



Rigshospitalet



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EPJ- OBSERVATORIET 2008

## “Intelligent system til dokumentation og genbrug af data på en intensiv afdeling\*”

\* Intelligent system used for documentation and reuse of data in an intensive care department.

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CIS 2.6.0 - Critical Information System

(Systemadministrator, Lokaladministrator, ITA specia...)  
 Dato: 10/21/2008 Klokkeslet: 8:55:29 AM

Inlagt	Patientdata	Medicin	Score
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		Indlæggelse	Patientstatus	Udskrivning	Ordnation	Dispensering	EGS	APACHE II	SAPS II	S.O.F.A.	FIN 2	NEMS
<input type="button" value="Seng 1"/>	Peter Holte	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 2"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 3"/>	Ove Horsevad	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 4"/>	Peter Skjoldborg	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 5-1"/>	Margot Emilie Jensen	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 6-1"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 6-2"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 7"/>	Bjørk Glundø	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 8"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 9"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 10-1"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 10-2"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Seng 11-1"/>	- tom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Standby (Ø)"/>	Kamille Jensen	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="button" value="Standby (L)"/>	Olaf von Mehrfeldt	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Why it is important to register?

- Measure activity, quality and costs
- Benchmarks and calls to action
- Improve guidelines and procedures
- Invest and use resources efficiently, keep track of costs.

Patients discharged in 2007

	All patients	Children*	Adults**
Count	922	100	555
ICU Mortality (%)	14 %	8 %	16 %
30 days mortality (%)	20 %	9 %	23 %
90 days mortality (%)	26 %	10 %	31 %
APACHE II (expected )			40 %
SAPS II (expected )			35 %
Length of Stay	5.8	6.7	8.2

Patients discharged in 2006

	All patients	Children*	Adults**
Count	919	87	580
ICU Mortality (%)	14 %	6 %	14 %
30 days mortality (%)	23 %	6 %	25 %
90 days mortality (%)	29 %	6 %	31 %
365 days mortality (%)	36 %	7 %	42 %
APACHE II (expected )			44 %
SAPS II (expected )			39 %

\* children < 15 years on admittance

\*\*Adults ≥ 15 years on admittance and admitted ≥ 24 timer

## “What is not measured can not be improved”

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		2005	2006	2007
<b>Indicator : Result Measurement Standardised Mortality Ratio(SMR30d)*</b>		0.64	0.64	0.66
Counts	30 days mortality after admission to ICU 4131 for patients more than 15 years and admitted to ICU 4131 for more than 24 hours	23%	25%	23%
States	Expected mortality (SAPS II) for patients more than 15 years and admitted to ICU 4131 for more than 24 hours	36%	39%	35%

\* (NB. mortality 30 days)

		2005	2006	2007
<b>Indicator : Infection measurement Ventilator assisted pneumonia (VAP)</b>		4.4 pr. 1000 vent. dys	4.8 pr. 1000 vent. dys	6.4pr. 1000 vent. days
Counts	Number of patients admitted for more than 24 hours in ICU 4131 and who developed VAP during stay.	17	18	21
States	Total number of days with invasive mechanical ventilation for patients admitted to ICU 4131 for more than 24 hours.	3.826	3.774	3.289

		2005	2006	2007
<b>Indicator : Activity measurement Readmission in ICU</b>		na*	2.9%	4%
Counts	Number of patients with unplanned re-admission to ICU 4131 within 48 hours of discharge from ICU 4131.	na*	27	32
States	Total number of patients discharged from ICU 4131.	na*	919	797

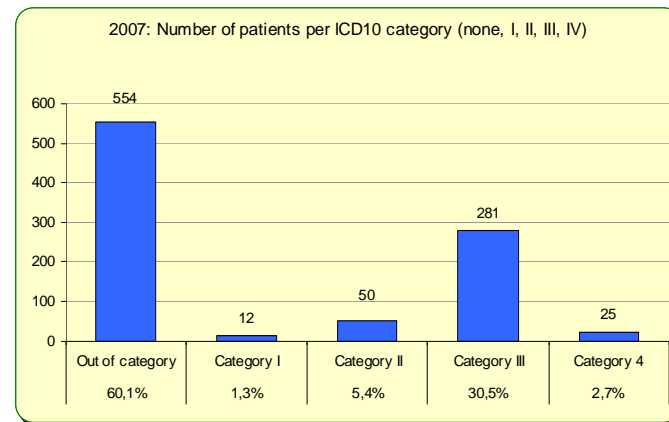
\* Definition for re-admission was different in 2005, 2006 and 2007.

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### ICD10 related data



#### Number of patients registered in ICD10 categories:

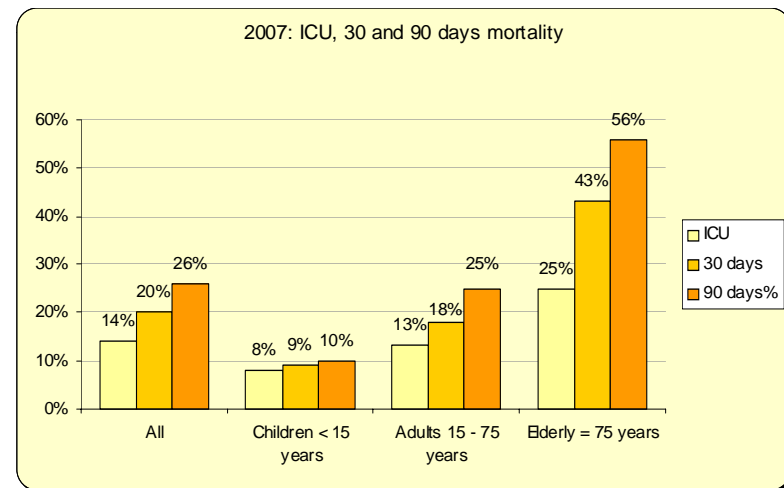
The graph shows the number of patients per category, based on the Danish National Health Board rules for 2007.

DRG Gruppe	2005			2006			2007		
	Antal pt.	%	DRG værdi '000	Antal pt.	%	DRG værdi '000	Antal pt.	%	DRG værdi '000
Ingen	236	30%	-	324	36%	-	508	56%	-
I	25	3%	1,650	47	5%	3,008	5	1%	400
II	22	3%	3,256	151	17%	21,744	5	1%	510
III	438	55%	122,640	355	39%	96,560	355	39%	98,690
IV	79	10%	58,065	31	3%	22,103	31	3%	15,283
<b>Total</b>	<b>800</b>	<b>100%</b>	<b>185,611</b>	<b>907</b>	<b>100%</b>	<b>143,415</b>	<b>907</b>	<b>100%</b>	<b>114,883</b>

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## Department profile

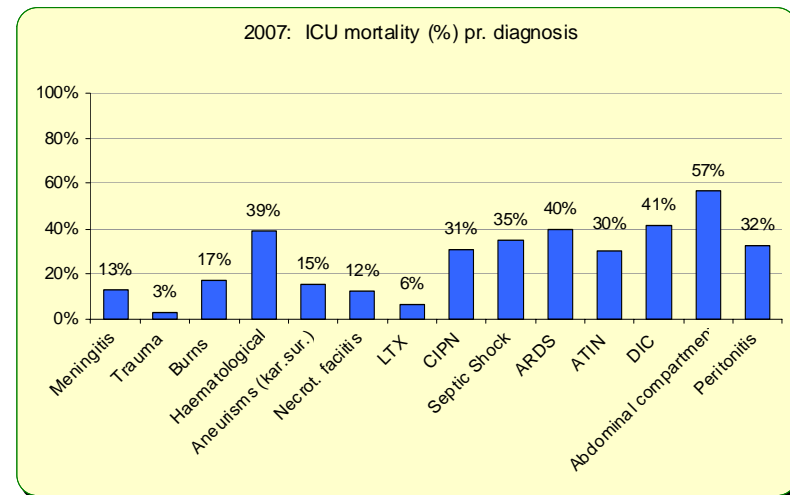


ICU 30 and 90 days mortality, by age category

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## Mortality and diagnoses



### ICU mortality (%) per diagnosis

The graph shows the mortality in percentage for selected diagnoses.

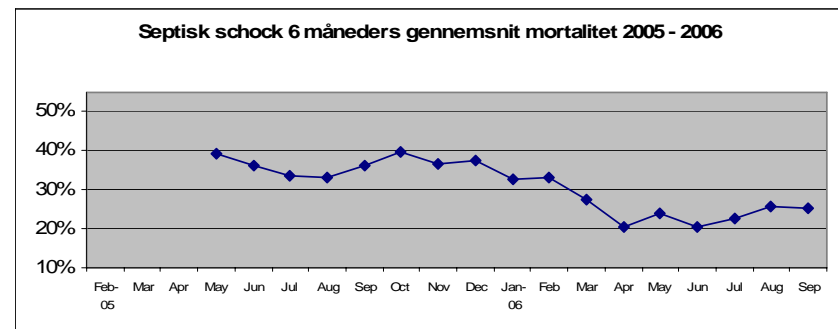
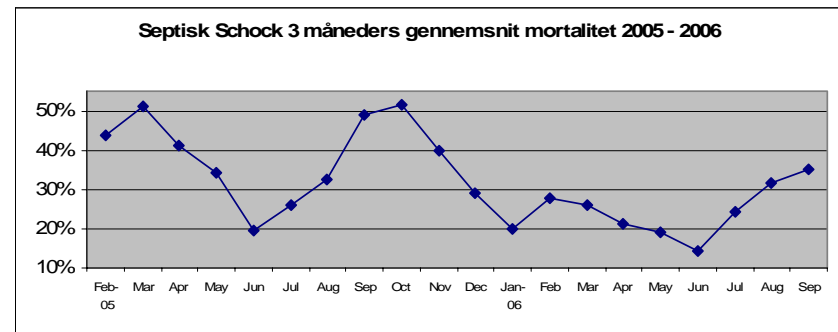
Note: Some patients can be in more than one category.



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### Mortality analysis – Septic Shock







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**Septisk shock** Luk

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**Definition:**

**Opfylde nedenstående kriterier**

**OPFYLD NEDENSTÅENDE KRITERIE**

- Sepsis el. svær sepsis

**OG OPFYLDE NEDENSTÅENDE KRITERIE**

- Sepsis induceret persisterende arteriel hypotension  
( SBP < 90 mmHg, MAP < 70 mmHg eller en reduktion i SBP > 40 mmHg fra baseline) eller < 2 SD under det normale for alderen - under fravær af andre årsager til hypotension ) trods adekvat volumenresuscitation

**Beslutningsfacilitering I - Initial resuscitation og infektionskontrol**

1	INITIAL ( FØRSTE 6 TIMER ) SYMPTOMATISK BEHANDLINGSSTRATEGI VED SEPTISK SHOCK OG SVÆR SEPSIS
1A	Resuscitations-terapi iværksættes straks hos patienter med hypotension eller eleveret s-laktat > 4 mmol/l. Resuscitations-terapi påbegyndes før evt. overflytning til intensiv
1C	Resuscitations-terapimål ved volumensubstitution: <ul style="list-style-type: none"> <li>- CVP 8-12 mmHg (12-15 mmHg ved tilstande med mekanisk ventilation el. ved nedsat ventriculær compliance )</li> <li>- MAP &gt;= 65 mmHg</li> <li>- Timediureser &gt;= 0,5 ml/kg/time</li> <li>- SCVO2 (centralvenøs ilt saturation) &gt;= 70% el. SVO2 (blandet venøs ilt saturation) &gt;= 65%</li> </ul>
2C	Hvis SCVO2 >= 70% el. SVO2 >= 65% ikke opnås : <ul style="list-style-type: none"> <li>- Yderligere volumensubstitution anvendes / overvejes</li> <li>- Transfusion med pakket erytrocytsuspension til hæmatokrit &gt;= 30% og / el. Dobutamininfusion (0-20 µg/kg/min) til SCVO2 el SVO2 &gt;= 70%</li> </ul>
1	DIAGNOSTIK

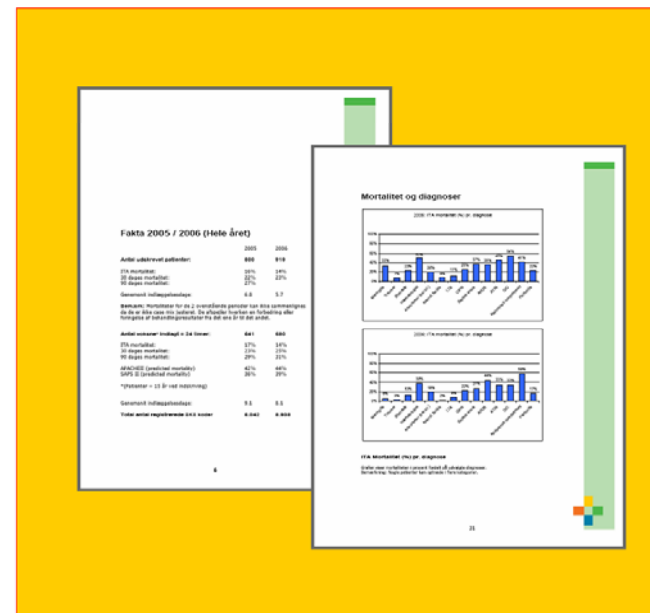


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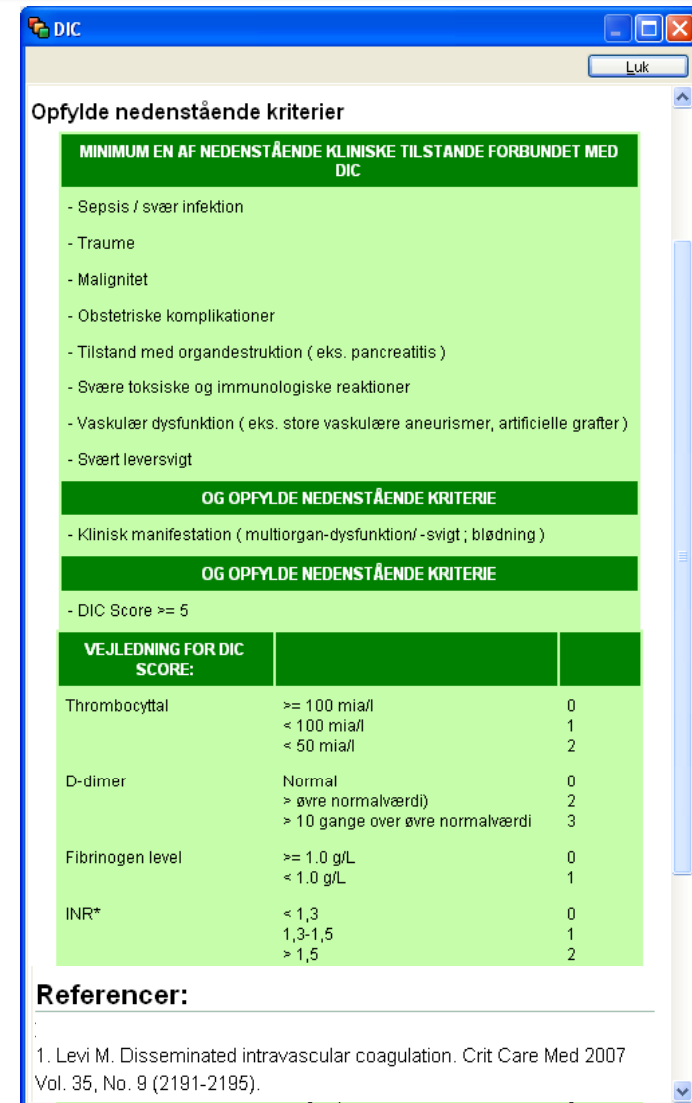
## Prerequisites for registration

- Define your goals
- Focus on qualitative registration
- Answers at your finger tips
- Keep track of details for case mix
- Generate real value for users



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**Opfylde nedenstående kriterier**

**MINIMUM EN AF NEDENSTÅENDE KLINISKE TILSTANDE FORBUNDET MED DIC**

- Sepsis / svær infektion
- Traume
- Malignitet
- Obstetriske komplikationer
- Tilstand med organdestruktion ( eks. pancreatitis )
- Svære toksiske og immunologiske reaktioner
- Vaskulær dysfunktion ( eks. store vaskulære aneurismer, artificielle grafter )
- Svært leversvigt

**OG OPFYLDE NEDENSTÅENDE KRITERIE**

- Klinisk manifestation ( multiorgan-dysfunktion/ -svigt ; blødning )

**OG OPFYLDE NEDENSTÅENDE KRITERIE**

- DIC Score  $\geq$  5

**VEJLEDNING FOR DIC SCORE:**

Thrombocytal	$\geq$ 100 mia/l	0
	< 100 mia/l	1
	< 50 mia/l	2
D-dimer	Normal	0
	> øvre normalværdi)	2
	> 10 gange over øvre normalværdi	3
Fibrinogen level	$\geq$ 1.0 g/L	0
	< 1.0 g/L	1
INR*	< 1,3	0
	1,3-1,5	1
	> 1,5	2

**Referencer:**

1. Levi M. Disseminated intravascular coagulation. Crit Care Med 2007 Vol. 35, No. 9 (2191-2195).

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## Advanced Search function

OG  =

Beskrivelse af søgning:  
 Arkiveret = Ja  
 Alder ved indlæggelse >= 15  
 Indlæggelsesdage, ITA >= 1,00  
 Ljdskrivningsårsag = Ulitstrækkelig kapacitet

-- vælg gemt søgning --

CPR-nr	Navn	Fornavn	Alder	Køn	Indlæggelsesdato	Afdeling
002344-1234	Pärsson	Gerd	71	F	10-04-2007 14:20	A5
002336-1234	Sommer	Frede Christian	82	F	08-04-2007 16:00	G1
002332-1234	Nohr	Veronica	86	M	08-04-2007 08:00	C7
002326-1234	Isaksson	Vivi	48	M	06-04-2007 10:30	C3
002318-1234	Højbjerg	Frede Christian	48	M	04-04-2007 00:20	C3
UZZ313-1234	Noor	Avrøja	83	F	03-04-2007 01:00	C5
002312-1234	Hoen	Fabio	45	F	03-04-2007 01:50	C5
002307-1234	Galsberg	Lilian Ely	49	F	01-04-2007 20:15	C3
002303-1234	Holm-Nygaard	Harry	44	M	31-03-2007 19:30	C6
002281-1234	Munk	Holger V.	45	F	26-03-2007 13:43	L1
002255-1234	Jensen	Lotte	79	F	21-03-2007 09:00	O2
002241-1234	Olsen	Henrik H.	87	M	18-03-2007 13:30	C3
002239-1234	Holm-Nygaard	Ole Erik	71	F	18-03-2007 10:25	A6
002213-1234	Johnson	Mathias	88	M	13-03-2007 01:00	C3
002209-1234	Isaksson	Erik Arne	63	F	11-03-2007 12:30	C3
002190-1234	Holm-Nygaard	Bjerk	70	F	07-03-2007 17:30	C3
002100-1234	Silva	Karl Åge	30	M	07-03-2007 00:04	O2
002185-1234	Olsen	Nikkie	67	M	07-03-2007 01:55	C5
002177-1234	Glunde	Vivi	32	M	05-03-2007 21:30	O2
002176-1234	Koed	Eddie	66	F	05-03-2007 17:10	A6
002171-1234	Møller	Elise	76	M	02-03-2007 12:30	C5
002141-1234	Fischer	Flemming	60	M	23-02-2007 13:15	ORC
002131-1234	Mikkelsen	Lotte	49	F	21-02-2007 02:30	C5
002123-1234	Böll	Karl Åge	69	M	19-02-2007 15:00	A4

Fundet 210 patienter.



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Overall hospital mortality

	Scenario 1
Hospital A	15%
Hospital B	17%
Hospital C	12%



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Healthcare....

Organisations...

Patients...

Management...

Doctors...

Nurses....

## What are the challenges ahead?

- Improve the detail level of registration
- Increase the variety of data sources
- Improve automatic registration
- Develop national/international registration standards and definitions

### Welcome to the IHTSDO Website



#### Ownership of SNOMED CT® transfers to IHTSDO®

Welcome to IHTSDO®, the International Health Terminology Standards Development Organisation.



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- Using the world’s most advanced classification system
- Optimise search functionalities for user
- Define recommended codes for each type of department
- Use national/international definitions

SNOMED demo



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SNOMED demo





## Conclusion

- The future is based on accurate, readily available and live data
- We can no longer dissociate treatments from their outcomes and economic consequences
- We need a national cooperation to define national/international standards and a common way of registering data for common outputs across the entire healthcare sector.



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