



# Fatal occupational injuries underreported in Norway

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# Overview

1. Background and aim of study
2. Material: two main sources: Death registers in Norwegian Labour Inspection Authority and in Statistics Norway
3. Methods: Comparing two registers by means of unique personal number of deceased, estimation of total number by a capture-recapture model
4. Results: An underreporting in both registers of 30-43%
5. Conclusions



# 1 Background and aim of study

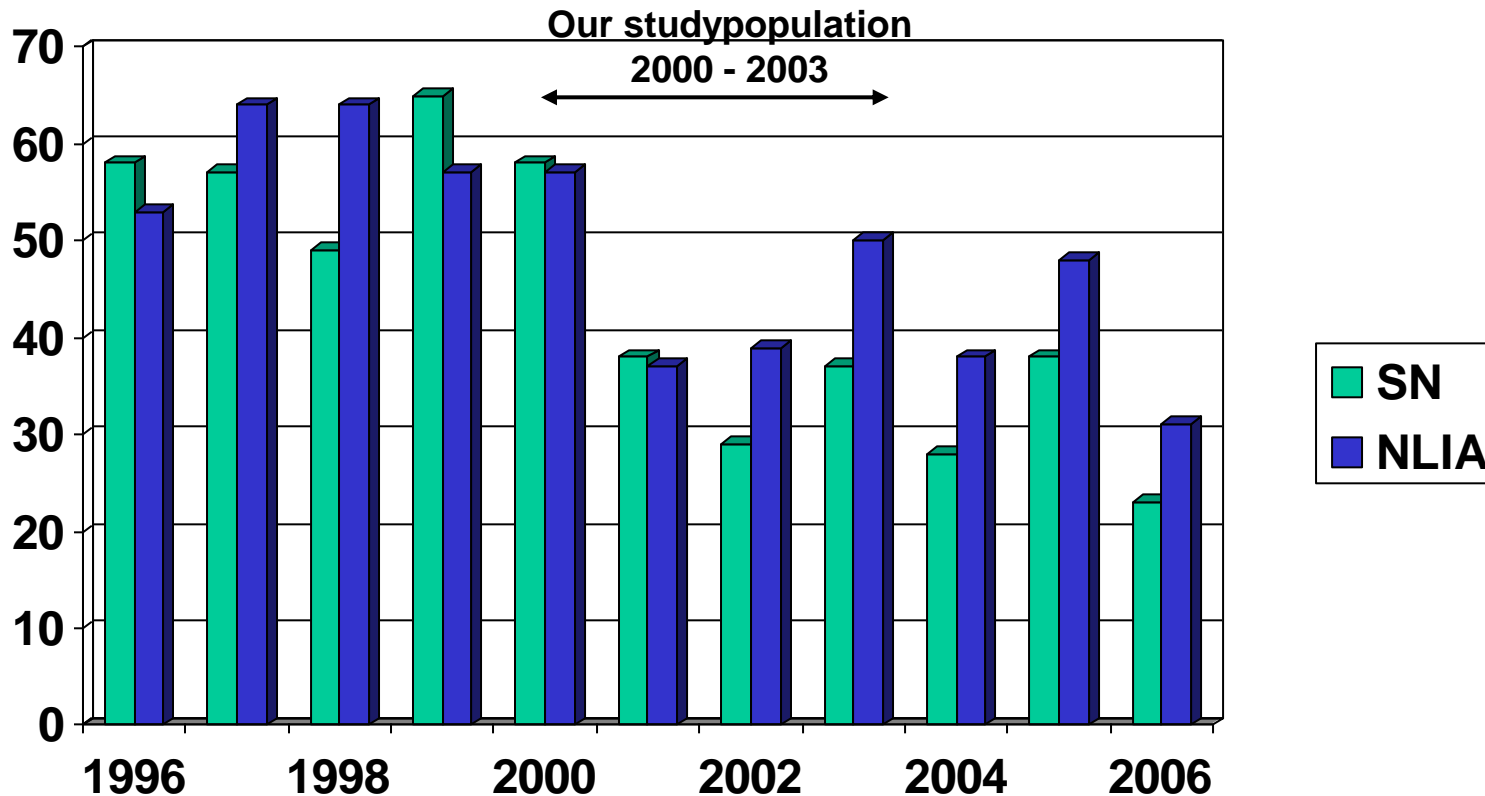
- Norwegian population ab. 4.5 million, number of employees ab 2.2 million
- 2/3 of all fatal occupational injuries (OI) in Norway are recorded by the Norwegian Labour Inspection Authority (NLIA)
- The other 1/3 are recorded by authorities of aviation, shipping, fishing and oil production
- The NLIA register of fatal OI is regarded as complete
- Aim of study: to assess the completeness of the register of fatal OI at NLIA (Norwegian Labour Inspection Authority)



## 2 Material: two main sources

- Death register at the Norwegian Labour Inspection Authorities (NLIA)
  - based on reports from employers and police
  - fatal occupational injury irrespective of residence
  - occupational injury: only mainland based activities
- Death register in Statistics Norway (SN)
  - all deaths of residents in Norway (no non-residents)
  - occupational injuries from mainland plus air, sea, offshore

# Fatal occupational injuries in Norway 1996-2006 registered in the two sources: Statistics Norway (SN) and Norwegian Labour Inspection Authority (NLIA)

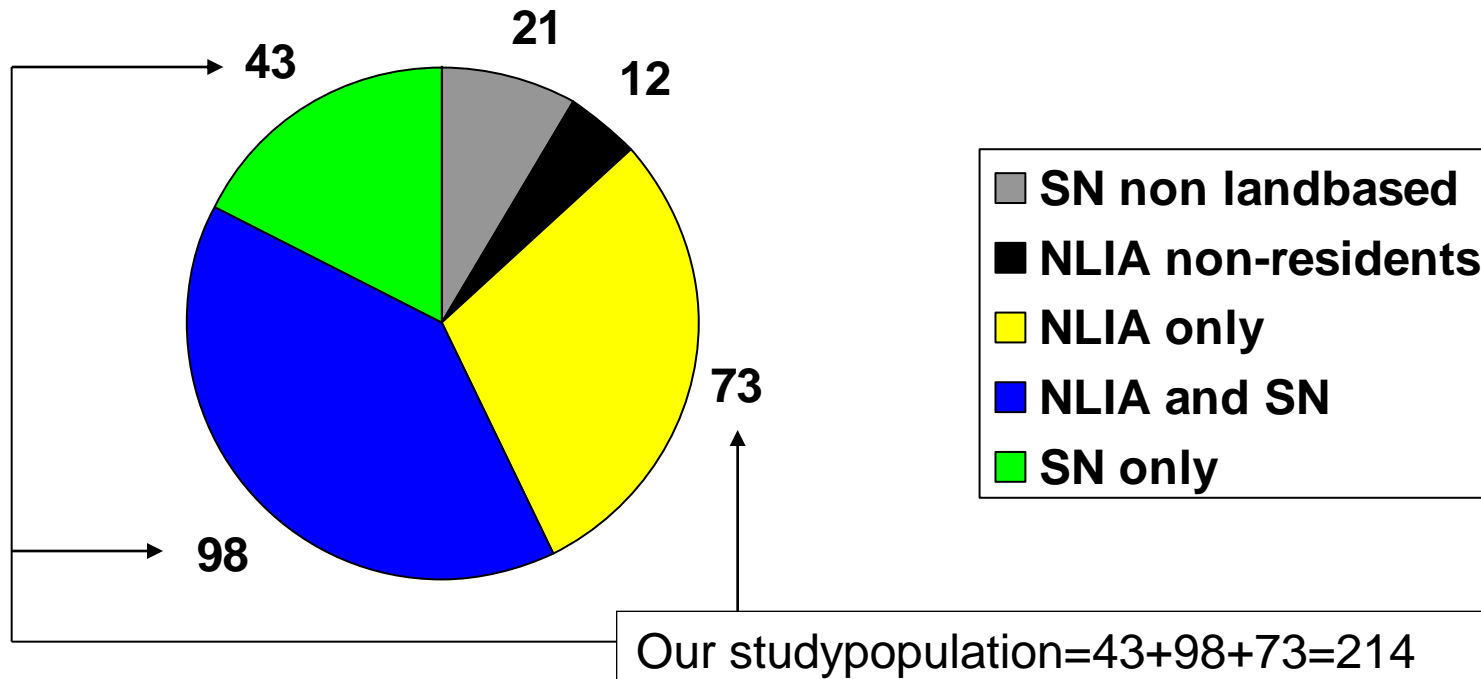


# 3 Methods

- Comparing NLIA case-wise with Statistics Norway by means of unique personal number for
  - residents in Norway
  - mainland based activity
- Estimate true number of fatal occupational injuries in this population with a capture-recapture model
  - Chao et al, Stat Med 2001;20:3123-57
  - McCarty et al: Int J Epidemiol 1993;22:559-65

## 4 Results

# Total registered fatal OI in Norwegian Labour Inspection Authority (NLIA) and in Statistics Norway (SN) for the period 2000-2003, N=247





# Capture-recapture

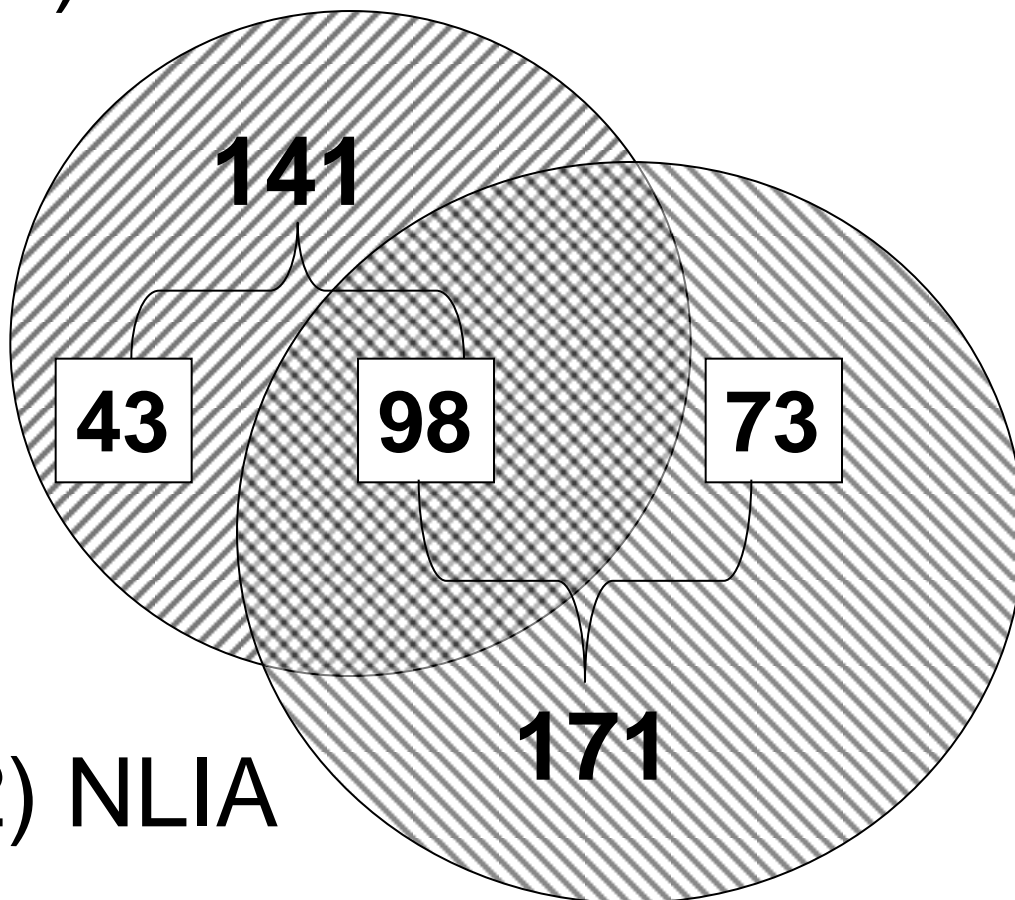
- Probability of being registered by source A (SN) is the same for all (true number) fatal occupational injuries as for those registered by source B (NLIA),
- if the two sources are independent:
  - $p_A \cdot \text{true number} = 141$
  - $p_A \cdot 171 = 98$
  - $\text{true number} = 141 \cdot 171 / 98 = 246$





To find true number of fatal occupational injuries of residents in Norway, employed in mainland based activities, two more registers will now be studied

1) SN



2) NLIA

Registers in:

3) Insurance companies

4) National Insurance Administration

$1+2+3+4 =$   
true number  
246?



# Fatal occupational injuries

Annual averages vs. persons employed

• Norway 2000-3 (NLIA)	43	
– Pr 100.000 (2,3 mill)		1,9
• Norway 2000-3 estimate	62	
– Pr. 100.000 estimate		2,7
• Sweden 2000-3 (SLIA)	59	
– Pr 100.000 (4,2 mill)		1,4
• Denmark 2001-4 (DLIA)	51	
– Pr 100.000 (2,7 mill)		1,8



## 5 Conclusions

- NLIA underreported (2000-3) in particular:
  - Traffic accidents (small vehicles)
  - Military personell (not in war)
  - Health and social sector
- SN underreports due to poor classification of activity
- Underreporting may lead to misinterpretation of risks
- One third of all recorded fatal occupational injuries (both sources) were due to transport accidents (V01-V99, ICD-10)
- Underreporting in NLIA may be worse for individuals who are residents abroad