Heart Surgery in Norway 2014

Norwegian Registry for Cardiac Surgery
In Collaboration With

Norwegian Association for Cardiothoracic Surgery
Background and history

- The Norwegian Registry for Cardiac Surgery is a national register by Norwegian law and funded by Department of Health through Health care region South - East.
- The registry is one of nine national registers for cardiovascular diseases run by the National Institute of Public Health and physically located at Oslo University Hospital.
- The registry is a continuation of «The Norwegian Heart Surgery Register» run by Norwegian Association for Cardio-Thoracic Surgery 1994 – 2012. The registry is now collecting data from the current five cardiac surgical centres in Norway.
- Anonymous data from the precedent register are used to describe trends in activity, changing demographics and risk factors, as well as early morbidity and 30 d. mortality.
- This slide collection is a succession of the yearly reports «Heart Surgery in Norway» from 1995 - 2013.
Heart Surgery in Norway 2014

- Activities are described by number of specified operations for whole Norway, per region and county, and per cardio-surgical unit
- Risk factors, morbidity and 30 d. mortality are presented in per cent
- Comments to the results can be obtained from the registry or from the cardio-surgical units
- If slides are used in presentations, the source must be given and if used in publications, authorization is required
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Heart Surgery in Norway 2014
New operations reported to the Norwegian Registry for Cardiac Surgery

4165 procedures

- 3871 > 18 years
  - 1070 females (27.6 %)
  - 278 prev. surg. (7.3 %)
  - 417 prev. PCI (12.0 %)
  - 335 urgent / emergencies (8.6 %)
  - 195 «closed» oper. excl.TAVR (5.9 %)

- 486 > 80 years (12.6 %)
  - 213 females (43.8 %)

- 291 < 18 years (6.9 %)
  - 119 girls (40.6 %)
  - 45 prev. surg. (15.5 %)
  - 31 urgent/emergencies (10.7 %)
  - 55 «closed» oper. (18.9 %)
Heart Surgery in Norway 2014
Operations per unit 2004 - 2014

2010: Oslo Heart Centre (HiO) was incorporated in Rikshospitalet
2011: Rikshospitalet and Ullevål Hospital merged into
Oslo University Hospital (OUS)
Heart Surgery in Norway 2014
Total number of operations 1995 – 2014

No of operations

TAVR, Surgery on Thoracic aorta, transplantsations, VAD, ECMO are included, TEVAR or implantations of ICD or Pacemakers are not included
Heart Surgery in Norway 2014
Operations on cardio-pulmonary bypass 1997 - 2014

No of operations


4259 4381 4316 4263 4694 4745 4864 5163 5090 5079 5044 4884 4473 4261 4007 4039 4011 3732

Norsk Hjertekirurgiregister
Heart Surgery in Norway 2014
Heart Surgery in Norway 2014
Average and oldest patient 1995 – 2014

Age

Average (adults)
Oldest patient

1995 1997 1999 2001 2003 2005 2007 2009 2011 2013
Heart Surgery in Norway 2014

Sex distribution by age group

- 1283 women
- 2882 men
Heart Surgery in Norway 2014

Sex distribution by surgical procedure
Heart Surgery in Norway 2014
Operations for coronary artery disease 1995 - 2014

No of operations

OPCAB included (small numbers)
Heart Surgery in Norway 2014
Treatment for coronary artery disease 1995 - 2014

No of procedures

Source: NHKiR & NPR

CABG
PCI
Heart Surgery in Norway 2014
Surgery for heart valve diseases 1995 - 2014

No of procedures

TAVR included, TAVR numbers complete from 2013

Norsk Hjertekirurgiregister
Heart Surgery in Norway 2014
Heart valve surgery 2003 - 2014

No of procedures

Aortic valve
Mitral valve
Tricuspid valve
Heart Surgery in Norway

Includes all known procedures 2014,
Sources: NHKiR + HUS & OUS
Heart Surgery in Norway 2014
SAVR/P & TAVR all age groups 2003 - 2014

No of procedures

- TAVR
- SAVR/P

Year:
- 2003
- 2005
- 2007
- 2009
- 2011
- 2013

Number of procedures:
- 0
- 200
- 400
- 600
- 800
- 1000
- 1200
- 1400
- 1600

Percentage:
- 0%
- 20%
- 40%
- 60%
- 80%
- 100%
Heart Surgery in Norway 2014
Choice of prosthetic heart valves 1995 - 2014

Per cent

TAVR included

- Mechanical
- Tissue valves
Heart Surgery in Norway 2014
Heart valve procedures 2003 - 2014

No of procedures

- Mechanical valve
- Tissue valve
- Valve repair
- excl. TAVR


Values: 0 200 400 600 800 1000 1200 1400
Heart Surgery in Norway 2014
Age distribution CABG, SAVR(P), combined CABG+SAVR, TAVR 2014
Heart Surgery in Norway 2014
Operations for congenital heart disease 1995-2014

Includes «closed surgery»
Heart Surgery in Norway 2014

No of operations incl. «hybrid procedures»

*Simultaneous valve surgery and TEVAR excluded
Heart Surgery in Norway 2014
All aortic operations and TEVAR 2014*

No of procedures

- Valve + ascend.: 168
- Ascending and arch: 197
- Descending and TAAA: 43
- TEVAR: 90

* Includes «hybrid procedures», Source: NHKiR og NORKAR
Heart Surgery in Norway 2014
Heart and Lung* Transplantations 1995 – 2014

No of transplants

* > 99% performed on ECC
There were no «stand alone» procedure in 2014
Heart Surgery in Norway 2014
Trends in activity 1995 - 2014

- Total activity
- CABG
- Valve surgery
- Congenital surgery
- Aortic surgery
- Transplantations
Heart Surgery in Norway 2014
Heart operations by county
Operations per 100 000 inhabitants
## Heart Surgery in Norway 2014

### Surgical rates by type of procedure /100 000*

<table>
<thead>
<tr>
<th>Region</th>
<th>CABG</th>
<th>Valve opr.</th>
<th>Comb. CABG+ valve opr.</th>
<th>Valve + aortic opr.</th>
<th>TAVR **</th>
<th>Aortic opr.</th>
<th>TEVAR ***</th>
<th>Cong. opr</th>
<th>Transpl. Heart or lungs</th>
</tr>
</thead>
<tbody>
<tr>
<td>South-East Norway</td>
<td>25.6</td>
<td>21.3</td>
<td>7.5</td>
<td>3.1</td>
<td>4</td>
<td>4.7</td>
<td>1.2</td>
<td>6.1</td>
<td>1.4</td>
</tr>
<tr>
<td>Western Norway</td>
<td>37.6</td>
<td>24.2</td>
<td>6.9</td>
<td>3.7</td>
<td>6</td>
<td>3.2</td>
<td>2.7</td>
<td>5.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Middle Norway</td>
<td>42.5</td>
<td>17.2</td>
<td>7.8</td>
<td>2.9</td>
<td>4.7</td>
<td>5.7</td>
<td>1.9</td>
<td>4.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Northern Norway</td>
<td>52.9</td>
<td>33.5</td>
<td>11</td>
<td>4.2</td>
<td>11.2</td>
<td>8.8</td>
<td>2.7</td>
<td>5.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Norway</td>
<td>33.4</td>
<td>22.5</td>
<td>7.8</td>
<td>3.3</td>
<td>4.8</td>
<td>4.9</td>
<td>1.8</td>
<td>5.8</td>
<td>1.3</td>
</tr>
</tbody>
</table>

* National Bureau of Statistics population 31.12.13 and place of living reported
** 20 TAVR from OUS included
*** 40 TEVAR from HUS, St. Olav and UNN included
Heart Surgery in Norway 2014

Procedures for coronary artery disease per 100,000 inhabitants 2014

Per 100,000

Source: NHKiR & NPR
Heart Surgery in Norway 2014
Risk factors *

* Euroscore I calculated for pts. ≥ 18 years
Hypertension is registered since 2013

% reported
Heart Surgery in Norway 2014
Estimated risk by Euroscore I 2001 - 2014

Euroscore I registered since year 2000
Heart Surgery in Norway 2014
Observed 30 d. mortality by type of surgery

30 d. mortality from Statistics Norway

CABG | Valve surg. | CABG + valve | Valve + aortic | Aortic surg | Congenital surg | Transplantations | All oper.

- 2001
- 2005
- 2010
- 2011
- 2012
- 2013
- 2014

Norsk Hjertekirurgiregister
Heart Surgery in Norway 2014

Observed early morbidity*

% reported

* TEVAR, VAD and ECMO not included
Heart Surgery in Norway 2014
CABG: results per center ie. mean and range

Operations per center: 232 - 420
Age: 64.6 – 66.4 years
Females: 14.6 – 22 %
Urgent / emergencies: 2.8 – 8.6 %
Prev. heart surgery: 0.5 – 0.9 %
Euroscore I: 2.9 – 4.5 %
Heart Surgery in Norway 2014
SAVR: results per center ie. mean and range

Operations per center: 63 - 307

Age: 66.2 – 70.9 years

Females: 33.1 – 44.9 %

Urgent / emergencies: 2.0 – 5.8 %

Prev. heart surgery: 1.6 – 14.2 %

Euroscore I: 5.7 – 7.0 %
Heart Surgery in Norway 2014
SAVR +CABG: results per center ie. mean and range

Operations per center:
48 – 126

Age:
69.7 – 73.7 years

Females:
22.9 – 32.0 %

Urgent / emergencies:
1.3 – 2.1 %

Prev. heart surgery:
0.8 – 6.3 %

Euroscore I:
6.5 – 7.4 %
Norwegian Registry for Cardiac Surgery and Norwegian Association for Cardio-Thoracic Surgery will express sincere thanks to those pioneers who have contributed to the establishment and development of a national registry for cardiac surgery and all those who have provided data for the registries since 1994 to this day.