

GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

**Report
PROSAFE project**

Year 2017

National report for general ICUs (5 ICUs)

POLAND

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

May 2018

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The PROSAFE/CREACTIVE project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement No. 602714 and DGSANCO Contract No. 2007331. Stefano Finazzi has been supported by Fondazione CARIPLO through grant No. 2014-1962. GiViTI thanks Alifax, Bellco, MSD and Thermo Fisher for the unconditional grants.

Contents

The project	5
Data collection	5
The reports	6
Description of the statistics	6
Project participation	6
Description of the hospitals and ICUs	6
Study flow-chart	7
Description of patients	10
Statistics	15
Project participation	17
Description of hospitals	19
Description of ICUs	20
Study flow-chart	23
Description of adult patients	25
Description of adult patients evaluated in the GiViTI model	37
Description of adult non surgical patients evaluated in the GiViTI model	49
Description of adult elective surgical patients evaluated in the GiViTI model	61
Description of adult emergency surgical patients evaluated in the GiViTI model	73
Validity of the models	85
Appendix	87
Coauthors	89

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 2017 in Italy were:

- the Infections Surveillance Petal, designed to describe the epidemiology of infections in ICUs in Italy, focusing specifically on the identification and study of the main risk and prognostic factors for infections, with a view to comparing the various ICUs in terms of incidence of infections and their severity, prevalent bacterial flora and multiresistant germs;
- the Cardiosurgical Petal, whose aim is to describe in detail the characteristics of patients admitted to the ICU and subject to cardiosurgical procedures;
- the StART Petal, whose objective is to assess the appropriateness of ICU bed utilization by comparing the level of care required by admitted patients with the level of care that can be provided using available resources.
- the CReACTIVE (Collaborative REsearch on ACute Traumatic brain Injury in intensiVe care medicine in Europe) and CAF (Creactive Ambulatory Follow-up) Petals, that aim to collect relevant information to better characterize patients admitted to the ICU for a traumatic brain injury (european collaborative project FP7-HEALTH-2013-INNOVATION-1).
- the COMPACT 2 Petal, designed to randomize eligible patients and collect data for the clinical trial.
- the VIP 1 Petal, designed to collect data for the study.

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 317 ICUs collected data during 2017, 273 Italian and 44 foreign ICUs, for a total of 101720 patients registered in PROSAFE. Only the ICUs that collected valid data (234) 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 91576 patients admitted to intensive care during 2017.

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 234 ICUs which collected valid data in 2017 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 2017 and ICU stay days were used to calculate indicators of utilization, i.e. indicators able to measure utilization levels and healthcare facility activity levels.

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

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

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

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

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

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

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

Study flow-chart

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

The program envisages 5 status levels:

- status 1 - the patient record presents errors or unsolved warnings;

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

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

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

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

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

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

Centre XX000 - Year 2014

Data validity

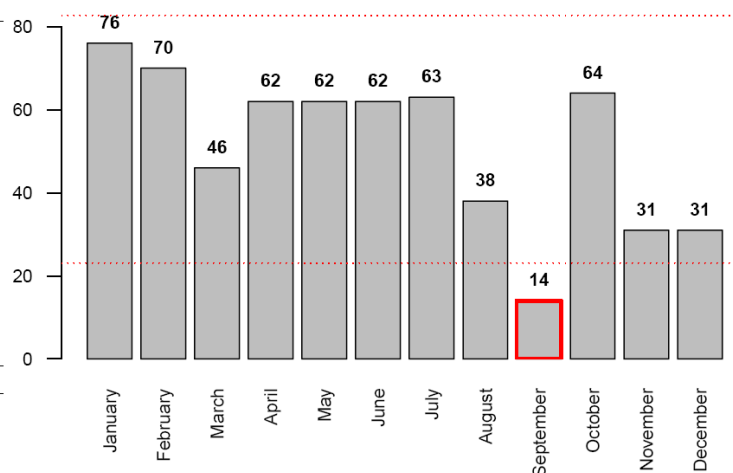
Patients admitted: 619

Admissions

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

Admissions

Mean	51.6
Median	62.0
SD	19.1
VC	37.1



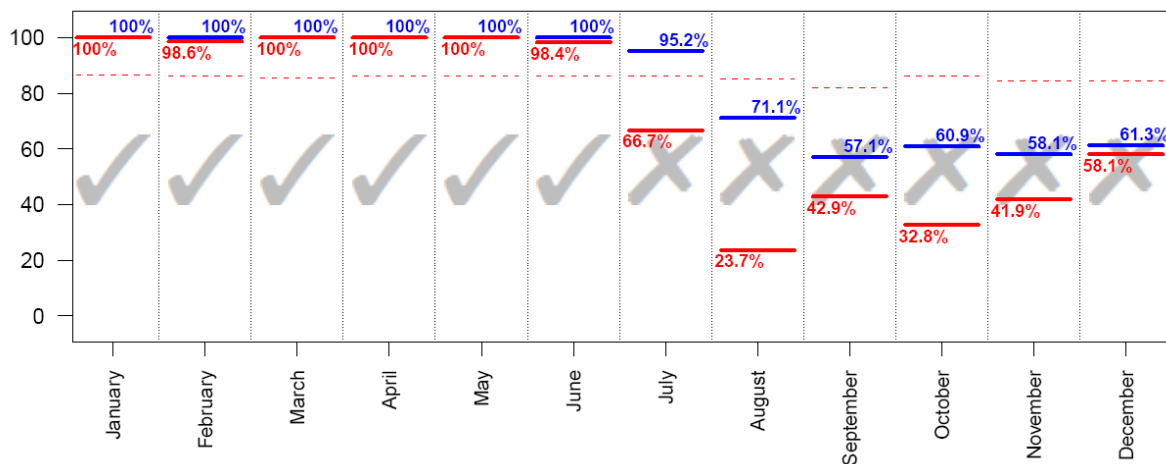
WARNING! The highlighted months have a number of patients quite different from the average. Please verify the correctness of the data and, particularly, that all consecutive patients have been registered in the Prosafe software.

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

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

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

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



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

Description of patients

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

where

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

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

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

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

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

NA

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

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

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

Incidence of VAP Two different incidence rates are presented:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Readmissions Only readmissions from other hospital wards are considered.

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

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

Patients	Model	Mortality
Adults non CS	GiViTI 2017	Last hospital mortality
Pediatric	PIM 2	ICU mortality
	PIM 3	ICU mortality
	PELOD	ICU mortality

Statistics

National report for general ICUs - Year 2017
Project participation*

Nation	TYPE										Total	
	General	Cardiosurgical	Surgical	Neurosurgical	Pediatrics	HDC	Other					
 Cyprus	1 ICU 655 patients											1 ICU 655 patients
 Greece	4 ICUs 1092 patients											4 ICUs 1092 patients
 Hungary	2 ICUs 942 patients			1 ICU 388 patients								3 ICUs 1330 patients
 Israel					2 ICUs 1291 patients							2 ICUs 1291 patients
 Italy	153 ICUs 53756 patients	20 ICUs 11411 patients	11 ICUs 7245 patients	10 ICUs 4024 patients	4 ICUs 1305 patients	5 ICUs 2332 patients	9 ICUs 3474 patients					212 ICUs 83547 patients
 Poland	5 ICUs 1091 patients				1 ICU 202 patients							6 ICUs 1293 patients
 Slovenia			5 ICUs 1862 patients								1 ICU 506 patients	6 ICUs 2368 patients
Total	165 ICUs 57536 patients	20 ICUs 11411 patients	16 ICUs 9107 patients	11 ICUs 4412 patients	7 ICUs 2798 patients	5 ICUs 2332 patients	10 ICUs 3980 patients					234 ICUs 91576 patients

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

Description of hospitals (N=5) - Year 2017

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

Type of ICUs present in hospital	N	%
General	5	100.0
Medical	1	20.0
Surgical	2	40.0
Neurological/neurosurgical	2	40.0
Cardiosurgical	1	20.0
Burns	1	20.0
Post-transplantations	1	20.0
Other	2	40.0

Type of subICUs present in hospital	N	%
General	2	40.0
Surgical	2	40.0
Cardiological	4	80.0
Respiratory	2	40.0
Neurological (stroke unit)	4	80.0
Other	2	40.0

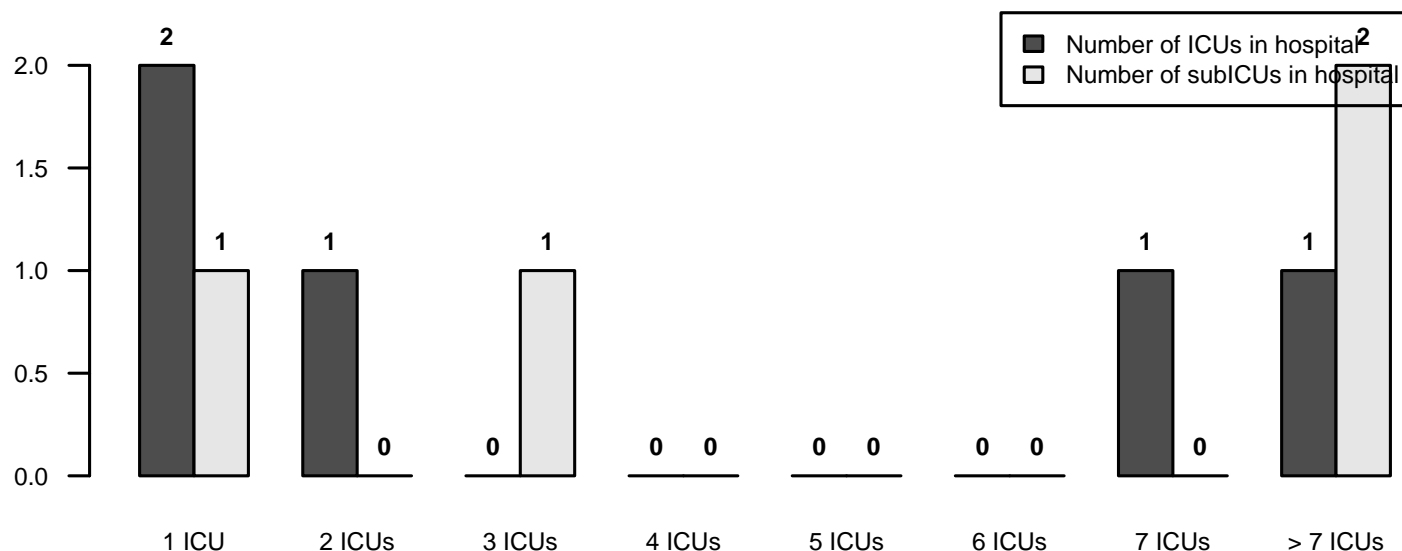
Non surgical specialties	N	%
Cardiology	3	60.0
Pulmonology	3	60.0
Nephrology	2	40.0
Infection disease	1	20.0
Pediatric	4	80.0
Neonatology	5	100.0
Neurology	3	60.0
Haematology	0	0.0
Emergency room	4	80.0
Traumatology	4	80.0
Emergency medical	4	80.0

Surgical specialties (independent ward)	N	%
Neurosurgery	1	20.0
Cardiosurgery	0	0.0
Major vascular surgery	1	20.0
Thoracic surgery	0	0.0
Pediatric surgery	1	20.0
Transplantation activities	0	0.0

Surgical specialties (procedures only)	N	%
Neurosurgery	2	40.0
Cardiosurgery	0	0.0
Major vascular surgery	1	20.0
Thoracic surgery	2	40.0
Pediatric surgery	1	20.0
Transplantation activities	4	80.0

Services/activities available in H (h24)	N	%
Neuroradiology	1	20.0
Interventional neuroradiology	1	20.0
Interventional vascular radiology	1	20.0
CT scan	4	80.0
MRI	4	80.0
Interventional hemodynamic	2	40.0
Endoscopy	4	80.0
Bronchoscopy	3	60.0
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	1	20.0
Hyperbaric chamber	0	0.0



Description of ICUs (N=5) - Year 2017

Number of activable beds		
Mean (SD)	7.4	(3.7)
Median (Q1–Q3)	7.2	(4.4–10.2)
Missing	1	

Number of beds declared to hospital		
Mean (SD)	8.7	(3.2)
Median (Q1–Q3)	9.8	(8.2–10.2)
Missing	1	

University affiliation	N	%
Yes	1	20.0
No	4	80.0
Missing	0	

Square meter per bed		
Mean (SD)	13.9	(7.4)
Median (Q1–Q3)	18	(9.5–19)
Missing	0	

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

ICU Structure	N	%
NON OPEN-SPACE	2	40.0
OPEN-SPACE (or alike)	3	60.0
Missing	0	

Physicians	N	%
Dedicated to ICU only	0	0.0
Dedicated to ICU on a rotation basis	1	25.0
Dedicated to ICU only and on a rotation basis	3	75.0
Missing	1	

Declared beds per physician (average)		
Mean (SD)	3.7	(3.1)
Median (Q1–Q3)	2.6	(2.1–4.3)
Missing	1	

Nurses	N	%
Dedicated to ICU only	0	0.0
Dedicated to ICU on a rotation basis	1	25.0
Dedicated to ICU only and on a rotation basis	3	75.0
Missing	1	

Declared beds per nurse (average)		
Mean (SD)	2.1	(0.5)
Median (Q1–Q3)	1.8	(1.8–2.2)
Missing	2	

Number of hours conceded for relatives' visits	N	%
1	1	20.0
2	1	20.0
3-4	1	20.0
5-12	2	40.0
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)	1.0	0.9–1.1	55.8
Advanced ICU monitors	1.0	0.8–1.1	56.2
Invasive monitoring of cardiac output (Swan-Ganz)	0.2	0.0–0.5	0.0
Invasive monitoring of cardiac output (PICCO)	0.2	0.0–0.3	50.0
Invasive monitoring of cardiac output (Vigileo)	0.0	0.0–0.1	100.0
Non-invasive monitoring of cardiac output (impedentiometry)	0.1	0.1–0.1	33.3
Defibrillators	0.4	0.2–0.6	43.0
Both invasive and non invasive ventilators	1.3	1.0–1.6	54.2
Invasive ventilators	1.2	0.8–1.5	72.2
Non invasive ventilators	0.0	0.0–0.0	100.0
Syringe pumps	4.9	4.3–5.8	45.8
Peristaltic pumps	0.8	0.6–1.7	41.7

Biomedical equipment in ICU	N	%
Transoesophageal echo	0	0.0
Basic ultrasounds	5	100.0
Advanced ultrasounds	2	40.0
Blood-gas analyzer	5	100.0
Haemodialysis - Haemofiltration	5	100.0
Transport ventilator	4	80.0
Fiberscope	5	100.0
Extracorporeal circulation system	0	0.0

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

Description of ICUs (N=5) - Year 2017

Patients admitted

Mean (SD)	219.4 (148.6)
Median	175.5
Q1–Q3	91–362
Missing	0

Occupancy rate (%)

Mean (SD)	65.8 (19.3)
Median	57.8
Q1–Q3	54.2–69.3
Missing	1

Rotation index (patients/bed)

Mean (SD)	27.4 (10.3)
Median	26.1
Q1–Q3	19.1–34.4
Missing	1

Turnover (hours)

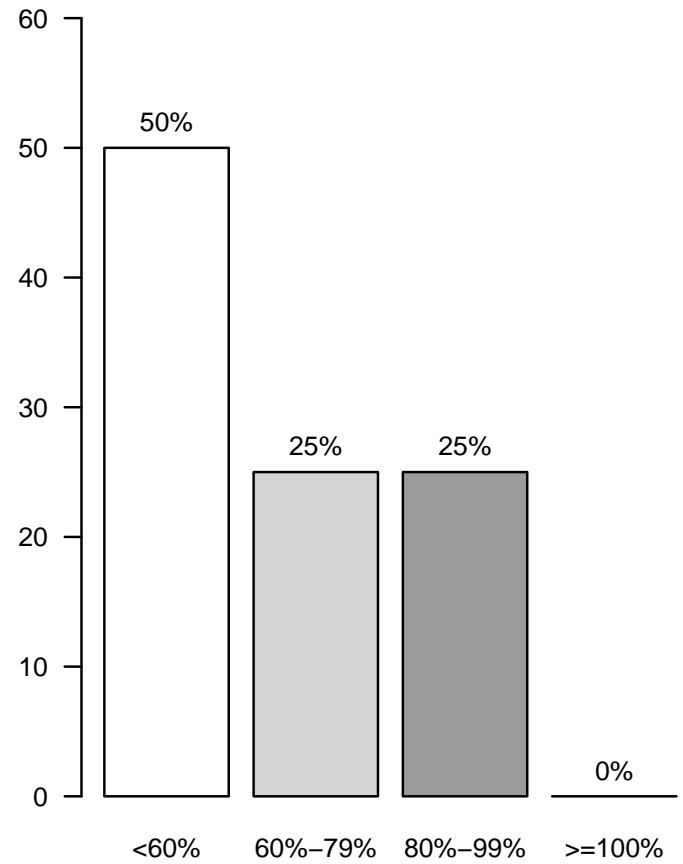
Mean (SD)	130.5 (87.5)
Median	148
Q1–Q3	94.4–184.1
Missing	1

Occupied beds per physician (average)

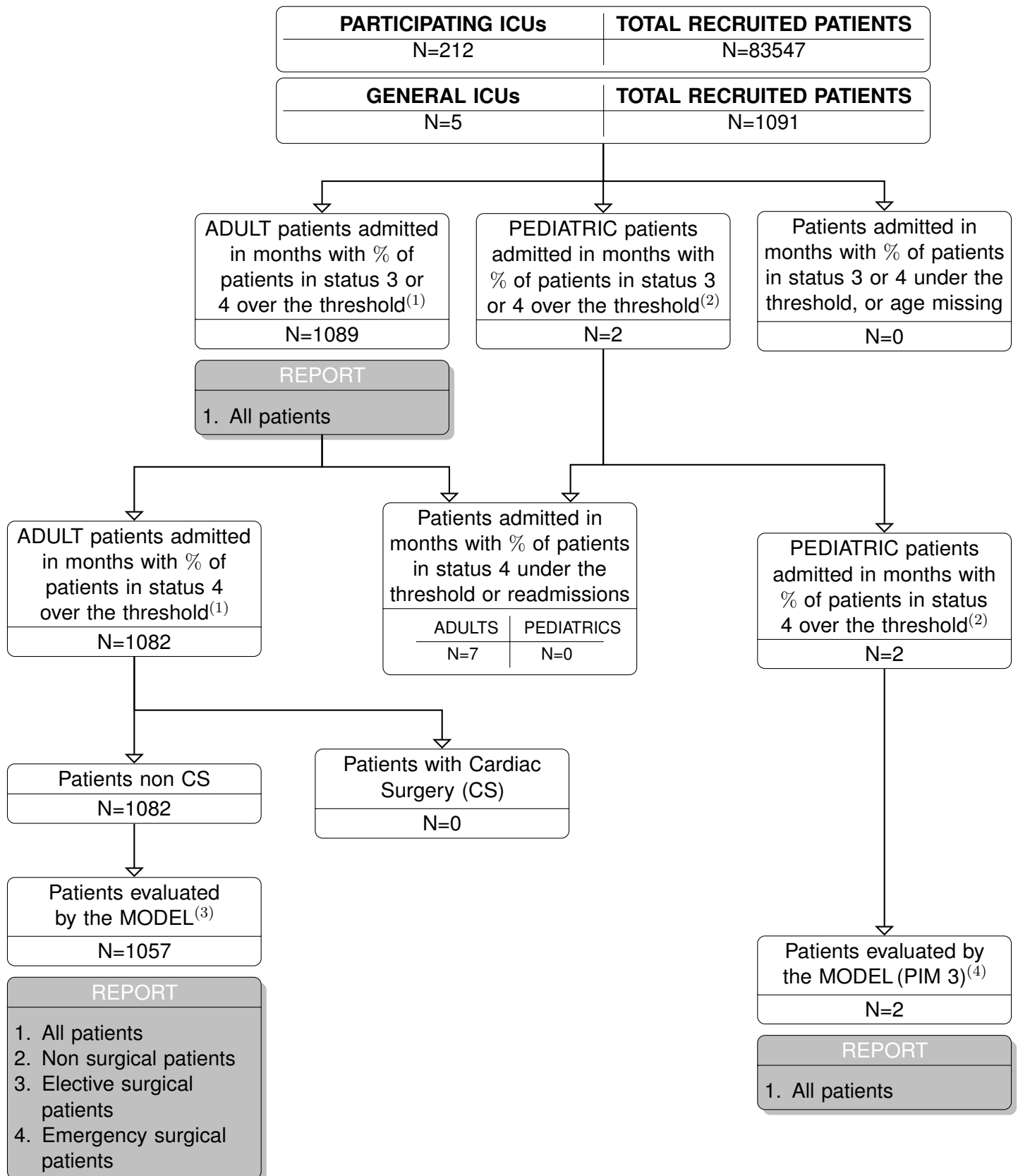
Mean (SD)	2.3 (1.5)
Median	1.9
Q1–Q3	1.4–2.7
Missing	1

Occupied beds per nurse (average)

Mean (SD)	1.4 (0.3)
Median	1.4
Q1–Q3	1.2–1.6
Missing	2

Occupancy rate (%)

National report for general ICUs (5 ICUs) - Year 2017
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 2017
Characteristics on admission - Adult patients

Patients (N): 1089

Sex	N	%
Male	608	55.8
Female	481	44.2
Missing	0	

Age (years)	N	%
17-45	153	14.0
46-65	371	34.1
66-75	256	23.5
>75	309	28.4
Missing	0	
Mean	64.3	
SD	16.3	
Median	66	
Q1–Q3	55–77	
Min–Max	17–100	

Body mass Index (BMI)	N	%
Underweight	47	4.4
Normal	433	40.1
Overweight	330	30.6
Obese	269	24.9
Missing	10	

Pregnancy status	N	%
Females (N=481)		
Not fertile	217	45.2
Not pregnant/Unknown	251	52.3
Currently pregnant	3	0.6
Post partum	9	1.9
Missing	1	

Comorbidities	N	%
No	158	14.6
Yes	927	85.4
Missing	4	

Comorbidities (top 10)	N	%
Hypertension	585	53.9
NYHA class II-III	324	29.9
Arrhythmia	264	24.3
Diabetes Type II with insulin treatment	163	15.0
Myocardial infarction	141	13.0
Alcohol addiction	131	12.1
Moderate COPD	104	9.6
Diabetes Type II without insulin tr.	102	9.4
Cerebrovascular disease	90	8.3
Peripheral vascular disease	90	8.3
Missing	4	

Stay before ICU (days)		
Mean	4.5	
SD	9.9	
Median	1	
Q1–Q3	0–5	
Missing	6	

Source of admission	N	%
Same hospital	883	81.4
Other hospital	202	18.6
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	4	

Ward of admission	N	%
Hospital (N=1085)		
Medical ward	299	27.6
Surgical ward	513	47.3
Emergency room	252	23.2
Other ICU	16	1.5
High dependency care unit	5	0.5
Missing	0	

Reason for transfer from	N	%
Other ICU (N=16)		
Specialist expertise	11	68.8
Step-up care	0	0.0
Logistical/organizational reasons	3	18.8
Step-down care	2	12.5
Missing	0	

Ward of admission	N	%
Same hospital (N=883)		
Medical ward	197	22.3
Surgical ward	465	52.7
Emergency room	219	24.8
Other ICU	0	0.0
High dependency care unit	2	0.2
Missing	0	

Ward of admission	N	%
Other hospital (N=202)		
Medical ward	102	50.5
Surgical ward	48	23.8
Emergency room	33	16.3
Other ICU	16	7.9
High dependency care unit	3	1.5
Missing	0	

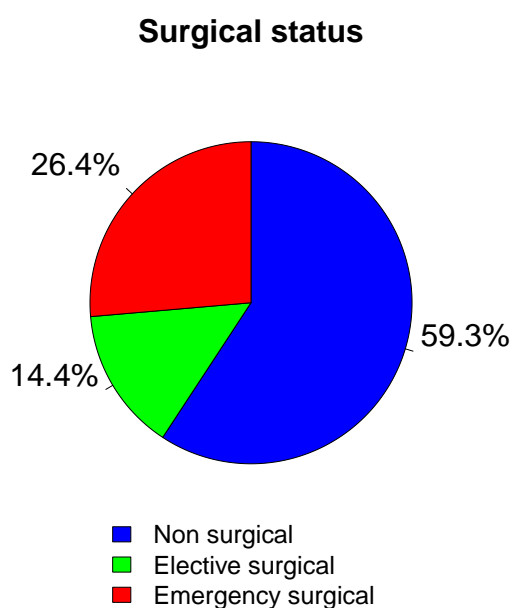
Scheduled admission	N	%
No	968	89.2
Yes	117	10.8
Missing	4	

National report for general ICUs - Year 2017

Characteristics on admission - Adult patients

Trauma	N	%
No	963	88.8
Yes	122	11.2
Multiple trauma	21	1.9
Missing	4	

Surgical status	N	%
Non surgical	643	59.3
Elective surgical	156	14.4
Emergency surgical	286	26.4
Missing	4	



Source of admission	N	%
Surgical pt. (N=442)		
Operating theatre of surgical ward	350	79.2
Operating theatre of emergency room	5	1.1
Surgical ward	53	12.0
Other	34	7.7
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=156)		
Gastrointestinal surgery	44	28.2
Gynaecological surgery	36	23.1
Pancreatic surgery	21	13.5
Neurosurgery	18	11.5
Orthopaedic surgery	13	8.3
Biliary tract surgery	9	5.8
Esophageal surgery	6	3.8
Nephro/Urological surgery	5	3.2
Organ donation	3	1.9
Other surgery	3	1.9
Missing	0	

Timing	N	%
Elective surgical (N=156)		
From -7 to -3 days	4	2.6
From -2 to -1 days	5	3.2
On ICU admission day	152	97.4
The day after ICU admission	3	1.9
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=286)		
Gastrointestinal surgery	141	49.3
Neurosurgery	67	23.4
Other surgery	23	8.0
Orthopaedic surgery	16	5.6
Biliary tract surgery	11	3.8
Gynaecological surgery	8	2.8
Pancreatic surgery	7	2.4
Obstetric surgery	6	2.1
Abdominal vascular surgery	6	2.1
Splenectomy	4	1.4
Missing	0	

Timing	N	%
Emergency surgical (N=286)		
From -7 to -3 days	20	7.0
From -2 to -1 days	35	12.2
On ICU admission day	233	81.5
The day after ICU admission	15	5.2
Missing	0	

Non surgical interventions	N	%
None	970	89.4
Elective	30	2.8
Emergency	85	7.8
Missing	4	

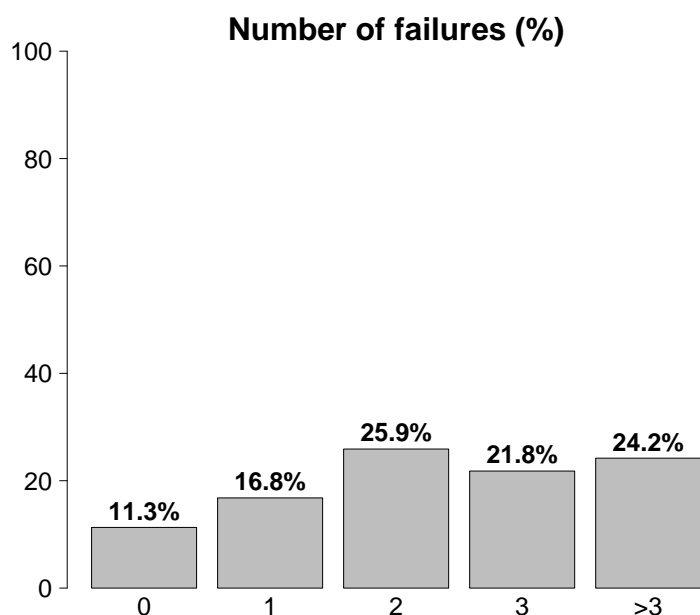
Non surgical interventions	N	%
Elective (N=30)		
Interventional neuroradiology	21	70.0
Interventional endoscopy	7	23.3
Interventional cardiology	1	3.3
Interventional radiology	0	0.0
Missing	1	

Non surgical interventions	N	%
Emergency (N=85)		
Interventional endoscopy	33	38.8
Interventional cardiology	28	32.9
Interventional neuroradiology	21	24.7
Interventional radiology	1	1.2
Missing	2	

National report for general ICUs - Year 2017

Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	136	12.5
Post surgical weaning	56	5.2
Surgical monitoring	19	1.8
Post interventional weaning	4	0.4
Interventional monitoring	19	1.8
Non surgical monitoring	36	3.3
Missing	2	
Admission for procedures/treatments	0	0.0
Intensive Treatment	938	86.5
Only ventilatory support	280	25.8
Only cardiovascular support	46	4.2
Ventilatory and cardiovascular support	612	56.4
Missing	0	
Palliative Sedation	8	0.7
Diagnosis of death/Organ donation	3	0.3
Missing	4	



Failures on admission	N	%
No	123	11.3
Yes	966	88.7
A: Respiratory failure	892	81.9
B: Cardiovascular failure	658	60.4
C: Neurological failure	275	25.3
D: Hepatic failure	28	2.6
E: Renal failure	334	30.7
F: Acute skin failure	1	0.1
G: Metabolic failure	400	36.7
H: Coagulation failure	15	1.4
Missing	0	

Failures on admission (top 10)	N	%
AB	189	17.4
A	151	13.9
ABEG	105	9.6
ABC	75	6.9
ABCEG	63	5.8
ABG	60	5.5
ABCG	44	4.0
ABE	39	3.6
AC	32	2.9
AEG	24	2.2
Missing	0	

Respiratory failure	N	%
None	197	18.1
Only hypoxic failure	644	59.1
Only hypercapnic failure	27	2.5
Hypoxic-hypercapnic failure	54	5.0
Intubation for airway maint.	167	15.3
Missing	0	

Cardiovascular failure	N	%
None	431	39.6
Without shock	312	28.7
Cardiogenic shock	78	7.2
Septic shock	141	12.9
Haemorrhagic/hypovolemic shock	58	5.3
Hypovolemic shock	17	1.6
Anaphylactic shock	2	0.2
Neurogenic shock	16	1.5
Other shock	30	2.8
Mixed shock	4	0.4
Missing	0	

Neurologic failure	N	%
None	348	55.9
Cerebral coma	107	17.2
Metabolic coma	44	7.1
Postanoxic coma	113	18.1
Toxic coma	11	1.8
Missing or not evaluable	466	

Renal failure (AKIN)	N	%
None	751	69.2
Mild	126	11.6
Moderate	83	7.6
Severe	125	11.5
Missing	4	

Metabolic failure	N	%
None	685	63.1
pH \leq 7.3, PaCO ₂ < 45 mmHg	143	13.2
Base deficit \geq 5 mmol/L, lactate > 1.5x	257	23.7
Missing	4	

National report for general ICUs - Year 2017

Characteristics on admission - Adult patients

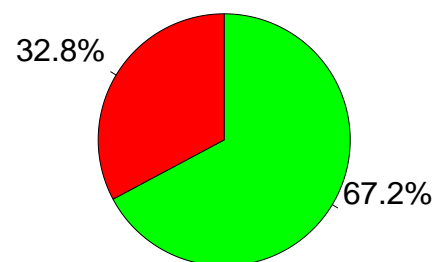
Clinical conditions on admission	N	%
Respiratory	197	18.2
Acute exacerbation of COPD	63	5.8
Aspiration pneumonia	54	5.0
Pneumothorax/Pneumomediastinum	21	1.9
Pleural effusion	19	1.8
Upper respiratory tract disease	17	1.6
Cardiovascular	292	26.9
Cardiac arrest	124	11.4
Left heart failure without pulm. edema	108	10.0
Left heart failure with pulmonary edema	51	4.7
Acute ischaemia	27	2.5
Acute severe arrhythmia: tachycardias	16	1.5
Neurological	219	20.2
Cerebral Aneurysm	48	4.4
Intracranial hypertension	45	4.1
Seizures	36	3.3
Spontaneous Subarachnoid haemorrhage	33	3.0
Cerebral artery stroke	30	2.8
Gastrointestinal and hepatic	243	22.4
Intestinal occlusion	37	3.4
Gastrointestinal bleeding: upper tract	32	2.9
Gastrointestinal perforation	29	2.7
Digestive tract malignancy	28	2.6
Pancreatic malignancy	24	2.2
Trauma (anatomical districts)	122	11.2
Head	79	7.3
Pelvis/bone/joint & muscle	24	2.2
Chest	23	2.1
Spine	15	1.4
Abdomen	9	0.8
Major vessels injury	1	0.1
-	0	0.0
Other	164	15.1
Gynaecological disease	43	4.0
Metabolic disorder	24	2.2
Acute intoxication	24	2.2
Nephrourologic disease	20	1.8
Coagulation disorder	15	1.4
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	452	41.7
Pneumonia	218	20.1
NON-surgical urinary tract infection	46	4.2
NON-surgical secondary peritonitis	40	3.7
Post-surgical peritonitis	38	3.5
L.R.T.I. other than pneumonia	23	2.1
Primary peritonitis	21	1.9
Cholecystitis/cholangitis	16	1.5
NON-surgical skin/soft tissue infection	12	1.1
Post-surgical skin/soft tissue infection	11	1.0
Gastroenteritis	10	0.9
Missing	4	

Trauma (anatomical districts)	N	%
Head	79	7.3
Traumatic Subdural haematoma	41	3.8
Extradural/epidural haematoma	23	2.1
Traumatic intraparenchymal bleeding	15	1.4
Skull fracture	15	1.4
Cerebral contusion/laceration	13	1.2
Spine	15	1.4
Vertebral fracture, without deficit	7	0.6
Tetraplegia	4	0.4
Cervical injury, incomplete deficit	3	0.3
Chest	23	2.1
Other injuries of the chest	12	1.1
Traum. haemothorax/pneumothorax	9	0.8
Severe lung contusion/laceration	5	0.5
Abdomen	9	0.8
Bowel transection/perforation	2	0.2
Liver: Moderate-Severe laceration	2	0.2
Liver: Massive laceration	2	0.2
Pelvis/bone/joint & muscle	24	2.2
Long bone fracture	22	2.0
Multiple fracture of the pelvis	1	0.1
Very severe or open fracture of the pelvis	1	0.1
Major vessels injury	1	0.1
Major thoracic vessels: transection	1	0.1
-	0	0.0
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	4	

Infection severity on admission	N	%
None	633	58.6
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPTIC SHOCK	301	27.8
SEPTIC SHOCK	147	13.6
Missing	8	

Infection severity on admission

Patients infected (N=448)

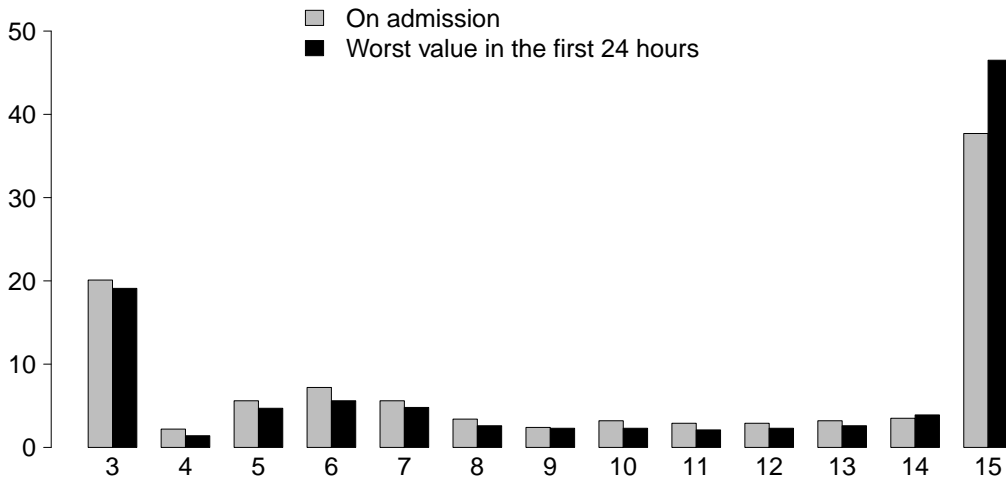


■ INFECTION WITHOUT SEPSIS/SEPTIC SHOCK
■ SEPTIC SHOCK

National report for general ICUs - Year 2017

Severity scores - Adult patients

Glasgow Coma Scale (%)



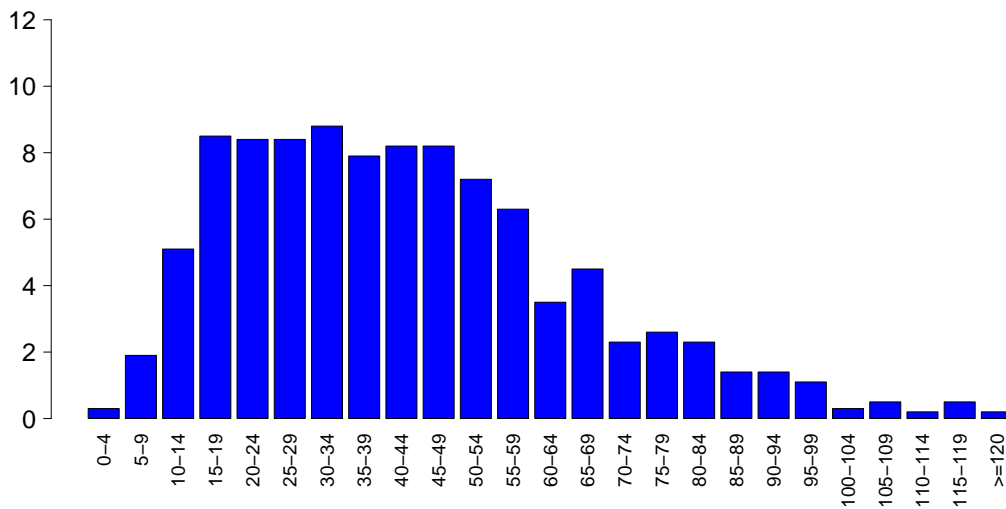
GCS (admission)

Median	11
Q1–Q3	5–15
Not evaluable	462
Missing	4

GCS (first 24 hours)

Median	14
Q1–Q3	5–15
Not evaluable	463
Missing	4

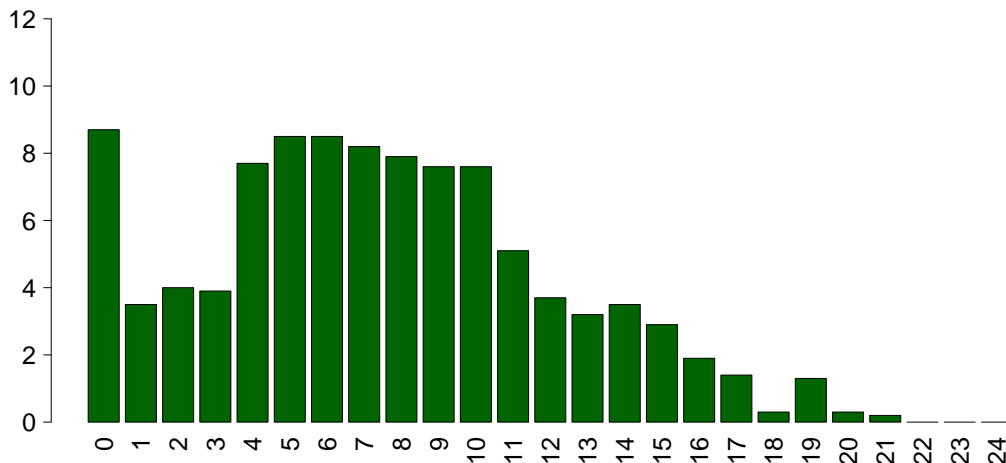
SAPS II (%)



SAPSII

Mean	42.8
SD	22.8
Median	40
Q1–Q3	25–56
Not evaluable	463
Missing	-459

SOFA (%)



SOFA

Mean	7.4
SD	4.7
Median	7
Q1–Q3	4–10
Not evaluable	463
Missing	-459

National report for general ICUs - Year 2017
Characteristics during the stay - Adult patients

Complications during the stay	N	%
No	526	48.5
Yes	559	51.5
Missing	4	

Failures during the stay	N	%
No	958	88.0
Yes	131	12.0
A: Respiratory failure	53	4.9
B: Cardiovascular failure	50	4.6
C: Neurological failure	5	0.5
D: Hepatic failure	14	1.3
E: Renal failure (AKIN)	54	5.0
F: Acute skin failure	0	0.0
G: Metabolic failure	1	0.1
H: Coagulation failure	1	0.1
Missing	0	

Failures during the stay (top 10)	N	%
E	33	3.0
A	24	2.2
B	24	2.2
AB	15	1.4
D	11	1.0
BE	6	0.6
ABE	5	0.5
AE	5	0.5
AC	1	0.1
ACE	1	0.1
Missing	0	

Respiratory failure occurred	N	%
None	1032	95.1
Intubation for airway maint.	4	0.4
Hypoxic failure	45	4.1
Hypercapnic failure	8	0.7
Missing	4	

Cardiovascular failure occurred	N	%
None	1035	95.4
Cardiogenic shock	2	0.2
Hypovolemic shock	22	2.0
Haemorrhagic/hypovolemic shock	4	0.4
Septic shock	14	1.3
Anaphylactic shock	0	0.0
Neurogenic shock	7	0.6
Other shock	2	0.2
Missing	4	

Neurological failure occurred	N	%
None	1080	99.5
Cerebral coma	4	0.4
Metabolic coma	1	0.1
Postanoxic coma	0	0.0
Missing	4	

Renal failure occurred (AKIN)	N	%
None	1031	95.0
Mild	2	0.2
Moderate	5	0.5
Severe	47	4.3
Missing	4	

Complications during the stay	N	%
Respiratory	64	5.9
Pneumothorax/Pneumomediastinum	27	2.5
Pleural effusion	11	1.0
Acute asthma/bronchospasm	8	0.7
Pulmonary embolism	7	0.6
Upper resp. tract disease	4	0.4
Cardiovascular	197	18.2
Left heart failure w/o pulm. edema	98	9.0
Cardiac arrest	66	6.1
Acute severe arrhythmia: tachycardias	23	2.1
Pulmonary edema	11	1.0
Acute ischaemia	10	0.9
Neurological	179	16.5
Intracranial hypertension	88	8.1
Brain edema	64	5.9
Drowsiness/agitation/delirium	50	4.6
Seizures	22	2.0
New ischaemic stroke	12	1.1
Gastrointestinal and hepatic	63	5.8
Gastrointestinal bleeding: upper tract	15	1.4
Liver Dysfunction Syndrome	10	0.9
Bowel ischaemia	7	0.6
Gastrointestinal bleeding: lower tract	7	0.6
Intrabdominal bleeding	6	0.6
Other	43	4.0
Nephrourologic disease	15	1.4
Category/Stage II: Partial Thickness Skin Loss	8	0.7
Category/Stage III: Full Thickness Skin Loss	8	0.7
Other skin and/or soft tissue pathology	6	0.6
Iatrogenic major vessels injury	3	0.3
Category/Stage I: Nonblanchable Erythema	2	0.2
Metabolic disorder	1	0.1
Infections	218	20.1
Pneumonia	67	6.2
L.R.T.I. other than pneumonia	63	5.8
NON-surgical urinary tract infection	43	4.0
Post-surgical peritonitis	28	2.6
Upper respiratory tract infection	11	1.0
Post-surgical urinary tract infection	9	0.8
Post-surgical skin/soft tissue infection	8	0.7
Gastroenteritis	7	0.6
Sinusitis	7	0.6
Post-surgical CNS infection	6	0.6
Missing	4	

National report for general ICUs - Year 2017
Characteristics during the stay - Adult patients

Infections	N	%
None	480	44.2
Only on admission	387	35.7
On admission and during ICU stay	65	6.0
Only during ICU stay	153	14.1
Missing	4	

Maximum severity of infection	N	%
None	480	44.4
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	443	41.0
SEPTIC SHOCK	158	14.6
Missing	8	

Severity evolution

		N (R %)	During the stay				TOT
			None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	
Admission	None	480 (75.8%)	0 (0.0%)	147 (23.2%)	6 (0.9%)	633	
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0	
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	296 (98.3%)	5 (1.7%)	301	
	SEPTIC SHOCK	-	-	-	147 (100.0%)	147	
	TOT	480	0	443	158	1081	

Ventil. Associat. Pneumonia (VAP)	N	%
No	1030	94.6
Yes	59	5.4
Missing	0	

Incidence of VAP

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

Estimate	11.1
CI (95%)	8.4–14.3

Incidence of VAP

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

Estimate	8.9%
CI (95%)	6.8–11.4

Catheter Bacteraemia (CR-BSI)	N	%
No	1085	100.0
Yes	0	0.0
Missing	4	

Incidence of CR-BSI

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

Estimate	0.0
CI (95%)	0.0–0.5

Incidence of CR-BSI

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

Estimate	0.0%
CI (95%)	0.0–0.6

National report for general ICUs - Year 2017
Process indicators - Adult patients

Procedures and/or treatments (Missing=4) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3	
	1068	98.4								Missing	
Invasive ventilation	956	88.1	706	65.1	219	20.2	3	1-7	0	0-0	0
Non invasive ventilation	75	6.9	5	0.5	9	0.8	1	1-3	0	0-2	0
Tracheostomy	149	13.7	13	1.2	95	8.8	12	5-27	0	5-11	0
iNO (inhaled nitric oxide)	0	0.0									
Central Venous Catheter PICC	891 0	82.1 0.0	418 0	38.5	350	32.3	5	2-10	0	0-0	0
Arterial Catheter	1009	93.0	322	29.7	289	26.6	4	2-10	0	0-0	0
Vasoactive drugs	841	77.5	517	47.6	177	16.3	3	1-7	0	0-0	0
Antiarrhythmics	160	14.7	27	2.5	15	1.4	3	1-5	0	0-1	0
IABP	3	0.3	2	0.2	0	0	1	0-2	0	4-4	0
Invasive monitoring of C.O.	390	35.9	66	6.1	53	4.9	4	2-9	0	0-0	0
Continuous monitoring of ScVO2	1	0.1	1	0.1	1	0.1	32	32-32	0	0-0	0
Temporary pacing	4	0.4	3	0.3	2	0.2	2	0-4	0	0-0	0
Ventricular assistance	0	0.0									
DC-shock	23	2.1								1	0-2
CPR	76	7.0								0	0-4
Massive blood transfusion	31	2.9								0	0-0
ICP monitoring without CSF drainage	0	0.0									
ICP monitoring with CSF drainage	0	0.0									
External ventricular drainage without ICP	0	0.0									
Haemofiltration	62	5.7	8	0.7	6	0.6	4	2-8	0	1	0-2
Haemodialysis	74	6.8	12	1.1	9	0.8	3	2-5	0	1	0-3
ECMO	0	0.0									
Hepatic clearance techniques	0	0.0									
Clearance techniques during sepsis	2	0.2	1	0.1	1	0.1	2	2-2	0	59	59-59
IAP (intra-abdominal pressure)	0	0.0									
Hypothermia	1	0.1	0	0	0	0	1	1-1	0	0	0
Enteral nutrition	566	52.2	124	11.4	212	19.5	6	3-11	0	1	0-1
Parenteral nutrition	470	43.3	98	9	164	15.1	4	2-8	0	1	0-1
SDD (Topical, Topical and systemic)	139	12.8									
Patient restraint	1	0.1									
Peridural catheter	3	0.3	1	0.1	2	0.2	2	2-8	0	0	0-0
Electrical cardioversion	26	2.4								0	0-1
Vacuum therapy	1	0.1									
Antibiotics	798	73.5									
Antibiotic prophylaxis	249	22.9	142	13.1	103	9.5	3	1-5	0	0	0-0
Empirical antibiotic therapy	495	45.6	147	13.5	69	6.4	3	2-4	0	0	0-1
Targeted antibiotic therapy	310	28.6	36	3.3	108	10	6	4-12	0	3	2-5

National report for general ICUs - Year 2017

Process indicators - Adult patients

Invasive ventilation (N=956)	N	%	Length (days)				
			Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	706	73.8	7.1	10.8	3	1–8	0
For airway maintenance	164	17.1	6.5	9.8	3	1–7	0
In weaning	63	6.6	0.1	0.3	0	0–0	0
Not evaluable	24	2.5	1.6	2.3	1	0–2	0
Reintubation within 48 hours	6	0.6	7.3	11.1	3	2.25–3.75	0

Non invasive ventilation (N=75)	N	%	Number of surgical interventions			N	%
Non invasive ventilation only	37	49.3	0	1010	93.1		
Non invasive ventilation failed	6	8.0	1	59	5.4		
For weaning	29	38.7	2	7	0.6		
Other	3	4.0	3	5	0.5		
Missing	0		>3	4	0.4		
			Missing	4			

Tracheostomy not present on admission (N=136)	N	%	Surgical interventions			Mean	%
Surgical	46	33.8	Days from admission			9.2	
Percutwist	0	0.0				SD	8.9
Ciaglia	0	0.0				Median	6
Monodil. Ciaglia	0	0.0				Q1–Q3	3–11.2
Fantoni	0	0.0				Missing	3
Griggs	84	61.8					
Other Kind	1	0.7					
Unknown	5	3.7					
Missing	0						

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=135)	Mean	SD	Median	Q1–Q3	Missing
	8.4	5.8	7	5–11	0

Invasive monitoring of C.O. (N=390)	N	%	Surgical interventions (top 10)			N	%
Swan Ganz	1	0.3	Gastrointestinal surgery	33	3.0		
PICCO	54	13.8	Neurosurgery	19	1.8		
LIDCO	248	63.6	Organ donation	16	1.5		
Vigileo-PRAM	31	7.9	Other surgery	14	1.3		
Other	56	14.4	Pancreatic surgery	10	0.9		
Missing	0		Splenectomy	4	0.4		
			Nephro/Urological surgery	3	0.3		
			Orthopaedic surgery	3	0.3		
			Biliary tract surgery	2	0.2		
			Hepatic surgery	1	0.1		
			Missing	4			

SDD (N=139)	N	%	Non surgical interventions			N	%
Topical	70	50.4	Days from admission <td></td> <td></td>				
Topical and systemic	69	49.6	Mean			14.0	
Missing	0		SD			14.0	
			Median			10.5	
			Q1–Q3			5–18	
			Missing			2	

Antibiotic therapy	N	%	Non surgical interventions			N	%
Pt. infected in ICU only (N=153)			Days from admission <td></td> <td></td>				
Only empirical	36	24.5	Mean			14.0	
Only targeted	29	19.7	SD			14.0	
Targeted after empirical	80	54.4	Median			10.5	
Other	2	1.4	Q1–Q3			5–18	
Missing	6		Missing			2	

Surgical interventions	N	%	Non surgical interventions			N	%
No	1010	93.1	Interventional endoscopy			46	4.2
Yes	75	6.9	Interventional radiology			2	0.2
Missing	4		Interventional cardiology			2	0.2
			Interventional neuroradiology			2	0.2
			Missing			4	

National report for general ICUs - Year 2017

Outcome indicators - Adult patients

ICU outcome	N	%
Dead	430	40.1
Transferred to same hospital	468	43.7
Transferred to other hospital	126	11.8
Discharged home	47	4.4
Disch. terminally ill	0	0.0
Missing	18	

Transferred to (N=594)	N	%
Ward	580	97.6
Other ICU	10	1.7
High dependency care unit	4	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=10)	N	%
Specialist expertise	2	20.0
Step-up care	5	50.0
Logistical/organizational reasons	1	10.0
Step-down care	2	20.0
Missing	0	

Transferred to Same hospital (N=468)	N	%
Ward	465	99.4
Other ICU	0	0.0
High dependency care unit	3	0.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=126)	N	%
Ward	115	91.3
Other ICU	10	7.9
High dependency care unit	1	0.8
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	641	59.9
Dead	430	40.1
Missing	18	

Timing of ICU mortality (N=430)	N	%
Daytime (08:00AM - 07:59PM)	239	55.6
Nighttime (08:00PM - 07:59AM)	191	44.4
Weekdays (Monday - Friday)	310	72.1
Weekend (Saturday - Sunday)	120	27.9
Missing	0	

Hospital mortality *	N	%
Alive	588	54.6
Dead	488	45.4
Missing	6	

Timing of hosp. mortality * (N=488)	N	%
In ICU	428	87.7
Within 24 hours after ICU	4	0.8
24-47 hours after ICU	9	1.8
48-71 hours after ICU	8	1.6
72-95 hours after ICU	2	0.4
After 95 hours after ICU	37	7.6
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=60)		
Mean	18.1	
SD	41.3	
Median	7	
Q1–Q3	2–18.2	
Missing	0	

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=1082).

National report for general ICUs - Year 2017

Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	584	54.3
Dead	492	45.7
Missing	6	

Readmission from ward	N	%
No	1082	99.4
Yes	7	0.6
Missing	0	

Number of readmissions (N=7)	N	%
1	6	85.7
2	1	14.3
>2	0	0.0
Missing	0	

Timing of readmission (N=7)	N	%
Within 48 hours	2	28.6
48-71 hours	0	0.0
72-95 hours	1	14.3
After 95 hours	4	57.1
Missing	0	

Timing readmission (days)	N	7
Mean	11.3	
SD	14.8	
Median	4.9	
Q1-Q3	2.1-14	

ICU stay (days)	Mean	8.1
	SD	11.5
	Median	4
	Q1-Q3	1-9
	Missing	4

ICU stay (days) Alive (N=641)	Mean	7.6
	SD	10.7
	Median	4
	Q1-Q3	2-9
	Missing	0

ICU stay (days) Dead (N=430)	Mean	7.7
	SD	11.0
	Median	4
	Q1-Q3	1-9.8
	Missing	0

Stay after ICU (days) * Alive (N=636)	Mean	9.5
	SD	17.2
	Median	6
	Q1-Q3	0-12
	Missing	2

Hospital stay (days) *	Mean	17.0
	SD	20.9
	Median	11
	Q1-Q3	5-21
	Missing	7

Hospital stay (days) * Alive (N=588)	Mean	20.0
	SD	20.2
	Median	14
	Q1-Q3	7-25
	Missing	0

Hospital stay (days) * Dead (N=488)	Mean	13.4
	SD	21.3
	Median	8
	Q1-Q3	2-15
	Missing	1

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=1082).

National report for general ICUs - Year 2017

Characteristics on admission - Adult patients evaluated in the GiViTI model

Patients (N): 1057

Sex	N	%
Male	588	55.6
Female	469	44.4
Missing	0	

Age (years)	N	%
17-45	147	13.9
46-65	357	33.8
66-75	251	23.7
>75	302	28.6
Missing	0	
Mean	64.4	
SD	16.3	
Median	66	
Q1–Q3	55–77	
Min–Max	17–100	

Body mass Index (BMI)	N	%
Underweight	47	4.4
Normal	422	39.9
Overweight	322	30.5
Obese	266	25.2
Missing	0	

Pregnancy status	N	%
Females (N=469)		
Not fertile	212	45.2
Not pregnant/Unknown	245	52.2
Currently pregnant	3	0.6
Post partum	9	1.9
Missing	0	

Comorbidities	N	%
No	151	14.3
Yes	906	85.7
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	574	54.3
NYHA class II-III	317	30.0
Arrhythmia	257	24.3
Diabetes Type II with insulin treatment	162	15.3
Myocardial infarction	137	13.0
Alcohol addiction	125	11.8
Moderate COPD	104	9.8
Diabetes Type II without insulin tr.	100	9.5
Peripheral vascular disease	88	8.3
Cerebrovascular disease	87	8.2
Missing	0	

Stay before ICU (days)		
Mean	4.5	
SD	9.9	
Median	1	
Q1–Q3	0–5	
Missing	0	

Source of admission	N	%
Same hospital	862	81.6
Other hospital	195	18.4
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=1057)		
Medical ward	291	27.5
Surgical ward	498	47.1
Emergency room	248	23.5
Other ICU	15	1.4
High dependency care unit	5	0.5
Missing	0	

Reason for transfer from	N	%
Other ICU (N=15)		
Specialist expertise	10	66.7
Step-up care	0	0.0
Logistical/organizational reasons	3	20.0
Step-down care	2	13.3
Missing	0	

Ward of admission	N	%
Same hospital (N=862)		
Medical ward	194	22.5
Surgical ward	451	52.3
Emergency room	215	24.9
Other ICU	0	0.0
High dependency care unit	2	0.2
Missing	0	

Ward of admission	N	%
Other hospital (N=195)		
Medical ward	97	49.7
Surgical ward	47	24.1
Emergency room	33	16.9
Other ICU	15	7.7
High dependency care unit	3	1.5
Missing	0	

Scheduled admission	N	%
No	943	89.2
Yes	114	10.8
Missing	0	

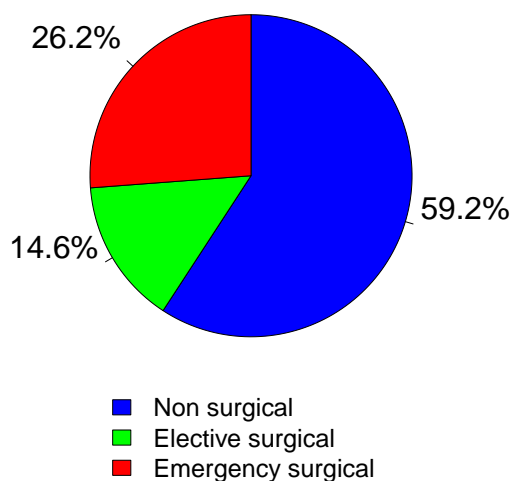
National report for general ICUs - Year 2017

Characteristics on admission - Adult patients evaluated in the GiViTI model

Trauma	N	%
No	938	88.7
Yes	119	11.3
Multiple trauma	20	1.9
Missing	0	

Surgical status	N	%
Non surgical	626	59.2
Elective surgical	154	14.6
Emergency surgical	277	26.2
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=431)		
Operating theatre of surgical ward	343	79.6
Operating theatre of emergency room	5	1.2
Surgical ward	51	11.8
Other	32	7.4
Missing	0	

Surgical interventions (top 10)	N	%
Elective surgical (N=154)		
Gastrointestinal surgery	44	28.6
Gynaecological surgery	36	23.4
Pancreatic surgery	21	13.6
Neurosurgery	18	11.7
Orthopaedic surgery	13	8.4
Biliary tract surgery	9	5.8
Esophageal surgery	6	3.9
Nephro/Urological surgery	5	3.2
Other surgery	3	1.9
Abdominal vascular surgery	2	1.3
Missing	0	

Timing	N	%
Elective surgical (N=154)		
From -7 to -3 days	4	2.6
From -2 to -1 days	5	3.2
On ICU admission day	152	98.7
The day after ICU admission	1	0.6
Missing	0	

Surgical interventions (top 10)	N	%
Emergency surgical (N=277)		
Gastrointestinal surgery	136	49.1
Neurosurgery	65	23.5
Other surgery	22	7.9
Orthopaedic surgery	16	5.8
Biliary tract surgery	11	4.0
Gynaecological surgery	8	2.9
Pancreatic surgery	7	2.5
Obstetric surgery	6	2.2
Abdominal vascular surgery	6	2.2
Splenectomy	4	1.4
Missing	0	

Timing	N	%
Emergency surgical (N=277)		
From -7 to -3 days	19	6.9
From -2 to -1 days	35	12.6
On ICU admission day	224	80.9
The day after ICU admission	15	5.4
Missing	0	

Non surgical interventions	N	%
None	946	89.5
Elective	29	2.7
Emergency	82	7.8
Missing	0	

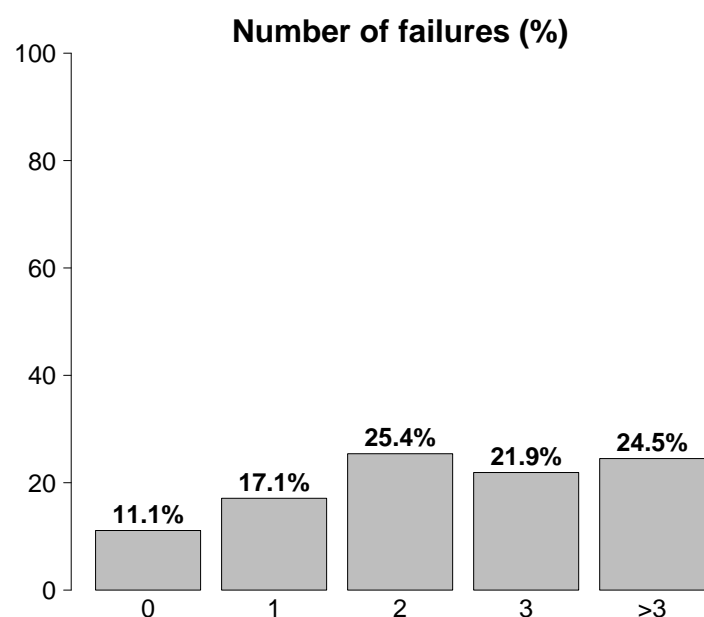
Non surgical interventions	N	%
Elective (N=29)		
Interventional neuroradiology	20	69.0
Interventional endoscopy	7	24.1
Interventional cardiology	1	3.4
Interventional radiology	0	0.0
Missing	1	

Non surgical interventions	N	%
Emergency (N=82)		
Interventional endoscopy	33	40.2
Interventional cardiology	25	30.5
Interventional neuroradiology	21	25.6
Interventional radiology	1	1.2
Missing	2	

National report for general ICUs - Year 2017

Characteristics on admission - Adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	135	12.8
Post surgical weaning	56	5.3
Surgical monitoring	19	1.8
Post interventional weaning	4	0.4
Interventional monitoring	18	1.7
Non surgical monitoring	36	3.4
Missing	2	
Admission for procedures/treatments	0	0.0
Intensive Treatment	922	87.2
Only ventilatory support	278	26.3
Only cardiovascular support	46	4.4
Ventilatory and cardiovascular support	598	56.6
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	117	11.1
Yes	940	88.9
A: Respiratory failure	876	82.9
B: Cardiovascular failure	644	60.9
C: Neurological failure	266	25.2
D: Hepatic failure	28	2.6
E: Renal failure	322	30.5
F: Acute skin failure	1	0.1
G: Metabolic failure	386	36.5
H: Coagulation failure	14	1.3
Missing	0	

Failures on admission (top 10)	N	%
AB	183	17.3
A	151	14.3
ABEG	103	9.7
ABC	74	7.0
ABCEG	62	5.9
ABG	58	5.5
ABCG	43	4.1
ABE	38	3.6
AC	32	3.0
AEG	24	2.3
Missing	0	

Respiratory failure	N	%
None	181	17.1
Only hypoxic failure	632	59.8
Only hypercapnic failure	27	2.6
Hypoxic-hypercapnic failure	53	5.0
Intubation for airway maint.	164	15.5
Missing	0	

Cardiovascular failure	N	%
None	413	39.1
Without shock	304	28.8
Cardiogenic shock	78	7.4
Septic shock	139	13.2
Haemorrhagic/hypovolemic shock	57	5.4
Hypovolemic shock	17	1.6
Anaphylactic shock	2	0.2
Neurogenic shock	14	1.3
Other shock	29	2.7
Mixed shock	4	0.4
Missing	0	

Neurologic failure	N	%
None	341	56.2
Cerebral coma	101	16.6
Metabolic coma	42	6.9
Postanoxic coma	112	18.5
Toxic coma	11	1.8
Missing or not evaluable	450	

Renal failure (AKIN)	N	%
None	735	69.5
Mild	119	11.3
Moderate	83	7.9
Severe	120	11.4
Missing	0	

Metabolic failure	N	%
None	671	63.5
pH ≤ 7.3, PaCO ₂ < 45 mmHg	137	13.0
Base deficit ≥ 5 mmol/L, lactate > 1.5x	249	23.6
Missing	0	

National report for general ICUs - Year 2017

Characteristics on admission - Adult patients evaluated in the GiViTI model

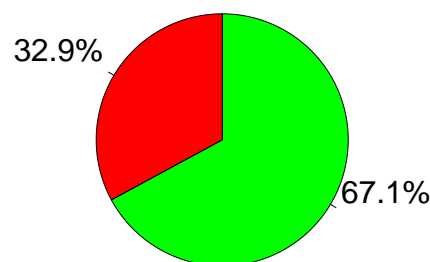
Clinical conditions on admission	N	%
Respiratory	193	18.3
Acute exacerbation of COPD	63	6.0
Aspiration pneumonia	52	4.9
Pneumothorax/Pneumomediastinum	20	1.9
Pleural effusion	18	1.7
Upper respiratory tract disease	17	1.6
Cardiovascular	285	27.0
Cardiac arrest	120	11.4
Left heart failure without pulm. edema	107	10.1
Left heart failure with pulmonary edema	49	4.6
Acute ischaemia	25	2.4
Acute severe arrhythmia: tachycardias	15	1.4
Neurological	210	19.9
Cerebral Aneurysm	46	4.4
Intracranial hypertension	44	4.2
Seizures	36	3.4
Spontaneous Subarachnoid haemorrhage	31	2.9
Cerebral artery stroke	29	2.7
Gastrointestinal and hepatic	237	22.4
Intestinal occlusion	37	3.5
Gastrointestinal bleeding: upper tract	31	2.9
Gastrointestinal perforation	29	2.7
Digestive tract malignancy	28	2.6
Pancreatic malignancy	24	2.3
Trauma (anatomical districts)	119	11.3
Head	77	7.3
Pelvis/bone/joint & muscle	24	2.3
Chest	22	2.1
Spine	15	1.4
Abdomen	9	0.9
-	0	0.0
-	0	0.0
Other	160	15.1
Gynaecological disease	43	4.1
Metabolic disorder	23	2.2
Acute intoxication	22	2.1
Nephrourologic disease	19	1.8
Coagulation disorder	14	1.3
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	439	41.5
Pneumonia	213	20.2
NON-surgical urinary tract infection	44	4.2
NON-surgical secondary peritonitis	39	3.7
Post-surgical peritonitis	36	3.4
L.R.T.I. other than pneumonia	23	2.2
Primary peritonitis	21	2.0
Cholecystitis/cholangitis	16	1.5
NON-surgical skin/soft tissue infection	12	1.1
Post-surgical skin/soft tissue infection	11	1.0
Gastroenteritis	10	0.9
Missing	0	0.0

Trauma (anatomical districts)	N	%
Head	77	7.3
Traumatic Subdural haematoma	39	3.7
Extradural/epidural haematoma	22	2.1
Traumatic intraparenchymal bleeding	14	1.3
Skull fracture	14	1.3
Cerebral contusion/laceration	12	1.1
Spine	15	1.4
Vertebral fracture, without deficit	7	0.7
Tetraplegia	4	0.4
Cervical injury, incomplete deficit	3	0.3
Chest	22	2.1
Other injuries of the chest	12	1.1
Traum. haemothorax/pneumothorax	8	0.8
Severe lung contusion/laceration	5	0.5
Abdomen	9	0.9
Bowel transection/perforation	2	0.2
Liver: Moderate-Severe laceration	2	0.2
Liver: Massive laceration	2	0.2
Pelvis/bone/joint & muscle	24	2.3
Long bone fracture	22	2.1
Multiple fracture of the pelvis	1	0.1
Very severe or open fracture of the pelvis	1	0.1
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	0.0

Infection severity on admission	N	%
None	618	58.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	292	27.7
SEPTIC SHOCK	143	13.6
Missing	4	

Infection severity on admission

Patients infected (N=435)

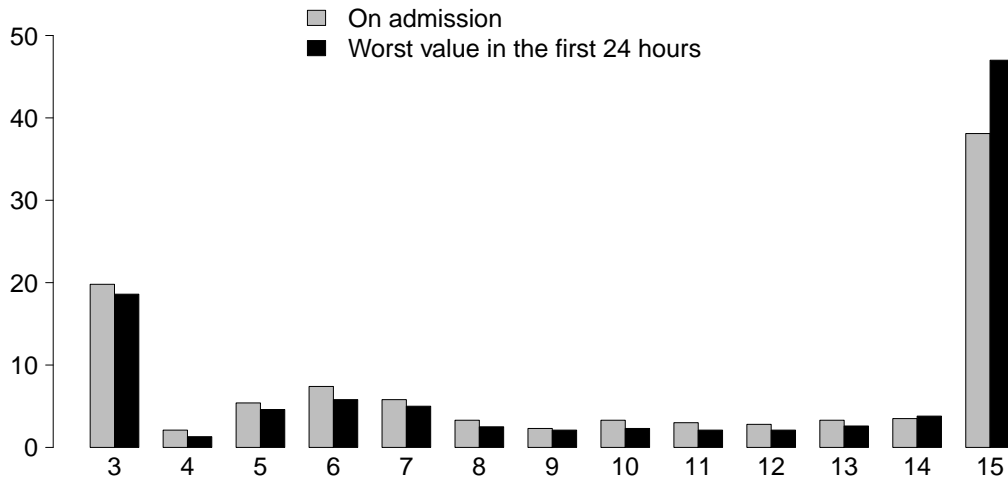


■ INFECTION WITHOUT SEPSIS/SEPSIS
■ SEPTIC SHOCK

National report for general ICUs - Year 2017

Severity scores - Adult patients evaluated in the GiViTI model

Glasgow Coma Scale (%)



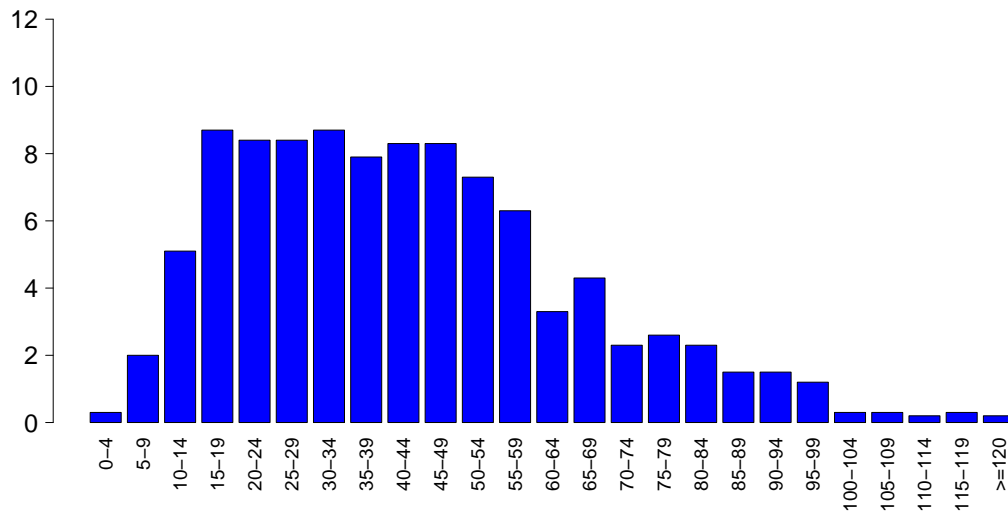
GCS (admission)

Median	11
Q1–Q3	5–15
Not evaluable	450
Missing	0

GCS (first 24 hours)

Median	14
Q1–Q3	6–15
Not evaluable	451
Missing	0

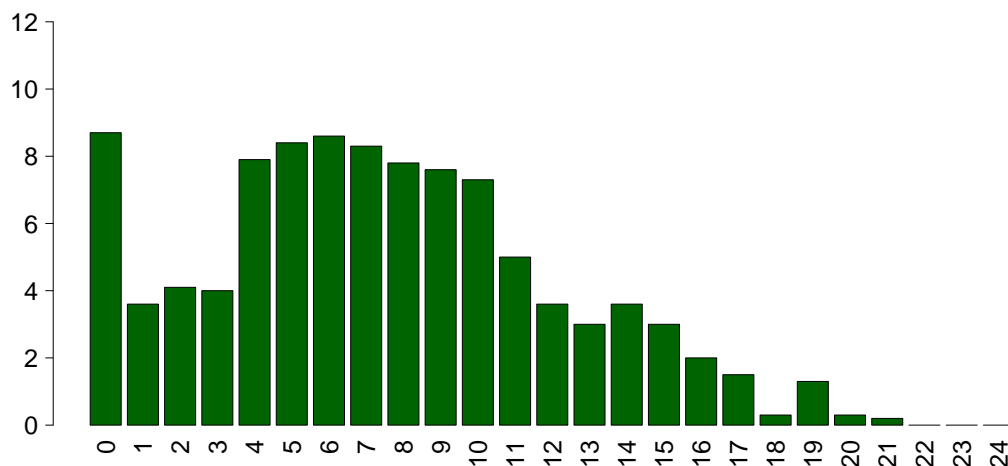
SAPS II (%)



SAPSII

Mean	42.6
SD	22.6
Median	40
Q1–Q3	25–56
Not evaluable	451
Missing	-451

SOFA (%)



SOFA

Mean	7.4
SD	4.7
Median	7
Q1–Q3	4–10
Not evaluable	451
Missing	-451

National report for general ICUs - Year 2017

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

Complications during the stay	N	%
No	510	48.2
Yes	547	51.8
Missing	0	

Failures during the stay	N	%
No	928	87.8
Yes	129	12.2
A: Respiratory failure	53	5.0
B: Cardiovascular failure	50	4.7
C: Neurological failure	5	0.5
D: Hepatic failure	13	1.2
E: Renal failure (AKIN)	53	5.0
F: Acute skin failure	0	0.0
G: Metabolic failure	1	0.1
H: Coagulation failure	1	0.1
Missing	0	

Failures during the stay (top 10)	N	%
E	32	3.0
A	24	2.3
B	24	2.3
AB	15	1.4
D	10	0.9
BE	6	0.6
ABE	5	0.5
AE	5	0.5
AC	1	0.1
ACE	1	0.1
Missing	0	

Respiratory failure occurred	N	%
None	1004	95.0
Intubation for airway maint.	4	0.4
Hypoxic failure	45	4.3
Hypercapnic failure	8	0.8
Missing	0	

Cardiovascular failure occurred	N	%
None	1007	95.3
Cardiogenic shock	2	0.2
Hypovolemic shock	22	2.1
Haemorrhagic/hypovolemic shock	4	0.4
Septic shock	14	1.3
Anaphylactic shock	0	0.0
Neurogenic shock	7	0.7
Other shock	2	0.2
Missing	0	

Neurological failure occurred	N	%
None	1052	99.5
Cerebral coma	4	0.4
Metabolic coma	1	0.1
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	1004	95.0
Mild	2	0.2
Moderate	4	0.4
Severe	47	4.4
Missing	0	

Complications during the stay	N	%
Respiratory	63	6.0
Pneumothorax/Pneumomediastinum	26	2.5
Pleural effusion	11	1.0
Acute asthma/bronchospasm	8	0.8
Pulmonary embolism	6	0.6
Upper resp. tract disease	4	0.4
Cardiovascular	191	18.1
Left heart failure w/o pulm. edema	94	8.9
Cardiac arrest	65	6.1
Acute severe arrhythmia: tachycardias	23	2.2
Pulmonary edema	11	1.0
Acute ischaemia	9	0.9
Neurological	174	16.5
Intracranial hypertension	85	8.0
Brain edema	61	5.8
Drowsiness/agitation/delirium	50	4.7
Seizures	21	2.0
New ischaemic stroke	12	1.1
Gastrointestinal and hepatic	61	5.8
Gastrointestinal bleeding: upper tract	15	1.4
Liver Dysfunction Syndrome	10	0.9
Gastrointestinal bleeding: lower tract	7	0.7
Bowel ischaemia	6	0.6
Intrabdominal bleeding	6	0.6
Other	40	3.8
Nephrourologic disease	13	1.2
Category/Stage II: Partial Thickness Skin Loss	8	0.8
Category/Stage III: Full Thickness Skin Loss	8	0.8
Other skin and/or soft tissue pathology	5	0.5
Iatrogenic major vessels injury	3	0.3
Category/Stage I: Nonblanchable Erythema	2	0.2
Metabolic disorder	1	0.1
Infections	214	20.2
Pneumonia	66	6.2
L.R.T.I. other than pneumonia	60	5.7
NON-surgical urinary tract infection	41	3.9
Post-surgical peritonitis	27	2.6
Upper respiratory tract infection	11	1.0
Post-surgical urinary tract infection	9	0.9
Post-surgical skin/soft tissue infection	8	0.8
Sinusitis	7	0.7
Post-surgical CNS infection	6	0.6
Gastroenteritis	6	0.6
Missing	0	

National report for general ICUs - Year 2017

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

Infections			Maximum severity of infection		
	N	%		N	%
None	467	44.2	None	467	44.3
Only on admission	376	35.6	-	0	0.0
On admission and during ICU stay	63	6.0	INFECTION WITHOUT SEPSIS/SEPSIS	432	41.0
Only during ICU stay	151	14.3	SEPTIC SHOCK	154	14.6
Missing	0		Missing	4	

Severity evolution

Severity evolution		During the stay				
		None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	467 (75.6%)	0 (0.0%)	145 (23.5%)	6 (1.0%)	618
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	287 (98.3%)	5 (1.7%)	292
	SEPTIC SHOCK	-	-	-	143 (100.0%)	143
	TOT	467	0	432	154	1053

Ventil. Associat. Pneumonia (VAP)	N	%
No	999	94.5
Yes	58	5.5
Missing	0	

Incidence of VAP

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

Estimate	11.2
CI (95%)	8.5–14.5

Incidence of VAP

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

Estimate	8.9%
CI (95%)	6.8–11.6

Catheter Bacteraemia (CR-BSI)	N	%
No	1057	100.0
Yes	0	0.0
Missing	0	

Incidence of CR-BSI

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

Estimate	0.0
CI (95%)	0.0–0.5

Incidence of CR-BSI

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

Estimate	0.0%
CI (95%)	0.0–0.6

National report for general ICUs - Year 2017
Process indicators - Adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3	Missing
	1041	98.5									
Invasive ventilation	931	88.1	687	65	214	20.2	3	1-7	0	0-0	0
Non invasive ventilation	72	6.8	4	0.4	8	0.8	1	1-3	0	0-2	0
Tracheostomy	143	13.5	13	1.2	92	8.7	12	5-27	0	4-11	0
iNO (inhaled nitric oxide)	0	0.0									
Central Venous Catheter PICC	874	82.7	410	38.8	345	32.6	5	2-10	0	0-0	0
Arterial Catheter	988	93.5	317	30	285	27	4	2-9	0	0-0	0
Vasoactive drugs	822	77.8	503	47.6	175	16.6	3	1-7	0	0-0	0
Antiarrhythmics	155	14.7	25	2.4	15	1.4	3	1-5	0	0-1	0
IABP	3	0.3	2	0.2	0	0	1	0-2	0	4-4	0
Invasive monitoring of C.O.	380	36.0	63	6	51	4.8	4	2-9	0	0-0	0
Continuous monitoring of ScVO2	1	0.1	1	0.1	1	0.1	32	32-32	0	0-0	0
Temporary pacing	4	0.4	3	0.3	2	0.2	2	0-4	0	0-0	0
Ventricular assistance	0	0.0									
DC-shock	22	2.1								1	0-2
CPR	75	7.1								0	0-4
Massive blood transfusion	30	2.8								0	0-0
ICP monitoring without CSF drainage	0	0.0									
ICP monitoring with CSF drainage	0	0.0									
External ventricular drainage without ICP	0	0.0									
Haemofiltration	60	5.7	7	0.7	4	0.4	4	2-7	0	1	0-2
Haemodialysis	73	6.9	12	1.1	9	0.9	3	2-4	0	1	0-3
ECMO	0	0.0									
Hepatic clearance techniques	0	0.0									
Clearance techniques during sepsis	2	0.2	1	0.1	1	0.1	2	2-2	0	59	59-59
IAP (intra-abdominal pressure)	0	0.0									
Hypothermia	1	0.1	0	0	0	0	1	1-1	0	0-0	0
Enteral nutrition	551	52.1	118	11.2	207	19.6	6	3-11	0	1	0-1
Parenteral nutrition	463	43.8	97	9.2	160	15.1	4	2-8	0	1	0-1
SDD (Topical, Topical and systemic)	136	12.9									
Patient restraint	1	0.1									
Peridural catheter	3	0.3	1	0.1	2	0.2	2	2-8	0	0	0-0
Electrical cardioversion	26	2.5								0	0-1
Vacuum therapy	1	0.1									
Antibiotics	779	73.7									
Antibiotic prophylaxis	243	23.0	140	13.2	101	9.6	3	1-5	0	0	0-0
Empirical antibiotic therapy	485	45.9	143	13.5	67	6.3	3	2-4	0	0	0-1
Targeted antibiotic therapy	302	28.6	33	3.1	107	10.1	6	4-12	0	3	2-5

National report for general ICUs - Year 2017

Process indicators - Adult patients evaluated in the GiViTI model

Invasive ventilation (N=931)	N	%	Length (days)					
			Mean	SD	Median	Q1-Q3	Missing	
Due to pulmonary failure	693	74.4	7.1	10.8	3	1–8	0	
For airway maintenance	161	17.3	6.3	9.6	3	1–7	0	
In weaning	63	6.8	0.1	0.3	0	0–0	0	
Not evaluable	15	1.6	1.7	2.7	1	0–1.5	0	
Reintubation within 48 hours	6	0.6	7.3	11.1	3	2.25–3.75	0	
Non invasive ventilation (N=72)	N	%	Number of surgical interventions					
Non invasive ventilation only	35	48.6				0	984	93.1
Non invasive ventilation failed	6	8.3				1	58	5.5
For weaning	28	38.9				2	6	0.6
Other	3	4.2				3	5	0.5
Missing	0					>3	4	0.4
						Missing	0	
Tracheostomy not present on admission (N=130)	N	%	Surgical interventions					
Surgical	43	33.1	Days from admission					
Percutwist	0	0.0				Mean	9.3	
Ciaglia	0	0.0				SD	9.0	
Monodil. Ciaglia	0	0.0				Median	6	
Fantoni	0	0.0				Q1–Q3	3–12	
Griggs	81	62.3				Missing	3	
Other Kind	1	0.8	Surgical interventions (top 10)					
Unknown	5	3.8				N	%	
Missing	0					Gastrointestinal surgery	31	2.9
						Neurosurgery	19	1.8
						Organ donation	15	1.4
						Other surgery	14	1.3
						Pancreatic surgery	10	0.9
						Splenectomy	4	0.4
						Nephro/Urological surgery	3	0.3
						Orthopaedic surgery	3	0.3
						Biliary tract surgery	2	0.2
						Hepatic surgery	1	0.1
						Missing	0	
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=129)			Non surgical interventions					
Mean	8.4					N	%	
SD	5.9					No	1019	96.4
Median	7					Yes	38	3.6
Q1–Q3	5–11					Missing	0	
Missing	0		Non surgical interventions					
			Days from admission					
						Mean	14.0	
						SD	14.0	
						Median	10.5	
						Q1–Q3	5–18	
						Missing	2	
Invasive monitoring of C.O. (N=380)	N	%	Non surgical interventions					
Swan Ganz	1	0.3				N	%	
PICCO	53	13.9				Interventional endoscopy	45	4.3
LIDCO	242	63.7				Interventional cardiology	2	0.2
Vigileo-PRAM	29	7.6				Interventional neuroradiology	2	0.2
Other	55	14.5				Interventional radiology	1	0.1
Missing	0					Missing	0	
SDD (N=136)	N	%	Non surgical interventions					
Topical	69	50.7				N	%	
Topical and systemic	67	49.3				Interventional endoscopy	45	4.3
Missing	0					Interventional cardiology	2	0.2
Antibiotic therapy			Non surgical interventions					
Pt. infected in ICU only (N=151)	N	%				N	%	
Only empirical	36	24.8				Interventional endoscopy	45	4.3
Only targeted	29	20.0				Interventional cardiology	2	0.2
Targeted after empirical	78	53.8				Interventional neuroradiology	2	0.2
Other	2	1.4				Interventional radiology	1	0.1
Missing	6					Missing	0	
Surgical interventions	N	%	Non surgical interventions					
No	984	93.1				N	%	
Yes	73	6.9				Interventional endoscopy	45	4.3
Missing	0					Interventional cardiology	2	0.2

National report for general ICUs - Year 2017**Outcome indicators - Adult patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	414	39.7
Transferred to same hospital	459	44.0
Transferred to other hospital	123	11.8
Discharged home	47	4.5
Disch. terminally ill	0	0.0
Missing	14	

Transferred to (N=582)	N	%
Ward	568	97.6
Other ICU	10	1.7
High dependency care unit	4	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=10)	N	%
Specialist expertise	2	20.0
Step-up care	5	50.0
Logistical/organizational reasons	1	10.0
Step-down care	2	20.0
Missing	0	

Transferred to Same hospital (N=459)	N	%
Ward	456	99.3
Other ICU	0	0.0
High dependency care unit	3	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=123)	N	%
Ward	112	91.1
Other ICU	10	8.1
High dependency care unit	1	0.8
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	629	60.3
Dead	414	39.7
Missing	14	

Timing of ICU mortality (N=414)	N	%
Daytime (08:00AM - 07:59PM)	231	55.8
Nighttime (08:00PM - 07:59AM)	183	44.2
Weekdays (Monday - Friday)	299	72.2
Weekend (Saturday - Sunday)	115	27.8
Missing	0	

Hospital mortality	N	%
Alive	584	55.3
Dead	473	44.7
Missing	0	

Timing of hosp. mortality (N=473)	N	%
In ICU	414	87.5
Within 24 hours after ICU	4	0.8
24-47 hours after ICU	9	1.9
48-71 hours after ICU	7	1.5
72-95 hours after ICU	2	0.4
After 95 hours after ICU	37	7.8
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=59)		
Mean		18.3
SD		41.6
Median		7
Q1–Q3		2–18.5
Missing		0

National report for general ICUs - Year 2017

Outcome indicators - Adult patients evaluated in the GiViTI model

Last hospital mortality			ICU stay (days)		
	N	%			
Alive	580	54.9	Mean	8.0	
Dead	477	45.1	SD	11.5	
Missing	0		Median	4	
			Q1–Q3	2–9	
			Missing	0	
			ICU stay (days)		
			Alive (N=629)		
			Mean	7.6	
			SD	10.7	
			Median	4	
			Q1–Q3	2–9	
			Missing	0	
			ICU stay (days)		
			Dead (N=414)		
			Mean	7.7	
			SD	10.9	
			Median	4	
			Q1–Q3	1–9.8	
			Missing	0	
			Stay after ICU (days)		
			Alive (N=629)		
			Mean	9.5	
			SD	17.2	
			Median	6	
			Q1–Q3	0–12	
			Missing	0	
			Hospital stay (days)		
			Mean	17.1	
			SD	21.0	
			Median	11	
			Q1–Q3	5–21	
			Missing	0	
			Hospital stay (days)		
			Alive (N=584)		
			Mean	20.0	
			SD	20.2	
			Median	14	
			Q1–Q3	7–25	
			Missing	0	
			Hospital stay (days)		
			Dead (N=473)		
			Mean	13.6	
			SD	21.5	
			Median	8	
			Q1–Q3	3–16	
			Missing	0	

National report for general ICUs - Year 2017

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

Patients (N): 626

Sex	N	%
Male	375	59.9
Female	251	40.1
Missing	0	

Age (years)	N	%
17-45	81	12.9
46-65	213	34.0
66-75	158	25.2
>75	174	27.8
Missing	0	
Mean	64.5	
SD	16.3	
Median	66	
Q1–Q3	55.2–77	
Min–Max	17–100	

Body mass Index (BMI)	N	%
Underweight	30	4.8
Normal	272	43.5
Overweight	174	27.8
Obese	150	24.0
Missing	0	

Pregnancy status	N	%
Females (N=251)		
Not fertile	112	44.6
Not pregnant/Unknown	135	53.8
Currently pregnant	1	0.4
Post partum	3	1.2
Missing	0	

Comorbidities	N	%
No	69	11.0
Yes	557	89.0
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	336	53.7
NYHA class II-III	214	34.2
Arrhythmia	154	24.6
Alcohol addiction	98	15.7
Myocardial infarction	90	14.4
Diabetes Type II with insulin treatment	86	13.7
Moderate COPD	74	11.8
Diabetes Type II without insulin tr.	67	10.7
Cerebrovascular disease	63	10.1
Moderate or severe renal disease	54	8.6
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.7	11.0	1	0–5	0

Source of admission	N	%
Same hospital	471	75.2
Other hospital	155	24.8
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=626)		
Medical ward	276	44.1
Surgical ward	104	16.6
Emergency room	230	36.7
Other ICU	11	1.8
High dependency care unit	5	0.8
Missing	0	

Reason for transfer from	N	%
Other ICU (N=11)		
Specialist expertise	6	54.5
Step-up care	0	0.0
Logistical/organizational reasons	3	27.3
Step-down care	2	18.2
Missing	0	

Ward of admission	N	%
Same hospital (N=471)		
Medical ward	183	38.9
Surgical ward	89	18.9
Emergency room	197	41.8
Other ICU	0	0.0
High dependency care unit	2	0.4
Missing	0	

Ward of admission	N	%
Other hospital (N=155)		
Medical ward	93	60.0
Surgical ward	15	9.7
Emergency room	33	21.3
Other ICU	11	7.1
High dependency care unit	3	1.9
Missing	0	

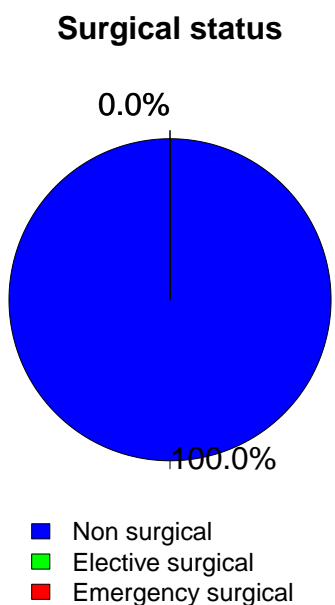
Scheduled admission	N	%
No	607	97.0
Yes	19	3.0
Missing	0	

National report for general ICUs - Year 2017

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

Trauma	N	%
No	580	92.7
Yes	46	7.3
Multiple trauma	11	1.8
Missing	0	

Surgical status	N	%
Non surgical	626	100.0
Elective surgical	0	0.0
Emergency surgical	0	0.0
Missing	0	



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

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

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

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

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

Non surgical interventions	N	%
None	527	84.2
Elective	26	4.2
Emergency	73	11.7
Missing	0	

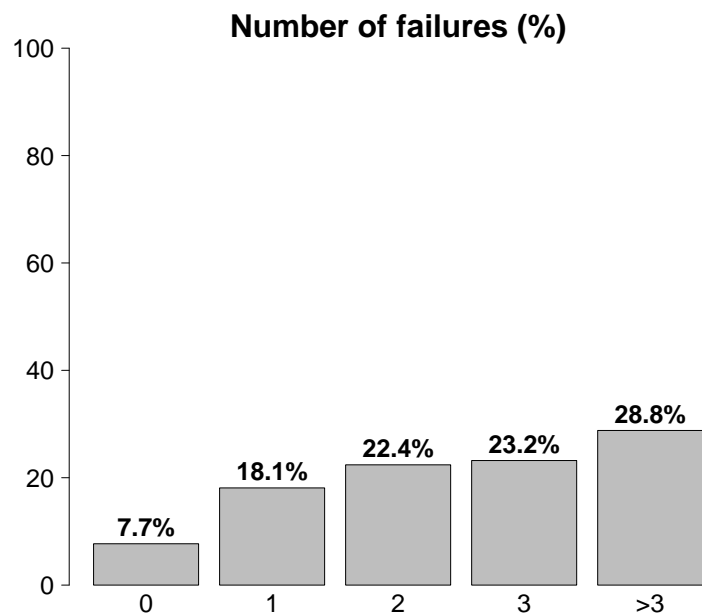
Non surgical interventions	N	%
Elective (N=26)		
Interventional neuroradiology	19	73.1
Interventional endoscopy	6	23.1
Interventional cardiology	1	3.8
Interventional radiology	0	0.0
Missing	0	

Non surgical interventions	N	%
Emergency (N=73)		
Interventional endoscopy	27	37.0
Interventional cardiology	25	34.2
Interventional neuroradiology	20	27.4
Interventional radiology	1	1.4
Missing	0	

National report for general ICUs - Year 2017

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

Reason for admission	N	%
Monitoring/Weaning	60	9.6
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	4	0.6
Interventional monitoring	18	2.9
Non surgical monitoring	36	5.8
Missing	2	
Admission for procedures/treatments	0	0.0
Intensive Treatment	566	90.4
Only ventilatory support	205	32.7
Only cardiovascular support	24	3.8
Ventilatory and cardiovascular support	337	53.8
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	48	7.7
Yes	578	92.3
A: Respiratory failure	542	86.6
B: Cardiovascular failure	361	57.7
C: Neurological failure	212	33.9
D: Hepatic failure	25	4.0
E: Renal failure	221	35.3
F: Acute skin failure	0	0.0
G: Metabolic failure	258	41.2
H: Coagulation failure	8	1.3
Missing	0	

Failures on admission (top 10)	N	%
A	104	16.6
AB	73	11.7
ABC	56	8.9
ABCEG	55	8.8
ABEG	53	8.5
ABCG	29	4.6
AC	25	4.0
ABG	23	3.7
ABE	19	3.0
AEG	18	2.9
Missing	0	

Respiratory failure	N	%
None	84	13.4
Only hypoxic failure	370	59.1
Only hypercapnic failure	25	4.0
Hypoxic-hypercapnic failure	44	7.0
Intubation for airway maint.	103	16.5
Missing	0	

Cardiovascular failure	N	%
None	265	42.3
Without shock	171	27.3
Cardiogenic shock	70	11.2
Septic shock	71	11.3
Haemorrhagic/hypovolemic shock	16	2.6
Hypovolemic shock	5	0.8
Anaphylactic shock	1	0.2
Neurogenic shock	10	1.6
Other shock	15	2.4
Mixed shock	2	0.3
Missing	0	

Neurologic failure	N	%
None	191	47.4
Cerebral coma	65	16.1
Metabolic coma	35	8.7
Postanoxic coma	103	25.6
Toxic coma	9	2.2
Missing or not evaluable	223	

Renal failure (AKIN)	N	%
None	405	64.7
Mild	83	13.3
Moderate	54	8.6
Severe	84	13.4
Missing	0	

Metabolic failure	N	%
None	368	58.8
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	93	14.9
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	165	26.4
Missing	0	

National report for general ICUs - Year 2017

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

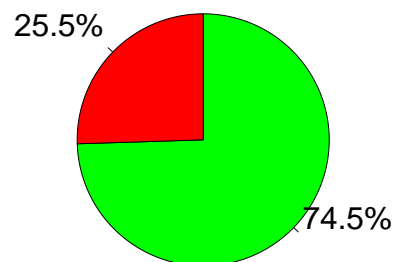
Clinical conditions on admission	N	%
Respiratory	154	24.6
Acute exacerbation of COPD	58	9.3
Aspiration pneumonia	41	6.5
Upper respiratory tract disease	14	2.2
Pleural effusion	12	1.9
Pneumothorax/Pneumomediastinum	10	1.6
Cardiovascular	234	37.4
Cardiac arrest	112	17.9
Left heart failure without pulm. edema	73	11.7
Left heart failure with pulmonary edema	46	7.3
Acute ischaemia	24	3.8
Acute severe arrhythmia: tachycardias	13	2.1
Neurological	161	25.7
Cerebral Aneurysm	37	5.9
Seizures	34	5.4
Cerebral artery stroke	26	4.2
Intracranial hypertension	24	3.8
Metabolic/postanoxic encephalopathy	23	3.7
Gastrointestinal and hepatic	72	11.5
Gastrointestinal bleeding: upper tract	24	3.8
Acute on chronic liver disease	15	2.4
Acute pancreatitis	14	2.2
Liver Dysfunction Syndrome	9	1.4
Ascites	8	1.3
Trauma (anatomical districts)	46	7.3
Head	31	5.0
Chest	12	1.9
Spine	11	1.8
Pelvis/bone/joint & muscle	7	1.1
-	0	0.0
-	0	0.0
-	0	0.0
Other	72	11.5
Acute intoxication	20	3.2
Metabolic disorder	16	2.6
Nephrourologic disease	14	2.2
Coagulation disorder	8	1.3
Other disease	8	1.3
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	285	45.5
Pneumonia	183	29.2
NON-surgical urinary tract infection	35	5.6
L.R.T.I. other than pneumonia	20	3.2
NON-surgical CNS infection	8	1.3
Gastroenteritis	7	1.1
Upper respiratory tract infection	7	1.1
NON-surgical skin/soft tissue infection	6	1.0
Cholecystitis/choolangitis	5	0.8
Post-surgical peritonitis	5	0.8
NON-surgical secondary peritonitis	5	0.8
Missing	0	

Trauma (anatomical districts)	N	%
Head	31	5.0
Traumatic Subdural haematoma	10	1.6
Extradural/epidural haematoma	8	1.3
Traumatic intraparenchymal bleeding	7	1.1
Skull fracture	7	1.1
Cerebral contusion/laceration	6	1.0
Spine	11	1.8
Vertebral fracture, without deficit	5	0.8
Tetraplegia	3	0.5
Cervical injury, incomplete deficit	2	0.3
Chest	12	1.9
Other injuries of the chest	9	1.4
Severe lung contusion/laceration	3	0.5
Diaphragmatic rupture	2	0.3
Abdomen	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Pelvis/bone/joint & muscle	7	1.1
Long bone fracture	7	1.1
-	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	341	54.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPTIC SHOCK	210	33.7
SEPTIC SHOCK	72	11.6
Missing	3	

Infection severity on admission

Patients infected (N=282)

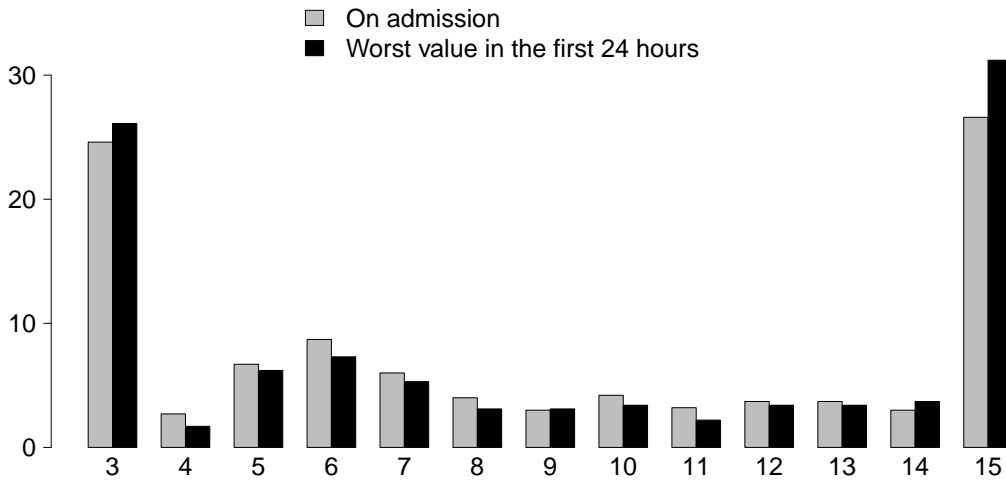


■ INFECTION WITHOUT SEPSIS/SEPTIC SHOCK
 ■ SEPTIC SHOCK

National report for general ICUs - Year 2017

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

Glasgow Coma Scale (%)



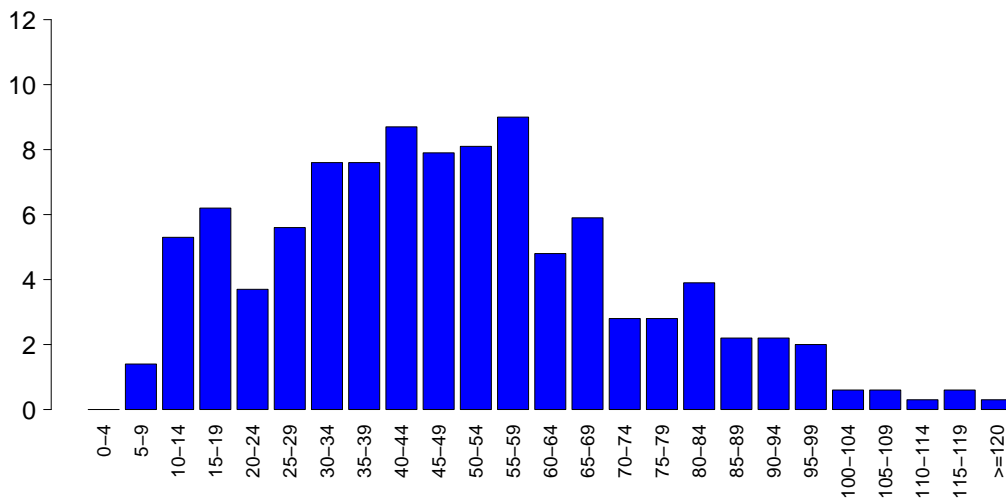
GCS (admission)

Median	8
Q1–Q3	4–15
Not evaluable	223
Missing	0

GCS (first 24 hours)

Median	9
Q1–Q3	3–15
Not evaluable	270
Missing	0

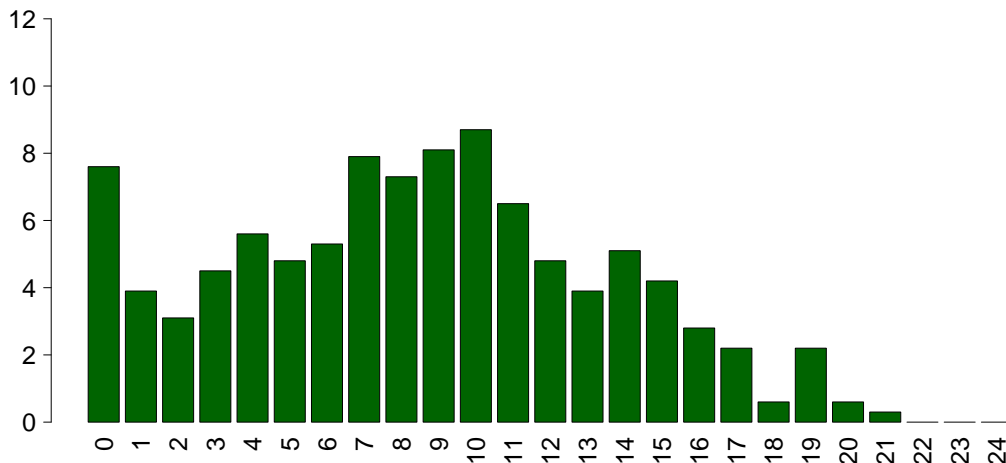
SAPS II (%)



SAPSII

Mean	48.9
SD	23.9
Median	47
Q1–Q3	31–64
Not evaluable	270
Missing	-270

SOFA (%)



SOFA

Mean	8.4
SD	5.0
Median	8.5
Q1–Q3	5–12
Not evaluable	270
Missing	-270

National report for general ICUs - Year 2017

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

Complications during the stay	N	%
No	287	45.8
Yes	339	54.2
Missing	0	

Failures during the stay	N	%
No	554	88.5
Yes	72	11.5
A: Respiratory failure	25	4.0
B: Cardiovascular failure	24	3.8
C: Neurological failure	3	0.5
D: Hepatic failure	11	1.8
E: Renal failure (AKIN)	26	4.2
F: Acute skin failure	0	0.0
G: Metabolic failure	0	0.0
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
E	19	3.0
A	14	2.2
B	14	2.2
D	10	1.6
AB	6	1.0
ABE	2	0.3
AE	2	0.3
BE	2	0.3
AC	1	0.2
C	1	0.2
Missing	0	

Respiratory failure occurred	N	%
None	601	96.0
Intubation for airway maint.	2	0.3
Hypoxic failure	20	3.2
Hypercapnic failure	7	1.1
Missing	0	

Cardiovascular failure occurred	N	%
None	602	96.2
Cardiogenic shock	1	0.2
Hypovolemic shock	10	1.6
Haemorrhagic/hypovolemic shock	1	0.2
Septic shock	4	0.6
Anaphylactic shock	0	0.0
Neurogenic shock	7	1.1
Other shock	2	0.3
Missing	0	

Neurological failure occurred	N	%
None	623	99.5
Cerebral coma	3	0.5
Metabolic coma	0	0.0
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	600	95.8
Mild	0	0.0
Moderate	2	0.3
Severe	24	3.8
Missing	0	

Complications during the stay	N	%
Respiratory	42	6.7
Pneumothorax/Pneumomediastinum	16	2.6
Acute asthma/bronchospasm	7	1.1
Pleural effusion	4	0.6
Pulmonary embolism	4	0.6
Upper resp. tract disease	4	0.6
Cardiovascular	138	22.0
Left heart failure w/o pulm. edema	69	11.0
Cardiac arrest	52	8.3
Acute severe arrhythmia: tachycardias	17	2.7
Pulmonary edema	9	1.4
Acute ischaemia	7	1.1
Neurological	98	15.7
Intracranial hypertension	37	5.9
Brain edema	33	5.3
Drowsiness/agitation/delirium	29	4.6
Seizures	16	2.6
New ischaemic stroke	7	1.1
Gastrointestinal and hepatic	35	5.6
Gastrointestinal bleeding: upper tract	12	1.9
Liver Dysfunction Syndrome	8	1.3
Acute on chronic liver disease	4	0.6
Ascites	4	0.6
Bowel ischaemia	3	0.5
Other	23	3.7
Nephrourologic disease	7	1.1
Category/Stage III: Full Thickness Skin Loss	6	1.0
Category/Stage II: Partial Thickness Skin Loss	5	0.8
Other skin and/or soft tissue pathology	4	0.6
Iatrogenic major vessels injury	2	0.3
Other disease	1	0.2
-	0	0.0
Infections	113	18.1
L.R.T.I. other than pneumonia	41	6.5
Pneumonia	41	6.5
NON-surgical urinary tract infection	23	3.7
Upper respiratory tract infection	9	1.4
Sinusitis	6	1.0
Primary bacteraemia of unknown origin	3	0.5
NON-surgical CNS infection	3	0.5
Gastroenteritis	3	0.5
Post-surgical urinary tract infection	3	0.5
Catheter-related local infection	2	0.3
Missing	0	

National report for general ICUs - Year 2017

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

Infections			Maximum severity of infection		
	N	%		N	%
None	263	42.0	None	263	42.2
Only on admission	250	39.9	-	0	0.0
On admission and during ICU stay	35	5.6	INFECTION WITHOUT SEPSIS/SEPSIS	285	45.7
Only during ICU stay	78	12.5	SEPTIC SHOCK	75	12.0
Missing	0		Missing	3	

Severity evolution

Severity evolution		During the stay				
		None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	263 (77.1%)	0 (0.0%)	76 (22.3%)	2 (0.6%)	341
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	209 (99.5%)	1 (0.5%)	210
	SEPTIC SHOCK	-	-	-	72 (100.0%)	72
	TOT	263	0	285	75	623

Ventil. Associat. Pneumonia (VAP)	N	%
No	590	94.2
Yes	36	5.8
Missing	0	

Incidence of VAP

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

Estimate	10.6
CI (95%)	7.4–14.6

Incidence of VAP

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

Estimate	8.4%
CI (95%)	5.9–11.7

Catheter Bacteraemia (CR-BSI)	N	%
No	626	100.0
Yes	0	0.0
Missing	0	

Incidence of CR-BSI

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

Estimate	0.0
CI (95%)	0.0–0.8

Incidence of CR-BSI

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

Estimate	0.0%
CI (95%)	0.0–1.0

National report for general ICUs - Year 2017
Process indicators - Adult non surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3	Missing
	611	97.6									
Invasive ventilation	532	85.0	343	54.8	144	23	4	1-8	0	0-0	0
Non invasive ventilation	58	9.3	4	0.6	6	1	1	1-3	0	0-3	0
Tracheostomy	99	15.8	10	1.6	63	10.1	14	5-28	0	4-11	0
iNO (inhaled nitric oxide)	0	0.0									
Central Venous Catheter	487	77.8	201	32.1	200	31.9	6	2-12	0	0-0	0
PICC	0	0.0									
Arterial Catheter	576	92.0	191	30.5	181	28.9	5	2-10	0	0-0	0
Vasoactive drugs	464	74.1	251	40.1	112	17.9	3	1-7	0	0-0	0
Antiarrhythmics	95	15.2	22	3.5	9	1.4	3	1-5	0	0-1	0
IABP	3	0.5	2	0.3	0	0	1	0-2	0	4-4	0
Invasive monitoring of C.O.	184	29.4	28	4.5	24	3.8	5	2-9	0	0-1	0
Continuous monitoring of ScVO2	0	0.0									
Temporary pacing	4	0.6	3	0.5	2	0.3	2	0-4	0	0-0	0
Ventricular assistance	0	0.0									
DC-shock	18	2.9								0-1	0
CPR	56	8.9								0-2	0
Massive blood transfusion	12	1.9								0-1	0
ICP monitoring without CSF drainage	0	0.0									
ICP monitoring with CSF drainage	0	0.0									
External ventricular drainage without ICP	0	0.0									
Haemofiltration	33	5.3	2	0.3	3	0.5	4	2-9	0	1-0-2	0
Haemodialysis	50	8.0	10	1.6	8	1.3	3	2-4	0	0-3	0
ECMO	0	0.0									
Hepatic clearance techniques	0	0.0									
Clearance techniques during sepsis	1	0.2	1	0.2	1	0.2	2	2-2	0		
IAP (intra-abdominal pressure)	0	0.0									
Hypothermia	1	0.2	0	0	0	0	1	1-1	0	0-0	0
Enteral nutrition	382	61.0	90	14.4	140	22.4	6	3-12	0	1-0-1	0
Parenteral nutrition	200	31.9	57	9.1	63	10.1	5	2-9	0	1-0-2	0
SDD (Topical, Topical and systemic)	72	11.5									
Patient restraint	1	0.2									
Peridural catheter	0	0.0									
Electrical cardioversion	16	2.6								0-1	0
Vacuum therapy	0	0.0									
Antibiotics	433	69.2									
Antibiotic prophylaxis	92	14.7	66	10.5	61	9.7	4	3-7	0	0-0	0
Empirical antibiotic therapy	302	48.2	78	12.5	36	5.8	3	2-5	0	0-1	0
Targeted antibiotic therapy	172	27.5	20	3.2	54	8.6	7	4-13	0	2-5	0

National report for general ICUs - Year 2017

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

		Length (days)						
		N	%	Mean	SD	Median	Q1-Q3	Missing
Invasive ventilation (N=532)								
Due to pulmonary failure		418	78.6	8.0	11.4	4	1–9	0
For airway maintenance		103	19.4	6.4	10.2	3	1–7	0
In weaning		7	1.3	0.0	0.0	0	0–0	0
Not evaluable		4	0.8	0.5	0.6	0.5	0–1	0
Reintubation within 48 hours		3	0.6	2.3	0.6	2	2–2.5	0
Non invasive ventilation (N=58)		N	%					
Non invasive ventilation only		30	51.7					
Non invasive ventilation failed		4	6.9					
For weaning		21	36.2					
Other		3	5.2					
Missing		0						
Tracheostomy not present on admission (N=89)		N	%					
Surgical		30	33.7					
Percutwist		0	0.0					
Ciaglia		0	0.0					
Monodil. Ciaglia		0	0.0					
Fantoni		0	0.0					
Griggs		54	60.7					
Other Kind		1	1.1					
Unknown		4	4.5					
Missing		0						
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=89)								
Mean			7.9					
SD			5.6					
Median			7					
Q1–Q3			4–11					
Missing			0					
Invasive monitoring of C.O. (N=184)		N	%					
Swan Ganz		1	0.5					
PICCO		29	15.8					
LIDCO		115	62.5					
Vigileo-PRAM		11	6.0					
Other		28	15.2					
Missing		0						
SDD (N=72)		N	%					
Topical		33	45.8					
Topical and systemic		39	54.2					
Missing		0						
Antibiotic therapy Pt. infected in ICU only (N=78)		N	%					
Only empirical		20	27.0					
Only targeted		13	17.6					
Targeted after empirical		41	55.4					
Other		0	0.0					
Missing		4						
Surgical interventions		N	%					
No		599	95.7					
Yes		27	4.3					
Missing		0						
Number of surgical interventions		N	%					
0		599	95.7					
1		26	4.2					
2		1	0.2					
3		0	0.0					
>3		0	0.0					
Missing		0						
Surgical interventions Days from admission								
Mean			7.8					
SD			6.2					
Median			6.5					
Q1–Q3			2.2–11					
Missing			2					
Surgical interventions (top 10)		N	%					
Organ donation		9	1.4					
Gastrointestinal surgery		6	1.0					
Neurosurgery		6	1.0					
Orthopaedic surgery		2	0.3					
Pancreatic surgery		1	0.2					
Nephro/Urological surgery		1	0.2					
Ophthalmic surgery		1	0.2					
Biliary tract surgery		1	0.2					
Splenectomy		1	0.2					
-		0	0.0					
Missing		0						
Non surgical interventions		N	%					
No		597	95.4					
Yes		29	4.6					
Missing		0						
Non surgical interventions Days from admission								
Mean			12.8					
SD			11.5					
Median			10					
Q1–Q3			5–18					
Missing			2					
Non surgical interventions		N	%					
Interventional endoscopy		30	4.8					
Interventional cardiology		2	0.3					
Interventional neuroradiology		2	0.3					
Interventional radiology		1	0.2					
Missing		0						

National report for general ICUs - Year 2017**Outcome indicators - Adult non surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	294	48.0
Transferred to same hospital	195	31.8
Transferred to other hospital	98	16.0
Discharged home	26	4.2
Disch. terminally ill	0	0.0
Missing	13	

Transferred to (N=293)	N	%
Ward	284	96.9
Other ICU	7	2.4
High dependency care unit	2	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=7)	N	%
Specialist expertise	1	14.3
Step-up care	3	42.9
Logistical/organizational reasons	1	14.3
Step-down care	2	28.6
Missing	0	

Transferred to Same hospital (N=195)	N	%
Ward	193	99.0
Other ICU	0	0.0
High dependency care unit	2	1.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=98)	N	%
Ward	91	92.9
Other ICU	7	7.1
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	319	52.0
Dead	294	48.0
Missing	13	

Timing of ICU mortality (N=294)	N	%
Daytime (08:00AM - 07:59PM)	172	58.5
Nighttime (08:00PM - 07:59AM)	122	41.5
Weekdays (Monday - Friday)	220	74.8
Weekend (Saturday - Sunday)	74	25.2
Missing	0	

Hospital mortality	N	%
Alive	299	47.8
Dead	327	52.2
Missing	0	

Timing of hosp. mortality (N=327)	N	%
In ICU	294	89.9
Within 24 hours after ICU	1	0.3
24-47 hours after ICU	4	1.2
48-71 hours after ICU	5	1.5
72-95 hours after ICU	2	0.6
After 95 hours after ICU	21	6.4
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=33)		
Mean		20.4
SD		52.9
Median		7
Q1–Q3		2–17
Missing		0

National report for general ICUs - Year 2017

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

Last hospital mortality			ICU stay (days)		
	N	%			
Alive	296	47.3	Mean	8.5	
Dead	330	52.7	SD	11.4	
Missing	0		Median	5	
			Q1–Q3	2–10	
			Missing	0	
ICU stay (days)			ICU stay (days)		
Alive (N=319)			Alive (N=319)		
			Mean	8.5	
			SD	10.7	
			Median	5	
			Q1–Q3	2–10	
			Missing	0	
ICU stay (days)			ICU stay (days)		
Dead (N=294)			Dead (N=294)		
			Mean	7.2	
			SD	10.0	
			Median	3	
			Q1–Q3	1–9	
			Missing	0	
Stay after ICU (days)			Stay after ICU (days)		
Alive (N=319)			Alive (N=319)		
			Mean	8.4	
			SD	20.5	
			Median	3	
			Q1–Q3	0–10.5	
			Missing	0	
Hospital stay (days)			Hospital stay (days)		
Alive (N=299)			Alive (N=299)		
			Mean	16.0	
			SD	22.1	
			Median	9	
			Q1–Q3	4–20	
			Missing	0	
Hospital stay (days)			Hospital stay (days)		
Dead (N=327)			Dead (N=327)		
			Mean	13.1	
			SD	23.1	
			Median	8	
			Q1–Q3	2–15	
			Missing	0	

National report for general ICUs - Year 2017

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

Patients (N): 154

Sex	N	%
Male	70	45.5
Female	84	54.5
Missing	0	

Age (years)	N	%
17-45	16	10.4
46-65	59	38.3
66-75	45	29.2
>75	34	22.1
Missing	0	
Mean	64.1	
SD	13.0	
Median	66	
Q1–Q3	58–73	
Min–Max	20–89	

Body mass Index (BMI)	N	%
Underweight	5	3.2
Normal	42	27.3
Overweight	59	38.3
Obese	48	31.2
Missing	0	

Pregnancy status	N	%
Females (N=84)		
Not fertile	29	34.5
Not pregnant/Unknown	53	63.1
Currently pregnant	1	1.2
Post partum	1	1.2
Missing	0	

Comorbidities	N	%
No	27	17.5
Yes	127	82.5
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	89	57.8
Arrhythmia	34	22.1
NYHA class II-III	28	18.2
Any tumour without metastasis	26	16.9
Diabetes Type II with insulin treatment	24	15.6
Myocardial infarction	21	13.6
Peripheral vascular disease	17	11.0
Diabetes Type II without insulin tr.	13	8.4
Moderate COPD	13	8.4
Cerebrovascular disease	8	5.2
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	5.1	8.7	2	1–6	0

Source of admission	N	%
Same hospital	151	98.1
Other hospital	3	1.9
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=154)		
Medical ward	2	1.3
Surgical ward	152	98.7
Emergency room	0	0.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

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

Ward of admission	N	%
Same hospital (N=151)		
Medical ward	2	1.3
Surgical ward	149	98.7
Emergency room	0	0.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Ward of admission	N	%
Other hospital (N=3)		
Medical ward	0	0.0
Surgical ward	3	100.0
Emergency room	0	0.0
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Scheduled admission	N	%
No	61	39.6
Yes	93	60.4
Missing	0	

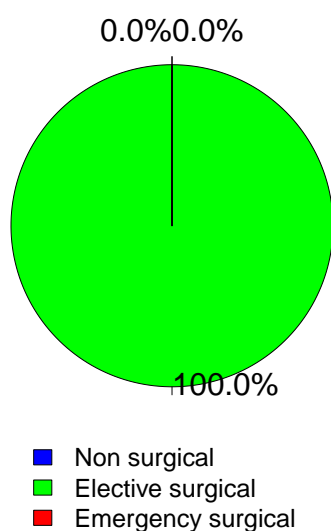
National report for general ICUs - Year 2017

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

Trauma	N	%
No	152	98.7
Yes	2	1.3
Multiple trauma	1	0.6
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	154	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Timing	N	%
Elective surgical (N=154)		
From -7 to -3 days	4	2.6
From -2 to -1 days	5	3.2
On ICU admission day	152	98.7
The day after ICU admission	1	0.6
Missing	0	

Surgical interventions (top 10)

Emergency surgical (N=0)	N	%
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Timing

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

Source of admission

Surgical pt. (N=154)	N	%
Operating theatre of surgical ward	145	94.2
Operating theatre of emergency room	0	0.0
Surgical ward	7	4.5
Other	2	1.3
Missing	0	

Surgical interventions (top 10)

Elective surgical (N=154)	N	%
Gastrointestinal surgery	44	28.6
Gynaecological surgery	36	23.4
Pancreatic surgery	21	13.6
Neurosurgery	18	11.7
Orthopaedic surgery	13	8.4
Biliary tract surgery	9	5.8
Esophageal surgery	6	3.9
Nephro/Urological surgery	5	3.2
Other surgery	3	1.9
Abdominal vascular surgery	2	1.3
Missing	0	

Non surgical interventions

	N	%
None	153	99.4
Elective	1	0.6
Emergency	0	0.0
Missing	0	

Non surgical interventions

Elective (N=1)	N	%
Interventional endoscopy	1	100.0
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	0	

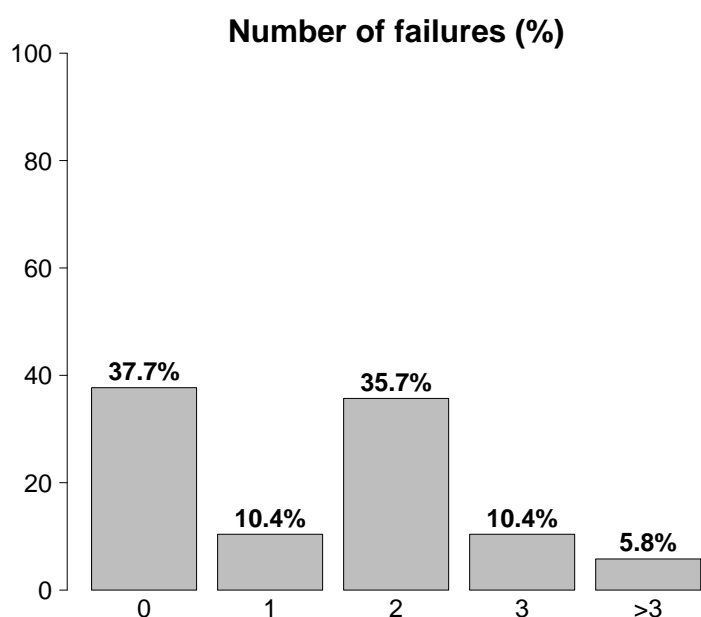
Non surgical interventions

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

National report for general ICUs - Year 2017

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

Reason for admission	N	%
Monitoring/Weaning	59	38.3
Post surgical weaning	47	30.5
Surgical monitoring	12	7.8
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	95	61.7
Only ventilatory support	13	8.4
Only cardiovascular support	8	5.2
Ventilatory and cardiovascular support	74	48.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	58	37.7
Yes	96	62.3
A: Respiratory failure	87	56.5
B: Cardiovascular failure	82	53.2
C: Neurological failure	5	3.2
D: Hepatic failure	1	0.6
E: Renal failure	15	9.7
F: Acute skin failure	1	0.6
G: Metabolic failure	20	13.0
H: Coagulation failure	0	0.0
Missing	0	

Failures on admission (top 10)	N	%
AB	51	33.1
A	8	5.2
B	8	5.2
ABEG	7	4.5
ABG	7	4.5
ABE	4	2.6
ABC	2	1.3
ABCEG	1	0.6
ABCG	1	0.6
ABD	1	0.6
Missing	0	

Respiratory failure	N	%
None	67	43.5
Only hypoxic failure	78	50.6
Only hypercapnic failure	1	0.6
Hypoxic-hypercapnic failure	0	0.0
Intubation for airway maint.	8	5.2
Missing	0	

Cardiovascular failure	N	%
None	72	46.8
Without shock	60	39.0
Cardiogenic shock	1	0.6
Septic shock	5	3.2
Haemorrhagic/hypovolemic shock	13	8.4
Hypovolemic shock	3	1.9
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	0	0.0
Mixed shock	0	0.0
Missing	0	

Neurologic failure	N	%
None	82	94.3
Cerebral coma	3	3.4
Metabolic coma	0	0.0
Postanoxic coma	2	2.3
Toxic coma	0	0.0
Missing or not evaluable	67	

Renal failure (AKIN)	N	%
None	139	90.3
Mild	7	4.5
Moderate	5	3.2
Severe	3	1.9
Missing	0	

Metabolic failure	N	%
None	134	87.0
pH <= 7.3, PaCO ₂ < 45 mmHg	8	5.2
Base deficit >= 5 mmol/L, lactate >1.5x	12	7.8
Missing	0	

National report for general ICUs - Year 2017

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

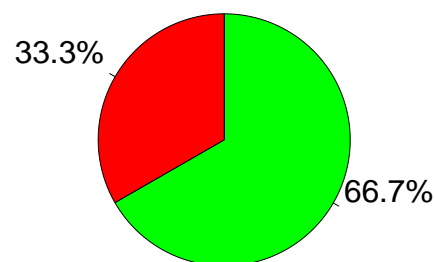
Clinical conditions on admission	N	%
Respiratory	19	12.3
Pneumothorax/Pneumomediastinum	6	3.9
Acute exacerbation of COPD	5	3.2
Pleural effusion	3	1.9
Upper respiratory tract disease	1	0.6
Atelectasis	1	0.6
Cardiovascular	16	10.4
Left heart failure without pulm. edema	12	7.8
Cardiac arrest	2	1.3
Left heart failure with pulmonary edema	1	0.6
Peripheral vascular disease	1	0.6
-	0	0.0
Neurological	19	12.3
Brain tumour	15	9.7
Intracranial hypertension	2	1.3
Cerebral artery stroke	1	0.6
Seizures	1	0.6
Cerebral Aneurysm	1	0.6
Gastrointestinal and hepatic	62	40.3
Digestive tract malignancy	25	16.2
Pancreatic malignancy	20	13.0
Intestinal occlusion	5	3.2
Acute bile-duct disease	4	2.6
Paralytic Ileus	3	1.9
Trauma (anatomical districts)	2	1.3
Head	1	0.6
Spine	1	0.6
Chest	1	0.6
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Other	57	37.0
Gynaecological disease	36	23.4
Orthopaedic disease	10	6.5
Other disease	4	2.6
Metabolic disorder	3	1.9
Autoimmune disease	2	1.3
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	15	9.7
Post-surgical peritonitis	3	1.9
Cholecystitis/cholangitis	2	1.3
Pleurisy/Pleural empyema	2	1.3
Primary peritonitis	2	1.3
Artery or vein infection	1	0.6
Post-surgical bone and joint infection	1	0.6
Gastroenteritis	1	0.6
Post-surgical mediastinitis	1	0.6
NON-surgical secondary peritonitis	1	0.6
Tertiary peritonitis	1	0.6
Missing	0	0.0

Trauma (anatomical districts)	N	%
Head	1	0.6
Extradural/epidural haematoma	1	0.6
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Spine	1	0.6
Vertebral fracture, without deficit	1	0.6
-	0	0.0
-	0	0.0
Chest	1	0.6
Traum. haemothorax/pneumothorax	1	0.6
-	0	0.0
-	0	0.0
Abdomen	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Pelvis/bone/joint & muscle	0	0.0
-	0	0.0
-	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	0.0

Infection severity on admission	N	%
None	139	90.3
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	10	6.5
SEPTIC SHOCK	5	3.2
Missing	0	0.0

Infection severity on admission

Patients infected (N=15)

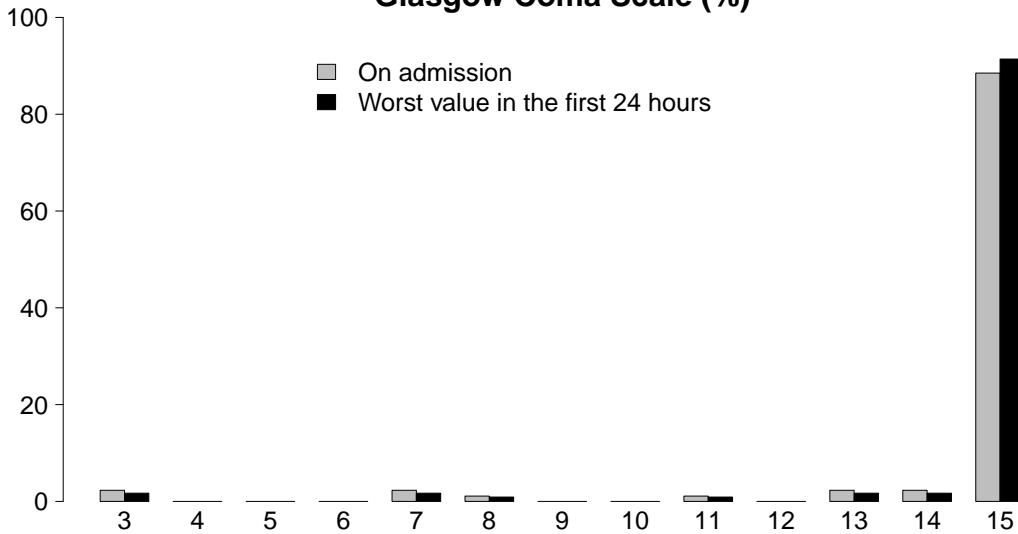


■ INFECTION WITHOUT SEPSIS/SEPSIS
 ■ SEPTIC SHOCK

National report for general ICUs - Year 2017

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

Glasgow Coma Scale (%)



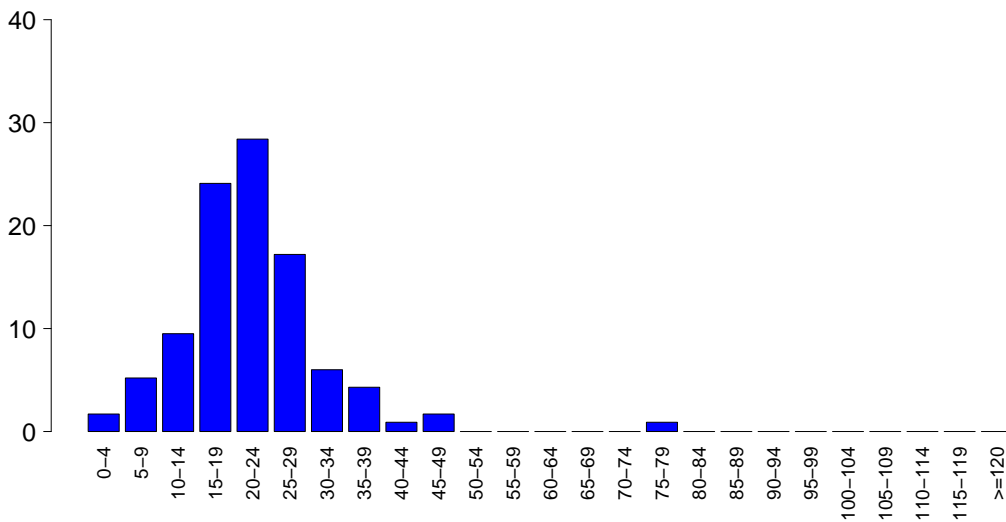
GCS (admission)

Median	15
Q1–Q3	15–15
Not evaluable	67
Missing	0

GCS (first 24 hours)

Median	15
Q1–Q3	15–15
Not evaluable	38
Missing	0

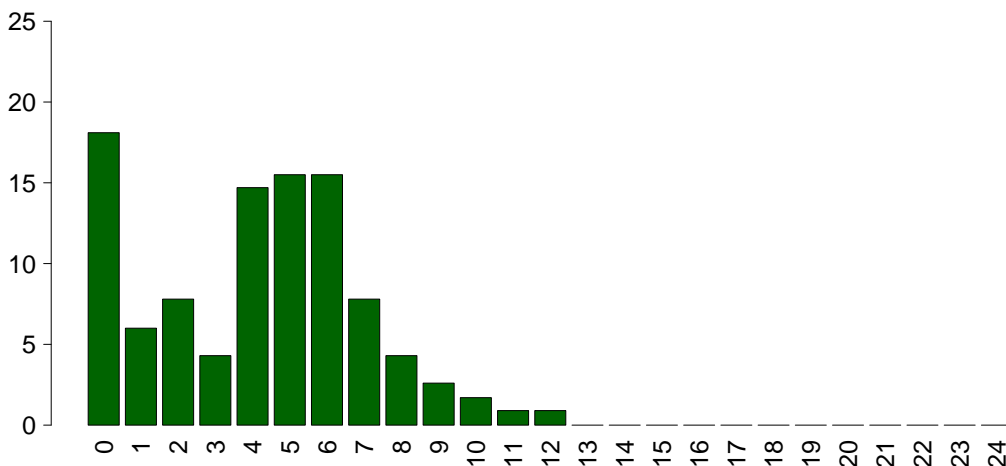
SAPS II (%)



SAPSII

Mean	21.9
SD	9.5
Median	21
Q1–Q3	18–26
Not evaluable	38
Missing	-38

SOFA (%)



SOFA

Mean	4.1
SD	2.9
Median	4
Q1–Q3	2–6
Not evaluable	38
Missing	-38

National report for general ICUs - Year 2017

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

Complications during the stay	N	%
No	110	71.4
Yes	44	28.6
Missing	0	

Failures during the stay	N	%
No	137	89.0
Yes	17	11.0
A: Respiratory failure	10	6.5
B: Cardiovascular failure	5	3.2
C: Neurological failure	2	1.3
D: Hepatic failure	0	0.0
E: Renal failure (AKIN)	9	5.8
F: Acute skin failure	0	0.0
G: Metabolic failure	1	0.6
H: Coagulation failure	1	0.6
Missing	0	

Failures during the stay (top 10)	N	%
E	4	2.6
A	3	1.9
AB	2	1.3
AE	2	1.3
B	2	1.3
ABE	1	0.6
ACE	1	0.6
ACH	1	0.6
EG	1	0.6
-	0	0.0
Missing	0	

Respiratory failure occurred	N	%
None	144	93.5
Intubation for airway maint.	0	0.0
Hypoxic failure	10	6.5
Hypercapnic failure	0	0.0
Missing	0	

Cardiovascular failure occurred	N	%
None	149	96.8
Cardiogenic shock	1	0.6
Hypovolemic shock	3	1.9
Haemorrhagic/hypovolemic shock	0	0.0
Septic shock	1	0.6
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	0	0.0
Missing	0	

Neurological failure occurred	N	%
None	152	98.7
Cerebral coma	1	0.6
Metabolic coma	1	0.6
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	145	94.2
Mild	0	0.0
Moderate	1	0.6
Severe	8	5.2
Missing	0	

Complications during the stay	N	%
Respiratory	7	4.5
Pleural effusion	4	2.6
Pneumothorax/Pneumomediastinum	2	1.3
Acute asthma/bronchospasm	1	0.6
Atelectasis	1	0.6
-	0	0.0
Cardiovascular	12	7.8
Acute severe arrhythmia: tachycardias	4	2.6
Cardiac arrest	3	1.9
Left heart failure w/o pulm. edema	3	1.9
Acute severe arrhythmia: bradycardias	1	0.6
Deep venous thrombosis	1	0.6
Neurological	14	9.1
Drowsiness/agitation/delirium	9	5.8
Intracranial hypertension	3	1.9
Brain edema	2	1.3
Hydrocephalus	2	1.3
New ischaemic stroke	1	0.6
Gastrointestinal and hepatic	3	1.9
Anastomotic dehiscence	2	1.3
Gastrointestinal bleeding: lower tract	1	0.6
Intrabdominal bleeding	1	0.6
-	0	0.0
-	0	0.0
Other	4	2.6
Category/Stage I: Nonblanchable Erythema	2	1.3
Metabolic disorder	1	0.6
Other skin and/or soft tissue pathology	1	0.6
-	0	0.0
-	0	0.0
-	0	0.0
-	0	0.0
Infections	25	16.2
Post-surgical peritonitis	10	6.5
NON-surgical urinary tract infection	6	3.9
Pneumonia	4	2.6
Post-surgical urinary tract infection	3	1.9
Cholecystitis/cholangitis	2	1.3
Post-surgical CNS infection	2	1.3
Post-surgical skin/soft tissue infection	2	1.3
Gastroenteritis	1	0.6
L.R.T.I. other than pneumonia	1	0.6
Post-surg. gynecological inf.	1	0.6
Missing	0	

National report for general ICUs - Year 2017

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

Infections			Maximum severity of infection		
	N	%		N	%
None	116	75.3	None	116	75.3
Only on admission	13	8.4	-	0	0.0
On admission and during ICU stay	2	1.3	INFECTION WITHOUT SEPSIS/SEPSIS	32	20.8
Only during ICU stay	23	14.9	SEPTIC SHOCK	6	3.9
Missing	0		Missing	0	

Severity evolution		During the stay				
		None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	116 (83.5%)	0 (0.0%)	22 (15.8%)	1 (0.7%)	139
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	10 (100.0%)	0 (0.0%)	10
	SEPTIC SHOCK	-	-	-	5 (100.0%)	5
	TOT	116	0	32	6	154

Ventil. Associat. Pneumonia (VAP)	N	%
No	150	97.4
Yes	4	2.6
Missing	0	

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

Estimate	13.9
CI (95%)	3.8–35.6

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

Estimate	11.1%
CI (95%)	3.0–28.4

Catheter Bacteraemia (CR-BSI)	N	%
No	154	100.0
Yes	0	0.0
Missing	0	

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

Estimate	0.0
CI (95%)	0.0–5.0

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

Estimate	0.0%
CI (95%)	0.0–6.1

National report for general ICUs - Year 2017
Process indicators - Adult elective surgical patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0) Procedures (antibiotics excluded)	Use		On admission		On discharge		Length (days)		Days from admission	
	N	%	N	%	N	%	Median	Q1-Q3	Median	Q1-Q3
	153	99.4								
Invasive ventilation	137	89.0	130	84.4	11	7.1	0	0-1	0	0-0
Non invasive ventilation	6	3.9	0	0	1	0.6	1	0-1	0	0-1
Tracheostomy	7	4.5	1	0.6	4	2.6	18	11-29	0	10-15
iNO (inhaled nitric oxide)	0	0.0								
Central Venous Catheter PICC	138	89.6	82	53.2	45	29.2	3	1-5	0	0-0
Arterial Catheter	147	95.5	22	14.3	15	9.7	2	1-5	0	0-0
Vasoactive drugs	110	71.4	89	57.8	8	5.2	3	1-5	0	0-0
Antiarrhythmics	17	11.0	1	0.6	0	0	2	1-4	0	0-2
IABP	0	0.0								
Invasive monitoring of C.O.	74	48.1	5	3.2	4	2.6	3	1-5	0	0-0
Continuous monitoring of ScVO2	0	0.0								
Temporary pacing	0	0.0								
Ventricular assistance	0	0.0								
DC-shock	2	1.3							1	0-2
CPR	5	3.2							0	0-2
Massive blood transfusion	4	2.6							0	0-0
ICP monitoring without CSF drainage	0	0.0								
ICP monitoring with CSF drainage	0	0.0								
External ventricular drainage without ICP	0	0.0								
Haemofiltration	6	3.9	0	0	0	0	5	4-10	0	1-2
Haemodialysis	3	1.9	0	0	0	0	1	1-2	0	0-2
ECMO	0	0.0								
Hepatic clearance techniques	0	0.0								
Clearance techniques during sepsis	0	0.0								
IAP (intra-abdominal pressure)	0	0.0								
Hypothermia	0	0.0								
Enteral nutrition	33	21.4	7	4.5	12	7.8	3	2-8	0	1-3
Parenteral nutrition	96	62.3	7	4.5	40	26	3	2-5	0	0-1
SDD (Topical, Topical and systemic)	12	7.8								
Patient restraint	0	0.0								
Peridural catheter	2	1.3	0	0	1	0.6	2	1-2	0	0-0
Electrical cardioversion	2	1.3							1	0-2
Vacuum therapy	1	0.6								
Antibiotics	101	65.6								
Antibiotic prophylaxis	74	48.1	32	20.8	14	9.1	1	1-3	0	0-0
Empirical antibiotic therapy	29	18.8	9	5.8	6	3.9	3	2-3	0	0-3
Targeted antibiotic therapy	23	14.9	1	0.6	11	7.1	5	4-10	0	2-7

National report for general ICUs - Year 2017**Process indicators - Adult elective surgical patients evaluated in the GiViTI model**

			Length (days)				
Invasive ventilation (N=137)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	79	57.2	3.3	8.2	1	0–2.5	0
For airway maintenance	7	5.1	6.3	5.8	4	2.5–9.5	0
In weaning	47	34.1	0.1	0.3	0	0–0	0
Not evaluable	5	3.6	0.8	0.8	1	0–1	0
Reintubation within 48 hours	2	1.4	16.5	19.1	16.5	9.75–23.25	0
Non invasive ventilation (N=6)	N	%	Number of surgical interventions				
Non invasive ventilation only	3	50.0	0 144 93.5				
Non invasive ventilation failed	1	16.7	1 4 2.6				
For weaning	2	33.3	2 3 1.9				
Other	0	0.0	3 2 1.3				
Missing	0		>3 1 0.6				
Tracheostomy not present on admission (N=6)	N	%	Missing 0				
Surgical	2	33.3	Surgical interventions				
Percutwist	0	0.0	Days from admission				
Ciaglia	0	0.0	Mean 16.2				
Monodil. Ciaglia	0	0.0	SD 12.8				
Fantoni	0	0.0	Median 13.5				
Griggs	3	50.0	Q1–Q3 6.5–22.2				
Other Kind	0	0.0	Missing 0				
Unknown	1	16.7	Surgical interventions (top 10)				
Missing	0		N %				
			Neurosurgery 8 5.2				
			Gastrointestinal surgery 6 3.9				
			Other surgery 3 1.9				
			Pancreatic surgery 1 0.6				
			ENT surgery 1 0.6				
			Biliary tract surgery 1 0.6				
			- 0 0.0				
			- 0 0.0				
			- 0 0.0				
			Missing 0				
Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=6)			Non surgical interventions				
Mean	15.5		N %				
SD	9.6		No 153 99.4				
Median	14		Yes 1 0.6				
Q1–Q3	10.2–14.8		Missing 0				
Missing	0		Non surgical interventions				
Invasive monitoring of C.O. (N=74)	N	%	Days from admission				
Swan Ganz	0	0.0	Mean 16.0				
PICCO	3	4.1	SD				
LIDCO	64	86.5	Median 16				
Vigileo-PRAM	0	0.0	Q1–Q3 16–16				
Other	7	9.5	Missing 0				
Missing	0		Non surgical interventions				
SDD (N=12)	N	%	N %				
Topical	10	83.3	Interventional endoscopy 1 0.6				
Topical and systemic	2	16.7	Interventional radiology 0 0.0				
Missing	0		Interventional cardiology 0 0.0				
Antibiotic therapy			Interventional neuroradiology 0 0.0				
Pt. infected in ICU only (N=23)	N	%	Missing 0				
Only empirical	7	30.4	Non surgical interventions				
Only targeted	4	17.4	N %				
Targeted after empirical	10	43.5	Interventional endoscopy 1 0.6				
Other	2	8.7	Interventional radiology 0 0.0				
Missing	0		Interventional cardiology 0 0.0				
Surgical interventions	N	%	Interventional neuroradiology 0 0.0				
No	144	93.5	Missing 0				
Yes	10	6.5					
Missing	0						

National report for general ICUs - Year 2017**Outcome indicators - Adult elective surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	13	8.4
Transferred to same hospital	129	83.8
Transferred to other hospital	5	3.2
Discharged home	7	4.5
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=134)	N	%
Ward	133	99.3
Other ICU	0	0.0
High dependency care unit	1	0.7
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=129)	N	%
Ward	129	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=5)	N	%
Ward	4	80.0
Other ICU	0	0.0
High dependency care unit	1	20.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	141	91.6
Dead	13	8.4
Missing	0	

Timing of ICU mortality (N=13)	N	%
Daytime (08:00AM - 07:59PM)	7	53.8
Nighttime (08:00PM - 07:59AM)	6	46.2
Weekdays (Monday - Friday)	8	61.5
Weekend (Saturday - Sunday)	5	38.5
Missing	0	

Hospital mortality	N	%
Alive	134	87.0
Dead	20	13.0
Missing	0	

Timing of hosp. mortality (N=20)	N	%
In ICU	13	65.0
Within 24 hours after ICU	1	5.0
24-47 hours after ICU	1	5.0
48-71 hours after ICU	0	0.0
72-95 hours after ICU	0	0.0
After 95 hours after ICU	5	25.0
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=7)		
Mean		26.1
SD		29.1
Median		19
Q1–Q3		4–40.5
Missing		0

National report for general ICUs - Year 2017

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

Last hospital mortality	N	%
Alive	134	87.0
Dead	20	13.0
Missing	0	

ICU stay (days)	
Mean	4.9
SD	8.4
Median	2
Q1–Q3	1–5
Missing	0

ICU stay (days) Alive (N=141)	
Mean	3.9
SD	6.0
Median	2
Q1–Q3	1–4
Missing	0

ICU stay (days) Dead (N=13)	
Mean	15.2
SD	18.9
Median	7
Q1–Q3	1–24
Missing	0

Stay after ICU (days) Alive (N=141)	
Mean	10.8
SD	12.5
Median	7
Q1–Q3	4–12
Missing	0

Hospital stay (days)	
Mean	19.7
SD	18.3
Median	14
Q1–Q3	9–23.8
Missing	0

Hospital stay (days) Alive (N=134)	
Mean	18.6
SD	16.6
Median	13.5
Q1–Q3	9–23
Missing	0

Hospital stay (days) Dead (N=20)	
Mean	27.1
SD	26.5
Median	17
Q1–Q3	5.5–38.8
Missing	0

National report for general ICUs - Year 2017

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

Patients (N): 277

Sex	N	%
Male	143	51.6
Female	134	48.4
Missing	0	

Age (years)	N	%
17-45	50	18.1
46-65	85	30.7
66-75	48	17.3
>75	94	33.9
Missing	0	
Mean	64.5	
SD	17.7	
Median	66	
Q1–Q3	53–79	
Min–Max	17–95	

Body mass Index (BMI)	N	%
Underweight	12	4.3
Normal	108	39.0
Overweight	89	32.1
Obese	68	24.5
Missing	0	

Pregnancy status	N	%
Females (N=134)		
Not fertile	71	53.0
Not pregnant/Unknown	57	42.5
Currently pregnant	1	0.7
Post partum	5	3.7
Missing	0	

Comorbidities	N	%
No	55	19.9
Yes	222	80.1
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	149	53.8
NYHA class II-III	75	27.1
Arrhythmia	69	24.9
Diabetes Type II with insulin treatment	52	18.8
Peripheral vascular disease	27	9.7
Alcohol addiction	26	9.4
Myocardial infarction	26	9.4
Any tumour without metastasis	23	8.3
Diabetes Type II without insulin tr.	20	7.2
Moderate COPD	17	6.1
Missing	0	

Stay before ICU (days)	Mean	SD	Median	Q1–Q3	Missing
	4.0	8.0	1	0–4	0

Source of admission	N	%
Same hospital	240	86.6
Other hospital	37	13.4
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission	N	%
Hospital (N=277)		
Medical ward	13	4.7
Surgical ward	242	87.4
Emergency room	18	6.5
Other ICU	4	1.4
High dependency care unit	0	0.0
Missing	0	

Reason for transfer from	N	%
Other ICU (N=4)		
Specialist expertise	4	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=240)		
Medical ward	9	3.8
Surgical ward	213	88.8
Emergency room	18	7.5
Other ICU	0	0.0
High dependency care unit	0	0.0
Missing	0	

Ward of admission	N	%
Other hospital (N=37)		
Medical ward	4	10.8
Surgical ward	29	78.4
Emergency room	0	0.0
Other ICU	4	10.8
High dependency care unit	0	0.0
Missing	0	

Scheduled admission	N	%
No	275	99.3
Yes	2	0.7
Missing	0	

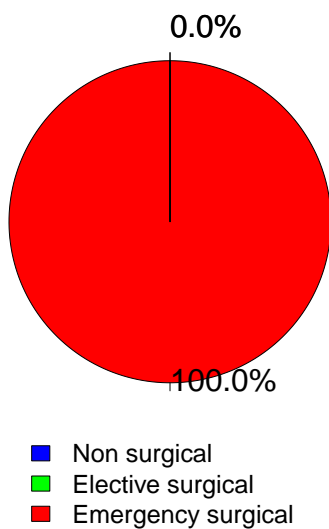
National report for general ICUs - Year 2017

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

Trauma	N	%
No	206	74.4
Yes	71	25.6
Multiple trauma	8	2.9
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	277	100.0
Missing	0	

Surgical status



Source of admission	N	%
Surgical pt. (N=277)		
Operating theatre of surgical ward	198	71.5
Operating theatre of emergency room	5	1.8
Surgical ward	44	15.9
Other	30	10.8
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=277)		
Gastrointestinal surgery	136	49.1
Neurosurgery	65	23.5
Other surgery	22	7.9
Orthopaedic surgery	16	5.8
Biliary tract surgery	11	4.0
Gynaecological surgery	8	2.9
Pancreatic surgery	7	2.5
Obstetric surgery	6	2.2
Abdominal vascular surgery	6	2.2
Splenectomy	4	1.4
Missing	0	

Timing	N	%
Emergency surgical (N=277)		
From -7 to -3 days	19	6.9
From -2 to -1 days	35	12.6
On ICU admission day	224	80.9
The day after ICU admission	15	5.4
Missing	0	

Non surgical interventions	N	%
None	266	96.0
Elective	2	0.7
Emergency	9	3.2
Missing	0	

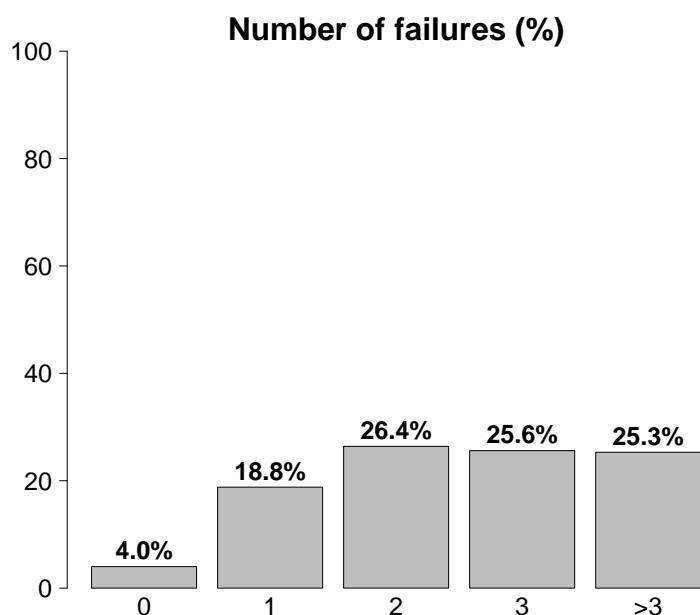
Non surgical interventions	N	%
Elective (N=2)		
Interventional neuroradiology	1	50.0
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional endoscopy	0	0.0
Missing	1	

Non surgical interventions	N	%
Emergency (N=9)		
Interventional endoscopy	6	66.7
Interventional neuroradiology	1	11.1
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Missing	2	

National report for general ICUs - Year 2017

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

Reason for admission	N	%
Monitoring/Weaning	16	5.8
Post surgical weaning	9	3.2
Surgical monitoring	7	2.5
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	261	94.2
Only ventilatory support	60	21.7
Only cardiovascular support	14	5.1
Ventilatory and cardiovascular support	187	67.5
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	11	4.0
Yes	266	96.0
A: Respiratory failure	247	89.2
B: Cardiovascular failure	201	72.6
C: Neurological failure	49	17.7
D: Hepatic failure	2	0.7
E: Renal failure	86	31.0
F: Acute skin failure	0	0.0
G: Metabolic failure	108	39.0
H: Coagulation failure	6	2.2
Missing	0	

Failures on admission (top 10)	N	%
AB	59	21.3
ABEG	43	15.5
A	39	14.1
ABG	28	10.1
ABC	16	5.8
ABE	15	5.4
ABCG	13	4.7
B	9	3.2
ABCEG	6	2.2
AC	6	2.2
Missing	0	

Respiratory failure	N	%
None	30	10.8
Only hypoxic failure	184	66.4
Only hypercapnic failure	1	0.4
Hypoxic-hypercapnic failure	9	3.2
Intubation for airway maint.	53	19.1
Missing	0	

Cardiovascular failure	N	%
None	76	27.4
Without shock	73	26.4
Cardiogenic shock	7	2.5
Septic shock	63	22.7
Haemorrhagic/hypovolemic shock	28	10.1
Hypovolemic shock	9	3.2
Anaphylactic shock	1	0.4
Neurogenic shock	4	1.4
Other shock	14	5.1
Mixed shock	2	0.7
Missing	0	

Neurologic failure	N	%
None	68	58.1
Cerebral coma	33	28.2
Metabolic coma	7	6.0
Postanoxic coma	7	6.0
Toxic coma	2	1.7
Missing or not evaluable	160	

Renal failure (AKIN)	N	%
None	191	69.0
Mild	29	10.5
Moderate	24	8.7
Severe	33	11.9
Missing	0	

Metabolic failure	N	%
None	169	61.0
pH \leq 7.3, PaCO ₂ $<$ 45 mmHg	36	13.0
Base deficit \geq 5 mmol/L, lactate $>$ 1.5x	72	26.0
Missing	0	

National report for general ICUs - Year 2017

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

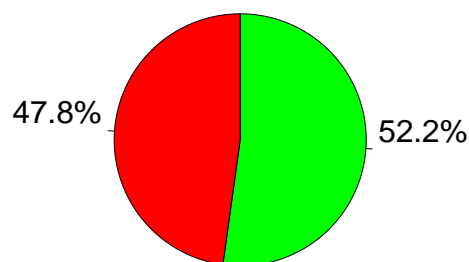
Clinical conditions on admission	N	%
Respiratory	20	7.2
Aspiration pneumonia	10	3.6
Pneumothorax/Pneumomediastinum	4	1.4
Pleural effusion	3	1.1
Upper respiratory tract disease	2	0.7
Atelectasis	1	0.4
Cardiovascular	35	12.6
Left heart failure without pulm. edema	22	7.9
Cardiac arrest	6	2.2
Left heart failure with pulmonary edema	2	0.7
Right heart failure	2	0.7
Acute severe arrhythmia: tachycardias	2	0.7
Neurological	30	10.8
Intracranial hypertension	18	6.5
Cerebral Aneurysm	8	2.9
Spontaneous Subarachnoid haemorrhage	7	2.5
Spontaneous Hydrocephalus	5	1.8
Non traumatic cerebral oedema	5	1.8
Gastrointestinal and hepatic	103	37.2
Intestinal occlusion	30	10.8
Gastrointestinal perforation	25	9.0
Anastomotic dehiscence	11	4.0
Paralytic Ileus	9	3.2
Bowel ischaemia	8	2.9
Trauma (anatomical districts)	71	25.6
Head	45	16.2
Pelvis/bone/joint & muscle	17	6.1
Chest	9	3.2
Abdomen	9	3.2
Spine	3	1.1
-	0	0.0
-	0	0.0
Other	31	11.2
Coagulation disorder	6	2.2
Gynaecological disease	5	1.8
Obstetric disease	5	1.8
Metabolic disorder	4	1.4
Nephrourologic disease	4	1.4
Post transplantation	0	0.0
-	0	0.0
-	0	0.0
Infections	139	50.2
NON-surgical secondary peritonitis	33	11.9
Pneumonia	30	10.8
Post-surgical peritonitis	28	10.1
Primary peritonitis	18	6.5
Cholecystitis/cholangitis	9	3.2
NON-surgical urinary tract infection	9	3.2
Post-surgical skin/soft tissue infection	7	2.5
NON-surgical skin/soft tissue infection	6	2.2
Tertiary peritonitis	5	1.8
Post-surgical CNS infection	3	1.1
Missing	0	

Trauma (anatomical districts)	N	%
Head	45	16.2
Traumatic Subdural haematoma	29	10.5
Extradural/epidural haematoma	13	4.7
Traumatic intraparenchymal bleeding	7	2.5
Skull fracture	7	2.5
Cerebral contusion/laceration	6	2.2
Spine	3	1.1
Vertebral fracture, without deficit	1	0.4
Cervical injury, incomplete deficit	1	0.4
Tetraplegia	1	0.4
Chest	9	3.2
Traum. haemothorax/pneumothorax	6	2.2
Other injuries of the chest	3	1.1
Flail chest	2	0.7
Abdomen	9	3.2
Bowel transection/perforation	2	0.7
Liver: Moderate-Severe laceration	2	0.7
Liver: Massive laceration	2	0.7
Pelvis/bone/joint & muscle	17	6.1
Long bone fracture	15	5.4
Multiple fracture of the pelvis	1	0.4
Very severe or open fracture of the pelvis	1	0.4
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	138	50.0
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPTIC SHOCK	72	26.1
SEPTIC SHOCK	66	23.9
Missing	1	

Infection severity on admission

Patients infected (N=138)

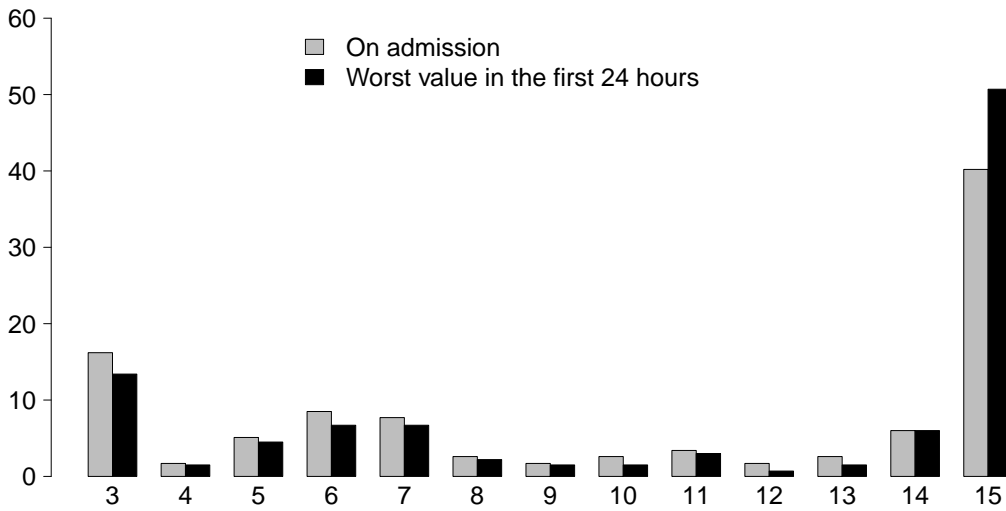


■ INFECTION WITHOUT SEPSIS/SEPTIC SHOCK
 ■ SEPTIC SHOCK

National report for general ICUs - Year 2017

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

Glasgow Coma Scale (%)



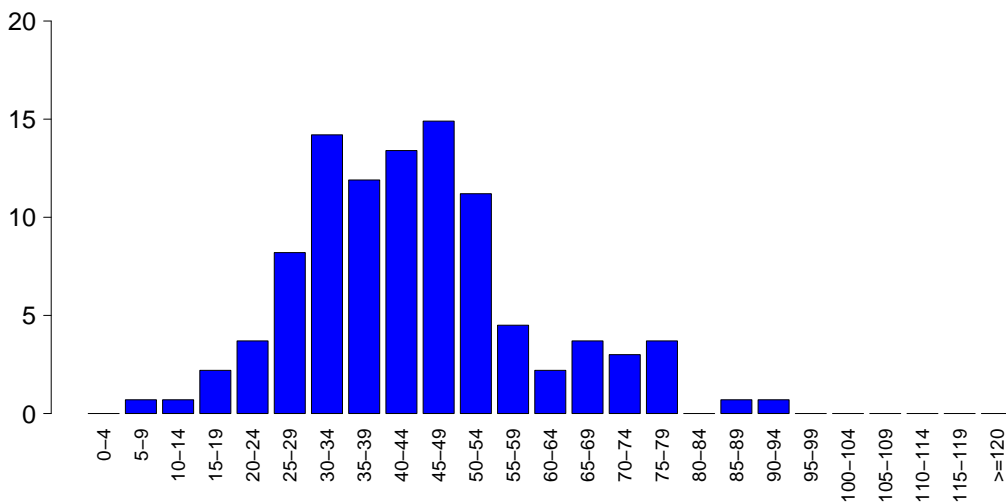
GCS (admission)

Median	12
Q1–Q3	6–15
Not evaluable	160
Missing	0

GCS (first 24 hours)

Median	15
Q1–Q3	6–15
Not evaluable	143
Missing	0

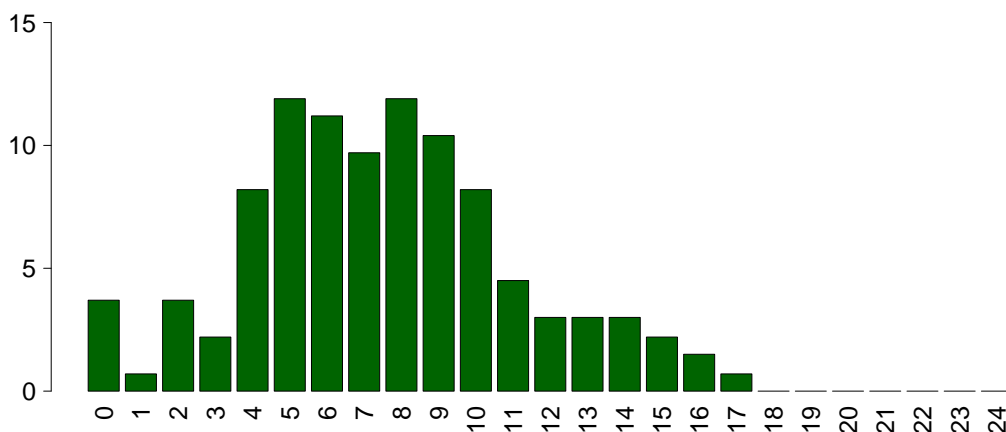
SAPS II (%)



SAPSII

Mean	43.5
SD	15.5
Median	42
Q1–Q3	33–51
Not evaluable	143
Missing	-143

SOFA (%)



SOFA

Mean	7.5
SD	3.6
Median	7
Q1–Q3	5–10
Not evaluable	143
Missing	-143

National report for general ICUs - Year 2017

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

Complications during the stay	N	%
No	113	40.8
Yes	164	59.2
Missing	0	

Failures during the stay	N	%
No	237	85.6
Yes	40	14.4
A: Respiratory failure	18	6.5
B: Cardiovascular failure	21	7.6
C: Neurological failure	0	0.0
D: Hepatic failure	2	0.7
E: Renal failure (AKIN)	18	6.5
F: Acute skin failure	0	0.0
G: Metabolic failure	0	0.0
H: Coagulation failure	0	0.0
Missing	0	

Failures during the stay (top 10)	N	%
E	9	3.2
B	8	2.9
A	7	2.5
AB	7	2.5
BE	4	1.4
ABE	2	0.7
ADE	1	0.4
AE	1	0.4
DE	1	0.4
-	0	0.0
Missing	0	

Respiratory failure occurred	N	%
None	259	93.5
Intubation for airway maint.	2	0.7
Hypoxic failure	15	5.4
Hypercapnic failure	1	0.4
Missing	0	

Cardiovascular failure occurred	N	%
None	256	92.4
Cardiogenic shock	0	0.0
Hypovolemic shock	9	3.2
Haemorrhagic/hypovolemic shock	3	1.1
Septic shock	9	3.2
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	0	0.0
Missing	0	

Neurological failure occurred	N	%
None	277	100.0
Cerebral coma	0	0.0
Metabolic coma	0	0.0
Postanoxic coma	0	0.0
Missing	0	

Renal failure occurred (AKIN)	N	%
None	259	93.5
Mild	2	0.7
Moderate	1	0.4
Severe	15	5.4
Missing	0	

Complications during the stay	N	%
Respiratory	14	5.1
Pneumothorax/Pneumomediastinum	8	2.9
Pleural effusion	3	1.1
Haemoptysis	2	0.7
Pulmonary embolism	2	0.7
-	0	0.0
Cardiovascular	41	14.8
Left heart failure w/o pulm. edema	22	7.9
Cardiac arrest	10	3.6
Hypertensive crisis	4	1.4
Acute ischaemia	2	0.7
Deep venous thrombosis	2	0.7
Neurological	62	22.4
Intracranial hypertension	45	16.2
Brain edema	26	9.4
Drowsiness/agitation/delirium	12	4.3
New ischaemic stroke	4	1.4
Seizures	4	1.4
Gastrointestinal and hepatic	23	8.3
Gastrointestinal perforation	5	1.8
Intrabdominal bleeding	4	1.4
Acute bile-duct disease	3	1.1
Bowel ischaemia	3	1.1
Gastrointestinal bleeding: lower tract	3	1.1
Other	13	4.7
Nephrourologic disease	6	2.2
Category/Stage II: Partial Thickness Skin Loss	3	1.1
Category/Stage III: Full Thickness Skin Loss	2	0.7
Iatrogenic major vessels injury	1	0.4
Eclampsia	1	0.4
-	0	0.0
-	0	0.0
Infections	76	27.4
Pneumonia	21	7.6
L.R.T.I. other than pneumonia	18	6.5
Post-surgical peritonitis	15	5.4
NON-surgical urinary tract infection	12	4.3
Post-surgical skin/soft tissue infection	4	1.4
Post-surgical CNS infection	3	1.1
Primary peritonitis	3	1.1
Post-surgical urinary tract infection	3	1.1
Gastroenteritis	2	0.7
NON-surgical secondary peritonitis	2	0.7
Missing	0	

National report for general ICUs - Year 2017

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

Infections			Maximum severity of infection		
	N	%		N	%
None	88	31.8	None	88	31.9
Only on admission	113	40.8	-	0	0.0
On admission and during ICU stay	26	9.4	INFECTION WITHOUT SEPSIS/SEPSIS	115	41.7
Only during ICU stay	50	18.1	SEPTIC SHOCK	73	26.4
Missing	0		Missing	1	

Severity evolution

Severity evolution		During the stay				
		None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	88 (63.8%)	0 (0.0%)	47 (34.1%)	3 (2.2%)	138
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	68 (94.4%)	4 (5.6%)	72
	SEPTIC SHOCK	-	-	-	66 (100.0%)	66
	TOT	88	0	115	73	276

Ventil. Associat. Pneumonia (VAP)	N	%
No	259	93.5
Yes	18	6.5
Missing	0	

Incidence of VAP

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

Estimate	12.1
CI (95%)	7.2–19.1

Incidence of VAP

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

Estimate	9.7%
CI (95%)	5.7–15.3

Catheter Bacteraemia (CR-BSI)	N	%
No	277	100.0
Yes	0	0.0
Missing	0	

Incidence of CR-BSI

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

Estimate	0.0
CI (95%)	0.0–1.6

Incidence of CR-BSI

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

Estimate	0.0%
CI (95%)	0.0–1.9

National report for general ICUs - Year 2017
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
	277	100.0										
Invasive ventilation	262	94.6	214	77.3	59	21.3	3	1-7	0	0	0-0	0
Non invasive ventilation	8	2.9	0	0	1	0.4	2	1-3	0	0	0-2	0
Tracheostomy	37	13.4	2	0.7	25	9	10	5-21	0	8	5-11	0
iNO (inhaled nitric oxide)	0	0.0										
Central Venous Catheter PICC	249	89.9	127	45.8	100	36.1	5	3-10	0	0	0-0	0
Arterial Catheter	265	95.7	104	37.5	89	32.1	5	2-10	0	0	0-0	0
Vasoactive drugs	248	89.5	163	58.8	55	19.9	3	2-6	0	0	0-0	0
Antiarrhythmics	43	15.5	2	0.7	6	2.2	3	1-6	0	0	0-1	0
IABP	0	0.0										
Invasive monitoring of C.O.	122	44.0	30	10.8	23	8.3	5	3-9	0	0	0-0	0
Continuous monitoring of ScVO2	1	0.4	1	0.4	1	0.4	32	32-32	0			
Temporary pacing	0	0.0										
Ventricular assistance	0	0.0										
DC-shock	2	0.7								2	1-2	0
CPR	14	5.1								2	0-4	0
Massive blood transfusion	14	5.1								0	0-0	0
ICP monitoring without CSF drainage	0	0.0										
ICP monitoring with CSF drainage	0	0.0										
External ventricular drainage without ICP	0	0.0										
Haemofiltration	21	7.6	5	1.8	1	0.4	4	3-7	0	1	0-1	0
Haemodialysis	20	7.2	2	0.7	1	0.4	4	3-6	0	1	0-4	0
ECMO	0	0.0										
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	1	0.4	0	0	0	0	2	2-2	0	59	59-59	0
IAP (intra-abdominal pressure)	0	0.0										
Hypothermia	0	0.0										
Enteral nutrition	136	49.1	21	7.6	55	19.9	5	2-11	0	1	0-2	0
Parenteral nutrition	167	60.3	33	11.9	57	20.6	5	2-9	0	1	0-1	0
SDD (Topical, Topical and systemic)	52	18.8										
Patient restraint	0	0.0										
Peridural catheter	1	0.4	1	0.4	1	0.4	13	13-13	0	0	0-1	0
Electrical cardioversion	8	2.9										
Vacuum therapy	0	0.0										
Antibiotics	245	88.4										
Antibiotic prophylaxis	77	27.8	42	15.2	26	9.4	3	1-5	0	0	0-0	0
Empirical antibiotic therapy	154	55.6	56	20.2	25	9	2	2-4	0	0	0-0	0
Targeted antibiotic therapy	107	38.6	12	4.3	42	15.2	6	3-11	0	3	2-4	0

National report for general ICUs - Year 2017

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

Invasive ventilation (N=262)	N	%	Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	196	74.8	6.7	10.2	4	1-7	0
For airway maintenance	51	19.5	6.2	8.7	3	1-8	0
In weaning	9	3.4	0.3	0.5	0	0-1	0
Not evaluable	6	2.3	3.3	3.9	2.5	0.2-4.8	0
Reintubation within 48 hours	1	0.4	4.0		4	4-4	0

Non invasive ventilation (N=8)	N	%
Non invasive ventilation only	2	25.0
Non invasive ventilation failed	1	12.5
For weaning	5	62.5
Other	0	0.0
Missing	0	

Tracheostomy not present on admission (N=35)	N	%
Surgical	11	31.4
Percutwist	0	0.0
Ciaglia	0	0.0
Monodil. Ciaglia	0	0.0
Fantoni	0	0.0
Griggs	24	68.6
Other Kind	0	0.0
Unknown	0	0.0
Missing	0	

Tracheostomy - Days after the beginning of inv. vent.
Not present on admission (N=34)

Mean	8.4
SD	5.3
Median	8
Q1-Q3	5.2-11
Missing	0

Invasive monitoring of C.O. (N=122)	N	%
Swan Ganz	0	0.0
PICCO	21	17.2
LIDCO	63	51.6
Vigileo-PRAM	18	14.8
Other	20	16.4
Missing	0	

SDD (N=52)	N	%
Topical	26	50.0
Topical and systemic	26	50.0
Missing	0	

Antibiotic therapy

Pt. infected in ICU only (N=50)	N	%
Only empirical	9	18.8
Only targeted	12	25.0
Targeted after empirical	27	56.2
Other	0	0.0
Missing	2	

Surgical interventions	N	%
No	241	87.0
Yes	36	13.0
Missing	0	

Number of surgical interventions	N	%
0	241	87.0
1	28	10.1
2	2	0.7
3	3	1.1
>3	3	1.1
Missing	0	

Surgical interventions

Days from admission

Mean	7.5
SD	7.1
Median	5
Q1-Q3	3-8
Missing	1

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	19	6.9
Other surgery	11	4.0
Pancreatic surgery	8	2.9
Organ donation	6	2.2
Neurosurgery	5	1.8
Splenectomy	3	1.1
Nephro/Urological surgery	2	0.7
Hepatic surgery	1	0.4
Orthopaedic surgery	1	0.4
-	0	0.0
Missing	0	

Non surgical interventions	N	%
No	269	97.1
Yes	8	2.9
Missing	0	

Non surgical interventions

Days from admission

Mean	16.6
SD	19.3
Median	11.5
Q1-Q3	7-17.8
Missing	0

Non surgical interventions	N	%
Interventional endoscopy	14	5.1
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	0	

National report for general ICUs - Year 2017**Outcome indicators - Adult emergency surgical patients evaluated in the GiViTI model**

ICU outcome	N	%
Dead	107	38.8
Transferred to same hospital	135	48.9
Transferred to other hospital	20	7.2
Discharged home	14	5.1
Disch. terminally ill	0	0.0
Missing	1	

Transferred to (N=155)	N	%
Ward	151	97.4
Other ICU	3	1.9
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=3)	N	%
Specialist expertise	1	33.3
Step-up care	2	66.7
Logistical/organizational reasons	0	0.0
Step-down care	0	0.0
Missing	0	

Transferred to Same hospital (N=135)	N	%
Ward	134	99.3
Other ICU	0	0.0
High dependency care unit	1	0.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=20)	N	%
Ward	17	85.0
Other ICU	3	15.0
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	169	61.2
Dead	107	38.8
Missing	1	

Timing of ICU mortality (N=107)	N	%
Daytime (08:00AM - 07:59PM)	52	48.6
Nighttime (08:00PM - 07:59AM)	55	51.4
Weekdays (Monday - Friday)	71	66.4
Weekend (Saturday - Sunday)	36	33.6
Missing	0	

Hospital mortality	N	%
Alive	151	54.5
Dead	126	45.5
Missing	0	

Timing of hosp. mortality (N=126)	N	%
In ICU	107	84.9
Within 24 hours after ICU	2	1.6
24-47 hours after ICU	4	3.2
48-71 hours after ICU	2	1.6
72-95 hours after ICU	0	0.0
After 95 hours after ICU	11	8.7
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=19)		
Mean		11.9
SD		15.7
Median		5
Q1-Q3		1-16.5
Missing		0

National report for general ICUs - Year 2017

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

Last hospital mortality	N	%
Alive	150	54.2
Dead	127	45.8
Missing	0	

ICU stay (days)	
Mean	8.8
SD	12.7
Median	5
Q1–Q3	2–10
Missing	0

ICU stay (days) Alive (N=169)	
Mean	8.9
SD	13.0
Median	5
Q1–Q3	2–11
Missing	0

ICU stay (days) Dead (N=107)	
Mean	8.2
SD	11.9
Median	4
Q1–Q3	1–9
Missing	0

Stay after ICU (days) Alive (N=169)	
Mean	10.6
SD	13.4
Median	7
Q1–Q3	1–13
Missing	0

Hospital stay (days)	
Mean	18.3
SD	19.9
Median	12
Q1–Q3	6–22
Missing	0

Hospital stay (days) Alive (N=151)	
Mean	23.0
SD	22.4
Median	16
Q1–Q3	9–27.5
Missing	0

Hospital stay (days) Dead (N=126)	
Mean	12.7
SD	14.5
Median	8
Q1–Q3	3–15
Missing	0

National report for general ICUs - Year 2017**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.

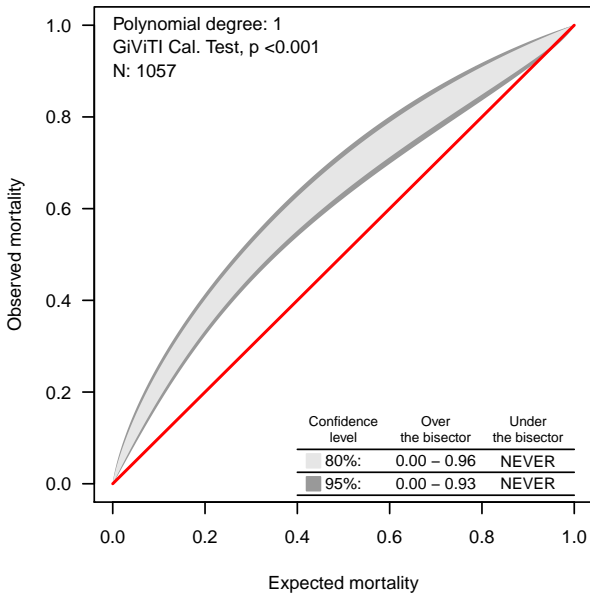
These pages show the calibration belts built on 2017 data using PIM 2, PIM 3, PELOD, SAPSII, GiViTI 2016 and GiViTI 2017 prognostic models. For further informations please look at [PLoS ONE 6(2): e16110].

National report for general ICUs - Year 2017

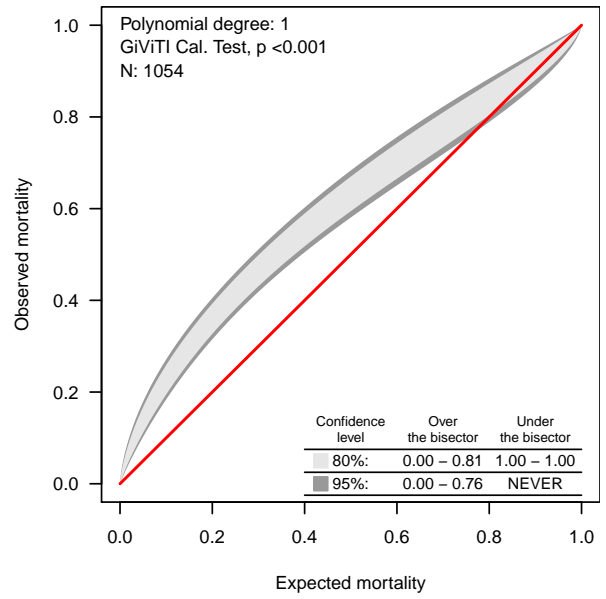
Validity of the models - Calibration belts

EXTERNAL SCORE

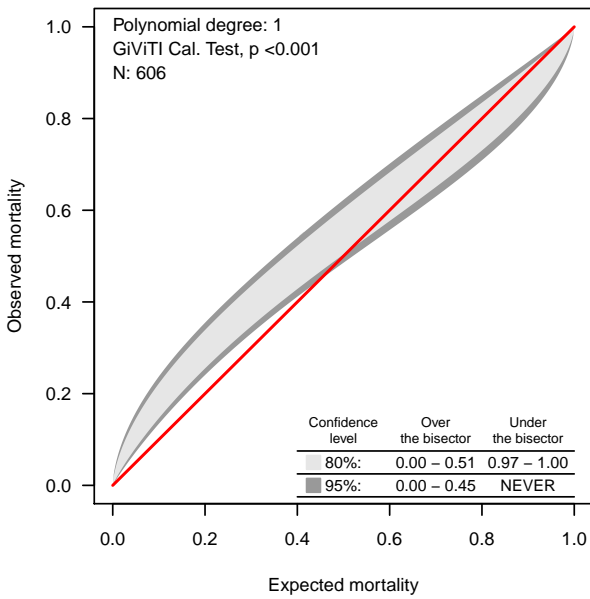
Predictive model: GiViTI 2017



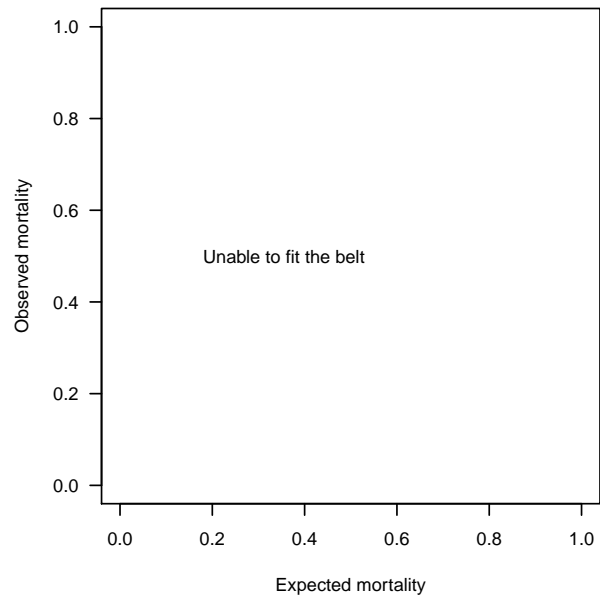
Predictive model: GiViTI 2016



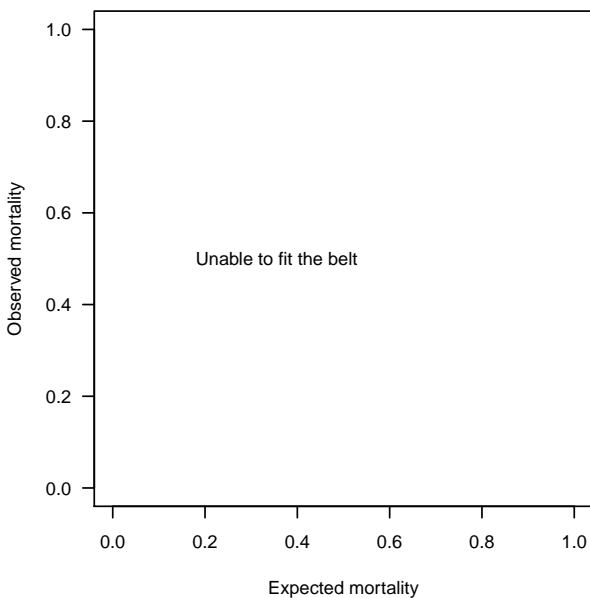
Predictive model: SAPSII



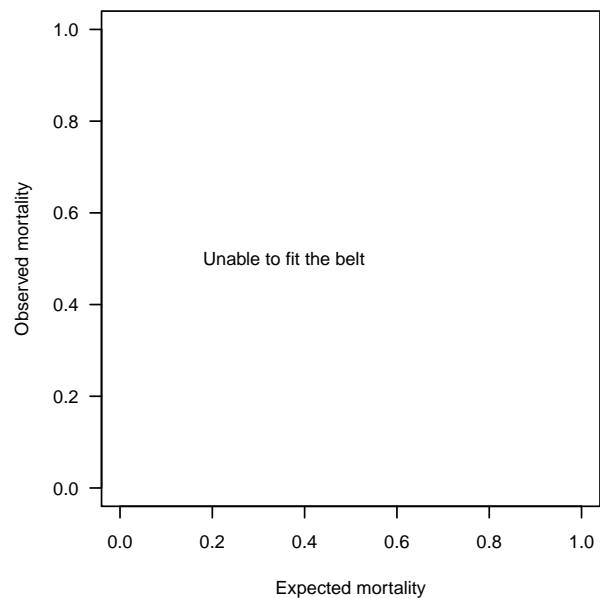
Predictive model : PELOD



Predictive model: PIM2



Predictive model: PIM3



Appendix

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