



# Traumepasientene - hvordan går det med dem etter utskriving?

Norsk sykehus- og helsetjenesteforskning  
Samhandlingskonferanse for den akuttmedisinske kjede  
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Stiftelsen  
Norsk Luftambulanse





Utfordringen

Hvordan måler vi senfølger etter skade?

Gjennomgang av studie

Oppsummering



# Utfordringen



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## The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013

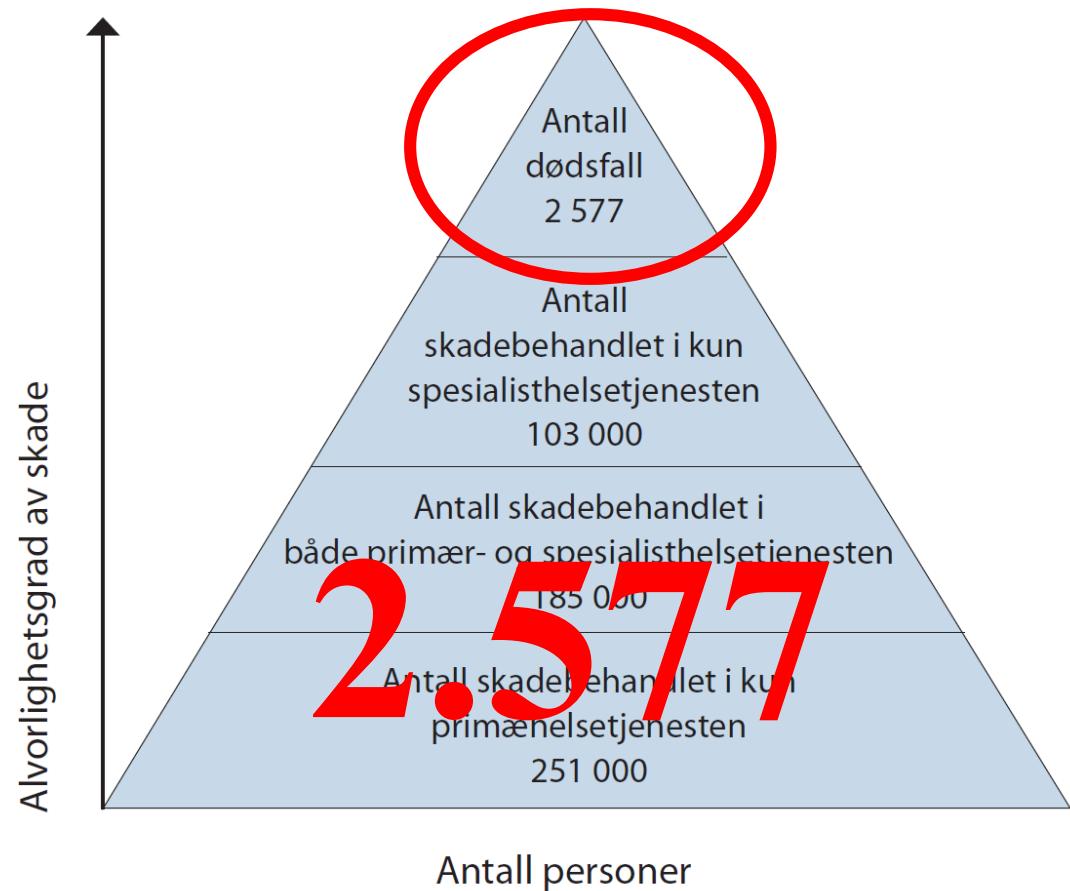
Juanita A Haagsma,<sup>1,60</sup> Nicholas Graetz,<sup>1</sup> Ian Bolliger,<sup>1</sup> Mohsen Naghavi,<sup>1</sup> Hideki Higashi,<sup>1</sup> Erin C Mullany,<sup>1</sup> Semaw Ferede Abera,<sup>2,3</sup> Jerry Puthenpurakal Abraham,<sup>4,5</sup> Koranteng Adofo,<sup>6</sup> Ubai Alsharif,<sup>7</sup> Emmanuel A Ameh,<sup>8</sup> Walid Ammar,<sup>9</sup> Carl Abelardo T Antonio,<sup>10</sup> Lope H Barrero,<sup>11</sup> Tolesa Bekele,<sup>12</sup> Dipan Bose,<sup>13</sup> Alexandra Brazinova,<sup>14</sup> Ferrán Catalá-López,<sup>15</sup> Lalit Dandona,<sup>1,16</sup> Rakhi Dandona,<sup>16</sup> Paul I Dargan,<sup>17</sup> Diego De Leo,<sup>18</sup> Louisa Degenhardt,<sup>19</sup> Sarah Derrett,<sup>20,21</sup> Samath D Dharmaratne,<sup>22</sup> Tim R Driscoll,<sup>23</sup> Leilei Duan,<sup>24</sup> Sergey Petrovich Ermakov,<sup>25,26</sup> Farshad Farzadfar,<sup>27</sup> Valery L Feigin,<sup>28</sup> Richard C Franklin,<sup>29</sup> Belinda Gabbe,<sup>30</sup> Richard A Gosselin,<sup>31</sup> Nima Hafezi-Nejad,<sup>32</sup> Randah Ribhi Hamadeh,<sup>33</sup> Martha Hijar,<sup>34</sup> Guoqing Hu,<sup>35</sup> Sudha P Jayaraman,<sup>36</sup> Guohong Jiang,<sup>37</sup> Yousef Saleh Khader,<sup>38</sup> Ejaz Ahmad Khan,<sup>39,40</sup> Sanjay Krishnaswami,<sup>41</sup>

Haagsma et al. Int J of Inj Prev. 2015

- **Vanligste årsak** til dødelighet og sykelighet i verden
- **973 millioner** mennesker har årlig behov for helsehjelp
- **4.8 millioner** årlige dødsfall som følge av skader

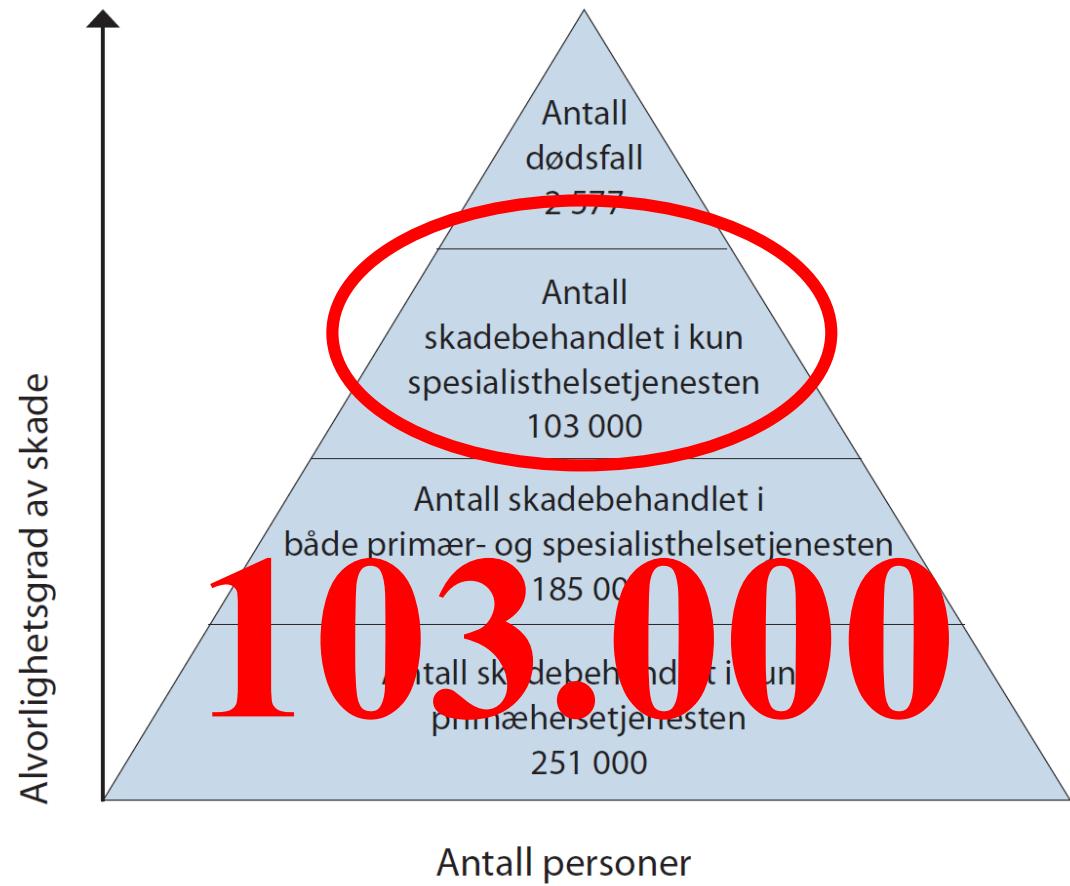
## Skadebildet i Norge

Hovedvekt på personskader  
i sentrale registre



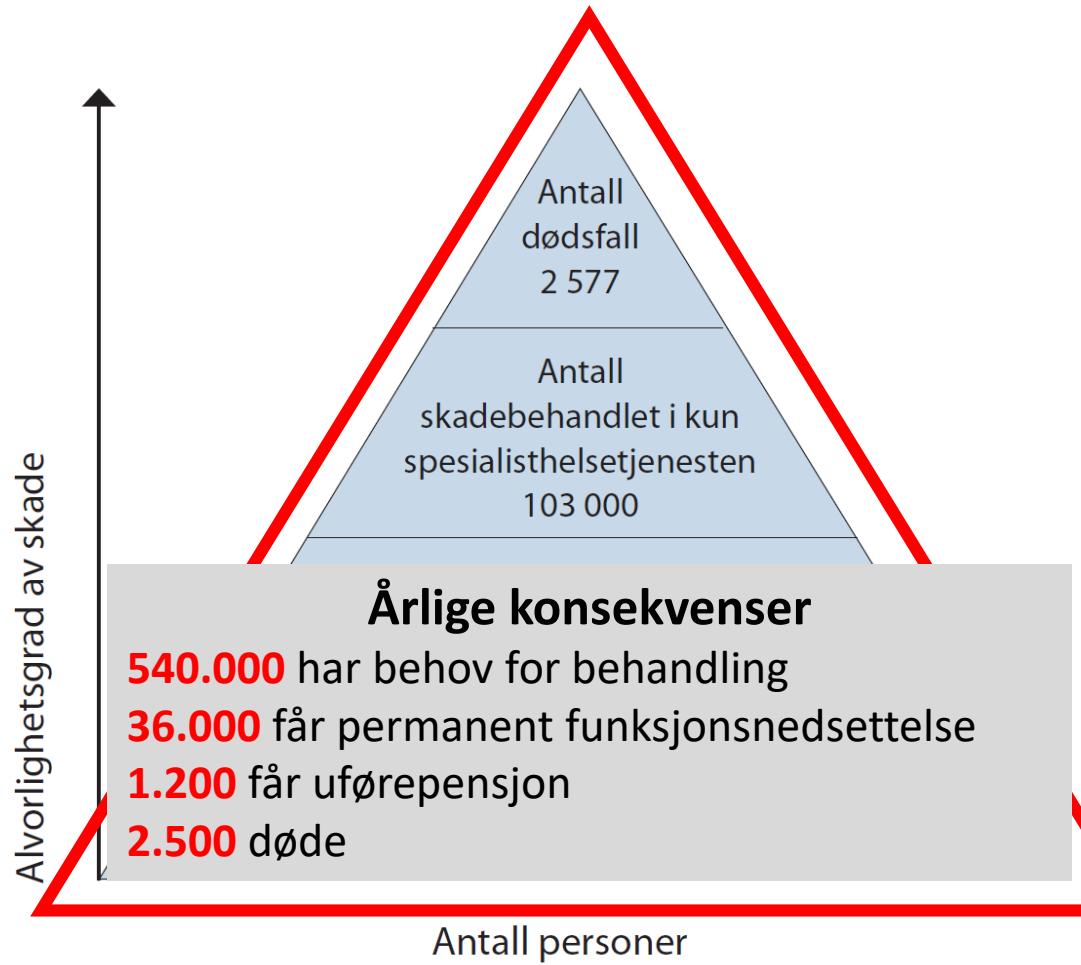
## Skadebildet i Norge

Hovedvekt på personskader  
i sentrale registre



## Skadebildet i Norge

Hovedvekt på personskader  
i sentrale registre



# Antall alvorlige traumer

Uleberg et al. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2014, 22:64  
http://www.sjtrem.com/content/22/1/64

**ORIGINAL RESEARCH** **Open Access**

## Norwegian trauma care: a national cross-sectional survey of all hospitals involved in the management of major trauma patients

Oddvar Uleberg<sup>1,2\*</sup>, Ole-Petter Vinjevoll<sup>3</sup>, Thomas Kristiansen<sup>4</sup> and Pål Klestad<sup>2,5</sup>

**Abstract**

**Background:** Approximately 10% of the Norwegian population is injured every year, with injuries ranging from minor injuries treated by general practitioners to major and complex injuries requiring specialist in-hospital care. There is a lack of knowledge concerning the caseload of potentially severely injured patients in Norwegian hospitals. Aim of the study was to describe the current status of the Norwegian trauma system by identifying the number and the distribution of contributing hospitals and the caseload of potentially severely injured trauma patients within these hospitals.

**Methods:** A cross-sectional survey with a structured questionnaire was sent in the summer of 2012 to all Norwegian hospitals that receive trauma patients. These were defined by number of trauma team activations in the included hospitals. A literature review was performed to assess over time the development of hospitals receiving trauma patients.

**Results:** Forty-one hospitals responded and were included in the study. In 2011, four trauma centres and 37 acute care hospitals received a total of 6,017 trauma patients. The centres admitted 1,753 (30%) patients and other hospitals received 4,264 (69%) patients. There were significant regional differences between both categories. More than half (52.9%) of the hospitals admitted fewer than 100 patients annually. The national mean of hospital activation via trauma teams was 1.13 per 100,000 inhabitants. There was a 37% (from 30 to 41) reduction in the number of hospitals admitting trauma patients between 1988 and 2011.

**Conclusions:** In 2011, hospital-based trauma care in Norway was delivered by four trauma centres and 37 acute care hospitals. Many hospitals still receive a small number of potentially severely injured patients and only a few hospitals have an electronic trauma registry. Future development of the Norwegian trauma system needs to address the challenge posed by a scattered population and long geographical distances. The implementation of a trauma system, carefully balanced between centres with adequate caseloads against time from injury to hospital care, is needed and has been shown to have a beneficial effect in countries with comparable challenges.

**Keywords:** Epidemiology, Injury, Norway, Trauma, Trauma system

**Background**

The Global Burden of Injury Study reported a 9.3% reduction in deaths caused by injuries from 1990 until 2010; however, traumatic injury is still recognized as one of the primary challenges in modern health care [1,2]. Every year, approximately 5.1 million deaths worldwide are caused by

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Injuries of any type, which represent a mortality rate of 74 per 100,000 persons and constitute the leading cause of death from 1 to 44 years of age [1,3]. The Norwegian mortality rate related to trauma varies among reports, with rates ranging from 29 to 77 per 100,000, depending on which definitions are used [4-10]. In Norway, approximately 540,000 persons are injured annually [8], 36,000 persons sustain permanent functional impairment, 1,200 persons receive disability pensions [8,11], and approximately 2,500 persons die as a result of accidents and violence, including self-inflicted injuries [8,11].

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## ORIGINAL ARTICLE

### Implementation of a trauma system in Norway: a national survey

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#### Conflict of interests

The authors have no conflicts of interest to declare.

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doi:10.1111/aas.12467

**Background:** Trauma systems have improved outcomes for injured patients, but might be challenging to implement. We assessed the implementation of a trauma system in Norway after recommendations for a national trauma system were published in 2007, with a focus on elements in acute care hospitals.

**Methods:** All hospitals in Norway, except for the four regional trauma centres, admitting injured patients at the time of the study were included in a telephone survey. The questionnaire was administered during May 2013 by the regional trauma coordinators who interviewed the local trauma coordinator and/or the local doctor responsible for trauma care in the acute care hospitals. The main categories were availability of the trauma team and team training, written procedures, preparedness of trauma care personnel. The compliance to a set of 17 predefined trauma system criteria was evaluated at each institution.

**Results:** Of the 33 acute care hospitals in Norway admitting trauma patients at the time of the survey, 27 were included. The median number of fulfilled criteria was 14. Major deficiencies were found in fulfilling competence criteria, maintaining a local trauma registry, and trauma audits. The number of fulfilled criteria correlated strongly with the size of the hospital and the frequency of trauma team activation.

**Conclusions:** Shortcomings in requirements for lower-level trauma care hospitals correlate to hospital size and frequency with which the trauma team is activated. In order to fulfill the minimum requirements, smaller hospitals should receive more attention.

#### Editorial comment: what this article tells us

Six years after it was decided to implement a national trauma system, acute care hospitals in Norway generally fulfil the list of criteria in that system. Some aspects, however, were less well covered, such as use of trauma registries, trauma audits and training of personnel.

Acta Anaesthesiologica Scandinavica 59 (2015) 384–391

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**Acta Anaesthesiologica  
Scandinavica**



Uleberg et al. SJTREM 2014, 22:64

Dehli et al. Acta Anaesthesiologica Scandinavica 59;(2015):384–391

## Trauma care in a combined rural and urban region: an observational study

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Acta Anaesthesiol Scand. 2017; 61(3): 346 - 56

- **2323** traumepasienter (3 år)
- **48 (2 %)** pasienter døde (30 dagers mortalitet)
- **119 (5 %)** pasienter døde (inntil 6.5 år etter skade)

# Hvordan måler vi senfølger etter skade?

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PLOS ONE

## Health Outcome after Major Trauma: What Are We Measuring?



Karen Hoffman<sup>1\*</sup>, Elaine Cole<sup>1</sup>, E. Diane Playford<sup>2</sup>, Eva Grill<sup>3</sup>, Helene L. Soberg<sup>4</sup>, Karim Brohi<sup>1\*</sup>

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**Conclusion:** Outcome measures used in major trauma capture only a small proportion of health impacts. There is no inclusive classification for measuring disability or health outcome following trauma. The ICF may provide a useful framework for the development of a comprehensive health outcome measure for trauma care.

- **Død** er det mest vanlige utfallsmål
- Opptil **1500** ulike utfallsmål
- **Ingen** konsensus

# Hvordan går det med den potensielt alvorlig skadde pasienten i et langtidsperspektiv?

Original article

## Population-based analysis of the impact of trauma on longer-term functional outcomes

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Br J Surg. 2019 Jan; 106 (1): 65 - 73

# Andre studier på «Return to work»

## Lite antall pasienter

Tøien *et al.* Injury 2012 N = 188

Spreadborough *et al.* Clin Rehabil 2018 N = 99

Folkard *et al.* Injury 2016 N = 92

Andelic *et al.* Acta Neurol Scand 2009 N = 62

Overgaard *et al.* N = J Trauma 2011 N = 322

## Spesifikke skader

Clay *et al.* J Rehabil Med 2010 – ikke livstruende ortopedisk traume

Hilton *et al.* Spinal Cord 2017 - traumatisk spinalskafe

Marek *et al.* Am Surg 2018 – traumatisk spinalskafe

Sigurdadottir et al. Neuropsychol Rehabil 2018 – traumatisk hodeskafe

## Spesifikke skademekanismer

Rudbeck *et al.* J Occup Environ Med 2018 - arbeidsulykker

Pellissier *et al.* Accid Anal Prev 2017 - transportulykker



# Utfallsmål



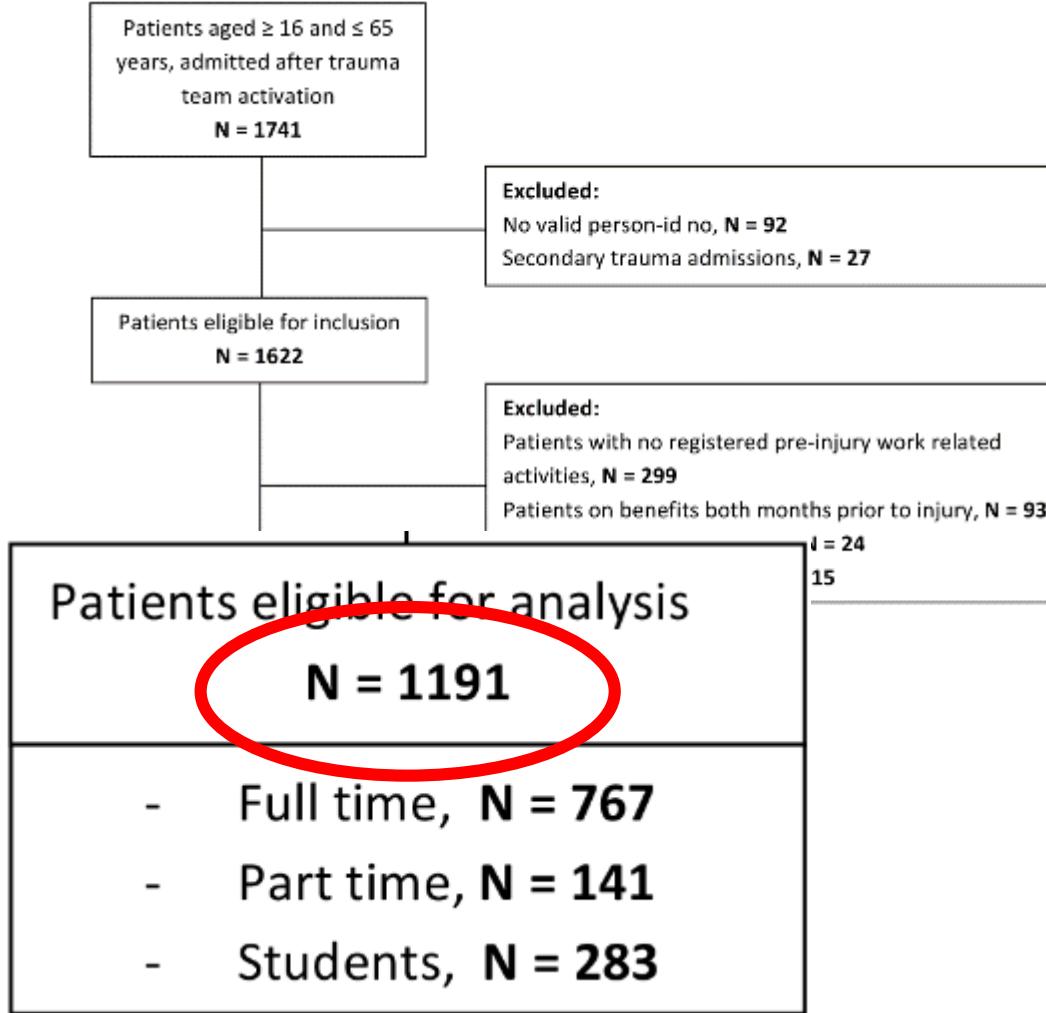
## Primære utfallsmål

- Hvor stor andel av pasientene mottar medisinske stønadsordninger etter skade ?
- Når returnerer pasientene til arbeid etter skade ?

## Sekundære utfallsmål

- Mortalitet; etter 30 dager og i løpet av oppfølgningsperioden (inntil 72 mnd)

# Metode



## Inklusjon

- Traumeteam
- Alder 16 – 65 år
- Fødselsnummer
- Ikke medisinske støtte ordninger siste 2 mnd. før skade

## Eksklusjon

- *Prehospital død*

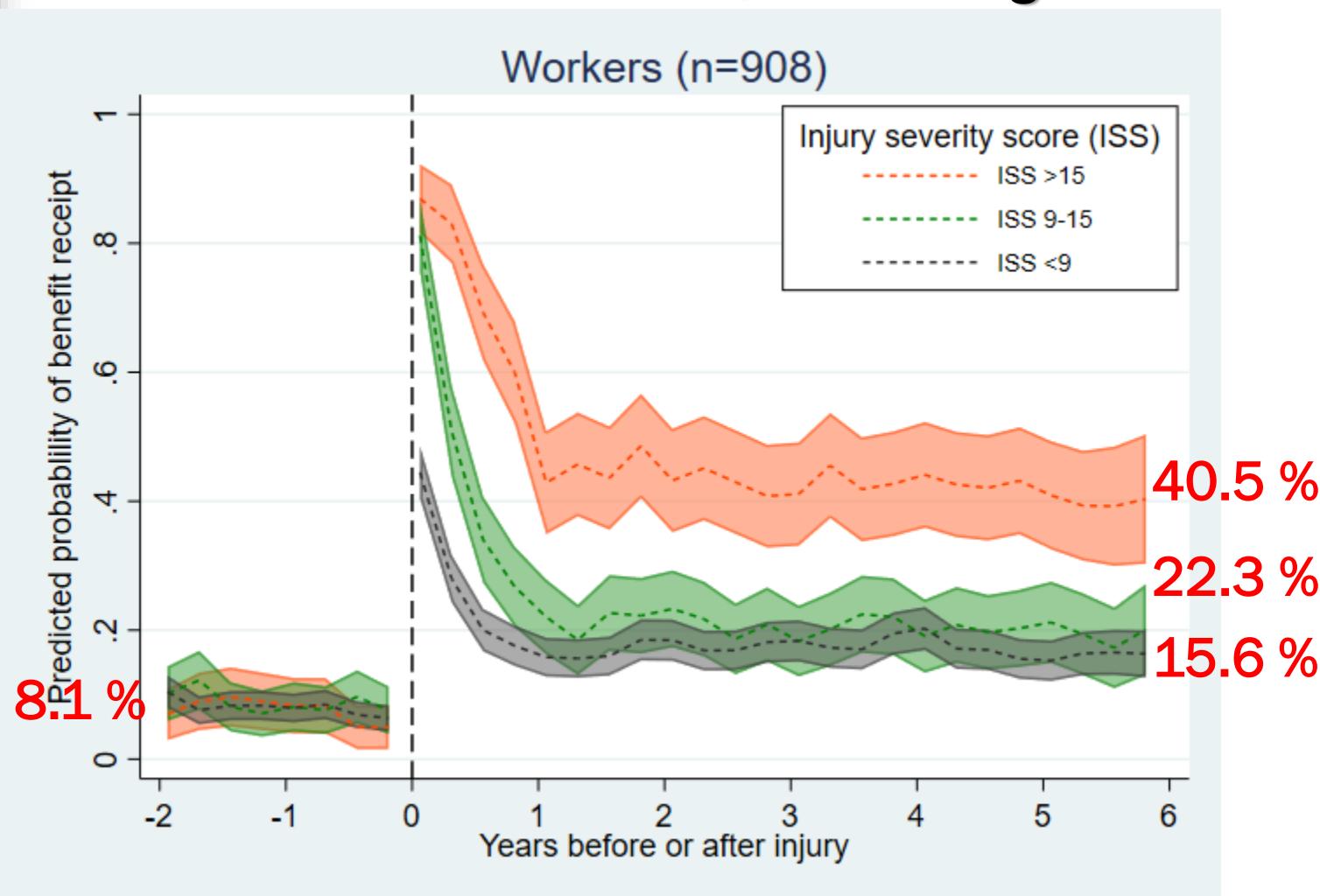
## Kobling

- FD-trygd
- Nasjonal utdanningsdatabase
- Dødsårsaksregisteret

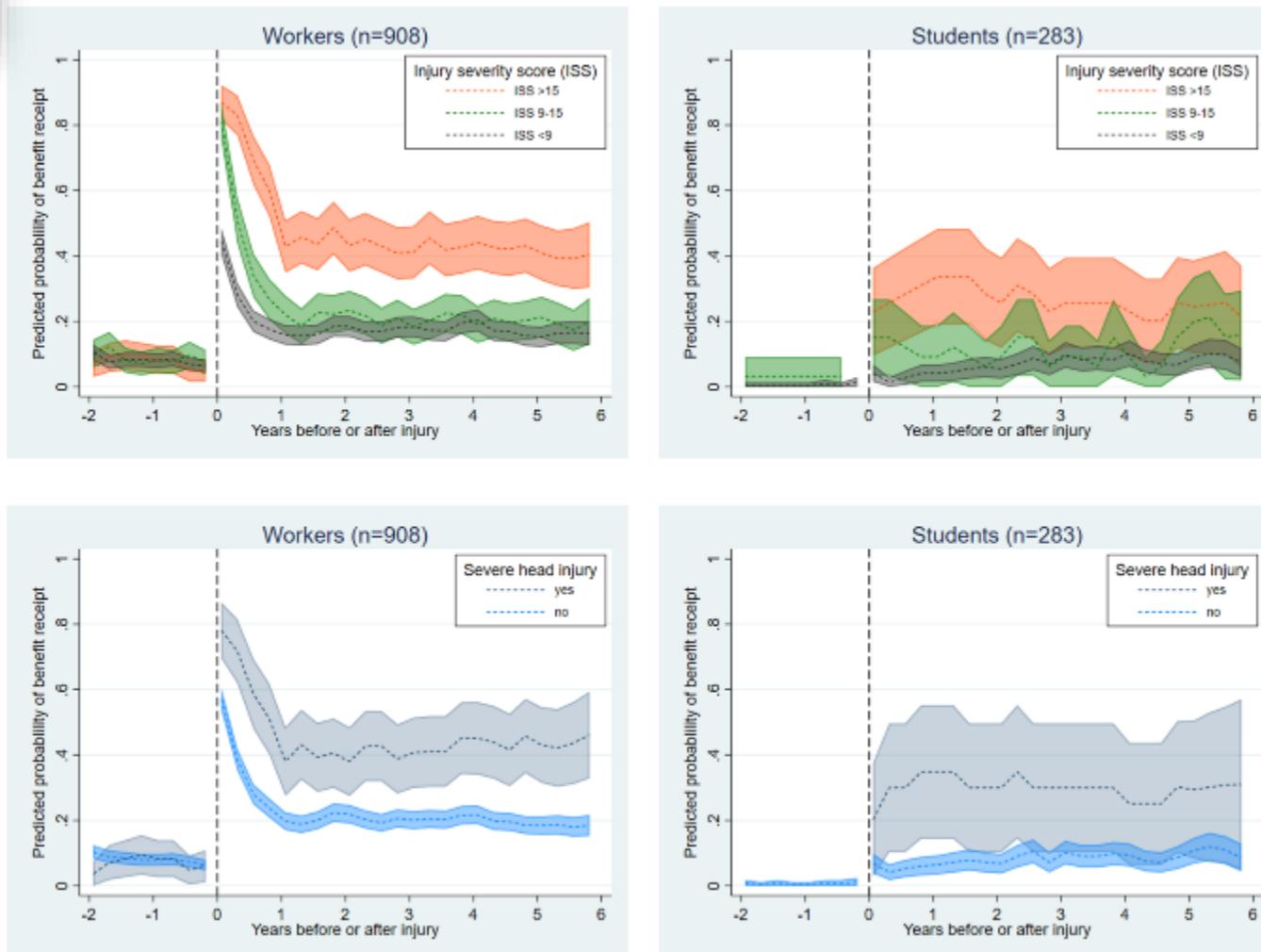
# Resultater

|                          | No. of patients* (n=1191) |
|--------------------------|---------------------------|
| Injury Severity Score†   |                           |
| < 9 (minor injury)       | 4 (1–10)                  |
| 9–15 (moderate injury)   | 772 (64·8)                |
| > 15 (severe injury)     | 226 (19·0)                |
| Death                    | 193 (16·2)                |
| Within 30 days of injury | 12 (1·0)                  |
| During entire follow-up  | 29 (2·4)                  |

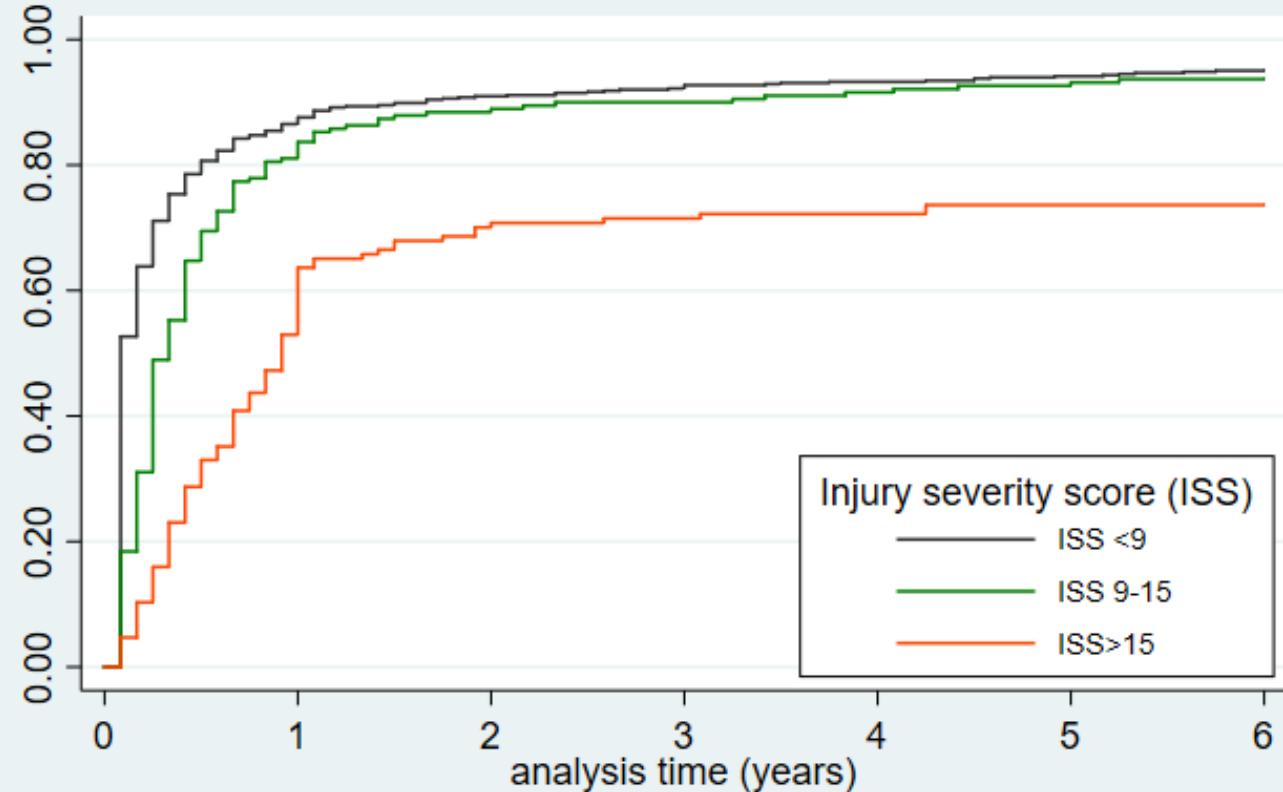
# Behov for medisinske støtteordninger



# Behov for medisinske støtteordninger



# Retur til arbeid



- 90.6 % returnerte til arbeid etter skade
  - Median tid ISS < 9 1 måned
  - Median tid ISS 9 - 15 4 måneder
  - Median tid ISS > 15 11 måneder



# Oppsummering



Få pasienter er alvorlig skadd.

Få pasienter dør etter ankomst sykehus.

Pasienter med mest alvorlig skade / hodeskade bruker mest medisinske støtteordninger og kommer senere tilbake i jobb.

Pasienter med lite / moderat skade har en 2-3 dobling i bruk av medisinske støtteordninger etter skade.

Livet til mange pasienter med potensielt alvorlig skade er påvirket i flere år etter skaden.

A photograph showing a group of medical professionals in a hallway. Some are wearing white coats and others are in orange safety vests. They are pushing a patient on a gurney. The scene is somewhat blurry, suggesting movement. In the foreground, a large red text overlay reads "Takk for oppmerksomheten!"

Takk for oppmerksomheten!

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