GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

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Report
PROSAFE project

Year 2019

National report for general ICUs (143 ICUs)

ITALY

PROSAFE project - **National report for general ICUs** (143 ICUs)
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use within the Intensive Care Units of the Local Health Authorities.

Contents

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 2019 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 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 TUONO Petal, designed to permit comparison of chest ultrasound reports;
- 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 271 ICUs collected data during 2019, 246 Italian and 25 foreign ICUs, for a total of 92831 patients registered in PROSAFE. Only the ICUs that collected valid data (205) 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 85226 patients admitted to intensive care during 2019.

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 (Italian) national report on the neurosurgical ICUs.
4. 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 partecipating ICUs

The table on page 17 summarizes the participation in the project of the 205 ICUs which collected valid data in 2019 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 23, 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 2019 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.

$$\text{Occupation rate} \;=\; \frac{\text{ICU stay days}}{\text{Days} \times \text{Number of beds}} \tag{1}$$

- 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.

$$\text{Rotation index} \;=\; \frac{\text{Number of patients}}{\text{Number of beds}} \tag{2}$$

- 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.

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

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 25 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:

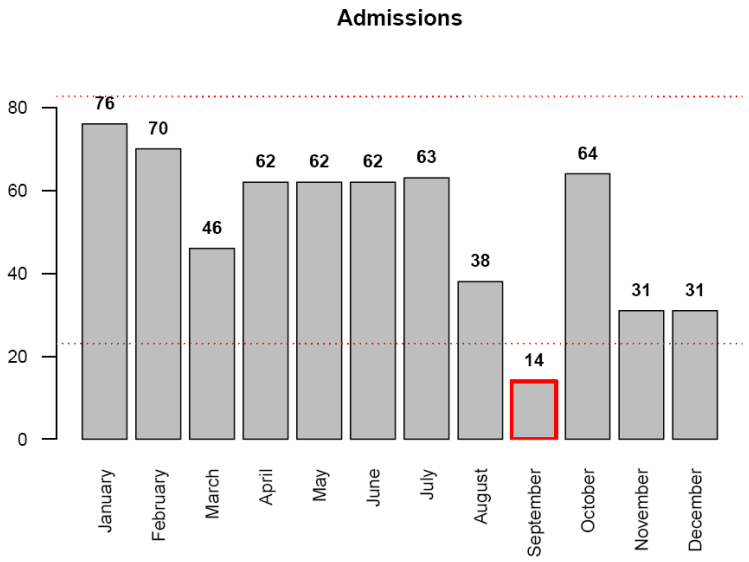
- status 1 - the patient record presents errors or unsolved warnings;
- status 2 - the record is incomplete, there are still missing data;
- status 3 - the patient has been discharged from the ICU, the clinical data are all entered and have undergone congruency checks; only hospital outcome is missing;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

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

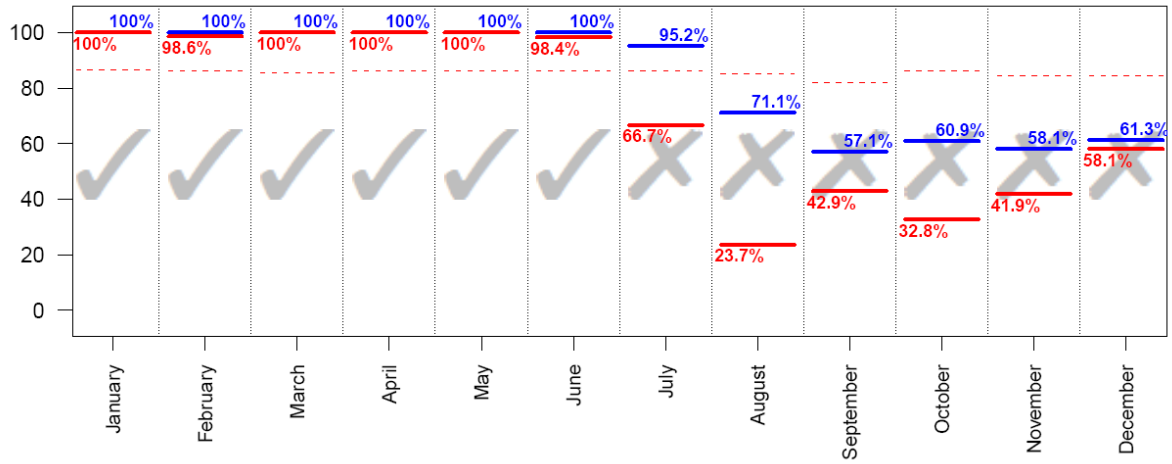


WARNING! The highligthed months have a number of patients quite different from the average. Please verify the correctness of the data and, particularly, that all consecutive patients have been registered in the Prosafe software.

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 hight). 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:

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

The categories of underweight, overweight and obese are determined according to the following criteria: underweight if BMI<20 (males) or BMI<19 (females); normal weight if 20<=BMI<=25 (males) or 19<=BMI<=24 (females); overweight if 25<BMI<=30 (males) or 24<BMI<=29 (females); obese if BMI>30 (males) or 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 sorgical 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:

$$\text{Predicted hospital mortality} \;=\; \frac{\mathrm{e}^{\text{Logit}}}{1+\mathrm{e}^{\text{Logit}}} \tag{5}$$

where

$$\text{Logit} \;=\; -7.763 + 0.074 \times SAPSII + 0.997 \times \ln\left(\text{SAPSII}+1\right) \tag{6}$$

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

$$\text{Predicted ICU mortality} \;=\; \frac{1}{1+\mathrm{e}^{7.64-0.30\times\text{PELOD}}} \tag{7}$$

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:

$$\text{Predicted ICU mortality} \;=\; \frac{\mathrm{e}^{\text{PIM}}}{1+\mathrm{e}^{\text{PIM}}} \tag{8}$$

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	TOT
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:

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

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.

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

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:

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

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

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 mainteinance -> 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	GiViTI 2019	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.

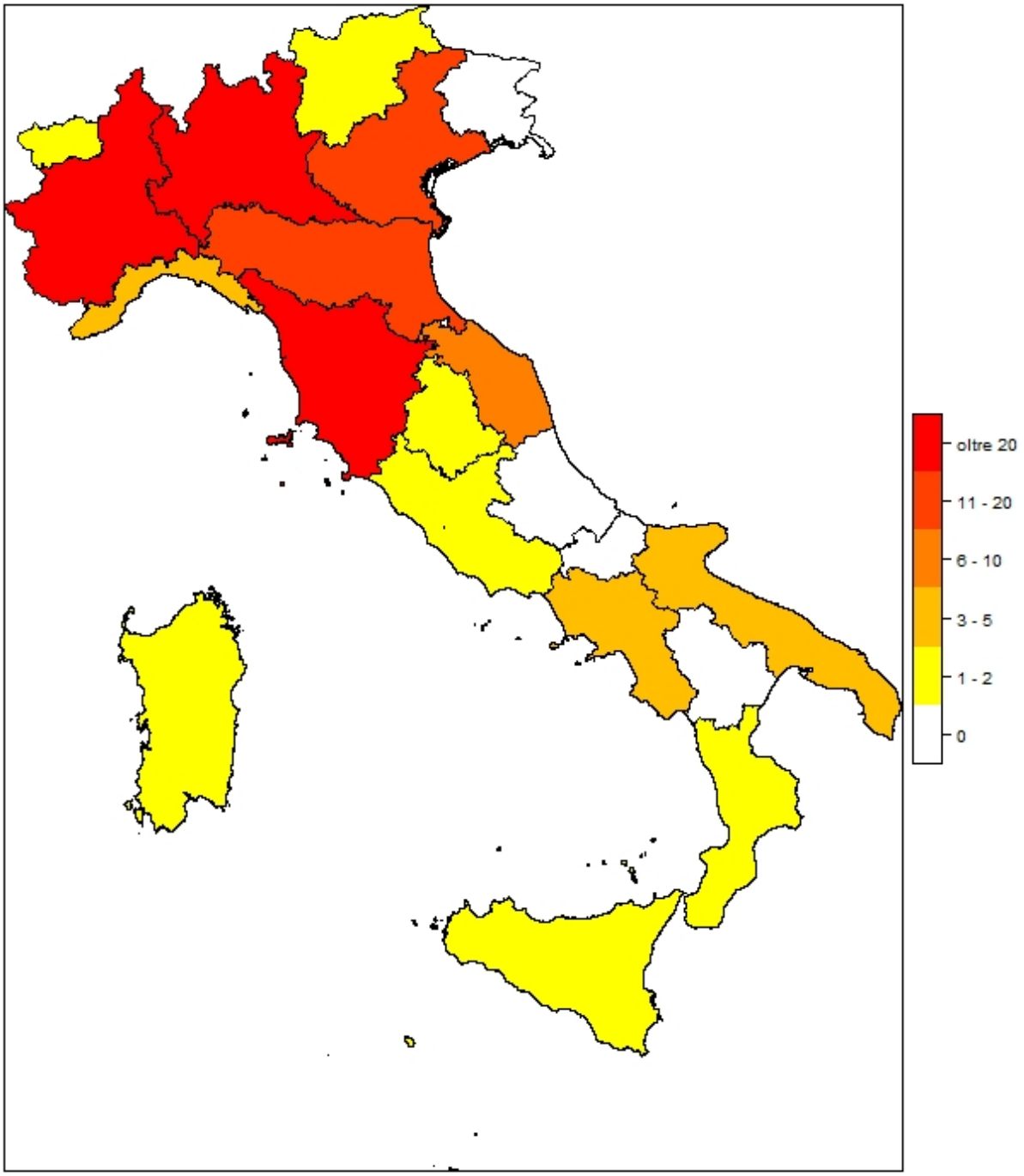
Statistics

National report for general ICUs - Year 2019
Project participation*

	TYPE							
Nation	General	Cardiosurgical	Surgical	Neurosurgical	Pediatrics	HDC	Other	**Total**
Cyprus	1 ICUs 195 patients							**1 ICUs** **195 patients**
Greece	1 ICUs 435 patients							**1 ICUs** **435 patients**
Hungary				1 ICUs 362 patients				**1 ICUs** **362 patients**
Israel					2 ICUs 1037 patients			**2 ICUs** **1037 patients**
Italy	**143 ICUs** **55075 patients**	16 ICUs 9565 patients	9 ICUs 4976 patients	9 ICUs 3747 patients	3 ICUs 1066 patients	6 ICUs 3067 patients	7 ICUs 3283 patients	**193 ICUs** **80779 patients**
Slovenia	1 ICUs 328 patients		4 ICUs 1371 patients				2 ICUs 719 patients	**7 ICUs** **2418 patients**
Total	**146 ICUs** **56033 patients**	**16 ICUs** **9565 patients**	**13 ICUs** **6347 patients**	**10 ICUs** **4109 patients**	**5 ICUs** **2103 patients**	**6 ICUs** **3067 patients**	**9 ICUs** **4002 patients**	**205 ICUs** **85226 patients**

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

Location of Italian participating ICUs (N=143)
ICUs per region



Region	N	%
Abruzzo	0	0
Basilicata	0	0
Calabria	1	0.7
Campania	4	2.8
Emilia Romagna	16	11.2
Friuli Venezia Giulia	0	0
Lazio	2	1.4
Liguria	4	2.8
Lombardia	35	24.5
Marche	7	4.9
Molise	0	0
Piemonte	23	16.1
Puglia	4	2.8
Sardegna	1	0.7
Sicilia	2	1.4
Toscana	26	18.2
Trentino Alto Adige	2	1.4
Umbria	1	0.7
Valle d'Aosta	1	0.7
Veneto	14	9.8

Geographical area	N	%
Northern Italy	95	66.4
Central Italy	36	25.2
Southern Italy	12	8.4

Description of hospitals (N=143) - **Year 2019**

Number of beds in hospital	N	%
< 300 beds	58	43.3
300 - 800 beds	66	49.3
> 800 beds	10	7.5
Missing	9	

Type of ICUs present in hospital	N	%
General	134	93.7
Medical	1	0.7
Surgical	3	2.1
Neurological/neurosurgical	11	7.7
Cardiosurgical	25	17.5
Burns	6	4.2
Post-transplantations	5	3.5
Other	32	22.4

Type of subICUs present in hospital	N	%
General	25	17.5
Surgical	5	3.5
Cardiological	102	71.3
Respiratory	22	15.4
Neurological (stroke unit)	59	41.3
Other	12	8.4

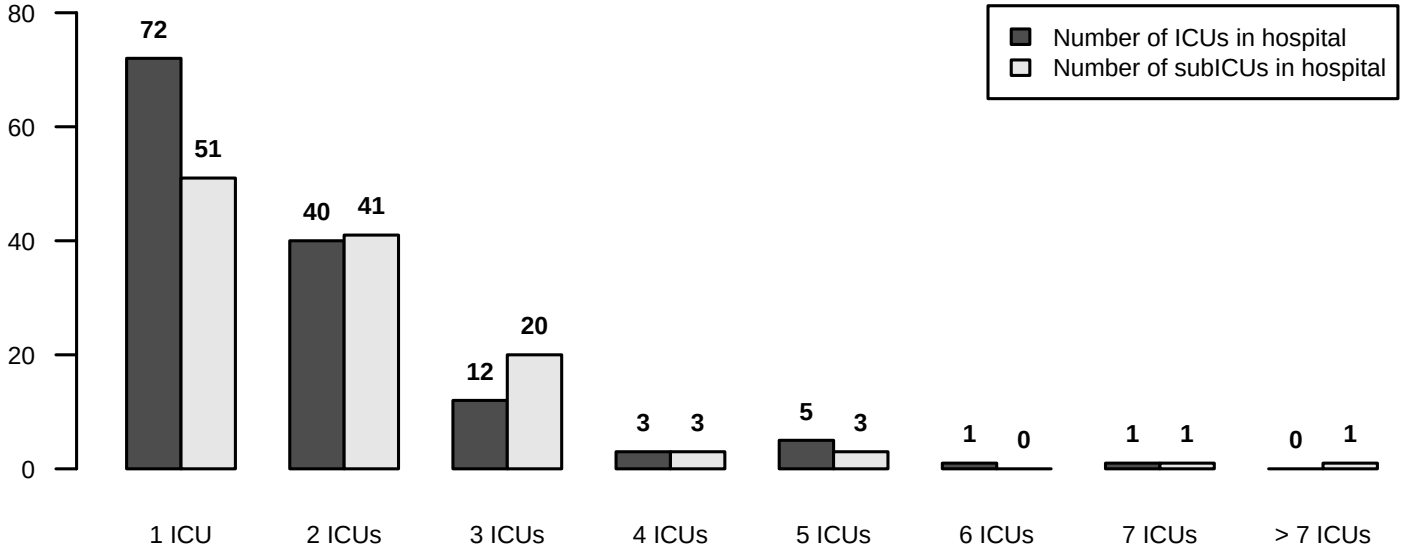
Non surgical specialties	N	%
Cardiology	127	94.8
Pulmonology	69	51.5
Nephrology	111	83.5
Infection disease	54	40.3
Pediatric	110	82.1
Neonatology	75	56.0
Neurology	100	74.6
Haematology	54	40.3
Emergency room	134	100.0
Traumatology	95	70.9
Emergency medical	80	59.7

Surgical specialties (independent ward)	N	%
Neurosurgery	40	28.0
Cardiosurgery	27	18.9
Major vascular surgery	60	42.0
Thoracic surgery	40	28.0
Pediatric surgery	20	14.0
Transplantation activities	15	10.5

Surgical specialties (procedures only)	N	%
Neurosurgery	9	6.3
Cardiosurgery	2	1.4
Major vascular surgery	20	14.0
Thoracic surgery	30	21.0
Pediatric surgery	29	20.3
Transplantation activities	13	9.1

Services/activities available in H (h24)	N	%
Neuroradiology	54	37.8
Interventional neuroradiology	37	25.9
Interventional vascular radiology	49	34.3
CT scan	134	93.7
MRI	63	44.1
Interventional hemodynamic	80	55.9
Endoscopy	90	62.9
Bronchoscopy	51	35.7
Hyperbaric chamber	6	4.2

Services/activities available in H (rep.)	N	%
Neuroradiology	13	9.1
Interventional neuroradiology	6	4.2
Interventional vascular radiology	26	18.2
CT scan	0	0.0
MRI	55	38.5
Interventional hemodynamic	5	3.5
Endoscopy	44	30.8
Bronchoscopy	56	39.2
Hyperbaric chamber	1	0.7



Description of ICUs (N=143) - **Year 2019**

Number of activable beds	
Mean (SD)	8.5 (3.5)
Median (Q1−Q3)	8 (6−10.2)
Missing	11

Number of beds declared to hospital	
Mean (SD)	27.4 (90.6)
Median (Q1−Q3)	7.9 (6−10.9)
Missing	9

University affiliation	N	%
Yes	48	35.8
No	86	64.2
Missing	9	

Square meter per bed	
Mean (SD)	15.9 (21.5)
Median (Q1−Q3)	12 (9−18)
Missing	10

Clinical psychologist	N	%
No	102	76.1
For relatives	31	23.1
For patients	27	20.1
For personnel	19	14.2

ICU Structure	N	%
NON OPEN-SPACE	53	39.6
OPEN-SPACE (or alike)	81	60.4
Missing	9	

Physicians	N	%
Dedicated to ICU only	20	14.9
Dedicated to ICU on a rotation basis	19	14.2
Dedicated to ICU only and on a rotation basis	95	70.9
Missing	9	

Declared beds per physician (average)	
Mean (SD)	16.7 (51.6)
Median (Q1−Q3)	4.6 (3.8−6)
Missing	9

Nurses	N	%
Dedicated to ICU only	86	64.2
Dedicated to ICU on a rotation basis	4	3.0
Dedicated to ICU only and on a rotation basis	44	32.8
Missing	9	

Declared beds per nurse (average)	
Mean (SD)	7.3 (22.8)
Median (Q1−Q3)	2.1 (2−2.4)
Missing	10

Number of hours conceeded for relatives' visits	N	%
1	6	4.5
2	11	8.2
3-4	16	11.9
5-12	90	67.2
13-20	2	1.5
>20	9	6.7
Missing	9	

Maximum number of visitors per patient	N	%
One	43	32.1
Two	84	62.7
Three or more	7	5.2
Missing	9	

Biomedical devices per declared bed	Median	Q1-Q3	<5 Years (mean %)
Total available monitors (excluding those dedicated to transport)	1.2	1.0−1.3	60.0
of which only for basic monitoring (without transducers detection of invasive pressure, pic, pvc, ...)	0.0	0.0−0.0	73.7
Invasive monitoring of cardiac output (Swan-Ganz)	0.1	0.0−0.3	65.0
Invasive monitoring of cardiac output (PiCCO)	0.2	0.1−0.3	77.8
Invasive monitoring of cardiac output (Vigileo)	0.1	0.0−0.2	73.6
Non-invasive monitoring of cardiac output (impedentiometry)	0.0	0.0−0.0	86.7
Defibrillators	0.2	0.2−0.4	72.0
Both invasive and non invasive ventilators	1.2	1.0−1.4	72.3
Non invasive ventilators	0.0	0.0−0.2	64.9
Syringe pumps	5.0	3.3−6.1	76.1
Peristaltic pumps	2.2	1.2−3.3	80.3

Biomedical equipment in ICU	N	%
Transoesophageal echo	51	38.1
Basic ultrasounds	133	99.3
Advanced ultrasounds	120	90.2
Blood-gas analyzer	134	100.0
Haemodialysis - Haemofiltration	117	87.3
Transport ventilator	127	94.8
Fiberscope	134	100.0
Extracorporeal circulation system	22	16.4

Routine microbiological surveillance cultures	N	%
Yes	129	96.3
No	5	3.7
Missing	9	

Description of ICUs (N=143) - **Year 2019**

Patients admitted	
Mean (SD)	387.2 (208.6)
Median	345.4
Q1−Q3	228.4−491.1
Missing	7

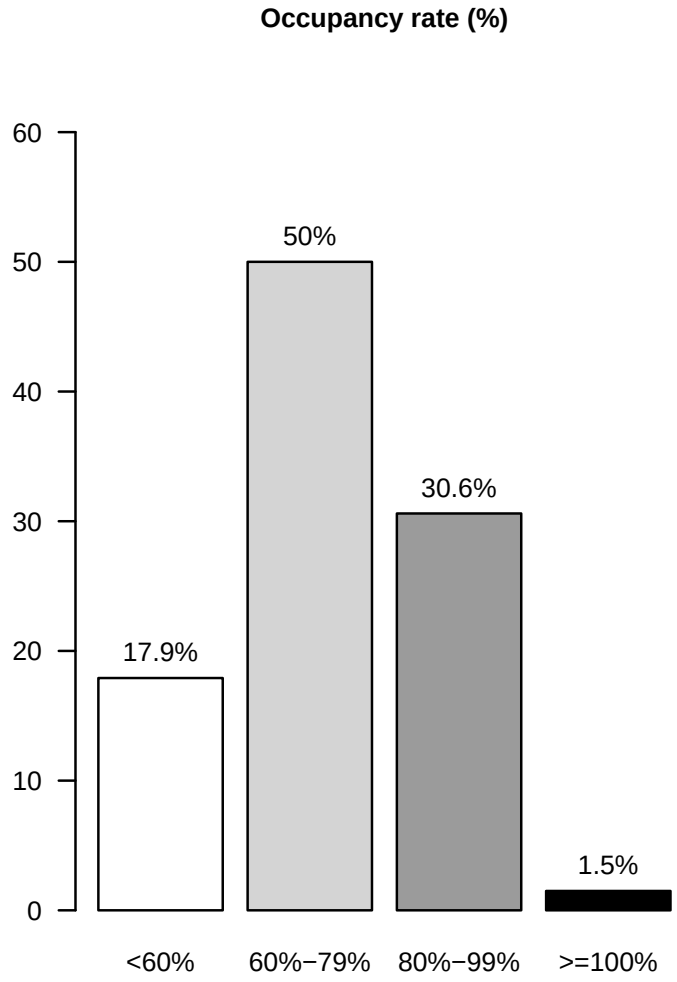
Occupancy rate (%)	
Mean (SD)	74.2 (12.4)
Median	72.6
Q1−Q3	65.2−83.4
Missing	16

Rotation index (patients/bed)	
Mean (SD)	48.3 (14.0)
Median	47
Q1−Q3	40.2−55.5
Missing	16

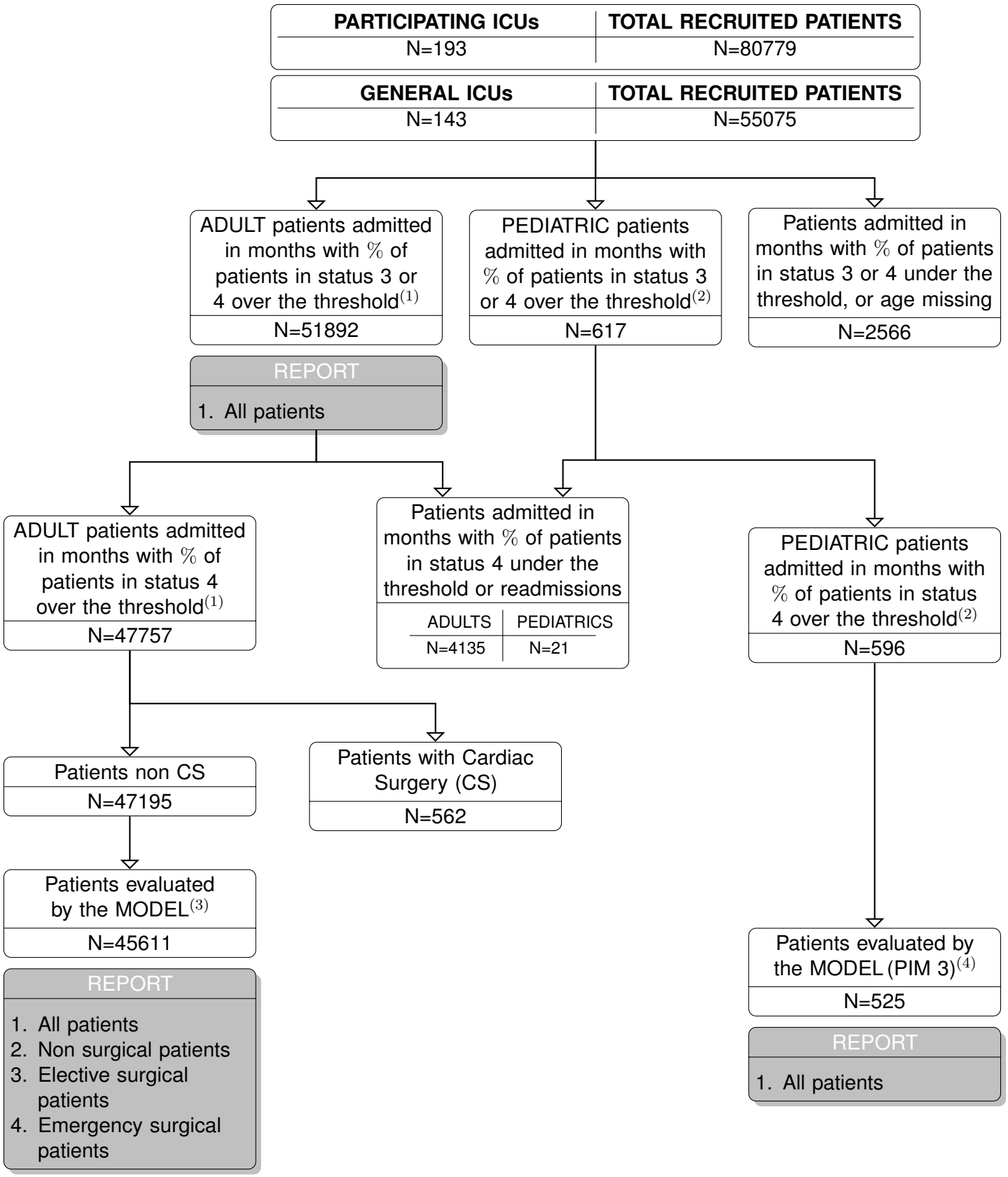
Turnover (hours)	
Mean (SD)	51.7 (32.5)
Median	44.9
Q1−Q3	28.4−69.8
Missing	16

Occupied beds per physician (average)	
Mean (SD)	3.5 (1.2)
Median	3.4
Q1−Q3	2.6−4.3
Missing	9

Occupied beds per nurse (average)	
Mean (SD)	1.6 (0.3)
Median	1.6
Q1−Q3	1.4−1.8
Missing	10



National report for general ICUs (143 ICUs) - **Year 2019**
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) Patients transferred to other ICU are excluded.

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult patients

Patients (N): 51892

Sex	N	%
Male	31098	59.9
Female	20784	40.1
Missing	10	

Age (years)	N	%
17-45	5928	11.4
46-65	14178	27.3
66-75	13376	25.8
>75	18410	35.5
Missing	0	
Mean	66.7	
SD	16.2	
Median	70	
Q1−Q3	57−79	
Min−Max	17−102	

Body mass Index (BMI)	N	%
Underweight	2876	5.6
Normal	22774	44.4
Overweight	15852	30.9
Obese	9833	19.2
Missing	557	

Pregnancy status **Females** (N=20784)	N	%
Not fertile	11048	53.2
Not pregnant/Unknown	9198	44.3
Currently pregnant	89	0.4
Post partum	426	2.1
Missing	23	

Comorbidities	N	%
No	7367	14.2
Yes	44399	85.8
Missing	126	

Comorbidities (top 10)	N	%
Hypertension	27355	52.8
Arrhythmia	9003	17.4
Moderate COPD	7298	14.1
Diabetes Type II without insulin tr.	6941	13.4
Myocardial infarction	6732	13.0
Any tumour without metastasis	6401	12.4
Cerebrovascular disease	5476	10.6
NYHA class II-III	5231	10.1
Peripheral vascular disease	5153	10.0
Antiplatelet therapy	4853	9.4
Missing	126	

Stay before ICU (days)	
Mean	4.3
SD	11.1
Median	1
Q1−Q3	0−3
Missing	157

Source of admission	N	%
Same hospital	45665	88.2
Other hospital	5876	11.3
Long-term chronic care hospital	245	0.5
Directly from the community	7	0.0
Missing	99	

Ward of admission **Hospital** (N=51541)	N	%
Medical ward	7283	14.1
Surgical ward	21968	42.6
Emergency room	17953	34.8
Other ICU	2962	5.7
High dependency care unit	1372	2.7
Missing	3	

Reason for transfer from **Other ICU** (N=2962)	N	%
Specialist expertise	855	28.9
Step-up care	461	15.6
Logistical/organizational reasons	1582	53.4
Step-down care	64	2.2
Missing	0	

Ward of admission **Same hospital** (N=45665)	N	%
Medical ward	6524	14.3
Surgical ward	21680	47.5
Emergency room	15382	33.7
Other ICU	842	1.8
High dependency care unit	1236	2.7
Missing	1	

Ward of admission **Other hospital** (N=5876)	N	%
Medical ward	759	12.9
Surgical ward	288	4.9
Emergency room	2571	43.8
Other ICU	2120	36.1
High dependency care unit	136	2.3
Missing	2	

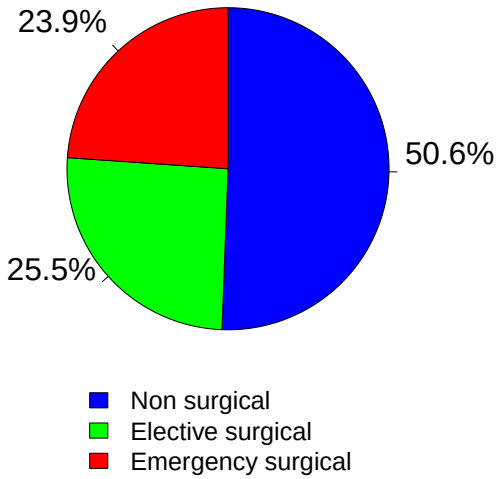
Scheduled admission	N	%
No	41084	79.4
Yes	10678	20.6
Missing	130	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult patients

Trauma	N	%
No	45379	87.7
Yes	6387	12.3
Multiple trauma	2649	5.1
Missing	126	

Surgical status	N	%
Non surgical	26183	50.6
Elective surgical	13187	25.5
Emergency surgical	12395	23.9
Missing	127	

Surgical status



Source of admission **Surgical pt.** (N=25582)	N	%
Operating theatre of surgical ward	18951	74.2
Operating theatre of emergency room	2293	9.0
Surgical ward	1190	4.7
Other	3109	12.2
Missing	39	

Surgical interventions (top 10) **Elective surgical** (N=13187)	N	%
Gastrointestinal surgery	3601	27.3
Nephro/Urological surgery	1570	11.9
Orthopaedic surgery	1564	11.9
Neurosurgery	1250	9.5
ENT surgery	799	6.1
Thoracic surgery	747	5.7
Gynaecological surgery	654	5.0
Abdominal vascular surgery	544	4.1
Hepatic surgery	524	4.0
Pancreatic surgery	463	3.5
Missing	1471	

Timing **Elective surgical** (N=13187)	N	%
From -7 to -3 days	221	1.7
From -2 to -1 days	394	3.0
On ICU admission day	13356	101.3
The day after ICU admission	108	0.8
Missing	25	

Surgical interventions (top 10) **Emergency surgical** (N=12395)	N	%
Gastrointestinal surgery	5398	43.5
Neurosurgery	1764	14.2
Orthopaedic surgery	1453	11.7
Nephro/Urological surgery	698	5.6
Abdominal vascular surgery	484	3.9
Biliary tract surgery	452	3.6
Peripheral vascular surgery	424	3.4
ENT surgery	393	3.2
Obstetric surgery	298	2.4
Thoracic surgery	293	2.4
Missing	738	

Timing **Emergency surgical** (N=12395)	N	%
From -7 to -3 days	326	2.6
From -2 to -1 days	1358	11.0
On ICU admission day	10962	88.4
The day after ICU admission	585	4.7
Missing	44	

Non surgical interventions	N	%
None	47113	91.0
Elective	717	1.4
Emergency	3934	7.6
Missing	128	

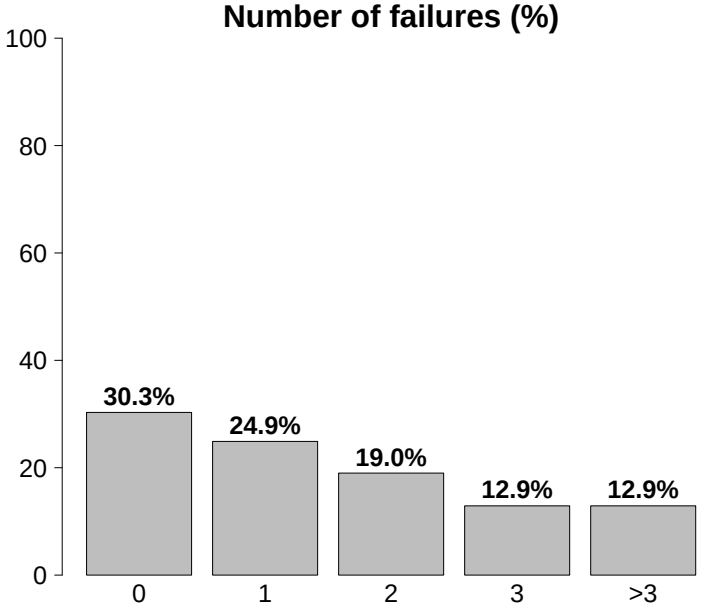
Non surgical interventions **Elective** (N=717)	N	%
Interventional endoscopy	241	33.6
Interventional radiology	138	19.2
Interventional cardiology	136	19.0
Interventional neuroradiology	110	15.3
Missing	92	

Non surgical interventions **Emergency** (N=3934)	N	%
Interventional cardiology	1505	38.3
Interventional radiology	937	23.8
Interventional endoscopy	799	20.3
Interventional neuroradiology	661	16.8
Missing	32	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	21150	40.9
Post surgical weaning	7119	13.8
Surgical monitoring	8250	16.0
Post interventional weaning	208	0.4
Interventional monitoring	838	1.6
Non surgical monitoring	4461	8.7
Missing	274	
Admission for procedures/treatments	0	0.0
Intensive Treatment	30234	58.4
Only ventilatory support	15459	29.9
Only cardiovascular support	2292	4.4
Ventilatory and cardiovascular support	12480	24.1
Missing	3	
Palliative Sedation	249	0.5
Diagnosis of death/Organ donation	128	0.2
Missing	131	

Number of failures (%)



Failures on admission	N	%
No	15710	30.3
Yes	36181	69.7
A: Respiratory failure	27936	53.8
B: Cardiovascular failure	14772	28.5
C: Neurological failure	6979	13.4
D: Hepatic failure	384	0.7
E: Renal failure	18112	34.9
F: Acute skin failure	28	0.1
G: Metabolic failure	12619	24.3
H: Coagulation failure	620	1.2
Missing	1	

Failures on admission (top 10)	N	%
A	7856	15.1
ABEG	3606	6.9
E	3227	6.2
AB	2641	5.1
AE	2188	4.2
AC	2160	4.2
ABE	1838	3.5
ABCEG	1369	2.6
EG	1185	2.3
AEG	1179	2.3
Missing	1	

Respiratory failure	N	%
None	23953	46.2
Only hypoxic failure	9045	17.4
Only hypercapnic failure	1259	2.4
Hypoxic-hypercapnic failure	3260	6.3
Intubation for airway maint.	14372	27.7
Missing	3	

Cardiovascular failure	N	%
None	37120	71.5
Without shock	3178	6.1
Cardiogenic shock	2734	5.3
Septic shock	3621	7.0
Haemorrhagic/hypovolemic shock	1946	3.8
Hypovolemic shock	1390	2.7
Anaphylactic shock	52	0.1
Neurogenic shock	446	0.9
Other shock	671	1.3
Mixed shock	730	1.4
Missing	4	

Neurologic failure	N	%
None	35992	83.8
Cerebral coma	3755	8.7
Metabolic coma	1204	2.8
Postanoxic coma	1739	4.0
Toxic coma	281	0.7
Missing or not evaluable	8921	

Renal failure (AKIN)	N	%
None	33502	64.9
Mild	8707	16.9
Moderate	4198	8.1
Severe	5207	10.1
Missing	278	

Metabolic failure	N	%
None	38989	75.5
pH <= 7.3, PaCO2 < 45 mmHg	3261	6.3
Base deficit >= 5 mmol/L, lactate >1.5x	9358	18.1
Missing	284	

National report for general ICUs - Year 2019
Characteristics on admission - Adult patients

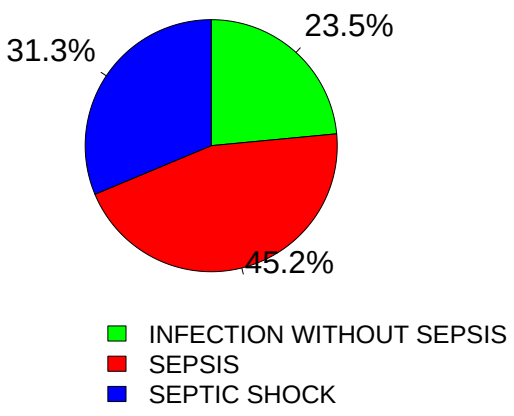
Clinical conditions on admission	N	%
Respiratory	8986	17.4
Acute exacerbation of COPD	2041	3.9
Pleural effusion	1691	3.3
Atelectasis	1080	2.1
Aspiration pneumonia	945	1.8
Upper respiratory tract disease	845	1.6
Cardiovascular	9616	18.6
Cardiac arrest	2477	4.8
Left heart failure with pulmonary edema	1716	3.3
Left heart failure without pulm. edema	1149	2.2
Acute severe arrhythmia: tachycardias	994	1.9
Acute ischaemia	824	1.6
Neurological	7569	14.6
Spontaneous Intraparenchymal bleeding	1620	3.1
Cerebral artery stroke	1311	2.5
Seizures	1206	2.3
Brain tumour	1094	2.1
Spontaneous Subarachnoid haemorrhage	845	1.6
Gastrointestinal and hepatic	10607	20.5
Digestive tract malignancy	2809	5.4
Gastrointestinal perforation	1693	3.3
Intestinal occlusion	1582	3.1
Gastrointestinal bleeding: upper tract	776	1.5
Bowel ischaemia	730	1.4
Trauma (anatomical districts)	6386	12.3
Pelvis/bone/joint & muscle	2845	5.5
Head	2629	5.1
Chest	2378	4.6
Spine	1471	2.8
Abdomen	1142	2.2
Major vessels injury	219	0.4
Miscellaneous	124	0.2
Other	12345	23.9
Other disease	2931	5.7
Nephrourologic disease	2659	5.1
Metabolic disorder	2369	4.6
Orthopaedic disease	1141	2.2
ENT/maxillofacial disease	1114	2.2
Post transplantation	345	0.7
Renal transplantation	134	0.3
Liver transplantation	132	0.3
Infections	13885	26.8
Pneumonia	5450	10.5
NON-surgical secondary peritonitis	1349	2.6
NON-surgical urinary tract infection	1297	2.5
Post-surgical peritonitis	909	1.8
L.R.T.I. other than pneumonia	899	1.7
Primary bacteraemia of unknown origin	667	1.3
Cholecystitis/cholangitis	626	1.2
NON-surgical skin/soft tissue infection	620	1.2
Primary peritonitis	413	0.8
NON-surgical CNS infection	411	0.8
Missing	150	

Trauma (anatomical districts)	N	%
Head	2629	5.1
Traumatic subarachnoid haemorrhage	980	1.9
Traumatic Subdural haematoma	945	1.8
Maxillofacial fracture	921	1.8
Cerebral contusion/laceration	798	1.5
Skull fracture	665	1.3
Spine	1471	2.8
Vertebral fracture, without deficit	1206	2.3
Cervical injury, incomplete deficit	93	0.2
Tetraplegia	71	0.1
Chest	2378	4.6
Other injuries of the chest	1328	2.6
Traum. haemothorax/pneumothorax	978	1.9
Severe lung contusion/laceration	556	1.1
Abdomen	1142	2.2
Minor injuries of the abdomen	327	0.6
Spleen: Moderate-Severe laceration	304	0.6
Liver: Moderate-Severe laceration	239	0.5
Pelvis/bone/joint & muscle	2845	5.5
Long bone fracture	2281	4.4
Multiple fracture of the pelvis	737	1.4
Very severe or open fracture of the pelvis	115	0.2
Major vessels injury	219	0.4
Proximal limbs vessels: transection	84	0.2
Neck vessels: dissection/transection	51	0.1
Aorta: rupture/dissection	42	0.1
Miscellaneous	124	0.2
Burns (>30% BSA)	88	0.2
Inhalation injury	50	0.1
Missing	150	

Infection severity on admission	N	%
None	37857	73.9
INFECTION WITHOUT SEPSIS	3145	6.1
SEPSIS	6054	11.8
SEPTIC SHOCK	4200	8.2
Missing	636	

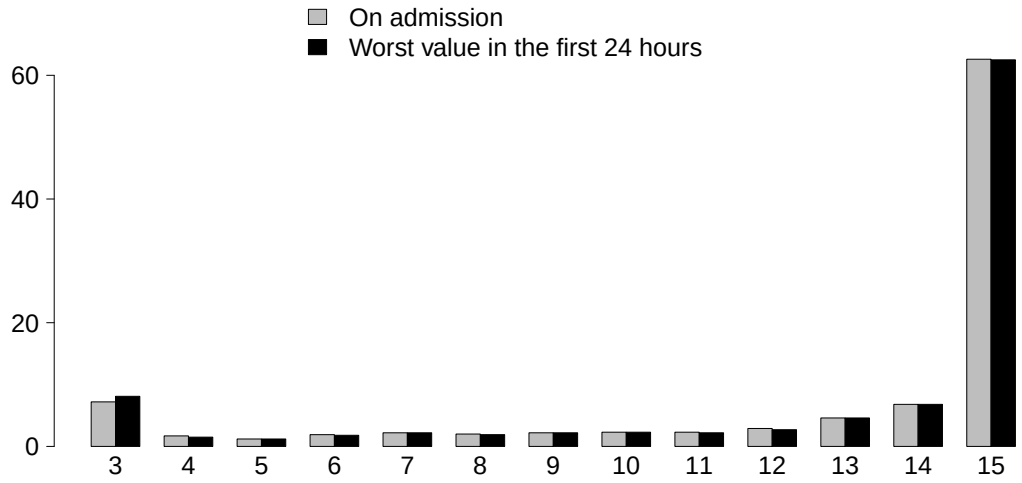
Infection severity on admission

Patients infected (N=13399)



National report for general ICUs - **Year 2019**
Severity scores - Adult patients

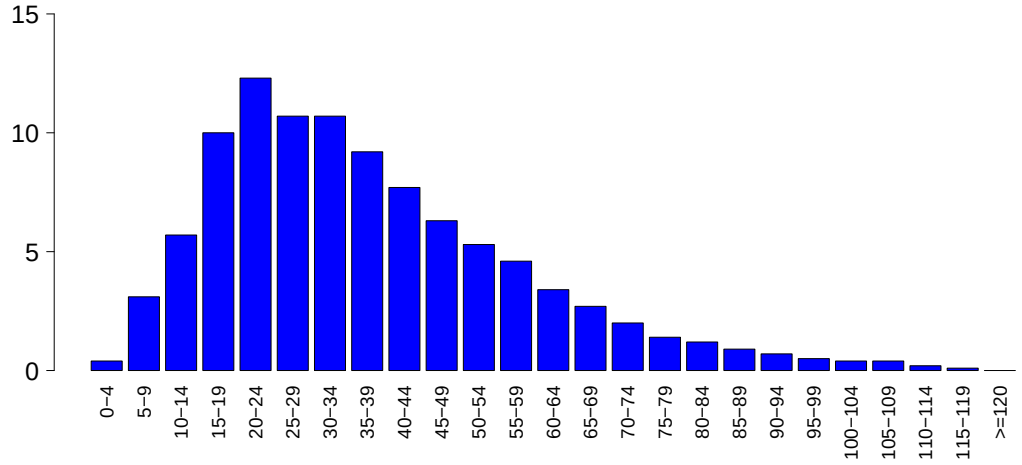
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	12−15
Not evaluable	8730
Missing	191

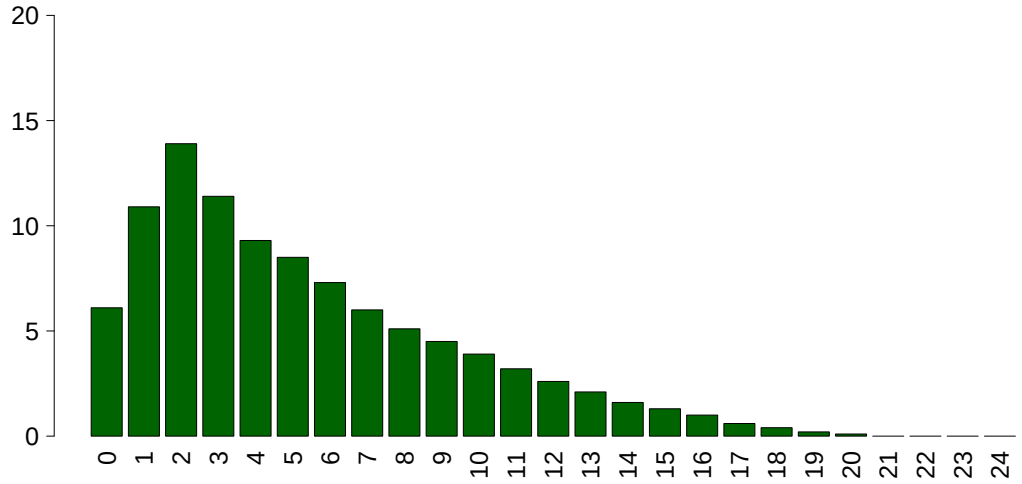
GCS (first 24 hours)	
Median	15
Q1−Q3	12−15
Not evaluable	7397
Missing	245

SAPS II (%)



SAPSII	
Mean	37.1
SD	20.4
Median	33
Q1−Q3	22−48
Not evaluable	7397
Missing	273

SOFA (%)



SOFA	
Mean	5.3
SD	4.2
Median	4
Q1−Q3	2−8
Not evaluable	7397
Missing	280

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult patients

Complications during the stay	N	%
No	36710	71.1
Yes	14918	28.9
Missing	264	

Failures during the stay	N	%
No	45213	87.1
Yes	6678	12.9
A: Respiratory failure	3278	6.3
B: Cardiovascular failure	2845	5.5
C: Neurological failure	533	1.0
D: Hepatic failure	194	0.4
E: Renal failure (AKIN)	1763	3.4
F: Acute skin failure	12	0.0
G: Metabolic failure	529	1.0
H: Coagulation failure	235	0.5
Missing	1	

Failures during the stay (top 10)	N	%
A	1948	3.8
B	1399	2.7
E	747	1.4
AB	543	1.0
G	335	0.6
BE	267	0.5
ABE	252	0.5
C	208	0.4
AE	175	0.3
D	74	0.1
Missing	1	

Respiratory failure occured	N	%
None	48350	93.7
Intubation for airway maint.	954	1.8
Hypoxic failure	2298	4.5
Hypercapnic failure	661	1.3
Missing	264	

Cardiovascular failure occured	N	%
None	48783	94.5
Cardiogenic shock	766	1.5
Hypovolemic shock	356	0.7
Haemorrhagic/hypovolemic shock	302	0.6
Septic shock	1052	2.0
Anaphylactic shock	3	0.0
Neurogenic shock	199	0.4
Other shock	292	0.6
Missing	264	

Neurological failure occured	N	%
None	51095	99.0
Cerebral coma	290	0.6
Metabolic coma	110	0.2
Postanoxic coma	139	0.3
Missing	264	

Renal failure occured (AKIN)	N	%
None	49865	96.6
Mild	209	0.4
Moderate	310	0.6
Severe	1244	2.4
Missing	264	

Complications during the stay	N	%
Respiratory	2479	4.8
Pleural effusion	930	1.8
Atelectasis	542	1.0
Pneumothorax/Pneumomediastinum	326	0.6
Severe ARDS	317	0.6
Upper resp. tract disease	181	0.4
Cardiovascular	3666	7.1
Acute severe arrhythmia: tachycardias	1343	2.6
Cardiac arrest	1234	2.4
Acute severe arrhythmia: bradycardias	292	0.6
Pulmonary edema	271	0.5
Left heart failure w/o pulm. edema	239	0.5
Neurological	3365	6.5
Drowsiness/agitation/delirium	1619	3.1
Seizures	598	1.2
Brain edema	573	1.1
Intracranial hypertension	505	1.0
New ischaemic stroke	207	0.4
Gastrointestinal and hepatic	1458	2.8
Bowel ischaemia	227	0.4
Gastrointestinal bleeding: upper tract	218	0.4
Paralytic Ileus	206	0.4
Gastrointestinal perforation	165	0.3
Gastrointestinal bleeding: lower tract	162	0.3
Other	1269	2.5
Metabolic disorder	529	1.0
Other disease	301	0.6
Nephrourologic disease	290	0.6
Category/Stage II: Partial Thickness Skin Loss	76	0.1
Other skin and/or soft tissue pathology	68	0.1
Category/Stage III: Full Thickness Skin Loss	34	0.1
Extremity compartment syndrome (severe)	33	0.1
Infections	4270	8.3
Pneumonia	1583	3.1
L.R.T.I. other than pneumonia	910	1.8
NON-surgical urinary tract infection	583	1.1
Primary bacteraemia of unknown origin	479	0.9
Catheter-related bacteremia (CR-BSI)	442	0.9
Post-surgical peritonitis	190	0.4
Upper respiratory tract infection	140	0.3
Post-surgical skin/soft tissue infection	138	0.3
F.U.O. fever of unknown origin	124	0.2
Clinical sepsis	99	0.2
Missing	264	

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult patients

Infections	N	%
None	34988	67.8
Only on admission	12366	24.0
On admission and during ICU stay	1476	2.9
Only during ICU stay	2794	5.4
Missing	268	

Maximum severity of infection	N	%
None	34988	68.6
INFECTION WITHOUT SEPSIS	3370	6.6
SEPSIS	7736	15.2
SEPTIC SHOCK	4893	9.6
Missing	905	

Severity evolution

		During the stay				
	N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	34988 (93.1%)	907 (2.4%)	1423 (3.8%)	278 (0.7%)	37596
	INFECTION WITHOUT SEPSIS	-	2456 (78.3%)	603 (19.2%)	76 (2.4%)	3135
	SEPSIS	-	-	5694 (94.3%)	341 (5.6%)	6036
	SEPTIC SHOCK	-	-	-	4187 (100.0%)	4189
	TOT	34988	3364	7722	4882	50956

Ventil. Associat. Pneumonia (VAP)	N	%
No	50459	97.4
Yes	1335	2.6
Missing	98	

Catheter Bacteraemia (CR-BSI)	N	%
No	51186	99.1
Yes	442	0.9
Missing	264	

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

Estimate	9.2
CI (95%)	8.7−9.7

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

Estimate	1.9
CI (95%)	1.7−2.0

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

Estimate	7.3%
CI (95%)	6.9−7.7

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

Estimate	2.2%
CI (95%)	2.0−2.5

National report for general ICUs - **Year 2019**

Process indicators - Adult patients

Procedures and/or treatments (Missing=149)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	49310	95.3										
Invasive ventilation	34470	66.6	25604	49.5	7566	14.6	1	0–5	101	0	0–0	4
Non invasive ventilation	8177	15.8	1996	3.9	1753	3.4	1	1–3	22	0	0–2	4
Tracheostomy	5269	10.2	1484	2.9	4545	8.8	10	4–19	21	8	4–12	0
iNO (inhaled nitric oxide)	118	0.2	3	0	17	0	2	1–4	0	1	0–3	0
Central Venous Catheter	33361	64.5	15802	30.5	27449	53	4	1–9	119	0	0–0	5
PICC	1280	2.5	552	1.1	1113	2.2	4	1–9	5	5	1–16	0
Arterial Catheter	42649	82.4	21652	41.8	12061	23.3	3	1–7	133	0	0–0	6
Vasoactive drugs	18437	35.6	8523	16.5	4311	8.3	2	1–4	56	0	0–0	3
Antiarrhythmics	3545	6.9	984	1.9	1824	3.5	3	1–7	8	1	0–2	0
IABP	355	0.7	271	0.5	108	0.2	2	1–3	1	0	0–1	0
Invasive monitoring of C.O.	1751	3.4	294	0.6	345	0.7	4	2–7	4	0	0–1	0
Continous monitoring of ScVO2	128	0.2	48	0.1	37	0.1	3	1–5	1	0	0–1	0
Temporary pacing	192	0.4	127	0.2	86	0.2	1	1–3	1	0	0–1	0
Ventricular assistance	10	0.0	7	0	2	0	2	1–3	0	0	0–0	0
DC-shock	805	1.6								0	0–1	0
CPR	1332	2.6								0	0–0	1
Massive blood transfusion	632	1.2								0	0–0	1
ICP monitoring without CSF drainage	394	0.8	142	0.3	89	0.2	6	3–10	2	0	0–1	0
ICP monitoring with CSF drainage	421	0.8	226	0.4	196	0.4	9	3–15	0	0	0–1	0
External ventricular drainage without ICP	156	0.3	100	0.2	90	0.2	7	3–13	0	0	0–1	0
Haemofiltration	1914	3.7	182	0.4	509	1	3	2–8	5	1	0–2	2
Haemodialysis	1307	2.5	263	0.5	561	1.1	3	1–8	4	1	0–2	2
ECMO	157	0.3	59	0.1	59	0.1	7	1–15	0	1	0–4	0
Hepatic clearance techniques	14	0.0										
Clearance techniques during sepsis	247	0.5	12	0	42	0.1	2	1–4	0	1	0–2	0
IAP (intra-abdominal pressure)	567	1.1										
Hypothermia	408	0.8										
Enteral nutrition	16273	31.4	2693	5.2	11248	21.7	6	3–13	57	1	0–2	9
Parenteral nutrition	8351	16.1	1271	2.5	5249	10.1	4	2–8	37	1	0–2	8
SDD (Topical, Topical and systemic)	694	1.3										
Patient restraint	1209	2.3										
Peridural catheter	1584	3.1	1347	2.6	1284	2.5	1	1–2	2	1	0–2	0
Electrical cardioversion	329	0.6								1	0–3	0
Vacuum therapy	293	0.6										
Antibiotics	31855	61.6										
Antibiotic prophylaxis	16007	30.9	11112	21.5	8761	16.9	1	1–3	31	0	0–0	2
Empirical antibiotic therapy	10450	20.2	5089	9.8	4720	9.1	3	2–5	39	0	0–1	3
Empirical antibiotic therapy in unconfirmed diagnosis	3604	7.0	1471	2.8	1949	3.8	4	2–6	5	0	0–1	0
Targeted antibiotic therapy	7461	14.4	1581	3.1	4679	9	6	3–11	23	3	2–7	0

National report for general ICUs - **Year 2019**
Process indicators - Adult patients

Invasive ventilation (N=34470)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	11121	28.9	7.4	10.5	4	1−9	42
For airway mainteinance	13948	36.2	5.3	9.3	2	1−6	40
In weaning	7490	19.4	0.4	0.5	0	0−1	0
Not evaluable	5965	15.5	3.1	6.3	1	0−3	4079
Reintubation within 48 hours	1221	3.2	5.7	8.2	3	1−7	2

Non invasive ventilation (N=8177)	N	%
Non invasive ventilation only	4221	51.6
Non invasive ventilation failed	1444	17.7
For weaning	2183	26.7
Other	329	4.0
Missing	0	

Tracheostomy not present on admission (N=3785)	N	%
Surgical	767	20.3
Percutwist	321	8.5
Ciaglia	541	14.3
Monodil. Ciaglia	1242	32.8
Fantoni	132	3.5
Griggs	558	14.7
Other Kind	160	4.2
Unknown	57	1.5
Missing	7	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=3739)	
Mean	8.8
SD	9.2
Median	7
Q1−Q3	4−12
Missing	4

Invasive monitoring of C.O. (N=1751)	N	%
Swan Ganz	364	20.8
PICCO	1112	63.5
LIDCO	0	0.0
Vigileo-PRAM	170	9.7
Other	104	5.9
Missing	1	

SDD (N=694)	N	%
Topical	690	99.4
Topical and systemic	4	0.6
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=2794)	N	%
No therapy	468	16.8
Only empirical	611	21.9
Only targeted	782	28.0
Targeted after empirical	775	27.7
Other	158	5.7
Missing	0	

Surgical interventions	N	%
No	49438	95.6
Yes	2262	4.4
Missing	192	

Number of surgical interventions	N	%
0	49438	95.6
1	1698	3.3
2	373	0.7
3	116	0.2
>3	75	0.1
Missing	192	

Surgical interventions Days from admission	
Mean	9.1
SD	9.3
Median	6
Q1−Q3	3−12
Missing	11

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	1004	1.9
Orthopaedic surgery	578	1.1
ENT surgery	327	0.6
Neurosurgery	323	0.6
Other surgery	136	0.3
Thoracic surgery	131	0.3
Maxillo-Facial surgery	117	0.2
Nephro/Urological surgery	106	0.2
Plastic surgery	74	0.1
Peripheral vascular surgery	68	0.1
Missing	192	

Non surgical interventions	N	%
No	50700	98.1
Yes	990	1.9
Missing	202	

Non surgical interventions Days from admission	
Mean	11.9
SD	11.5
Median	8
Q1−Q3	4−16
Missing	25

Non surgical interventions	N	%
Interventional endoscopy	630	1.2
Interventional radiology	281	0.5
Interventional cardiology	190	0.4
Interventional neuroradiology	74	0.1
Missing	202	

National report for general ICUs - **Year 2019**
Outcome indicators - Adult patients

ICU outcome	N	%
Dead	8773	17.0
Transferred to same hospital	37832	73.3
Transferred to other hospital	4443	8.6
Discharged home	372	0.7
Disch. terminally ill	190	0.4
Missing	282	

Transferred to (N=42275)	N	%
Ward	34397	81.4
Other ICU	3171	7.5
High dependency care unit	3539	8.4
Rehabilitation	938	2.2
Day hospital or Long-term care	230	0.5
Missing	0	

Reason of transfer to Other ICU (N=3268)	N	%
Specialist expertise	1329	40.7
Step-up care	262	8.0
Logistical/organizational reasons	1526	46.7
Step-down care	151	4.6
Missing	0	

Transferred to Same hospital (N=37832)	N	%
Ward	33264	87.9
Other ICU	1022	2.7
High dependency care unit	3298	8.7
Rehabilitation	185	0.5
Day hospital or Long-term care	63	0.2
Missing	0	

Transferred to Other hospital (N=4443)	N	%
Ward	1133	25.5
Other ICU	2149	48.4
High dependency care unit	241	5.4
Rehabilitation	753	16.9
Day hospital or Long-term care	167	3.8
Missing	0	

ICU mortality	N	%
Alive	42647	82.6
Dead	8963	17.4
Missing	282	

Timing of ICU mortality (N=8963)	N	%
Daytime (08:00AM - 07:59PM)	6151	68.6
Nighttime (08:00PM - 07:59AM)	2809	31.4
Weekdays (Monday - Friday)	6706	74.8
Weekend (Saturday - Sunday)	2255	25.2
Missing	3	

C.A.M. activation (N=8963)	N	%
Yes, with organ donation	559	6.4
Yes, without organ donation	524	6.0
No, with organ donation	23	0.3
No, without organ donation	7663	87.4
Missing	194	

Tissue removal (N=8963)	N	%
Yes, with C.A.M. activation	336	3.7
Yes, without C.A.M. activation	488	5.4
No	8137	90.8
Missing	2	

Hospital mortality *	N	%
Dead	10523	22.2
Transf. to other acute-care hospital	4866	10.3
Transf. to other type of hosp. stay	7399	15.6
Nursing home	886	1.9
Voluntary discharge	298	0.6
Discharged home	23371	49.4
Missing	414	

To other type of H stay* (N=7399)	N	%
Rehabilitation in the same institute	1433	19.4
Rehabilitation in other institute	3820	51.6
DH/long-term care, same inst.	787	10.6
DH/long-term care, other inst.	1356	18.3
Missing	3	

Disch. terminally ill* (N=36820)	N	%
Yes	581	1.6
No	36233	98.4
Missing	6	

Hospital mortality *	N	%
Alive	36233	76.5
Dead	11104	23.5
Missing	420	

Timing of hosp. mortality * (N=11104)	N	%
In ICU	8123	73.2
Within 24 hours after ICU	203	1.8
24-47 hours after ICU	184	1.7
48-71 hours after ICU	188	1.7
72-95 hours after ICU	145	1.3
After 95 hours after ICU	2249	20.3
Missing	12	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=2981)	
Mean	16.3
SD	20.8
Median	10
Q1−Q3	4−21
Missing	7

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=47757).

National report for general ICUs - **Year 2019**
Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	35795	75.8
Dead	11440	24.2
Missing	522	

Readmission from ward	N	%
No	50138	96.7
Yes	1688	3.3
Missing	66	

Number of readmissions (N=1688)	N	%
1	1542	91.4
2	131	7.8
>2	15	0.9
Missing	0	

Timing of readmission (N=1688)	N	%
Within 48 hours	384	23.2
48-71 hours	179	10.8
72-95 hours	141	8.5
After 95 hours	950	57.4
Missing	34	

Timing readmission (days)	
N	1688
Mean	9.4
SD	14.8
Median	4.8
Q1−Q3	2−11

ICU stay (days)	
Mean	5.8
SD	9.2
Median	2
Q1−Q3	1−6
Missing	278

ICU stay (days) **Alive** (N=42647)	
Mean	5.5
SD	8.8
Median	2
Q1−Q3	1−6
Missing	8

ICU stay (days) **Dead** (N=8963)	
Mean	7.2
SD	10.8
Median	3
Q1−Q3	1−9
Missing	2

Stay after ICU (days) * **Alive** (N=39417)	
Mean	12.3
SD	15.6
Median	8
Q1−Q3	4−15
Missing	222

Hospital stay (days) *	
Mean	18.7
SD	20.4
Median	13
Q1−Q3	7−24
Missing	430

Hospital stay (days) * **Alive** (N=36233)	
Mean	19.8
SD	20.2
Median	14
Q1−Q3	8−25
Missing	9

Hospital stay (days) * **Dead** (N=11104)	
Mean	15.2
SD	20.5
Median	9
Q1−Q3	3−20
Missing	10

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=47757).

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult patients evaluated in the GiViTI model

Patients (N): 45611

Sex	N	%
Male	27199	59.6
Female	18408	40.4
Missing	4	

Age (years)	N	%
17-45	5345	11.7
46-65	12491	27.4
66-75	11701	25.7
>75	16074	35.2
Missing	0	
Mean	66.6	
SD	16.3	
Median	70	
Q1−Q3	57−79	
Min−Max	17−102	

Body mass Index (BMI)	N	%
Underweight	2504	5.5
Normal	20254	44.4
Overweight	14062	30.8
Obese	8787	19.3
Missing	4	

Pregnancy status **Females** (N=18408)	N	%
Not fertile	9730	52.9
Not pregnant/Unknown	8195	44.5
Currently pregnant	84	0.5
Post partum	399	2.2
Missing	0	

Comorbidities	N	%
No	6706	14.7
Yes	38905	85.3
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	23856	52.3
Arrhythmia	7870	17.3
Moderate COPD	6347	13.9
Diabetes Type II without insulin tr.	6061	13.3
Myocardial infarction	5871	12.9
Any tumour without metastasis	5645	12.4
Cerebrovascular disease	4777	10.5
Peripheral vascular disease	4500	9.9
NYHA class II-III	4437	9.7
Antiplatelet therapy	4230	9.3
Missing	0	

Stay before ICU (days)	
Mean	3.7
SD	9.7
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	40300	88.4
Other hospital	5311	11.6
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=45611)	N	%
Medical ward	6387	14.0
Surgical ward	19150	42.0
Emergency room	16326	35.8
Other ICU	2621	5.7
High dependency care unit	1127	2.5
Missing	0	

Reason for transfer from **Other ICU** (N=2621)	N	%
Specialist expertise	743	28.3
Step-up care	387	14.8
Logistical/organizational reasons	1433	54.7
Step-down care	58	2.2
Missing	0	

Ward of admission **Same hospital** (N=40300)	N	%
Medical ward	5682	14.1
Surgical ward	18892	46.9
Emergency room	14028	34.8
Other ICU	687	1.7
High dependency care unit	1011	2.5
Missing	0	

Ward of admission **Other hospital** (N=5311)	N	%
Medical ward	705	13.3
Surgical ward	258	4.9
Emergency room	2298	43.3
Other ICU	1934	36.4
High dependency care unit	116	2.2
Missing	0	

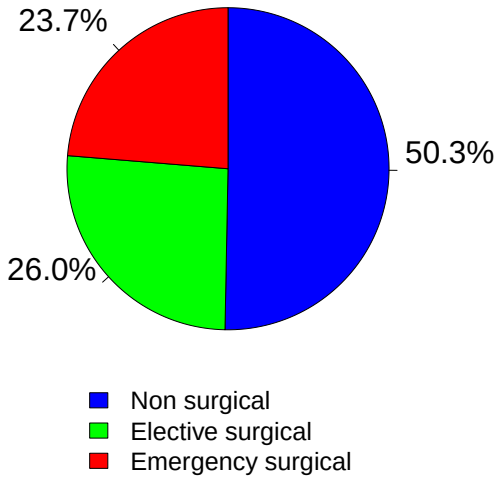
Scheduled admission	N	%
No	36059	79.1
Yes	9552	20.9
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult patients evaluated in the GiViTI model

Trauma	N	%
No	39792	87.2
Yes	5819	12.8
Multiple trauma	2449	5.4
Missing	0	

Surgical status	N	%
Non surgical	22951	50.3
Elective surgical	11851	26.0
Emergency surgical	10809	23.7
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=22660)	N	%
Operating theatre of surgical ward	16863	74.4
Operating theatre of emergency room	2096	9.2
Surgical ward	999	4.4
Other	2702	11.9
Missing	0	

Surgical interventions (top 10) **Elective surgical** (N=11851)	N	%
Gastrointestinal surgery	3332	28.1
Nephro/Urological surgery	1494	12.6
Orthopaedic surgery	1403	11.8
Neurosurgery	1192	10.1
ENT surgery	729	6.2
Thoracic surgery	714	6.0
Gynaecological surgery	604	5.1
Abdominal vascular surgery	506	4.3
Hepatic surgery	498	4.2
Pancreatic surgery	435	3.7
Missing	944	

Timing **Elective surgical** (N=11851)	N	%
From -7 to -3 days	162	1.4
From -2 to -1 days	325	2.7
On ICU admission day	11999	101.2
The day after ICU admission	85	0.7
Missing	17	

Surgical interventions (top 10) **Emergency surgical** (N=10809)	N	%
Gastrointestinal surgery	4602	42.6
Neurosurgery	1606	14.9
Orthopaedic surgery	1338	12.4
Nephro/Urological surgery	638	5.9
Abdominal vascular surgery	432	4.0
Biliary tract surgery	413	3.8
Peripheral vascular surgery	375	3.5
ENT surgery	341	3.2
Obstetric surgery	282	2.6
Thoracic surgery	256	2.4
Missing	526	

Timing **Emergency surgical** (N=10809)	N	%
From -7 to -3 days	269	2.5
From -2 to -1 days	1165	10.8
On ICU admission day	9605	88.9
The day after ICU admission	512	4.7
Missing	27	

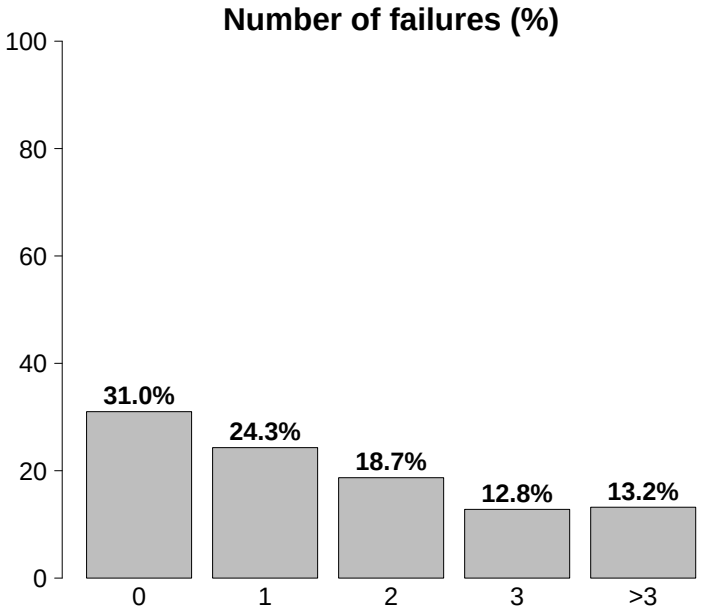
Non surgical interventions	N	%
None	41420	90.8
Elective	632	1.4
Emergency	3559	7.8
Missing	0	

Non surgical interventions **Elective** (N=632)	N	%
Interventional endoscopy	209	33.1
Interventional radiology	125	19.8
Interventional cardiology	125	19.8
Interventional neuroradiology	100	15.8
Missing	73	

Non surgical interventions **Emergency** (N=3559)	N	%
Interventional cardiology	1378	38.7
Interventional radiology	834	23.4
Interventional endoscopy	707	19.9
Interventional neuroradiology	618	17.4
Missing	22	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	19251	42.2
Post surgical weaning	6522	14.4
Surgical monitoring	7573	16.7
Post interventional weaning	192	0.4
Interventional monitoring	750	1.7
Non surgical monitoring	3982	8.8
Missing	232	
Admission for procedures/treatments	0	0.0
Intensive Treatment	26356	57.8
Only ventilatory support	13364	29.3
Only cardiovascular support	2023	4.4
Ventilatory and cardiovascular support	10969	24.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	4	



Failures on admission	N	%
No	14140	31.0
Yes	31471	69.0
A: Respiratory failure	24333	53.3
B: Cardiovascular failure	12992	28.5
C: Neurological failure	6138	13.5
D: Hepatic failure	336	0.7
E: Renal failure	15893	34.8
F: Acute skin failure	25	0.1
G: Metabolic failure	11183	24.5
H: Coagulation failure	555	1.2
Missing	0	

Failures on admission (top 10)	N	%
A	6638	14.6
ABEG	3189	7.0
E	2905	6.4
AB	2248	4.9
AC	1956	4.3
AE	1861	4.1
ABE	1561	3.4
ABCEG	1250	2.7
AEG	1038	2.3
EG	1010	2.2
Missing	0	

Respiratory failure	N	%
None	21278	46.7
Only hypoxic failure	7888	17.3
Only hypercapnic failure	1104	2.4
Hypoxic-hypercapnic failure	2836	6.2
Intubation for airway maint.	12505	27.4
Missing	0	

Cardiovascular failure	N	%
None	32619	71.5
Without shock	2752	6.0
Cardiogenic shock	2410	5.3
Septic shock	3180	7.0
Haemorrhagic/hypovolemic shock	1736	3.8
Hypovolemic shock	1229	2.7
Anaphylactic shock	49	0.1
Neurogenic shock	419	0.9
Other shock	583	1.3
Mixed shock	634	1.4
Missing	0	

Neurologic failure	N	%
None	31838	83.8
Cerebral coma	3271	8.6
Metabolic coma	1040	2.7
Postanoxic coma	1565	4.1
Toxic coma	262	0.7
Missing or not evaluable	7635	

Renal failure (AKIN)	N	%
None	29718	65.2
Mild	7707	16.9
Moderate	3688	8.1
Severe	4498	9.9
Missing	0	

Metabolic failure	N	%
None	34427	75.5
pH <= 7.3, PaCO2 < 45 mmHg	2845	6.2
Base deficit >= 5 mmol/L, lactate >1.5x	8338	18.3
Missing	1	

National report for general ICUs - Year 2019
Characteristics on admission - Adult patients evaluated in the GiViTI model

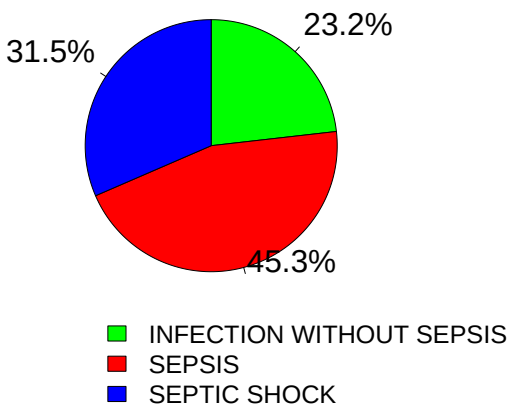
Clinical conditions on admission	N	%
Respiratory	7816	17.1
Acute exacerbation of COPD	1803	4.0
Pleural effusion	1411	3.1
Atelectasis	867	1.9
Aspiration pneumonia	829	1.8
Upper respiratory tract disease	716	1.6
Cardiovascular	8085	17.7
Cardiac arrest	2196	4.8
Left heart failure with pulmonary edema	1527	3.3
Left heart failure without pulm. edema	980	2.1
Acute severe arrhythmia: tachycardias	879	1.9
Acute ischaemia	712	1.6
Neurological	6746	14.8
Spontaneous Intraparenchymal bleeding	1395	3.1
Cerebral artery stroke	1175	2.6
Seizures	1074	2.4
Brain tumour	1029	2.3
Spontaneous Subarachnoid haemorrhage	763	1.7
Gastrointestinal and hepatic	9338	20.5
Digestive tract malignancy	2576	5.6
Gastrointestinal perforation	1454	3.2
Intestinal occlusion	1431	3.1
Gastrointestinal bleeding: upper tract	660	1.4
Acute bile-duct disease	649	1.4
Trauma (anatomical districts)	5819	12.8
Pelvis/bone/joint & muscle	2609	5.7
Head	2386	5.2
Chest	2192	4.8
Spine	1359	3.0
Abdomen	1051	2.3
Major vessels injury	199	0.4
Miscellaneous	109	0.2
Other	11183	24.5
Other disease	2657	5.8
Nephrourologic disease	2454	5.4
Metabolic disorder	2083	4.6
Orthopaedic disease	1045	2.3
ENT/maxillofacial disease	994	2.2
Post transplantation	310	0.7
Renal transplantation	125	0.3
Liver transplantation	115	0.3
Infections	12045	26.4
Pneumonia	4774	10.5
NON-surgical secondary peritonitis	1196	2.6
NON-surgical urinary tract infection	1143	2.5
L.R.T.I. other than pneumonia	784	1.7
Post-surgical peritonitis	652	1.4
Primary bacteraemia of unknown origin	569	1.2
Cholecystitis/cholangitis	562	1.2
NON-surgical skin/soft tissue infection	548	1.2
NON-surgical CNS infection	385	0.8
Primary peritonitis	370	0.8
Missing	0	

Trauma (anatomical districts)	N	%
Head	2386	5.2
Traumatic subarachnoid haemorrhage	892	2.0
Maxillofacial fracture	848	1.9
Traumatic Subdural haematoma	847	1.9
Cerebral contusion/laceration	729	1.6
Skull fracture	608	1.3
Spine	1359	3.0
Vertebral fracture, without deficit	1116	2.4
Cervical injury, incomplete deficit	86	0.2
Tetraplegia	59	0.1
Chest	2192	4.8
Other injuries of the chest	1252	2.7
Traum. haemothorax/pneumothorax	895	2.0
Severe lung contusion/laceration	500	1.1
Abdomen	1051	2.3
Minor injuries of the abdomen	304	0.7
Spleen: Moderate-Severe laceration	276	0.6
Liver: Moderate-Severe laceration	220	0.5
Pelvis/bone/joint & muscle	2609	5.7
Long bone fracture	2083	4.6
Multiple fracture of the pelvis	675	1.5
Very severe or open fracture of the pelvis	102	0.2
Major vessels injury	199	0.4
Proximal limbs vessels: transection	81	0.2
Neck vessels: dissection/transection	48	0.1
Major abdominal vessels: transection	33	0.1
Miscellaneous	109	0.2
Burns (>30% BSA)	77	0.2
Inhalation injury	44	0.1
Missing	0	

Infection severity on admission	N	%
None	33566	74.3
INFECTION WITHOUT SEPSIS	2701	6.0
SEPSIS	5259	11.6
SEPTIC SHOCK	3661	8.1
Missing	424	

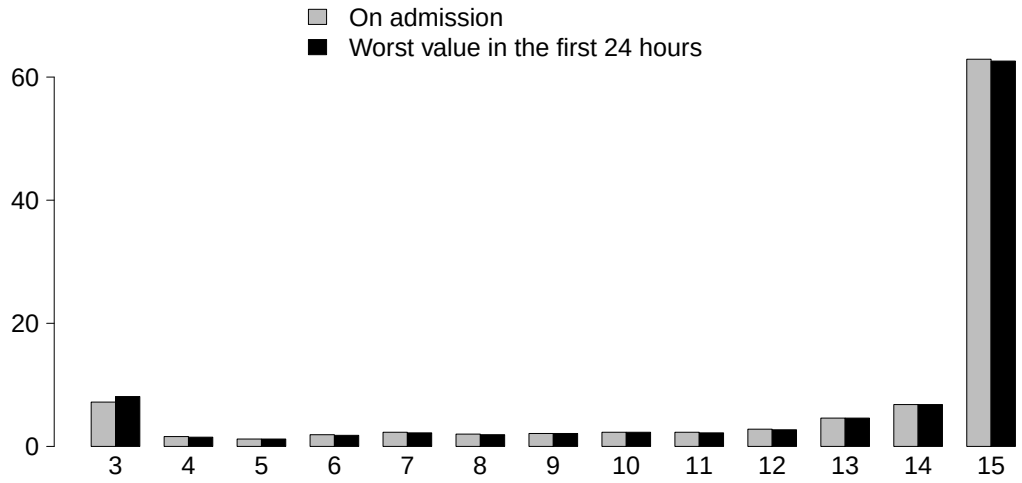
Infection severity on admission

Patients infected (N=11621)



National report for general ICUs - **Year 2019**
Severity scores - Adult patients evaluated in the GiViTI model

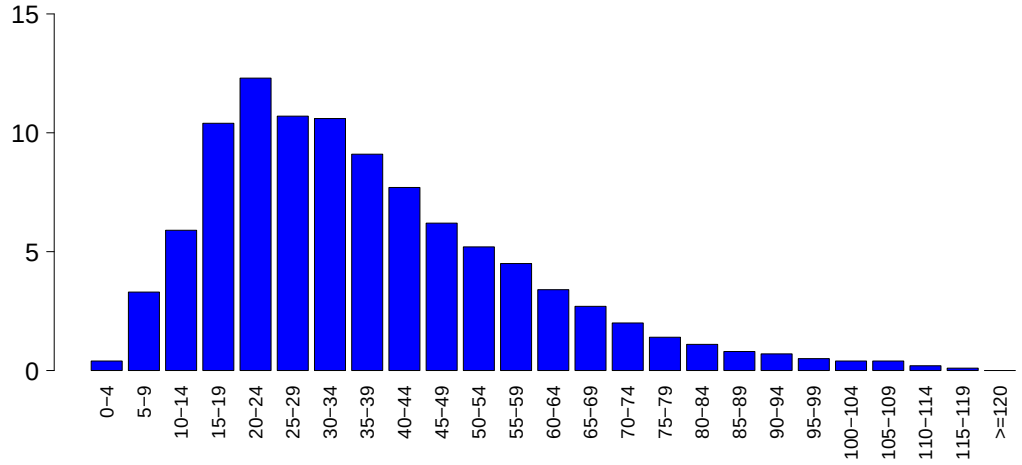
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	12−15
Not evaluable	7635
Missing	0

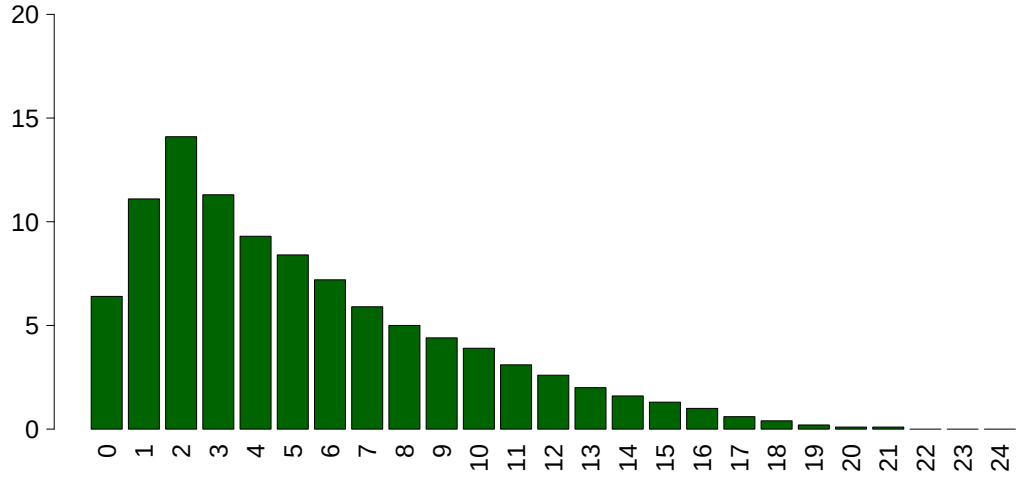
GCS (first 24 hours)	
Median	15
Q1−Q3	12−15
Not evaluable	6425
Missing	0

SAPS II (%)



SAPSII	
Mean	36.9
SD	20.5
Median	33
Q1−Q3	22−48
Not evaluable	6425
Missing	0

SOFA (%)



SOFA	
Mean	5.3
SD	4.2
Median	4
Q1−Q3	2−8
Not evaluable	6425
Missing	0

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult patients evaluated in the GiViTI model

Complications during the stay	N	%
No	32606	71.5
Yes	13003	28.5
Missing	2	

Failures during the stay	N	%
No	39823	87.3
Yes	5788	12.7
A: Respiratory failure	2827	6.2
B: Cardiovascular failure	2449	5.4
C: Neurological failure	475	1.0
D: Hepatic failure	160	0.4
E: Renal failure (AKIN)	1523	3.3
F: Acute skin failure	8	0.0
G: Metabolic failure	445	1.0
H: Coagulation failure	212	0.5
Missing	0	

Failures during the stay (top 10)	N	%
A	1683	3.7
B	1220	2.7
E	666	1.5
AB	467	1.0
G	288	0.6
ABE	222	0.5
BE	216	0.5
C	190	0.4
AE	145	0.3
D	64	0.1
Missing	0	

Respiratory failure occured	N	%
None	42782	93.8
Intubation for airway maint.	809	1.8
Hypoxic failure	1989	4.4
Hypercapnic failure	568	1.2
Missing	2	

Cardiovascular failure occured	N	%
None	43160	94.6
Cardiogenic shock	675	1.5
Hypovolemic shock	322	0.7
Haemorrhagic/hypovolemic shock	256	0.6
Septic shock	870	1.9
Anaphylactic shock	3	0.0
Neurogenic shock	171	0.4
Other shock	258	0.6
Missing	2	

Neurological failure occured	N	%
None	45134	99.0
Cerebral coma	263	0.6
Metabolic coma	91	0.2
Postanoxic coma	126	0.3
Missing	2	

Renal failure occured (AKIN)	N	%
None	44086	96.7
Mild	180	0.4
Moderate	266	0.6
Severe	1077	2.4
Missing	2	

Complications during the stay	N	%
Respiratory	2167	4.8
Pleural effusion	806	1.8
Atelectasis	475	1.0
Pneumothorax/Pneumomediastinum	291	0.6
Severe ARDS	277	0.6
Upper resp. tract disease	151	0.3
Cardiovascular	3200	7.0
Acute severe arrhythmia: tachycardias	1194	2.6
Cardiac arrest	1052	2.3
Acute severe arrhythmia: bradycardias	263	0.6
Pulmonary edema	231	0.5
Deep venous thrombosis	210	0.5
Neurological	2988	6.6
Drowsiness/agitation/delirium	1410	3.1
Seizures	548	1.2
Brain edema	520	1.1
Intracranial hypertension	455	1.0
New ischaemic stroke	188	0.4
Gastrointestinal and hepatic	1227	2.7
Bowel ischaemia	188	0.4
Gastrointestinal bleeding: upper tract	184	0.4
Paralytic Ileus	181	0.4
Gastrointestinal bleeding: lower tract	139	0.3
Gastrointestinal perforation	127	0.3
Other	1084	2.4
Metabolic disorder	445	1.0
Other disease	264	0.6
Nephrourologic disease	249	0.5
Category/Stage II: Partial Thickness Skin Loss	63	0.1
Other skin and/or soft tissue pathology	57	0.1
Extremity compartment syndrome (severe)	33	0.1
Category/Stage III: Full Thickness Skin Loss	28	0.1
Infections	3705	8.1
Pneumonia	1397	3.1
L.R.T.I. other than pneumonia	799	1.8
NON-surgical urinary tract infection	500	1.1
Primary bacteraemia of unknown origin	414	0.9
Catheter-related bacteremia (CR-BSI)	386	0.8
Post-surgical peritonitis	146	0.3
Post-surgical skin/soft tissue infection	119	0.3
Upper respiratory tract infection	119	0.3
F.U.O. fever of unknown origin	106	0.2
Clinical sepsis	88	0.2
Missing	2	

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult patients evaluated in the GiViTI model

Infections	N	%
None	31099	68.2
Only on admission	10805	23.7
On admission and during ICU stay	1238	2.7
Only during ICU stay	2467	5.4
Missing	2	

Maximum severity of infection	N	%
None	31099	69.0
INFECTION WITHOUT SEPSIS	2920	6.5
SEPSIS	6790	15.1
SEPTIC SHOCK	4241	9.4
Missing	561	

Severity evolution		**During the stay**				
	N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	31099 (93.1%)	806 (2.4%)	1272 (3.8%)	229 (0.7%)	33406
	INFECTION WITHOUT SEPSIS	-	2109 (78.1%)	524 (19.4%)	67 (2.5%)	2700
	SEPSIS	-	-	4980 (94.7%)	276 (5.3%)	5256
	SEPTIC SHOCK	-	-	-	3659 (100.0%)	3660
	TOT	31099	2915	6777	4231	45022

Ventil. Associat. Pneumonia (VAP)	N	%
No	44424	97.4
Yes	1186	2.6
Missing	1	

Catheter Bacteraemia (CR-BSI)	N	%
No	45223	99.2
Yes	386	0.8
Missing	2	

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

Estimate	9.5
CI (95%)	8.9−10.0

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

Estimate	1.9
CI (95%)	1.7−2.1

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

Estimate	7.6%
CI (95%)	7.2−8.0

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

Estimate	2.3%
CI (95%)	2.1−2.5

National report for general ICUs - **Year 2019**

Process indicators - 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)	43374	95.1										
Invasive ventilation	30134	66.1	22423	49.2	6527	14.3	1	0–5	3	0	0–0	0
Non invasive ventilation	7106	15.6	1725	3.8	1504	3.3	1	1–3	1	0	0–2	0
Tracheostomy	4505	9.9	1236	2.7	3894	8.5	10	4–19	0	8	4–12	0
iNO (inhaled nitric oxide)	95	0.2	0	0	13	0	2	1–4	0	1	0–2	0
Central Venous Catheter	28849	63.3	13157	28.8	23871	52.3	4	1–9	3	0	0–0	0
PICC	1103	2.4	457	1	960	2.1	3	1–8	0	4	1–16	0
Arterial Catheter	37600	82.4	19064	41.8	10591	23.2	3	1–7	5	0	0–0	0
Vasoactive drugs	16056	35.2	7412	16.3	3760	8.2	2	1–4	0	0	0–0	0
Antiarrhythmics	3113	6.8	849	1.9	1593	3.5	3	1–7	0	1	0–2	0
IABP	310	0.7	238	0.5	91	0.2	2	1–3	0	0	0–1	0
Invasive monitoring of C.O.	1563	3.4	266	0.6	316	0.7	4	2–7	0	0	0–1	0
Continous monitoring of ScVO2	117	0.3	46	0.1	33	0.1	3	1–5	0	0	0–1	0
Temporary pacing	151	0.3	91	0.2	72	0.2	2	1–3	0	0	0–1	0
Ventricular assistance	10	0.0	7	0	2	0	2	1–3	0	0	0–0	0
DC-shock	721	1.6								0	0–1	0
CPR	1179	2.6								0	0–0	0
Massive blood transfusion	549	1.2								0	0–0	0
ICP monitoring without CSF drainage	355	0.8	123	0.3	82	0.2	6	3–10	0	0	0–1	0
ICP monitoring with CSF drainage	353	0.8	181	0.4	152	0.3	9	3–16	0	0	0–1	0
External ventricular drainage without ICP	146	0.3	93	0.2	83	0.2	7	3–13	0	0	0–1	0
Haemofiltration	1664	3.6	156	0.3	445	1	3	2–7	0	1	0–2	0
Haemodialysis	1111	2.4	223	0.5	482	1.1	3	1–8	1	1	0–2	0
ECMO	141	0.3	57	0.1	53	0.1	7	1–15	0	1	0–4	0
Hepatic clearance techniques	11	0.0										
Clearance techniques during sepsis	216	0.5	10	0	40	0.1	2	1–4	0	1	0–2	0
IAP (intra-abdominal pressure)	479	1.1										
Hypothermia	372	0.8										
Enteral nutrition	14210	31.2	2224	4.9	9817	21.5	6	3–13	2	1	0–2	0
Parenteral nutrition	7161	15.7	955	2.1	4534	9.9	4	2–8	3	1	0–2	0
SDD (Topical, Topical and systemic)	658	1.4										
Patient restraint	1128	2.5										
Peridural catheter	1470	3.2	1256	2.8	1200	2.6	1	1–2	1	0	0–2	0
Electrical cardioversion	283	0.6								1	0–3	0
Vacuum therapy	238	0.5										
Antibiotics	27883	61.1										
Antibiotic prophylaxis	14117	31.0	9669	21.2	7995	17.5	1	1–3	5	0	0–0	0
Empirical antibiotic therapy	9152	20.1	4407	9.7	4199	9.2	3	2–5	0	0	0–1	0
Empirical antibiotic therapy in unconfirmed diagnosis	3163	6.9	1269	2.8	1710	3.7	4	2–6	0	0	0–1	0
Targeted antibiotic therapy	6399	14.0	1292	2.8	4026	8.8	6	3–11	2	4	2–7	0

National report for general ICUs - **Year 2019**
Process indicators - Adult patients evaluated in the GiViTI model

Invasive ventilation (N=30134)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	9713	28.9	7.3	10.3	4	1−9	0
For airway mainteinance	12153	36.2	5.3	8.3	2	1−6	3
In weaning	6870	20.4	0.4	0.5	0	0−1	0
Not evaluable	4867	14.5	3.1	6.3	1	0−3	3474
Reintubation within 48 hours	1113	3.3	5.6	8.2	3	1−7	2

Non invasive ventilation (N=7106)	N	%
Non invasive ventilation only	3665	51.6
Non invasive ventilation failed	1282	18.0
For weaning	1872	26.3
Other	287	4.0
Missing	0	

Tracheostomy not present on admission (N=3269)	N	%
Surgical	671	20.5
Percutwist	287	8.8
Ciaglia	469	14.3
Monodil. Ciaglia	1089	33.3
Fantoni	125	3.8
Griggs	445	13.6
Other Kind	132	4.0
Unknown	48	1.5
Missing	3	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=3229)	
Mean	8.7
SD	6.6
Median	8
Q1−Q3	4−12
Missing	2

Invasive monitoring of C.O. (N=1563)	N	%
Swan Ganz	322	20.6
PICCO	990	63.3
LIDCO	0	0.0
Vigileo-PRAM	152	9.7
Other	99	6.3
Missing	0	

SDD (N=658)	N	%
Topical	654	99.4
Topical and systemic	4	0.6
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=2467)	N	%
No therapy	407	16.5
Only empirical	546	22.1
Only targeted	703	28.5
Targeted after empirical	670	27.2
Other	141	5.7
Missing	0	

Surgical interventions	N	%
No	43662	95.7
Yes	1949	4.3
Missing	0	

Number of surgical interventions	N	%
0	43662	95.7
1	1475	3.2
2	320	0.7
3	94	0.2
>3	60	0.1
Missing	0	

Surgical interventions Days from admission	
Mean	9.1
SD	9.4
Median	6
Q1−Q3	3−12
Missing	8

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	801	1.8
Orthopaedic surgery	524	1.1
ENT surgery	289	0.6
Neurosurgery	288	0.6
Thoracic surgery	125	0.3
Other surgery	116	0.3
Maxillo-Facial surgery	106	0.2
Nephro/Urological surgery	91	0.2
Plastic surgery	66	0.1
Peripheral vascular surgery	61	0.1
Missing	0	

Non surgical interventions	N	%
No	44778	98.2
Yes	833	1.8
Missing	0	

Non surgical interventions Days from admission	
Mean	11.9
SD	11.8
Median	8
Q1−Q3	4−15
Missing	20

Non surgical interventions	N	%
Interventional endoscopy	531	1.2
Interventional radiology	231	0.5
Interventional cardiology	160	0.4
Interventional neuroradiology	60	0.1
Missing	0	

National report for general ICUs - **Year 2019**
Outcome indicators - Adult patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	7435	16.3
Transferred to same hospital	33734	74.0
Transferred to other hospital	3934	8.6
Discharged home	340	0.7
Disch. terminally ill	168	0.4
Missing	0	

Transferred to (N=37668)	N	%
Ward	30710	81.5
Other ICU	2783	7.4
High dependency care unit	3172	8.4
Rehabilitation	808	2.1
Day hospital or Long-term care	195	0.5
Missing	0	

Reason of transfer to Other ICU (N=2869)	N	%
Specialist expertise	1141	39.8
Step-up care	224	7.8
Logistical/organizational reasons	1358	47.3
Step-down care	146	5.1
Missing	0	

Transferred to Same hospital (N=33734)	N	%
Ward	29669	87.9
Other ICU	880	2.6
High dependency care unit	2960	8.8
Rehabilitation	166	0.5
Day hospital or Long-term care	59	0.2
Missing	0	

Transferred to Other hospital (N=3934)	N	%
Ward	1041	26.5
Other ICU	1903	48.4
High dependency care unit	212	5.4
Rehabilitation	642	16.3
Day hospital or Long-term care	136	3.5
Missing	0	

ICU mortality	N	%
Alive	38008	83.3
Dead	7603	16.7
Missing	0	

Timing of ICU mortality (N=7603)	N	%
Daytime (08:00AM - 07:59PM)	5217	68.6
Nighttime (08:00PM - 07:59AM)	2385	31.4
Weekdays (Monday - Friday)	5710	75.1
Weekend (Saturday - Sunday)	1892	24.9
Missing	1	

C.A.M. activation (N=7603)	N	%
Yes, with organ donation	454	6.1
Yes, without organ donation	447	6.0
No, with organ donation	21	0.3
No, without organ donation	6511	87.6
Missing	170	

Tissue removal (N=7603)	N	%
Yes, with C.A.M. activation	278	3.7
Yes, without C.A.M. activation	422	5.6
No	6901	90.8
Missing	2	

Hospital mortality	N	%
Dead	9945	21.8
Transf. to other acute-care hospital	4663	10.2
Transf. to other type of hosp. stay	6796	14.9
Nursing home	874	1.9
Voluntary discharge	291	0.6
Discharged home	23042	50.5
Missing	0	

To other type of H stay (N=6796)	N	%
Rehabilitation in the same institute	1039	15.3
Rehabilitation in other institute	3673	54.1
DH/long-term care, same inst.	774	11.4
DH/long-term care, other inst.	1307	19.2
Missing	3	

Disch. terminally ill (N=35666)	N	%
Yes	559	1.6
No	35107	98.4
Missing	0	

Hospital mortality	N	%
Alive	35107	77.0
Dead	10504	23.0
Missing	0	

Timing of hosp. mortality (N=10504)	N	%
In ICU	7602	72.4
Within 24 hours after ICU	193	1.8
24-47 hours after ICU	175	1.7
48-71 hours after ICU	182	1.7
72-95 hours after ICU	138	1.3
After 95 hours after ICU	2210	21.0
Missing	4	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=2902)	
Mean	16.3
SD	20.4
Median	10
Q1−Q3	4−22
Missing	4

National report for general ICUs - **Year 2019**
Outcome indicators - Adult patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	34782	76.3
Dead	10829	23.7
Missing	0	

ICU stay (days)	
Mean	5.6
SD	8.9
Median	2
Q1−Q3	1−6
Missing	1

ICU stay (days) **Alive** (N=38008)	
Mean	5.3
SD	8.6
Median	2
Q1−Q3	1−6
Missing	0

ICU stay (days) **Dead** (N=7603)	
Mean	7.1
SD	10.0
Median	3
Q1−Q3	1−9
Missing	1

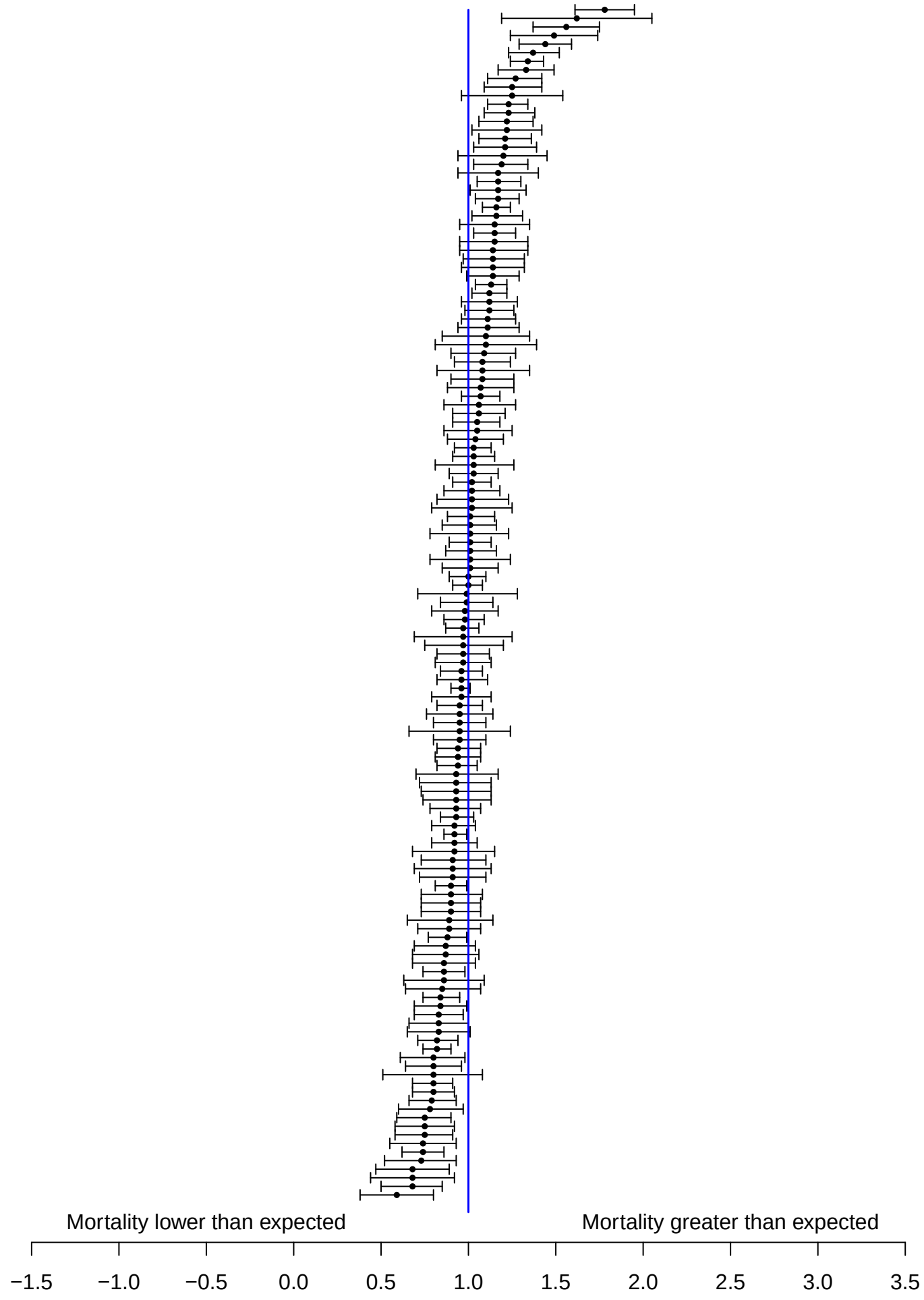
Stay after ICU (days) **Alive** (N=38008)	
Mean	12.4
SD	15.6
Median	8
Q1−Q3	4−16
Missing	14

Hospital stay (days)	
Mean	18.9
SD	20.1
Median	13
Q1−Q3	7−24
Missing	8

Hospital stay (days) **Alive** (N=35107)	
Mean	19.9
SD	20.0
Median	14
Q1−Q3	8−25
Missing	4

Hospital stay (days) **Dead** (N=10504)	
Mean	15.5
SD	20.1
Median	9
Q1−Q3	3−21
Missing	4

National report for general ICUs - **Year 2019**
Analysis of hospital mortality - Adult patients evaluated in the GiViTI model
Predictive model: **GiViTI 2019**



National report for general ICUs - **Year 2019**
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

Patients (N): 22951

Sex	N	%
Male	14002	61.0
Female	8946	39.0
Missing	3	

Age (years)	N	%
17-45	2758	12.0
46-65	6480	28.2
66-75	5872	25.6
>75	7841	34.2
Missing	0	
Mean	66.1	
SD	16.4	
Median	70	
Q1−Q3	57−79	
Min−Max	17−102	

Body mass Index (BMI)	N	%
Underweight	1261	5.5
Normal	10091	44.0
Overweight	7159	31.2
Obese	4437	19.3
Missing	3	

Pregnancy status **Females** (N=8946)	N	%
Not fertile	4772	53.3
Not pregnant/Unknown	4079	45.6
Currently pregnant	39	0.4
Post partum	56	0.6
Missing	0	

Comorbidities	N	%
No	3313	14.4
Yes	19638	85.6
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	11668	50.8
Arrhythmia	4177	18.2
Diabetes Type II without insulin tr.	3232	14.1
Moderate COPD	3189	13.9
Myocardial infarction	2988	13.0
Cerebrovascular disease	2773	12.1
NYHA class II-III	2677	11.7
Moderate or severe renal disease	2366	10.3
Antiplatelet therapy	2111	9.2
Peripheral vascular disease	2100	9.1
Missing	0	

Stay before ICU (days)	
Mean	3.8
SD	10.4
Median	0
Q1−Q3	0−2
Missing	0

Source of admission	N	%
Same hospital	18731	81.6
Other hospital	4220	18.4
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=22951)	N	%
Medical ward	5431	23.7
Surgical ward	1288	5.6
Emergency room	13112	57.1
Other ICU	2186	9.5
High dependency care unit	934	4.1
Missing	0	

Reason for transfer from **Other ICU** (N=2186)	N	%
Specialist expertise	528	24.2
Step-up care	314	14.4
Logistical/organizational reasons	1292	59.1
Step-down care	52	2.4
Missing	0	

Ward of admission **Same hospital** (N=18731)	N	%
Medical ward	4809	25.7
Surgical ward	1203	6.4
Emergency room	11394	60.8
Other ICU	494	2.6
High dependency care unit	831	4.4
Missing	0	

Ward of admission **Other hospital** (N=4220)	N	%
Medical ward	622	14.7
Surgical ward	85	2.0
Emergency room	1718	40.7
Other ICU	1692	40.1
High dependency care unit	103	2.4
Missing	0	

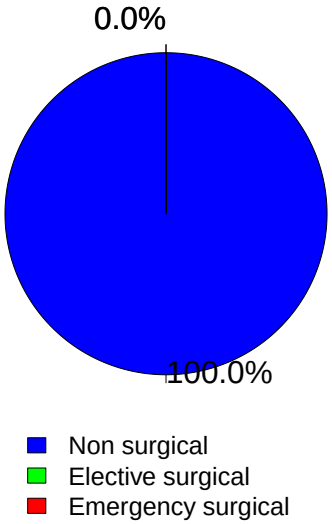
Scheduled admission	N	%
No	22804	99.4
Yes	147	0.6
Missing	0	

National report for general ICUs - Year 2019
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

Trauma	N	%
No	20055	87.4
Yes	2896	12.6
Multiple trauma	1349	5.9
Missing	0	

Surgical status	N	%
Non surgical	22951	100.0
Elective surgical	0	0.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission Surgical pt. (N=0)	N	%
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) Elective surgical (N=0)	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	0.0
Missing	0	

Timing Elective surgical (N=0)	N	%
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) Emergency surgical (N=0)	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	0.0
Missing	0	

Timing Emergency surgical (N=0)	N	%
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	19725	85.9
Elective	394	1.7
Emergency	2832	12.3
Missing	0	

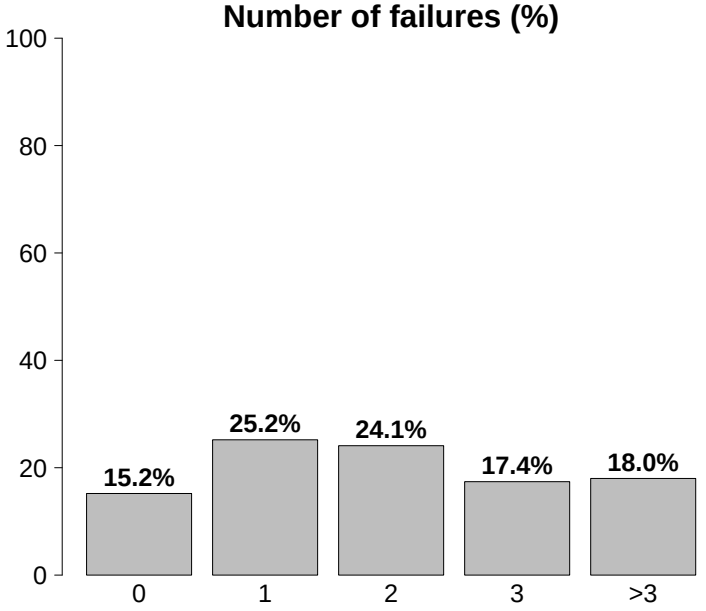
Non surgical interventions Elective (N=394)	N	%
Interventional endoscopy	126	32.0
Interventional cardiology	120	30.5
Interventional radiology	76	19.3
Interventional neuroradiology	75	19.0
Missing	0	

Non surgical interventions Emergency (N=2832)	N	%
Interventional cardiology	1322	46.7
Interventional endoscopy	560	19.8
Interventional radiology	540	19.1
Interventional neuroradiology	446	15.7
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	5118	22.3
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	182	0.8
Interventional monitoring	738	3.2
Non surgical monitoring	3982	17.5
Missing	216	
Admission for procedures/treatments	0	0.0
Intensive Treatment	17829	77.7
Only ventilatory support	9729	42.4
Only cardiovascular support	1168	5.1
Ventilatory and cardiovascular support	6932	30.2
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	4	

Number of failures (%)



Failures on admission	N	%
No	3496	15.2
Yes	19455	84.8
A: Respiratory failure	16661	72.6
B: Cardiovascular failure	8100	35.3
C: Neurological failure	4903	21.4
D: Hepatic failure	274	1.2
E: Renal failure	9346	40.7
F: Acute skin failure	22	0.1
G: Metabolic failure	7083	30.9
H: Coagulation failure	330	1.4
Missing	0	

Failures on admission (top 10)	N	%
A	4509	19.6
ABEG	1868	8.1
AC	1549	6.7
AE	1348	5.9
AB	1266	5.5
ABCEG	1000	4.4
ABE	919	4.0
AEG	794	3.5
E	713	3.1
ABC	587	2.6
Missing	0	

Respiratory failure	N	%
None	6290	27.4
Only hypoxic failure	5908	25.7
Only hypercapnic failure	993	4.3
Hypoxic-hypercapnic failure	2551	11.1
Intubation for airway maint.	7209	31.4
Missing	0	

Cardiovascular failure	N	%
None	14851	64.7
Without shock	1792	7.8
Cardiogenic shock	2197	9.6
Septic shock	1921	8.4
Haemorrhagic/hypovolemic shock	499	2.2
Hypovolemic shock	555	2.4
Anaphylactic shock	41	0.2
Neurogenic shock	270	1.2
Other shock	434	1.9
Mixed shock	391	1.7
Missing	0	

Neurologic failure	N	%
None	14449	74.7
Cerebral coma	2341	12.1
Metabolic coma	871	4.5
Postanoxic coma	1446	7.5
Toxic coma	245	1.3
Missing or not evaluable	3599	

Renal failure (AKIN)	N	%
None	13605	59.3
Mild	3921	17.1
Moderate	2257	9.8
Severe	3168	13.8
Missing	0	

Metabolic failure	N	%
None	15868	69.1
pH <= 7.3, PaCO2 < 45 mmHg	1808	7.9
Base deficit >= 5 mmol/L, lactate >1.5x	5275	23.0
Missing	0	

National report for general ICUs - Year 2019
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

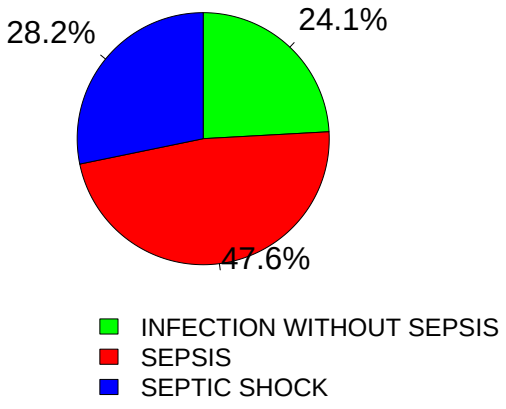
Clinical conditions on admission	N	%
Respiratory	5781	25.2
Acute exacerbation of COPD	1711	7.5
Pleural effusion	1076	4.7
Aspiration pneumonia	673	2.9
Atelectasis	634	2.8
Moderate ARDS	421	1.8
Cardiovascular	5842	25.5
Cardiac arrest	2005	8.7
Left heart failure with pulmonary edema	1437	6.3
Left heart failure without pulm. edema	864	3.8
Acute ischaemia	630	2.7
Acute severe arrhythmia: tachycardias	628	2.7
Neurological	4495	19.6
Cerebral artery stroke	1013	4.4
Seizures	951	4.1
Spontaneous Intraparenchymal bleeding	942	4.1
Metabolic/postanoxic encephalopathy	688	3.0
Spontaneous Subarachnoid haemorrhage	463	2.0
Gastrointestinal and hepatic	1650	7.2
Gastrointestinal bleeding: upper tract	458	2.0
Acute pancreatitis	238	1.0
Liver Dysfunction Syndrome	174	0.8
Gastrointestinal bleeding: lower tract	135	0.6
Acute bile-duct disease	130	0.6
Trauma (anatomical districts)	2896	12.6
Head	1508	6.6
Chest	1393	6.1
Pelvis/bone/joint & muscle	805	3.5
Spine	765	3.3
Abdomen	438	1.9
Miscellaneous	91	0.4
Major vessels injury	61	0.3
Other	4343	18.9
Metabolic disorder	1627	7.1
Acute intoxication	955	4.2
Other disease	917	4.0
Nephrourologic disease	706	3.1
Coagulation disorder	330	1.4
Post transplantation	85	0.4
Renal transplantation	41	0.2
Bone marrow transplantation	28	0.1
Infections	8144	35.5
Pneumonia	4375	19.1
NON-surgical urinary tract infection	825	3.6
L.R.T.I. other than pneumonia	689	3.0
Primary bacteraemia of unknown origin	499	2.2
NON-surgical CNS infection	330	1.4
Pandemic influenza A/H1N1	304	1.3
NON-surgical skin/soft tissue infection	299	1.3
Clinical sepsis	285	1.2
Cholecystitis/cholangitis	272	1.2
Gastroenteritis	182	0.8
Missing	0	

Trauma (anatomical districts)	N	%
Head	1508	6.6
Traumatic subarachnoid haemorrhage	631	2.7
Maxillofacial fracture	512	2.2
Traumatic Subdural haematoma	501	2.2
Cerebral contusion/laceration	470	2.0
Skull fracture	384	1.7
Spine	765	3.3
Vertebral fracture, without deficit	657	2.9
Cervical injury, incomplete deficit	41	0.2
Tetraplegia	34	0.1
Chest	1393	6.1
Other injuries of the chest	821	3.6
Traum. haemothorax/pneumothorax	547	2.4
Severe lung contusion/laceration	318	1.4
Abdomen	438	1.9
Minor injuries of the abdomen	158	0.7
Spleen: Moderate-Severe laceration	127	0.6
Liver: Moderate-Severe laceration	113	0.5
Pelvis/bone/joint & muscle	805	3.5
Long bone fracture	519	2.3
Multiple fracture of the pelvis	366	1.6
Very severe or open fracture of the pelvis	36	0.2
Major vessels injury	61	0.3
Proximal limbs vessels: transection	18	0.1
Neck vessels: dissection/transection	15	0.1
Aorta: rupture/dissection	13	0.1
Miscellaneous	91	0.4
Burns (>30% BSA)	65	0.3
Inhalation injury	38	0.2
Missing	0	

Infection severity on admission	N	%
None	14807	65.5
INFECTION WITHOUT SEPSIS	1885	8.3
SEPSIS	3718	16.4
SEPTIC SHOCK	2203	9.7
Missing	338	

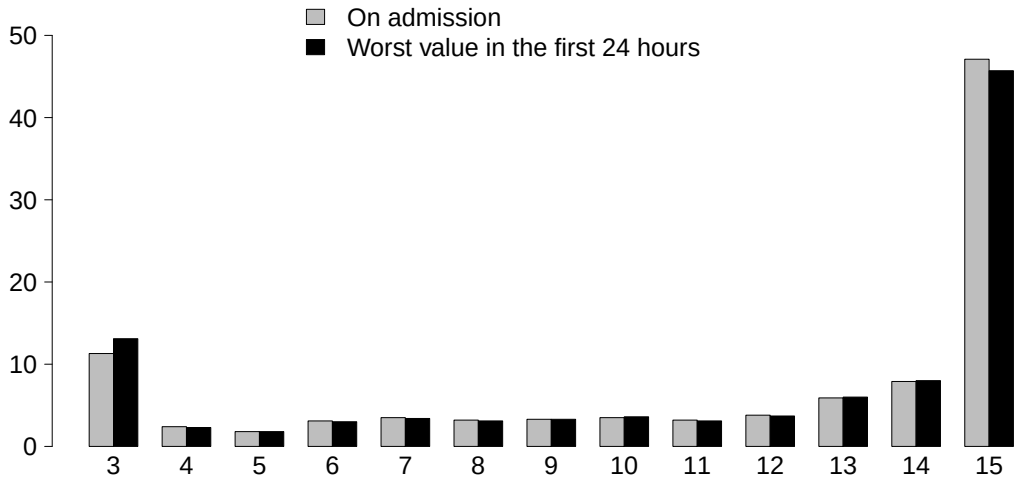
Infection severity on admission

Patients infected (N=7806)



National report for general ICUs - **Year 2019**
Severity scores - Adult non surgical patients evaluated in the GiViTI model

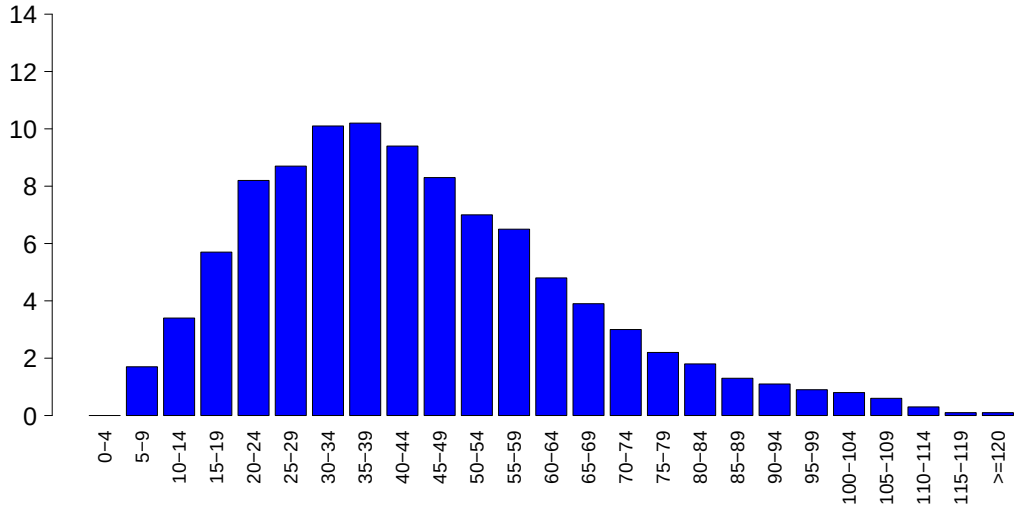
Glasgow Coma Scale (%)



GCS (admission)	
Median	14
Q1−Q3	8−15
Not evaluable	3599
Missing	0

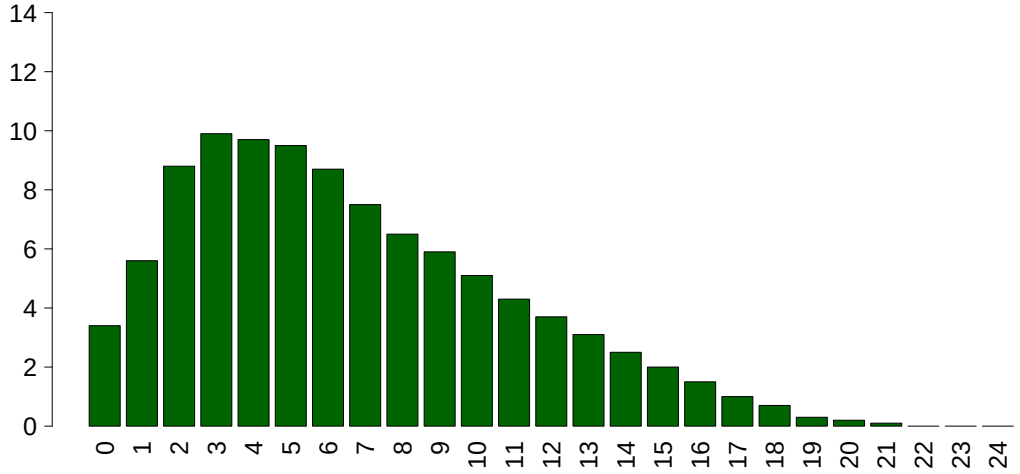
GCS (first 24 hours)	
Median	14
Q1−Q3	8−15
Not evaluable	3715
Missing	0

SAPS II (%)



SAPSII	
Mean	43.7
SD	21.3
Median	40
Q1−Q3	28−56
Not evaluable	3715
Missing	0

SOFA (%)



SOFA	
Mean	6.6
SD	4.3
Median	6
Q1−Q3	3−9
Not evaluable	3715
Missing	0

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult non surgical patients evaluated in the GiViTI model

Complications during the stay	N	%
No	14404	62.8
Yes	8545	37.2
Missing	2	

Failures during the stay	N	%
No	19081	83.1
Yes	3870	16.9
A: Respiratory failure	1882	8.2
B: Cardiovascular failure	1677	7.3
C: Neurological failure	357	1.6
D: Hepatic failure	107	0.5
E: Renal failure (AKIN)	969	4.2
F: Acute skin failure	5	0.0
G: Metabolic failure	276	1.2
H: Coagulation failure	125	0.5
Missing	0	

Failures during the stay (top 10)	N	%
A	1128	4.9
B	852	3.7
E	405	1.8
AB	307	1.3
G	176	0.8
C	154	0.7
BE	150	0.7
ABE	138	0.6
AE	98	0.4
D	45	0.2
Missing	0	

Respiratory failure occured	N	%
None	21067	91.8
Intubation for airway maint.	483	2.1
Hypoxic failure	1365	5.9
Hypercapnic failure	427	1.9
Missing	2	

Cardiovascular failure occured	N	%
None	21272	92.7
Cardiogenic shock	555	2.4
Hypovolemic shock	162	0.7
Haemorrhagic/hypovolemic shock	116	0.5
Septic shock	595	2.6
Anaphylactic shock	3	0.0
Neurogenic shock	136	0.6
Other shock	181	0.8
Missing	2	

Neurological failure occured	N	%
None	22592	98.4
Cerebral coma	190	0.8
Metabolic coma	60	0.3
Postanoxic coma	111	0.5
Missing	2	

Renal failure occured (AKIN)	N	%
None	21980	95.8
Mild	102	0.4
Moderate	149	0.6
Severe	718	3.1
Missing	2	

Complications during the stay	N	%
Respiratory	1410	6.1
Pleural effusion	491	2.1
Atelectasis	259	1.1
Severe ARDS	229	1.0
Pneumothorax/Pneumomediastinum	194	0.8
Haemoptysis	97	0.4
Cardiovascular	2197	9.6
Cardiac arrest	850	3.7
Acute severe arrhythmia: tachycardias	714	3.1
Acute severe arrhythmia: bradycardias	187	0.8
Pulmonary edema	179	0.8
Left heart failure w/o pulm. edema	158	0.7
Neurological	1925	8.4
Drowsiness/agitation/delirium	897	3.9
Seizures	372	1.6
Brain edema	367	1.6
Intracranial hypertension	285	1.2
New ischaemic stroke	98	0.4
Gastrointestinal and hepatic	554	2.4
Gastrointestinal bleeding: upper tract	115	0.5
Paralytic Ileus	87	0.4
Liver Dysfunction Syndrome	84	0.4
Bowel ischaemia	76	0.3
Gastrointestinal bleeding: lower tract	64	0.3
Other	645	2.8
Metabolic disorder	276	1.2
Nephrourologic disease	153	0.7
Other disease	141	0.6
Category/Stage II: Partial Thickness Skin Loss	44	0.2
Other skin and/or soft tissue pathology	30	0.1
Category/Stage III: Full Thickness Skin Loss	20	0.1
Category/Stage IV: Full Thickness Tissue Loss	17	0.1
Infections	2324	10.1
Pneumonia	917	4.0
L.R.T.I. other than pneumonia	529	2.3
NON-surgical urinary tract infection	353	1.5
Primary bacteraemia of unknown origin	253	1.1
Catheter-related bacteremia (CR-BSI)	248	1.1
Upper respiratory tract infection	80	0.3
F.U.O. fever of unknown origin	52	0.2
NON-surgical skin/soft tissue infection	48	0.2
Clinical sepsis	45	0.2
Gastroenteritis	45	0.2
Missing	2	

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult non surgical patients evaluated in the GiViTI model

Infections	N	%
None	13347	58.2
Only on admission	7278	31.7
On admission and during ICU stay	864	3.8
Only during ICU stay	1460	6.4
Missing	2	

Maximum severity of infection	N	%
None	13347	59.2
INFECTION WITHOUT SEPSIS	1918	8.5
SEPSIS	4664	20.7
SEPTIC SHOCK	2631	11.7
Missing	391	

Severity evolution

		During the stay				
	N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	13347 (90.6%)	488 (3.3%)	757 (5.1%)	143 (1.0%)	14735
	INFECTION WITHOUT SEPSIS	-	1426 (75.7%)	399 (21.2%)	59 (3.1%)	1884
	SEPSIS	-	-	3496 (94.1%)	220 (5.9%)	3716
	SEPTIC SHOCK	-	-	-	2201 (100.0%)	2202
	TOT	13347	1914	4653	2623	22537

Ventil. Associat. Pneumonia (VAP)	N	%
No	22170	96.6
Yes	780	3.4
Missing	1	

Catheter Bacteraemia (CR-BSI)	N	%
No	22701	98.9
Yes	248	1.1
Missing	2	

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

Estimate	8.8
CI (95%)	8.2−9.4

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

Estimate	1.8
CI (95%)	1.6−2.1

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

Estimate	7.0%
CI (95%)	6.5−7.5

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

Estimate	2.2%
CI (95%)	1.9−2.5

National report for general ICUs - **Year 2019**

Process indicators - Adult 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)	22088	96.2										
Invasive ventilation	15150	66.0	9323	40.6	4810	21	3	1–8	3	0	0–0	0
Non invasive ventilation	5348	23.3	1389	6.1	1073	4.7	2	1–3	0	0	0–2	0
Tracheostomy	3011	13.1	774	3.4	2529	11	11	5–20	0	8	4–12	0
iNO (inhaled nitric oxide)	82	0.4	0	0	9	0	2	1–4	0	1	0–2	0
Central Venous Catheter	16630	72.5	5241	22.8	12920	56.3	5	2–11	2	0	0–0	0
PICC	678	3.0	213	0.9	568	2.5	5	2–10	0	4	1–15	0
Arterial Catheter	19398	84.5	5622	24.5	6923	30.2	4	2–9	4	0	0–0	0
Vasoactive drugs	9735	42.4	3532	15.4	2749	12	2	1–4	0	0	0–0	0
Antiarrhythmics	2016	8.8	537	2.3	1043	4.5	3	1–8	0	1	0–2	0
IABP	295	1.3	230	1	89	0.4	2	1–3	0	0	0–1	0
Invasive monitoring of C.O.	943	4.1	71	0.3	233	1	4	2–7	0	0	0–1	0
Continous monitoring of ScVO2	68	0.3	12	0.1	16	0.1	4	3–7	0	0	0–1	0
Temporary pacing	129	0.6	76	0.3	58	0.3	2	1–3	0	0	0–1	0
Ventricular assistance	10	0.0	7	0	2	0	2	1–3	0	0	0–0	0
DC-shock	633	2.8								0	0–0	0
CPR	1001	4.4								0	0–0	0
Massive blood transfusion	155	0.7								0	0–0	0
ICP monitoring without CSF drainage	116	0.5	21	0.1	35	0.2	8	3–11	0	0	0–1	0
ICP monitoring with CSF drainage	54	0.2	12	0.1	19	0.1	9	6–14	0	2	0–4	0
External ventricular drainage without ICP	15	0.1	8	0	9	0	13	5–14	0	3	2–14	0
Haemofiltration	1200	5.2	115	0.5	317	1.4	3	2–7	0	0	0–1	0
Haemodialysis	818	3.6	169	0.7	365	1.6	3	1–8	1	1	0–2	0
ECMO	124	0.5	46	0.2	51	0.2	8	1–15	0	1	0–4	0
Hepatic clearance techniques	8	0.0										
Clearance techniques during sepsis	141	0.6	3	0	26	0.1	2	1–3	0	0	0–1	0
IAP (intra-abdominal pressure)	176	0.8										
Hypothermia	348	1.5										
Enteral nutrition	10424	45.4	1795	7.8	6948	30.3	6	3–13	2	1	0–2	0
Parenteral nutrition	3412	14.9	453	2	1753	7.6	5	2–9	2	1	0–2	0
SDD (Topical, Topical and systemic)	325	1.4										
Patient restraint	710	3.1										
Peridural catheter	99	0.4	14	0.1	55	0.2	4	2–7	0	1	0–2	0
Electrical cardioversion	194	0.8								1	0–3	0
Vacuum therapy	29	0.1										
Antibiotics	13125	57.2										
Antibiotic prophylaxis	3680	16.0	1201	5.2	1970	8.6	3	1–5	3	0	0–0	0
Empirical antibiotic therapy	5836	25.4	2467	10.7	2314	10.1	3	2–5	0	0	0–0	0
Empirical antibiotic therapy in unconfirmed diagnosis	2226	9.7	815	3.6	1124	4.9	4	2–7	0	0	0–1	0
Targeted antibiotic therapy	4590	20.0	981	4.3	2809	12.2	6	3–11	2	3	1–6	0

National report for general ICUs - **Year 2019**
Process indicators - Adult non surgical patients evaluated in the GiViTI model

Invasive ventilation (N=15150)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	7373	43.7	7.5	10.3	4	1−10	0
For airway mainteinance	6987	41.4	5.7	8.4	3	1−7	3
In weaning	396	2.3	0.5	0.5	0	0−1	0
Not evaluable	2115	12.5	6.9	8.7	4	1−9	1725
Reintubation within 48 hours	561	3.3	6.2	8.2	4	1−8	1

Non invasive ventilation (N=5348)	N	%
Non invasive ventilation only	2936	54.9
Non invasive ventilation failed	1117	20.9
For weaning	1111	20.8
Other	184	3.4
Missing	0	

Tracheostomy not present on admission (N=2237)	N	%
Surgical	436	19.5
Percutwist	213	9.5
Ciaglia	343	15.3
Monodil. Ciaglia	750	33.5
Fantoni	86	3.8
Griggs	268	12.0
Other Kind	107	4.8
Unknown	31	1.4
Missing	3	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=2212)	
Mean	8.8
SD	6.7
Median	8
Q1−Q3	4−11.8
Missing	2

Invasive monitoring of C.O. (N=943)	N	%
Swan Ganz	188	19.9
PICCO	637	67.6
LIDCO	0	0.0
Vigileo-PRAM	61	6.5
Other	57	6.0
Missing	0	

SDD (N=325)	N	%
Topical	321	98.8
Topical and systemic	4	1.2
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=1460)	N	%
No therapy	235	16.1
Only empirical	320	21.9
Only targeted	413	28.3
Targeted after empirical	411	28.2
Other	81	5.5
Missing	0	

Surgical interventions	N	%
No	21970	95.7
Yes	981	4.3
Missing	0	

Number of surgical interventions	N	%
0	21970	95.7
1	819	3.6
2	121	0.5
3	27	0.1
>3	14	0.1
Missing	0	

Surgical interventions Days from admission	
Mean	9.1
SD	9.2
Median	6
Q1−Q3	3−12
Missing	8

Surgical interventions (top 10)	N	%
Orthopaedic surgery	282	1.2
ENT surgery	205	0.9
Gastrointestinal surgery	195	0.8
Neurosurgery	138	0.6
Thoracic surgery	80	0.3
Nephro/Urological surgery	48	0.2
Maxillo-Facial surgery	48	0.2
Organ donation	40	0.2
Other surgery	31	0.1
Biliary tract surgery	29	0.1
Missing	0	

Non surgical interventions	N	%
No	22382	97.5
Yes	569	2.5
Missing	0	

Non surgical interventions Days from admission	
Mean	11.0
SD	11.2
Median	7
Q1−Q3	3−14
Missing	12

Non surgical interventions	N	%
Interventional endoscopy	370	1.6
Interventional cardiology	138	0.6
Interventional radiology	130	0.6
Interventional neuroradiology	21	0.1
Missing	0	

National report for general ICUs - **Year 2019**
Outcome indicators - Adult non surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	5707	24.9
Transferred to same hospital	13812	60.2
Transferred to other hospital	3022	13.2
Discharged home	269	1.2
Disch. terminally ill	141	0.6
Missing	0	

Transferred to (N=16834)	N	%
Ward	11623	69.0
Other ICU	2112	12.5
High dependency care unit	2332	13.9
Rehabilitation	592	3.5
Day hospital or Long-term care	175	1.0
Missing	0	

Reason of transfer to Other ICU (N=2186)	N	%
Specialist expertise	966	44.2
Step-up care	191	8.7
Logistical/organizational reasons	946	43.3
Step-down care	83	3.8
Missing	0	

Transferred to Same hospital (N=13812)	N	%
Ward	10774	78.0
Other ICU	729	5.3
High dependency care unit	2142	15.5
Rehabilitation	118	0.9
Day hospital or Long-term care	49	0.4
Missing	0	

Transferred to Other hospital (N=3022)	N	%
Ward	849	28.1
Other ICU	1383	45.8
High dependency care unit	190	6.3
Rehabilitation	474	15.7
Day hospital or Long-term care	126	4.2
Missing	0	

ICU mortality	N	%
Alive	17103	74.5
Dead	5848	25.5
Missing	0	

Timing of ICU mortality (N=5848)	N	%
Daytime (08:00AM - 07:59PM)	4031	68.9
Nighttime (08:00PM - 07:59AM)	1816	31.1
Weekdays (Monday - Friday)	4408	75.4
Weekend (Saturday - Sunday)	1440	24.6
Missing	1	

C.A.M. activation (N=5848)	N	%
Yes, with organ donation	370	6.5
Yes, without organ donation	361	6.3
No, with organ donation	14	0.2
No, without organ donation	4960	86.9
Missing	143	

Tissue removal (N=5848)	N	%
Yes, with C.A.M. activation	217	3.7
Yes, without C.A.M. activation	311	5.3
No	5318	91.0
Missing	2	

Hospital mortality	N	%
Dead	7099	30.9
Transf. to other acute-care hospital	3328	14.5
Transf. to other type of hosp. stay	3851	16.8
Nursing home	449	2.0
Voluntary discharge	210	0.9
Discharged home	8014	34.9
Missing	0	

To other type of H stay (N=3851)	N	%
Rehabilitation in the same institute	573	14.9
Rehabilitation in other institute	2114	54.9
DH/long-term care, same inst.	438	11.4
DH/long-term care, other inst.	724	18.8
Missing	2	

Disch. terminally ill (N=15852)	N	%
Yes	335	2.1
No	15517	97.9
Missing	0	

Hospital mortality	N	%
Alive	15517	67.6
Dead	7434	32.4
Missing	0	

Timing of hosp. mortality (N=7434)	N	%
In ICU	5847	78.7
Within 24 hours after ICU	108	1.5
24-47 hours after ICU	119	1.6
48-71 hours after ICU	121	1.6
72-95 hours after ICU	81	1.1
After 95 hours after ICU	1157	15.6
Missing	1	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=1587)	
Mean	14.6
SD	18.3
Median	9
Q1−Q3	3−20
Missing	1

National report for general ICUs - **Year 2019**
Outcome indicators - Adult non surgical patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	15272	66.5
Dead	7679	33.5
Missing	0	

ICU stay (days)	
Mean	7.3
SD	9.7
Median	4
Q1−Q3	2−9
Missing	0

ICU stay (days) **Alive** (N=17103)	
Mean	7.5
SD	9.7
Median	4
Q1−Q3	2−9
Missing	0

ICU stay (days) **Dead** (N=5848)	
Mean	6.9
SD	9.6
Median	3
Q1−Q3	1−9
Missing	0

Stay after ICU (days) **Alive** (N=17103)	
Mean	11.9
SD	15.4
Median	8
Q1−Q3	2−16
Missing	5

Hospital stay (days)	
Mean	18.5
SD	19.7
Median	13
Q1−Q3	6−24
Missing	3

Hospital stay (days) **Alive** (N=15517)	
Mean	20.8
SD	20.0
Median	16
Q1−Q3	8−27
Missing	2

Hospital stay (days) **Dead** (N=7434)	
Mean	13.7
SD	18.2
Median	8
Q1−Q3	2−18
Missing	1

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

Patients (N): 11851

Sex	N	%
Male	7007	59.1
Female	4844	40.9
Missing	0	

Age (years)	N	%
17-45	874	7.4
46-65	3334	28.1
66-75	3618	30.5
>75	4025	34.0
Missing	0	
Mean	68.1	
SD	13.9	
Median	71	
Q1−Q3	60−78	
Min−Max	17−102	

Body mass Index (BMI)	N	%
Underweight	576	4.9
Normal	5130	43.3
Overweight	3515	29.7
Obese	2630	22.2
Missing	0	

Pregnancy status **Females** (N=4844)	N	%
Not fertile	2403	49.6
Not pregnant/Unknown	2395	49.4
Currently pregnant	9	0.2
Post partum	37	0.8
Missing	0	

Comorbidities	N	%
No	1190	10.0
Yes	10661	90.0
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	6782	57.2
Any tumour without metastasis	2856	24.1
Moderate COPD	1937	16.3
Arrhythmia	1861	15.7
Myocardial infarction	1706	14.4
Diabetes Type II without insulin tr.	1631	13.8
Peripheral vascular disease	1321	11.1
Antiplatelet therapy	1145	9.7
Metastatic cancer	1054	8.9
NYHA class II-III	930	7.8
Missing	0	

Stay before ICU (days)	
Mean	3.9
SD	9.1
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	11741	99.1
Other hospital	110	0.9
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=11851)	N	%
Medical ward	191	1.6
Surgical ward	11489	96.9
Emergency room	57	0.5
Other ICU	82	0.7
High dependency care unit	32	0.3
Missing	0	

Reason for transfer from **Other ICU** (N=82)	N	%
Specialist expertise	30	36.6
Step-up care	11	13.4
Logistical/organizational reasons	39	47.6
Step-down care	2	2.4
Missing	0	

Ward of admission **Same hospital** (N=11741)	N	%
Medical ward	186	1.6
Surgical ward	11430	97.4
Emergency room	43	0.4
Other ICU	51	0.4
High dependency care unit	31	0.3
Missing	0	

Ward of admission **Other hospital** (N=110)	N	%
Medical ward	5	4.5
Surgical ward	59	53.6
Emergency room	14	12.7
Other ICU	31	28.2
High dependency care unit	1	0.9
Missing	0	

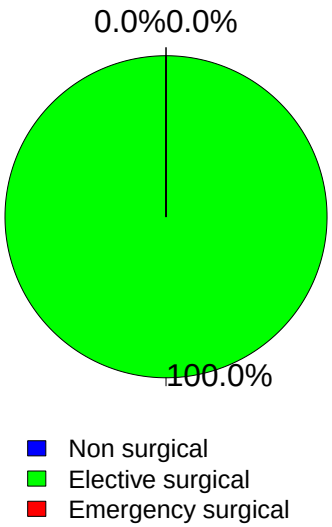
Scheduled admission	N	%
No	2468	20.8
Yes	9383	79.2
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

Trauma	N	%
No	11324	95.6
Yes	527	4.4
Multiple trauma	74	0.6
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	11851	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=11851)	N	%
Operating theatre of surgical ward	11048	93.2
Operating theatre of emergency room	17	0.1
Surgical ward	441	3.7
Other	345	2.9
Missing	0	

Surgical interventions (top 10) **Elective surgical** (N=11851)	N	%
Gastrointestinal surgery	3332	28.1
Nephro/Urological surgery	1494	12.6
Orthopaedic surgery	1403	11.8
Neurosurgery	1192	10.1
ENT surgery	729	6.2
Thoracic surgery	714	6.0
Gynaecological surgery	604	5.1
Abdominal vascular surgery	506	4.3
Hepatic surgery	498	4.2
Pancreatic surgery	435	3.7
Missing	944	

Timing **Elective surgical** (N=11851)	N	%
From -7 to -3 days	162	1.4
From -2 to -1 days	325	2.7
On ICU admission day	11999	101.2
The day after ICU admission	85	0.7
Missing	17	

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

Timing **Emergency surgical** (N=0)	N	%
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	11588	97.8
Elective	163	1.4
Emergency	100	0.8
Missing	0	

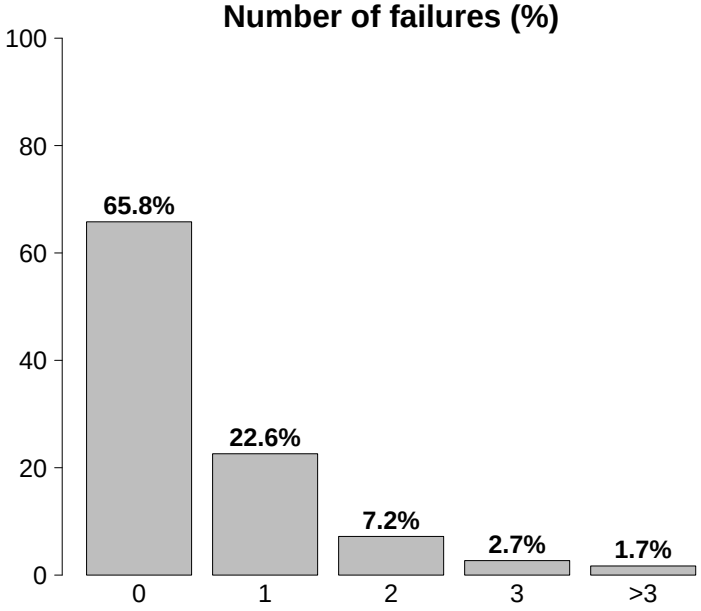
Non surgical interventions **Elective** (N=163)	N	%
Interventional endoscopy	52	31.9
Interventional radiology	35	21.5
Interventional neuroradiology	14	8.6
Interventional cardiology	4	2.5
Missing	58	

Non surgical interventions **Emergency** (N=100)	N	%
Interventional radiology	35	35.0
Interventional cardiology	27	27.0
Interventional endoscopy	19	19.0
Interventional neuroradiology	4	4.0
Missing	15	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	9881	83.4
Post surgical weaning	4494	37.9
Surgical monitoring	5371	45.3
Post interventional weaning	3	0.0
Interventional monitoring	6	0.1
Non surgical monitoring	0	0.0
Missing	7	
Admission for procedures/treatments	0	0.0
Intensive Treatment	1970	16.6
Only ventilatory support	1083	9.1
Only cardiovascular support	323	2.7
Ventilatory and cardiovascular support	564	4.8
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	

Number of failures (%)



Failures on admission	N	%
No	7795	65.8
Yes	4056	34.2
A: Respiratory failure	1647	13.9
B: Cardiovascular failure	887	7.5
C: Neurological failure	140	1.2
D: Hepatic failure	22	0.2
E: Renal failure	2349	19.8
F: Acute skin failure	0	0.0
G: Metabolic failure	1107	9.3
H: Coagulation failure	62	0.5
Missing	0	

Failures on admission (top 10)	N	%
E	1382	11.7
A	760	6.4
G	363	3.1
EG	289	2.4
AB	192	1.6
AE	157	1.3
B	136	1.1
ABEG	124	1.0
ABE	105	0.9
BE	78	0.7
Missing	0	

Respiratory failure	N	%
None	10204	86.1
Only hypoxic failure	377	3.2
Only hypercapnic failure	45	0.4
Hypoxic-hypercapnic failure	80	0.7
Intubation for airway maint.	1145	9.7
Missing	0	

Cardiovascular failure	N	%
None	10964	92.5
Without shock	205	1.7
Cardiogenic shock	84	0.7
Septic shock	82	0.7
Haemorrhagic/hypovolemic shock	252	2.1
Hypovolemic shock	184	1.6
Anaphylactic shock	7	0.1
Neurogenic shock	4	0.0
Other shock	30	0.3
Mixed shock	39	0.3
Missing	0	

Neurologic failure	N	%
None	10066	98.6
Cerebral coma	73	0.7
Metabolic coma	27	0.3
Postanoxic coma	35	0.3
Toxic coma	5	0.0
Missing or not evaluable	1645	

Renal failure (AKIN)	N	%
None	9502	80.2
Mild	1633	13.8
Moderate	407	3.4
Severe	309	2.6
Missing	0	

Metabolic failure	N	%
None	10744	90.7
pH <= 7.3, PaCO2 < 45 mmHg	318	2.7
Base deficit >= 5 mmol/L, lactate >1.5x	789	6.7
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

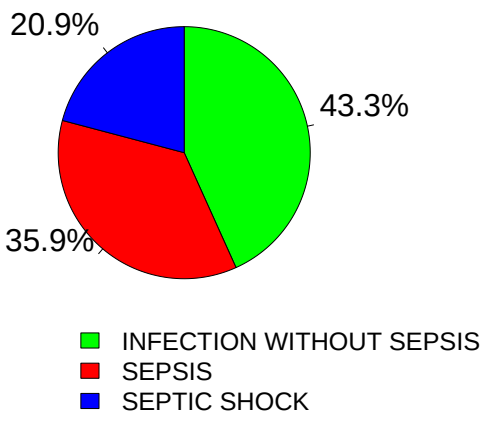
Clinical conditions on admission	N	%
Respiratory	1228	10.4
Lung cancer	516	4.4
Upper respiratory tract disease	203	1.7
Pleural effusion	123	1.0
Atelectasis	119	1.0
Acute asthma/bronchospasm	82	0.7
Cardiovascular	1211	10.2
Non-ruptured aneurysm	440	3.7
Peripheral vascular disease	299	2.5
Acute severe arrhythmia: tachycardias	109	0.9
Cardiac arrest	76	0.6
Left heart failure without pulm. edema	49	0.4
Neurological	1113	9.4
Brain tumour	849	7.2
Neuropathy/myopathy	69	0.6
Seizures	52	0.4
Cerebral Aneurysm	48	0.4
Cerebral artery stroke	36	0.3
Gastrointestinal and hepatic	3500	29.5
Digestive tract malignancy	2181	18.4
Pancreatic malignancy	408	3.4
Hepatic malignancy	407	3.4
Acute bile-duct disease	188	1.6
Intestinal occlusion	118	1.0
Trauma (anatomical districts)	527	4.4
Pelvis/bone/joint & muscle	474	4.0
Spine	62	0.5
Head	48	0.4
Chest	38	0.3
Abdomen	10	0.1
Major vessels injury	2	0.0
-	0	0.0
Other	5068	42.8
Other disease	1413	11.9
Nephrourologic disease	1360	11.5
Orthopaedic disease	794	6.7
ENT/maxillofacial disease	760	6.4
Gynaecological disease	529	4.5
Post transplantation	41	0.3
Liver transplantation	18	0.2
Renal transplantation	16	0.1
Infections	561	4.7
Pneumonia	101	0.9
Post-surgical peritonitis	46	0.4
NON-surgical urinary tract infection	45	0.4
NON-surgical skin/soft tissue infection	40	0.3
Cholecystitis/cholangitis	38	0.3
NON-surgical secondary peritonitis	34	0.3
Post-surgical urinary tract infection	32	0.3
Orthopaedic prosthesis infection	29	0.2
Pleurisy/Pleural empyema	29	0.2
L.R.T.I. other than pneumonia	24	0.2
Missing	0	

Trauma (anatomical districts)	N	%
Head	48	0.4
Maxillofacial fracture	29	0.2
Cerebral contusion/laceration	15	0.1
Traumatic subarachnoid haemorrhage	7	0.1
Extradural/epidural haematoma	4	0.0
Traumatic Subdural haematoma	4	0.0
Spine	62	0.5
Vertebral fracture, without deficit	52	0.4
Cervical injury, incomplete deficit	5	0.0
Tetraplegia	2	0.0
Chest	38	0.3
Other injuries of the chest	22	0.2
Traum. haemothorax/pneumothorax	15	0.1
Severe lung contusion/laceration	6	0.1
Abdomen	10	0.1
Minor injuries of the abdomen	5	0.0
Kidney: Rupture/laceration	2	0.0
Liver: Moderate-Severe laceration	1	0.0
Pelvis/bone/joint & muscle	474	4.0
Long bone fracture	450	3.8
Multiple fracture of the pelvis	35	0.3
Very severe or open fracture of the pelvis	2	0.0
Major vessels injury	2	0.0
Aorta: rupture/dissection	1	0.0
Proximal limbs vessels: transection	1	0.0
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	11290	95.4
INFECTION WITHOUT SEPSIS	234	2.0
SEPSIS	194	1.6
SEPTIC SHOCK	113	1.0
Missing	20	

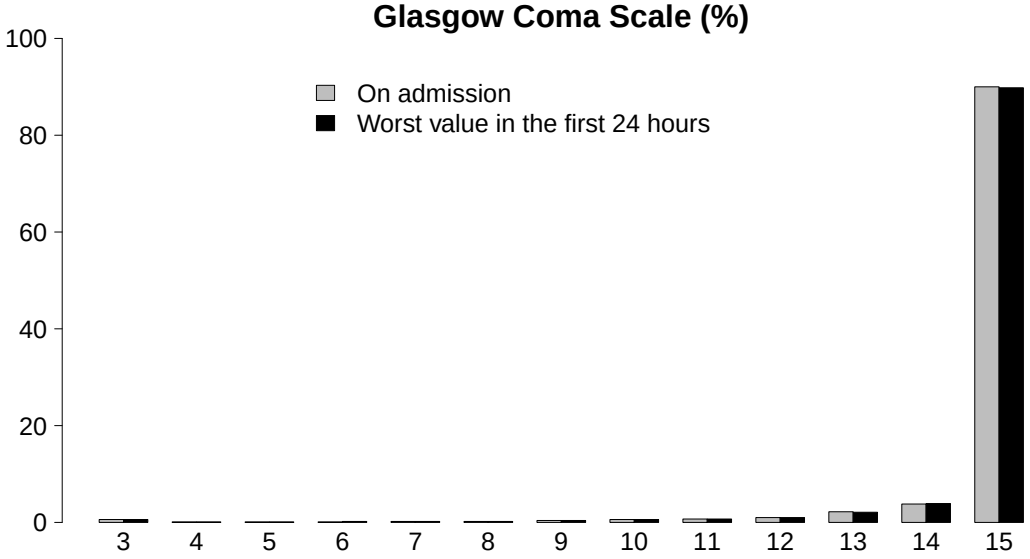
Infection severity on admission

Patients infected (N=541)



National report for general ICUs - **Year 2019**
Severity scores - Adult elective surgical patients evaluated in the GiViTI model

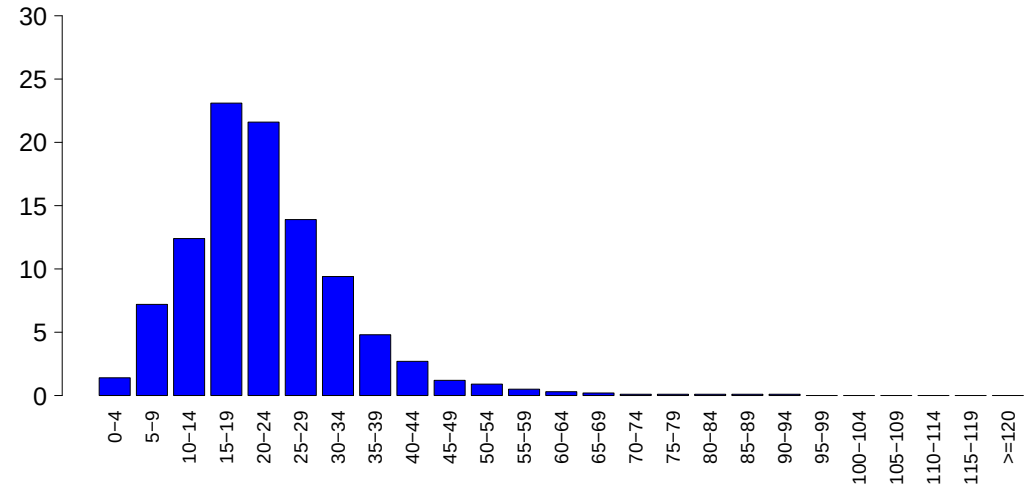
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	15−15
Not evaluable	1645
Missing	0

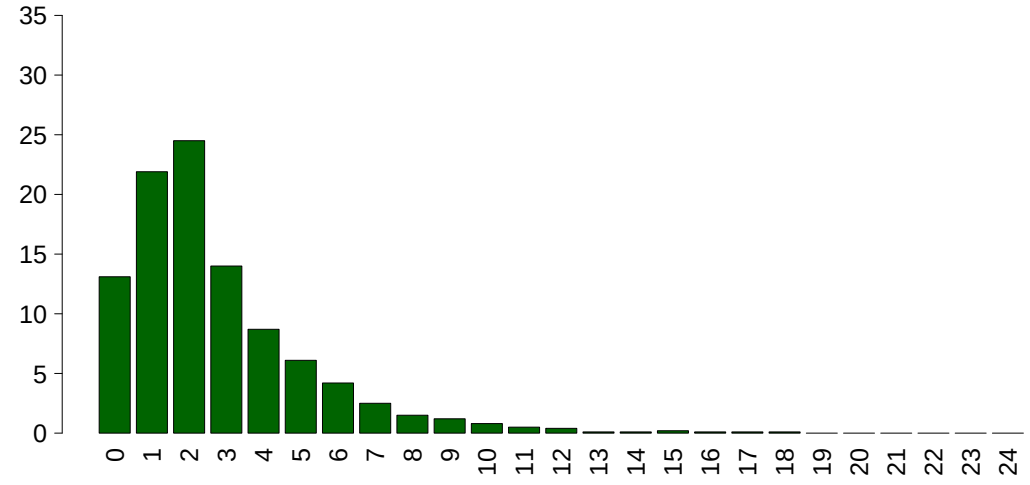
GCS (first 24 hours)	
Median	15
Q1−Q3	15−15
Not evaluable	828
Missing	0

SAPS II (%)



SAPSII	
Mean	22.4
SD	11.1
Median	21
Q1−Q3	15−28
Not evaluable	828
Missing	0

SOFA (%)



SOFA	
Mean	2.7
SD	2.5
Median	2
Q1−Q3	1−4
Not evaluable	828
Missing	0

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult elective surgical patients evaluated in the GiViTI model

Complications during the stay	N	%
No	10761	90.8
Yes	1090	9.2
Missing	0	

Failures during the stay	N	%
No	11381	96.0
Yes	470	4.0
A: Respiratory failure	282	2.4
B: Cardiovascular failure	176	1.5
C: Neurological failure	25	0.2
D: Hepatic failure	14	0.1
E: Renal failure (AKIN)	108	0.9
F: Acute skin failure	0	0.0
G: Metabolic failure	34	0.3
H: Coagulation failure	12	0.1
Missing	0	

Failures during the stay (top 10)	N	%
A	176	1.5
B	76	0.6
AB	50	0.4
E	50	0.4
G	23	0.2
ABE	21	0.2
BE	11	0.1
AE	10	0.1
AC	7	0.1
C	6	0.1
Missing	0	

Respiratory failure occured	N	%
None	11569	97.6
Intubation for airway maint.	105	0.9
Hypoxic failure	183	1.5
Hypercapnic failure	33	0.3
Missing	0	

Cardiovascular failure occured	N	%
None	11675	98.5
Cardiogenic shock	29	0.2
Hypovolemic shock	41	0.3
Haemorrhagic/hypovolemic shock	36	0.3
Septic shock	51	0.4
Anaphylactic shock	0	0.0
Neurogenic shock	3	0.0
Other shock	23	0.2
Missing	0	

Neurological failure occured	N	%
None	11826	99.8
Cerebral coma	16	0.1
Metabolic coma	7	0.1
Postanoxic coma	2	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	11743	99.1
Mild	24	0.2
Moderate	28	0.2
Severe	56	0.5
Missing	0	

Complications during the stay	N	%
Respiratory	207	1.7
Pleural effusion	62	0.5
Atelectasis	54	0.5
Upper resp. tract disease	32	0.3
Pneumothorax/Pneumomediastinum	26	0.2
Acute asthma/bronchospasm	18	0.2
Cardiovascular	258	2.2
Acute severe arrhythmia: tachycardias	130	1.1
Cardiac arrest	31	0.3
Acute severe arrhythmia: bradycardias	24	0.2
Peripheral vascular disease	23	0.2
Acute ischaemia	17	0.1
Neurological	208	1.8
Drowsiness/agitation/delirium	132	1.1
Seizures	43	0.4
Post-surgical intracranial bleeding	17	0.1
New ischaemic stroke	15	0.1
Brain edema	9	0.1
Gastrointestinal and hepatic	176	1.5
Intrabdominal bleeding	36	0.3
Anastomotic dehiscence	34	0.3
Bowel ischaemia	24	0.2
Gastrointestinal perforation	23	0.2
Paralytic Ileus	19	0.2
Other	124	1.0
Other disease	54	0.5
Metabolic disorder	34	0.3
Nephrourologic disease	34	0.3
Other skin and/or soft tissue pathology	8	0.1
Category/Stage III: Full Thickness Skin Loss	2	0.0
Extremity compartment syndrome (severe)	2	0.0
Graft vascular thrombosis	1	0.0
Infections	230	1.9
Pneumonia	67	0.6
Post-surgical peritonitis	38	0.3
L.R.T.I. other than pneumonia	33	0.3
NON-surgical urinary tract infection	25	0.2
Primary bacteraemia of unknown origin	23	0.2
Clinical sepsis	17	0.1
Catheter-related bacteremia (CR-BSI)	13	0.1
Post-surgical skin/soft tissue infection	12	0.1
F.U.O. fever of unknown origin	9	0.1
Upper respiratory tract infection	6	0.1
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult elective surgical patients evaluated in the GiViTI model

Infections	N	%
None	11108	93.7
Only on admission	513	4.3
On admission and during ICU stay	48	0.4
Only during ICU stay	182	1.5
Missing	0	

Maximum severity of infection	N	%
None	11108	94.1
INFECTION WITHOUT SEPSIS	254	2.2
SEPSIS	294	2.5
SEPTIC SHOCK	153	1.3
Missing	42	

Severity evolution		**During the stay**				
	N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	11108 (98.6%)	47 (0.4%)	82 (0.7%)	29 (0.3%)	11266
	INFECTION WITHOUT SEPSIS	-	207 (88.5%)	25 (10.7%)	2 (0.9%)	234
	SEPSIS	-	-	186 (95.9%)	8 (4.1%)	194
	SEPTIC SHOCK	-	-	-	113 (100.0%)	113
	TOT	11108	254	293	152	11807

Ventil. Associat. Pneumonia (VAP)	N	%
No	11803	99.6
Yes	48	0.4
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	11838	99.9
Yes	13	0.1
Missing	0	

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

Estimate	11.0
CI (95%)	8.1−14.6

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

Estimate	0.9
CI (95%)	0.5−1.6

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

Estimate	8.8%
CI (95%)	6.5−11.7

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

Estimate	1.1%
CI (95%)	0.6−1.9

National report for general ICUs - **Year 2019**

Process indicators - Adult 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
Procedures (antibiotics excluded)	10858	91.6										
Invasive ventilation	6489	54.8	5924	50	276	2.3	0	0–1	0	0	0–0	0
Non invasive ventilation	759	6.4	217	1.8	220	1.9	1	1–2	1	0	0–1	0
Tracheostomy	447	3.8	306	2.6	431	3.6	2	1–5	0	8	3–11	0
iNO (inhaled nitric oxide)	1	0.0	0	0	0	0	4	4–4	0	0	0–0	0
Central Venous Catheter	4749	40.1	3739	31.6	4494	37.9	1	1–3	1	0	0–0	0
PICC	208	1.8	156	1.3	194	1.6	1	1–2	0	1	0–6	0
Arterial Catheter	9012	76.0	7464	63	1152	9.7	1	1–2	1	0	0–0	0
Vasoactive drugs	1563	13.2	1000	8.4	156	1.3	1	0–2	0	0	0–1	0
Antiarrhythmics	355	3.0	133	1.1	196	1.7	1	1–3	0	1	0–2	0
IABP	8	0.1	2	0	1	0	1	1–2	0	0	0–0	0
Invasive monitoring of C.O.	123	1.0	63	0.5	13	0.1	2	1–4	0	0	0–1	0
Continous monitoring of ScVO2	18	0.2	16	0.1	8	0.1	1	1–2	0	0	0–0	0
Temporary pacing	9	0.1	7	0.1	6	0.1	1	1–2	0	0	0–0	0
Ventricular assistance	0	0.0										
DC-shock	32	0.3								0	0–0	0
CPR	39	0.3								0	0–0	0
Massive blood transfusion	71	0.6								0	0–0	0
ICP monitoring without CSF drainage	7	0.1	1	0	0	0	4	2–6	0	2	1–4	0
ICP monitoring with CSF drainage	35	0.3	28	0.2	21	0.2	2	1–7	0	1	1–8	0
External ventricular drainage without ICP	18	0.2	15	0.1	16	0.1	1	1–3	0	0	0–0	0
Haemofiltration	70	0.6	8	0.1	25	0.2	3	1–7	0	1	0–2	0
Haemodialysis	72	0.6	15	0.1	29	0.2	1	0–3	0	1	1–2	0
ECMO	5	0.0	2	0	1	0	2	0–10	0	3	2–8	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	10	0.1	3	0	2	0	2	1–3	0	1	0–3	0
IAP (intra-abdominal pressure)	63	0.5										
Hypothermia	7	0.1	2	0	0	0	0	0–1	0	0	0–0	0
Enteral nutrition	755	6.4	104	0.9	576	4.9	3	1–8	0	1	1–2	0
Parenteral nutrition	1174	9.9	197	1.7	969	8.2	2	1–4	1	1	0–1	0
SDD (Topical, Topical and systemic)	119	1.0										
Patient restraint	169	1.4										
Peridural catheter	1191	10.0	1127	9.5	1017	8.6	1	1–2	1	0	0–0	0
Electrical cardioversion	17	0.1								2	0–3	0
Vacuum therapy	12	0.1										
Antibiotics	6424	54.2										
Antibiotic prophylaxis	5793	48.9	5085	42.9	3324	28	1	1–1	2	0	0–0	0
Empirical antibiotic therapy	402	3.4	206	1.7	235	2	2	1–5	0	0	0–2	0
Empirical antibiotic therapy in unconfirmed diagnosis	182	1.5	82	0.7	129	1.1	3	1–5	0	0	0–2	0
Targeted antibiotic therapy	288	2.4	114	1	208	1.8	4	2–8	0	4	2–8	0

National report for general ICUs - **Year 2019**
Process indicators - Adult elective surgical patients evaluated in the GiViTI model

Invasive ventilation (N=6489)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	450	5.8	4.6	7.8	2	1−5	0
For airway mainteinance	1133	14.7	2.2	5.3	1	0−2	0
In weaning	4451	57.7	0.3	0.5	0	0−1	0
Not evaluable	1680	21.8	1.4	4.1	0	0−1	1222
Reintubation within 48 hours	182	2.4	3.1	6.8	1	0−2	0

Non invasive ventilation (N=759)	N	%
Non invasive ventilation only	447	58.9
Non invasive ventilation failed	68	9.0
For weaning	219	28.9
Other	25	3.3
Missing	0	

Tracheostomy not present on admission (N=141)	N	%
Surgical	47	33.3
Percutwist	13	9.2
Ciaglia	17	12.1
Monodil. Ciaglia	36	25.5
Fantoni	5	3.5
Griggs	16	11.3
Other Kind	5	3.5
Unknown	2	1.4
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=134)	
Mean	8.3
SD	7.2
Median	8
Q1−Q3	3−11
Missing	0

Invasive monitoring of C.O. (N=123)	N	%
Swan Ganz	14	11.4
PICCO	52	42.3
LIDCO	0	0.0
Vigileo-PRAM	46	37.4
Other	11	8.9
Missing	0	

SDD (N=119)	N	%
Topical	119	100.0
Topical and systemic	0	0.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=182)	N	%
No therapy	40	22.0
Only empirical	64	35.2
Only targeted	38	20.9
Targeted after empirical	32	17.6
Other	8	4.4
Missing	0	

Surgical interventions	N	%
No	11743	99.1
Yes	108	0.9
Missing	0	

Number of surgical interventions	N	%
0	11743	99.1
1	89	0.8
2	15	0.1
3	4	0.0
>3	0	0.0
Missing	0	

Surgical interventions Days from admission	
Mean	8.9
SD	9.1
Median	4
Q1−Q3	2−12.5
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	56	0.5
Neurosurgery	18	0.2
ENT surgery	14	0.1
Orthopaedic surgery	10	0.1
Maxillo-Facial surgery	5	0.0
Thoracic surgery	5	0.0
Peripheral vascular surgery	5	0.0
Esophageal surgery	4	0.0
Pancreatic surgery	3	0.0
Nephro/Urological surgery	3	0.0
Missing	0	

Non surgical interventions	N	%
No	11810	99.7
Yes	41	0.3
Missing	0	

Non surgical interventions Days from admission	
Mean	11.7
SD	11.1
Median	7.5
Q1−Q3	4−13
Missing	1

Non surgical interventions	N	%
Interventional endoscopy	25	0.2
Interventional radiology	15	0.1
Interventional cardiology	6	0.1
Interventional neuroradiology	1	0.0
Missing	0	

National report for general ICUs - **Year 2019**
Outcome indicators - Adult elective surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	231	1.9
Transferred to same hospital	11420	96.4
Transferred to other hospital	161	1.4
Discharged home	34	0.3
Disch. terminally ill	5	0.0
Missing	0	

Transferred to (N=11581)	N	%
Ward	11221	96.9
Other ICU	85	0.7
High dependency care unit	235	2.0
Rehabilitation	35	0.3
Day hospital or Long-term care	5	0.0
Missing	0	

Reason of transfer to Other ICU (N=86)	N	%
Specialist expertise	39	45.3
Step-up care	6	7.0
Logistical/organizational reasons	39	45.3
Step-down care	2	2.3
Missing	0	

Transferred to Same hospital (N=11420)	N	%
Ward	11147	97.6
Other ICU	36	0.3
High dependency care unit	230	2.0
Rehabilitation	4	0.0
Day hospital or Long-term care	3	0.0
Missing	0	

Transferred to Other hospital (N=161)	N	%
Ward	74	46.0
Other ICU	49	30.4
High dependency care unit	5	3.1
Rehabilitation	31	19.3
Day hospital or Long-term care	2	1.2
Missing	0	

ICU mortality	N	%
Alive	11615	98.0
Dead	236	2.0
Missing	0	

Timing of ICU mortality (N=236)	N	%
Daytime (08:00AM - 07:59PM)	149	63.1
Nighttime (08:00PM - 07:59AM)	87	36.9
Weekdays (Monday - Friday)	169	71.6
Weekend (Saturday - Sunday)	67	28.4
Missing	0	

C.A.M. activation (N=236)	N	%
Yes, with organ donation	3	1.3
Yes, without organ donation	9	3.9
No, with organ donation	0	0.0
No, without organ donation	219	94.8
Missing	5	

Tissue removal (N=236)	N	%
Yes, with C.A.M. activation	4	1.7
Yes, without C.A.M. activation	17	7.2
No	215	91.1
Missing	0	

Hospital mortality	N	%
Dead	638	5.4
Transf. to other acute-care hospital	339	2.9
Transf. to other type of hosp. stay	1102	9.3
Nursing home	204	1.7
Voluntary discharge	29	0.2
Discharged home	9539	80.5
Missing	0	

To other type of H stay (N=1102)	N	%
Rehabilitation in the same institute	201	18.2
Rehabilitation in other institute	582	52.8
DH/long-term care, same inst.	121	11.0
DH/long-term care, other inst.	198	18.0
Missing	0	

Disch. terminally ill (N=11213)	N	%
Yes	95	0.8
No	11118	99.2
Missing	0	

Hospital mortality	N	%
Alive	11118	93.8
Dead	733	6.2
Missing	0	

Timing of hosp. mortality (N=733)	N	%
In ICU	236	32.2
Within 24 hours after ICU	44	6.0
24-47 hours after ICU	21	2.9
48-71 hours after ICU	18	2.5
72-95 hours after ICU	14	1.9
After 95 hours after ICU	399	54.5
Missing	1	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=497)	
Mean	19.9
SD	22.2
Median	13
Q1−Q3	5−27
Missing	1

National report for general ICUs - **Year 2019**
Outcome indicators - Adult elective surgical patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	11110	93.7
Dead	741	6.3
Missing	0	

ICU stay (days)	
Mean	2.0
SD	3.9
Median	1
Q1−Q3	1−1
Missing	0

ICU stay (days) **Alive** (N=11615)	
Mean	1.8
SD	3.5
Median	1
Q1−Q3	1−1
Missing	0

ICU stay (days) **Dead** (N=236)	
Mean	8.0
SD	10.9
Median	3
Q1−Q3	1−11
Missing	0

Stay after ICU (days) **Alive** (N=11615)	
Mean	11.3
SD	13.6
Median	7
Q1−Q3	4−13
Missing	2

Hospital stay (days)	
Mean	16.9
SD	18.1
Median	11
Q1−Q3	7−21
Missing	1

Hospital stay (days) **Alive** (N=11118)	
Mean	16.3
SD	17.4
Median	11
Q1−Q3	7−20
Missing	0

Hospital stay (days) **Dead** (N=733)	
Mean	25.9
SD	25.7
Median	19
Q1−Q3	8.8−35
Missing	1

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

Patients (N): 10809

Sex	N	%
Male	6190	57.3
Female	4618	42.7
Missing	1	

Age (years)	N	%
17-45	1713	15.8
46-65	2677	24.8
66-75	2211	20.5
>75	4208	38.9
Missing	0	
Mean	66.0	
SD	18.4	
Median	71	
Q1−Q3	54−80	
Min−Max	17−101	

Body mass Index (BMI)	N	%
Underweight	667	6.2
Normal	5033	46.6
Overweight	3388	31.3
Obese	1720	15.9
Missing	1	

Pregnancy status **Females** (N=4618)	N	%
Not fertile	2555	55.3
Not pregnant/Unknown	1721	37.3
Currently pregnant	36	0.8
Post partum	306	6.6
Missing	0	

Comorbidities	N	%
No	2203	20.4
Yes	8606	79.6
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	5406	50.0
Arrhythmia	1832	16.9
Moderate COPD	1221	11.3
Diabetes Type II without insulin tr.	1198	11.1
Myocardial infarction	1177	10.9
Any tumour without metastasis	1146	10.6
Cerebrovascular disease	1085	10.0
Peripheral vascular disease	1079	10.0
Antiplatelet therapy	974	9.0
Moderate or severe renal disease	922	8.5
Missing	0	

Stay before ICU (days)	
Mean	3.5
SD	8.8
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	9828	90.9
Other hospital	981	9.1
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=10809)	N	%
Medical ward	765	7.1
Surgical ward	6373	59.0
Emergency room	3157	29.2
Other ICU	353	3.3
High dependency care unit	161	1.5
Missing	0	

Reason for transfer from **Other ICU** (N=353)	N	%
Specialist expertise	185	52.4
Step-up care	62	17.6
Logistical/organizational reasons	102	28.9
Step-down care	4	1.1
Missing	0	

Ward of admission **Same hospital** (N=9828)	N	%
Medical ward	687	7.0
Surgical ward	6259	63.7
Emergency room	2591	26.4
Other ICU	142	1.4
High dependency care unit	149	1.5
Missing	0	

Ward of admission **Other hospital** (N=981)	N	%
Medical ward	78	8.0
Surgical ward	114	11.6
Emergency room	566	57.7
Other ICU	211	21.5
High dependency care unit	12	1.2
Missing	0	

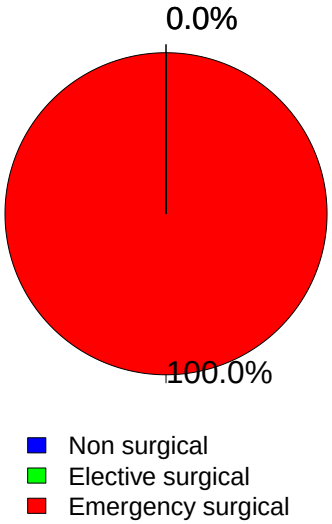
Scheduled admission	N	%
No	10787	99.8
Yes	22	0.2
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

Trauma	N	%
No	8413	77.8
Yes	2396	22.2
Multiple trauma	1026	9.5
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	10809	100.0
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=10809)	N	%
Operating theatre of surgical ward	5815	53.8
Operating theatre of emergency room	2079	19.2
Surgical ward	558	5.2
Other	2357	21.8
Missing	0	

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

Timing **Elective surgical** (N=0)	N	%
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) **Emergency surgical** (N=10809)	N	%
Gastrointestinal surgery	4602	42.6
Neurosurgery	1606	14.9
Orthopaedic surgery	1338	12.4
Nephro/Urological surgery	638	5.9
Abdominal vascular surgery	432	4.0
Biliary tract surgery	413	3.8
Peripheral vascular surgery	375	3.5
ENT surgery	341	3.2
Obstetric surgery	282	2.6
Thoracic surgery	256	2.4
Missing	526	

Timing **Emergency surgical** (N=10809)	N	%
From -7 to -3 days	269	2.5
From -2 to -1 days	1165	10.8
On ICU admission day	9605	88.9
The day after ICU admission	512	4.7
Missing	27	

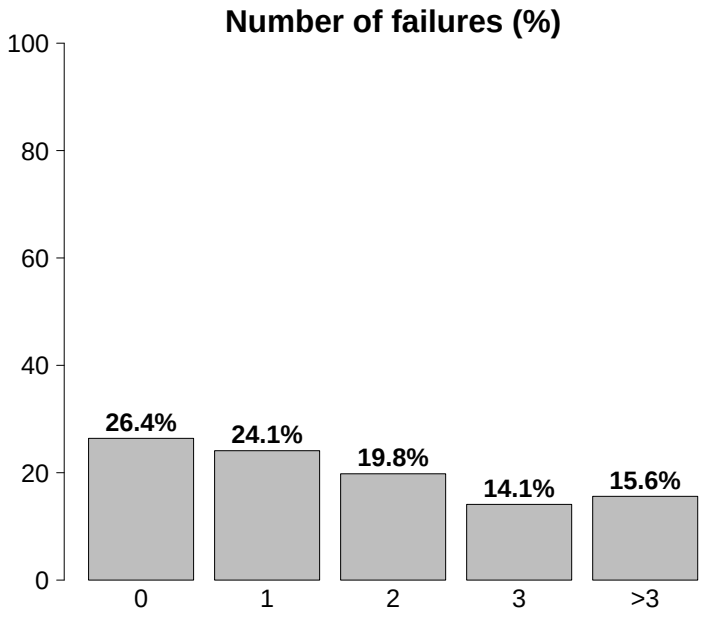
Non surgical interventions	N	%
None	10107	93.5
Elective	75	0.7
Emergency	627	5.8
Missing	0	

Non surgical interventions **Elective** (N=75)	N	%
Interventional endoscopy	31	41.3
Interventional radiology	14	18.7
Interventional neuroradiology	11	14.7
Interventional cardiology	1	1.3
Missing	18	

Non surgical interventions **Emergency** (N=627)	N	%
Interventional radiology	259	41.3
Interventional neuroradiology	168	26.8
Interventional endoscopy	128	20.4
Interventional cardiology	29	4.6
Missing	43	

National report for general ICUs - **Year 2019**
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	4252	39.3
Post surgical weaning	2028	18.8
Surgical monitoring	2202	20.4
Post interventional weaning	7	0.1
Interventional monitoring	6	0.1
Non surgical monitoring	0	0.0
Missing	9	
Admission for procedures/treatments	0	0.0
Intensive Treatment	6557	60.7
Only ventilatory support	2552	23.6
Only cardiovascular support	532	4.9
Ventilatory and cardiovascular support	3473	32.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	2849	26.4
Yes	7960	73.6
A: Respiratory failure	6025	55.7
B: Cardiovascular failure	4005	37.1
C: Neurological failure	1095	10.1
D: Hepatic failure	40	0.4
E: Renal failure	4198	38.8
F: Acute skin failure	3	0.0
G: Metabolic failure	2993	27.7
H: Coagulation failure	163	1.5
Missing	0	

Failures on admission (top 10)	N	%
A	1369	12.7
ABEG	1197	11.1
E	810	7.5
AB	790	7.3
ABE	537	5.0
AC	365	3.4
AE	356	3.3
EG	285	2.6
ABG	273	2.5
G	247	2.3
Missing	0	

Respiratory failure	N	%
None	4784	44.3
Only hypoxic failure	1603	14.8
Only hypercapnic failure	66	0.6
Hypoxic-hypercapnic failure	205	1.9
Intubation for airway maint.	4151	38.4
Missing	0	

Cardiovascular failure	N	%
None	6804	62.9
Without shock	755	7.0
Cardiogenic shock	129	1.2
Septic shock	1177	10.9
Haemorrhagic/hypovolemic shock	985	9.1
Hypovolemic shock	490	4.5
Anaphylactic shock	1	0.0
Neurogenic shock	145	1.3
Other shock	119	1.1
Mixed shock	204	1.9
Missing	0	

Neurologic failure	N	%
None	7323	87.0
Cerebral coma	857	10.2
Metabolic coma	142	1.7
Postanoxic coma	84	1.0
Toxic coma	12	0.1
Missing or not evaluable	2391	

Renal failure (AKIN)	N	%
None	6611	61.2
Mild	2153	19.9
Moderate	1024	9.5
Severe	1021	9.4
Missing	0	

Metabolic failure	N	%
None	7815	72.3
pH <= 7.3, PaCO2 < 45 mmHg	719	6.7
Base deficit >= 5 mmol/L, lactate >1.5x	2274	21.0
Missing	1	

National report for general ICUs - Year 2019
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

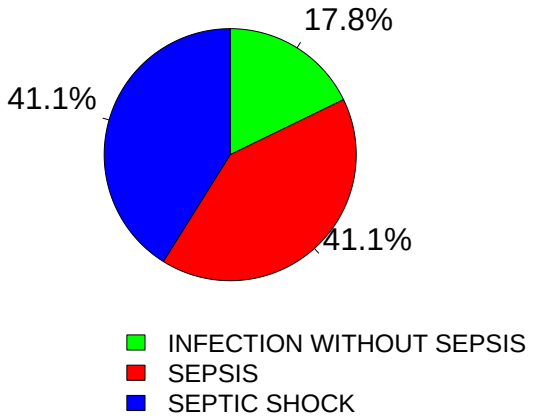
Clinical conditions on admission	N	%
Respiratory	807	7.5
Pleural effusion	212	2.0
Upper respiratory tract disease	132	1.2
Aspiration pneumonia	116	1.1
Atelectasis	114	1.1
Pulmonary embolism	53	0.5
Cardiovascular	1032	9.5
Ruptured or fissured aneurysm	312	2.9
Peripheral vascular disease	223	2.1
Acute severe arrhythmia: tachycardias	142	1.3
Cardiac arrest	115	1.1
Left heart failure without pulm. edema	67	0.6
Neurological	1138	10.5
Spontaneous Intraparenchymal bleeding	439	4.1
Spontaneous Subarachnoid haemorrhage	292	2.7
Cerebral Aneurysm	209	1.9
Cerebral artery stroke	126	1.2
Chronic Subdural haematoma	89	0.8
Gastrointestinal and hepatic	4188	38.7
Gastrointestinal perforation	1337	12.4
Intestinal occlusion	1222	11.3
Bowel ischaemia	538	5.0
Digestive tract malignancy	345	3.2
Acute bile-duct disease	331	3.1
Trauma (anatomical districts)	2396	22.2
Pelvis/bone/joint & muscle	1330	12.3
Head	830	7.7
Chest	761	7.0
Abdomen	603	5.6
Spine	532	4.9
Major vessels injury	136	1.3
Miscellaneous	18	0.2
Other	1772	16.4
Nephrourologic disease	388	3.6
Other disease	327	3.0
Metabolic disorder	286	2.6
Orthopaedic disease	172	1.6
Coagulation disorder	163	1.5
Post transplantation	184	1.7
Liver transplantation	86	0.8
Renal transplantation	68	0.6
Infections	3340	30.9
NON-surgical secondary peritonitis	1073	9.9
Post-surgical peritonitis	557	5.2
Primary peritonitis	300	2.8
Pneumonia	298	2.8
NON-surgical urinary tract infection	273	2.5
Cholecystitis/cholangitis	252	2.3
NON-surgical skin/soft tissue infection	209	1.9
L.R.T.I. other than pneumonia	71	0.7
Clinical sepsis	54	0.5
Primary bacteraemia of unknown origin	51	0.5
Missing	0	

Trauma (anatomical districts)	N	%
Head	830	7.7
Traumatic Subdural haematoma	342	3.2
Maxillofacial fracture	307	2.8
Traumatic subarachnoid haemorrhage	254	2.3
Cerebral contusion/laceration	244	2.3
Skull fracture	220	2.0
Spine	532	4.9
Vertebral fracture, without deficit	407	3.8
Cervical injury, incomplete deficit	40	0.4
Paraplegia	27	0.2
Chest	761	7.0
Other injuries of the chest	409	3.8
Traum. haemothorax/pneumothorax	333	3.1
Severe lung contusion/laceration	176	1.6
Abdomen	603	5.6
Spleen: Moderate-Severe laceration	148	1.4
Minor injuries of the abdomen	141	1.3
Spleen: Massive rupture	123	1.1
Pelvis/bone/joint & muscle	1330	12.3
Long bone fracture	1114	10.3
Multiple fracture of the pelvis	274	2.5
Massive crush/amputation	78	0.7
Major vessels injury	136	1.3
Proximal limbs vessels: transection	62	0.6
Neck vessels: dissection/transection	33	0.3
Major abdominal vessels: transection	22	0.2
Miscellaneous	18	0.2
Burns (>30% BSA)	12	0.1
Inhalation injury	6	0.1
Missing	0	

Infection severity on admission	N	%
None	7469	69.5
INFECTION WITHOUT SEPSIS	582	5.4
SEPSIS	1347	12.5
SEPTIC SHOCK	1345	12.5
Missing	66	

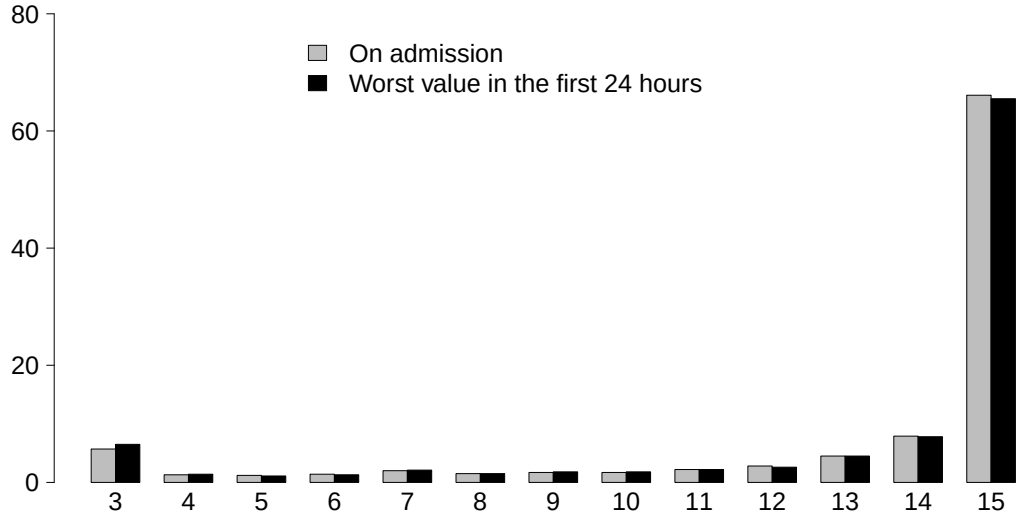
Infection severity on admission

Patients infected (N=3274)



National report for general ICUs - **Year 2019**
Severity scores - Adult emergency surgical patients evaluated in the GiViTI model

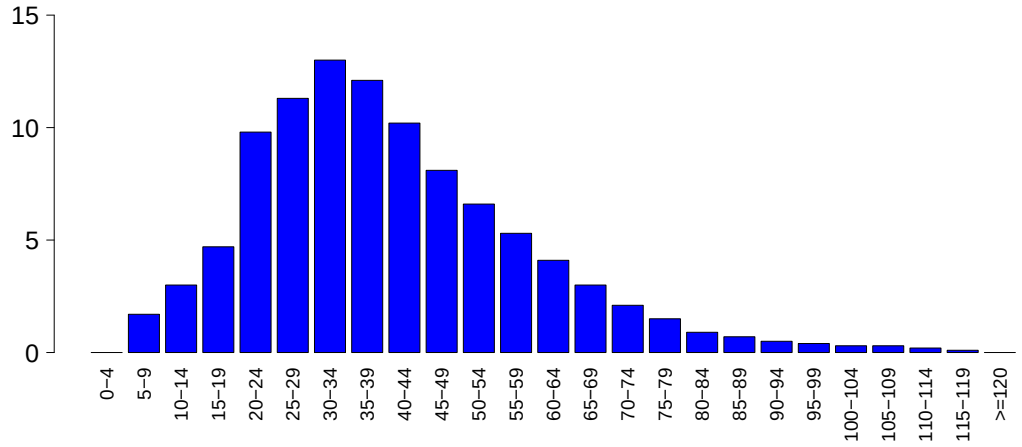
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	13−15
Not evaluable	2391
Missing	0

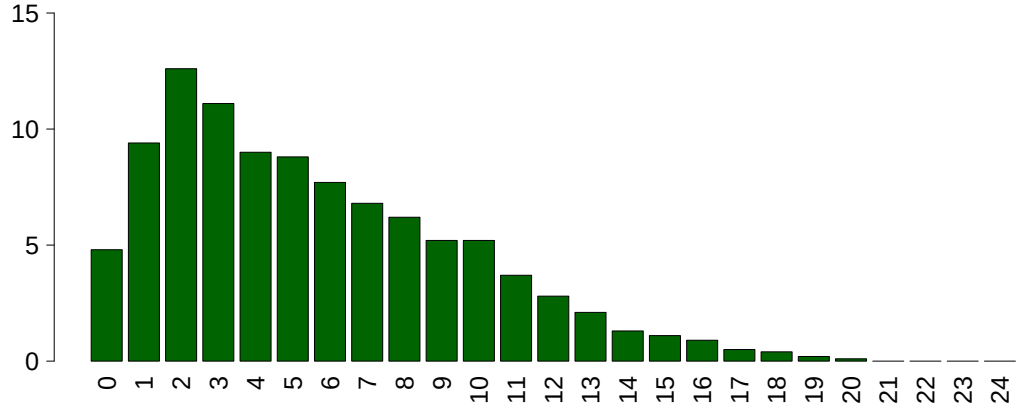
GCS (first 24 hours)	
Median	15
Q1−Q3	13−15
Not evaluable	1882
Missing	0

SAPS II (%)



SAPSII	
Mean	40.1
SD	18.4
Median	37
Q1−Q3	26−50
Not evaluable	1882
Missing	0

SOFA (%)



SOFA	
Mean	5.6
SD	4.0
Median	5
Q1−Q3	2−8
Not evaluable	1882
Missing	0

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult emergency surgical patients evaluated in the GiViTI model

Complications during the stay	N	%
No	7441	68.8
Yes	3368	31.2
Missing	0	

Failures during the stay	N	%
No	9361	86.6
Yes	1448	13.4
A: Respiratory failure	663	6.1
B: Cardiovascular failure	596	5.5
C: Neurological failure	93	0.9
D: Hepatic failure	39	0.4
E: Renal failure (AKIN)	446	4.1
F: Acute skin failure	3	0.0
G: Metabolic failure	135	1.2
H: Coagulation failure	75	0.7
Missing	0	

Failures during the stay (top 10)	N	%
A	379	3.5
B	292	2.7
E	211	2.0
AB	110	1.0
G	89	0.8
ABE	63	0.6
BE	55	0.5
AE	37	0.3
C	30	0.3
AC	18	0.2
Missing	0	

Respiratory failure occured	N	%
None	10146	93.9
Intubation for airway maint.	221	2.0
Hypoxic failure	441	4.1
Hypercapnic failure	108	1.0
Missing	0	

Cardiovascular failure occured	N	%
None	10213	94.5
Cardiogenic shock	91	0.8
Hypovolemic shock	119	1.1
Haemorrhagic/hypovolemic shock	104	1.0
Septic shock	224	2.1
Anaphylactic shock	0	0.0
Neurogenic shock	32	0.3
Other shock	54	0.5
Missing	0	

Neurological failure occured	N	%
None	10716	99.1
Cerebral coma	57	0.5
Metabolic coma	24	0.2
Postanoxic coma	13	0.1
Missing	0	

Renal failure occured (AKIN)	N	%
None	10363	95.9
Mild	54	0.5
Moderate	89	0.8
Severe	303	2.8
Missing	0	

Complications during the stay	N	%
Respiratory	550	5.1
Pleural effusion	253	2.3
Atelectasis	162	1.5
Pneumothorax/Pneumomediastinum	71	0.7
Moderate ARDS	39	0.4
Severe ARDS	39	0.4
Cardiovascular	745	6.9
Acute severe arrhythmia: tachycardias	350	3.2
Cardiac arrest	171	1.6
Deep venous thrombosis	87	0.8
Acute severe arrhythmia: bradycardias	52	0.5
Peripheral vascular disease	42	0.4
Neurological	855	7.9
Drowsiness/agitation/delirium	381	3.5
Intracranial hypertension	164	1.5
Brain edema	144	1.3
Seizures	133	1.2
New ischaemic stroke	75	0.7
Gastrointestinal and hepatic	497	4.6
Bowel ischaemia	88	0.8
Paralytic Ileus	75	0.7
Gastrointestinal perforation	72	0.7
Anastomotic dehiscence	65	0.6
Intrabdominal bleeding	62	0.6
Other	315	2.9
Metabolic disorder	135	1.2
Other disease	69	0.6
Nephrourologic disease	62	0.6
Extremity compartment syndrome (severe)	27	0.2
Other skin and/or soft tissue pathology	19	0.2
Category/Stage II: Partial Thickness Skin Loss	18	0.2
Category/Stage I: Nonblanchable Erythema	6	0.1
Infections	1151	10.6
Pneumonia	413	3.8
L.R.T.I. other than pneumonia	237	2.2
Primary bacteraemia of unknown origin	138	1.3
Catheter-related bacteremia (CR-BSI)	125	1.2
NON-surgical urinary tract infection	122	1.1
Post-surgical peritonitis	91	0.8
Post-surgical skin/soft tissue infection	71	0.7
F.U.O. fever of unknown origin	45	0.4
Upper respiratory tract infection	33	0.3
NON-surgical secondary peritonitis	30	0.3
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics during the stay - Adult emergency surgical patients evaluated in the GiViTI model

Infections	N	%
None	6644	61.5
Only on admission	3014	27.9
On admission and during ICU stay	326	3.0
Only during ICU stay	825	7.6
Missing	0	

Maximum severity of infection	N	%
None	6644	62.2
INFECTION WITHOUT SEPSIS	748	7.0
SEPSIS	1832	17.2
SEPTIC SHOCK	1457	13.6
Missing	128	

Severity evolution		**During the stay**				
	N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	6644 (89.7%)	271 (3.7%)	433 (5.8%)	57 (0.8%)	7405
	INFECTION WITHOUT SEPSIS	-	476 (81.8%)	100 (17.2%)	6 (1.0%)	582
	SEPSIS	-	-	1298 (96.4%)	48 (3.6%)	1346
	SEPTIC SHOCK	-	-	-	1345 (100.0%)	1345
	TOT	6644	747	1831	1456	10678

Ventil. Associat. Pneumonia (VAP)	N	%
No	10451	96.7
Yes	358	3.3
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	10684	98.8
Yes	125	1.2
Missing	0	

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

Estimate	11.2
CI (95%)	10.1−12.5

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

Estimate	2.4
CI (95%)	1.9−2.8

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

Estimate	9.0%
CI (95%)	8.1−10.0

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

Estimate	2.8%
CI (95%)	2.3−3.4

National report for general ICUs - **Year 2019**

Process indicators - Adult 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)	10428	96.5										
Invasive ventilation	8495	78.6	7176	66.4	1441	13.3	1	1–5	0	0	0–0	0
Non invasive ventilation	999	9.2	119	1.1	211	2	2	1–3	0	1	0–4	0
Tracheostomy	1047	9.7	156	1.4	934	8.6	11	5–21	0	7	4–12	0
iNO (inhaled nitric oxide)	12	0.1	0	0	4	0	1	1–2	0	0	0–4	0
Central Venous Catheter	7470	69.1	4177	38.6	6457	59.7	4	2–9	0	0	0–0	0
PICC	217	2.0	88	0.8	198	1.8	3	1–7	0	7	1–23	0
Arterial Catheter	9190	85.0	5978	55.3	2516	23.3	3	1–7	0	0	0–0	0
Vasoactive drugs	4758	44.0	2880	26.6	855	7.9	2	1–4	0	0	0–0	0
Antiarrhythmics	742	6.9	179	1.7	354	3.3	3	1–6	0	1	0–2	0
IABP	7	0.1	6	0.1	1	0	0	0–2	0	0	0–0	0
Invasive monitoring of C.O.	497	4.6	132	1.2	70	0.6	4	2–7	0	0	0–1	0
Continous monitoring of ScVO2	31	0.3	18	0.2	9	0.1	2	1–3	0	0	0–0	0
Temporary pacing	13	0.1	8	0.1	8	0.1	2	1–8	0	1	1–4	0
Ventricular assistance	0	0.0										
DC-shock	56	0.5								1	0–2	0
CPR	139	1.3								0	0–1	0
Massive blood transfusion	323	3.0								0	0–0	0
ICP monitoring without CSF drainage	232	2.1	101	0.9	47	0.4	6	4–9	0	0	0–0	0
ICP monitoring with CSF drainage	264	2.4	141	1.3	112	1	10	5–17	0	0	0–0	0
External ventricular drainage without ICP	113	1.0	70	0.6	58	0.5	8	3–13	0	0	0–1	0
Haemofiltration	394	3.6	33	0.3	103	1	4	2–9	0	1	0–3	0
Haemodialysis	221	2.0	39	0.4	88	0.8	3	1–8	0	1	0–3	0
ECMO	12	0.1	9	0.1	1	0	4	1–7	0	5	4–8	0
Hepatic clearance techniques	3	0.0										
Clearance techniques during sepsis	65	0.6	4	0	12	0.1	2	1–4	0	1	0–1	0
IAP (intra-abdominal pressure)	240	2.2										
Hypothermia	17	0.2	4	0	5	0	2	1–4	0	0	0–3	0
Enteral nutrition	3031	28.0	325	3	2293	21.2	6	3–14	0	2	1–3	0
Parenteral nutrition	2575	23.8	305	2.8	1812	16.8	4	2–8	0	1	0–2	0
SDD (Topical, Topical and systemic)	214	2.0										
Patient restraint	249	2.3										
Peridural catheter	180	1.7	115	1.1	128	1.2	2	1–4	0	1	0–3	0
Electrical cardioversion	72	0.7								1	0–2	0
Vacuum therapy	197	1.8										
Antibiotics	8334	77.1										
Antibiotic prophylaxis	4644	43.0	3383	31.3	2701	25	2	1–3	0	0	0–0	0
Empirical antibiotic therapy	2914	27.0	1734	16	1650	15.3	3	2–5	0	0	0–2	0
Empirical antibiotic therapy in unconfirmed diagnosis	755	7.0	372	3.4	457	4.2	3	2–6	0	0	0–3	0
Targeted antibiotic therapy	1521	14.1	197	1.8	1009	9.3	6	3–11	0	4	2–8	0

National report for general ICUs - **Year 2019**
Process indicators - Adult emergency surgical patients evaluated in the GiViTI model

Invasive ventilation (N=8495)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	1890	21.0	7.0	10.9	3	1−8	0
For airway mainteinance	4033	44.7	5.5	8.6	2	1−7	0
In weaning	2023	22.4	0.5	0.5	0	0−1	0
Not evaluable	1072	11.9	1.9	4.4	1	0−1	527
Reintubation within 48 hours	370	4.1	5.9	8.6	3	1−8	1

Non invasive ventilation (N=999)	N	%
Non invasive ventilation only	282	28.2
Non invasive ventilation failed	97	9.7
For weaning	542	54.3
Other	78	7.8
Missing	0	

Tracheostomy not present on admission (N=891)	N	%
Surgical	188	21.1
Percutwist	61	6.8
Ciaglia	109	12.2
Monodil. Ciaglia	303	34.0
Fantoni	34	3.8
Griggs	161	18.1
Other Kind	20	2.2
Unknown	15	1.7
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=883)	
Mean	8.6
SD	6.2
Median	7
Q1−Q3	4−12
Missing	0

Invasive monitoring of C.O. (N=497)	N	%
Swan Ganz	120	24.1
PICCO	301	60.6
LIDCO	0	0.0
Vigileo-PRAM	45	9.1
Other	31	6.2
Missing	0	

SDD (N=214)	N	%
Topical	214	100.0
Topical and systemic	0	0.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=825)	N	%
No therapy	132	16.0
Only empirical	162	19.6
Only targeted	252	30.5
Targeted after empirical	227	27.5
Other	52	6.3
Missing	0	

Surgical interventions	N	%
No	9949	92.0
Yes	860	8.0
Missing	0	

Number of surgical interventions	N	%
0	9949	92.0
1	567	5.2
2	184	1.7
3	63	0.6
>3	46	0.4
Missing	0	

Surgical interventions Days from admission	
Mean	9.2
SD	9.7
Median	6
Q1−Q3	3−12
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	550	5.1
Orthopaedic surgery	232	2.1
Neurosurgery	132	1.2
Other surgery	85	0.8
ENT surgery	70	0.6
Maxillo-Facial surgery	53	0.5
Nephro/Urological surgery	40	0.4
Thoracic surgery	40	0.4
Plastic surgery	39	0.4
Peripheral vascular surgery	30	0.3
Missing	0	

Non surgical interventions	N	%
No	10586	97.9
Yes	223	2.1
Missing	0	

Non surgical interventions Days from admission	
Mean	14.0
SD	13.0
Median	11
Q1−Q3	5−18
Missing	7

Non surgical interventions	N	%
Interventional endoscopy	136	1.3
Interventional radiology	86	0.8
Interventional neuroradiology	38	0.4
Interventional cardiology	16	0.1
Missing	0	

National report for general ICUs - **Year 2019**
Outcome indicators - Adult emergency surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	1497	13.8
Transferred to same hospital	8502	78.7
Transferred to other hospital	751	6.9
Discharged home	37	0.3
Disch. terminally ill	22	0.2
Missing	0	

Transferred to (N=9253)	N	%
Ward	7866	85.0
Other ICU	586	6.3
High dependency care unit	605	6.5
Rehabilitation	181	2.0
Day hospital or Long-term care	15	0.2
Missing	0	

Reason of transfer to Other ICU (N=597)	N	%
Specialist expertise	136	22.8
Step-up care	27	4.5
Logistical/organizational reasons	373	62.5
Step-down care	61	10.2
Missing	0	

Transferred to Same hospital (N=8502)	N	%
Ward	7748	91.1
Other ICU	115	1.4
High dependency care unit	588	6.9
Rehabilitation	44	0.5
Day hospital or Long-term care	7	0.1
Missing	0	

Transferred to Other hospital (N=751)	N	%
Ward	118	15.7
Other ICU	471	62.7
High dependency care unit	17	2.3
Rehabilitation	137	18.2
Day hospital or Long-term care	8	1.1
Missing	0	

ICU mortality	N	%
Alive	9290	85.9
Dead	1519	14.1
Missing	0	

Timing of ICU mortality (N=1519)	N	%
Daytime (08:00AM - 07:59PM)	1037	68.3
Nighttime (08:00PM - 07:59AM)	482	31.7
Weekdays (Monday - Friday)	1133	74.6
Weekend (Saturday - Sunday)	385	25.4
Missing	0	

C.A.M. activation (N=1519)	N	%
Yes, with organ donation	81	5.4
Yes, without organ donation	77	5.1
No, with organ donation	7	0.5
No, without organ donation	1332	89.0
Missing	22	

Tissue removal (N=1519)	N	%
Yes, with C.A.M. activation	57	3.8
Yes, without C.A.M. activation	94	6.2
No	1368	90.1
Missing	0	

Hospital mortality	N	%
Dead	2208	20.4
Transf. to other acute-care hospital	996	9.2
Transf. to other type of hosp. stay	1843	17.1
Nursing home	221	2.0
Voluntary discharge	52	0.5
Discharged home	5489	50.8
Missing	0	

To other type of H stay (N=1843)	N	%
Rehabilitation in the same institute	265	14.4
Rehabilitation in other institute	977	53.0
DH/long-term care, same inst.	215	11.7
DH/long-term care, other inst.	385	20.9
Missing	1	

Disch. terminally ill (N=8601)	N	%
Yes	129	1.5
No	8472	98.5
Missing	0	

Hospital mortality	N	%
Alive	8472	78.4
Dead	2337	21.6
Missing	0	

Timing of hosp. mortality (N=2337)	N	%
In ICU	1519	65.1
Within 24 hours after ICU	41	1.8
24-47 hours after ICU	35	1.5
48-71 hours after ICU	43	1.8
72-95 hours after ICU	43	1.8
After 95 hours after ICU	654	28.0
Missing	2	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=818)	
Mean	17.5
SD	22.6
Median	11
Q1−Q3	5−23
Missing	2

National report for general ICUs - **Year 2019**
Outcome indicators - Adult emergency surgical patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	8400	77.7
Dead	2409	22.3
Missing	0	

ICU stay (days)	
Mean	6.1
SD	9.8
Median	2
Q1−Q3	1−7
Missing	1

ICU stay (days) **Alive** (N=9290)	
Mean	5.8
SD	9.5
Median	2
Q1−Q3	1−6
Missing	0

ICU stay (days) **Dead** (N=1519)	
Mean	7.8
SD	11.1
Median	4
Q1−Q3	1−10
Missing	1

Stay after ICU (days) **Alive** (N=9290)	
Mean	14.8
SD	18.0
Median	10
Q1−Q3	5−18
Missing	7

Hospital stay (days)	
Mean	21.9
SD	22.5
Median	15
Q1−Q3	9−28
Missing	4

Hospital stay (days) **Alive** (N=8472)	
Mean	23.0
SD	22.3
Median	16
Q1−Q3	10−29
Missing	2

Hospital stay (days) **Dead** (N=2337)	
Mean	17.9
SD	22.6
Median	11
Q1−Q3	4−24
Missing	2

National report for general ICUs - **Year 2019**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Patients (N): 525

Sex	N	%
Male	314	59.8
Female	211	40.2
Missing	0	

Age	N	%
Newborn (0-4 weeks)	0	0.0
1-6 months	2	0.4
6-12 months	13	2.5
12-24 months	29	5.5
2-4 years	85	16.2
5-8 years	79	15.0
9-16 years	317	60.4
Missing	0	
Mean	9.8	
SD	5.4	
Median	11	
Q1−Q3	5−15	
Min−Max	0−16	

Weight (kg) **Newborns** (N=0)	
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	333	63.4
Yes	192	36.6
Missing	0	

Comorbidities (top 10)	N	%
Encephalopathy	43	8.2
Genetic diseases	28	5.3
Hemiplegia or paraplegia or quadriplegia	24	4.6
Asthma	21	4.0
Neurodegenerative/Neuromuscular disease	19	3.6
Brain and skull malformations	18	3.4
Skeletal malformations/disorders	16	3.0
Any tumour without metastasis	13	2.5
Malignant haematological disease	12	2.3
Congenital heart defect	11	2.1
Missing	0	

Previous ICU admissions	N	%
None	370	70.5
<=2	52	9.9
>2	23	4.4
Unknown	80	15.2
Missing	0	

Previous ICU admissions (N=75)	N	%
Paediatric	32	42.7
Neonatal	15	20.0
General - adult	31	41.3
Other/Unknown	6	8.0
Missing	0	

Stay before ICU (days)	
Mean	2.8
SD	15.7
Median	0
Q1−Q3	0−1
Missing	0

Source of admission	N	%
Same hospital	426	81.1
Other hospital	62	11.8
Long-term chronic care hospital	1	0.2
Directly from the community	36	6.9
Missing	0	

Ward of admission **Hospital** (N=488)	N	%
Medical ward	82	16.8
Surgical ward	145	29.7
Emergency room	250	51.2
Other ICU	9	1.8
High dependency care unit	2	0.4
Neonatology	0	0.0
Missing	0	

Reason for transfer from **Other ICU** (N=9)	N	%
Specialist expertise	1	11.1
Step-up care	1	11.1
Logistical/organizational reasons	7	77.8
Step-down care	0	0.0
Missing	0	

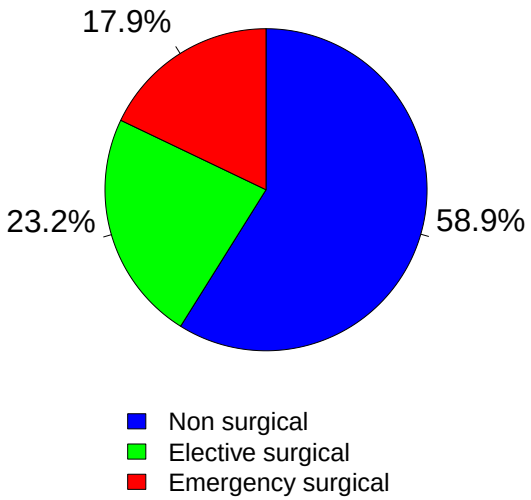
Scheduled admission	N	%
No	417	79.4
Yes	108	20.6
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Trauma	N	%
No	367	69.9
Yes	158	30.1
Multiple trauma	71	13.5
Missing	0	

Surgical status	N	%
Non surgical	309	58.9
Elective surgical	122	23.2
Emergency surgical	94	17.9
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=216)	N	%
Operating theatre of surgical ward	138	64.8
Operating theatre of emergency room	31	14.6
Surgical ward	3	1.4
Other	41	19.2
Missing	3	

Surgical interventions (top 10) **Elective surgical** (N=122)	N	%
Maxillo-Facial surgery	33	27.0
ENT surgery	27	22.1
Orthopaedic surgery	16	13.1
Neurosurgery	15	12.3
Gastrointestinal surgery	9	7.4
Thoracic surgery	6	4.9
Nephro/Urological surgery	5	4.1
Hepatic surgery	3	2.5
Other surgery	3	2.5
Acquired valv. heart dis. surgery	1	0.8
Missing	4	

Timing **Elective surgical** (N=122)	N	%
From -7 to -3 days	1	0.8
From -2 to -1 days	6	4.9
On ICU admission day	117	95.9
The day after ICU admission	0	0.0
Missing	0	

Surgical interventions (top 10) **Emergency surgical** (N=94)	N	%
Gastrointestinal surgery	30	31.9
Orthopaedic surgery	22	23.4
Neurosurgery	22	23.4
Splenectomy	10	10.6
Nephro/Urological surgery	5	5.3
Maxillo-Facial surgery	5	5.3
Peripheral vascular surgery	4	4.3
Other surgery	3	3.2
ENT surgery	2	2.1
Gynaecological surgery	1	1.1
Missing	0	

Timing **Emergency surgical** (N=94)	N	%
From -7 to -3 days	0	0.0
From -2 to -1 days	10	10.6
On ICU admission day	84	89.4
The day after ICU admission	10	10.6
Missing	0	

Non surgical interventions	N	%
None	499	95.0
Elective	0	0.0
Emergency	26	5.0
Missing	0	

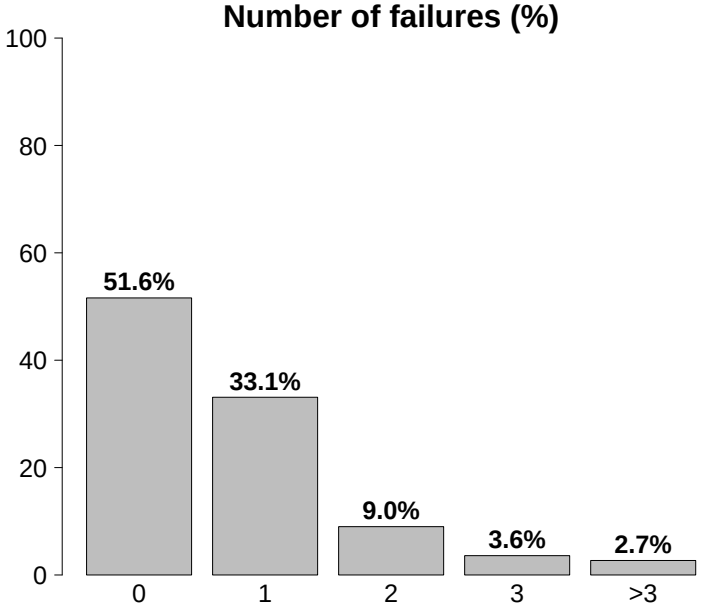
Non surgical interventions **Elective** (N=0)	N	%
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Therapeutic endoscopy (bronchoscopy excluded)	0	0.0
Therapeutic bronchoscopy	0	0.0
Missing	0	

Non surgical interventions **Emergency** (N=26)	N	%
Interventional radiology	15	57.7
Therapeutic endoscopy (bronchoscopy excluded)	3	11.5
Interventional neuroradiology	2	7.7
Diagnostic bronchoscopy on admission	1	3.8
Interventional cardiology	0	0.0
Interventional endoscopy	0	0.0
Missing	5	

National report for general ICUs - **Year 2019**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Reason for admission	N	%
Monitoring/Weaning	317	62.0
Post surgical weaning	83	16.7
Surgical monitoring	82	16.5
Post interventional weaning	3	0.6
Interventional monitoring	8	1.6
Non surgical monitoring	128	25.7
Missing	13	
Admission for procedures/treatments	0	0.0
Intensive Treatment	193	37.8
Ventilatory support	180	34.3
Cardiovascular support	40	7.6
Metabolic support	21	4.0
Missing	0	
Palliative Sedation	1	0.2
Diagnosis of death/Organ donation	0	0.0
Missing	14	

Number of failures (%)



Failures on admission	N	%
No	271	51.6
Yes	254	48.4
A: Respiratory failure	162	30.9
B: Cardiovascular failure	75	14.3
C: Neurological failure	46	8.8
D: Hepatic failure	34	6.5
E: Renal failure	51	9.7
F: Acute skin failure	0	0.0
G: Metabolic failure	18	3.4
H: Coagulation failure	3	0.6
Missing	0	

Failures on admission (top 10)	N	%
A	94	17.9
B	25	4.8
E	20	3.8
AB	18	3.4
C	17	3.2
G	9	1.7
D	8	1.5
ABC	7	1.3
AC	7	1.3
AD	6	1.1
Missing	0	

Respiratory failure	N	%
None	345	65.7
Only hypoxic failure	51	9.7
Only hypercapnic failure	8	1.5
Hypoxic-hypercapnic failure	13	2.5
Intubation for airway maint.	108	20.6
Missing	0	

Cardiovascular failure	N	%
None	485	92.4
Without shock	8	1.5
Cardiogenic shock	9	1.7
Septic shock	7	1.3
Haemorrhagic/hypovolemic shock	11	2.1
Hypovolemic shock	0	0.0
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.2
Other shock	1	0.2
Mixed shock	3	0.6
Missing	0	

Neurologic failure	N	%
None	391	85.2
Cerebral coma	42	9.2
Metabolic coma	10	2.2
Postanoxic coma	12	2.6
Toxic coma	4	0.9
Missing or not evaluable	66	

Renal failure (RIFLE)	N	%
None	474	90.3
Risk	33	6.3
Injury	8	1.5
Failure	6	1.1
Loss	3	0.6
End-stage renal disease	1	0.2
Missing	0	

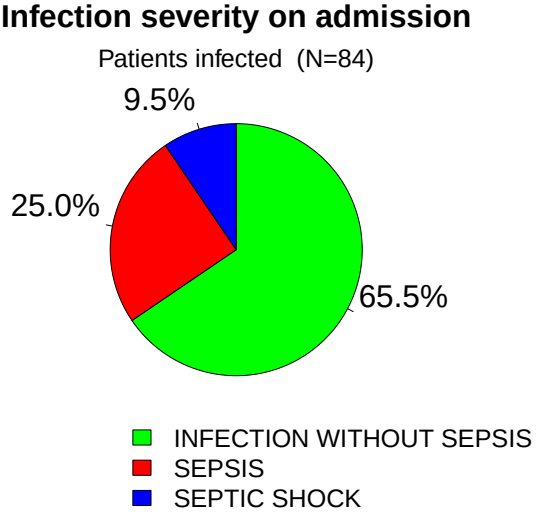
National report for general ICUs - **Year 2019**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Clinical conditions on admission	N	%
Respiratory	89	17.0
Acute asthma/bronchospasm	33	6.3
Upper respiratory tract disease	20	3.8
Aspiration pneumonia	11	2.1
Pneumothorax/Pneumomediastinum	9	1.7
Atelectasis	6	1.1
Cardiovascular	21	4.0
Cardiac arrest	15	2.9
Left heart failure with pulmonary edema	2	0.4
Systemic hypertensive crisis	1	0.2
Left heart failure without pulm. edema	1	0.2
Congenital non-cyanotic cardiopathy	1	0.2
Neurological	105	20.0
Seizures	72	13.7
Brain tumour	13	2.5
Metabolic/postanoxic encephalopathy	9	1.7
Cerebral artery stroke	3	0.6
Spontaneous Hydrocephalus	3	0.6
Gastrointestinal and hepatic	31	5.9
Oesophago-gastro-intestinal malf.	6	1.1
Intrabdominal bleeding (non traumatic)	5	1.0
Intestinal occlusion	4	0.8
Acute inflammatory bowel disease	4	0.8
Bowel ischaemia	3	0.6
Trauma (anatomical districts)	158	30.1
Head	65	12.4
Abdomen	60	11.4
Pelvis/bone/joint & muscle	52	9.9
Chest	49	9.3
Spine	22	4.2
Major vessels injury	5	1.0
Miscellaneous	1	0.2
Other	158	30.1
Other disease	54	10.3
ENT/maxillofacial disease	43	8.2
Acute intoxication	22	4.2
Metabolic disorder	18	3.4
Orthopaedic disease	10	1.9
Post transplantation	3	0.6
Bone marrow transplantation	2	0.4
Lung transplantation	1	0.2
Infections	87	16.6
Pneumonia	36	6.9
L.R.T.I. other than pneumonia	9	1.7
Upper respiratory tract infection	8	1.5
Other viral infections	7	1.3
NON-surgical CNS infection	6	1.1
Gastroenteritis	4	0.8
NON-surgical secondary peritonitis	4	0.8
Primary bacteraemia of unknown origin	3	0.6
Post-surgical peritonitis	3	0.6
F.U.O. fever of unknown origin	2	0.4
Missing	0	

Trauma (anatomical districts)	N	%
Head	65	12.4
Skull fracture	22	4.2
Cerebral contusion/laceration	16	3.0
Traumatic subarachnoid haemorrhage	16	3.0
Maxillofacial fracture	15	2.9
Extradural/epidural haematoma	14	2.7
Spine	22	4.2
Vertebral fracture, without deficit	18	3.4
Paraplegia	2	0.4
Lumbar injury, incomplete deficit	1	0.2
Chest	49	9.3
Other injuries of the chest	27	5.1
Severe lung contusion/laceration	21	4.0
Traum. haemothorax/pneumothorax	19	3.6
Abdomen	60	11.4
Spleen: Moderate-Severe laceration	31	5.9
Minor injuries of the abdomen	14	2.7
Liver: Moderate-Severe laceration	11	2.1
Pelvis/bone/joint & muscle	52	9.9
Long bone fracture	41	7.8
Multiple fracture of the pelvis	12	2.3
Extremity compartment syndrome	2	0.4
Major vessels injury	5	1.0
Proximal limbs vessels: transection	4	0.8
Neck vessels: dissection/transection	1	0.2
-	0	0.0
Miscellaneous	1	0.2
Burns (>30% BSA)	1	0.2
-	0	0.0
Missing	0	

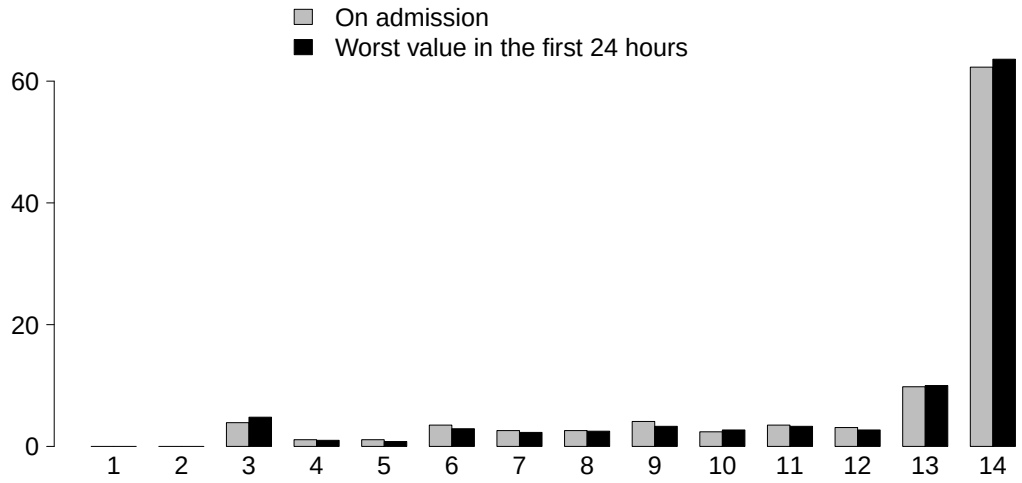
Infection severity on admission	N	%
None	438	83.9
INFECTION WITHOUT SEPSIS	55	10.5
SEPSIS	21	4.0
SEPTIC SHOCK	8	1.5
Missing	3	

Infection severity on admission



National report for general ICUs - **Year 2019**
Severity scores - Pediatric patients evaluated with PIM 3

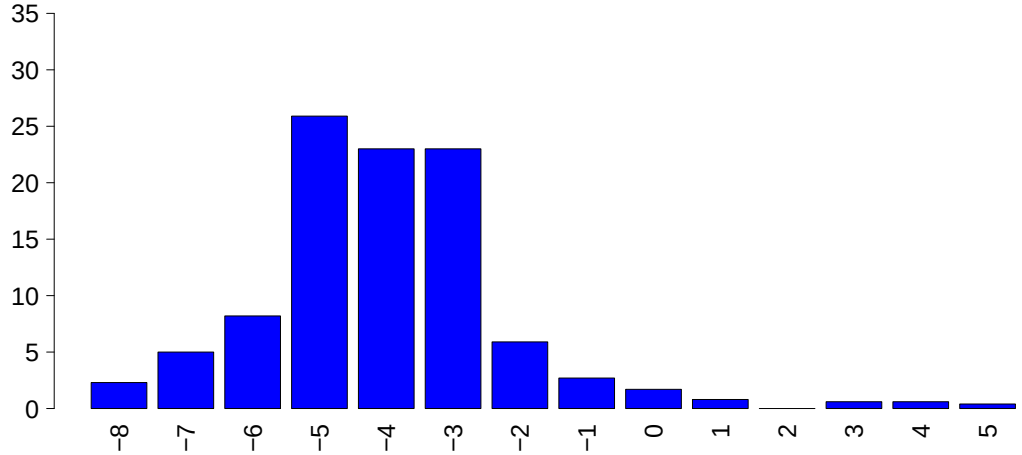
Glasgow Coma Scale (%)



GCS (admission)	
Median	14
Q1−Q3	12−14
Not evaluable	66
Missing	0

GCS (first 24 hours)	
Median	14
Q1−Q3	12−14
Not evaluable	44
Missing	0

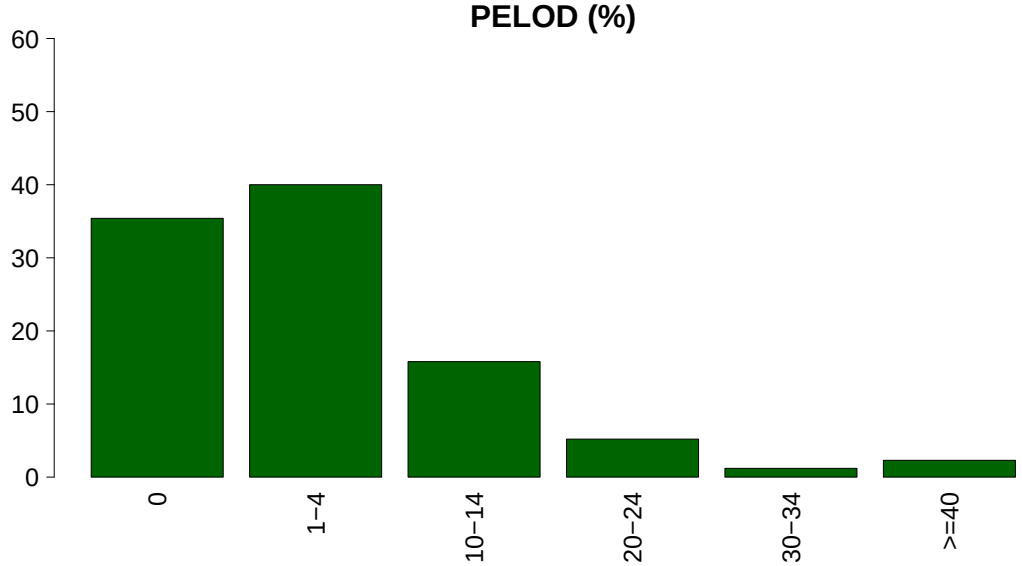
PIM 2 (%)



PIM 2	
Median	-4.3
Q1−Q3	-4.8−-3
Not evaluable	0
Missing	0

PIM 3	
Median	-4.4
Q1−Q3	-5.5−-3.3
Not evaluable	0
Missing	0

PELOD (%)



PELOD	
Mean	4.8
SD	9.3
Median	1
Q1−Q3	0−2.2
Not evaluable	44
Missing	1

National report for general ICUs - **Year 2019**
Characteristics during the stay - Pediatric patients evaluated with PIM 3

Complications during the stay	N	%
No	458	87.2
Yes	67	12.8
Missing	0	

Failures during the stay	N	%
No	507	96.6
Yes	18	3.4
A: Respiratory failure	10	1.9
B: Cardiovascular failure	6	1.1
C: Neurological failure	2	0.4
D: Hepatic failure	1	0.2
E: Renal failure (AKIN)	1	0.2
F: Acute skin failure	0	0.0
G: Metabolic failure	1	0.2
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
A	8	1.5
B	4	0.8
AB	2	0.4
C	2	0.4
DG	1	0.2
E	1	0.2
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Respiratory failure occured	N	%
None	515	98.1
Intubation for airway maint.	5	1.0
Hypoxic failure	6	1.1
Hypercapnic failure	2	0.4
Missing	0	

Cardiovascular failure occured	N	%
None	519	98.9
Cardiogenic shock	1	0.2
Hypovolemic shock	0	0.0
Haemorrhagic/hypovolemic shock	0	0.0
Septic shock	3	0.6
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.2
Other shock	2	0.4
Missing	0	

Neurological failure occured	N	%
None	523	99.6
Cerebral coma	2	0.4
Metabolic coma	0	0.0
Postanoxic coma	0	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	524	99.8
Mild	0	0.0
Moderate	0	0.0
Severe	1	0.2
Missing	0	

Complications during the stay	N	%
Respiratory	16	3.0
Atelectasis	3	0.6
Upper resp. tract disease	3	0.6
Severe ARDS	2	0.4
Aspiration pneumonia	2	0.4
Acute asthma/bronchospasm	2	0.4
Cardiovascular	9	1.7
Cardiac arrest	7	1.3
Acute severe arrhythmia: bradycardias	1	0.2
Deep venous thrombosis	1	0.2
Acute severe arrhythmia: tachycardias	1	0.2
-	0	0.0
Neurological	29	5.5
Drowsiness/agitation/delirium	13	2.5
Seizures	9	1.7
Intracranial hypertension	4	0.8
Brain edema	3	0.6
Postanoxic encephalopathy	2	0.4
Gastrointestinal and hepatic	4	0.8
Acute pancreatitis	1	0.2
Gastrointestinal bleeding: lower tract	1	0.2
Liver Dysfunction Syndrome	1	0.2
Paralytic Ileus	1	0.2
-	0	0.0
Other	2	0.4
Extremity compartment syndrome (severe)	1	0.2
Metabolic disorder	1	0.2
Other skin and/or soft tissue pathology	1	0.2
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Infections	19	3.6
Pneumonia	8	1.5
Primary bacteraemia of unknown origin	2	0.4
Catheter-related bacteremia (CR-BSI)	2	0.4
L.R.T.I. other than pneumonia	2	0.4
NON-surgical urinary tract infection	2	0.4
Clinical sepsis	1	0.2
NON-surgical skin/soft tissue infection	1	0.2
Upper respiratory tract infection	1	0.2
-	0	0.0
-	0	0.0
Missing	0	

National report for general ICUs - **Year 2019**
Characteristics during the stay - Pediatric patients evaluated with PIM 3

Infections	N	%
None	420	80.0
Only on admission	86	16.4
On admission and during ICU stay	1	0.2
Only during ICU stay	18	3.4
Missing	0	

Maximum severity of infection	N	%
None	420	80.6
INFECTION WITHOUT SEPSIS	60	11.5
SEPSIS	30	5.8
SEPTIC SHOCK	11	2.1
Missing	4	

Severity evolution

		During the stay				
	N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	420 (96.1%)	9 (2.1%)	7 (1.6%)	1 (0.2%)	437
	INFECTION WITHOUT SEPSIS	-	51 (92.7%)	4 (7.3%)	0 (0.0%)	55
	SEPSIS	-	-	19 (90.5%)	2 (9.5%)	21
	SEPTIC SHOCK	-	-	-	8 (100.0%)	8
	TOT	420	60	30	11	521

Ventil. Associat. Pneumonia (VAP)	N	%
No	518	98.7
Yes	7	1.3
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	523	99.6
Yes	2	0.4
Missing	0	

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

Estimate	10.4
CI (95%)	4.2−21.5

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

Estimate	2.3
CI (95%)	0.3−8.2

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

Estimate	8.3%
CI (95%)	3.4−17.2

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

Estimate	2.7%
CI (95%)	0.3−9.8

National report for general ICUs - **Year 2019**

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
Procedures (antibiotics excluded)	425	81.0										
Invasive ventilation	256	48.8	203	38.7	25	4.8	1	0–2	0	0	0–0	0
Non invasive ventilation	42	8.0	12	2.3	12	2.3	1	1–2	0	0	0–2	0
Tracheostomy	19	3.6	12	2.3	17	3.2	9	5–24	0	7	5–7	0
iNO (inhaled nitric oxide)	0	0.0										
Central Venous Catheter	169	32.2	88	16.8	135	25.7	2	1–6	0	0	0–0	0
PICC	11	2.1	6	1.1	12	2.3	1	1–4	0	4	2–5	0
Arterial Catheter	275	52.4	140	26.7	40	7.6	2	1–4	0	0	0–0	0
Vasoactive drugs	44	8.4	22	4.2	11	2.1	1	1–3	0	0	0–0	0
Antiarrhythmics	4	0.8	0	0	0	0	0	0–2	0	0	0–0	0
IABP	1	0.2	0	0	0	0	1	1–1	0	0	0–0	0
Invasive monitoring of C.O.	4	0.8	2	0.4	0	0	1	1–1	0	0	0–1	0
Continous monitoring of ScVO2	0	0.0										
Temporary pacing	0	0.0										
Ventricular assistance	0	0.0										
DC-shock	2	0.4								0	0–0	0
CPR	8	1.5								0	0–0	0
Massive transfusion	5	1.0								0	0–0	0
ICP monitoring without CSF drainage	3	0.6	1	0.2	0	0	5	5–8	0	0	0–1	0
ICP monitoring with CSF drainage	3	0.6	2	0.4	1	0.2	3	2–6	0	0	0–0	0
External ventricular drainage without ICP	2	0.4	1	0.2	0	0	13	12–14	0	20	20–20	0
Haemofiltration	1	0.2	0	0	0	0	0	0–0	0	1	1–1	0
Haemodialysis	2	0.4	0	0	1	0.2	9	7–11	0	0	0–0	0
ECMO	2	0.4	1	0.2	0	0	2	1–2	0	4	4–4	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	1	0.2	0	0	0	0	1	1–1	0	0	0–0	0
IAP (intra-abdominal pressure)	2	0.4										
Hypothermia	1	0.2	1	0.2	0	0	1	1–1	0			
Enteral nutrition	90	17.1	26	5	62	11.8	5	3–11	0	1	0–1	0
Parenteral nutrition	42	8.0	11	2.1	26	5	2	1–5	0	1	0–2	0
SDD (Topical, Topical and systemic)	7	1.3										
Patient restraint	7	1.3										
Diagnostic fibrobronchoscopy	9	1.7								1	0–2	0
Surfactant treatment	0	0.0										
Vacuum therapy	1	0.2										
Oxygen therapy	71	13.5	44	8.4	39	7.4	1	1–2	0	0	0–0	0
Blood transfusion	0	0.0										
Peritoneal dialysis	0	0.0										
Plasmapheresis	1	0.2										
Thoracic drainage	5	1.0	5	1	3	0.6	3	3–4	0			
Peridural catheter	6	1.1	5	1	6	1.1	1	1–3	0	0	0–0	0
Urinary catheter	70	13.3	50	9.5	46	8.8	2	1–4	0	0	0–0	0
Near-infrared spectroscopy	0	0.0										
Phototherapy	0	0.0										
Electrical cardioversion	0	0.0										
Antibiotics	234	44.6										
Antibiotic prophylaxis	128	24.4	97	18.5	84	16	1	1–3	0	0	0–0	0
Empirical antibiotic therapy	63	12.0	37	7	51	9.7	2	1–4	0	0	0–0	0
Empirical antibiotic therapy in unconfirmed diagnosis	36	6.9	17	3.2	28	5.3	2	1–3	0	0	0–0	0
Targeted antibiotic therapy	22	4.2	3	0.6	14	2.7	5	2–7	0	3	1–4	0

National report for general ICUs - **Year 2019**
Process indicators - Pediatric patients evaluated with PIM 3

Invasive ventilation (N=256)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	46	15.8	4.1	5.7	1.5	1−6	0
For airway mainteinance	104	35.7	5.0	10.9	1	1−4	0
In weaning	97	33.3	0.4	0.5	0	0−1	0
Not evaluable	44	15.1	2.4	2.8	1	1−3	35
Reintubation within 48 hours	7	2.4	3.9	7.6	1	0.5−2	0

Non invasive ventilation (N=42)	N	%
Non invasive ventilation only	29	69.0
Non invasive ventilation failed	3	7.1
For weaning	8	19.0
Other	2	4.8
Missing	0	

Tracheostomy not present on admission (N=7)	N	%
Surgical	1	14.3
Percutwist	0	0.0
Ciaglia	0	0.0
Monodil. Ciaglia	5	71.4
Fantoni	0	0.0
Griggs	1	14.3
Other Kind	0	0.0
Unknown	0	0.0
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=7)	
Mean	5.9
SD	3.1
Median	7
Q1−Q3	5−7
Missing	0

Invasive monitoring of C.O. (N=4)	N	%
Swan Ganz	1	25.0
PICCO	2	50.0
LIDCO	0	0.0
Vigileo-PRAM	0	0.0
Other	1	25.0
Missing	0	

SDD (N=7)	N	%
Topical	7	100.0
Topical and systemic	0	0.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=18)	N	%
No therapy	4	22.2
Only empirical	4	22.2
Only targeted	8	44.4
Targeted after empirical	2	11.1
Other	0	0.0
Missing	0	

Surgical interventions	N	%
No	519	98.9
Yes	6	1.1
Missing	0	

Number of surgical interventions	N	%
0	519	98.9
1	6	1.1
2	0	0.0
3	0	0.0
>3	0	0.0
Missing	0	

Surgical interventions Days from admission	
Mean	12.3
SD	7.4
Median	9.5
Q1−Q3	7.2−14
Missing	0

Surgical interventions (top 10)	N	%
Orthopaedic surgery	4	0.8
ENT surgery	1	0.2
Neurosurgery	1	0.2
-	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	524	99.8
Yes	1	0.2
Missing	0	

Non surgical interventions Days from admission	
Mean	
SD	
Median	
Q1−Q3	
Missing	1

Non surgical interventions	N	%
Therapeutic endoscopy (bronchoscopy excluded)	1	0.2
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Therapeutic bronchoscopy	0	0.0
Missing	0	

National report for general ICUs - **Year 2019**
Outcome indicators - Pediatric patients evaluated with PIM 3

ICU outcome	N	%
Dead	27	5.1
Transferred to same hospital	438	83.4
Transferred to other hospital	46	8.8
Discharged home	14	2.7
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=484)	N	%
Ward	451	93.2
Other ICU	0	0.0
High dependency care unit	25	5.2
Rehabilitation	8	1.7
Day hospital or Long-term care	0	0.0
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=438)	N	%
Ward	415	94.7
Other ICU	0	0.0
High dependency care unit	22	5.0
Rehabilitation	1	0.2
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=46)	N	%
Ward	36	78.3
Other ICU	0	0.0
High dependency care unit	3	6.5
Rehabilitation	7	15.2
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	498	94.9
Dead	27	5.1
Missing	0	

Timing of ICU mortality (N=27)	N	%
Daytime (08:00AM - 07:59PM)	17	63.0
Nighttime (08:00PM - 07:59AM)	10	37.0
Weekdays (Monday - Friday)	18	66.7
Weekend (Saturday - Sunday)	9	33.3
Missing	0	

C.A.M. activation (N=27)	N	%
Yes, with organ donation	5	18.5
Yes, without organ donation	3	11.1
No, with organ donation	0	0.0
No, without organ donation	19	70.4
Missing	0	

Tissue removal (N=27)	N	%
Yes, with C.A.M. activation	1	3.7
Yes, without C.A.M. activation	1	3.7
No	25	92.6
Missing	0	

Hospital mortality	N	%
Dead	31	5.9
Transf. to other acute-care hospital	57	10.9
Transf. to other type of hosp. stay	22	4.2
Nursing home	12	2.3
Voluntary discharge	4	0.8
Discharged home	398	76.0
Missing	1	

To other type of H stay (N=22)	N	%
Rehabilitation in the same institute	5	22.7
Rehabilitation in other institute	17	77.3
DH/long-term care, same inst.	0	0.0
DH/long-term care, other inst.	0	0.0
Missing	0	

Disch. terminally ill (N=493)	N	%
Yes	1	0.2
No	492	99.8
Missing	0	

Hospital mortality	N	%
Alive	492	93.9
Dead	32	6.1
Missing	1	

Timing of hosp. mortality (N=32)	N	%
In ICU	27	84.4
Within 24 hours after ICU	3	9.4
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	6.2
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=5)	
Mean	4.0
SD	6.5
Median	0
Q1−Q3	0−5
Missing	0

National report for general ICUs - **Year 2019**
Outcome indicators - Pediatric patients evaluated with PIM 3

Last hospital mortality	N	%
Alive	492	93.9
Dead	32	6.1
Missing	1	

Expected outcome (N=498)	N	%
Recovery/resolution of acute episode	477	95.8
Palliative care grade 1	13	2.6
Palliative care grade 2	0	0.0
Palliative care grade 3	3	0.6
Palliative care grade 4	5	1.0
Missing	0	

Outcome treatments (N=21)	N	%
NON invasive ventilation	2	9.5
Invasive ventilation	4	19.0
Oxygen therapy	4	19.0
Tracheostomy	4	19.0
Diuretics grugs	1	4.8
Inotropic agents drugs	0	0.0
Antiepileptics drugs	7	33.3
Dialytic therapy	0	0.0
Limb replacement	0	0.0
Nasogastric tube	2	9.5
Ostomies	5	23.8
Home based parenteral nutrition	0	0.0
Motor physiotherapy	5	23.8
Respiratory physiotherapy	4	19.0
Posture	7	33.3
Psychological counselling	9	42.9
Missing	0	

ICU stay (days)	
Mean	3.2
SD	6.1
Median	1
Q1−Q3	1−3
Missing	0

ICU stay (days) **Alive** (N=498)	
Mean	3.1
SD	5.4
Median	1
Q1−Q3	1−3
Missing	0

ICU stay (days) **Dead** (N=27)	
Mean	5.8
SD	13.6
Median	1
Q1−Q3	1−3
Missing	0

Stay after ICU (days) **Alive** (N=498)	
Mean	7.3
SD	9.4
Median	5
Q1−Q3	2−9
Missing	4

Hospital stay (days)	
Mean	11.5
SD	13.6
Median	8
Q1−Q3	4−13
Missing	1

Hospital stay (days) **Alive** (N=492)	
Mean	11.7
SD	13.4
Median	8
Q1−Q3	4−13
Missing	0

Hospital stay (days) **Dead** (N=32)	
Mean	8.3
SD	17.1
Median	1
Q1−Q3	0.8−6.8
Missing	0

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 2019 data using PIM 2, PIM 3, PELOD, SAPSII, and GiViTI 2019 prognostic models. The latter are reported for both the overall population and the subgroups presented in the report. Patients with valid data for the model were splitted in two subgroups in order to build the model on the first one (training set) and to validate it on the second one (validation set).

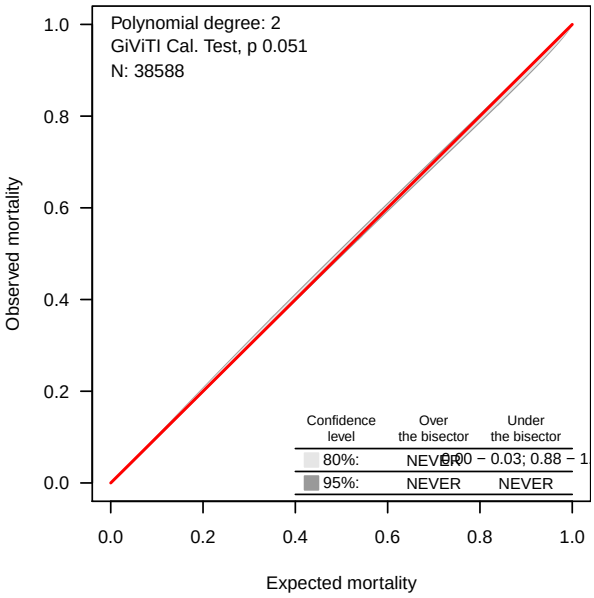
These belts serve as a representation of the validity of the models used to evaluate the performance of each ICU. A model is well calibrated, and thus a useful tool for evaluating individual departments, when the bisector is fully included in the belt. Only when this occurs can a deviation from the bisector be attributed to local factors and not to poor calibration of the model. Poor calibration is clearly visible for SAPSII and, accordingly, this should be used with caution to assess the performance of individual ICUs.

Moreover, the calibration belt built on 2019 data using the GiViTI 2018 model is reported. The aim of this belt is to investigate 2018 to 2019 difference in terms of performance of the GiViTI general ICUs.

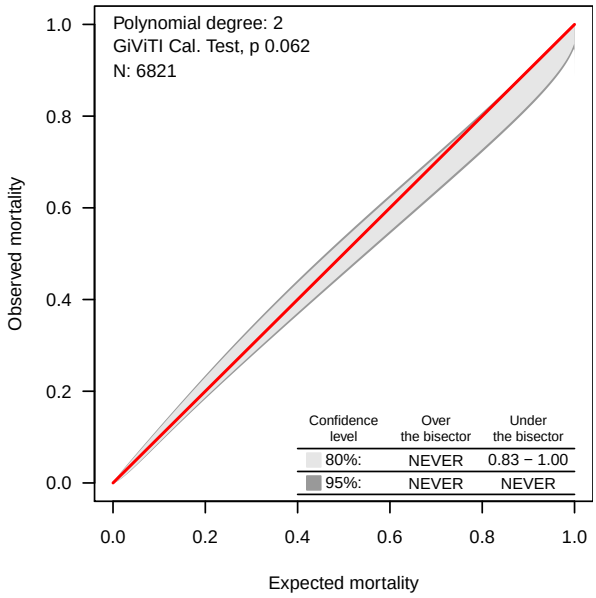
For further informations please look at [PLoS ONE 6(2): e16110].

National report for general ICUs - Year 2019
Validity of the models - Calibration belts

Predictive model: GiViTI 2019 (training set)

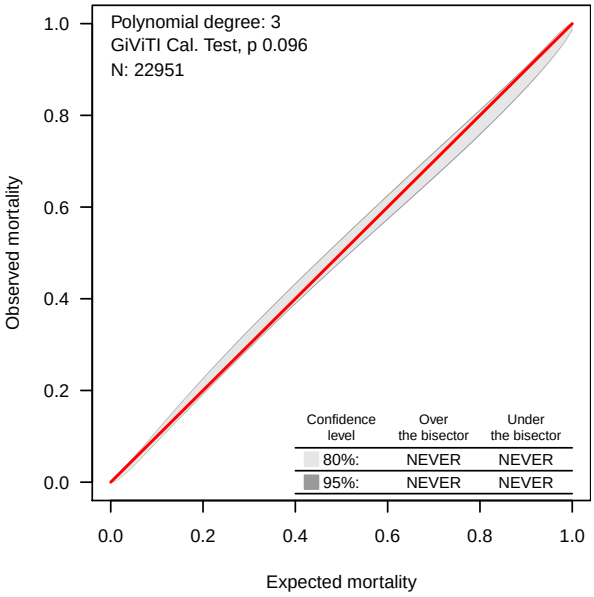


Predictive model: GiViTI 2019 (validation set)

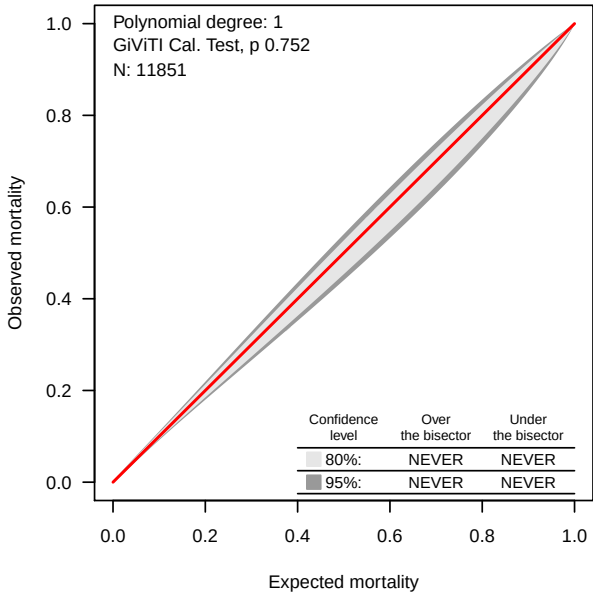


UNIFORMITY OF FIT

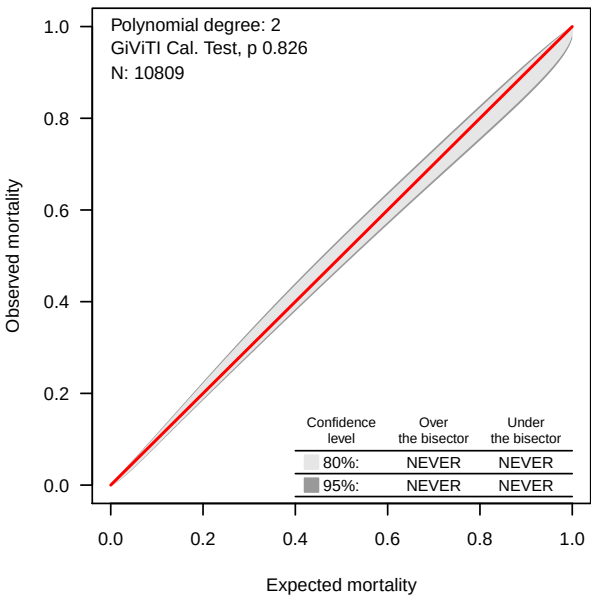
Predictive model: GiViTI 2019
Non surgical



Predictive model: GiViTI 2019
Elective surgical



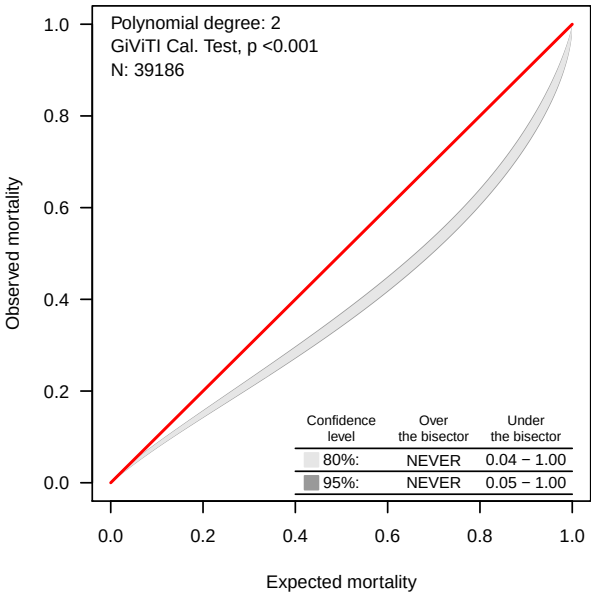
Predictive model: GiViTI 2019
Emergency surgical



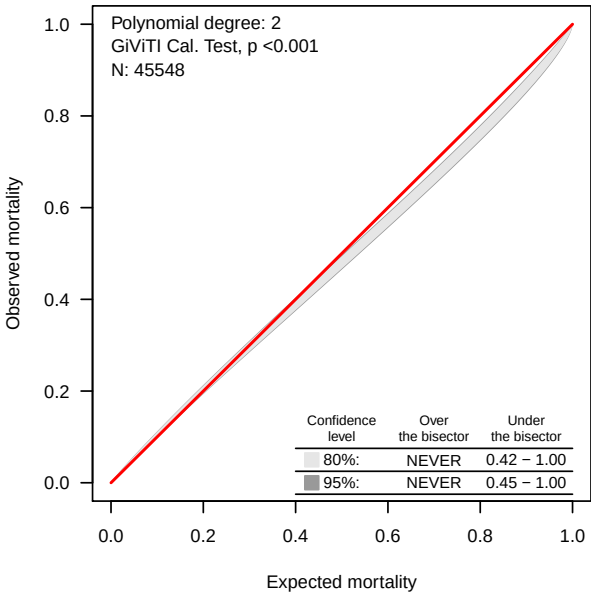
National report for general ICUs - **Year 2019**
Validity of the models - Calibration belts

EXTERNAL SCORE

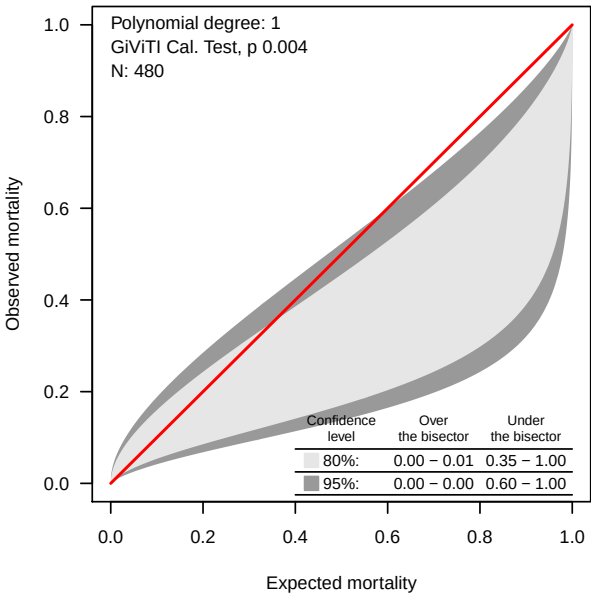
Predictive model: SAPSII



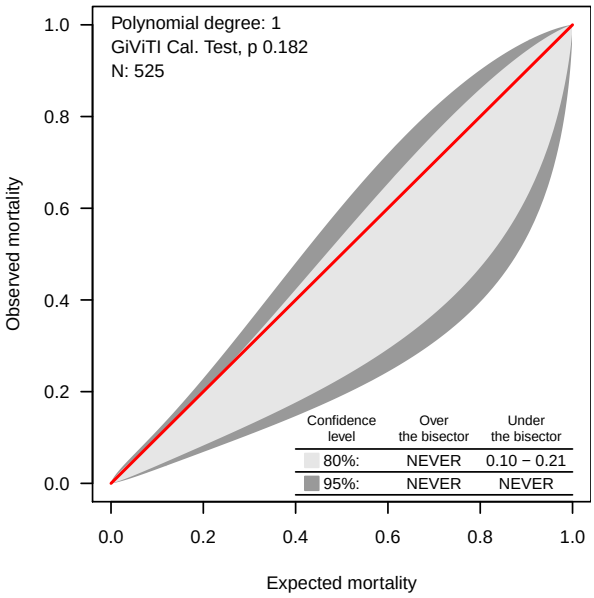
Predictive model: GiViTI 2018



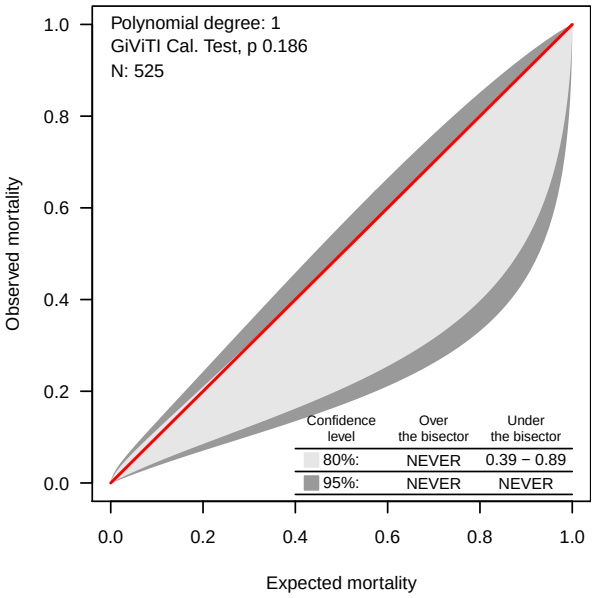
Predictive model : PELOD



Predictive model: PIM2



Predictive model: PIM3



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