

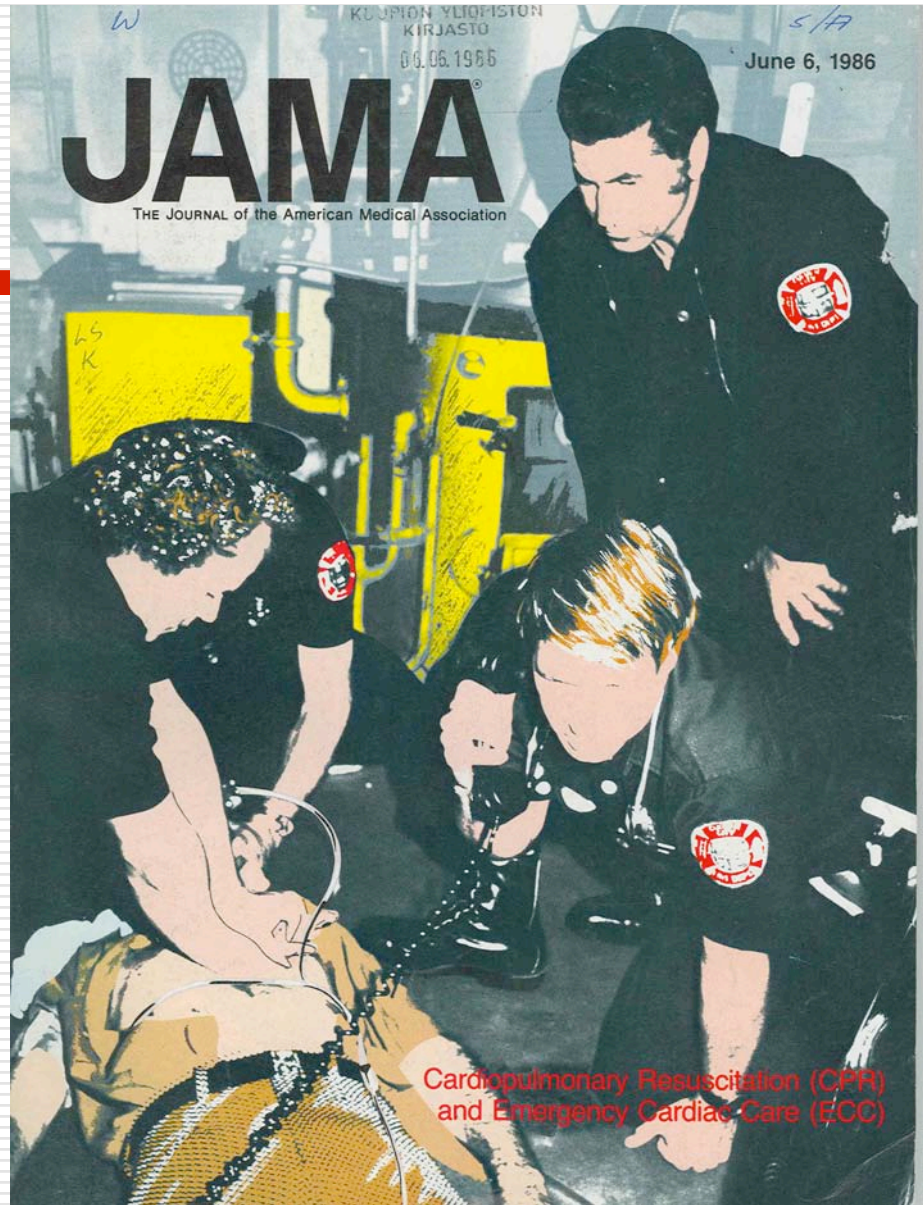
# Postresuscitation Care 1986 vs.2006 Where are we heading?

---

Jouni Kurola

Kuopio

Finland



Cardiopulmonary Resuscitation (CPR)  
and Emergency Cardiac Care (ECC)

# Postresuscitation Care 1986

---

- Extracranial homeostasis
  - Normotension (focus CPP)
  - Head elevated 10-30 degrees
  - Sedate
  - Control Seizures
  - Focus on Blood Gases (Optimize ventilation)
  - Normothermia (Safar P J Iowa Med Soc 1964)
  - Corticosteroids (optional)
- Intracranial homeostasis
  - Rule out mass lesion
  - ICP treatment (monitoring)
    - One option is hypothermia 30-32 degrees

# Postresuscitation Care 2006 (1)

---

- Ventilation
  - Normoventilation
  - O<sub>2</sub>?
- Circulation
  - Consider immediate revascularization
  - MAP 65-70?
- Sedation
  - If hypothermia-YES
  - Others?
- Seizure control
  - Evidence for treatment?
  - Myoclonus- outcome?
- Temperature control
  - Therapeutic hypothermia
- Blood glucose

# Postresuscitation Care 2006 (2)

---

- Mostly weak evidence (level C)
- Level A evidence selected patients
  - Therapeutic hypothermia
  - ICD
  - CABG
  - B-blockers

Table 1 Therapeutic possibilities

- 
1. Optimising physiology
    - Body temperature
    - Blood pressure
    - Blood glucose
    - Acid-base status
    - Electrolytes (potassium)
  2. Revascularisation
    - Thrombolysis
    - PTCA
    - CABG
  3. Antiarrhythmic therapy
    - ICD
    - Betablockers
    - Amiodarone
  4. Anticonvulsant therapy
-

# Case 1

---

- ❑ 70 y Norwegian male. Travelling in Finland
- ❑ Wittn. VF CPR started within 5 min, ROSC 20 min.
- ❑ History of hypertension, TIA and DM 2
- ❑ ED: GCS 4-5, intubated, Circ. stable. Normothermic
- ❑ Admitted to ICU



# Better chances to survival to hospital discharge 1986 vs 2006?

---

 Yes, hypothermia works

  No, too old and ROSC too long

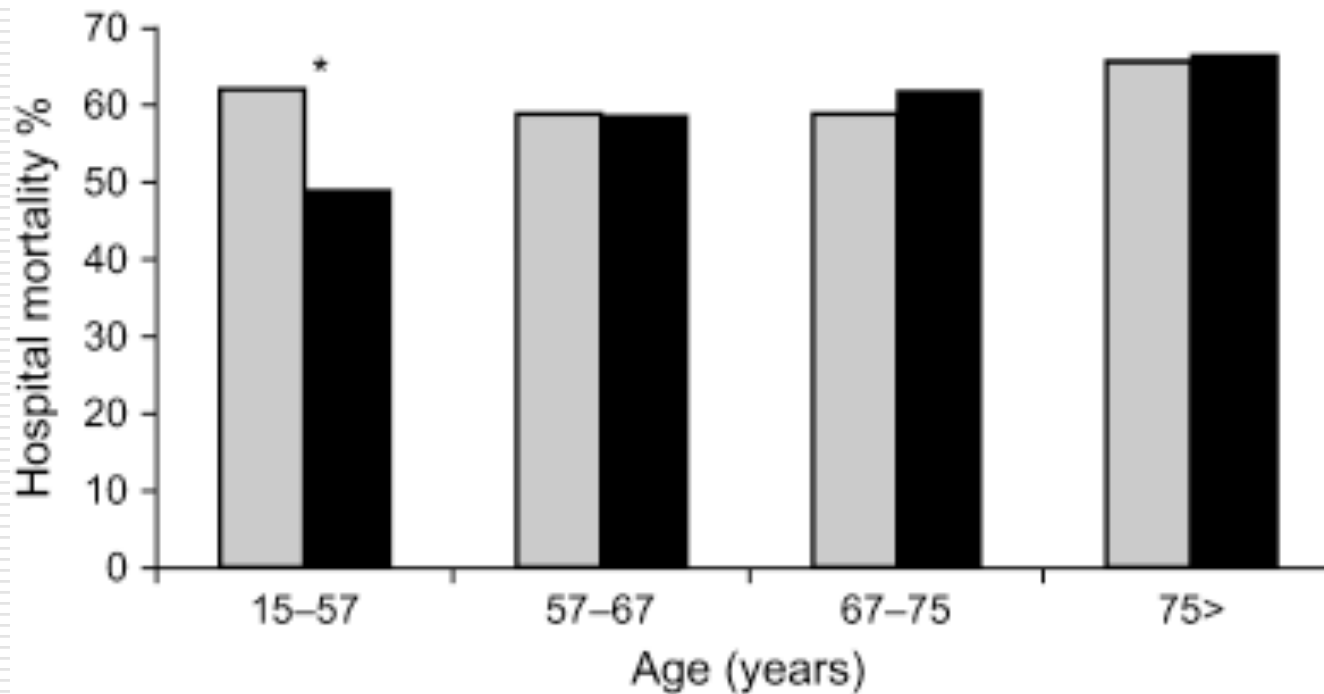
  I dont know

---

# Travelling 1986 – 2001

Hospital mortality 86-87 (n=604) vs.  
99-01 (n=1036) in Finnish ICU:s

---



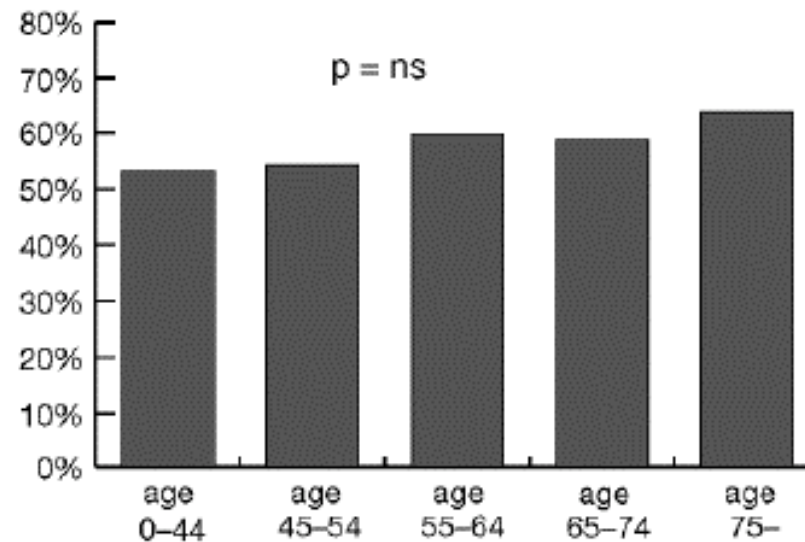
---

Niskanen et al Acta Anaesth Scand 2007

# If we don't give hypothermia

Hospital mortality in Finnish ICU:s 2004-5 (n=1148)

---



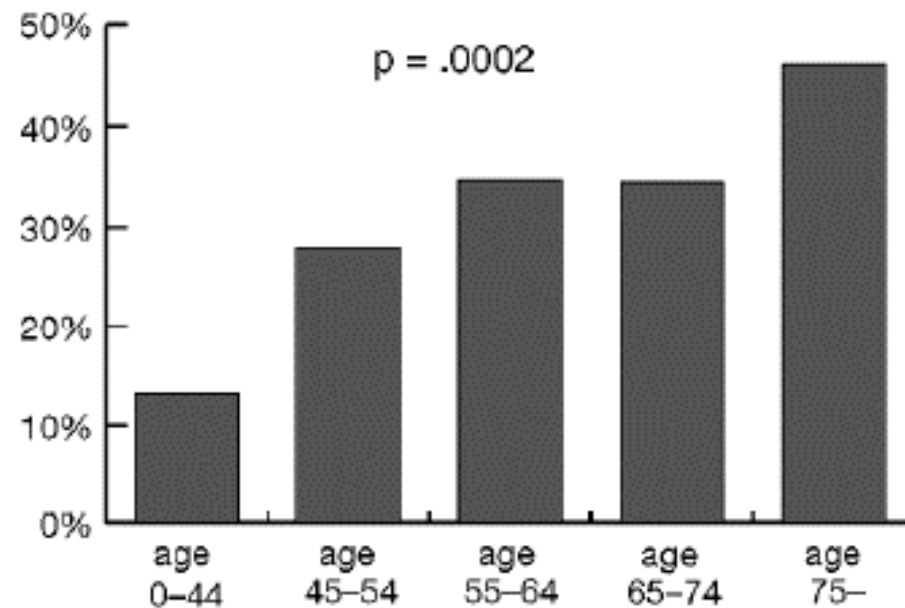
---

Oksanen et al Acta Anaest Scand 2007 in press

# If we give hypothermia (+ other aggressive post-resuscitation therapy)

Hospital mortality in Finnish ICU:s 2004-5 (n=407)

---



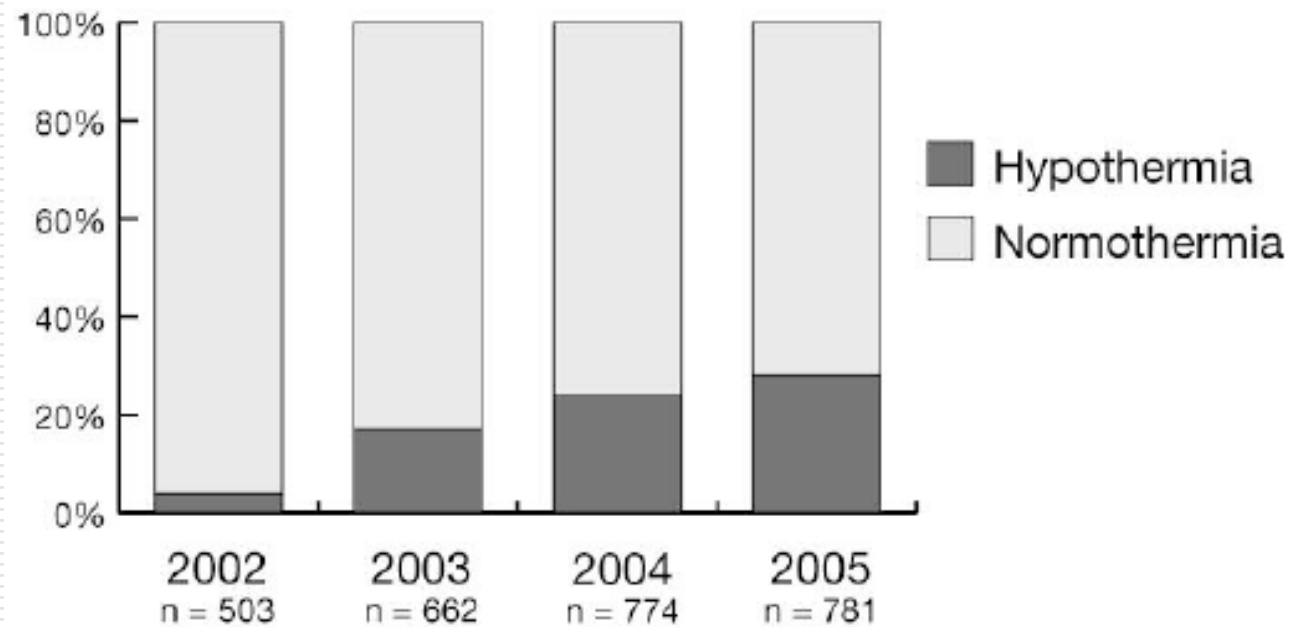
---

Oksanen et al Acta Anaest Scand 2007 in press

# Implementation of hypothermia

Finnish ICU:s 2004-5

---



---

Oksanen et al Acta Anaest Scand 2007 in press

# Implementation of hypothermia

Finnish ICU:s 2004-5

---

	Hypothermia group (n=407)	Normothermia group (n=1148)	P value
Age (years)	61 (53–70)	68 (58–77)	p<.0001
APACHE II score	29 (24–34)	31 (25–37)	p<.0001
TISS score (maximum)	47 (42–52)	34 (28–40)	p<.0001
TISS score (average)	37 (33–43)	30 (25–35)	p<.0001
Prearrest performance:			
Independent	381 (94 %)	865 (75 %)	p<.0001
Need weekly help	17 (4 %)	238 (21 %)	p<.0001
In-hospital arrest	20 (5 %)	367 (32 %)	p<.0001

---

Oksanen et al Acta Anaest Scand 2007 in press

# In Sweden?

## Municipality of Göteborg

---

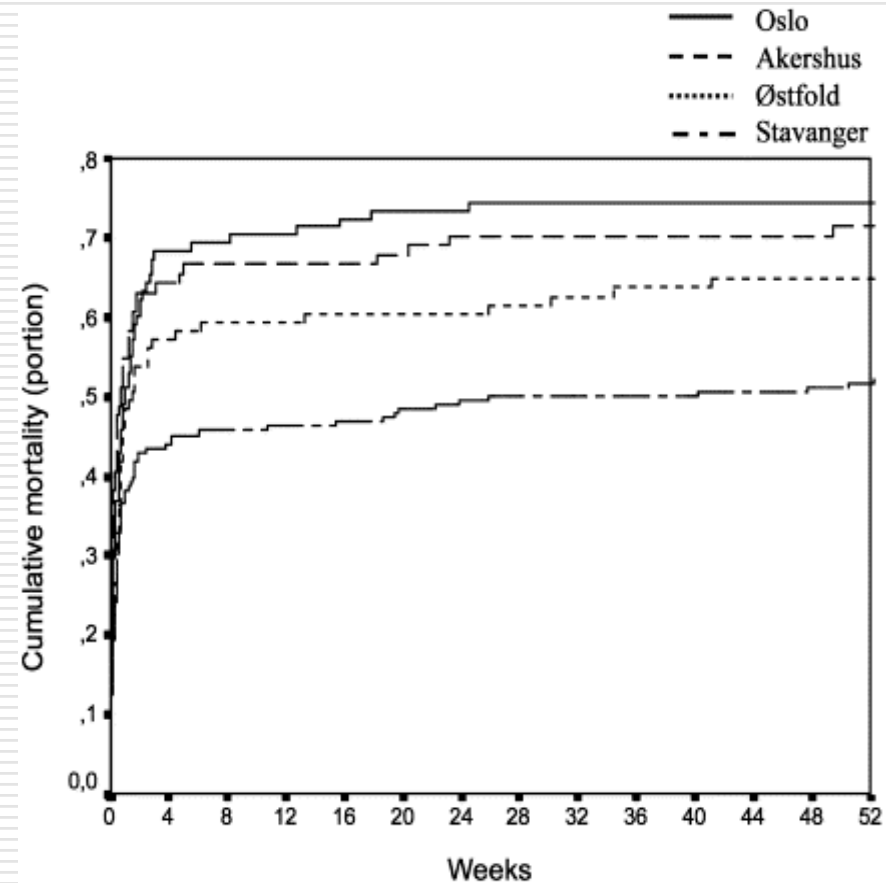
Table 2 Characteristics, treatment and survival in the present survey as compared with previous observations

	Present observation, 2003–2005 ( <i>n</i> = 85)	Previous observation, 1980–2000 ( <i>n</i> = 1310)
Age, mean (years)	65	66
Gender (%)		
Female	21	29
First recorded rhythm of cardiac arrest		
Ventricular fibrillation (%)	50	65
Previous history (%)		
AMI	25	39
Heart failure	23	31
Diabetes	15	14
Investigation and treatment (%)		
Coronary angiography	28	11
Fibrinolysis	2	3
PCI	15	2
CABG	6	4
Hypothermia	32	0
Outcome		
Discharged alive (%)	32	36

# In Scandinavia? (2)

## Variety in performance of post-resuscitation care?

- Norway 95-99\*
  - Temperature control, blood glucose and seizure control
- Göteborg area\*\*
  - Two hospitals, different post-resuscitation care?
- All Swedish hospitals\*\*\*
  - Survival to 1-month 14% to 42 % from those admitted alive



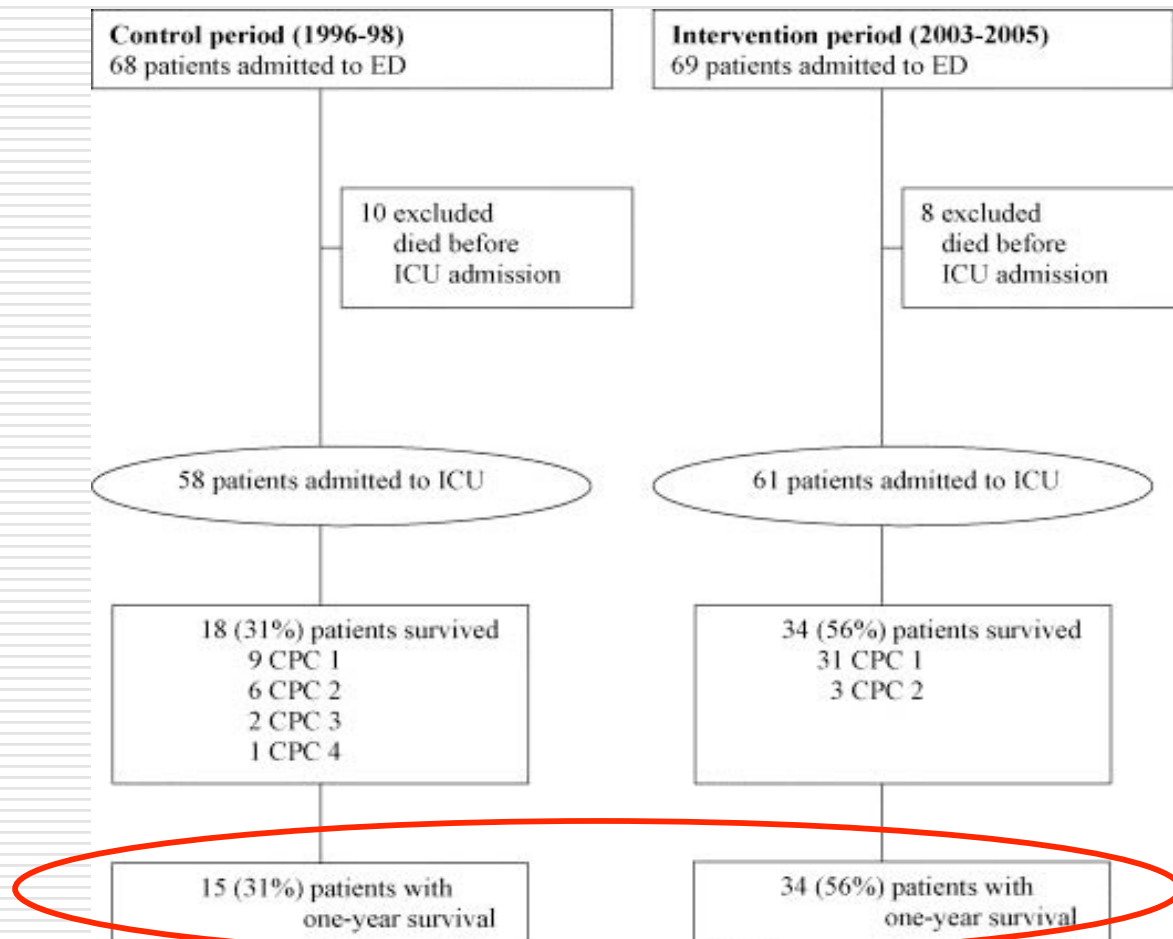
\* Langhelle et al Resuscitation 2003

\*\* Enghdal et al Resuscitation 2000

\*\*\* Herlitz et al Resuscitation 2006

# In Norway? (1)

## Oslo Area (Post-Resuscitation Protocol)



Sunde et al Resuscitation 2007

# Case 2




---

- ❑ 77 y male
- ❑ DM,AMI-2005, CHF since then. Memory problems. EF 40%, no valve problems. Angio:peripheral disease. Living alone. Daily help.
- ❑ Witnessed VF, ROSC 15 min
- ❑ ICU?



# Admission to ICU?

---

   Yes, full ICU treatment w. hypothermia

   Yes, but no hypothermia

   No, too bad heart failure and too old?

---

# Admission policy to ICU (1)

## 1986 vs. 2006

Characteristics and outcome of patients according to the source of admission.

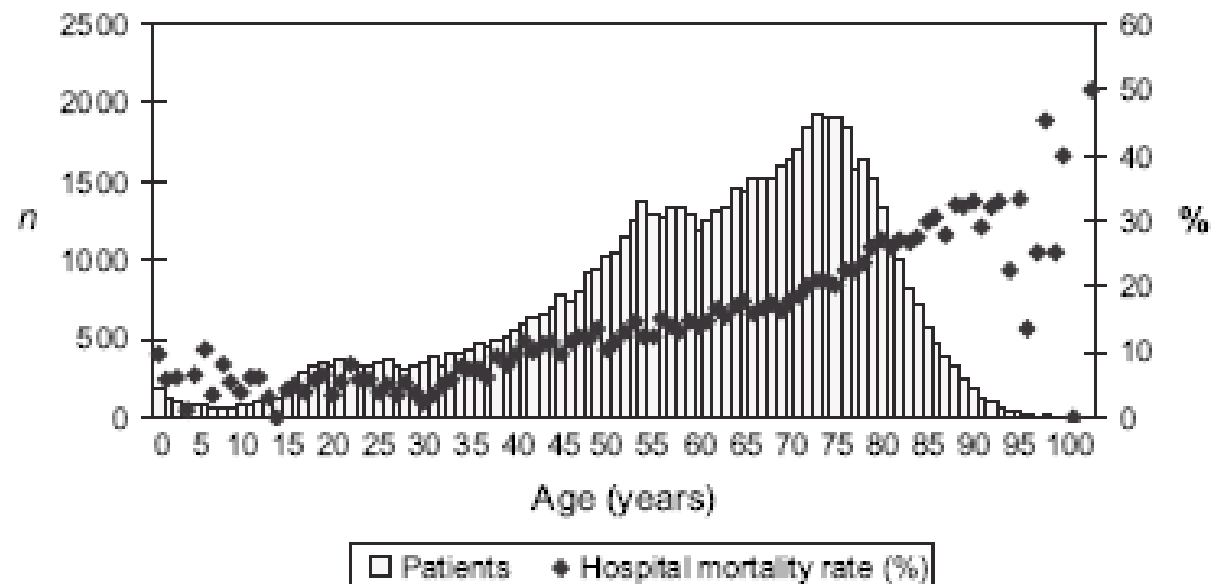
	1986–87	1999–2001	P-value
Patients arriving from the emergency department	<i>n</i> = 408	<i>n</i> = 714	
Age (years)	62.6 ± 13.5	65.4 ± 13.7	0.001
Glasgow coma score (median; interquartile range)	3 (3–6)	4 (3–6)*	0.862
Male gender	267 (65.4)	504 (71.2)†	0.045
Hospital mortality ( <i>n</i> , %)	245 (60.0)	419 (58.7)	0.654
Patients arriving from the other parts of the hospital	<i>n</i> = 196	<i>n</i> = 322	
Age (years)	65.3 ± 13.2	66.9 ± 13.4	0.200
Glasgow coma score (median; interquartile range)	5 (3–14)	4 (3–9)‡	0.027
Male gender	107 (54.6)	197 (69.1)§	0.001
Hospital mortality ( <i>n</i> , %)	245 (60)	419 (59)	0.654

\**n* = 695; †*n* = 708; ‡*n* = 309; §*n* = 285.

# Admission policy to ICU (2)

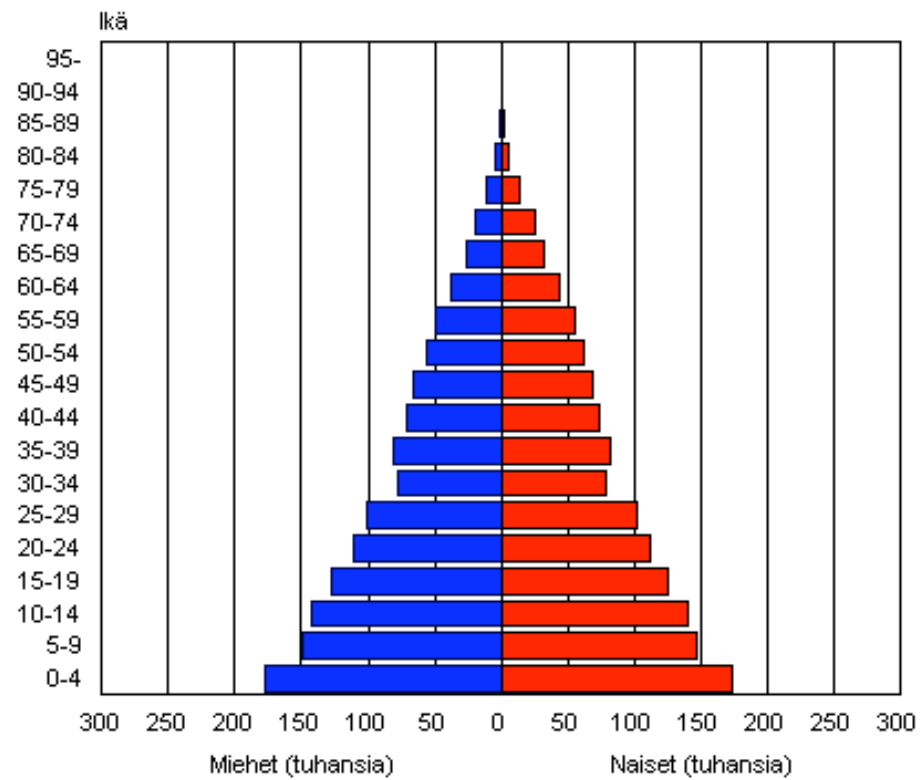
## 1986 vs. 2006

---



## Suomen väestön ikäpyramidi vuosina 1900-2030

1900



---

\_\_\_\_\_

---