13	

Incidence of VAP*(Pts. with VAP/1000 days of VM pre-VAP)*

Estimate	14.5
CI (95%)	13.6–15.5

Incidence of VAP*(Pts. with VAP/pts. ventilated for 8 days)*

Estimate	11.6%
CI (95%)	10.9–12.4

Catheter Bacteraemia (CR-BSI)	N	%
No	6487	95.4
Yes	313	4.6
Missing	16	

Incidence of CR-BSI*(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)*

Estimate	3.5
CI (95%)	3.1–3.9

Incidence of CR-BSI*(Pts. with CR-BSI/pts. catheterized for 12 days)*

Estimate	4.2%
CI (95%)	3.8–4.7

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Process indicators - COVID adult patients

Procedures and/or treatments (Missing=4)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	6785	99.6										
Invasive ventilation	5410	79.4	2472	36.3	2460	36.1	11	5–19	14	0	0–1	2
	2858	42.0	1335	19.6	770	11.3	3	1–5	6	0	0–7	0
Non invasive ventilation	1704	25.0	143	2.1	1155	17	14	7–24	7	11	8–16	2
Tracheostomy	260	3.8	4	0.1	66	1	4	2–6	1	5	2–10	1
iNO (inhaled nitric oxide)	6143	90.2	1780	26.1	4606	67.6	11	6–20	21	0	0–0	5
Central Venous Catheter	181	2.7	38	0.6	147	2.2	6	2–11	0	22	3–39	0
PICC	6552	96.2	1910	28	3215	47.2	11	5–20	20	0	0–0	5
Arterial Catheter	3695	54.2	607	8.9	1355	19.9	5	2–10	11	0	0–2	4
Vasoactive drugs	590	8.7	87	1.3	282	4.1	5	2–12	1	5	1–11	0
Antiarrhythmics	5	0.1	3	0	0	0	3	0–3	0	6	4–9	0
IABP	250	3.7	18	0.3	90	1.3	8	4–14	2	3	0–8	0
Invasive monitoring of C.O.	14	0.2	1	0	5	0.1	10	6–21	0	2	0–7	0
Continuous monitoring of ScVO2	9	0.1	3	0	2	0	2	1–4	0	8	2–13	0
Temporary pacing	0	0.0										
Ventricular assistance	80	1.2								4	1–11	0
DC-shock	140	2.1								3	0–10	0
CPR	16	0.2								8	0–9	0
Massive blood transfusion	7	0.1	6	0.1	2	0	3	2–6	0	0	0–0	0
ICP monitoring without CSF drainage	7	0.1	3	0	3	0	9	2–14	0	7	0–22	0
ICP monitoring with CSF drainage	2	0.0	2	0	2	0	4	2–5	0			
External ventricular drainage without ICP	426	6.3	27	0.4	154	2.3	6	3–14	1	6	3–12	1
Haemofiltration	218	3.2	29	0.4	100	1.5	6	2–13	1	6	1–15	1
Haemodialysis	79	1.2	14	0.2	43	0.6	12	4–28	0	6	1–9	0
ECMO	0	0.0										
Hepatic clearance techniques	125	1.8	5	0.1	46	0.7	3	2–6	2	6	3–12	2
Clearance techniques during sepsis	24	0.4										
IAP (intra-abdominal pressure)	1	0.0	0	0	1	0	1	1–1	0	14	14–14	0
Hypothermia	5154	75.7	840	12.3	3454	50.7	12	6–21	12	1	0–2	7
Enteral nutrition	1543	22.7	205	3	647	9.5	8	4–14	6	1	0–2	1
Parenteral nutrition	143	2.1										
SDD (Topical, Topical and systemic)	208	3.1										
Patient restraint	3	0.0	1	0	2	0	6	6–30	0	20	10–31	0
Peridural catheter	85	1.2								10	3–16	0
Electrical cardioversion	4	0.1										
Vacuum therapy												

National report for general ICUs - Year 2020
Process indicators - COVID adult patients

Procedures and/or treatments (Missing=4)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	4975	73.0										
Antibiotic prophylaxis	803	11.8	463	6.8	354	5.2	4	2-8	0	0	0-0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	3038	44.6	1278	18.8	923	13.5	5	3-8	4	0	0-4	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	463	6.8	191	2.8	189	2.8	5	3-7	0	1	0-4	0
Targeted antibiotic therapy	2287	33.6	294	4.3	1154	16.9	8	5-13	7	8	4-13	5
Antifungal in empirical therapy	225	3.3	27	0.4	86	1.3	6	3-10	1	9	2-17	0
Antifungal in targeted therapy	418	6.1	29	0.4	202	3	10	5-15	0	12	7-21	0
Pre-emptive antifungal	293	4.3	158	2.3	175	2.6	6	2-11	0	2	0-6	0

Antibiotic therapy					
Pt. infected in ICU only (N=0)					
	N	%			
No therapy	0	0.0	No therapy	0	0.0
Only empirical	0	0.0	Only empirical	0	0.0
Only targeted	0	0.0	Only targeted	0	0.0
Targeted after empirical	0	0.0	Targeted after empirical	0	0.0
Other	0	0.0	Other	0	0.0
Missing	0		Missing	0	

Antifungal therapy					
Pt. infected in ICU only (N=0)					
	N	%			
No therapy	0	0.0	No therapy	0	0.0
Only empirical	0	0.0	Only empirical	0	0.0
Only targeted	0	0.0	Only targeted	0	0.0
Targeted after empirical	0	0.0	Targeted after empirical	0	0.0
Other	0	0.0	Other	0	0.0
Missing	0		Missing	0	

Antifungal therapy			
Pt. infected in ICU only (N=0)			
	N	%	
No therapy	0	0.0	
Only empirical	0	0.0	
Only targeted	0	0.0	
Targeted after empirical	0	0.0	
Other	0	0.0	
Missing	0		

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Process indicators - COVID adult patients

Invasive ventilation (N=5410)	N	%	Length (days)				
			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	5053	87.5	14.7	14.1	11	5–19	12
For airway maintenance	222	3.8	10.0	13.4	6	1–13	1
In weaning	18	0.3	0.6	0.5	1	0–1	0
Not evaluable	482	8.3	11.3	14.2	7	3–14	286
Reintubation within 48 hours	83	1.4	13.9	14.5	10	3–19.75	1

Non invasive ventilation (N=2858)	N	%
Non invasive ventilation only	1204	42.1
Non invasive ventilation failed	971	34.0
For weaning	575	20.1
Other	108	3.8
Missing	0	

Tracheostomy not present on admission (N=1561)	N	%
Surgical	277	17.7
Percutwist	191	12.2
Ciaglia	244	15.6
Monodil. Ciaglia	693	44.4
Fantoni	6	0.4
Griggs	106	6.8
Other Kind	28	1.8
Unknown	13	0.8
Missing	3	

**Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=1554)**

Mean	12.1
SD	7.6
Median	11
Q1–Q3	7–15
Missing	2

Invasive monitoring of C.O. (N=250)	N	%
Swan Ganz	22	8.8
PICCO	201	80.4
LIDCO	1	0.4
Vigileo-PRAM	14	5.6
Other	11	4.4
Missing	1	

SDD (N=143)	N	%
Topical	143	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	6634	97.5
Yes	172	2.5
Missing	10	

Number of surgical interventions	N	%
0	6634	97.5
1	157	2.3
2	12	0.2
3	2	0.0
>3	1	0.0
Missing	10	

**Surgical interventions
Days from admission**

Mean	19.0
SD	20.0
Median	13
Q1–Q3	7–22
Missing	0

Surgical interventions (top 10)	N	%
ENT surgery	105	1.5
Gastrointestinal surgery	22	0.3
Thoracic surgery	19	0.3
Peripheral vascular surgery	10	0.1
Other surgery	10	0.1
Orthopaedic surgery	8	0.1
Nephro/Urological surgery	5	0.1
Maxillo-Facial surgery	3	0.0
Biliary tract surgery	2	0.0
Other cardiac surgery	1	0.0
Missing	10	

Non surgical interventions	N	%
No	6717	98.7
Yes	89	1.3
Missing	10	

**Non surgical interventions
Days from admission**

Mean	25.5
SD	21.7
Median	19
Q1–Q3	10–34
Missing	2

Non surgical interventions	N	%
Interventional endoscopy	74	1.1
Interventional radiology	24	0.4
Interventional cardiology	13	0.2
Interventional neuroradiology	1	0.0
Missing	10	

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Outcome indicators - COVID adult patients

ICU outcome	N	%
Dead	2574	37.9
Transferred to same hospital	3271	48.1
Transferred to other hospital	912	13.4
Discharged home	23	0.3
Disch. terminally ill	17	0.3
Missing	19	

Transferred to (N=4183)	N	%
Ward	2640	63.1
Other ICU	750	17.9
High dependency care unit	648	15.5
Rehabilitation	140	3.3
Day hospital or Long-term care	5	0.1
Missing	0	

Reason of transfer to Other ICU (N=761)	N	%
Specialist expertise	110	14.5
Step-up care	92	12.1
Logistical/organizational reasons	553	72.7
Step-down care	6	0.8
Missing	0	

Transferred to Same hospital (N=3271)	N	%
Ward	2530	77.3
Other ICU	142	4.3
High dependency care unit	584	17.9
Rehabilitation	14	0.4
Day hospital or Long-term care	1	0.0
Missing	0	

Transferred to Other hospital (N=912)	N	%
Ward	110	12.1
Other ICU	608	66.7
High dependency care unit	64	7.0
Rehabilitation	126	13.8
Day hospital or Long-term care	4	0.4
Missing	0	

ICU mortality	N	%
Alive	4206	61.9
Dead	2591	38.1
Missing	19	

Timing of ICU mortality (N=2591)	N	%
Daytime (08:00AM - 07:59PM)	1853	71.5
Nighttime (08:00PM - 07:59AM)	737	28.5
Weekdays (Monday - Friday)	1870	72.2
Weekend (Saturday - Sunday)	721	27.8
Missing	1	

C.A.M. activation (N=2591)	N	%
Yes, with organ donation	0	0.0
Yes, without organ donation	13	0.5
No, with organ donation	1	0.0
No, without organ donation	2559	99.5
Missing	18	

Tissue removal (N=2591)	N	%
Yes, with C.A.M. activation	0	0.0
Yes, without C.A.M. activation	7	0.3
No	2584	99.7
Missing	0	

Hospital mortality *	N	%
Dead	2612	42.3
Transf. to other acute-care hospital	894	14.5
Transf. to other type of hosp. stay	937	15.2
Nursing home	53	0.9
Voluntary discharge	11	0.2
Discharged home	1661	26.9
Missing	37	

To other type of H stay* (N=937)	N	%
Rehabilitation in the same institute	182	19.4
Rehabilitation in other institute	655	69.9
DH/long-term care, same inst.	25	2.7
DH/long-term care, other inst.	75	8.0
Missing	0	

Disch. terminally ill* (N=3556)	N	%
Yes	27	0.8
No	3525	99.2
Missing	4	

Hospital mortality *	N	%
Alive	3525	57.2
Dead	2639	42.8
Missing	41	

Timing of hosp. mortality * (N=2639)	N	%
In ICU	2379	90.1
Within 24 hours after ICU	21	0.8
24-47 hours after ICU	10	0.4
48-71 hours after ICU	16	0.6
72-95 hours after ICU	21	0.8
After 95 hours after ICU	192	7.3
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=260)		
Mean	13.9	
SD	15.2	
Median	10	
Q1–Q3	3-19	
Missing	0	

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=6205).

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Outcome indicators - COVID adult patients

Last hospital mortality *	N	%
Alive	3319	54.1
Dead	2821	45.9
Missing	65	

Readmission from ward	N	%
No	6703	98.4
Yes	111	1.6
Missing	2	

Number of readmissions (N=111)	N	%
1	106	95.5
2	3	2.7
>2	2	1.8
Missing	0	

Timing of readmission (N=111)	N	%
Within 48 hours	33	30.0
48-71 hours	12	10.9
72-95 hours	8	7.3
After 95 hours	57	51.8
Missing	1	

Timing readmission (days)	N	
Mean	7.1	
SD	9.1	
Median	4.1	
Q1–Q3	1.8-8.9	

ICU stay (days)		
Mean	15.1	
SD	15.2	
Median	11	
Q1–Q3	5-20	
Missing	22	

ICU stay (days) Alive (N=4206)		
Mean	15.8	
SD	16.8	
Median	10	
Q1–Q3	4-21	
Missing	5	

ICU stay (days) Dead (N=2591)		
Mean	13.9	
SD	12.2	
Median	11	
Q1–Q3	5-19	
Missing	1	

Stay after ICU (days) *		
Alive (N=3814)		
Mean	13.3	
SD	14.1	
Median	11	
Q1–Q3	1-19	
Missing	25	

Hospital stay (days) *		
Mean	27.0	
SD	22.4	
Median	22	
Q1–Q3	12-36	
Missing	37	

Hospital stay (days) *		
Alive (N=3525)		
Mean	32.2	
SD	23.3	
Median	27	
Q1–Q3	15-44	
Missing	0	

Hospital stay (days) *		
Dead (N=2639)		
Mean	20.0	
SD	19.0	
Median	16	
Q1–Q3	9-25	
Missing	2	

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=6205).

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Characteristics on admission - COVID adult patients evaluated in the GiViTI model

Patients (N): 6085

Sex	N	%
Male	4601	75.6
Female	1484	24.4
Missing	0	

Age (years)	N	%
17-45	317	5.2
46-65	2579	42.4
66-75	2220	36.5
>75	969	15.9
Missing	0	
Mean	64.9	
SD	11.2	
Median	66	
Q1–Q3	58-73	
Min–Max	17–93	

Body mass Index (BMI)	N	%
Underweight	61	1.0
Normal	1847	30.6
Overweight	2445	40.5
Obese	1682	27.9
Missing	50	

Pregnancy status	N	%
Females (N=1484)		
Not fertile	590	39.8
Not pregnant/Unknown	887	59.8
Currently pregnant	3	0.2
Post partum	4	0.3
Missing	0	

Comorbidities	N	%
No	1431	23.5
Yes	4654	76.5
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	3369	55.4
Diabetes Type II without insulin tr.	921	15.1
Myocardial infarction	578	9.5
Arrhythmia	495	8.1
Moderate COPD	487	8.0
Antiplatelet therapy	331	5.4
Diabetes Type II with insulin treatment	323	5.3
Any tumour without metastasis	312	5.1
Cerebrovascular disease	285	4.7
Moderate or severe renal disease	275	4.5
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	5.1	8.5	3	1-6	0

Source of admission	N	%
Same hospital	4836	79.5
Other hospital	1232	20.2
Long-term chronic care hospital	17	0.3
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=6068)		
Medical ward	3159	52.1
Surgical ward	95	1.6
Emergency room	1667	27.5
Other ICU	584	9.6
High dependency care unit	563	9.3
Missing	0	

Reason for transfer from	N	%
Other ICU (N=584)		
Specialist expertise	110	18.8
Step-up care	157	26.9
Logistical/organizational reasons	316	54.1
Step-down care	1	0.2
Missing	0	

Ward of admission	N	%
Same hospital (N=4836)		
Medical ward	2779	57.5
Surgical ward	86	1.8
Emergency room	1324	27.4
Other ICU	154	3.2
High dependency care unit	493	10.2
Missing	0	

Ward of admission	N	%
Other hospital (N=1232)		
Medical ward	380	30.8
Surgical ward	9	0.7
Emergency room	343	27.8
Other ICU	430	34.9
High dependency care unit	70	5.7
Missing	0	

Scheduled admission	N	%
No	6074	99.8
Yes	11	0.2
Missing	0	

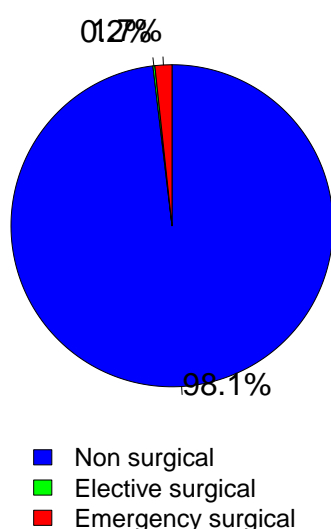
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Characteristics on admission - COVID adult patients evaluated in the GiViTI model

Trauma	N	%
No	6047	99.4
Yes	38	0.6
Multiple trauma	6	0.1
Missing	0	

Surgical status	N	%
Non surgical	5968	98.1
Elective surgical	13	0.2
Emergency surgical	104	1.7
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=117)		
Operating theatre of surgical ward	32	27.4
Operating theatre of emergency room	19	16.2
Surgical ward	5	4.3
Other	61	52.1
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=13)		
Neurosurgery	4	30.8
Gastrointestinal surgery	3	23.1
Orthopaedic surgery	2	15.4
Obstetric surgery	1	7.7
Nephro/Urological surgery	1	7.7
ENT surgery	1	7.7
Thoracic surgery	1	7.7
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Timing	N	%
Elective surgical (N=13)		
From -7 to -3 days	1	7.7
From -2 to -1 days	2	15.4
On ICU admission day	10	76.9
The day after ICU admission	0	0.0
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=104)		
Gastrointestinal surgery	41	39.4
Neurosurgery	18	17.3
Orthopaedic surgery	8	7.7
Thoracic surgery	8	7.7
ENT surgery	7	6.7
Abdominal vascular surgery	6	5.8
Peripheral vascular surgery	6	5.8
Nephro/Urological surgery	5	4.8
Other surgery	4	3.8
Biliary tract surgery	2	1.9
Missing	0	

Timing	N	%
Emergency surgical (N=104)		
From -7 to -3 days	2	1.9
From -2 to -1 days	14	13.5
On ICU admission day	85	81.7
The day after ICU admission	9	8.7
Missing	0	

Non surgical interventions	N	%
None	5989	98.4
Elective	5	0.1
Emergency	91	1.5
Missing	0	

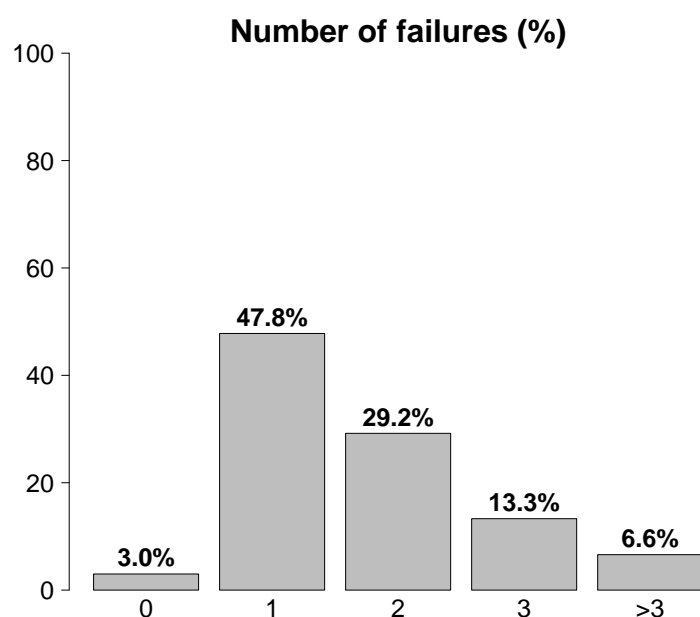
Non surgical interventions	N	%
Elective (N=5)		
Interventional cardiology	3	60.0
Interventional radiology	1	20.0
Interventional neuroradiology	1	20.0
Interventional endoscopy	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=91)		
Interventional cardiology	49	53.8
Interventional radiology	22	24.2
Interventional endoscopy	11	12.1
Interventional neuroradiology	10	11.0
Missing	0	

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Characteristics on admission - COVID adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	265	4.4
Post surgical weaning	8	0.1
Surgical monitoring	22	0.4
Post interventional weaning	4	0.1
Interventional monitoring	38	0.6
Non surgical monitoring	181	3.0
Missing	12	
Admission for procedures/treatments	0	0.0
Intensive Treatment	5820	95.6
Only ventilatory support	4143	68.1
Only cardiovascular support	27	0.4
Ventilatory and cardiovascular support	1650	27.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	185	3.0
Yes	5900	97.0
A: Respiratory failure	5793	95.2
B: Cardiovascular failure	1677	27.6
C: Neurological failure	178	2.9
D: Hepatic failure	8	0.1
E: Renal failure	1775	29.2
F: Acute skin failure	1	0.0
G: Metabolic failure	1095	18.0
H: Coagulation failure	20	0.3
Missing	0	

Failures on admission (top 10)	N	%
A	2848	46.8
AB	821	13.5
AE	646	10.6
AEG	328	5.4
ABEG	319	5.2
ABE	291	4.8
AG	227	3.7
ABG	115	1.9
E	48	0.8
AC	47	0.8
Missing	0	

Respiratory failure	N	%
None	292	4.8
Only hypoxic failure	5003	82.2
Only hypercapnic failure	23	0.4
Hypoxic-hypercapnic failure	568	9.3
Intubation for airway maint.	199	3.3
Missing	0	

Cardiovascular failure	N	%
None	4408	72.4
Without shock	934	15.3
Cardiogenic shock	122	2.0
Septic shock	361	5.9
Haemorrhagic/hypovolemic shock	29	0.5
Hypovolemic shock	115	1.9
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.0
Other shock	85	1.4
Mixed shock	29	0.5
Missing	0	

Neurologic failure	N	%
None	4905	96.5
Cerebral coma	85	1.7
Metabolic coma	61	1.2
Postanoxic coma	26	0.5
Toxic coma	6	0.1
Missing or not evaluable	1002	

Renal failure (AKIN)	N	%
None	4310	70.8
Mild	1016	16.7
Moderate	426	7.0
Severe	333	5.5
Missing	0	

Metabolic failure	N	%
None	4990	82.0
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	395	6.5
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	700	11.5
Missing	0	

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Characteristics on admission - COVID adult patients evaluated in the GiViTI model

Clinical conditions on admission	N	%
Respiratory	2672	43.9
Severe ARDS	1205	19.8
Moderate ARDS	1155	19.0
Mild ARDS	169	2.8
Pulmonary embolism	123	2.0
Pneumothorax/Pneumomediastinum	96	1.6
Cardiovascular	253	4.2
Left heart failure with pulmonary edema	47	0.8
Acute severe arrhythmia: tachycardias	46	0.8
Left heart failure without pulm. edema	37	0.6
Cardiac arrest	30	0.5
Acute myocardial infarction	29	0.5
Neurological	94	1.5
Cerebral artery stroke	25	0.4
Seizures	21	0.3
Spontaneous Intraparenchymal bleeding	12	0.2
Neuropathy/myopathy	10	0.2
Brain tumour	8	0.1
Gastrointestinal and hepatic	78	1.3
Gastrointestinal bleeding: upper tract	13	0.2
Gastrointestinal perforation	12	0.2
Retroperitoneal bleeding	8	0.1
Intrabdominal bleeding (non traumatic)	7	0.1
Intestinal occlusion	6	0.1
Trauma (anatomical districts)	38	0.6
Pelvis/bone/joint & muscle	19	0.3
Head	17	0.3
Chest	5	0.1
Spine	4	0.1
Abdomen	3	0.0
Miscellaneous	1	0.0
-	0	0.0
Other	171	2.8
Metabolic disorder	69	1.1
Nephrourologic disease	45	0.7
Other disease	26	0.4
Coagulation disorder	20	0.3
Haematological disease	12	0.2
Post transplantation	12	0.2
Renal transplantation	8	0.1
Bone marrow transplantation	3	0.0
Infections	6085	100.0
COVID-19	6085	100.0
Pneumonia	4216	69.3
Primary bacteraemia of unknown origin	84	1.4
NON-surgical urinary tract infection	78	1.3
Other fungal infections	40	0.7
L.R.T.I. other than pneumonia	31	0.5
Catheter-related bacteremia (CR-BSI)	22	0.4
NON-surgical skin/soft tissue infection	15	0.2
NON-surgical secondary peritonitis	10	0.2
Gastroenteritis	8	0.1
Missing	0	

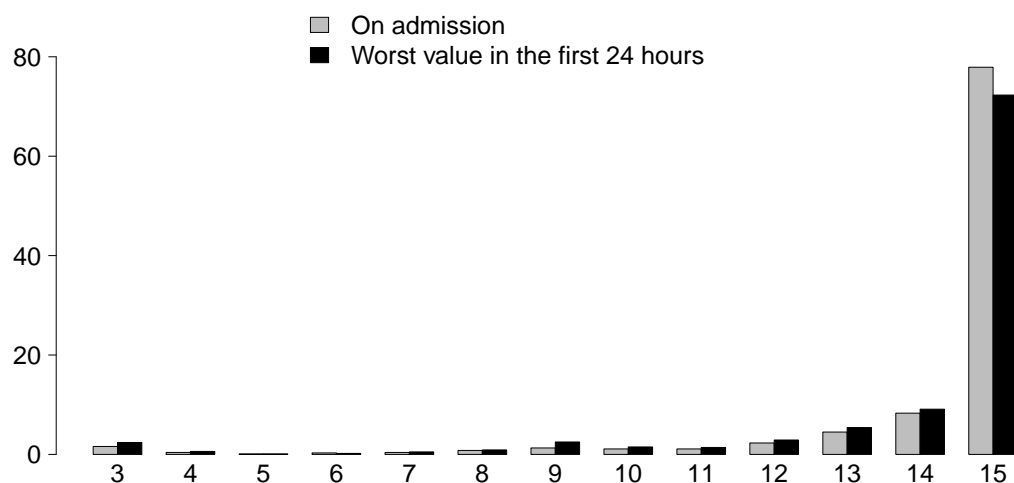
Trauma (anatomical districts)	N	%
Head	17	0.3
Cerebral contusion/laceration	8	0.1
Traumatic subarachnoid haemorrhage	6	0.1
Traumatic Subdural haematoma	5	0.1
Traumatic intraparenchymal bleeding	4	0.1
Skull fracture	4	0.1
Spine	4	0.1
Vertebral fracture, without deficit	3	0.0
Cervical injury, incomplete deficit	1	0.0
-	0	0.0
Chest	5	0.1
Other injuries of the chest	4	0.1
Traum. haemothorax/pneumothorax	2	0.0
Diaphragmatic rupture	1	0.0
Abdomen	3	0.0
Liver: Moderate-Severe laceration	1	0.0
Spleen: Moderate-Severe laceration	1	0.0
Minor injuries of the abdomen	1	0.0
Pelvis/bone/joint & muscle	19	0.3
Long bone fracture	15	0.2
Multiple fracture of the pelvis	4	0.1
Very severe or open fracture of the pelvis	2	0.0
Major vessels injury	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Miscellaneous	1	0.0
Burns (>30% BSA)	1	0.0
-	0	0.0
Missing	0	

PaO2/FiO2 (100*mmHg%) (prime 24h)	N	%
>=400 >=53.2 (0)	43	0.7
300-399 39.9-53.1 (1)	140	2.3
200-299 26.6-39.8 (2)	517	8.5
100-199 13.3-26.5 (3)	2666	43.8
<100 <13.3 (4)	2719	44.7
Missing	0	

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Severity scores - COVID adult patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



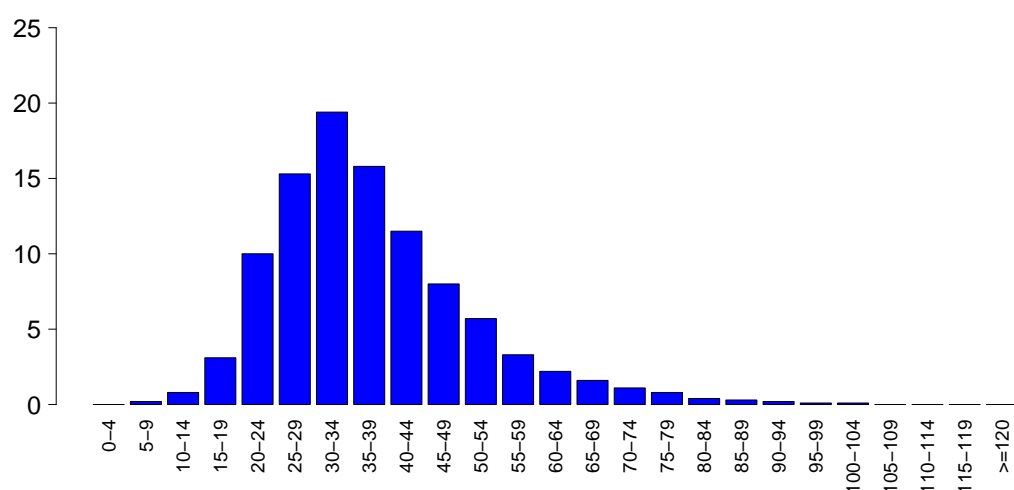
GCS (admission)

Median	15
Q1–Q3	15-15
Not evaluable	1002
Missing	0

GCS (worst in first 24 hours)

Median	15
Q1–Q3	14-15
Not evaluable	1718
Missing	0

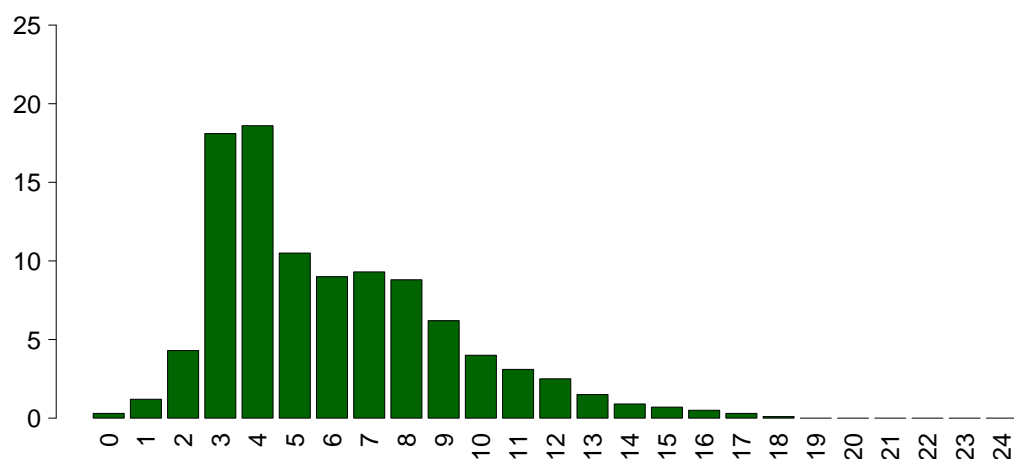
SAPS II (%)



SAPSII

Mean	37.5
SD	13.5
Median	35
Q1–Q3	29-44
Not evaluable	1718
Missing	0

SOFA (%)



SOFA

Mean	6.0
SD	3.1
Median	5
Q1–Q3	4-8
Not evaluable	1718
Missing	0

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Characteristics during the stay - COVID adult patients evaluated in the GiViTI model

Complications during the stay	N	%
No	2385	39.2
Yes	3696	60.8
Missing	4	

Failures during the stay	N	%
No	3879	63.7
Yes	2206	36.3
A: Respiratory failure	1025	16.8
B: Cardiovascular failure	1281	21.1
C: Neurological failure	42	0.7
D: Hepatic failure	17	0.3
E: Renal failure (AKIN)	761	12.5
F: Acute skin failure	1	0.0
G: Metabolic failure	127	2.1
H: Coagulation failure	30	0.5
Missing	0	

Failures during the stay (top 10)	N	%
B	562	9.2
A	491	8.1
AB	293	4.8
E	254	4.2
BE	228	3.7
ABE	112	1.8
AE	69	1.1
G	51	0.8
EG	23	0.4
BEG	10	0.2
Missing	0	

Respiratory failure occurred	N	%
None	5056	83.1
Intubation for airway maint.	77	1.3
Hypoxic failure	943	15.5
Hypercapnic failure	124	2.0
Missing	4	

Cardiovascular failure occurred	N	%
None	4800	78.9
Cardiogenic shock	207	3.4
Hypovolemic shock	119	2.0
Haemorrhagic/hypovolemic shock	39	0.6
Septic shock	764	12.6
Anaphylactic shock	1	0.0
Neurogenic shock	4	0.1
Other shock	210	3.5
Missing	4	

Neurological failure occurred	N	%
None	6039	99.3
Cerebral coma	12	0.2
Metabolic coma	24	0.4
Postanoxic coma	6	0.1
Missing	4	

Renal failure occurred (AKIN)	N	%
None	5320	87.5
Mild	80	1.3
Moderate	123	2.0
Severe	558	9.2
Missing	4	

Complications during the stay	N	%
Respiratory	1039	17.1
Severe ARDS	414	6.8
Pneumothorax/Pneumomediastinum	270	4.4
Pulmonary embolism	142	2.3
Moderate ARDS	108	1.8
Pleural effusion	104	1.7
Cardiovascular	673	11.1
Acute severe arrhythmia: tachycardias	287	4.7
Cardiac arrest	146	2.4
Deep venous thrombosis	104	1.7
Pulmonary hypertension	48	0.8
Hypertensive crisis	46	0.8
Neurological	360	5.9
Drowsiness/agitation/delirium	272	4.5
CrIMyNe	67	1.1
Seizures	18	0.3
New ischaemic stroke	16	0.3
Non-surgical intracranial bleeding	13	0.2
Gastrointestinal and hepatic	149	2.5
Gastrointestinal bleeding: lower tract	33	0.5
Gastrointestinal bleeding: upper tract	27	0.4
Paralytic Ileus	23	0.4
Retroperitoneal bleeding	15	0.2
Bowel ischaemia	13	0.2
Other	249	4.1
Metabolic disorder	127	2.1
Other disease	55	0.9
Nephrourologic disease	47	0.8
Category/Stage II: Partial Thickness Skin Loss	20	0.3
Category/Stage III: Full Thickness Skin Loss	12	0.2
Category/Stage I: Nonblanchable Erythema	6	0.1
Category/Stage IV: Full Thickness Tissue Loss	4	0.1
Infections	1882	30.9
Pneumonia	890	14.6
L.R.T.I. other than pneumonia	399	6.6
Primary bacteraemia of unknown origin	384	6.3
NON-surgical urinary tract infection	324	5.3
Catheter-related bacteremia (CR-BSI)	293	4.8
COVID-19	72	1.2
Other fungal infections	68	1.1
Clinical sepsis	49	0.8
Upper respiratory tract infection	29	0.5
Catheter-related local infection	23	0.4
Missing	4	

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Characteristics during the stay - COVID adult patients evaluated in the GiViTI model

Infections	N	%
None	0	0.0
Only on admission	4199	69.1
On admission and during ICU stay	1882	30.9
Only during ICU stay	0	0.0
Missing	4	

Ventil. Associat. Pneumonia (VAP)	N	%
No	5238	86.1
Yes	843	13.9
Missing	4	

Incidence of VAP*(Pts. with VAP/1000 days of VM pre-VAP)*

Estimate	14.4
CI (95%)	13.5–15.4

Incidence of VAP*(Pts. with VAP/pts. ventilated for 8 days)*

Estimate	11.5%
CI (95%)	10.8–12.3

Catheter Bacteraemia (CR-BSI)	N	%
No	5788	95.2
Yes	293	4.8
Missing	4	

Incidence of CR-BSI*(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)*

Estimate	3.7
CI (95%)	3.3–4.1

Incidence of CR-BSI*(Pts. with CR-BSI/pts. catheterized for 12 days)*

Estimate	4.4%
CI (95%)	3.9–5.0

National report for general ICUs - Year 2020
Process indicators - COVID adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	6065	99.7										
Invasive ventilation	4841	79.6	2226	36.6	2254	37	11	5–19	1	0	0–1	0
Non invasive ventilation	2576	42.3	1207	19.8	709	11.7	3	1–5	0	0	0–7	0
Tracheostomy	1511	24.8	122	2	1030	16.9	14	7–24	0	11	8–16	0
iNO (inhaled nitric oxide)	246	4.0	4	0.1	66	1.1	4	2–6	0	5	2–11	0
Central Venous Catheter	5505	90.5	1587	26.1	4171	68.5	11	6–20	2	0	0–0	0
PICC	167	2.7	35	0.6	137	2.3	5	2–11	0	20	2–39	0
Arterial Catheter	5891	96.8	1717	28.2	2932	48.2	11	5–20	1	0	0–0	0
Vasoactive drugs	3355	55.1	544	8.9	1258	20.7	5	2–11	1	0	0–2	0
Antiarrhythmics	541	8.9	79	1.3	263	4.3	5	2–12	1	5	1–11	0
IABP	5	0.1	3	0	0	0	3	0–3	0	6	4–9	0
Invasive monitoring of C.O.	214	3.5	15	0.2	78	1.3	8	4–14	0	3	0–8	0
Continuous monitoring of ScVO2	10	0.2	1	0	4	0.1	12	8–26	0	0	0–5	0
Temporary pacing	7	0.1	2	0	2	0	2	1–3	0	3	1–12	0
Ventricular assistance	0	0.0										
DC-shock	70	1.2								4	1–12	0
CPR	124	2.0								4	1–10	0
Massive blood transfusion	15	0.2								7	0–10	0
ICP monitoring without CSF drainage	6	0.1	5	0.1	2	0	4	2–6	0	0	0–0	0
ICP monitoring with CSF drainage	7	0.1	3	0	3	0	9	2–14	0	7	0–22	0
External ventricular drainage without ICP	2	0.0	2	0	2	0	4	2–5	0			
Haemofiltration	377	6.2	21	0.3	132	2.2	5	3–14	0	6	3–12	0
Haemodialysis	196	3.2	28	0.5	94	1.5	6	2–13	0	6	1–15	0
ECMO	71	1.2	13	0.2	41	0.7	12	4–30	0	4	1–9	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	115	1.9	5	0.1	43	0.7	3	2–5	0	6	3–12	0
IAP (intra-abdominal pressure)	20	0.3										
Hypothermia	1	0.0	0	0	1	0	1	1–1	0	14	14–14	0
Enteral nutrition	4676	76.8	771	12.7	3189	52.4	11	6–21	1	1	0–2	1
Parenteral nutrition	1382	22.7	185	3	600	9.9	8	4–14	1	0	0–2	0
SDD (Topical, Topical and systemic)	139	2.3										
Patient restraint	203	3.3										
Peridural catheter	2	0.0	1	0	2	0	6	5–6	0	0	0–0	0
Electrical cardioversion	77	1.3								11	3–16	0
Vacuum therapy	3	0.0										

National report for general ICUs - Year 2020
Process indicators - COVID adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	4488	73.8										
Antibiotic prophylaxis	726	11.9	413	6.8	331	5.4	4	2-8	0	0	0-0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	2772	45.6	1172	19.3	861	14.1	5	3-8	0	0	0-4	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	401	6.6	167	2.7	166	2.7	5	3-8	0	0	0-4	0
Targeted antibiotic therapy	2039	33.5	242	4	1051	17.3	8	5-14	0	8	4-13	0
Antifungal in empirical therapy	208	3.4	24	0.4	81	1.3	6	3-10	0	9	2-17	0
Antifungal in targeted therapy	381	6.3	28	0.5	190	3.1	10	5-15	0	11	7-20	0
Pre-emptive antifungal	290	4.8	158	2.6	174	2.9	6	2-11	0	2	0-6	0

Antibiotic therapy			
Pt. infected in ICU only (N=0)		N	%
No therapy		0	0.0
Only empirical		0	0.0
Only targeted		0	0.0
Targeted after empirical		0	0.0
Other		0	0.0
Missing		0	

Antifungal therapy			
Pt. infected in ICU only (N=0)		N	%
No therapy		0	0.0
Only empirical		0	0.0
Only targeted		0	0.0
Targeted after empirical		0	0.0
Other		0	0.0
Missing		0	

National report for general ICUs - Year 2020**Process indicators** - COVID adult patients evaluated in the GiViTI model

Invasive ventilation (N=4841)	N	%	Length (days)				
			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	4535	87.8	14.6	13.6	11	5–19	1
For airway maintenance	188	3.6	10.2	13.0	6.5	2–13	0
In weaning	14	0.3	0.6	0.5	1	0–1	0
Not evaluable	431	8.3	11.6	14.5	7	3–13.5	252
Reintubation within 48 hours	78	1.5	14.4	14.7	10	4–20	0

Non invasive ventilation (N=2576)	N	%
Non invasive ventilation only	1077	41.8
Non invasive ventilation failed	874	33.9
For weaning	527	20.5
Other	98	3.8
Missing	0	

Tracheostomy not present on admission (N=1389)	N	%
Surgical	252	18.1
Percutwist	156	11.2
Ciaglia	222	16.0
Monodil. Ciaglia	648	46.7
Fantoni	6	0.4
Griggs	70	5.0
Other Kind	24	1.7
Unknown	11	0.8
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=1382)

Mean	12.1
SD	7.4
Median	11
Q1–Q3	7-15
Missing	0

Invasive monitoring of C.O. (N=214)	N	%
Swan Ganz	21	9.8
PICCO	171	79.9
LIDCO	1	0.5
Vigileo-PRAM	10	4.7
Other	11	5.1
Missing	0	

SDD (N=139)	N	%
Topical	139	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	5940	97.6
Yes	145	2.4
Missing	0	

Number of surgical interventions	N	%
0	5940	97.6
1	132	2.2
2	10	0.2
3	2	0.0
>3	1	0.0
Missing	0	

Surgical interventions Days from admission

Mean	19.3
SD	19.3
Median	14
Q1–Q3	8-22
Missing	0

Surgical interventions (top 10)	N	%
ENT surgery	89	1.5
Gastrointestinal surgery	21	0.3
Thoracic surgery	15	0.2
Peripheral vascular surgery	9	0.1
Other surgery	8	0.1
Orthopaedic surgery	7	0.1
Nephro/Urological surgery	5	0.1
Maxillo-Facial surgery	3	0.0
Biliary tract surgery	2	0.0
Obstetric surgery	1	0.0
Missing	0	

Non surgical interventions	N	%
No	6015	98.8
Yes	70	1.2
Missing	0	

Non surgical interventions Days from admission

Mean	22.5
SD	19.6
Median	17
Q1–Q3	9-30
Missing	2

Non surgical interventions	N	%
Interventional endoscopy	54	0.9
Interventional radiology	19	0.3
Interventional cardiology	12	0.2
Interventional neuroradiology	1	0.0
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators - COVID adult patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	2334	38.4
Transferred to same hospital	2913	47.9
Transferred to other hospital	802	13.2
Discharged home	21	0.3
Disch. terminally ill	15	0.2
Missing	0	

Transferred to (N=3715)	N	%
Ward	2309	62.2
Other ICU	665	17.9
High dependency care unit	611	16.4
Rehabilitation	125	3.4
Day hospital or Long-term care	5	0.1
Missing	0	

Reason of transfer to Other ICU (N=674)	N	%
Specialist expertise	93	13.8
Step-up care	69	10.2
Logistical/organizational reasons	506	75.1
Step-down care	6	0.9
Missing	0	

Transferred to Same hospital (N=2913)	N	%
Ward	2217	76.1
Other ICU	131	4.5
High dependency care unit	552	18.9
Rehabilitation	12	0.4
Day hospital or Long-term care	1	0.0
Missing	0	

Transferred to Other hospital (N=802)	N	%
Ward	92	11.5
Other ICU	534	66.6
High dependency care unit	59	7.4
Rehabilitation	113	14.1
Day hospital or Long-term care	4	0.5
Missing	0	

ICU mortality	N	%
Alive	3736	61.4
Dead	2349	38.6
Missing	0	

Timing of ICU mortality (N=2349)	N	%
Daytime (08:00AM - 07:59PM)	1671	71.2
Nighttime (08:00PM - 07:59AM)	677	28.8
Weekdays (Monday - Friday)	1704	72.5
Weekend (Saturday - Sunday)	645	27.5
Missing	1	

C.A.M. activation (N=2349)	N	%
Yes, with organ donation	0	0.0
Yes, without organ donation	11	0.5
No, with organ donation	1	0.0
No, without organ donation	2322	99.5
Missing	15	

Tissue removal (N=2349)	N	%
Yes, with C.A.M. activation	0	0.0
Yes, without C.A.M. activation	7	0.3
No	2342	99.7
Missing	0	

Hospital mortality	N	%
Dead	2580	42.4
Transf. to other acute-care hospital	864	14.2
Transf. to other type of hosp. stay	929	15.3
Nursing home	52	0.9
Voluntary discharge	11	0.2
Discharged home	1649	27.1
Missing	0	

To other type of H stay (N=929)	N	%
Rehabilitation in the same institute	179	19.3
Rehabilitation in other institute	650	70.0
DH/long-term care, same inst.	25	2.7
DH/long-term care, other inst.	75	8.1
Missing	0	

Disch. terminally ill (N=3505)	N	%
Yes	27	0.8
No	3478	99.2
Missing	0	

Hospital mortality	N	%
Alive	3478	57.2
Dead	2607	42.8
Missing	0	

Timing of hosp. mortality (N=2607)	N	%
In ICU	2349	90.1
Within 24 hours after ICU	21	0.8
24-47 hours after ICU	10	0.4
48-71 hours after ICU	16	0.6
72-95 hours after ICU	21	0.8
After 95 hours after ICU	190	7.3
Missing	0	

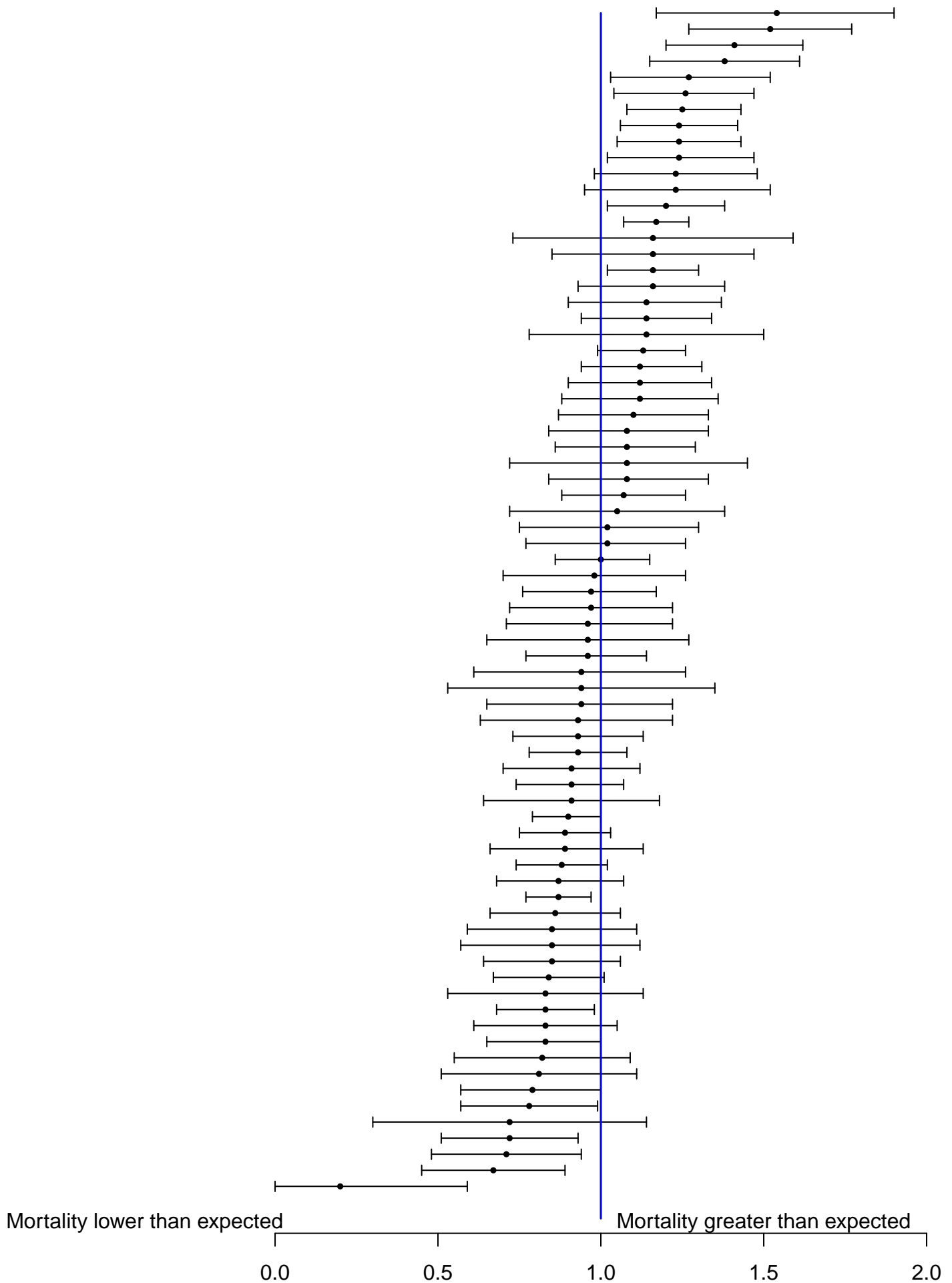
Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=258)		
Mean	13.8	
SD	15.2	
Median	9.5	
Q1–Q3	3-18.8	
Missing	0	

National report for general ICUs - Year 2020**Outcome indicators** - COVID adult patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%			
Alive	3296	54.2		Mean	15.0
Dead	2789	45.8		SD	14.8
Missing	0			Median	11
				Q1–Q3	5-20
				Missing	0
			ICU stay (days)		
			Alive (N=3736)		
				Mean	15.6
				SD	16.2
				Median	10
				Q1–Q3	4-21
				Missing	0
			ICU stay (days)		
			Dead (N=2349)		
				Mean	14.0
				SD	12.1
				Median	11
				Q1–Q3	6-19
				Missing	0
			Stay after ICU (days)		
			Alive (N=3736)		
				Mean	13.4
				SD	14.1
				Median	11
				Q1–Q3	2-19
				Missing	0
			Hospital stay (days)		
				Mean	27.0
				SD	21.4
				Median	22
				Q1–Q3	12-36
				Missing	0
			Hospital stay (days)		
			Alive (N=3478)		
				Mean	32.3
				SD	23.3
				Median	28
				Q1–Q3	15-44
				Missing	0
			Hospital stay (days)		
			Dead (N=2607)		
				Mean	19.8
				SD	15.8
				Median	16
				Q1–Q3	9-25
				Missing	0

National report for general ICUs - Year 2020

Analysis of hospital mortality COVID adult patients evaluated in the GiViTI model

Predictive model: **GiViTI 2020 (COVID)**

National report for general ICUs - Year 2020

Characteristics on admission - Pediatric patients evaluated with PIM 3

Patients (N): 260

Sex	N	%
Male	146	56.2
Female	114	43.8
Missing	0	

Age	N	%
Newborn (0-4 weeks)	0	0.0
1-6 months	0	0.0
6-12 months	5	1.9
12-24 months	14	5.4
2-4 years	29	11.2
5-8 years	39	15.0
9-16 years	173	66.5
Missing	0	
Mean	10.5	
SD	5.1	
Median	12	
Q1–Q3	6-15	
Min–Max	0–16	

Weight (kg) Newborns (N=0)	N	%
Mean		
SD		
Median		
Q1–Q3		
Missing	0	

Gestational age Newborns (N=0)	N	%
At term	0	0.0
Not at term	0	0.0
Missing	0	

Comorbidities	N	%
No	163	62.7
Yes	97	37.3
Missing	0	

Comorbidities (top 10)	N	%
Encephalopathy	21	8.1
Asthma	10	3.8
Neurodegenerative/Neuromuscular disease	9	3.5
Any tumour without metastasis	8	3.1
Skeletal malformations/disorders	8	3.1
Hemiplegia or paraplegia or quadriplegia	7	2.7
Upper airway abnormalities	7	2.7
Diabetes Type I	6	2.3
Genetic diseases	6	2.3
Autoimmune disease	4	1.5
Missing	0	

Previous ICU admissions	N	%
None	199	76.5
≤2	23	8.8
>2	11	4.2
Unknown	27	10.4
Missing	0	

Previous ICU admissions (N=34)	N	%
Paediatric	10	29.4
Neonatal	6	17.6
General - adult	21	61.8
Other/Unknown	1	2.9
Missing	0	

Stay before ICU (days)	Mean	SD
	3.0	14.9
Median	0	
Q1–Q3	0-1	
Missing	0	

Source of admission	N	%
Same hospital	237	91.2
Other hospital	11	4.2
Long-term chronic care hospital	0	0.0
Directly from the community	12	4.6
Missing	0	

Ward of admission Hospital (N=248)	N	%
Medical ward	43	17.3
Surgical ward	78	31.5
Emergency room	119	48.0
Other ICU	7	2.8
High dependency care unit	1	0.4
Neonatology	0	0.0
Missing	0	

Reason for transfer from Other ICU (N=7)	N	%
Specialist expertise	3	42.9
Step-up care	1	14.3
Logistical/organizational reasons	3	42.9
Step-down care	0	0.0
Missing	0	

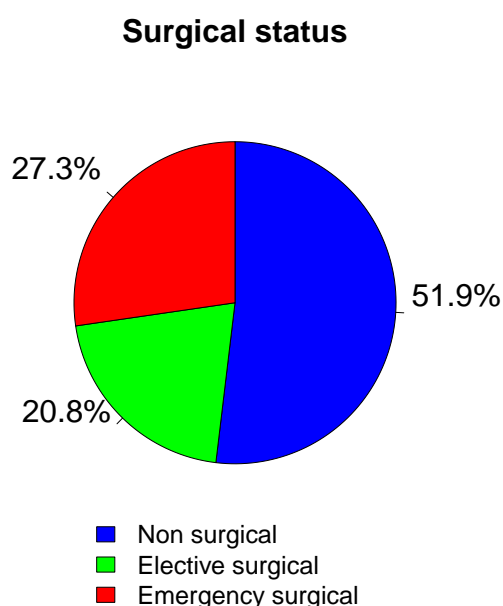
Scheduled admission	N	%
No	215	82.7
Yes	45	17.3
Missing	0	

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Characteristics on admission - Pediatric patients evaluated with PIM 3

Trauma	N	%
No	168	64.6
Yes	92	35.4
Multiple trauma	27	10.4
Missing	0	

Surgical status	N	%
Non surgical	135	51.9
Elective surgical	54	20.8
Emergency surgical	71	27.3
Missing	0	



Source of admission	N	%
Surgical pt. (N=125)		
Operating theatre of surgical ward	74	60.2
Operating theatre of emergency room	21	17.1
Surgical ward	2	1.6
Other	26	21.1
Missing	2	

Surgical interventions (top 10)	N	%
Elective surgical (N=54)		
Orthopaedic surgery	15	27.8
ENT surgery	14	25.9
Gastrointestinal surgery	7	13.0
Thoracic surgery	6	11.1
Neurosurgery	5	9.3
Nephro/Urological surgery	2	3.7
Maxillo-Facial surgery	2	3.7
Biliary tract surgery	2	3.7
Hepatic surgery	1	1.9
Gynaecological surgery	1	1.9
Missing	0	

Timing	N	%
Elective surgical (N=54)		
From -7 to -3 days	1	1.9
From -2 to -1 days	2	3.7
On ICU admission day	49	90.7
The day after ICU admission	4	7.4
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=71)		
Gastrointestinal surgery	25	35.2
Neurosurgery	19	26.8
Orthopaedic surgery	15	21.1
Splenectomy	6	8.5
ENT surgery	3	4.2
Hepatic surgery	2	2.8
Nephro/Urological surgery	2	2.8
Plastic surgery	2	2.8
Peripheral vascular surgery	2	2.8
Pancreatic surgery	1	1.4
Missing	0	

Timing	N	%
Emergency surgical (N=71)		
From -7 to -3 days	1	1.4
From -2 to -1 days	9	12.7
On ICU admission day	69	97.2
The day after ICU admission	1	1.4
Missing	0	

Non surgical interventions	N	%
None	247	95.0
Elective	3	1.2
Emergency	10	3.8
Missing	0	

Non surgical interventions	N	%
Elective (N=3)		
Interventional radiology	2	66.7
Diagnostic bronchoscopy on admission	1	33.3
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Therapeutic endoscopy (bronchoscopy excluded)	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=10)		
Interventional radiology	5	50.0
Therapeutic endoscopy (bronchoscopy excluded)	3	30.0
Interventional neuroradiology	2	20.0
Interventional cardiology	0	0.0
Interventional endoscopy	0	0.0
Therapeutic bronchoscopy	0	0.0
Missing	0	

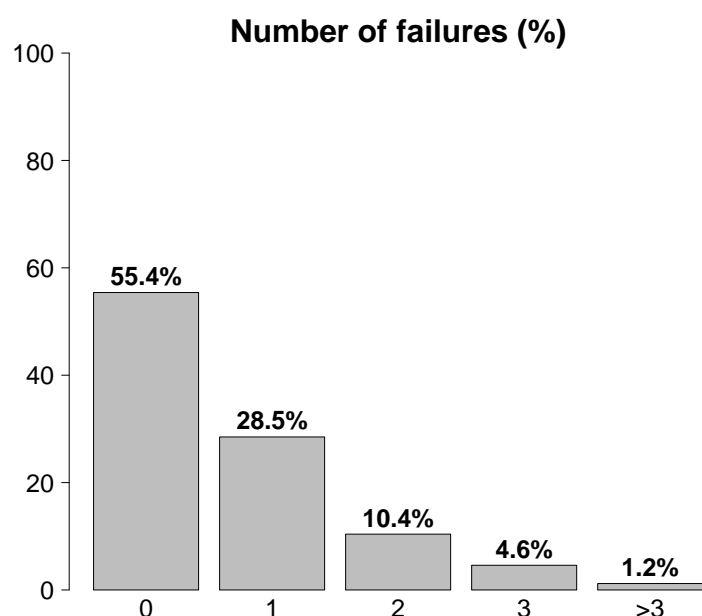
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Characteristics on admission - Pediatric patients evaluated with PIM 3

Reason for admission	N	%
Monitoring/Weaning	158	62.9
Post surgical weaning	43	17.6
Surgical monitoring	49	20.1
Post interventional weaning	2	0.8
Interventional monitoring	5	2.0
Non surgical monitoring	52	21.3
Missing	7	
Admission for procedures/treatments	0	0.0
Intensive Treatment	93	37.1
Ventilatory support	83	31.9
Cardiovascular support	24	9.2
Metabolic support	8	3.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	9	

Failures on admission (top 10)	N	%
A	41	15.8
B	14	5.4
AB	13	5.0
G	7	2.7
E	6	2.3
ABC	4	1.5
D	4	1.5
AC	3	1.2
AE	3	1.2
BC	3	1.2
Missing	0	

Respiratory failure	N	%
None	177	68.1
Only hypoxic failure	24	9.2
Only hypercapnic failure	6	2.3
Hypoxic-hypercapnic failure	4	1.5
Intubation for airway maint.	49	18.8
Missing	0	



Cardiovascular failure	N	%
None	236	90.8
Without shock	4	1.5
Cardiogenic shock	2	0.8
Septic shock	4	1.5
Haemorrhagic/hypovolemic shock	5	1.9
Hypovolemic shock	2	0.8
Anaphylactic shock	0	0.0
Neurogenic shock	3	1.2
Other shock	1	0.4
Mixed shock	3	1.2
Missing	0	

Neurologic failure	N	%
None	193	82.8
Cerebral coma	28	12.0
Metabolic coma	2	0.9
Postanoxic coma	4	1.7
Toxic coma	6	2.6
Missing or not evaluable	27	

Failures on admission	N	%
No	144	55.4
Yes	116	44.6
A: Respiratory failure	74	28.5
B: Cardiovascular failure	45	17.3
C: Neurological failure	18	6.9
D: Hepatic failure	11	4.2
E: Renal failure	16	6.2
F: Acute skin failure	0	0.0
G: Metabolic failure	12	4.6
H: Coagulation failure	0	0.0
Missing	0	

Renal failure (RIFLE)	N	%
None	244	93.8
Risk	10	3.8
Injury	2	0.8
Failure	3	1.2
Loss	1	0.4
End-stage renal disease	0	0.0
Missing	0	

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Characteristics on admission - Pediatric patients evaluated with PIM 3

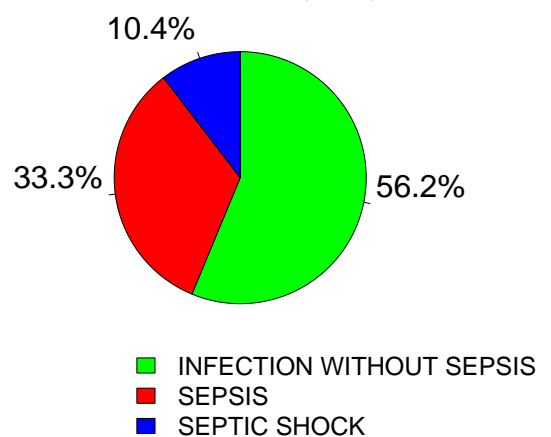
Clinical conditions on admission	N	%
Respiratory	33	12.7
Acute asthma/bronchospasm	10	3.8
Upper respiratory tract disease	7	2.7
Aspiration pneumonia	5	1.9
Pleural effusion	2	0.8
Atelectasis	2	0.8
Cardiovascular	6	2.3
Acute severe arrhythmia: tachycardias	2	0.8
Cardiac arrest	2	0.8
Systemic hypertensive crisis	1	0.4
Non congenital coronary disease	1	0.4
-	0	0.0
Neurological	36	13.8
Seizures	18	6.9
Brain tumour	6	2.3
AVM (ArterioVenous Malformation)	4	1.5
Neuropathy/myopathy	4	1.5
Spontaneous Hydrocephalus	2	0.8
Gastrointestinal and hepatic	23	8.8
Oesophago-gastro-intestinal malf.	6	2.3
Gastrointestinal perforation	4	1.5
Acute inflammatory bowel disease	4	1.5
Intrabdominal bleeding (non traumatic)	2	0.8
Hepatic-pancreatic-bile duct malf.	2	0.8
Trauma (anatomical districts)	92	35.4
Head	42	16.2
Abdomen	28	10.8
Pelvis/bone/joint & muscle	28	10.8
Chest	21	8.1
Spine	10	3.8
Miscellaneous	2	0.8
Major vessels injury	1	0.4
Other	70	26.9
Acute intoxication	19	7.3
Other disease	14	5.4
Metabolic disorder	12	4.6
Orthopaedic disease	12	4.6
ENT/maxillofacial disease	9	3.5
Post transplantation	5	1.9
Bone marrow transplantation	5	1.9
-	0	0.0
Infections	48	18.5
Pneumonia	20	7.7
NON-surgical CNS infection	5	1.9
Clinical sepsis	4	1.5
NON-surgical secondary peritonitis	4	1.5
Upper respiratory tract infection	4	1.5
Gastroenteritis	3	1.2
L.R.T.I. other than pneumonia	3	1.2
Post-surgical peritonitis	3	1.2
Pandemic influenza A/H1N1	2	0.8
Myocarditis	1	0.4
Missing	0	

Trauma (anatomical districts)	N	%
Head	42	16.2
Skull fracture	15	5.8
Extradural/epidural haematoma	11	4.2
Maxillofacial fracture	10	3.8
Traumatic subarachnoid haemorrhage	9	3.5
Cerebral contusion/laceration	8	3.1
Spine	10	3.8
Vertebral fracture, without deficit	6	2.3
Lumbar injury, incomplete deficit	2	0.8
Tetraplegia	1	0.4
Chest	21	8.1
Other injuries of the chest	12	4.6
Traum. haemothorax/pneumothorax	9	3.5
Severe lung contusion/laceration	5	1.9
Abdomen	28	10.8
Spleen: Massive rupture	9	3.5
Spleen: Moderate-Severe laceration	8	3.1
Liver: Moderate-Severe laceration	6	2.3
Pelvis/bone/joint & muscle	28	10.8
Long bone fracture	21	8.1
Multiple fracture of the pelvis	4	1.5
Extremity compartment syndrome	2	0.8
Major vessels injury	1	0.4
Major abdominal vessels: transection	1	0.4
-	0	0.0
-	0	0.0
Miscellaneous	2	0.8
Inhalation injury	2	0.8
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	212	81.5
INFECTION WITHOUT SEPSIS	27	10.4
SEPSIS	16	6.2
SEPTIC SHOCK	5	1.9
Missing	0	

Infection severity on admission

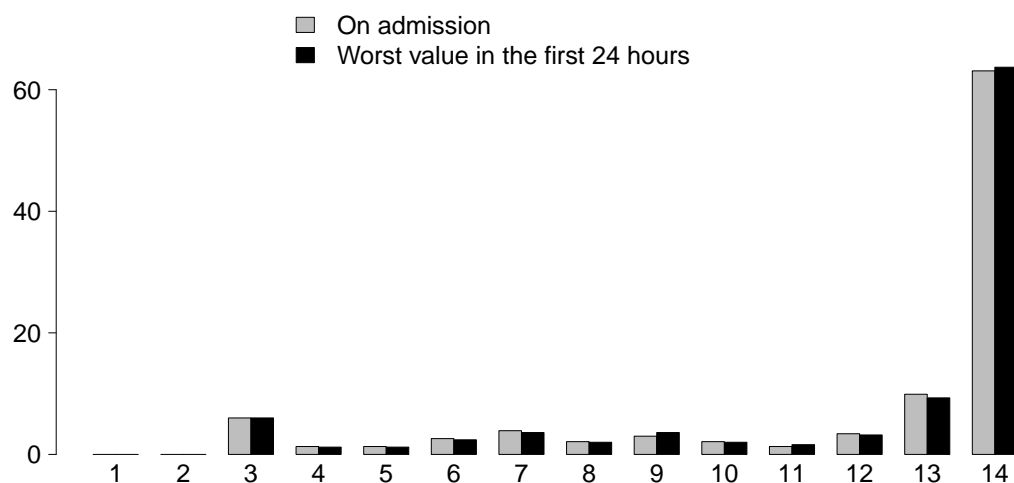
Patients infected (N=48)



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Severity scores - Pediatric patients evaluated with PIM 3

Glasgow Coma Scale (%)



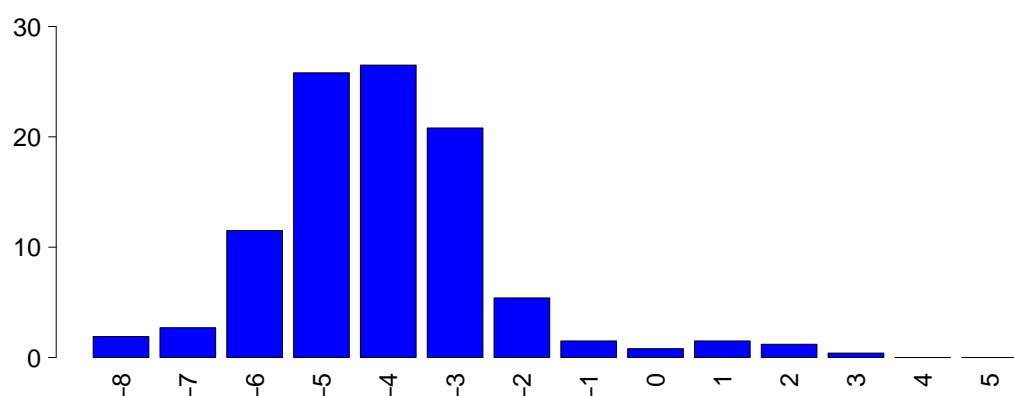
GCS (admission)

Median	14
Q1–Q3	12-14
Not evaluable	27
Missing	0

GCS (worst in first 24 hours)

Median	14
Q1–Q3	12-14
Not evaluable	12
Missing	0

PIM 2 (%)



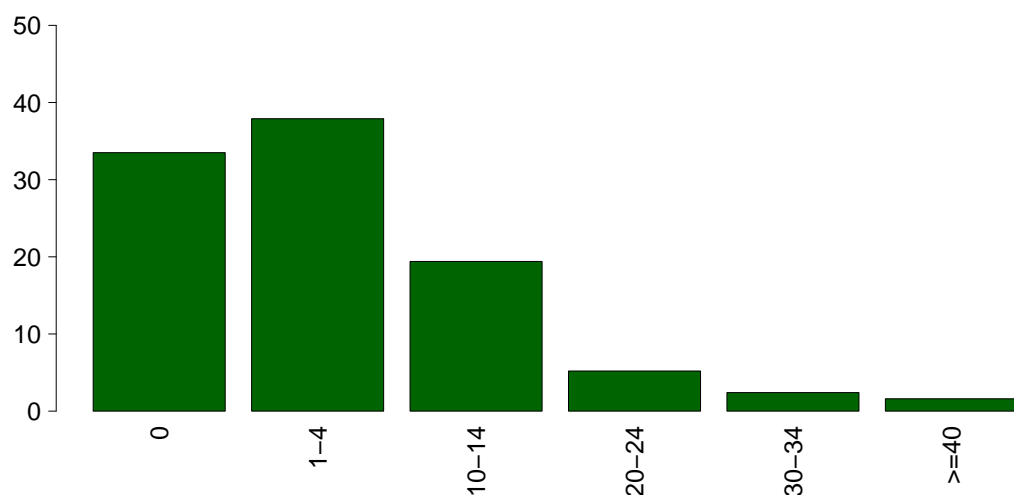
PIM 2

Median	-4.3
Q1–Q3	-5–3.2
Not evaluable	0
Missing	0

PIM 3

Median	-4.4
Q1–Q3	-5.4–3.4
Not evaluable	0
Missing	0

PELOD (%)



PELOD

Mean	5.3
SD	9.7
Median	1
Q1–Q3	0-10
Not evaluable	12
Missing	0

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Characteristics during the stay - Pediatric patients evaluated with PIM 3

Complications during the stay	N	%
No	241	92.7
Yes	19	7.3
Missing	0	

Failures during the stay	N	%
No	252	96.9
Yes	8	3.1
A: Respiratory failure	2	0.8
B: Cardiovascular failure	4	1.5
C: Neurological failure	0	0.0
D: Hepatic failure	0	0.0
E: Renal failure (AKIN)	1	0.4
F: Acute skin failure	0	0.0
G: Metabolic failure	1	0.4
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
B	4	1.5
A	2	0.8
E	1	0.4
G	1	0.4
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Respiratory failure occurred	N	%
None	258	99.2
Intubation for airway maint.	1	0.4
Hypoxic failure	1	0.4
Hypercapnic failure	0	0.0
Missing	0	

Cardiovascular failure occurred	N	%
None	256	98.5
Cardiogenic shock	1	0.4
Hypovolemic shock	0	0.0
Haemorrhagic/hypovolemic shock	1	0.4
Septic shock	1	0.4
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.4
Other shock	0	0.0
Missing	0	

Neurological failure occurred	N	%
None	260	100.0
Cerebral coma	0	0.0
Metabolic coma	0	0.0
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	259	99.6
Mild	0	0.0
Moderate	1	0.4
Severe	0	0.0
Missing	0	

Complications during the stay	N	%
Respiratory	3	1.2
Severe ARDS	1	0.4
Aspiration pneumonia	1	0.4
Pleural effusion	1	0.4
-	0	0.0
-	0	0.0
Cardiovascular	5	1.9
Cardiac arrest	3	1.2
Left heart failure w/o pulm. edema	1	0.4
Pulmonary edema	1	0.4
-	0	0.0
-	0	0.0
Neurological	7	2.7
Intracranial hypertension	5	1.9
Brain edema	3	1.2
CrI/MyNe	1	0.4
Drowsiness/agitation/delirium	1	0.4
-	0	0.0
Gastrointestinal and hepatic	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Other	1	0.4
Metabolic disorder	1	0.4
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Infections	6	2.3
Pneumonia	3	1.2
Primary bacteraemia of unknown origin	2	0.8
Catheter-related bacteremia (CR-BSI)	2	0.8
Clinical sepsis	1	0.4
Upper respiratory tract infection	1	0.4
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

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Characteristics during the stay - Pediatric patients evaluated with PIM 3

Infections	N	%
None	208	80.0
Only on admission	46	17.7
On admission and during ICU stay	2	0.8
Only during ICU stay	4	1.5
Missing	0	

Maximum severity of infection	N	%
None	208	80.0
INFECTION WITHOUT SEPSIS	29	11.2
SEPSIS	17	6.5
SEPTIC SHOCK	6	2.3
Missing	0	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	208 (98.1%)	4 (1.9%)	0 (0.0%)	0 (0.0%)	212
	INFECTION WITHOUT SEPSIS	-	25 (92.6%)	2 (7.4%)	0 (0.0%)	27
	SEPSIS	-	-	15 (93.8%)	1 (6.2%)	16
	SEPTIC SHOCK	-	-	-	5 (100.0%)	5
	TOT	208	29	17	6	260

Ventil. Associat. Pneumonia (VAP)	N	%
No	257	98.8
Yes	3	1.2
Missing	0	

Incidence of VAP

(Pts. with VAP/1000 days of VM pre-VAP)

Estimate	13.2
CI (95%)	2.7–38.5

Incidence of VAP

(Pts. with VAP/pts. ventilated for 8 days)

Estimate	10.5%
CI (95%)	2.2–30.8

Catheter Bacteraemia (CR-BSI)	N	%
No	258	99.2
Yes	2	0.8
Missing	0	

Incidence of CR-BSI

(Pts. with CR-BSI/1000 days of CVC pre-CR-BSI)

Estimate	4.8
CI (95%)	0.6–17.2

Incidence of CR-BSI

(Pts. with CR-BSI/pts. catheterized for 12 days)

Estimate	5.7%
CI (95%)	0.7–20.6

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Process indicators - Pediatric patients evaluated with PIM 3

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission	
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3
Procedures (antibiotics excluded)	218	83.8								
Invasive ventilation	129	49.6	104	40	13	5	1	0-2	0	0-1
Non invasive ventilation	20	7.7	6	2.3	8	3.1	2	1-3	0	0-1
Tracheostomy	14	5.4	9	3.5	13	5	8	2-17	5	5-7
iNO (inhaled nitric oxide)	0	0.0								0
Central Venous Catheter	89	34.2	46	17.7	73	28.1	3	1-6	0	0-0
PICC	1	0.4	1	0.4	1	0.4	17	17-17	0	0
Arterial Catheter	154	59.2	77	29.6	22	8.5	2	1-4	0	0-0
Vasoactive drugs	28	10.8	10	3.8	11	4.2	2	1-3	0	0-0
Antiarrhythmics	1	0.4	1	0.4	0	0	0	0-0	0	0
IABP	0	0.0								
Invasive monitoring of C.O.	1	0.4	0	0	0	0	3	3-3	0	0-0
Continuous monitoring of ScVO2	0	0.0								
Temporary pacing	0	0.0								
Ventricular assistance	0	0.0								
DC-shock	1	0.4							0	0-0
CPR	4	1.5							0	0-0
Massive transfusion	3	1.2							0	0-0
ICP monitoring without CSF drainage	5	1.9	3	1.2	2	0.8	1	1-2	0	0-1
ICP monitoring with CSF drainage	3	1.2	2	0.8	0	0	4	4-10	0	0-0
External ventricular drainage without ICP	2	0.8	1	0.4	2	0.8	1	1-1	0	0-0
Haemofiltration	0	0.0							2	2-2
Haemodialysis	0	0.0								
ECMO	0	0.0								
Hepatic clearance techniques	0	0.0								
Clearance techniques during sepsis	1	0.4	0	0	0	0	1	1-1	0	0-0
IAP (intra-abdominal pressure)	0	0.0								
Hypothermia	1	0.4	0	0	1	0.4	5	5-5	0	0-0
Enteral nutrition	39	15.0	9	3.5	29	11.2	4	2-8	0	0-1
Parenteral nutrition	17	6.5	2	0.8	13	5	2	2-5	0	0-0
SDD (Topical, Topical and systemic)	5	1.9								
Patient restraint	2	0.8							0	0-4
Diagnostic fibronchoscopy	4	1.5								
Surfactant treatment	0	0.0								
Vacuum therapy	0	0.0								
Oxygen therapy	26	10.0	15	5.8	18	6.9	2	1-3	1	0-5
Blood transfusion	0	0.0								
Peritoneal dialysis	0	0.0								
Plasmapheresis	1	0.4								
Thoracic drainage	2	0.8	0	0	0	0	6	6-6	0	0-0
Peridural catheter	2	0.8	2	0.8	2	0.8	1	1-1	0	0
Urinary catheter	51	19.6	27	10.4	34	13.1	2	1-3	0	0-0
Near-infrared spectroscopy	0	0.0								
Phototherapy	0	0.0								
Electrical cardioversion	0	0.0								

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Process indicators - Pediatric patients evaluated with PIM 3

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	132	50.8										
Antibiotic prophylaxis	76	29.2	51	19.6	46	17.7	1	1–2	0	0	0–0	0
Empirical antibiotic therapy (infection diagnosis confirmed)	32	12.3	20	7.7	22	8.5	2	2–5	0	0	0–0	0
Empirical antibiotic therapy (infection diagnosis unconfirmed)	21	8.1	9	3.5	18	6.9	2	1–5	0	0	0–0	0
Targeted antibiotic therapy	12	4.6	1	0.4	5	1.9	6	4–10	0	2	0–2	0
Antifungal in empirical therapy	5	1.9	1	0.4	4	1.5	1	1–2	0	0	0–0	0
Antifungal in targeted therapy	1	0.4	0	0	1	0.4	0	0–0	0	2	2–2	0
Pre-emptive antifungal	2	0.8	2	0.8	2	0.8	3	2–4	0			

Antibiotic therapy			
Pt. infected in ICU only (N=4)			
	N	%	
No therapy	0	0.0	
Only empirical	1	25.0	
Only targeted	1	25.0	
Targeted after empirical	1	25.0	
Other	1	25.0	
Missing	0		

Antifungal therapy			
Pt. infected in ICU only (N=4)			
	N	%	
No therapy	4	100.0	
Only empirical	0	0.0	
Only targeted	0	0.0	
Targeted after empirical	0	0.0	
Other	0	0.0	
Missing	0		

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Process indicators - Pediatric patients evaluated with PIM 3

Invasive ventilation (N=129)	N	%	Length (days)				
			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	20	13.3	4.8	7.8	2.5	1–4	0
For airway maintenance	48	32.0	3.0	4.7	1	1–3.2	0
In weaning	54	36.0	0.4	0.5	0	0–1	0
Not evaluable	28	18.7	7.0	12.2	1	0–6.5	20
Reintubation within 48 hours	0	0.0					

Non invasive ventilation (N=20)	N	%
Non invasive ventilation only	15	75.0
Non invasive ventilation failed	1	5.0
For weaning	4	20.0
Other	0	0.0
Missing	0	

Tracheostomy not present on admission (N=5)	N	%
Surgical	0	0.0
Percutwist	0	0.0
Ciaglia	1	20.0
Monodil. Ciaglia	2	40.0
Fantoni	1	20.0
Griggs	1	20.0
Other Kind	0	0.0
Unknown	0	0.0
Missing	0	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=5)

Mean	7.8
SD	6.9
Median	5
Q1–Q3	5-6
Missing	0

Invasive monitoring of C.O. (N=1)	N	%
Swan Ganz	0	0.0
PICCO	1	100.0
LIDCO	0	0.0
Vigileo-PRAM	0	0.0
Other	0	0.0
Missing	0	

SDD (N=5)	N	%
Topical	5	100.0
Topical and systemic	0	0.0
Missing	0	

Surgical interventions	N	%
No	258	99.2
Yes	2	0.8
Missing	0	

Number of surgical interventions	N	%
0	258	99.2
1	0	0.0
2	2	0.8
3	0	0.0
>3	0	0.0
Missing	0	

Surgical interventions
Days from admission

Mean	12.8
SD	7.7
Median	10
Q1–Q3	8.5-14.2
Missing	0

Surgical interventions (top 10)	N	%
Maxillo-Facial surgery	3	1.2
Orthopaedic surgery	1	0.4
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Non surgical interventions	N	%
No	260	100.0
Yes	0	0.0
Missing	0	

Non surgical interventions
Days from admission

Mean	
SD	
Median	
Q1–Q3	
Missing	0

Non surgical interventions	N	%
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Therapeutic endoscopy (bronchoscopy excluded)	0	0.0
Therapeutic bronchoscopy	0	0.0
Missing	0	

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Outcome indicators - Pediatric patients evaluated with PIM 3

ICU outcome	N	%
Dead	11	4.2
Transferred to same hospital	222	85.4
Transferred to other hospital	20	7.7
Discharged home	7	2.7
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=242)	N	%
Ward	218	90.1
Other ICU	0	0.0
High dependency care unit	16	6.6
Rehabilitation	7	2.9
Day hospital or Long-term care	1	0.4
Missing	0	

Reason of transfer to Other ICU (N=0)	N	%
Specialist expertise	0	0.0
Step-up care	0	0.0
Logistical/organizational reasons	0	0.0
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=222)	N	%
Ward	205	92.3
Other ICU	0	0.0
High dependency care unit	15	6.8
Rehabilitation	2	0.9
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=20)	N	%
Ward	13	65.0
Other ICU	0	0.0
High dependency care unit	1	5.0
Rehabilitation	5	25.0
Day hospital or Long-term care	1	5.0
Missing	0	

ICU mortality	N	%
Alive	249	95.8
Dead	11	4.2
Missing	0	

Timing of ICU mortality (N=11)	N	%
Daytime (08:00AM - 07:59PM)	10	90.9
Nighttime (08:00PM - 07:59AM)	1	9.1
Weekdays (Monday - Friday)	10	90.9
Weekend (Saturday - Sunday)	1	9.1
Missing	0	

C.A.M. activation (N=11)	N	%
Yes, with organ donation	0	0.0
Yes, without organ donation	4	36.4
No, with organ donation	0	0.0
No, without organ donation	7	63.6
Missing	0	

Tissue removal (N=11)	N	%
Yes, with C.A.M. activation	0	0.0
Yes, without C.A.M. activation	0	0.0
No	11	100.0
Missing	0	

Hospital mortality	N	%
Dead	14	5.4
Transf. to other acute-care hospital	24	9.2
Transf. to other type of hosp. stay	18	6.9
Nursing home	2	0.8
Voluntary discharge	4	1.5
Discharged home	198	76.2
Missing	0	

To other type of H stay (N=18)	N	%
Rehabilitation in the same institute	3	16.7
Rehabilitation in other institute	14	77.8
DH/long-term care, same inst.	0	0.0
DH/long-term care, other inst.	1	5.6
Missing	0	

Disch. terminally ill (N=246)	N	%
Yes	0	0.0
No	246	100.0
Missing	0	

Hospital mortality	N	%
Alive	246	94.6
Dead	14	5.4
Missing	0	

Timing of hosp. mortality (N=14)	N	%
In ICU	11	78.6
Within 24 hours after ICU	1	7.1
24-47 hours after ICU	0	0.0
48-71 hours after ICU	0	0.0
72-95 hours after ICU	0	0.0
After 95 hours after ICU	2	14.3
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=3)		
Mean		32.0
SD		42.3
Median		16
Q1–Q3		8-48
Missing		0

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Outcome indicators - Pediatric patients evaluated with PIM 3

Last hospital mortality	N	%
Alive	246	94.6
Dead	14	5.4
Missing	0	

Expected outcome (N=249)	N	%
Recovery/resolution of acute episode	248	99.6
Palliative care grade 1	1	0.4
Palliative care grade 2	0	0.0
Palliative care grade 3	0	0.0
Palliative care grade 4	0	0.0
Missing	0	

Outcome treatments (N=1)	N	%
NON invasive ventilation	0	0.0
Invasive ventilation	0	0.0
Oxygen therapy	0	0.0
Tracheostomy	0	0.0
Diuretics grugs	0	0.0
Inotropic agents drugs	0	0.0
Antiepileptics drugs	1	100.0
Dialytic therapy	0	0.0
Limb replacement	0	0.0
Nasogastric tube	0	0.0
Ostomies	0	0.0
Home based parenteral nutrition	0	0.0
Motor physiotherapy	0	0.0
Respiratory physiotherapy	0	0.0
Posture	0	0.0
Psychological counselling	0	0.0
Missing	0	

ICU stay (days)		
Mean	3.1	
SD	5.0	
Median	1	
Q1–Q3	1-3	
Missing	0	

ICU stay (days) Alive (N=249)		
Mean	3.1	
SD	5.0	
Median	1	
Q1–Q3	1-3	
Missing	0	

ICU stay (days) Dead (N=11)		
Mean	3.2	
SD	5.0	
Median	1	
Q1–Q3	1-2.5	
Missing	0	

Stay after ICU (days) Alive (N=249)		
Mean	7.6	
SD	12.0	
Median	5	
Q1–Q3	2-9	
Missing	0	

Hospital stay (days)		
Mean	13.2	
SD	20.5	
Median	9	
Q1–Q3	4-14	
Missing	0	

Hospital stay (days) Alive (N=246)		
Mean	12.3	
SD	16.9	
Median	9	
Q1–Q3	5-14	
Missing	0	

Hospital stay (days) Dead (N=14)		
Mean	28.9	
SD	52.1	
Median	4.5	
Q1–Q3	1-31.5	
Missing	0	

Appendix

National report for general ICUs - Year 2020

Prognostic models GiViTI 2020 - COVID adult patients

Model: Logistic regression.

Dependent variable: Hospital mortality^o.

Sample used for model development: Adults patients from general Italian ICUs, with infection from COVID-19 at admission.

Sample size (TRAINING set): 5092 patients.

Independent variables	Coefficients (95% CI)	Odds Ratio (95% CI)	p
Intercept	-3.71 (-4.29;-3.13)	/	/
Miscellanea			
Min((Age - 52), 0) in decades	0.37 (0.09;0.65)	1.45 (1.09;1.92)	<0.001
Max((Age - 52), 0) in decades	0.72 (0.63;0.80)	2.05 (1.88;2.23)	
Ventilatory support (Non-invasive vs Not)	1.16 (0.64;1.68)	3.19 (1.89;5.37)	<0.001
Ventilatory support (Invasive vs Not)	1.53 (1.00;2.05)	4.61 (2.73;7.79)	
Sex (Female vs Male)	-0.33 (-0.48;-0.17)	0.72 (0.62;0.84)	<0.001
Admitted in hospital the same day of ICU admission (Yes vs No)	0.43 (-0.22;0.64)	1.54 (1.25;1.89)	<0.001
exp1 - Stay before ICU (days) / 9.4)	-0.91 (-1.22;-0.59)	0.40 (0.30;0.55)	
Transfer from other ICU: Logistical/organizational reasons (Yes vs No)	-0.69 (-1.04;-0.35)	0.50 (0.35;0.70)	<0.001
Physiopatological components			
PaO2/FiO2 (100*mmHg/%) (<100 vs >=200)	1.26 (1.01;1.51)	3.51 (2.73;4.52)	<0.001
PaO2/FiO2 (100*mmHg/%) (100-199 vs >=200)	0.65 (0.41;0.90)	1.92 (1.50;2.46)	
Platelets (10 ³ /mm3) (100-150 vs >=150)	0.27 (0.06;0.49)	1.32 (1.07;1.63)	<0.001
Platelets (10 ³ /mm3) (50-99 vs >=150)	0.53 (0.16;0.91)	1.71 (1.17;2.49)	
Platelets (10 ³ /mm3) (<50 vs >=150)	1.18 (0.46;1.90)	3.24 (1.58;6.66)	0.001
Systolic Blood Pressure (mmHg) (<70 vs >=100)	0.48 (0.20;0.75)	1.61 (1.22;2.13)	
Systolic Blood Pressure (mmHg) (70-99 vs >=100)	0.17 (0.02;0.33)	1.19 (1.02;1.39)	0.001
Bilirubin (mg/100ml) (1.2-1.9 vs <1.2)	0.27 (0.06;0.47)	1.30 (1.06;1.60)	
Bilirubin (mg/100ml) (2-5.9 vs <1.2)	0.42 (0.09;0.75)	1.52 (1.10;2.11)	0.001
Bilirubin (mg/100ml) (>=6 vs <1.2)	1.18 (-0.01;2.37)	3.24 (0.99;10.65)	
WBC (10 ⁹ /L) (>=20 vs <20)	0.31 (0.03;0.59)	/	×
Creatinine (mg/dl) (2-3.4 vs <2)	0.55 (0.13;0.98)	/	×
Creatinine (mg/dl) (>=3.5 vs <2)	1.74 (0.41;3.06)	/	
Comorbidities			
Myocardial infarction (Yes vs No)	0.37 (0.14;0.59)	1.45 (1.16;1.81)	0.001
Chronic respiratory comorbidities (Moderate COPD vs No)	0.25 (0.01;0.50)	1.29 (1.01;1.64)	0.002
Chronic respiratory comorbidities (Severe COPD o Restrictive lung disease vs No)	0.61 (0.21;1.01)	1.85 (1.24;2.75)	
Immunitary comorbidities (Autoimmune disease o Immunosuppression o Malignant haematological disease vs Not)	0.86 (0.57;1.15)	/	×
Organ failures			
GCS and Coma (3,4,5,6,7,8 and None vs 14,15)	1.24 (0.27;2.20)	3.44 (1.31;9.04)	<0.001
GCS and Coma (3,4,5,6,7,8 and Metabolic coma or Toxic coma or Postanoxic coma vs 14,15)	0.89 (0.19;1.60)	2.44 (1.20;4.96)	
GCS and Coma (3,4,5,6,7,8 and Cerebral coma vs 14,15)	0.43 (-0.16;1.02)	1.54 (0.85;2.76)	<0.001
GCS and Coma (9,10,11,12,13 vs 14,15)	0.43 (0.20;0.66)	1.54 (1.22;1.93)	
GCS and Coma (Not evaluable in the first 24 hours in neurological patient* vs 14,15)	1.03 (-0.05;2.12)	2.81 (0.95;8.29)	<0.001
GCS and Coma (Not evaluable in the first 24 hours in NON-neurological patient* vs 14,15)	0.42 (0.26;0.58)	1.53 (1.30;1.79)	
Cardiogenic shock (Yes vs No)	1.02 (0.39;1.66)	2.78 (1.48;5.24)	<0.001
Numero di insufficienze d'organo	0.17 (0.08;0.27)	1.19 (1.08;1.31)	<0.001
Renal failure (AKIN): Moderate-Severe vs Mild-None	0.92 (0.48;1.36)	/	×
Interactions among independent variables			
Immunitary comorbidities × WBC (10 ⁹ /L) (>20)	-1.46 (-2.33;-0.59)	/	0.001
Creatinine (mg/dl) (2-3.4 vs <2) × Renal failure (AKIN) (Moderate-Severe)	-0.86 (-1.53;-0.18)	/	0.002
Creatinine (mg/dl) (>=3.5 vs <2) × Renal failure (AKIN) (Moderate-Severe)	-1.90 (-3.34;-0.46)	/	

Dependent variable explained

Likelihood Ratio Test: 1573.6
Degree of freedom: 37
p-value: <0.0001

Goodness-of-fit

Area under the ROC curve: 0.806
GiViTI Calibration Test: 2.33
p-value: 0.127
Polynomial Degree: 2

^oFor patients transferred to other ICU or to rehabilitation/high dependency care unit in other hospital, it is considered the outcome at the last hospital discharge.

* A neurological patient is a one with an altered consciousness, probably due to a direct brain injury. It is defined by the presence of at least one of these clinical conditions on admission: Cerebral artery stroke, Vertebral basilar ischemic stroke, Intracranial hypertension, Spontaneous Hydrocephalus, Non traumatic cerebral oedema, Metabolic/postanoxic encephalopathy, Seizures, Brain tumour, Cerebral Aneurysm, AVM (ArterioVenous Malformation), Chronic Subdural haematoma, Spontaneous Subarachnoid haemorrhage, Spontaneous Intraparenchymal bleeding, CNS degenerative disease, Brain and skull malformations, Cerebral contusion/laceration, Traumatic diffuse injury without oedema, Traumatic diffuse injury with oedema, Extradural/epidural haematoma, Traumatic Subdural haematoma, Traumatic intraparenchymal bleeding, Traumatic subarachnoid haemorrhage, Skull fracture, NON-surgical CNS infection, Post-surgical CNS infection, Ventriculostomy-related CNS infection.

× See interaction significance.

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Validity of the models 2020 - Calibration belts

The calibration belt is designed to compare actually observed mortality with expected mortality according to a given prediction model. Expected mortality is plotted on the x axis while observed mortality is plotted on the y-axis. Two overlapping belts are presented in each graph: the first, in light grey, with a confidence level of 80%, and the second, in dark grey, with a confidence level of 95%. The belt lying above the bisector indicates that observed mortality is higher than expected mortality; vice versa, the belt lying below the bisector indicates that observed mortality is lower than expected mortality. The belt is plotted in the range of expected mortality values actually present in the sample under study. The higher the polynomial, the more complex the relationship between expected and observed mortality. A significant test ($p < 0.05$) indicates poor calibration.

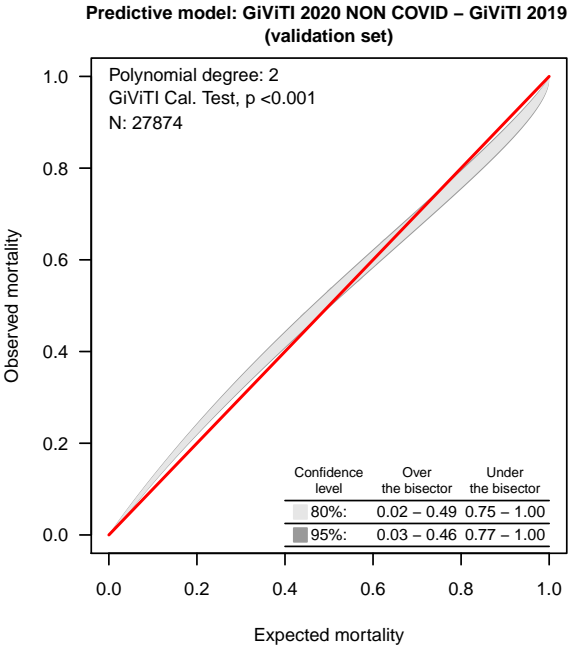
These pages show the calibration belts built on two different sets of data:

- **NON-COVID patients of 2020** - PIM 2, PIM 3, PELOD, SAPSII scores and GiViTI 2019 prognostic model are proposed. The latter is reported for both the overall population and the subgroups presented in the report. The aim of this belt is to investigate 2019 to 2020 difference in terms of performance of the GiViTI general ICUs.
- **COVID patients 2020** - SAPSII scores and GiViTI COVID 2020 prognostic model are proposed. Patients with valid data for the COVID 2020 model were splitted in two subgroups in order to build the model on the first one (*training set*- 85% patients) and to validate it on the second one (*validation set* - 15% patients).

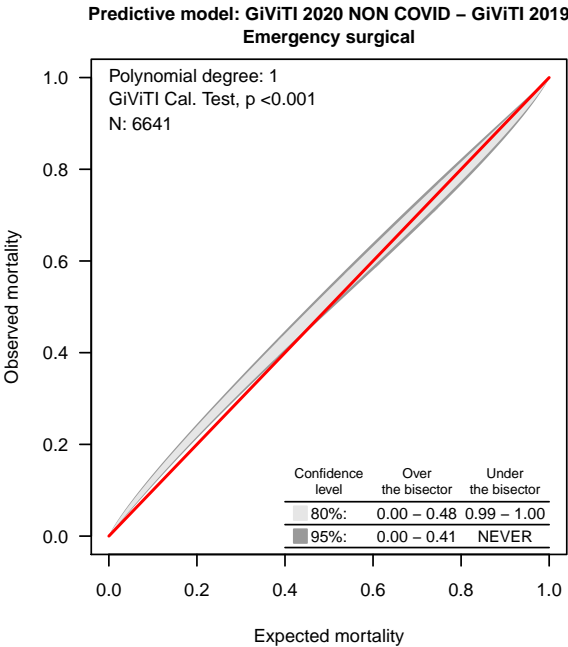
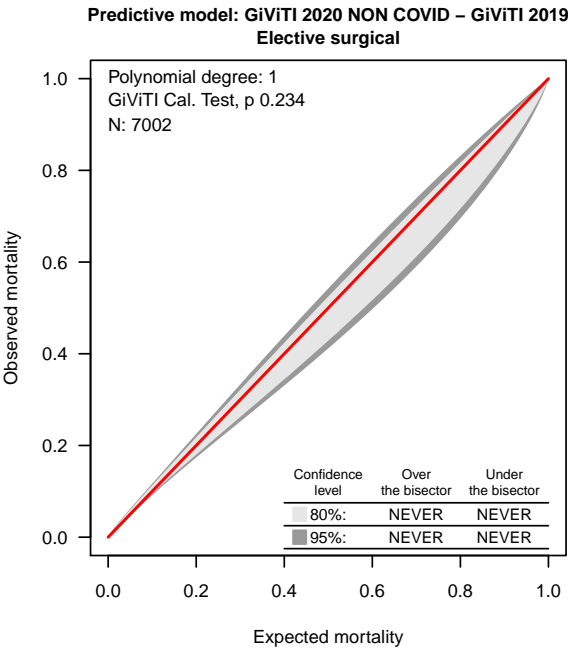
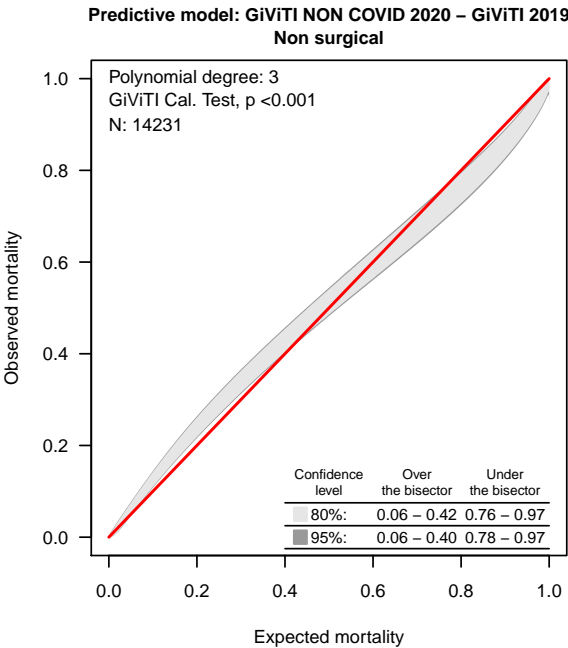
Il collettivo dei pazienti con dati validi per il modello COVID è stato inoltre diviso in due set in modo tale da poter sviluppare il modello su un primo gruppo, detto *training set* (campione di sviluppo - 85% dei pazienti) ed utilizzarne un secondo per validarlo *validation set* (campione di validazione - 15% dei pazienti). Moreover, the calibration belt built on 2020 data using the GiViTI 2019 model is reported. Th

For further informations please look at [PLoS ONE 6(2): e16110].

National report for general ICUs - Year 2020
Validity of the models NON COVID - Calibration belts



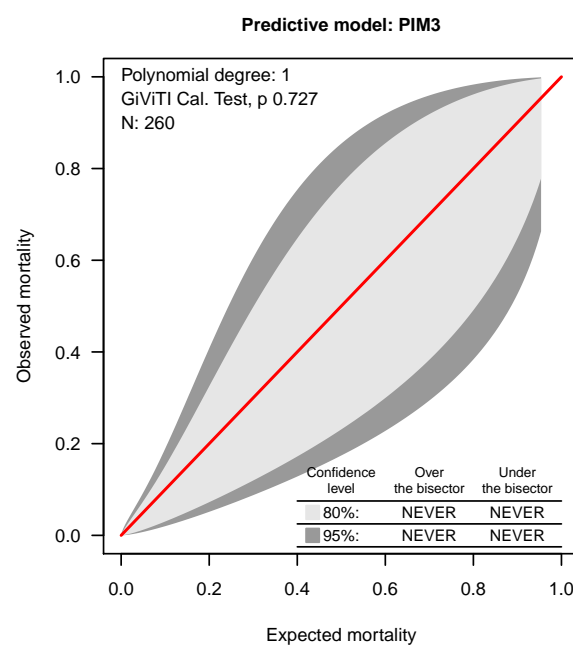
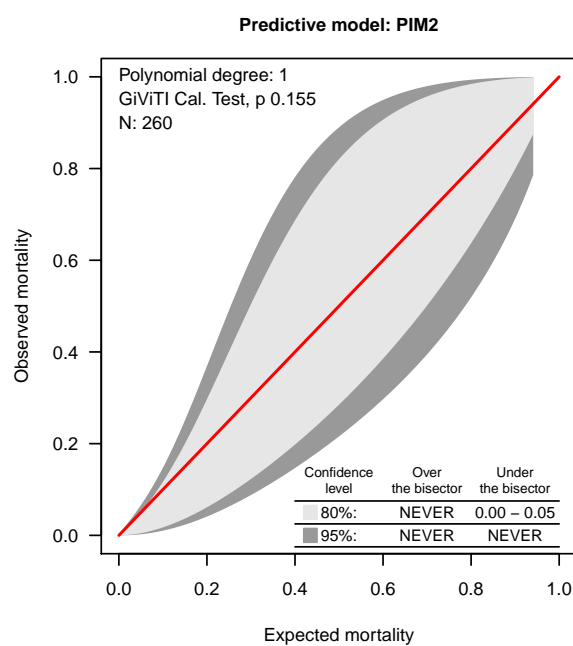
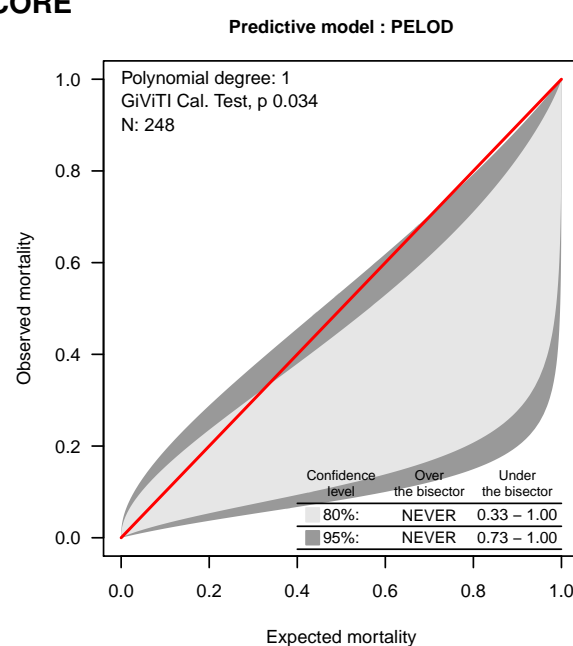
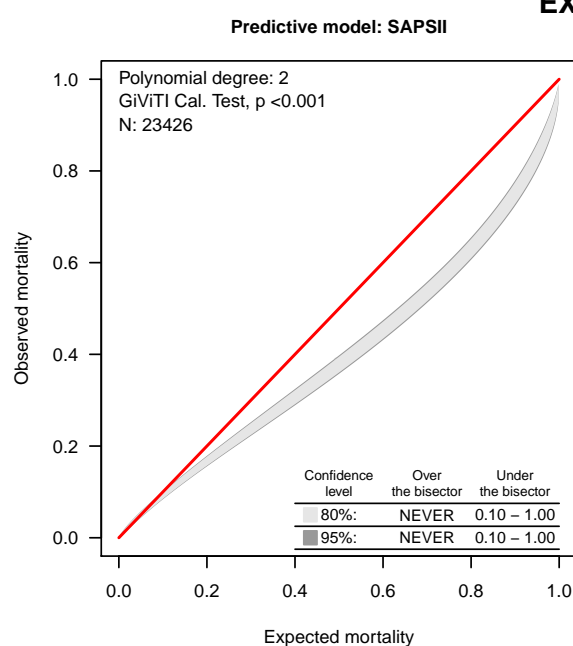
UNIFORMITY OF FIT - Medici, chirurgici d’elezione, chirurgici d’urgenza



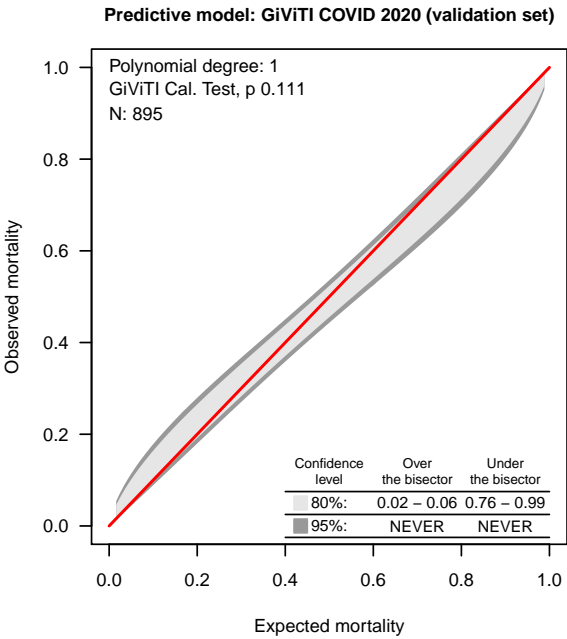
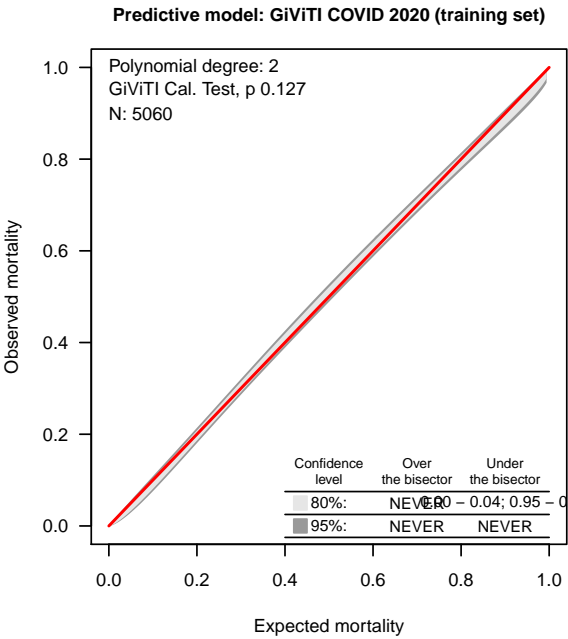
National report for general ICUs - Year 2020

Validity of the models NON COVID - Calibration belts

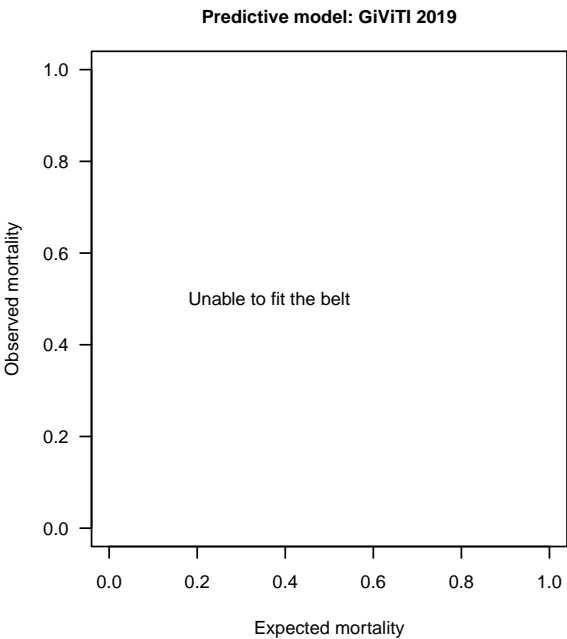
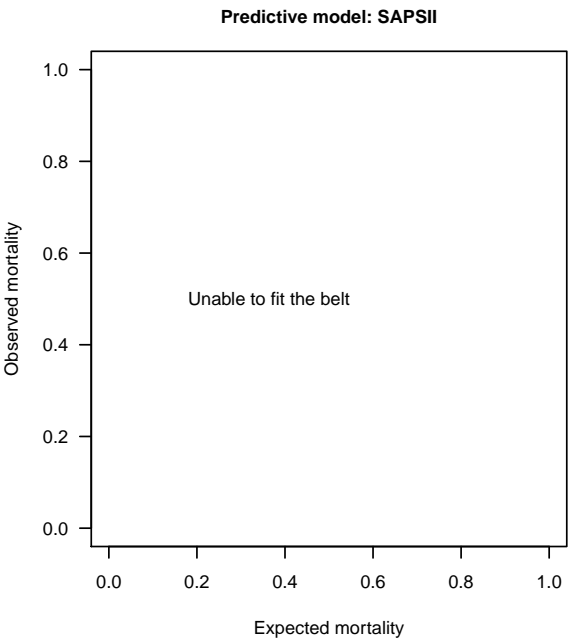
EXTERNAL SCORE



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Validity of the models COVID - Calibration belts



EXTERNAL SCORE



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