

# Resource use and outcome in intensive care units

<b>Submission date</b> 26/01/2021	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 31/01/2021	<b>Overall study status</b> Completed	<input checked="" type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 16/08/2022	<b>Condition category</b> Other	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Intensive care prevents death and disability caused by critical illness and it consumes large amounts of health care resources. The severity of illness influences both the risk of death and the amount of resources needed to achieve survivors. Both the ability to achieve survivors and the resources needed to achieve survivors at a specific severity of illness may vary widely between intensive care units internationally and within a country. The aim of this study is to evaluate variation in resources needed and the ability achieve survivors in intensive care units over time, using methods that take into account the severity of illness in resource use and mortality. This study attempts to find factors possibly related to such variations, for example, structural and organizational characteristics of the intensive care units in Finland, Estonia, and Switzerland.

### Who can participate?

Patients treated in participating intensive care units from 1/1/2008 - 31/12/2017

### What does the study involve?

The study uses routinely collected information of severity of illness and resource use during admissions to intensive care units. The data has been collected as part of standard care in a registry and will be analyzed in fully anonymized form, i.e. so that no patients can be recognized based on the data available for the study.

### What are the benefits and risks of participating?

None for the individual patients. Potential benefits for society and health care may help to better allocate health care resources in the future.

### Where is the study run from?

The study is run from the Department of Intensive Care Medicine, Bern University Hospital and University of Bern, Bern, Switzerland.

### When is the study starting and how long is it expected to run for?

August 2017 to April 2021

Who is funding the study?  
Investigator initiated and funded

Who is the main contact?  
Professor (Emeritus) Jukka Takala, [jukka.takala@med.unibe.ch](mailto:jukka.takala@med.unibe.ch)

## Contact information

**Type(s)**  
Scientific

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## Additional identifiers

**Clinical Trials Information System (CTIS)**  
Nil known

**ClinicalTrials.gov (NCT)**  
Nil known

**Protocol serial number**  
Nil known

## Study information

**Scientific Title**  
Variation in severity-adjusted resource utilization and outcome in intensive care units

**Study objectives**  
This health economic study evaluates variation in resource use and mortality, both standardized for the severity of illness, in intensive care units over time, assesses factors related to the variation, and evaluates the cost structure and ICU organization in participating intensive units in Finland, Estonia, and Switzerland.

**Ethics approval required**  
Old ethics approval format

**Ethics approval(s)**

According to the national regulations in Finland, Estonia, and Switzerland, no ethics committee approval is needed for health economic studies using anonymized data from existing health care registry. The study protocol, database contents and process of data management were approved by the National Institute of Health and Welfare, Finland (Decision THL/1524/5.05.00 /2017 and THL/1173/05.00/2018)

**Study design**

Retrospective analysis

**Primary study design**

Observational

**Study type(s)**

Other

**Health condition(s) or problem(s) studied**

Resource use and hospital outcome standardized for severity of illness in patients admitted to intensive care units

**Interventions**

Registry data from all admissions in 21 intensive care units from 2008-2017 will be used.

Severity of illness and resource use data, collected prospectively in a quality registry, are retrospectively analyzed for severity adjusted, standardized resource use ratio (SRUR) and standardized mortality ratio (SMR). The variation over time and association between SRUR and SMR and their association with predefined structural and organizational variables will be analyzed.

**Intervention Type**

Other

**Primary outcome(s)**

Resource use is measured from the retrospectively collected records using:

1. Length of intensive care unit stay
2. Daily collected data on therapeutic interventions (TISS-score)
3. Severity of illness measured during the first 24 hrs of intensive unit stay
4. Mortality measured at hospital discharge

**Key secondary outcome(s)**

Characteristics of treatment centres measured from the retrospectively collected records using:

1. ICU-category (University, small/large non-University)
2. Cardiac surgery in hospital (yes/no)
3. Neurosurgery in hospital (yes/no)
4. Nurses/bed
5. Nurses/bed to physician/bed ratio
6. Total number of beds
7. Readmissions/total admissions
8. Admissions/bed
9. Specialist availability 24/7 (yes/no)
10. Medical emergency team (yes/no)

- 11. Physician full time equivalents(FTE)/bed,
- 12. Organization type (independent or not)
- 13. Median SAPS category
- 14. SMR

**Completion date**

30/04/2021

## Eligibility

**Key inclusion criteria**

All patients admitted to the participating intensive care units 2008-2017

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

All

**Sex**

All

**Total final enrolment**

207953

**Key exclusion criteria**

- 1. Data collection error
- 2. Missing admission number
- 3. Missing severity score
- 4. Missing diagnosis

**Date of first enrolment**

01/01/2008

**Date of final enrolment**

31/12/2017

## Locations

**Countries of recruitment**

Estonia

Finland

Switzerland

**Study participating centre**  
**Bern University Hospital**  
Department of Intensive Care Medicine  
Inselspital  
Freiburgstrasse 18  
Bern  
Switzerland  
3010

## Sponsor information

**Organisation**  
University Hospital of Bern

**ROR**  
<https://ror.org/01q9sj412>

## Funder(s)

**Funder type**  
Other

**Funder Name**  
Investigator initiated and funded

## Results and Publications

### Individual participant data (IPD) sharing plan

The current data sharing plans for this study are unknown and will be available at a later date

### IPD sharing plan summary

Data sharing statement to be made available at a later date

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	Participant information sheet	18/10/2021	19/10/2021	Yes	No
<a href="#">Participant information sheet</a>		11/11/2025	11/11/2025	No	Yes
<a href="#">Protocol file</a>		22/08/2017	16/08/2022	No	No
<a href="#">Statistical Analysis Plan</a>		29/01/2021	03/02/2021	No	No