

GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

**Report
PROSAFE project**

Year 2018

National report for general ICUs (6 ICUs)

POLAND

PROSAFE project - National report for general ICUs (6 ICUs)

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The project

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

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

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

The Petals functioning in 2018 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 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 TUONO Petal, designed to permit comparison of chest ultrasound reports.
- the BIO-AX-TBI Petal, whose aim is to identify biological and imaging biomarkers that best characterize axonal injury in traumatic brain injury.

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 293 ICUs collected data during 2018, 257 Italian and 36 foreign ICUs, for a total of 97069 patients registered in PROSAFE. Only the ICUs that collected valid data (233) 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 88248 patients admitted to intensive care during 2018.

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. An analysis application form is available on the GiViTI website to obtain more complex analyses.

Description of the statistics

Project participation

The table on page 17 summarizes the participation in the project of the 233 ICUs which collected valid data in 2018 for a period of at least 4 months.

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 21, 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 2018 and ICU stay days were used to calculate indicators of utilization, i.e. indicators able to measure utilization levels and healthcare facility activity levels.

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

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

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

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

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

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

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

Study flow-chart

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

The program envisages 5 status levels:

- status 1 - the patient record presents errors or unsolved warnings;
- status 2 - the record is incomplete, there are still missing data;

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

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

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

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

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

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

Centre XX000 - Year 2014

Data validity

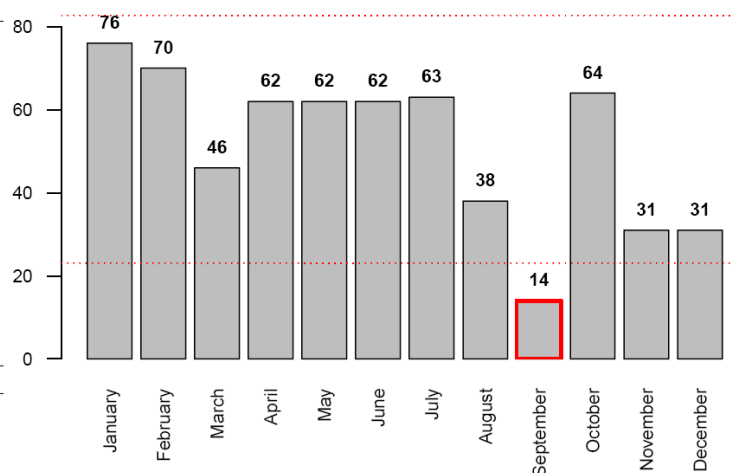
Patients admitted: 619

Admissions

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

Admissions

Mean	51.6
Median	62.0
SD	19.1
VC	37.1



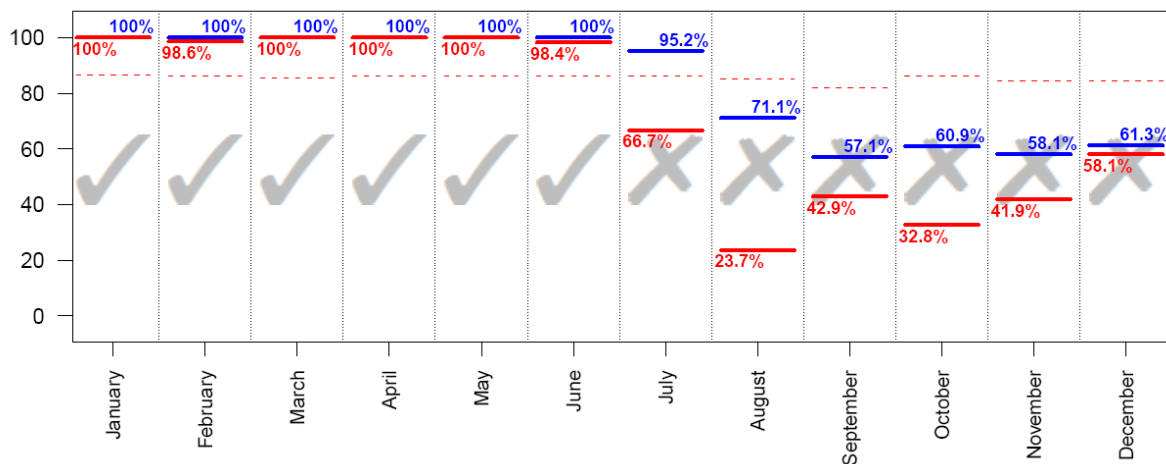
WARNING! The highlighted months have a number of patients quite different from the average. Please verify the correctness of the data and, particularly, that all consecutive patients have been registered in the Prosafe software.

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

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

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

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



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

Description of patients

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

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

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

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

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

The categories of underweight, overweight and obese are determined according to the following criteria: underweight if 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 surgical interventions on admissions is specified. Each single intervention (even more than one per patient) is counted. It may happen that the percentages exceed the threshold of 100 % if patients underwent more than one intervention in the specified time periods.

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

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

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

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

where

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

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

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

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

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

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

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

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

Incidence of VAP Two different incidence rates are presented:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Readmissions Only readmissions from other hospital wards are considered.




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

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

Patients	Model	Mortality
Adults non CS	GiViTI 2018	Last hospital mortality
Pediatric	PIM 2	ICU mortality
	PIM 3	ICU mortality
	PELOD	ICU mortality

Statistics

**National report for general ICUs - Year 2018
Project participation***

Nation	TYPE								Total
	General	Cardiosurgical	Surgical	Neurosurgical	Pediatrics	HDC	Other		
 Cyprus	2 ICUs 1115 patients								2 ICUs 1115 patients
 Greece	4 ICUs 944 patients				1 ICU 144 patients				5 ICUs 1088 patients
 Hungary				1 ICU 437 patients					1 ICU 437 patients
 Israel	1 ICU 519 patients				1 ICU 792 patients			1 ICU 449 patients	3 ICUs 1760 patients
 Italy	151 ICUs 51496 patients	19 ICUs 10771 patients	11 ICUs 6483 patients	11 ICUs 4712 patients	3 ICUs 1076 patients	4 ICUs 2358 patients	8 ICUs 3169 patients		207 ICUs 80065 patients
 Poland	6 ICUs 875 patients				2 ICUs 386 patients				8 ICUs 1261 patients
 Slovenia	1 ICU 323 patients		4 ICUs 1523 patients				2 ICUs 676 patients		7 ICUs 2522 patients
Total	165 ICUs 55272 patients	19 ICUs 10771 patients	15 ICUs 8006 patients	12 ICUs 5149 patients	7 ICUs 2398 patients	4 ICUs 2358 patients	11 ICUs 4294 patients	4 ICUs 2358 patients	233 ICUs 88248 patients

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

Description of hospitals (N=6) - Year 2018

Number of beds in hospital	N	%
< 300 beds	2	40.0
300 - 800 beds	3	60.0
> 800 beds	0	0.0
Missing	1	

Type of ICUs present in hospital	N	%
General	5	83.3
Medical	2	33.3
Surgical	2	33.3
Neurological/neurosurgical	2	33.3
Cardiosurgical	2	33.3
Burns	1	16.7
Post-transplantations	1	16.7
Other	2	33.3

Type of subICUs present in hospital	N	%
General	1	16.7
Surgical	2	33.3
Cardiological	4	66.7
Respiratory	2	33.3
Neurological (stroke unit)	3	50.0
Other	2	33.3

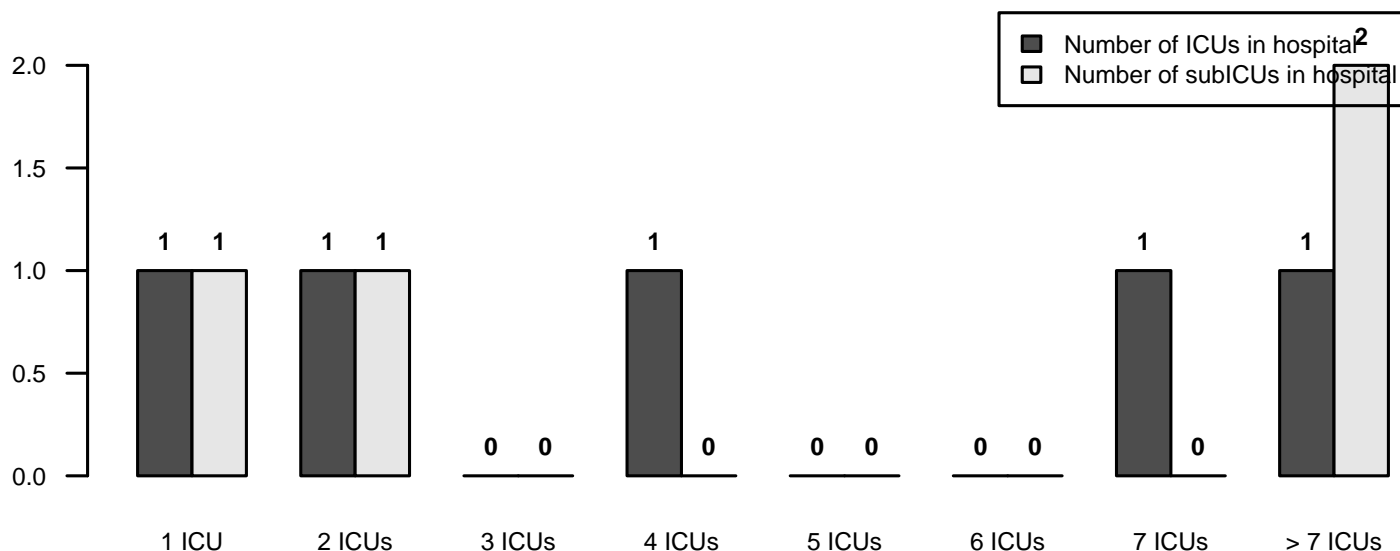
Non surgical specialties	N	%
Cardiology	3	60.0
Pulmonology	2	40.0
Nephrology	1	20.0
Infection disease	0	0.0
Pediatric	3	60.0
Neonatology	4	80.0
Neurology	2	40.0
Haematology	0	0.0
Emergency room	4	80.0
Traumatology	3	60.0
Emergency medical	3	60.0

Surgical specialties (independent ward)	N	%
Neurosurgery	1	16.7
Cardiosurgery	1	16.7
Major vascular surgery	2	33.3
Thoracic surgery	0	0.0
Pediatric surgery	1	16.7
Transplantation activities	1	16.7

Surgical specialties (procedures only)	N	%
Neurosurgery	2	33.3
Cardiosurgery	0	0.0
Major vascular surgery	1	16.7
Thoracic surgery	2	33.3
Pediatric surgery	1	16.7
Transplantation activities	3	50.0

Services/activities available in H (h24)	N	%
Neuroradiology	2	33.3
Interventional neuroradiology	1	16.7
Interventional vascular radiology	2	33.3
CT scan	5	83.3
MRI	4	66.7
Interventional hemodynamic	4	66.7
Endoscopy	5	83.3
Bronchoscopy	4	66.7
Hyperbaric chamber	0	0.0

Services/activities available in H (rep.)	N	%
Neuroradiology	1	16.7
Interventional neuroradiology	2	33.3
Interventional vascular radiology	2	33.3
CT scan	0	0.0
MRI	1	16.7
Interventional hemodynamic	0	0.0
Endoscopy	0	0.0
Bronchoscopy	1	16.7
Hyperbaric chamber	0	0.0



Description of ICUs (N=6) - Year 2018

Number of activable beds		
Mean (SD)	6.6	(2.8)
Median (Q1–Q3)	6	(4–9)
Missing	1	

Number of beds declared to hospital		
Mean (SD)	52.6	(99.8)
Median (Q1–Q3)	9	(9–10)
Missing	1	

University affiliation	N	%
Yes	2	40.0
No	3	60.0
Missing	1	

Square meter per bed		
Mean (SD)	15.2	(7.0)
Median (Q1–Q3)	18	(16–19)
Missing	1	

Clinical psychologist	N	%
No	0	0.0
For relatives	2	40.0
For patients	5	100.0
For personnel	1	20.0

ICU Structure	N	%
NON OPEN-SPACE	1	20.0
OPEN-SPACE (or alike)	4	80.0
Missing	1	

Physicians	N	%
Dedicated to ICU only	0	0.0
Dedicated to ICU on a rotation basis	0	0.0
Dedicated to ICU only and on a rotation basis	5	100.0
Missing	1	

Declared beds per physician (average)		
Mean (SD)	52.6	(110.2)
Median (Q1–Q3)	4.1	(2.2–5.2)
Missing	1	

Nurses	N	%
Dedicated to ICU only	1	20.0
Dedicated to ICU on a rotation basis	0	0.0
Dedicated to ICU only and on a rotation basis	4	80.0
Missing	1	

Declared beds per nurse (average)		
Mean (SD)	116.7	(230.2)
Median (Q1–Q3)	1.8	(1.7–116.9)
Missing	2	

Number of hours conceded for relatives' visits	N	%
1	1	20.0
2	0	0.0
3-4	1	20.0
5-12	2	40.0
13-20	0	0.0
>20	1	20.0
Missing	1	

Maximum number of visitors per patient	N	%
One	2	40.0
Two	2	40.0
Three or more	1	20.0
Missing	1	

Biomedical devices per declared bed	Median	Q1-Q3	<5 Years (mean %)
Total available monitors (excluding those dedicated to transport)	0.8	0.4–1.4	40.0
of which only for basic monitoring (without transducers detection of invasive pressure, pic, pvc, ...)	0.8	0.4–1.0	28.8
Invasive monitoring of cardiac output (Swan-Ganz)	0.0	0.0–0.3	0.0
Invasive monitoring of cardiac output (PiCCO)	0.0	0.0–0.1	33.3
Invasive monitoring of cardiac output (Vigileo)	0.0	0.0–0.0	50.0
Non-invasive monitoring of cardiac output (impedentiometry)	0.1	0.1–0.1	25.0
Defibrillators	0.2	0.2–0.5	44.4
Both invasive and non invasive ventilators	1.1	1.0–1.7	50.3
Non invasive ventilators	0.0	0.0–0.2	75.0
Syringe pumps	5.3	3.9–7.4	39.5
Peristaltic pumps	0.7	0.1–1.0	36.7

Biomedical equipment in ICU	N	%
Transoesophageal echo	1	20.0
Basic ultrasounds	5	100.0
Advanced ultrasounds	2	40.0
Blood-gas analyzer	5	100.0
Haemodialysis - Haemofiltration	5	100.0
Transport ventilator	5	100.0
Fiberscope	5	100.0
Extracorporeal circulation system	1	20.0

Routine microbiological surveillance cultures	N	%
Yes	5	100.0
No	0	0.0
Missing	1	

Description of ICUs (N=6) - Year 2018

Patients admitted

Mean (SD)	207.0 (85.7)
Median	210.1
Q1–Q3	174.5–243.7
Missing	1

Occupancy rate (%)

Mean (SD)	68.4 (9.4)
Median	70.6
Q1–Q3	66.1–73
Missing	2

Rotation index (patients/bed)

Mean (SD)	24.1 (5.4)
Median	22.6
Q1–Q3	21.2–25.5
Missing	2

Turnover (hours)

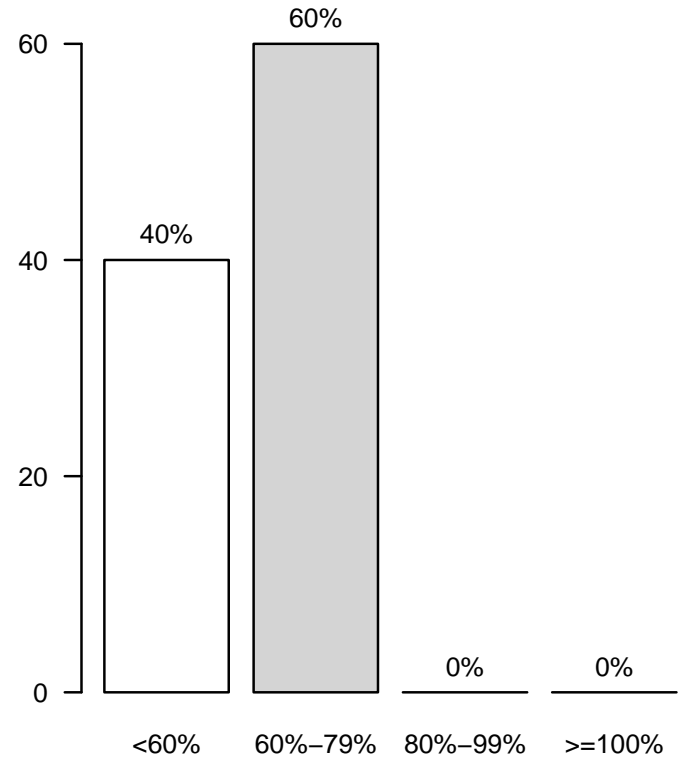
Mean (SD)	122.2 (51.4)
Median	123
Q1–Q3	94.7–150.5
Missing	2

Occupied beds per physician (average)

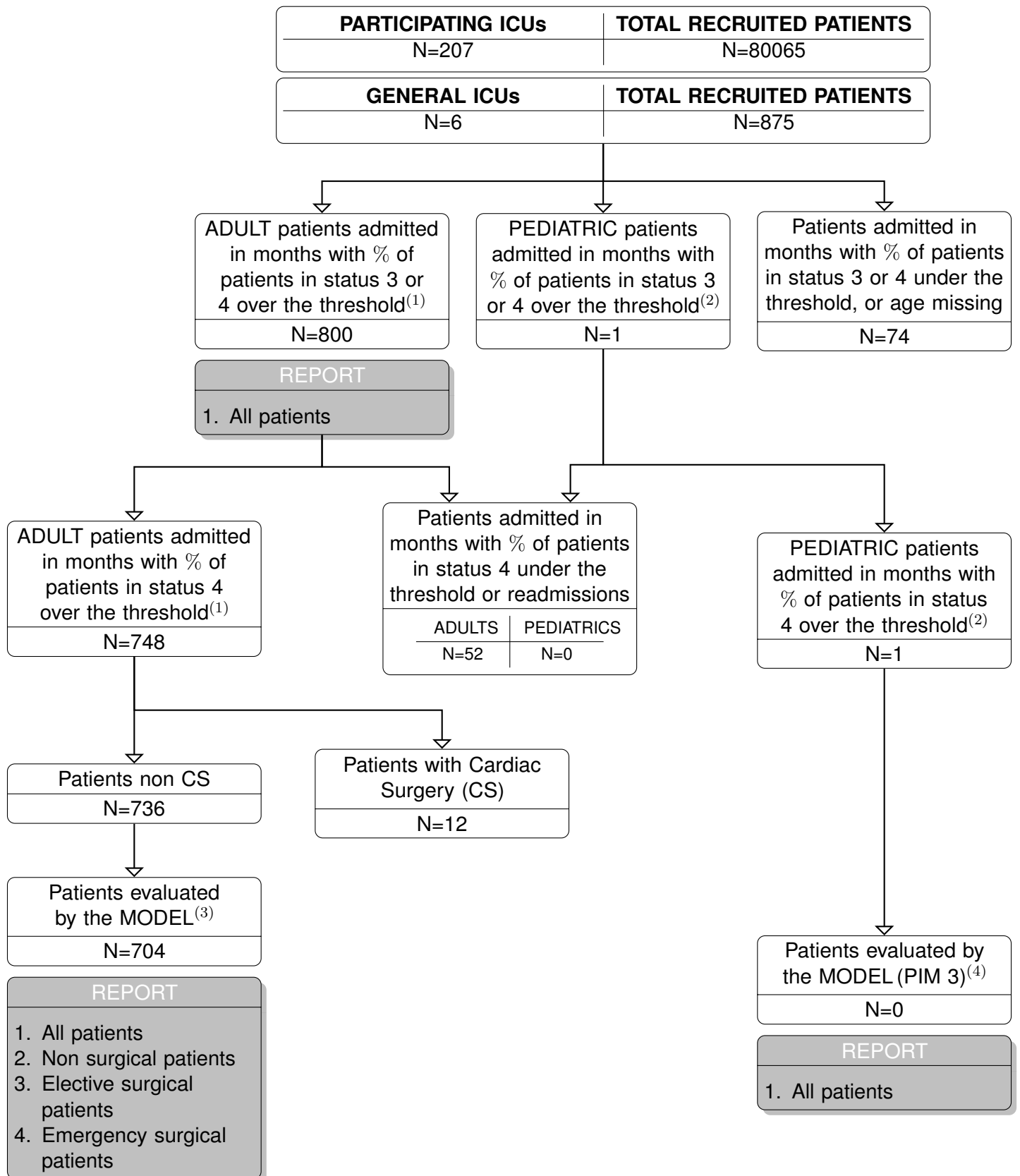
Mean (SD)	2.6 (1.3)
Median	2.9
Q1–Q3	1.7–3.6
Missing	1

Occupied beds per nurse (average)

Mean (SD)	2.7 (3.1)
Median	1.2
Q1–Q3	1–2.9
Missing	2

Occupancy rate (%)

National report for general ICUs (6 ICUs) - Year 2018
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 2018
Characteristics on admission - Adult patients

Patients (N): 800

Sex	N	%
Male	489	61.3
Female	309	38.7
Missing	2	

Age (years)	N	%
17-45	157	19.6
46-65	266	33.2
66-75	190	23.8
>75	187	23.4
Missing	0	
Mean	61.8	
SD	17.2	
Median	65	
Q1–Q3	51–75	
Min–Max	17–99	

Body mass Index (BMI)	N	%
Underweight	38	4.9
Normal	278	36.1
Overweight	261	33.9
Obese	194	25.2
Missing	29	

Pregnancy status	N	%
Females (N=309)		
Not fertile	115	37.7
Not pregnant/Unknown	180	59.0
Currently pregnant	3	1.0
Post partum	7	2.3
Missing	4	

Comorbidities	N	%
No	104	13.3
Yes	677	86.7
Missing	19	

Comorbidities (top 10)	N	%
Hypertension	398	51.0
NYHA class II-III	211	27.0
Arrhythmia	179	22.9
Myocardial infarction	119	15.2
Diabetes Type II with insulin treatment	109	14.0
Peripheral vascular disease	105	13.4
Moderate or severe renal disease	102	13.1
Alcohol addiction	101	12.9
Cerebrovascular disease	73	9.3
Diabetes Type II without insulin tr.	68	8.7
Missing	19	

Stay before ICU (days)		
Mean	4.5	
SD	8.6	
Median	1	
Q1–Q3	0–5	
Missing	21	

Source of admission	N	%
Same hospital	621	79.5
Other hospital	159	20.4
Long-term chronic care hospital	1	0.1
Directly from the community	0	0.0
Missing	19	

Ward of admission	N	%
Hospital (N=780)		
Medical ward	217	27.8
Surgical ward	310	39.7
Emergency room	216	27.7
Other ICU	34	4.4
High dependency care unit	3	0.4
Missing	0	

Reason for transfer from	N	%
Other ICU (N=34)		
Specialist expertise	4	11.8
Step-up care	3	8.8
Logistical/organizational reasons	26	76.5
Step-down care	1	2.9
Missing	0	

Ward of admission	N	%
Same hospital (N=621)		
Medical ward	157	25.3
Surgical ward	280	45.1
Emergency room	168	27.1
Other ICU	15	2.4
High dependency care unit	1	0.2
Missing	0	

Ward of admission	N	%
Other hospital (N=159)		
Medical ward	60	37.7
Surgical ward	30	18.9
Emergency room	48	30.2
Other ICU	19	11.9
High dependency care unit	2	1.3
Missing	0	

Scheduled admission	N	%
No	732	93.7
Yes	49	6.3
Missing	19	

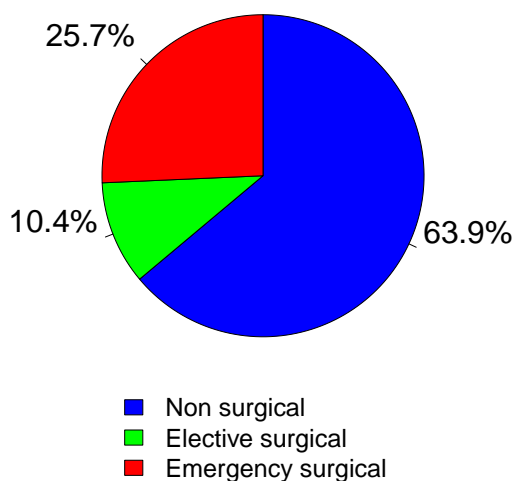
National report for general ICUs - Year 2018

Characteristics on admission - Adult patients

Trauma	N	%
No	692	88.6
Yes	89	11.4
Multiple trauma	18	2.3
Missing	19	

Surgical status	N	%
Non surgical	499	63.9
Elective surgical	81	10.4
Emergency surgical	201	25.7
Missing	19	

Surgical status



Source of admission	N	%
Surgical pt. (N=282)		
Operating theatre of surgical ward	196	69.5
Operating theatre of emergency room	4	1.4
Surgical ward	49	17.4
Other	33	11.7
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=81)		
Gastrointestinal surgery	21	25.9
Neurosurgery	17	21.0
Pancreatic surgery	9	11.1
Gynaecological surgery	9	11.1
Biliary tract surgery	6	7.4
Acquired valv. heart dis. surgery	4	4.9
Orthopaedic surgery	4	4.9
Esophageal surgery	4	4.9
Nephro/Urological surgery	3	3.7
Other surgery	3	3.7
Missing	1	

Timing	N	%
Elective surgical (N=81)		
From -7 to -3 days	8	9.9
From -2 to -1 days	10	12.3
On ICU admission day	68	84.0
The day after ICU admission	3	3.7
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=201)		
Gastrointestinal surgery	70	34.8
Neurosurgery	51	25.4
Orthopaedic surgery	16	8.0
Peripheral vascular surgery	13	6.5
Other surgery	13	6.5
Biliary tract surgery	10	5.0
Obstetric surgery	7	3.5
Abdominal vascular surgery	7	3.5
Gynaecological surgery	6	3.0
Splenectomy	4	2.0
Missing	4	

Timing	N	%
Emergency surgical (N=201)		
From -7 to -3 days	29	14.4
From -2 to -1 days	28	13.9
On ICU admission day	148	73.6
The day after ICU admission	12	6.0
Missing	0	

Non surgical interventions	N	%
None	715	91.5
Elective	8	1.0
Emergency	58	7.4
Missing	19	

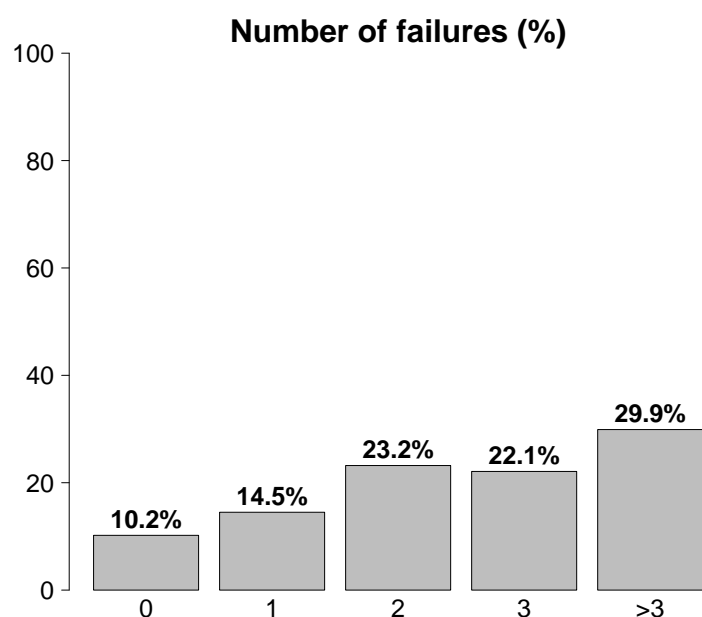
Non surgical interventions	N	%
Elective (N=8)		
Interventional neuroradiology	5	62.5
Interventional endoscopy	2	25.0
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Missing	1	

Non surgical interventions	N	%
Emergency (N=58)		
Interventional endoscopy	22	37.9
Interventional cardiology	18	31.0
Interventional neuroradiology	11	19.0
Interventional radiology	4	6.9
Missing	3	

National report for general ICUs - Year 2018

Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	80	10.2
Post surgical weaning	25	3.2
Surgical monitoring	8	1.0
Post interventional weaning	4	0.5
Interventional monitoring	6	0.8
Non surgical monitoring	36	4.6
Missing	1	
Admission for procedures/treatments	0	0.0
Intensive Treatment	698	89.4
Only ventilatory support	192	24.6
Only cardiovascular support	35	4.5
Ventilatory and cardiovascular support	471	60.3
Missing	0	
Palliative Sedation	2	0.3
Diagnosis of death/Organ donation	1	0.1
Missing	19	



Failures on admission	N	%
No	82	10.2
Yes	718	89.8
A: Respiratory failure	662	82.8
B: Cardiovascular failure	506	63.2
C: Neurological failure	185	23.1
D: Hepatic failure	26	3.2
E: Renal failure	323	40.4
F: Acute skin failure	3	0.4
G: Metabolic failure	337	42.1
H: Coagulation failure	22	2.8
Missing	0	

Failures on admission (top 10)	N	%
ABEG	113	14.1
AB	106	13.2
A	87	10.9
ABCEG	54	6.8
ABE	46	5.8
ABC	45	5.6
ABG	43	5.4
AC	26	3.2
ABCG	24	3.0
AG	23	2.9
Missing	0	

Respiratory failure	N	%
None	137	17.1
Only hypoxic failure	408	51.1
Only hypercapnic failure	34	4.3
Hypoxic-hypercapnic failure	129	16.1
Intubation for airway maint.	91	11.4
Missing	1	

Cardiovascular failure	N	%
None	294	36.8
Without shock	241	30.1
Cardiogenic shock	68	8.5
Septic shock	106	13.2
Haemorrhagic/hypovolemic shock	36	4.5
Hypovolemic shock	14	1.8
Anaphylactic shock	1	0.1
Neurogenic shock	8	1.0
Other shock	22	2.8
Mixed shock	10	1.2
Missing	0	

Neurologic failure	N	%
None	285	60.6
Cerebral coma	70	14.9
Metabolic coma	25	5.3
Postanoxic coma	80	17.0
Toxic coma	10	2.1
Missing or not evaluable	330	

Renal failure (AKIN)	N	%
None	457	58.6
Mild	99	12.7
Moderate	93	11.9
Severe	131	16.8
Missing	20	

Metabolic failure	N	%
None	443	56.8
pH ≤ 7.3, PaCO ₂ < 45 mmHg	73	9.4
Base deficit ≥ 5 mmol/L, lactate > 1.5x	264	33.8
Missing	20	

National report for general ICUs - Year 2018

Characteristics on admission - Adult patients

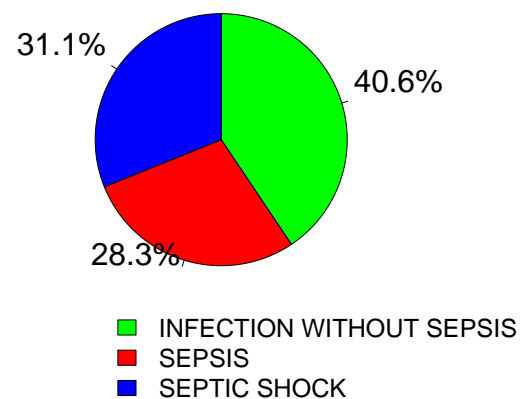
Clinical conditions on admission	N	%
Respiratory	174	22.3
Acute exacerbation of COPD	47	6.0
Mild ARDS	42	5.4
Aspiration pneumonia	34	4.4
Pleural effusion	25	3.2
Moderate ARDS	15	1.9
Cardiovascular	257	32.9
Cardiac arrest	100	12.8
Left heart failure without pulm. edema	80	10.2
Left heart failure with pulmonary edema	44	5.6
Acute myocardial infarction	25	3.2
Right heart failure	20	2.6
Neurological	179	22.9
Metabolic/postanoxic encephalopathy	38	4.9
Cerebral Aneurysm	28	3.6
Seizures	26	3.3
Intracranial hypertension	24	3.1
Spontaneous Subarachnoid haemorrhage	24	3.1
Gastrointestinal and hepatic	144	18.4
Acute pancreatitis	22	2.8
Gastrointestinal perforation	21	2.7
Gastrointestinal bleeding: upper tract	16	2.0
Acute on chronic liver disease	16	2.0
Intestinal occlusion	14	1.8
Trauma (anatomical districts)	89	11.4
Head	56	7.2
Chest	25	3.2
Pelvis/bone/joint & muscle	19	2.4
Spine	8	1.0
Abdomen	5	0.6
Major vessels injury	2	0.3
-	0	0.0
Other	156	20.0
Nephrourologic disease	42	5.4
Acute intoxication	34	4.4
Metabolic disorder	32	4.1
Coagulation disorder	22	2.8
Other disease	21	2.7
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	362	46.4
Pneumonia	200	25.6
NON-surgical urinary tract infection	29	3.7
Post-surgical peritonitis	25	3.2
NON-surgical secondary peritonitis	23	2.9
Cholecystitis/cholangitis	17	2.2
L.R.T.I. other than pneumonia	17	2.2
NON-surgical skin/soft tissue infection	13	1.7
Primary peritonitis	10	1.3
Gastroenteritis	8	1.0
Primary bacteraemia of unknown origin	7	0.9
Missing	19	

Trauma (anatomical districts)	N	%
Head	56	7.2
Traumatic Subdural haematoma	23	2.9
Skull fracture	21	2.7
Traumatic subarachnoid haemorrhage	12	1.5
Extradural/epidural haematoma	11	1.4
Traumatic intraparenchymal bleeding	11	1.4
Spine	8	1.0
Cervical injury, incomplete deficit	3	0.4
Vertebral fracture, without deficit	2	0.3
Dorsal injury, incomplete deficit	2	0.3
Chest	25	3.2
Traum. haemothorax/pneumothorax	14	1.8
Other injuries of the chest	9	1.2
Flail chest	6	0.8
Abdomen	5	0.6
Bowel transection/perforation	3	0.4
Spleen: Massive rupture	2	0.3
Stomach: Rupture or perforation	1	0.1
Pelvis/bone/joint & muscle	19	2.4
Long bone fracture	17	2.2
Multiple fracture of the pelvis	4	0.5
Massive crush/amputation	1	0.1
Major vessels injury	2	0.3
Aorta: rupture/dissection	1	0.1
Proximal limbs vessels: transection	1	0.1
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	19	

Infection severity on admission	N	%
None	419	53.8
INFECTION WITHOUT SEPSIS	146	18.7
SEPSIS	102	13.1
SEPTIC SHOCK	112	14.4
Missing	21	

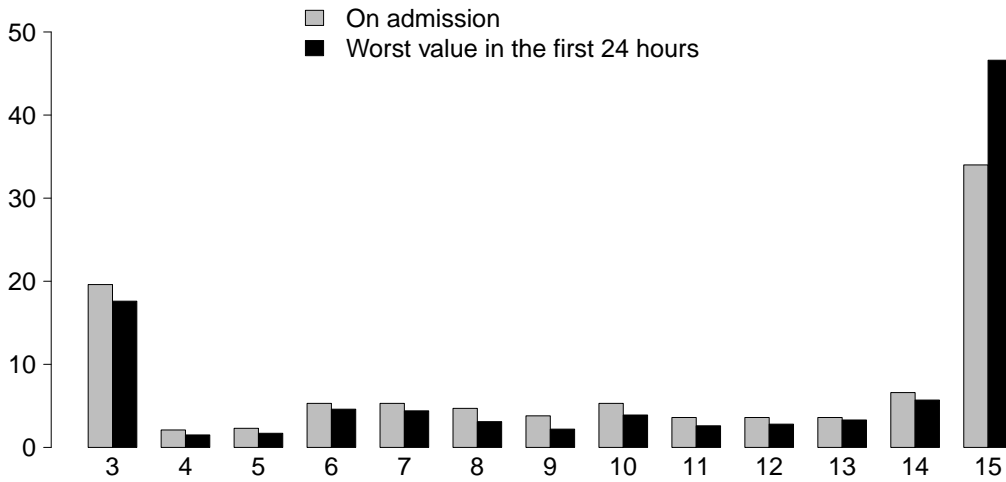
Infection severity on admission

Patients infected (N=360)



National report for general ICUs - Year 2018
Severity scores - Adult patients

Glasgow Coma Scale (%)



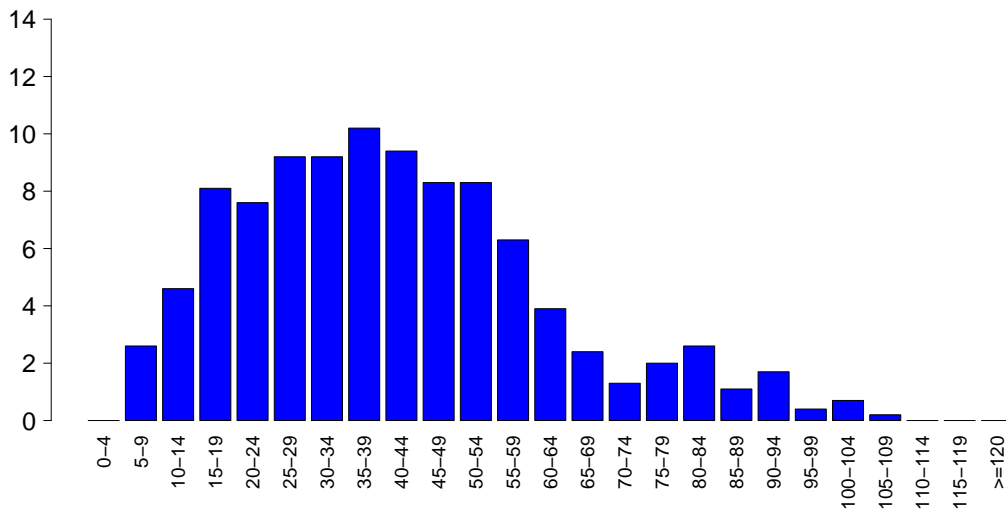
GCS (admission)

Median	11
Q1–Q3	6–15
Not evaluable	310
Missing	20

GCS (first 24 hours)

Median	14
Q1–Q3	6–15
Not evaluable	321
Missing	20

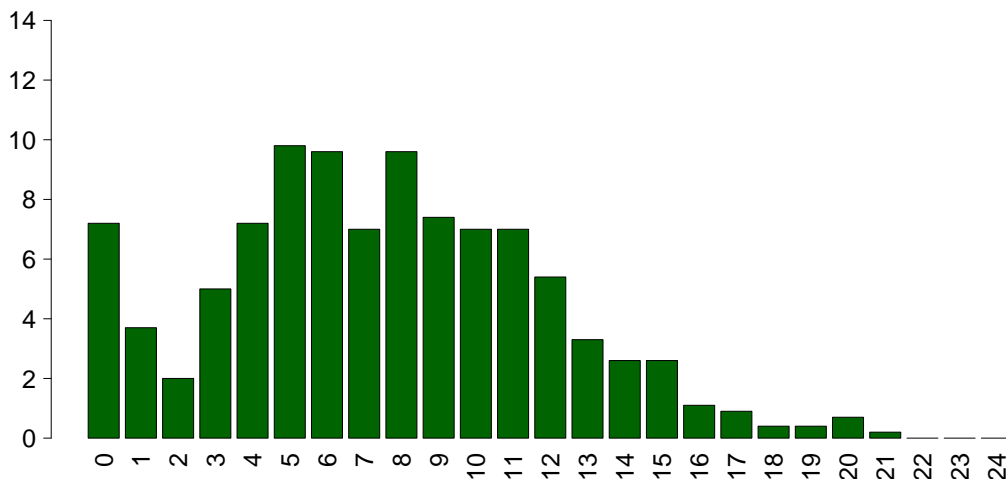
SAPS II (%)



SAPSII

Mean	41.3
SD	20.7
Median	39
Q1–Q3	26.5–53
Not evaluable	321
Missing	20

SOFA (%)



SOFA

Mean	7.5
SD	4.4
Median	7
Q1–Q3	4.5–10
Not evaluable	321
Missing	20

National report for general ICUs - Year 2018
Characteristics during the stay - Adult patients

Complications during the stay	N	%
No	368	47.2
Yes	412	52.8
Missing	20	

Failures during the stay	N	%
No	674	84.2
Yes	126	15.8
A: Respiratory failure	31	3.9
B: Cardiovascular failure	41	5.1
C: Neurological failure	4	0.5
D: Hepatic failure	5	0.6
E: Renal failure (AKIN)	66	8.2
F: Acute skin failure	2	0.2
G: Metabolic failure	20	2.5
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
E	38	4.8
B	23	2.9
G	14	1.8
A	13	1.6
AE	8	1.0
AB	6	0.8
BE	6	0.8
EG	5	0.6
D	3	0.4
ABCE	2	0.2
Missing	0	

Respiratory failure occurred	N	%
None	749	96.0
Intubation for airway maint.	7	0.9
Hypoxic failure	24	3.1
Hypercapnic failure	8	1.0
Missing	20	

Cardiovascular failure occurred	N	%
None	739	94.7
Cardiogenic shock	6	0.8
Hypovolemic shock	10	1.3
Haemorrhagic/hypovolemic shock	4	0.5
Septic shock	17	2.2
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.3
Other shock	2	0.3
Missing	20	

Neurological failure occurred	N	%
None	776	99.5
Cerebral coma	1	0.1
Metabolic coma	1	0.1
Postanoxic coma	2	0.3
Missing	20	

Renal failure occurred (AKIN)	N	%
None	714	91.5
Mild	3	0.4
Moderate	15	1.9
Severe	48	6.2
Missing	20	

Complications during the stay	N	%
Respiratory	53	6.8
Pleural effusion	22	2.8
Severe ARDS	6	0.8
Pneumothorax/Pneumomediastinum	6	0.8
Mild ARDS	5	0.6
Moderate ARDS	4	0.5
Cardiovascular	159	20.4
Cardiac arrest	60	7.7
Left heart failure w/o pulm. edema	40	5.1
Acute severe arrhythmia: tachycardias	25	3.2
Pulmonary edema	24	3.1
Right heart failure	11	1.4
Neurological	123	15.8
Brain edema	49	6.3
Intracranial hypertension	47	6.0
Drowsiness/agitation/delirium	36	4.6
Seizures	22	2.8
New ischaemic stroke	15	1.9
Gastrointestinal and hepatic	49	6.3
Gastrointestinal bleeding: upper tract	15	1.9
Anastomotic dehiscence	8	1.0
Bowel ischaemia	7	0.9
Gastrointestinal bleeding: lower tract	6	0.8
Paralytic Ileus	6	0.8
Other	56	7.2
Nephrourologic disease	22	2.8
Metabolic disorder	20	2.6
Category/Stage III: Full Thickness Skin Loss	6	0.8
Other disease	5	0.6
Category/Stage II: Partial Thickness Skin Loss	4	0.5
Extremity compartment syndrome (severe)	2	0.3
Other skin and/or soft tissue pathology	2	0.3
Infections	134	17.2
Pneumonia	52	6.7
NON-surgical urinary tract infection	33	4.2
L.R.T.I. other than pneumonia	25	3.2
Primary bacteraemia of unknown origin	10	1.3
Clinical sepsis	7	0.9
Post-surgical peritonitis	6	0.8
Gastroenteritis	5	0.6
Post-surgical skin/soft tissue infection	5	0.6
Post-surgical bone and joint infection	2	0.3
Catheter-related bacteremia (CR-BSI)	2	0.3
Missing	20	

National report for general ICUs - Year 2018
Characteristics during the stay - Adult patients

Infections	N	%	Maximum severity of infection	N	%
None	327	41.9	None	327	42.2
Only on admission	319	40.9	INFECTION WITHOUT SEPSIS	162	20.9
On admission and during ICU stay	42	5.4	SEPSIS	158	20.4
Only during ICU stay	92	11.8	SEPTIC SHOCK	128	16.5
Missing	20		Missing	25	

Severity evolution

		N (R %)	During the stay				TOT
			None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	
Admission	None	327 (78.6%)	40 (9.6%)	38 (9.1%)	11 (2.6%)	416	
	INFECTION WITHOUT SEPSIS	-	122 (83.6%)	21 (14.4%)	3 (2.1%)	146	
	SEPSIS	-	-	99 (97.1%)	3 (2.9%)	102	
	SEPTIC SHOCK	-	-	-	111 (100.0%)	111	
	TOT	327	162	158	128	775	

Ventil. Associat. Pneumonia (VAP)	N	%
No	754	94.2
Yes	46	5.8
Missing	0	

Incidence of VAP

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

Estimate	9.9
CI (95%)	7.2–13.2

Incidence of VAP

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

Estimate	7.9%
CI (95%)	5.8–10.6

Catheter Bacteraemia (CR-BSI)	N	%
No	778	99.7
Yes	2	0.3
Missing	20	

Incidence of CR-BSI

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

Estimate	0.3
CI (95%)	0.0–1.1

Incidence of CR-BSI

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

Estimate	0.3%
CI (95%)	0.0–1.3

National report for general ICUs - Year 2018
Process indicators - Adult patients

Procedures and/or treatments (Missing=19) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	776	99.4										
Invasive ventilation	680	87.1	505	64.7	160	20.5	3	1-9	0	0	0-0	0
Non invasive ventilation	50	6.4	12	1.5	12	1.5	2	1-6	0	0	0-4	0
Tracheostomy	123	15.7	13	1.7	71	9.1	14	6-24	0	8	6-10	0
iNO (inhaled nitric oxide)	1	0.1	1	0.1	0	0	2	2-2	0	0	0-0	0
Central Venous Catheter	699	89.5	298	38.2	263	33.7	6	2-12	0	0	0-0	0
PICC	1	0.1	0	0	0	0	0	0-0	0	0	0-0	0
Arterial Catheter	730	93.5	198	25.4	241	30.9	5	2-11	0	0	0-0	0
Vasoactive drugs	599	76.7	370	47.4	165	21.1	3	1-8	0	0	0-0	0
Antiarrhythmics	165	21.1	51	6.5	59	7.6	3	1-8	0	0	0-1	0
IABP	7	0.9	6	0.8	3	0.4	4	3-8	0	0	0-0	0
Invasive monitoring of C.O.	334	42.8	52	6.7	33	4.2	6	2-10	0	0	0-0	0
Continuous monitoring of ScVO2	0	0.0										
Temporary pacing	5	0.6	4	0.5	1	0.1	1	0-3	0	8	8-8	0
Ventricular assistance	0	0.0										
DC-shock	25	3.2										
CPR	71	9.1										
Massive blood transfusion	5	0.6										
ICP monitoring without CSF drainage	3	0.4	0	0	0	0	4	3-4	0	0	0-0	0
ICP monitoring with CSF drainage	0	0.0										
External ventricular drainage without ICP	0	0.0										
Haemofiltration	62	7.9	5	0.6	2	0.3	4	3-8	0	0	0-2	0
Haemodialysis	92	11.8	29	3.7	39	5	3	2-8	0	1	0-3	0
ECMO	3	0.4	3	0.4	1	0.1	6	4-6	0	0	0-0	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	1	0.1	0	0	0	0	0	0-0	0	5	5-5	0
IAP (intra-abdominal pressure)	10	1.3										
Hypothermia	1	0.1	1	0.1	0	0	3	3-3	0			
Enteral nutrition	446	57.1	62	7.9	135	17.3	7	3-13	0	1	0-1	0
Parenteral nutrition	346	44.3	34	4.4	120	15.4	5	2-10	0	0	0-1	0
SDD (Topical, Topical and systemic)	134	17.2										
Patient restraint	1	0.1										
Peridural catheter	1	0.1	0	0	1	0.1	6	6-6	0	1	1-1	0
Electrical cardioversion	17	2.2								1	0-2	0
Vacuum therapy	5	0.6										
Antibiotics	580	74.3										
Antibiotic prophylaxis	132	16.9	64	8.2	50	6.4	2	1-4	0	0	0-0	0
Empirical antibiotic therapy	309	39.6	84	10.8	70	9	3	2-5	0	0	0-0	0
Empirical antibiotic therapy in unconfirmed diagnosis	76	9.7	12	1.5	8	1	4	2-5	0	0	0-0	0
Targeted antibiotic therapy	231	29.6	35	4.5	78	10	7	4-12	0	3	2-6	0

National report for general ICUs - Year 2018

Outcome indicators - Adult patients

ICU outcome	N	%
Dead	314	40.7
Transferred to same hospital	305	39.6
Transferred to other hospital	116	15.0
Discharged home	36	4.7
Disch. terminally ill	0	0.0
Missing	29	

Transferred to (N=421)	N	%
Ward	397	94.3
Other ICU	21	5.0
High dependency care unit	3	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=21)	N	%
Specialist expertise	4	19.0
Step-up care	10	47.6
Logistical/organizational reasons	7	33.3
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=305)	N	%
Ward	303	99.3
Other ICU	0	0.0
High dependency care unit	2	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=116)	N	%
Ward	94	81.0
Other ICU	21	18.1
High dependency care unit	1	0.9
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	457	59.3
Dead	314	40.7
Missing	29	

Timing of ICU mortality (N=314)	N	%
Daytime (08:00AM - 07:59PM)	164	52.2
Nighttime (08:00PM - 07:59AM)	150	47.8
Weekdays (Monday - Friday)	226	72.0
Weekend (Saturday - Sunday)	88	28.0
Missing	0	

Hospital mortality *	N	%
Alive	407	55.8
Dead	322	44.2
Missing	19	

Timing of hosp. mortality * (N=322)	N	%
In ICU	296	91.9
Within 24 hours after ICU	1	0.3
24-47 hours after ICU	4	1.2
48-71 hours after ICU	3	0.9
72-95 hours after ICU	0	0.0
After 95 hours after ICU	18	5.6
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=26)		
Mean		12.5
SD		12.7
Median		9.5
Q1-Q3		2-17.5
Missing		0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=748).

National report for general ICUs - Year 2018

Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	404	55.4
Dead	325	44.6
Missing	19	

Readmission from ward	N	%
No	793	99.2
Yes	6	0.8
Missing	1	

Number of readmissions (N=6)	N	%
1	6	100.0
2	0	0.0
>2	0	0.0
Missing	0	

Timing of readmission (N=6)	N	%
Within 48 hours	2	33.3
48-71 hours	1	16.7
72-95 hours	1	16.7
After 95 hours	2	33.3
Missing	0	

Timing readmission (days)	N	%
Mean	3.1	
SD	2.7	
Median	2.9	
Q1-Q3	1.1-5.3	

ICU stay (days)	Mean	SD	Median	Q1-Q3	Missing
	9.4	12.9	5	2-11	20

ICU stay (days) Alive (N=457)	Mean	SD	Median	Q1-Q3	Missing
	8.9	11.1	5	2-11	0

ICU stay (days) Dead (N=314)	Mean	SD	Median	Q1-Q3	Missing
	9.1	13.2	5	1-10	0

Stay after ICU (days) * Alive (N=425)	Mean	SD	Median	Q1-Q3	Missing
	8.3	12.0	5	0-11	1

Hospital stay (days) *	Mean	SD	Median	Q1-Q3	Missing
	17.7	19.4	11	5-24	19

Hospital stay (days) * Alive (N=407)	Mean	SD	Median	Q1-Q3	Missing
	19.9	19.9	14	7-28	0

Hospital stay (days) * Dead (N=322)	Mean	SD	Median	Q1-Q3	Missing
	15.0	18.5	9	3-20	0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=748).

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Characteristics on admission - Adult patients evaluated in the GiViTI model

Patients (N): 704

Sex	N	%
Male	444	63.1
Female	260	36.9
Missing	0	

Age (years)	N	%
17-45	142	20.2
46-65	225	32.0
66-75	164	23.3
>75	173	24.6
Missing	0	
Mean	61.9	
SD	17.7	
Median	65	
Q1–Q3	51–75	
Min–Max	17–99	

Body mass Index (BMI)	N	%
Underweight	35	5.0
Normal	253	35.9
Overweight	239	33.9
Obese	177	25.1
Missing	0	

Pregnancy status	N	%
Females (N=260)		
Not fertile	103	39.6
Not pregnant/Unknown	147	56.5
Currently pregnant	3	1.2
Post partum	7	2.7
Missing	0	

Comorbidities	N	%
No	90	12.8
Yes	614	87.2
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	350	49.7
NYHA class II-III	198	28.1
Arrhythmia	158	22.4
Myocardial infarction	104	14.8
Diabetes Type II with insulin treatment	97	13.8
Alcohol addiction	97	13.8
Peripheral vascular disease	91	12.9
Moderate or severe renal disease	88	12.5
Cerebrovascular disease	65	9.2
Diabetes Type II without insulin tr.	65	9.2
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.4	8.5	1	0–4	0

Source of admission	N	%
Same hospital	559	79.4
Other hospital	144	20.5
Long-term chronic care hospital	1	0.1
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=703)		
Medical ward	206	29.3
Surgical ward	265	37.7
Emergency room	205	29.2
Other ICU	24	3.4
High dependency care unit	3	0.4
Missing	0	

Reason for transfer from	N	%
Other ICU (N=24)		
Specialist expertise	4	16.7
Step-up care	1	4.2
Logistical/organizational reasons	19	79.2
Step-down care	0	0.0
Missing	0	

Ward of admission	N	%
Same hospital (N=559)		
Medical ward	150	26.8
Surgical ward	239	42.8
Emergency room	161	28.8
Other ICU	8	1.4
High dependency care unit	1	0.2
Missing	0	

Ward of admission	N	%
Other hospital (N=144)		
Medical ward	56	38.9
Surgical ward	26	18.1
Emergency room	44	30.6
Other ICU	16	11.1
High dependency care unit	2	1.4
Missing	0	

Scheduled admission	N	%
No	669	95.0
Yes	35	5.0
Missing	0	

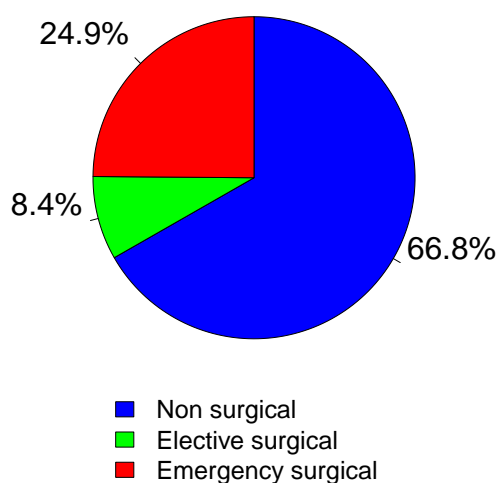
National report for general ICUs - Year 2018

Characteristics on admission - Adult patients evaluated in the GiViTI model

Trauma	N	%
No	622	88.4
Yes	82	11.6
Multiple trauma	18	2.6
Missing	0	

Surgical status	N	%
Non surgical	470	66.8
Elective surgical	59	8.4
Emergency surgical	175	24.9
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=234)		
Operating theatre of surgical ward	165	70.5
Operating theatre of emergency room	3	1.3
Surgical ward	41	17.5
Other	25	10.7
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=59)		
Gastrointestinal surgery	15	25.4
Neurosurgery	14	23.7
Pancreatic surgery	9	15.3
Gynaecological surgery	5	8.5
Biliary tract surgery	5	8.5
Nephro/Urological surgery	3	5.1
Orthopaedic surgery	3	5.1
Other surgery	3	5.1
Abdominal vascular surgery	2	3.4
Esophageal surgery	2	3.4
Missing	0	

Timing	N	%
Elective surgical (N=59)		
From -7 to -3 days	4	6.8
From -2 to -1 days	7	11.9
On ICU admission day	51	86.4
The day after ICU admission	3	5.1
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=175)		
Gastrointestinal surgery	65	37.1
Neurosurgery	39	22.3
Orthopaedic surgery	16	9.1
Other surgery	13	7.4
Peripheral vascular surgery	12	6.9
Biliary tract surgery	8	4.6
Obstetric surgery	7	4.0
Abdominal vascular surgery	7	4.0
Gynaecological surgery	4	2.3
Splenectomy	4	2.3
Missing	0	

Timing	N	%
Emergency surgical (N=175)		
From -7 to -3 days	22	12.6
From -2 to -1 days	23	13.1
On ICU admission day	131	74.9
The day after ICU admission	11	6.3
Missing	0	

Non surgical interventions	N	%
None	643	91.3
Elective	8	1.1
Emergency	53	7.5
Missing	0	

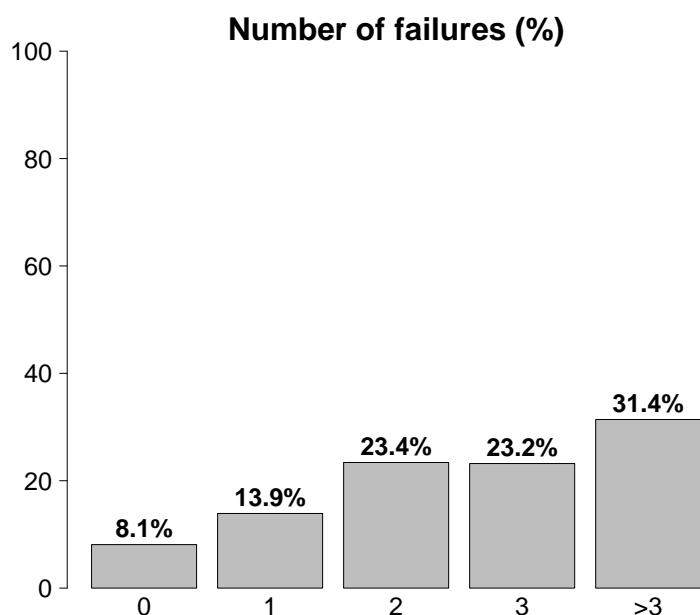
Non surgical interventions	N	%
Elective (N=8)		
Interventional neuroradiology	5	62.5
Interventional endoscopy	2	25.0
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Missing	1	

Non surgical interventions	N	%
Emergency (N=53)		
Interventional endoscopy	19	35.8
Interventional cardiology	17	32.1
Interventional neuroradiology	10	18.9
Interventional radiology	4	7.5
Missing	3	

National report for general ICUs - Year 2018

Characteristics on admission - Adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	71	10.1
Post surgical weaning	19	2.7
Surgical monitoring	7	1.0
Post interventional weaning	4	0.6
Interventional monitoring	6	0.9
Non surgical monitoring	34	4.8
Missing	1	
Admission for procedures/treatments	0	0.0
Intensive Treatment	633	89.9
Only ventilatory support	179	25.4
Only cardiovascular support	31	4.4
Ventilatory and cardiovascular support	423	60.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	57	8.1
Yes	647	91.9
A: Respiratory failure	602	85.5
B: Cardiovascular failure	454	64.5
C: Neurological failure	170	24.1
D: Hepatic failure	25	3.6
E: Renal failure	297	42.2
F: Acute skin failure	2	0.3
G: Metabolic failure	313	44.5
H: Coagulation failure	19	2.7
Missing	0	

Failures on admission (top 10)	N	%
ABEG	106	15.1
AB	87	12.4
A	77	10.9
ABCEG	49	7.0
ABE	43	6.1
ABC	41	5.8
ABG	40	5.7
AC	26	3.7
AG	23	3.3
ABCG	21	3.0
Missing	0	

Respiratory failure	N	%
None	102	14.5
Only hypoxic failure	371	52.7
Only hypercapnic failure	34	4.8
Hypoxic-hypercapnic failure	109	15.5
Intubation for airway maint.	88	12.5
Missing	0	

Cardiovascular failure	N	%
None	250	35.5
Without shock	206	29.3
Cardiogenic shock	64	9.1
Septic shock	99	14.1
Haemorrhagic/hypovolemic shock	35	5.0
Hypovolemic shock	12	1.7
Anaphylactic shock	1	0.1
Neurogenic shock	8	1.1
Other shock	20	2.8
Mixed shock	9	1.3
Missing	0	

Neurologic failure	N	%
None	255	60.0
Cerebral coma	65	15.3
Metabolic coma	22	5.2
Postanoxic coma	73	17.2
Toxic coma	10	2.4
Missing or not evaluable	279	

Renal failure (AKIN)	N	%
None	407	57.8
Mild	93	13.2
Moderate	88	12.5
Severe	116	16.5
Missing	0	

Metabolic failure	N	%
None	391	55.5
pH <= 7.3, PaCO ₂ < 45 mmHg	71	10.1
Base deficit >= 5 mmol/L, lactate >1.5x	242	34.4
Missing	0	

National report for general ICUs - Year 2018

Characteristics on admission - Adult patients evaluated in the GiViTI model

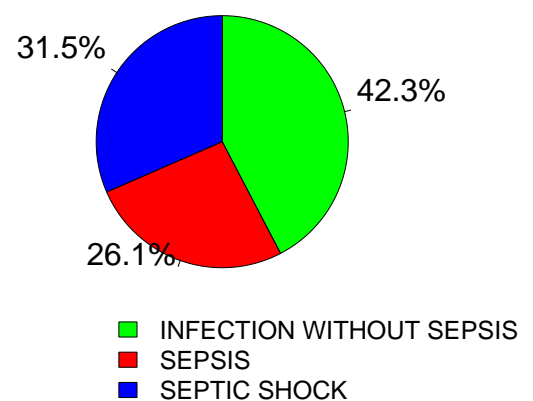
Clinical conditions on admission	N	%
Respiratory	159	22.6
Acute exacerbation of COPD	45	6.4
Mild ARDS	34	4.8
Aspiration pneumonia	33	4.7
Pleural effusion	19	2.7
Moderate ARDS	15	2.1
Cardiovascular	230	32.7
Cardiac arrest	89	12.6
Left heart failure without pulm. edema	73	10.4
Left heart failure with pulmonary edema	41	5.8
Acute myocardial infarction	23	3.3
Right heart failure	18	2.6
Neurological	157	22.3
Metabolic/postanoxic encephalopathy	33	4.7
Seizures	25	3.6
Cerebral Aneurysm	24	3.4
Intracranial hypertension	22	3.1
Spontaneous Subarachnoid haemorrhage	20	2.8
Gastrointestinal and hepatic	126	17.9
Acute pancreatitis	21	3.0
Gastrointestinal perforation	19	2.7
Gastrointestinal bleeding: upper tract	16	2.3
Acute on chronic liver disease	15	2.1
Intestinal occlusion	12	1.7
Trauma (anatomical districts)	82	11.6
Head	51	7.2
Chest	24	3.4
Pelvis/bone/joint & muscle	18	2.6
Spine	8	1.1
Abdomen	5	0.7
Major vessels injury	2	0.3
-	0	0.0
Other	139	19.7
Nephrourologic disease	38	5.4
Acute intoxication	34	4.8
Metabolic disorder	31	4.4
Coagulation disorder	19	2.7
Other disease	19	2.7
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	335	47.6
Pneumonia	193	27.4
NON-surgical urinary tract infection	24	3.4
Post-surgical peritonitis	22	3.1
NON-surgical secondary peritonitis	20	2.8
L.R.T.I. other than pneumonia	16	2.3
NON-surgical skin/soft tissue infection	13	1.8
Cholecystitis/cholangitis	11	1.6
Primary peritonitis	10	1.4
Gastroenteritis	8	1.1
Primary bacteraemia of unknown origin	6	0.9
Missing	0	

Trauma (anatomical districts)	N	%
Head	51	7.2
Traumatic Subdural haematoma	20	2.8
Skull fracture	20	2.8
Traumatic intraparenchymal bleeding	11	1.6
Traumatic subarachnoid haemorrhage	11	1.6
Cerebral contusion/laceration	9	1.3
Spine	8	1.1
Cervical injury, incomplete deficit	3	0.4
Vertebral fracture, without deficit	2	0.3
Dorsal injury, incomplete deficit	2	0.3
Chest	24	3.4
Traum. haemothorax/pneumothorax	13	1.8
Other injuries of the chest	9	1.3
Severe lung contusion/laceration	6	0.9
Abdomen	5	0.7
Bowel transection/perforation	3	0.4
Spleen: Massive rupture	2	0.3
Stomach: Rupture or perforation	1	0.1
Pelvis/bone/joint & muscle	18	2.6
Long bone fracture	16	2.3
Multiple fracture of the pelvis	4	0.6
Massive crush/amputation	1	0.1
Major vessels injury	2	0.3
Aorta: rupture/dissection	1	0.1
Proximal limbs vessels: transection	1	0.1
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	369	52.6
INFECTION WITHOUT SEPSIS	141	20.1
SEPSIS	87	12.4
SEPTIC SHOCK	105	15.0
Missing	2	

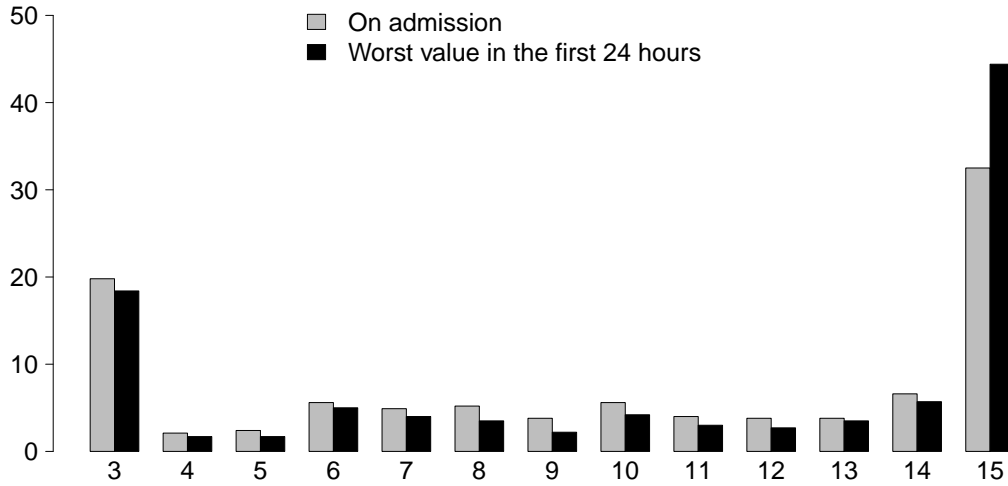
Infection severity on admission

Patients infected (N=333)



National report for general ICUs - Year 2018
Severity scores - Adult patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



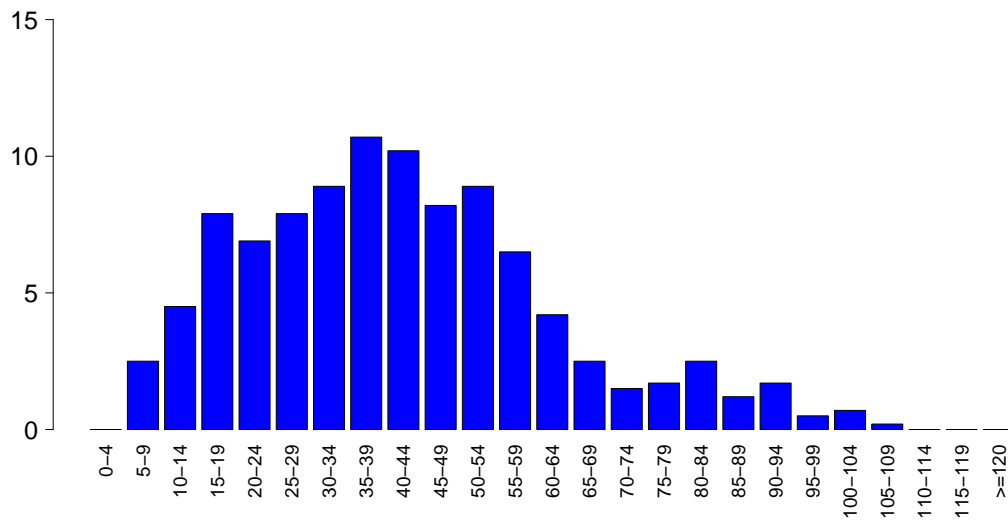
GCS (admission)

Median	11
Q1–Q3	6–15
Not evaluable	279
Missing	0

GCS (first 24 hours)

Median	14
Q1–Q3	6–15
Not evaluable	301
Missing	0

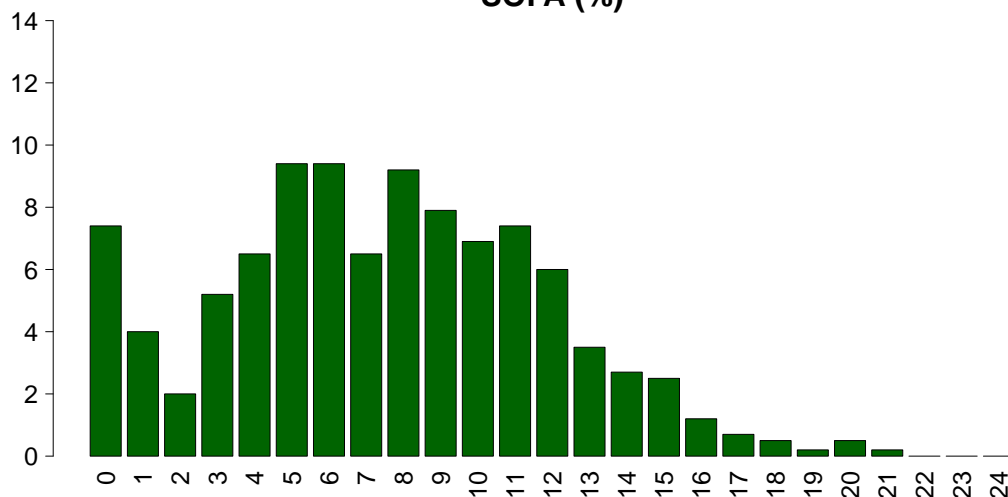
SAPS II (%)



SAPSII

Mean	42.0
SD	20.7
Median	40
Q1–Q3	27–53
Not evaluable	301
Missing	0

SOFA (%)



SOFA

Mean	7.5
SD	4.4
Median	7
Q1–Q3	4.5–11
Not evaluable	301
Missing	0

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Characteristics during the stay - Adult patients evaluated in the GiViTI model

Complications during the stay	N	%
No	334	47.4
Yes	370	52.6
Missing	0	

Failures during the stay	N	%
No	591	83.9
Yes	113	16.1

A: Respiratory failure	24	3.4
B: Cardiovascular failure	35	5.0
C: Neurological failure	3	0.4
D: Hepatic failure	5	0.7
E: Renal failure (AKIN)	63	8.9
F: Acute skin failure	2	0.3
G: Metabolic failure	20	2.8
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
E	37	5.3
B	19	2.7
G	14	2.0
A	8	1.1
AE	7	1.0
BE	6	0.9
AB	5	0.7
EG	5	0.7
D	3	0.4
ABCE	2	0.3
Missing	0	

Respiratory failure occurred	N	%
None	680	96.6
Intubation for airway maint.	6	0.9
Hypoxic failure	18	2.6
Hypercapnic failure	7	1.0
Missing	0	

Cardiovascular failure occurred	N	%
None	669	95.0
Cardiogenic shock	6	0.9
Hypovolemic shock	6	0.9
Haemorrhagic/hypovolemic shock	4	0.6
Septic shock	15	2.1
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.3
Other shock	2	0.3
Missing	0	

Neurological failure occurred	N	%
None	701	99.6
Cerebral coma	0	0.0
Metabolic coma	1	0.1
Postanoxic coma	2	0.3
Missing	0	

Renal failure occurred (AKIN)	N	%
None	641	91.1
Mild	3	0.4
Moderate	15	2.1
Severe	45	6.4
Missing	0	

Complications during the stay	N	%
Respiratory	43	6.1
Pleural effusion	13	1.8
Severe ARDS	6	0.9
Pneumothorax/Pneumomediastinum	5	0.7
Mild ARDS	4	0.6
Moderate ARDS	4	0.6
Cardiovascular	140	19.9
Cardiac arrest	57	8.1
Left heart failure w/o pulm. edema	34	4.8
Acute severe arrhythmia: tachycardias	23	3.3
Pulmonary edema	20	2.8
Deep venous thrombosis	9	1.3
Neurological	108	15.3
Brain edema	43	6.1
Intracranial hypertension	42	6.0
Drowsiness/agitation/delirium	31	4.4
Seizures	20	2.8
New ischaemic stroke	12	1.7
Gastrointestinal and hepatic	45	6.4
Gastrointestinal bleeding: upper tract	15	2.1
Anastomotic dehiscence	8	1.1
Bowel ischaemia	6	0.9
Gastrointestinal bleeding: lower tract	6	0.9
Acute on chronic liver disease	5	0.7
Other	53	7.5
Nephrourologic disease	21	3.0
Metabolic disorder	20	2.8
Category/Stage III: Full Thickness Skin Loss	4	0.6
Other disease	4	0.6
Category/Stage II: Partial Thickness Skin Loss	3	0.4
Extremity compartment syndrome (severe)	2	0.3
Other skin and/or soft tissue pathology	2	0.3
Infections	122	17.3
Pneumonia	46	6.5
NON-surgical urinary tract infection	31	4.4
L.R.T.I. other than pneumonia	23	3.3
Primary bacteraemia of unknown origin	8	1.1
Clinical sepsis	7	1.0
Post-surgical peritonitis	6	0.9
Gastroenteritis	4	0.6
Post-surgical skin/soft tissue infection	4	0.6
Post-surgical bone and joint infection	2	0.3
Catheter-related bacteremia (CR-BSI)	2	0.3
Missing	0	

National report for general ICUs - Year 2018

Characteristics during the stay - Adult patients evaluated in the GiViTI model

Infections				Maximum severity of infection				
	N	%		N	%		N	%
	None	285	40.5		None	285	40.8	
	Only on admission	297	42.2		INFECTION WITHOUT SEPSIS	156	22.3	
	On admission and during ICU stay	38	5.4		SEPSIS	138	19.8	
	Only during ICU stay	84	11.9		SEPTIC SHOCK	119	17.0	
	Missing	0			Missing	6		

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK
Admission	None	285 (77.9%)	38 (10.4%)	34 (9.3%)	9 (2.5%)	366
	INFECTION WITHOUT SEPSIS	-	118 (83.7%)	20 (14.2%)	3 (2.1%)	141
	SEPSIS	-	-	84 (96.6%)	3 (3.4%)	87
	SEPTIC SHOCK	-	-	-	104 (100.0%)	104
	TOT	285	156	138	119	698

Ventil. Associat. Pneumonia (VAP)	N	%
No	662	94.0
Yes	42	6.0
Missing	0	

Incidence of VAP

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

Estimate	9.6
CI (95%)	6.9–13.0

Incidence of VAP

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

Estimate	7.7%
CI (95%)	5.5–10.4

Catheter Bacteraemia (CR-BSI)	N	%
No	702	99.7
Yes	2	0.3
Missing	0	

Incidence of CR-BSI

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

Estimate	0.3
CI (95%)	0.0–1.1

Incidence of CR-BSI

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

Estimate	0.4%
CI (95%)	0.0–1.4

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Process indicators - Adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	699	99.3										
Invasive ventilation	611	86.8	439	62.4	148	21	3	1-9	0	0	0-0	0
Non invasive ventilation	43	6.1	10	1.4	9	1.3	2	1-5	0	0	0-2	0
Tracheostomy	112	15.9	11	1.6	65	9.2	15	7-26	0	8	6-10	0
iNO (inhaled nitric oxide)	1	0.1	1	0.1	0	0	2	2-2	0			
Central Venous Catheter	628	89.2	253	35.9	240	34.1	6	2-12	0	0	0-0	0
PICC	1	0.1	0	0	0	0	0	0-0	0	0	0-0	0
Arterial Catheter	656	93.2	175	24.9	220	31.2	5	2-11	0	0	0-0	0
Vasoactive drugs	531	75.4	308	43.8	155	22	3	1-9	0	0	0-0	0
Antiarrhythmics	155	22.0	47	6.7	57	8.1	3	1-8	0	0	0-1	0
IABP	6	0.9	5	0.7	2	0.3	4	2-6	0	0	0-0	0
Invasive monitoring of C.O.	281	39.9	47	6.7	32	4.5	6	2-10	0	0	0-0	0
Continuous monitoring of ScVO2	0	0.0										
Temporary pacing	4	0.6	3	0.4	1	0.1	2	0-6	0	8	8-8	0
Ventricular assistance	0	0.0										
DC-shock	23	3.3								1	0-4	0
CPR	69	9.8								1	0-4	0
Massive blood transfusion	4	0.6								0	0-2	0
ICP monitoring without CSF drainage	3	0.4	0	0	0	0	4	3-4	0	0	0-0	0
ICP monitoring with CSF drainage	0	0.0										
External ventricular drainage without ICP	0	0.0										
Haemofiltration	54	7.7	4	0.6	2	0.3	4	2-8	0	0	0-2	0
Haemodialysis	86	12.2	27	3.8	36	5.1	3	2-8	0	1	0-2	0
ECMO	2	0.3	2	0.3	0	0	6	6-7	0			
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	1	0.1	0	0	0	0	0	0-0	0	5	5-5	0
IAP (intra-abdominal pressure)	7	1.0										
Hypothermia	1	0.1	1	0.1	0	0	3	3-3	0			
Enteral nutrition	410	58.2	51	7.2	124	17.6	7	3-13	0	1	0-1	0
Parenteral nutrition	308	43.8	31	4.4	116	16.5	5	2-10	0	0	0-1	0
SDD (Topical, Topical and systemic)	129	18.3										
Patient restraint	0	0.0										
Peridural catheter	1	0.1	0	0	1	0.1	6	6-6	0	1	1-1	0
Electrical cardioversion	15	2.1								1	0-2	0
Vacuum therapy	5	0.7										
Antibiotics	522	74.1										
Antibiotic prophylaxis	116	16.5	55	7.8	48	6.8	2	1-5	0	0	0-0	0
Empirical antibiotic therapy	290	41.2	79	11.2	68	9.7	3	2-5	0	0	0-0	0
Empirical antibiotic therapy in unconfirmed diagnosis	62	8.8	9	1.3	6	0.9	4	2-5	0	0	0-0	0
Targeted antibiotic therapy	204	29.0	28	4	70	9.9	7	4-13	0	3	2-6	0

National report for general ICUs - Year 2018

Process indicators - Adult patients evaluated in the GiViTI model

Invasive ventilation (N=611)	N	%	Length (days)					
			Mean	SD	Median	Q1-Q3	Missing	
Due to pulmonary failure	495	81.0	8.6	13.3	4	1–10	0	
For airway maintenance	84	13.7	7.6	14.4	3	1–7	0	
In weaning	26	4.3	0.2	0.4	0	0–0	0	
Not evaluable	6	1.0	3.7	4.5	2	0.2–6	0	
Reintubation within 48 hours	3	0.5	2.7	1.5	3	2–3.5	0	
Non invasive ventilation (N=43)	N	%	Number of surgical interventions					
Non invasive ventilation only	25	58.1				0	668	94.9
Non invasive ventilation failed	4	9.3				1	27	3.8
For weaning	11	25.6				2	6	0.9
Other	3	7.0				3	3	0.4
Missing	0					>3	0	0.0
						Missing	0	
Tracheostomy not present on admission (N=101)	N	%	Surgical interventions					
Surgical	15	14.9	Days from admission					
Percutwist	0	0.0				Mean	9.1	
Ciaglia	0	0.0				SD	8.6	
Monodil. Ciaglia	1	1.0				Median	6.5	
Fantoni	0	0.0				Q1–Q3	3–10.5	
Griggs	56	55.4				Missing	0	
Other Kind	3	3.0	Surgical interventions (top 10)					
Unknown	26	25.7					N	%
Missing	0							
						Gastrointestinal surgery	20	2.8
						Other surgery	10	1.4
						Neurosurgery	9	1.3
						Orthopaedic surgery	4	0.6
						Organ donation	2	0.3
						Peripheral vascular surgery	1	0.1
						Biliary tract surgery	1	0.1
						Esophageal surgery	1	0.1
						-	0	0.0
						-	0	0.0
						Missing	0	
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=101)			Non surgical interventions					
Mean	8.0						N	%
SD	4.7					No	668	94.9
Median	8					Yes	36	5.1
Q1–Q3	6–10					Missing	0	
Missing	0		Non surgical interventions					
			Days from admission					
						Mean	19.0	
						SD	18.4	
						Median	15.5	
						Q1–Q3	6–24.2	
						Missing	0	
Invasive monitoring of C.O. (N=281)	N	%	Non surgical interventions					
Swan Ganz	9	3.2					N	%
PICCO	43	15.3				Interventional endoscopy	43	6.1
LIDCO	166	59.1				Interventional radiology	1	0.1
Vigileo-PRAM	16	5.7				Interventional cardiology	0	0.0
Other	47	16.7				Interventional neuroradiology	0	0.0
Missing	0					Missing	0	
SDD (N=129)	N	%	Non surgical interventions					
Topical	80	62.0					N	%
Topical and systemic	49	38.0				Interventional endoscopy	43	6.1
Missing	0					Interventional radiology	1	0.1
						Interventional cardiology	0	0.0
						Interventional neuroradiology	0	0.0
						Missing	0	
Antibiotic therapy			Non surgical interventions					
Pt. infected in ICU only (N=84)	N	%					N	%
Only empirical	19	23.8				Interventional endoscopy	43	6.1
Only targeted	22	27.5				Interventional radiology	1	0.1
Targeted after empirical	31	38.8				Interventional cardiology	0	0.0
Other	8	10.0				Interventional neuroradiology	0	0.0
Missing	4					Missing	0	
Surgical interventions	N	%	Non surgical interventions					
No	668	94.9					N	%
Yes	36	5.1				Interventional endoscopy	43	6.1
Missing	0					Interventional radiology	1	0.1
						Interventional cardiology	0	0.0
						Interventional neuroradiology	0	0.0
						Missing	0	

National report for general ICUs - Year 2018**Outcome indicators - Adult patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	286	41.1
Transferred to same hospital	264	37.9
Transferred to other hospital	111	15.9
Discharged home	35	5.0
Disch. terminally ill	0	0.0
Missing	8	

Transferred to (N=375)	N	%
Ward	351	93.6
Other ICU	21	5.6
High dependency care unit	3	0.8
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=21)	N	%
Specialist expertise	4	19.0
Step-up care	10	47.6
Logistical/organizational reasons	7	33.3
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=264)	N	%
Ward	262	99.2
Other ICU	0	0.0
High dependency care unit	2	0.8
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=111)	N	%
Ward	89	80.2
Other ICU	21	18.9
High dependency care unit	1	0.9
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	410	58.9
Dead	286	41.1
Missing	8	

Timing of ICU mortality (N=286)	N	%
Daytime (08:00AM - 07:59PM)	150	52.4
Nighttime (08:00PM - 07:59AM)	136	47.6
Weekdays (Monday - Friday)	208	72.7
Weekend (Saturday - Sunday)	78	27.3
Missing	0	

Hospital mortality	N	%
Alive	392	55.7
Dead	312	44.3
Missing	0	

Timing of hosp. mortality (N=312)	N	%
In ICU	286	91.7
Within 24 hours after ICU	1	0.3
24-47 hours after ICU	4	1.3
48-71 hours after ICU	3	1.0
72-95 hours after ICU	0	0.0
After 95 hours after ICU	18	5.8
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=26)		
Mean		12.5
SD		12.7
Median		9.5
Q1–Q3		2–17.5
Missing		0

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Outcome indicators - Adult patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	389	55.3
Dead	315	44.7
Missing	0	

ICU stay (days)	
Mean	9.6
SD	13.2
Median	5
Q1–Q3	2–11
Missing	0

ICU stay (days) Alive (N=410)	
Mean	9.1
SD	11.5
Median	5
Q1–Q3	2–11
Missing	0

ICU stay (days) Dead (N=286)	
Mean	9.3
SD	13.6
Median	5
Q1–Q3	1–10
Missing	0

Stay after ICU (days) Alive (N=410)	
Mean	8.3
SD	12.2
Median	4
Q1–Q3	0–11
Missing	0

Hospital stay (days)	
Mean	17.7
SD	19.5
Median	11
Q1–Q3	5–24
Missing	0

Hospital stay (days) Alive (N=392)	
Mean	19.7
SD	20.0
Median	13
Q1–Q3	6–27.2
Missing	0

Hospital stay (days) Dead (N=312)	
Mean	15.3
SD	18.7
Median	9
Q1–Q3	3–20
Missing	0

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

Patients (N): 470

Sex	N	%
Male	313	66.6
Female	157	33.4
Missing	0	

Age (years)	N	%
17-45	93	19.8
46-65	154	32.8
66-75	114	24.3
>75	109	23.2
Missing	0	
Mean	61.5	
SD	17.7	
Median	65	
Q1–Q3	51–75	
Min–Max	17–99	

Body mass Index (BMI)	N	%
Underweight	23	4.9
Normal	178	37.9
Overweight	162	34.5
Obese	107	22.8
Missing	0	

Pregnancy status	N	%
Females (N=157)		
Not fertile	62	39.5
Not pregnant/Unknown	93	59.2
Currently pregnant	1	0.6
Post partum	1	0.6
Missing	0	

Comorbidities	N	%
No	55	11.7
Yes	415	88.3
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	229	48.7
NYHA class II-III	134	28.5
Arrhythmia	109	23.2
Myocardial infarction	81	17.2
Alcohol addiction	75	16.0
Moderate or severe renal disease	67	14.3
Diabetes Type II with insulin treatment	62	13.2
Peripheral vascular disease	54	11.5
Cerebrovascular disease	51	10.9
Diabetes Type II without insulin tr.	50	10.6
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.1	9.0	1	0–4	0

Source of admission	N	%
Same hospital	353	75.1
Other hospital	116	24.7
Long-term chronic care hospital	1	0.2
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=469)		
Medical ward	192	40.9
Surgical ward	59	12.6
Emergency room	196	41.8
Other ICU	20	4.3
High dependency care unit	2	0.4
Missing	0	

Reason for transfer from	N	%
Other ICU (N=20)		
Specialist expertise	2	10.0
Step-up care	0	0.0
Logistical/organizational reasons	18	90.0
Step-down care	0	0.0
Missing	0	

Ward of admission	N	%
Same hospital (N=353)		
Medical ward	140	39.7
Surgical ward	50	14.2
Emergency room	155	43.9
Other ICU	8	2.3
High dependency care unit	0	0.0
Missing	0	

Ward of admission	N	%
Other hospital (N=116)		
Medical ward	52	44.8
Surgical ward	9	7.8
Emergency room	41	35.3
Other ICU	12	10.3
High dependency care unit	2	1.7
Missing	0	

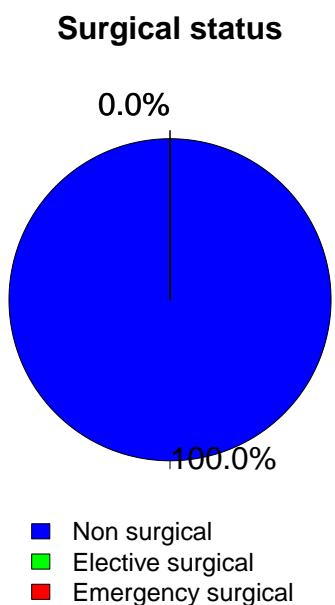
Scheduled admission	N	%
No	467	99.4
Yes	3	0.6
Missing	0	

National report for general ICUs - Year 2018

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

Trauma	N	%
No	431	91.7
Yes	39	8.3
Multiple trauma	6	1.3
Missing	0	

Surgical status	N	%
Non surgical	470	100.0
Elective surgical	0	0.0
Emergency surgical	0	0.0
Missing	0	



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

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

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

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

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

Non surgical interventions	N	%
None	427	90.9
Elective	6	1.3
Emergency	37	7.9
Missing	0	

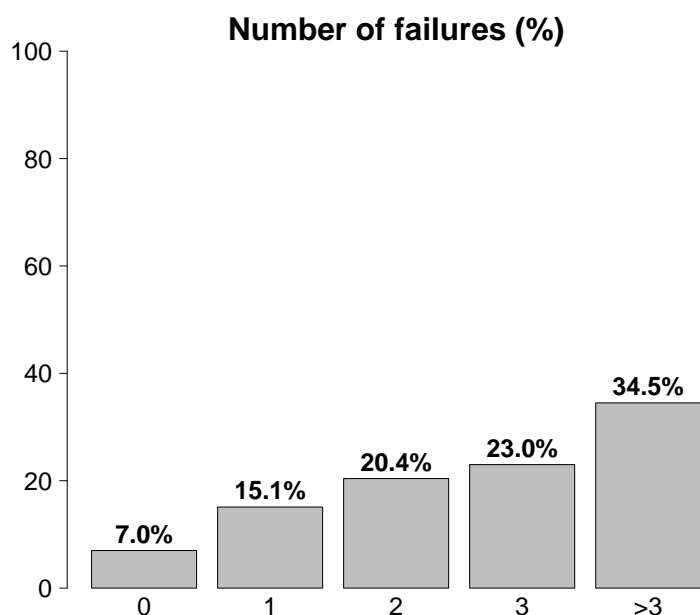
Non surgical interventions	N	%
Elective (N=6)		
Interventional neuroradiology	4	66.7
Interventional endoscopy	2	33.3
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=37)		
Interventional endoscopy	14	37.8
Interventional cardiology	13	35.1
Interventional neuroradiology	7	18.9
Interventional radiology	3	8.1
Missing	0	

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

Reason for admission	N	%
Monitoring/Weaning	45	9.6
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	4	0.9
Interventional monitoring	6	1.3
Non surgical monitoring	34	7.2
Missing	1	
Admission for procedures/treatments	0	0.0
Intensive Treatment	425	90.4
Only ventilatory support	142	30.2
Only cardiovascular support	18	3.8
Ventilatory and cardiovascular support	265	56.4
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	33	7.0
Yes	437	93.0
A: Respiratory failure	407	86.6
B: Cardiovascular failure	283	60.2
C: Neurological failure	142	30.2
D: Hepatic failure	21	4.5
E: Renal failure	208	44.3
F: Acute skin failure	1	0.2
G: Metabolic failure	230	48.9
H: Coagulation failure	13	2.8
Missing	0	

Failures on admission (top 10)	N	%
ABEG	66	14.0
A	58	12.3
ABCEG	42	8.9
AB	34	7.2
ABC	26	5.5
ABE	26	5.5
ABG	24	5.1
AC	23	4.9
ABCG	20	4.3
AG	20	4.3
Missing	0	

Respiratory failure	N	%
None	63	13.4
Only hypoxic failure	245	52.1
Only hypercapnic failure	27	5.7
Hypoxic-hypercapnic failure	80	17.0
Intubation for airway maint.	55	11.7
Missing	0	

Cardiovascular failure	N	%
None	187	39.8
Without shock	131	27.9
Cardiogenic shock	56	11.9
Septic shock	63	13.4
Haemorrhagic/hypovolemic shock	7	1.5
Hypovolemic shock	3	0.6
Anaphylactic shock	1	0.2
Neurogenic shock	6	1.3
Other shock	12	2.6
Mixed shock	4	0.9
Missing	0	

Neurologic failure	N	%
None	184	56.4
Cerebral coma	45	13.8
Metabolic coma	19	5.8
Postanoxic coma	68	20.9
Toxic coma	10	3.1
Missing or not evaluable	144	

Renal failure (AKIN)	N	%
None	262	55.7
Mild	69	14.7
Moderate	56	11.9
Severe	83	17.7
Missing	0	

Metabolic failure	N	%
None	240	51.1
pH <= 7.3, PaCO ₂ < 45 mmHg	56	11.9
Base deficit >= 5 mmol/L, lactate >1.5x	174	37.0
Missing	0	

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

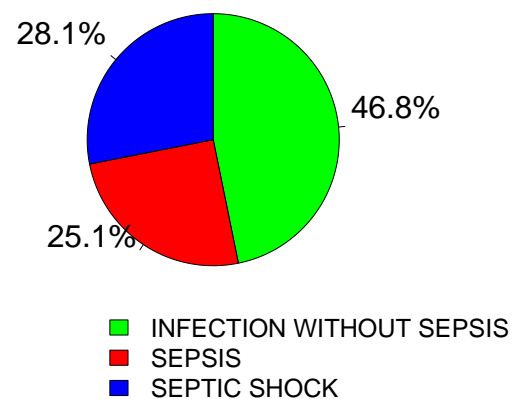
Clinical conditions on admission	N	%
Respiratory	141	30.0
Acute exacerbation of COPD	42	8.9
Aspiration pneumonia	31	6.6
Mild ARDS	27	5.7
Pleural effusion	17	3.6
Moderate ARDS	14	3.0
Cardiovascular	186	39.6
Cardiac arrest	83	17.7
Left heart failure without pulm. edema	51	10.9
Left heart failure with pulmonary edema	36	7.7
Acute myocardial infarction	20	4.3
Right heart failure	14	3.0
Neurological	114	24.3
Metabolic/postanoxic encephalopathy	31	6.6
Seizures	23	4.9
Cerebral artery stroke	14	3.0
Intracranial hypertension	13	2.8
Cerebral Aneurysm	11	2.3
Gastrointestinal and hepatic	52	11.1
Acute pancreatitis	17	3.6
Acute on chronic liver disease	14	3.0
Liver Dysfunction Syndrome	9	1.9
Gastrointestinal bleeding: upper tract	7	1.5
Ascites	6	1.3
Trauma (anatomical districts)	39	8.3
Head	25	5.3
Chest	15	3.2
Spine	4	0.9
Pelvis/bone/joint & muscle	3	0.6
-	0	0.0
-	0	0.0
-	0	0.0
Other	103	21.9
Acute intoxication	34	7.2
Metabolic disorder	27	5.7
Nephrourologic disease	25	5.3
Other disease	17	3.6
Coagulation disorder	13	2.8
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	237	50.4
Pneumonia	167	35.5
NON-surgical urinary tract infection	22	4.7
L.R.T.I. other than pneumonia	14	3.0
NON-surgical secondary peritonitis	8	1.7
Primary bacteraemia of unknown origin	5	1.1
Gastroenteritis	5	1.1
NON-surgical CNS infection	4	0.9
NON-surgical skin/soft tissue infection	4	0.9
NON-surgical bone and joint infection	2	0.4
Cholecystitis/cholangitis	2	0.4
Missing	0	

Trauma (anatomical districts)	N	%
Head	25	5.3
Skull fracture	13	2.8
Traumatic intraparenchymal bleeding	10	2.1
Cerebral contusion/laceration	8	1.7
Traumatic subarachnoid haemorrhage	6	1.3
Traumatic diffuse injury with oedema	5	1.1
Spine	4	0.9
Vertebral fracture, without deficit	1	0.2
Cervical injury, incomplete deficit	1	0.2
Dorsal injury, incomplete deficit	1	0.2
Chest	15	3.2
Traum. haemothorax/pneumothorax	7	1.5
Other injuries of the chest	7	1.5
Flail chest	5	1.1
Abdomen	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Pelvis/bone/joint & muscle	3	0.6
Long bone fracture	2	0.4
Multiple fracture of the pelvis	1	0.2
-	0	0.0
Major vessels injury	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	233	49.8
INFECTION WITHOUT SEPSIS	110	23.5
SEPSIS	59	12.6
SEPTIC SHOCK	66	14.1
Missing	2	

Infection severity on admission

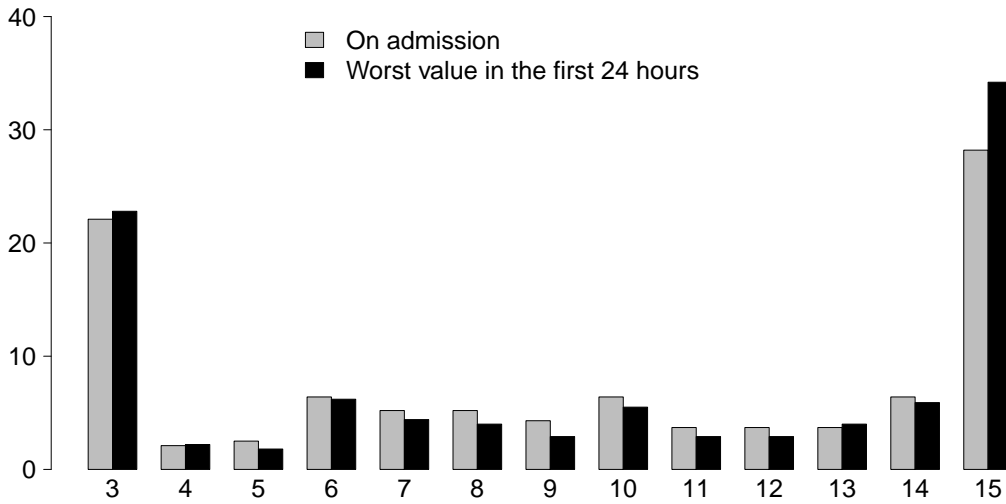
Patients infected (N=235)



National report for general ICUs - Year 2018

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

Glasgow Coma Scale (%)



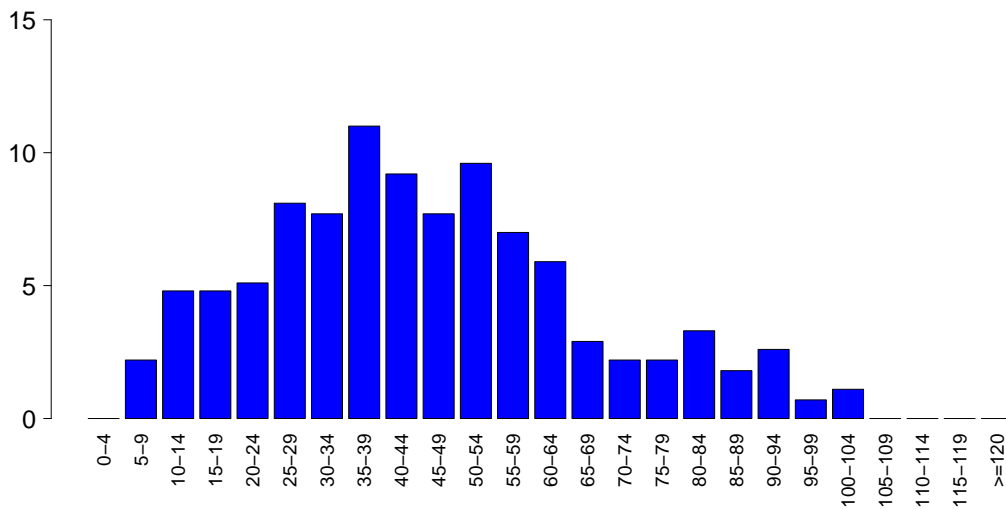
GCS (admission)

Median	10
Q1–Q3	5–15
Not evaluable	144
Missing	0

GCS (first 24 hours)

Median	10.5
Q1–Q3	4.8–15
Not evaluable	198
Missing	0

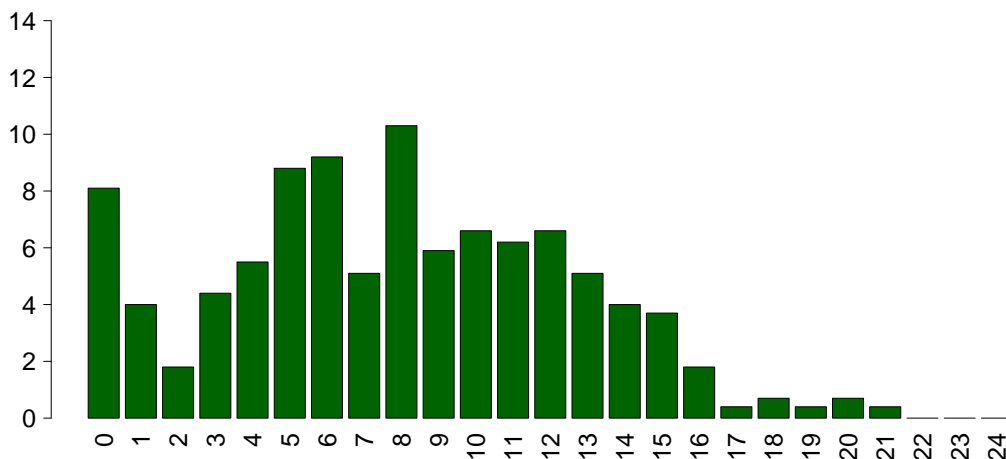
SAPS II (%)



SAPSII

Mean	45.4
SD	21.7
Median	43
Q1–Q3	29.8–58
Not evaluable	198
Missing	0

SOFA (%)



SOFA

Mean	7.8
SD	4.7
Median	8
Q1–Q3	5–11
Not evaluable	198
Missing	0

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

Complications during the stay	N	%
No	218	46.4
Yes	252	53.6
Missing	0	

Failures during the stay	N	%
No	387	82.3
Yes	83	17.7
A: Respiratory failure	13	2.8
B: Cardiovascular failure	28	6.0
C: Neurological failure	2	0.4
D: Hepatic failure	4	0.9
E: Renal failure (AKIN)	45	9.6
F: Acute skin failure	0	0.0
G: Metabolic failure	16	3.4
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
E	27	5.7
B	18	3.8
G	11	2.3
BE	5	1.1
A	4	0.9
AE	4	0.9
EG	4	0.9
AB	2	0.4
ABE	2	0.4
D	2	0.4
Missing	0	

Respiratory failure occurred	N	%
None	457	97.2
Intubation for airway maint.	4	0.9
Hypoxic failure	9	1.9
Hypercapnic failure	4	0.9
Missing	0	

Cardiovascular failure occurred	N	%
None	442	94.0
Cardiogenic shock	5	1.1
Hypovolemic shock	5	1.1
Haemorrhagic/hypovolemic shock	3	0.6
Septic shock	12	2.6
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.4
Other shock	1	0.2
Missing	0	

Neurological failure occurred	N	%
None	468	99.6
Cerebral coma	0	0.0
Metabolic coma	1	0.2
Postanoxic coma	1	0.2
Missing	0	

Renal failure occurred (AKIN)	N	%
None	425	90.4
Mild	2	0.4
Moderate	8	1.7
Severe	35	7.4
Missing	0	

Complications during the stay	N	%
Respiratory	31	6.6
Pleural effusion	8	1.7
Severe ARDS	4	0.9
Aspiration pneumonia	4	0.9
Pneumothorax/Pneumomediastinum	4	0.9
Mild ARDS	3	0.6
Cardiovascular	100	21.3
Cardiac arrest	39	8.3
Left heart failure w/o pulm. edema	23	4.9
Acute severe arrhythmia: tachycardias	18	3.8
Pulmonary edema	15	3.2
Deep venous thrombosis	6	1.3
Neurological	64	13.6
Drowsiness/agitation/delirium	22	4.7
Brain edema	19	4.0
Intracranial hypertension	17	3.6
Seizures	14	3.0
New ischaemic stroke	7	1.5
Gastrointestinal and hepatic	24	5.1
Gastrointestinal bleeding: upper tract	8	1.7
Acute on chronic liver disease	4	0.9
Bowel ischaemia	4	0.9
Gastrointestinal bleeding: lower tract	4	0.9
Paralytic Ileus	4	0.9
Other	35	7.4
Metabolic disorder	16	3.4
Nephrourologic disease	14	3.0
Category/Stage II: Partial Thickness Skin Loss	3	0.6
Category/Stage III: Full Thickness Skin Loss	3	0.6
Other disease	2	0.4
-	0	0.0
-	0	0.0
Infections	76	16.2
Pneumonia	31	6.6
L.R.T.I. other than pneumonia	20	4.3
NON-surgical urinary tract infection	19	4.0
Primary bacteraemia of unknown origin	6	1.3
Gastroenteritis	4	0.9
Clinical sepsis	3	0.6
Upper respiratory tract infection	2	0.4
Catheter-related bacteremia (CR-BSI)	1	0.2
Cholecystitis/cholangitis	1	0.2
F.U.O. fever of unknown origin	1	0.2
Missing	0	

National report for general ICUs - Year 2018

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

Infections				Maximum severity of infection				
	N	%		N	%		N	%
	None	180	38.3		None	180	38.6	
	Only on admission	214	45.5		INFECTION WITHOUT SEPSIS	122	26.2	
	On admission and during ICU stay	23	4.9		SEPSIS	87	18.7	
	Only during ICU stay	53	11.3		SEPTIC SHOCK	77	16.5	
	Missing	0			Missing	4		

Severity evolution

Severity evolution		N (R %)	During the stay				TOT
			None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	
Admission	None	180 (77.6%)	28 (12.1%)	16 (6.9%)	8 (3.4%)	232	
	INFECTION WITHOUT SEPSIS	-	94 (85.5%)	14 (12.7%)	2 (1.8%)	110	
	SEPSIS	-	-	57 (96.6%)	2 (3.4%)	59	
	SEPTIC SHOCK	-	-	-	65 (100.0%)	65	
	TOT	180	122	87	77	466	

Ventil. Associat. Pneumonia (VAP)	N	%
No	442	94.0
Yes	28	6.0
Missing	0	

Incidence of VAP

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

Estimate	8.7
CI (95%)	5.8–12.6

Incidence of VAP

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

Estimate	7.0%
CI (95%)	4.6–10.1

Catheter Bacteraemia (CR-BSI)	N	%
No	469	99.8
Yes	1	0.2
Missing	0	

Incidence of CR-BSI

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

Estimate	0.2
CI (95%)	0.0–1.2

Incidence of CR-BSI

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

Estimate	0.3%
CI (95%)	0.0–1.5

National report for general ICUs - Year 2018
Process indicators - Adult non surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	465	98.9										
Invasive ventilation	396	84.3	260	55.3	118	25.1	4	1-9	0	0	0-0	0
Non invasive ventilation	34	7.2	8	1.7	8	1.7	2	1-5	0	0	0-3	0
Tracheostomy	82	17.4	11	2.3	50	10.6	16	7-28	0	8	5-10	0
iNO (inhaled nitric oxide)	1	0.2	1	0.2	0	0	2	2-2	0	0	0-0	0
Central Venous Catheter	410	87.2	129	27.4	167	35.5	7	2-13	0	0	0-0	0
PICC	0	0.0										
Arterial Catheter	432	91.9	118	25.1	160	34	6	2-11	0	0	0-0	0
Vasoactive drugs	333	70.9	169	36	109	23.2	4	2-9	0	0	0-0	0
Antiarrhythmics	107	22.8	31	6.6	42	8.9	4	2-9	0	0	0-1	0
IABP	4	0.9	3	0.6	1	0.2	4	4-7	0	0	0-0	0
Invasive monitoring of C.O.	163	34.7	31	6.6	22	4.7	6	2-10	0	0	0-0	0
Continuous monitoring of ScVO2	0	0.0										
Temporary pacing	3	0.6	3	0.6	1	0.2	3	2-9	0			
Ventricular assistance	0	0.0										
DC-shock	17	3.6								1	0-3	0
CPR	52	11.1								1	0-4	0
Massive blood transfusion	0	0.0										
ICP monitoring without CSF drainage	2	0.4	0	0	0	0	4	4-4	0	0	0-0	0
ICP monitoring with CSF drainage	0	0.0										
External ventricular drainage without ICP	0	0.0										
Haemofiltration	38	8.1	3	0.6	1	0.2	5	3-8	0	0	0-2	0
Haemodialysis	60	12.8	21	4.5	30	6.4	2	1-7	0	1	0-2	0
ECMO	1	0.2	1	0.2	0	0	7	7-7	0			
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	1	0.2	0	0	0	0	0	0-0	0	5	5-5	0
IAP (intra-abdominal pressure)	5	1.1										
Hypothermia	1	0.2	1	0.2	0	0	3	3-3	0			
Enteral nutrition	310	66.0	43	9.1	98	20.9	7	3-13	0	0	0-1	0
Parenteral nutrition	166	35.3	20	4.3	80	17	6	2-10	0	0	0-1	0
SDD (Topical, Topical and systemic)	92	19.6										
Patient restraint	0	0.0										
Peridural catheter	0	0.0										
Electrical cardioversion	11	2.3								1	0-2	0
Vacuum therapy	2	0.4										
Antibiotics	335	71.3										
Antibiotic prophylaxis	52	11.1	22	4.7	28	6	2	1-6	0	0	0-0	0
Empirical antibiotic therapy	206	43.8	56	11.9	54	11.5	3	2-5	0	0	0-0	0
Empirical antibiotic therapy in unconfirmed diagnosis	37	7.9	8	1.7	5	1.1	4	2-5	0	0	0-0	0
Targeted antibiotic therapy	136	28.9	20	4.3	49	10.4	7	4-13	0	3	2-5	0

National report for general ICUs - Year 2018**Process indicators - Adult non surgical patients evaluated in the GiViTI model**

			Length (days)					
			Mean	SD	Median	Q1-Q3	Missing	
Invasive ventilation (N=396)			N	%				
	Due to pulmonary failure	335	84.6	10.1	15.3	5	1–10.5	0
	For airway maintenance	54	13.6	4.6	9.3	2	1–5	0
	In weaning	5	1.3	0.4	0.5	0	0–1	0
	Not evaluable	2	0.5	5.0	2.8	5	4–6	0
	Reintubation within 48 hours	3	0.8	2.7	1.5	3	2–3.5	0
Non invasive ventilation (N=34)			N	%	Number of surgical interventions			
	Non invasive ventilation only	21	61.8			0	459	97.7
	Non invasive ventilation failed	3	8.8			1	9	1.9
	For weaning	9	26.5			2	0	0.0
	Other	1	2.9			3	2	0.4
	Missing	0				>3	0	0.0
						Missing	0	
Tracheostomy not present on admission (N=71)			N	%	Surgical interventions			
	Surgical	11	15.5	Days from admission				
	Percutwist	0	0.0	Mean	11.9			
	Ciaglia	0	0.0	SD	9.0			
	Monodil. Ciaglia	1	1.4	Median	10			
	Fantoni	0	0.0	Q1–Q3	4.5–19			
	Griggs	35	49.3	Missing	0			
	Other Kind	2	2.8	Surgical interventions (top 10)				
	Unknown	22	31.0	N	%			
	Missing	0		Neurosurgery	5	1.1		
				Other surgery	5	1.1		
				Orthopaedic surgery	1	0.2		
				Gastrointestinal surgery	1	0.2		
				Peripheral vascular surgery	1	0.2		
				Biliary tract surgery	1	0.2		
				Esophageal surgery	1	0.2		
				-	0	0.0		
				-	0	0.0		
				-	0	0.0		
				Missing	0			
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=71)					Non surgical interventions			
	Mean	7.8	N	%				
	SD	4.3	No	443	94.3			
	Median	8	Yes	27	5.7			
	Q1–Q3	5–10	Missing	0				
	Missing	0	Non surgical interventions					
			Days from admission					
			Mean	22.4				
			SD	19.5				
			Median	18				
			Q1–Q3	9.5–26				
			Missing	0				
Invasive monitoring of C.O. (N=163)			N	%	Non surgical interventions			
	Swan Ganz	6	3.7	N	%			
	PICCO	32	19.6	Interventional endoscopy	33	7.0		
	LIDCO	85	52.1	Interventional radiology	1	0.2		
	Vigileo-PRAM	9	5.5	Interventional cardiology	0	0.0		
	Other	31	19.0	Interventional neuroradiology	0	0.0		
	Missing	0		Missing	0			
SDD (N=92)			N	%	Non surgical interventions			
	Topical	53	57.6	N	%			
	Topical and systemic	39	42.4	Interventional endoscopy	33	7.0		
	Missing	0		Interventional radiology	1	0.2		
Antibiotic therapy								
Pt. infected in ICU only (N=53)			N	%	Non surgical interventions			
	Only empirical	15	30.0	N	%			
	Only targeted	11	22.0	Interventional endoscopy	33	7.0		
	Targeted after empirical	22	44.0	Interventional radiology	1	0.2		
	Other	2	4.0	Interventional cardiology	0	0.0		
	Missing	3		Interventional neuroradiology	0	0.0		
Surgical interventions			N	%	Non surgical interventions			
	No	459	97.7	N	%			
	Yes	11	2.3	Interventional endoscopy	33	7.0		
	Missing	0		Interventional radiology	1	0.2		
				Interventional cardiology	0	0.0		
				Interventional neuroradiology	0	0.0		
				Missing	0			

National report for general ICUs - Year 2018**Outcome indicators - Adult non surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	202	43.7
Transferred to same hospital	147	31.8
Transferred to other hospital	85	18.4
Discharged home	28	6.1
Disch. terminally ill	0	0.0
Missing	8	

Transferred to (N=232)	N	%
Ward	215	92.7
Other ICU	15	6.5
High dependency care unit	2	0.9
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=15)	N	%
Specialist expertise	2	13.3
Step-up care	7	46.7
Logistical/organizational reasons	6	40.0
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=147)	N	%
Ward	145	98.6
Other ICU	0	0.0
High dependency care unit	2	1.4
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=85)	N	%
Ward	70	82.4
Other ICU	15	17.6
High dependency care unit	0	0.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	260	56.3
Dead	202	43.7
Missing	8	

Timing of ICU mortality (N=202)	N	%
Daytime (08:00AM - 07:59PM)	104	51.5
Nighttime (08:00PM - 07:59AM)	98	48.5
Weekdays (Monday - Friday)	145	71.8
Weekend (Saturday - Sunday)	57	28.2
Missing	0	

Hospital mortality	N	%
Alive	255	54.3
Dead	215	45.7
Missing	0	

Timing of hosp. mortality (N=215)	N	%
In ICU	202	94.0
Within 24 hours after ICU	1	0.5
24-47 hours after ICU	2	0.9
48-71 hours after ICU	2	0.9
72-95 hours after ICU	0	0.0
After 95 hours after ICU	8	3.7
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=13)		
Mean		10.7
SD		13.4
Median		8
Q1–Q3		2–13
Missing		0

National report for general ICUs - Year 2018

Outcome indicators - Adult non surgical patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%			
Alive	253	53.8	Mean		10.3
Dead	217	46.2	SD		14.2
Missing	0		Median		6
			Q1–Q3		2–11
			Missing		0
ICU stay (days)			ICU stay (days)		
Alive (N=260)			Alive (N=260)		
			Mean		9.9
			SD		12.2
			Median		6
			Q1–Q3		2.8–11
			Missing		0
ICU stay (days)			ICU stay (days)		
Dead (N=202)			Dead (N=202)		
			Mean		9.5
			SD		14.2
			Median		5
			Q1–Q3		1–10
			Missing		0
Stay after ICU (days)			Stay after ICU (days)		
Alive (N=260)			Alive (N=260)		
			Mean		6.7
			SD		10.9
			Median		2
			Q1–Q3		0–9
			Missing		0
Hospital stay (days)			Hospital stay (days)		
Alive (N=255)			Alive (N=255)		
			Mean		17.0
			SD		19.7
			Median		10
			Q1–Q3		4–23
			Missing		0
Hospital stay (days)			Hospital stay (days)		
Dead (N=215)			Dead (N=215)		
			Mean		15.3
			SD		19.4
			Median		9
			Q1–Q3		2–19.5
			Missing		0

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

Patients (N): 59

Sex	N	%
Male	35	59.3
Female	24	40.7
Missing	0	

Age (years)	N	%
17-45	14	23.7
46-65	17	28.8
66-75	16	27.1
>75	12	20.3
Missing	0	
Mean	60.4	
SD	16.7	
Median	64	
Q1–Q3	48–72.5	
Min–Max	26–93	

Body mass Index (BMI)	N	%
Underweight	3	5.1
Normal	18	30.5
Overweight	22	37.3
Obese	16	27.1
Missing	0	

Pregnancy status	N	%
Females (N=24)		
Not fertile	5	20.8
Not pregnant/Unknown	19	79.2
Currently pregnant	0	0.0
Post partum	0	0.0
Missing	0	

Comorbidities	N	%
No	8	13.6
Yes	51	86.4
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	32	54.2
NYHA class II-III	14	23.7
Arrhythmia	13	22.0
Any tumour without metastasis	12	20.3
Diabetes Type II with insulin treatment	12	20.3
Peripheral vascular disease	11	18.6
Myocardial infarction	5	8.5
Peptic ulcer disease	5	8.5
End-stage renal disease	4	6.8
Metastatic cancer	4	6.8
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	6.5	7.1	4	1.5–9	0

Source of admission	N	%
Same hospital	55	93.2
Other hospital	4	6.8
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=59)		
Medical ward	0	0.0
Surgical ward	59	100.0
Emergency room	0	0.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Reason for transfer from	N	%
Other ICU (N=0)		
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	

Ward of admission	N	%
Same hospital (N=55)		
Medical ward	0	0.0
Surgical ward	55	100.0
Emergency room	0	0.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Ward of admission	N	%
Other hospital (N=4)		
Medical ward	0	0.0
Surgical ward	4	100.0
Emergency room	0	0.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Scheduled admission	N	%
No	28	47.5
Yes	31	52.5
Missing	0	

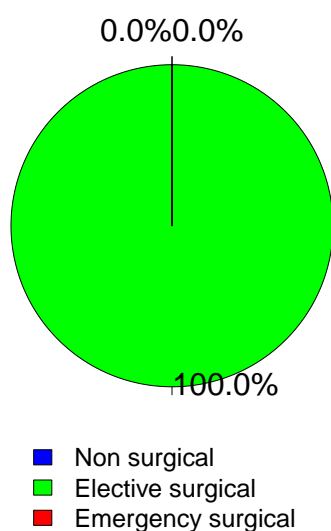
National report for general ICUs - Year 2018

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

Trauma	N	%
No	57	96.6
Yes	2	3.4
Multiple trauma	0	0.0
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	59	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Timing	N	%
Elective surgical (N=59)		
From -7 to -3 days	4	6.8
From -2 to -1 days	7	11.9
On ICU admission day	51	86.4
The day after ICU admission	3	5.1
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
-	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	

Source of admission

Surgical pt. (N=59)	N	%
Operating theatre of surgical ward	49	83.1
Operating theatre of emergency room	0	0.0
Surgical ward	10	16.9
Other	0	0.0
Missing	0	

Non surgical interventions

	N	%
None	57	96.6
Elective	0	0.0
Emergency	2	3.4
Missing	0	

Surgical interventions (top 10)

Elective surgical (N=59)	N	%
Gastrointestinal surgery	15	25.4
Neurosurgery	14	23.7
Pancreatic surgery	9	15.3
Gynaecological surgery	5	8.5
Biliary tract surgery	5	8.5
Nephro/Urological surgery	3	5.1
Orthopaedic surgery	3	5.1
Other surgery	3	5.1
Abdominal vascular surgery	2	3.4
Esophageal surgery	2	3.4
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
Missing	0	

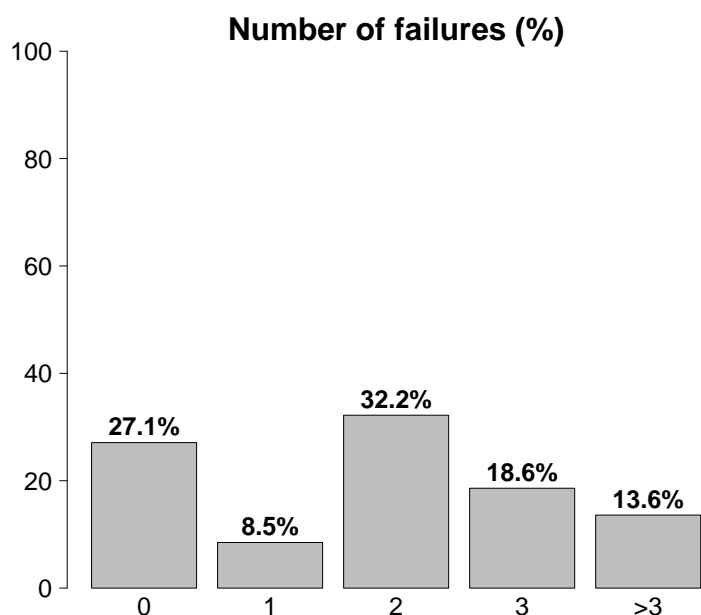
Non surgical interventions

Emergency (N=2)	N	%
Interventional radiology	1	50.0
Interventional cardiology	1	50.0
Interventional endoscopy	1	50.0
Interventional neuroradiology	0	0.0
Missing	0	

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

Reason for admission	N	%
Monitoring/Weaning	17	28.8
Post surgical weaning	14	23.7
Surgical monitoring	3	5.1
Post interventional weaning	0	0.0
Interventional monitoring	0	0.0
Non surgical monitoring	0	0.0
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	42	71.2
Only ventilatory support	7	11.9
Only cardiovascular support	2	3.4
Ventilatory and cardiovascular support	33	55.9
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	16	27.1
Yes	43	72.9
A: Respiratory failure	40	67.8
B: Cardiovascular failure	35	59.3
C: Neurological failure	5	8.5
D: Hepatic failure	1	1.7
E: Renal failure	15	25.4
F: Acute skin failure	0	0.0
G: Metabolic failure	12	20.3
H: Coagulation failure	1	1.7
Missing	0	

Failures on admission (top 10)	N	%
AB	17	28.8
ABEG	5	8.5
ABC	4	6.8
A	3	5.1
ABE	3	5.1
ABG	2	3.4
AEG	2	3.4
ABCEG	1	1.7
ABEH	1	1.7
ADEG	1	1.7
Missing	0	

Respiratory failure	N	%
None	19	32.2
Only hypoxic failure	32	54.2
Only hypercapnic failure	0	0.0
Hypoxic-hypercapnic failure	5	8.5
Intubation for airway maint.	3	5.1
Missing	0	

Cardiovascular failure	N	%
None	24	40.7
Without shock	26	44.1
Cardiogenic shock	1	1.7
Septic shock	1	1.7
Haemorrhagic/hypovolemic shock	3	5.1
Hypovolemic shock	1	1.7
Anaphylactic shock	0	0.0
Neurogenic shock	1	1.7
Other shock	1	1.7
Mixed shock	1	1.7
Missing	0	

Neurologic failure	N	%
None	19	79.2
Cerebral coma	4	16.7
Metabolic coma	1	4.2
Postanoxic coma	0	0.0
Toxic coma	0	0.0
Missing or not evaluable	35	

Renal failure (AKIN)	N	%
None	44	74.6
Mild	2	3.4
Moderate	5	8.5
Severe	8	13.6
Missing	0	

Metabolic failure	N	%
None	47	79.7
pH <= 7.3, PaCO ₂ < 45 mmHg	2	3.4
Base deficit >= 5 mmol/L, lactate >1.5x	10	16.9
Missing	0	

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

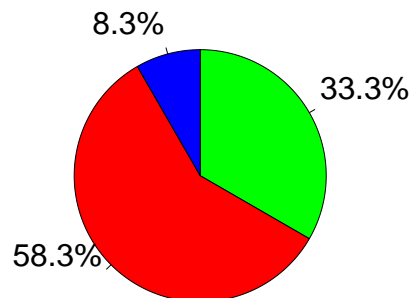
Clinical conditions on admission	N	%
Respiratory	5	8.5
Mild ARDS	2	3.4
Acute asthma/bronchospasm	1	1.7
Pneumothorax/Pneumomediastinum	1	1.7
Moderate ARDS	1	1.7
-	0	0.0
Cardiovascular	9	15.3
Left heart failure without pulm. edema	6	10.2
Non-ruptured aneurysm	3	5.1
Left heart failure with pulmonary edema	2	3.4
Cardiac arrest	2	3.4
Right heart failure	1	1.7
Neurological	16	27.1
Brain tumour	12	20.3
Cerebral artery stroke	2	3.4
Non traumatic cerebral oedema	2	3.4
Cerebral Aneurysm	2	3.4
Intracranial hypertension	1	1.7
Gastrointestinal and hepatic	23	39.0
Digestive tract malignancy	8	13.6
Pancreatic malignancy	7	11.9
Intestinal occlusion	2	3.4
Acute pancreatitis	2	3.4
Gastrointestinal perforation	1	1.7
Trauma (anatomical districts)	2	3.4
Pelvis/bone/joint & muscle	2	3.4
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Other	11	18.6
Gynaecological disease	7	11.9
Nephrourologic disease	4	6.8
Coagulation disorder	1	1.7
-	0	0.0
-	0	0.0
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	12	20.3
Pneumonia	5	8.5
Post-surgical peritonitis	3	5.1
Primary bacteraemia of unknown origin	1	1.7
Cholecystitis/cholangitis	1	1.7
Post-surgical skin/soft tissue infection	1	1.7
Tertiary peritonitis	1	1.7
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Trauma (anatomical districts)	N	%
Head	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Spine	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Chest	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Abdomen	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Pelvis/bone/joint & muscle	2	3.4
Long bone fracture	2	3.4
-	0	0.0
-	0	0.0
Major vessels injury	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	47	79.7
INFECTION WITHOUT SEPSIS	4	6.8
SEPSIS	7	11.9
SEPTIC SHOCK	1	1.7
Missing	0	

Infection severity on admission

Patients infected (N=12)

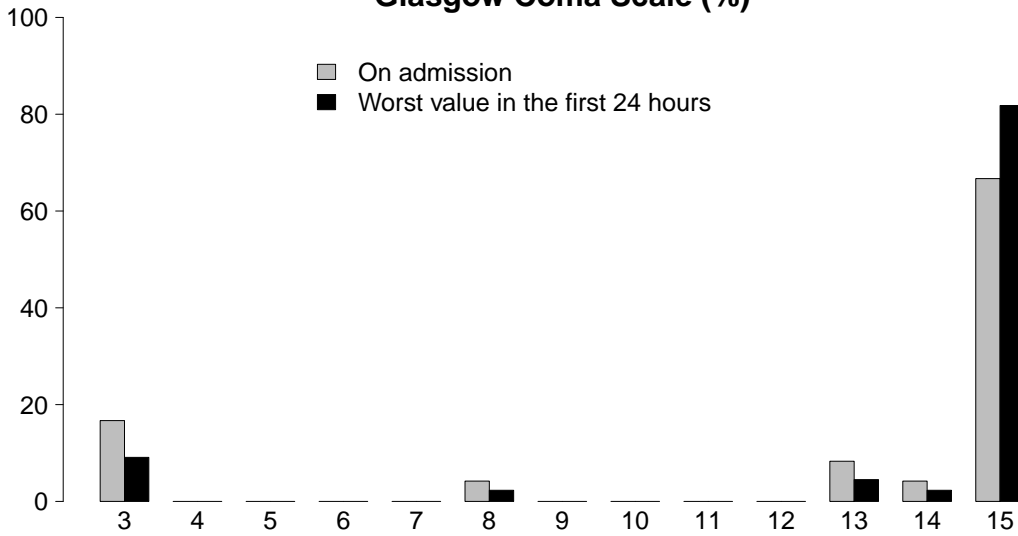


- INFECTION WITHOUT SEPSIS
- SEPSIS
- SEPTIC SHOCK

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

Glasgow Coma Scale (%)



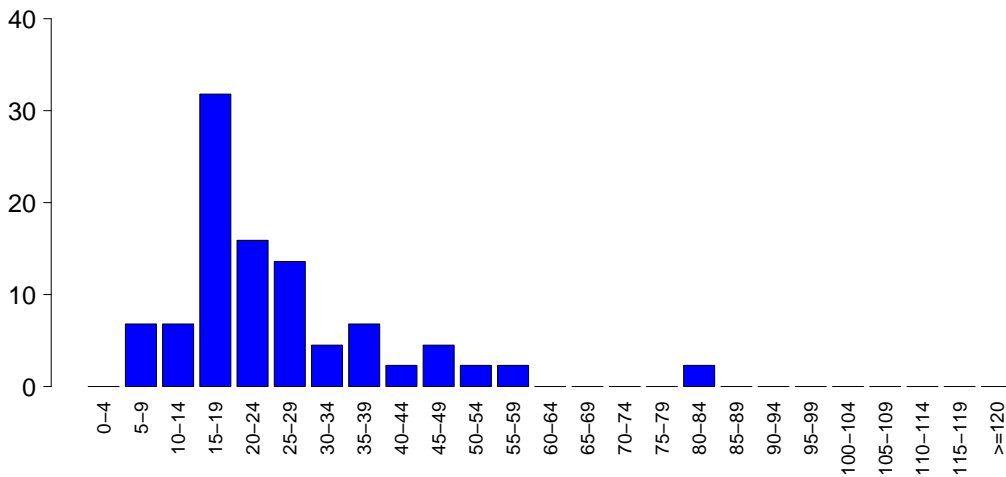
GCS (admission)

Median	15
Q1–Q3	13–15
Not evaluable	35
Missing	0

GCS (first 24 hours)

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

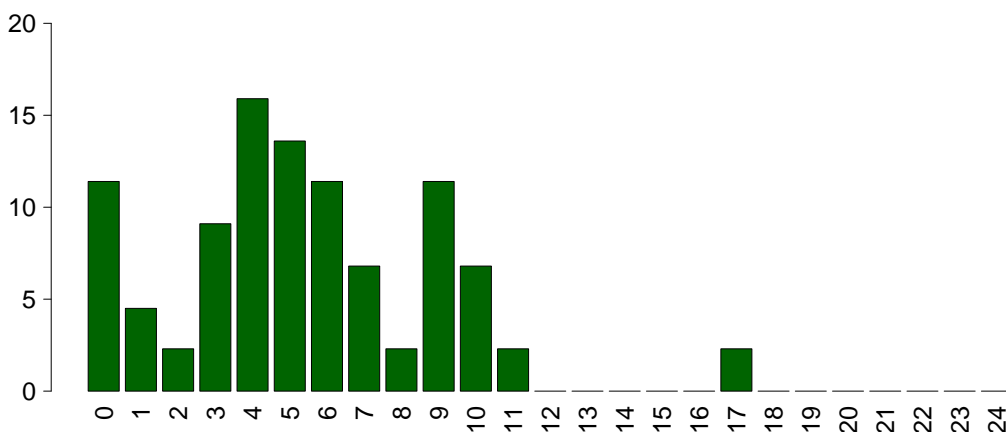
SAPS II (%)



SAPSII

Mean	25.5
SD	14.8
Median	21
Q1–Q3	16–29
Not evaluable	15
Missing	0

SOFA (%)



SOFA

Mean	5.4
SD	3.6
Median	5
Q1–Q3	3–7.2
Not evaluable	15
Missing	0

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

Complications during the stay	N	%
No	40	67.8
Yes	19	32.2
Missing	0	

Failures during the stay	N	%
No	59	100.0
Yes	0	0.0
A: Respiratory failure	0	0.0
B: Cardiovascular failure	0	0.0
C: Neurological failure	0	0.0
D: Hepatic failure	0	0.0
E: Renal failure (AKIN)	0	0.0
F: Acute skin failure	0	0.0
G: Metabolic failure	0	0.0
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	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	

Respiratory failure occurred	N	%
None	59	100.0
Intubation for airway maint.	0	0.0
Hypoxic failure	0	0.0
Hypercapnic failure	0	0.0
Missing	0	

Cardiovascular failure occurred	N	%
None	59	100.0
Cardiogenic shock	0	0.0
Hypovolemic shock	0	0.0
Haemorrhagic/hypovolemic shock	0	0.0
Septic shock	0	0.0
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	0	0.0
Missing	0	

Neurological failure occurred	N	%
None	59	100.0
Cerebral coma	0	0.0
Metabolic coma	0	0.0
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	59	100.0
Mild	0	0.0
Moderate	0	0.0
Severe	0	0.0
Missing	0	

Complications during the stay	N	%
Respiratory	2	3.4
Pleural effusion	1	1.7
Pneumothorax/Pneumomediastinum	1	1.7
-	0	0.0
-	0	0.0
-	0	0.0
Cardiovascular	5	8.5
Acute ischaemia	1	1.7
Cardiac arrest	1	1.7
Deep venous thrombosis	1	1.7
Left heart failure w/o pulm. edema	1	1.7
Pulmonary edema	1	1.7
Neurological	10	16.9
Brain edema	5	8.5
Drowsiness/agitation/delirium	4	6.8
Intracranial hypertension	4	6.8
Seizures	3	5.1
New ischaemic stroke	2	3.4
Gastrointestinal and hepatic	1	1.7
Anastomotic dehiscence	1	1.7
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Other	3	5.1
Category/Stage III: Full Thickness Skin Loss	1	1.7
Iatrogenic major vessels injury	1	1.7
Nephrourologic disease	1	1.7
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Infections	7	11.9
NON-surgical urinary tract infection	4	6.8
Post-surgical peritonitis	2	3.4
Post-surgical bone and joint infection	1	1.7
Pneumonia	1	1.7
Sinusitis	1	1.7
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

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

Infections			Maximum severity of infection		
	N	%		N	%
None	42	71.2	None	42	71.2
Only on admission	10	16.9	INFECTION WITHOUT SEPSIS	3	5.1
On admission and during ICU stay	2	3.4	SEPSIS	13	22.0
Only during ICU stay	5	8.5	SEPTIC SHOCK	1	1.7
Missing	0		Missing	0	

Severity evolution

Severity evolution		During the stay				
		None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	42 (89.4%)	2 (4.3%)	3 (6.4%)	0 (0.0%)	47
	INFECTION WITHOUT SEPSIS	-	1 (25.0%)	3 (75.0%)	0 (0.0%)	4
	SEPSIS	-	-	7 (100.0%)	0 (0.0%)	7
	SEPTIC SHOCK	-	-	-	1 (100.0%)	1
	TOT	42	3	13	1	59

Ventil. Associat. Pneumonia (VAP)	N	%
No	58	98.3
Yes	1	1.7
Missing	0	

Incidence of VAP

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

Estimate	5.6
CI (95%)	0.1–31.3

Incidence of VAP

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

Estimate	4.5%
CI (95%)	0.1–25.0

Catheter Bacteraemia (CR-BSI)	N	%
No	59	100.0
Yes	0	0.0
Missing	0	

Incidence of CR-BSI

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

Estimate	0.0
CI (95%)	0.0–12.2

Incidence of CR-BSI

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

Estimate	0.0%
CI (95%)	0.0–14.6

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

Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission			
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	59	100.0										
Invasive ventilation	54	91.5	49	83.1	5	8.5	1	0-3	0	0	0-0	0
Non invasive ventilation	0	0.0										
Tracheostomy	6	10.2	0	0	2	3.4	14	8-16	0	8	6-10	0
iNO (inhaled nitric oxide)	0	0.0										
Central Venous Catheter	55	93.2	44	74.6	14	23.7	3	1-6	0	0	0-0	0
PICC	0	0.0										
Arterial Catheter	56	94.9	12	20.3	9	15.3	2	1-5	0	0	0-0	0
Vasoactive drugs	43	72.9	37	62.7	5	8.5	1	1-4	0	0	0-0	0
Antiarrhythmics	11	18.6	4	6.8	3	5.1	1	1-3	0	0	0-0	0
IABP	0	0.0										
Invasive monitoring of C.O.	38	64.4	3	5.1	2	3.4	2	1-5	0	0	0-0	0
Continuous monitoring of ScVO2	0	0.0										
Temporary pacing	0	0.0										
Ventricular assistance	0	0.0										
DC-shock	0	0.0										
CPR	3	5.1								1	0-2	0
Massive blood transfusion	0	0.0										
ICP monitoring without CSF drainage	0	0.0										
ICP monitoring with CSF drainage	0	0.0										
External ventricular drainage without ICP	0	0.0										
Haemofiltration	5	8.5	0	0	0	0	3	3-4	0	0	0-0	0
Haemodialysis	5	8.5	1	1.7	2	3.4	5	3-5	0	1	1-1	0
ECMO	0	0.0										
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	0	0.0										
IAP (intra-abdominal pressure)	1	1.7										
Hypothermia	0	0.0										
Enteral nutrition	17	28.8	1	1.7	4	6.8	5	2-15	0	1	0-2	0
Parenteral nutrition	34	57.6	2	3.4	7	11.9	3	2-6	0	0	0-0	0
SDD (Topical, Topical and systemic)	5	8.5										
Patient restraint	0	0.0										
Peridural catheter	0	0.0										
Electrical cardioversion	1	1.7								0	0-0	0
Vacuum therapy	1	1.7										
Antibiotics	31	52.5										
Antibiotic prophylaxis	16	27.1	12	20.3	4	6.8	1	1-3	0	0	0-0	0
Empirical antibiotic therapy	5	8.5	0	0	0	0	2	1-3	0	0	0-0	0
Empirical antibiotic therapy in unconfirmed diagnosis	7	11.9	0	0	0	0	4	2-5	0	0	0-0	0
Targeted antibiotic therapy	9	15.3	1	1.7	3	5.1	6	3-11	0	4	4-6	0

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

			Length (days)				
Invasive ventilation (N=54)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	37	68.5	4.7	6.8	2	0-5	0
For airway maintenance	3	5.6	7.0	10.4	1	1-10	0
In weaning	14	25.9	0.1	0.3	0	0-0	0
Not evaluable	0	0.0					
Reintubation within 48 hours	0	0.0					
Non invasive ventilation (N=0)			Number of surgical interventions				
Non invasive ventilation only	0	0.0				0	55
Non invasive ventilation failed	0	0.0				1	3
For weaning	0	0.0				2	1
Other	0	0.0				3	0
Missing	0					>3	0
						Missing	0
Tracheostomy not present on admission (N=6)			Surgical interventions				
	N	%	Days from admission				
Surgical	2	33.3	Mean	4.0			
Percutwist	0	0.0	SD	2.0			
Ciaglia	0	0.0	Median	3			
Monodil. Ciaglia	0	0.0	Q1-Q3	3-5			
Fantoni	0	0.0	Missing	0			
Griggs	3	50.0					
Other Kind	0	0.0					
Unknown	1	16.7					
Missing	0						
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=6)			Surgical interventions (top 10)				
Mean	7.3		Neurosurgery	2	3.4		
SD	3.3		Other surgery	2	3.4		
Median	7.5		Gastrointestinal surgery	1	1.7		
Q1-Q3	6-9.8		-	0	0.0		
Missing	0		-	0	0.0		
			-	0	0.0		
			-	0	0.0		
			-	0	0.0		
			-	0	0.0		
			-	0	0.0		
			-	0	0.0		
			Missing	0	0.0		
Invasive monitoring of C.O. (N=38)			Non surgical interventions				
Swan Ganz	0	0.0	No	58	98.3		
PICCO	1	2.6	Yes	1	1.7		
LIDCO	34	89.5	Missing	0			
Vigileo-PRAM	0	0.0					
Other	3	7.9					
Missing	0						
SDD (N=5)			Non surgical interventions				
Topical	5	100.0	Days from admission				
Topical and systemic	0	0.0	Mean	6.0			
Missing	0		SD				
			Median	6			
			Q1-Q3	6-6			
			Missing	0			
Antibiotic therapy			Non surgical interventions				
Pt. infected in ICU only (N=5)			N	%			
Only empirical	0	0.0	Interventional endoscopy	1	1.7		
Only targeted	5	100.0	Interventional radiology	0	0.0		
Targeted after empirical	0	0.0	Interventional cardiology	0	0.0		
Other	0	0.0	Interventional neuroradiology	0	0.0		
Missing	0		Missing	0			
Surgical interventions			N	%			
No	55	93.2					
Yes	4	6.8					
Missing	0						

National report for general ICUs - Year 2018**Outcome indicators** - Adult elective surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	10	16.9
Transferred to same hospital	43	72.9
Transferred to other hospital	4	6.8
Discharged home	2	3.4
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=47)	N	%
Ward	46	97.9
Other ICU	1	2.1
High dependency care unit	0	0.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=1)	N	%
Specialist expertise	0	0.0
Step-up care	0	0.0
Logistical/organizational reasons	1	100.0
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=43)	N	%
Ward	43	100.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=4)	N	%
Ward	3	75.0
Other ICU	1	25.0
High dependency care unit	0	0.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	49	83.1
Dead	10	16.9
Missing	0	

Timing of ICU mortality (N=10)	N	%
Daytime (08:00AM - 07:59PM)	9	90.0
Nighttime (08:00PM - 07:59AM)	1	10.0
Weekdays (Monday - Friday)	8	80.0
Weekend (Saturday - Sunday)	2	20.0
Missing	0	

Hospital mortality	N	%
Alive	44	74.6
Dead	15	25.4
Missing	0	

Timing of hosp. mortality (N=15)	N	%
In ICU	10	66.7
Within 24 hours after ICU	0	0.0
24-47 hours after ICU	1	6.7
48-71 hours after ICU	0	0.0
72-95 hours after ICU	0	0.0
After 95 hours after ICU	4	26.7
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=5)		
Mean		11.6
SD		10.4
Median		9
Q1–Q3		9–10
Missing		0

National report for general ICUs - Year 2018

Outcome indicators - Adult elective surgical patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%			
Alive	44	74.6	Mean	5.3	
Dead	15	25.4	SD	6.7	
Missing	0		Median	2	
			Q1–Q3	1–5.5	
			Missing	0	
ICU stay (days)			ICU stay (days)		
Alive (N=49)			Alive (N=49)		
			Mean	4.8	
			SD	6.4	
			Median	2	
			Q1–Q3	1–5	
			Missing	0	
ICU stay (days)			ICU stay (days)		
Dead (N=10)			Dead (N=10)		
			Mean	7.5	
			SD	7.9	
			Median	5	
			Q1–Q3	2–8.2	
			Missing	0	
Stay after ICU (days)			Stay after ICU (days)		
Alive (N=49)			Alive (N=49)		
			Mean	12.9	
			SD	12.7	
			Median	9	
			Q1–Q3	5–18	
			Missing	0	
Hospital stay (days)			Hospital stay (days)		
Alive (N=49)			Alive (N=49)		
			Mean	22.1	
			SD	16.7	
			Median	17	
			Q1–Q3	9–33.5	
			Missing	0	
Hospital stay (days)			Hospital stay (days)		
Alive (N=44)			Alive (N=44)		
			Mean	23.0	
			SD	17.5	
			Median	16	
			Q1–Q3	9–34.2	
			Missing	0	
Hospital stay (days)			Hospital stay (days)		
Dead (N=15)			Dead (N=15)		
			Mean	19.6	
			SD	14.2	
			Median	20	
			Q1–Q3	7.5–26	
			Missing	0	

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

Patients (N): 175

Sex	N	%
Male	96	54.9
Female	79	45.1
Missing	0	

Age (years)	N	%
17-45	35	20.0
46-65	54	30.9
66-75	34	19.4
>75	52	29.7
Missing	0	
Mean	63.2	
SD	17.8	
Median	65	
Q1–Q3	53–78	
Min–Max	20–96	

Body mass Index (BMI)	N	%
Underweight	9	5.1
Normal	57	32.6
Overweight	55	31.4
Obese	54	30.9
Missing	0	

Pregnancy status	N	%
Females (N=79)		
Not fertile	36	45.6
Not pregnant/Unknown	35	44.3
Currently pregnant	2	2.5
Post partum	6	7.6
Missing	0	

Comorbidities	N	%
No	27	15.4
Yes	148	84.6
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	89	50.9
NYHA class II-III	50	28.6
Arrhythmia	36	20.6
Peripheral vascular disease	26	14.9
Diabetes Type II with insulin treatment	23	13.1
Alcohol addiction	21	12.0
Moderate or severe renal disease	18	10.3
Myocardial infarction	18	10.3
Diabetes Type II without insulin tr.	15	8.6
Cerebrovascular disease	13	7.4
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.3	7.4	1	0–5	0

Source of admission	N	%
Same hospital	151	86.3
Other hospital	24	13.7
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=175)		
Medical ward	14	8.0
Surgical ward	147	84.0
Emergency room	9	5.1
Other ICU	4	2.3
High dependency care unit	1	0.6
Missing	0	

Reason for transfer from	N	%
Other ICU (N=4)		
Specialist expertise	2	50.0
Step-up care	1	25.0
Logistical/organizational reasons	1	25.0
Step-down care	0	0.0
Missing	0	

Ward of admission	N	%
Same hospital (N=151)		
Medical ward	10	6.6
Surgical ward	134	88.7
Emergency room	6	4.0
Other ICU	0	0.0
High dependency care unit	1	0.7
Missing	0	

Ward of admission	N	%
Other hospital (N=24)		
Medical ward	4	16.7
Surgical ward	13	54.2
Emergency room	3	12.5
Other ICU	4	16.7
High dependency care unit	0	0.0
Missing	0	

Scheduled admission	N	%
No	174	99.4
Yes	1	0.6
Missing	0	

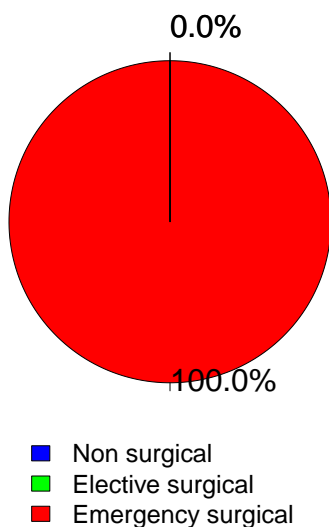
National report for general ICUs - Year 2018

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

Trauma	N	%
No	134	76.6
Yes	41	23.4
Multiple trauma	12	6.9
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	175	100.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=175)		
Operating theatre of surgical ward	116	66.3
Operating theatre of emergency room	3	1.7
Surgical ward	31	17.7
Other	25	14.3
Missing	0	

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

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

Surgical interventions (top 10)	N	%
Emergency surgical (N=175)		
Gastrointestinal surgery	65	37.1
Neurosurgery	39	22.3
Orthopaedic surgery	16	9.1
Other surgery	13	7.4
Peripheral vascular surgery	12	6.9
Biliary tract surgery	8	4.6
Obstetric surgery	7	4.0
Abdominal vascular surgery	7	4.0
Gynaecological surgery	4	2.3
Splenectomy	4	2.3
Missing	0	

Timing	N	%
Emergency surgical (N=175)		
From -7 to -3 days	22	12.6
From -2 to -1 days	23	13.1
On ICU admission day	131	74.9
The day after ICU admission	11	6.3
Missing	0	

Non surgical interventions	N	%
None	159	90.9
Elective	2	1.1
Emergency	14	8.0
Missing	0	

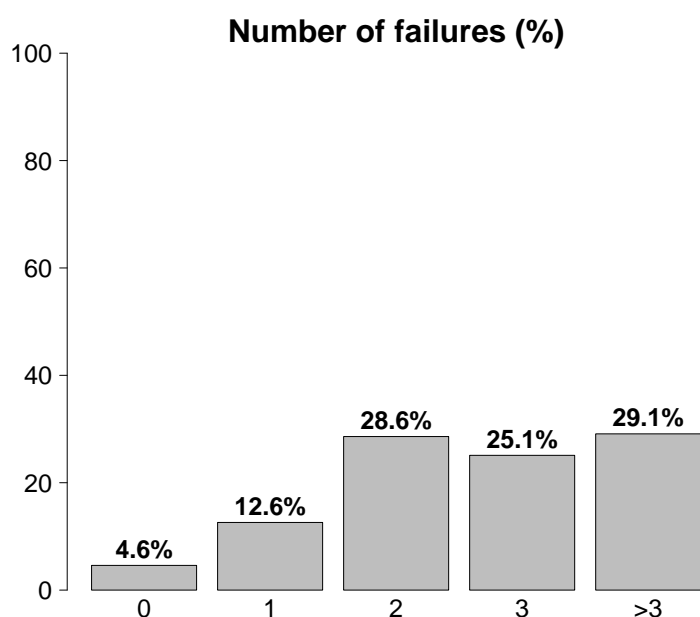
Non surgical interventions	N	%
Elective (N=2)		
Interventional neuroradiology	1	50.0
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional endoscopy	0	0.0
Missing	1	

Non surgical interventions	N	%
Emergency (N=14)		
Interventional endoscopy	4	28.6
Interventional cardiology	3	21.4
Interventional neuroradiology	3	21.4
Interventional radiology	0	0.0
Missing	4	

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

Reason for admission	N	%
Monitoring/Weaning	9	5.1
Post surgical weaning	5	2.9
Surgical monitoring	4	2.3
Post interventional weaning	0	0.0
Interventional monitoring	0	0.0
Non surgical monitoring	0	0.0
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	166	94.9
Only ventilatory support	30	17.1
Only cardiovascular support	11	6.3
Ventilatory and cardiovascular support	125	71.4
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	8	4.6
Yes	167	95.4
A: Respiratory failure	155	88.6
B: Cardiovascular failure	136	77.7
C: Neurological failure	23	13.1
D: Hepatic failure	3	1.7
E: Renal failure	74	42.3
F: Acute skin failure	1	0.6
G: Metabolic failure	71	40.6
H: Coagulation failure	5	2.9
Missing	0	

Failures on admission (top 10)	N	%
AB	36	20.6
ABEG	35	20.0
A	16	9.1
ABE	14	8.0
ABG	14	8.0
ABC	11	6.3
ABCEG	6	3.4
B	5	2.9
AE	4	2.3
AEG	4	2.3
Missing	0	

Respiratory failure	N	%
None	20	11.4
Only hypoxic failure	94	53.7
Only hypercapnic failure	7	4.0
Hypoxic-hypercapnic failure	24	13.7
Intubation for airway maint.	30	17.1
Missing	0	

Cardiovascular failure	N	%
None	39	22.3
Without shock	49	28.0
Cardiogenic shock	7	4.0
Septic shock	35	20.0
Haemorrhagic/hypovolemic shock	25	14.3
Hypovolemic shock	8	4.6
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.6
Other shock	7	4.0
Mixed shock	4	2.3
Missing	0	

Neurologic failure	N	%
None	52	69.3
Cerebral coma	16	21.3
Metabolic coma	2	2.7
Postanoxic coma	5	6.7
Toxic coma	0	0.0
Missing or not evaluable	100	

Renal failure (AKIN)	N	%
None	101	57.7
Mild	22	12.6
Moderate	27	15.4
Severe	25	14.3
Missing	0	

Metabolic failure	N	%
None	104	59.4
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	13	7.4
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	58	33.1
Missing	0	

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

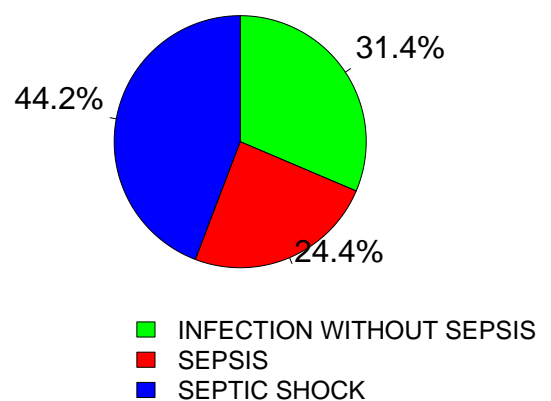
Clinical conditions on admission	N	%
Respiratory	13	7.4
Mild ARDS	5	2.9
Acute exacerbation of COPD	3	1.7
Pleural effusion	2	1.1
Aspiration pneumonia	2	1.1
Severe ARDS	2	1.1
Cardiovascular	35	20.0
Left heart failure without pulm. edema	16	9.1
Peripheral vascular disease	7	4.0
Cardiac arrest	4	2.3
Non-ruptured aneurysm	4	2.3
Left heart failure with pulmonary edema	3	1.7
Neurological	27	15.4
Cerebral Aneurysm	11	6.3
Spontaneous Subarachnoid haemorrhage	9	5.1
Intracranial hypertension	8	4.6
Spontaneous Hydrocephalus	5	2.9
Non traumatic cerebral oedema	5	2.9
Gastrointestinal and hepatic	51	29.1
Gastrointestinal perforation	16	9.1
Gastrointestinal bleeding: upper tract	9	5.1
Intestinal occlusion	9	5.1
Paralytic Ileus	5	2.9
Anastomotic dehiscence	4	2.3
Trauma (anatomical districts)	41	23.4
Head	26	14.9
Pelvis/bone/joint & muscle	13	7.4
Chest	9	5.1
Abdomen	5	2.9
Spine	4	2.3
Major vessels injury	2	1.1
-	0	0.0
Other	25	14.3
Nephrourologic disease	9	5.1
Coagulation disorder	5	2.9
Metabolic disorder	4	2.3
Orthopaedic disease	2	1.1
Other disease	2	1.1
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	86	49.1
Pneumonia	21	12.0
Post-surgical peritonitis	17	9.7
NON-surgical secondary peritonitis	12	6.9
Primary peritonitis	10	5.7
NON-surgical skin/soft tissue infection	9	5.1
Cholecystitis/choolangitis	8	4.6
Gastroenteritis	3	1.7
NON-surg. gynecological inf.	3	1.7
Post-surgical skin/soft tissue infection	3	1.7
L.R.T.I. other than pneumonia	2	1.1
Missing	0	

Trauma (anatomical districts)	N	%
Head	26	14.9
Traumatic Subdural haematoma	15	8.6
Skull fracture	7	4.0
Extradural/epidural haematoma	5	2.9
Traumatic subarachnoid haemorrhage	5	2.9
Traumatic diffuse injury with oedema	4	2.3
Spine	4	2.3
Cervical injury, incomplete deficit	2	1.1
Vertebral fracture, without deficit	1	0.6
Dorsal injury, incomplete deficit	1	0.6
Chest	9	5.1
Traum. haemothorax/pneumothorax	6	3.4
Severe lung contusion/laceration	4	2.3
Diaphragmatic rupture	4	2.3
Abdomen	5	2.9
Bowel transection/perforation	3	1.7
Spleen: Massive rupture	2	1.1
Stomach: Rupture or perforation	1	0.6
Pelvis/bone/joint & muscle	13	7.4
Long bone fracture	12	6.9
Multiple fracture of the pelvis	3	1.7
Massive crush/amputation	1	0.6
Major vessels injury	2	1.1
Aorta: rupture/dissection	1	0.6
Proximal limbs vessels: transection	1	0.6
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	89	50.9
INFECTION WITHOUT SEPSIS	27	15.4
SEPSIS	21	12.0
SEPTIC SHOCK	38	21.7
Missing	0	

Infection severity on admission

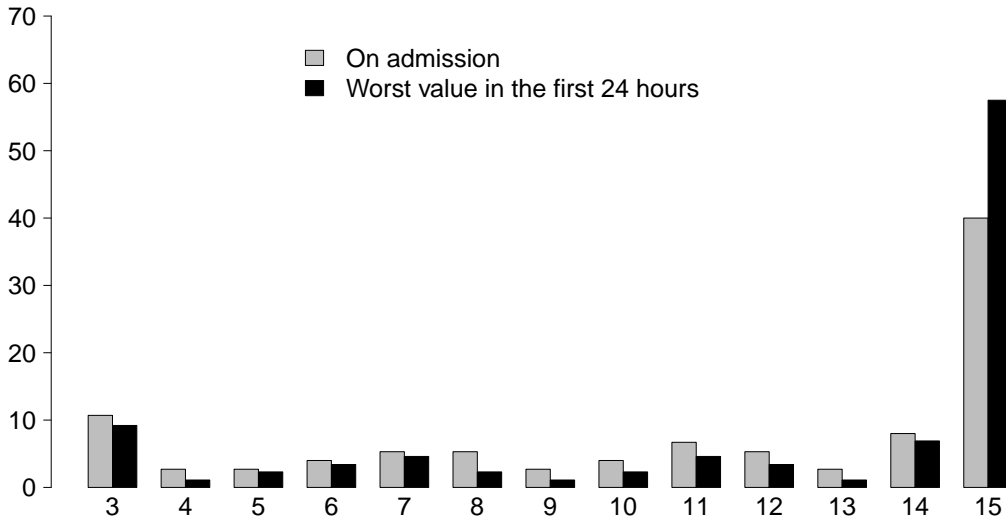
Patients infected (N=86)



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

Glasgow Coma Scale (%)



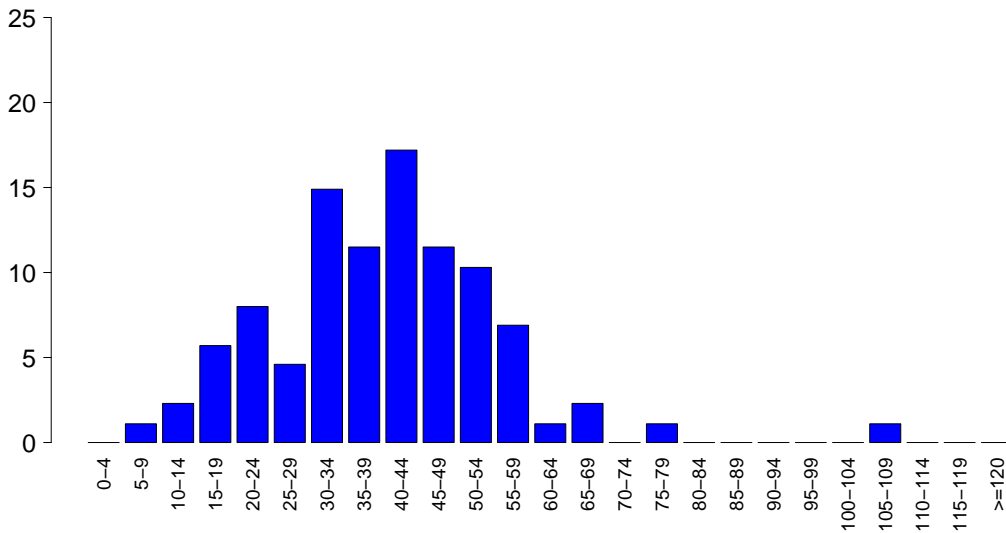
GCS (admission)

Median	13
Q1–Q3	7.5–15
Not evaluable	100
Missing	0

GCS (first 24 hours)

Median	15
Q1–Q3	10–15
Not evaluable	88
Missing	0

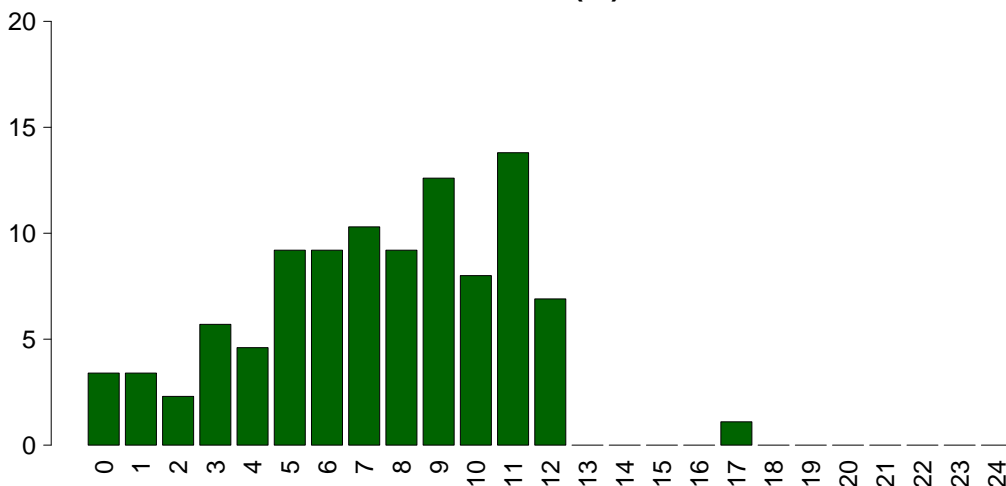
SAPS II (%)



SAPSII

Mean	39.6
SD	15.3
Median	40
Q1–Q3	30.5–48.5
Not evaluable	88
Missing	0

SOFA (%)



SOFA

Mean	7.4
SD	3.4
Median	8
Q1–Q3	5–10
Not evaluable	88
Missing	0

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

Complications during the stay	N	%
No	76	43.4
Yes	99	56.6
Missing	0	

Failures during the stay	N	%
No	145	82.9
Yes	30	17.1

A: Respiratory failure	11	6.3
B: Cardiovascular failure	7	4.0
C: Neurological failure	1	0.6
D: Hepatic failure	1	0.6
E: Renal failure (AKIN)	18	10.3
F: Acute skin failure	2	1.1
G: Metabolic failure	4	2.3
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
E	10	5.7
A	4	2.3
AB	3	1.7
AE	3	1.7
G	3	1.7
ABCE	1	0.6
B	1	0.6
BE	1	0.6
BEF	1	0.6
D	1	0.6
Missing	0	

Respiratory failure occurred	N	%
None	164	93.7
Intubation for airway maint.	2	1.1
Hypoxic failure	9	5.1
Hypercapnic failure	3	1.7
Missing	0	

Cardiovascular failure occurred	N	%
None	168	96.0
Cardiogenic shock	1	0.6
Hypovolemic shock	1	0.6
Haemorrhagic/hypovolemic shock	1	0.6
Septic shock	3	1.7
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	1	0.6
Missing	0	

Neurological failure occurred	N	%
None	174	99.4
Cerebral coma	0	0.0
Metabolic coma	0	0.0
Postanoxic coma	1	0.6
Missing	0	

Renal failure occurred (AKIN)	N	%
None	157	89.7
Mild	1	0.6
Moderate	7	4.0
Severe	10	5.7
Missing	0	

Complications during the stay	N	%
Respiratory	10	5.7
Pleural effusion	4	2.3
Moderate ARDS	2	1.1
Severe ARDS	2	1.1
Mild ARDS	1	0.6
Pulmonary embolism	1	0.6
Cardiovascular	35	20.0
Cardiac arrest	17	9.7
Left heart failure w/o pulm. edema	10	5.7
Acute severe arrhythmia: tachycardias	5	2.9
Pulmonary edema	4	2.3
Right heart failure	3	1.7
Neurological	34	19.4
Intracranial hypertension	21	12.0
Brain edema	19	10.9
Drowsiness/agitation/delirium	5	2.9
Haemorrhagic transformation (stroke)	5	2.9
Hydrocephalus	3	1.7
Gastrointestinal and hepatic	20	11.4
Gastrointestinal bleeding: upper tract	7	4.0
Anastomotic dehiscence	6	3.4
Bowel ischaemia	2	1.1
Gastrointestinal bleeding: lower tract	2	1.1
Gastrointestinal perforation	2	1.1
Other	15	8.6
Nephrourologic disease	6	3.4
Metabolic disorder	4	2.3
Extremity compartment syndrome (severe)	2	1.1
Other disease	2	1.1
Other skin and/or soft tissue pathology	2	1.1
Category/Stage IV: Full Thickness Tissue Loss	1	0.6
HELLP syndrome	1	0.6
Infections	39	22.3
Pneumonia	14	8.0
NON-surgical urinary tract infection	8	4.6
Clinical sepsis	4	2.3
Post-surgical peritonitis	4	2.3
Post-surgical skin/soft tissue infection	4	2.3
L.R.T.I. other than pneumonia	3	1.7
Primary bacteraemia of unknown origin	2	1.1
Post-surgical bone and joint infection	1	0.6
Burn infection	1	0.6
Catheter-related bacteremia (CR-BSI)	1	0.6
Missing	0	

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

Infections			Maximum severity of infection		
	N	%		N	%
None	63	36.0	None	63	36.4
Only on admission	73	41.7	INFECTION WITHOUT SEPSIS	31	17.9
On admission and during ICU stay	13	7.4	SEPSIS	38	22.0
Only during ICU stay	26	14.9	SEPTIC SHOCK	41	23.7
Missing	0		Missing	2	

Severity evolution

Severity evolution		During the stay				
		None	INFECTION WITHOUT SEPSIS	SEPSIS	SEPTIC SHOCK	TOT
Admission	None	63 (72.4%)	8 (9.2%)	15 (17.2%)	1 (1.1%)	87
	INFECTION WITHOUT SEPSIS	-	23 (85.2%)	3 (11.1%)	1 (3.7%)	27
	SEPSIS	-	-	20 (95.2%)	1 (4.8%)	21
	SEPTIC SHOCK	-	-	-	38 (100.0%)	38
	TOT	63	31	38	41	173

Ventil. Associat. Pneumonia (VAP)	N	%
No	162	92.6
Yes	13	7.4
Missing	0	

Incidence of VAP

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

Estimate	13.1
CI (95%)	7.0–22.4

Incidence of VAP

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

Estimate	10.5%
CI (95%)	5.6–17.9

Catheter Bacteraemia (CR-BSI)	N	%
No	174	99.4
Yes	1	0.6
Missing	0	

Incidence of CR-BSI

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

Estimate	0.7
CI (95%)	0.0–3.7

Incidence of CR-BSI

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

Estimate	0.8%
CI (95%)	0.0–4.4

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Process indicators - Adult emergency surgical patients evaluated in the GiViTI model															
Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use			On admission			On discharge			Length (days)			Days from admission		
	N	%	100.0	N	%		N	%		Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Invasive ventilation	161	92.0		130	74.3		25	14.3		3	1-10	0	0	0-0	0
Non invasive ventilation	9	5.1		2	1.1		1	0.6		2	1-3	0	1	0-2	0
Tracheostomy	24	13.7		0	0		13	7.4		8	5-17	0	8	7-10	0
iNO (inhaled nitric oxide)	0	0.0													
Central Venous Catheter	163	93.1		80	45.7		59	33.7		5	2-13	0	0	0-0	0
PICC	1	0.6		0	0		0	0		0	0-0	0	0	0-0	0
Arterial Catheter	168	96.0		45	25.7		51	29.1		5	2-11	0	0	0-0	0
Vasoactive drugs	155	88.6		102	58.3		41	23.4		4	1-9	0	0	0-0	0
Antiarrhythmics	37	21.1		12	6.9		12	6.9		3	2-7	0	0	0-1	0
IABP	2	1.1		2	1.1		1	0.6		4	3-6	0			
Invasive monitoring of C.O.	80	45.7		13	7.4		8	4.6		7	2-12	0	0	0-0	0
Continuous monitoring of ScVO2	0	0.0													
Temporary pacing	1	0.6		0	0		0	0		0	0-0	0	8	8-8	0
Ventricular assistance	0	0.0													
DC-shock	6	3.4											1	1-7	0
CPR	14	8.0											1	0-4	0
Massive blood transfusion	4	2.3											0	0-2	0
ICP monitoring without CSF drainage	1	0.6		0	0		0	0		2	2-2	0	0	0-0	0
ICP monitoring with CSF drainage	0	0.0													
External ventricular drainage without ICP	0	0.0													
Haemofiltration	11	6.3		1	0.6		1	0.6		4	2-9	0	0	0-3	0
Haemodialysis	21	12.0		5	2.9		4	2.3		8	3-13	0	1	1-2	0
ECMO	1	0.6		1	0.6		0	0		6	6-6	0			
Hepatic clearance techniques	0	0.0													
Clearance techniques during sepsis	0	0.0													
IAP (intra-abdominal pressure)	1	0.6													
Hypothermia	0	0.0													
Enteral nutrition	83	47.4		7	4		22	12.6		6	2-12	0	1	0-2	0
Parenteral nutrition	108	61.7		9	5.1		29	16.6		6	2-10	0	0	0-1	0
SDD (Topical, Topical and systemic)	32	18.3													
Patient restraint	0	0.0													
Peridural catheter	1	0.6		0	0		1	0.6		6	6-6	0	1	1-1	0
Electrical cardioversion	3	1.7											1	0-2	0
Vacuum therapy	2	1.1													
Antibiotics	156	89.1													
Antibiotic prophylaxis	48	27.4		21	12		16	9.1		2	1-3	0	0	0-0	0
Empirical antibiotic therapy	79	45.1		23	13.1		14	8		2	2-4	0	0	0-0	0
Empirical antibiotic therapy in unconfirmed diagnosis	18	10.3		1	0.6		1	0.6		4	2-6	0	0	0-0	0
Targeted antibiotic therapy	59	33.7		7	4		18	10.3		7	4-12	0	3	2-7	0

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Process indicators - Adult emergency surgical patients evaluated in the GiViTI model
Length (days)

Invasive ventilation (N=161)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	123	76.4	5.8	6.7	3	1–10	0
For airway maintenance	27	16.8	13.6	20.6	6	2–12.5	0
In weaning	7	4.3	0.3	0.5	0	0–0.5	0
Not evaluable	4	2.5	3.0	5.4	0.5	0–3.5	0
Reintubation within 48 hours	0	0.0					

Non invasive ventilation (N=9)	N	%
Non invasive ventilation only	4	44.4
Non invasive ventilation failed	1	11.1
For weaning	2	22.2
Other	2	22.2
Missing	0	

Tracheostomy not present on admission (N=24)	N	%
Surgical	2	8.3
Percutwist	0	0.0
Ciaglia	0	0.0
Monodil. Ciaglia	0	0.0
Fantoni	0	0.0
Griggs	18	75.0
Other Kind	1	4.2
Unknown	3	12.5
Missing	0	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=24)

Mean	8.9
SD	6.0
Median	8.5
Q1–Q3	6.8–10.2
Missing	0

Invasive monitoring of C.O. (N=80)	N	%
Swan Ganz	3	3.8
PICCO	10	12.5
LIDCO	47	58.8
Vigileo-PRAM	7	8.8
Other	13	16.2
Missing	0	

SDD (N=32)	N	%
Topical	22	68.8
Topical and systemic	10	31.2
Missing	0	

Antibiotic therapy

Pt. infected in ICU only (N=26)	N	%
Only empirical	4	16.0
Only targeted	6	24.0
Targeted after empirical	9	36.0
Other	6	24.0
Missing	1	

Surgical interventions	N	%
No	154	88.0
Yes	21	12.0
Missing	0	

Number of surgical interventions	N	%
0	154	88.0
1	15	8.6
2	5	2.9
3	1	0.6
>3	0	0.0
Missing	0	

Surgical interventions

Days from admission

Mean	8.6
SD	8.7
Median	6.5
Q1–Q3	3–9
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	18	10.3
Orthopaedic surgery	3	1.7
Other surgery	3	1.7
Neurosurgery	2	1.1
Organ donation	2	1.1
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Non surgical interventions	N	%
No	167	95.4
Yes	8	4.6
Missing	0	

Non surgical interventions

Days from admission

Mean	7.4
SD	6.1
Median	7
Q1–Q3	2–8
Missing	0

Non surgical interventions	N	%
Interventional endoscopy	9	5.1
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	0	

National report for general ICUs - Year 2018**Outcome indicators - Adult emergency surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	74	42.3
Transferred to same hospital	74	42.3
Transferred to other hospital	22	12.6
Discharged home	5	2.9
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=96)	N	%
Ward	90	93.8
Other ICU	5	5.2
High dependency care unit	1	1.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=5)	N	%
Specialist expertise	2	40.0
Step-up care	3	60.0
Logistical/organizational reasons	0	0.0
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=74)	N	%
Ward	74	100.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=22)	N	%
Ward	16	72.7
Other ICU	5	22.7
High dependency care unit	1	4.5
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	101	57.7
Dead	74	42.3
Missing	0	

Timing of ICU mortality (N=74)	N	%
Daytime (08:00AM - 07:59PM)	37	50.0
Nighttime (08:00PM - 07:59AM)	37	50.0
Weekdays (Monday - Friday)	55	74.3
Weekend (Saturday - Sunday)	19	25.7
Missing	0	

Hospital mortality	N	%
Alive	93	53.1
Dead	82	46.9
Missing	0	

Timing of hosp. mortality (N=82)	N	%
In ICU	74	90.2
Within 24 hours after ICU	0	0.0
24-47 hours after ICU	1	1.2
48-71 hours after ICU	1	1.2
72-95 hours after ICU	0	0.0
After 95 hours after ICU	6	7.3
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=8)		
Mean		15.9
SD		13.8
Median		15
Q1–Q3		3.5–23
Missing		0

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Outcome indicators - Adult emergency surgical patients evaluated in the GiViTI model

Last hospital mortality		N	%
Alive		92	52.6
Dead		83	47.4
Missing		0	

ICU stay (days)			
	Mean		9.0
	SD		11.7
	Median		5
	Q1–Q3		2–12
	Missing		0

ICU stay (days)			
Alive (N=101)			
	Mean		9.2
	SD		11.0
	Median		5
	Q1–Q3		2–12
	Missing		0

ICU stay (days)			
Dead (N=74)			
	Mean		8.8
	SD		12.7
	Median		4
	Q1–Q3		1–12
	Missing		0

Stay after ICU (days)			
Alive (N=101)			
	Mean		10.1
	SD		14.1
	Median		6
	Q1–Q3		0–14
	Missing		0

Hospital stay (days)			
	Mean		18.2
	SD		19.7
	Median		13
	Q1–Q3		6–22
	Missing		0

Hospital stay (days)			
Alive (N=93)			
	Mean		21.4
	SD		21.0
	Median		17
	Q1–Q3		8–27
	Missing		0

Hospital stay (days)			
Dead (N=82)			
	Mean		14.5
	SD		17.4
	Median		9.5
	Q1–Q3		4–18
	Missing		0

National report for general ICUs - Year 2018**Validity of the models** - Calibration belts

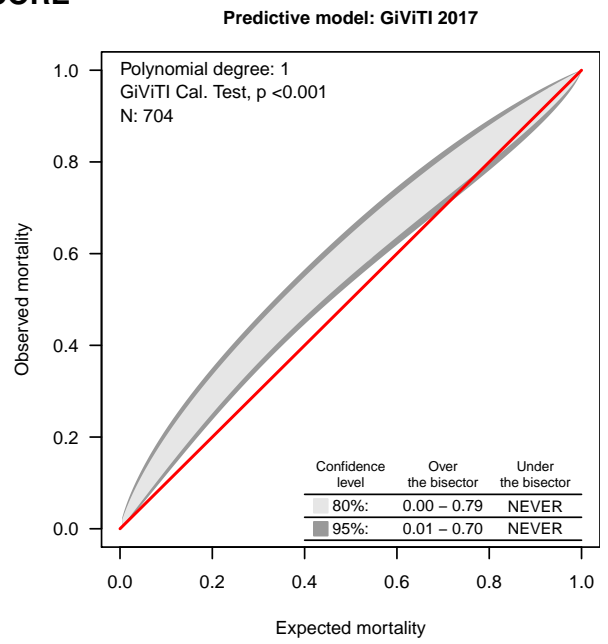
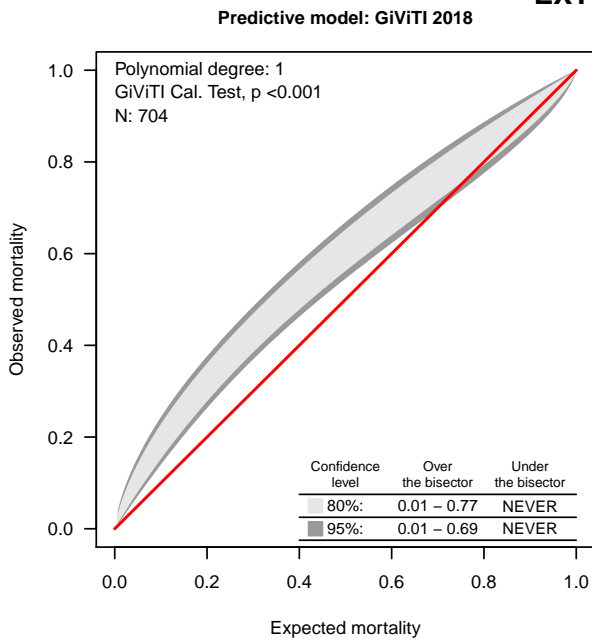
The calibration belt is designed to compare actually observed mortality with expected mortality according to a given prediction model. Expected mortality is plotted on the x axis while observed mortality is plotted on the y-axis. Two overlapping belts are presented in each graph: the first, in light grey, with a confidence level of 80%, and the second, in dark grey, with a confidence level of 95%. The belt lying above the bisector indicates that observed mortality is higher than expected mortality; vice versa, the belt lying below the bisector indicates that observed mortality is lower than expected mortality. The belt is plotted in the range of expected mortality values actually present in the sample under study. The higher the polynomial, the more complex the relationship between expected and observed mortality. A significant test ($p < 0.05$) indicates poor calibration.

These pages show the calibration belts built on 2018 data using PIM 2, PIM 3, PELOD, SAPSII, GiViTI 2017 and GiViTI 2018 prognostic models. For further informations please look at [PLoS ONE 6(2): e16110].

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Validity of the models - Calibration belts

EXTERNAL SCORE



Appendix

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