

GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

**Report
PROSAFE project**

Year 2016

National report for general ICUs (5 ICUs)

GREECE

PROSAFE project - National report for general ICUs (5 ICUs)

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Authors of the report:

Guido Bertolini, Bergamo - IT
Greta Carrara, Bergamo - IT
Stefano Finazzi, Bergamo - IT
Joanne Fleming, Padova - IT
Elena Garbero, Bergamo - IT
Giulia Mandelli, Bergamo - IT
Jessica Nava, Bergamo - IT
Luana Nava, Bergamo - IT
Giulia Paci, Bergamo - IT
Daniele Poole, Belluno - IT
Carlotta Rossi, Bergamo - IT

Software developers:

Obou Brissy, Bergamo - IT
Daniele Crespi, Bergamo - IT
Matteo Mondini, Bergamo - IT
Claudio Previtali, Bergamo - IT
Michele Zanetti, Bergamo - IT

Steering Committee:

Guido Bertolini, Bergamo - IT
Andrea Bottazzi, Pavia - IT
Arturo Chiericato, Milano - IT
Roberto Fumagalli, Milano - IT
Sergio Livigni, Torino - IT
Giuseppe Nardi, Rimini - IT
Giancarlo Negro, Lecce - IT
Carlo Olivieri, Novara - IT
Daniele Poole, Belluno - IT
Danilo Radrizzani, Milano - IT
Clara Ripamonti, Lecco - IT
Mario Tavola, Genova - IT
Bruno Viaggi, Firenze - IT

GiViTI Coordinating Center

Daccò Center for Clinical Research on Rare Diseases
Mario Negri Institute for Pharmacological Research
Villa Camozzi - 24020 Ranica (BG), IT
tel: +390354535313
email: giviti@marionegri.it
www.giviti.marionegri.it

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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 2016 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 Petal (Collaborative REsearch on ACute Traumatic brain Injury in intensiVe care medicine in Europe), that aims 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 COMPACT 2 Petal, designed to randomize eligible patients and collect data for the clinical trial.

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 325 ICUs collected data during 2016, 284 Italian and 41 foreign ICUs, for a total of 104374 patients registered in PROSAFE. Only the ICUs that collected valid data (251) 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 95511 patients admitted to intensive care during 2016.

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 (Italian) national report on the high dependency units.
5. 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 251 ICUs which collected valid data in 2016 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 2016 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

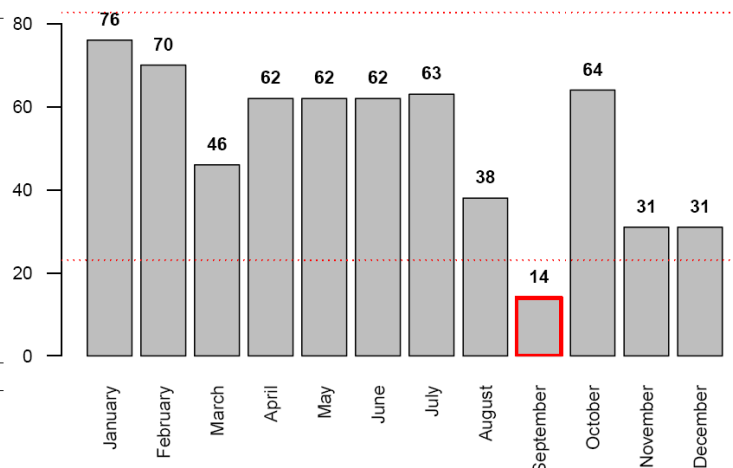
Patients admitted: 619

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

Admissions



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

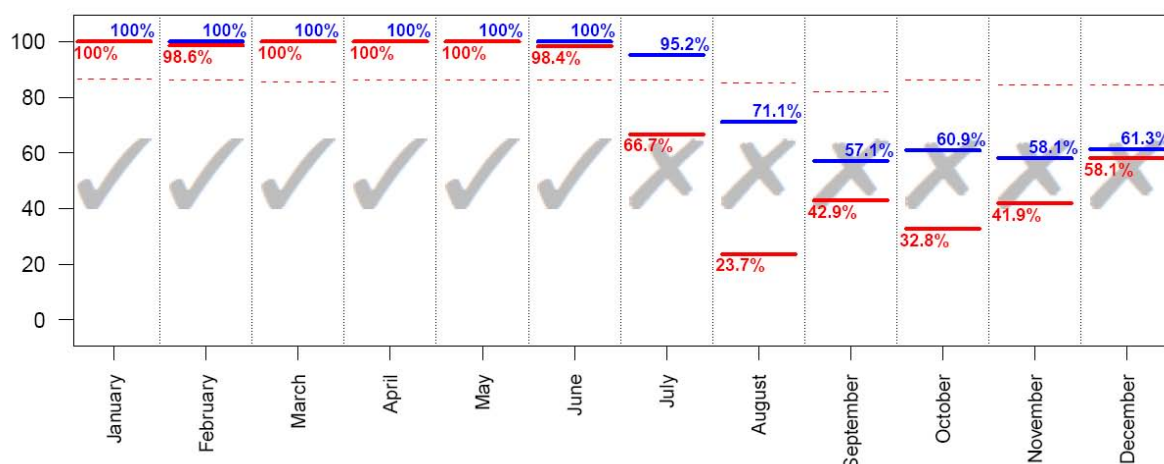
The second table divides the recruited patients by admission month and form completion status. Overall, the ICU in

question presents complete data for 485 patients. 134 patients still present incomplete data.

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

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

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



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

Description of patients

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

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

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

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

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

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

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

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

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

Surgical interventions on admission (top 10) This lists the top 10 surgical interventions, divided by elective surgery and emergency surgery patients, operated between 7 days prior to and one day after admission to the ICU. Each single intervention (even more than one per patient) is counted.

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

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

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

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

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

where

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

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

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

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

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

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

Evoluzione della gravità		Degenza				
N (R %)		Nessuna	Infezione con o senza SIRS	SEPSI GRAVE	SHOCK SETTICO	TOT
Ammissione	Nessuna	173 (93.0%)	9 (4.8%)	1 (0.5%)	3 (1.6%)	186
	Infezione con o senza SIRS	-	19 (95.0%)	0 (0.0%)	1 (5.0%)	20
	SEPSI GRAVE	-	-	15 (88.2%)	2 (11.8%)	17
	SHOCK SETTICO	-	-	-	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 2016	Last hospital mortality
Pediatric	PIM 2	ICU mortality
	PIM 3	ICU mortality
	PELOD	ICU mortality

Statistics

Nation	TYPE							Total
	General	Cardiosurgical	Surgical	Neurosurgical	Pediatrics	HDC	Other	
 Cyprus	2 ICUs 1116 patients							2 ICUs 1116 patients
 Greece	5 ICUs 1096 patients				1 ICUs 152 patients			6 ICUs 1248 patients
 Hungary	1 ICUs 523 patients			1 ICUs 355 patients				2 ICUs 878 patients
 Israel					3 ICUs 1315 patients			3 ICUs 1315 patients
 Italy	166 ICUs 56797 patients	21 ICUs 12855 patients	13 ICUs 6842 patients	11 ICUs 4512 patients	4 ICUs 1438 patients	7 ICUs 2859 patients	7 ICUs 2787 patients	229 ICUs 88090 patients
 Poland	1 ICUs 171 patients				1 ICUs 100 patients			2 ICUs 271 patients
 Slovenia			5 ICUs 1818 patients				2 ICUs 775 patients	7 ICUs 2593 patients
Total	175 ICUs 59703 patients	21 ICUs 12855 patients	18 ICUs 8660 patients	12 ICUs 4867 patients	9 ICUs 3005 patients	7 ICUs 2859 patients	9 ICUs 3562 patients	251 ICUs 95511 patients

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

Description of hospitals (N=5) - Year 2016

Number of beds in hospital	N	%
< 300 beds	1	20.0
300 - 800 beds	4	80.0
> 800 beds	0	0.0
Missing	0	

Type of ICUs present in hospital	N	%
General	5	100.0
Medical	0	0.0
Surgical	0	0.0
Neurological/neurosurgical	0	0.0
Cardiosurgical	3	60.0
Burns	0	0.0
Post-transplantations	0	0.0
Other	1	20.0

Type of subICUs present in hospital	N	%
General	0	0.0
Surgical	0	0.0
Cardiological	5	100.0
Respiratory	0	0.0
Neurological (stroke unit)	1	20.0
Other	1	20.0

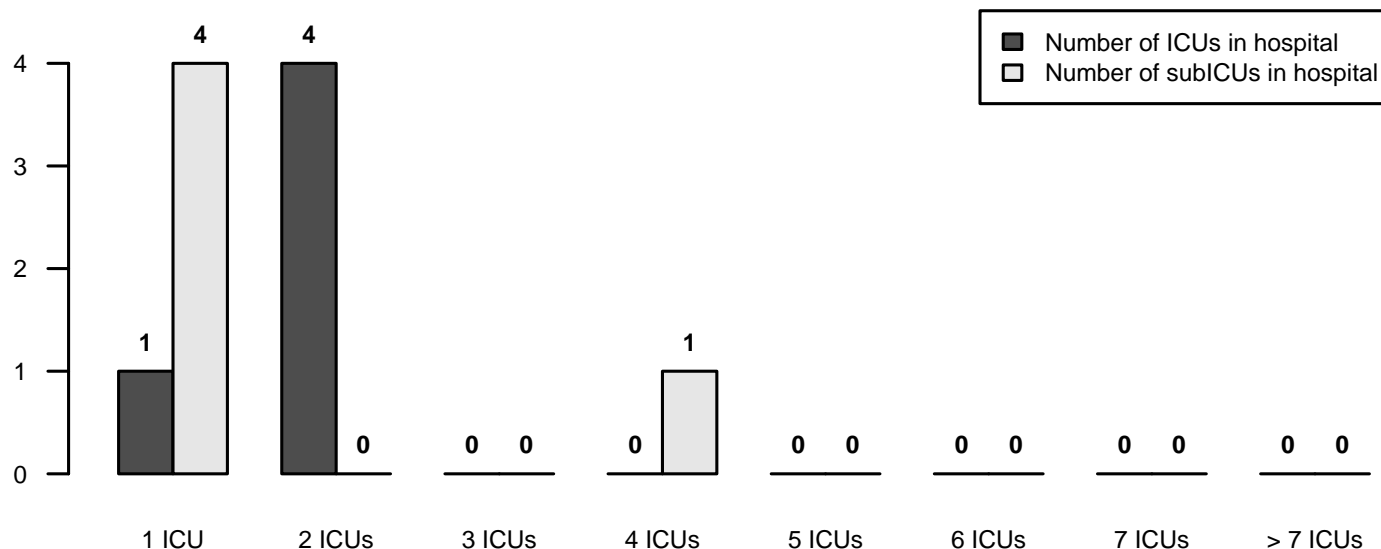
Non surgical specialties	N	%
Cardiology	5	100.0
Pulmonology	4	80.0
Nephrology	5	100.0
Infection disease	4	80.0
Pediatric	5	100.0
Neonatology	4	80.0
Neurology	4	80.0
Haematology	4	80.0
Emergency room	5	100.0
Traumatology	3	60.0
Emergency medical	4	80.0

Surgical specialties (independent ward)	N	%
Neurosurgery	5	100.0
Cardiosurgery	3	60.0
Major vascular surgery	3	60.0
Thoracic surgery	3	60.0
Pediatric surgery	3	60.0
Transplantation activities	0	0.0

Surgical specialties (procedures only)	N	%
Neurosurgery	0	0.0
Cardiosurgery	0	0.0
Major vascular surgery	0	0.0
Thoracic surgery	0	0.0
Pediatric surgery	0	0.0
Transplantation activities	3	60.0

Services/activities available in H (h24)	N	%
Neuroradiology	2	40.0
Interventional neuroradiology	0	0.0
Interventional vascular radiology	2	40.0
CT scan	5	100.0
MRI	4	80.0
Interventional hemodynamic	4	80.0
Endoscopy	5	100.0
Bronchoscopy	5	100.0
Hyperbaric chamber	0	0.0

Services/activities available in H (rep.)	N	%
Neuroradiology	1	20.0
Interventional neuroradiology	1	20.0
Interventional vascular radiology	1	20.0
CT scan	0	0.0
MRI	0	0.0
Interventional hemodynamic	0	0.0
Endoscopy	0	0.0
Bronchoscopy	0	0.0
Hyperbaric chamber	0	0.0



Description of ICUs (N=5) - Year 2016

Number of activable beds

Mean (SD)	1.5 (0.5)
Median (Q1–Q3)	1.5 (1.3–1.8)
Missing	2

Number of beds declared to hospital

Mean (SD)	158.2 (330.8)
Median (Q1–Q3)	12 (9–12)
Missing	0

University affiliation

	N	%
Yes	3	60.0
No	2	40.0
Missing	0	

Square meter per bed

Mean (SD)	15.2 (1.1)
Median (Q1–Q3)	16 (14–16)
Missing	0

Clinical psychologist

	N	%
No	2	40.0
For relatives	3	60.0
For patients	2	40.0
For personnel	0	0.0

ICU Structure

	N	%
NON OPEN-SPACE	1	20.0
OPEN-SPACE (or alike)	4	80.0
Missing	0	

Physicians

	N	%
Dedicated to ICU only	2	50.0
Dedicated to ICU on a rotation basis	0	0.0
Dedicated to ICU only and on a rotation basis	2	50.0
Missing	1	

Declared beds per physician (average)

Mean (SD)	27.6 (56.8)
Median (Q1–Q3)	2.3 (2–2.4)
Missing	0

Nurses

	N	%
Dedicated to ICU only	2	50.0
Dedicated to ICU on a rotation basis	0	0.0
Dedicated to ICU only and on a rotation basis	2	50.0
Missing	1	

Declared beds per nurse (average)

Mean (SD)	26.9 (55.0)
Median (Q1–Q3)	2.3 (2.2–2.4)
Missing	0

Number of hours conceded for relatives' visits

	N	%
1	5	100.0
2	0	0.0
3-4	0	0.0
5-12	0	0.0
13-20	0	0.0
>20	0	0.0
Missing	0	

Maximum number of visitors per patient

	N	%
One	1	20.0
Two	3	60.0
Three or more	1	20.0
Missing	0	

Biomedical devices per declared bed

	Median	Q1-Q3	<5 Years (mean %)
Basic ICU monitors (ECG, NIPB, SaO2)	1.5	1.2–1.5	30.3
Advanced ICU monitors	0.0	0.0–0.2	66.7
Invasive monitoring of cardiac output (Swan-Ganz)	0.2	0.1–1.0	25.0
Invasive monitoring of cardiac output (PiCCO)	0.1	0.1–0.1	50.0
Invasive monitoring of cardiac output (Vigileo)	0.1	0.0–0.2	0.0
Non-invasive monitoring of cardiac output (impedentiometry)	0.0	0.0–0.0	
Defibrillators	0.2	0.1–0.2	50.0
Both invasive and non invasive ventilators	1.3	1.3–1.6	39.0
Invasive ventilators	1.3	1.2–1.3	42.1
Non invasive ventilators	0.2	0.2–0.2	48.0
Syringe pumps	0.0	0.0–2.2	77.8
Peristaltic pumps	3.3	2.2–4.2	36.1

Biomedical equipment in ICU

	N	%
Transoesophageal echo	3	60.0
Basic ultrasounds	5	100.0
Advanced ultrasounds	5	100.0
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	0	

Description of ICUs (N=5) - Year 2016

Patients admitted

Mean (SD)	212.5 (58.7)
Median	193.6
Q1–Q3	179.6–235.9
Missing	2

Occupancy rate (%)

Mean (SD)	81.2 (11.1)
Median	84.4
Q1–Q3	76.7–87.3
Missing	2

Rotation index (patients/bed)

Mean (SD)	21.6 (11.5)
Median	16.1
Q1–Q3	15–25.5
Missing	2

Turnover (hours)

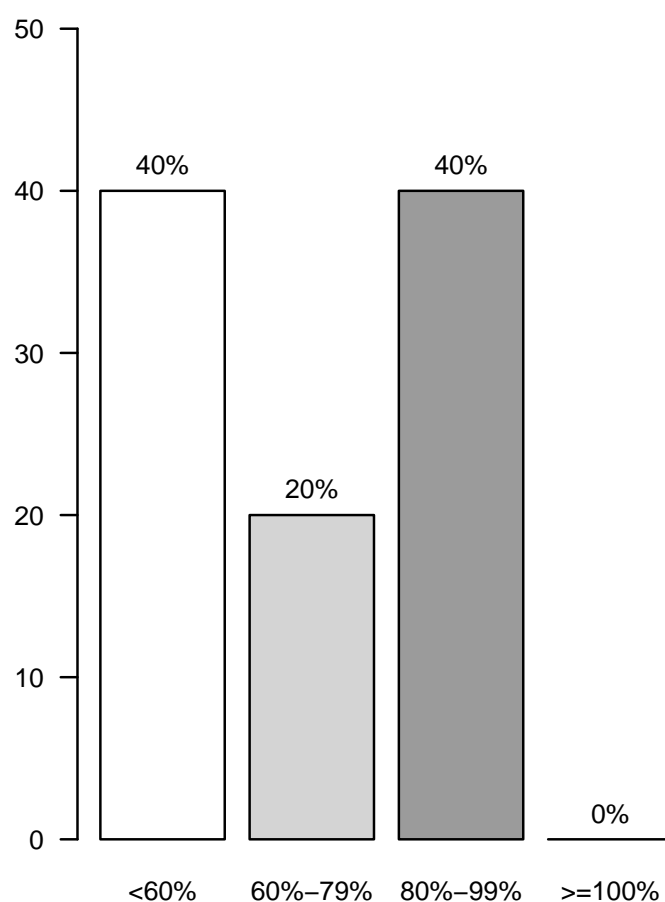
Mean (SD)	101.6 (88.0)
Median	83.2
Q1–Q3	53.8–140.3
Missing	2

Occupied beds per physician (average)

Mean (SD)	1.6 (0.5)
Median	1.8
Q1–Q3	1.6–1.8
Missing	0

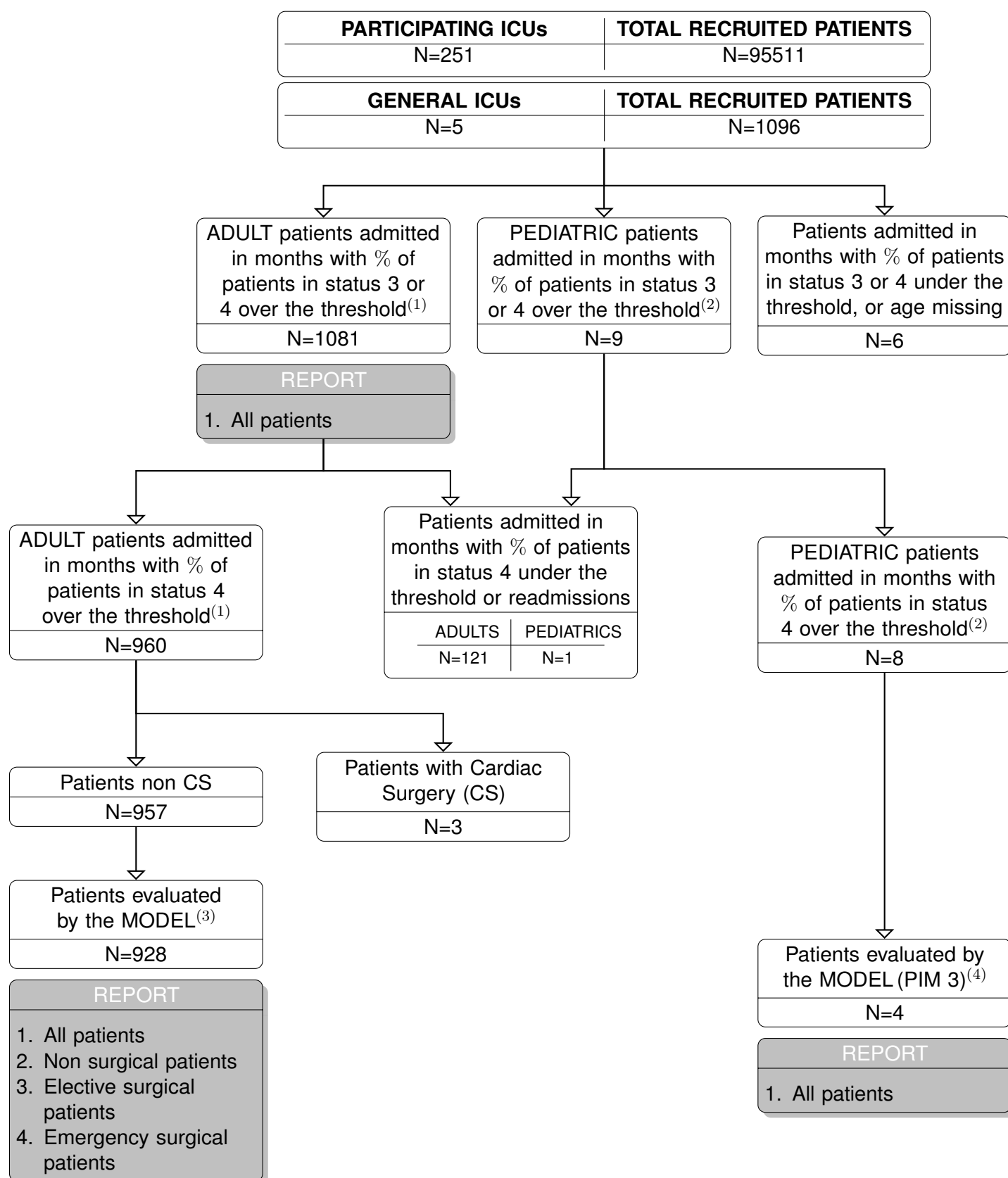
Occupied beds per nurse (average)

Mean (SD)	1.6 (0.5)
Median	1.8
Q1–Q3	1.6–1.8
Missing	0

Occupancy rate (%)

National report for general ICUs (5 ICUs) - Year 2016

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 2016
Characteristics on admission - Adult patients

Patients (N): 1081

Sex	N	%
Male	691	63.9
Female	390	36.1
Missing	0	

Age (years)	N	%
17-45	197	18.2
46-65	344	31.8
66-75	266	24.6
>75	274	25.3
Missing	0	
Mean	61.9	
SD	17.1	
Median	65	
Q1–Q3	51–76	
Min–Max	17–98	

Body mass Index (BMI)	N	%
Underweight	34	3.2
Normal	312	29.3
Overweight	389	36.6
Obese	329	30.9
Missing	17	

Pregnancy status	N	%
Females (N=390)		
Not fertile	147	37.9
Not pregnant/Unknown	227	58.5
Currently pregnant	0	0.0
Post partum	14	3.6
Missing	2	

Comorbidities	N	%
No	215	20.0
Yes	859	80.0
Missing	7	

Comorbidities (top 10)	N	%
Hypertension	515	48.0
Diabetes Type II without insulin tr.	162	15.1
Arrhythmia	140	13.0
Any tumour without metastasis	122	11.4
NYHA class II-III	111	10.3
Myocardial infarction	105	9.8
Severe COPD	105	9.8
Peripheral vascular disease	100	9.3
Cerebrovascular disease	85	7.9
Moderate or severe renal disease	80	7.4
Missing	7	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	5.5	12.5	1	0–5	6

Source of admission	N	%
Same hospital	937	87.2
Other hospital	135	12.6
Long-term chronic care hospital	3	0.3
Directly from the community	0	0.0
Missing	6	

Ward of admission	N	%
Hospital (N=1072)		
Medical ward	338	31.5
Surgical ward	418	39.0
Emergency room	274	25.6
Other ICU	33	3.1
High dependency care unit	9	0.8
Missing	0	

Reason for transfer from	N	%
Other ICU (N=33)		
Specialist expertise	14	42.4
Step-up care	15	45.5
Logistical/organizational reasons	4	12.1
Step-down care	0	0.0
Missing	0	

Ward of admission	N	%
Same hospital (N=937)		
Medical ward	314	33.5
Surgical ward	400	42.7
Emergency room	202	21.6
Other ICU	16	1.7
High dependency care unit	5	0.5
Missing	0	

Ward of admission	N	%
Other hospital (N=135)		
Medical ward	24	17.8
Surgical ward	18	13.3
Emergency room	72	53.3
Other ICU	17	12.6
High dependency care unit	4	3.0
Missing	0	

Scheduled admission	N	%
No	889	82.8
Yes	185	17.2
Missing	7	

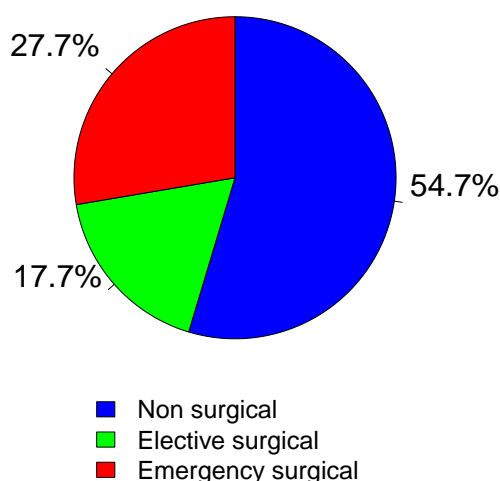
National report for general ICUs - Year 2016

Characteristics on admission - Adult patients

Trauma	N	%
No	909	84.6
Yes	165	15.4
Multiple trauma	73	6.8
Missing	7	

Surgical status	N	%
Non surgical	587	54.7
Elective surgical	190	17.7
Emergency surgical	297	27.7
Missing	7	

Surgical status



Source of admission	N	%
Surgical pt. (N=487)		
Operating theatre of surgical ward	309	63.4
Operating theatre of emergency room	80	16.4
Surgical ward	36	7.4
Other	62	12.7
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=190)		
Neurosurgery	60	31.6
Abdominal vascular surgery	33	17.4
Gastrointestinal surgery	31	16.3
Thoracic surgery	14	7.4
Pancreatic surgery	13	6.8
Peripheral vascular surgery	12	6.3
Gynaecological surgery	11	5.8
Nephro/Urological surgery	10	5.3
Biliary tract surgery	8	4.2
ENT surgery	7	3.7
Missing	0	

Timing	N	%
Elective surgical (N=190)		
From -7 to -3 days	4	2.1
From -2 to -1 days	14	7.4
On ICU admission day	200	105.3
The day after ICU admission	2	1.1
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=297)		
Neurosurgery	110	37.0
Gastrointestinal surgery	93	31.3
Orthopaedic surgery	26	8.8
Abdominal vascular surgery	23	7.7
Peripheral vascular surgery	15	5.1
Obstetric surgery	10	3.4
Biliary tract surgery	8	2.7
Other surgery	7	2.4
Nephro/Urological surgery	5	1.7
Maxillo-Facial surgery	4	1.3
Missing	0	

Timing	N	%
Emergency surgical (N=297)		
From -7 to -3 days	11	3.7
From -2 to -1 days	35	11.8
On ICU admission day	262	88.2
The day after ICU admission	12	4.0
Missing	0	

Non surgical interventions	N	%
None	996	92.7
Elective	32	3.0
Emergency	46	4.3
Missing	7	

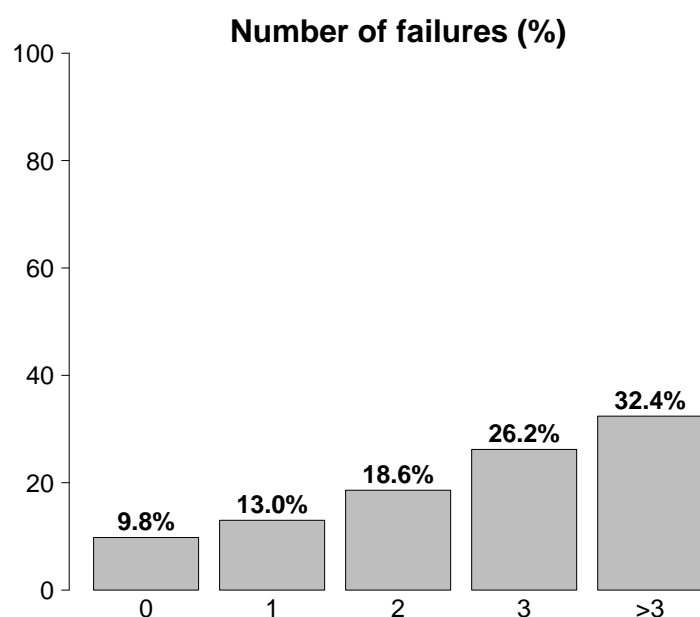
Non surgical interventions	N	%
Elective (N=32)		
Interventional endoscopy	19	59.4
Interventional radiology	6	18.8
Interventional neuroradiology	5	15.6
Interventional cardiology	0	0.0
Missing	2	

Non surgical interventions	N	%
Emergency (N=46)		
Interventional endoscopy	18	39.1
Interventional neuroradiology	12	26.1
Interventional radiology	11	23.9
Interventional cardiology	5	10.9
Missing	0	

National report for general ICUs - Year 2016

Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	164	15.3
Post surgical weaning	31	2.9
Surgical monitoring	59	5.5
Post interventional weaning	0	0.0
Interventional monitoring	17	1.6
Non surgical monitoring	57	5.3
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	907	84.5
Only ventilatory support	149	13.9
Only cardiovascular support	23	2.1
Ventilatory and cardiovascular support	735	68.5
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	2	0.2
Missing	8	



Failures on admission	N	%
No	106	9.8
Yes	975	90.2
A: Respiratory failure	884	81.8
B: Cardiovascular failure	758	70.1
C: Neurological failure	235	21.7
D: Hepatic failure	15	1.4
E: Renal failure	463	42.8
F: Acute skin failure	4	0.4
G: Metabolic failure	500	46.3
H: Coagulation failure	42	3.9
Missing	0	

Failures on admission (top 10)	N	%
ABEG	176	16.3
AB	129	11.9
ABG	106	9.8
A	85	7.9
ABE	84	7.8
ABC	70	6.5
ABCEG	65	6.0
ABCG	36	3.3
G	30	2.8
ABCE	21	1.9
Missing	0	

Respiratory failure	N	%
None	197	18.2
Only hypoxic failure	290	26.8
Only hypercapnic failure	48	4.4
Hypoxic-hypercapnic failure	83	7.7
Intubation for airway maint.	463	42.8
Missing	0	

Cardiovascular failure	N	%
None	323	29.9
Without shock	135	12.5
Cardiogenic shock	45	4.2
Septic shock	224	20.7
Haemorrhagic/hypovolemic shock	85	7.9
Hypovolemic shock	72	6.7
Anaphylactic shock	5	0.5
Neurogenic shock	45	4.2
Other shock	97	9.0
Mixed shock	50	4.6
Missing	0	

Neurologic failure	N	%
None	779	76.8
Cerebral coma	133	13.1
Metabolic coma	37	3.6
Postanoxic coma	60	5.9
Toxic coma	5	0.5
Missing or not evaluable	67	

Renal failure (AKIN)	N	%
None	609	56.8
Mild	208	19.4
Moderate	91	8.5
Severe	164	15.3
Missing	9	

Metabolic failure	N	%
None	572	53.4
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	81	7.6
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	419	39.1
Missing	9	

National report for general ICUs - Year 2016

Characteristics on admission - Adult patients

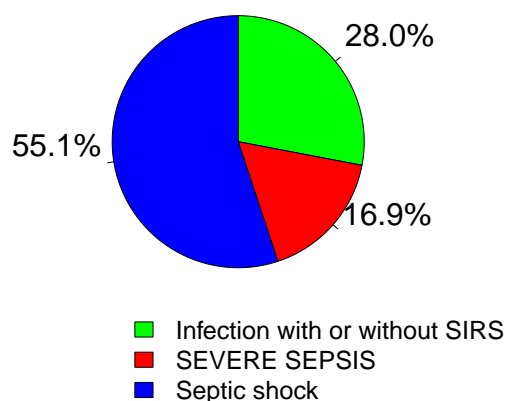
Clinical conditions on admission	N	%
Respiratory	358	33.4
Atelectasis	194	18.1
Moderate ARDS	62	5.8
Aspiration pneumonia	50	4.7
Pleural effusion	36	3.4
Severe ARDS	28	2.6
Cardiovascular	247	23.0
Acute severe arrhythmia: tachycardias	75	7.0
Left heart failure with pulmonary edema	48	4.5
Cardiac arrest	41	3.8
Non-ruptured aneurysm	31	2.9
Ruptured or fissured aneurysm	26	2.4
Neurological	241	22.5
Brain tumour	53	4.9
Spontaneous Intraparenchymal bleeding	51	4.8
Spontaneous Subarachnoid haemorrhage	38	3.5
Seizures	37	3.4
Intracranial hypertension	36	3.4
Gastrointestinal and hepatic	139	13.0
Gastrointestinal perforation	25	2.3
Intestinal occlusion	19	1.8
Digestive tract malignancy	18	1.7
Bowel ischaemia	17	1.6
Gastrointestinal bleeding: upper tract	16	1.5
Trauma (anatomical districts)	165	15.4
Head	98	9.1
Chest	61	5.7
Pelvis/bone/joint & muscle	45	4.2
Spine	29	2.7
Abdomen	28	2.6
Major vessels injury	5	0.5
Miscellaneous	4	0.4
Other	227	21.2
Metabolic disorder	107	10.0
Nephrourologic disease	63	5.9
Coagulation disorder	42	3.9
Acute intoxication	15	1.4
Haematological disease	14	1.3
Post transplantation	3	0.3
Bone marrow transplantation	1	0.1
Renal transplantation	1	0.1
Infections	497	46.3
Pneumonia	230	21.4
NON-surgical urinary tract infection	37	3.4
L.R.T.I. other than pneumonia	35	3.3
Primary bacteraemia of unknown origin	34	3.2
Primary peritonitis	32	3.0
Upper respiratory tract infection	26	2.4
Post-surgical peritonitis	23	2.1
NON-surgical secondary peritonitis	20	1.9
Cholecystitis/choolangitis	16	1.5
NON-surgical skin/soft tissue infection	13	1.2
Missing	8	

Trauma (anatomical districts)	N	%
Head	98	9.1
Traumatic subarachnoid haemorrhage	54	5.0
Skull fracture	39	3.6
Cerebral contusion/laceration	30	2.8
Maxillofacial fracture	30	2.8
Traumatic Subdural haematoma	25	2.3
Spine	29	2.7
Vertebral fracture, without deficit	16	1.5
Cervical injury, incomplete deficit	6	0.6
Paraplegia	3	0.3
Chest	61	5.7
Traum. haemothorax/pneumothorax	38	3.5
Other injuries of the chest	24	2.2
Severe lung contusion/laceration	11	1.0
Abdomen	28	2.6
Liver: Moderate-Severe laceration	7	0.7
Minor injuries of the abdomen	7	0.7
Bowel transection/perforation	5	0.5
Pelvis/bone/joint & muscle	45	4.2
Long bone fracture	34	3.2
Multiple fracture of the pelvis	12	1.1
Very severe or open fracture of the pelvis	2	0.2
Major vessels injury	5	0.5
Proximal limbs vessels: transection	3	0.3
Aorta: rupture/dissection	2	0.2
Neck vessels: dissection/transection	1	0.1
Miscellaneous	4	0.4
Burns (>30% BSA)	4	0.4
-	0	0.0
Missing	8	

Infection severity on admission	N	%
None	576	54.0
Infection with or without SIRS	137	12.9
SEVERE SEPSIS	83	7.8
Septic shock	270	25.3
Missing	15	

Infection severity on admission

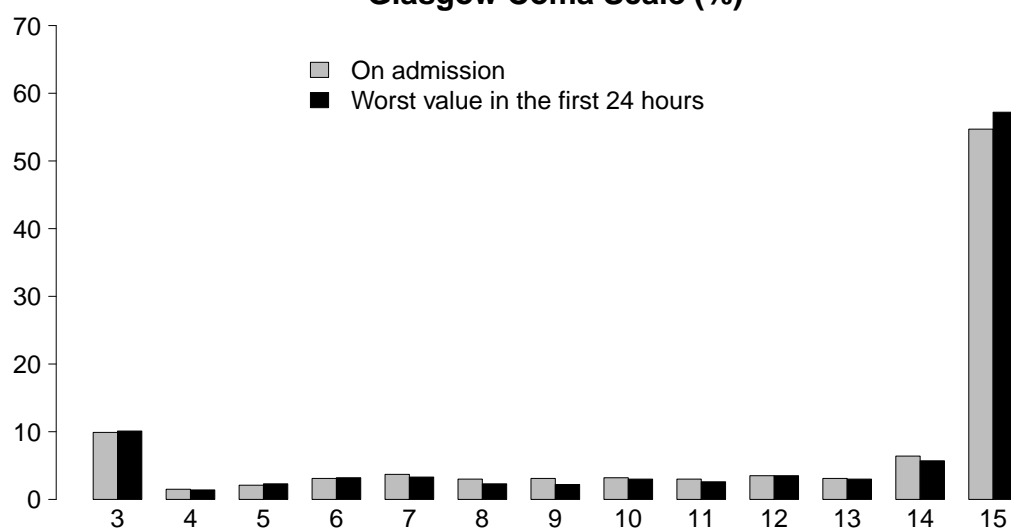
Patients infected (N=490)



National report for general ICUs - Year 2016

Severity scores - Adult patients

Glasgow Coma Scale (%)

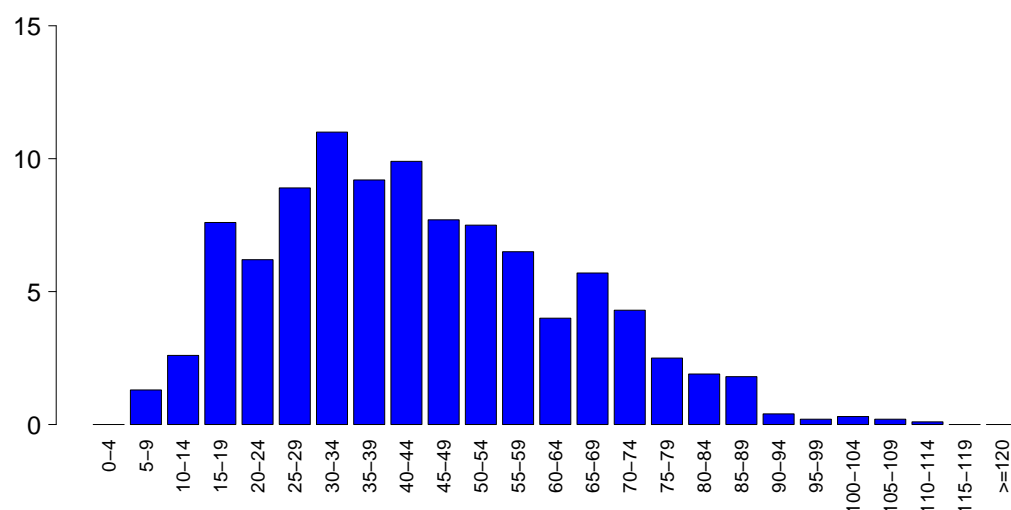
**GCS (admission)**

Median	15
Q1–Q3	9–15
Not evaluable	58
Missing	9

GCS (first 24 hours)

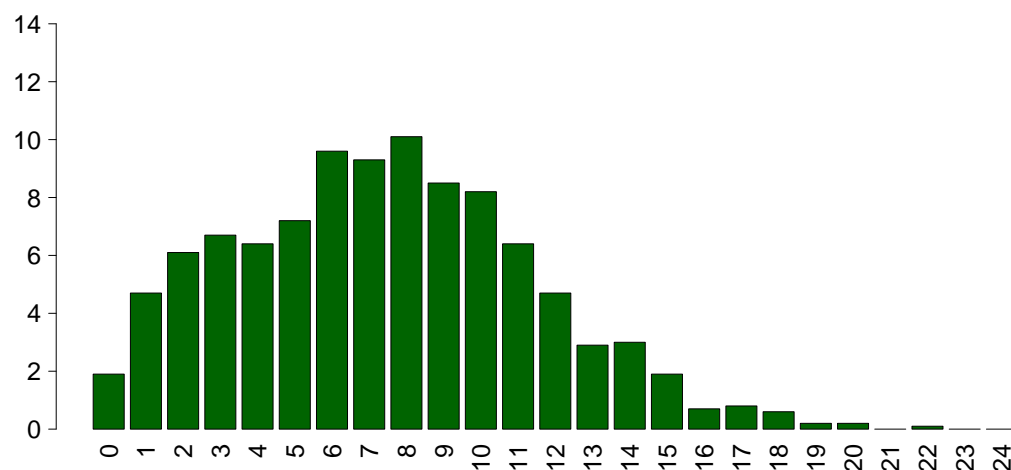
Median	15
Q1–Q3	10–15
Not evaluable	165
Missing	9

SAPS II (%)

**SAPSII**

Mean	43.4
SD	19.8
Median	41
Q1–Q3	28–56.5
Not evaluable	165
Missing	9

SOFA (%)

**SOFA**

Mean	7.4
SD	4.0
Median	7
Q1–Q3	4–10
Not evaluable	165
Missing	9

National report for general ICUs - Year 2016
Characteristics during the stay - Adult patients

Complications during the stay	N	%
No	440	41.0
Yes	633	59.0
Missing	8	

Failures during the stay	N	%
No	729	67.4
Yes	352	32.6
A: Respiratory failure	130	12.0
B: Cardiovascular failure	229	21.2
C: Neurological failure	41	3.8
D: Hepatic failure	29	2.7
E: Renal failure (AKIN)	192	17.8
F: Acute skin failure	13	1.2
G: Metabolic failure	21	1.9
H: Coagulation failure	30	2.8
Missing	0	

Failures during the stay (top 10)	N	%
B	62	5.7
E	47	4.3
BE	42	3.9
AB	36	3.3
ABE	22	2.0
A	21	1.9
AE	14	1.3
ABEH	7	0.6
BCE	6	0.6
C	6	0.6
Missing	0	

Respiratory failure occurred	N	%
None	943	87.9
Intubation for airway maint.	45	4.2
Hypoxic failure	87	8.1
Hypercapnic failure	32	3.0
Missing	8	

Cardiovascular failure occurred	N	%
None	844	78.7
Cardiogenic shock	28	2.6
Hypovolemic shock	9	0.8
Haemorrhagic/hypovolemic shock	9	0.8
Septic shock	192	17.9
Anaphylactic shock	0	0.0
Neurogenic shock	6	0.6
Other shock	8	0.7
Missing	8	

Neurological failure occurred	N	%
None	1032	96.2
Cerebral coma	27	2.5
Metabolic coma	11	1.0
Postanoxic coma	4	0.4
Missing	8	

Renal failure occurred (AKIN)	N	%
None	881	82.1
Mild	23	2.1
Moderate	19	1.8
Severe	150	14.0
Missing	8	

Complications during the stay	N	%
Respiratory	183	17.1
Atelectasis	90	8.4
Moderate ARDS	29	2.7
Severe ARDS	29	2.7
Pneumothorax/Pneumomediastinum	22	2.1
Pleural effusion	18	1.7
Cardiovascular	156	14.5
Acute severe arrhythmia: tachycardias	76	7.1
Cardiac arrest	24	2.2
Acute severe arrhythmia: bradycardias	20	1.9
Deep venous thrombosis	19	1.8
Hypertensive crisis	18	1.7
Neurological	159	14.8
Drowsiness/agitation/delirium	51	4.8
Intracranial hypertension	51	4.8
CriMyNe	33	3.1
Seizures	30	2.8
Brain edema	25	2.3
Gastrointestinal and hepatic	76	7.1
Liver Dysfunction Syndrome	28	2.6
Paralytic Ileus	17	1.6
Anastomotic dehiscence	10	0.9
Ascites	8	0.7
Gastrointestinal bleeding: upper tract	7	0.7
Other	77	7.2
Nephrourologic disease	34	3.2
Metabolic disorder	21	2.0
Category/Stage IV: Full Thickness Tissue Loss	13	1.2
Category/Stage II: Partial Thickness Skin Loss	5	0.5
Other skin and/or soft tissue pathology	5	0.5
Category/Stage I: Nonblanchable Erythema	4	0.4
Category/Stage III: Full Thickness Skin Loss	4	0.4
Infections	314	29.3
Pneumonia	141	13.1
Primary bacteraemia of unknown origin	98	9.1
Catheter-related bacteremia (CR-BSI)	57	5.3
NON-surgical urinary tract infection	16	1.5
L.R.T.I. other than pneumonia	15	1.4
Post-surgical peritonitis	14	1.3
Catheter-related local infection	8	0.7
Cholecystitis/cholangitis	6	0.6
Post-surgical CNS infection	6	0.6
Post-surgical skin/soft tissue infection	6	0.6
Missing	8	

National report for general ICUs - Year 2016
Characteristics during the stay - Adult patients

Infections	N	%
None	388	36.2
Only on admission	371	34.6
On admission and during ICU stay	126	11.7
Only during ICU stay	188	17.5
Missing	8	

Maximum severity of infection	N	%
None	388	36.4
Infection with or without SIRS	182	17.1
SEVERE SEPSIS	101	9.5
Septic shock	394	37.0
Missing	16	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	Infection with or without SIRS	SEVERE SEPSIS	Septic shock
Admission	None	388 (67.6%)	65 (11.3%)	32 (5.6%)	89 (15.5%)	574
	Infection with or without SIRS	-	116 (84.7%)	3 (2.2%)	18 (13.1%)	137
	SEVERE SEPSIS	-	-	66 (79.5%)	17 (20.5%)	83
	Septic shock	-	-	-	270 (100.0%)	270
	TOT	388	181	101	394	1064

Ventil. Associat. Pneumonia (VAP)	N	%
No	955	88.5
Yes	124	11.5
Missing	2	

Incidence of VAP

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

Estimate	18.1
CI (95%)	15.0–21.6

Incidence of VAP

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

Estimate	14.5%
CI (95%)	12.0–17.2

Catheter Bacteraemia (CR-BSI)	N	%
No	1016	94.7
Yes	57	5.3
Missing	8	

Incidence of CR-BSI

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

Estimate	5.4
CI (95%)	4.1–7.1

Incidence of CR-BSI

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

Estimate	6.5%
CI (95%)	5.0–8.5

National report for general ICUs - Year 2016
Process indicators - Adult patients

Procedures and/or treatments (Missing=8) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Antibiotics	1067	99.4										
Invasive ventilation	842	78.5	514	47.9	217	20.2	5	1-14	2	0	0-0	0
Non invasive ventilation	280	26.1	12	1.1	14	1.3	1	1-3	0	0	0-1	0
Tracheostomy	244	22.7	37	3.4	172	16	14	7-28	2	9	6-14	0
iNO (inhaled nitric oxide)	0	0.0										
Central Venous Catheter	1023	95.3	431	40.2	531	49.5	5	2-14	3	0	0-0	1
PICC	0	0.0										
Arterial Catheter	1046	97.5	363	33.8	314	29.3	5	2-14	2	0	0-0	1
Vasoactive drugs	816	76.0	336	31.3	190	17.7	3	1-11	2	0	0-0	1
Antiarrhythmics	279	26.0	35	3.3	134	12.5	3	1-9	1	0	0-2	0
IABP	0	0.0										
Invasive monitoring of C.O.	31	2.9	0	0	6	0.6	2	2-4	0	1	0-5	0
Continuous monitoring of ScVO2	9	0.8	0	0	1	0.1	1	0-5	0	1	0-2	0
Temporary pacing	10	0.9	4	0.4	1	0.1	6	4-11	0	0	0-0	0
Ventricular assistance	0	0.0										
DC-shock	23	2.1								0	0-3	0
CPR	43	4.0								0	0-1	0
Massive blood transfusion	89	8.3								0	0-2	0
ICP monitoring without liquor-drainage	64	6.0	22	2.1	6	0.6	10	6-12	0	0	0-0	0
ICP monitoring with liquor-drainage	32	3.0	16	1.5	7	0.7	6	3-14	0	0	0-1	0
External ventricular drainage without ICP	37	3.4	23	2.1	17	1.6	10	4-13	0	2	0-6	0
Haemofiltration	134	12.5	14	1.3	38	3.5	5	2-13	0	1	0-3	0
Haemodialysis	41	3.8	3	0.3	10	0.9	6	2-11	0	1	0-8	0
ECMO	0	0.0										
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	0	0.0										
IAP (intra-abdominal pressure)	88	8.2										
Hypothermia	15	1.4										
Enteral nutrition	607	56.6	37	3.4	225	21	8	3-20	1	2	1-3	0
Parenteral nutrition	243	22.6	7	0.7	73	6.8	5	3-12	0	0	0-3	0
SDD (Topical, Topical and systemic)	2	0.2										
Patient restraint	37	3.4										
Peridural catheter	24	2.2	12	1.1	12	1.1	2	1-3	0	0	0-0	0
Electrical cardioversion	3	0.3								1	0-2	0
Vacuum therapy	0	0.0										
Antibiotics	938	87.4										
Antibiotics for surgical prophylaxis	318	29.6	204	19	141	13.1	2	1-3	0	0	0-0	0
Antibiotics for medical prophylaxis	132	12.3	26	2.4	29	2.7	4	2-7	0	0	0-0	0
Empirical antibiotic therapy	482	44.9	153	14.3	136	12.7	4	2-7	0	0	0-3	0
Targeted antibiotic therapy	402	37.5	42	3.9	228	21.2	9	4-20	1	4	2-8	0

National report for general ICUs - Year 2016

Process indicators - Adult patients

			Length (days)				
Invasive ventilation (N=842)			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure			11.5	15.7	5	1–15	0
For airway maintenance			10.6	16.3	5	1–13	1
In weaning			0.4	0.5	0	0–1	0
Not evaluable			10.4	9.5	8.5	1–17.5	1
Reintubation within 48 hours			10.7	11.1	5	1.5–22.25	0
Non invasive ventilation (N=280)			Number of surgical interventions				
Non invasive ventilation only						0	1006
Non invasive ventilation failed						1	51
For weaning						2	11
Other						3	4
Missing						>3	0
						Missing	9
Tracheostomy not present on admission (N=207)			Surgical interventions				
			Days from admission				
				Mean			12.0
				SD			12.3
				Median			8
				Q1–Q3			3–15
				Missing			0
			Surgical interventions (top 10)				
						N	%
			Gastrointestinal surgery			31	2.9
			Neurosurgery			22	2.1
			Orthopaedic surgery			9	0.8
			Thoracic surgery			4	0.4
			Pancreatic surgery			3	0.3
			Hepatic surgery			3	0.3
			Nephro/Urological surgery			3	0.3
			Maxillo-Facial surgery			3	0.3
			Peripheral vascular surgery			2	0.2
			Biliary tract surgery			2	0.2
			Missing			9	
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=205)			Non surgical interventions				
						N	%
				Mean			
				SD			
				Median			
				Q1–Q3			
				Missing			
Invasive monitoring of C.O. (N=31)			Non surgical interventions				
						N	%
			Swan Ganz			9	29.0
			PICCO			13	41.9
			LIDCO			8	25.8
			Vigileo-PRAM			0	0.0
			Other			1	3.2
			Missing			0	
SDD (N=2)			Non surgical interventions				
						N	%
			Topical			1	50.0
			Topical and systemic			1	50.0
			Missing			0	
Antibiotic therapy			Non surgical interventions				
Pt. infected in ICU only (N=188)			Days from admission				
				Mean			14.0
				SD			21.0
				Median			6.5
				Q1–Q3			3–16.2
				Missing			2
Surgical interventions			Non surgical interventions				
						N	%
			No			1028	95.9
			Yes			44	4.1
			Missing			9	
			Non surgical interventions				
						N	%
			Interventional endoscopy			36	3.4
			Interventional radiology			6	0.6
			Interventional neuroradiology			5	0.5
			Interventional cardiology			3	0.3
			Missing			9	

National report for general ICUs - Year 2016**Outcome indicators - Adult patients**

ICU outcome	N	%
Dead	321	30.2
Transferred to same hospital	694	65.3
Transferred to other hospital	47	4.4
Discharged home	1	0.1
Disch. terminally ill	0	0.0
Missing	18	

Transferred to (N=741)	N	%
Ward	707	95.4
Other ICU	22	3.0
High dependency care unit	12	1.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=22)	N	%
Specialist expertise	7	31.8
Step-up care	3	13.6
Logistical/organizational reasons	10	45.5
Step-down care	2	9.1
Missing	0	

Transferred to Same hospital (N=694)	N	%
Ward	683	98.4
Other ICU	5	0.7
High dependency care unit	6	0.9
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=47)	N	%
Ward	24	51.1
Other ICU	17	36.2
High dependency care unit	6	12.8
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	742	69.8
Dead	321	30.2
Missing	18	

Timing of ICU mortality (N=321)	N	%
Daytime (08:00AM - 07:59PM)	195	60.7
Nighttime (08:00PM - 07:59AM)	126	39.3
Weekdays (Monday - Friday)	239	74.5
Weekend (Saturday - Sunday)	82	25.5
Missing	0	

Hospital mortality *	N	%
Alive	572	60.4
Dead	375	39.6
Missing	13	

Timing of hosp. mortality * (N=375)	N	%
In ICU	291	77.6
Within 24 hours after ICU	5	1.3
24-47 hours after ICU	3	0.8
48-71 hours after ICU	10	2.7
72-95 hours after ICU	8	2.1
After 95 hours after ICU	58	15.5
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=84)	
Mean	17.1
SD	19.1
Median	10.5
Q1–Q3	3–22.2
Missing	0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=960).

National report for general ICUs - Year 2016

Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	568	60.2
Dead	376	39.8
Missing	16	

Readmission from ward	N	%
No	1056	97.9
Yes	23	2.1
Missing	2	

Number of readmissions (N=23)	N	%
1	20	87.0
2	3	13.0
>2	0	0.0
Missing	0	

Timing of readmission (N=23)	N	%
Within 48 hours	4	21.1
48-71 hours	2	10.5
72-95 hours	0	0.0
After 95 hours	13	68.4
Missing	4	

Timing readmission (days)	N	23
Mean	6.2	
SD	12.3	
Median	5	
Q1–Q3	0.3–11.7	

ICU stay (days)	Mean	11.4
	SD	16.0
	Median	5
	Q1–Q3	2–14
	Missing	10

ICU stay (days) Alive (N=742)	Mean	10.4
	SD	14.9
	Median	4
	Q1–Q3	2–12
	Missing	0

ICU stay (days) Dead (N=321)	Mean	13.1
	SD	16.5
	Median	7
	Q1–Q3	3–18
	Missing	0

Stay after ICU (days) *	Mean	13.8
Alive (N=657)	SD	17.1
	Median	8
	Q1–Q3	4–17
	Missing	7

Hospital stay (days) *	Mean	24.9
	SD	25.9
	Median	16
	Q1–Q3	9–31.8
	Missing	14

Hospital stay (days) *	Mean	25.8
Alive (N=572)	SD	25.9
	Median	17
	Q1–Q3	10–30
	Missing	1

Hospital stay (days) *	Mean	23.6
Dead (N=375)	SD	25.9
	Median	15
	Q1–Q3	7–32
	Missing	0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=960).

National report for general ICUs - Year 2016

Characteristics on admission - Adult patients evaluated in the GiViTI model

Patients (N): 928

Sex	N	%
Male	592	63.8
Female	336	36.2
Missing	0	

Age (years)	N	%
17-45	167	18.0
46-65	295	31.8
66-75	233	25.1
>75	233	25.1
Missing	0	
Mean	62.1	
SD	16.9	
Median	66	
Q1–Q3	51–76	
Min–Max	17–98	

Body mass Index (BMI)	N	%
Underweight	33	3.6
Normal	261	28.1
Overweight	344	37.1
Obese	290	31.2
Missing	0	

Pregnancy status	N	%
Females (N=336)		
Not fertile	126	37.5
Not pregnant/Unknown	197	58.6
Currently pregnant	0	0.0
Post partum	13	3.9
Missing	0	

Comorbidities	N	%
No	187	20.2
Yes	741	79.8
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	455	49.0
Diabetes Type II without insulin tr.	136	14.7
Arrhythmia	119	12.8
Any tumour without metastasis	114	12.3
NYHA class II-III	102	11.0
Peripheral vascular disease	97	10.5
Severe COPD	90	9.7
Myocardial infarction	89	9.6
Cerebrovascular disease	74	8.0
Moderate or severe renal disease	63	6.8
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.8	10.5	1	0–5	0

Source of admission	N	%
Same hospital	819	88.3
Other hospital	109	11.7
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=928)		
Medical ward	291	31.4
Surgical ward	358	38.6
Emergency room	246	26.5
Other ICU	25	2.7
High dependency care unit	8	0.9
Missing	0	

Reason for transfer from	N	%
Other ICU (N=25)		
Specialist expertise	11	44.0
Step-up care	13	52.0
Logistical/organizational reasons	1	4.0
Step-down care	0	0.0
Missing	0	

Ward of admission	N	%
Same hospital (N=819)		
Medical ward	275	33.6
Surgical ward	345	42.1
Emergency room	179	21.9
Other ICU	15	1.8
High dependency care unit	5	0.6
Missing	0	

Ward of admission	N	%
Other hospital (N=109)		
Medical ward	16	14.7
Surgical ward	13	11.9
Emergency room	67	61.5
Other ICU	10	9.2
High dependency care unit	3	2.8
Missing	0	

Scheduled admission	N	%
No	756	81.5
Yes	172	18.5
Missing	0	

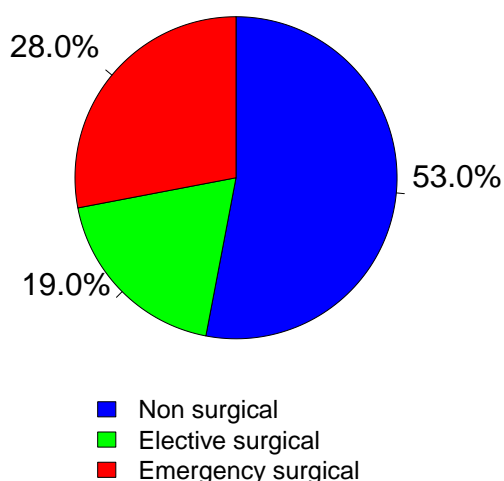
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Characteristics on admission - Adult patients evaluated in the GiViTI model

Trauma	N	%
No	792	85.3
Yes	136	14.7
Multiple trauma	62	6.7
Missing	0	

Surgical status	N	%
Non surgical	492	53.0
Elective surgical	176	19.0
Emergency surgical	260	28.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=436)		
Operating theatre of surgical ward	279	64.0
Operating theatre of emergency room	75	17.2
Surgical ward	28	6.4
Other	54	12.4
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=176)		
Neurosurgery	54	30.7
Abdominal vascular surgery	32	18.2
Gastrointestinal surgery	28	15.9
Thoracic surgery	13	7.4
Peripheral vascular surgery	12	6.8
Pancreatic surgery	11	6.2
Gynaecological surgery	11	6.2
Nephro/Urological surgery	10	5.7
ENT surgery	7	4.0
Biliary tract surgery	7	4.0
Missing	0	

Timing	N	%
Elective surgical (N=176)		
From -7 to -3 days	4	2.3
From -2 to -1 days	14	8.0
On ICU admission day	184	104.5
The day after ICU admission	1	0.6
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=260)		
Neurosurgery	94	36.2
Gastrointestinal surgery	77	29.6
Orthopaedic surgery	26	10.0
Abdominal vascular surgery	23	8.8
Peripheral vascular surgery	15	5.8
Obstetric surgery	10	3.8
Biliary tract surgery	7	2.7
Nephro/Urological surgery	5	1.9
Other surgery	5	1.9
Maxillo-Facial surgery	4	1.5
Missing	0	

Timing	N	%
Emergency surgical (N=260)		
From -7 to -3 days	7	2.7
From -2 to -1 days	29	11.2
On ICU admission day	235	90.4
The day after ICU admission	9	3.5
Missing	0	

Non surgical interventions	N	%
None	860	92.7
Elective	30	3.2
Emergency	38	4.1
Missing	0	

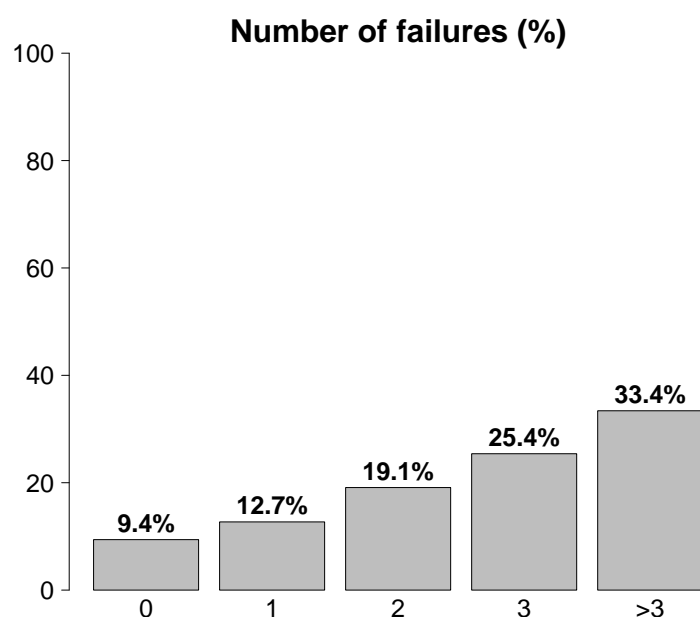
Non surgical interventions	N	%
Elective (N=30)		
Interventional endoscopy	19	63.3
Interventional radiology	5	16.7
Interventional neuroradiology	4	13.3
Interventional cardiology	0	0.0
Missing	2	

Non surgical interventions	N	%
Emergency (N=38)		
Interventional endoscopy	15	39.5
Interventional neuroradiology	12	31.6
Interventional radiology	6	15.8
Interventional cardiology	5	13.2
Missing	0	

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Characteristics on admission - Adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	146	15.7
Post surgical weaning	29	3.1
Surgical monitoring	55	5.9
Post interventional weaning	0	0.0
Interventional monitoring	15	1.6
Non surgical monitoring	47	5.1
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	782	84.3
Only ventilatory support	130	14.0
Only cardiovascular support	21	2.3
Ventilatory and cardiovascular support	631	68.0
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	87	9.4
Yes	841	90.6
A: Respiratory failure	761	82.0
B: Cardiovascular failure	652	70.3
C: Neurological failure	198	21.3
D: Hepatic failure	12	1.3
E: Renal failure	411	44.3
F: Acute skin failure	4	0.4
G: Metabolic failure	442	47.6
H: Coagulation failure	41	4.4
Missing	0	

Failures on admission (top 10)	N	%
ABEG	156	16.8
AB	111	12.0
ABG	91	9.8
A	71	7.7
ABE	69	7.4
ABCEG	58	6.2
ABC	56	6.0
ABCG	28	3.0
G	27	2.9
AE	20	2.2
Missing	0	

Respiratory failure	N	%
None	167	18.0
Only hypoxic failure	260	28.0
Only hypercapnic failure	36	3.9
Hypoxic-hypercapnic failure	79	8.5
Intubation for airway maint.	386	41.6
Missing	0	

Cardiovascular failure	N	%
None	276	29.7
Without shock	123	13.3
Cardiogenic shock	44	4.7
Septic shock	197	21.2
Haemorrhagic/hypovolemic shock	77	8.3
Hypovolemic shock	33	3.6
Anaphylactic shock	5	0.5
Neurogenic shock	41	4.4
Other shock	91	9.8
Mixed shock	41	4.4
Missing	0	

Neurologic failure	N	%
None	687	77.6
Cerebral coma	112	12.7
Metabolic coma	26	2.9
Postanoxic coma	56	6.3
Toxic coma	4	0.5
Missing or not evaluable	43	

Renal failure (AKIN)	N	%
None	517	55.7
Mild	185	19.9
Moderate	77	8.3
Severe	149	16.1
Missing	0	

Metabolic failure	N	%
None	486	52.4
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	72	7.8
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	370	39.9
Missing	0	

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Characteristics on admission - Adult patients evaluated in the GiViTI model

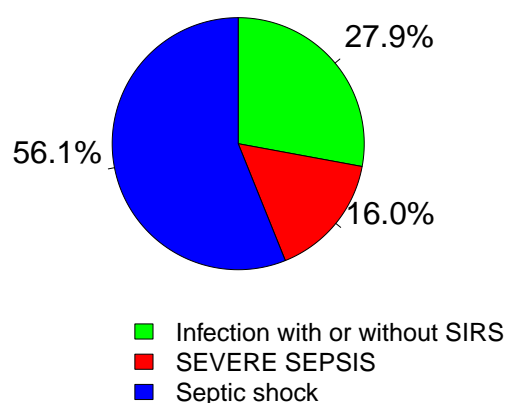
Clinical conditions on admission	N	%
Respiratory	324	34.9
Atelectasis	183	19.7
Moderate ARDS	60	6.5
Aspiration pneumonia	44	4.7
Pleural effusion	30	3.2
Severe ARDS	24	2.6
Cardiovascular	230	24.8
Acute severe arrhythmia: tachycardias	71	7.7
Left heart failure with pulmonary edema	45	4.8
Cardiac arrest	38	4.1
Non-ruptured aneurysm	29	3.1
Ruptured or fissured aneurysm	26	2.8
Neurological	213	23.0
Brain tumour	47	5.1
Spontaneous Intraparenchymal bleeding	46	5.0
Spontaneous Subarachnoid haemorrhage	34	3.7
Intracranial hypertension	31	3.3
Seizures	30	3.2
Gastrointestinal and hepatic	115	12.4
Gastrointestinal perforation	21	2.3
Intestinal occlusion	16	1.7
Bowel ischaemia	16	1.7
Digestive tract malignancy	16	1.7
Ascites	12	1.3
Trauma (anatomical districts)	136	14.7
Head	78	8.4
Chest	55	5.9
Pelvis/bone/joint & muscle	37	4.0
Spine	25	2.7
Abdomen	25	2.7
Major vessels injury	4	0.4
Miscellaneous	3	0.3
Other	209	22.5
Metabolic disorder	99	10.7
Nephrourologic disease	60	6.5
Coagulation disorder	41	4.4
Acute intoxication	13	1.4
Haematological disease	13	1.4
Post transplantation	2	0.2
Bone marrow transplantation	1	0.1
Renal transplantation	1	0.1
Infections	424	45.7
Pneumonia	198	21.3
L.R.T.I. other than pneumonia	32	3.4
NON-surgical urinary tract infection	32	3.4
Primary bacteraemia of unknown origin	28	3.0
Primary peritonitis	26	2.8
Post-surgical peritonitis	21	2.3
NON-surgical secondary peritonitis	19	2.0
Upper respiratory tract infection	18	1.9
Cholecystitis/choolangitis	15	1.6
NON-surgical skin/soft tissue infection	11	1.2
Missing	0	

Trauma (anatomical districts)	N	%
Head	78	8.4
Traumatic subarachnoid haemorrhage	40	4.3
Skull fracture	31	3.3
Cerebral contusion/laceration	26	2.8
Maxillofacial fracture	23	2.5
Traumatic Subdural haematoma	19	2.0
Spine	25	2.7
Vertebral fracture, without deficit	14	1.5
Cervical injury, incomplete deficit	4	0.4
Paraplegia	3	0.3
Chest	55	5.9
Traum. haemothorax/pneumothorax	36	3.9
Other injuries of the chest	21	2.3
Severe lung contusion/laceration	10	1.1
Abdomen	25	2.7
Liver: Moderate-Severe laceration	7	0.8
Spleen: Moderate-Severe laceration	5	0.5
Minor injuries of the abdomen	5	0.5
Pelvis/bone/joint & muscle	37	4.0
Long bone fracture	30	3.2
Multiple fracture of the pelvis	9	1.0
Very severe or open fracture of the pelvis	1	0.1
Major vessels injury	4	0.4
Proximal limbs vessels: transection	3	0.3
Neck vessels: dissection/transection	1	0.1
Aorta: rupture/dissection	1	0.1
Miscellaneous	3	0.3
Burns (>30% BSA)	3	0.3
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	504	54.6
Infection with or without SIRS	117	12.7
SEVERE SEPSIS	67	7.3
Septic shock	235	25.5
Missing	5	

Infection severity on admission

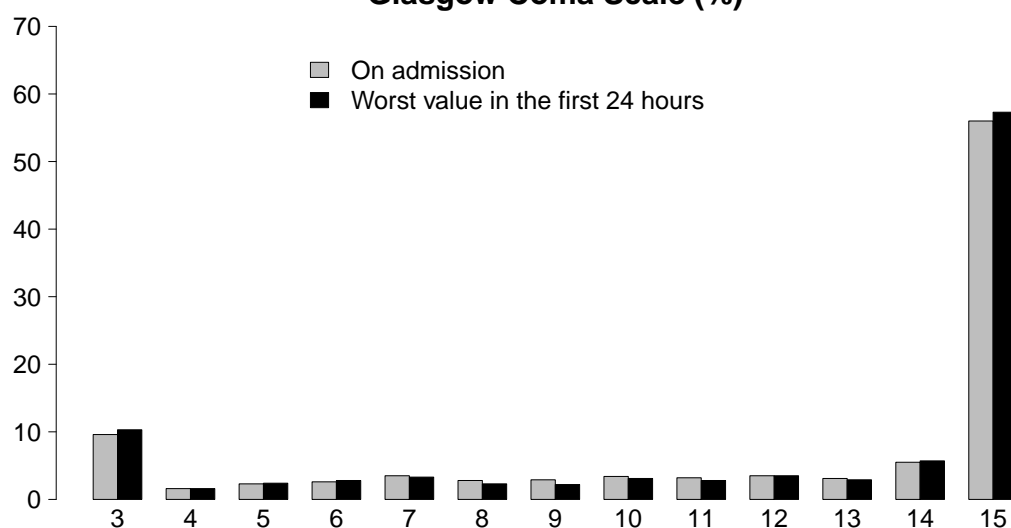
Patients infected (N=419)



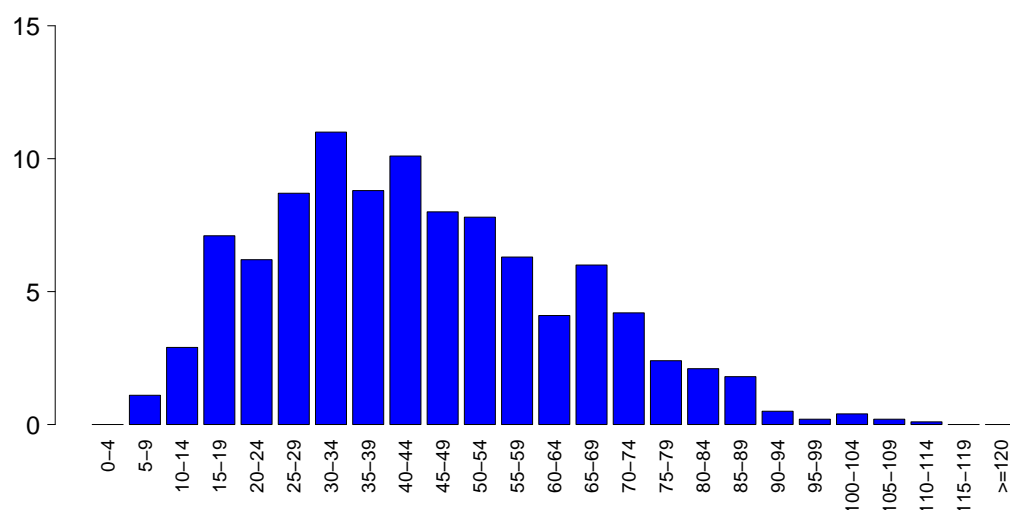
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Severity scores - Adult patients evaluated in the GiViTI model

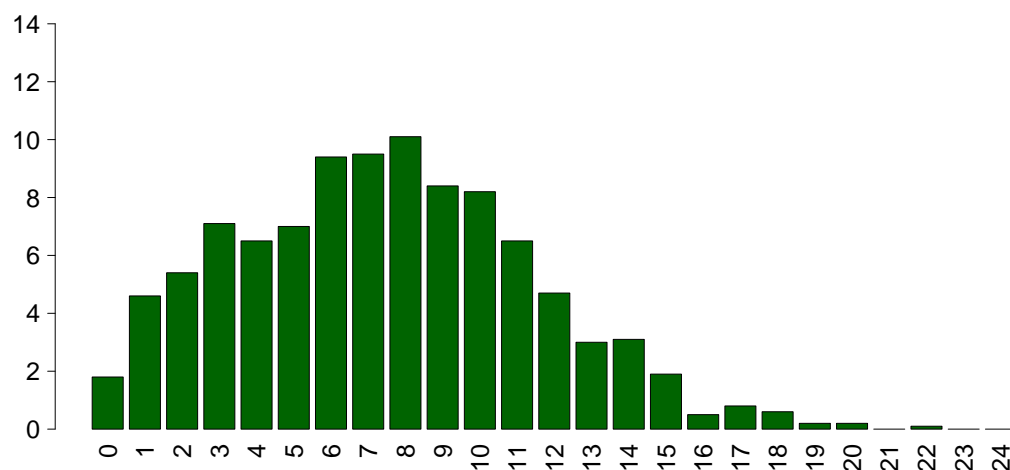
Glasgow Coma Scale (%)



SAPS II (%)



SOFA (%)



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

Complications during the stay	N	%
No	381	41.1
Yes	547	58.9
Missing	0	

Failures during the stay	N	%
No	607	65.4
Yes	321	34.6
A: Respiratory failure	116	12.5
B: Cardiovascular failure	207	22.3
C: Neurological failure	38	4.1
D: Hepatic failure	23	2.5
E: Renal failure (AKIN)	176	19.0
F: Acute skin failure	10	1.1
G: Metabolic failure	19	2.0
H: Coagulation failure	27	2.9
Missing	0	

Failures during the stay (top 10)	N	%
B	59	6.4
E	44	4.7
BE	39	4.2
AB	33	3.6
A	20	2.2
ABE	20	2.2
AE	13	1.4
ABEH	6	0.6
C	6	0.6
CE	6	0.6
Missing	0	

Respiratory failure occurred	N	%
None	812	87.5
Intubation for airway maint.	43	4.6
Hypoxic failure	79	8.5
Hypercapnic failure	28	3.0
Missing	0	

Cardiovascular failure occurred	N	%
None	721	77.7
Cardiogenic shock	26	2.8
Hypovolemic shock	6	0.6
Haemorrhagic/hypovolemic shock	8	0.9
Septic shock	175	18.9
Anaphylactic shock	0	0.0
Neurogenic shock	5	0.5
Other shock	6	0.6
Missing	0	

Neurological failure occurred	N	%
None	890	95.9
Cerebral coma	25	2.7
Metabolic coma	10	1.1
Postanoxic coma	4	0.4
Missing	0	

Renal failure occurred (AKIN)	N	%
None	752	81.0
Mild	19	2.0
Moderate	15	1.6
Severe	142	15.3
Missing	0	

Complications during the stay	N	%
Respiratory	158	17.0
Atelectasis	81	8.7
Moderate ARDS	25	2.7
Severe ARDS	24	2.6
Pneumothorax/Pneumomediastinum	21	2.3
Pleural effusion	15	1.6
Cardiovascular	142	15.3
Acute severe arrhythmia: tachycardias	72	7.8
Cardiac arrest	23	2.5
Acute severe arrhythmia: bradycardias	18	1.9
Deep venous thrombosis	16	1.7
Hypertensive crisis	16	1.7
Neurological	140	15.1
Drowsiness/agitation/delirium	50	5.4
Intracranial hypertension	41	4.4
CriMyNe	28	3.0
Seizures	27	2.9
Brain edema	19	2.0
Gastrointestinal and hepatic	60	6.5
Liver Dysfunction Syndrome	23	2.5
Paralytic Ileus	15	1.6
Anastomotic dehiscence	8	0.9
Ascites	8	0.9
Acute bile-duct disease	4	0.4
Other	63	6.8
Nephrourologic disease	26	2.8
Metabolic disorder	19	2.0
Category/Stage IV: Full Thickness Tissue Loss	12	1.3
Category/Stage I: Nonblanchable Erythema	4	0.4
Category/Stage III: Full Thickness Skin Loss	4	0.4
Other skin and/or soft tissue pathology	4	0.4
Category/Stage II: Partial Thickness Skin Loss	3	0.3
Infections	274	29.5
Pneumonia	125	13.5
Primary bacteraemia of unknown origin	89	9.6
Catheter-related bacteremia (CR-BSI)	50	5.4
L.R.T.I. other than pneumonia	14	1.5
Post-surgical peritonitis	14	1.5
NON-surgical urinary tract infection	12	1.3
Cholecystitis/cholangitis	6	0.6
Post-surgical CNS infection	6	0.6
Upper respiratory tract infection	6	0.6
NON-surgical secondary peritonitis	5	0.5
Missing	0	

National report for general ICUs - Year 2016

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

Infections	N	%
None	341	36.7
Only on admission	313	33.7
On admission and during ICU stay	111	12.0
Only during ICU stay	163	17.6
Missing	0	

Maximum severity of infection	N	%
None	341	37.0
Infection with or without SIRS	151	16.4
SEVERE SEPSIS	83	9.0
Septic shock	347	37.6
Missing	6	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	Infection with or without SIRS	SEVERE SEPSIS	Septic shock
Admission	None	341 (67.8%)	54 (10.7%)	29 (5.8%)	79 (15.7%)	503
	Infection with or without SIRS	-	97 (82.9%)	3 (2.6%)	17 (14.5%)	117
	SEVERE SEPSIS	-	-	51 (76.1%)	16 (23.9%)	67
	Septic shock	-	-	-	235 (100.0%)	235
	TOT	341	151	83	347	922

Ventil. Associat. Pneumonia (VAP)	N	%
No	814	87.7
Yes	114	12.3
Missing	0	

Incidence of VAP

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

Estimate	21.3
CI (95%)	17.6–25.6

Incidence of VAP

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

Estimate	17.1%
CI (95%)	14.1–20.5

Catheter Bacteraemia (CR-BSI)	N	%
No	878	94.6
Yes	50	5.4
Missing	0	

Incidence of CR-BSI

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

Estimate	6.1
CI (95%)	4.5–8.1

Incidence of CR-BSI

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

Estimate	7.3%
CI (95%)	5.5–9.7

National report for general ICUs - Year 2016
Process indicators - Adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission	
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3
Procedures (antibiotics excluded)	924	99.6									
Invasive ventilation	719	77.5	428	46.1	205	22.1	4	1-12	0	0	0-0
Non invasive ventilation	261	28.1	12	1.3	14	1.5	1	1-3	0	0	0-1
Tracheostomy	189	20.4	27	2.9	151	16.3	14	7-28	0	8	6-12
iNO (inhaled nitric oxide)	0	0.0									0
Central Venous Catheter	884	95.3	351	37.8	493	53.1	5	2-13	0	0	0-0
PICC	0	0.0									0
Arterial Catheter	905	97.5	329	35.5	296	31.9	5	2-13	0	0	0-0
Vasoactive drugs	704	75.9	272	29.3	180	19.4	3	1-9	0	0	0-0
Antiarrhythmics	264	28.4	33	3.6	131	14.1	3	1-9	0	0	0-2
IABP	0	0.0									0
Invasive monitoring of C.O.	30	3.2	0	0	6	0.6	2	2-4	0	1	0-3
Continuous monitoring of ScVO2	8	0.9	0	0	1	0.1	2	0-7	0	1	0-2
Temporary pacing	10	1.1	4	0.4	1	0.1	6	4-11	0	0	0-0
Ventricular assistance	0	0.0									0
DC-shock	19	2.0								0	0-2
CPR	40	4.3								0	0-1
Massive blood transfusion	85	9.2								0	0-2
ICP monitoring without liquor-drainage	53	5.7	22	2.4	6	0.6	9	5-12	0	0	0-0
ICP monitoring with liquor-drainage	26	2.8	13	1.4	6	0.6	6	3-13	0	1	0-2
External ventricular drainage without ICP	33	3.6	22	2.4	16	1.7	10	4-13	0	0	0-4
Haemofiltration	124	13.4	13	1.4	36	3.9	5	2-13	0	0	0-3
Haemodialysis	34	3.7	1	0.1	10	1.1	6	2-9	0	1	0-12
ECMO	0	0.0									0
Hepatic clearance techniques	0	0.0									
Clearance techniques during sepsis	0	0.0									
IAP (intra-abdominal pressure)	79	8.5									
Hypothermia	14	1.5									
Enteral nutrition	513	55.3	25	2.7	209	22.5	7	3-18	0	2	1-3
Parenteral nutrition	198	21.3	2	0.2	63	6.8	5	3-11	0	0	0-4
SDD (Topical, Topical and systemic)	2	0.2									0
Patient restraint	34	3.7									
Peridural catheter	24	2.6	12	1.3	12	1.3	2	1-3	0	0	0-0
Electrical cardioversion	3	0.3								1	0-2
Vacuum therapy	0	0.0									0
Antibiotics	805	86.7									
Antibiotics for surgical prophylaxis	297	32.0	198	21.3	139	15	2	1-3	0	0	0-0
Antibiotics for medical prophylaxis	86	9.3	15	1.6	25	2.7	3	1-5	0	0	0-0
Empirical antibiotic therapy	408	44.0	130	14	129	13.9	4	2-6	0	0	0-3
Targeted antibiotic therapy	347	37.4	37	4	208	22.4	8	4-20	0	4	2-8

National report for general ICUs - Year 2016**Process indicators - Adult patients evaluated in the GiViTI model**

			Length (days)				
Invasive ventilation (N=719)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	308	42.8	10.9	15.4	5	1–14	0
For airway maintenance	351	48.8	10.1	16.7	4	1–11	0
In weaning	28	3.9	0.4	0.5	0	0–1	0
Not evaluable	32	4.5	9.7	9.5	7	1–14.5	0
Reintubation within 48 hours	10	1.4	10.7	11.1	5	1.5–22.25	0
Non invasive ventilation (N=261)	N	%	Number of surgical interventions				
Non invasive ventilation only	133	51.0				0	870
Non invasive ventilation failed	35	13.4				1	44
For weaning	86	33.0				2	10
Other	7	2.7				3	4
Missing	0					>3	0
						Missing	0
Tracheostomy not present on admission (N=162)	N	%	Surgical interventions				
			Days from admission				
Surgical	17	10.5				Mean	12.1
Percutwist	11	6.8				SD	12.6
Ciaglia	69	42.6				Median	8
Monodil. Ciaglia	2	1.2				Q1–Q3	3–15
Fantoni	0	0.0				Missing	0
Griggs	43	26.5					
Other Kind	3	1.9					
Unknown	17	10.5					
Missing	0						
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=161)			Surgical interventions (top 10)				
Mean	8.9					N	%
SD	5.4		Gastrointestinal surgery	28	3.0		
Median	8		Neurosurgery	19	2.0		
Q1–Q3	5.8–12		Orthopaedic surgery	7	0.8		
Missing	1		Thoracic surgery	4	0.4		
			Pancreatic surgery	3	0.3		
			Hepatic surgery	3	0.3		
			Nephro/Urological surgery	3	0.3		
			Maxillo-Facial surgery	3	0.3		
			Peripheral vascular surgery	2	0.2		
			Plastic surgery	1	0.1		
			Missing	0			
Invasive monitoring of C.O. (N=30)	N	%	Non surgical interventions				
Swan Ganz	9	30.0				N	%
PICCO	12	40.0				No	888
LIDCO	8	26.7				Yes	40
Vigileo-PRAM	0	0.0				Missing	0
Other	1	3.3					
Missing	0						
SDD (N=2)	N	%	Non surgical interventions				
Topical	1	50.0	Days from admission				
Topical and systemic	1	50.0				Mean	15.0
Missing	0					SD	21.7
						Median	7.5
						Q1–Q3	3.8–20
						Missing	2
Antibiotic therapy			Non surgical interventions				
Pt. infected in ICU only (N=163)	N	%				N	%
Only empirical	40	25.6	Interventional endoscopy	35	3.8		
Only targeted	40	25.6	Interventional radiology	4	0.4		
Targeted after empirical	67	42.9	Interventional neuroradiology	4	0.4		
Other	9	5.8	Interventional cardiology	3	0.3		
Missing	7		Missing	0			
Surgical interventions	N	%					
No	870	93.8					
Yes	58	6.2					
Missing	0						

National report for general ICUs - Year 2016**Outcome indicators** - Adult patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	287	31.0
Transferred to same hospital	610	65.9
Transferred to other hospital	27	2.9
Discharged home	1	0.1
Disch. terminally ill	0	0.0
Missing	3	

Transferred to (N=637)	N	%
Ward	614	96.4
Other ICU	14	2.2
High dependency care unit	9	1.4
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=14)	N	%
Specialist expertise	6	42.9
Step-up care	2	14.3
Logistical/organizational reasons	4	28.6
Step-down care	2	14.3
Missing	0	

Transferred to Same hospital (N=610)	N	%
Ward	601	98.5
Other ICU	3	0.5
High dependency care unit	6	1.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=27)	N	%
Ward	13	48.1
Other ICU	11	40.7
High dependency care unit	3	11.1
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	638	69.0
Dead	287	31.0
Missing	3	

Timing of ICU mortality (N=287)	N	%
Daytime (08:00AM - 07:59PM)	175	61.0
Nighttime (08:00PM - 07:59AM)	112	39.0
Weekdays (Monday - Friday)	213	74.2
Weekend (Saturday - Sunday)	74	25.8
Missing	0	

Hospital mortality	N	%
Alive	560	60.3
Dead	368	39.7
Missing	0	

Timing of hosp. mortality (N=368)	N	%
In ICU	287	78.0
Within 24 hours after ICU	5	1.4
24-47 hours after ICU	3	0.8
48-71 hours after ICU	10	2.7
72-95 hours after ICU	7	1.9
After 95 hours after ICU	56	15.2
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=81)	
Mean	17.4
SD	19.4
Median	11
Q1–Q3	3–23
Missing	0

National report for general ICUs - Year 2016**Outcome indicators** - Adult patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	559	60.2
Dead	369	39.8
Missing	0	

ICU stay (days)		
	Mean	10.5
	SD	15.6
	Median	4
	Q1–Q3	2–12
	Missing	0

ICU stay (days)		
Alive (N=638)		
	Mean	9.3
	SD	13.9
	Median	3
	Q1–Q3	2–10.8
	Missing	0

ICU stay (days)		
Dead (N=287)		
	Mean	12.7
	SD	16.9
	Median	7
	Q1–Q3	2–17
	Missing	0

Stay after ICU (days)		
Alive (N=638)		
	Mean	14.0
	SD	17.2
	Median	9
	Q1–Q3	4–17
	Missing	1

Hospital stay (days)		
	Mean	24.8
	SD	25.4
	Median	16
	Q1–Q3	9–31.5
	Missing	1

Hospital stay (days)		
Alive (N=560)		
	Mean	25.9
	SD	26.0
	Median	17
	Q1–Q3	10–30
	Missing	1

Hospital stay (days)		
Dead (N=368)		
	Mean	23.2
	SD	24.4
	Median	15
	Q1–Q3	7–32
	Missing	0

National report for general ICUs - Year 2016

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

Patients (N): 492

Sex	N	%
Male	305	62.0
Female	187	38.0
Missing	0	

Age (years)	N	%
17-45	75	15.2
46-65	144	29.3
66-75	133	27.0
>75	140	28.5
Missing	0	
Mean	63.7	
SD	16.3	
Median	67	
Q1–Q3	54–76	
Min–Max	18–90	

Body mass Index (BMI)	N	%
Underweight	21	4.3
Normal	144	29.3
Overweight	177	36.0
Obese	150	30.5
Missing	0	

Pregnancy status	N	%
Females (N=187)		
Not fertile	82	43.9
Not pregnant/Unknown	104	55.6
Currently pregnant	0	0.0
Post partum	1	0.5
Missing	0	

Comorbidities	N	%
No	74	15.0
Yes	418	85.0
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	246	50.0
Diabetes Type II without insulin tr.	81	16.5
Arrhythmia	74	15.0
NYHA class II-III	60	12.2
Severe COPD	57	11.6
Cerebrovascular disease	46	9.3
Myocardial infarction	45	9.1
Peripheral vascular disease	43	8.7
Moderate or severe renal disease	39	7.9
Dementia	37	7.5
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	5.4	12.7	1	0–5	0

Source of admission	N	%
Same hospital	431	87.6
Other hospital	61	12.4
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=492)		
Medical ward	260	52.8
Surgical ward	51	10.4
Emergency room	153	31.1
Other ICU	22	4.5
High dependency care unit	6	1.2
Missing	0	

Reason for transfer from	N	%
Other ICU (N=22)		
Specialist expertise	9	40.9
Step-up care	12	54.5
Logistical/organizational reasons	1	4.5
Step-down care	0	0.0
Missing	0	

Ward of admission	N	%
Same hospital (N=431)		
Medical ward	244	56.6
Surgical ward	49	11.4
Emergency room	120	27.8
Other ICU	14	3.2
High dependency care unit	4	0.9
Missing	0	

Ward of admission	N	%
Other hospital (N=61)		
Medical ward	16	26.2
Surgical ward	2	3.3
Emergency room	33	54.1
Other ICU	8	13.1
High dependency care unit	2	3.3
Missing	0	

Scheduled admission	N	%
No	474	96.3
Yes	18	3.7
Missing	0	

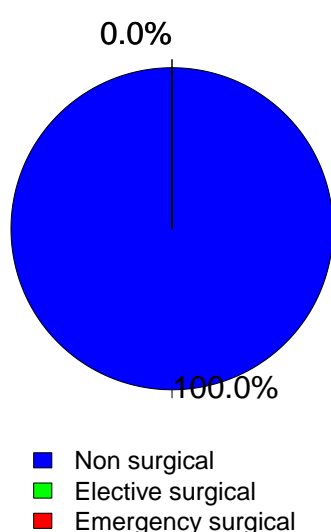
National report for general ICUs - Year 2016

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

Trauma	N	%
No	436	88.6
Yes	56	11.4
Multiple trauma	26	5.3
Missing	0	

Surgical status	N	%
Non surgical	492	100.0
Elective surgical	0	0.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



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

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

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

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

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

Non surgical interventions	N	%
None	441	89.6
Elective	25	5.1
Emergency	26	5.3
Missing	0	

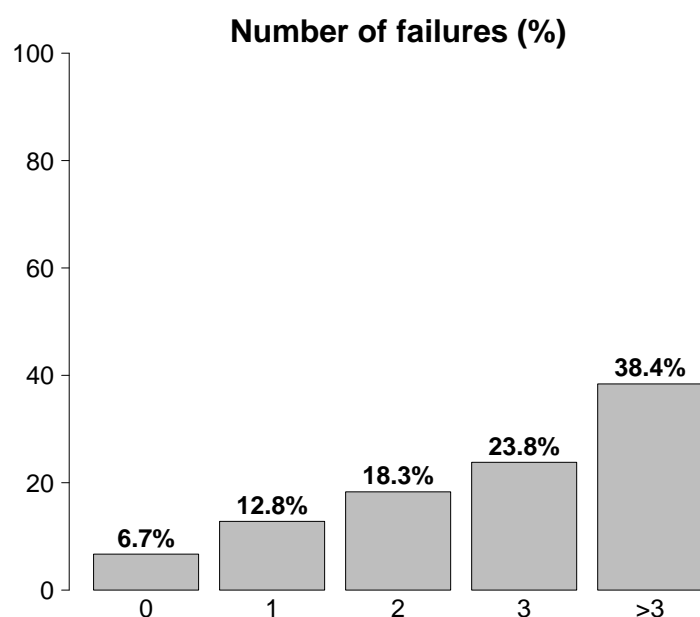
Non surgical interventions	N	%
Elective (N=25)		
Interventional endoscopy	18	72.0
Interventional radiology	5	20.0
Interventional neuroradiology	2	8.0
Interventional cardiology	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=26)		
Interventional endoscopy	11	42.3
Interventional neuroradiology	8	30.8
Interventional cardiology	4	15.4
Interventional radiology	3	11.5
Missing	0	

National report for general ICUs - Year 2016

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

Reason for admission	N	%
Monitoring/Weaning	62	12.6
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	0	0.0
Interventional monitoring	15	3.0
Non surgical monitoring	47	9.6
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	430	87.4
Only ventilatory support	80	16.3
Only cardiovascular support	18	3.7
Ventilatory and cardiovascular support	332	67.5
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	33	6.7
Yes	459	93.3
A: Respiratory failure	412	83.7
B: Cardiovascular failure	350	71.1
C: Neurological failure	124	25.2
D: Hepatic failure	8	1.6
E: Renal failure	271	55.1
F: Acute skin failure	2	0.4
G: Metabolic failure	238	48.4
H: Coagulation failure	17	3.5
Missing	0	

Failures on admission (top 10)	N	%
ABEG	86	17.5
ABCEG	52	10.6
AB	49	10.0
ABE	43	8.7
A	39	7.9
ABG	33	6.7
ABC	24	4.9
AE	16	3.3
ABCE	14	2.8
E	11	2.2
Missing	0	

Respiratory failure	N	%
None	80	16.3
Only hypoxic failure	163	33.1
Only hypercapnic failure	34	6.9
Hypoxic-hypercapnic failure	60	12.2
Intubation for airway maint.	155	31.5
Missing	0	

Cardiovascular failure	N	%
None	142	28.9
Without shock	62	12.6
Cardiogenic shock	41	8.3
Septic shock	137	27.8
Haemorrhagic/hypovolemic shock	12	2.4
Hypovolemic shock	13	2.6
Anaphylactic shock	5	1.0
Neurogenic shock	19	3.9
Other shock	31	6.3
Mixed shock	30	6.1
Missing	0	

Neurologic failure	N	%
None	349	73.8
Cerebral coma	47	9.9
Metabolic coma	24	5.1
Postanoxic coma	50	10.6
Toxic coma	3	0.6
Missing or not evaluable	19	

Renal failure (AKIN)	N	%
None	221	44.9
Mild	124	25.2
Moderate	47	9.6
Severe	100	20.3
Missing	0	

Metabolic failure	N	%
None	254	51.6
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	48	9.8
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	190	38.6
Missing	0	

National report for general ICUs - Year 2016**Characteristics on admission** - Adult non surgical patients evaluated in the GiViTI model

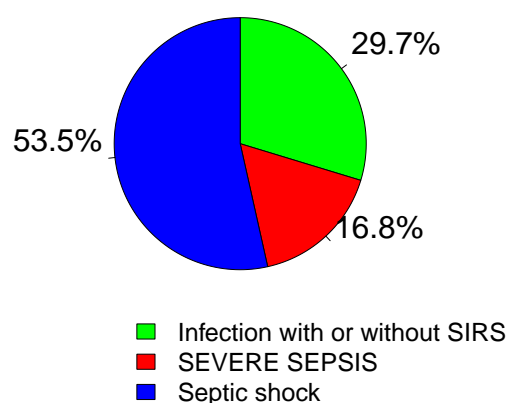
Clinical conditions on admission	N	%
Respiratory	190	38.6
Atelectasis	84	17.1
Moderate ARDS	44	8.9
Aspiration pneumonia	37	7.5
Severe ARDS	23	4.7
Pleural effusion	22	4.5
Cardiovascular	120	24.4
Left heart failure with pulmonary edema	40	8.1
Acute severe arrhythmia: tachycardias	40	8.1
Cardiac arrest	32	6.5
Acute ischaemia	8	1.6
Right heart failure	7	1.4
Neurological	103	20.9
Metabolic/postanoxic encephalopathy	20	4.1
Seizures	20	4.1
Neuropathy/myopathy	18	3.7
Cerebral artery stroke	17	3.5
Spontaneous Intraparenchymal bleeding	15	3.0
Gastrointestinal and hepatic	33	6.7
Gastrointestinal bleeding: upper tract	8	1.6
Ascites	7	1.4
Liver Dysfunction Syndrome	5	1.0
Gastrointestinal bleeding: lower tract	4	0.8
Acute pancreatitis	4	0.8
Trauma (anatomical districts)	56	11.4
Head	30	6.1
Chest	26	5.3
Pelvis/bone/joint & muscle	15	3.0
Spine	13	2.6
Abdomen	6	1.2
Miscellaneous	3	0.6
-	0	0.0
Other	116	23.6
Metabolic disorder	52	10.6
Nephrourologic disease	37	7.5
Coagulation disorder	17	3.5
Acute intoxication	12	2.4
Haematological disease	11	2.2
Post transplantation	2	0.4
Bone marrow transplantation	1	0.2
Renal transplantation	1	0.2
Infections	314	63.8
Pneumonia	181	36.8
L.R.T.I. other than pneumonia	29	5.9
NON-surgical urinary tract infection	27	5.5
Primary bacteraemia of unknown origin	24	4.9
Upper respiratory tract infection	11	2.2
Cholecystitis/cholangitis	8	1.6
Catheter-related bacteremia (CR-BSI)	7	1.4
Gastroenteritis	7	1.4
NON-surgical CNS infection	6	1.2
Pleurisy/Pleural empyema	6	1.2
Missing	0	

Trauma (anatomical districts)	N	%
Head	30	6.1
Traumatic subarachnoid haemorrhage	18	3.7
Cerebral contusion/laceration	14	2.8
Skull fracture	9	1.8
Maxillofacial fracture	9	1.8
Traumatic Subdural haematoma	4	0.8
Spine	13	2.6
Vertebral fracture, without deficit	8	1.6
Cervical injury, incomplete deficit	2	0.4
Tetraplegia	2	0.4
Chest	26	5.3
Traum. haemothorax/pneumothorax	16	3.3
Other injuries of the chest	11	2.2
Flail chest	5	1.0
Abdomen	6	1.2
Liver: Moderate-Severe laceration	2	0.4
Liver: Massive laceration	1	0.2
Spleen: Moderate-Severe laceration	1	0.2
Pelvis/bone/joint & muscle	15	3.0
Long bone fracture	12	2.4
Multiple fracture of the pelvis	3	0.6
Very severe or open fracture of the pelvis	1	0.2
Major vessels injury	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Miscellaneous	3	0.6
Burns (>30% BSA)	3	0.6
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	178	36.5
Infection with or without SIRS	92	18.9
SEVERE SEPSIS	52	10.7
Septic shock	166	34.0
Missing	4	

Infection severity on admission

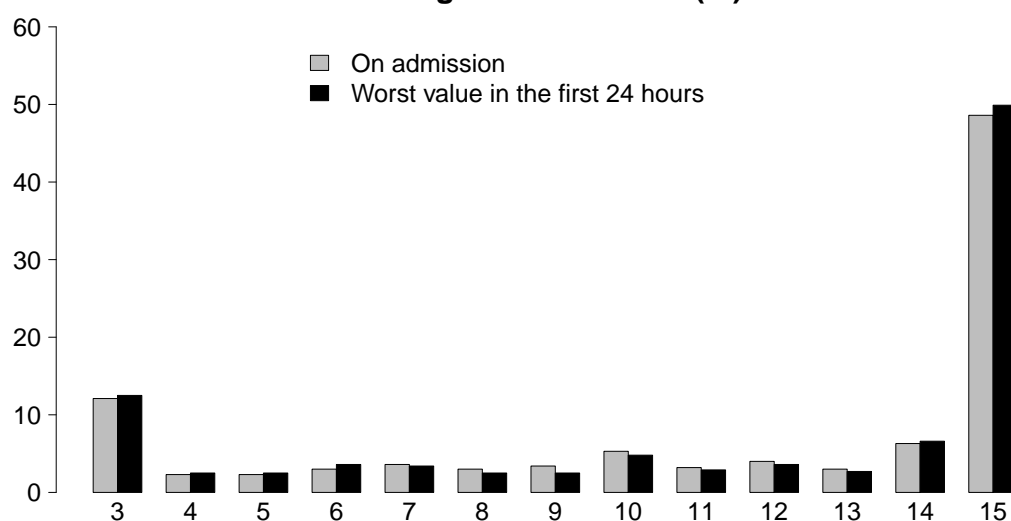
Patients infected (N=310)



National report for general ICUs - Year 2016

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

Glasgow Coma Scale (%)



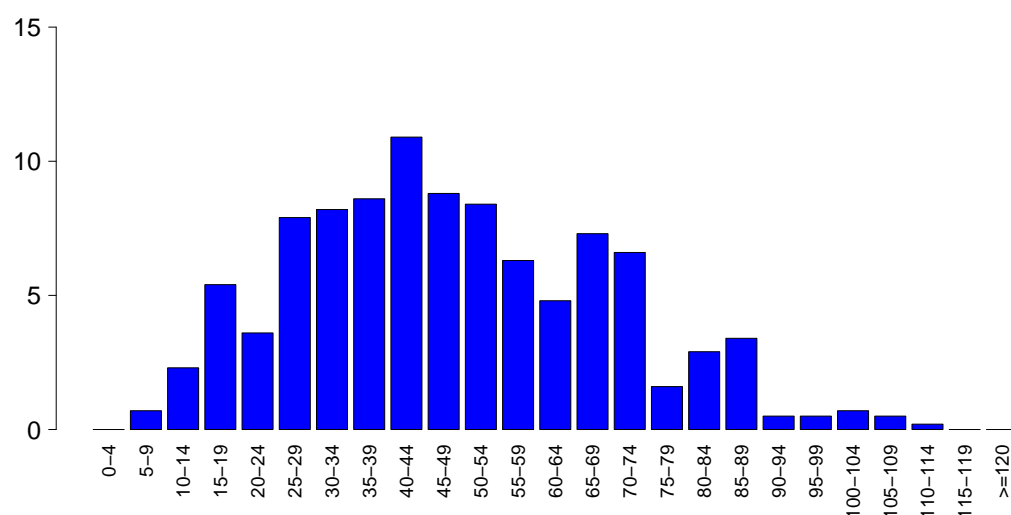
GCS (admission)

Median	14
Q1–Q3	8–15
Not evaluable	19
Missing	0

GCS (first 24 hours)

Median	14
Q1–Q3	8–15
Not evaluable	51
Missing	0

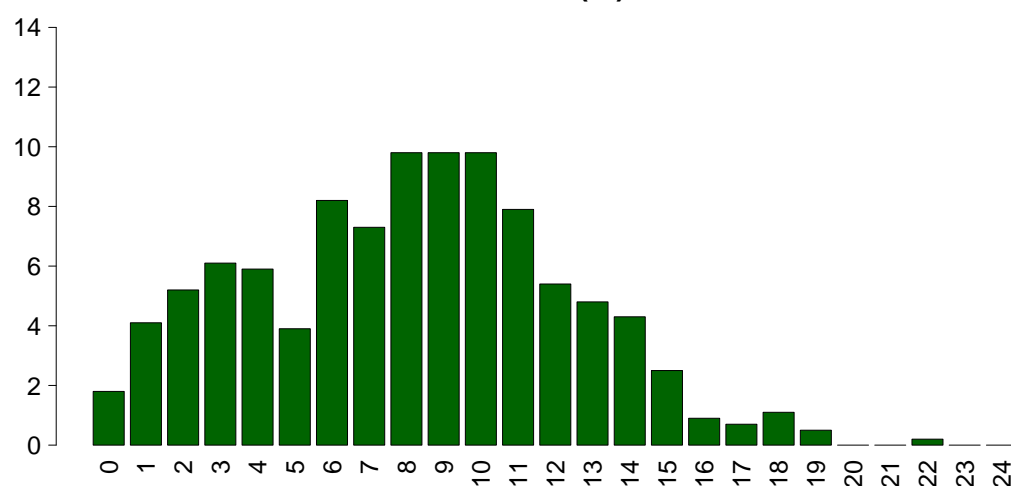
SAPS II (%)



SAPSII

Mean	48.0
SD	20.6
Median	46
Q1–Q3	32–62
Not evaluable	51
Missing	0

SOFA (%)



SOFA

Mean	8.1
SD	4.2
Median	8
Q1–Q3	5–11
Not evaluable	51
Missing	0

National report for general ICUs - Year 2016

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

Complications during the stay	N	%
No	180	36.6
Yes	312	63.4
Missing	0	

Failures during the stay	N	%
No	307	62.4
Yes	185	37.6
A: Respiratory failure	70	14.2
B: Cardiovascular failure	112	22.8
C: Neurological failure	19	3.9
D: Hepatic failure	11	2.2
E: Renal failure (AKIN)	108	22.0
F: Acute skin failure	6	1.2
G: Metabolic failure	9	1.8
H: Coagulation failure	15	3.0
Missing	0	

Failures during the stay (top 10)	N	%
B	30	6.1
E	27	5.5
BE	26	5.3
AB	20	4.1
ABE	12	2.4
A	11	2.2
AE	11	2.2
CE	5	1.0
ABEH	4	0.8
C	3	0.6
Missing	0	

Respiratory failure occurred	N	%
None	422	85.8
Intubation for airway maint.	23	4.7
Hypoxic failure	51	10.4
Hypercapnic failure	21	4.3
Missing	0	

Cardiovascular failure occurred	N	%
None	380	77.2
Cardiogenic shock	13	2.6
Hypovolemic shock	3	0.6
Haemorrhagic/hypovolemic shock	1	0.2
Septic shock	98	19.9
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.4
Other shock	4	0.8
Missing	0	

Neurological failure occurred	N	%
None	473	96.1
Cerebral coma	11	2.2
Metabolic coma	6	1.2
Postanoxic coma	3	0.6
Missing	0	

Renal failure occurred (AKIN)	N	%
None	384	78.0
Mild	7	1.4
Moderate	12	2.4
Severe	89	18.1
Missing	0	

Complications during the stay	N	%
Respiratory	91	18.5
Atelectasis	51	10.4
Severe ARDS	17	3.5
Moderate ARDS	14	2.8
Aspiration pneumonia	9	1.8
Pneumothorax/Pneumomediastinum	8	1.6
Cardiovascular	73	14.8
Acute severe arrhythmia: tachycardias	36	7.3
Cardiac arrest	15	3.0
Acute severe arrhythmia: bradycardias	11	2.2
Pulmonary edema	10	2.0
Deep venous thrombosis	4	0.8
Neurological	78	15.9
Drowsiness/agitation/delirium	36	7.3
Seizures	20	4.1
Intracranial hypertension	15	3.0
CrI/MyNe	14	2.8
Brain edema	10	2.0
Gastrointestinal and hepatic	19	3.9
Liver Dysfunction Syndrome	11	2.2
Paralytic Ileus	5	1.0
Gastrointestinal bleeding: upper tract	2	0.4
Acute bile-duct disease	1	0.2
Acute on chronic liver disease	1	0.2
Other	34	6.9
Nephrourologic disease	14	2.8
Metabolic disorder	9	1.8
Category/Stage IV: Full Thickness Tissue Loss	5	1.0
Category/Stage II: Partial Thickness Skin Loss	3	0.6
Category/Stage I: Nonblanchable Erythema	2	0.4
Category/Stage III: Full Thickness Skin Loss	2	0.4
Iatrogenic major vessels injury	2	0.4
Infections	144	29.3
Pneumonia	69	14.0
Primary bacteraemia of unknown origin	53	10.8
Catheter-related bacteremia (CR-BSI)	32	6.5
L.R.T.I. other than pneumonia	9	1.8
NON-surgical urinary tract infection	9	1.8
Cholecystitis/cholangitis	4	0.8
Catheter-related local infection	3	0.6
Upper respiratory tract infection	3	0.6
Artery or vein infection	2	0.4
NON-surgical CNS infection	2	0.4
Missing	0	

National report for general ICUs - Year 2016

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

Infections	N	%
None	118	24.0
Only on admission	230	46.7
On admission and during ICU stay	84	17.1
Only during ICU stay	60	12.2
Missing	0	

Maximum severity of infection	N	%
None	118	24.2
Infection with or without SIRS	93	19.1
SEVERE SEPSIS	58	11.9
Septic shock	219	44.9
Missing	4	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	Infection with or without SIRS	SEVERE SEPSIS	Septic shock
Admission	None	118 (66.3%)	17 (9.6%)	13 (7.3%)	30 (16.9%)	178
	Infection with or without SIRS	-	76 (82.6%)	3 (3.3%)	13 (14.1%)	92
	SEVERE SEPSIS	-	-	42 (80.8%)	10 (19.2%)	52
	Septic shock	-	-	-	166 (100.0%)	166
	TOT	118	93	58	219	488

Ventil. Associat. Pneumonia (VAP)	N	%
No	430	87.4
Yes	62	12.6
Missing	0	

Incidence of VAP

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

Estimate	20.1
CI (95%)	15.4–25.8

Incidence of VAP

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

Estimate	16.1%
CI (95%)	12.3–20.6

Catheter Bacteraemia (CR-BSI)	N	%
No	460	93.5
Yes	32	6.5
Missing	0	

Incidence of CR-BSI

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

Estimate	6.9
CI (95%)	4.7–9.7

Incidence of CR-BSI

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

Estimate	8.3%
CI (95%)	5.6–11.7

National report for general ICUs - Year 2016
Process indicators - Adult non surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)		Use		On admission		On discharge		Length (days)		Days from admission			
		N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)		488	99.2										
Procedures (antibiotics excluded)	Invasive ventilation	357	72.6	182	37	121	24.6	6	2-13	0	0	0-0	0
	Non invasive ventilation	162	32.9	7	1.4	8	1.6	2	1-4	0	0	0-2	0
	Tracheostomy	107	21.7	19	3.9	83	16.9	13	6-26	0	7	5-11	0
	iNO (inhaled nitric oxide)	0	0.0										
	Central Venous Catheter	458	93.1	110	22.4	224	45.5	6	3-13	0	0	0-0	0
	PICC	0	0.0										
	Arterial Catheter	472	95.9	99	20.1	158	32.1	6	2-13	0	0	0-0	0
	Vasoactive drugs	377	76.6	111	22.6	107	21.7	4	1-10	0	0	0-0	0
	Antiarrhythmics	147	29.9	20	4.1	80	16.3	4	2-10	0	0	0-1	0
	IABP	0	0.0										
	Invasive monitoring of C.O.	19	3.9	0	0	4	0.8	2	2-3	0	1	0-2	0
	Continuous monitoring of ScVO2	4	0.8	0	0	0	0	6	0-14	0	1	0-4	0
	Temporary pacing	10	2.0	4	0.8	1	0.2	6	4-11	0	0	0-0	0
	Ventricular assistance	0	0.0										
	DC-shock	13	2.6										
	CPR	31	6.3										
	Massive blood transfusion	37	7.5										
	ICP monitoring without liquor-drainage	16	3.3	1	0.2	0	0	8	5-13	0	0	0-0	0
	ICP monitoring with liquor-drainage	5	1.0	2	0.4	1	0.2	3	3-13	0	0	0-4	0
	External ventricular drainage without ICP	7	1.4	2	0.4	2	0.4	11	8-13	0	4	0-4	0
	Haemofiltration	82	16.7	8	1.6	24	4.9	5	2-14	0	0	0-3	0
	Haemodialysis	24	4.9	1	0.2	8	1.6	4	2-8	0	1	0-8	0
	ECMO	0	0.0										
	Hepatic clearance techniques	0	0.0										
	Clearance techniques during sepsis	0	0.0										
	IAP (intra-abdominal pressure)	17	3.5										
Hypothermia	8	1.6											
Enteral nutrition	338	68.7	18	3.7	131	26.6	6	3-15	0	1	1-3	0	
Parenteral nutrition	99	20.1	1	0.2	25	5.1	5	2-12	0	0	0-2	0	
SDD (Topical, Topical and systemic)	1	0.2											
Patient restraint	21	4.3											
Peridural catheter	1	0.2	0	0	0	0	4	4-4	0	0	0-0	0	
Electrical cardioversion	2	0.4								1	0-2	0	
Vacuum therapy	0	0.0											
Antibiotics	401	81.5											
Antibiotics for surgical prophylaxis	5	1.0	0	0	2	0.4	1	0-1	0	0	0-4	0	
Antibiotics for medical prophylaxis	68	13.8	12	2.4	22	4.5	2	1-5	0	0	0-0	0	
Empirical antibiotic therapy	266	54.1	94	19.1	86	17.5	4	2-6	0	0	0-0	0	
Targeted antibiotic therapy	217	44.1	27	5.5	122	24.8	8	4-18	0	3	0-6	0	

National report for general ICUs - Year 2016**Process indicators - Adult non surgical patients evaluated in the GiViTI model**

				Length (days)				
Invasive ventilation (N=357)		N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure		204	57.1	11.4	15.2	6	2–15	0
For airway maintenance		129	36.1	10.1	16.6	4	1–11	0
In weaning		0	0.0					
Not evaluable		24	6.7	9.1	8.9	7	1–13.8	0
Reintubation within 48 hours		8	2.2	13.4	10.8	13	3.75–23	0
Non invasive ventilation (N=162)		N	%	Number of surgical interventions				
Non invasive ventilation only		83	51.2			0	472	95.9
Non invasive ventilation failed		27	16.7			1	18	3.7
For weaning		47	29.0			2	2	0.4
Other		5	3.1			3	0	0.0
Missing		0				>3	0	0.0
						Missing	0	
Tracheostomy not present on admission (N=88)		N	%	Surgical interventions				
				Days from admission				
Surgical		8	9.1			Mean	11.9	
Percutwist		5	5.7			SD	13.2	
Ciaglia		43	48.9			Median	7	
Monodil. Ciaglia		0	0.0			Q1–Q3	3–14.2	
Fantoni		0	0.0			Missing	0	
Griggs		22	25.0					
Other Kind		2	2.3					
Unknown		8	9.1					
Missing		0						
Tracheostomy - Days after the beginning of inv. vent.				Surgical interventions (top 10)				
Not present on admission (N=88)				N	%			
Mean		8.3		Gastrointestinal surgery	6	1.2		
SD		5.3		Orthopaedic surgery	4	0.8		
Median		7		Neurosurgery	4	0.8		
Q1–Q3		5–11		Thoracic surgery	3	0.6		
Missing		1		Peripheral vascular surgery	2	0.4		
				Hepatic surgery	1	0.2		
				Maxillo-Facial surgery	1	0.2		
				Other surgery	1	0.2		
				-	0	0.0		
				-	0	0.0		
				Missing	0			
Invasive monitoring of C.O. (N=19)		N	%	Non surgical interventions				
Swan Ganz		8	42.1			N	%	
PICCO		5	26.3			No	468	95.1
LIDCO		6	31.6			Yes	24	4.9
Vigileo-PRAM		0	0.0			Missing	0	
Other		0	0.0					
Missing		0						
SDD (N=1)		N	%	Non surgical interventions				
Topical		1	100.0	Days from admission				
Topical and systemic		0	0.0			Mean	9.5	
Missing		0				SD	11.7	
						Median	5	
						Q1–Q3	3–10	
						Missing	2	
Antibiotic therapy				Non surgical interventions				
Pt. infected in ICU only (N=60)		N	%	N	%			
Only empirical		16	27.6	Interventional endoscopy	17	3.5		
Only targeted		14	24.1	Interventional cardiology	3	0.6		
Targeted after empirical		23	39.7	Interventional neuroradiology	3	0.6		
Other		5	8.6	Interventional radiology	2	0.4		
Missing		2		Missing	0			
Surgical interventions		N	%					
No		472	95.9					
Yes		20	4.1					
Missing		0						

National report for general ICUs - Year 2016**Outcome indicators** - Adult non surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	185	37.8
Transferred to same hospital	288	58.8
Transferred to other hospital	16	3.3
Discharged home	1	0.2
Disch. terminally ill	0	0.0
Missing	2	

Transferred to (N=304)	N	%
Ward	288	94.7
Other ICU	8	2.6
High dependency care unit	8	2.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=8)	N	%
Specialist expertise	3	37.5
Step-up care	2	25.0
Logistical/organizational reasons	2	25.0
Step-down care	1	12.5
Missing	0	

Transferred to Same hospital (N=288)	N	%
Ward	279	96.9
Other ICU	3	1.0
High dependency care unit	6	2.1
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=16)	N	%
Ward	9	56.2
Other ICU	5	31.2
High dependency care unit	2	12.5
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	305	62.2
Dead	185	37.8
Missing	2	

Timing of ICU mortality (N=185)	N	%
Daytime (08:00AM - 07:59PM)	114	61.6
Nighttime (08:00PM - 07:59AM)	71	38.4
Weekdays (Monday - Friday)	137	74.1
Weekend (Saturday - Sunday)	48	25.9
Missing	0	

Hospital mortality	N	%
Alive	255	51.8
Dead	237	48.2
Missing	0	

Timing of hosp. mortality (N=237)	N	%
In ICU	185	78.1
Within 24 hours after ICU	3	1.3
24-47 hours after ICU	3	1.3
48-71 hours after ICU	6	2.5
72-95 hours after ICU	4	1.7
After 95 hours after ICU	36	15.2
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=52)		
Mean		15.4
SD		15.6
Median		11.5
Q1–Q3		3–21
Missing		0

National report for general ICUs - Year 2016**Outcome indicators** - Adult non surgical patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
		N	%		
	Alive	254	51.6		Mean 10.9
	Dead	238	48.4		SD 15.0
	Missing	0			Median 6
					Q1–Q3 2–13
					Missing 0
<hr/>					
			ICU stay (days)		
			Alive (N=305)		
				Mean	10.6
				SD	14.4
				Median	6
				Q1–Q3	2–12
				Missing	0
<hr/>					
			ICU stay (days)		
			Dead (N=185)		
				Mean	10.9
				SD	13.0
				Median	6
				Q1–Q3	2–15
				Missing	0
<hr/>					
			Stay after ICU (days)		
			Alive (N=305)		
				Mean	13.5
				SD	16.5
				Median	8
				Q1–Q3	3–18
				Missing	0
<hr/>					
			Hospital stay (days)		
				Mean	24.5
				SD	26.0
				Median	16
				Q1–Q3	7.8–31
				Missing	0
<hr/>					
			Hospital stay (days)		
			Alive (N=255)		
				Mean	26.6
				SD	27.5
				Median	18
				Q1–Q3	9–30.5
				Missing	0
<hr/>					
			Hospital stay (days)		
			Dead (N=237)		
				Mean	22.2
				SD	24.0
				Median	15
				Q1–Q3	6–31
				Missing	0

National report for general ICUs - Year 2016

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

Patients (N): 176

Sex	N	%
Male	115	65.3
Female	61	34.7
Missing	0	

Age (years)	N	%
17-45	23	13.1
46-65	76	43.2
66-75	51	29.0
>75	26	14.8
Missing	0	
Mean	61.6	
SD	13.6	
Median	64	
Q1–Q3	53–71	
Min–Max	24–90	

Body mass Index (BMI)	N	%
Underweight	2	1.1
Normal	38	21.6
Overweight	70	39.8
Obese	66	37.5
Missing	0	

Pregnancy status	N	%
Females (N=61)		
Not fertile	12	19.7
Not pregnant/Unknown	48	78.7
Currently pregnant	0	0.0
Post partum	1	1.6
Missing	0	

Comorbidities	N	%
No	31	17.6
Yes	145	82.4
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	92	52.3
Any tumour without metastasis	57	32.4
Diabetes Type II without insulin tr.	29	16.5
Peripheral vascular disease	20	11.4
Severe COPD	20	11.4
Arrhythmia	18	10.2
Myocardial infarction	17	9.7
NYHA class II-III	13	7.4
Metastatic cancer	12	6.8
Moderate or severe renal disease	12	6.8
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	6.4	8.2	3	1–8	0

Source of admission	N	%
Same hospital	171	97.2
Other hospital	5	2.8
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=176)		
Medical ward	8	4.5
Surgical ward	166	94.3
Emergency room	1	0.6
Other ICU	1	0.6
High dependency care unit	0	0.0
Missing	0	

Reason for transfer from	N	%
Other ICU (N=1)		
Specialist expertise	1	100.0
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=171)		
Medical ward	8	4.7
Surgical ward	162	94.7
Emergency room	1	0.6
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Ward of admission	N	%
Other hospital (N=5)		
Medical ward	0	0.0
Surgical ward	4	80.0
Emergency room	0	0.0
Other ICU	1	20.0
High dependency care unit	0	0.0
Missing	0	

Scheduled admission	N	%
No	25	14.2
Yes	151	85.8
Missing	0	

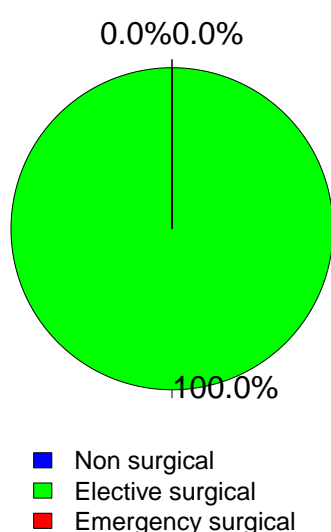
National report for general ICUs - Year 2016

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

Trauma	N	%
No	173	98.3
Yes	3	1.7
Multiple trauma	0	0.0
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	176	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=176)		
Operating theatre of surgical ward	157	89.2
Operating theatre of emergency room	1	0.6
Surgical ward	9	5.1
Other	9	5.1
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=176)		
Neurosurgery	54	30.7
Abdominal vascular surgery	32	18.2
Gastrointestinal surgery	28	15.9
Thoracic surgery	13	7.4
Peripheral vascular surgery	12	6.8
Pancreatic surgery	11	6.2
Gynaecological surgery	11	6.2
Nephro/Urological surgery	10	5.7
ENT surgery	7	4.0
Biliary tract surgery	7	4.0
Missing	0	

Timing	N	%
Elective surgical (N=176)		
From -7 to -3 days	4	2.3
From -2 to -1 days	14	8.0
On ICU admission day	184	104.5
The day after ICU admission	1	0.6
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	174	98.9
Elective	0	0.0
Emergency	2	1.1
Missing	0	

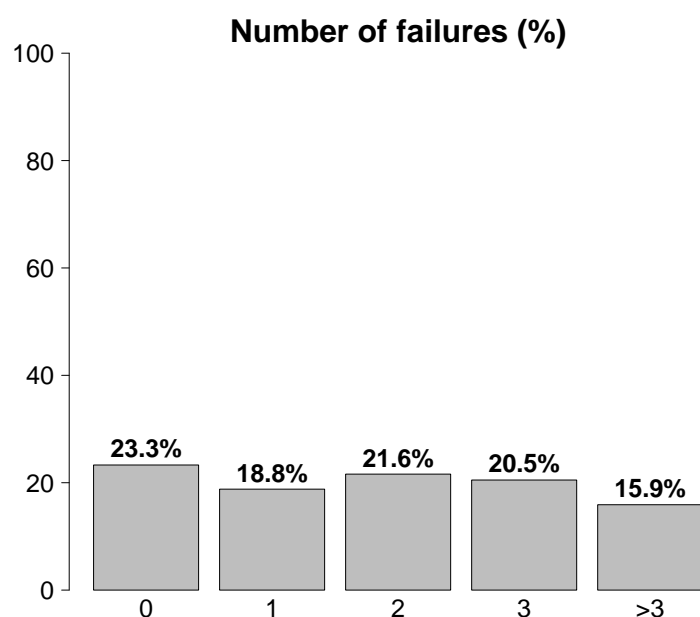
Non surgical interventions	N	%
Elective (N=0)		
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=2)		
Interventional radiology	1	50.0
Interventional cardiology	1	50.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	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	63	35.8
Post surgical weaning	27	15.3
Surgical monitoring	36	20.5
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	113	64.2
Only ventilatory support	19	10.8
Only cardiovascular support	0	0.0
Ventilatory and cardiovascular support	94	53.4
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	41	23.3
Yes	135	76.7
A: Respiratory failure	113	64.2
B: Cardiovascular failure	94	53.4
C: Neurological failure	7	4.0
D: Hepatic failure	0	0.0
E: Renal failure	46	26.1
F: Acute skin failure	0	0.0
G: Metabolic failure	68	38.6
H: Coagulation failure	5	2.8
Missing	0	

Failures on admission (top 10)	N	%
AB	30	17.0
ABEG	22	12.5
ABG	22	12.5
A	16	9.1
G	12	6.8
ABE	9	5.1
ABC	5	2.8
E	5	2.8
ABEGH	4	2.3
EG	4	2.3
Missing	0	

Respiratory failure	N	%
None	63	35.8
Only hypoxic failure	24	13.6
Only hypercapnic failure	1	0.6
Hypoxic-hypercapnic failure	6	3.4
Intubation for airway maint.	82	46.6
Missing	0	

Cardiovascular failure	N	%
None	82	46.6
Without shock	21	11.9
Cardiogenic shock	2	1.1
Septic shock	8	4.5
Haemorrhagic/hypovolemic shock	18	10.2
Hypovolemic shock	8	4.5
Anaphylactic shock	0	0.0
Neurogenic shock	5	2.8
Other shock	30	17.0
Mixed shock	2	1.1
Missing	0	

Neurologic failure	N	%
None	161	95.8
Cerebral coma	5	3.0
Metabolic coma	1	0.6
Postanoxic coma	1	0.6
Toxic coma	0	0.0
Missing or not evaluable	8	

Renal failure (AKIN)	N	%
None	130	73.9
Mild	22	12.5
Moderate	9	5.1
Severe	15	8.5
Missing	0	

Metabolic failure	N	%
None	108	61.4
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	6	3.4
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	62	35.2
Missing	0	

National report for general ICUs - Year 2016**Characteristics on admission** - Adult elective surgical patients evaluated in the GiViTI model

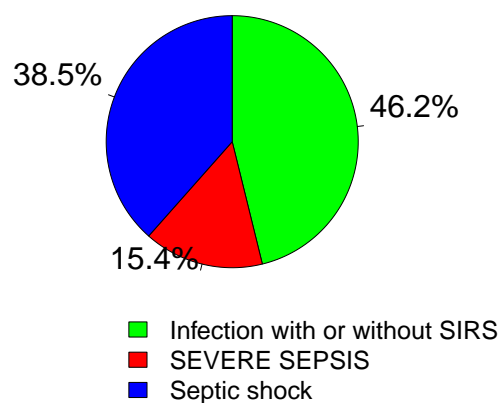
Clinical conditions on admission	N	%
Respiratory	71	40.3
Atelectasis	56	31.8
Lung cancer	10	5.7
Pleural effusion	4	2.3
Moderate ARDS	4	2.3
Pneumothorax/Pneumomediastinum	3	1.7
Cardiovascular	56	31.8
Non-ruptured aneurysm	27	15.3
Acute severe arrhythmia: tachycardias	15	8.5
Peripheral vascular disease	9	5.1
Acute severe arrhythmia: bradycardias	5	2.8
Left heart failure without pulm. edema	4	2.3
Neurological	53	30.1
Brain tumour	40	22.7
Cerebral Aneurysm	4	2.3
Spontaneous Subarachnoid haemorrhage	4	2.3
Neuropathy/myopathy	4	2.3
Intracranial hypertension	3	1.7
Gastrointestinal and hepatic	23	13.1
Digestive tract malignancy	6	3.4
Pancreatic malignancy	6	3.4
Hepatic malignancy	4	2.3
Intrabdominal bleeding (non traumatic)	2	1.1
Gastrointestinal perforation	2	1.1
Trauma (anatomical districts)	3	1.7
Spine	1	0.6
Abdomen	1	0.6
Pelvis/bone/joint & muscle	1	0.6
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Other	36	20.5
Metabolic disorder	17	9.7
Gynaecological disease	8	4.5
Nephrourologic disease	6	3.4
Coagulation disorder	5	2.8
Other disease	2	1.1
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	26	14.8
Post-surgical peritonitis	4	2.3
Pneumonia	4	2.3
Upper respiratory tract infection	4	2.3
NON-surgical skin/soft tissue infection	3	1.7
Primary bacteraemia of unknown origin	2	1.1
Cholecystitis/cholangitis	2	1.1
Primary peritonitis	2	1.1
Post-surgical CNS infection	1	0.6
Other viral infections	1	0.6
NON-surgical pericarditis	1	0.6
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	1	0.6
Cervical injury, incomplete deficit	1	0.6
-	0	0.0
-	0	0.0
Chest	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Abdomen	1	0.6
Liver: Moderate-Severe laceration	1	0.6
-	0	0.0
-	0	0.0
Pelvis/bone/joint & muscle	1	0.6
Long bone fracture	1	0.6
-	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	150	85.2
Infection with or without SIRS	12	6.8
SEVERE SEPSIS	4	2.3
Septic shock	10	5.7
Missing	0	

Infection severity on admission

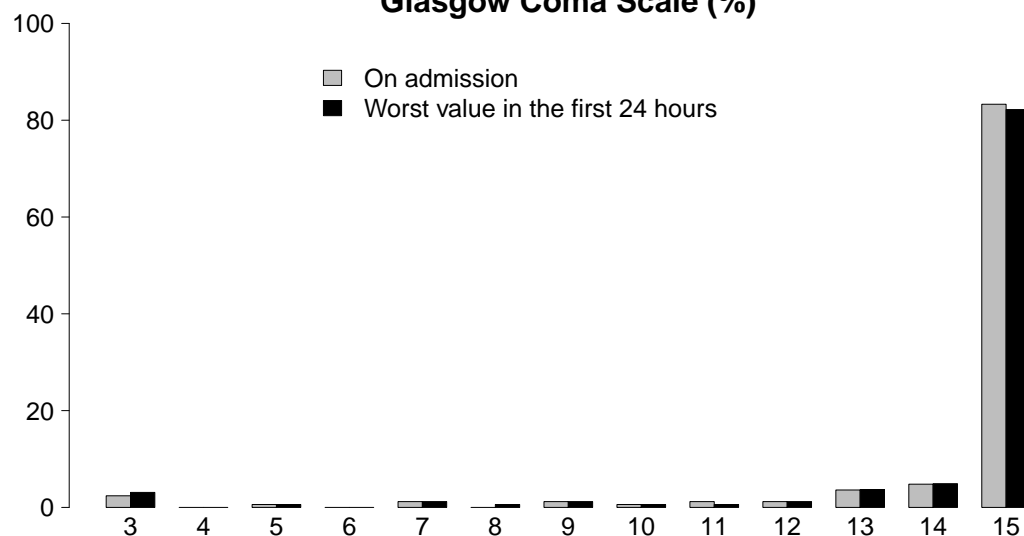
Patients infected (N=26)



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

Glasgow Coma Scale (%)

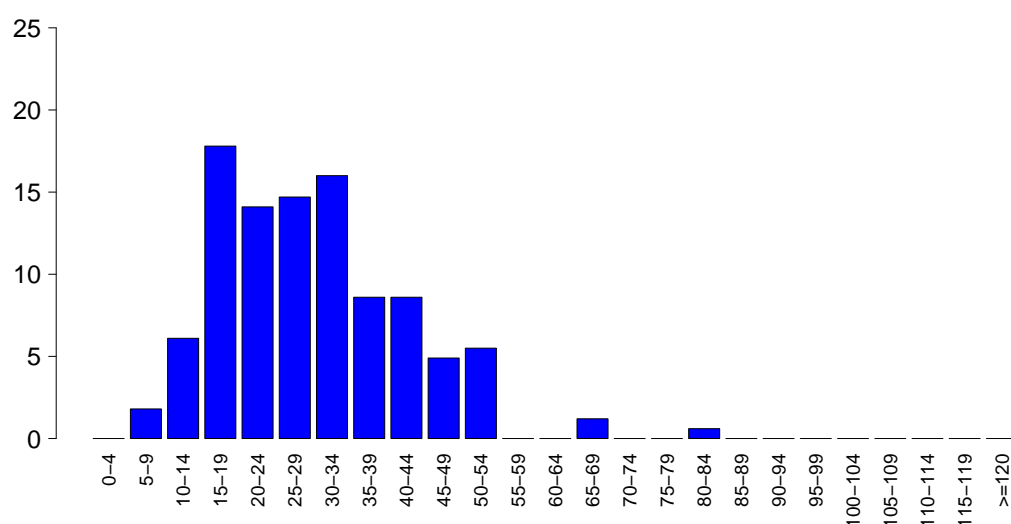
**GCS (admission)**

Median	15
Q1–Q3	15–15
Not evaluable	8
Missing	0

GCS (first 24 hours)

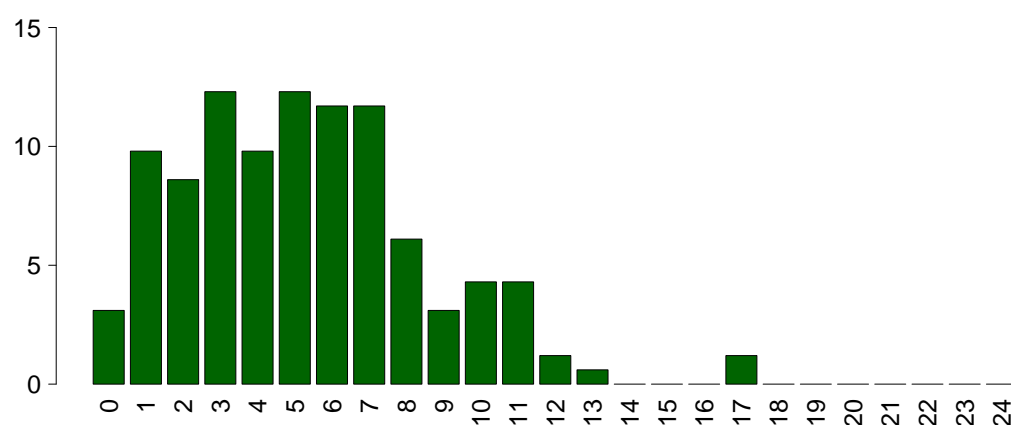
Median	15
Q1–Q3	15–15
Not evaluable	13
Missing	0

SAPS II (%)

**SAPSII**

Mean	29.2
SD	12.5
Median	28
Q1–Q3	19–37
Not evaluable	13
Missing	0

SOFA (%)

**SOFA**

Mean	5.3
SD	3.3
Median	5
Q1–Q3	3–7
Not evaluable	13
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	114	64.8
Yes	62	35.2
Missing	0	

Failures during the stay	N	%
No	141	80.1
Yes	35	19.9
A: Respiratory failure	13	7.4
B: Cardiovascular failure	24	13.6
C: Neurological failure	5	2.8
D: Hepatic failure	2	1.1
E: Renal failure (AKIN)	18	10.2
F: Acute skin failure	1	0.6
G: Metabolic failure	4	2.3
H: Coagulation failure	4	2.3
Missing	0	

Failures during the stay (top 10)	N	%
B	5	2.8
E	5	2.8
AB	4	2.3
A	3	1.7
BE	3	1.7
BC	2	1.1
BCE	2	1.1
ABCE	1	0.6
ABE	1	0.6
ABEF	1	0.6
Missing	0	

Respiratory failure occurred	N	%
None	163	92.6
Intubation for airway maint.	6	3.4
Hypoxic failure	7	4.0
Hypercapnic failure	3	1.7
Missing	0	

Cardiovascular failure occurred	N	%
None	152	86.4
Cardiogenic shock	2	1.1
Hypovolemic shock	1	0.6
Haemorrhagic/hypovolemic shock	3	1.7
Septic shock	19	10.8
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	0	0.0
Missing	0	

Neurological failure occurred	N	%
None	171	97.2
Cerebral coma	3	1.7
Metabolic coma	2	1.1
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	158	89.8
Mild	3	1.7
Moderate	1	0.6
Severe	14	8.0
Missing	0	

Complications during the stay	N	%
Respiratory	15	8.5
Atelectasis	7	4.0
Severe ARDS	3	1.7
Moderate ARDS	2	1.1
Pleural effusion	2	1.1
Mild ARDS	1	0.6
Cardiovascular	19	10.8
Acute severe arrhythmia: tachycardias	12	6.8
Hypertensive crisis	7	4.0
Cardiac arrest	2	1.1
Acute severe arrhythmia: bradycardias	1	0.6
Deep venous thrombosis	1	0.6
Neurological	8	4.5
Intracranial hypertension	3	1.7
CrI/MyNe	2	1.1
Drowsiness/agitation/delirium	2	1.1
Hydrocephalus	2	1.1
New ischaemic stroke	2	1.1
Gastrointestinal and hepatic	9	5.1
Anastomotic dehiscence	2	1.1
Ascites	2	1.1
Liver Dysfunction Syndrome	2	1.1
Acute bile-duct disease	1	0.6
Acute inflammatory bowel disease	1	0.6
Other	8	4.5
Metabolic disorder	4	2.3
Nephrourologic disease	4	2.3
Category/Stage I: Nonblanchable Erythema	1	0.6
Category/Stage IV: Full Thickness Tissue Loss	1	0.6
-	0	0.0
-	0	0.0
-	0	0.0
Infections	32	18.2
Primary bacteraemia of unknown origin	10	5.7
Pneumonia	8	4.5
Post-surgical peritonitis	6	3.4
Post-surgical CNS infection	2	1.1
NON-surgical urinary tract infection	2	1.1
Ventriculostomy-related CNS infection	2	1.1
Catheter-related bacteremia (CR-BSI)	1	0.6
Catheter-related local infection	1	0.6
Clinical sepsis	1	0.6
L.R.T.I. other than pneumonia	1	0.6
Missing	0	

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

Infections		N	%	Maximum severity of infection		N	%
None		123	69.9	None		123	69.9
Only on admission		21	11.9	Infection with or without SIRS		21	11.9
On admission and during ICU stay		5	2.8	SEVERE SEPSIS		6	3.4
Only during ICU stay		27	15.3	Septic shock		26	14.8
Missing		0		Missing		0	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	Infection with or without SIRS	SEVERE SEPSIS	Septic shock
Admission	None	123 (82.0%)	10 (6.7%)	3 (2.0%)	14 (9.3%)	150
	Infection with or without SIRS	-	11 (91.7%)	0 (0.0%)	1 (8.3%)	12
	SEVERE SEPSIS	-	-	3 (75.0%)	1 (25.0%)	4
	Septic shock	-	-	-	10 (100.0%)	10
	TOT	123	21	6	26	176

Ventil. Associat. Pneumonia (VAP)	N	%
No	168	95.5
Yes	8	4.5
Missing	0	

Incidence of VAP

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

Estimate	15.7
CI (95%)	6.8–30.9

Incidence of VAP

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

Estimate	12.5%
CI (95%)	5.4–24.7

Catheter Bacteraemia (CR-BSI)	N	%
No	175	99.4
Yes	1	0.6
Missing	0	

Incidence of CR-BSI

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

Estimate	1.1
CI (95%)	0.0–6.4

Incidence of CR-BSI

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

Estimate	1.4%
CI (95%)	0.0–7.7

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

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)		Days from admission	
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3
Procedures (antibiotics excluded)	176	100.0								
Invasive ventilation	132	75.0	96	54.5	16	9.1	1	0-3	0	0-0
Non invasive ventilation	58	33.0	3	1.7	4	2.3	1	0-1	0	0-1
Tracheostomy	17	9.7	3	1.7	16	9.1	13	6-23	0	7-14
iNO (inhaled nitric oxide)	0	0.0								0
Central Venous Catheter	170	96.6	99	56.2	104	59.1	2	1-4	0	0-0
PICC	0	0.0								0
Arterial Catheter	173	98.3	91	51.7	37	21	2	1-3	0	0-0
Vasoactive drugs	110	62.5	51	29	14	8	1	1-3	0	0-0
Antiarrhythmics	42	23.9	3	1.7	14	8	2	1-3	0	0-1
IABP	0	0.0								0
Invasive monitoring of C.O.	3	1.7	0	0	0	0	6	4-6	0	4-11
Continuous monitoring of ScVO2	1	0.6	0	0	0	0	0	0-0	0	2-2
Temporary pacing	0	0.0								0
Ventricular assistance	0	0.0								0
DC-shock	2	1.1								0
CPR	1	0.6							0	0-0
Massive blood transfusion	11	6.2							0	0-0
ICP monitoring without liquor-drainage	2	1.1	1	0.6	0	0	8	7-9	0	0-1
ICP monitoring with liquor-drainage	4	2.3	2	1.1	1	0.6	12	2-26	0	0-0
External ventricular drainage without ICP	5	2.8	5	2.8	2	1.1	10	3-28	0	1-1
Haemofiltration	15	8.5	2	1.1	5	2.8	4	2-8	0	0-5
Haemodialysis	3	1.7	0	0	0	0	3	2-4	0	0-6
ECMO	0	0.0								0
Hepatic clearance techniques	0	0.0								0
Clearance techniques during sepsis	0	0.0								0
IAP (intra-abdominal pressure)	29	16.5								0
Hypothermia	2	1.1								0
Enteral nutrition	43	24.4	3	1.7	23	13.1	6	2-19	0	1-3
Parenteral nutrition	18	10.2	0	0	8	4.5	4	1-5	0	0-2
SDD (Topical, Topical and systemic)	0	0.0								0
Patient restraint	3	1.7								0
Peridural catheter	22	12.5	12	6.8	12	6.8	2	1-3	0	0-0
Electrical cardioversion	0	0.0								0
Vacuum therapy	0	0.0								0
Antibiotics	162	92.0								
Antibiotics for surgical prophylaxis	143	81.2	91	51.7	76	43.2	1	1-2	0	0-0
Antibiotics for medical prophylaxis	5	2.8	1	0.6	3	1.7	2	1-3	0	0-0
Empirical antibiotic therapy	24	13.6	3	1.7	9	5.1	4	2-5	0	1-5
Targeted antibiotic therapy	29	16.5	3	1.7	19	10.8	6	3-17	0	1-9

National report for general ICUs - Year 2016**Process indicators** - Adult elective surgical patients evaluated in the GiViTI model

Process indicators - Adult elective surgical patients evaluated in the GIVITI model					Length (days)				
Invasive ventilation (N=132)			N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure			26	19.7	5.5	8.3	1	0.2–5.8	0
For airway maintenance			78	59.1	6.1	11.0	1	1–5.8	0
In weaning			26	19.7	0.4	0.5	0	0–1	0
Not evaluable			2	1.5	14.5	19.1	14.5	7.8–21.2	0
Reintubation within 48 hours			1	0.8	0.0		0	0–0	0
Non invasive ventilation (N=58)			N	%	Number of surgical interventions				
Non invasive ventilation only			34	58.6			0	169	96.0
Non invasive ventilation failed			4	6.9			1	5	2.8
For weaning			20	34.5			2	2	1.1
Other			0	0.0			3	0	0.0
Missing			0				>3	0	0.0
Missing							Missing	0	
Tracheostomy not present on admission (N=14)			N	%	Surgical interventions				
Surgical			2	14.3	Days from admission				
Percutwist			1	7.1			Mean	7.6	
Ciaglia			5	35.7			SD	5.3	
Monodil. Ciaglia			1	7.1			Median	8	
Fantoni			0	0.0			Q1–Q3	3–10	
Griggs			3	21.4			Missing	0	
Other Kind			0	0.0	Surgical interventions (top 10)				
Unknown			2	14.3			N	%	
Missing			0				Gastrointestinal surgery	4	2.3
							Neurosurgery	3	1.7
							Hepatic surgery	1	0.6
							Nephro/Urological surgery	1	0.6
							-	0	0.0
							-	0	0.0
							-	0	0.0
							-	0	0.0
							-	0	0.0
							-	0	0.0
							-	0	0.0
							Missing	0	
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=14)					Non surgical interventions				
Mean			11.3				N	%	
SD			5.2				No	171	97.2
Median			9				Yes	5	2.8
Q1–Q3			7.2–14				Missing	0	
Missing			0		Non surgical interventions				
					Days from admission				
							Mean	11.4	
							SD	8.2	
							Median	10	
							Q1–Q3	5–18	
							Missing	0	
Invasive monitoring of C.O. (N=3)			N	%	Non surgical interventions				
Swan Ganz			0	0.0			N	%	
PICCO			3	100.0			Interventional endoscopy	6	3.4
LIDCO			0	0.0			Interventional radiology	1	0.6
Vigileo-PRAM			0	0.0			Interventional cardiology	0	0.0
Other			0	0.0			Interventional neuroradiology	0	0.0
Missing			0				Missing	0	
SDD (N=0)			N	%	Antibiotic therapy				
Topical			0	0.0	Pt. infected in ICU only (N=27)				
Topical and systemic			0	0.0			N	%	
Missing			0				Only empirical	7	29.2
							Only targeted	9	37.5
							Targeted after empirical	8	33.3
							Other	0	0.0
							Missing	3	
Surgical interventions			N	%	Surgical interventions				
No			169	96.0			N	%	
Yes			7	4.0			Interventional endoscopy	6	3.4
Missing			0				Interventional radiology	1	0.6
							Interventional cardiology	0	0.0
							Interventional neuroradiology	0	0.0
							Missing	0	

National report for general ICUs - Year 2016**Outcome indicators** - Adult elective surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	20	11.4
Transferred to same hospital	154	87.5
Transferred to other hospital	2	1.1
Discharged home	0	0.0
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=156)	N	%
Ward	156	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	

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

Transferred to Same hospital (N=154)	N	%
Ward	154	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=2)	N	%
Ward	2	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	

ICU mortality	N	%
Alive	156	88.6
Dead	20	11.4
Missing	0	

Timing of ICU mortality (N=20)	N	%
Daytime (08:00AM - 07:59PM)	13	65.0
Nighttime (08:00PM - 07:59AM)	7	35.0
Weekdays (Monday - Friday)	16	80.0
Weekend (Saturday - Sunday)	4	20.0
Missing	0	

Hospital mortality	N	%
Alive	150	85.2
Dead	26	14.8
Missing	0	

Timing of hosp. mortality (N=26)	N	%
In ICU	20	76.9
Within 24 hours after ICU	1	3.8
24-47 hours after ICU	0	0.0
48-71 hours after ICU	0	0.0
72-95 hours after ICU	0	0.0
After 95 hours after ICU	5	19.2
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=6)		
Mean		15.5
SD		17.5
Median		11
Q1–Q3		8.5–12.8
Missing		0

National report for general ICUs - Year 2016**Outcome indicators** - Adult elective surgical patients evaluated in the GiViTI model

Last hospital mortality	N	%
Alive	150	85.2
Dead	26	14.8
Missing	0	

ICU stay (days)		
	Mean	5.2
	SD	9.0
	Median	2
	Q1–Q3	1–3.2
	Missing	0

ICU stay (days)		
Alive (N=156)		
	Mean	4.1
	SD	7.6
	Median	1
	Q1–Q3	1–3
	Missing	0

ICU stay (days)		
Dead (N=20)		
	Mean	13.8
	SD	13.7
	Median	6.5
	Q1–Q3	3–21.2
	Missing	0

Stay after ICU (days)		
Alive (N=156)		
	Mean	13.2
	SD	16.7
	Median	8
	Q1–Q3	6–13
	Missing	0

Hospital stay (days)		
	Mean	23.3
	SD	22.2
	Median	15
	Q1–Q3	10–27
	Missing	0

Hospital stay (days)		
Alive (N=150)		
	Mean	22.8
	SD	22.8
	Median	15
	Q1–Q3	10–23.8
	Missing	0

Hospital stay (days)		
Dead (N=26)		
	Mean	26.7
	SD	18.9
	Median	26.5
	Q1–Q3	11–39
	Missing	0

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

Patients (N): 260

Sex	N	%
Male	172	66.2
Female	88	33.8
Missing	0	

Age (years)	N	%
17-45	69	26.5
46-65	75	28.8
66-75	49	18.8
>75	67	25.8
Missing	0	
Mean	59.4	
SD	19.5	
Median	63	
Q1–Q3	44–76	
Min–Max	17–98	

Body mass Index (BMI)	N	%
Underweight	10	3.8
Normal	79	30.4
Overweight	97	37.3
Obese	74	28.5
Missing	0	

Pregnancy status	N	%
Females (N=88)		
Not fertile	32	36.4
Not pregnant/Unknown	45	51.1
Currently pregnant	0	0.0
Post partum	11	12.5
Missing	0	

Comorbidities	N	%
No	82	31.5
Yes	178	68.5
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	117	45.0
Peripheral vascular disease	34	13.1
NYHA class II-III	29	11.2
Arrhythmia	27	10.4
Myocardial infarction	27	10.4
Diabetes Type II without insulin tr.	26	10.0
Any tumour without metastasis	23	8.8
Cerebrovascular disease	22	8.5
Antiplatelet therapy	21	8.1
Alcohol addiction	19	7.3
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	2.6	6.2	1	0–2	0

Source of admission	N	%
Same hospital	217	83.5
Other hospital	43	16.5
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=260)		
Medical ward	23	8.8
Surgical ward	141	54.2
Emergency room	92	35.4
Other ICU	2	0.8
High dependency care unit	2	0.8
Missing	0	

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

Ward of admission	N	%
Same hospital (N=217)		
Medical ward	23	10.6
Surgical ward	134	61.8
Emergency room	58	26.7
Other ICU	1	0.5
High dependency care unit	1	0.5
Missing	0	

Ward of admission	N	%
Other hospital (N=43)		
Medical ward	0	0.0
Surgical ward	7	16.3
Emergency room	34	79.1
Other ICU	1	2.3
High dependency care unit	1	2.3
Missing	0	

Scheduled admission	N	%
No	257	98.8
Yes	3	1.2
Missing	0	

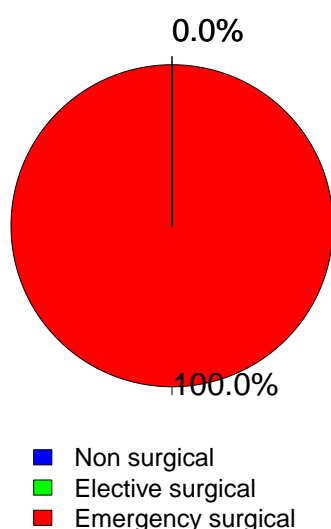
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Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

Trauma	N	%
No	183	70.4
Yes	77	29.6
Multiple trauma	36	13.8
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	260	100.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=260)		
Operating theatre of surgical ward	122	46.9
Operating theatre of emergency room	74	28.5
Surgical ward	19	7.3
Other	45	17.3
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
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=260)		
Neurosurgery	94	36.2
Gastrointestinal surgery	77	29.6
Orthopaedic surgery	26	10.0
Abdominal vascular surgery	23	8.8
Peripheral vascular surgery	15	5.8
Obstetric surgery	10	3.8
Biliary tract surgery	7	2.7
Nephro/Urological surgery	5	1.9
Other surgery	5	1.9
Maxillo-Facial surgery	4	1.5
Missing	0	

Timing	N	%
Emergency surgical (N=260)		
From -7 to -3 days	7	2.7
From -2 to -1 days	29	11.2
On ICU admission day	235	90.4
The day after ICU admission	9	3.5
Missing	0	

Non surgical interventions	N	%
None	245	94.2
Elective	5	1.9
Emergency	10	3.8
Missing	0	

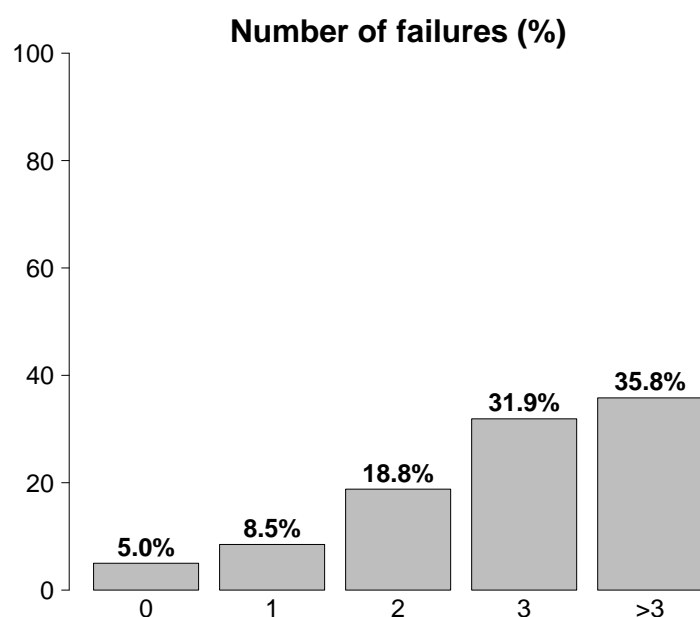
Non surgical interventions	N	%
Elective (N=5)		
Interventional neuroradiology	2	40.0
Interventional endoscopy	1	20.0
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Missing	2	

Non surgical interventions	N	%
Emergency (N=10)		
Interventional neuroradiology	4	40.0
Interventional endoscopy	4	40.0
Interventional radiology	2	20.0
Interventional cardiology	0	0.0
Missing	0	

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

Reason for admission	N	%
Monitoring/Weaning	21	8.1
Post surgical weaning	2	0.8
Surgical monitoring	19	7.3
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	239	91.9
Only ventilatory support	31	11.9
Only cardiovascular support	3	1.2
Ventilatory and cardiovascular support	205	78.8
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	13	5.0
Yes	247	95.0
A: Respiratory failure	236	90.8
B: Cardiovascular failure	208	80.0
C: Neurological failure	67	25.8
D: Hepatic failure	4	1.5
E: Renal failure	94	36.2
F: Acute skin failure	2	0.8
G: Metabolic failure	136	52.3
H: Coagulation failure	19	7.3
Missing	0	

Failures on admission (top 10)	N	%
ABEG	48	18.5
ABG	36	13.8
AB	32	12.3
ABC	27	10.4
ABCG	17	6.5
ABE	17	6.5
A	16	6.2
AC	9	3.5
ABEGH	7	2.7
ABCEG	6	2.3
Missing	0	

Respiratory failure	N	%
None	24	9.2
Only hypoxic failure	73	28.1
Only hypercapnic failure	1	0.4
Hypoxic-hypercapnic failure	13	5.0
Intubation for airway maint.	149	57.3
Missing	0	

Cardiovascular failure	N	%
None	52	20.0
Without shock	40	15.4
Cardiogenic shock	1	0.4
Septic shock	52	20.0
Haemorrhagic/hypovolemic shock	47	18.1
Hypovolemic shock	12	4.6
Anaphylactic shock	0	0.0
Neurogenic shock	17	6.5
Other shock	30	11.5
Mixed shock	9	3.5
Missing	0	

Neurologic failure	N	%
None	177	72.5
Cerebral coma	60	24.6
Metabolic coma	1	0.4
Postanoxic coma	5	2.0
Toxic coma	1	0.4
Missing or not evaluable	16	

Renal failure (AKIN)	N	%
None	166	63.8
Mild	39	15.0
Moderate	21	8.1
Severe	34	13.1
Missing	0	

Metabolic failure	N	%
None	124	47.7
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	18	6.9
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	118	45.4
Missing	0	

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

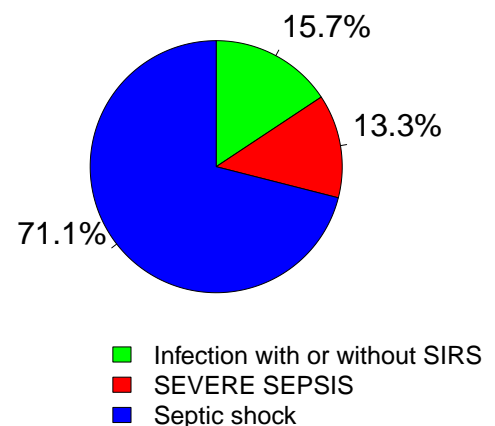
Clinical conditions on admission	N	%
Respiratory	63	24.2
Atelectasis	43	16.5
Moderate ARDS	12	4.6
Aspiration pneumonia	6	2.3
Mild ARDS	6	2.3
Pleural effusion	4	1.5
Cardiovascular	54	20.8
Ruptured or fissured aneurysm	21	8.1
Acute severe arrhythmia: tachycardias	16	6.2
Peripheral vascular disease	9	3.5
Acute severe arrhythmia: bradycardias	7	2.7
Acute ischaemia	6	2.3
Neurological	57	21.9
Spontaneous Intraparenchymal bleeding	28	10.8
Intracranial hypertension	21	8.1
Spontaneous Subarachnoid haemorrhage	18	6.9
Spontaneous Hydrocephalus	9	3.5
Cerebral artery stroke	8	3.1
Gastrointestinal and hepatic	59	22.7
Gastrointestinal perforation	19	7.3
Intestinal occlusion	15	5.8
Bowel ischaemia	14	5.4
Digestive tract malignancy	9	3.5
Acute bile-duct disease	5	1.9
Trauma (anatomical districts)	77	29.6
Head	48	18.5
Chest	29	11.2
Pelvis/bone/joint & muscle	21	8.1
Abdomen	18	6.9
Spine	11	4.2
Major vessels injury	4	1.5
-	0	0.0
Other	57	21.9
Metabolic disorder	30	11.5
Coagulation disorder	19	7.3
Nephrourologic disease	17	6.5
Obstetric disease	4	1.5
Obstetric Haemorrhage	3	1.2
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	84	32.3
Primary peritonitis	19	7.3
Post-surgical peritonitis	15	5.8
NON-surgical secondary peritonitis	14	5.4
Pneumonia	13	5.0
Cholecystitis/choolangitis	5	1.9
Post-surgical skin/soft tissue infection	5	1.9
NON-surgical urinary tract infection	4	1.5
L.R.T.I. other than pneumonia	3	1.2
Upper respiratory tract infection	3	1.2
Primary bacteraemia of unknown origin	2	0.8
Missing	0	

Trauma (anatomical districts)	N	%
Head	48	18.5
Traumatic subarachnoid haemorrhage	22	8.5
Skull fracture	22	8.5
Traumatic Subdural haematoma	15	5.8
Maxillofacial fracture	14	5.4
Cerebral contusion/laceration	12	4.6
Spine	11	4.2
Vertebral fracture, without deficit	6	2.3
Dorsal injury, incomplete deficit	2	0.8
Paraplegia	2	0.8
Chest	29	11.2
Traum. haemothorax/pneumothorax	20	7.7
Other injuries of the chest	10	3.8
Tension pneumothorax	6	2.3
Abdomen	18	6.9
Liver: Moderate-Severe laceration	4	1.5
Spleen: Moderate-Severe laceration	4	1.5
Minor injuries of the abdomen	4	1.5
Pelvis/bone/joint & muscle	21	8.1
Long bone fracture	17	6.5
Multiple fracture of the pelvis	6	2.3
Massive crush/amputation	1	0.4
Major vessels injury	4	1.5
Proximal limbs vessels: transection	3	1.2
Neck vessels: dissection/transection	1	0.4
Aorta: rupture/dissection	1	0.4
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	176	68.0
Infection with or without SIRS	13	5.0
SEVERE SEPSIS	11	4.2
Septic shock	59	22.8
Missing	1	

Infection severity on admission

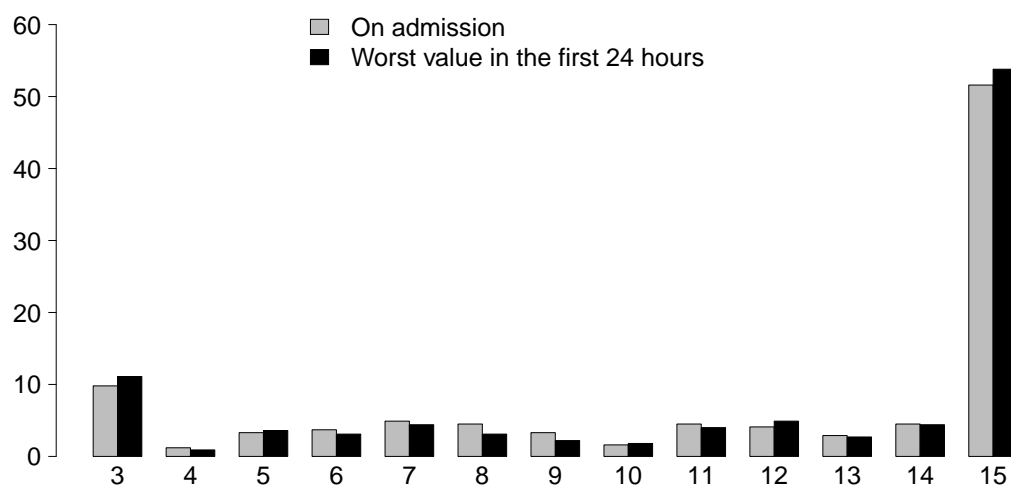
Patients infected (N=83)



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

Glasgow Coma Scale (%)



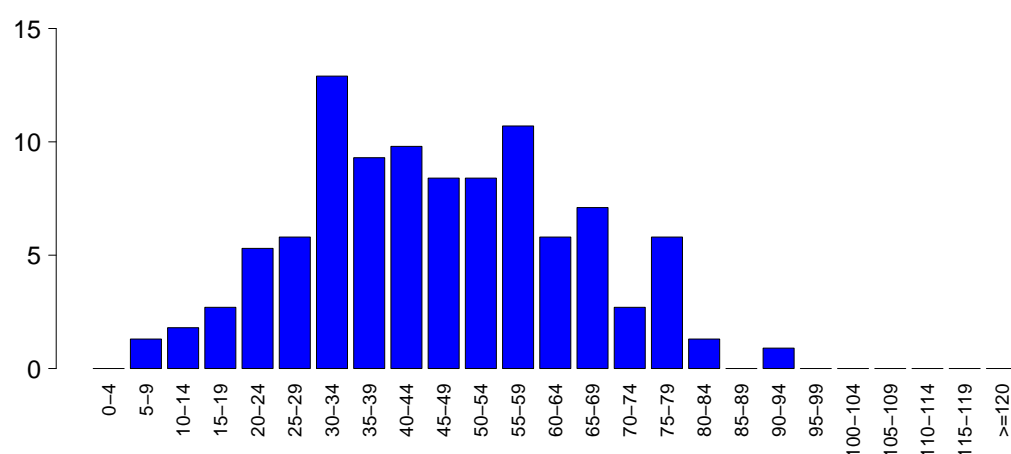
GCS (admission)

Median	15
Q1–Q3	8–15
Not evaluable	16
Missing	0

GCS (first 24 hours)

Median	15
Q1–Q3	8–15
Not evaluable	35
Missing	0

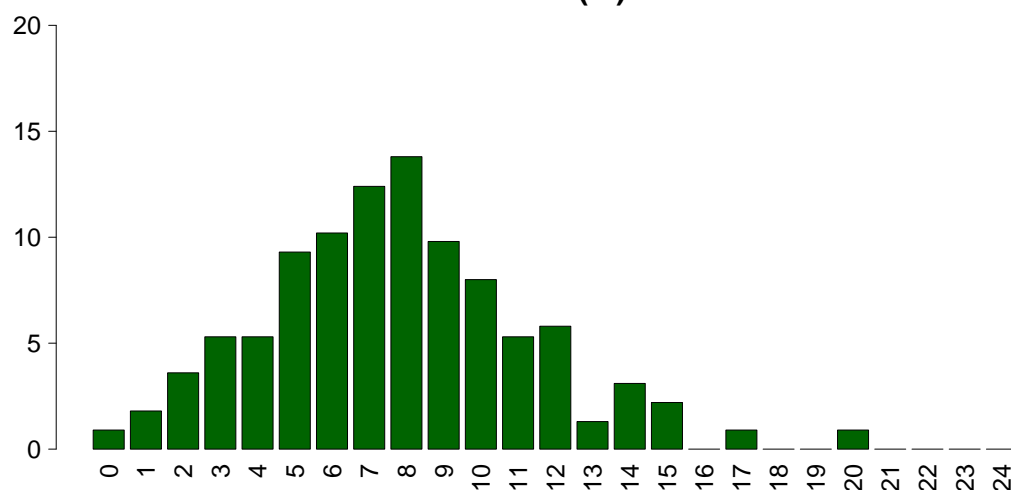
SAPS II (%)



SAPSII

Mean	46.3
SD	17.8
Median	45
Q1–Q3	33–59
Not evaluable	35
Missing	0

SOFA (%)



SOFA

Mean	7.7
SD	3.6
Median	8
Q1–Q3	5–10
Not evaluable	35
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	87	33.5
Yes	173	66.5
Missing	0	

Failures during the stay	N	%
No	159	61.2
Yes	101	38.8

A: Respiratory failure	33	12.7
B: Cardiovascular failure	71	27.3
C: Neurological failure	14	5.4
D: Hepatic failure	10	3.8
E: Renal failure (AKIN)	50	19.2
F: Acute skin failure	3	1.2
G: Metabolic failure	6	2.3
H: Coagulation failure	8	3.1
Missing	0	

Failures during the stay (top 10)	N	%
B	24	9.2
E	12	4.6
BE	10	3.8
AB	9	3.5
ABE	7	2.7
A	6	2.3
BEH	3	1.2
C	3	1.2
ABC	2	0.8
ABDE	2	0.8
Missing	0	

Respiratory failure occurred	N	%
None	227	87.3
Intubation for airway maint.	14	5.4
Hypoxic failure	21	8.1
Hypercapnic failure	4	1.5
Missing	0	

Cardiovascular failure occurred	N	%
None	189	72.7
Cardiogenic shock	11	4.2
Hypovolemic shock	2	0.8
Haemorrhagic/hypovolemic shock	4	1.5
Septic shock	58	22.3
Anaphylactic shock	0	0.0
Neurogenic shock	3	1.2
Other shock	2	0.8
Missing	0	

Neurological failure occurred	N	%
None	246	94.6
Cerebral coma	11	4.2
Metabolic coma	2	0.8
Postanoxic coma	1	0.4
Missing	0	

Renal failure occurred (AKIN)	N	%
None	210	80.8
Mild	9	3.5
Moderate	2	0.8
Severe	39	15.0
Missing	0	

Complications during the stay	N	%
Respiratory	52	20.0
Atelectasis	23	8.8
Pneumothorax/Pneumomediastinum	12	4.6
Moderate ARDS	9	3.5
Pulmonary embolism	7	2.7
Pleural effusion	6	2.3
Cardiovascular	50	19.2
Acute severe arrhythmia: tachycardias	24	9.2
Deep venous thrombosis	11	4.2
Hypertensive crisis	7	2.7
Acute severe arrhythmia: bradycardias	6	2.3
Cardiac arrest	6	2.3
Neurological	54	20.8
Intracranial hypertension	23	8.8
CrIMyNe	12	4.6
Drowsiness/agitation/delirium	12	4.6
Brain edema	9	3.5
Seizures	7	2.7
Gastrointestinal and hepatic	32	12.3
Liver Dysfunction Syndrome	10	3.8
Paralytic Ileus	9	3.5
Anastomotic dehiscence	6	2.3
Ascites	6	2.3
Gastrointestinal perforation	4	1.5
Other	21	8.1
Nephrourologic disease	8	3.1
Category/Stage IV: Full Thickness Tissue Loss	6	2.3
Metabolic disorder	6	2.3
Other skin and/or soft tissue pathology	3	1.2
Category/Stage III: Full Thickness Skin Loss	2	0.8
Category/Stage I: Nonblanchable Erythema	1	0.4
Suspected Deep Tissue Injury: Depth Unknown	1	0.4
Infections	98	37.7
Pneumonia	48	18.5
Primary bacteraemia of unknown origin	26	10.0
Catheter-related bacteremia (CR-BSI)	17	6.5
Post-surgical peritonitis	8	3.1
L.R.T.I. other than pneumonia	4	1.5
Post-surgical CNS infection	3	1.2
Upper respiratory tract infection	3	1.2
Cholecystitis/cholangitis	2	0.8
F.U.O. fever of unknown origin	2	0.8
NON-surgical secondary peritonitis	2	0.8
Missing	0	

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

Infections	N	%
None	100	38.5
Only on admission	62	23.8
On admission and during ICU stay	22	8.5
Only during ICU stay	76	29.2
Missing	0	

Maximum severity of infection	N	%
None	100	38.8
Infection with or without SIRS	37	14.3
SEVERE SEPSIS	19	7.4
Septic shock	102	39.5
Missing	2	

Severity evolution

Severity evolution		During the stay				
		N (R %)	None	Infection with or without SIRS	SEVERE SEPSIS	Septic shock
Admission	None	100 (57.1%)	27 (15.4%)	13 (7.4%)	35 (20.0%)	175
	Infection with or without SIRS	-	10 (76.9%)	0 (0.0%)	3 (23.1%)	13
	SEVERE SEPSIS	-	-	6 (54.5%)	5 (45.5%)	11
	Septic shock	-	-	-	59 (100.0%)	59
	TOT	100	37	19	102	258

Ventil. Associat. Pneumonia (VAP)	N	%
No	216	83.1
Yes	44	16.9
Missing	0	

Incidence of VAP

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

Estimate	25.1
CI (95%)	18.2–33.6

Incidence of VAP

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

Estimate	20.1%
CI (95%)	14.6–26.9

Catheter Bacteraemia (CR-BSI)	N	%
No	243	93.5
Yes	17	6.5
Missing	0	

Incidence of CR-BSI

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

Estimate	6.4
CI (95%)	3.8–10.3

Incidence of CR-BSI

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

Estimate	7.7%
CI (95%)	4.5–12.3

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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	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
	260	100.0										
Invasive ventilation	230	88.5	150	57.7	68	26.2	5	1-15	0	0	0-0	0
Non invasive ventilation	41	15.8	2	0.8	2	0.8	2	1-3	0	0	0-2	0
Tracheostomy	65	25.0	5	1.9	52	20	16	9-28	0	10	6-12	0
iNO (inhaled nitric oxide)	0	0.0										
Central Venous Catheter	256	98.5	142	54.6	165	63.5	5	2-17	0	0	0-0	0
PICC	0	0.0										
Arterial Catheter	260	100.0	139	53.5	101	38.8	5	2-17	0	0	0-0	0
Vasoactive drugs	217	83.5	110	42.3	59	22.7	3	1-11	0	0	0-0	0
Antiarrhythmics	75	28.8	10	3.8	37	14.2	3	1-10	0	1	0-2	0
IABP	0	0.0										
Invasive monitoring of C.O.	8	3.1	0	0	2	0.8	4	1-4	0	2	1-8	0
Continuous monitoring of ScVO2	3	1.2	0	0	1	0.4	3	2-4	0	0	0-2	0
Temporary pacing	0	0.0										
Ventricular assistance	0	0.0										
DC-shock	4	1.5										
CPR	8	3.1								1	0-3	0
Massive blood transfusion	37	14.2								1	0-4	0
ICP monitoring without liquor-drainage	35	13.5	20	7.7	6	2.3	9	6-12	0	0	0-2	0
ICP monitoring with liquor-drainage	17	6.5	9	3.5	4	1.5	7	4-12	0	0	0-2	0
External ventricular drainage without ICP	21	8.1	15	5.8	12	4.6	7	2-13	0	0	0-8	0
Haemofiltration	27	10.4	3	1.2	7	2.7	7	2-14	0	0	0-2	0
Haemodialysis	7	2.7	0	0	2	0.8	13	8-24	0	0	0-15	0
ECMO	0	0.0										
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	0	0.0										
IAP (intra-abdominal pressure)	33	12.7										
Hypothermia	4	1.5										
Enteral nutrition	132	50.8	4	1.5	55	21.2	10	3-23	0	2	1-3	0
Parenteral nutrition	81	31.2	1	0.4	30	11.5	5	3-11	0	2	0-5	0
SDD (Topical, Topical and systemic)	1	0.4										
Patient restraint	10	3.8										
Peridural catheter	1	0.4	0	0	0	0	1	1-1	0	0	0-0	0
Electrical cardioversion	1	0.4								1	1-1	0
Vacuum therapy	0	0.0										
Antibiotics	242	93.1										
Antibiotics for surgical prophylaxis	149	57.3	107	41.2	61	23.5	2	1-4	0	0	0-0	0
Antibiotics for medical prophylaxis	13	5.0	2	0.8	0	0	4	3-6	0	0	0-0	0
Empirical antibiotic therapy	118	45.4	33	12.7	34	13.1	4	2-5	0	3	0-5	0
Targeted antibiotic therapy	101	38.8	7	2.7	67	25.8	12	5-23	0	6	3-9	0

National report for general ICUs - Year 2016**Process indicators - Adult emergency surgical patients evaluated in the GiViTI model**

		Length (days)					
Invasive ventilation (N=230)		N	%	Mean	SD	Median	Q1-Q3
Due to pulmonary failure		78	33.9	11.2	17.5	4	1–14
For airway maintenance		144	62.6	12.2	18.9	5	1–16.2
In weaning		2	0.9	0.5	0.7	0.5	0.2–0.8
Not evaluable		6	2.6	10.5	10.4	8.5	3–13.2
Reintubation within 48 hours		1	0.4	0.0		0	0–0
Non invasive ventilation (N=41)		N	%	Number of surgical interventions			
Non invasive ventilation only		16	39.0			0	229
Non invasive ventilation failed		4	9.8			1	21
For weaning		19	46.3			2	6
Other		2	4.9			3	4
Missing		0				>3	0
						Missing	0
Tracheostomy not present on admission (N=60)		N	%	Surgical interventions			
Surgical		7	11.7	Days from admission			
Percutwist		5	8.3			Mean	13.0
Ciaglia		21	35.0			SD	13.4
Monodil. Ciaglia		1	1.7			Median	8
Fantoni		0	0.0			Q1–Q3	3–17
Griggs		18	30.0			Missing	0
Other Kind		1	1.7	Surgical interventions (top 10)			
Unknown		7	11.7			N	%
Missing		0				Gastrointestinal surgery	18
						Neurosurgery	12
						Pancreatic surgery	3
						Orthopaedic surgery	3
						Nephro/Urological surgery	2
						Maxillo-Facial surgery	2
						Hepatic surgery	1
						Plastic surgery	1
						Thoracic surgery	1
						Biliary tract surgery	1
						Missing	0
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=59)				Non surgical interventions			
Mean		9.3				N	%
SD		5.6				No	249
Median		9				Yes	11
Q1–Q3		5.5–12.5				Missing	0
Missing		0		Non surgical interventions			
Invasive monitoring of C.O. (N=8)		N	%	Days from admission			
Swan Ganz		1	12.5			Mean	25.9
PICCO		4	50.0			SD	33.2
LIDCO		2	25.0			Median	16.5
Vigileo-PRAM		0	0.0			Q1–Q3	6.2–29.8
Other		1	12.5			Missing	0
Missing		0		Non surgical interventions			
SDD (N=1)		N	%	Days from admission			
Topical		0	0.0			N	%
Topical and systemic		1	100.0			Interventional endoscopy	12
Missing		0				Interventional radiology	1
						Interventional neuroradiology	1
						Interventional cardiology	0
						Missing	0
Antibiotic therapy				Non surgical interventions			
Pt. infected in ICU only (N=76)		N	%	Days from admission			
Only empirical		17	23.0			N	%
Only targeted		17	23.0			Interventional endoscopy	12
Targeted after empirical		36	48.6			Interventional radiology	1
Other		4	5.4			Interventional neuroradiology	1
Missing		2				Interventional cardiology	0
Surgical interventions		N	%				
No		229	88.1				
Yes		31	11.9				
Missing		0					

National report for general ICUs - Year 2016**Outcome indicators** - Adult emergency surgical patients evaluated in the GiViTI model

ICU outcome	N	%
Dead	82	31.7
Transferred to same hospital	168	64.9
Transferred to other hospital	9	3.5
Discharged home	0	0.0
Disch. terminally ill	0	0.0
Missing	1	

Transferred to (N=177)	N	%
Ward	170	96.0
Other ICU	6	3.4
High dependency care unit	1	0.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=6)	N	%
Specialist expertise	3	50.0
Step-up care	0	0.0
Logistical/organizational reasons	2	33.3
Step-down care	1	16.7
Missing	0	

Transferred to Same hospital (N=168)	N	%
Ward	168	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=9)	N	%
Ward	2	22.2
Other ICU	6	66.7
High dependency care unit	1	11.1
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	177	68.3
Dead	82	31.7
Missing	1	

Timing of ICU mortality (N=82)	N	%
Daytime (08:00AM - 07:59PM)	48	58.5
Nighttime (08:00PM - 07:59AM)	34	41.5
Weekdays (Monday - Friday)	60	73.2
Weekend (Saturday - Sunday)	22	26.8
Missing	0	

Hospital mortality	N	%
Alive	155	59.6
Dead	105	40.4
Missing	0	

Timing of hosp. mortality (N=105)	N	%
In ICU	82	78.1
Within 24 hours after ICU	1	1.0
24-47 hours after ICU	0	0.0
48-71 hours after ICU	4	3.8
72-95 hours after ICU	3	2.9
After 95 hours after ICU	15	14.3
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=23)		
Mean	22.3	
SD	26.5	
Median	9	
Q1–Q3	3–37	
Missing	0	

National report for general ICUs - Year 2016**Outcome indicators** - Adult emergency surgical patients evaluated in the GiViTI model

Last hospital mortality		N	%
Alive		155	59.6
Dead		105	40.4
Missing		0	

ICU stay (days)		
	Mean	13.4
	SD	18.9
	Median	5.5
	Q1–Q3	2–17
	Missing	0

ICU stay (days)		
Alive (N=177)		
	Mean	11.6
	SD	16.1
	Median	5
	Q1–Q3	2–16
	Missing	0

ICU stay (days)		
Dead (N=82)		
	Mean	16.7
	SD	23.4
	Median	8.5
	Q1–Q3	3–20.8
	Missing	0

Stay after ICU (days)		
Alive (N=177)		
	Mean	15.5
	SD	18.8
	Median	9
	Q1–Q3	5–18.2
	Missing	1

Hospital stay (days)		
	Mean	26.4
	SD	26.3
	Median	17
	Q1–Q3	9–35.5
	Missing	1

Hospital stay (days)		
Alive (N=155)		
	Mean	27.7
	SD	26.2
	Median	18
	Q1–Q3	11–37.8
	Missing	1

Hospital stay (days)		
Dead (N=105)		
	Mean	24.6
	SD	26.5
	Median	14
	Q1–Q3	8–32
	Missing	0

National report for general ICUs - Year 2016**Validity of the models** - Calibration belts

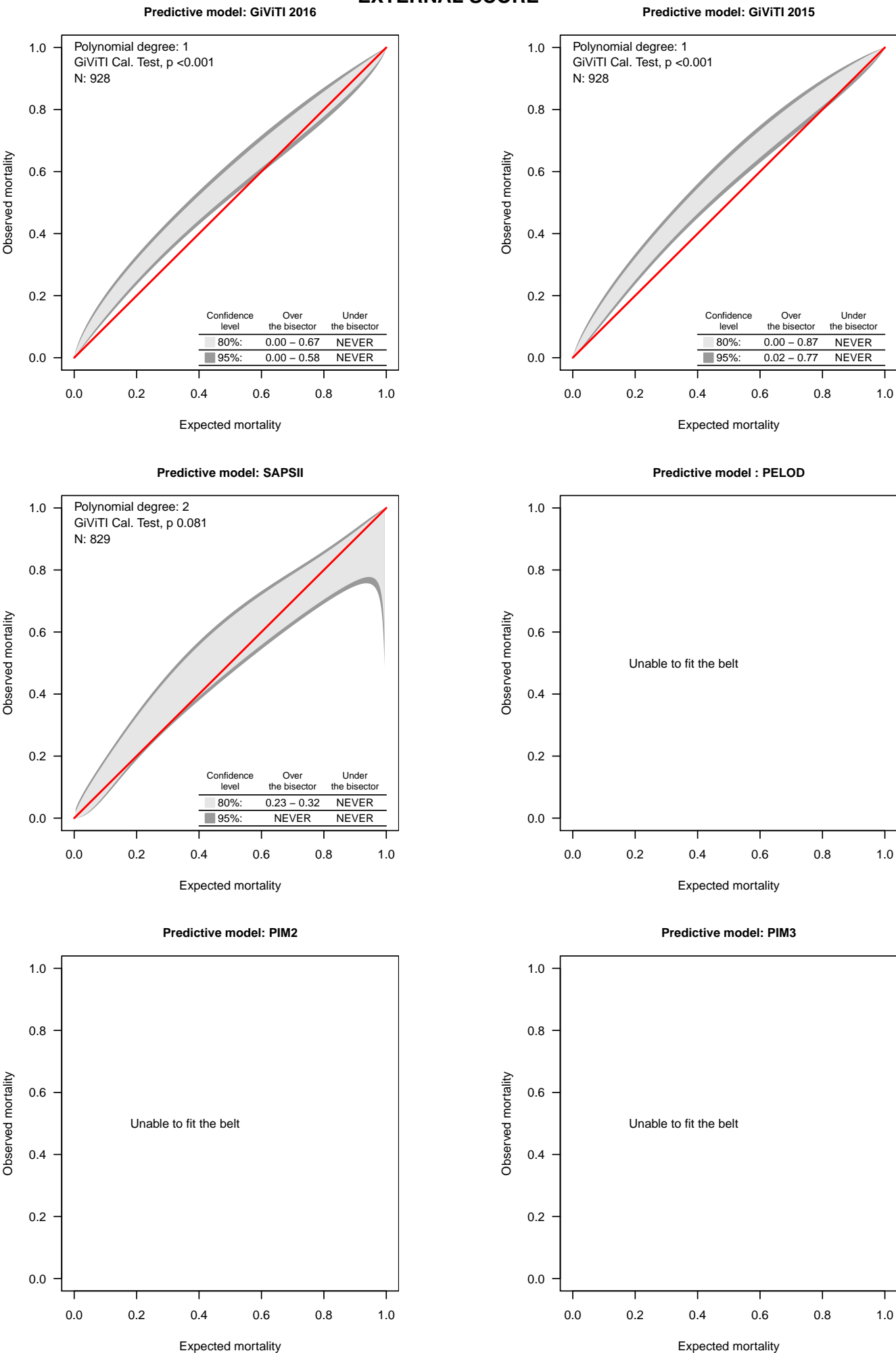
The calibration belt is designed to compare actually observed mortality with expected mortality according to a given prediction model. Expected mortality is plotted on the x axis while observed mortality is plotted on the y-axis. Two overlapping belts are presented in each graph: the first, in light 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 2016 data using PIM 2, PIM 3, PELOD, SAPSII, GiViTI 2015 and GiViTI 2016 prognostic models. For further informations please look at [PLoS ONE 6(2): e16110].

National report for general ICUs - Year 2016

Validity of the models - Calibration belts

EXTERNAL SCORE



Appendix

Coauthors

Stavroula Ilia (Heraklion), Anastasios Kioulpalis (Heraklion), Panagio Partala (Alexandroupolis), Paraskevi Tselioti (Pireus), Nektaria Xirouchaki (Heraklion), Epameinondas Zakynthinos (Larissa).