GiViTI

Gruppo Italiano per la Valutazione degli Interventi In Terapia Intensiva

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Report
PROSAFE project

Year 2017

National report (6 ICUs)

SLOVENIA

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PROSAFE project - **National report** (6 ICUs)
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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

The table on page 17 summarizes the participation in the project of the 234 ICUs which collected valid data in 2017 for a period of at least 4 months.

Description of the hospitals and ICUs

This section presents the organizational-structural features of the ICUs included in the report. The information (except for the information shown on page 21, which is the result of joint analysis of structural data and those collected during the year via the software) is taken from the 'Structural Data' form (available on the GiViTI portal at https://givitiweb.marionegri.it/). Absolute numbers, percentages and the number of missing data are reported for the categorical variables; the mean, standard deviation, median and Q1 (first quartile: the value below which lie 25% of the population) and Q3 (third quartile: the value below which lie 75% of the population) serve as indicators for the continuous variables.
Below are a few tips on how to correctly interpret the statistics.

Number of accredited beds Number of beds officially accredited.

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

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

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

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

Indicators of utilization Data on the number of available beds, total admissions in 2017 and ICU stay days were used to calculate indicators of utilization, i.e. indicators able to measure utilization levels and healthcare facility activity levels.

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

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

- 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 23 presents the various subgroups of analysed patients. PROSAFE has a very accurate indicator of the completeness and validity of the data entered on each patient, i.e. status.
The program envisages 5 status levels:

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

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

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

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

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

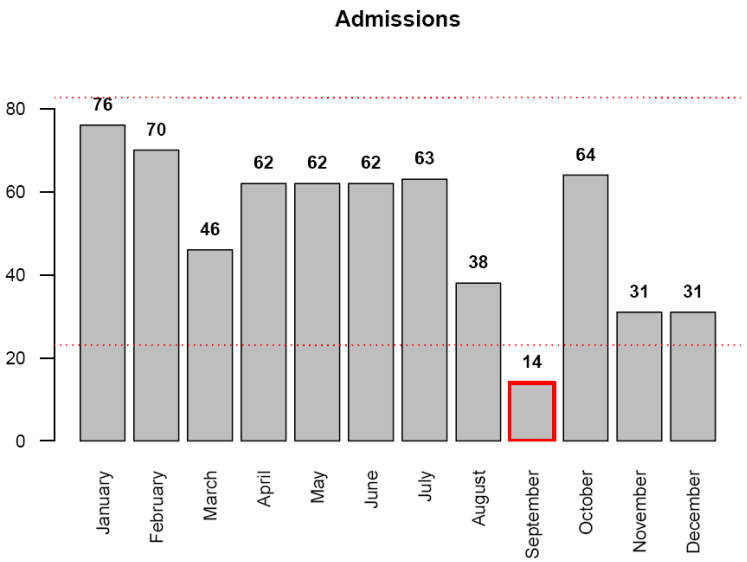
To more clearly illustrate the selection methods used in the choice of valid data, we present an extract from the data validity report of a randomly selected, anonymized ICU.

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

Centre XX000 - Year 2014
Data validity
Patients admitted: 619

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

Admissions	
Mean	51.6
Median	62.0
SD	19.1
VC	37.1

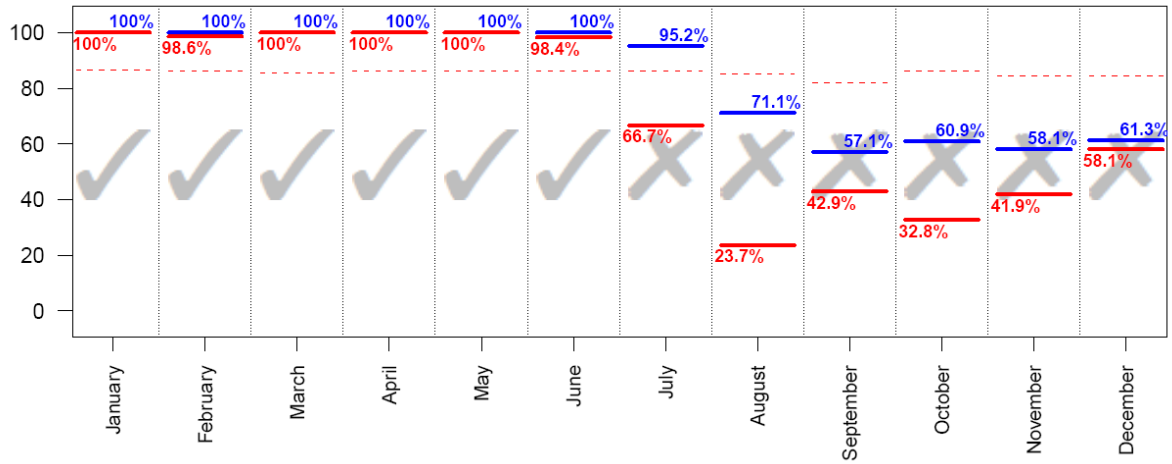


WARNING! The highligthed months have a number of patients quite different from the average. Please verify the correctness of the data and, particularly, that all consecutive patients have been registered in the Prosafe software.

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

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.

Description of hospitals (N=6) - **Year 2017**

Number of beds in hospital	N	%
< 300 beds	2	33.3
300 - 800 beds	3	50.0
> 800 beds	1	16.7
Missing	0	

Type of ICUs present in hospital	N	%
General	0	0.0
Medical	5	83.3
Surgical	6	100.0
Neurological/neurosurgical	1	16.7
Cardiosurgical	1	16.7
Burns	1	16.7
Post-transplantations	0	0.0
Other	1	16.7

Type of subICUs present in hospital	N	%
General	1	16.7
Surgical	4	66.7
Cardiological	1	16.7
Respiratory	0	0.0
Neurological (stroke unit)	1	16.7
Other	2	33.3

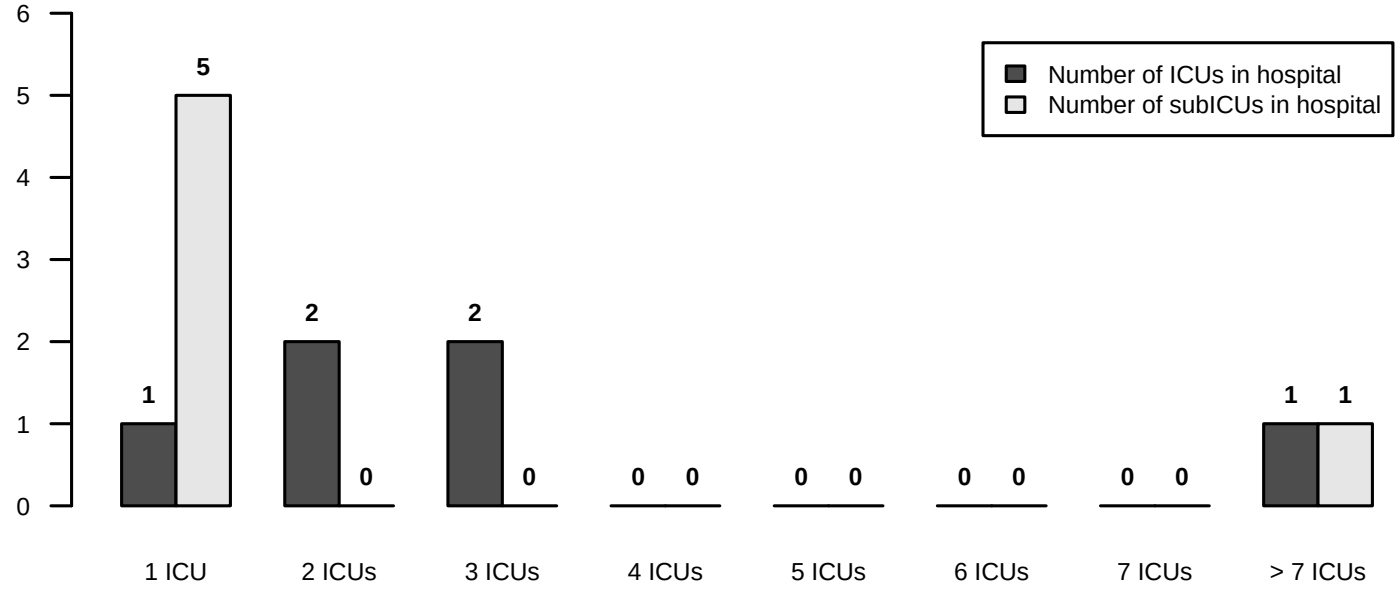
Non surgical specialties	N	%
Cardiology	5	83.3
Pulmonology	4	66.7
Nephrology	5	83.3
Infection disease	3	50.0
Pediatric	5	83.3
Neonatology	1	16.7
Neurology	5	83.3
Haematology	4	66.7
Emergency room	5	83.3
Traumatology	5	83.3
Emergency medical	4	66.7

Surgical specialties (independent ward)	N	%
Neurosurgery	1	16.7
Cardiosurgery	1	16.7
Major vascular surgery	4	66.7
Thoracic surgery	1	16.7
Pediatric surgery	2	33.3
Transplantation activities	1	16.7

Surgical specialties (procedures only)	N	%
Neurosurgery	5	83.3
Cardiosurgery	1	16.7
Major vascular surgery	1	16.7
Thoracic surgery	1	16.7
Pediatric surgery	4	66.7
Transplantation activities	2	33.3

Services/activities available in H (h24)	N	%
Neuroradiology	3	50.0
Interventional neuroradiology	2	33.3
Interventional vascular radiology	2	33.3
CT scan	5	83.3
MRI	3	50.0
Interventional hemodynamic	3	50.0
Endoscopy	5	83.3
Bronchoscopy	4	66.7
Hyperbaric chamber	0	0.0

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



Description of ICUs (N=6) - **Year 2017**

Number of activable beds	
Mean (SD)	11.0 (5.4)
Median (Q1−Q3)	10 (8−11)
Missing	1

Number of beds declared to hospital	
Mean (SD)	128.0 (160.8)
Median (Q1−Q3)	20 (11−263)
Missing	1

University affiliation	N	%
Yes	4	66.7
No	2	33.3
Missing	0	

Square meter per bed	
Mean (SD)	19.0 (14.6)
Median (Q1−Q3)	14.6 (10.2−29.3)
Missing	0

Clinical psychologist	N	%
No	3	50.0
For relatives	1	16.7
For patients	3	50.0
For personnel	0	0.0

ICU Structure	N	%
NON OPEN-SPACE	2	33.3
OPEN-SPACE (or alike)	4	66.7
Missing	0	

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

Declared beds per physician (average)	
Mean (SD)	81.7 (103.9)
Median (Q1−Q3)	9.7 (5−177.2)
Missing	1

Nurses	N	%
Dedicated to ICU only	2	40.0
Dedicated to ICU on a rotation basis	0	0.0
Dedicated to ICU only and on a rotation basis	3	60.0
Missing	1	

Declared beds per nurse (average)	
Mean (SD)	26.5 (35.2)
Median (Q1−Q3)	2.4 (1.5−50)
Missing	1

Number of hours conceeded for relatives' visits	N	%
1	4	66.7
2	1	16.7
3-4	1	16.7
5-12	0	0.0
13-20	0	0.0
>20	0	0.0
Missing	0	

Maximum number of visitors per patient	N	%
One	1	16.7
Two	4	66.7
Three or more	1	16.7
Missing	0	

Biomedical devices per declared bed	Median	Q1-Q3	<5 Years (mean %)
Basic ICU monitors (ECG, NIPB, SaO2)	0.0	0.0−1.0	0.0
Advanced ICU monitors	1.0	0.0−1.0	40.0
Invasive monitoring of cardiac output (Swan-Ganz)	0.0	0.0−0.0	0.0
Invasive monitoring of cardiac output (PiCCO)	0.0	0.0−0.2	12.5
Invasive monitoring of cardiac output (Vigileo)	0.0	0.0−0.2	25.0
Non-invasive monitoring of cardiac output (impedentiometry)	0.0	0.0−0.0	75.0
Defibrillators	0.1	0.0−0.1	0.0
Both invasive and non invasive ventilators	0.6	0.1−1.0	32.7
Invasive ventilators	0.6	0.0−1.0	31.5
Non invasive ventilators	0.1	0.0−0.3	47.9
Syringe pumps	3.2	0.2−4.0	43.2
Peristaltic pumps	0.0	0.0−0.1	38.9

Biomedical equipment in ICU	N	%
Transoesophageal echo	2	33.3
Basic ultrasounds	6	100.0
Advanced ultrasounds	3	50.0
Blood-gas analyzer	5	83.3
Haemodialysis - Haemofiltration	4	66.7
Transport ventilator	6	100.0
Fiberscope	6	100.0
Extracorporeal circulation system	0	0.0

Routine microbiological surveillance cultures	N	%
Yes	6	100.0
No	0	0.0
Missing	0	

Description of ICUs (N=6) - **Year 2017**

Patients admitted	
Mean (SD)	392.5 (213.0)
Median	443.1
Q1−Q3	294.3−541.4
Missing	2

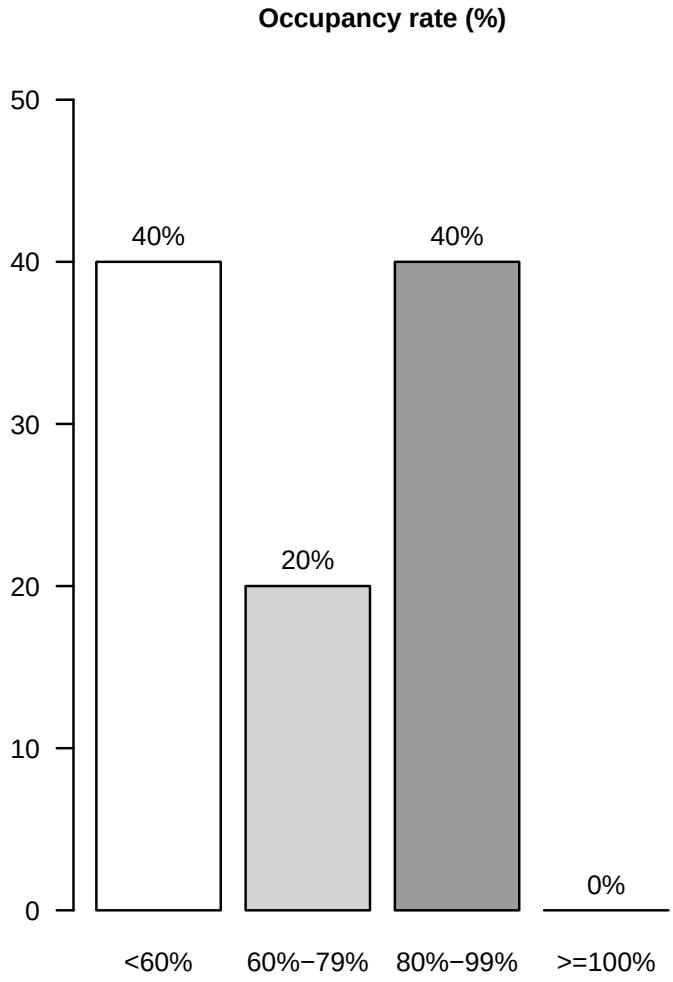
Occupancy rate (%)	
Mean (SD)	77.0 (11.4)
Median	82.4
Q1−Q3	73.2−83.6
Missing	3

Rotation index (patients/bed)	
Mean (SD)	31.6 (15.4)
Median	28.9
Q1−Q3	23.3−38.5
Missing	3

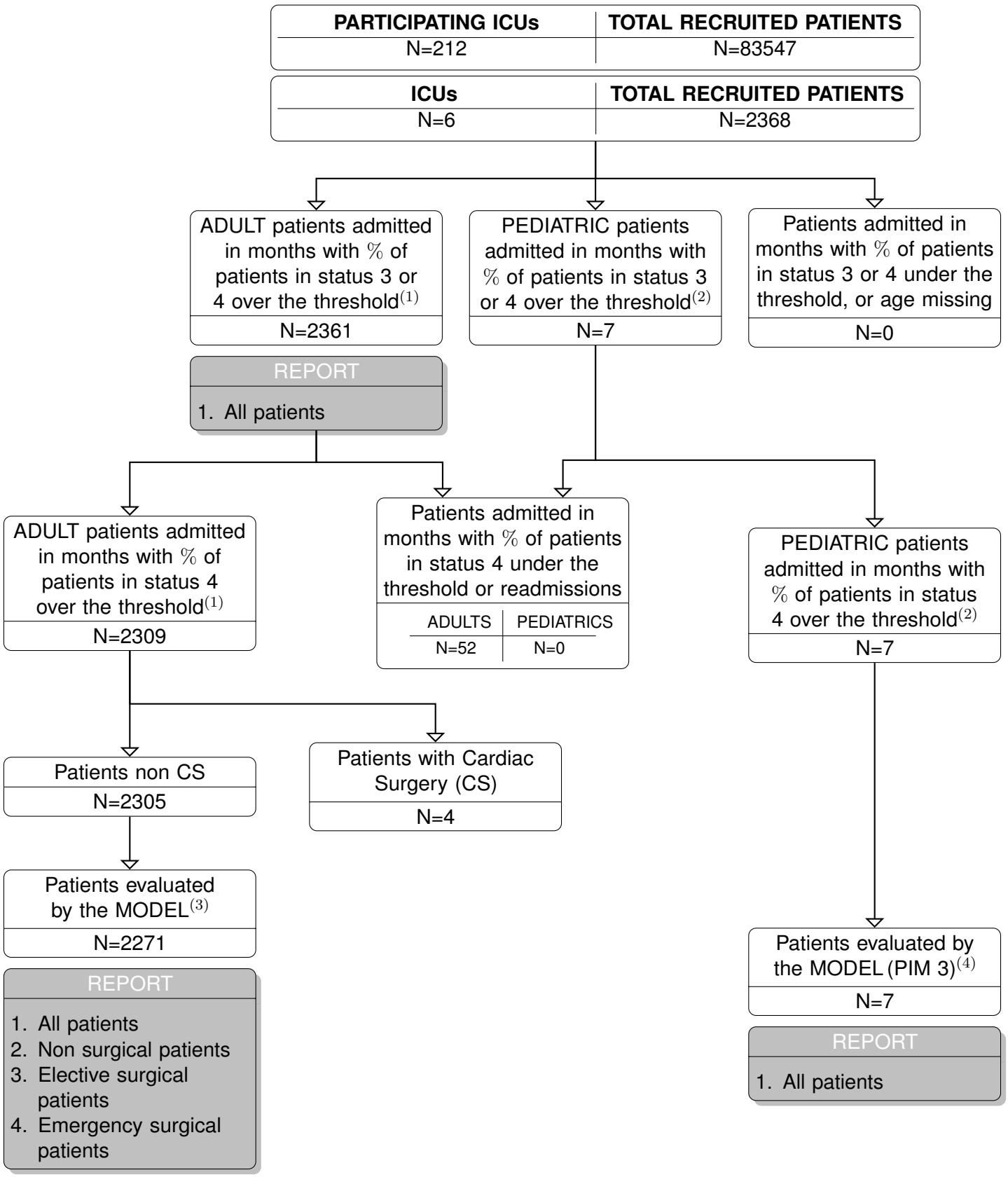
Turnover (hours)	
Mean (SD)	85.1 (81.1)
Median	45.3
Q1−Q3	38.5−111.8
Missing	3

Occupied beds per physician (average)	
Mean (SD)	4.5 (1.0)
Median	4.1
Q1−Q3	4.1−4.5
Missing	1

Occupied beds per nurse (average)	
Mean (SD)	1.4 (0.4)
Median	1.2
Q1−Q3	1.1−1.6
Missing	1



National report (6 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 - **Year 2017**
Characteristics on admission - Adult patients

Patients (N): 2361

Sex	N	%
Male	1486	62.9
Female	875	37.1
Missing	0	

Age (years)	N	%
17-45	293	12.4
46-65	746	31.6
66-75	599	25.4
>75	723	30.6
Missing	0	
Mean	65.2	
SD	16.5	
Median	67	
Q1−Q3	56−78	
Min−Max	17−98	

Body mass Index (BMI)	N	%
Underweight	79	3.4
Normal	965	41.2
Overweight	842	35.9
Obese	459	19.6
Missing	16	

Pregnancy status **Females** (N=875)	N	%
Not fertile	433	49.5
Not pregnant/Unknown	429	49.0
Currently pregnant	1	0.1
Post partum	12	1.4
Missing	0	

Comorbidities	N	%
No	359	15.2
Yes	2002	84.8
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	1290	54.6
Any tumour without metastasis	424	18.0
Arrhythmia	367	15.5
NYHA class II-III	366	15.5
Diabetes Type II without insulin tr.	271	11.5
Moderate or severe renal disease	262	11.1
Metastatic cancer	228	9.7
Peripheral vascular disease	179	7.6
Myocardial infarction	177	7.5
Diabetes Type II with insulin treatment	167	7.1
Missing	0	

Stay before ICU (days)	
Mean	4.5
SD	11.1
Median	1
Q1−Q3	0−3
Missing	4

Source of admission	N	%
Same hospital	2149	91.0
Other hospital	113	4.8
Long-term chronic care hospital	98	4.2
Directly from the community	1	0.0
Missing	0	

Ward of admission **Hospital** (N=2262)	N	%
Medical ward	268	11.8
Surgical ward	1246	55.1
Emergency room	545	24.1
Other ICU	101	4.5
High dependency care unit	102	4.5
Missing	0	

Reason for transfer from **Other ICU** (N=101)	N	%
Specialist expertise	24	23.8
Step-up care	19	18.8
Logistical/organizational reasons	56	55.4
Step-down care	2	2.0
Missing	0	

Ward of admission **Same hospital** (N=2149)	N	%
Medical ward	259	12.1
Surgical ward	1235	57.5
Emergency room	526	24.5
Other ICU	37	1.7
High dependency care unit	92	4.3
Missing	0	

Ward of admission **Other hospital** (N=113)	N	%
Medical ward	9	8.0
Surgical ward	11	9.7
Emergency room	19	16.8
Other ICU	64	56.6
High dependency care unit	10	8.8
Missing	0	

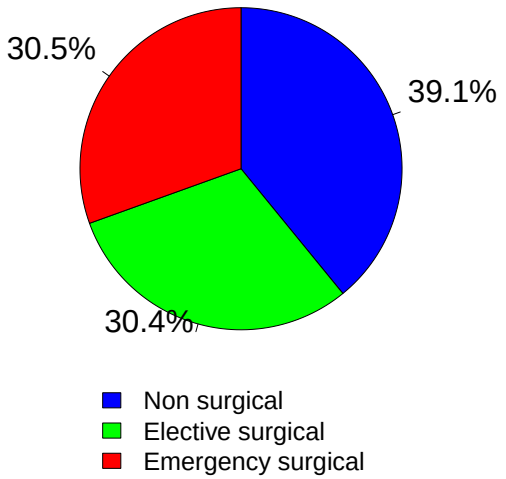
Scheduled admission	N	%
No	1753	74.2
Yes	608	25.8
Missing	0	

National report - **Year 2017**
Characteristics on admission - Adult patients

Trauma	N	%
No	1934	81.9
Yes	427	18.1
Multiple trauma	142	6.0
Missing	0	

Surgical status	N	%
Non surgical	923	39.1
Elective surgical	718	30.4
Emergency surgical	720	30.5
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=1438)	N	%
Operating theatre of surgical ward	1026	71.5
Operating theatre of emergency room	102	7.1
Surgical ward	94	6.6
Other	213	14.8
Missing	3	

Surgical interventions (top 10) **Elective surgical** (N=718)	N	%
Gastrointestinal surgery	404	56.3
Nephro/Urological surgery	112	15.6
Peripheral vascular surgery	54	7.5
Hepatic surgery	39	5.4
Orthopaedic surgery	35	4.9
Other surgery	34	4.7
Gynaecological surgery	27	3.8
Neurosurgery	14	1.9
Abdominal vascular surgery	9	1.3
Pancreatic surgery	7	1.0
Missing	0	

Timing **Elective surgical** (N=718)	N	%
From -7 to -3 days	22	3.1
From -2 to -1 days	21	2.9
On ICU admission day	725	101.0
The day after ICU admission	10	1.4
Missing	0	

Surgical interventions (top 10) **Emergency surgical** (N=720)	N	%
Gastrointestinal surgery	346	48.1
Neurosurgery	144	20.0
Orthopaedic surgery	55	7.6
Other surgery	50	6.9
Peripheral vascular surgery	26	3.6
Nephro/Urological surgery	20	2.8
Abdominal vascular surgery	19	2.6
Biliary tract surgery	19	2.6
Thoracic surgery	14	1.9
ENT surgery	10	1.4
Missing	17	

Timing **Emergency surgical** (N=720)	N	%
From -7 to -3 days	20	2.8
From -2 to -1 days	65	9.0
On ICU admission day	643	89.3
The day after ICU admission	35	4.9
Missing	1	

Non surgical interventions	N	%
None	2236	94.7
Elective	9	0.4
Emergency	116	4.9
Missing	0	

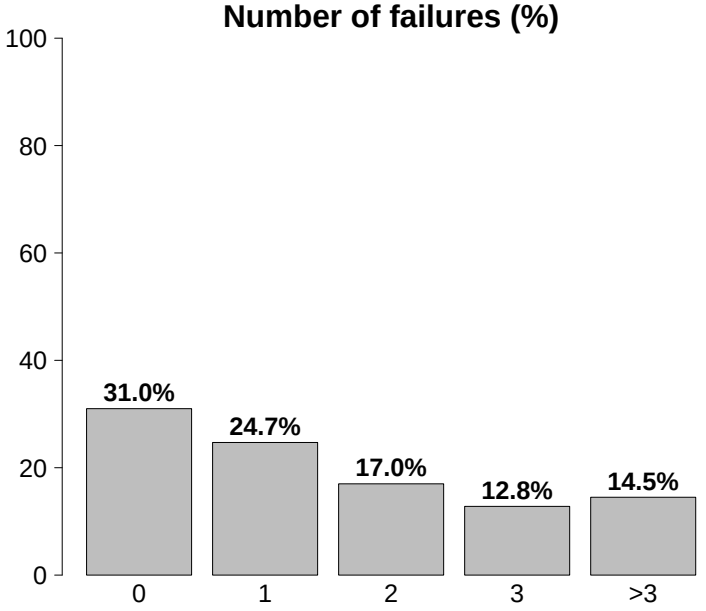
Non surgical interventions **Elective** (N=9)	N	%
Interventional radiology	4	44.4
Interventional endoscopy	2	22.2
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	3	

Non surgical interventions **Emergency** (N=116)	N	%
Interventional cardiology	42	36.2
Interventional endoscopy	34	29.3
Interventional radiology	25	21.6
Interventional neuroradiology	6	5.2
Missing	9	

National report - **Year 2017**
Characteristics on admission - Adult patients

Reason for admission	N	%
Monitoring/Weaning	967	41.0
Post surgical weaning	16	0.7
Surgical monitoring	554	23.5
Post interventional weaning	1	0.0
Interventional monitoring	48	2.0
Non surgical monitoring	341	14.5
Missing	7	
Admission for procedures/treatments	0	0.0
Intensive Treatment	1388	58.8
Only ventilatory support	502	21.3
Only cardiovascular support	203	8.6
Ventilatory and cardiovascular support	683	28.9
Missing	0	
Palliative Sedation	4	0.2
Diagnosis of death/Organ donation	2	0.1
Missing	0	

Number of failures (%)



Failures on admission	N	%
No	731	31.0
Yes	1630	69.0
A: Respiratory failure	1185	50.2
B: Cardiovascular failure	886	37.5
C: Neurological failure	193	8.2
D: Hepatic failure	30	1.3
E: Renal failure	794	33.6
F: Acute skin failure	1	0.0
G: Metabolic failure	625	26.5
H: Coagulation failure	76	3.2
Missing	0	

Failures on admission (top 10)	N	%
A	333	14.1
AB	186	7.9
ABEG	182	7.7
E	132	5.6
ABE	81	3.4
B	76	3.2
BEG	70	3.0
ABCEG	59	2.5
ABG	57	2.4
EG	57	2.4
Missing	0	

Respiratory failure	N	%
None	1176	49.8
Only hypoxic failure	619	26.2
Only hypercapnic failure	59	2.5
Hypoxic-hypercapnic failure	37	1.6
Intubation for airway maint.	470	19.9
Missing	0	

Cardiovascular failure	N	%
None	1475	62.5
Without shock	297	12.6
Cardiogenic shock	61	2.6
Septic shock	282	11.9
Haemorrhagic/hypovolemic shock	101	4.3
Hypovolemic shock	46	1.9
Anaphylactic shock	5	0.2
Neurogenic shock	13	0.6
Other shock	41	1.7
Mixed shock	40	1.7
Missing	0	

Neurologic failure	N	%
None	1782	90.2
Cerebral coma	85	4.3
Metabolic coma	67	3.4
Postanoxic coma	32	1.6
Toxic coma	9	0.5
Missing or not evaluable	386	

Renal failure (AKIN)	N	%
None	1566	66.4
Mild	446	18.9
Moderate	182	7.7
Severe	166	7.0
Missing	1	

Metabolic failure	N	%
None	1736	73.5
pH <= 7.3, PaCO2 < 45 mmHg	350	14.8
Base deficit >= 5 mmol/L, lactate >1.5x	275	11.6
Missing	0	

National report - **Year 2017**
Characteristics on admission - Adult patients

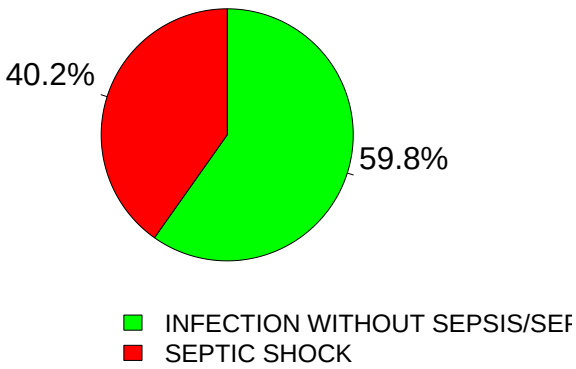
Clinical conditions on admission	N	%
Respiratory	301	12.8
Pleural effusion	79	3.3
Aspiration pneumonia	72	3.1
Atelectasis	39	1.7
Pulmonary embolism	30	1.3
Pneumothorax/Pneumomediastinum	25	1.1
Cardiovascular	450	19.1
Cardiac arrest	78	3.3
Peripheral vascular disease	67	2.8
Left heart failure without pulm. edema	64	2.7
Acute severe arrhythmia: tachycardias	55	2.3
Acute ischaemia	51	2.2
Neurological	154	6.5
Cerebral artery stroke	61	2.6
Seizures	21	0.9
Metabolic/postanoxic encephalopathy	15	0.6
Non traumatic cerebral oedema	14	0.6
Brain tumour	12	0.5
Gastrointestinal and hepatic	747	31.7
Digestive tract malignancy	370	15.7
Intestinal occlusion	91	3.9
Gastrointestinal perforation	79	3.3
Paralytic Ileus	61	2.6
Gastrointestinal bleeding: upper tract	43	1.8
Trauma (anatomical districts)	427	18.1
Head	259	11.0
Chest	125	5.3
Pelvis/bone/joint & muscle	117	5.0
Spine	84	3.6
Abdomen	46	1.9
Major vessels injury	16	0.7
Miscellaneous	2	0.1
Other	754	31.9
Other disease	436	18.5
Nephrourologic disease	167	7.1
Metabolic disorder	108	4.6
Coagulation disorder	76	3.2
Gynaecological disease	26	1.1
Post transplantation	34	1.4
Liver transplantation	20	0.8
Renal transplantation	11	0.5
Infections	818	34.7
Pneumonia	355	15.0
NON-surgical secondary peritonitis	86	3.6
NON-surgical urinary tract infection	85	3.6
Post-surgical peritonitis	77	3.3
NON-surgical skin/soft tissue infection	39	1.7
Primary peritonitis	30	1.3
Cholecystitis/cholangitis	29	1.2
Post-surgical skin/soft tissue infection	29	1.2
L.R.T.I. other than pneumonia	26	1.1
Clinical sepsis	23	1.0
Missing	1	

Trauma (anatomical districts)	N	%
Head	259	11.0
Traumatic Subdural haematoma	142	6.0
Traumatic subarachnoid haemorrhage	140	5.9
Skull fracture	135	5.7
Cerebral contusion/laceration	124	5.3
Maxillofacial fracture	64	2.7
Spine	84	3.6
Vertebral fracture, without deficit	52	2.2
Tetraplegia	13	0.6
Cervical injury, incomplete deficit	11	0.5
Chest	125	5.3
Traum. haemothorax/pneumothorax	74	3.1
Other injuries of the chest	70	3.0
Severe lung contusion/laceration	38	1.6
Abdomen	46	1.9
Minor injuries of the abdomen	24	1.0
Bowel transection/perforation	8	0.3
Spleen: Massive rupture	6	0.3
Pelvis/bone/joint & muscle	117	5.0
Long bone fracture	96	4.1
Multiple fracture of the pelvis	17	0.7
Very severe or open fracture of the pelvis	5	0.2
Major vessels injury	16	0.7
Proximal limbs vessels: transection	7	0.3
Neck vessels: dissection/transection	3	0.1
Major abdominal vessels: transection	3	0.1
Miscellaneous	2	0.1
Burns (>30% BSA)	2	0.1
-	0	0.0
Missing	1	

Infection severity on admission	N	%
None	1542	66.2
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	472	20.2
SEPTIC SHOCK	317	13.6
Missing	30	

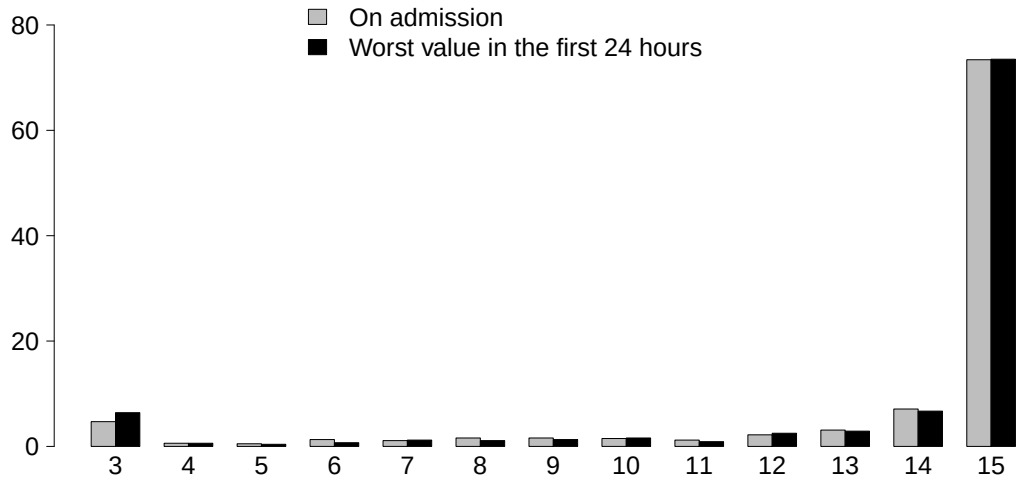
Infection severity on admission

Patients infected (N=789)



National report - **Year 2017**
Severity scores - Adult patients

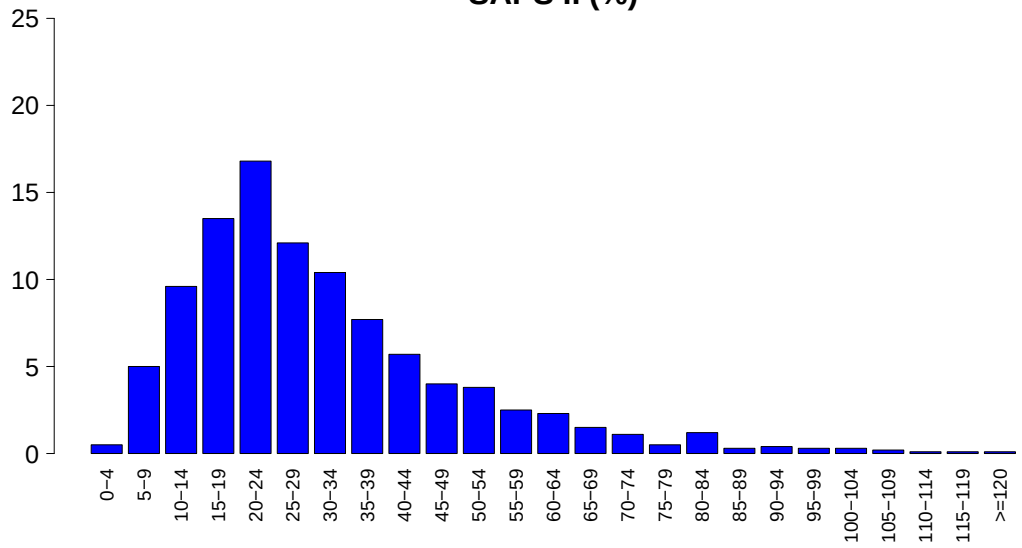
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	14−15
Not evaluable	385
Missing	1

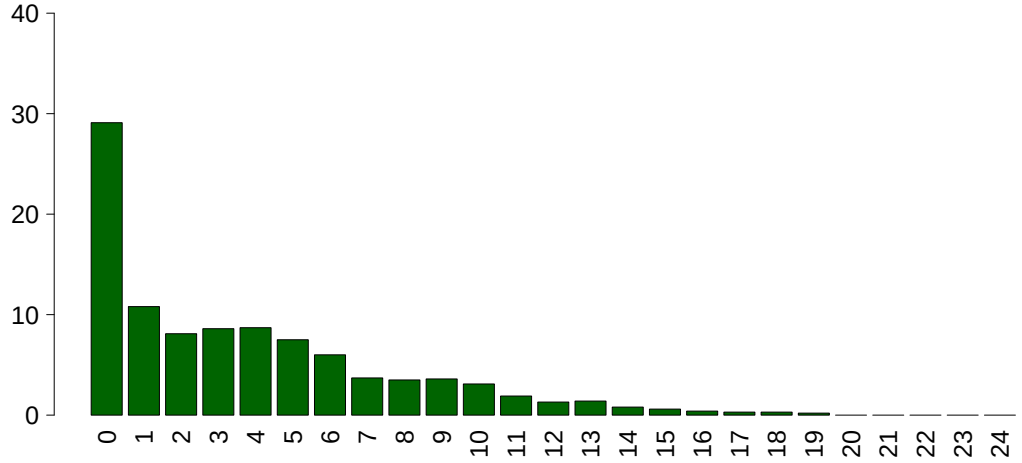
GCS (first 24 hours)	
Median	15
Q1−Q3	14−15
Not evaluable	489
Missing	1

SAPS II (%)



SAPSII	
Mean	30.9
SD	18.5
Median	26
Q1−Q3	18−39
Not evaluable	489
Missing	-488

SOFA (%)



SOFA	
Mean	3.7
SD	4.0
Median	3
Q1−Q3	0−6
Not evaluable	489
Missing	-488

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

Complications during the stay	N	%
No	1362	57.7
Yes	998	42.3
Missing	1	

Failures during the stay	N	%
No	2012	85.2
Yes	349	14.8
A: Respiratory failure	156	6.6
B: Cardiovascular failure	160	6.8
C: Neurological failure	23	1.0
D: Hepatic failure	37	1.6
E: Renal failure (AKIN)	124	5.3
F: Acute skin failure	0	0.0
G: Metabolic failure	50	2.1
H: Coagulation failure	26	1.1
Missing	0	

Failures during the stay (top 10)	N	%
A	68	2.9
B	60	2.5
E	38	1.6
AB	31	1.3
G	23	1.0
BE	19	0.8
ABE	18	0.8
D	13	0.6
AE	10	0.4
AC	5	0.2
Missing	0	

Respiratory failure occured	N	%
None	2204	93.4
Intubation for airway maint.	44	1.9
Hypoxic failure	96	4.1
Hypercapnic failure	35	1.5
Missing	1	

Cardiovascular failure occured	N	%
None	2200	93.2
Cardiogenic shock	42	1.8
Hypovolemic shock	9	0.4
Haemorrhagic/hypovolemic shock	14	0.6
Septic shock	85	3.6
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.1
Other shock	16	0.7
Missing	1	

Neurological failure occured	N	%
None	2337	99.0
Cerebral coma	10	0.4
Metabolic coma	12	0.5
Postanoxic coma	1	0.0
Missing	1	

Renal failure occured (AKIN)	N	%
None	2236	94.7
Mild	20	0.8
Moderate	31	1.3
Severe	73	3.1
Missing	1	

Complications during the stay	N	%
Respiratory	209	8.9
Pleural effusion	92	3.9
Aspiration pneumonia	58	2.5
Atelectasis	49	2.1
Pneumothorax/Pneumomediastinum	26	1.1
Severe ARDS	14	0.6
Cardiovascular	184	7.8
Acute severe arrhythmia: tachycardias	80	3.4
Cardiac arrest	44	1.9
Acute severe arrhythmia: bradycardias	22	0.9
Hypertensive crisis	16	0.7
Pulmonary edema	16	0.7
Neurological	257	10.9
Drowsiness/agitation/delirium	141	6.0
Intracranial hypertension	75	3.2
Brain edema	38	1.6
CrIMyNe	16	0.7
Seizures	16	0.7
Gastrointestinal and hepatic	227	9.6
Paralytic Ileus	104	4.4
Liver Dysfunction Syndrome	30	1.3
Anastomotic dehiscence	29	1.2
Gastrointestinal bleeding: upper tract	28	1.2
Gastrointestinal perforation	19	0.8
Other	199	8.4
Other disease	108	4.6
Metabolic disorder	50	2.1
Nephrourologic disease	39	1.7
Other skin and/or soft tissue pathology	13	0.6
Category/Stage II: Partial Thickness Skin Loss	6	0.3
Category/Stage III: Full Thickness Skin Loss	3	0.1
Iatrogenic major vessels injury	3	0.1
Infections	432	18.3
Pneumonia	193	8.2
Post-surgical peritonitis	69	2.9
Post-surgical skin/soft tissue infection	41	1.7
NON-surgical urinary tract infection	41	1.7
F.U.O. fever of unknown origin	25	1.1
L.R.T.I. other than pneumonia	23	1.0
Clinical sepsis	20	0.8
NON-surgical secondary peritonitis	16	0.7
Catheter-related bacteremia (CR-BSI)	12	0.5
Tertiary peritonitis	12	0.5
Missing	1	

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

Infections	N	%
None	1263	53.5
Only on admission	665	28.2
On admission and during ICU stay	153	6.5
Only during ICU stay	279	11.8
Missing	1	

Maximum severity of infection	N	%
None	1263	54.9
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	675	29.3
SEPTIC SHOCK	364	15.8
Missing	59	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	1263 (83.5%)	0 (0.0%)	228 (15.1%)	22 (1.5%)	1513
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	447 (94.7%)	25 (5.3%)	472
	SEPTIC SHOCK	-	-	-	317 (100.0%)	317
	TOT	1263	0	675	364	2302

Ventil. Associat. Pneumonia (VAP)	N	%
No	2198	93.1
Yes	163	6.9
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	2348	99.5
Yes	12	0.5
Missing	1	

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

Estimate	26.2
CI (95%)	22.4−30.6

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

Estimate	0.9
CI (95%)	0.5−1.7

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

Estimate	21.0%
CI (95%)	17.9−24.5

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

Estimate	1.1%
CI (95%)	0.6−2.0

National report - **Year 2017**
Process indicators - Adult patients

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)	2124	90.0										
Invasive ventilation	948	40.2	613	26	163	6.9	4	1–12	1	0	0–1	0
Non invasive ventilation	559	23.7	84	3.6	120	5.1	2	1–4	0	0	0–1	0
Tracheostomy	120	5.1	16	0.7	77	3.3	6	0–18	2	19	11–25	0
iNO (inhaled nitric oxide)	24	1.0	7	0.3	4	0.2	4	2–11	0	2	1–15	0
Central Venous Catheter	1468	62.2	941	39.9	1176	49.8	4	2–10	1	0	0–0	0
PICC	237	10.0	71	3	173	7.3	4	2–6	0	0	0–1	0
Arterial Catheter	1631	69.1	977	41.4	551	23.3	4	2–9	0	0	0–0	0
Vasoactive drugs	1269	53.7	605	25.6	161	6.8	2	1–5	0	0	0–0	0
Antiarrhythmics	187	7.9	32	1.4	55	2.3	2	1–6	0	1	0–4	0
IABP	1	0.0	1	0	1	0	11	11–11	0			
Invasive monitoring of C.O.	74	3.1	15	0.6	9	0.4	5	2–9	0	1	0–3	0
Continous monitoring of ScVO2	11	0.5	1	0	1	0	1	1–2	0	0	0–0	0
Temporary pacing	9	0.4	1	0	0	0	3	1–7	0	1	0–2	0
Ventricular assistance	0	0.0										
DC-shock	28	1.2								2	1–6	0
CPR	47	2.0								0	0–1	0
Massive blood transfusion	46	1.9								0	0–0	0
ICP monitoring without CSF drainage	135	5.7	98	4.2	16	0.7	7	3–15	0	0	0–1	0
ICP monitoring with CSF drainage	26	1.1	13	0.6	9	0.4	10	7–19	0	1	0–7	0
External ventricular drainage without ICP	9	0.4	6	0.3	4	0.2	2	2–5	0	11	7–25	0
Haemofiltration	5	0.2	2	0.1	2	0.1	4	4–7	0	3	2–12	0
Haemodialysis	125	5.3	28	1.2	37	1.6	5	2–13	1	2	0–6	0
ECMO	1	0.0	0	0	0	0	1	1–1	0	3	3–3	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	7	0.3	0	0	1	0	0	0–2	0	2	1–2	0
IAP (intra-abdominal pressure)	96	4.1										
Hypothermia	32	1.4	7	0.3	4	0.2	2	1–9	0	0	0–1	0
Enteral nutrition	717	30.4	70	3	438	18.6	5	2–14	0	1	1–2	0
Parenteral nutrition	1314	55.7	202	8.6	839	35.5	3	2–7	1	1	0–1	0
SDD (Topical, Topical and systemic)	5	0.2										
Patient restraint	121	5.1										
Peridural catheter	283	12.0	266	11.3	236	10	3	2–4	0	0	0–1	0
Electrical cardioversion	14	0.6								2	0–6	0
Vacuum therapy	24	1.0										
Antibiotics	1870	79.2										
Antibiotic prophylaxis	1066	45.2	739	31.3	447	18.9	2	1–4	0	0	0–0	0
Empirical antibiotic therapy	763	32.3	296	12.5	267	11.3	3	2–5	0	0	0–2	0
Targeted antibiotic therapy	616	26.1	133	5.6	408	17.3	7	3–14	0	3	2–6	0

National report - **Year 2017**
Process indicators - Adult patients

Invasive ventilation (N=948)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	418	43.1	8.4	10.4	5	1−11	0
For airway mainteinance	458	47.3	9.0	10.9	4	1−14	0
In weaning	24	2.5	0.6	0.5	1	0−1	0
Not evaluable	69	7.1	6.0	11.0	1	1−5	22
Reintubation within 48 hours	17	1.8	8.2	9.4	4	2−9	0

Non invasive ventilation (N=559)	N	%
Non invasive ventilation only	369	66.0
Non invasive ventilation failed	48	8.6
For weaning	132	23.6
Other	10	1.8
Missing	0	

Tracheostomy not present on admission (N=104)	N	%
Surgical	19	18.3
Percutwist	32	30.8
Ciaglia	5	4.8
Monodil. Ciaglia	4	3.8
Fantoni	0	0.0
Griggs	2	1.9
Other Kind	17	16.3
Unknown	25	24.0
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=104)	
Mean	18.8
SD	10.5
Median	19
Q1−Q3	11−24
Missing	0

Invasive monitoring of C.O. (N=74)	N	%
Swan Ganz	0	0.0
PICCO	45	60.8
LIDCO	27	36.5
Vigileo-PRAM	0	0.0
Other	2	2.7
Missing	0	

SDD (N=5)	N	%
Topical	4	80.0
Topical and systemic	1	20.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=279)	N	%
Only empirical	78	29.8
Only targeted	67	25.6
Targeted after empirical	94	35.9
Other	23	8.8
Missing	17	

Surgical interventions	N	%
No	2165	91.7
Yes	195	8.3
Missing	1	

Number of surgical interventions	N	%
0	2165	91.7
1	112	4.7
2	39	1.7
3	21	0.9
>3	23	1.0
Missing	1	

Surgical interventions Days from admission	
Mean	9.8
SD	8.5
Median	8
Q1−Q3	4−13
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	180	7.6
Other surgery	60	2.5
Neurosurgery	31	1.3
Orthopaedic surgery	28	1.2
Pancreatic surgery	14	0.6
ENT surgery	13	0.6
Maxillo-Facial surgery	9	0.4
Thoracic surgery	7	0.3
Nephro/Urological surgery	6	0.3
Plastic surgery	5	0.2
Missing	1	

Non surgical interventions	N	%
No	2301	97.5
Yes	59	2.5
Missing	1	

Non surgical interventions Days from admission	
Mean	12.0
SD	11.5
Median	8.5
Q1−Q3	5−15
Missing	1

Non surgical interventions	N	%
Interventional endoscopy	37	1.6
Interventional radiology	24	1.0
Interventional cardiology	12	0.5
Interventional neuroradiology	0	0.0
Missing	1	

National report - **Year 2017**
Outcome indicators - Adult patients

ICU outcome	N	%
Dead	287	12.2
Transferred to same hospital	1926	81.8
Transferred to other hospital	135	5.7
Discharged home	7	0.3
Disch. terminally ill	0	0.0
Missing	6	

Transferred to (N=2061)	N	%
Ward	1514	73.5
Other ICU	156	7.6
High dependency care unit	391	19.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=156)	N	%
Specialist expertise	36	23.1
Step-up care	30	19.2
Logistical/organizational reasons	82	52.6
Step-down care	8	5.1
Missing	0	

Transferred to Same hospital (N=1926)	N	%
Ward	1457	75.6
Other ICU	95	4.9
High dependency care unit	374	19.4
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=135)	N	%
Ward	57	42.2
Other ICU	61	45.2
High dependency care unit	17	12.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	2068	87.8
Dead	287	12.2
Missing	6	

Timing of ICU mortality (N=287)	N	%
Daytime (08:00AM - 07:59PM)	185	64.5
Nighttime (08:00PM - 07:59AM)	102	35.5
Weekdays (Monday - Friday)	214	74.6
Weekend (Saturday - Sunday)	73	25.4
Missing	0	

Hospital mortality *	N	%
Alive	1836	79.7
Dead	467	20.3
Missing	6	

Timing of hosp. mortality * (N=467)	N	%
In ICU	280	60.0
Within 24 hours after ICU	9	1.9
24-47 hours after ICU	13	2.8
48-71 hours after ICU	14	3.0
72-95 hours after ICU	10	2.1
After 95 hours after ICU	141	30.2
Missing	0	

Timing of hosp. mortality (days from ICU disch.) * **Discharged alive from ICU** (N=187)	
Mean	24.6
SD	33.4
Median	12
Q1−Q3	4−27.5
Missing	0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=2309).

National report - **Year 2017**
Outcome indicators - Adult patients

Last hospital mortality *	N	%
Alive	1822	79.2
Dead	479	20.8
Missing	8	

Readmission from ward	N	%
No	2309	97.8
Yes	52	2.2
Missing	0	

Number of readmissions (N=52)	N	%
1	49	94.2
2	3	5.8
>2	0	0.0
Missing	0	

Timing of readmission (N=52)	N	%
Within 48 hours	8	15.4
48-71 hours	9	17.3
72-95 hours	4	7.7
After 95 hours	31	59.6
Missing	0	

Timing readmission (days)	
N	52
Mean	9.6
SD	11.3
Median	5
Q1−Q3	2.2−11.2

ICU stay (days)	
Mean	6.8
SD	10.6
Median	3
Q1−Q3	1−7
Missing	1

ICU stay (days) **Alive** (N=2068)	
Mean	6.6
SD	10.1
Median	3
Q1−Q3	1−7
Missing	0

ICU stay (days) **Dead** (N=287)	
Mean	8.2
SD	13.4
Median	3
Q1−Q3	1−10
Missing	0

Stay after ICU (days) * **Alive** (N=2023)	
Mean	15.6
SD	23.2
Median	8
Q1−Q3	4−17
Missing	4

Hospital stay (days) *	
Mean	24.6
SD	32.4
Median	14
Q1−Q3	8−29
Missing	6

Hospital stay (days) * **Alive** (N=1836)	
Mean	24.1
SD	31.9
Median	14
Q1−Q3	8−28
Missing	1

Hospital stay (days) * **Dead** (N=467)	
Mean	26.0
SD	34.1
Median	14
Q1−Q3	4.5−33
Missing	0

* Statistics computed on patients admitted in months with % of patients in status 4 over the threshold (readmissions excluded) (N=2309).

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

Patients (N): 2271

Sex	N	%
Male	1426	62.8
Female	845	37.2
Missing	0	

Age (years)	N	%
17-45	280	12.3
46-65	724	31.9
66-75	572	25.2
>75	695	30.6
Missing	0	
Mean	65.2	
SD	16.4	
Median	67	
Q1−Q3	56−78	
Min−Max	17−98	

Body mass Index (BMI)	N	%
Underweight	77	3.4
Normal	927	40.8
Overweight	819	36.1
Obese	448	19.7
Missing	0	

Pregnancy status **Females** (N=845)	N	%
Not fertile	414	49.0
Not pregnant/Unknown	419	49.6
Currently pregnant	1	0.1
Post partum	11	1.3
Missing	0	

Comorbidities	N	%
No	347	15.3
Yes	1924	84.7
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	1244	54.8
Any tumour without metastasis	405	17.8
NYHA class II-III	354	15.6
Arrhythmia	349	15.4
Diabetes Type II without insulin tr.	262	11.5
Moderate or severe renal disease	256	11.3
Metastatic cancer	219	9.6
Peripheral vascular disease	171	7.5
Myocardial infarction	169	7.4
Diabetes Type II with insulin treatment	163	7.2
Missing	0	

Stay before ICU (days)	
Mean	4.1
SD	10.5
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	2069	91.1
Other hospital	107	4.7
Long-term chronic care hospital	95	4.2
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=2176)	N	%
Medical ward	255	11.7
Surgical ward	1201	55.2
Emergency room	537	24.7
Other ICU	96	4.4
High dependency care unit	87	4.0
Missing	0	

Reason for transfer from **Other ICU** (N=96)	N	%
Specialist expertise	23	24.0
Step-up care	18	18.8
Logistical/organizational reasons	53	55.2
Step-down care	2	2.1
Missing	0	

Ward of admission **Same hospital** (N=2069)	N	%
Medical ward	247	11.9
Surgical ward	1191	57.6
Emergency room	518	25.0
Other ICU	36	1.7
High dependency care unit	77	3.7
Missing	0	

Ward of admission **Other hospital** (N=107)	N	%
Medical ward	8	7.5
Surgical ward	10	9.3
Emergency room	19	17.8
Other ICU	60	56.1
High dependency care unit	10	9.3
Missing	0	

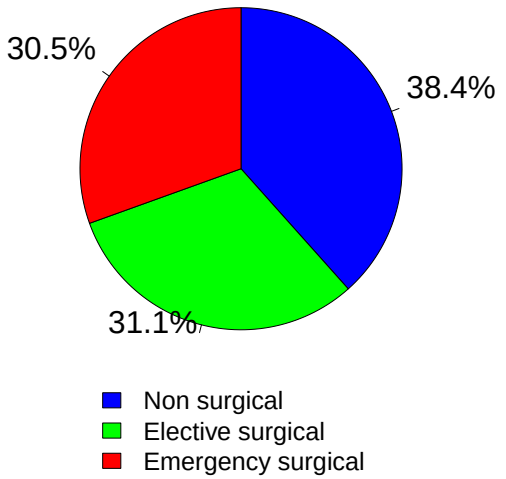
Scheduled admission	N	%
No	1672	73.6
Yes	599	26.4
Missing	0	

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

Trauma	N	%
No	1858	81.8
Yes	413	18.2
Multiple trauma	136	6.0
Missing	0	

Surgical status	N	%
Non surgical	873	38.4
Elective surgical	706	31.1
Emergency surgical	692	30.5
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=1398)	N	%
Operating theatre of surgical ward	1003	71.8
Operating theatre of emergency room	97	6.9
Surgical ward	91	6.5
Other	205	14.7
Missing	2	

Surgical interventions (top 10) **Elective surgical** (N=706)	N	%
Gastrointestinal surgery	397	56.2
Nephro/Urological surgery	109	15.4
Peripheral vascular surgery	54	7.6
Hepatic surgery	39	5.5
Orthopaedic surgery	34	4.8
Other surgery	34	4.8
Gynaecological surgery	27	3.8
Neurosurgery	13	1.8
Abdominal vascular surgery	9	1.3
Pancreatic surgery	7	1.0
Missing	0	

Timing **Elective surgical** (N=706)	N	%
From -7 to -3 days	21	3.0
From -2 to -1 days	19	2.7
On ICU admission day	715	101.3
The day after ICU admission	10	1.4
Missing	0	

Surgical interventions (top 10) **Emergency surgical** (N=692)	N	%
Gastrointestinal surgery	331	47.8
Neurosurgery	136	19.7
Orthopaedic surgery	55	7.9
Other surgery	46	6.6
Peripheral vascular surgery	25	3.6
Nephro/Urological surgery	20	2.9
Abdominal vascular surgery	19	2.7
Biliary tract surgery	19	2.7
Thoracic surgery	14	2.0
ENT surgery	9	1.3
Missing	18	

Timing **Emergency surgical** (N=692)	N	%
From -7 to -3 days	18	2.6
From -2 to -1 days	60	8.7
On ICU admission day	619	89.5
The day after ICU admission	35	5.1
Missing	1	

Non surgical interventions	N	%
None	2153	94.8
Elective	7	0.3
Emergency	111	4.9
Missing	0	

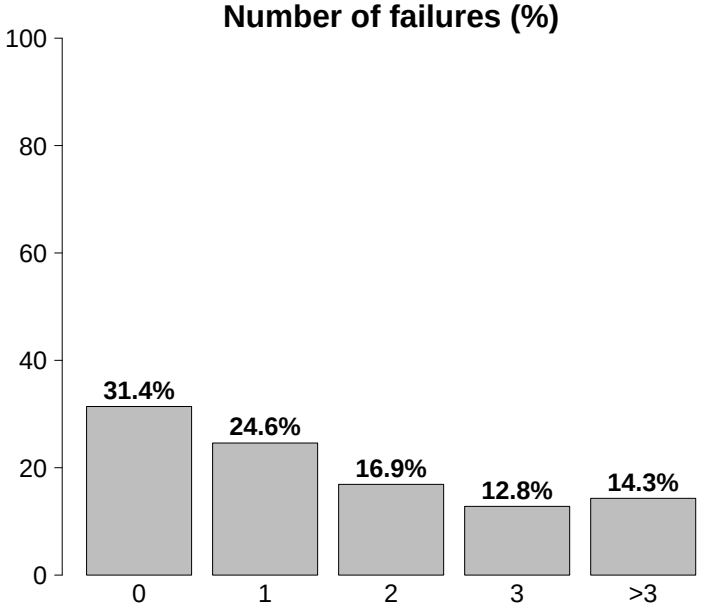
Non surgical interventions **Elective** (N=7)	N	%
Interventional radiology	3	42.9
Interventional endoscopy	2	28.6
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	2	

Non surgical interventions **Emergency** (N=111)	N	%
Interventional cardiology	38	34.2
Interventional endoscopy	34	30.6
Interventional radiology	24	21.6
Interventional neuroradiology	6	5.4
Missing	9	

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

Reason for admission	N	%
Monitoring/Weaning	939	41.3
Post surgical weaning	15	0.7
Surgical monitoring	544	24.0
Post interventional weaning	1	0.0
Interventional monitoring	44	1.9
Non surgical monitoring	329	14.5
Missing	6	
Admission for procedures/treatments	0	0.0
Intensive Treatment	1332	58.7
Only ventilatory support	482	21.2
Only cardiovascular support	198	8.7
Ventilatory and cardiovascular support	652	28.7
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	713	31.4
Yes	1558	68.6
A: Respiratory failure	1134	49.9
B: Cardiovascular failure	850	37.4
C: Neurological failure	171	7.5
D: Hepatic failure	29	1.3
E: Renal failure	754	33.2
F: Acute skin failure	1	0.0
G: Metabolic failure	601	26.5
H: Coagulation failure	75	3.3
Missing	0	

Failures on admission (top 10)	N	%
A	322	14.2
AB	181	8.0
ABEG	174	7.7
E	126	5.5
ABE	76	3.3
B	73	3.2
BEG	70	3.1
ABG	56	2.5
EG	54	2.4
ABCEG	52	2.3
Missing	0	

Respiratory failure	N	%
None	1137	50.1
Only hypoxic failure	593	26.1
Only hypercapnic failure	52	2.3
Hypoxic-hypercapnic failure	34	1.5
Intubation for airway maint.	455	20.0
Missing	0	

Cardiovascular failure	N	%
None	1421	62.6
Without shock	285	12.5
Cardiogenic shock	58	2.6
Septic shock	267	11.8
Haemorrhagic/hypovolemic shock	101	4.4
Hypovolemic shock	43	1.9
Anaphylactic shock	5	0.2
Neurogenic shock	13	0.6
Other shock	39	1.7
Mixed shock	39	1.7
Missing	0	

Neurologic failure	N	%
None	1726	91.0
Cerebral coma	74	3.9
Metabolic coma	60	3.2
Postanoxic coma	30	1.6
Toxic coma	7	0.4
Missing or not evaluable	374	

Renal failure (AKIN)	N	%
None	1517	66.8
Mild	424	18.7
Moderate	173	7.6
Severe	157	6.9
Missing	0	

Metabolic failure	N	%
None	1670	73.5
pH <= 7.3, PaCO2 < 45 mmHg	339	14.9
Base deficit >= 5 mmol/L, lactate >1.5x	262	11.5
Missing	0	

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

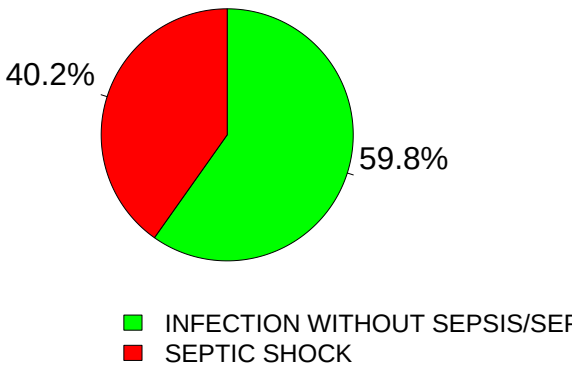
Clinical conditions on admission	N	%
Respiratory	283	12.5
Pleural effusion	71	3.1
Aspiration pneumonia	66	2.9
Atelectasis	37	1.6
Pulmonary embolism	28	1.2
Pneumothorax/Pneumomediastinum	24	1.1
Cardiovascular	432	19.0
Cardiac arrest	76	3.3
Peripheral vascular disease	66	2.9
Left heart failure without pulm. edema	60	2.6
Acute ischaemia	51	2.2
Acute myocardial infarction	49	2.2
Neurological	147	6.5
Cerebral artery stroke	59	2.6
Seizures	20	0.9
Metabolic/postanoxic encephalopathy	14	0.6
Brain tumour	12	0.5
Non traumatic cerebral oedema	11	0.5
Gastrointestinal and hepatic	725	31.9
Digestive tract malignancy	363	16.0
Intestinal occlusion	89	3.9
Gastrointestinal perforation	76	3.3
Paralytic Ileus	56	2.5
Gastrointestinal bleeding: upper tract	42	1.8
Trauma (anatomical districts)	413	18.2
Head	248	10.9
Chest	121	5.3
Pelvis/bone/joint & muscle	113	5.0
Spine	82	3.6
Abdomen	45	2.0
Major vessels injury	16	0.7
Miscellaneous	2	0.1
Other	724	31.9
Other disease	411	18.1
Nephrourologic disease	164	7.2
Metabolic disorder	105	4.6
Coagulation disorder	75	3.3
Gynaecological disease	26	1.1
Post transplantation	34	1.5
Liver transplantation	20	0.9
Renal transplantation	11	0.5
Infections	774	34.1
Pneumonia	338	14.9
NON-surgical secondary peritonitis	85	3.7
NON-surgical urinary tract infection	79	3.5
Post-surgical peritonitis	69	3.0
NON-surgical skin/soft tissue infection	37	1.6
Cholecystitis/cholangitis	29	1.3
Primary peritonitis	27	1.2
Post-surgical skin/soft tissue infection	27	1.2
L.R.T.I. other than pneumonia	23	1.0
Upper respiratory tract infection	22	1.0
Missing	0	

Trauma (anatomical districts)	N	%
Head	248	10.9
Traumatic Subdural haematoma	137	6.0
Traumatic subarachnoid haemorrhage	133	5.9
Skull fracture	131	5.8
Cerebral contusion/laceration	115	5.1
Maxillofacial fracture	63	2.8
Spine	82	3.6
Vertebral fracture, without deficit	50	2.2
Tetraplegia	13	0.6
Cervical injury, incomplete deficit	11	0.5
Chest	121	5.3
Traum. haemothorax/pneumothorax	72	3.2
Other injuries of the chest	69	3.0
Severe lung contusion/laceration	38	1.7
Abdomen	45	2.0
Minor injuries of the abdomen	23	1.0
Bowel transection/perforation	8	0.4
Spleen: Massive rupture	6	0.3
Pelvis/bone/joint & muscle	113	5.0
Long bone fracture	93	4.1
Multiple fracture of the pelvis	16	0.7
Very severe or open fracture of the pelvis	5	0.2
Major vessels injury	16	0.7
Proximal limbs vessels: transection	7	0.3
Neck vessels: dissection/transection	3	0.1
Major abdominal vessels: transection	3	0.1
Miscellaneous	2	0.1
Burns (>30% BSA)	2	0.1
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	1497	66.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	447	19.9
SEPTIC SHOCK	300	13.4
Missing	27	

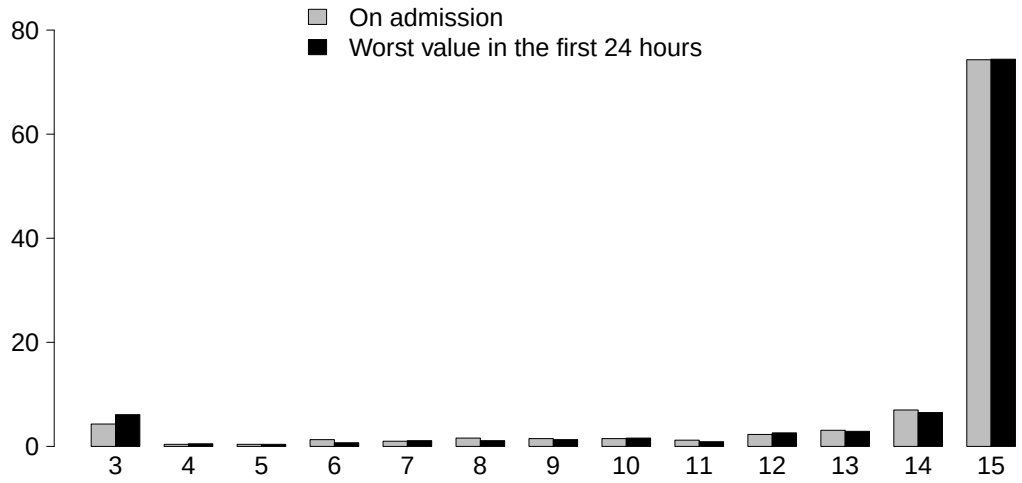
Infection severity on admission

Patients infected (N=747)



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

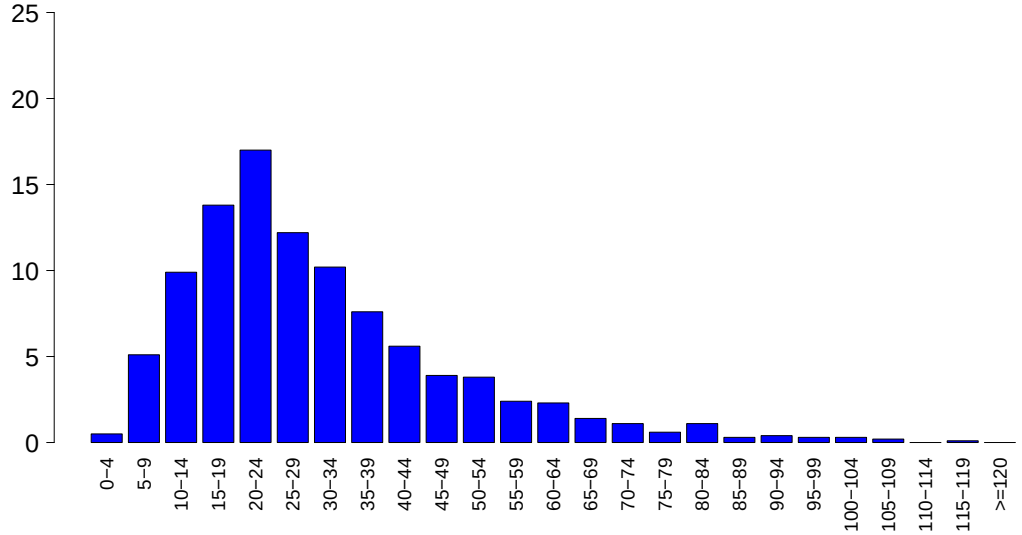
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	14−15
Not evaluable	374
Missing	0

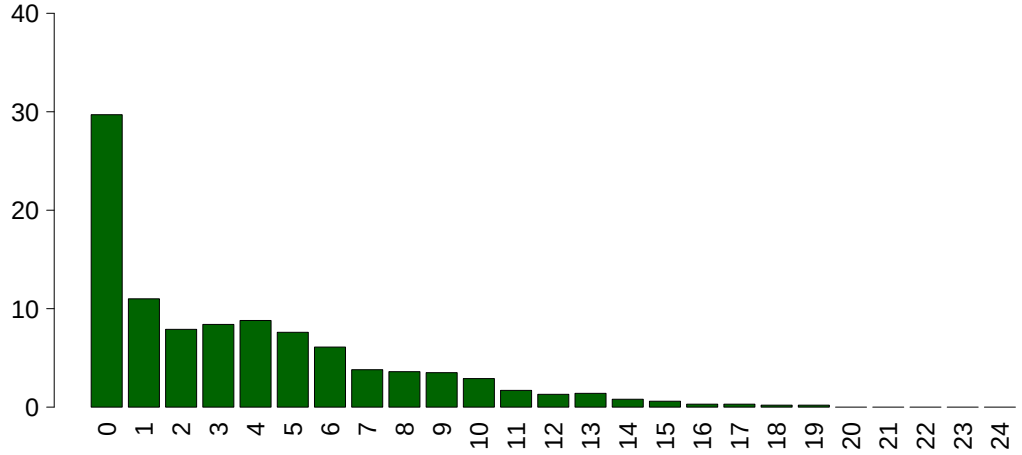
GCS (first 24 hours)	
Median	15
Q1−Q3	14−15
Not evaluable	470
Missing	0

SAPS II (%)



SAPSII	
Mean	30.6
SD	18.2
Median	26
Q1−Q3	18−38
Not evaluable	470
Missing	-470

SOFA (%)



SOFA	
Mean	3.7
SD	3.9
Median	3
Q1−Q3	0−6
Not evaluable	470
Missing	-470

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

Complications during the stay	N	%
No	1323	58.3
Yes	948	41.7
Missing	0	

Failures during the stay	N	%
No	1938	85.3
Yes	333	14.7
A: Respiratory failure	147	6.5
B: Cardiovascular failure	151	6.6
C: Neurological failure	21	0.9
D: Hepatic failure	36	1.6
E: Renal failure (AKIN)	118	5.2
F: Acute skin failure	0	0.0
G: Metabolic failure	47	2.1
H: Coagulation failure	24	1.1
Missing	0	

Failures during the stay (top 10)	N	%
A	66	2.9
B	58	2.6
E	37	1.6
AB	30	1.3
G	23	1.0
ABE	17	0.7
BE	17	0.7
D	12	0.5
AE	10	0.4
AC	4	0.2
Missing	0	

Respiratory failure occured	N	%
None	2124	93.5
Intubation for airway maint.	42	1.8
Hypoxic failure	89	3.9
Hypercapnic failure	34	1.5
Missing	0	

Cardiovascular failure occured	N	%
None	2120	93.4
Cardiogenic shock	40	1.8
Hypovolemic shock	9	0.4
Haemorrhagic/hypovolemic shock	10	0.4
Septic shock	81	3.6
Anaphylactic shock	0	0.0
Neurogenic shock	2	0.1
Other shock	16	0.7
Missing	0	

Neurological failure occured	N	%
None	2250	99.1
Cerebral coma	8	0.4
Metabolic coma	12	0.5
Postanoxic coma	1	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	2153	94.8
Mild	20	0.9
Moderate	28	1.2
Severe	70	3.1
Missing	0	

Complications during the stay	N	%
Respiratory	197	8.7
Pleural effusion	84	3.7
Aspiration pneumonia	57	2.5
Atelectasis	46	2.0
Pneumothorax/Pneumomediastinum	23	1.0
Severe ARDS	12	0.5
Cardiovascular	173	7.6
Acute severe arrhythmia: tachycardias	74	3.3
Cardiac arrest	42	1.8
Acute severe arrhythmia: bradycardias	21	0.9
Hypertensive crisis	16	0.7
Deep venous thrombosis	14	0.6
Neurological	242	10.7
Drowsiness/agitation/delirium	133	5.9
Intracranial hypertension	69	3.0
Brain edema	34	1.5
Seizures	16	0.7
CrIMyNe	13	0.6
Gastrointestinal and hepatic	218	9.6
Paralytic Ileus	100	4.4
Anastomotic dehiscence	29	1.3
Liver Dysfunction Syndrome	29	1.3
Gastrointestinal bleeding: upper tract	27	1.2
Gastrointestinal perforation	19	0.8
Other	190	8.4
Other disease	104	4.6
Metabolic disorder	47	2.1
Nephrourologic disease	38	1.7
Other skin and/or soft tissue pathology	12	0.5
Category/Stage II: Partial Thickness Skin Loss	6	0.3
Category/Stage III: Full Thickness Skin Loss	2	0.1
Extremity compartment syndrome (severe)	2	0.1
Infections	407	17.9
Pneumonia	181	8.0
Post-surgical peritonitis	67	3.0
Post-surgical skin/soft tissue infection	39	1.7
NON-surgical urinary tract infection	38	1.7
F.U.O. fever of unknown origin	22	1.0
L.R.T.I. other than pneumonia	22	1.0
Clinical sepsis	20	0.9
NON-surgical secondary peritonitis	16	0.7
Primary bacteraemia of unknown origin	10	0.4
Catheter-related bacteremia (CR-BSI)	10	0.4
Missing	0	

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

Infections	N	%
None	1233	54.3
Only on admission	631	27.8
On admission and during ICU stay	143	6.3
Only during ICU stay	264	11.6
Missing	0	

Maximum severity of infection	N	%
None	1233	55.6
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	640	28.9
SEPTIC SHOCK	343	15.5
Missing	55	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	1233 (83.9%)	0 (0.0%)	216 (14.7%)	20 (1.4%)	1469
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	424 (94.9%)	23 (5.1%)	447
	SEPTIC SHOCK	-	-	-	300 (100.0%)	300
	TOT	1233	0	640	343	2216

Ventil. Associat. Pneumonia (VAP)	N	%
No	2119	93.3
Yes	152	6.7
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	2261	99.6
Yes	10	0.4
Missing	0	

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

Estimate	26.2
CI (95%)	22.2−30.8

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

Estimate	0.8
CI (95%)	0.4−1.6

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

Estimate	21.0%
CI (95%)	17.8−24.6

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

Estimate	1.0%
CI (95%)	0.5−1.9

National report - **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)	2037	89.7										
Invasive ventilation	900	39.6	583	25.7	156	6.9	4	1–12	0	0	0–1	0
Non invasive ventilation	536	23.6	79	3.5	115	5.1	2	1–4	0	0	0–1	0
Tracheostomy	109	4.8	13	0.6	72	3.2	6	0–18	0	19	14–25	0
iNO (inhaled nitric oxide)	22	1.0	6	0.3	3	0.1	3	1–9	0	2	1–15	0
Central Venous Catheter	1400	61.6	896	39.5	1125	49.5	4	2–10	0	0	0–0	0
PICC	231	10.2	69	3	169	7.4	4	2–6	0	0	0–1	0
Arterial Catheter	1564	68.9	944	41.6	534	23.5	4	2–9	0	0	0–0	0
Vasoactive drugs	1220	53.7	583	25.7	157	6.9	2	1–5	0	0	0–0	0
Antiarrhythmics	175	7.7	28	1.2	51	2.2	2	1–6	0	1	0–4	0
IABP	0	0.0										
Invasive monitoring of C.O.	73	3.2	15	0.7	9	0.4	5	2–9	0	1	0–3	0
Continous monitoring of ScVO2	11	0.5	1	0	1	0	1	1–2	0	0	0–0	0
Temporary pacing	8	0.4	1	0	0	0	2	1–9	0	1	0–1	0
Ventricular assistance	0	0.0										
DC-shock	27	1.2								2	1–6	0
CPR	46	2.0								0	0–1	0
Massive blood transfusion	42	1.8								0	0–0	0
ICP monitoring without CSF drainage	127	5.6	94	4.1	15	0.7	7	3–16	0	0	0–1	0
ICP monitoring with CSF drainage	25	1.1	12	0.5	8	0.4	11	8–19	0	1	0–7	0
External ventricular drainage without ICP	9	0.4	6	0.3	4	0.2	2	2–5	0	11	7–25	0
Haemofiltration	5	0.2	2	0.1	2	0.1	4	4–7	0	3	2–12	0
Haemodialysis	120	5.3	27	1.2	36	1.6	5	2–13	0	2	0–6	0
ECMO	1	0.0	0	0	0	0	1	1–1	0	3	3–3	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	7	0.3	0	0	1	0	0	0–2	0	2	1–2	0
IAP (intra-abdominal pressure)	92	4.1										
Hypothermia	32	1.4	7	0.3	4	0.2	2	1–9	0	0	0–1	0
Enteral nutrition	683	30.1	63	2.8	418	18.4	5	2–14	0	1	1–2	0
Parenteral nutrition	1257	55.4	186	8.2	803	35.4	3	1–7	0	1	0–1	0
SDD (Topical, Topical and systemic)	5	0.2										
Patient restraint	114	5.0										
Peridural catheter	280	12.3	264	11.6	234	10.3	3	2–4	0	0	0–1	0
Electrical cardioversion	14	0.6								2	0–6	0
Vacuum therapy	22	1.0										
Antibiotics	1793	79.0										
Antibiotic prophylaxis	1039	45.8	725	31.9	437	19.2	2	1–3	0	0	0–0	0
Empirical antibiotic therapy	720	31.7	281	12.4	257	11.3	3	2–5	0	0	0–2	0
Targeted antibiotic therapy	576	25.4	124	5.5	380	16.7	7	3–14	0	3	2–6	0

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

Invasive ventilation (N=900)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	391	42.5	8.3	10.3	5	1−11	0
For airway mainteinance	443	48.2	8.8	10.6	4	1−14	0
In weaning	23	2.5	0.6	0.5	1	0−1	0
Not evaluable	62	6.7	5.3	9.4	1	1−5	19
Reintubation within 48 hours	17	1.8	8.2	9.4	4	2−9	0

Non invasive ventilation (N=536)	N	%
Non invasive ventilation only	354	66.0
Non invasive ventilation failed	45	8.4
For weaning	128	23.9
Other	9	1.7
Missing	0	

Tracheostomy not present on admission (N=96)	N	%
Surgical	17	17.7
Percutwist	30	31.2
Ciaglia	5	5.2
Monodil. Ciaglia	4	4.2
Fantoni	0	0.0
Griggs	2	2.1
Other Kind	16	16.7
Unknown	22	22.9
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=96)	
Mean	19.4
SD	10.5
Median	19
Q1−Q3	11.8−24
Missing	0

Invasive monitoring of C.O. (N=73)	N	%
Swan Ganz	0	0.0
PICCO	44	60.3
LIDCO	27	37.0
Vigileo-PRAM	0	0.0
Other	2	2.7
Missing	0	

SDD (N=5)	N	%
Topical	4	80.0
Topical and systemic	1	20.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=264)	N	%
Only empirical	76	30.8
Only targeted	63	25.5
Targeted after empirical	86	34.8
Other	22	8.9
Missing	17	

Surgical interventions	N	%
No	2087	91.9
Yes	184	8.1
Missing	0	

Number of surgical interventions	N	%
0	2087	91.9
1	105	4.6
2	37	1.6
3	21	0.9
>3	21	0.9
Missing	0	

Surgical interventions Days from admission	
Mean	9.5
SD	8.1
Median	8
Q1−Q3	4−12
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	177	7.8
Other surgery	55	2.4
Neurosurgery	31	1.4
Orthopaedic surgery	23	1.0
Pancreatic surgery	14	0.6
ENT surgery	11	0.5
Maxillo-Facial surgery	7	0.3
Nephro/Urological surgery	6	0.3
Thoracic surgery	6	0.3
Plastic surgery	5	0.2
Missing	0	

Non surgical interventions	N	%
No	2218	97.7
Yes	53	2.3
Missing	0	

Non surgical interventions Days from admission	
Mean	12.1
SD	12.2
Median	8
Q1−Q3	4−14
Missing	1

Non surgical interventions	N	%
Interventional endoscopy	30	1.3
Interventional radiology	21	0.9
Interventional cardiology	11	0.5
Interventional neuroradiology	0	0.0
Missing	0	

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

ICU outcome	N	%
Dead	272	12.0
Transferred to same hospital	1860	82.1
Transferred to other hospital	128	5.6
Discharged home	6	0.3
Disch. terminally ill	0	0.0
Missing	5	

Transferred to (N=1988)	N	%
Ward	1468	73.8
Other ICU	151	7.6
High dependency care unit	369	18.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=151)	N	%
Specialist expertise	35	23.2
Step-up care	29	19.2
Logistical/organizational reasons	80	53.0
Step-down care	7	4.6
Missing	0	

Transferred to Same hospital (N=1860)	N	%
Ward	1413	76.0
Other ICU	93	5.0
High dependency care unit	354	19.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=128)	N	%
Ward	55	43.0
Other ICU	58	45.3
High dependency care unit	15	11.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	1994	88.0
Dead	272	12.0
Missing	5	

Timing of ICU mortality (N=272)	N	%
Daytime (08:00AM - 07:59PM)	177	65.1
Nighttime (08:00PM - 07:59AM)	95	34.9
Weekdays (Monday - Friday)	202	74.3
Weekend (Saturday - Sunday)	70	25.7
Missing	0	

Hospital mortality	N	%
Alive	1817	80.0
Dead	454	20.0
Missing	0	

Timing of hosp. mortality (N=454)	N	%
In ICU	272	59.9
Within 24 hours after ICU	9	2.0
24-47 hours after ICU	11	2.4
48-71 hours after ICU	14	3.1
72-95 hours after ICU	9	2.0
After 95 hours after ICU	139	30.6
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=182)	
Mean	25.0
SD	33.8
Median	13
Q1−Q3	4−28
Missing	0

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

Last hospital mortality	N	%
Alive	1805	79.5
Dead	466	20.5
Missing	0	

ICU stay (days)	
Mean	6.7
SD	10.2
Median	3
Q1−Q3	1−7
Missing	0

ICU stay (days) **Alive** (N=1994)	
Mean	6.5
SD	9.8
Median	3
Q1−Q3	1−7
Missing	0

ICU stay (days) **Dead** (N=272)	
Mean	8.0
SD	12.9
Median	4
Q1−Q3	1−10
Missing	0

Stay after ICU (days) **Alive** (N=1994)	
Mean	15.5
SD	23.2
Median	8
Q1−Q3	4−17
Missing	0

Hospital stay (days)	
Mean	24.1
SD	29.1
Median	14
Q1−Q3	8−29
Missing	0

Hospital stay (days) **Alive** (N=1817)	
Mean	23.6
SD	27.6
Median	14
Q1−Q3	8−28
Missing	0

Hospital stay (days) **Dead** (N=454)	
Mean	26.1
SD	34.2
Median	14.5
Q1−Q3	5−33
Missing	0

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

Patients (N): 873

Sex	N	%
Male	567	64.9
Female	306	35.1
Missing	0	

Age (years)	N	%
17-45	97	11.1
46-65	253	29.0
66-75	218	25.0
>75	305	34.9
Missing	0	
Mean	66.3	
SD	16.9	
Median	69	
Q1−Q3	56−79	
Min−Max	17−96	

Body mass Index (BMI)	N	%
Underweight	25	2.9
Normal	360	41.2
Overweight	310	35.5
Obese	178	20.4
Missing	0	

Pregnancy status **Females** (N=306)	N	%
Not fertile	173	56.5
Not pregnant/Unknown	131	42.8
Currently pregnant	1	0.3
Post partum	1	0.3
Missing	0	

Comorbidities	N	%
No	118	13.5
Yes	755	86.5
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	507	58.1
NYHA class II-III	202	23.1
Arrhythmia	152	17.4
Moderate or severe renal disease	151	17.3
Diabetes Type II without insulin tr.	120	13.7
Myocardial infarction	86	9.9
Diabetes Type II with insulin treatment	73	8.4
Any tumour without metastasis	63	7.2
Peripheral vascular disease	62	7.1
Moderate COPD	51	5.8
Missing	0	

Stay before ICU (days)	
Mean	4.6
SD	12.8
Median	0
Q1−Q3	0−2
Missing	0

Source of admission	N	%
Same hospital	708	81.1
Other hospital	72	8.2
Long-term chronic care hospital	93	10.7
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=780)	N	%
Medical ward	193	24.7
Surgical ward	107	13.7
Emergency room	381	48.8
Other ICU	58	7.4
High dependency care unit	41	5.3
Missing	0	

Reason for transfer from **Other ICU** (N=58)	N	%
Specialist expertise	2	3.4
Step-up care	9	15.5
Logistical/organizational reasons	45	77.6
Step-down care	2	3.4
Missing	0	

Ward of admission **Same hospital** (N=708)	N	%
Medical ward	188	26.6
Surgical ward	102	14.4
Emergency room	372	52.5
Other ICU	10	1.4
High dependency care unit	36	5.1
Missing	0	

Ward of admission **Other hospital** (N=72)	N	%
Medical ward	5	6.9
Surgical ward	5	6.9
Emergency room	9	12.5
Other ICU	48	66.7
High dependency care unit	5	6.9
Missing	0	

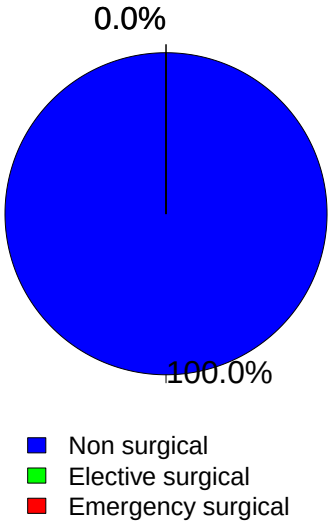
Scheduled admission	N	%
No	873	100.0
Yes	0	0.0
Missing	0	

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

Trauma	N	%
No	701	80.3
Yes	172	19.7
Multiple trauma	54	6.2
Missing	0	

Surgical status	N	%
Non surgical	873	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	

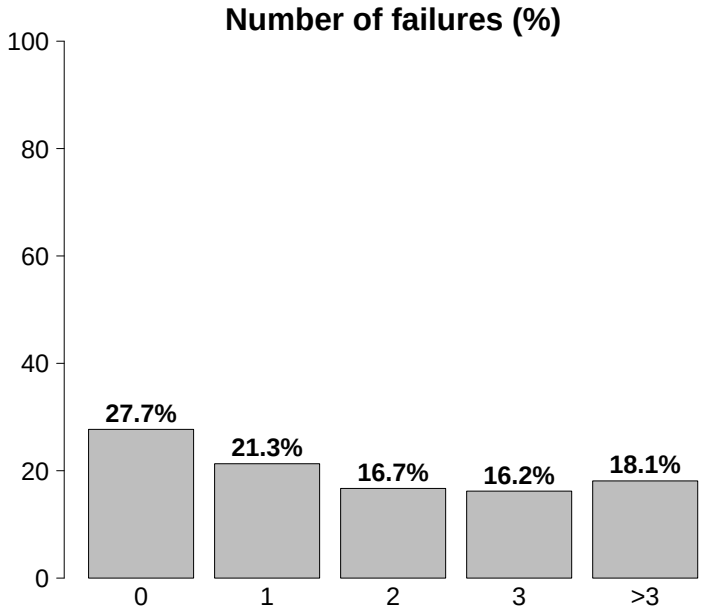
Non surgical interventions	N	%
None	794	91.0
Elective	3	0.3
Emergency	76	8.7
Missing	0	

Non surgical interventions **Elective** (N=3)	N	%
Interventional radiology	2	66.7
Interventional endoscopy	1	33.3
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	0	

Non surgical interventions **Emergency** (N=76)	N	%
Interventional cardiology	36	47.4
Interventional endoscopy	24	31.6
Interventional radiology	11	14.5
Interventional neuroradiology	5	6.6
Missing	0	

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

Reason for admission	N	%
Monitoring/Weaning	380	43.5
Post surgical weaning	0	0.0
Surgical monitoring	0	0.0
Post interventional weaning	1	0.1
Interventional monitoring	44	5.1
Non surgical monitoring	329	37.9
Missing	6	
Admission for procedures/treatments	0	0.0
Intensive Treatment	493	56.5
Only ventilatory support	167	19.1
Only cardiovascular support	90	10.3
Ventilatory and cardiovascular support	236	27.0
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	242	27.7
Yes	631	72.3
A: Respiratory failure	403	46.2
B: Cardiovascular failure	326	37.3
C: Neurological failure	104	11.9
D: Hepatic failure	13	1.5
E: Renal failure	406	46.5
F: Acute skin failure	1	0.1
G: Metabolic failure	311	35.6
H: Coagulation failure	31	3.6
Missing	0	

Failures on admission (top 10)	N	%
E	81	9.3
A	77	8.8
ABEG	71	8.1
BEG	47	5.4
EG	41	4.7
AB	37	4.2
ABCEG	35	4.0
AEG	24	2.7
ABE	22	2.5
ABG	22	2.5
Missing	0	

Respiratory failure	N	%
None	470	53.8
Only hypoxic failure	225	25.8
Only hypercapnic failure	40	4.6
Hypoxic-hypercapnic failure	16	1.8
Intubation for airway maint.	122	14.0
Missing	0	

Cardiovascular failure	N	%
None	547	62.7
Without shock	99	11.3
Cardiogenic shock	46	5.3
Septic shock	113	12.9
Haemorrhagic/hypovolemic shock	23	2.6
Hypovolemic shock	6	0.7
Anaphylactic shock	3	0.3
Neurogenic shock	8	0.9
Other shock	8	0.9
Mixed shock	20	2.3
Missing	0	

Neurologic failure	N	%
None	637	86.0
Cerebral coma	32	4.3
Metabolic coma	45	6.1
Postanoxic coma	24	3.2
Toxic coma	3	0.4
Missing or not evaluable	132	

Renal failure (AKIN)	N	%
None	467	53.5
Mild	242	27.7
Moderate	96	11.0
Severe	68	7.8
Missing	0	

Metabolic failure	N	%
None	562	64.4
pH <= 7.3, PaCO2 < 45 mmHg	222	25.4
Base deficit >= 5 mmol/L, lactate >1.5x	89	10.2
Missing	0	

National report - **Year 2017**

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

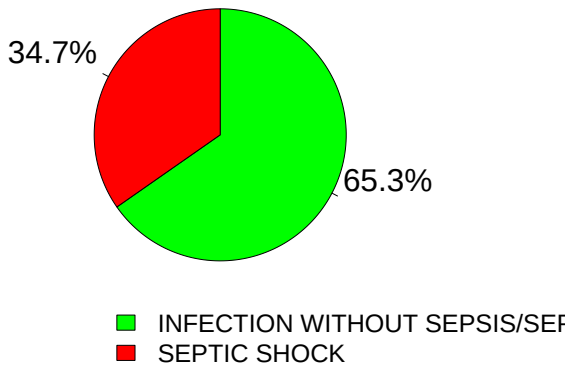
Clinical conditions on admission	N	%
Respiratory	157	18.0
Aspiration pneumonia	37	4.2
Pleural effusion	32	3.7
Pulmonary embolism	23	2.6
Atelectasis	19	2.2
Pneumothorax/Pneumomediastinum	18	2.1
Cardiovascular	291	33.3
Cardiac arrest	63	7.2
Left heart failure without pulm. edema	46	5.3
Acute ischaemia	45	5.2
Acute myocardial infarction	44	5.0
Left heart failure with pulmonary edema	33	3.8
Neurological	98	11.2
Cerebral artery stroke	51	5.8
Seizures	13	1.5
Metabolic/postanoxic encephalopathy	12	1.4
Vertebral basilar ischemic stroke	7	0.8
Non traumatic cerebral oedema	5	0.6
Gastrointestinal and hepatic	84	9.6
Gastrointestinal bleeding: upper tract	28	3.2
Acute pancreatitis	12	1.4
Paralytic Ileus	8	0.9
Acute on chronic liver disease	8	0.9
Gastrointestinal bleeding: lower tract	7	0.8
Trauma (anatomical districts)	172	19.7
Head	114	13.1
Chest	61	7.0
Spine	40	4.6
Pelvis/bone/joint & muscle	27	3.1
Abdomen	9	1.0
Major vessels injury	2	0.2
-	0	0.0
Other	185	21.2
Other disease	79	9.0
Metabolic disorder	65	7.4
Coagulation disorder	31	3.6
Nephrourologic disease	20	2.3
Acute intoxication	16	1.8
Post transplantation	7	0.8
Renal transplantation	3	0.3
Bone marrow transplantation	1	0.1
Infections	389	44.6
Pneumonia	241	27.6
NON-surgical urinary tract infection	49	5.6
Upper respiratory tract infection	20	2.3
Clinical sepsis	13	1.5
L.R.T.I. other than pneumonia	13	1.5
NON-surgical skin/soft tissue infection	13	1.5
Post-surgical skin/soft tissue infection	12	1.4
Primary bacteraemia of unknown origin	10	1.1
Cholecystitis/cholangitis	9	1.0
Pleurisy/Pleural empyema	8	0.9
Missing	0	

Trauma (anatomical districts)	N	%
Head	114	13.1
Skull fracture	61	7.0
Traumatic subarachnoid haemorrhage	57	6.5
Traumatic Subdural haematoma	51	5.8
Cerebral contusion/laceration	50	5.7
Maxillofacial fracture	29	3.3
Spine	40	4.6
Vertebral fracture, without deficit	25	2.9
Cervical injury, incomplete deficit	7	0.8
Tetraplegia	5	0.6
Chest	61	7.0
Other injuries of the chest	36	4.1
Traum. haemothorax/pneumothorax	31	3.6
Flail chest	17	1.9
Abdomen	9	1.0
Minor injuries of the abdomen	8	0.9
Spleen: Moderate-Severe laceration	1	0.1
-	0	0.0
Pelvis/bone/joint & muscle	27	3.1
Long bone fracture	21	2.4
Multiple fracture of the pelvis	6	0.7
Very severe or open fracture of the pelvis	2	0.2
Major vessels injury	2	0.2
Aorta: rupture/dissection	1	0.1
Major abdominal vessels: transection	1	0.1
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	484	56.3
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	245	28.5
SEPTIC SHOCK	130	15.1
Missing	14	

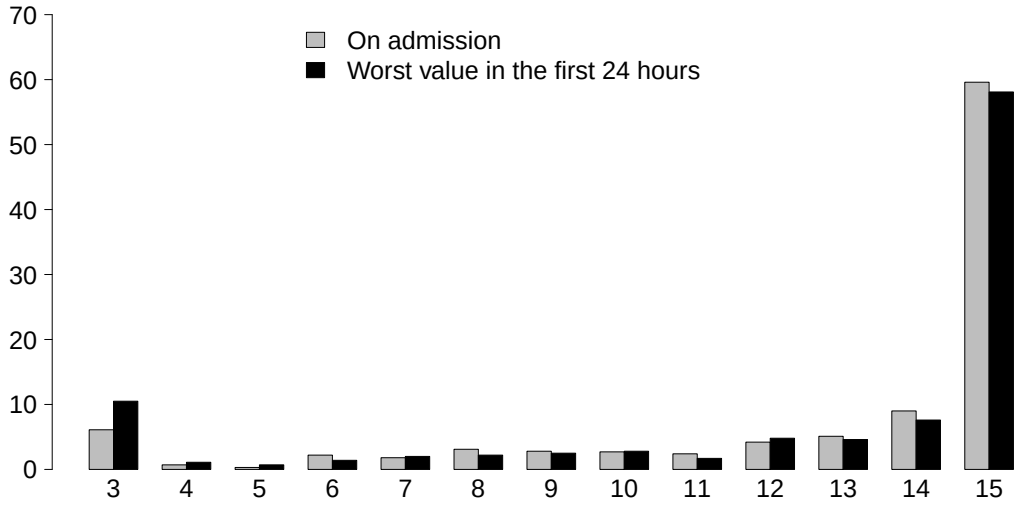
Infection severity on admission

Patients infected (N=375)



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

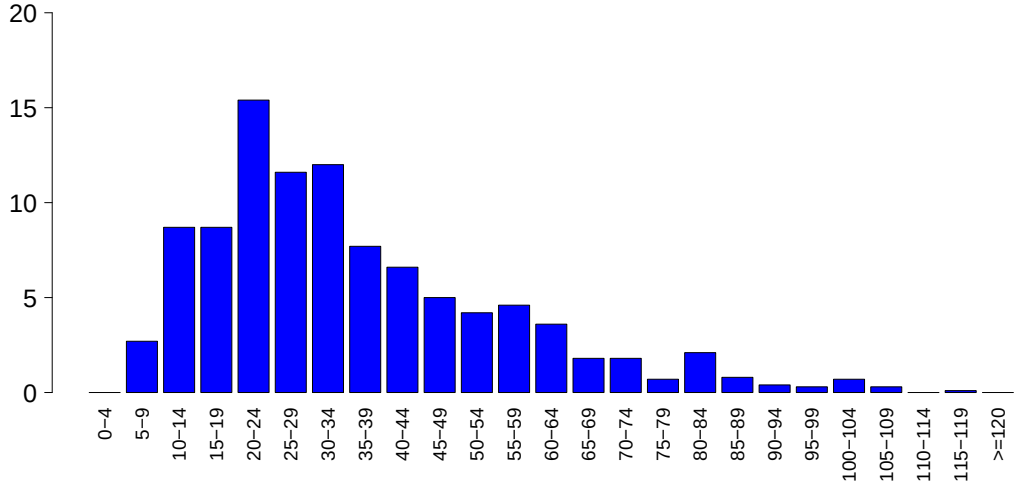
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	12−15
Not evaluable	132
Missing	0

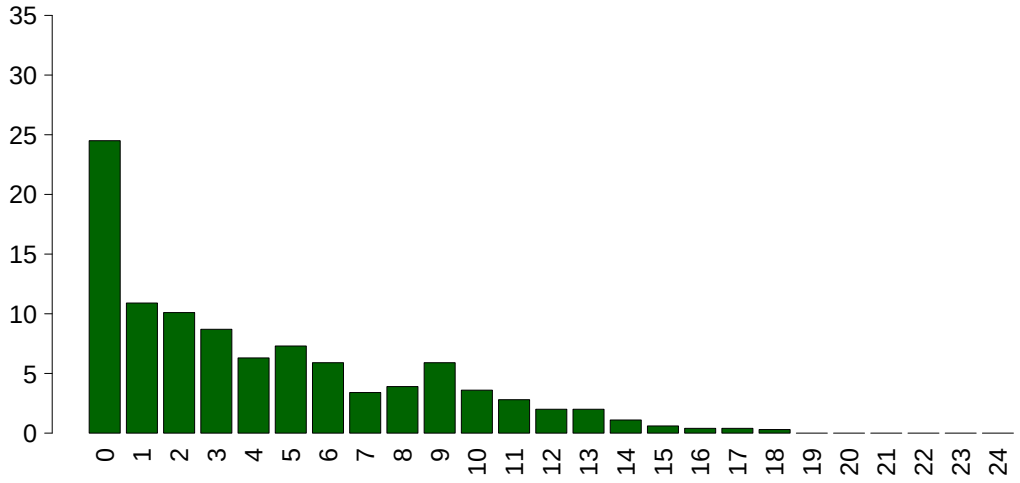
GCS (first 24 hours)	
Median	15
Q1−Q3	12−15
Not evaluable	159
Missing	0

SAPS II (%)



SAPSII	
Mean	35.6
SD	20.0
Median	31
Q1−Q3	22−46
Not evaluable	159
Missing	-159

SOFA (%)



SOFA	
Mean	4.2
SD	4.2
Median	3
Q1−Q3	1−7
Not evaluable	159
Missing	-159

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

Complications during the stay	N	%
No	571	65.4
Yes	302	34.6
Missing	0	

Failures during the stay	N	%
No	731	83.7
Yes	142	16.3
A: Respiratory failure	68	7.8
B: Cardiovascular failure	68	7.8
C: Neurological failure	11	1.3
D: Hepatic failure	10	1.1
E: Renal failure (AKIN)	41	4.7
F: Acute skin failure	0	0.0
G: Metabolic failure	14	1.6
H: Coagulation failure	7	0.8
Missing	0	

Failures during the stay (top 10)	N	%
B	33	3.8
A	30	3.4
AB	13	1.5
E	11	1.3
G	9	1.0
ABE	8	0.9
AE	7	0.8
BE	5	0.6
D	4	0.5
AC	3	0.3
Missing	0	

Respiratory failure occured	N	%
None	805	92.2
Intubation for airway maint.	18	2.1
Hypoxic failure	43	4.9
Hypercapnic failure	14	1.6
Missing	0	

Cardiovascular failure occured	N	%
None	805	92.2
Cardiogenic shock	32	3.7
Hypovolemic shock	2	0.2
Haemorrhagic/hypovolemic shock	0	0.0
Septic shock	30	3.4
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.1
Other shock	8	0.9
Missing	0	

Neurological failure occured	N	%
None	862	98.7
Cerebral coma	5	0.6
Metabolic coma	5	0.6
Postanoxic coma	1	0.1
Missing	0	

Renal failure occured (AKIN)	N	%
None	832	95.3
Mild	7	0.8
Moderate	7	0.8
Severe	27	3.1
Missing	0	

Complications during the stay	N	%
Respiratory	62	7.1
Pleural effusion	27	3.1
Atelectasis	15	1.7
Aspiration pneumonia	14	1.6
Pneumothorax/Pneumomediastinum	9	1.0
Severe ARDS	5	0.6
Cardiovascular	58	6.6
Acute severe arrhythmia: tachycardias	22	2.5
Cardiac arrest	12	1.4
Acute severe arrhythmia: bradycardias	10	1.1
Pulmonary edema	6	0.7
Hypertensive crisis	5	0.6
Neurological	80	9.2
Drowsiness/agitation/delirium	45	5.2
Intracranial hypertension	22	2.5
Brain edema	13	1.5
CrIMyNe	8	0.9
New ischaemic stroke	5	0.6
Gastrointestinal and hepatic	42	4.8
Paralytic Ileus	15	1.7
Gastrointestinal bleeding: upper tract	10	1.1
Liver Dysfunction Syndrome	7	0.8
Acute bile-duct disease	4	0.5
Ascites	4	0.5
Other	45	5.2
Other disease	21	2.4
Metabolic disorder	14	1.6
Nephrourologic disease	9	1.0
Category/Stage II: Partial Thickness Skin Loss	4	0.5
Other skin and/or soft tissue pathology	3	0.3
Category/Stage III: Full Thickness Skin Loss	1	0.1
Category/Stage IV: Full Thickness Tissue Loss	1	0.1
Infections	105	12.0
Pneumonia	55	6.3
NON-surgical urinary tract infection	16	1.8
L.R.T.I. other than pneumonia	11	1.3
Clinical sepsis	7	0.8
Primary bacteraemia of unknown origin	6	0.7
Upper respiratory tract infection	5	0.6
F.U.O. fever of unknown origin	4	0.5
Other viral infections	4	0.5
NON-surgical secondary peritonitis	3	0.3
NON-surgical skin/soft tissue infection	3	0.3
Missing	0	

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

Infections	N	%
None	419	48.0
Only on admission	349	40.0
On admission and during ICU stay	40	4.6
Only during ICU stay	65	7.4
Missing	0	

Maximum severity of infection	N	%
None	419	48.9
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	292	34.1
SEPTIC SHOCK	145	16.9
Missing	17	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	419 (87.1%)	0 (0.0%)	56 (11.6%)	6 (1.2%)	481
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	236 (96.3%)	9 (3.7%)	245
	SEPTIC SHOCK	-	-	-	130 (100.0%)	130
	TOT	419	0	292	145	856

Ventil. Associat. Pneumonia (VAP)	N	%
No	825	94.5
Yes	48	5.5
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	871	99.8
Yes	2	0.2
Missing	0	

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

Estimate	20.1
CI (95%)	14.8−26.7

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

Estimate	0.5
CI (95%)	0.1−1.7

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

Estimate	16.1%
CI (95%)	11.9−21.4

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

Estimate	0.6%
CI (95%)	0.1−2.0

National report - **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)	669	76.6										
Invasive ventilation	346	39.6	176	20.2	56	6.4	5	1–10	0	0	0–1	0
Non invasive ventilation	169	19.4	24	2.7	39	4.5	2	1–4	0	0	0–1	0
Tracheostomy	41	4.7	7	0.8	30	3.4	12	2–23	0	19	12–28	0
iNO (inhaled nitric oxide)	3	0.3	1	0.1	0	0	10	7–18	0	4	4–4	0
Central Venous Catheter	466	53.4	163	18.7	320	36.7	5	2–10	0	0	0–0	0
PICC	85	9.7	18	2.1	54	6.2	4	2–8	0	0	0–1	0
Arterial Catheter	525	60.1	178	20.4	170	19.5	4	2–9	0	0	0–0	0
Vasoactive drugs	453	51.9	144	16.5	90	10.3	3	1–6	0	0	0–0	0
Antiarrhythmics	74	8.5	12	1.4	26	3	3	1–7	0	1	0–3	0
IABP	0	0.0										
Invasive monitoring of C.O.	23	2.6	3	0.3	2	0.2	4	2–8	0	0	0–1	0
Continous monitoring of ScVO2	2	0.2	0	0	0	0	5	3–7	0	1	1–1	0
Temporary pacing	6	0.7	1	0.1	0	0	2	1–6	0	0	0–1	0
Ventricular assistance	0	0.0										
DC-shock	8	0.9								0	0–3	0
CPR	29	3.3								0	0–0	0
Massive blood transfusion	9	1.0								0	0–0	0
ICP monitoring without CSF drainage	20	2.3	10	1.1	1	0.1	7	3–14	0	1	1–4	0
ICP monitoring with CSF drainage	6	0.7	4	0.5	1	0.1	8	7–10	0	1	0–2	0
External ventricular drainage without ICP	2	0.2	1	0.1	0	0	4	4–5	0	3	3–3	0
Haemofiltration	1	0.1	1	0.1	0	0	4	4–4	0			
Haemodialysis	59	6.8	11	1.3	21	2.4	5	2–10	0	1	0–5	0
ECMO	0	0.0										
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	1	0.1	0	0	0	0	0	0–0	0	6	6–6	0
IAP (intra-abdominal pressure)	17	1.9										
Hypothermia	16	1.8	3	0.3	2	0.2	2	1–9	0	0	0–1	0
Enteral nutrition	219	25.1	28	3.2	102	11.7	6	2–17	0	1	1–2	0
Parenteral nutrition	265	30.4	47	5.4	127	14.5	4	2–10	0	1	0–2	0
SDD (Topical, Topical and systemic)	2	0.2										
Patient restraint	48	5.5										
Peridural catheter	7	0.8	3	0.3	4	0.5	3	2–4	0	0	0–3	0
Electrical cardioversion	5	0.6								0	0–4	0
Vacuum therapy	1	0.1										
Antibiotics	504	57.7										
Antibiotic prophylaxis	117	13.4	52	6	49	5.6	3	2–6	0	0	0–0	0
Empirical antibiotic therapy	325	37.2	108	12.4	129	14.8	3	2–5	0	0	0–0	0
Targeted antibiotic therapy	222	25.4	54	6.2	134	15.3	6	3–12	0	3	1–5	0

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

Invasive ventilation (N=346)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	209	59.4	8.1	10.4	5	1−9	0
For airway mainteinance	121	34.4	8.7	11.2	4	1−13	0
In weaning	7	2.0	0.6	0.5	1	0−1	0
Not evaluable	15	4.3	11.4	15.0	6.5	1.5−15.5	5
Reintubation within 48 hours	3	0.9	6.7	6.4	4	3−9	0

Non invasive ventilation (N=169)	N	%
Non invasive ventilation only	100	59.2
Non invasive ventilation failed	30	17.8
For weaning	33	19.5
Other	6	3.6
Missing	0	

Tracheostomy not present on admission (N=34)	N	%
Surgical	12	35.3
Percutwist	9	26.5
Ciaglia	2	5.9
Monodil. Ciaglia	2	5.9
Fantoni	0	0.0
Griggs	0	0.0
Other Kind	3	8.8
Unknown	6	17.6
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=34)	
Mean	20.4
SD	13.4
Median	19
Q1−Q3	11.2−27.8
Missing	0

Invasive monitoring of C.O. (N=23)	N	%
Swan Ganz	0	0.0
PICCO	18	78.3
LIDCO	5	21.7
Vigileo-PRAM	0	0.0
Other	0	0.0
Missing	0	

SDD (N=2)	N	%
Topical	1	50.0
Topical and systemic	1	50.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=65)	N	%
Only empirical	17	27.0
Only targeted	17	27.0
Targeted after empirical	26	41.3
Other	3	4.8
Missing	2	

Surgical interventions	N	%
No	836	95.8
Yes	37	4.2
Missing	0	

Number of surgical interventions	N	%
0	836	95.8
1	23	2.6
2	11	1.3
3	3	0.3
>3	0	0.0
Missing	0	

Surgical interventions Days from admission	
Mean	10.9
SD	9.3
Median	8.5
Q1−Q3	4−14
Missing	0

Surgical interventions (top 10)	N	%
Orthopaedic surgery	12	1.4
Other surgery	11	1.3
Neurosurgery	9	1.0
Gastrointestinal surgery	8	0.9
ENT surgery	6	0.7
Maxillo-Facial surgery	3	0.3
Pancreatic surgery	1	0.1
Nephro/Urological surgery	1	0.1
Peripheral vascular surgery	1	0.1
Thoracic vascular surgery	1	0.1
Missing	0	

Non surgical interventions	N	%
No	851	97.5
Yes	22	2.5
Missing	0	

Non surgical interventions Days from admission	
Mean	10.8
SD	13.6
Median	5
Q1−Q3	4−13
Missing	1

Non surgical interventions	N	%
Interventional cardiology	10	1.1
Interventional endoscopy	8	0.9
Interventional radiology	6	0.7
Interventional neuroradiology	0	0.0
Missing	0	

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

ICU outcome	N	%
Dead	142	16.3
Transferred to same hospital	638	73.4
Transferred to other hospital	84	9.7
Discharged home	5	0.6
Disch. terminally ill	0	0.0
Missing	4	

Transferred to (N=722)	N	%
Ward	541	74.9
Other ICU	75	10.4
High dependency care unit	106	14.7
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=75)	N	%
Specialist expertise	19	25.3
Step-up care	28	37.3
Logistical/organizational reasons	26	34.7
Step-down care	2	2.7
Missing	0	

Transferred to Same hospital (N=638)	N	%
Ward	498	78.1
Other ICU	37	5.8
High dependency care unit	103	16.1
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=84)	N	%
Ward	43	51.2
Other ICU	38	45.2
High dependency care unit	3	3.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	727	83.7
Dead	142	16.3
Missing	4	

Timing of ICU mortality (N=142)	N	%
Daytime (08:00AM - 07:59PM)	89	62.7
Nighttime (08:00PM - 07:59AM)	53	37.3
Weekdays (Monday - Friday)	96	67.6
Weekend (Saturday - Sunday)	46	32.4
Missing	0	

Hospital mortality	N	%
Alive	644	73.8
Dead	229	26.2
Missing	0	

Timing of hosp. mortality (N=229)	N	%
In ICU	142	62.0
Within 24 hours after ICU	2	0.9
24-47 hours after ICU	8	3.5
48-71 hours after ICU	11	4.8
72-95 hours after ICU	3	1.3
After 95 hours after ICU	63	27.5
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=87)	
Mean	21.7
SD	28.5
Median	11
Q1−Q3	3−24.5
Missing	0

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

Last hospital mortality	N	%
Alive	637	73.0
Dead	236	27.0
Missing	0	

ICU stay (days)	
Mean	6.8
SD	11.8
Median	3
Q1−Q3	1−7
Missing	0

ICU stay (days) **Alive** (N=727)	
Mean	6.9
SD	11.1
Median	3
Q1−Q3	1−7
Missing	0

ICU stay (days) **Dead** (N=142)	
Mean	6.7
SD	14.8
Median	3
Q1−Q3	1−7
Missing	0

Stay after ICU (days) **Alive** (N=727)	
Mean	14.7
SD	20.1
Median	8
Q1−Q3	3−17
Missing	0

Hospital stay (days)	
Mean	22.8
SD	29.2
Median	13
Q1−Q3	5−27
Missing	0

Hospital stay (days) **Alive** (N=644)	
Mean	22.4
SD	27.5
Median	14
Q1−Q3	6−26
Missing	0

Hospital stay (days) **Dead** (N=229)	
Mean	23.8
SD	33.6
Median	10
Q1−Q3	3−30
Missing	0

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

Patients (N): 706

Sex	N	%
Male	424	60.1
Female	282	39.9
Missing	0	

Age (years)	N	%
17-45	55	7.8
46-65	261	37.0
66-75	220	31.2
>75	170	24.1
Missing	0	
Mean	65.8	
SD	13.0	
Median	67	
Q1−Q3	59−75	
Min−Max	17−97	

Body mass Index (BMI)	N	%
Underweight	25	3.5
Normal	265	37.5
Overweight	271	38.4
Obese	145	20.5
Missing	0	

Pregnancy status **Females** (N=282)	N	%
Not fertile	109	38.7
Not pregnant/Unknown	171	60.6
Currently pregnant	0	0.0
Post partum	2	0.7
Missing	0	

Comorbidities	N	%
No	64	9.1
Yes	642	90.9
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	406	57.5
Any tumour without metastasis	254	36.0
Metastatic cancer	130	18.4
Diabetes Type II without insulin tr.	83	11.8
Arrhythmia	77	10.9
Peripheral vascular disease	51	7.2
Cerebrovascular disease	49	6.9
NYHA class II-III	49	6.9
Diabetes Type II with insulin treatment	47	6.7
Severe malnutrition	44	6.2
Missing	0	

Stay before ICU (days)	
Mean	3.7
SD	7.6
Median	1
Q1−Q3	1−3
Missing	0

Source of admission	N	%
Same hospital	701	99.3
Other hospital	5	0.7
Long-term chronic care hospital	0	0.0
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=706)	N	%
Medical ward	12	1.7
Surgical ward	680	96.3
Emergency room	1	0.1
Other ICU	3	0.4
High dependency care unit	10	1.4
Missing	0	

Reason for transfer from **Other ICU** (N=3)	N	%
Specialist expertise	1	33.3
Step-up care	1	33.3
Logistical/organizational reasons	1	33.3
Step-down care	0	0.0
Missing	0	

Ward of admission **Same hospital** (N=701)	N	%
Medical ward	12	1.7
Surgical ward	680	97.0
Emergency room	0	0.0
Other ICU	1	0.1
High dependency care unit	8	1.1
Missing	0	

Ward of admission **Other hospital** (N=5)	N	%
Medical ward	0	0.0
Surgical ward	0	0.0
Emergency room	1	20.0
Other ICU	2	40.0
High dependency care unit	2	40.0
Missing	0	

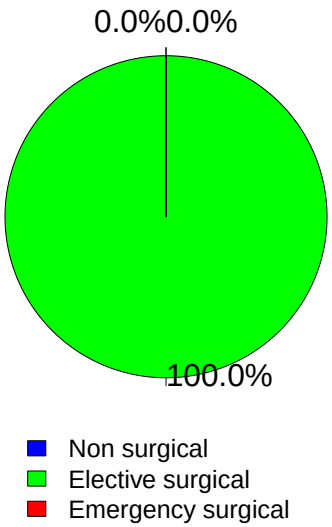
Scheduled admission	N	%
No	107	15.2
Yes	599	84.8
Missing	0	

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

Trauma	N	%
No	683	96.7
Yes	23	3.3
Multiple trauma	2	0.3
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	706	100.0
Emergency surgical	0	0.0
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=706)	N	%
Operating theatre of surgical ward	646	91.5
Operating theatre of emergency room	0	0.0
Surgical ward	34	4.8
Other	26	3.7
Missing	0	

Surgical interventions (top 10) **Elective surgical** (N=706)	N	%
Gastrointestinal surgery	397	56.2
Nephro/Urological surgery	109	15.4
Peripheral vascular surgery	54	7.6
Hepatic surgery	39	5.5
Orthopaedic surgery	34	4.8
Other surgery	34	4.8
Gynaecological surgery	27	3.8
Neurosurgery	13	1.8
Abdominal vascular surgery	9	1.3
Pancreatic surgery	7	1.0
Missing	0	

Timing **Elective surgical** (N=706)	N	%
From -7 to -3 days	21	3.0
From -2 to -1 days	19	2.7
On ICU admission day	715	101.3
The day after ICU admission	10	1.4
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	700	99.2
Elective	1	0.1
Emergency	5	0.7
Missing	0	

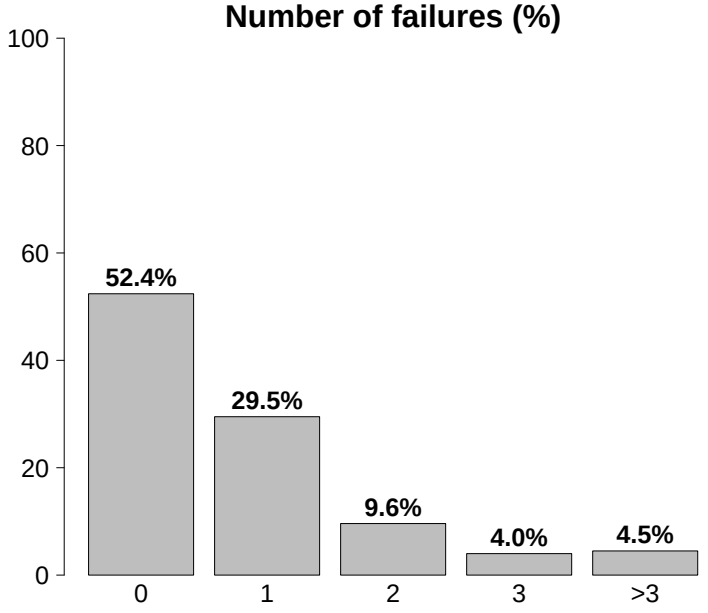
Non surgical interventions **Elective** (N=1)	N	%
Interventional radiology	0	0.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Interventional endoscopy	0	0.0
Missing	1	

Non surgical interventions **Emergency** (N=5)	N	%
Interventional radiology	3	60.0
Interventional endoscopy	1	20.0
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	1	

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

Reason for admission	N	%
Monitoring/Weaning	423	59.9
Post surgical weaning	2	0.3
Surgical monitoring	421	59.6
Post interventional weaning	0	0.0
Interventional monitoring	0	0.0
Non surgical monitoring	0	0.0
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	283	40.1
Only ventilatory support	143	20.3
Only cardiovascular support	58	8.2
Ventilatory and cardiovascular support	82	11.6
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	370	52.4
Yes	336	47.6
A: Respiratory failure	225	31.9
B: Cardiovascular failure	140	19.8
C: Neurological failure	8	1.1
D: Hepatic failure	2	0.3
E: Renal failure	102	14.4
F: Acute skin failure	0	0.0
G: Metabolic failure	80	11.3
H: Coagulation failure	10	1.4
Missing	0	

Failures on admission (top 10)	N	%
A	127	18.0
B	36	5.1
AB	32	4.5
E	27	3.8
ABEG	19	2.7
G	18	2.5
AE	12	1.7
ABE	11	1.6
EG	8	1.1
BG	7	1.0
Missing	0	

Respiratory failure	N	%
None	481	68.1
Only hypoxic failure	174	24.6
Only hypercapnic failure	3	0.4
Hypoxic-hypercapnic failure	3	0.4
Intubation for airway maint.	45	6.4
Missing	0	

Cardiovascular failure	N	%
None	566	80.2
Without shock	50	7.1
Cardiogenic shock	7	1.0
Septic shock	20	2.8
Haemorrhagic/hypovolemic shock	23	3.3
Hypovolemic shock	20	2.8
Anaphylactic shock	2	0.3
Neurogenic shock	0	0.0
Other shock	14	2.0
Mixed shock	4	0.6
Missing	0	

Neurologic failure	N	%
None	667	98.8
Cerebral coma	0	0.0
Metabolic coma	5	0.7
Postanoxic coma	3	0.4
Toxic coma	0	0.0
Missing or not evaluable	31	

Renal failure (AKIN)	N	%
None	604	85.6
Mild	57	8.1
Moderate	22	3.1
Severe	23	3.3
Missing	0	

Metabolic failure	N	%
None	626	88.7
pH <= 7.3, PaCO2 < 45 mmHg	33	4.7
Base deficit >= 5 mmol/L, lactate >1.5x	47	6.7
Missing	0	

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

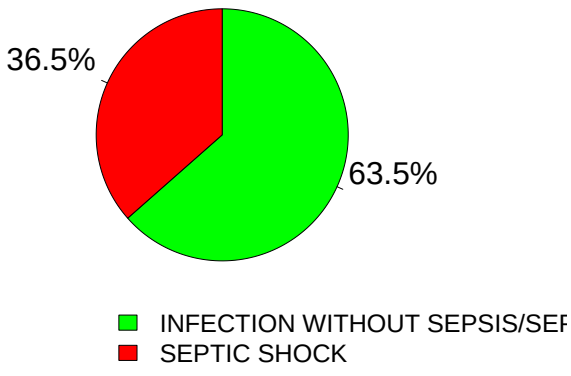
Clinical conditions on admission	N	%
Respiratory	36	5.1
Pleural effusion	14	2.0
Pneumothorax/Pneumomediastinum	5	0.7
Atelectasis	4	0.6
Restrictive lung disease, exacerbation	4	0.6
Pulmonary embolism	3	0.4
Cardiovascular	77	10.9
Peripheral vascular disease	49	6.9
Left heart failure without pulm. edema	6	0.8
Acute severe arrhythmia: tachycardias	6	0.8
Cardiac arrest	5	0.7
Non-ruptured aneurysm	5	0.7
Neurological	15	2.1
Brain tumour	4	0.6
Cerebral artery stroke	3	0.4
Seizures	3	0.4
Cerebral Aneurysm	2	0.3
Neuropathy/myopathy	2	0.3
Gastrointestinal and hepatic	377	53.4
Digestive tract malignancy	312	44.2
Hepatic malignancy	34	4.8
Intestinal occlusion	23	3.3
Paralytic Ileus	15	2.1
Acute bile-duct disease	9	1.3
Trauma (anatomical districts)	23	3.3
Pelvis/bone/joint & muscle	18	2.5
Head	2	0.3
Spine	2	0.3
Chest	1	0.1
Abdomen	1	0.1
Major vessels injury	1	0.1
-	0	0.0
Other	346	49.0
Other disease	224	31.7
Nephrourologic disease	96	13.6
Gynaecological disease	16	2.3
Metabolic disorder	15	2.1
Coagulation disorder	10	1.4
Post transplantation	11	1.6
Liver transplantation	7	1.0
Renal transplantation	4	0.6
Infections	66	9.3
Post-surgical peritonitis	20	2.8
Pneumonia	11	1.6
NON-surgical urinary tract infection	8	1.1
Primary peritonitis	4	0.6
NON-surgical secondary peritonitis	4	0.6
Post-surgical urinary tract infection	4	0.6
NON-surgical skin/soft tissue infection	3	0.4
Post-surgical skin/soft tissue infection	3	0.4
NON-surgical bone and joint infection	2	0.3
Cholecystitis/cholangitis	2	0.3
Missing	0	

Trauma (anatomical districts)	N	%
Head	2	0.3
Maxillofacial fracture	2	0.3
Traumatic Subdural haematoma	1	0.1
-	0	0.0
-	0	0.0
-	0	0.0
Spine	2	0.3
Vertebral fracture, without deficit	1	0.1
Tetraplegia	1	0.1
-	0	0.0
Chest	1	0.1
Traum. haemothorax/pneumothorax	1	0.1
Flail chest	1	0.1
Other injuries of the chest	1	0.1
Abdomen	1	0.1
Spleen: Massive rupture	1	0.1
-	0	0.0
-	0	0.0
Pelvis/bone/joint & muscle	18	2.5
Long bone fracture	18	2.5
-	0	0.0
-	0	0.0
Major vessels injury	1	0.1
Major abdominal vessels: transection	1	0.1
-	0	0.0
-	0	0.0
Miscellaneous	0	0.0
-	0	0.0
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	640	91.0
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	40	5.7
SEPTIC SHOCK	23	3.3
Missing	3	

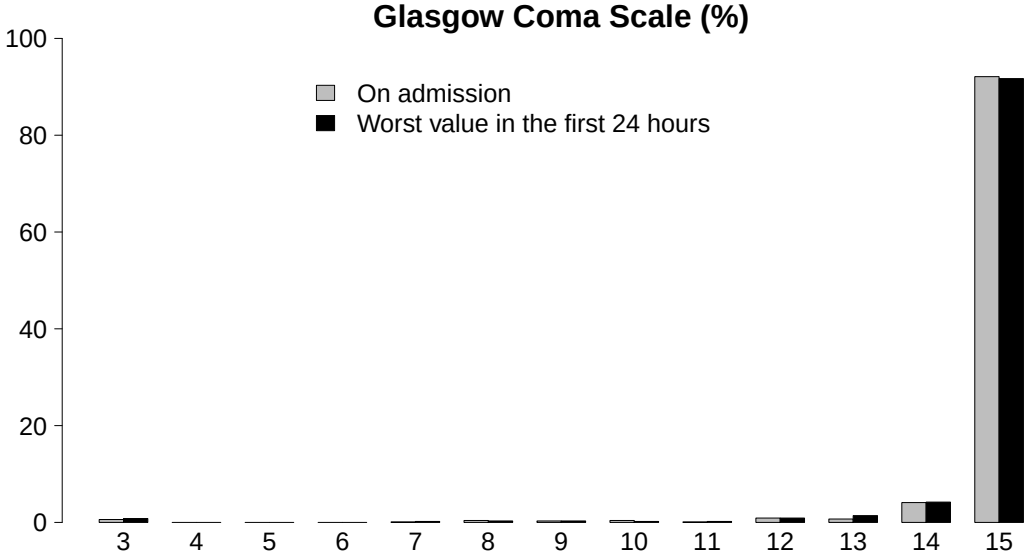
Infection severity on admission

Patients infected (N=63)



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

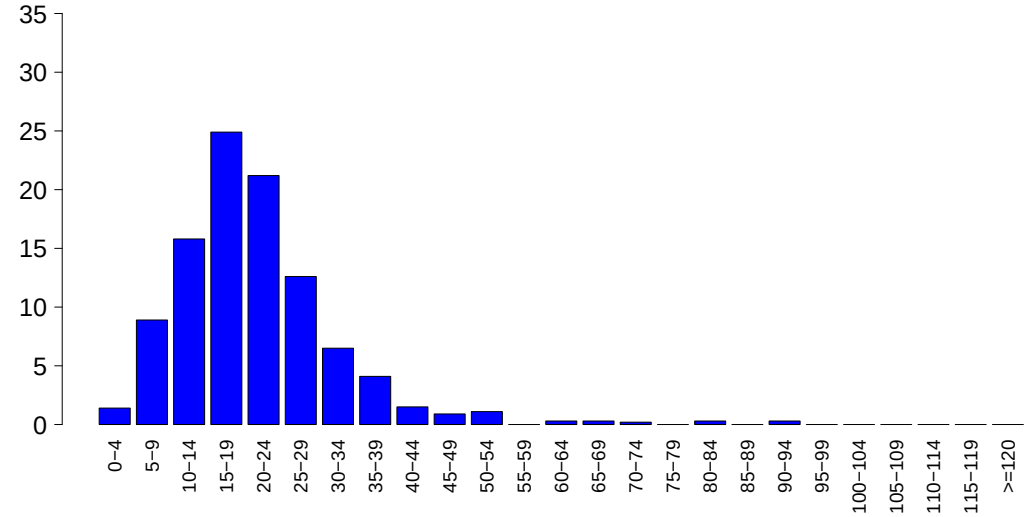
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	15−15
Not evaluable	31
Missing	0

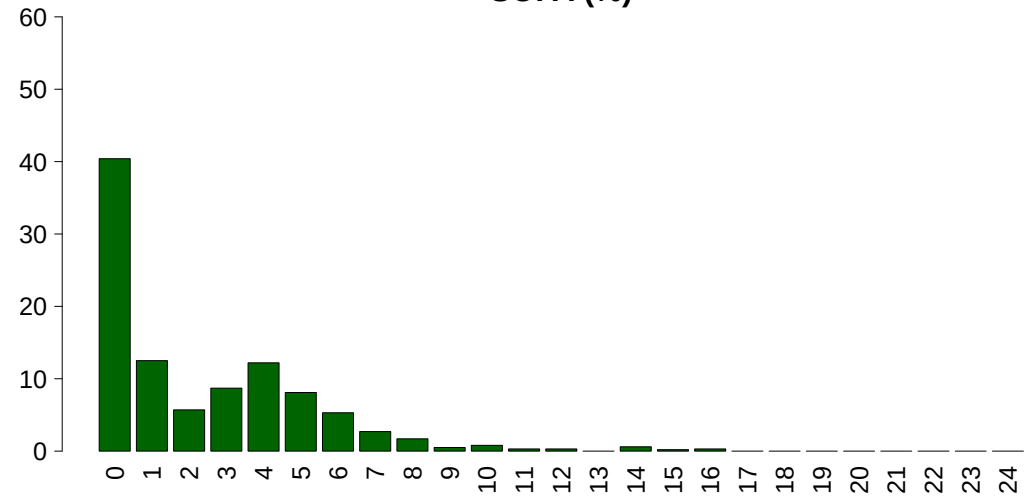
GCS (first 24 hours)	
Median	15
Q1−Q3	15−15
Not evaluable	40
Missing	0

SAPS II (%)



SAPSII	
Mean	21.0
SD	11.2
Median	19
Q1−Q3	14−26
Not evaluable	40
Missing	-40

SOFA (%)



SOFA	
Mean	2.4
SD	2.8
Median	1
Q1−Q3	0−4
Not evaluable	40
Missing	-40

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

Complications during the stay	N	%
No	471	66.7
Yes	235	33.3
Missing	0	

Failures during the stay	N	%
No	662	93.8
Yes	44	6.2
A: Respiratory failure	18	2.5
B: Cardiovascular failure	18	2.5
C: Neurological failure	3	0.4
D: Hepatic failure	6	0.8
E: Renal failure (AKIN)	17	2.4
F: Acute skin failure	0	0.0
G: Metabolic failure	10	1.4
H: Coagulation failure	4	0.6
Missing	0	

Failures during the stay (top 10)	N	%
B	7	1.0
E	7	1.0
G	6	0.8
A	5	0.7
AB	5	0.7
ABE	2	0.3
AE	2	0.3
ABDEH	1	0.1
ABEG	1	0.1
AC	1	0.1
Missing	0	

Respiratory failure occured	N	%
None	688	97.5
Intubation for airway maint.	6	0.8
Hypoxic failure	12	1.7
Hypercapnic failure	4	0.6
Missing	0	

Cardiovascular failure occured	N	%
None	688	97.5
Cardiogenic shock	1	0.1
Hypovolemic shock	0	0.0
Haemorrhagic/hypovolemic shock	4	0.6
Septic shock	11	1.6
Anaphylactic shock	0	0.0
Neurogenic shock	0	0.0
Other shock	3	0.4
Missing	0	

Neurological failure occured	N	%
None	703	99.6
Cerebral coma	1	0.1
Metabolic coma	2	0.3
Postanoxic coma	0	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	689	97.6
Mild	4	0.6
Moderate	4	0.6
Severe	9	1.3
Missing	0	

Complications during the stay	N	%
Respiratory	26	3.7
Pleural effusion	12	1.7
Atelectasis	10	1.4
Aspiration pneumonia	5	0.7
Pulmonary embolism	3	0.4
Mild ARDS	2	0.3
Cardiovascular	37	5.2
Acute severe arrhythmia: tachycardias	19	2.7
Cardiac arrest	8	1.1
Deep venous thrombosis	4	0.6
Hypertensive crisis	3	0.4
Pulmonary edema	3	0.4
Neurological	43	6.1
Drowsiness/agitation/delirium	38	5.4
Seizures	3	0.4
CrIMyNe	2	0.3
New ischaemic stroke	2	0.3
Brain edema	1	0.1
Gastrointestinal and hepatic	70	9.9
Paralytic Ileus	48	6.8
Anastomotic dehiscence	7	1.0
Gastrointestinal perforation	5	0.7
Liver Dysfunction Syndrome	4	0.6
Ascites	3	0.4
Other	83	11.8
Other disease	64	9.1
Nephrourologic disease	12	1.7
Metabolic disorder	10	1.4
Other skin and/or soft tissue pathology	4	0.6
Graft vascular thrombosis	1	0.1
Severe graft dysfunction	1	0.1
Iatrogenic major vessels injury	1	0.1
Infections	93	13.2
Post-surgical peritonitis	41	5.8
Post-surgical skin/soft tissue infection	23	3.3
Pneumonia	18	2.5
F.U.O. fever of unknown origin	7	1.0
Clinical sepsis	5	0.7
Extra/retroperitoneal abscess	2	0.3
NON-surgical urinary tract infection	2	0.3
Post-surgical urinary tract infection	2	0.3
Primary bacteraemia of unknown origin	1	0.1
Post-surgical bone and joint infection	1	0.1
Missing	0	

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

Infections	N	%
None	565	80.0
Only on admission	48	6.8
On admission and during ICU stay	18	2.5
Only during ICU stay	75	10.6
Missing	0	

Maximum severity of infection	N	%
None	565	81.8
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	93	13.5
SEPTIC SHOCK	33	4.8
Missing	15	

Severity evolution

		During the stay				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	565 (90.0%)	0 (0.0%)	57 (9.1%)	6 (1.0%)	628
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	36 (90.0%)	4 (10.0%)	40
	SEPTIC SHOCK	-	-	-	23 (100.0%)	23
	TOT	565	0	93	33	691

Ventil. Associat. Pneumonia (VAP)	N	%
No	695	98.4
Yes	11	1.6
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	706	100.0
Yes	0	0.0
Missing	0	

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

Estimate	24.6
CI (95%)	12.3−43.9

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

Estimate	0.0
CI (95%)	0.0−1.8

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

Estimate	19.6%
CI (95%)	9.8−35.1

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

Estimate	0.0%
CI (95%)	0.0−2.1

National report - **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)	688	97.5										
Invasive ventilation	97	13.7	64	9.1	12	1.7	1	1–5	0	0	0–0	0
Non invasive ventilation	181	25.6	30	4.2	18	2.5	1	1–3	0	0	0–0	0
Tracheostomy	8	1.1	2	0.3	6	0.8	18	7–25	0	18	14–24	0
iNO (inhaled nitric oxide)	3	0.4	1	0.1	1	0.1	5	4–16	0	8	5–12	0
Central Venous Catheter	409	57.9	360	51	381	54	3	2–5	0	0	0–0	0
PICC	70	9.9	32	4.5	58	8.2	3	2–5	0	0	0–1	0
Arterial Catheter	462	65.4	355	50.3	71	10.1	3	1–4	0	0	0–0	0
Vasoactive drugs	282	39.9	166	23.5	14	2	2	1–3	0	0	0–0	0
Antiarrhythmics	27	3.8	2	0.3	3	0.4	1	0–4	0	1	0–2	0
IABP	0	0.0										
Invasive monitoring of C.O.	9	1.3	2	0.3	0	0	5	2–7	0	6	2–12	0
Continous monitoring of ScVO2	5	0.7	1	0.1	0	0	1	1–2	0	0	0–0	0
Temporary pacing	1	0.1	0	0	0	0	14	14–14	0	1	1–1	0
Ventricular assistance	0	0.0										
DC-shock	5	0.7								3	2–6	0
CPR	6	0.8								0	0–2	0
Massive blood transfusion	8	1.1								0	0–0	0
ICP monitoring without CSF drainage	1	0.1	1	0.1	0	0	16	16–16	0			
ICP monitoring with CSF drainage	1	0.1	1	0.1	1	0.1	19	19–19	0			
External ventricular drainage without ICP	1	0.1	1	0.1	0	0	2	2–2	0			
Haemofiltration	0	0.0										
Haemodialysis	11	1.6	4	0.6	4	0.6	4	3–16	0	4	3–10	0
ECMO	0	0.0										
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	2	0.3	0	0	0	0	0	0–1	0	2	1–2	0
IAP (intra-abdominal pressure)	11	1.6										
Hypothermia	3	0.4	2	0.3	0	0	1	0–1	0	0	0–0	0
Enteral nutrition	170	24.1	8	1.1	153	21.7	2	1–4	0	1	1–2	0
Parenteral nutrition	505	71.5	69	9.8	391	55.4	2	1–4	0	1	0–1	0
SDD (Topical, Topical and systemic)	1	0.1										
Patient restraint	14	2.0										
Peridural catheter	265	37.5	256	36.3	226	32	3	2–4	0	0	0–0	0
Electrical cardioversion	2	0.3								8	7–9	0
Vacuum therapy	2	0.3										
Antibiotics	644	91.2										
Antibiotic prophylaxis	579	82.0	455	64.4	229	32.4	1	0–2	0	0	0–0	0
Empirical antibiotic therapy	94	13.3	24	3.4	41	5.8	2	1–4	0	2	0–3	0
Targeted antibiotic therapy	76	10.8	11	1.6	63	8.9	6	3–11	0	3	2–5	0

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

Invasive ventilation (N=97)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	41	39.8	6.6	9.1	3	1−7	0
For airway mainteinance	45	43.7	5.8	9.2	1	0−7	0
In weaning	2	1.9	0.0	0.0	0	0−0	0
Not evaluable	15	14.6	1.4	2.2	1	0−1	6
Reintubation within 48 hours	0	0.0					

Non invasive ventilation (N=181)	N	%
Non invasive ventilation only	157	86.7
Non invasive ventilation failed	4	2.2
For weaning	20	11.0
Other	0	0.0
Missing	0	

Tracheostomy not present on admission (N=6)	N	%
Surgical	1	16.7
Percutwist	0	0.0
Ciaglia	1	16.7
Monodil. Ciaglia	1	16.7
Fantoni	0	0.0
Griggs	0	0.0
Other Kind	2	33.3
Unknown	1	16.7
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=6)	
Mean	18.2
SD	11.0
Median	18.5
Q1−Q3	13.5−22
Missing	0

Invasive monitoring of C.O. (N=9)	N	%
Swan Ganz	0	0.0
PICCO	6	66.7
LIDCO	2	22.2
Vigileo-PRAM	0	0.0
Other	1	11.1
Missing	0	

SDD (N=1)	N	%
Topical	1	100.0
Topical and systemic	0	0.0
Missing	0	

Antibiotic therapy Pt. infected in ICU only (N=75)	N	%
Only empirical	35	50.0
Only targeted	18	25.7
Targeted after empirical	15	21.4
Other	2	2.9
Missing	5	

Surgical interventions	N	%
No	682	96.6
Yes	24	3.4
Missing	0	

Number of surgical interventions	N	%
0	682	96.6
1	17	2.4
2	4	0.6
3	1	0.1
>3	2	0.3
Missing	0	

Surgical interventions Days from admission	
Mean	7.1
SD	5.1
Median	6
Q1−Q3	3−10
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	19	2.7
Pancreatic surgery	5	0.7
Other surgery	5	0.7
Nephro/Urological surgery	2	0.3
Neurosurgery	2	0.3
Maxillo-Facial surgery	1	0.1
ENT surgery	1	0.1
Thoracic surgery	1	0.1
Organ/s transplantation	1	0.1
-	0	0.0
Missing	0	

Non surgical interventions	N	%
No	697	98.7
Yes	9	1.3
Missing	0	

Non surgical interventions Days from admission	
Mean	15.0
SD	10.5
Median	12
Q1−Q3	7.5−22
Missing	0

Non surgical interventions	N	%
Interventional radiology	7	1.0
Interventional endoscopy	3	0.4
Interventional cardiology	1	0.1
Interventional neuroradiology	0	0.0
Missing	0	

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

ICU outcome	N	%
Dead	19	2.7
Transferred to same hospital	680	96.3
Transferred to other hospital	6	0.8
Discharged home	1	0.1
Disch. terminally ill	0	0.0
Missing	0	

Transferred to (N=686)	N	%
Ward	607	88.5
Other ICU	11	1.6
High dependency care unit	68	9.9
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

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

Transferred to Same hospital (N=680)	N	%
Ward	603	88.7
Other ICU	9	1.3
High dependency care unit	68	10.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=6)	N	%
Ward	4	66.7
Other ICU	2	33.3
High dependency care unit	0	0.0
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	687	97.3
Dead	19	2.7
Missing	0	

Timing of ICU mortality (N=19)	N	%
Daytime (08:00AM - 07:59PM)	11	57.9
Nighttime (08:00PM - 07:59AM)	8	42.1
Weekdays (Monday - Friday)	13	68.4
Weekend (Saturday - Sunday)	6	31.6
Missing	0	

Hospital mortality	N	%
Alive	666	94.3
Dead	40	5.7
Missing	0	

Timing of hosp. mortality (N=40)	N	%
In ICU	19	47.5
Within 24 hours after ICU	3	7.5
24-47 hours after ICU	0	0.0
48-71 hours after ICU	1	2.5
72-95 hours after ICU	0	0.0
After 95 hours after ICU	17	42.5
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=21)	
Mean	22.4
SD	20.7
Median	18
Q1−Q3	7−27
Missing	0

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

Last hospital mortality	N	%
Alive	666	94.3
Dead	40	5.7
Missing	0	

ICU stay (days)	
Mean	3.7
SD	5.6
Median	2
Q1−Q3	1−4
Missing	0

ICU stay (days) **Alive** (N=687)	
Mean	3.6
SD	5.4
Median	2
Q1−Q3	1−4
Missing	0

ICU stay (days) **Dead** (N=19)	
Mean	8.1
SD	9.3
Median	5
Q1−Q3	1.5−10.5
Missing	0

Stay after ICU (days) **Alive** (N=687)	
Mean	10.7
SD	16.9
Median	6
Q1−Q3	4−10
Missing	0

Hospital stay (days)	
Mean	17.9
SD	20.9
Median	11
Q1−Q3	8−19
Missing	0

Hospital stay (days) **Alive** (N=666)	
Mean	17.5
SD	20.9
Median	11
Q1−Q3	8−18
Missing	0

Hospital stay (days) **Dead** (N=40)	
Mean	24.6
SD	20.2
Median	20.5
Q1−Q3	7.5−35
Missing	0

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

Patients (N): 692

Sex	N	%
Male	435	62.9
Female	257	37.1
Missing	0	

Age (years)	N	%
17-45	128	18.5
46-65	210	30.3
66-75	134	19.4
>75	220	31.8
Missing	0	
Mean	63.3	
SD	18.7	
Median	66	
Q1−Q3	52−79	
Min−Max	17−98	

Body mass Index (BMI)	N	%
Underweight	27	3.9
Normal	302	43.6
Overweight	238	34.4
Obese	125	18.1
Missing	0	

Pregnancy status **Females** (N=257)	N	%
Not fertile	132	51.4
Not pregnant/Unknown	117	45.5
Currently pregnant	0	0.0
Post partum	8	3.1
Missing	0	

Comorbidities	N	%
No	165	23.8
Yes	527	76.2
Missing	0	

Comorbidities (top 10)	N	%
Hypertension	331	47.8
Arrhythmia	120	17.3
NYHA class II-III	103	14.9
Any tumour without metastasis	88	12.7
Moderate or severe renal disease	65	9.4
Diabetes Type II without insulin tr.	59	8.5
Peripheral vascular disease	58	8.4
Myocardial infarction	49	7.1
Alcohol addiction	48	6.9
Drug-induced coagulopathy	45	6.5
Missing	0	

Stay before ICU (days)	
Mean	3.8
SD	9.6
Median	1
Q1−Q3	0−3
Missing	0

Source of admission	N	%
Same hospital	660	95.4
Other hospital	30	4.3
Long-term chronic care hospital	2	0.3
Directly from the community	0	0.0
Missing	0	

Ward of admission **Hospital** (N=690)	N	%
Medical ward	50	7.2
Surgical ward	414	60.0
Emergency room	155	22.5
Other ICU	35	5.1
High dependency care unit	36	5.2
Missing	0	

Reason for transfer from **Other ICU** (N=35)	N	%
Specialist expertise	20	57.1
Step-up care	8	22.9
Logistical/organizational reasons	7	20.0
Step-down care	0	0.0
Missing	0	

Ward of admission **Same hospital** (N=660)	N	%
Medical ward	47	7.1
Surgical ward	409	62.0
Emergency room	146	22.1
Other ICU	25	3.8
High dependency care unit	33	5.0
Missing	0	

Ward of admission **Other hospital** (N=30)	N	%
Medical ward	3	10.0
Surgical ward	5	16.7
Emergency room	9	30.0
Other ICU	10	33.3
High dependency care unit	3	10.0
Missing	0	

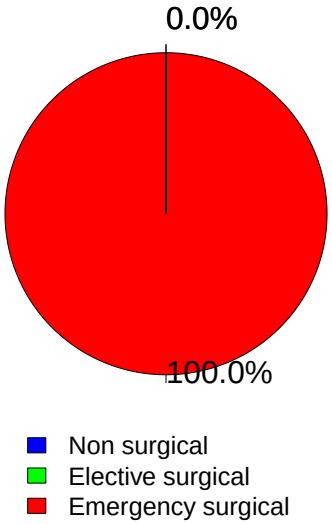
Scheduled admission	N	%
No	692	100.0
Yes	0	0.0
Missing	0	

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

Trauma	N	%
No	474	68.5
Yes	218	31.5
Multiple trauma	80	11.6
Missing	0	

Surgical status	N	%
Non surgical	0	0.0
Elective surgical	0	0.0
Emergency surgical	692	100.0
Missing	0	

Surgical status



Source of admission **Surgical pt.** (N=692)	N	%
Operating theatre of surgical ward	357	51.7
Operating theatre of emergency room	97	14.1
Surgical ward	57	8.3
Other	179	25.9
Missing	2	

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=692)	N	%
Gastrointestinal surgery	331	47.8
Neurosurgery	136	19.7
Orthopaedic surgery	55	7.9
Other surgery	46	6.6
Peripheral vascular surgery	25	3.6
Nephro/Urological surgery	20	2.9
Abdominal vascular surgery	19	2.7
Biliary tract surgery	19	2.7
Thoracic surgery	14	2.0
ENT surgery	9	1.3
Missing	18	

Timing **Emergency surgical** (N=692)	N	%
From -7 to -3 days	18	2.6
From -2 to -1 days	60	8.7
On ICU admission day	619	89.5
The day after ICU admission	35	5.1
Missing	1	

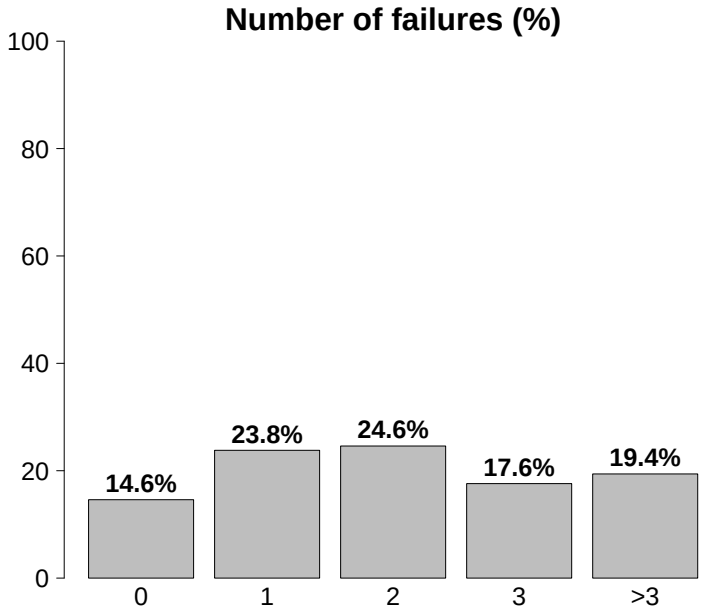
Non surgical interventions	N	%
None	659	95.2
Elective	3	0.4
Emergency	30	4.3
Missing	0	

Non surgical interventions **Elective** (N=3)	N	%
Interventional radiology	1	33.3
Interventional endoscopy	1	33.3
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	1	

Non surgical interventions **Emergency** (N=30)	N	%
Interventional radiology	10	33.3
Interventional endoscopy	9	30.0
Interventional cardiology	2	6.7
Interventional neuroradiology	1	3.3
Missing	8	

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

Reason for admission	N	%
Monitoring/Weaning	136	19.7
Post surgical weaning	13	1.9
Surgical monitoring	123	17.8
Post interventional weaning	0	0.0
Interventional monitoring	0	0.0
Non surgical monitoring	0	0.0
Missing	0	
Admission for procedures/treatments	0	0.0
Intensive Treatment	556	80.3
Only ventilatory support	172	24.9
Only cardiovascular support	50	7.2
Ventilatory and cardiovascular support	334	48.3
Missing	0	
Palliative Sedation	0	0.0
Diagnosis of death/Organ donation	0	0.0
Missing	0	



Failures on admission	N	%
No	101	14.6
Yes	591	85.4
A: Respiratory failure	506	73.1
B: Cardiovascular failure	384	55.5
C: Neurological failure	59	8.5
D: Hepatic failure	14	2.0
E: Renal failure	246	35.5
F: Acute skin failure	0	0.0
G: Metabolic failure	210	30.3
H: Coagulation failure	34	4.9
Missing	0	

Failures on admission (top 10)	N	%
A	118	17.1
AB	112	16.2
ABEG	84	12.1
ABE	43	6.2
ABG	28	4.0
B	21	3.0
E	18	2.6
ABC	17	2.5
BEG	17	2.5
AE	15	2.2
Missing	0	

Respiratory failure	N	%
None	186	26.9
Only hypoxic failure	194	28.0
Only hypercapnic failure	9	1.3
Hypoxic-hypercapnic failure	15	2.2
Intubation for airway maint.	288	41.6
Missing	0	

Cardiovascular failure	N	%
None	308	44.5
Without shock	136	19.7
Cardiogenic shock	5	0.7
Septic shock	134	19.4
Haemorrhagic/hypovolemic shock	55	7.9
Hypovolemic shock	17	2.5
Anaphylactic shock	0	0.0
Neurogenic shock	5	0.7
Other shock	17	2.5
Mixed shock	15	2.2
Missing	0	

Neurologic failure	N	%
None	422	87.7
Cerebral coma	42	8.7
Metabolic coma	10	2.1
Postanoxic coma	3	0.6
Toxic coma	4	0.8
Missing or not evaluable	211	

Renal failure (AKIN)	N	%
None	446	64.5
Mild	125	18.1
Moderate	55	7.9
Severe	66	9.5
Missing	0	

Metabolic failure	N	%
None	482	69.7
pH <= 7.3, PaCO2 < 45 mmHg	84	12.1
Base deficit >= 5 mmol/L, lactate >1.5x	126	18.2
Missing	0	

National report - **Year 2017**

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

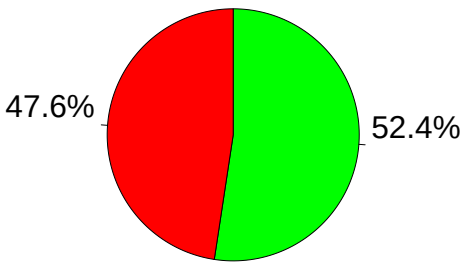
Clinical conditions on admission	N	%
Respiratory	90	13.0
Aspiration pneumonia	26	3.8
Pleural effusion	25	3.6
Atelectasis	14	2.0
Upper respiratory tract disease	8	1.2
Moderate ARDS	8	1.2
Cardiovascular	64	9.2
Peripheral vascular disease	11	1.6
Acute severe arrhythmia: tachycardias	10	1.4
Left heart failure without pulm. edema	8	1.2
Cardiac arrest	8	1.2
Ruptured or fissured aneurysm	6	0.9
Neurological	34	4.9
Brain tumour	7	1.0
Cerebral artery stroke	5	0.7
Non traumatic cerebral oedema	5	0.7
Chronic Subdural haematoma	5	0.7
Intracranial hypertension	4	0.6
Gastrointestinal and hepatic	264	38.2
Gastrointestinal perforation	72	10.4
Intestinal occlusion	64	9.2
Digestive tract malignancy	44	6.4
Paralytic Ileus	33	4.8
Bowel ischaemia	30	4.3
Trauma (anatomical districts)	218	31.5
Head	132	19.1
Pelvis/bone/joint & muscle	68	9.8
Chest	59	8.5
Spine	40	5.8
Abdomen	35	5.1
Major vessels injury	13	1.9
Miscellaneous	2	0.3
Other	193	27.9
Other disease	108	15.6
Nephrourologic disease	48	6.9
Coagulation disorder	34	4.9
Metabolic disorder	25	3.6
Gynaecological disease	8	1.2
Post transplantation	16	2.3
Liver transplantation	12	1.7
Renal transplantation	4	0.6
Infections	319	46.1
Pneumonia	86	12.4
NON-surgical secondary peritonitis	75	10.8
Post-surgical peritonitis	44	6.4
Primary peritonitis	22	3.2
NON-surgical urinary tract infection	22	3.2
NON-surgical skin/soft tissue infection	21	3.0
Cholecystitis/cholangitis	18	2.6
Post-surgical skin/soft tissue infection	12	1.7
Tertiary peritonitis	10	1.4
L.R.T.I. other than pneumonia	8	1.2
Missing	0	

Trauma (anatomical districts)	N	%
Head	132	19.1
Traumatic Subdural haematoma	85	12.3
Traumatic subarachnoid haemorrhage	76	11.0
Skull fracture	70	10.1
Cerebral contusion/laceration	65	9.4
Maxillofacial fracture	32	4.6
Spine	40	5.8
Vertebral fracture, without deficit	24	3.5
Tetraplegia	7	1.0
Cervical injury, incomplete deficit	4	0.6
Chest	59	8.5
Traum. haemothorax/pneumothorax	40	5.8
Other injuries of the chest	32	4.6
Severe lung contusion/laceration	22	3.2
Abdomen	35	5.1
Minor injuries of the abdomen	15	2.2
Bowel transection/perforation	8	1.2
Liver: Moderate-Severe laceration	5	0.7
Pelvis/bone/joint & muscle	68	9.8
Long bone fracture	54	7.8
Multiple fracture of the pelvis	10	1.4
Extremity compartment syndrome	4	0.6
Major vessels injury	13	1.9
Proximal limbs vessels: transection	7	1.0
Neck vessels: dissection/transection	3	0.4
Major thoracic vessels: transection	1	0.1
Miscellaneous	2	0.3
Burns (>30% BSA)	2	0.3
-	0	0.0
Missing	0	

Infection severity on admission	N	%
None	373	54.7
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	162	23.8
SEPTIC SHOCK	147	21.6
Missing	10	

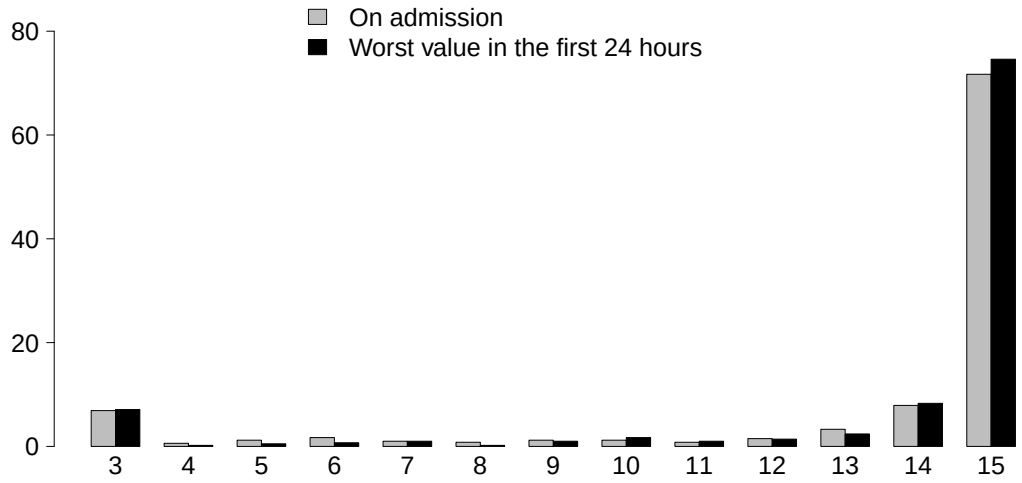
Infection severity on admission

Patients infected (N=309)



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

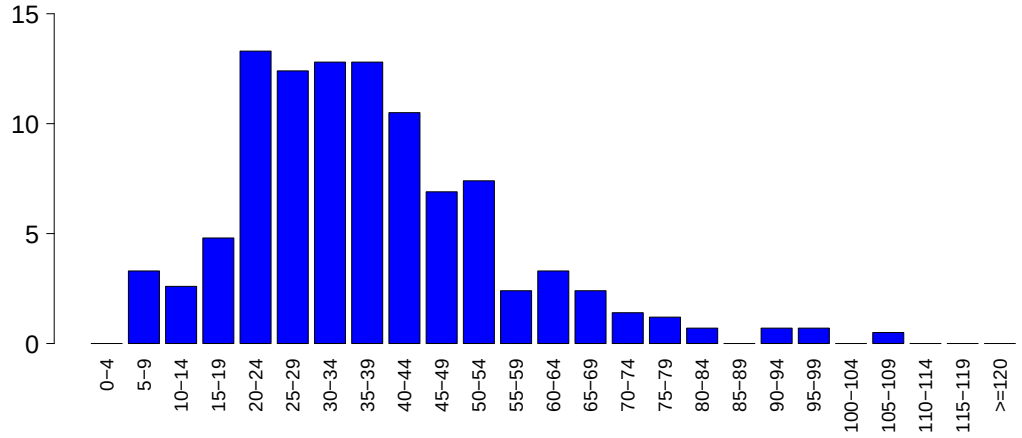
Glasgow Coma Scale (%)



GCS (admission)	
Median	15
Q1−Q3	14−15
Not evaluable	211
Missing	0

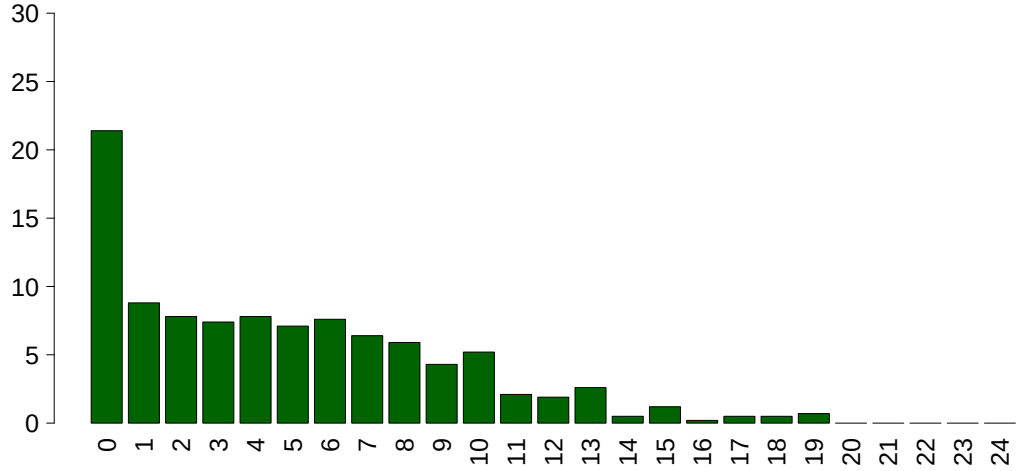
GCS (first 24 hours)	
Median	15
Q1−Q3	14−15
Not evaluable	271
Missing	0

SAPS II (%)



SAPSII	
Mean	37.1
SD	17.6
Median	35
Q1−Q3	26−46
Not evaluable	271
Missing	-271

SOFA (%)



SOFA	
Mean	4.8
SD	4.3
Median	4
Q1−Q3	1−8
Not evaluable	271
Missing	-271

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

Complications during the stay	N	%
No	281	40.6
Yes	411	59.4
Missing	0	

Failures during the stay	N	%
No	545	78.8
Yes	147	21.2
A: Respiratory failure	61	8.8
B: Cardiovascular failure	65	9.4
C: Neurological failure	7	1.0
D: Hepatic failure	20	2.9
E: Renal failure (AKIN)	60	8.7
F: Acute skin failure	0	0.0
G: Metabolic failure	23	3.3
H: Coagulation failure	13	1.9
Missing	0	

Failures during the stay (top 10)	N	%
A	31	4.5
E	19	2.7
B	18	2.6
AB	12	1.7
BE	11	1.6
G	8	1.2
ABE	7	1.0
D	7	1.0
ABD	2	0.3
AG	2	0.3
Missing	0	

Respiratory failure occured	N	%
None	631	91.2
Intubation for airway maint.	18	2.6
Hypoxic failure	34	4.9
Hypercapnic failure	16	2.3
Missing	0	

Cardiovascular failure occured	N	%
None	627	90.6
Cardiogenic shock	7	1.0
Hypovolemic shock	7	1.0
Haemorrhagic/hypovolemic shock	6	0.9
Septic shock	40	5.8
Anaphylactic shock	0	0.0
Neurogenic shock	1	0.1
Other shock	5	0.7
Missing	0	

Neurological failure occured	N	%
None	685	99.0
Cerebral coma	2	0.3
Metabolic coma	5	0.7
Postanoxic coma	0	0.0
Missing	0	

Renal failure occured (AKIN)	N	%
None	632	91.3
Mild	9	1.3
Moderate	17	2.5
Severe	34	4.9
Missing	0	

Complications during the stay	N	%
Respiratory	109	15.8
Pleural effusion	45	6.5
Aspiration pneumonia	38	5.5
Atelectasis	21	3.0
Pneumothorax/Pneumomediastinum	12	1.7
Mild ARDS	6	0.9
Cardiovascular	78	11.3
Acute severe arrhythmia: tachycardias	33	4.8
Cardiac arrest	22	3.2
Deep venous thrombosis	10	1.4
Acute severe arrhythmia: bradycardias	9	1.3
Hypertensive crisis	8	1.2
Neurological	119	17.2
Drowsiness/agitation/delirium	50	7.2
Intracranial hypertension	47	6.8
Brain edema	20	2.9
Seizures	10	1.4
Post-surgical intracranial bleeding	6	0.9
Gastrointestinal and hepatic	106	15.3
Paralytic Ileus	37	5.3
Anastomotic dehiscence	21	3.0
Liver Dysfunction Syndrome	18	2.6
Gastrointestinal bleeding: upper tract	15	2.2
Bowel ischaemia	12	1.7
Other	62	9.0
Metabolic disorder	23	3.3
Other disease	19	2.7
Nephrourologic disease	17	2.5
Other skin and/or soft tissue pathology	5	0.7
Category/Stage II: Partial Thickness Skin Loss	2	0.3
Extremity compartment syndrome (severe)	2	0.3
Blunt cerebral vessels trauma	1	0.1
Infections	209	30.2
Pneumonia	108	15.6
Post-surgical peritonitis	24	3.5
NON-surgical urinary tract infection	20	2.9
Post-surgical skin/soft tissue infection	13	1.9
NON-surgical secondary peritonitis	12	1.7
F.U.O. fever of unknown origin	11	1.6
L.R.T.I. other than pneumonia	10	1.4
Tertiary peritonitis	9	1.3
Catheter-related bacteremia (CR-BSI)	8	1.2
Clinical sepsis	8	1.2
Missing	0	

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

Infections	N	%
None	249	36.0
Only on admission	234	33.8
On admission and during ICU stay	85	12.3
Only during ICU stay	124	17.9
Missing	0	

Maximum severity of infection	N	%
None	249	37.2
-	0	0.0
INFECTION WITHOUT SEPSIS/SEPSIS	255	38.1
SEPTIC SHOCK	165	24.7
Missing	23	

Severity evolution		**During the stay**				
	N (R %)	None	-	INFECTION WITHOUT SEPSIS/SEPSIS	SEPTIC SHOCK	TOT
Admission	None	249 (69.2%)	0 (0.0%)	103 (28.6%)	8 (2.2%)	360
	-	-	0 (0.0%)	0 (0.0%)	0 (0.0%)	0
	INFECTION WITHOUT SEPSIS/SEPSIS	-	-	152 (93.8%)	10 (6.2%)	162
	SEPTIC SHOCK	-	-	-	147 (100.0%)	147
	TOT	249	0	255	165	669

Ventil. Associat. Pneumonia (VAP)	N	%
No	599	86.6
Yes	93	13.4
Missing	0	

Catheter Bacteraemia (CR-BSI)	N	%
No	684	98.8
Yes	8	1.2
Missing	0	

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

Estimate	31.4
CI (95%)	25.4−38.5

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

Estimate	1.4
CI (95%)	0.6−2.8

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

Estimate	25.2%
CI (95%)	20.3−30.8

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

Estimate	1.7%
CI (95%)	0.8−3.4

National report - **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)	680	98.3										
Invasive ventilation	457	66.0	343	49.6	88	12.7	4	1–14	0	0	0–0	0
Non invasive ventilation	186	26.9	25	3.6	58	8.4	3	1–5	0	0	0–4	0
Tracheostomy	60	8.7	4	0.6	36	5.2	4	0–13	0	19	14–24	0
iNO (inhaled nitric oxide)	16	2.3	4	0.6	2	0.3	2	1–6	0	1	1–16	0
Central Venous Catheter	525	75.9	373	53.9	424	61.3	6	3–15	0	0	0–0	0
PICC	76	11.0	19	2.7	57	8.2	5	3–7	0	0	0–1	0
Arterial Catheter	577	83.4	411	59.4	293	42.3	6	2–14	0	0	0–0	0
Vasoactive drugs	485	70.1	273	39.5	53	7.7	3	1–7	0	0	0–0	0
Antiarrhythmics	74	10.7	14	2	22	3.2	2	1–6	0	2	1–5	0
IABP	0	0.0										
Invasive monitoring of C.O.	41	5.9	10	1.4	7	1	6	3–10	0	1	0–3	0
Continous monitoring of ScVO2	4	0.6	0	0	1	0.1	2	1–6	0	0	0–0	0
Temporary pacing	1	0.1	0	0	0	0	0	0–0	0	1	1–1	0
Ventricular assistance	0	0.0										
DC-shock	14	2.0								2	1–5	0
CPR	11	1.6								0	0–4	0
Massive blood transfusion	25	3.6								0	0–0	0
ICP monitoring without CSF drainage	106	15.3	83	12	14	2	7	3–17	0	0	0–0	0
ICP monitoring with CSF drainage	18	2.6	7	1	6	0.9	12	8–20	0	1	0–10	0
External ventricular drainage without ICP	6	0.9	4	0.6	4	0.6	2	1–8	0	25	18–32	0
Haemofiltration	4	0.6	1	0.1	2	0.3	6	3–7	0	3	2–12	0
Haemodialysis	50	7.2	12	1.7	11	1.6	7	1–15	0	2	1–7	0
ECMO	1	0.1	0	0	0	0	1	1–1	0	3	3–3	0
Hepatic clearance techniques	0	0.0										
Clearance techniques during sepsis	4	0.6	0	0	1	0.1	2	0–7	0	2	1–2	0
IAP (intra-abdominal pressure)	64	9.2										
Hypothermia	13	1.9	2	0.3	2	0.3	6	1–9	0	1	0–1	0
Enteral nutrition	294	42.5	27	3.9	163	23.6	8	2–18	0	1	1–3	0
Parenteral nutrition	487	70.4	70	10.1	285	41.2	5	2–11	0	1	0–1	0
SDD (Topical, Topical and systemic)	2	0.3										
Patient restraint	52	7.5										
Peridural catheter	8	1.2	5	0.7	4	0.6	3	3–4	0	3	2–10	0
Electrical cardioversion	7	1.0								1	0–2	0
Vacuum therapy	19	2.7										
Antibiotics	645	93.2										
Antibiotic prophylaxis	343	49.6	218	31.5	159	23	3	1–5	0	0	0–0	0
Empirical antibiotic therapy	301	43.5	149	21.5	87	12.6	3	2–6	0	0	0–2	0
Targeted antibiotic therapy	278	40.2	59	8.5	183	26.4	8	4–16	0	4	2–7	0

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

Invasive ventilation (N=457)	N	%	Length (days) Mean	SD	Median	Q1-Q3	Missing
Due to pulmonary failure	141	30.4	9.2	10.5	5	1−13	0
For airway mainteinance	277	59.7	9.4	10.5	4	1−15	0
In weaning	14	3.0	0.6	0.5	1	0−1	0
Not evaluable	32	6.9	4.2	6.9	1.5	1−3	8
Reintubation within 48 hours	14	3.0	8.5	10.1	4.5	2−8.5	0

Non invasive ventilation (N=186)	N	%
Non invasive ventilation only	97	52.2
Non invasive ventilation failed	11	5.9
For weaning	75	40.3
Other	3	1.6
Missing	0	

Tracheostomy not present on admission (N=56)	N	%
Surgical	4	7.1
Percutwist	21	37.5
Ciaglia	2	3.6
Monodil. Ciaglia	1	1.8
Fantoni	0	0.0
Griggs	2	3.6
Other Kind	11	19.6
Unknown	15	26.8
Missing	0	

Tracheostomy - Days after the beginning of inv. vent. Not present on admission (N=56)	
Mean	18.8
SD	8.4
Median	19
Q1−Q3	13.2−24
Missing	0

Invasive monitoring of C.O. (N=41)	N	%
Swan Ganz	0	0.0
PICCO	20	48.8
LIDCO	20	48.8
Vigileo-PRAM	0	0.0
Other	1	2.4
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=124)	N	%
Only empirical	24	21.1
Only targeted	28	24.6
Targeted after empirical	45	39.5
Other	17	14.9
Missing	10	

Surgical interventions	N	%
No	569	82.2
Yes	123	17.8
Missing	0	

Number of surgical interventions	N	%
0	569	82.2
1	65	9.4
2	22	3.2
3	17	2.5
>3	19	2.7
Missing	0	

Surgical interventions Days from admission	
Mean	9.5
SD	8.1
Median	8
Q1−Q3	4−12
Missing	0

Surgical interventions (top 10)	N	%
Gastrointestinal surgery	150	21.7
Other surgery	39	5.6
Neurosurgery	20	2.9
Orthopaedic surgery	11	1.6
Pancreatic surgery	8	1.2
Plastic surgery	5	0.7
Thoracic surgery	5	0.7
ENT surgery	4	0.6
Peripheral vascular surgery	4	0.6
Nephro/Urological surgery	3	0.4
Missing	0	

Non surgical interventions	N	%
No	670	96.8
Yes	22	3.2
Missing	0	

Non surgical interventions Days from admission	
Mean	12.0
SD	11.7
Median	8
Q1−Q3	5−13.5
Missing	0

Non surgical interventions	N	%
Interventional endoscopy	19	2.7
Interventional radiology	8	1.2
Interventional cardiology	0	0.0
Interventional neuroradiology	0	0.0
Missing	0	

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

ICU outcome	N	%
Dead	111	16.1
Transferred to same hospital	542	78.4
Transferred to other hospital	38	5.5
Discharged home	0	0.0
Disch. terminally ill	0	0.0
Missing	1	

Transferred to (N=580)	N	%
Ward	320	55.2
Other ICU	65	11.2
High dependency care unit	195	33.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Reason of transfer to Other ICU (N=65)	N	%
Specialist expertise	13	20.0
Step-up care	1	1.5
Logistical/organizational reasons	48	73.8
Step-down care	3	4.6
Missing	0	

Transferred to Same hospital (N=542)	N	%
Ward	312	57.6
Other ICU	47	8.7
High dependency care unit	183	33.8
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

Transferred to Other hospital (N=38)	N	%
Ward	8	21.1
Other ICU	18	47.4
High dependency care unit	12	31.6
Rehabilitation	0	0.0
Day hospital or Long-term care	0	0.0
Missing	0	

ICU mortality	N	%
Alive	580	83.9
Dead	111	16.1
Missing	1	

Timing of ICU mortality (N=111)	N	%
Daytime (08:00AM - 07:59PM)	77	69.4
Nighttime (08:00PM - 07:59AM)	34	30.6
Weekdays (Monday - Friday)	93	83.8
Weekend (Saturday - Sunday)	18	16.2
Missing	0	

Hospital mortality	N	%
Alive	507	73.3
Dead	185	26.7
Missing	0	

Timing of hosp. mortality (N=185)	N	%
In ICU	111	60.0
Within 24 hours after ICU	4	2.2
24-47 hours after ICU	3	1.6
48-71 hours after ICU	2	1.1
72-95 hours after ICU	6	3.2
After 95 hours after ICU	59	31.9
Missing	0	

Timing of hosp. mortality (days from ICU disch.) Discharged alive from ICU (N=74)	
Mean	29.6
SD	41.4
Median	13
Q1−Q3	5−34.5
Missing	0

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

Last hospital mortality	N	%
Alive	502	72.5
Dead	190	27.5
Missing	0	

ICU stay (days)	
Mean	9.5
SD	10.9
Median	5
Q1−Q3	2−13
Missing	0

ICU stay (days) **Alive** (N=580)	
Mean	9.5
SD	11.0
Median	5
Q1−Q3	2−12
Missing	0

ICU stay (days) **Dead** (N=111)	
Mean	9.6
SD	10.4
Median	5
Q1−Q3	2−14
Missing	0

Stay after ICU (days) **Alive** (N=580)	
Mean	22.4
SD	30.5
Median	12
Q1−Q3	5−25
Missing	0

Hospital stay (days)	
Mean	32.0
SD	34.0
Median	21
Q1−Q3	11−39
Missing	0

Hospital stay (days) **Alive** (N=507)	
Mean	33.0
SD	32.7
Median	23
Q1−Q3	12−40.5
Missing	0

Hospital stay (days) **Dead** (N=185)	
Mean	29.2
SD	37.1
Median	16
Q1−Q3	6−35
Missing	0

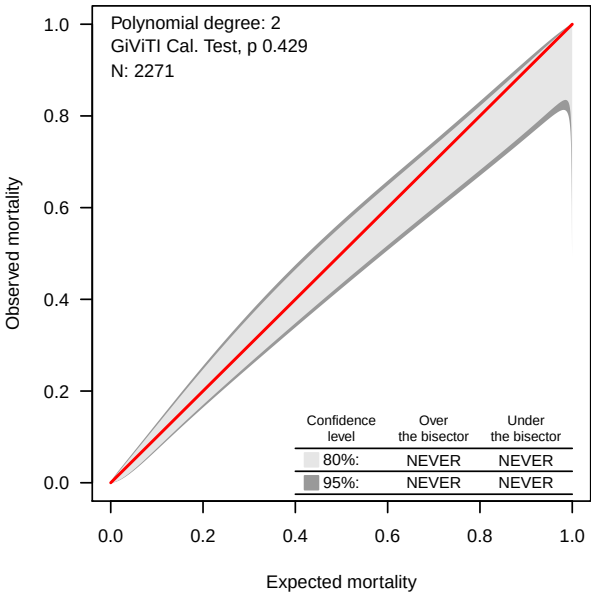
The calibration belt is designed to compare actually observed mortality with expected mortality according to a given prediction model. Expected mortality is plotted on the x axis while observed mortality is plotted on the y-axis. Two overlapping belts are presented in each graph: the first, in light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

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

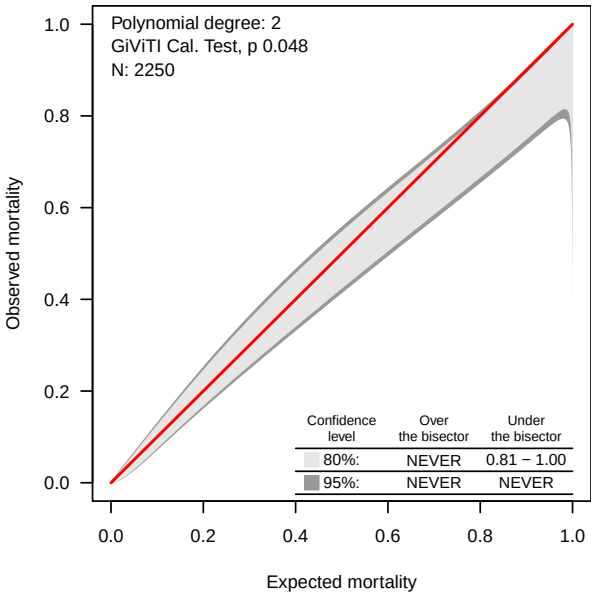
National report - **Year 2017**
Validity of the models - Calibration belts

EXTERNAL SCORE

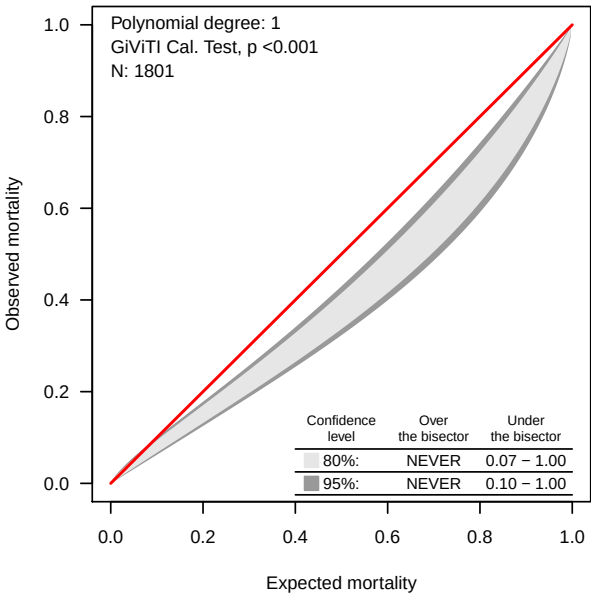
Predictive model: GiViTI 2017



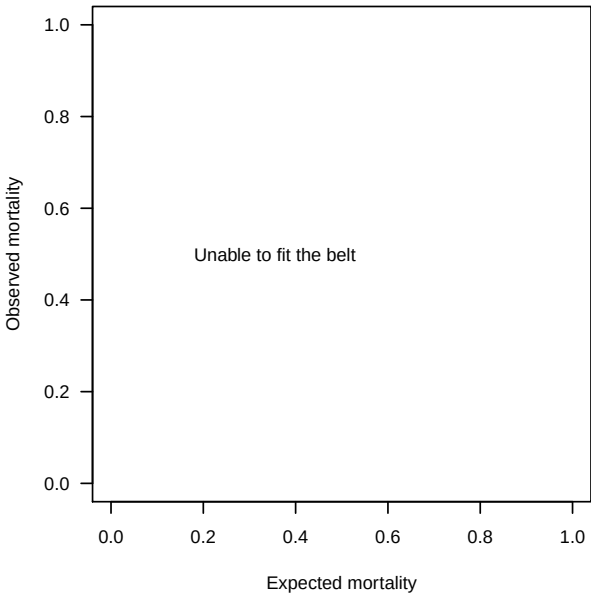
Predictive model: GiViTI 2016



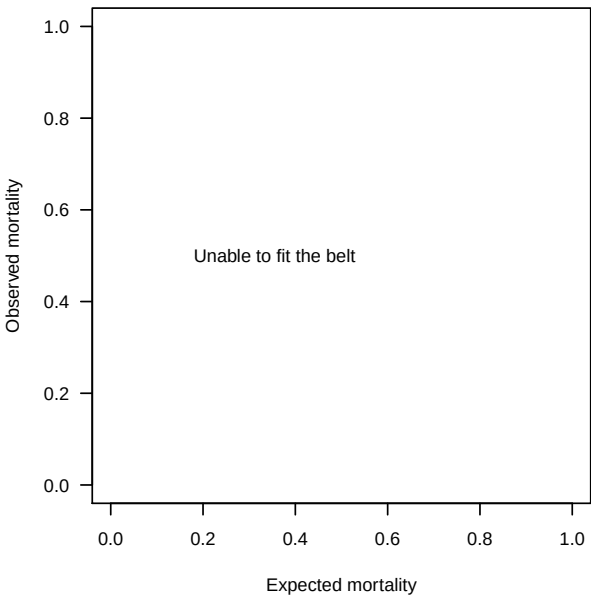
Predictive model: SAPSII



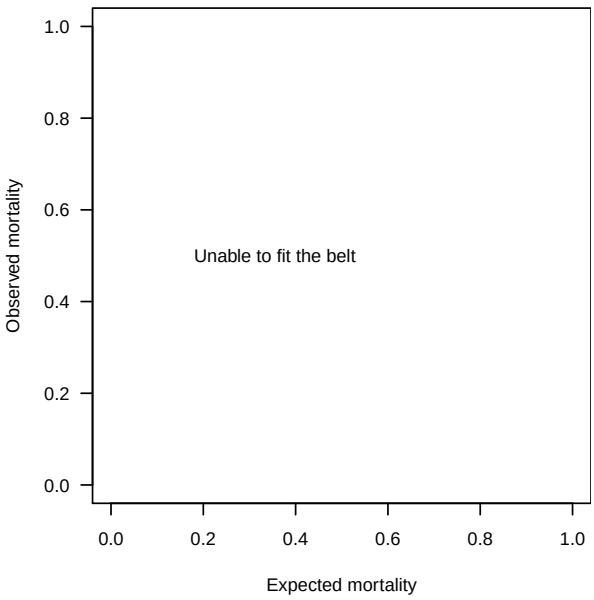
Predictive model : PELOD



Predictive model: PIM2



Predictive model: PIM3



Appendix

Coauthors

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