

## **Sikkerhetsarbeid i den nordiske fiskeflåten**

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## **Trends of the fatal injuries in the fishing industry - a review**

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- TRENDS OF THE RATES OF FATAL INJURIES
- CAUSAL ANALYSIS
- TRENDS OF THE RATES OF VESSEL DISASTERS
- FATIGUE & SAFETY CULTURE
- CONCLUSIONS

# United Kingdom

## Fatal injuries all causes

1919-1934: 2.7

1935-1938: 4.6

1948-2005: 1.3

Relative Risk compared to  
other industries:

1976-80 : 52

1991-95: 77

(Roberts)



## Denmark

The fatality rates  
decreased in the Danish  
fishing

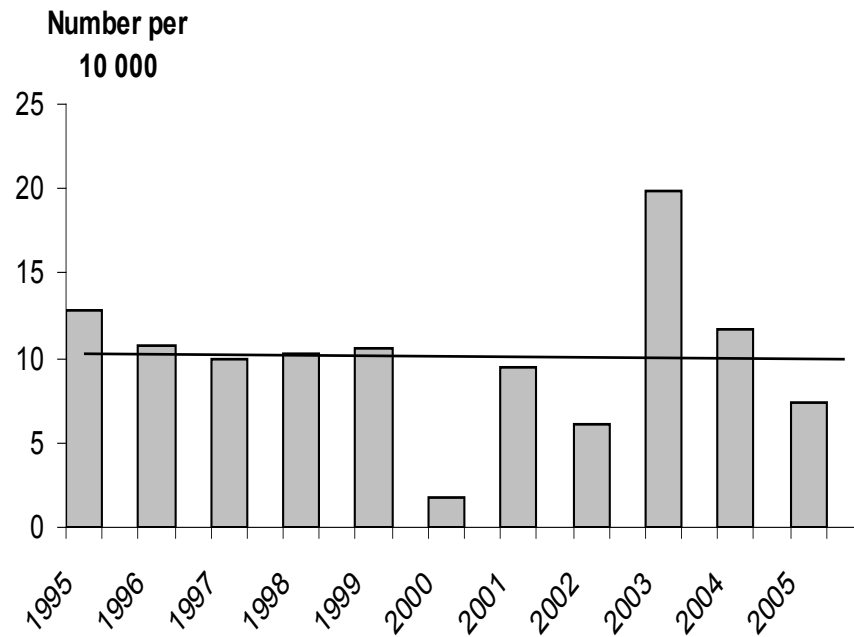
1970-72 : 2.4

1988-92: 1.4

1995-05: 1.0

nearly stable during that  
period.

Figure 1. Incidence rates of persons lost in fatal accidents per 10 000 Danish fulltime fishermen per year during 1995-2005 (Hedegård et al. 2008)



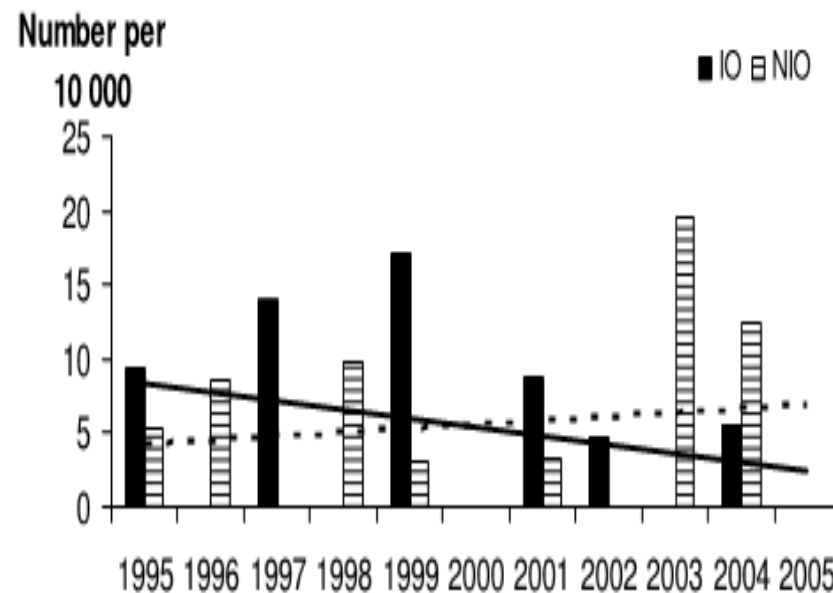
## Denmark

1995-2005 :

inspection obligated vessels IO had nearly half the risk compared to the small non-obligation inspection fishing vessels.

About half of the fatal injuries was due to fatal vessel disasters .

Figure 2. The incidence rates of persons lost in fatal vessel disasters per 10 000 Danish fulltime fishermen per year during 1995-2005 (Hedegård et al 2008).



IO=inspection obligated vessels, NIO=non inspection obligated vessels.

(Trend curve analysis = non-significant)

## Norway

The fatal injury rates in the Norwegian fishing decreased from 1955-2006 except for the two periods 1980-84 and 1990-94 due to some casualties with total losses of larger vessels (Aasjord 2006)

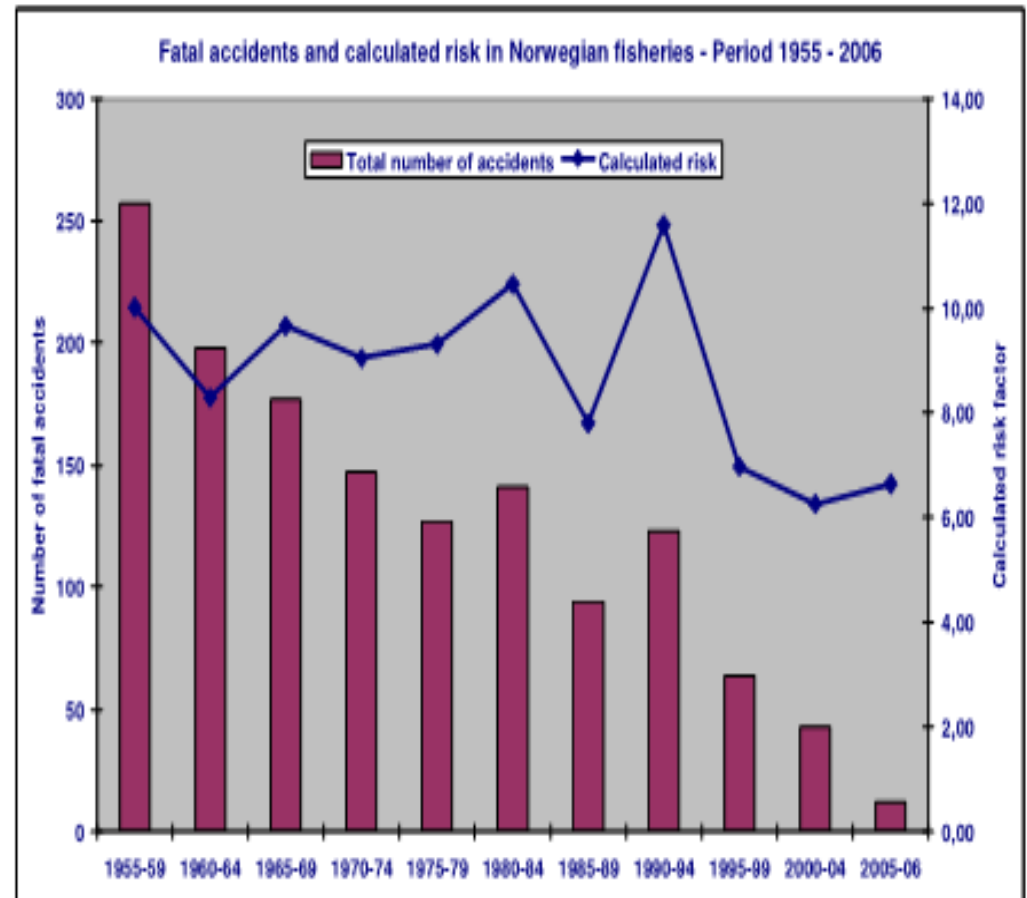
1998-2006

<13 meters 2.5,

13-28 meters 0.6

>28 meters 0.2

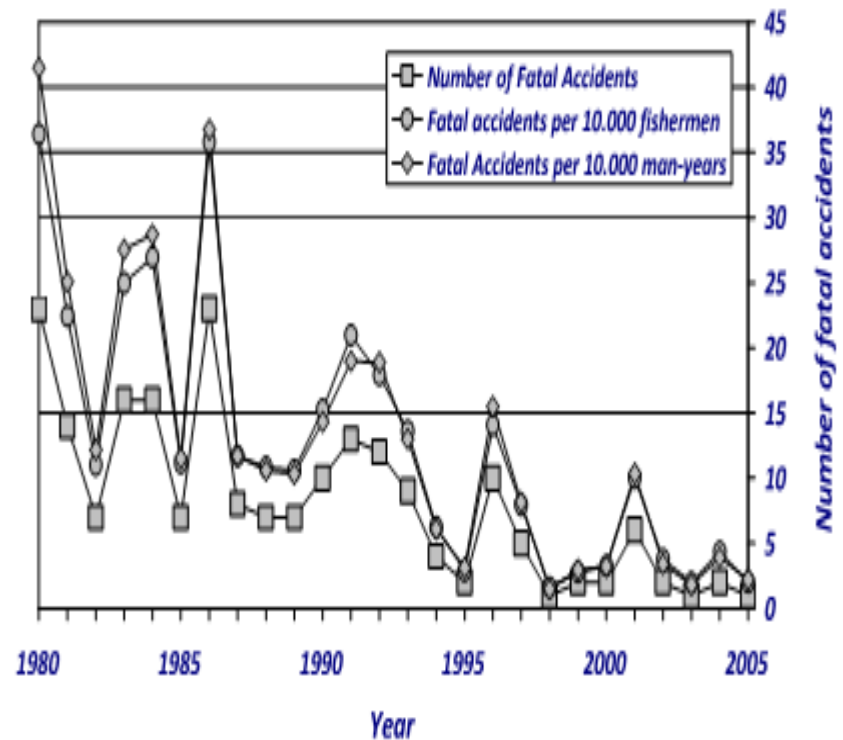
The calculated risks: Per 1000 man-labour-years



## Iceland

For 1966-1986 the fatal rate in the Icelandic fishing was 0.89 per 1000 man-years (Petursdottir 2007). The study population is "Icelandic seafarers" but also some seafarers from the merchant fleet are included that add to the lower injury rate. Another explanation of the low rate is that they mainly have large fishing vessels with a better safety standard (Rafnsson et al. 1994). The incidence of fatal injuries among Icelandic fishermen has been steadily declining during the period from 1980 to 2005 and now below 0.5 per 1000 man-years

*Fatal accidents among Icelandic fishermen*



## The Polish small-scale fishing 1960-1999

(Jaremin & Kotulak 2004)

- The calculated overall injury rate was 0.9 deaths per 1000 fishermen per year.
- The highest incidence rates were in the smaller boats <13 m in length.





## Alaska

The annual fishing related fatal injury rate in Alaska was  
1980-84: 4.2

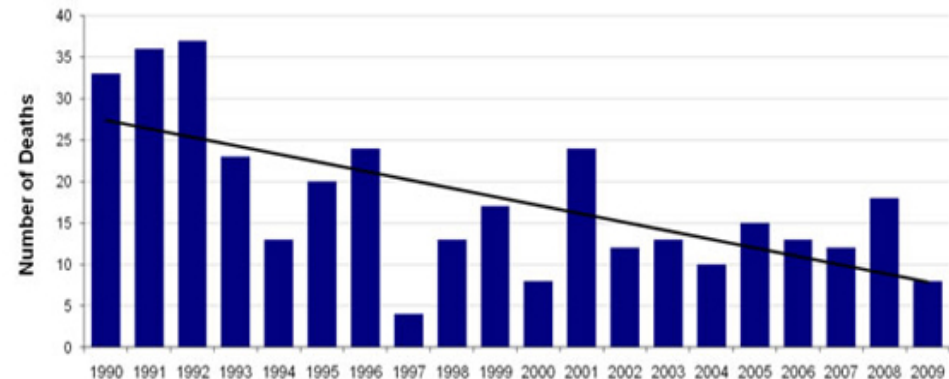
1991-98 : 1.2

2008: 1.2

All US workers during the same period was 0.04 deaths per 1000 workers

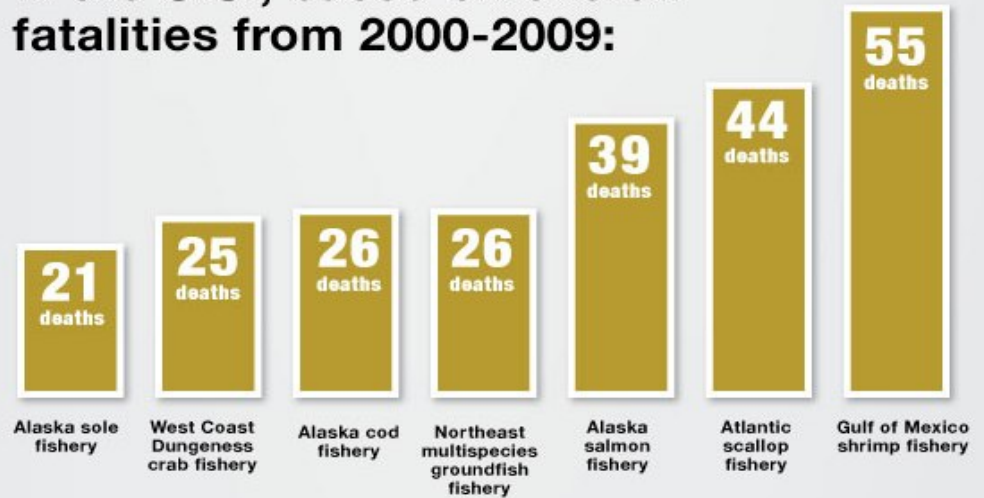
(Lincoln et al.)

- The authors' explanation for the risk reduction: From 1990 a comprehensive plan for prevention was implemented



## USA 2000-2009

### The most hazardous fisheries in the U.S., based on overall fatalities from 2000-2009:



### The highest death rates per 100,000 full time equivalent workers, 2000-2009

How the fishing industry's death rate far exceeds the national workplace average of **4 deaths per 100,000 workers**:

West Coast Dungeness  
crab fishery

**310**

fatalities per  
100,000 FTEs

Atlantic scallop  
fishery

**425**

fatalities per  
100,000 FTEs

Northeast multispecies  
groundfish fishery

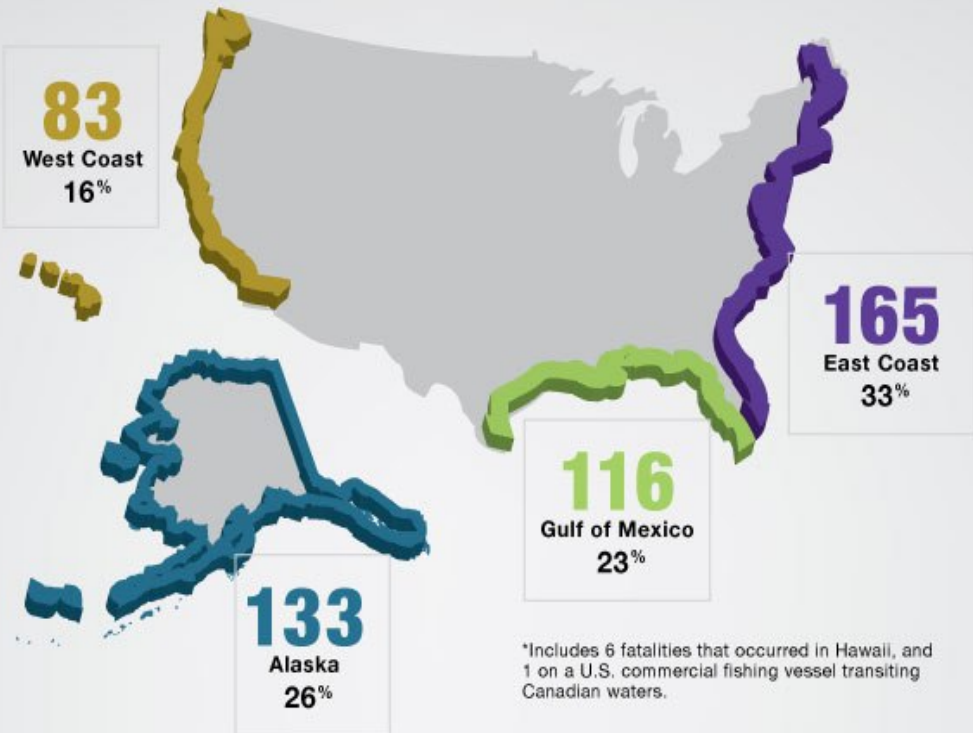
**600**

fatalities per  
100,000 FTEs

# USA 2000-2009

## U.S. commercial fishing deaths by region, 2000-2009, 504 total\*

As this map shows, the East Coast suffered the highest fishing death toll in a recent 10-year period.



# Causal analysis of fatal injuries



## Norge

SINTEF rapport 13 Sep 2012:

Fiskerulykker og årsaksforhold

Analyse av årsaksforhold ved dødsulykker og alvorlige personskader i norsk fiskeri

### Forfattere

Halvard L. Aasjord

Ingunn Marie Holmen

Trine Thorvaldsen



## Oppsummering av sentrale utfordringer-1:

- Den høyeste andel dødsulykker forekommer i sjarkflåten.
- Flest dødsulykker forekommer ved forlis/havari, overbordulykker, drukninger i havn og slag eller klemming i spill/haler eller vinsj.
- Den høyeste andel rapporterte personskader forekommer i havfiskeflåten, av alle fartøygrupper har trålfartøy rapportert flest ulykker.
- Flest ulykker skjer under fiske – og fangstarbeid arbeid på dekk, fangstbehandling og
- Lasteroms-arbeid.

## Norge

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## Oppsummering av sentrale utfordringer-2:

- Flesteparten av de rapporterte ulykkene medfører fratreden utover 72 timer
- Lengde på fravær og langsiktig konsekvenser av personskader er ukjent.
- Årsaker til ulykker er sammensatte.
- Fartøybevegelser (slingring) er særlig fremtredende i ulykkesrapportering.
- Det er behov for kunnskap om hva som påvirker og endrer stabiliteten til fartøyet.
- Fiskers yteevne kan påvirkes av arbeidsforholdene i fisket.

## United Kingdom

In the UK on average half of the fishing fatalities were due to incidents involving vessels including foundering of unstable, badly maintained and unseaworthy vessels (Roberts 2010).

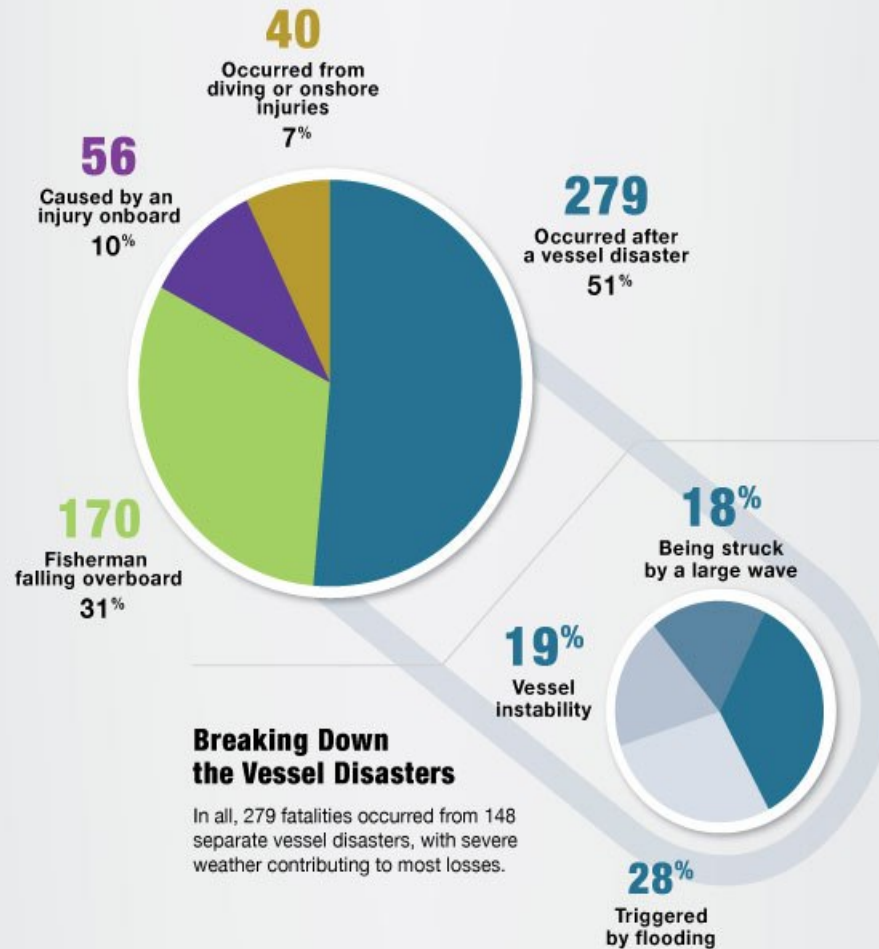




## USA 2000-2009

On average half of the fishing fatalities were due to incidents involving vessels including foundering  
(NIOSH 2012)

**From 2000-2010, 545 commercial fishermen died while fishing in the U.S.**





## ALASKA

**In Alaska 68%** of the fatalities in the period 1980-88 were due to loss of vessel by capsizing, foundering etc. (Schnitzer et al 1993).



## **Polish small-scale fishing 1960-1999**

(Jaremin & Kotulak 2004)

- 60% are related to sea catastrophes, often involving multiple vessels.
- Alcohol was implicated in 45% of deaths where autopsy was carried out
- The mortality rates vary significantly by type of vessel

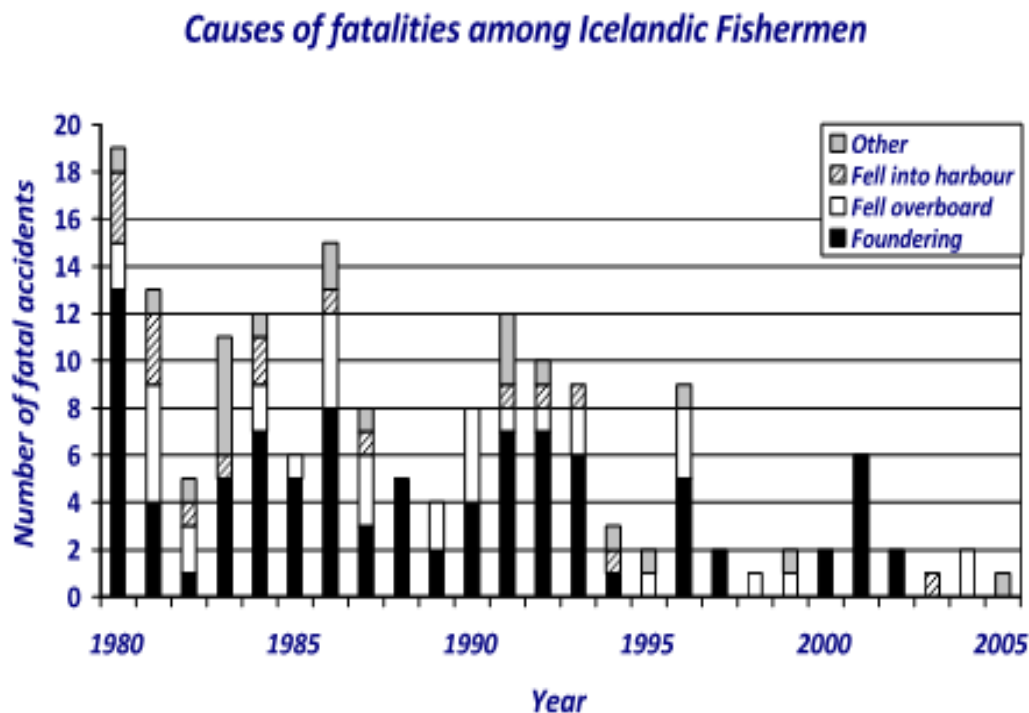


## ICELAND

The fatal injuries in Icelandic fishing decreased rapidly in 1966-1986.

Half of the fatalities were due to foundering and other frequent causes were falls over board and falls into the harbour.

(Petursdottir 2007)



## DENMARK

Of 114 fatalities 1989–2005,

**53 % occurred in 36 vessel disasters** mainly caused by foundering/capsizing due to stability changes in rough weather and collisions.

**34%** occurred during working on board

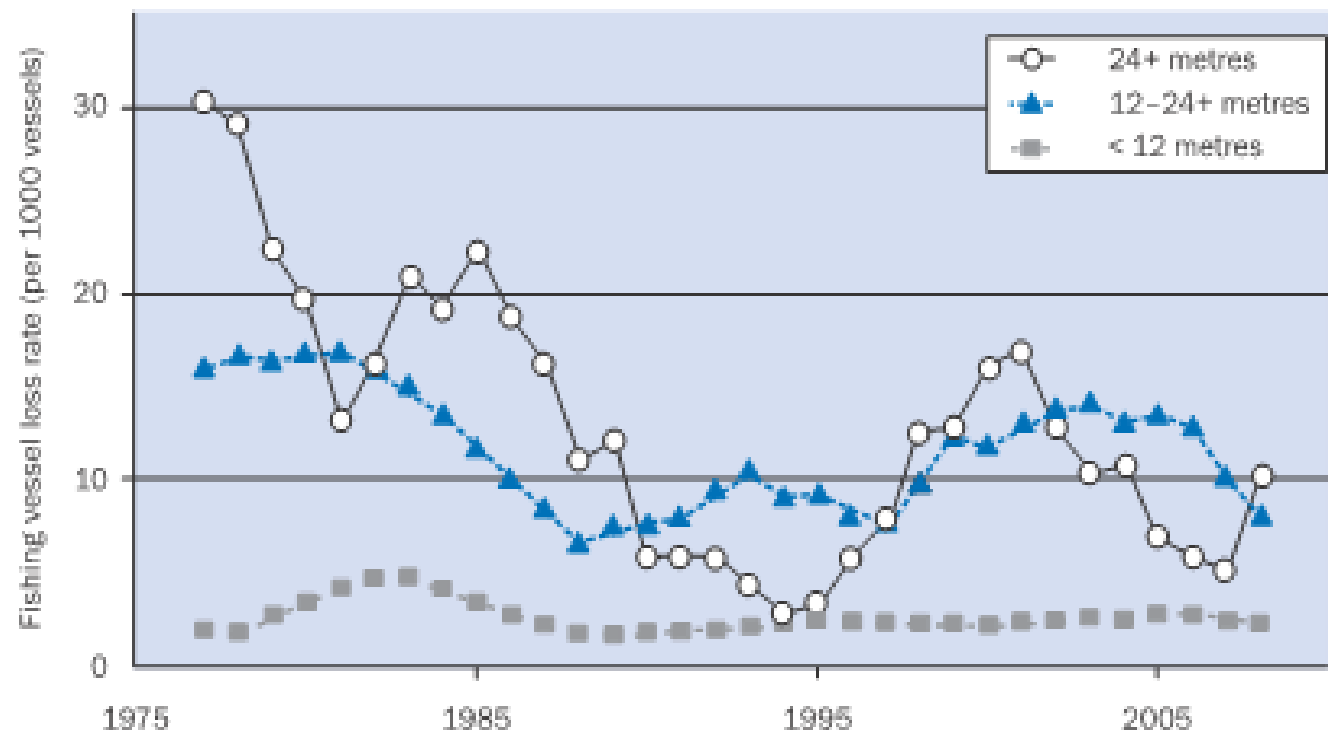
**12%** due to difficult Embarking/disembarking conditions by darkness in foreign ports and alcohol intoxication (Hedegaard et al 2008).

# TRENDS OF THE RATES OF VESSEL DISASTERS



## UK FISHING VESSEL LOSSES 1975-2005

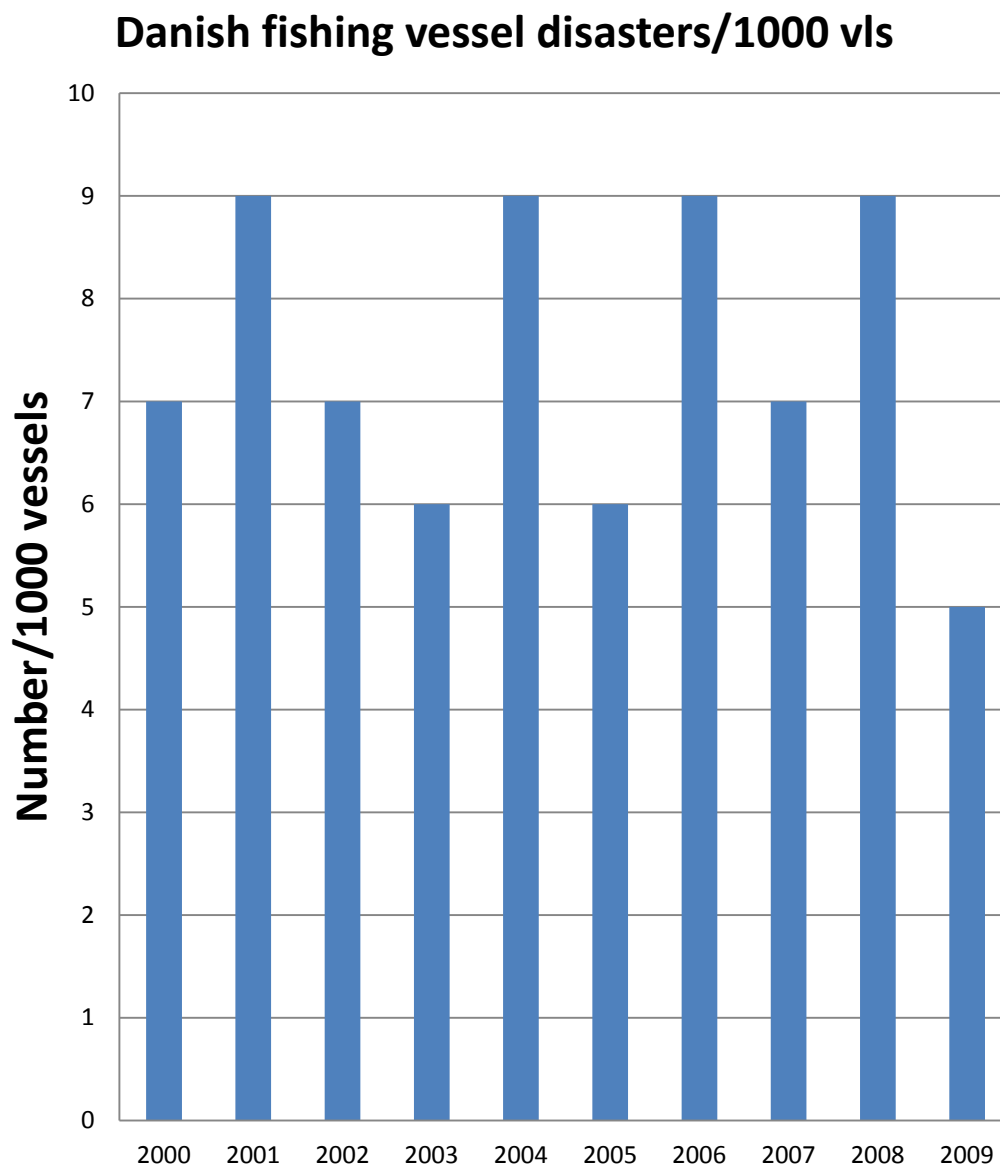
### A. Fishing vessel losses



## DENMARK

The rate of disasters among the Danish fishing ships continued with a slight decreasing slope during 2000-2009

(Danish Maritime Authority 2010).



# FATIGUE





## FATIGUE



- Fatigue has been shown to be in line with alcohol intoxication as an important causal contribution risk factor in the merchant fleet and recently also reported in fishery (Smith et al. 2006; Thomas et al 2001).
- British fishermen 60% (n = 48) believed their personal safety had been at risk because of fatigue at work, 16% (n = 13) had been involved in a fatigue related accident, and 44% (n = 36) said they had worked to the point of exhaustion or collapse (Allen et al. 2010).

# SAFETY CULTURE



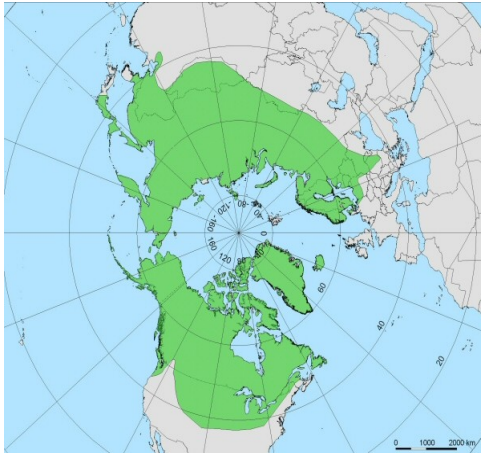
# Fishing Safety Culture!

Fish Safe Program in Canada's British Columbia.



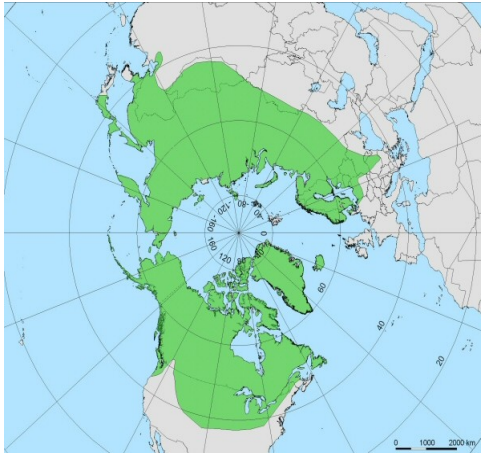
- The hypothesis is often raised of a link between a poor safety culture and vessel accidents both in the merchant fleet and fishing vessels.
- Canada's *Times Colonist* (30 August 2009): "Many deaths occur after vessels capsize, something that can be caused by a cabin or fishing gear added where they shouldn't be. Sixty per cent of the 760 fisherman who have so far taken the Fish Safe Four-day stability course say they have changed the way they carry out their jobs".

## CONCLUSIONS 1



- Fatal injury trends are alike in the northern part of the globe.
- 50 % reduction 1970-80 to 1990-2000
- Rates 2-4 per 1000 man-years decreased to
- 0.5-1 per 1000 man-years
- Except USA average  $> 2$  /1000 man-years (FTS)
- Highest risks on the smallest vessels and some specific types of fishing  $> 6$ .
- The relative risks compared to other industries, varied from 25 to 50

## CONCLUSIONS 2



- National rates cannot be directly compared
- Trends are valid documentation of the effects of the interventions
- Approximately 50% of fatal injuries in fishing are related to fishing vessel disasters and drownings.
- Program for prevention of vessels disasters are established – vessel stability, training programs, rescue after falling in water etc
- Research based intervention programs to learn what works and what does not work are needed.

## CONCLUSIONS 3



- The hypothesis is that fatigue and lack of good safety culture, are some major causal factors in vessel disasters.
- The lack of programs for safety in developing countries is in contrast to the number of fishermen worldwide.
- 



Mange tak

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