GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

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Report
PROSAFE project

Year 2017

National report for general ICUs (153 ICUs)

ITALY

SESTANTE EDIZIONI - BERGAMO

PROSAFE project - **National report for general ICUs** (153 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

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 and location of Italian partecipating ICUs

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

Description of the hospitals and ICUs

This section presents the organizational-structural features of the ICUs included in the report. The information (except for the information shown on page 23, which is the result of joint analysis of structural data and those collected during the year via the software) is taken from the 'Structural Data' form (available on the GiViTI portal at https://givitiweb.marionegri.it/). Absolute numbers, percentages and the number of missing data are reported for the categorical variables; the mean, standard deviation, median and Q1 (first quartile: the value below which lie 25% of the population) and Q3 (third quartile: the value below which lie 75% of the population) serve as indicators for the continuous variables. Below are a few tips on how to correctly interpret the statistics.

Number of accredited beds Number of beds officially accredited.

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

ICU Structure We define as 'OPEN-SPACE' a ward where each room can be 'monitored' from any other. A

room can be 'monitored' from another room when all the beds located in the other room can be visually and instrumentally controlled.

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

Indicators of utilization Data on the number of available beds, total admissions in 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.

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

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

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

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

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

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

Study flow-chart

The flow chart, or tree diagram, on page 25 presents the various subgroups of analysed patients. PROSAFE has a very accurate indicator of the completeness and validity of the data entered on each patient, i.e. status.
The program envisages 5 status levels:

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

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

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

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

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

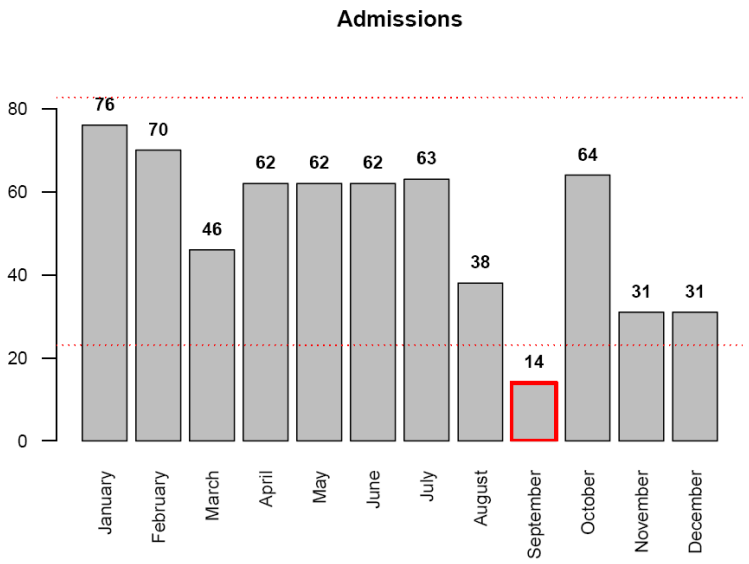
To more clearly illustrate the selection methods used in the choice of valid data, we present an extract from the data validity report of a randomly selected, anonymized ICU.

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

Centre XX000 - Year 2014
Data validity
Patients admitted: 619

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

Admissions	
Mean	51.6
Median	62.0
SD	19.1
VC	37.1

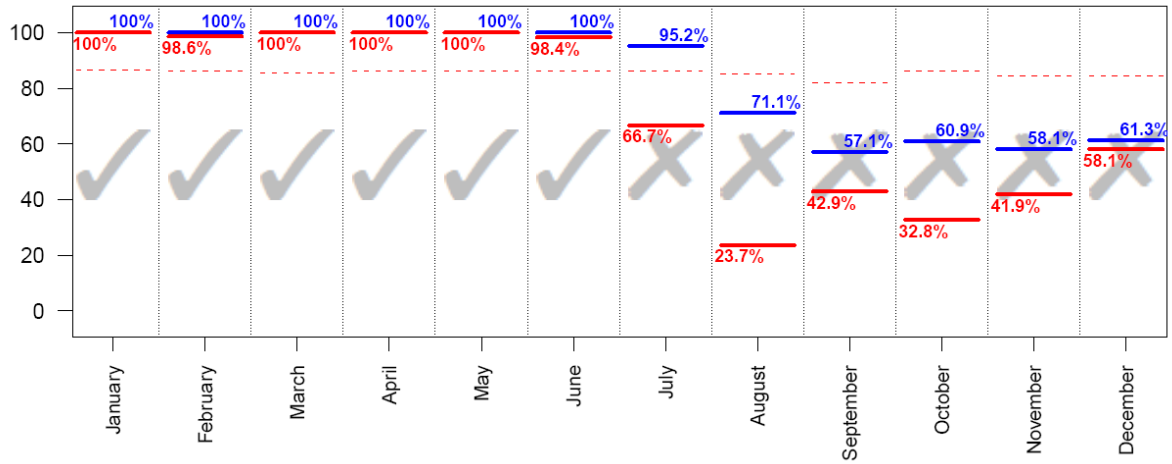


WARNING! The highligthed months have a number of patients quite different from the average. Please verify the correctness of the data and, particularly, that all consecutive patients have been registered in the Prosafe software.

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

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

The final graph shows level of data completeness in the various months. Percentages of patients with records in status 3 or 4 and in status 4 are shown in blue and red respectively.
According to our elimination criterion, the overall analysis will exclude those patients admitted in the months of August, September, October, November and December since they present a validity percentage below the defined threshold (dashed line). Accordingly, 441 patients have valid data for the analysis. Regarding analysis of hospital mortality, patients admitted in July will also be excluded (in that month the % of patients with record not in status 4 is still too hight). Hence, the analysis on hospital outcome will involve 378 patients on 619 admitted.



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

Description of patients

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

where

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

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

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

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

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

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

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

Incidence of VAP Two different incidence rates are presented:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Readmissions Only readmissions from other hospital wards are considered.

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

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

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

Analysis of mortality: forest plot The graph shows the various O/E scores of the ICUs involved in the project. The O/E score is given by the ratio between the total number of observed deaths and the total number of expected deaths (according to the indicated reference model). The dotted line, in correspondence to the value of 1, separates the

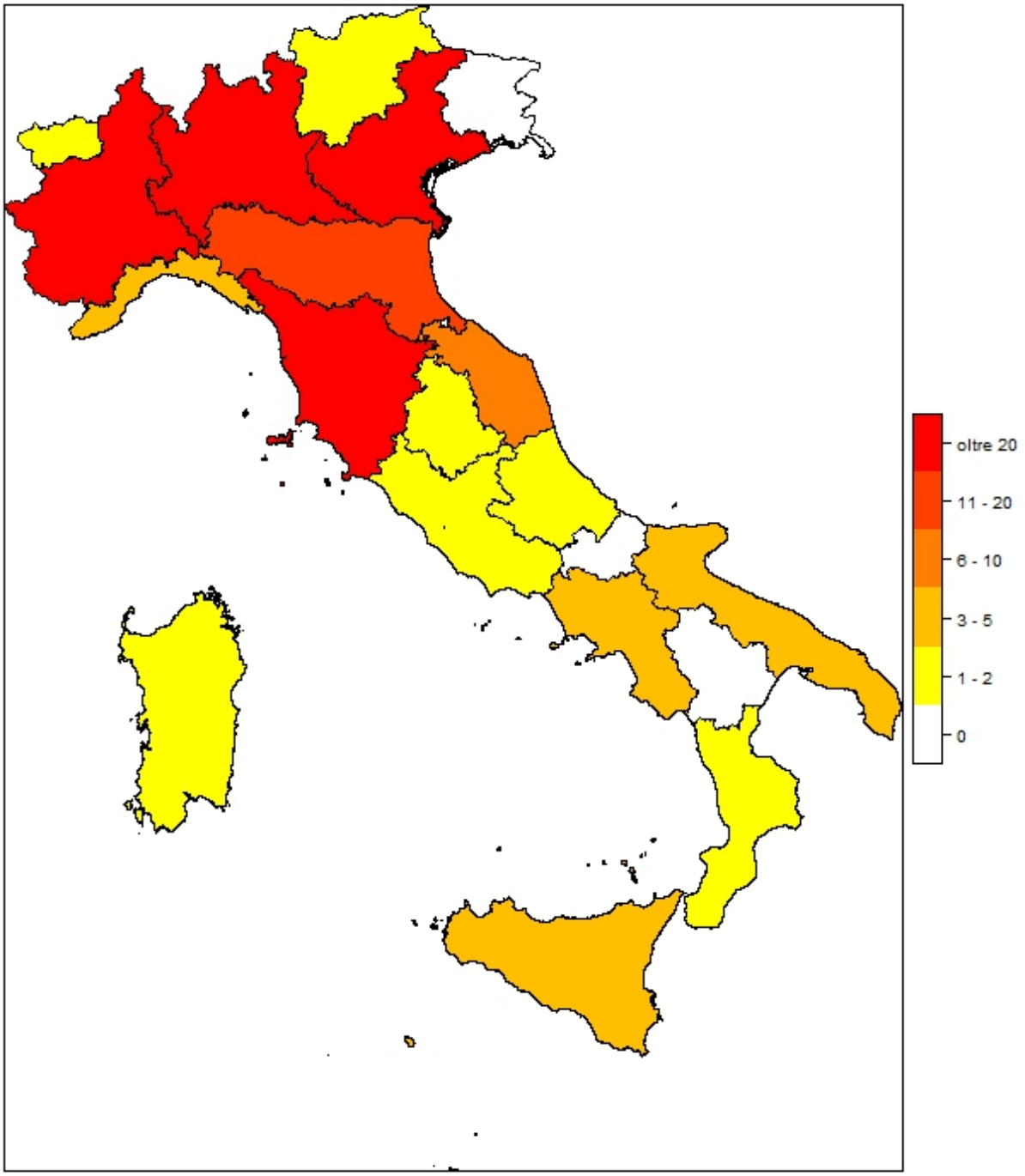
ICUs with lower or higher mortality than predicted by the model. Each estimate is accompanied by a 95% confidence interval.

Statistics

	TYPE							
Nation	General	Cardiosurgical	Surgical	Neurosurgical	Pediatrics	HDC	Other	**Total**
Cyprus	1 ICUs 655 patients							**1 ICUs** **655 patients**
Greece	4 ICUs 1092 patients							**4 ICUs** **1092 patients**
Hungary	2 ICUs 942 patients			1 ICUs 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 ICUs 202 patients			**6 ICUs** **1293 patients**
Slovenia			5 ICUs 1862 patients				1 ICUs 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.

Location of Italian participating ICUs (N=153)
ICUs per region



Region	N	%
Abruzzo	1	0.7
Basilicata	0	0
Calabria	1	0.7
Campania	5	3.3
Emilia Romagna	14	9.2
Friuli Venezia Giulia	0	0
Lazio	2	1.3
Liguria	5	3.3
Lombardia	36	23.5
Marche	7	4.6
Molise	0	0
Piemonte	24	15.7
Puglia	5	3.3
Sardegna	2	1.3
Sicilia	3	2
Toscana	24	15.7
Trentino Alto Adige	1	0.7
Umbria	1	0.7
Valle d'Aosta	1	0.7
Veneto	21	13.7

Geographical area	N	%
Northern Italy	102	66.7
Central Italy	35	22.9
Southern Italy	16	10.5

Description of hospitals (N=153) - **Year 2017**

Number of beds in hospital	N	%
< 300 beds	60	39.5
300 - 800 beds	76	50.0
> 800 beds	16	10.5
Missing	1	

Type of ICUs present in hospital	N	%
General	152	99.3
Medical	2	1.3
Surgical	4	2.6
Neurological/neurosurgical	15	9.8
Cardiosurgical	31	20.3
Burns	5	3.3
Post-transplantations	5	3.3
Other	30	19.6

Type of subICUs present in hospital	N	%
General	24	15.7
Surgical	8	5.2
Cardiological	114	74.5
Respiratory	27	17.6
Neurological (stroke unit)	64	41.8
Other	13	8.5

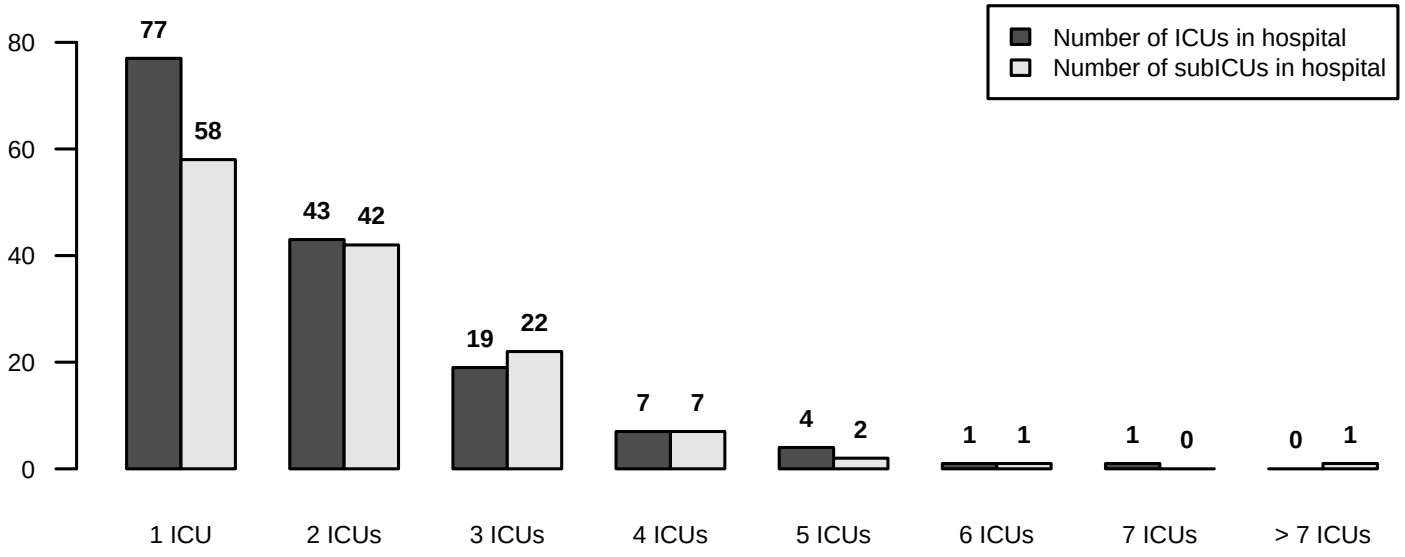
Non surgical specialties	N	%
Cardiology	145	95.4
Pulmonology	80	52.6
Nephrology	127	83.6
Infection disease	61	40.1
Pediatric	125	82.2
Neonatology	85	55.9
Neurology	112	73.7
Haematology	65	42.8
Emergency room	151	99.3
Traumatology	104	68.4
Emergency medical	86	56.6

Surgical specialties (independent ward)	N	%
Neurosurgery	48	31.4
Cardiosurgery	33	21.6
Major vascular surgery	73	47.7
Thoracic surgery	43	28.1
Pediatric surgery	29	19.0
Transplantation activities	21	13.7

Surgical specialties (procedures only)	N	%
Neurosurgery	12	7.8
Cardiosurgery	3	2.0
Major vascular surgery	24	15.7
Thoracic surgery	40	26.1
Pediatric surgery	31	20.3
Transplantation activities	15	9.8

Services/activities available in H (h24)	N	%
Neuroradiology	52	34.0
Interventional neuroradiology	37	24.2
Interventional vascular radiology	50	32.7
CT scan	131	85.6
MRI	62	40.5
Interventional hemodynamic	78	51.0
Endoscopy	97	63.4
Bronchoscopy	54	35.3
Hyperbaric chamber	11	7.2

Services/activities available in H (rep.)	N	%
Neuroradiology	12	7.8
Interventional neuroradiology	8	5.2
Interventional vascular radiology	27	17.6
CT scan	2	1.3
MRI	55	35.9
Interventional hemodynamic	9	5.9
Endoscopy	36	23.5
Bronchoscopy	49	32.0
Hyperbaric chamber	1	0.7



Description of ICUs (N=153) - **Year 2017**

Number of activable beds	
Mean (SD)	8.2 (3.2)
Median (Q1−Q3)	8 (6−10)
Missing	22

Number of beds declared to hospital	
Mean (SD)	32.6 (105.8)
Median (Q1−Q3)	7 (5.7−10)
Missing	21

University affiliation	N	%
Yes	52	34.2
No	100	65.8
Missing	1	

Square meter per bed	
Mean (SD)	15.9 (20.5)
Median (Q1−Q3)	12 (9−18)
Missing	3

Clinical psychologist	N	%
No	119	78.3
For relatives	32	21.1
For patients	26	17.1
For personnel	17	11.2

ICU Structure	N	%
NON OPEN-SPACE	53	34.9
OPEN-SPACE (or alike)	99	65.1
Missing	1	

Physicians	N	%
Dedicated to ICU only	27	20.6
Dedicated to ICU on a rotation basis	20	15.3
Dedicated to ICU only and on a rotation basis	84	64.1
Missing	22	

Declared beds per physician (average)	
Mean (SD)	22.3 (74.9)
Median (Q1−Q3)	4.4 (3.6−6)
Missing	21

Nurses	N	%
Dedicated to ICU only	93	70.5
Dedicated to ICU on a rotation basis	5	3.8
Dedicated to ICU only and on a rotation basis	34	25.8
Missing	21	

Declared beds per nurse (average)	
Mean (SD)	9.5 (31.1)
Median (Q1−Q3)	2 (1.9−2.4)
Missing	21

Number of hours conceeded for relatives' visits	N	%
1	17	11.2
2	20	13.2
3-4	23	15.1
5-12	82	53.9
13-20	4	2.6
>20	6	3.9
Missing	1	

Maximum number of visitors per patient	N	%
One	57	37.5
Two	88	57.9
Three or more	7	4.6
Missing	1	

Biomedical devices per declared bed	Median	Q1-Q3	<5 Years (mean %)
Basic ICU monitors (ECG, NIPB, SaO2)	0.4	0.0−1.2	64.9
Advanced ICU monitors	1.1	0.3−1.3	71.5
Invasive monitoring of cardiac output (Swan-Ganz)	0.1	0.0−0.4	63.3
Invasive monitoring of cardiac output (PiCCO)	0.2	0.0−0.3	77.2
Invasive monitoring of cardiac output (Vigileo)	0.1	0.0−0.2	69.9
Non-invasive monitoring of cardiac output (impedentiometry)	0.0	0.0−0.0	86.4
Defibrillators	0.3	0.2−0.4	70.5
Both invasive and non invasive ventilators	1.2	1.0−1.4	71.3
Invasive ventilators	0.2	0.0−1.1	64.9
Non invasive ventilators	0.0	0.0−0.2	61.3
Syringe pumps	4.9	3.2−6.3	76.3
Peristaltic pumps	2.1	1.2−3.0	79.4

Biomedical equipment in ICU	N	%
Transoesophageal echo	58	38.2
Basic ultrasounds	149	98.0
Advanced ultrasounds	134	88.2
Blood-gas analyzer	151	99.3
Haemodialysis - Haemofiltration	131	86.2
Transport ventilator	146	96.1
Fiberscope	150	98.7
Extracorporeal circulation system	24	15.8

Routine microbiological surveillance cultures	N	%
Yes	144	94.7
No	8	5.3
Missing	1	

Description of ICUs (N=153) - **Year 2017**

Patients admitted	
Mean (SD)	358.1 (174.3)
Median	326.9
Q1−Q3	224.3−452.7
Missing	9

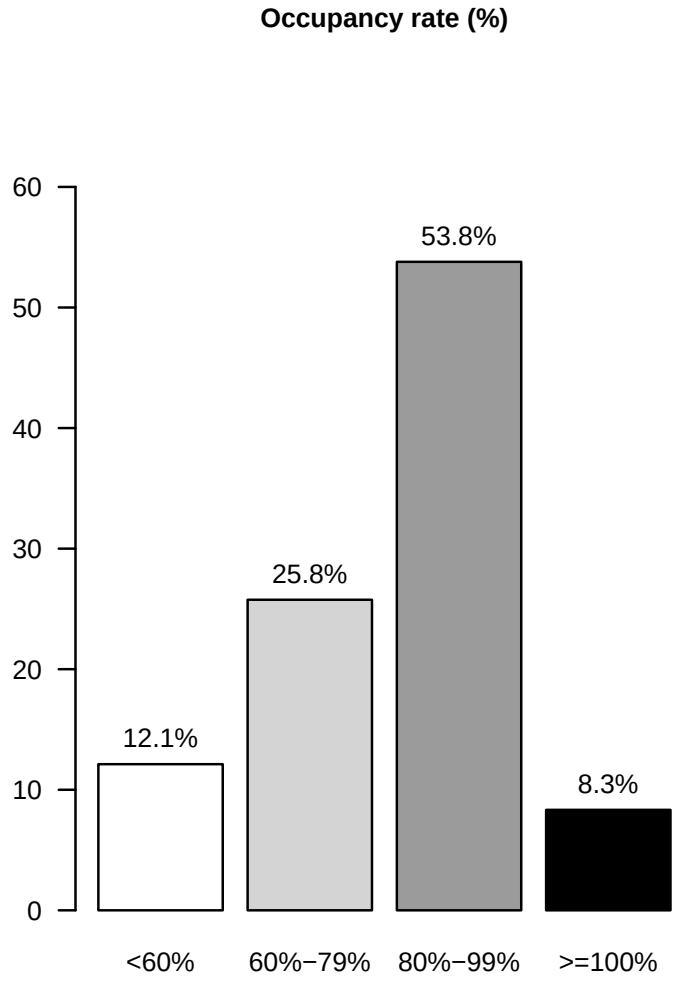
Occupancy rate (%)	
Mean (SD)	84.4 (13.2)
Median	83.6
Q1−Q3	75.5−92.7
Missing	30

Rotation index (patients/bed)	
Mean (SD)	47.9 (14.7)
Median	45.4
Q1−Q3	38.6−53.9
Missing	30

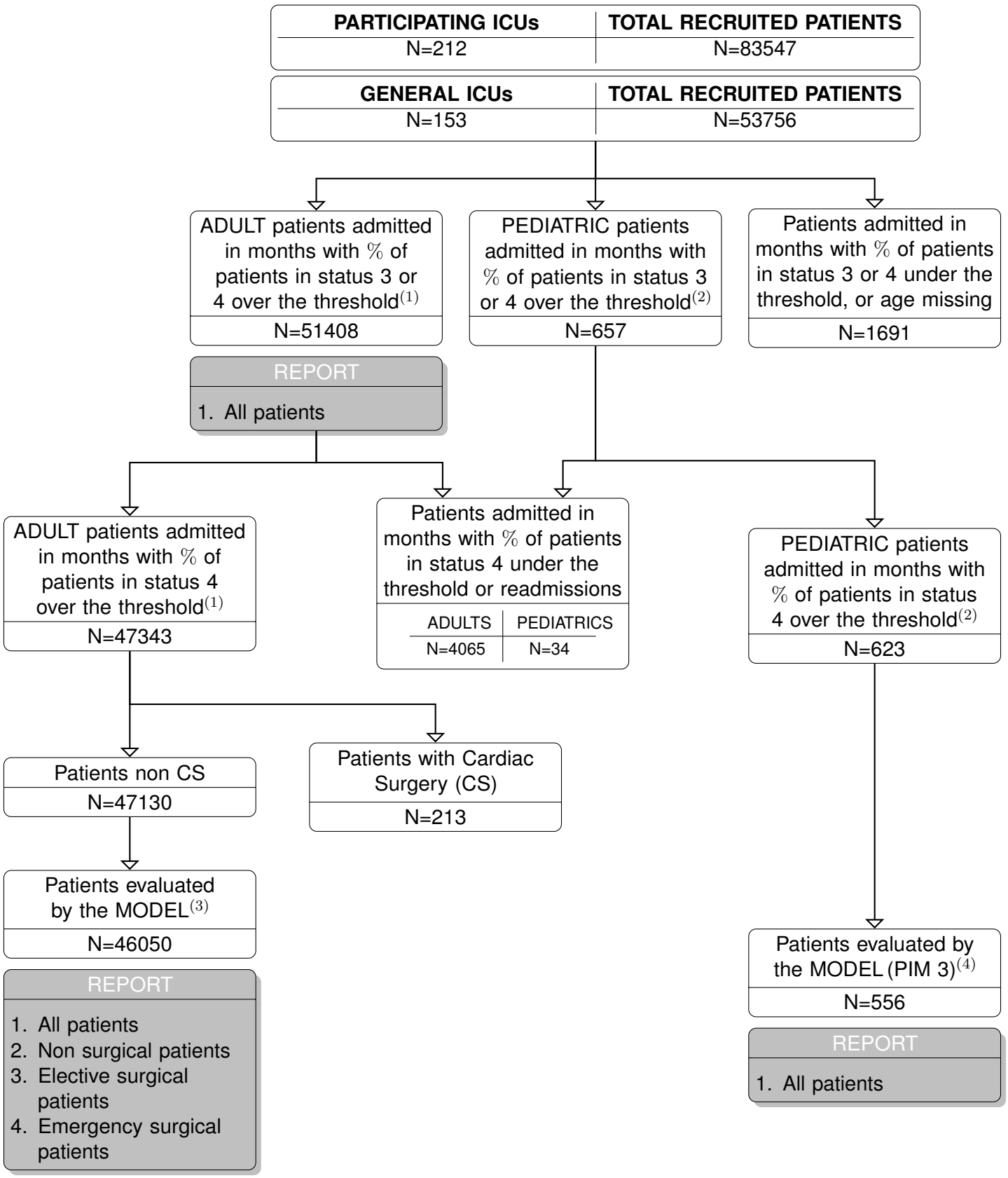
Turnover (hours)	
Mean (SD)	33.7 (36.3)
Median	27.4
Q1−Q3	11.4−48.4
Missing	30

Occupied beds per physician (average)	
Mean (SD)	3.9 (1.3)
Median	3.6
Q1−Q3	3−4.6
Missing	21

Occupied beds per nurse (average)	
Mean (SD)	1.8 (0.3)
Median	1.8
Q1−Q3	1.6−2
Missing	21



National report for general ICUs (153 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): 51408

Sex	N	%
Male	30379	59.2
Female	20932	40.8
Missing	97	

Age (years)	N	%
17-45	6100	11.9
46-65	13275	25.8
66-75	13039	25.4
>75	18994	36.9
Missing	0	
Mean	66.9	
SD	16.3	
Median	71	
Q1−Q3	58−79	
Min−Max	17−103	

Body mass Index (BMI)	N	%
Underweight	2892	5.7
Normal	22616	44.5
Overweight	15845	31.2
Obese	9477	18.6
Missing	578	

Pregnancy status **Females** (N=20932)	N	%
Not fertile	11330	54.2
Not pregnant/Unknown	8995	43.0
Currently pregnant	86	0.4
Post partum	496	2.4
Missing	25	

Comorbidities	N	%
No	7411	14.4
Yes	43907	85.6
Missing	90	

Comorbidities (top 10)	N	%
Hypertension	26943	52.5
Arrhythmia	8848	17.2
Moderate COPD	7378	14.4
Myocardial infarction	6837	13.3
Diabetes Type II without insulin tr.	6753	13.2
Any tumour without metastasis	6096	11.9
Cerebrovascular disease	5585	10.9
NYHA class II-III	5368	10.5
Peripheral vascular disease	5080	9.9
Antiplatelet therapy	4802	9.4
Missing	90	

Stay before ICU (days)	
Mean	4.6
SD	11.5
Median	1
Q1−Q3	0−4
Missing	130

Source of admission	N	%
Same hospital	45101	87.9
Other hospital	5965	11.6
Long-term chronic care hospital	264	0.5
Directly from the community	8	0.0
Missing	70	

Ward of admission **Hospital** (N=51066)	N	%
Medical ward	7380	14.5
Surgical ward	21899	42.9
Emergency room	17405	34.1
Other ICU	3108	6.1
High dependency care unit	1271	2.5
Missing	3	

Reason for transfer from **Other ICU** (N=3108)	N	%
Specialist expertise	823	26.5
Step-up care	567	18.2
Logistical/organizational reasons	1660	53.4
Step-down care	58	1.9
Missing	0	

Ward of admission **Same hospital** (N=45101)	N	%
Medical ward	6630	14.7
Surgical ward	21504	47.7
Emergency room	14786	32.8
Other ICU	1014	2.2
High dependency care unit	1164	2.6
Missing	3	

Ward of admission **Other hospital** (N=5965)	N	%
Medical ward	750	12.6
Surgical ward	395	6.6
Emergency room	2619	43.9
Other ICU	2094	35.1
High dependency care unit	107	1.8
Missing	0	

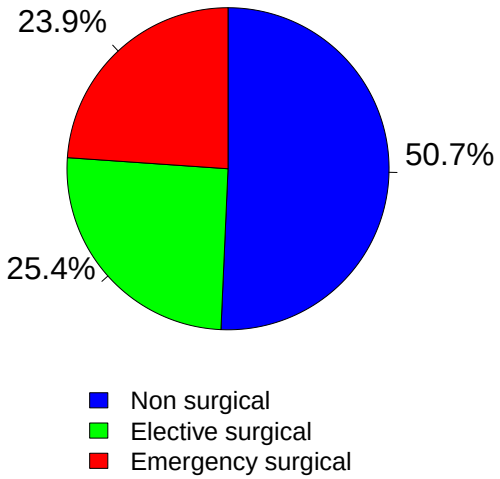
Scheduled admission	N	%
No	41014	79.9
Yes	10303	20.1
Missing	91	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients

Trauma	N	%
No	44944	87.6
Yes	6375	12.4
Multiple trauma	2507	4.9
Missing	89	

Surgical status	N	%
Non surgical	26035	50.7
Elective surgical	13011	25.4
Emergency surgical	12272	23.9
Missing	90	

Surgical status



Source of admission **Surgical pt.** (N=25283)	N	%
Operating theatre of surgical ward	18685	74.0
Operating theatre of emergency room	2087	8.3
Surgical ward	1327	5.3
Other	3149	12.5
Missing	35	

Surgical interventions (top 10) **Elective surgical** (N=13011)	N	%
Gastrointestinal surgery	3612	27.8
Orthopaedic surgery	1871	14.4
Nephro/Urological surgery	1635	12.6
Neurosurgery	876	6.7
ENT surgery	854	6.6
Thoracic surgery	691	5.3
Gynaecological surgery	670	5.1
Abdominal vascular surgery	590	4.5
Hepatic surgery	557	4.3
Pancreatic surgery	470	3.6
Missing	1185	

Timing **Elective surgical** (N=13011)	N	%
From -7 to -3 days	273	2.1
From -2 to -1 days	401	3.1
On ICU admission day	12985	99.8
The day after ICU admission	150	1.2
Missing	24	

Surgical interventions (top 10) **Emergency surgical** (N=12272)	N	%
Gastrointestinal surgery	5329	43.4
Neurosurgery	1811	14.8
Orthopaedic surgery	1361	11.1
Nephro/Urological surgery	631	5.1
Abdominal vascular surgery	510	4.2
Biliary tract surgery	471	3.8
Peripheral vascular surgery	453	3.7
Obstetric surgery	354	2.9
ENT surgery	334	2.7
Splenectomy	332	2.7
Missing	686	

Timing **Emergency surgical** (N=12272)	N	%
From -7 to -3 days	397	3.2
From -2 to -1 days	1390	11.3
On ICU admission day	10632	86.6
The day after ICU admission	565	4.6
Missing	49	

Non surgical interventions	N	%
None	46951	91.5
Elective	660	1.3
Emergency	3705	7.2
Missing	92	

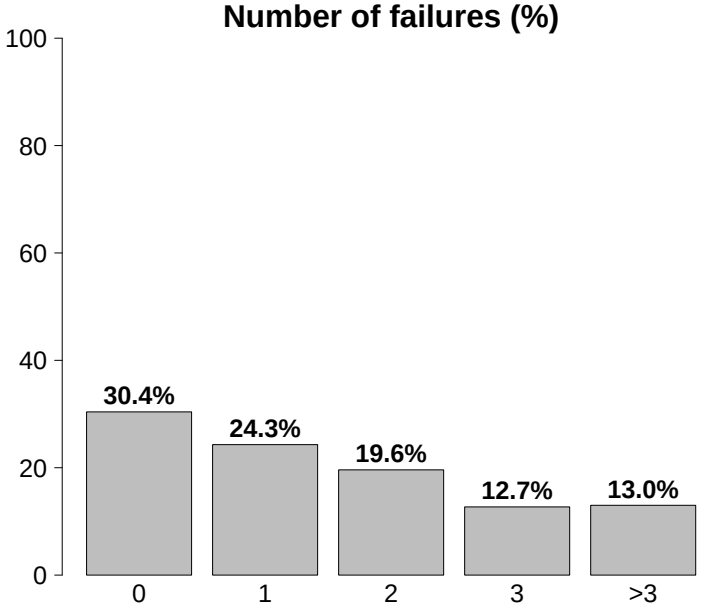
Non surgical interventions **Elective** (N=660)	N	%
Interventional endoscopy	213	32.3
Interventional radiology	143	21.7
Interventional cardiology	134	20.3
Interventional neuroradiology	73	11.1
Missing	97	

Non surgical interventions **Emergency** (N=3705)	N	%
Interventional cardiology	1371	37.0
Interventional radiology	867	23.4
Interventional endoscopy	866	23.4
Interventional neuroradiology	546	14.7
Missing	55	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	21277	41.5
Post surgical weaning	7327	14.4
Surgical monitoring	8166	16.0
Post interventional weaning	199	0.4
Interventional monitoring	737	1.4
Non surgical monitoring	4562	8.9
Missing	286	
Admission for procedures/treatments	0	0.0
Intensive Treatment	29763	58.0
Only ventilatory support	15511	30.2
Only cardiovascular support	2170	4.2
Ventilatory and cardiovascular support	12080	23.5
Missing	2	
Palliative Sedation	187	0.4
Diagnosis of death/Organ donation	89	0.2
Missing	92	

Number of failures (%)



Failures on admission	N	%
No	15636	30.4
Yes	35772	69.6
A: Respiratory failure	27590	53.7
B: Cardiovascular failure	14250	27.7
C: Neurological failure	7264	14.1
D: Hepatic failure	421	0.8
E: Renal failure	18067	35.1
F: Acute skin failure	20	0.0
G: Metabolic failure	12578	24.5
H: Coagulation failure	772	1.5
Missing	0	

Failures on admission (top 10)	N	%
A	7397	14.4
ABEG	3479	6.8
E	3367	6.5
AB	2477	4.8
AC	2425	4.7
AE	2200	4.3
ABE	1720	3.3
ABCEG	1400	2.7
AEG	1247	2.4
EG	1211	2.4
Missing	0	

Respiratory failure	N	%
None	23817	46.3
Only hypoxic failure	8861	17.2
Only hypercapnic failure	1516	2.9
Hypoxic-hypercapnic failure	3506	6.8
Intubation for airway maint.	13707	26.7
Missing	1	

Cardiovascular failure	N	%
None	37158	72.3
Without shock	2942	5.7
Cardiogenic shock	2835	5.5
Septic shock	3405	6.6
Haemorrhagic/hypovolemic shock	1975	3.8
Hypovolemic shock	1146	2.2
Anaphylactic shock	59	0.1
Neurogenic shock	443	0.9
Other shock	657	1.3
Mixed shock	788	1.5
Missing	0	

Neurologic failure	N	%
None	35239	82.9
Cerebral coma	3756	8.8
Metabolic coma	1320	3.1
Postanoxic coma	1882	4.4
Toxic coma	300	0.7
Missing or not evaluable	8911	

Renal failure (AKIN)	N	%
None	33168	64.7
Mild	8965	17.5
Moderate	4120	8.0
Severe	4983	9.7
Missing	172	

Metabolic failure	N	%
None	38650	75.4
pH <= 7.3, PaCO2 < 45 mmHg	3597	7.0
Base deficit >= 5 mmol/L, lactate >1.5x	8981	17.5
Missing	180	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients

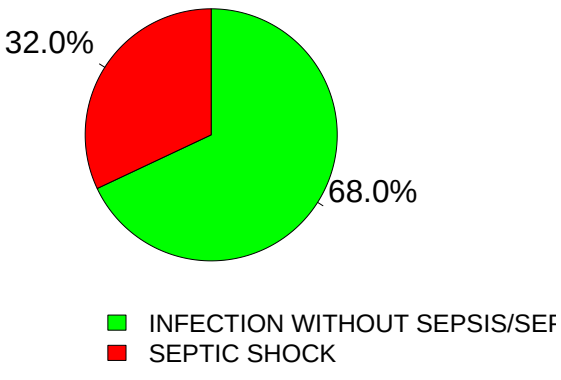
Clinical conditions on admission	N	%
Respiratory	9698	18.9
Acute exacerbation of COPD	2512	4.9
Pleural effusion	2058	4.0
Atelectasis	1273	2.5
Aspiration pneumonia	983	1.9
Upper respiratory tract disease	810	1.6
Cardiovascular	9595	18.7
Cardiac arrest	2438	4.8
Left heart failure with pulmonary edema	1856	3.6
Left heart failure without pulm. edema	1260	2.5
Acute severe arrhythmia: tachycardias	1129	2.2
Acute myocardial infarction	730	1.4
Neurological	7282	14.2
Spontaneous Intraparenchymal bleeding	1576	3.1
Cerebral artery stroke	1379	2.7
Seizures	1143	2.2
Spontaneous Subarachnoid haemorrhage	854	1.7
Metabolic/postanoxic encephalopathy	843	1.6
Gastrointestinal and hepatic	10718	20.9
Digestive tract malignancy	2762	5.4
Gastrointestinal perforation	1679	3.3
Intestinal occlusion	1584	3.1
Gastrointestinal bleeding: upper tract	800	1.6
Acute bile-duct disease	735	1.4
Trauma (anatomical districts)	6373	12.4
Pelvis/bone/joint & muscle	2791	5.4
Head	2571	5.0
Chest	2273	4.4
Spine	1359	2.6
Abdomen	1068	2.1
Major vessels injury	234	0.5
Miscellaneous	116	0.2
Other	13108	25.5
Other disease	2911	5.7
Metabolic disorder	2848	5.6
Nephrourologic disease	2587	5.0
Orthopaedic disease	1362	2.7
Acute intoxication	1158	2.3
Post transplantation	383	0.7
Renal transplantation	156	0.3
Liver transplantation	144	0.3
Infections	13203	25.7
Pneumonia	4789	9.3
NON-surgical secondary peritonitis	1330	2.6
NON-surgical urinary tract infection	1202	2.3
L.R.T.I. other than pneumonia	996	1.9
Post-surgical peritonitis	844	1.6
Primary bacteraemia of unknown origin	672	1.3
Cholecystitis/cholangitis	598	1.2
Clinical sepsis	559	1.1
NON-surgical skin/soft tissue infection	544	1.1
Primary peritonitis	407	0.8
Missing	100	

Trauma (anatomical districts)	N	%
Head	2571	5.0
Traumatic Subdural haematoma	922	1.8
Traumatic subarachnoid haemorrhage	901	1.8
Maxillofacial fracture	837	1.6
Cerebral contusion/laceration	734	1.4
Skull fracture	631	1.2
Spine	1359	2.6
Vertebral fracture, without deficit	1116	2.2
Cervical injury, incomplete deficit	87	0.2
Tetraplegia	63	0.1
Chest	2273	4.4
Other injuries of the chest	1194	2.3
Traum. haemothorax/pneumothorax	882	1.7
Severe lung contusion/laceration	583	1.1
Abdomen	1068	2.1
Spleen: Moderate-Severe laceration	305	0.6
Minor injuries of the abdomen	265	0.5
Liver: Moderate-Severe laceration	234	0.5
Pelvis/bone/joint & muscle	2791	5.4
Long bone fracture	2255	4.4
Multiple fracture of the pelvis	700	1.4
Very severe or open fracture of the pelvis	105	0.2
Major vessels injury	234	0.5
Proximal limbs vessels: transection	83	0.2
Major abdominal vessels: transection	51	0.1
Neck vessels: dissection/transection	49	0.1
Miscellaneous	116	0.2
Burns (>30% BSA)	82	0.2
Inhalation injury	49	0.1
Missing	100	

Infection severity on admission	N	%
None	38105	75.3
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	8515	16.8
SEPTIC SHOCK	4007	7.9
Missing	781	

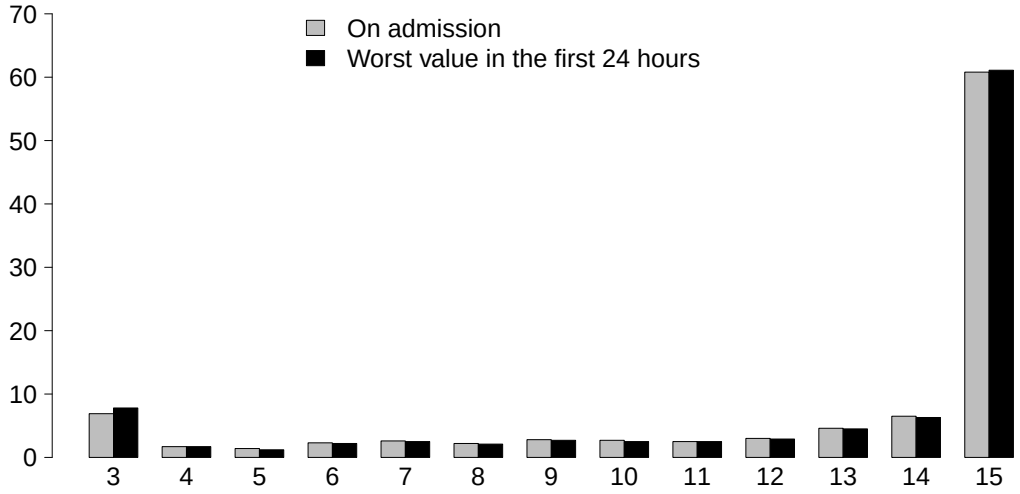
Infection severity on admission

Patients infected (N=12522)



National report for general ICUs - **Year 2017**
Severity scores - Adult patients

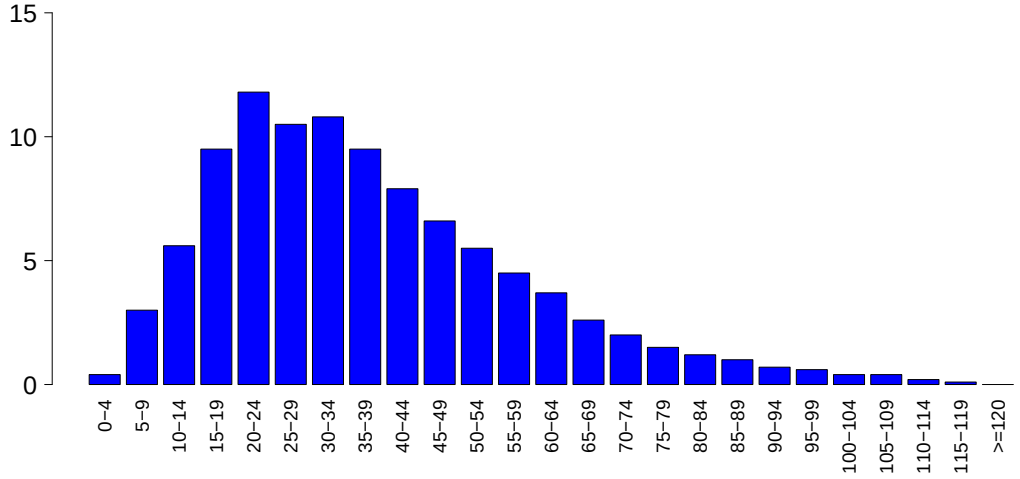
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	11−15
Not evaluable	8788
Missing	123

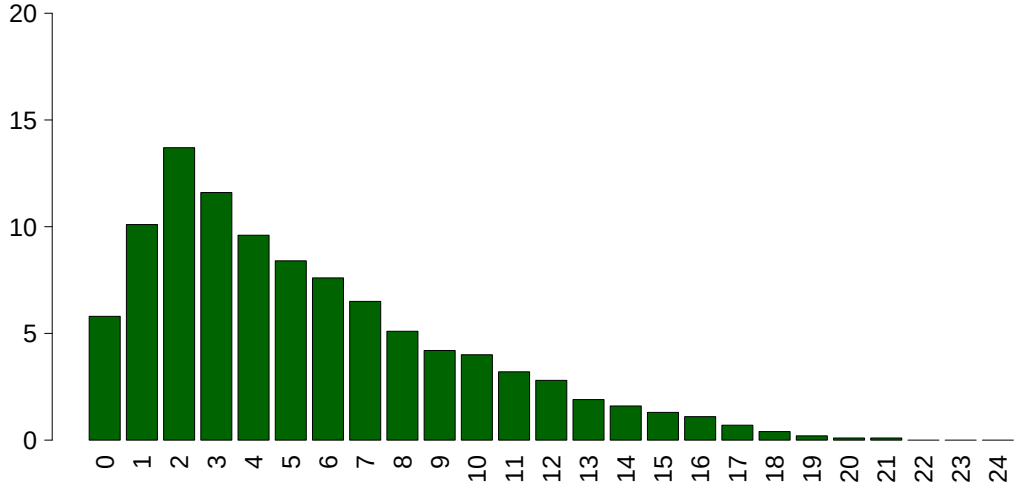
GCS (first 24 hours)	
Median	15
Q1−Q3	11−15
Not evaluable	7401
Missing	152

SAPS II (%)



SAPSII	
Mean	37.6
SD	20.5
Median	34
Q1−Q3	22−49
Not evaluable	7401
Missing	174

SOFA (%)



SOFA	
Mean	5.4
SD	4.2
Median	4
Q1−Q3	2−8
Not evaluable	7401
Missing	175

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

Complications during the stay	N	%
No	35918	70.1
Yes	15327	29.9
Missing	163	

Failures during the stay	N	%
No	44471	86.5
Yes	6937	13.5
A: Respiratory failure	3314	6.4
B: Cardiovascular failure	3016	5.9
C: Neurological failure	552	1.1
D: Hepatic failure	221	0.4
E: Renal failure (AKIN)	1971	3.8
F: Acute skin failure	8	0.0
G: Metabolic failure	564	1.1
H: Coagulation failure	293	0.6
Missing	0	

Failures during the stay (top 10)	N	%
A	1886	3.7
B	1446	2.8
E	779	1.5
AB	617	1.2
G	339	0.7
BE	303	0.6
ABE	229	0.4
AE	220	0.4
C	217	0.4
D	94	0.2
Missing	0	

Respiratory failure occured	N	%
None	47931	93.5
Intubation for airway maint.	860	1.7
Hypoxic failure	2331	4.5
Hypercapnic failure	693	1.4
Missing	163	

Cardiovascular failure occured	N	%
None	48229	94.1
Cardiogenic shock	898	1.8
Hypovolemic shock	326	0.6
Haemorrhagic/hypovolemic shock	292	0.6
Septic shock	1196	2.3
Anaphylactic shock	8	0.0
Neurogenic shock	192	0.4
Other shock	283	0.6
Missing	163	

Neurological failure occured	N	%
None	50693	98.9
Cerebral coma	311	0.6
Metabolic coma	137	0.3
Postanoxic coma	108	0.2
Missing	163	

Renal failure occured (AKIN)	N	%
None	49274	96.2
Mild	242	0.5
Moderate	299	0.6
Severe	1430	2.8
Missing	163	

Complications during the stay	N	%
Respiratory	2666	5.2
Pleural effusion	1074	2.1
Atelectasis	640	1.2
Pneumothorax/Pneumomediastinum	337	0.7
Severe ARDS	332	0.6
Acute asthma/bronchospasm	180	0.4
Cardiovascular	3950	7.7
Acute severe arrhythmia: tachycardias	1513	3.0
Cardiac arrest	1302	2.5
Pulmonary edema	339	0.7
Acute severe arrhythmia: bradycardias	274	0.5
Left heart failure w/o pulm. edema	254	0.5
Neurological	3126	6.1
Drowsiness/agitation/delirium	1386	2.7
Seizures	543	1.1
Intracranial hypertension	542	1.1
Brain edema	455	0.9
New ischaemic stroke	249	0.5
Gastrointestinal and hepatic	1509	2.9
Gastrointestinal bleeding: upper tract	262	0.5
Bowel ischaemia	235	0.5
Paralytic Ileus	195	0.4
Liver Dysfunction Syndrome	184	0.4
Gastrointestinal perforation	176	0.3
Other	1412	2.8
Metabolic disorder	564	1.1
Nephrourologic disease	320	0.6
Other disease	283	0.6
Category/Stage II: Partial Thickness Skin Loss	104	0.2
Other skin and/or soft tissue pathology	65	0.1
Category/Stage I: Nonblanchable Erythema	58	0.1
Category/Stage III: Full Thickness Skin Loss	42	0.1
Infections	4597	9.0
Pneumonia	1490	2.9
L.R.T.I. other than pneumonia	1021	2.0
NON-surgical urinary tract infection	707	1.4
Primary bacteraemia of unknown origin	482	0.9
Catheter-related bacteremia (CR-BSI)	467	0.9
Post-surgical peritonitis	218	0.4
Upper respiratory tract infection	175	0.3
Clinical sepsis	158	0.3
Post-surgical skin/soft tissue infection	148	0.3
NON-surgical skin/soft tissue infection	107	0.2
Missing	163	

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

Infections	N	%
None	34924	68.2
Only on admission	11719	22.9
On admission and during ICU stay	1457	2.8
Only during ICU stay	3140	6.1
Missing	168	

Maximum severity of infection	N	%
None	34924	69.3
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	10592	21.0
SEPTIC SHOCK	4901	9.7
Missing	991	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	34924 (92.2%)	0 (0.0%)	2519 (6.7%)	418 (1.1%)	37861
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	8033 (94.5%)	464 (5.5%)	8497
	SEPTIC SHOCK	-	-	-	4002 (100.0%)	4004
	TOT	34924	0	10554	4884	50362

Ventil. Associat. Pneumonia (VAP)	N	%
No	50083	97.5
Yes	1276	2.5
Missing	49	

Catheter Bacteraemia (CR-BSI)	N	%
No	50778	99.1
Yes	467	0.9
Missing	163	

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

Estimate	8.2
CI (95%)	7.8−8.7

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

Estimate	1.9
CI (95%)	1.7−2.1

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

Estimate	6.6%
CI (95%)	6.2−7.0

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

Estimate	2.3%
CI (95%)	2.1−2.5

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

Procedures and/or treatments (Missing=103)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	48376	94.3										
Invasive ventilation	34117	66.5	25448	49.6	7297	14.2	1	1–6	62	0	0–0	2
Non invasive ventilation	8046	15.7	1830	3.6	1758	3.4	1	1–3	7	0	0–2	1
Tracheostomy	5625	11.0	1463	2.9	4732	9.2	10	5–20	25	8	4–12	1
iNO (inhaled nitric oxide)	107	0.2	10	0	16	0	2	1–4	0	2	0–4	0
Central Venous Catheter	33482	65.3	16621	32.4	26832	52.3	4	2–9	88	0	0–0	5
PICC	1020	2.0	386	0.8	848	1.7	4	2–10	2	5	1–16	0
Arterial Catheter	40104	78.2	20448	39.9	11197	21.8	3	1–7	89	0	0–0	5
Vasoactive drugs	17682	34.5	8065	15.7	4300	8.4	2	1–4	31	0	0–0	5
Antiarrhythmics	3889	7.6	1215	2.4	2106	4.1	3	1–7	5	1	0–2	0
IABP	331	0.6	236	0.5	107	0.2	2	1–4	0	0	0–1	0
Invasive monitoring of C.O.	1726	3.4	306	0.6	344	0.7	4	2–7	2	0	0–1	0
Continous monitoring of ScVO2	72	0.1	27	0.1	15	0	4	1–6	0	0	0–1	0
Temporary pacing	176	0.3	111	0.2	81	0.2	1	1–3	0	0	0–1	0
Ventricular assistance	8	0.0	4	0	2	0	2	1–6	0	3	0–10	0
DC-shock	933	1.8								0	0–1	0
CPR	1394	2.7								0	0–1	0
Massive blood transfusion	794	1.5								0	0–0	0
ICP monitoring without CSF drainage	400	0.8	147	0.3	72	0.1	6	4–10	0	0	0–1	0
ICP monitoring with CSF drainage	458	0.9	289	0.6	248	0.5	7	2–16	3	0	0–1	0
External ventricular drainage without ICP	197	0.4	129	0.3	100	0.2	7	3–15	0	0	0–1	0
Haemofiltration	1923	3.7	171	0.3	536	1	4	2–8	4	1	0–2	1
Haemodialysis	1306	2.5	217	0.4	527	1	3	1–7	5	1	0–4	1
ECMO	155	0.3	67	0.1	58	0.1	6	2–13	1	1	0–3	0
Hepatic clearance techniques	8	0.0										
Clearance techniques during sepsis	336	0.7	15	0	67	0.1	3	1–5	2	0	0–1	0
IAP (intra-abdominal pressure)	623	1.2										
Hypothermia	462	0.9										
Enteral nutrition	15923	31.0	2540	5	10557	20.6	7	3–14	30	1	1–2	0
Parenteral nutrition	9579	18.7	1493	2.9	5759	11.2	4	2–8	14	1	0–2	5
SDD (Topical, Topical and systemic)	217	0.4										
Patient restraint	1149	2.2										
Peridural catheter	1689	3.3	1498	2.9	1378	2.7	1	1–2	1	0	0–2	0
Electrical cardioversion	309	0.6								1	0–3	0
Vacuum therapy	251	0.5										
Antibiotics	32331	63.0										
Antibiotic prophylaxis	19258	37.5	12855	25.1	11159	21.8	1	1–3	21	0	0–0	2
Empirical antibiotic therapy	11149	21.7	5205	10.1	4999	9.7	3	2–6	26	0	0–1	4
Targeted antibiotic therapy	7318	14.3	1464	2.9	4497	8.8	7	4–12	17	4	2–7	3

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

Invasive ventilation (N=34117)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	11531	30.3	7.7	11.0	4	1−9	22
For airway mainteinance	13295	34.9	5.6	8.9	2	1−7	21
In weaning	7632	20.0	0.4	0.5	0	0−1	0
Not evaluable	5649	14.8	3.8	7.8	1	0−3	3865
Reintubation within 48 hours	626	1.6	8.1	9.6	5	2−10	0

Non invasive ventilation (N=8046)	N	%
Non invasive ventilation only	4231	52.6
Non invasive ventilation failed	1288	16.0
For weaning	2207	27.4
Other	320	4.0
Missing	0	

Tracheostomy not present on admission (N=4162)	N	%
Surgical	857	20.6
Percutwist	470	11.3
Ciaglia	479	11.5
Monodil. Ciaglia	1437	34.5
Fantoni	228	5.5
Griggs	456	11.0
Other Kind	163	3.9
Unknown	67	1.6
Missing	5	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=4100)	
Mean	8.7
SD	6.5
Median	7
Q1−Q3	4−12
Missing	5

Invasive monitoring of C.O. (N=1726)	N	%
Swan Ganz	397	23.0
PICCO	1057	61.2
LIDCO	10	0.6
Vigileo-PRAM	179	10.4
Other	80	4.6
Missing	3	

SDD (N=217)	N	%
Topical	210	96.8
Topical and systemic	7	3.2
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=3140)	N	%
Only empirical	651	25.1
Only targeted	991	38.2
Targeted after empirical	806	31.1
Other	147	5.7
Missing	545	

Surgical interventions	N	%
No	49072	95.7
Yes	2214	4.3
Missing	122	

Number of surgical interventions	N	%
0	49072	95.7
1	1720	3.4
2	311	0.6
3	108	0.2
>3	75	0.1
Missing	122	

Surgical interventions Days from admission	
Mean	9.3
SD	9.6
Median	6
Q1−Q3	3−12
Missing	19

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	1012	2.0
Orthopaedic surgery	598	1.2
Neurosurgery	293	0.6
ENT surgery	277	0.5
Maxillo-Facial surgery	122	0.2
Thoracic surgery	100	0.2
Other surgery	98	0.2
Plastic surgery	86	0.2
Nephro/Urological surgery	78	0.2
Organ donation	69	0.1
Missing	122	

Non surgical interventions	N	%
No	50215	97.9
Yes	1052	2.1
Missing	141	

Non surgical interventions Days from admission	
Mean	11.9
SD	12.0
Median	8
Q1−Q3	4−16
Missing	15

Non surgical interventions	N	%
Interventional endoscopy	670	1.3
Interventional radiology	288	0.6
Interventional cardiology	197	0.4
Interventional neuroradiology	70	0.1
Missing	141	

National report for general ICUs - **Year 2017**
Outcome indicators - Adult patients

ICU outcome	N	%
Dead	9079	17.7
Transferred to same hospital	37270	72.8
Transferred to other hospital	4262	8.3
Discharged home	408	0.8
Disch. terminally ill	201	0.4
Missing	188	

Transferred to (N=41532)	N	%
Ward	33757	81.3
Other ICU	3134	7.5
High dependency care unit	3376	8.1
Rehabilitation	991	2.4
Day hospital or Long-term care	274	0.7
Missing	0	

Reason of transfer to Other ICU (N=3214)	N	%
Specialist expertise	1392	43.3
Step-up care	223	6.9
Logistical/organizational reasons	1501	46.7
Step-down care	98	3.0
Missing	0	

Transferred to Same hospital (N=37270)	N	%
Ward	32606	87.5
Other ICU	1191	3.2
High dependency care unit	3175	8.5
Rehabilitation	199	0.5
Day hospital or Long-term care	99	0.3
Missing	0	

Transferred to Other hospital (N=4262)	N	%
Ward	1151	27.0
Other ICU	1943	45.6
High dependency care unit	201	4.7
Rehabilitation	792	18.6
Day hospital or Long-term care	175	4.1
Missing	0	

ICU mortality	N	%
Alive	41940	81.9
Dead	9280	18.1
Missing	188	

Timing of ICU mortality (N=9280)	N	%
Daytime (08:00AM - 07:59PM)	6172	66.5
Nighttime (08:00PM - 07:59AM)	3107	33.5
Weekdays (Monday - Friday)	6951	74.9
Weekend (Saturday - Sunday)	2328	25.1
Missing	1	

C.A.M. activation (N=9280)	N	%
Yes, with organ donation	552	6.1
Yes, without organ donation	592	6.5
No, with organ donation	23	0.3
No, without organ donation	7911	87.1
Missing	202	

Tissue removal (N=9280)	N	%
Yes, with C.A.M. activation	374	4.0
Yes, without C.A.M. activation	527	5.7
No	8379	90.3
Missing	0	

Hospital mortality *	N	%
Dead	11070	23.5
Transf. to other acute-care hospital	4481	9.5
Transf. to other type of hosp. stay	7082	15.1
Nursing home	751	1.6
Voluntary discharge	282	0.6
Discharged home	23362	49.7
Missing	315	

To other type of H stay* (N=7082)	N	%
Rehabilitation in the same institute	1280	18.1
Rehabilitation in other institute	3692	52.1
DH/long-term care, same inst.	788	11.1
DH/long-term care, other inst.	1321	18.7
Missing	1	

Disch. terminally ill* (N=35958)	N	%
Yes	599	1.7
No	35356	98.3
Missing	3	

Hospital mortality *	N	%
Alive	35356	75.2
Dead	11669	24.8
Missing	318	

Timing of hosp. mortality * (N=11669)	N	%
In ICU	8474	72.6
Within 24 hours after ICU	197	1.7
24-47 hours after ICU	199	1.7
48-71 hours after ICU	177	1.5
72-95 hours after ICU	162	1.4
After 95 hours after ICU	2457	21.1
Missing	3	

Timing of hosp. mortality (days from ICU disch.) * Discharged alive from ICU (N=3195)	
Mean	16.1
SD	19.5
Median	10
Q1−Q3	4−21.8
Missing	1

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=47343).

National report for general ICUs - **Year 2017**
Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	34993	74.5
Dead	11952	25.5
Missing	398	

Readmission from ward	N	%
No	49805	97.0
Yes	1545	3.0
Missing	58	

Number of readmissions (N=1545)	N	%
1	1410	91.3
2	121	7.8
>2	14	0.9
Missing	0	

Timing of readmission (N=1545)	N	%
Within 48 hours	346	22.8
48-71 hours	168	11.1
72-95 hours	113	7.4
After 95 hours	890	58.7
Missing	28	

Timing readmission (days)	
N	1545
Mean	10.2
SD	17.4
Median	5
Q1−Q3	2−11.6

ICU stay (days)	
Mean	6.1
SD	9.8
Median	2
Q1−Q3	1−7
Missing	181

ICU stay (days) **Alive** (N=41940)	
Mean	5.7
SD	9.5
Median	2
Q1−Q3	1−6
Missing	3

ICU stay (days) **Dead** (N=9280)	
Mean	7.5
SD	11.0
Median	3
Q1−Q3	1−9
Missing	1

Stay after ICU (days) * **Alive** (N=38735)	
Mean	12.7
SD	15.8
Median	8
Q1−Q3	4−16
Missing	208

Hospital stay (days) *	
Mean	19.4
SD	20.8
Median	13
Q1−Q3	7−25
Missing	330

Hospital stay (days) * **Alive** (N=35356)	
Mean	20.6
SD	20.6
Median	15
Q1−Q3	8−26
Missing	11

Hospital stay (days) * **Dead** (N=11669)	
Mean	15.9
SD	20.7
Median	9
Q1−Q3	3−21
Missing	7

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=47343).

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients evaluated in the GiViTI model

Patients (N): 46050

Sex	N	%
Male	27164	59.1
Female	18797	40.9
Missing	89	

Age (years)	N	%
17-45	5499	11.9
46-65	11838	25.7
66-75	11625	25.2
>75	17088	37.1
Missing	0	
Mean	66.9	
SD	16.4	
Median	71	
Q1−Q3	58−79	
Min−Max	17−103	

Body mass Index (BMI)	N	%
Underweight	2578	5.6
Normal	20415	44.4
Overweight	14353	31.2
Obese	8615	18.7
Missing	89	

Pregnancy status **Females** (N=18797)	N	%
Not fertile	10161	54.1
Not pregnant/Unknown	8090	43.1
Currently pregnant	80	0.4
Post partum	459	2.4
Missing	7	

Comorbidities	N	%
No	6771	14.7
Yes	39279	85.3
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	24159	52.5
Arrhythmia	7937	17.2
Moderate COPD	6654	14.4
Myocardial infarction	6174	13.4
Diabetes Type II without insulin tr.	6044	13.1
Any tumour without metastasis	5446	11.8
Cerebrovascular disease	5071	11.0
NYHA class II-III	4874	10.6
Peripheral vascular disease	4574	9.9
Antiplatelet therapy	4409	9.6
Missing	0	

Stay before ICU (days)	
Mean	3.9
SD	10.1
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	40376	87.7
Other hospital	5442	11.8
Long-term chronic care hospital	232	0.5
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=45818)	N	%
Medical ward	6446	14.1
Surgical ward	19411	42.4
Emergency room	16079	35.1
Other ICU	2771	6.0
High dependency care unit	1111	2.4
Missing	0	

Reason for transfer from **Other ICU** (N=2771)	N	%
Specialist expertise	725	26.2
Step-up care	486	17.5
Logistical/organizational reasons	1509	54.5
Step-down care	51	1.8
Missing	0	

Ward of admission **Same hospital** (N=40376)	N	%
Medical ward	5766	14.3
Surgical ward	19056	47.2
Emergency room	13686	33.9
Other ICU	853	2.1
High dependency care unit	1015	2.5
Missing	0	

Ward of admission **Other hospital** (N=5442)	N	%
Medical ward	680	12.5
Surgical ward	355	6.5
Emergency room	2393	44.0
Other ICU	1918	35.2
High dependency care unit	96	1.8
Missing	0	

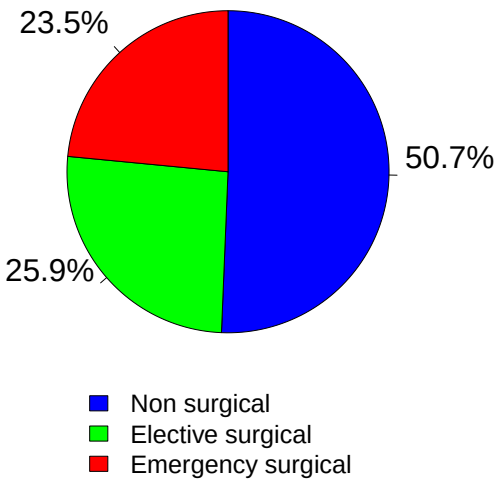
Scheduled admission	N	%
No	36627	79.5
Yes	9423	20.5
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients evaluated in the GiViTI model

Trauma	N	%
No	40197	87.3
Yes	5853	12.7
Multiple trauma	2311	5.0
Missing	0	

Surgical status	N	%
Non surgical	23334	50.7
Elective surgical	11909	25.9
Emergency surgical	10807	23.5
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=22716)	N	%
Operating theatre of surgical ward	16906	74.5
Operating theatre of emergency room	1892	8.3
Surgical ward	1127	5.0
Other	2767	12.2
Missing	24	

Surgical interventions (top 10) **Elective surgical** (N=11909)	N	%
Gastrointestinal surgery	3341	28.1
Orthopaedic surgery	1741	14.6
Nephro/Urological surgery	1556	13.1
ENT surgery	799	6.7
Neurosurgery	720	6.0
Thoracic surgery	655	5.5
Gynaecological surgery	632	5.3
Hepatic surgery	524	4.4
Abdominal vascular surgery	520	4.4
Pancreatic surgery	438	3.7
Missing	983	

Timing **Elective surgical** (N=11909)	N	%
From -7 to -3 days	208	1.7
From -2 to -1 days	348	2.9
On ICU admission day	11951	100.4
The day after ICU admission	133	1.1
Missing	17	

Surgical interventions (top 10) **Emergency surgical** (N=10807)	N	%
Gastrointestinal surgery	4658	43.1
Neurosurgery	1577	14.6
Orthopaedic surgery	1270	11.8
Nephro/Urological surgery	574	5.3
Abdominal vascular surgery	461	4.3
Biliary tract surgery	431	4.0
Peripheral vascular surgery	405	3.7
Obstetric surgery	334	3.1
ENT surgery	297	2.7
Splenectomy	296	2.7
Missing	504	

Timing **Emergency surgical** (N=10807)	N	%
From -7 to -3 days	338	3.1
From -2 to -1 days	1188	11.0
On ICU admission day	9408	87.1
The day after ICU admission	497	4.6
Missing	41	

Non surgical interventions	N	%
None	42127	91.5
Elective	575	1.2
Emergency	3348	7.3
Missing	0	

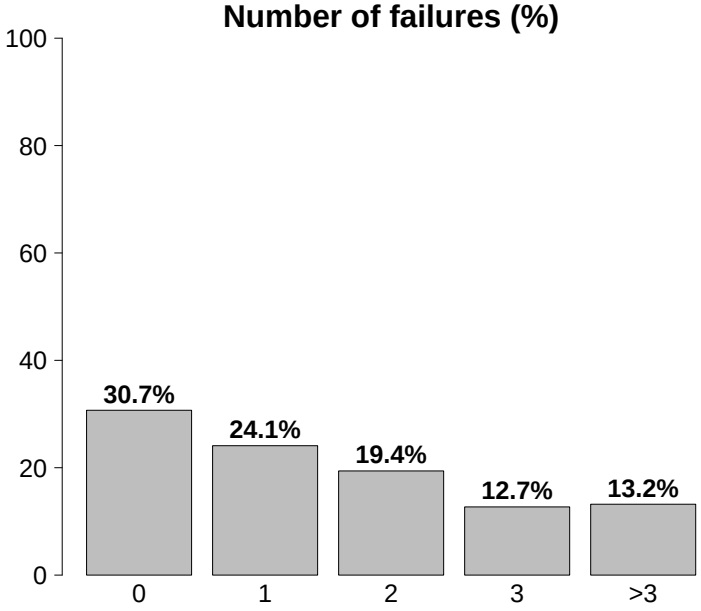
Non surgical interventions **Elective** (N=575)	N	%
Interventional endoscopy	184	32.0
Interventional radiology	123	21.4
Interventional cardiology	120	20.9
Interventional neuroradiology	65	11.3
Missing	83	

Non surgical interventions **Emergency** (N=3348)	N	%
Interventional cardiology	1274	38.1
Interventional endoscopy	781	23.3
Interventional radiology	773	23.1
Interventional neuroradiology	476	14.2
Missing	44	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients evaluated in the GiViTI model

Reason for admission	N	%
Monitoring/Weaning	19393	42.1
Post surgical weaning	6687	14.6
Surgical monitoring	7469	16.3
Post interventional weaning	183	0.4
Interventional monitoring	647	1.4
Non surgical monitoring	4154	9.1
Missing	253	
Admission for procedures/treatments	0	0.0
Intensive Treatment	26657	57.9
Only ventilatory support	13830	30.0
Only cardiovascular support	1934	4.2
Ventilatory and cardiovascular support	10893	23.7
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	

Number of failures (%)



Failures on admission	N	%
No	14118	30.7
Yes	31932	69.3
A: Respiratory failure	24723	53.7
B: Cardiovascular failure	12827	27.9
C: Neurological failure	6442	14.0
D: Hepatic failure	388	0.8
E: Renal failure	16136	35.0
F: Acute skin failure	20	0.0
G: Metabolic failure	11334	24.6
H: Coagulation failure	720	1.6
Missing	0	

Failures on admission (top 10)	N	%
A	6555	14.2
ABEG	3151	6.8
E	3028	6.6
AB	2196	4.8
AC	2189	4.8
AE	1941	4.2
ABE	1539	3.3
ABCEG	1258	2.7
AEG	1108	2.4
EG	1044	2.3
Missing	0	

Respiratory failure	N	%
None	21327	46.3
Only hypoxic failure	7891	17.1
Only hypercapnic failure	1344	2.9
Hypoxic-hypercapnic failure	3176	6.9
Intubation for airway maint.	12312	26.7
Missing	0	

Cardiovascular failure	N	%
None	33223	72.1
Without shock	2632	5.7
Cardiogenic shock	2576	5.6
Septic shock	3049	6.6
Haemorrhagic/hypovolemic shock	1749	3.8
Hypovolemic shock	1057	2.3
Anaphylactic shock	58	0.1
Neurogenic shock	401	0.9
Other shock	609	1.3
Mixed shock	696	1.5
Missing	0	

Neurologic failure	N	%
None	31884	83.2
Cerebral coma	3308	8.6
Metabolic coma	1140	3.0
Postanoxic coma	1718	4.5
Toxic coma	276	0.7
Missing or not evaluable	7724	

Renal failure (AKIN)	N	%
None	29913	65.0
Mild	8073	17.5
Moderate	3689	8.0
Severe	4375	9.5
Missing	0	

Metabolic failure	N	%
None	34716	75.4
pH <= 7.3, PaCO2 < 45 mmHg	3193	6.9
Base deficit >= 5 mmol/L, lactate >1.5x	8141	17.7
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult patients evaluated in the GiViTI model

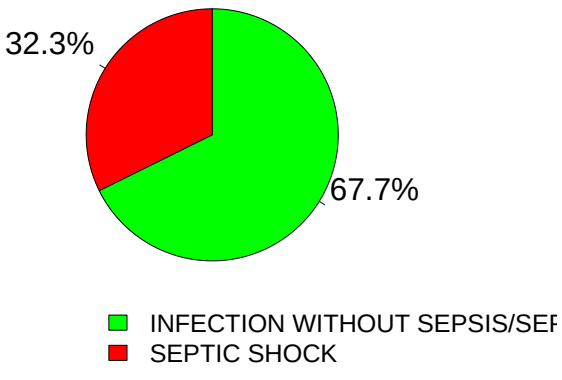
Clinical conditions on admission	N	%
Respiratory	8590	18.7
Acute exacerbation of COPD	2272	4.9
Pleural effusion	1794	3.9
Atelectasis	1104	2.4
Aspiration pneumonia	876	1.9
Upper respiratory tract disease	716	1.6
Cardiovascular	8606	18.7
Cardiac arrest	2244	4.9
Left heart failure with pulmonary edema	1688	3.7
Left heart failure without pulm. edema	1130	2.5
Acute severe arrhythmia: tachycardias	1008	2.2
Acute myocardial infarction	671	1.5
Neurological	6466	14.0
Spontaneous Intraparenchymal bleeding	1402	3.0
Cerebral artery stroke	1236	2.7
Seizures	1045	2.3
Metabolic/postanoxic encephalopathy	783	1.7
Spontaneous Subarachnoid haemorrhage	758	1.6
Gastrointestinal and hepatic	9591	20.8
Digestive tract malignancy	2578	5.6
Gastrointestinal perforation	1479	3.2
Intestinal occlusion	1456	3.2
Gastrointestinal bleeding: upper tract	712	1.5
Acute bile-duct disease	689	1.5
Trauma (anatomical districts)	5854	12.7
Pelvis/bone/joint & muscle	2587	5.6
Head	2360	5.1
Chest	2105	4.6
Spine	1240	2.7
Abdomen	979	2.1
Major vessels injury	199	0.4
Miscellaneous	107	0.2
Other	11986	26.0
Metabolic disorder	2577	5.6
Other disease	2559	5.6
Nephrourologic disease	2417	5.2
Orthopaedic disease	1272	2.8
Acute intoxication	1079	2.3
Post transplantation	346	0.8
Renal transplantation	151	0.3
Liver transplantation	120	0.3
Infections	11650	25.3
Pneumonia	4252	9.2
NON-surgical secondary peritonitis	1220	2.6
NON-surgical urinary tract infection	1100	2.4
L.R.T.I. other than pneumonia	876	1.9
Post-surgical peritonitis	619	1.3
Primary bacteraemia of unknown origin	585	1.3
Cholecystitis/cholangitis	551	1.2
Clinical sepsis	505	1.1
NON-surgical skin/soft tissue infection	479	1.0
Primary peritonitis	358	0.8
Missing	0	

Trauma (anatomical districts)	N	%
Head	2360	5.1
Traumatic subarachnoid haemorrhage	842	1.8
Traumatic Subdural haematoma	831	1.8
Maxillofacial fracture	783	1.7
Cerebral contusion/laceration	673	1.5
Skull fracture	582	1.3
Spine	1240	2.7
Vertebral fracture, without deficit	1025	2.2
Cervical injury, incomplete deficit	75	0.2
Tetraplegia	59	0.1
Chest	2105	4.6
Other injuries of the chest	1095	2.4
Traum. haemothorax/pneumothorax	817	1.8
Severe lung contusion/laceration	537	1.2
Abdomen	979	2.1
Spleen: Moderate-Severe laceration	282	0.6
Minor injuries of the abdomen	245	0.5
Liver: Moderate-Severe laceration	212	0.5
Pelvis/bone/joint & muscle	2587	5.6
Long bone fracture	2091	4.5
Multiple fracture of the pelvis	642	1.4
Very severe or open fracture of the pelvis	99	0.2
Major vessels injury	199	0.4
Proximal limbs vessels: transection	78	0.2
Major abdominal vessels: transection	44	0.1
Neck vessels: dissection/transection	43	0.1
Miscellaneous	107	0.2
Burns (>30% BSA)	74	0.2
Inhalation injury	47	0.1
Missing	0	

Infection severity on admission	N	%
None	34400	75.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	7473	16.4
SEPTIC SHOCK	3565	7.8
Missing	612	

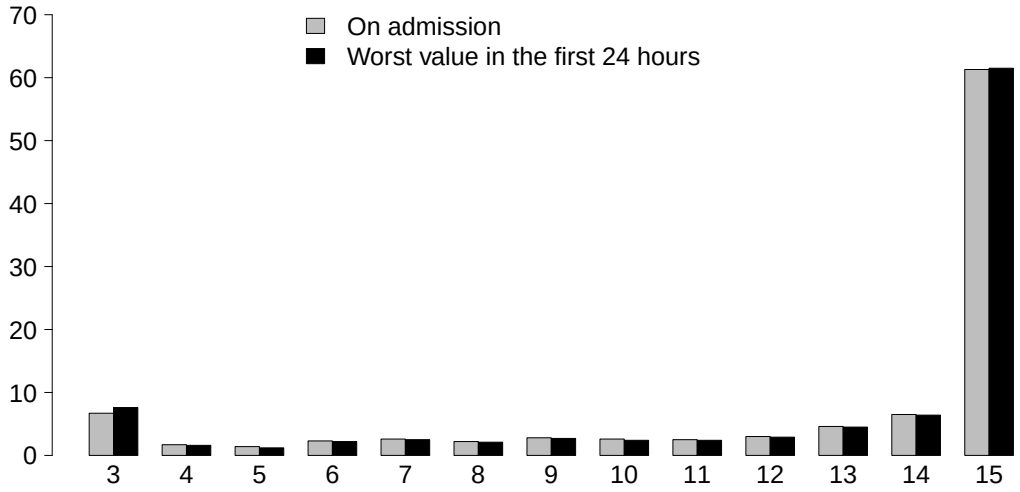
Infection severity on admission

Patients infected (N=11038)



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

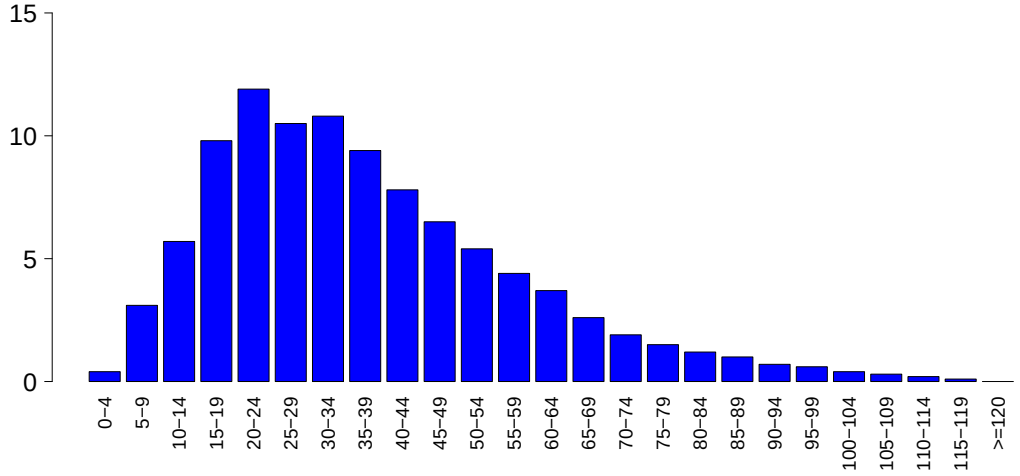
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	12−15
Not evaluable	7724
Missing	0

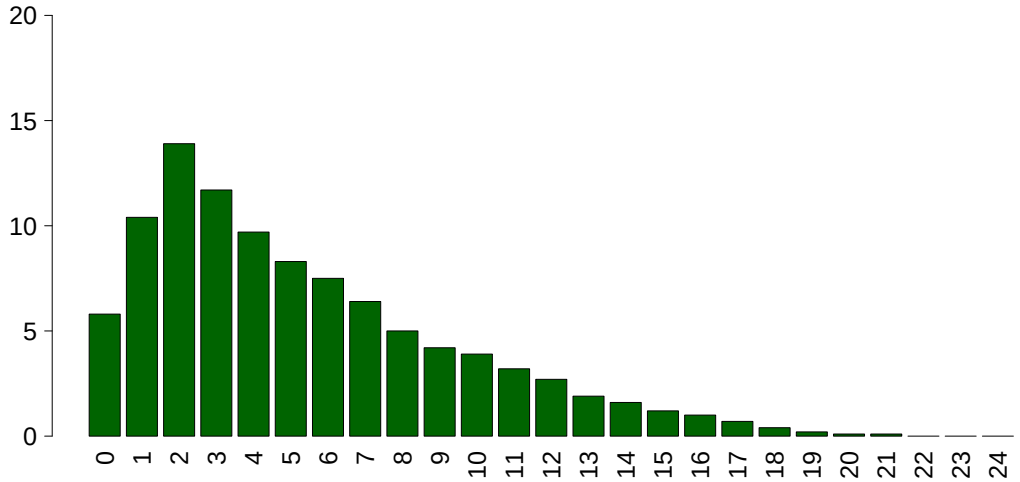
GCS (first 24 hours)	
Median	15
Q1−Q3	12−15
Not evaluable	6549
Missing	0

SAPS II (%)



SAPSII	
Mean	37.4
SD	20.5
Median	33
Q1−Q3	22−49
Not evaluable	6549
Missing	0

SOFA (%)



SOFA	
Mean	5.4
SD	4.2
Median	4
Q1−Q3	2−8
Not evaluable	6549
Missing	0

National report for general ICUs - **Year 2017**
Characteristics during the stay - Adult patients evaluated in the GiViTI model

Complications during the stay	N	%
No	32451	70.5
Yes	13598	29.5
Missing	1	

Failures during the stay	N	%
No	39905	86.7
Yes	6145	13.3
A: Respiratory failure	2943	6.4
B: Cardiovascular failure	2653	5.8
C: Neurological failure	495	1.1
D: Hepatic failure	195	0.4
E: Renal failure (AKIN)	1731	3.8
F: Acute skin failure	6	0.0
G: Metabolic failure	499	1.1
H: Coagulation failure	256	0.6
Missing	0	

Failures during the stay (top 10)	N	%
A	1679	3.6
B	1287	2.8
E	690	1.5
AB	540	1.2
G	296	0.6
BE	260	0.6
AE	199	0.4
C	199	0.4
ABE	198	0.4
D	81	0.2
Missing	0	

Respiratory failure occured	N	%
None	43106	93.6
Intubation for airway maint.	766	1.7
Hypoxic failure	2073	4.5
Hypercapnic failure	611	1.3
Missing	1	

Cardiovascular failure occured	N	%
None	43396	94.2
Cardiogenic shock	812	1.8
Hypovolemic shock	287	0.6
Haemorrhagic/hypovolemic shock	249	0.5
Septic shock	1029	2.2
Anaphylactic shock	7	0.0
Neurogenic shock	167	0.4
Other shock	253	0.5
Missing	1	

Neurological failure occured	N	%
None	45554	98.9
Cerebral coma	281	0.6
Metabolic coma	116	0.3
Postanoxic coma	100	0.2
Missing	1	

Renal failure occured (AKIN)	N	%
None	44318	96.2
Mild	214	0.5
Moderate	266	0.6
Severe	1251	2.7
Missing	1	

Complications during the stay	N	%
Respiratory	2375	5.2
Pleural effusion	971	2.1
Atelectasis	570	1.2
Pneumothorax/Pneumomediastinum	296	0.6
Severe ARDS	291	0.6
Acute asthma/bronchospasm	161	0.3
Cardiovascular	3527	7.7
Acute severe arrhythmia: tachycardias	1368	3.0
Cardiac arrest	1165	2.5
Pulmonary edema	296	0.6
Acute severe arrhythmia: bradycardias	251	0.5
Left heart failure w/o pulm. edema	227	0.5
Neurological	2808	6.1
Drowsiness/agitation/delirium	1242	2.7
Seizures	499	1.1
Intracranial hypertension	486	1.1
Brain edema	411	0.9
New ischaemic stroke	224	0.5
Gastrointestinal and hepatic	1301	2.8
Gastrointestinal bleeding: upper tract	224	0.5
Bowel ischaemia	207	0.4
Paralytic Ileus	175	0.4
Liver Dysfunction Syndrome	162	0.4
Gastrointestinal perforation	155	0.3
Other	1250	2.7
Metabolic disorder	499	1.1
Nephrourologic disease	283	0.6
Other disease	250	0.5
Category/Stage II: Partial Thickness Skin Loss	95	0.2
Category/Stage I: Nonblanchable Erythema	56	0.1
Other skin and/or soft tissue pathology	55	0.1
Category/Stage III: Full Thickness Skin Loss	35	0.1
Infections	4075	8.8
Pneumonia	1333	2.9
L.R.T.I. other than pneumonia	912	2.0
NON-surgical urinary tract infection	636	1.4
Primary bacteraemia of unknown origin	431	0.9
Catheter-related bacteremia (CR-BSI)	416	0.9
Post-surgical peritonitis	184	0.4
Upper respiratory tract infection	159	0.3
Clinical sepsis	135	0.3
Post-surgical skin/soft tissue infection	115	0.2
F.U.O. fever of unknown origin	95	0.2
Missing	1	

National report for general ICUs - **Year 2017**
Characteristics during the stay - Adult patients evaluated in the GiViTI model

Infections	N	%
None	31593	68.6
Only on admission	10381	22.5
On admission and during ICU stay	1268	2.8
Only during ICU stay	2807	6.1
Missing	1	

Maximum severity of infection	N	%
None	31593	69.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	9377	20.7
SEPTIC SHOCK	4333	9.6
Missing	747	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	31593 (92.3%)	0 (0.0%)	2260 (6.6%)	365 (1.1%)	34218
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	7083 (94.8%)	389 (5.2%)	7472
	SEPTIC SHOCK	-	-	-	3565 (100.0%)	3565
	TOT	31593	0	9343	4319	45255

Ventil. Associat. Pneumonia (VAP)	N	%
No	44903	97.5
Yes	1146	2.5
Missing	1	

Catheter Bacteraemia (CR-BSI)	N	%
No	45633	99.1
Yes	416	0.9
Missing	1	

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

Estimate	8.4
CI (95%)	7.9−8.9

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

Estimate	1.9
CI (95%)	1.7−2.1

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

Estimate	6.7%
CI (95%)	6.3−7.1

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

Estimate	2.3%
CI (95%)	2.1−2.5

National report for general ICUs - **Year 2017**

Process indicators - Adult patients evaluated in the GiViTI model

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	43369	94.2										
Invasive ventilation	30505	66.2	22820	49.6	6393	13.9	1	1–6	1	0	0–0	0
Non invasive ventilation	7239	15.7	1653	3.6	1570	3.4	1	1–3	1	0	0–2	0
Tracheostomy	4938	10.7	1238	2.7	4155	9	10	5–20	0	7	4–12	0
iNO (inhaled nitric oxide)	98	0.2	7	0	16	0	2	1–4	0	2	0–4	0
Central Venous Catheter	29811	64.7	14378	31.2	23914	51.9	4	2–9	3	0	0–0	0
PICC	875	1.9	329	0.7	737	1.6	4	2–10	1	5	1–16	0
Arterial Catheter	35970	78.1	18273	39.7	9906	21.5	3	1–7	4	0	0–0	0
Vasoactive drugs	15704	34.1	7096	15.4	3779	8.2	2	1–4	1	0	0–0	1
Antiarrhythmics	3505	7.6	1068	2.3	1872	4.1	3	1–7	0	1	0–2	0
IABP	295	0.6	205	0.4	98	0.2	2	1–4	0	0	0–1	0
Invasive monitoring of C.O.	1535	3.3	241	0.5	318	0.7	4	2–7	0	0	0–1	0
Continous monitoring of ScVO2	67	0.1	26	0.1	14	0	3	1–6	0	0	0–1	0
Temporary pacing	152	0.3	94	0.2	69	0.1	1	1–3	0	0	0–1	0
Ventricular assistance	7	0.0	4	0	1	0	2	0–4	0	0	0–3	0
DC-shock	853	1.9								0	0–1	0
CPR	1257	2.7								0	0–1	0
Massive blood transfusion	723	1.6								0	0–0	0
ICP monitoring without CSF drainage	365	0.8	125	0.3	64	0.1	6	4–10	0	0	0–1	0
ICP monitoring with CSF drainage	354	0.8	205	0.4	183	0.4	8	3–17	0	0	0–1	0
External ventricular drainage without ICP	168	0.4	110	0.2	86	0.2	7	3–15	0	0	0–1	0
Haemofiltration	1682	3.7	134	0.3	459	1	4	2–8	1	1	0–2	1
Haemodialysis	1139	2.5	198	0.4	462	1	3	1–7	0	1	0–4	0
ECMO	131	0.3	52	0.1	49	0.1	6	2–14	0	1	0–3	0
Hepatic clearance techniques	6	0.0										
Clearance techniques during sepsis	294	0.6	12	0	56	0.1	3	1–5	0	0	0–1	0
IAP (intra-abdominal pressure)	563	1.2										
Hypothermia	436	0.9										
Enteral nutrition	14229	30.9	2137	4.6	9394	20.4	7	3–14	2	1	1–2	0
Parenteral nutrition	8471	18.4	1176	2.6	5083	11	4	2–8	2	1	0–2	2
SDD (Topical, Topical and systemic)	206	0.4										
Patient restraint	1058	2.3										
Peridural catheter	1537	3.3	1359	3	1260	2.7	1	1–2	0	0	0–2	0
Electrical cardioversion	266	0.6								1	0–3	0
Vacuum therapy	201	0.4										
Antibiotics	28892	62.7										
Antibiotic prophylaxis	17347	37.7	11477	24.9	9921	21.5	1	1–3	1	0	0–0	0
Empirical antibiotic therapy	9923	21.5	4533	9.8	4425	9.6	3	2–6	1	0	0–1	1
Targeted antibiotic therapy	6479	14.1	1196	2.6	3983	8.6	7	4–12	2	4	2–7	1

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

Invasive ventilation (N=30505)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	10292	30.2	7.5	10.7	4	1−9	1
For airway mainteinance	11956	35.1	5.5	8.6	2	1−7	0
In weaning	6987	20.5	0.4	0.5	0	0−1	0
Not evaluable	4837	14.2	3.8	7.7	1	0−4	3434
Reintubation within 48 hours	567	1.7	8.0	9.6	5	2−10	0

Non invasive ventilation (N=7239)	N	%
Non invasive ventilation only	3790	52.4
Non invasive ventilation failed	1155	16.0
For weaning	2010	27.8
Other	284	3.9
Missing	0	

Tracheostomy not present on admission (N=3700)	N	%
Surgical	782	21.1
Percutwist	409	11.1
Ciaglia	415	11.2
Monodil. Ciaglia	1307	35.3
Fantoni	200	5.4
Griggs	390	10.5
Other Kind	142	3.8
Unknown	55	1.5
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=3651)	
Mean	8.5
SD	6.4
Median	7
Q1−Q3	4−11
Missing	3

Invasive monitoring of C.O. (N=1535)	N	%
Swan Ganz	329	21.4
PICCO	965	62.9
LIDCO	9	0.6
Vigileo-PRAM	158	10.3
Other	73	4.8
Missing	1	

SDD (N=206)	N	%
Topical	199	96.6
Topical and systemic	7	3.4
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=2807)	N	%
Only empirical	567	24.5
Only targeted	886	38.3
Targeted after empirical	738	31.9
Other	123	5.3
Missing	493	

Surgical interventions	N	%
No	44125	95.8
Yes	1925	4.2
Missing	0	

Number of surgical interventions	N	%
0	44125	95.8
1	1494	3.2
2	272	0.6
3	93	0.2
>3	66	0.1
Missing	0	

Surgical interventions Days from admission	
Mean	9.2
SD	9.4
Median	6
Q1−Q3	3−12
Missing	17

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	859	1.9
Orthopaedic surgery	551	1.2
ENT surgery	254	0.6
Neurosurgery	244	0.5
Maxillo-Facial surgery	116	0.3
Thoracic surgery	97	0.2
Other surgery	89	0.2
Nephro/Urological surgery	69	0.1
Plastic surgery	69	0.1
Organ donation	62	0.1
Missing	0	

Non surgical interventions	N	%
No	45135	98.0
Yes	915	2.0
Missing	0	

Non surgical interventions Days from admission	
Mean	11.8
SD	11.8
Median	8
Q1−Q3	4−16
Missing	15

Non surgical interventions	N	%
Interventional endoscopy	586	1.3
Interventional radiology	240	0.5
Interventional cardiology	172	0.4
Interventional neuroradiology	62	0.1
Missing	0	

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

ICU outcome	N	%
Dead	7929	17.2
Transferred to same hospital	33742	73.3
Transferred to other hospital	3852	8.4
Discharged home	340	0.7
Disch. terminally ill	185	0.4
Missing	2	

Transferred to (N=37594)	N	%
Ward	30601	81.4
Other ICU	2774	7.4
High dependency care unit	3096	8.2
Rehabilitation	876	2.3
Day hospital or Long-term care	247	0.7
Missing	0	

Reason of transfer to Other ICU (N=2852)	N	%
Specialist expertise	1208	42.4
Step-up care	200	7.0
Logistical/organizational reasons	1353	47.4
Step-down care	91	3.2
Missing	0	

Transferred to Same hospital (N=33742)	N	%
Ward	29517	87.5
Other ICU	1047	3.1
High dependency care unit	2916	8.6
Rehabilitation	176	0.5
Day hospital or Long-term care	86	0.3
Missing	0	

Transferred to Other hospital (N=3852)	N	%
Ward	1084	28.1
Other ICU	1727	44.8
High dependency care unit	180	4.7
Rehabilitation	700	18.2
Day hospital or Long-term care	161	4.2
Missing	0	

ICU mortality	N	%
Alive	37934	82.4
Dead	8114	17.6
Missing	2	

Timing of ICU mortality (N=8114)	N	%
Daytime (08:00AM - 07:59PM)	5404	66.6
Nighttime (08:00PM - 07:59AM)	2709	33.4
Weekdays (Monday - Friday)	6061	74.7
Weekend (Saturday - Sunday)	2052	25.3
Missing	1	

C.A.M. activation (N=8114)	N	%
Yes, with organ donation	473	6.0
Yes, without organ donation	517	6.5
No, with organ donation	20	0.3
No, without organ donation	6919	87.3
Missing	185	

Tissue removal (N=8114)	N	%
Yes, with C.A.M. activation	320	3.9
Yes, without C.A.M. activation	467	5.8
No	7327	90.3
Missing	0	

Hospital mortality	N	%
Dead	10662	23.2
Transf. to other acute-care hospital	4343	9.4
Transf. to other type of hosp. stay	6912	15.0
Nursing home	748	1.6
Voluntary discharge	281	0.6
Discharged home	23104	50.2
Missing	0	

To other type of H stay (N=6912)	N	%
Rehabilitation in the same institute	1261	18.2
Rehabilitation in other institute	3580	51.8
DH/long-term care, same inst.	774	11.2
DH/long-term care, other inst.	1296	18.8
Missing	1	

Disch. terminally ill (N=35388)	N	%
Yes	589	1.7
No	34799	98.3
Missing	0	

Hospital mortality	N	%
Alive	34799	75.6
Dead	11251	24.4
Missing	0	

Timing of hosp. mortality (N=11251)	N	%
In ICU	8112	72.1
Within 24 hours after ICU	191	1.7
24-47 hours after ICU	196	1.7
48-71 hours after ICU	174	1.5
72-95 hours after ICU	161	1.4
After 95 hours after ICU	2416	21.5
Missing	1	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=3139)	
Mean	16.0
SD	19.3
Median	10
Q1−Q3	4−21
Missing	0

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

Last hospital mortality	N	%
Alive	34519	75.0
Dead	11531	25.0
Missing	0	

ICU stay (days)	
Mean	5.9
SD	9.6
Median	2
Q1−Q3	1−7
Missing	1

ICU stay (days) **Alive** (N=37934)	
Mean	5.6
SD	9.2
Median	2
Q1−Q3	1−6
Missing	0

ICU stay (days) **Dead** (N=8114)	
Mean	7.5
SD	10.9
Median	3
Q1−Q3	1−9
Missing	1

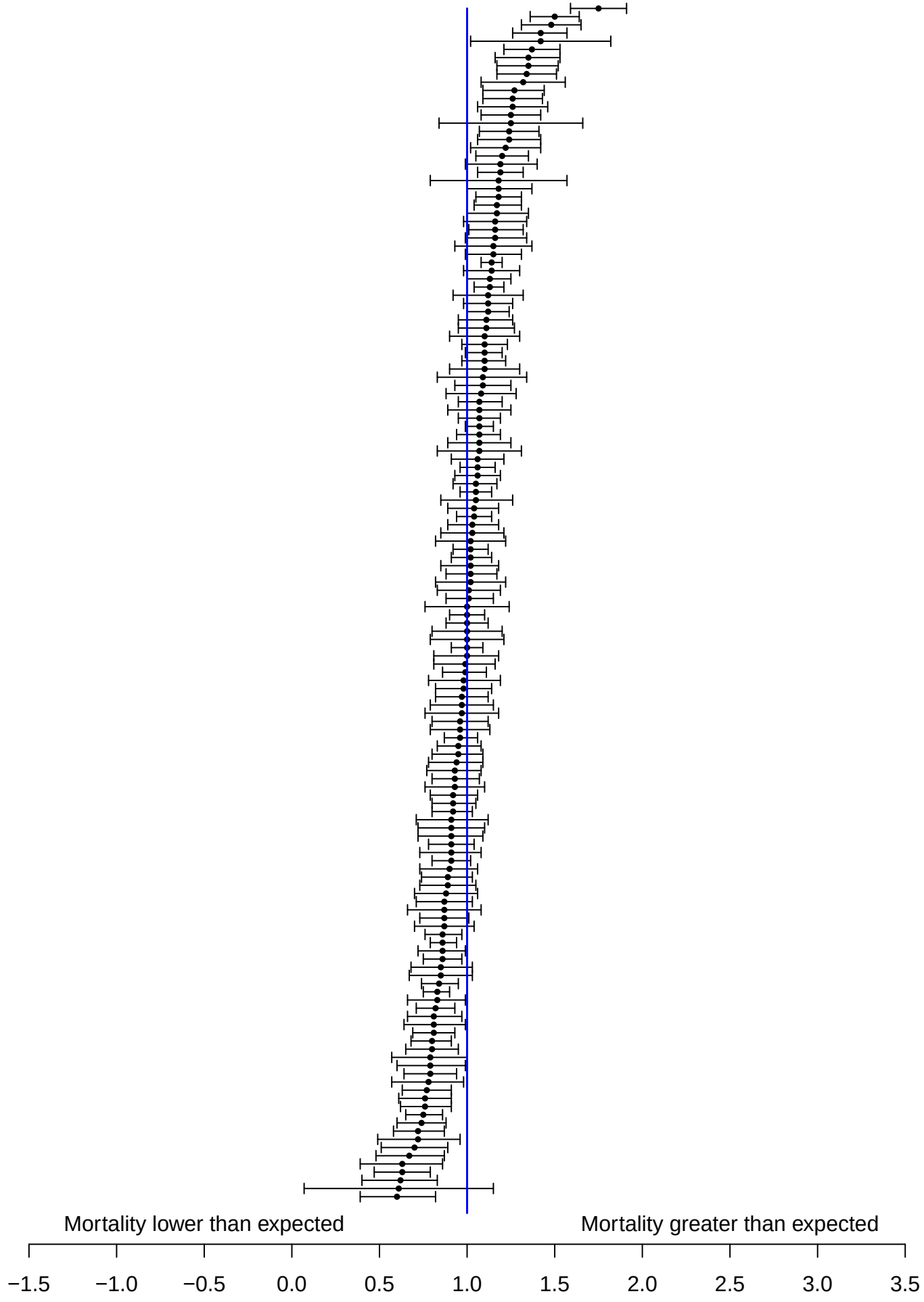
Stay after ICU (days) **Alive** (N=37934)	
Mean	12.7
SD	15.7
Median	8
Q1−Q3	4−16
Missing	21

Hospital stay (days)	
Mean	19.5
SD	20.6
Median	14
Q1−Q3	7−25
Missing	5

Hospital stay (days) **Alive** (N=34799)	
Mean	20.6
SD	20.5
Median	15
Q1−Q3	8−26
Missing	4

Hospital stay (days) **Dead** (N=11251)	
Mean	16.2
SD	20.5
Median	10
Q1−Q3	3−22
Missing	1

National report for general ICUs - **Year 2017**
Analysis of hospital mortality - Adult patients evaluated in the GiViTI model
Predictive model: **GiViTI 2017**



National report for general ICUs - **Year 2017**
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

Patients (N): 23334

Sex	N	%
Male	13939	59.8
Female	9358	40.2
Missing	37	

Age (years)	N	%
17-45	2769	11.9
46-65	6172	26.5
66-75	5765	24.7
>75	8628	37.0
Missing	0	
Mean	66.7	
SD	16.4	
Median	70	
Q1−Q3	57−79	
Min−Max	17−103	

Body mass Index (BMI)	N	%
Underweight	1321	5.7
Normal	10347	44.4
Overweight	7303	31.3
Obese	4326	18.6
Missing	37	

Pregnancy status **Females** (N=9358)	N	%
Not fertile	5167	55.2
Not pregnant/Unknown	4081	43.6
Currently pregnant	41	0.4
Post partum	66	0.7
Missing	3	

Comorbidities	N	%
No	3196	13.7
Yes	20138	86.3
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	11897	51.0
Arrhythmia	4301	18.4
Moderate COPD	3438	14.7
Diabetes Type II without insulin tr.	3268	14.0
Myocardial infarction	3135	13.4
Cerebrovascular disease	2939	12.6
NYHA class II-III	2929	12.6
Moderate or severe renal disease	2446	10.5
Antiplatelet therapy	2235	9.6
Severe COPD	2137	9.2
Missing	0	

Stay before ICU (days)	
Mean	3.9
SD	11.0
Median	0
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	18832	80.7
Other hospital	4294	18.4
Long-term chronic care hospital	208	0.9
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=23126)	N	%
Medical ward	5436	23.5
Surgical ward	1378	6.0
Emergency room	13084	56.6
Other ICU	2300	9.9
High dependency care unit	928	4.0
Missing	0	

Reason for transfer from **Other ICU** (N=2300)	N	%
Specialist expertise	533	23.2
Step-up care	379	16.5
Logistical/organizational reasons	1340	58.3
Step-down care	48	2.1
Missing	0	

Ward of admission **Same hospital** (N=18832)	N	%
Medical ward	4833	25.7
Surgical ward	1279	6.8
Emergency room	11240	59.7
Other ICU	636	3.4
High dependency care unit	844	4.5
Missing	0	

Ward of admission **Other hospital** (N=4294)	N	%
Medical ward	603	14.0
Surgical ward	99	2.3
Emergency room	1844	42.9
Other ICU	1664	38.8
High dependency care unit	84	2.0
Missing	0	

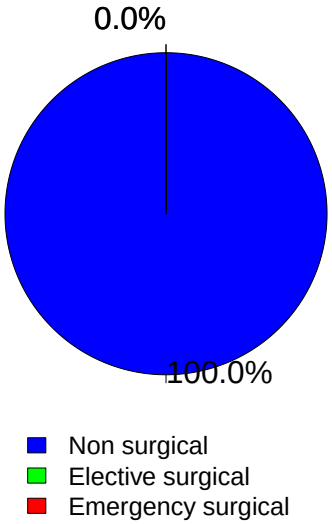
Scheduled admission	N	%
No	23218	99.5
Yes	116	0.5
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

Trauma	N	%
No	20483	87.8
Yes	2851	12.2
Multiple trauma	1263	5.4
Missing	0	

Surgical status	N	%
Non surgical	23334	100.0
Elective surgical	0	0.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



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

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

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

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

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

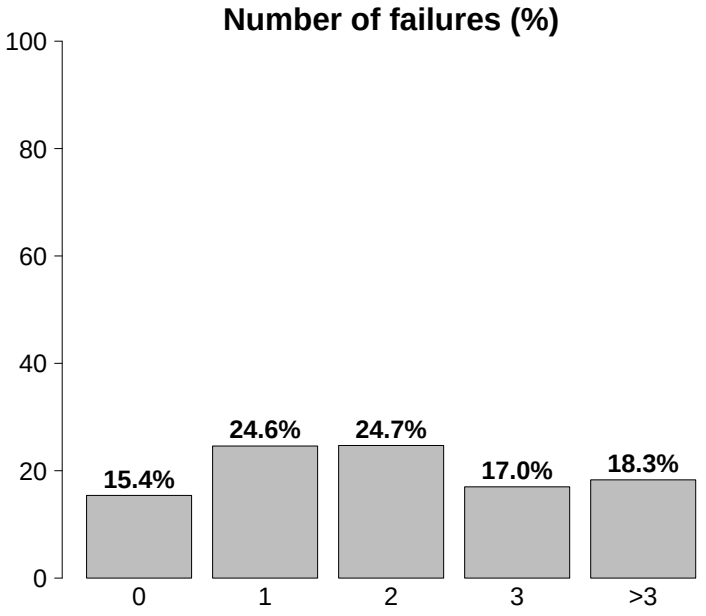
Non surgical interventions	N	%
None	20368	87.3
Elective	339	1.5
Emergency	2627	11.3
Missing	0	

Non surgical interventions **Elective** (N=339)	N	%
Interventional endoscopy	118	34.8
Interventional cardiology	112	33.0
Interventional radiology	71	20.9
Interventional neuroradiology	45	13.3
Missing	0	

Non surgical interventions **Emergency** (N=2627)	N	%
Interventional cardiology	1229	46.8
Interventional endoscopy	626	23.8
Interventional radiology	479	18.2
Interventional neuroradiology	319	12.1
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	5192	22.3
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	171	0.7
Interventional monitoring	630	2.7
Non surgical monitoring	4154	18.0
Missing	237	
Admission for procedures/treatments	0	0.0
Intensive Treatment	18142	77.7
Only ventilatory support	10094	43.3
Only cardiovascular support	1138	4.9
Ventilatory and cardiovascular support	6910	29.6
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	3586	15.4
Yes	19748	84.6
A: Respiratory failure	17004	72.9
B: Cardiovascular failure	8048	34.5
C: Neurological failure	5305	22.7
D: Hepatic failure	311	1.3
E: Renal failure	9385	40.2
F: Acute skin failure	18	0.1
G: Metabolic failure	7190	30.8
H: Coagulation failure	470	2.0
Missing	0	

Failures on admission (top 10)	N	%
A	4452	19.1
ABEG	1831	7.8
AC	1772	7.6
AE	1399	6.0
AB	1210	5.2
ABCEG	1062	4.6
ABE	882	3.8
AEG	828	3.5
E	672	2.9
ABC	611	2.6
Missing	0	

Respiratory failure	N	%
None	6330	27.1
Only hypoxic failure	5775	24.7
Only hypercapnic failure	1220	5.2
Hypoxic-hypercapnic failure	2827	12.1
Intubation for airway maint.	7182	30.8
Missing	0	

Cardiovascular failure	N	%
None	15286	65.5
Without shock	1687	7.2
Cardiogenic shock	2329	10.0
Septic shock	1823	7.8
Haemorrhagic/hypovolemic shock	532	2.3
Hypovolemic shock	495	2.1
Anaphylactic shock	45	0.2
Neurogenic shock	252	1.1
Other shock	435	1.9
Mixed shock	450	1.9
Missing	0	

Neurologic failure	N	%
None	14461	73.2
Cerebral coma	2447	12.4
Metabolic coma	996	5.0
Postanoxic coma	1596	8.1
Toxic coma	266	1.3
Missing or not evaluable	3568	

Renal failure (AKIN)	N	%
None	13948	59.8
Mild	4110	17.6
Moderate	2239	9.6
Severe	3037	13.0
Missing	0	

Metabolic failure	N	%
None	16144	69.2
pH <= 7.3, PaCO2 < 45 mmHg	2021	8.7
Base deficit >= 5 mmol/L, lactate >1.5x	5169	22.2
Missing	0	

National report for general ICUs - Year 2017
Characteristics on admission - Adult non surgical patients evaluated in the GiViTI model

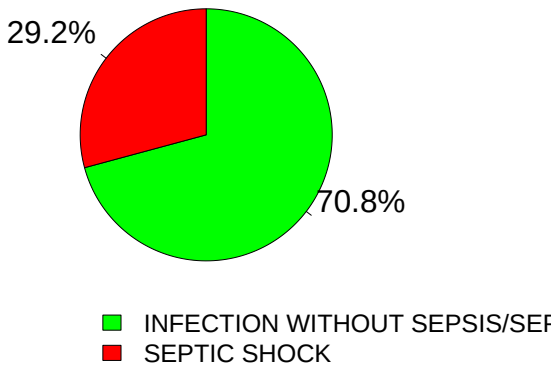
Clinical conditions on admission	N	%
Respiratory	6437	27.6
Acute exacerbation of COPD	2175	9.3
Pleural effusion	1345	5.8
Aspiration pneumonia	716	3.1
Atelectasis	710	3.0
Moderate ARDS	417	1.8
Cardiovascular	6210	26.6
Cardiac arrest	2055	8.8
Left heart failure with pulmonary edema	1600	6.9
Left heart failure without pulm. edema	987	4.2
Acute severe arrhythmia: tachycardias	737	3.2
Acute myocardial infarction	632	2.7
Neurological	4618	19.8
Cerebral artery stroke	1047	4.5
Spontaneous Intraparenchymal bleeding	1000	4.3
Seizures	938	4.0
Metabolic/postanoxic encephalopathy	734	3.1
Spontaneous Subarachnoid haemorrhage	462	2.0
Gastrointestinal and hepatic	1831	7.8
Gastrointestinal bleeding: upper tract	495	2.1
Acute pancreatitis	276	1.2
Liver Dysfunction Syndrome	190	0.8
Ascites	187	0.8
Acute bile-duct disease	166	0.7
Trauma (anatomical districts)	2851	12.2
Head	1510	6.5
Chest	1312	5.6
Pelvis/bone/joint & muscle	759	3.3
Spine	706	3.0
Abdomen	345	1.5
Miscellaneous	85	0.4
Major vessels injury	56	0.2
Other	4588	19.7
Metabolic disorder	1837	7.9
Acute intoxication	1045	4.5
Other disease	849	3.6
Nephrourologic disease	659	2.8
Coagulation disorder	470	2.0
Post transplantation	100	0.4
Renal transplantation	40	0.2
Liver transplantation	23	0.1
Infections	7848	33.6
Pneumonia	3869	16.6
NON-surgical urinary tract infection	811	3.5
L.R.T.I. other than pneumonia	768	3.3
Primary bacteraemia of unknown origin	520	2.2
Clinical sepsis	394	1.7
NON-surgical CNS infection	313	1.3
NON-surgical skin/soft tissue infection	271	1.2
Cholecystitis/cholangitis	252	1.1
Gastroenteritis	170	0.7
Upper respiratory tract infection	158	0.7
Missing	0	

Trauma (anatomical districts)	N	%
Head	1510	6.5
Traumatic subarachnoid haemorrhage	590	2.5
Maxillofacial fracture	511	2.2
Traumatic Subdural haematoma	475	2.0
Cerebral contusion/laceration	468	2.0
Skull fracture	394	1.7
Spine	706	3.0
Vertebral fracture, without deficit	626	2.7
Cervical injury, incomplete deficit	34	0.1
Tetraplegia	24	0.1
Chest	1312	5.6
Other injuries of the chest	719	3.1
Traum. haemothorax/pneumothorax	485	2.1
Severe lung contusion/laceration	335	1.4
Abdomen	345	1.5
Spleen: Moderate-Severe laceration	118	0.5
Minor injuries of the abdomen	110	0.5
Liver: Moderate-Severe laceration	90	0.4
Pelvis/bone/joint & muscle	759	3.3
Long bone fracture	498	2.1
Multiple fracture of the pelvis	327	1.4
Very severe or open fracture of the pelvis	33	0.1
Major vessels injury	56	0.2
Neck vessels: dissection/transection	16	0.1
Major abdominal vessels: transection	14	0.1
Proximal limbs vessels: transection	13	0.1
Miscellaneous	85	0.4
Burns (>30% BSA)	58	0.2
Inhalation injury	37	0.2
Missing	0	

Infection severity on admission	N	%
None	15486	67.8
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	5216	22.8
SEPTIC SHOCK	2149	9.4
Missing	483	

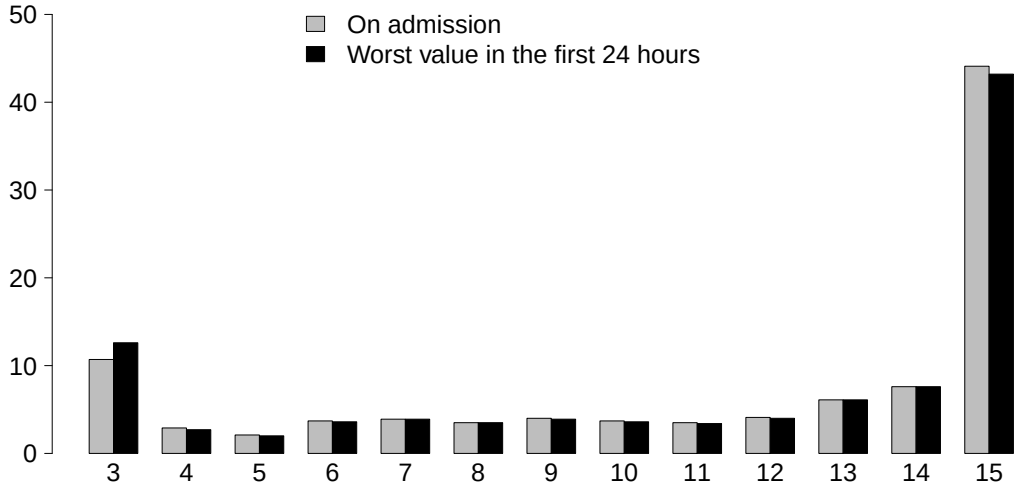
Infection severity on admission

Patients infected (N=7365)



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

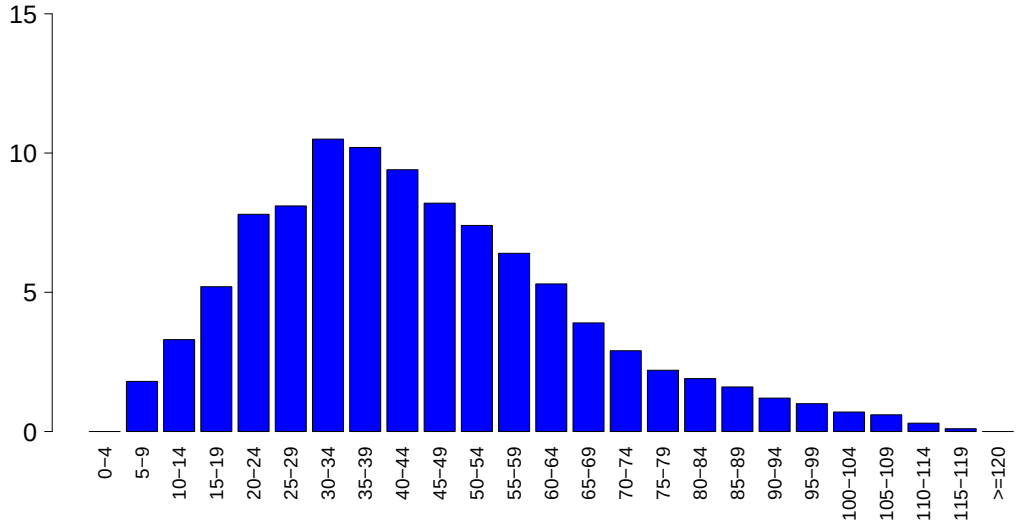
Glasgow Coma Scale (%)



GCS (admission)	
Median	14
Q1−Q3	8−15
Not evaluable	3568
Missing	0

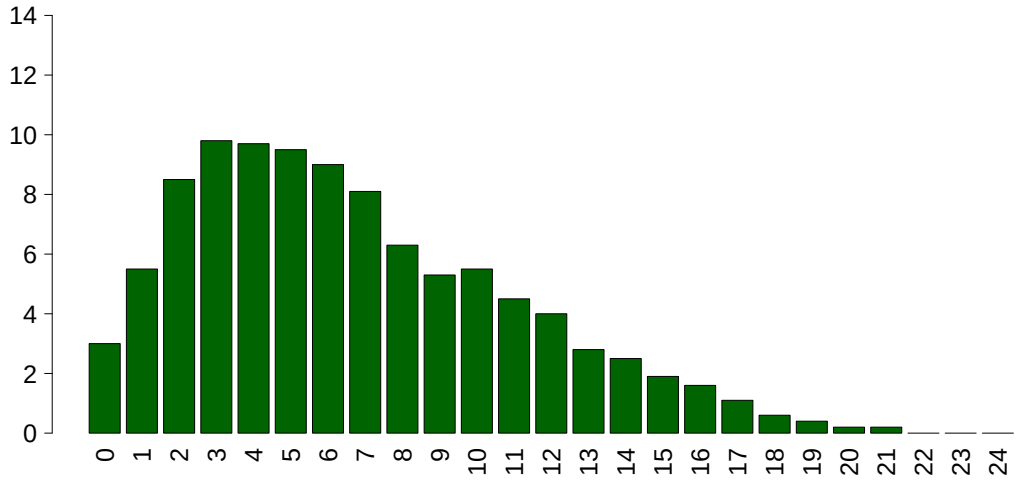
GCS (first 24 hours)	
Median	14
Q1−Q3	8−15
Not evaluable	3706
Missing	0

SAPS II (%)



SAPSII	
Mean	44.4
SD	21.4
Median	41
Q1−Q3	29−57
Not evaluable	3706
Missing	0

SOFA (%)



SOFA	
Mean	6.7
SD	4.3
Median	6
Q1−Q3	3−10
Not evaluable	3706
Missing	0

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	14456	62.0
Yes	8877	38.0
Missing	1	

Failures during the stay	N	%
No	19344	82.9
Yes	3990	17.1
A: Respiratory failure	1884	8.1
B: Cardiovascular failure	1718	7.4
C: Neurological failure	378	1.6
D: Hepatic failure	119	0.5
E: Renal failure (AKIN)	1055	4.5
F: Acute skin failure	4	0.0
G: Metabolic failure	319	1.4
H: Coagulation failure	156	0.7
Missing	0	

Failures during the stay (top 10)	N	%
A	1094	4.7
B	870	3.7
E	427	1.8
AB	345	1.5
G	182	0.8
C	165	0.7
BE	160	0.7
AE	123	0.5
ABE	106	0.5
AC	53	0.2
Missing	0	

Respiratory failure occured	N	%
None	21449	91.9
Intubation for airway maint.	460	2.0
Hypoxic failure	1345	5.8
Hypercapnic failure	435	1.9
Missing	1	

Cardiovascular failure occured	N	%
None	21615	92.6
Cardiogenic shock	631	2.7
Hypovolemic shock	134	0.6
Haemorrhagic/hypovolemic shock	98	0.4
Septic shock	623	2.7
Anaphylactic shock	4	0.0
Neurogenic shock	132	0.6
Other shock	171	0.7
Missing	1	

Neurological failure occured	N	%
None	22955	98.4
Cerebral coma	219	0.9
Metabolic coma	75	0.3
Postanoxic coma	86	0.4
Missing	1	

Renal failure occured (AKIN)	N	%
None	22278	95.5
Mild	107	0.5
Moderate	148	0.6
Severe	800	3.4
Missing	1	

Complications during the stay	N	%
Respiratory	1525	6.5
Pleural effusion	568	2.4
Atelectasis	318	1.4
Severe ARDS	224	1.0
Pneumothorax/Pneumomediastinum	209	0.9
Acute asthma/bronchospasm	116	0.5
Cardiovascular	2418	10.4
Cardiac arrest	936	4.0
Acute severe arrhythmia: tachycardias	841	3.6
Pulmonary edema	241	1.0
Acute severe arrhythmia: bradycardias	178	0.8
Left heart failure w/o pulm. edema	169	0.7
Neurological	1777	7.6
Drowsiness/agitation/delirium	755	3.2
Seizures	348	1.5
Intracranial hypertension	306	1.3
Brain edema	294	1.3
New ischaemic stroke	122	0.5
Gastrointestinal and hepatic	601	2.6
Gastrointestinal bleeding: upper tract	150	0.6
Liver Dysfunction Syndrome	98	0.4
Paralytic Ileus	89	0.4
Gastrointestinal bleeding: lower tract	75	0.3
Bowel ischaemia	72	0.3
Other	729	3.1
Metabolic disorder	319	1.4
Nephrourologic disease	166	0.7
Other disease	130	0.6
Category/Stage II: Partial Thickness Skin Loss	57	0.2
Category/Stage I: Nonblanchable Erythema	34	0.1
Other skin and/or soft tissue pathology	27	0.1
Category/Stage III: Full Thickness Skin Loss	24	0.1
Infections	2577	11.0
Pneumonia	857	3.7
L.R.T.I. other than pneumonia	602	2.6
NON-surgical urinary tract infection	480	2.1
Catheter-related bacteremia (CR-BSI)	289	1.2
Primary bacteraemia of unknown origin	287	1.2
Upper respiratory tract infection	109	0.5
Clinical sepsis	82	0.4
F.U.O. fever of unknown origin	64	0.3
Gastroenteritis	51	0.2
NON-surgical skin/soft tissue infection	48	0.2
Missing	1	

National report for general ICUs - **Year 2017**
Characteristics during the stay - Adult non surgical patients evaluated in the GiViTI model

Infections	N	%
None	13773	59.0
Only on admission	6983	29.9
On admission and during ICU stay	864	3.7
Only during ICU stay	1713	7.3
Missing	1	

Maximum severity of infection	N	%
None	13773	60.5
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	6378	28.0
SEPTIC SHOCK	2625	11.5
Missing	558	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	13773 (89.6%)	0 (0.0%)	1416 (9.2%)	187 (1.2%)	15376
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	4935 (94.6%)	280 (5.4%)	5215
	SEPTIC SHOCK	-	-	-	2149 (100.0%)	2149
	TOT	13773	0	6351	2616	22740

Ventil. Associat. Pneumonia (VAP)	N	%
No	22591	96.8
Yes	742	3.2
Missing	1	

Catheter Bacteraemia (CR-BSI)	N	%
No	23044	98.8
Yes	289	1.2
Missing	1	

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

Estimate	7.7
CI (95%)	7.1−8.2

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

Estimate	2.0
CI (95%)	1.8−2.2

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

Estimate	6.1%
CI (95%)	5.7−6.6

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

Estimate	2.4%
CI (95%)	2.1−2.7

National report for general ICUs - **Year 2017**

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

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	22353	95.8										
Invasive ventilation	15459	66.3	9581	41.1	4708	20.2	3	1–8	1	0	0–0	0
Non invasive ventilation	5287	22.7	1327	5.7	1085	4.6	2	1–3	1	0	0–1	0
Tracheostomy	3359	14.4	811	3.5	2790	12	11	6–20	0	7	4–11	0
iNO (inhaled nitric oxide)	79	0.3	7	0	14	0.1	2	1–4	0	2	0–4	0
Central Venous Catheter	16871	72.3	5650	24.2	12710	54.5	5	2–11	3	0	0–0	0
PICC	546	2.3	158	0.7	446	1.9	6	2–11	0	6	1–16	0
Arterial Catheter	18734	80.3	5621	24.1	6387	27.4	4	2–9	3	0	0–0	0
Vasoactive drugs	9618	41.2	3541	15.2	2759	11.8	2	1–5	0	0	0–0	0
Antiarrhythmics	2295	9.8	719	3.1	1241	5.3	3	1–8	0	1	0–2	0
IABP	289	1.2	202	0.9	95	0.4	2	1–4	0	0	0–1	0
Invasive monitoring of C.O.	890	3.8	61	0.3	204	0.9	4	2–8	0	0	0–1	0
Continous monitoring of ScVO2	37	0.2	9	0	10	0	5	2–8	0	0	0–1	0
Temporary pacing	135	0.6	84	0.4	63	0.3	1	0–3	0	0	0–1	0
Ventricular assistance	7	0.0	4	0	1	0	2	0–4	0	0	0–3	0
DC-shock	726	3.1								0	0–1	0
CPR	1060	4.5								0	0–0	0
Massive blood transfusion	227	1.0								0	0–0	0
ICP monitoring without CSF drainage	131	0.6	29	0.1	21	0.1	6	4–9	0	0	0–1	0
ICP monitoring with CSF drainage	58	0.2	27	0.1	26	0.1	12	5–20	0	1	0–2	0
External ventricular drainage without ICP	26	0.1	16	0.1	11	0	8	5–15	0	2	0–2	0
Haemofiltration	1207	5.2	103	0.4	333	1.4	3	2–8	0	0	0–2	0
Haemodialysis	784	3.4	144	0.6	314	1.3	3	1–7	0	1	0–3	0
ECMO	115	0.5	45	0.2	43	0.2	6	2–13	0	1	0–3	0
Hepatic clearance techniques	5	0.0										
Clearance techniques during sepsis	176	0.8	6	0	38	0.2	3	1–5	0	0	0–1	0
IAP (intra-abdominal pressure)	201	0.9										
Hypothermia	414	1.8										
Enteral nutrition	10377	44.5	1779	7.6	6666	28.6	7	3–14	2	1	0–2	0
Parenteral nutrition	4074	17.5	610	2.6	2032	8.7	5	2–9	2	1	0–2	2
SDD (Topical, Topical and systemic)	129	0.6										
Patient restraint	643	2.8										
Peridural catheter	82	0.4	13	0.1	47	0.2	4	2–8	0	1	0–2	0
Electrical cardioversion	183	0.8								1	0–3	0
Vacuum therapy	40	0.2										
Antibiotics	13180	56.5										
Antibiotic prophylaxis	5329	22.8	1870	8	2764	11.8	3	2–6	1	0	0–0	0
Empirical antibiotic therapy	6364	27.3	2603	11.2	2548	10.9	3	2–6	0	0	0–0	0
Targeted antibiotic therapy	4587	19.7	893	3.8	2780	11.9	7	4–12	2	3	2–7	1

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

Invasive ventilation (N=15459)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	7744	45.1	7.9	10.9	4	1−10	1
For airway mainteinance	6921	40.3	5.9	9.0	3	1−7	0
In weaning	394	2.3	0.5	0.5	1	0−1	0
Not evaluable	2099	12.2	7.5	10.3	4	1−9	1668
Reintubation within 48 hours	299	1.7	8.5	9.4	5	3−11	0

Non invasive ventilation (N=5287)	N	%
Non invasive ventilation only	2993	56.6
Non invasive ventilation failed	1021	19.3
For weaning	1086	20.5
Other	187	3.5
Missing	0	

Tracheostomy not present on admission (N=2548)	N	%
Surgical	503	19.7
Percutwist	307	12.0
Ciaglia	285	11.2
Monodil. Ciaglia	925	36.3
Fantoni	126	4.9
Griggs	252	9.9
Other Kind	111	4.4
Unknown	39	1.5
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=2514)	
Mean	8.4
SD	6.4
Median	7
Q1−Q3	4−11
Missing	3

Invasive monitoring of C.O. (N=890)	N	%
Swan Ganz	192	21.6
PICCO	591	66.4
LIDCO	7	0.8
Vigileo-PRAM	64	7.2
Other	36	4.0
Missing	0	

SDD (N=129)	N	%
Topical	123	95.3
Topical and systemic	6	4.7
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=1713)	N	%
Only empirical	336	23.9
Only targeted	577	41.0
Targeted after empirical	422	30.0
Other	73	5.2
Missing	305	

Surgical interventions	N	%
No	22395	96.0
Yes	939	4.0
Missing	0	

Number of surgical interventions	N	%
0	22395	96.0
1	809	3.5
2	82	0.4
3	26	0.1
>3	22	0.1
Missing	0	

Surgical interventions Days from admission	
Mean	9.4
SD	9.0
Median	6
Q1−Q3	3−12
Missing	15

Surgical interventions (top 10)	N	%
Orthopaedic surgery	270	1.2
Gastrointestinal surgery	232	1.0
ENT surgery	176	0.8
Neurosurgery	108	0.5
Maxillo-Facial surgery	63	0.3
Organ donation	55	0.2
Thoracic surgery	54	0.2
Other surgery	38	0.2
Nephro/Urological surgery	37	0.2
Biliary tract surgery	31	0.1
Missing	0	

Non surgical interventions	N	%
No	22699	97.3
Yes	635	2.7
Missing	0	

Non surgical interventions Days from admission	
Mean	11.2
SD	12.0
Median	7
Q1−Q3	3−15
Missing	14

Non surgical interventions	N	%
Interventional endoscopy	446	1.9
Interventional cardiology	138	0.6
Interventional radiology	106	0.5
Interventional neuroradiology	24	0.1
Missing	0	

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

ICU outcome	N	%
Dead	6040	25.9
Transferred to same hospital	13896	59.6
Transferred to other hospital	2947	12.6
Discharged home	292	1.3
Disch. terminally ill	158	0.7
Missing	1	

Transferred to (N=16843)	N	%
Ward	11655	69.2
Other ICU	2085	12.4
High dependency care unit	2211	13.1
Rehabilitation	672	4.0
Day hospital or Long-term care	220	1.3
Missing	0	

Reason of transfer to Other ICU (N=2149)	N	%
Specialist expertise	995	46.3
Step-up care	170	7.9
Logistical/organizational reasons	934	43.5
Step-down care	50	2.3
Missing	0	

Transferred to Same hospital (N=13896)	N	%
Ward	10812	77.8
Other ICU	818	5.9
High dependency care unit	2061	14.8
Rehabilitation	132	0.9
Day hospital or Long-term care	73	0.5
Missing	0	

Transferred to Other hospital (N=2947)	N	%
Ward	843	28.6
Other ICU	1267	43.0
High dependency care unit	150	5.1
Rehabilitation	540	18.3
Day hospital or Long-term care	147	5.0
Missing	0	

ICU mortality	N	%
Alive	17135	73.4
Dead	6198	26.6
Missing	1	

Timing of ICU mortality (N=6198)	N	%
Daytime (08:00AM - 07:59PM)	4159	67.1
Nighttime (08:00PM - 07:59AM)	2039	32.9
Weekdays (Monday - Friday)	4657	75.1
Weekend (Saturday - Sunday)	1541	24.9
Missing	0	

C.A.M. activation (N=6198)	N	%
Yes, with organ donation	380	6.3
Yes, without organ donation	440	7.3
No, with organ donation	15	0.2
No, without organ donation	5205	86.2
Missing	158	

Tissue removal (N=6198)	N	%
Yes, with C.A.M. activation	246	4.0
Yes, without C.A.M. activation	363	5.9
No	5589	90.2
Missing	0	

Hospital mortality	N	%
Dead	7544	32.3
Transf. to other acute-care hospital	3053	13.1
Transf. to other type of hosp. stay	3945	16.9
Nursing home	400	1.7
Voluntary discharge	213	0.9
Discharged home	8179	35.1
Missing	0	

To other type of H stay (N=3945)	N	%
Rehabilitation in the same institute	659	16.7
Rehabilitation in other institute	2061	52.2
DH/long-term care, same inst.	457	11.6
DH/long-term care, other inst.	768	19.5
Missing	0	

Disch. terminally ill (N=15790)	N	%
Yes	335	2.1
No	15455	97.9
Missing	0	

Hospital mortality	N	%
Alive	15455	66.2
Dead	7879	33.8
Missing	0	

Timing of hosp. mortality (N=7879)	N	%
In ICU	6196	78.6
Within 24 hours after ICU	101	1.3
24-47 hours after ICU	134	1.7
48-71 hours after ICU	113	1.4
72-95 hours after ICU	93	1.2
After 95 hours after ICU	1241	15.8
Missing	1	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=1683)	
Mean	14.3
SD	17.6
Median	8
Q1−Q3	3−19
Missing	0

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

Last hospital mortality	N	%
Alive	15248	65.3
Dead	8086	34.7
Missing	0	

ICU stay (days)	
Mean	7.7
SD	10.7
Median	4
Q1−Q3	2−9
Missing	0

ICU stay (days) **Alive** (N=17135)	
Mean	7.9
SD	10.6
Median	4
Q1−Q3	2−9
Missing	0

ICU stay (days) **Dead** (N=6198)	
Mean	7.3
SD	10.8
Median	3
Q1−Q3	1−9
Missing	0

Stay after ICU (days) **Alive** (N=17135)	
Mean	12.2
SD	15.5
Median	8
Q1−Q3	2−16
Missing	9

Hospital stay (days)	
Mean	19.1
SD	20.4
Median	13
Q1−Q3	6−25
Missing	2

Hospital stay (days) **Alive** (N=15455)	
Mean	21.5
SD	20.7
Median	16
Q1−Q3	8−28
Missing	2

Hospital stay (days) **Dead** (N=7879)	
Mean	14.4
SD	19.0
Median	8
Q1−Q3	2−19
Missing	0

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

Patients (N): 11909

Sex	N	%
Male	7057	59.5
Female	4808	40.5
Missing	44	

Age (years)	N	%
17-45	988	8.3
46-65	3195	26.8
66-75	3554	29.8
>75	4172	35.0
Missing	0	
Mean	68.0	
SD	14.3	
Median	71	
Q1−Q3	61−78	
Min−Max	17−100	

Body mass Index (BMI)	N	%
Underweight	628	5.3
Normal	4916	41.4
Overweight	3662	30.9
Obese	2659	22.4
Missing	44	

Pregnancy status **Females** (N=4808)	N	%
Not fertile	2440	50.8
Not pregnant/Unknown	2309	48.1
Currently pregnant	5	0.1
Post partum	50	1.0
Missing	4	

Comorbidities	N	%
No	1299	10.9
Yes	10610	89.1
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	6878	57.8
Any tumour without metastasis	2646	22.2
Moderate COPD	2014	16.9
Arrhythmia	1848	15.5
Myocardial infarction	1821	15.3
Diabetes Type II without insulin tr.	1589	13.3
Peripheral vascular disease	1352	11.4
Antiplatelet therapy	1147	9.6
NYHA class II-III	1052	8.8
Cerebrovascular disease	1024	8.6
Missing	0	

Stay before ICU (days)	
Mean	4.3
SD	9.7
Median	1
Q1−Q3	1−4
Missing	0

Source of admission	N	%
Same hospital	11748	98.6
Other hospital	156	1.3
Long-term chronic care hospital	5	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=11904)	N	%
Medical ward	215	1.8
Surgical ward	11488	96.5
Emergency room	62	0.5
Other ICU	90	0.8
High dependency care unit	49	0.4
Missing	0	

Reason for transfer from **Other ICU** (N=90)	N	%
Specialist expertise	33	36.7
Step-up care	23	25.6
Logistical/organizational reasons	34	37.8
Step-down care	0	0.0
Missing	0	

Ward of admission **Same hospital** (N=11748)	N	%
Medical ward	211	1.8
Surgical ward	11392	97.0
Emergency room	44	0.4
Other ICU	52	0.4
High dependency care unit	49	0.4
Missing	0	

Ward of admission **Other hospital** (N=156)	N	%
Medical ward	4	2.6
Surgical ward	96	61.5
Emergency room	18	11.5
Other ICU	38	24.4
High dependency care unit	0	0.0
Missing	0	

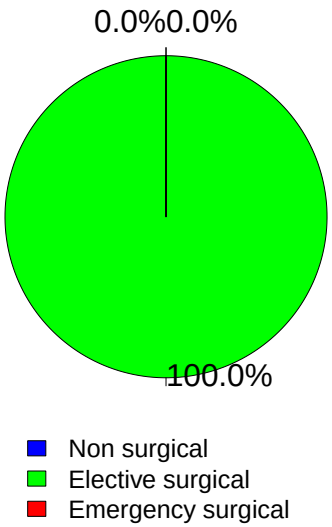
Scheduled admission	N	%
No	2618	22.0
Yes	9291	78.0
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

Trauma	N	%
No	11280	94.7
Yes	629	5.3
Multiple trauma	65	0.5
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	11909	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=11909)	N	%
Operating theatre of surgical ward	10943	91.9
Operating theatre of emergency room	15	0.1
Surgical ward	545	4.6
Other	401	3.4
Missing	5	

Surgical interventions (top 10) **Elective surgical** (N=11909)	N	%
Gastrointestinal surgery	3341	28.1
Orthopaedic surgery	1741	14.6
Nephro/Urological surgery	1556	13.1
ENT surgery	799	6.7
Neurosurgery	720	6.0
Thoracic surgery	655	5.5
Gynaecological surgery	632	5.3
Hepatic surgery	524	4.4
Abdominal vascular surgery	520	4.4
Pancreatic surgery	438	3.7
Missing	983	

Timing **Elective surgical** (N=11909)	N	%
From -7 to -3 days	208	1.7
From -2 to -1 days	348	2.9
On ICU admission day	11951	100.4
The day after ICU admission	133	1.1
Missing	17	

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

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

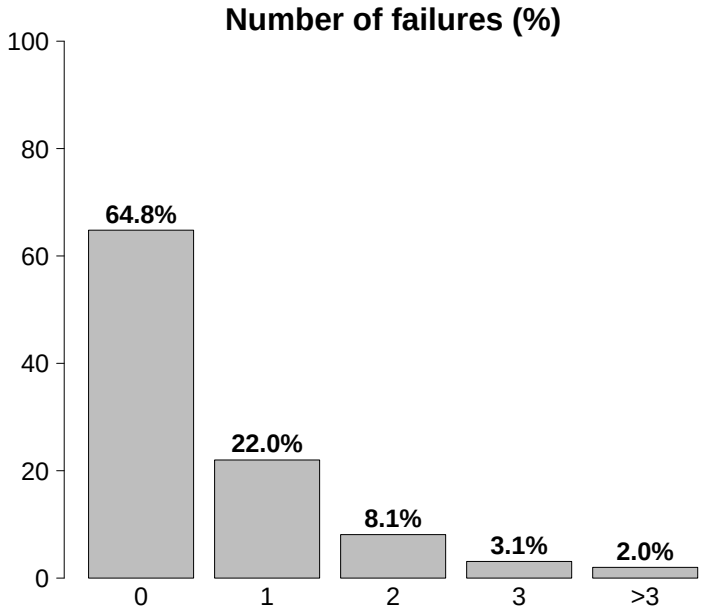
Non surgical interventions	N	%
None	11666	98.0
Elective	154	1.3
Emergency	89	0.7
Missing	0	

Non surgical interventions **Elective** (N=154)	N	%
Interventional endoscopy	40	26.0
Interventional radiology	35	22.7
Interventional neuroradiology	7	4.5
Interventional cardiology	3	1.9
Missing	69	

Non surgical interventions **Emergency** (N=89)	N	%
Interventional radiology	41	46.1
Interventional endoscopy	20	22.5
Interventional cardiology	9	10.1
Interventional neuroradiology	5	5.6
Missing	14	

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	9905	83.2
Post surgical weaning	4590	38.6
Surgical monitoring	5294	44.5
Post interventional weaning	4	0.0
Interventional monitoring	8	0.1
Non surgical monitoring	0	0.0
Missing	9	
Admission for procedures/treatments	0	0.0
Intensive Treatment	2004	16.8
Only ventilatory support	1073	9.0
Only cardiovascular support	308	2.6
Ventilatory and cardiovascular support	623	5.2
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	7721	64.8
Yes	4188	35.2
A: Respiratory failure	1696	14.2
B: Cardiovascular failure	931	7.8
C: Neurological failure	135	1.1
D: Hepatic failure	28	0.2
E: Renal failure	2565	21.5
F: Acute skin failure	0	0.0
G: Metabolic failure	1215	10.2
H: Coagulation failure	73	0.6
Missing	0	

Failures on admission (top 10)	N	%
E	1461	12.3
A	684	5.7
EG	345	2.9
G	318	2.7
AB	212	1.8
ABEG	161	1.4
AE	160	1.3
B	125	1.0
ABE	120	1.0
AEG	85	0.7
Missing	0	

Respiratory failure	N	%
None	10213	85.8
Only hypoxic failure	454	3.8
Only hypercapnic failure	55	0.5
Hypoxic-hypercapnic failure	100	0.8
Intubation for airway maint.	1087	9.1
Missing	0	

Cardiovascular failure	N	%
None	10978	92.2
Without shock	249	2.1
Cardiogenic shock	87	0.7
Septic shock	102	0.9
Haemorrhagic/hypovolemic shock	262	2.2
Hypovolemic shock	125	1.0
Anaphylactic shock	10	0.1
Neurogenic shock	13	0.1
Other shock	46	0.4
Mixed shock	37	0.3
Missing	0	

Neurologic failure	N	%
None	10052	98.7
Cerebral coma	76	0.7
Metabolic coma	31	0.3
Postanoxic coma	26	0.3
Toxic coma	2	0.0
Missing or not evaluable	1722	

Renal failure (AKIN)	N	%
None	9344	78.5
Mild	1767	14.8
Moderate	457	3.8
Severe	341	2.9
Missing	0	

Metabolic failure	N	%
None	10694	89.8
pH <= 7.3, PaCO2 < 45 mmHg	435	3.7
Base deficit >= 5 mmol/L, lactate >1.5x	780	6.5
Missing	0	

National report for general ICUs - Year 2017
Characteristics on admission - Adult elective surgical patients evaluated in the GiViTI model

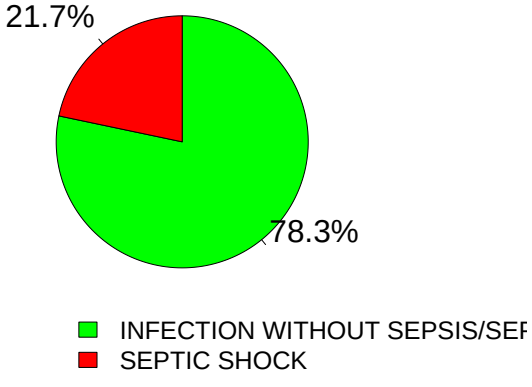
Clinical conditions on admission	N	%
Respiratory	1272	10.7
Lung cancer	465	3.9
Upper respiratory tract disease	216	1.8
Atelectasis	213	1.8
Pleural effusion	172	1.4
Acute asthma/bronchospasm	69	0.6
Cardiovascular	1264	10.6
Non-ruptured aneurysm	440	3.7
Peripheral vascular disease	329	2.8
Acute severe arrhythmia: tachycardias	121	1.0
Left heart failure without pulm. edema	73	0.6
Cardiac arrest	60	0.5
Neurological	725	6.1
Brain tumour	480	4.0
Cerebral artery stroke	66	0.6
Neuropathy/myopathy	54	0.5
Seizures	43	0.4
Cerebral Aneurysm	25	0.2
Gastrointestinal and hepatic	3484	29.3
Digestive tract malignancy	2114	17.8
Hepatic malignancy	441	3.7
Pancreatic malignancy	398	3.3
Acute bile-duct disease	213	1.8
Intestinal occlusion	110	0.9
Trauma (anatomical districts)	629	5.3
Pelvis/bone/joint & muscle	573	4.8
Chest	46	0.4
Spine	45	0.4
Head	41	0.3
Abdomen	11	0.1
Major vessels injury	3	0.0
Miscellaneous	2	0.0
Other	5465	45.9
Other disease	1409	11.8
Nephrourologic disease	1370	11.5
Orthopaedic disease	1005	8.4
ENT/maxillofacial disease	752	6.3
Gynaecological disease	550	4.6
Post transplantation	63	0.5
Liver transplantation	30	0.3
Renal transplantation	29	0.2
Infections	599	5.0
Pneumonia	105	0.9
Post-surgical peritonitis	59	0.5
NON-surgical urinary tract infection	49	0.4
Post-surgical urinary tract infection	45	0.4
Cholecystitis/cholangitis	42	0.4
NON-surgical secondary peritonitis	42	0.4
L.R.T.I. other than pneumonia	36	0.3
NON-surgical skin/soft tissue infection	32	0.3
Primary bacteraemia of unknown origin	29	0.2
Post-surgical skin/soft tissue infection	29	0.2
Missing	0	

Trauma (anatomical districts)	N	%
Head	41	0.3
Maxillofacial fracture	19	0.2
Traumatic subarachnoid haemorrhage	10	0.1
Traumatic Subdural haematoma	7	0.1
Cerebral contusion/laceration	5	0.0
Skull fracture	5	0.0
Spine	45	0.4
Vertebral fracture, without deficit	32	0.3
Cervical injury, incomplete deficit	6	0.1
Paraplegia	2	0.0
Chest	46	0.4
Other injuries of the chest	27	0.2
Traum. haemothorax/pneumothorax	13	0.1
Severe lung contusion/laceration	9	0.1
Abdomen	11	0.1
Liver: Moderate-Severe laceration	5	0.0
Spleen: Massive rupture	4	0.0
Kidney: Rupture/laceration	3	0.0
Pelvis/bone/joint & muscle	573	4.8
Long bone fracture	539	4.5
Multiple fracture of the pelvis	47	0.4
Very severe or open fracture of the pelvis	3	0.0
Major vessels injury	3	0.0
Neck vessels: dissection/transection	1	0.0
Major thoracic vessels: transection	1	0.0
Proximal limbs vessels: transection	1	0.0
Miscellaneous	2	0.0
Burns (>30% BSA)	2	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	11310	95.2
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	444	3.7
SEPTIC SHOCK	123	1.0
Missing	32	

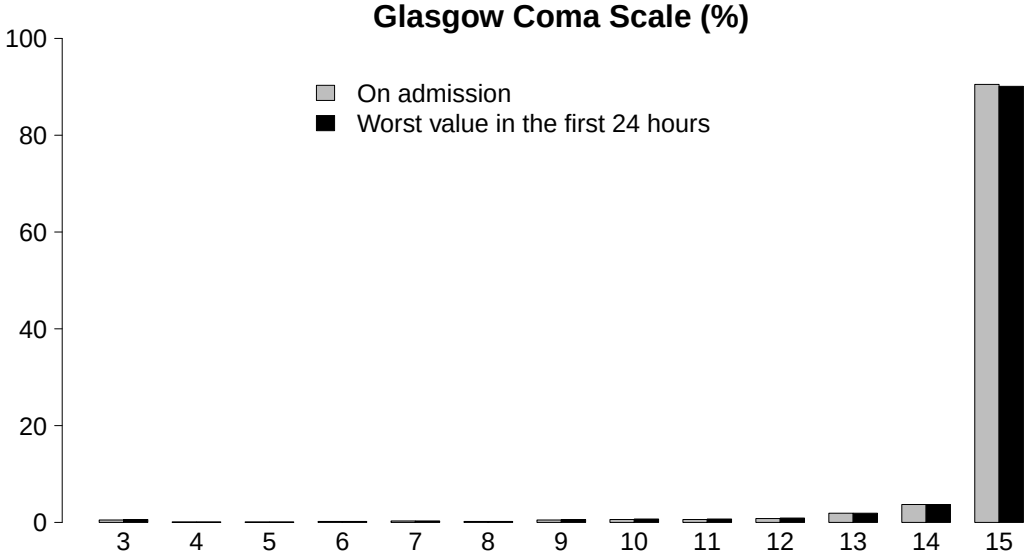
Infection severity on admission

Patients infected (N=567)



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

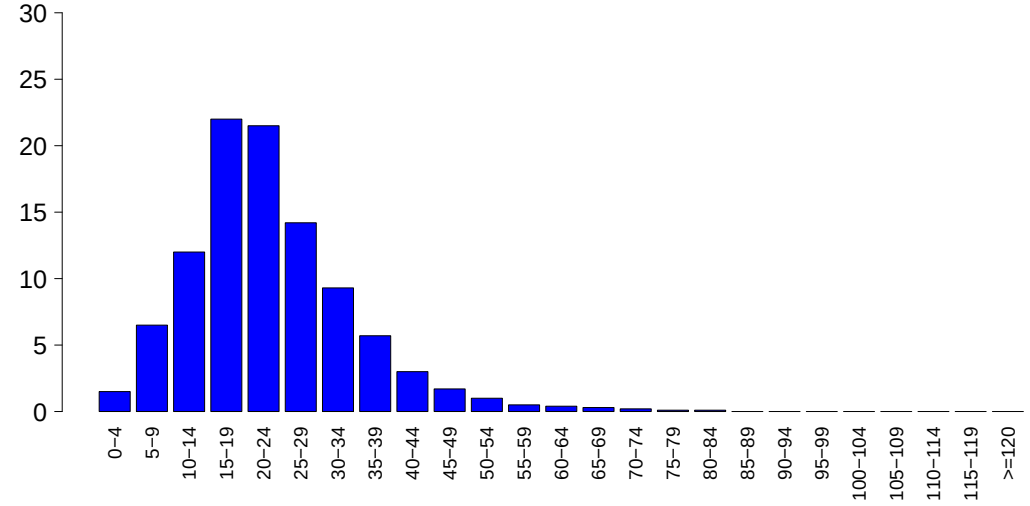
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	15−15
Not evaluable	1722
Missing	0

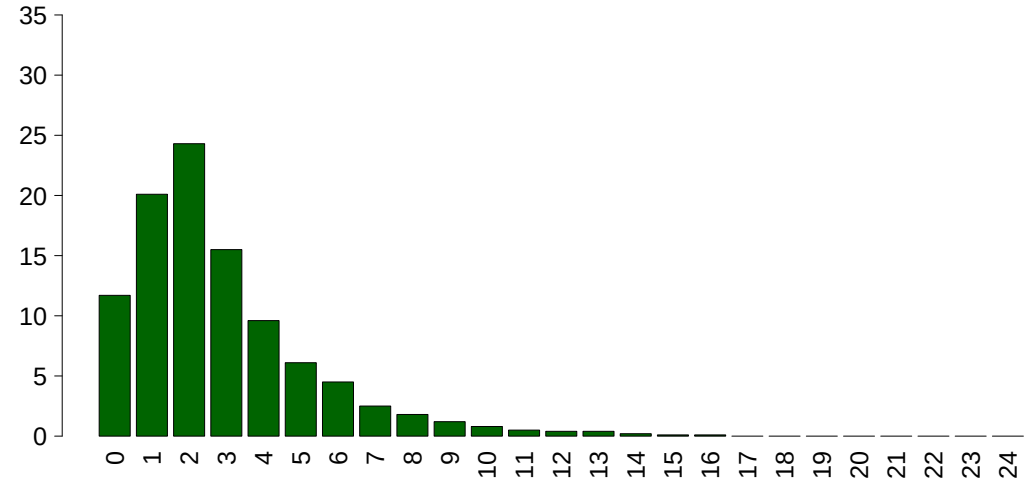
GCS (first 24 hours)	
Median	15
Q1−Q3	15−15
Not evaluable	847
Missing	0

SAPS II (%)



SAPSII	
Mean	23.0
SD	11.5
Median	21
Q1−Q3	16−28
Not evaluable	847
Missing	0

SOFA (%)



SOFA	
Mean	2.9
SD	2.5
Median	2
Q1−Q3	1−4
Not evaluable	847
Missing	0

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	10754	90.3
Yes	1155	9.7
Missing	0	

Failures during the stay	N	%
No	11351	95.3
Yes	558	4.7
A: Respiratory failure	326	2.7
B: Cardiovascular failure	224	1.9
C: Neurological failure	26	0.2
D: Hepatic failure	22	0.2
E: Renal failure (AKIN)	161	1.4
F: Acute skin failure	0	0.0
G: Metabolic failure	42	0.4
H: Coagulation failure	15	0.1
Missing	0	

Failures during the stay (top 10)	N	%
A	183	1.5
B	90	0.8
E	60	0.5
AB	55	0.5
ABE	34	0.3
G	28	0.2
AE	23	0.2
BE	18	0.2
D	13	0.1
AC	8	0.1
Missing	0	

Respiratory failure occured	N	%
None	11583	97.3
Intubation for airway maint.	102	0.9
Hypoxic failure	214	1.8
Hypercapnic failure	60	0.5
Missing	0	

Cardiovascular failure occured	N	%
None	11685	98.1
Cardiogenic shock	50	0.4
Hypovolemic shock	36	0.3
Haemorrhagic/hypovolemic shock	46	0.4
Septic shock	83	0.7
Anaphylactic shock	1	0.0
Neurogenic shock	1	0.0
Other shock	22	0.2
Missing	0	

Neurological failure occured	N	%
None	11883	99.8
Cerebral coma	13	0.1
Metabolic coma	11	0.1
Postanoxic coma	2	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	11748	98.6
Mild	36	0.3
Moderate	38	0.3
Severe	87	0.7
Missing	0	

Complications during the stay	N	%
Respiratory	224	1.9
Pleural effusion	91	0.8
Atelectasis	64	0.5
Acute asthma/bronchospasm	20	0.2
Mild ARDS	14	0.1
Upper resp. tract disease	13	0.1
Cardiovascular	307	2.6
Acute severe arrhythmia: tachycardias	145	1.2
Cardiac arrest	45	0.4
Acute ischaemia	25	0.2
Acute severe arrhythmia: bradycardias	25	0.2
Hypertensive crisis	24	0.2
Neurological	202	1.7
Drowsiness/agitation/delirium	129	1.1
New ischaemic stroke	24	0.2
Seizures	24	0.2
Post-surgical intracranial bleeding	16	0.1
Brain edema	10	0.1
Gastrointestinal and hepatic	177	1.5
Intrabdominal bleeding	32	0.3
Bowel ischaemia	28	0.2
Anastomotic dehiscence	26	0.2
Paralytic Ileus	21	0.2
Liver Dysfunction Syndrome	19	0.2
Other	149	1.3
Other disease	47	0.4
Metabolic disorder	42	0.4
Nephrourologic disease	38	0.3
Other skin and/or soft tissue pathology	9	0.1
Category/Stage II: Partial Thickness Skin Loss	7	0.1
Extremity compartment syndrome (severe)	6	0.1
Category/Stage III: Full Thickness Skin Loss	4	0.0
Infections	255	2.1
Pneumonia	78	0.7
Post-surgical peritonitis	44	0.4
L.R.T.I. other than pneumonia	34	0.3
Primary bacteraemia of unknown origin	28	0.2
Post-surgical skin/soft tissue infection	19	0.2
NON-surgical urinary tract infection	17	0.1
Clinical sepsis	16	0.1
Catheter-related bacteremia (CR-BSI)	11	0.1
Post-surgical urinary tract infection	9	0.1
F.U.O. fever of unknown origin	8	0.1
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics during the stay - Adult elective surgical patients evaluated in the GiViTI model

Infections	N	%
None	11111	93.3
Only on admission	543	4.6
On admission and during ICU stay	56	0.5
Only during ICU stay	199	1.7
Missing	0	

Maximum severity of infection	N	%
None	11111	93.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	556	4.7
SEPTIC SHOCK	193	1.6
Missing	49	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	11111 (98.4%)	0 (0.0%)	131 (1.2%)	47 (0.4%)	11289
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	423 (95.3%)	21 (4.7%)	444
	SEPTIC SHOCK	-	-	-	123 (100.0%)	123
	TOT	11111	0	554	191	11856

Ventil. Associat. Pneumonia (VAP)	N	%
No	11852	99.5
Yes	57	0.5
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	11898	99.9
Yes	11	0.1
Missing	0	

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

Estimate	10.1
CI (95%)	7.6−13.1

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

Estimate	0.7
CI (95%)	0.3−1.2

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

Estimate	8.1%
CI (95%)	6.1−10.5

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

Estimate	0.8%
CI (95%)	0.4−1.4

National report for general ICUs - **Year 2017**

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

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	10610	89.1										
Invasive ventilation	6550	55.0	6010	50.5	345	2.9	0	0–1	0	0	0–0	0
Non invasive ventilation	900	7.6	221	1.9	261	2.2	1	1–2	0	0	0–1	0
Tracheostomy	449	3.8	287	2.4	423	3.6	2	1–7	0	6	2–12	0
iNO (inhaled nitric oxide)	6	0.1	0	0	0	0	2	1–4	0	2	0–5	0
Central Venous Catheter	5298	44.5	4259	35.8	4913	41.3	1	1–3	0	0	0–0	0
PICC	141	1.2	102	0.9	127	1.1	1	1–3	0	0	0–1	0
Arterial Catheter	8411	70.6	6814	57.2	1207	10.1	1	1–2	0	0	0–0	0
Vasoactive drugs	1497	12.6	891	7.5	181	1.5	1	1–2	0	0	0–1	0
Antiarrhythmics	389	3.3	146	1.2	231	1.9	2	1–4	0	1	0–2	0
IABP	1	0.0	0	0	0	0	1	1–1	0	0	0–0	0
Invasive monitoring of C.O.	149	1.3	65	0.5	19	0.2	2	1–5	0	0	0–2	0
Continous monitoring of ScVO2	9	0.1	4	0	1	0	3	1–4	0	0	0–1	0
Temporary pacing	6	0.1	1	0	1	0	1	1–2	0	0	0–1	0
Ventricular assistance	0	0.0										
DC-shock	35	0.3								0	0–2	0
CPR	44	0.4								0	0–1	0
Massive blood transfusion	116	1.0								0	0–0	0
ICP monitoring without CSF drainage	9	0.1	2	0	2	0	6	2–7	0	0	0–2	0
ICP monitoring with CSF drainage	47	0.4	40	0.3	34	0.3	2	1–5	0	1	0–1	0
External ventricular drainage without ICP	17	0.1	12	0.1	14	0.1	2	1–4	0	1	1–1	0
Haemofiltration	90	0.8	4	0	21	0.2	3	1–7	0	1	0–3	0
Haemodialysis	107	0.9	18	0.2	49	0.4	2	0–5	0	1	1–2	0
ECMO	3	0.0	2	0	2	0	5	4–11	0	14	14–14	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	7	0.1	1	0	2	0	3	2–8	0	0	0–1	0
IAP (intra-abdominal pressure)	83	0.7										
Hypothermia	6	0.1	0	0	1	0	1	1–2	0	0	0–0	0
Enteral nutrition	820	6.9	86	0.7	627	5.3	3	1–7	0	1	1–3	0
Parenteral nutrition	1393	11.7	239	2	1108	9.3	2	1–4	0	1	0–1	0
SDD (Topical, Topical and systemic)	15	0.1										
Patient restraint	164	1.4										
Peridural catheter	1310	11.0	1236	10.4	1115	9.4	1	1–2	0	0	0–0	0
Electrical cardioversion	18	0.2								1	0–1	0
Vacuum therapy	14	0.1										
Antibiotics	7502	63.0										
Antibiotic prophylaxis	6940	58.3	6057	50.9	4236	35.6	1	1–1	0	0	0–0	0
Empirical antibiotic therapy	490	4.1	216	1.8	266	2.2	3	2–5	0	0	0–3	0
Targeted antibiotic therapy	355	3.0	124	1	269	2.3	5	2–10	0	5	2–8	0

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

Invasive ventilation (N=6550)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	556	7.1	5.3	9.6	2	1−5	0
For airway mainteinance	1076	13.7	2.6	6.2	1	0−2	0
In weaning	4533	57.8	0.3	0.5	0	0−1	0
Not evaluable	1671	21.3	1.6	4.2	1	0−1	1210
Reintubation within 48 hours	85	1.1	7.6	11.4	4	1−9	0

Non invasive ventilation (N=900)	N	%
Non invasive ventilation only	511	56.8
Non invasive ventilation failed	56	6.2
For weaning	307	34.1
Other	26	2.9
Missing	0	

Tracheostomy not present on admission (N=162)	N	%
Surgical	71	43.8
Percutwist	20	12.3
Ciaglia	10	6.2
Monodil. Ciaglia	41	25.3
Fantoni	10	6.2
Griggs	7	4.3
Other Kind	3	1.9
Unknown	0	0.0
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=156)	
Mean	7.5
SD	6.5
Median	6
Q1−Q3	2−12
Missing	0

Invasive monitoring of C.O. (N=149)	N	%
Swan Ganz	32	21.5
PICCO	62	41.6
LIDCO	1	0.7
Vigileo-PRAM	43	28.9
Other	11	7.4
Missing	0	

SDD (N=15)	N	%
Topical	15	100.0
Topical and systemic	0	0.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=199)	N	%
Only empirical	57	35.0
Only targeted	44	27.0
Targeted after empirical	56	34.4
Other	6	3.7
Missing	36	

Surgical interventions	N	%
No	11785	99.0
Yes	124	1.0
Missing	0	

Number of surgical interventions	N	%
0	11785	99.0
1	93	0.8
2	22	0.2
3	8	0.1
>3	1	0.0
Missing	0	

Surgical interventions Days from admission	
Mean	7.9
SD	8.5
Median	5
Q1−Q3	3−10
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	67	0.6
Orthopaedic surgery	19	0.2
ENT surgery	15	0.1
Nephro/Urological surgery	11	0.1
Peripheral vascular surgery	10	0.1
Neurosurgery	10	0.1
Other surgery	7	0.1
Thoracic surgery	6	0.1
Pancreatic surgery	4	0.0
Abdominal vascular surgery	3	0.0
Missing	0	

Non surgical interventions	N	%
No	11859	99.6
Yes	50	0.4
Missing	0	

Non surgical interventions Days from admission	
Mean	10.3
SD	8.8
Median	7
Q1−Q3	4.2−14
Missing	1

Non surgical interventions	N	%
Interventional radiology	32	0.3
Interventional endoscopy	22	0.2
Interventional cardiology	9	0.1
Interventional neuroradiology	0	0.0
Missing	0	

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

ICU outcome	N	%
Dead	278	2.3
Transferred to same hospital	11417	95.9
Transferred to other hospital	180	1.5
Discharged home	27	0.2
Disch. terminally ill	6	0.1
Missing	1	

Transferred to (N=11597)	N	%
Ward	11178	96.4
Other ICU	91	0.8
High dependency care unit	276	2.4
Rehabilitation	41	0.4
Day hospital or Long-term care	11	0.1
Missing	0	

Reason of transfer to Other ICU (N=93)	N	%
Specialist expertise	44	47.3
Step-up care	2	2.2
Logistical/organizational reasons	44	47.3
Step-down care	3	3.2
Missing	0	

Transferred to Same hospital (N=11417)	N	%
Ward	11082	97.1
Other ICU	54	0.5
High dependency care unit	268	2.3
Rehabilitation	8	0.1
Day hospital or Long-term care	5	0.0
Missing	0	

Transferred to Other hospital (N=180)	N	%
Ward	96	53.3
Other ICU	37	20.6
High dependency care unit	8	4.4
Rehabilitation	33	18.3
Day hospital or Long-term care	6	3.3
Missing	0	

ICU mortality	N	%
Alive	11624	97.6
Dead	284	2.4
Missing	1	

Timing of ICU mortality (N=284)	N	%
Daytime (08:00AM - 07:59PM)	182	64.1
Nighttime (08:00PM - 07:59AM)	102	35.9
Weekdays (Monday - Friday)	208	73.2
Weekend (Saturday - Sunday)	76	26.8
Missing	0	

C.A.M. activation (N=284)	N	%
Yes, with organ donation	5	1.8
Yes, without organ donation	9	3.2
No, with organ donation	0	0.0
No, without organ donation	264	95.0
Missing	6	

Tissue removal (N=284)	N	%
Yes, with C.A.M. activation	7	2.5
Yes, without C.A.M. activation	15	5.3
No	262	92.3
Missing	0	

Hospital mortality	N	%
Dead	696	5.8
Transf. to other acute-care hospital	330	2.8
Transf. to other type of hosp. stay	1237	10.4
Nursing home	169	1.4
Voluntary discharge	33	0.3
Discharged home	9444	79.3
Missing	0	

To other type of H stay (N=1237)	N	%
Rehabilitation in the same institute	305	24.7
Rehabilitation in other institute	608	49.2
DH/long-term care, same inst.	131	10.6
DH/long-term care, other inst.	192	15.5
Missing	1	

Disch. terminally ill (N=11213)	N	%
Yes	123	1.1
No	11090	98.9
Missing	0	

Hospital mortality	N	%
Alive	11090	93.1
Dead	819	6.9
Missing	0	

Timing of hosp. mortality (N=819)	N	%
In ICU	284	34.7
Within 24 hours after ICU	40	4.9
24-47 hours after ICU	14	1.7
48-71 hours after ICU	21	2.6
72-95 hours after ICU	17	2.1
After 95 hours after ICU	443	54.1
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=535)	
Mean	21.0
SD	23.7
Median	14
Q1−Q3	6−28.5
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	11087	93.1
Dead	822	6.9
Missing	0	

ICU stay (days)	
Mean	2.1
SD	4.7
Median	1
Q1−Q3	1−2
Missing	0

ICU stay (days) **Alive** (N=11624)	
Mean	1.9
SD	4.2
Median	1
Q1−Q3	1−1
Missing	0

ICU stay (days) **Dead** (N=284)	
Mean	9.3
SD	12.5
Median	5
Q1−Q3	2−13
Missing	0

Stay after ICU (days) **Alive** (N=11624)	
Mean	11.7
SD	14.0
Median	8
Q1−Q3	5−14
Missing	9

Hospital stay (days)	
Mean	17.8
SD	18.7
Median	12
Q1−Q3	7−22
Missing	2

Hospital stay (days) **Alive** (N=11090)	
Mean	17.1
SD	17.7
Median	12
Q1−Q3	7−21
Missing	2

Hospital stay (days) **Dead** (N=819)	
Mean	27.9
SD	27.5
Median	20
Q1−Q3	10−37
Missing	0

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

Patients (N): 10807

Sex	N	%
Male	6168	57.1
Female	4631	42.9
Missing	8	

Age (years)	N	%
17-45	1742	16.1
46-65	2471	22.9
66-75	2306	21.3
>75	4288	39.7
Missing	0	
Mean	66.3	
SD	18.4	
Median	71	
Q1−Q3	55−80	
Min−Max	17−100	

Body mass Index (BMI)	N	%
Underweight	629	5.8
Normal	5152	47.7
Overweight	3388	31.4
Obese	1630	15.1
Missing	8	

Pregnancy status **Females** (N=4631)	N	%
Not fertile	2554	55.2
Not pregnant/Unknown	1700	36.7
Currently pregnant	34	0.7
Post partum	343	7.4
Missing	0	

Comorbidities	N	%
No	2276	21.1
Yes	8531	78.9
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	5384	49.8
Arrhythmia	1788	16.5
Myocardial infarction	1218	11.3
Moderate COPD	1202	11.1
Diabetes Type II without insulin tr.	1187	11.0
Any tumour without metastasis	1160	10.7
Peripheral vascular disease	1118	10.3
Cerebrovascular disease	1108	10.3
Antiplatelet therapy	1027	9.5
Moderate or severe renal disease	937	8.7
Missing	0	

Stay before ICU (days)	
Mean	3.5
SD	8.4
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	9796	90.6
Other hospital	992	9.2
Long-term chronic care hospital	19	0.2
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=10788)	N	%
Medical ward	795	7.4
Surgical ward	6545	60.7
Emergency room	2933	27.2
Other ICU	381	3.5
High dependency care unit	134	1.2
Missing	0	

Reason for transfer from **Other ICU** (N=381)	N	%
Specialist expertise	159	41.7
Step-up care	84	22.0
Logistical/organizational reasons	135	35.4
Step-down care	3	0.8
Missing	0	

Ward of admission **Same hospital** (N=9796)	N	%
Medical ward	722	7.4
Surgical ward	6385	65.2
Emergency room	2402	24.5
Other ICU	165	1.7
High dependency care unit	122	1.2
Missing	0	

Ward of admission **Other hospital** (N=992)	N	%
Medical ward	73	7.4
Surgical ward	160	16.1
Emergency room	531	53.5
Other ICU	216	21.8
High dependency care unit	12	1.2
Missing	0	

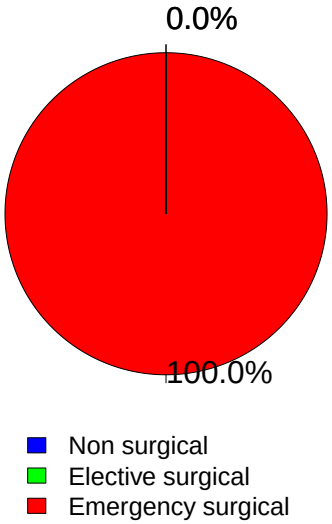
Scheduled admission	N	%
No	10791	99.9
Yes	16	0.1
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

Trauma	N	%
No	8434	78.0
Yes	2373	22.0
Multiple trauma	983	9.1
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	10807	100.0
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=10807)	N	%
Operating theatre of surgical ward	5963	55.3
Operating theatre of emergency room	1877	17.4
Surgical ward	582	5.4
Other	2366	21.9
Missing	19	

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

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

Surgical interventions (top 10) **Emergency surgical** (N=10807)	N	%
Gastrointestinal surgery	4658	43.1
Neurosurgery	1577	14.6
Orthopaedic surgery	1270	11.8
Nephro/Urological surgery	574	5.3
Abdominal vascular surgery	461	4.3
Biliary tract surgery	431	4.0
Peripheral vascular surgery	405	3.7
Obstetric surgery	334	3.1
ENT surgery	297	2.7
Splenectomy	296	2.7
Missing	504	

Timing **Emergency surgical** (N=10807)	N	%
From -7 to -3 days	338	3.1
From -2 to -1 days	1188	11.0
On ICU admission day	9408	87.1
The day after ICU admission	497	4.6
Missing	41	

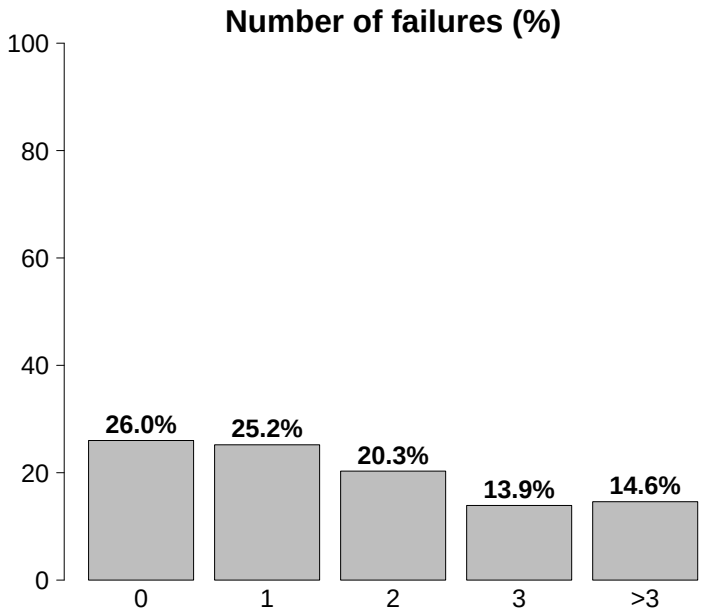
Non surgical interventions	N	%
None	10093	93.4
Elective	82	0.8
Emergency	632	5.8
Missing	0	

Non surgical interventions **Elective** (N=82)	N	%
Interventional endoscopy	26	31.7
Interventional radiology	17	20.7
Interventional neuroradiology	13	15.9
Interventional cardiology	5	6.1
Missing	21	

Non surgical interventions **Emergency** (N=632)	N	%
Interventional radiology	253	40.0
Interventional neuroradiology	152	24.1
Interventional endoscopy	135	21.4
Interventional cardiology	36	5.7
Missing	56	

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	4296	39.8
Post surgical weaning	2097	19.4
Surgical monitoring	2175	20.1
Post interventional weaning	8	0.1
Interventional monitoring	9	0.1
Non surgical monitoring	0	0.0
Missing	7	
Admission for procedures/treatments	0	0.0
Intensive Treatment	6511	60.2
Only ventilatory support	2663	24.6
Only cardiovascular support	488	4.5
Ventilatory and cardiovascular support	3360	31.1
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	2811	26.0
Yes	7996	74.0
A: Respiratory failure	6023	55.7
B: Cardiovascular failure	3848	35.6
C: Neurological failure	1002	9.3
D: Hepatic failure	49	0.5
E: Renal failure	4186	38.7
F: Acute skin failure	2	0.0
G: Metabolic failure	2929	27.1
H: Coagulation failure	177	1.6
Missing	0	

Failures on admission (top 10)	N	%
A	1419	13.1
ABEG	1159	10.7
E	895	8.3
AB	774	7.2
ABE	537	5.0
AE	382	3.5
AC	372	3.4
ABG	306	2.8
EG	303	2.8
G	222	2.1
Missing	0	

Respiratory failure	N	%
None	4784	44.3
Only hypoxic failure	1662	15.4
Only hypercapnic failure	69	0.6
Hypoxic-hypercapnic failure	249	2.3
Intubation for airway maint.	4043	37.4
Missing	0	

Cardiovascular failure	N	%
None	6959	64.4
Without shock	696	6.4
Cardiogenic shock	160	1.5
Septic shock	1124	10.4
Haemorrhagic/hypovolemic shock	955	8.8
Hypovolemic shock	437	4.0
Anaphylactic shock	3	0.0
Neurogenic shock	136	1.3
Other shock	128	1.2
Mixed shock	209	1.9
Missing	0	

Neurologic failure	N	%
None	7371	88.0
Cerebral coma	785	9.4
Metabolic coma	113	1.3
Postanoxic coma	96	1.1
Toxic coma	8	0.1
Missing or not evaluable	2434	

Renal failure (AKIN)	N	%
None	6621	61.3
Mild	2196	20.3
Moderate	993	9.2
Severe	997	9.2
Missing	0	

Metabolic failure	N	%
None	7878	72.9
pH <= 7.3, PaCO2 < 45 mmHg	737	6.8
Base deficit >= 5 mmol/L, lactate >1.5x	2192	20.3
Missing	0	

National report for general ICUs - Year 2017
Characteristics on admission - Adult emergency surgical patients evaluated in the GiViTI model

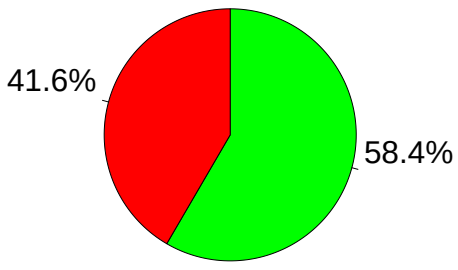
Clinical conditions on admission	N	%
Respiratory	881	8.2
Pleural effusion	277	2.6
Atelectasis	181	1.7
Aspiration pneumonia	127	1.2
Upper respiratory tract disease	123	1.1
Pulmonary embolism	54	0.5
Cardiovascular	1132	10.5
Ruptured or fissured aneurysm	331	3.1
Peripheral vascular disease	236	2.2
Acute severe arrhythmia: tachycardias	150	1.4
Cardiac arrest	129	1.2
Left heart failure without pulm. edema	70	0.6
Neurological	1123	10.4
Spontaneous Intraparenchymal bleeding	390	3.6
Spontaneous Subarachnoid haemorrhage	283	2.6
Cerebral Aneurysm	185	1.7
Cerebral artery stroke	123	1.1
Chronic Subdural haematoma	114	1.1
Gastrointestinal and hepatic	4276	39.6
Gastrointestinal perforation	1341	12.4
Intestinal occlusion	1259	11.6
Bowel ischaemia	538	5.0
Digestive tract malignancy	391	3.6
Acute bile-duct disease	310	2.9
Trauma (anatomical districts)	2374	22.0
Pelvis/bone/joint & muscle	1255	11.6
Head	809	7.5
Chest	747	6.9
Abdomen	623	5.8
Spine	489	4.5
Major vessels injury	140	1.3
Miscellaneous	20	0.2
Other	1933	17.9
Metabolic disorder	417	3.9
Nephrourologic disease	388	3.6
Other disease	301	2.8
Orthopaedic disease	190	1.8
Coagulation disorder	177	1.6
Post transplantation	183	1.7
Renal transplantation	82	0.8
Liver transplantation	67	0.6
Infections	3203	29.6
NON-surgical secondary peritonitis	1091	10.1
Post-surgical peritonitis	501	4.6
Primary peritonitis	283	2.6
Pneumonia	278	2.6
Cholecystitis/cholangitis	257	2.4
NON-surgical urinary tract infection	240	2.2
NON-surgical skin/soft tissue infection	176	1.6
Clinical sepsis	86	0.8
L.R.T.I. other than pneumonia	72	0.7
Post-surgical skin/soft tissue infection	51	0.5
Missing	0	

Trauma (anatomical districts)	N	%
Head	809	7.5
Traumatic Subdural haematoma	349	3.2
Maxillofacial fracture	253	2.3
Traumatic subarachnoid haemorrhage	242	2.2
Cerebral contusion/laceration	200	1.9
Skull fracture	183	1.7
Spine	489	4.5
Vertebral fracture, without deficit	367	3.4
Cervical injury, incomplete deficit	35	0.3
Tetraplegia	34	0.3
Chest	747	6.9
Other injuries of the chest	349	3.2
Traum. haemothorax/pneumothorax	319	3.0
Severe lung contusion/laceration	193	1.8
Abdomen	623	5.8
Spleen: Moderate-Severe laceration	163	1.5
Spleen: Massive rupture	156	1.4
Minor injuries of the abdomen	134	1.2
Pelvis/bone/joint & muscle	1255	11.6
Long bone fracture	1054	9.8
Multiple fracture of the pelvis	268	2.5
Massive crush/amputation	64	0.6
Major vessels injury	140	1.3
Proximal limbs vessels: transection	64	0.6
Major abdominal vessels: transection	30	0.3
Neck vessels: dissection/transection	26	0.2
Miscellaneous	20	0.2
Burns (>30% BSA)	14	0.1
Inhalation injury	10	0.1
Missing	0	

Infection severity on admission	N	%
None	7604	71.0
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	1813	16.9
SEPTIC SHOCK	1293	12.1
Missing	97	

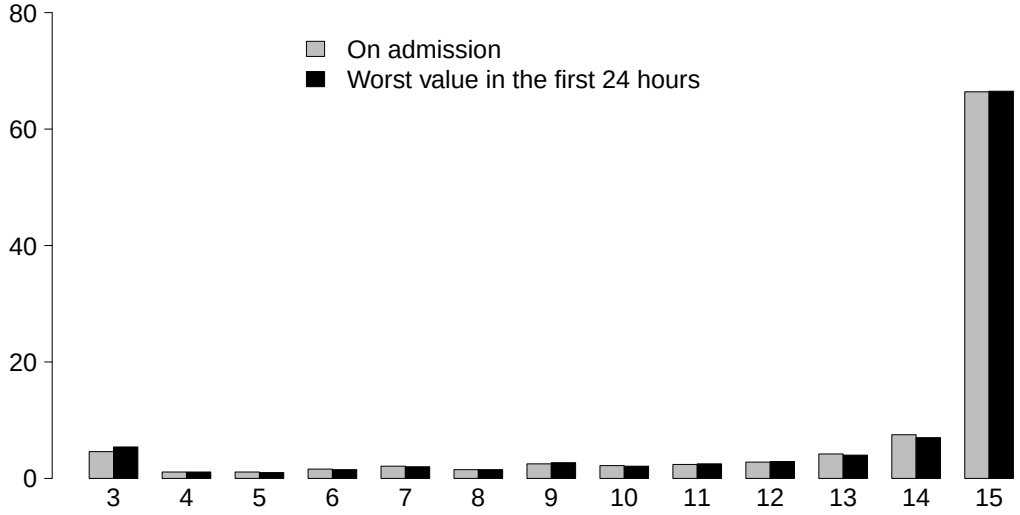
Infection severity on admission

Patients infected (N=3106)



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

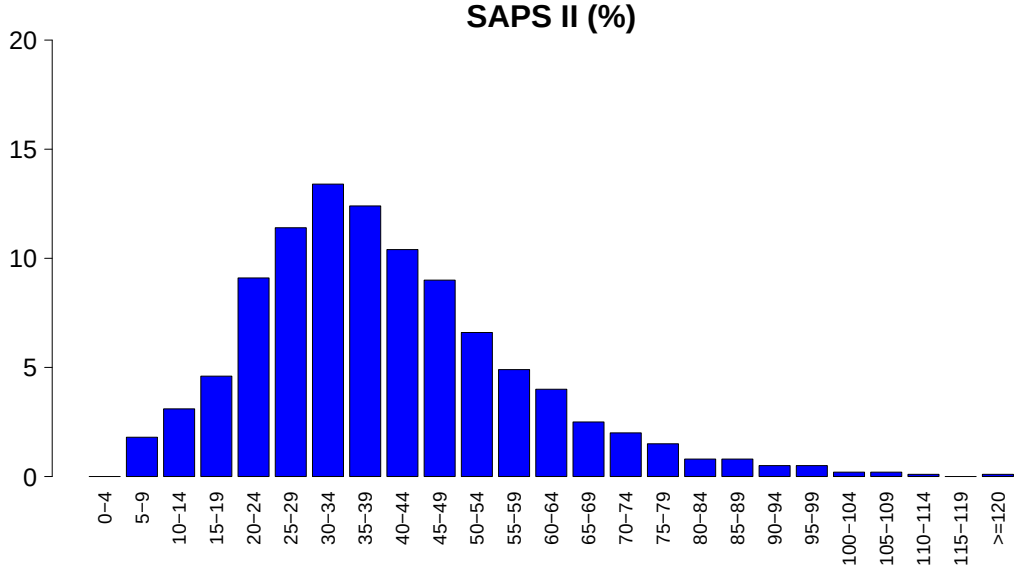
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	13−15
Not evaluable	2434
Missing	0

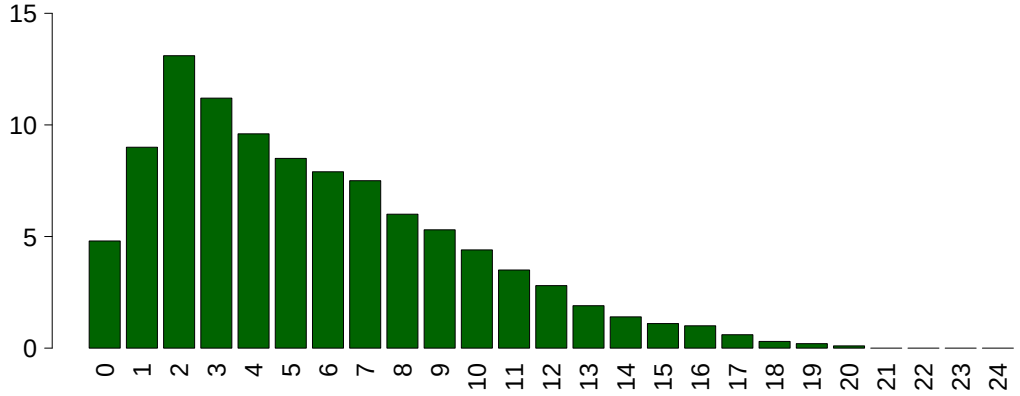
GCS (first 24 hours)	
Median	15
Q1−Q3	13−15
Not evaluable	1996
Missing	0

SAPS II (%)



SAPSII	
Mean	39.8
SD	18.0
Median	37
Q1−Q3	27−49
Not evaluable	1996
Missing	0

SOFA (%)



SOFA	
Mean	5.6
SD	4.0
Median	5
Q1−Q3	2−8
Not evaluable	1996
Missing	0

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	7241	67.0
Yes	3566	33.0
Missing	0	

Failures during the stay	N	%
No	9210	85.2
Yes	1597	14.8
A: Respiratory failure	733	6.8
B: Cardiovascular failure	711	6.6
C: Neurological failure	91	0.8
D: Hepatic failure	54	0.5
E: Renal failure (AKIN)	515	4.8
F: Acute skin failure	2	0.0
G: Metabolic failure	138	1.3
H: Coagulation failure	85	0.8
Missing	0	

Failures during the stay (top 10)	N	%
A	402	3.7
B	327	3.0
E	203	1.9
AB	140	1.3
G	86	0.8
BE	82	0.8
ABE	58	0.5
AE	53	0.5
C	30	0.3
D	23	0.2
Missing	0	

Respiratory failure occured	N	%
None	10074	93.2
Intubation for airway maint.	204	1.9
Hypoxic failure	514	4.8
Hypercapnic failure	116	1.1
Missing	0	

Cardiovascular failure occured	N	%
None	10096	93.4
Cardiogenic shock	131	1.2
Hypovolemic shock	117	1.1
Haemorrhagic/hypovolemic shock	105	1.0
Septic shock	323	3.0
Anaphylactic shock	2	0.0
Neurogenic shock	34	0.3
Other shock	60	0.6
Missing	0	

Neurological failure occured	N	%
None	10716	99.2
Cerebral coma	49	0.5
Metabolic coma	30	0.3
Postanoxic coma	12	0.1
Missing	0	

Renal failure occured (AKIN)	N	%
None	10292	95.2
Mild	71	0.7
Moderate	80	0.7
Severe	364	3.4
Missing	0	

Complications during the stay	N	%
Respiratory	626	5.8
Pleural effusion	312	2.9
Atelectasis	188	1.7
Pneumothorax/Pneumomediastinum	76	0.7
Severe ARDS	55	0.5
Mild ARDS	36	0.3
Cardiovascular	802	7.4
Acute severe arrhythmia: tachycardias	382	3.5
Cardiac arrest	184	1.7
Deep venous thrombosis	81	0.7
Acute severe arrhythmia: bradycardias	48	0.4
Peripheral vascular disease	43	0.4
Neurological	829	7.7
Drowsiness/agitation/delirium	358	3.3
Intracranial hypertension	174	1.6
Seizures	127	1.2
Brain edema	107	1.0
New ischaemic stroke	78	0.7
Gastrointestinal and hepatic	523	4.8
Bowel ischaemia	107	1.0
Gastrointestinal perforation	96	0.9
Anastomotic dehiscence	72	0.7
Intrabdominal bleeding	68	0.6
Gastrointestinal bleeding: upper tract	65	0.6
Other	372	3.4
Metabolic disorder	138	1.3
Nephrourologic disease	79	0.7
Other disease	73	0.7
Category/Stage II: Partial Thickness Skin Loss	31	0.3
Category/Stage I: Nonblanchable Erythema	19	0.2
Other skin and/or soft tissue pathology	19	0.2
Extremity compartment syndrome (severe)	16	0.1
Infections	1243	11.5
Pneumonia	398	3.7
L.R.T.I. other than pneumonia	276	2.6
NON-surgical urinary tract infection	139	1.3
Post-surgical peritonitis	126	1.2
Primary bacteraemia of unknown origin	116	1.1
Catheter-related bacteremia (CR-BSI)	116	1.1
Post-surgical skin/soft tissue infection	64	0.6
Upper respiratory tract infection	44	0.4
NON-surgical secondary peritonitis	41	0.4
Clinical sepsis	37	0.3
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics during the stay - Adult emergency surgical patients evaluated in the GiViTI model

Infections	N	%
None	6709	62.1
Only on admission	2855	26.4
On admission and during ICU stay	348	3.2
Only during ICU stay	895	8.3
Missing	0	

Maximum severity of infection	N	%
None	6709	62.9
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	2443	22.9
SEPTIC SHOCK	1515	14.2
Missing	140	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	6709 (88.8%)	0 (0.0%)	713 (9.4%)	131 (1.7%)	7553
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	1725 (95.1%)	88 (4.9%)	1813
	SEPTIC SHOCK	-	-	-	1293 (100.0%)	1293
	TOT	6709	0	2438	1512	10659

Ventil. Associat. Pneumonia (VAP)	N	%
No	10460	96.8
Yes	347	3.2
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	10691	98.9
Yes	116	1.1
Missing	0	

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

Estimate	10.2
CI (95%)	9.2−11.3

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

Estimate	2.0
CI (95%)	1.7−2.5

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

Estimate	8.2%
CI (95%)	7.3−9.1

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

Estimate	2.5%
CI (95%)	2.0−3.0

National report for general ICUs - **Year 2017**

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

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	10406	96.3										
Invasive ventilation	8496	78.6	7229	66.9	1340	12.4	1	1–5	0	0	0–0	0
Non invasive ventilation	1052	9.7	105	1	224	2.1	2	1–4	0	1	0–4	0
Tracheostomy	1130	10.5	140	1.3	942	8.7	11	5–20	0	8	5–12	0
iNO (inhaled nitric oxide)	13	0.1	0	0	2	0	2	1–4	0	3	2–4	0
Central Venous Catheter	7642	70.7	4469	41.4	6291	58.2	4	2–9	0	0	0–0	0
PICC	188	1.7	69	0.6	164	1.5	4	1–10	1	6	1–18	0
Arterial Catheter	8825	81.7	5838	54	2312	21.4	3	1–8	1	0	0–0	0
Vasoactive drugs	4589	42.5	2664	24.7	839	7.8	2	1–4	1	0	0–0	1
Antiarrhythmics	821	7.6	203	1.9	400	3.7	3	1–6	0	1	0–2	0
IABP	5	0.0	3	0	3	0	2	1–3	0	0	0–0	0
Invasive monitoring of C.O.	496	4.6	115	1.1	95	0.9	4	2–8	0	0	0–1	0
Continous monitoring of ScVO2	21	0.2	13	0.1	3	0	2	1–4	0	0	0–1	0
Temporary pacing	11	0.1	9	0.1	5	0	1	1–2	0	3	2–4	0
Ventricular assistance	0	0.0										
DC-shock	92	0.9								1	0–2	0
CPR	153	1.4								0	0–2	0
Massive blood transfusion	380	3.5								0	0–0	0
ICP monitoring without CSF drainage	225	2.1	94	0.9	41	0.4	7	4–11	0	0	0–1	0
ICP monitoring with CSF drainage	249	2.3	138	1.3	123	1.1	9	4–17	0	0	0–0	0
External ventricular drainage without ICP	125	1.2	82	0.8	61	0.6	8	3–15	0	0	0–1	0
Haemofiltration	385	3.6	27	0.2	105	1	4	2–9	1	1	0–3	1
Haemodialysis	248	2.3	36	0.3	99	0.9	3	1–9	0	2	1–5	0
ECMO	13	0.1	5	0	4	0	6	2–21	0	8	0–18	0
Hepatic clearance techniques	1	0.0										
Clearance techniques during sepsis	111	1.0	5	0	16	0.1	3	2–4	0	0	0–1	0
IAP (intra-abdominal pressure)	279	2.6										
Hypothermia	16	0.1	1	0	2	0	2	1–4	0	1	0–2	0
Enteral nutrition	3032	28.1	272	2.5	2101	19.4	7	3–15	0	2	1–3	0
Parenteral nutrition	3004	27.8	327	3	1943	18	4	2–8	0	1	0–2	0
SDD (Topical, Topical and systemic)	62	0.6										
Patient restraint	251	2.3										
Peridural catheter	145	1.3	110	1	98	0.9	2	1–4	0	2	1–4	0
Electrical cardioversion	65	0.6								1	1–3	0
Vacuum therapy	147	1.4										
Antibiotics	8210	76.0										
Antibiotic prophylaxis	5078	47.0	3550	32.8	2921	27	2	1–3	0	0	0–0	0
Empirical antibiotic therapy	3069	28.4	1714	15.9	1611	14.9	3	2–5	1	0	0–2	1
Targeted antibiotic therapy	1537	14.2	179	1.7	934	8.6	7	4–13	0	5	3–8	0

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

Invasive ventilation (N=8496)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	1992	21.9	6.9	10.0	3	1−8	0
For airway mainteinance	3959	43.6	5.7	8.3	2	1−7	0
In weaning	2060	22.7	0.5	0.5	1	0−1	0
Not evaluable	1067	11.8	2.8	6.4	1	0−1	556
Reintubation within 48 hours	183	2.0	7.5	8.9	5	2−10	0

Non invasive ventilation (N=1052)	N	%
Non invasive ventilation only	286	27.2
Non invasive ventilation failed	78	7.4
For weaning	617	58.7
Other	71	6.7
Missing	0	

Tracheostomy not present on admission (N=990)	N	%
Surgical	208	21.0
Percutwist	82	8.3
Ciaglia	120	12.1
Monodil. Ciaglia	341	34.4
Fantoni	64	6.5
Griggs	131	13.2
Other Kind	28	2.8
Unknown	16	1.6
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=981)	
Mean	9.0
SD	6.4
Median	8
Q1−Q3	5−12
Missing	0

Invasive monitoring of C.O. (N=496)	N	%
Swan Ganz	105	21.2
PICCO	312	62.9
LIDCO	1	0.2
Vigileo-PRAM	51	10.3
Other	26	5.2
Missing	1	

SDD (N=62)	N	%
Topical	61	98.4
Topical and systemic	1	1.6
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=895)	N	%
Only empirical	174	23.4
Only targeted	265	35.7
Targeted after empirical	260	35.0
Other	44	5.9
Missing	152	

Surgical interventions	N	%
No	9945	92.0
Yes	862	8.0
Missing	0	

Number of surgical interventions	N	%
0	9945	92.0
1	592	5.5
2	168	1.6
3	59	0.5
>3	43	0.4
Missing	0	

Surgical interventions Days from admission	
Mean	9.2
SD	9.9
Median	6
Q1−Q3	3−11
Missing	2

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	560	5.2
Orthopaedic surgery	262	2.4
Neurosurgery	126	1.2
ENT surgery	63	0.6
Maxillo-Facial surgery	51	0.5
Plastic surgery	47	0.4
Other surgery	44	0.4
Thoracic surgery	37	0.3
Nephro/Urological surgery	21	0.2
Peripheral vascular surgery	20	0.2
Missing	0	

Non surgical interventions	N	%
No	10577	97.9
Yes	230	2.1
Missing	0	

Non surgical interventions Days from admission	
Mean	13.4
SD	11.7
Median	9
Q1−Q3	5−19.5
Missing	0

Non surgical interventions	N	%
Interventional endoscopy	118	1.1
Interventional radiology	102	0.9
Interventional neuroradiology	38	0.4
Interventional cardiology	25	0.2
Missing	0	

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

ICU outcome	N	%
Dead	1611	14.9
Transferred to same hospital	8429	78.0
Transferred to other hospital	725	6.7
Discharged home	21	0.2
Disch. terminally ill	21	0.2
Missing	0	

Transferred to (N=9154)	N	%
Ward	7768	84.9
Other ICU	598	6.5
High dependency care unit	609	6.7
Rehabilitation	163	1.8
Day hospital or Long-term care	16	0.2
Missing	0	

Reason of transfer to Other ICU (N=610)	N	%
Specialist expertise	169	27.7
Step-up care	28	4.6
Logistical/organizational reasons	375	61.5
Step-down care	38	6.2
Missing	0	

Transferred to Same hospital (N=8429)	N	%
Ward	7623	90.4
Other ICU	175	2.1
High dependency care unit	587	7.0
Rehabilitation	36	0.4
Day hospital or Long-term care	8	0.1
Missing	0	

Transferred to Other hospital (N=725)	N	%
Ward	145	20.0
Other ICU	423	58.3
High dependency care unit	22	3.0
Rehabilitation	127	17.5
Day hospital or Long-term care	8	1.1
Missing	0	

ICU mortality	N	%
Alive	9175	84.9
Dead	1632	15.1
Missing	0	

Timing of ICU mortality (N=1632)	N	%
Daytime (08:00AM - 07:59PM)	1063	65.2
Nighttime (08:00PM - 07:59AM)	568	34.8
Weekdays (Monday - Friday)	1196	73.3
Weekend (Saturday - Sunday)	435	26.7
Missing	1	

C.A.M. activation (N=1632)	N	%
Yes, with organ donation	88	5.5
Yes, without organ donation	68	4.2
No, with organ donation	5	0.3
No, without organ donation	1450	90.0
Missing	21	

Tissue removal (N=1632)	N	%
Yes, with C.A.M. activation	67	4.1
Yes, without C.A.M. activation	89	5.5
No	1476	90.4
Missing	0	

Hospital mortality	N	%
Dead	2422	22.4
Transf. to other acute-care hospital	960	8.9
Transf. to other type of hosp. stay	1730	16.0
Nursing home	179	1.7
Voluntary discharge	35	0.3
Discharged home	5481	50.7
Missing	0	

To other type of H stay (N=1730)	N	%
Rehabilitation in the same institute	297	17.2
Rehabilitation in other institute	911	52.7
DH/long-term care, same inst.	186	10.8
DH/long-term care, other inst.	336	19.4
Missing	0	

Disch. terminally ill (N=8385)	N	%
Yes	131	1.6
No	8254	98.4
Missing	0	

Hospital mortality	N	%
Alive	8254	76.4
Dead	2553	23.6
Missing	0	

Timing of hosp. mortality (N=2553)	N	%
In ICU	1632	63.9
Within 24 hours after ICU	50	2.0
24-47 hours after ICU	48	1.9
48-71 hours after ICU	40	1.6
72-95 hours after ICU	51	2.0
After 95 hours after ICU	732	28.7
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=921)	
Mean	16.2
SD	19.0
Median	10
Q1−Q3	4−21
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	8184	75.7
Dead	2623	24.3
Missing	0	

ICU stay (days)	
Mean	6.3
SD	9.8
Median	2
Q1−Q3	1−7
Missing	1

ICU stay (days) **Alive** (N=9175)	
Mean	6.0
SD	9.5
Median	2
Q1−Q3	1−6
Missing	0

ICU stay (days) **Dead** (N=1632)	
Mean	8.0
SD	10.9
Median	4
Q1−Q3	1−11
Missing	1

Stay after ICU (days) **Alive** (N=9175)	
Mean	14.8
SD	17.7
Median	10
Q1−Q3	5−19
Missing	3

Hospital stay (days)	
Mean	22.2
SD	22.4
Median	15
Q1−Q3	9−28
Missing	1

Hospital stay (days) **Alive** (N=8254)	
Mean	23.5
SD	22.7
Median	17
Q1−Q3	10−29
Missing	0

Hospital stay (days) **Dead** (N=2553)	
Mean	17.9
SD	20.8
Median	12
Q1−Q3	4−24
Missing	1

National report for general ICUs - **Year 2017**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Patients (N): 556

Sex	N	%
Male	334	60.1
Female	222	39.9
Missing	0	

Age	N	%
Newborn (0-4 weeks)	0	0.0
1-6 months	12	2.2
6-12 months	28	5.0
12-24 months	43	7.7
2-4 years	66	11.9
5-8 years	84	15.1
9-16 years	323	58.1
Missing	0	
Mean	9.3	
SD	5.7	
Median	10	
Q1−Q3	4−15	
Min−Max	0−16	

Weight (kg) **Newborns** (N=0)	
Mean	
SD	
Median	
Q1−Q3	
Missing	0

Gestational age **Newborns** (N=0)	N	%
At term	0	0.0
Not at term	0	0.0
Missing	0	

Comorbidities	N	%
No	335	60.3
Yes	221	39.7
Missing	0	

Comorbidities (top 10)	N	%
Encephalopathy	54	9.7
Genetic diseases	22	4.0
Hemiplegia or paraplegia or quadriplegia	22	4.0
Malignant haematological disease	21	3.8
Neurodegenerative/Neuromuscular disease	21	3.8
Brain and skull malformations	19	3.4
Skeletal malformations/disorders	18	3.2
Asthma	17	3.1
Congenital heart defect	15	2.7
Hydrocephalus	12	2.2
Missing	0	

Previous ICU admissions	N	%
None	375	67.4
<=2	75	13.5
>2	26	4.7
Unknown	80	14.4
Missing	0	

Previous ICU admissions (N=101)	N	%
Paediatric	32	31.7
Neonatal	37	36.6
General - adult	48	47.5
Other/Unknown	2	2.0
Missing	0	

Stay before ICU (days)	
Mean	2.9
SD	16.8
Median	0
Q1−Q3	0−1
Missing	0

Source of admission	N	%
Same hospital	456	82.0
Other hospital	64	11.5
Long-term chronic care hospital	2	0.4
Directly from the community	34	6.1
Missing	0	

Ward of admission **Hospital** (N=520)	N	%
Medical ward	132	25.4
Surgical ward	140	26.9
Emergency room	227	43.7
Other ICU	20	3.8
High dependency care unit	1	0.2
Neonatology	0	0.0
Missing	0	

Reason for transfer from **Other ICU** (N=20)	N	%
Specialist expertise	5	25.0
Step-up care	11	55.0
Logistical/organizational reasons	4	20.0
Step-down care	0	0.0
Missing	0	

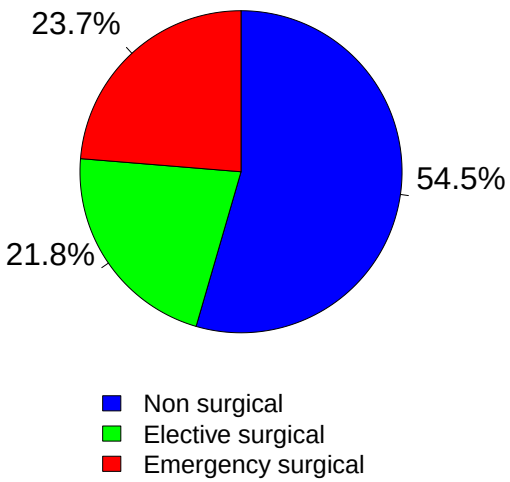
Scheduled admission	N	%
No	445	80.0
Yes	111	20.0
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Trauma	N	%
No	397	71.4
Yes	159	28.6
Multiple trauma	60	10.8
Missing	0	

Surgical status	N	%
Non surgical	303	54.5
Elective surgical	121	21.8
Emergency surgical	132	23.7
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=253)	N	%
Operating theatre of surgical ward	131	53.3
Operating theatre of emergency room	40	16.3
Surgical ward	4	1.6
Other	71	28.9
Missing	7	

Surgical interventions (top 10) **Elective surgical** (N=121)	N	%
ENT surgery	24	19.8
Maxillo-Facial surgery	23	19.0
Orthopaedic surgery	21	17.4
Gastrointestinal surgery	17	14.0
Neurosurgery	15	12.4
Thoracic surgery	7	5.8
Nephro/Urological surgery	6	5.0
Other surgery	5	4.1
Esophageal surgery	3	2.5
Splenectomy	2	1.7
Missing	0	

Timing **Elective surgical** (N=121)	N	%
From -7 to -3 days	0	0.0
From -2 to -1 days	0	0.0
On ICU admission day	124	102.5
The day after ICU admission	3	2.5
Missing	0	

Surgical interventions (top 10) **Emergency surgical** (N=132)	N	%
Gastrointestinal surgery	35	26.5
Neurosurgery	28	21.2
Orthopaedic surgery	26	19.7
ENT surgery	11	8.3
Splenectomy	10	7.6
Thoracic surgery	7	5.3
Nephro/Urological surgery	5	3.8
Maxillo-Facial surgery	5	3.8
Peripheral vascular surgery	4	3.0
Other surgery	4	3.0
Missing	0	

Timing **Emergency surgical** (N=132)	N	%
From -7 to -3 days	10	7.6
From -2 to -1 days	15	11.4
On ICU admission day	107	81.1
The day after ICU admission	15	11.4
Missing	1	

Non surgical interventions	N	%
None	515	92.6
Elective	12	2.2
Emergency	29	5.2
Missing	0	

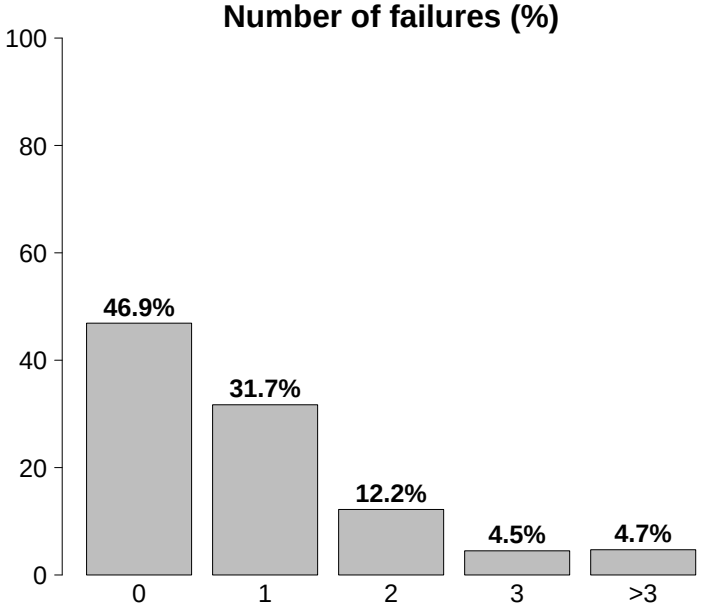
Non surgical interventions **Elective** (N=12)	N	%
Interventional radiology	3	25.0
Diagnostic bronchoscopy on admission	3	25.0
Therapeutic endoscopy (bronchoscopy excluded)	2	16.7
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Missing	4	

Non surgical interventions **Emergency** (N=29)	N	%
Interventional radiology	11	37.9
Therapeutic endoscopy (bronchoscopy excluded)	4	13.8
Interventional neuroradiology	3	10.3
Therapeutic bronchoscopy	3	10.3
Diagnostic bronchoscopy on admission	1	3.4
Interventional cardiology	0	0.0
Missing	7	

National report for general ICUs - **Year 2017**
Characteristics on admission - Pediatric patients evaluated with PIM 3

Reason for admission	N	%
Monitoring/Weaning	312	57.9
Post surgical weaning	92	17.7
Surgical monitoring	78	15.0
Post interventional weaning	2	0.4
Interventional monitoring	6	1.2
Non surgical monitoring	115	22.1
Missing	19	
Admission for procedures/treatments	0	0.0
Intensive Treatment	225	41.7
Ventilatory support	217	39.0
Cardiovascular support	57	10.3
Metabolic support	21	3.8
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	2	0.4
Missing	17	

Number of failures (%)



Failures on admission	N	%
No	261	46.9
Yes	295	53.1
A: Respiratory failure	196	35.3
B: Cardiovascular failure	92	16.5
C: Neurological failure	50	9.0
D: Hepatic failure	58	10.4
E: Renal failure	79	14.2
F: Acute skin failure	0	0.0
G: Metabolic failure	24	4.3
H: Coagulation failure	4	0.7
Missing	0	

Failures on admission (top 10)	N	%
A	99	17.8
E	24	4.3
B	23	4.1
AC	17	3.1
AB	14	2.5
C	12	2.2
D	12	2.2
ABDE	9	1.6
ABE	8	1.4
AE	8	1.4
Missing	0	

Respiratory failure	N	%
None	339	61.0
Only hypoxic failure	74	13.3
Only hypercapnic failure	5	0.9
Hypoxic-hypercapnic failure	12	2.2
Intubation for airway maint.	126	22.7
Missing	0	

Cardiovascular failure	N	%
None	499	89.7
Without shock	8	1.4
Cardiogenic shock	5	0.9
Septic shock	14	2.5
Haemorrhagic/hypovolemic shock	13	2.3
Hypovolemic shock	4	0.7
Anaphylactic shock	2	0.4
Neurogenic shock	5	0.9
Other shock	1	0.2
Mixed shock	5	0.9
Missing	0	

Neurologic failure	N	%
None	410	84.2
Cerebral coma	54	11.1
Metabolic coma	7	1.4
Postanoxic coma	9	1.8
Toxic coma	7	1.4
Missing or not evaluable	69	

Renal failure (RIFLE)	N	%
None	477	85.8
Risk	52	9.4
Injury	7	1.3
Failure	12	2.2
Loss	6	1.1
End-stage renal disease	2	0.4
Missing	0	

National report for general ICUs - **Year 2017**
Characteristics on admission - Pediatric patients evaluated with PIM 3

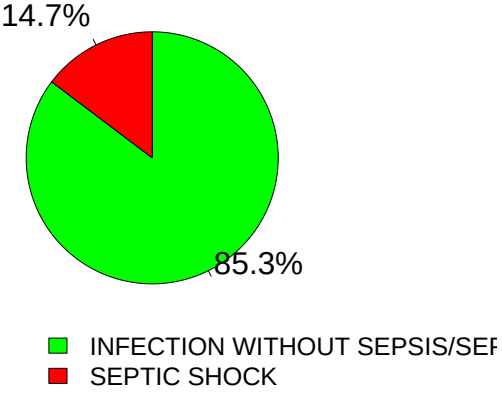
Clinical conditions on admission	N	%
Respiratory	107	19.2
Upper respiratory tract disease	24	4.3
Aspiration pneumonia	18	3.2
Acute asthma/bronchospasm	17	3.1
Atelectasis	11	2.0
Pleural effusion	9	1.6
Cardiovascular	21	3.8
Cardiac arrest	13	2.3
Left heart failure without pulm. edema	3	0.5
Acute severe arrhythmia: tachycardias	2	0.4
Acute severe arrhythmia: bradycardias	2	0.4
Systemic hypertensive crisis	1	0.2
Neurological	92	16.5
Seizures	58	10.4
Brain tumour	13	2.3
Metabolic/postanoxic encephalopathy	9	1.6
Brain and skull malformations	5	0.9
Spontaneous Hydrocephalus	3	0.5
Gastrointestinal and hepatic	44	7.9
Oesophago-gastro-intestinal malf.	13	2.3
Intestinal occlusion	6	1.1
Gastrointestinal perforation	6	1.1
Acute inflammatory bowel disease	5	0.9
Intrabdominal bleeding (non traumatic)	3	0.5
Trauma (anatomical districts)	159	28.6
Head	72	12.9
Abdomen	51	9.2
Pelvis/bone/joint & muscle	51	9.2
Chest	45	8.1
Spine	29	5.2
Major vessels injury	5	0.9
Miscellaneous	5	0.9
Other	152	27.3
Other disease	41	7.4
ENT/maxillofacial disease	35	6.3
Metabolic disorder	24	4.3
Acute intoxication	23	4.1
Orthopaedic disease	16	2.9
Post transplantation	6	1.1
Bone marrow transplantation	4	0.7
Lung transplantation	1	0.2
Infections	122	21.9
Pneumonia	44	7.9
Upper respiratory tract infection	18	3.2
NON-surgical CNS infection	11	2.0
NON-surgical secondary peritonitis	11	2.0
L.R.T.I. other than pneumonia	9	1.6
Gastroenteritis	6	1.1
Pleurisy/Pleural empyema	6	1.1
Primary bacteraemia of unknown origin	5	0.9
Clinical sepsis	3	0.5
F.U.O. fever of unknown origin	3	0.5
Missing	0	

Trauma (anatomical districts)	N	%
Head	72	12.9
Maxillofacial fracture	25	4.5
Cerebral contusion/laceration	23	4.1
Skull fracture	23	4.1
Traumatic subarachnoid haemorrhage	15	2.7
Traumatic diffuse injury with oedema	12	2.2
Spine	29	5.2
Vertebral fracture, without deficit	20	3.6
Dorsal injury, incomplete deficit	3	0.5
Paraplegia	2	0.4
Chest	45	8.1
Severe lung contusion/laceration	20	3.6
Traum. haemothorax/pneumothorax	15	2.7
Other injuries of the chest	15	2.7
Abdomen	51	9.2
Spleen: Moderate-Severe laceration	13	2.3
Spleen: Massive rupture	11	2.0
Liver: Moderate-Severe laceration	9	1.6
Pelvis/bone/joint & muscle	51	9.2
Long bone fracture	40	7.2
Multiple fracture of the pelvis	16	2.9
Massive crush/amputation	5	0.9
Major vessels injury	5	0.9
Proximal limbs vessels: transection	3	0.5
Neck vessels: dissection/transection	1	0.2
Aorta: rupture/dissection	1	0.2
Miscellaneous	5	0.9
Burns (>30% BSA)	3	0.5
Inhalation injury	2	0.4
Missing	0	

Infection severity on admission	N	%
None	434	78.9
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	99	18.0
SEPTIC SHOCK	17	3.1
Missing	6	

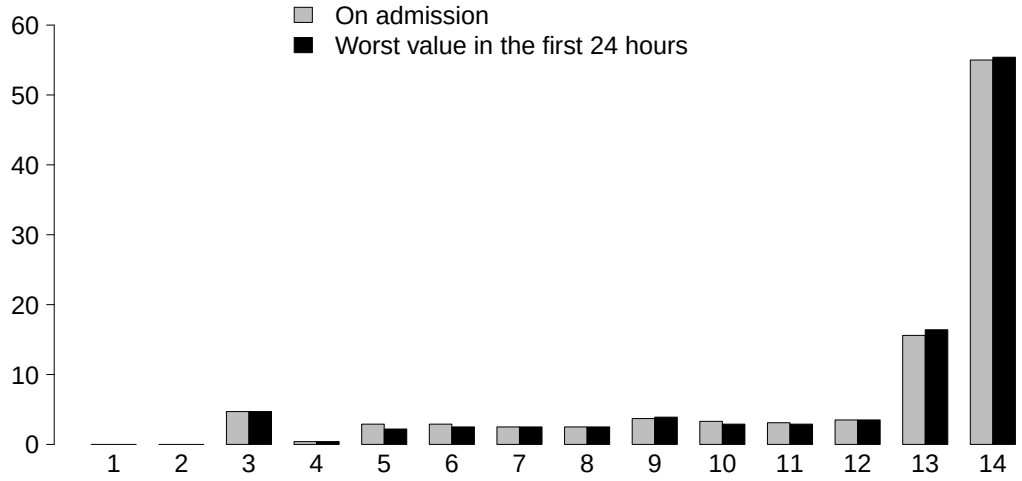
Infection severity on admission

Patients infected (N=116)



National report for general ICUs - **Year 2017**
Severity scores - Pediatric patients evaluated with PIM 3

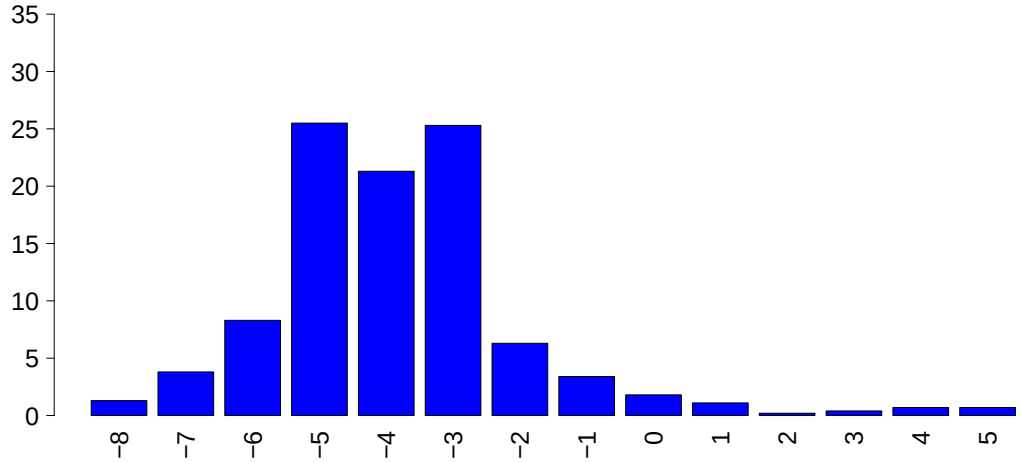
Glasgow Coma Scale (%)



GCS (admission)	
Median	14
Q1−Q3	11−14
Not evaluable	69
Missing	0

GCS (first 24 hours)	
Median	14
Q1−Q3	12−14
Not evaluable	45
Missing	0

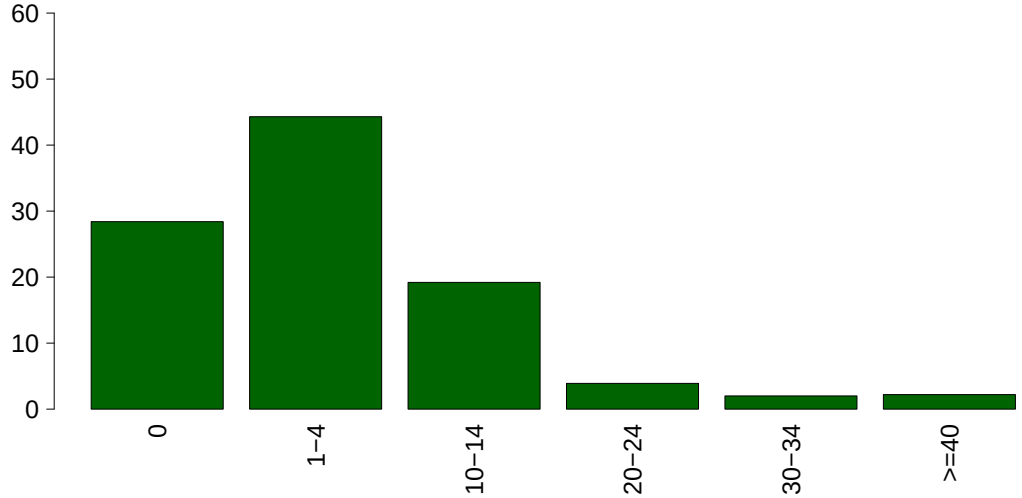
PIM 2 (%)



PIM 2	
Median	-4.2
Q1−Q3	-4.8−-3
Not evaluable	0
Missing	0

PIM 3	
Median	-4.3
Q1−Q3	-5.4−-3.2
Not evaluable	0
Missing	0

PELOD (%)



PELOD	
Mean	5.3
SD	9.7
Median	1
Q1−Q3	0−10
Not evaluable	45
Missing	1

National report for general ICUs - **Year 2017**
Characteristics during the stay - Pediatric patients evaluated with PIM 3

Complications during the stay	N	%
No	467	84.0
Yes	89	16.0
Missing	0	

Failures during the stay	N	%
No	519	93.3
Yes	37	6.7
A: Respiratory failure	21	3.8
B: Cardiovascular failure	12	2.2
C: Neurological failure	4	0.7
D: Hepatic failure	0	0.0
E: Renal failure (AKIN)	7	1.3
F: Acute skin failure	1	0.2
G: Metabolic failure	4	0.7
H: Coagulation failure	2	0.4
Missing	0	

Failures during the stay (top 10)	N	%
A	14	2.5
AB	4	0.7
B	4	0.7
G	4	0.7
E	3	0.5
AC	2	0.4
BE	2	0.4
ABEFH	1	0.2
BCE	1	0.2
C	1	0.2
Missing	0	

Respiratory failure occured	N	%
None	535	96.2
Intubation for airway maint.	10	1.8
Hypoxic failure	13	2.3
Hypercapnic failure	3	0.5
Missing	0	

Cardiovascular failure occured	N	%
None	544	97.8
Cardiogenic shock	0	0.0
Hypovolemic shock	0	0.0
Haemorrhagic/hypovolemic shock	1	0.2
Septic shock	7	1.3
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.4
Other shock	2	0.4
Missing	0	

Neurological failure occured	N	%
None	552	99.3
Cerebral coma	4	0.7
Metabolic coma	0	0.0
Postanoxic coma	0	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	549	98.7
Mild	1	0.2
Moderate	0	0.0
Severe	6	1.1
Missing	0	

Complications during the stay	N	%
Respiratory	30	5.4
Atelectasis	11	2.0
Pleural effusion	7	1.3
Severe ARDS	5	0.9
Acute asthma/bronchospasm	5	0.9
Upper resp. tract disease	5	0.9
Cardiovascular	13	2.3
Cardiac arrest	6	1.1
Acute severe arrhythmia: bradycardias	4	0.7
Deep venous thrombosis	2	0.4
Hypertensive crisis	1	0.2
Left heart failure w/o pulm. edema	1	0.2
Neurological	21	3.8
Brain edema	10	1.8
Intracranial hypertension	9	1.6
Drowsiness/agitation/delirium	5	0.9
Hydrocephalus	3	0.5
Seizures	3	0.5
Gastrointestinal and hepatic	9	1.6
Paralytic Ileus	3	0.5
Gastrointestinal perforation	2	0.4
Bowel ischaemia	1	0.2
Gastrointestinal bleeding: lower tract	1	0.2
Gastrointestinal bleeding: upper tract	1	0.2
Other	11	2.0
Metabolic disorder	4	0.7
Category/Stage I: Nonblanchable Erythema	2	0.4
Other disease	2	0.4
Fat embolism	1	0.2
Graft versus host disease	1	0.2
Nephrourologic disease	1	0.2
-	0	0.0
Infections	33	5.9
Pneumonia	13	2.3
Gastroenteritis	5	0.9
NON-surgical urinary tract infection	5	0.9
F.U.O. fever of unknown origin	4	0.7
L.R.T.I. other than pneumonia	4	0.7
Primary bacteraemia of unknown origin	2	0.4
Catheter-related bacteremia (CR-BSI)	2	0.4
Catheter-related local infection	2	0.4
NON-surgical skin/soft tissue infection	2	0.4
Post-surgical urinary tract infection	2	0.4
Missing	0	

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Characteristics during the stay - Pediatric patients evaluated with PIM 3

Infections	N	%
None	411	73.9
Only on admission	112	20.1
On admission and during ICU stay	10	1.8
Only during ICU stay	23	4.1
Missing	0	

Maximum severity of infection	N	%
None	411	75.3
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	113	20.7
SEPTIC SHOCK	22	4.0
Missing	10	

Severity evolution

	N (R %)	During the stay: None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	411 (95.6%)	0 (0.0%)	17 (4.0%)	2 (0.5%)	430
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	96 (97.0%)	3 (3.0%)	99
	SEPTIC SHOCK	-	-	-	17 (100.0%)	17
	TOT	411	0	113	22	546

Ventil. Associat. Pneumonia (VAP)	N	%
No	544	97.8
Yes	12	2.2
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	554	99.6
Yes	2	0.4
Missing	0	

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

Estimate	11.9
CI (95%)	6.2−20.9

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

Estimate	1.3
CI (95%)	0.2−4.8

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

Estimate	9.6%
CI (95%)	4.9−16.7

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

Estimate	1.6%
CI (95%)	0.2−5.8

National report for general ICUs - **Year 2017**

Process indicators - Pediatric patients evaluated with PIM 3

Procedures and/or treatments (Missing=0)	Use		On admission		On discharge		Length (days)			Days from admission		
	N	%	N	%	N	%	Median	Q1-Q3	Missing	Median	Q1-Q3	Missing
Procedures (antibiotics excluded)	471	84.7										
Invasive ventilation	316	56.8	250	45	30	5.4	1	0–3	0	0	0–0	0
Non invasive ventilation	48	8.6	14	2.5	11	2	1	1–3	0	0	0–0	0
Tracheostomy	34	6.1	13	2.3	29	5.2	10	3–18	0	8	6–10	0
iNO (inhaled nitric oxide)	0	0.0										
Central Venous Catheter	207	37.2	120	21.6	157	28.2	3	1–9	0	0	0–0	0
PICC	10	1.8	3	0.5	7	1.3	10	3–16	0	1	0–6	0
Arterial Catheter	284	51.1	167	30	48	8.6	2	1–6	0	0	0–0	0
Vasoactive drugs	70	12.6	34	6.1	14	2.5	2	1–6	0	0	0–1	0
Antiarrhythmics	3	0.5	1	0.2	0	0	0	0–0	0	0	0–1	0
IABP	0	0.0										
Invasive monitoring of C.O.	11	2.0	3	0.5	3	0.5	4	2–13	0	0	0–0	0
Continous monitoring of ScVO2	1	0.2	0	0	0	0	7	7–7	0	1	1–1	0
Temporary pacing	0	0.0										
Ventricular assistance	0	0.0										
DC-shock	4	0.7								0	0–0	0
CPR	11	2.0								0	0–1	0
Massive transfusion	6	1.1								0	0–0	0
ICP monitoring without CSF drainage	10	1.8	3	0.5	1	0.2	6	2–8	0	0	0–0	0
ICP monitoring with CSF drainage	2	0.4	0	0	2	0.4	1	1–1	0	0	0–1	0
External ventricular drainage without ICP	1	0.2	1	0.2	1	0.2	11	11–11	0			
Haemofiltration	6	1.1	0	0	1	0.2	3	2–4	0	2	0–3	0
Haemodialysis	5	0.9	2	0.4	2	0.4	6	2–11	0	2	1–2	0
ECMO	6	1.1	2	0.4	2	0.4	4	2–6	0	2	1–25	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	4	0.7	0	0	0	0	1	1–5	0	0	0–0	0
IAP (intra-abdominal pressure)	3	0.5										
Hypothermia	1	0.2	1	0.2	0	0	1	1–1	0			
Enteral nutrition	134	24.1	30	5.4	85	15.3	4	2–10	0	1	0–2	0
Parenteral nutrition	55	9.9	5	0.9	29	5.2	4	2–10	0	1	0–2	0
SDD (Topical, Topical and systemic)	2	0.4										
Patient restraint	4	0.7										
Diagnostic fibrobronchoscopy	12	2.2								1	0–3	0
Surfactant treatment	1	0.2	0	0	0	0			1			
Vacuum therapy	3	0.5										
Oxygen therapy	79	14.2	45	8.1	40	7.2	1	1–3	0	1	0–2	0
Blood transfusion	0	0.0										
Peritoneal dialysis	0	0.0										
Plasmapheresis	2	0.4										
Thoracic drainage	8	1.4	7	1.3	3	0.5	3	2–4	0	0	0–0	0
Peridural catheter	9	1.6	7	1.3	8	1.4	1	1–3	0	2	1–4	0
Urinary catheter	88	15.8	63	11.3	64	11.5	3	1–7	0	0	0–0	0
Near-infrared spectroscopy	0	0.0										
Phototherapy	0	0.0										
Electrical cardioversion	0	0.0										
Antibiotics	284	51.1										
Antibiotic prophylaxis	166	29.9	110	19.8	108	19.4	1	1–3	0	0	0–0	0
Empirical antibiotic therapy	104	18.7	68	12.2	65	11.7	2	1–4	0	0	0–2	0
Targeted antibiotic therapy	49	8.8	10	1.8	36	6.5	4	2–13	0	3	1–10	0

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Process indicators - Pediatric patients evaluated with PIM 3

Invasive ventilation (N=316)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	67	17.9	6.7	13.9	2	1−5.5	0
For airway mainteinance	124	33.2	5.6	10.3	2	1−5.2	0
In weaning	109	29.1	0.3	0.5	0	0−1	0
Not evaluable	74	19.8	3.2	5.3	1	0.8−3	58
Reintubation within 48 hours	4	1.1	5.0	2.6	5	3.5−6.5	0

Non invasive ventilation (N=48)	N	%
Non invasive ventilation only	31	64.6
Non invasive ventilation failed	9	18.8
For weaning	7	14.6
Other	1	2.1
Missing	0	

Tracheostomy not present on admission (N=21)	N	%
Surgical	10	47.6
Percutwist	1	4.8
Ciaglia	1	4.8
Monodil. Ciaglia	5	23.8
Fantoni	2	9.5
Griggs	1	4.8
Other Kind	1	4.8
Unknown	0	0.0
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=21)	
Mean	9.3
SD	8.3
Median	8
Q1−Q3	6−10
Missing	0

Invasive monitoring of C.O. (N=11)	N	%
Swan Ganz	7	63.6
PICCO	4	36.4
LIDCO	0	0.0
Vigileo-PRAM	0	0.0
Other	0	0.0
Missing	0	

SDD (N=2)	N	%
Topical	2	100.0
Topical and systemic	0	0.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=23)	N	%
Only empirical	7	43.8
Only targeted	3	18.8
Targeted after empirical	5	31.2
Other	1	6.2
Missing	7	

Surgical interventions	N	%
No	544	97.8
Yes	12	2.2
Missing	0	

Number of surgical interventions	N	%
0	544	97.8
1	7	1.3
2	4	0.7
3	0	0.0
>3	1	0.2
Missing	0	

Surgical interventions Days from admission	
Mean	13.5
SD	11.4
Median	10
Q1−Q3	7−16
Missing	0

Surgical interventions (top 10)	N	%
Orthopaedic surgery	5	0.9
Neurosurgery	4	0.7
ENT surgery	3	0.5
Gastrointestinal surgery	3	0.5
Other surgery	2	0.4
Maxillo-Facial surgery	1	0.2
Plastic surgery	1	0.2
-	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Non surgical interventions	N	%
No	550	98.9
Yes	6	1.1
Missing	0	

Non surgical interventions Days from admission	
Mean	10.0
SD	7.4
Median	7
Q1−Q3	6−9
Missing	1

Non surgical interventions	N	%
Therapeutic endoscopy (bronchoscopy excluded)	4	0.7
Interventional radiology	1	0.2
Interventional neuroradiology	1	0.2
Interventional cardiology	0	0.0
Interventional endoscopy	0	0.0
Therapeutic bronchoscopy	0	0.0
Missing	0	

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Outcome indicators - Pediatric patients evaluated with PIM 3

ICU outcome	N	%
Dead	33	5.9
Transferred to same hospital	454	81.7
Transferred to other hospital	56	10.1
Discharged home	13	2.3
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=510)	N	%
Ward	469	92.0
Other ICU	0	0.0
High dependency care unit	24	4.7
Rehabilitation	15	2.9
Day hospital or Long-term care	2	0.4
Missing	0	

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

Transferred to Same hospital (N=454)	N	%
Ward	426	93.8
Other ICU	0	0.0
High dependency care unit	21	4.6
Rehabilitation	7	1.5
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=56)	N	%
Ward	43	76.8
Other ICU	0	0.0
High dependency care unit	3	5.4
Rehabilitation	8	14.3
Day hospital or Long-term care	2	3.6
Missing	0	

ICU mortality	N	%
Alive	523	94.1
Dead	33	5.9
Missing	0	

Timing of ICU mortality (N=33)	N	%
Daytime (08:00AM - 07:59PM)	26	78.8
Nighttime (08:00PM - 07:59AM)	7	21.2
Weekdays (Monday - Friday)	25	75.8
Weekend (Saturday - Sunday)	8	24.2
Missing	0	

C.A.M. activation (N=33)	N	%
Yes, with organ donation	7	21.2
Yes, without organ donation	2	6.1
No, with organ donation	0	0.0
No, without organ donation	24	72.7
Missing	0	

Tissue removal (N=33)	N	%
Yes, with C.A.M. activation	3	9.1
Yes, without C.A.M. activation	0	0.0
No	30	90.9
Missing	0	

Hospital mortality	N	%
Dead	35	6.3
Transf. to other acute-care hospital	63	11.4
Transf. to other type of hosp. stay	41	7.4
Nursing home	9	1.6
Voluntary discharge	2	0.4
Discharged home	402	72.8
Missing	4	

To other type of H stay (N=41)	N	%
Rehabilitation in the same institute	11	26.8
Rehabilitation in other institute	25	61.0
DH/long-term care, same inst.	1	2.4
DH/long-term care, other inst.	4	9.8
Missing	0	

Disch. terminally ill (N=517)	N	%
Yes	1	0.2
No	516	99.8
Missing	0	

Hospital mortality	N	%
Alive	516	93.5
Dead	36	6.5
Missing	4	

Timing of hosp. mortality (N=36)	N	%
In ICU	33	91.7
Within 24 hours after ICU	0	0.0
24-47 hours after ICU	0	0.0
48-71 hours after ICU	1	2.8
72-95 hours after ICU	0	0.0
After 95 hours after ICU	2	5.6
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=3)	
Mean	11.3
SD	8.1
Median	15
Q1−Q3	8.5−16
Missing	0

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Outcome indicators - Pediatric patients evaluated with PIM 3

Last hospital mortality	N	%
Alive	516	93.5
Dead	36	6.5
Missing	4	

Expected outcome (N=523)	N	%
Recovery/resolution of acute episode	502	96.0
Palliative care grade 1	4	0.8
Palliative care grade 2	2	0.4
Palliative care grade 3	4	0.8
Palliative care grade 4	11	2.1
Missing	0	

Outcome treatments (N=21)	N	%
NON invasive ventilation	2	9.5
Invasive ventilation	3	14.3
Oxygen therapy	4	19.0
Tracheostomy	4	19.0
Diuretics grugs	0	0.0
Inotropic agents drugs	0	0.0
Antiepileptics drugs	13	61.9
Dialytic therapy	0	0.0
Limb replacement	0	0.0
Nasogastric tube	3	14.3
Ostomies	8	38.1
Home based parenteral nutrition	0	0.0
Motor physiotherapy	7	33.3
Respiratory physiotherapy	4	19.0
Posture	5	23.8
Psychological counselling	0	0.0
Missing	0	

ICU stay (days)	
Mean	4.3
SD	9.0
Median	1
Q1−Q3	1−3
Missing	0

ICU stay (days) **Alive** (N=523)	
Mean	4.1
SD	8.2
Median	1
Q1−Q3	1−3
Missing	0

ICU stay (days) **Dead** (N=33)	
Mean	7.2
SD	17.1
Median	1
Q1−Q3	1−6
Missing	0

Stay after ICU (days) **Alive** (N=523)	
Mean	8.7
SD	11.5
Median	5
Q1−Q3	2−10
Missing	5

Hospital stay (days)	
Mean	14.5
SD	20.7
Median	9
Q1−Q3	4−16
Missing	4

Hospital stay (days) **Alive** (N=516)	
Mean	14.2
SD	17.9
Median	9
Q1−Q3	5−16
Missing	0

Hospital stay (days) **Dead** (N=36)	
Mean	18.0
SD	44.6
Median	3.5
Q1−Q3	1−16
Missing	0

Appendix

National report for general ICUs - Year 2017
Prognostic models - Adult patients

Model: Logistic regression.
Dependent variable: Hospital mortality°.
Sample used for model development: Adults patients from general Italian ICUs.
Sample size (TRAINING set): 39243 patients.

Independent variables	Coefficients (95% CI)	Odds Ratio (95% CI)	*p*
Intercept	-3.51 (-3.71;-3.3)	/	/
Miscellanea			
Min((Age - 74), 0)	0.03 (0.03;0.04)	/	×
Max((Age - 74), 0)	0.07 (0.06;0.08)	/	
Min((BMI - 25), 0)	-0.07 (-0.09;-0.06)	0.93 (0.91;0.94)	<0.001
Surgical status (Non surgical vs. Elective surgical)	0.58 (0.42;0.74)	/	×
Surgical status (Emergency surgical vs. Elective surgical)	0.35 (0.23;0.48)	/	
Stay before ICU (days) (logarithm)	0.29 (0.25;0.33)	/	×
Admitted in hospital the same day of ICU admission (No vs. Yes)	-0.02 (-0.13;0.1)	/	×
Reason for admission: Monitoring/Weaning vs. Intensive Treatment (Only one support)	-0.74 (-0.86;-0.63)	0.47 (0.42;0.53)	×
Reason for admission: Monitoring/Weaning vs. Intensive Treatment (Ventilatory and cardiovascular support)	0.33 (0.19;0.48)	1.39 (1.21;1.61)	
Ward of admission: Medical ward/High dependency care unit vs. Surgical ward/Other ICU	0.19 (0.09;0.29)	/	×
Ward of admission: Emergency room vs. Surgical ward/Other ICU	0.04 (-0.07;0.15)	/	
Ward of admission: Long-term chronic care hospital vs. Surgical ward/Other ICU	0.45 (0.09;0.81)	/	
Source of admission: Other hospital vs. Same hospital/ Long-term chronic care hospital/Directly from the community	-0.22 (-0.32;-0.13)	0.8 (0.73;0.88)	<0.001
From Operating theatre (Yes vs. No)	-0.24 (-0.37;-0.11)	0.78 (0.69;0.89)	<0.001
Physiopatological components			
Bilirubin (mg/100ml) (1.2-5.9 vs. <1.2)	0.2 (0.12;0.28)	1.22 (1.13;1.32)	<0.001
Bilirubin (mg/100ml) (>=6 vs. <1.2)	0.79 (0.52;1.05)	2.2 (1.69;2.85)	
WBC (10^9/L) (<1 vs. 1-20)	0.28 (0.05;0.5)	1.32 (1.06;1.65)	<0.001
WBC (10^9/L) (>=20 vs. <20)	0.22 (0.13;0.3)	1.24 (1.14;1.35)	
Sodium (mEq/L) (>=145 vs. 125-144)	0.24 (0.14;0.33)	1.27 (1.15;1.39)	<0.001
Heart rate (bpm) (<40 vs. 40-120)	0.12 (-0.14;0.38)	/	×
Heart rate (bpm) (>120 vs. 40-120)	0.15 (0.07;0.24)	/	
Serum urea (mg/100 ml) (>=60 vs. <60)	0.24 (0.15;0.33)	/	×
Platelets (10^3/mm3) (50-99 vs. >=100)	0.29 (0.18;0.4)	1.34 (1.2;1.49)	<0.001
Platelets (10^3/mm3) (<50 vs. >=100)	0.62 (0.46;0.77)	1.85 (1.59;2.17)	
Systolic Blood Pressure (mmHg) (<70 vs. >=100)	0.63 (0.5;0.76)	/	×
Systolic Blood Pressure (mmHg) (70-99 vs. >=100)	0.19 (0.11;0.27)	/	
Urine Output (L/24h) (<0.4 vs. >=1)	0.48 (0.31;0.65)	/	×
Urine Output (L/24h) (0.4-0.99 vs. >=1)	0.25 (0.15;0.34)	/	
PaO2/FiO2 (100*mmHg/%) (100-199 vs. >=200)	0.22 (0.15;0.3)	1.25 (1.16;1.35)	<0.001
PaO2/FiO2 (100*mmHg/%) (<100 vs. >=200)	0.68 (0.56;0.81)	1.98 (1.75;2.24)	
Clinical conditions on admission			
Acute intoxication (Yes vs. No)	–1.29 (-1.63;-0.95)	0.28 (0.2;0.39)	<0.001
Spontaneous Intraparenchymal bleeding (Yes vs. No)	0.87 (0.7;1.04)	2.38 (2.01;2.82)	<0.001
Lung cancer (Yes vs. No)	1.28 (0.94;1.62)	3.6 (2.55;5.07)	<0.001
Acute pancreatitis (Yes vs. No)	0.55 (0.26;0.84)	1.73 (1.3;2.31)	<0.001
Seizures (Yes vs. No)	-0.33 (-0.53;-0.13)	0.72 (0.59;0.88)	0.001
Bowel ischaemia (Yes vs. No)	0.43 (0.19;0.66)	1.53 (1.21;1.94)	<0.001
Spontaneous Subarachnoid haemorrhage (Yes vs. No)	0.5 (0.27;0.72)	1.64 (1.32;2.05)	<0.001
Cardiac arrest (Yes vs. No)	0.1 (-0.07;0.27)	/	×
Cerebral artery stroke (Yes vs. No)	0.27 (0.09;0.44)	1.3 (1.1;1.55)	0.003
Left heart failure with pulmonary edema (Yes vs. No)	-0.42 (-0.57;-0.27)	0.65 (0.56;0.76)	<0.001
Spontaneous Hydrocephalus (Yes vs. No)	0.76 (0.23;1.3)	2.14 (1.25;3.66)	0.006
Metabolic/postanoxic encephalopathy (Yes vs. No)	0.59 (0.38;0.8)	1.8 (1.46;2.22)	<0.001
Intracranial hypertension (Yes vs. No)	0.71 (0.21;1.21)	2.03 (1.24;3.34)	0.006
Endocarditis (Yes vs. No)	0.79 (0.35;1.23)	2.21 (1.42;3.43)	<0.001
Peritonites (Yes vs. No)	0.3 (0.14;0.46)	1.35 (1.15;1.58)	<0.001
Skin or soft tissue infection (Yes vs. No)	0.56 (0.34;0.79)	1.75 (1.4;2.19)	<0.001
Cholecystitis/cholangitis (Yes vs. No)	-0.56 (-0.82;-0.3)	0.57 (0.44;0.74)	<0.001
Urinary tract infection (Yes vs. No)	-0.4 (-0.58;-0.22)	0.67 (0.56;0.8)	<0.001
CNS infection (Yes vs. No)	-0.47 (-0.82;-0.11)	0.63 (0.44;0.89)	0.008
SEPSIS (Yes vs. No)	0.65 (0.45;0.85)	/	×
SEPTIC SHOCK (Yes vs. No)	-0.16 (-0.33;0.01)	/	
Maxillofacial fracture (Yes vs. No)	-0.64 (-0.94;-0.34)	0.53 (0.39;0.71)	<0.001
Traumatic Subdural haematoma (Yes vs. No)	0.49 (0.28;0.71)	1.64 (1.32;2.03)	<0.001
Trauma Pelvis/bone/joint and muscle (Yes vs. No)	-0.33 (-0.5;-0.16)	0.72 (0.61;0.85)	<0.001
Spinal cord injury with complete neurologic deficit (Yes vs. No)	-0.33 (-0.5;-0.16)	0.72 (0.61;0.85)	<0.001
Traumatic diffuse injury with oedema (Yes vs. No)	0.86 (0.24;1.48)	2.36 (1.27;4.39)	0.01

(to be continued)

°For patients transferred to other ICU or to rehabilitation/high dependency care unit in other hospital, it is considered the outcome at the last hospital discharge.
× *See interaction significance.*

Comorbidities			
Severe COPD (Yes vs. No)	0.29 (0.17;0.4)	1.33 (1.19;1.49)	<0.001
Dementia (Yes vs. No)	0.82 (0.51;1.13)	/	×
Malignant haematological disease (Yes vs. No)	0.53 (0.34;0.71)	1.7 (1.41;2.04)	<0.001
Restrictive lung disease (Yes vs. No)	0.69 (0.52;0.85)	1.99 (1.68;2.35)	<0.001
Immunosuppression (Yes vs. No)	0.43 (0.23;0.64)	1.54 (1.26;1.89)	<0.001
Any tumour without metastasis (Yes vs. No tumor)	0.19 (0.09;0.29)	1.21 (1.1;1.34)	<0.001
Metastatic cancer (Yes vs. No tumor)	0.93 (0.78;1.08)	2.53 (2.18;2.93)	
Moderate or severe liver disease (Yes vs. No)	0.47 (0.28;0.66)	1.6 (1.32;1.94)	<0.001
Peripheral vascular disease (Yes vs. No)	0.16 (0.07;0.26)	1.18 (1.07;1.3)	0.001
Diabetes: Type II diabetes with insuline treatment vs. No diabetes or type I diabetes or type II diabetes without insuline treatment	0.24 (0.13;0.35)	1.27 (1.14;1.43)	<0.001
Neurodegenerative/Neuromuscular disease (Yes vs. No)	0.37 (0.2;0.53)	1.44 (1.23;1.7)	<0.001
Pressure ulcer: Stadium II, III, IV vs. Other	0.58 (0.3;0.86)	1.79 (1.35;2.37)	<0.001
NYHA class II-III (Yes vs. No heart failure)	0.18 (0.08;0.27)	1.19 (1.09;1.31)	<0.001
NYHA class IV (Yes vs. No heart failure)	0.46 (0.27;0.65)	1.58 (1.31;1.91)	
Hypertension (Yes vs. No)	-0.14 (-0.21;-0.07)	0.87 (0.81;0.93)	0.001
Severe psychosis (Yes vs. No)	-0.32 (-0.52;-0.11)	0.73 (0.59;0.89)	0.002
Cerebrovascular disease (Yes vs. No)	0.13 (0.04;0.22)	1.14 (1.04;1.25)	0.004
End-stage renal disease (Yes vs. No)	-0.22 (-0.43;-0.02)	0.8 (0.65;0.98)	0.033
Organ failures			
GCS (3,4,5 vs. 15)	1.8 (1.51;2.08)	/	
GCS (6,7,8 vs. 15)	0.98 (0.76;1.21)	/	
GCS (9,10,11,12,13,14 vs. 15)	0.47 (0.38;0.55)	/	×
GCS (Not evaluable in the first 24 hours in neurological patient* vs. 15)	1.1 (0.53;1.68)	/	
GCS (Not evaluable in the first 24 hours in NON-neurological patient* vs. 15)	0.29 (-0.27;0.86)	/	
Pupils in the first 24 hrs.: Bilaterally dilated and non-reactive/Unilaterally dilated and non-reactive/Unavailable/Unassessable vs. Bilaterally reactive and/or miotic	0.18 (-0.36;0.72)	/	×
Renal failure (AKIN): Mild vs None	0.14 (0.05;0.23)	/	
Renal failure (AKIN): Moderate vs None	0.35 (0.23;0.47)	/	×
Renal failure (AKIN): Severe vs None	0.36 (0.15;0.58)	/	
Coma (Yes vs. No)	-0.14 (-0.34;0.07)	/	×
Neurologic failure: Toxic coma (Yes vs. No)	-0.75 (-1.33;-0.17)	/	×
Neurologic failure: Not evaluable (Yes vs. No)	-0.11 (-0.23;0.02)	/	×
Non shock (Yes vs. No)	-0.2 (-0.38;-0.02)	/	×
Neurogenic shock (Yes vs. No)	0.36 (-0.02;0.74)	/	×
Anaphylactic shock (Yes vs. No)	-2.2 (-3.31;-1.09)	0.11 (0.04;0.34)	<0.001
Hypovolemic (non-haemorrhagic) shock (Yes vs. No)	-0.32 (-0.5;-0.15)	0.72 (0.61;0.86)	<0.001
Cardiovascular failure with shock (Yes vs. No)	-0.05 (-0.22;0.12)	/	×
Cardiovascular failure: Mixed shock (Yes vs. No)	0.39 (0.16;0.62)	/	×
Hepatic failure (Yes vs. No)	0.72 (0.4;1.05)	2.06 (1.49;2.85)	<0.001
Metabolic failure (Yes vs. No)	0.24 (0.16;0.32)	1.27 (1.18;1.38)	<0.001
Surgical and non surgical procedures			
Gastrointestinal surgery (Yes vs. No)	0.3 (0.17;0.42)	1.34 (1.19;1.52)	<0.001
Abdominal vascular surgery (Yes vs. No)	0.48 (0.25;0.71)	1.61 (1.28;2.03)	<0.001
Thoracic surgery (Yes vs. No)	-0.62 (-0.99;-0.24)	0.54 (0.37;0.78)	<0.001
Pancreatic surgery (Yes vs. No)	0.76 (0.43;1.1)	2.15 (1.54;2.99)	<0.001
Interactions among independent variables			
Pupils in the first 24 hrs. (Bilaterally dilated and non-reactive/Unilaterally dilated and non-reactive/Unavailable/Unassessable) × GCS (3,4,5)	1.71 (1.12;2.29)	/	<0.001
Pupils in the first 24 hrs. (Bilaterally dilated and non-reactive/Unilaterally dilated and non-reactive/Unavailable/Unassessable) × GCS (6,7,8)	0.67 (0.02;1.33)	/	
Pupils in the first 24 hrs. (Bilaterally dilated and non-reactive/Unilaterally dilated and non-reactive/Unavailable/Unassessable) × Admitted in hospital the same day of ICU admission	0.26 (0.1;0.41)	/	0.001
GCS (3,4,5) × Serum urea (mg/100 ml) (>=60)	-0.38 (-0.59;-0.18)	/	<0.001
GCS (Not evaluable in the first 24 hours in NON-neurological patient*) × Surgical status (Non surgical)	0.4 (0.21;0.59)	/	<0.001
GCS (3,4,5 or Not evaluable in the first 24 hours in neurological patient*) × Ward of admission (Emergency room)	0.33 (0.13;0.53)	/	0.001
GCS (3,4,5) × Neurogenic shock	0.8 (0.14;1.45)	/	0.014
GCS (Not evaluable in the first 24 hours in neurological patient*) × SEPSIS	-0.84 (-1.32;-0.37)	/	<0.001
GCS (3,4,5) × Stay before ICU (days) (logarithm)	-0.23 (-0.34;-0.12)	/	<0.001
Heart rate (bpm) (<40) × Urine Output (L/24h) (<0.4)	0.69 (0.21;1.18)	/	0.004
Systolic Blood Pressure (mmHg) (<100) × Renal failure (AKIN) (Severe)	0.35 (0.13;0.56)	/	0.002
Non shock × Coma	-0.29 (-0.55;-0.02)	/	0.035
SEPSIS × Reason for admission (Intensive Treatment)	-0.48 (-0.68;-0.28)	/	<0.001
SEPSIS × Cardiovascular failure (Mixed shock)	-1.26 (-2.16;-0.36)	/	0.005
SEPSIS × Serum urea (mg/100 ml) (>=60)	-0.24 (-0.39;-0.09)	/	0.001
SEPTIC SHOCK × Systolic Blood Pressure (mmHg) (<70)	-0.36 (-0.57;-0.14)	/	0.001
SEPTIC SHOCK × Heart rate (bpm) (<40)	1.71 (0.63;2.79)	/	<0.001
Max((Age - 74), 0) × Dementia	-0.04 (-0.07;-0.02)	/	<0.001
Dementia × Reason for admission (Intensive Treatment)	-0.39 (-0.69;-0.1)	/	0.009
Urine Output (L/24h) (<0.4) × Admitted in hospital the same day of ICU admission	0.29 (0.12;0.46)	/	<0.001
Urine Output (L/24h) (<0.4) × Cardiovascular failure with shock	0.39 (0.21;0.57)	/	<0.001
Cardiac arrest × Neurologic failure (Not evaluable)	0.59 (0.3;0.87)	/	<0.001

Dependent variable explained		**Goodness-of-fit**	
Likelihood Ratio Test:	17099	Area under the ROC curve:	0.891
Degree of freedom:	119	GiViTI Calibration Test:	1.53
p-value:	<0.0001	p-value:	0.217
		Polynomial Degree:	2

** A neurological patient is a one with an altered consciousness, probably due to a direct brain injury. It is defined by the presence of at least one of these clinical conditions on admission: Cerebral artery stroke, Vertebral basilar ischemic stroke, Intracranial hypertension, Spontaneous Hydrocephalus, Non traumatic cerebral oedema, Metabolic/postanoxic encephalopathy, Seizures, Brain tumour, Cerebral Aneurysm, AVM (ArterioVenous Malformation), Chronic Subdural haematoma, Spontaneous Subarachnoid haemorrhage, Spontaneous Intraparenchymal bleeding, CNS degenerative disease, Brain and skull malformations, Cerebral contusion/laceration, Traumatic diffuse injury without oedema, Traumatic diffuse injury with oedema, Extradural/epidural haematoma, Traumatic Subdural haematoma, Traumatic intraparenchymal bleeding, Traumatic subarachnoid haemorrhage, Skull fracture, NON-surgical CNS infection, Post-surgical CNS infection, Ventriculostomy-related CNS infection.*

× *See interaction significance.*

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, and GiViTI 2017 prognostic models. The latter are reported for both the overall population and the subgroups presented in the report. Patients with valid data for the model were splitted in two subgroups in order to build the model on the first one (training set) and to validate it on the second one (validation set).

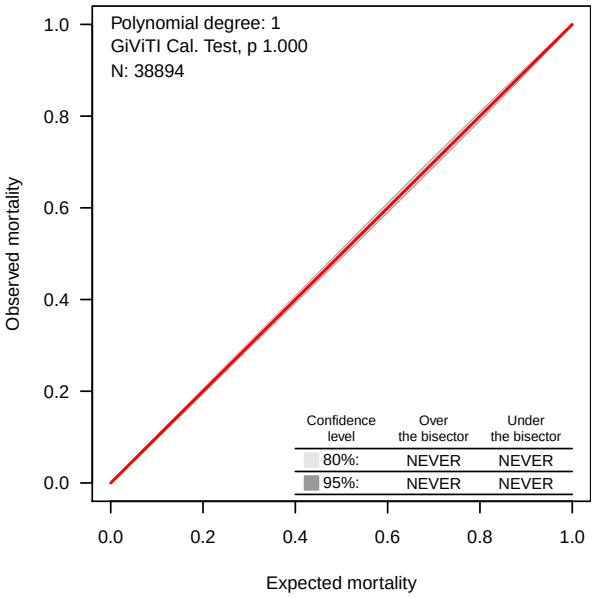
These belts serve as a representation of the validity of the models used to evaluate the performance of each ICU. A model is well calibrated, and thus a useful tool for evaluating individual departments, when the bisector is fully included in the belt. Only when this occurs can a deviation from the bisector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

Moreover, the calibration belt built on 2017 data using the GiViTI 2016 model is reported. The aim of this belt is to investigate 2016 to 2017 difference in terms of performance of the GiViTI general ICUs.

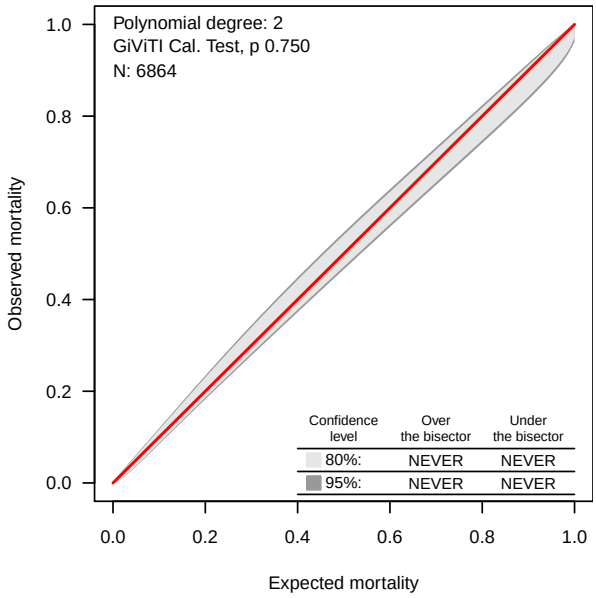
For further informations please look at [PLoS ONE 6(2): e16110].

National report for general ICUs - Year 2017
Validity of the models - Calibration belts

Predictive model: GiViTI 2017 (training set)

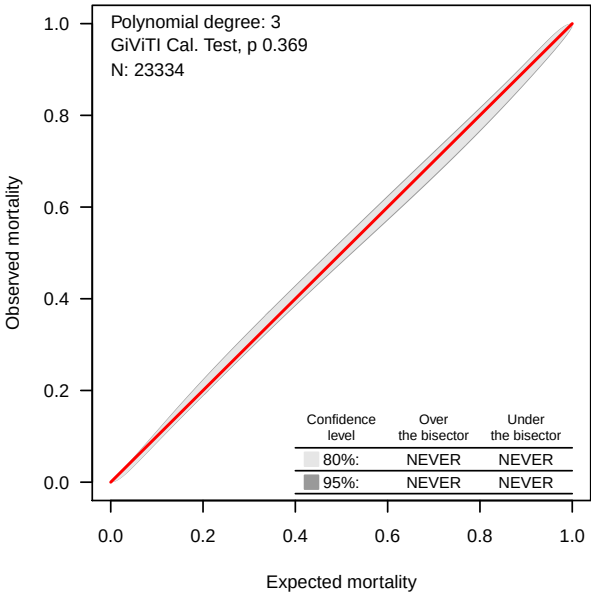


Predictive model: GiViTI 2017 (validation set)

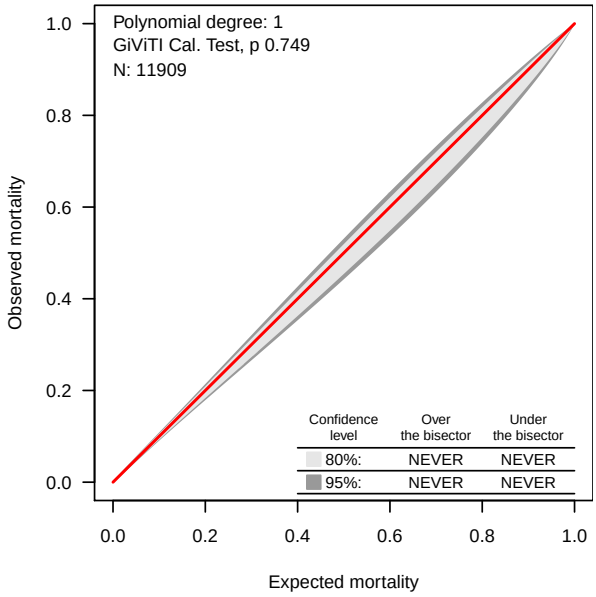


UNIFORMITY OF FIT

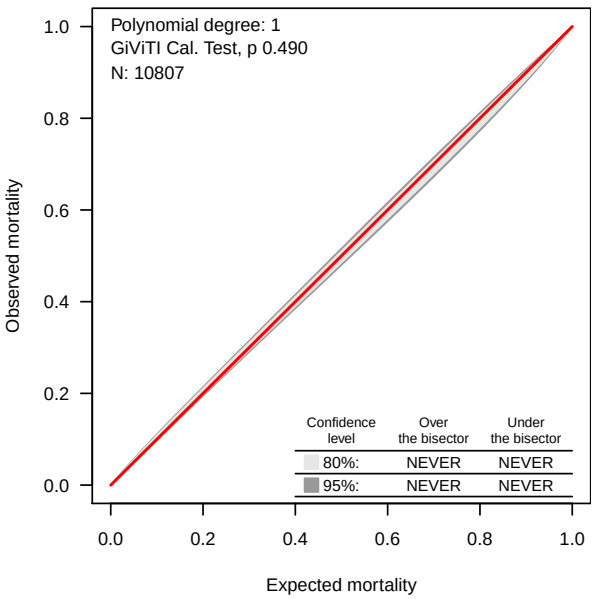
Predictive model: GiViTI 2017
Non surgical



Predictive model: GiViTI 2017
Elective surgical



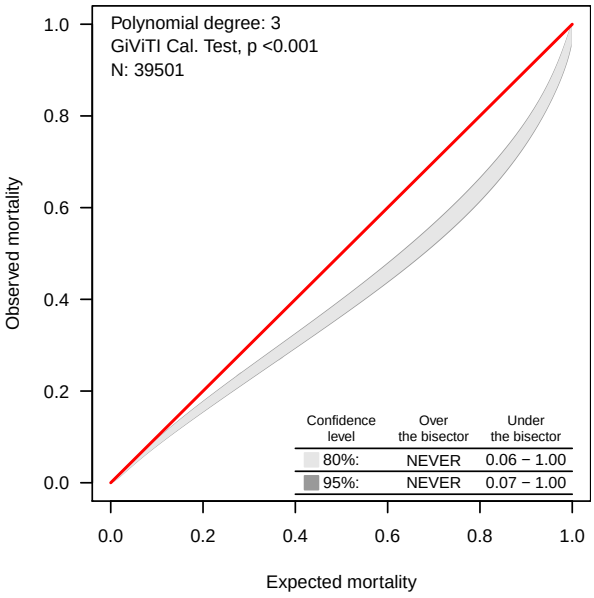
Predictive model: GiViTI 2017
Emergency surgical



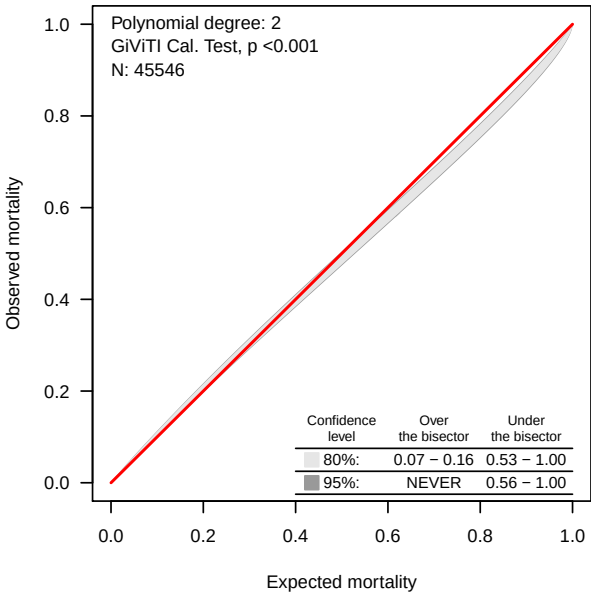
National report for general ICUs - Year 2017
Validity of the models - Calibration belts

EXTERNAL SCORE

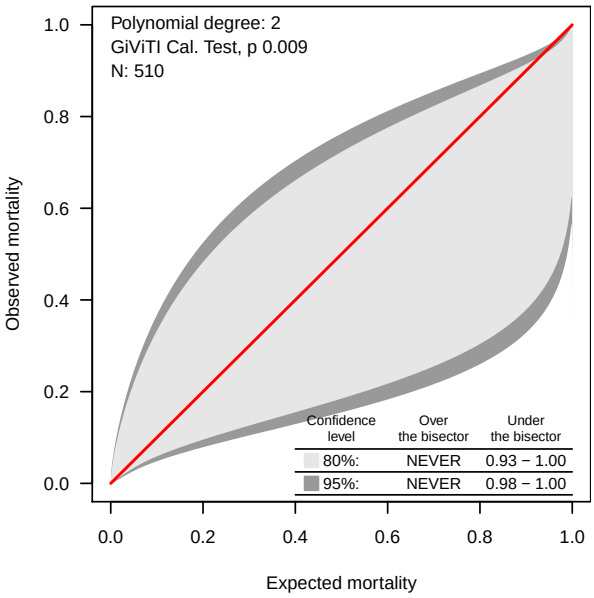
Predictive model: SAPSII



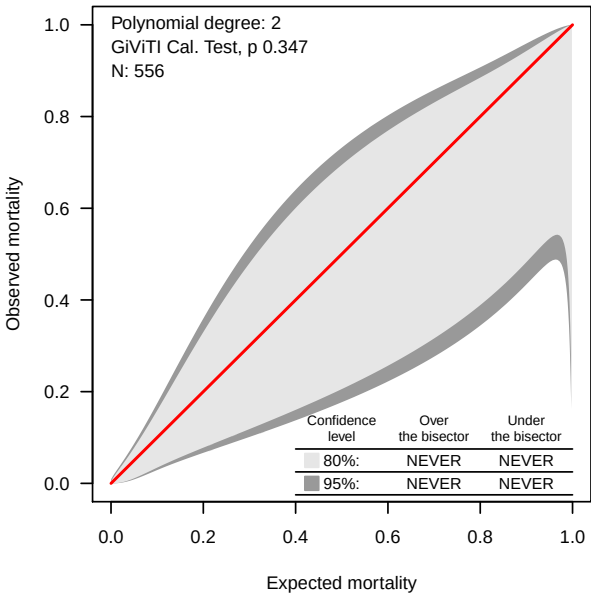
Predictive model: GiViTI 2016



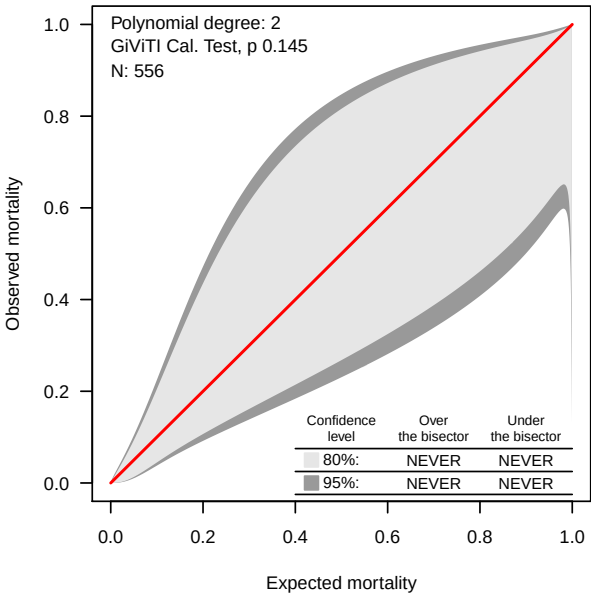
Predictive model : PELOD



Predictive model: PIM2



Predictive model: PIM3



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