

Summary

Work-related accidents in Norwegian road, sea and air transport: Roles and responsibilities

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The study examines regulatory authorities' and transport companies' knowledge of and sources of information about work-related accidents, views on risk factors related to work-related accidents, and understandings of roles and responsibilities in relation to work-related risk factors and -accidents. The main finding of the present study is that the road sector seems to perform poorer than the maritime sector and inland helicopter operations on these three aspects of accident prevention. As a consequence, respondents from the road sector rate their own efforts to prevent work-related accidents as lower than respondents from the other sectors. 19 qualitative interviews were conducted with 22 people from companies, authorities, voluntary organisations and others from the road, sea and air transport sector. Also, a small-scale web-based survey (N=128) was distributed to representatives from government agencies, NGOs and employees in transport companies in the three sectors. The study summarizes regulatory practices and thoughts from respondents from the different sectors on what factors contribute to risk in their sector. Finally, it concludes with suggestions on how the road sector can improve on these three aspects of risk prevention by learning from the other two sectors.

Background and aims

Work-related accidents refer to accidents involving transport operators at work, both employees and self-employed transport operators. Work-related risk factors are all factors that can be traced to transport operators' work situation, and which may influence transport safety.

According to the accident statistics, substantial shares of accidents in road and maritime transport are work-related, but knowledge is lacking on the relationship between accidents and work-related risk factors in transport organisations. A recent Norwegian study shows that 36 % of fatal road accidents in Norway from 2005 to 2010 involved at least one driver who was "at work" at the time of the accident (Phillips & Meyer 2012). In 2010, 495 maritime accidents were registered by the Norwegian Maritime Authority (NMA) (2011). About half of these were labelled work/personnel accidents. Excluding offshore helicopter operations, nearly 20 years have passed since the last accident involving serious passenger injury or death on a Norwegian scheduled flight operation (Civil Aviation Authority 2013a). However, inland helicopter operations has for several years been considered to be the most accident prone sector within commercial aviation. Inland helicopter operations in this study do not include ambulance and police helicopters, military, foreign and offshore operators. Inland helicopter operations have 10 times higher risk than offshore helicopters.

An important precondition of the prevention of work-related accidents is that regulatory authorities and transport companies recognize the importance of work-related risk factors and see it as their responsibility to implement measures to prevent them.

The main aims of the study are to examine regulatory authorities' and transport companies':

- 1) Knowledge of and sources of information about work-related accidents
- 2) Views on risk factors related to work-related accidents
- 3) Understandings of roles and responsibilities in relation to work-related risk factors and -accidents.

The study documented in this report is part of a larger research project “Work-related accidents in road, sea and air transport: Prevalence, causes and measures”, financed by the TRANSIKK program of the Research Council of Norway. The project lasts for 3 years and 4 months, from March 2014 to July 2017.

Data sources and methods

We have conducted 19 qualitative interviews with 22 people to gain knowledge on the aims of the study. Interviewees were selected from transport companies, government agencies, regulatory authorities, accident investigation groups, NGOs, and other relevant actors from the road, maritime and aviation sector. A small-scale web-based survey was distributed to representatives from government agencies, NGO's, trade unions and employees in transport companies in the three sectors. 128 people responded to the survey.

Sources of information about work-related accidents

In order to prevent work-related accidents, it is essential that regulatory agencies have access to information about the prevalence and causes of accidents. The magnitude and type of available information about work-related accidents is also important because this information serves to frame the problem: Without information about organisational factors which may influence safety outcomes, it is unlikely that measures aimed at such factors will be developed. It is necessary with knowledge about the prevalence and causes of work-related accidents in order to develop targeted measures and campaigns, and assess the efficacy of measures. We found that the extent to which this is the case, varies considerably between sectors. The survey asked respondents from public agencies whether their organisations have knowledge of the extent of work-related accidents in the sector. Overall, 38 % answered “Yes”, 10 % “No”, and 52 % “To some extent”. Figure S.1 shows results by sector.

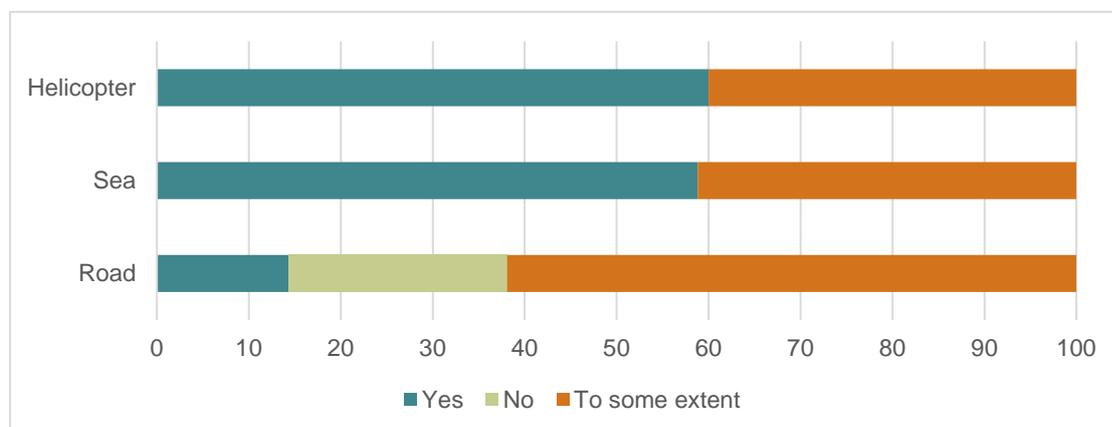


Figure S.1: Knowledge of extent of work-related accidents in the sector by sector. Percent (N=41)

The road sector was the sector with the lowest share of positive responses to this question about the extent of work-related accidents. This also applies to a related question about knowledge about accident causes.

Previous studies have recommended that work-related risk factors should be included in the database of the Accident Analysis Groups of the Norwegian Public Roads Administration, and that this database also should include a variable to identify drivers at work (Phillips & Meyer 2012; Nævestad & Phillips 2013). Such a measure could improve the knowledge about work-related accidents in the road sector. Interviewees also indicated that the quality of the Norwegian Maritime Authority database could be improved when it comes to causes. Generally, our study indicate that under-reporting of work-related accidents is a significant challenge in all studied sectors.

Views on risk factors related to work-related accidents

An important question for determining and defining responsibility and liability is what the causes of accidents are. Our study indicates that a vast majority of respondents across sectors, positions and organisations, regard risk factors related to operators/individual employees to be the most important cause of work-related accidents in their sector.

Furthermore, interviews indicate that in all the three sectors, small companies were mentioned as a possible risk factor, as they might lack the necessary resources or competence to focus on safety.

As previous research has shown that framework conditions may influence the safety level in transport industries, the survey included several questions measuring how respondents perceive framework condition to influence the level of safety in their sector. Survey data indicates that competition was viewed as the most important framework condition influencing safety in all three transport sectors.

Our previous research has also shown that the number of work-related accidents have been reduced in all the three sectors studied. Respondents were therefore asked to state what they believed to be the causes of this reduction. They believed safety improvement to be a consequence of targeted efforts, rather than random fluctuations or societal trends, especially the efforts of companies and operators. Respondents from the road sector, however, tend to place less emphasis on the safety efforts of companies and employees and more on technological development as a cause of improvement.

Understandings of roles and responsibilities

While risk factors say something about where efforts can be made to prevent future accidents, they do not in themselves locate responsibility for accidents. The survey therefore included questions about who is primarily responsible for the *occurrence* and for the *prevention* of work-related accidents; employees, company management, or authorities. Responsibility for the occurrence of work-related accidents is related to what Fahlquist (2006) refers to as blame responsibility, while responsibility for prevention is related to forward-looking responsibility.

Results indicate that a majority of respondents across sectors (55 %) believed the individual employee to be primarily responsible for the *occurrence* of work-related accidents, but 38 % held transport company managers responsible, and 7 % the authorities. This is in line with respondents' view on causes mentioned in the previous section; that risk factors related to

operators/individual employees is the most important cause of work-related accidents in their sector. A higher proportion of respondents from public agencies held companies primarily responsible.

When asked who is primarily responsible for the *prevention* of work-related accidents, the majority (64 %) believed transport company management to be primarily responsible for preventive efforts. Thus, respondents tended to attribute blame-responsibility to the individual operators and forward-looking responsibility to transport companies.

Respondents from the road sector, in particular, seem to put more emphasis on the responsibility of the individual operator than the other transport sectors. This is interesting, as research indicates that the risk of work-related accidents in transport is also influenced by operators' organisations and the framework conditions (e.g. regulating authorities, rules, competition) of these organisations (Nævestad et al., 2015). Thus, respondents could hypothetically have given transport organisations more blame-responsibility for the occurrence of work-related transport accidents.

Focus on the operator in the road sector

In the road sector, informants put more emphasis on the responsibility of the individual operator than informants in the other transport sectors. It was noted by informants that presently, drivers usually carry the entire responsibility due to the Road Traffic Act (Vegtrafikkloven). This approach differs from what is found in other parts of professional life. Informants pointed out that according to the Working Environment Act, employers have a wide-ranging responsibility for their workers' safety, but that this is rarely enforced in practice. On the other hand, the Road Traffic Act, which places all responsibility with the driver, is enforced through controls and in police investigations.

The Road Traffic Act seems to shape and legally frame the attribution of responsibility when it comes to road traffic accidents. This leads to blame-responsibility of the individual drivers when investigating accidents, instead of forward-looking responsibility where accountability is placed partly on the employer of the driver. Thus, it seems that in the road sector, responsibility is legally framed towards the driver rather than the employer, in contrast to the maritime sector, where for example the Maritime Safety Act focuses more on the shipping company's responsibility than the responsibility of the captain.

In conclusion, it seems that the "person view" on accident causation is more prevalent in the road sector than in the maritime sector and in inland helicopter operations, which lean more to the "system view" (Reason, 2000). There is a long-standing debate between safety researchers who point to risky operator behaviours to explain work place accidents, and researchers who hold that risky behaviours to a great extent are influenced by contextual factors. Reason (2000) refers to these two diverging positions as the person approach and the system approach, stating that each has its model of error causation and that each model gives rise to quite different philosophies of error management. According to the person approach, unsafe acts are primarily the result of inadequate mental processes like forgetfulness, inattention, poor motivation, carelessness, negligence, and recklessness. Accordingly, the counter measures that this view gives rise to aim to reduce unwanted variability in human behaviour, e.g. poster campaigns with information, procedures governing behaviour and disciplining measures.

The systems approach on the other hand, is based on the premise that it is human to err and that human errors are expected. The system approach views errors as consequences, rather than causes, and human errors are explained in light of systemic causes rather than a fallible human nature. As a consequence, the systems approach gives rise to prevention

strategies focusing on building “error tolerant” systems, e.g. introducing system defences involving barriers at many different levels: technological, organisational, cultural.

Unclear responsibilities in the road sector

Some of the informants in the road sector did not find responsibility to be sufficiently clearly defined for work-related road accidents. Others believed that in theory, responsibilities were well-defined, but that the practical follow-up was inconsistent.

Most of the informants in the road sector believed employers should take more responsibility for their employees’ behaviour. It was noted that presently, drivers usually carry the entire responsibility. This approach differs from what is found in other parts of professional life, where regulations in the Work Environment Act are more heavily applied. As noted, the Working Environment Act, give employers a wide-ranging responsibility for their workers’ safety, which is rarely enforced in practice, as the Road Traffic Act, placing responsibility with the driver, is enforced through controls and in police investigations.

In the survey, we asked whether responsibility for accident prevention was defined clearly enough in current regulations in the sector (cf. Figure S.2). 56 % of respondents across sectors found the responsibility clearly defined, whereas 21 % did not know. 23 % of respondents did not find responsibility to be defined clearly enough.

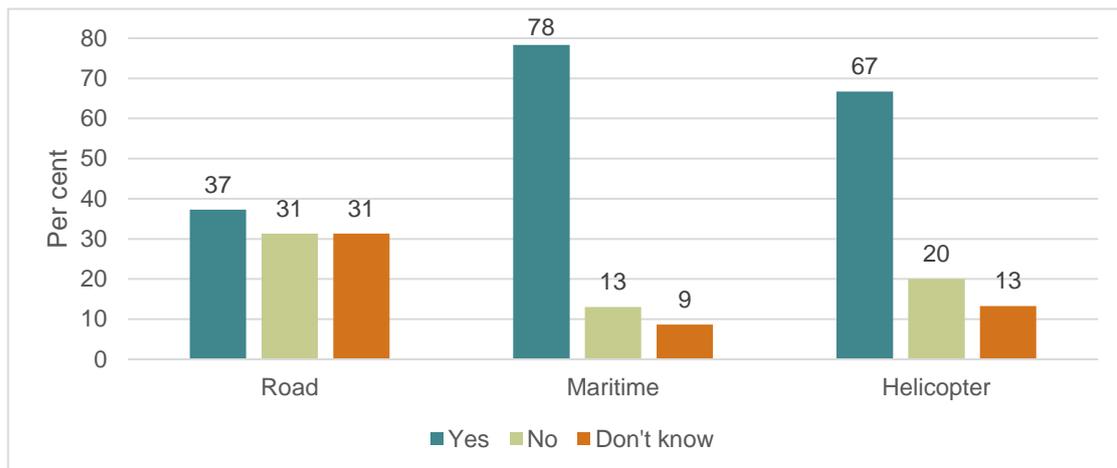


Figure S.2: Is responsibility for accident prevention sufficiently clearly defined in current regulations in the sector? Percent by sector

The road sector stands out with a relatively low share of respondents stating that responsibility is defined clearly enough; 37 %, versus 67 % in inland helicopter operations and 78 % in the maritime sector. The road sector also had a larger percentage of respondents stating that they do not know.

Respondents who explained their answers, pointed to the relationship between drivers and their organisations and/or their customers. The main concern was stress or pressure as a result of short deadlines, and the fact that drivers are held responsible even though they are not the ones defining route and speed. Additionally, several respondents saw the (legal) responsibility as a problem because it provides an opportunity for other stakeholders (managers or customers) to ignore their influence and liability. Thus, it seems that we see a distinction between legal versus practical accountability in the road sector.

What can the road sector learn from sea and air?

The road sector seems to perform poorer than the maritime sector and inland helicopter operations on the three aspects of accident prevention that we have examined in this report. Respondents from the road sector rate their own efforts to prevent work-related accidents as lower than respondents from the other sectors (cf. Figure S.3).

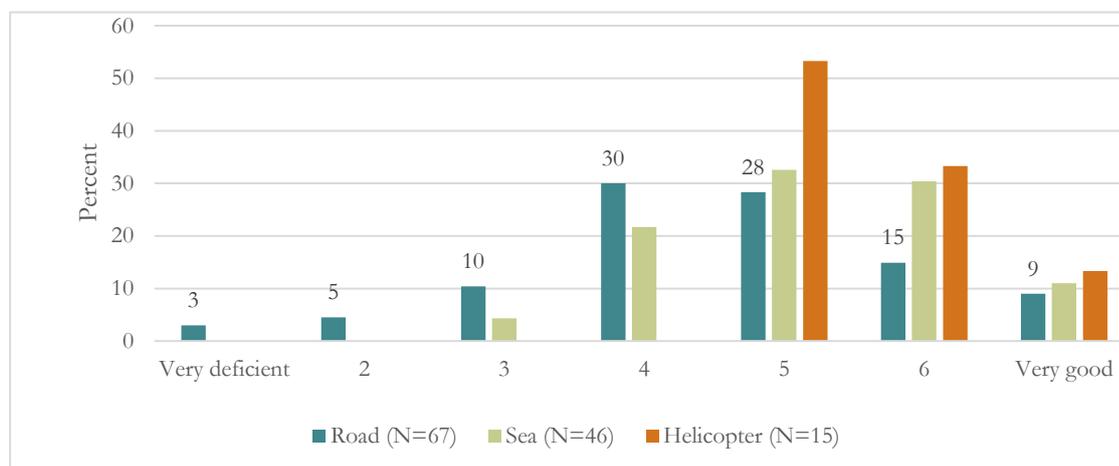


Figure S.3: How would you rate your own organisations' work with work-related accidents on a scale from 1 (=very deficient) to 7 (=very good), by sector. Percent (N=128)

In conclusion, it seems that efforts aiming to clearly define the responsibility for prevention of work-related accidents in the road sector are needed. Given that clearly defined responsibilities are a premise of effective prevention, we could assume that this would improve the efforts to prevent work-related accidents in the road sector.

Thus, given that the maritime respondents scored high on the questions related to a "clearly defined responsibility for work-related accidents", perhaps the road sector could learn from the legislation in the maritime sector. In the road sector, transport operators seem to carry more responsibility than what is found in other parts of professional life.

One informant believed that regulations similar to those in the oil industry should be introduced for transport assignments, so that the largest actor involved (the actor hiring contractors) is responsible for safety for all contracting companies. Today, it is possible to avoid the regulations from the Working Environment Act through hiring drivers as independent contractors. Another solution to this, could be giving independent contractors requirements beyond those they face today.

Towards a system-based approach in the road sector?

The regulatory regimes in transport have been moving in the direction of more system-based approach, where they introduce 'meta-rules' that specify how organisations should deal with risk, for example by specifying the establishment of risk management systems that may include methodologies and processes of risk assessment (Kringen, 2009). System-based regulations focus on the process or system (May, 2007), and assess whether the systems that are put into place are acceptable in order to control for example risk. The authorities in the maritime and inland helicopter sector have a system-based approach to safety, where accountability is placed with the organisation, rather than the individual (Elvebakk, 2015). This is reflected in the laws and regulations in the maritime and aviation

sector, which are primarily based on functional international regulations which place much of the responsibility on the transport employer and infrastructure owner.

The Road Supervisory Authority is aware of their role as a system-based regulatory authority, but see it as a challenge to audit based on this approach because of the lack of international regulations in their sector, and the fact that the rules and regulations in the NPRA are mostly prescriptive, based on technical specifications in different handbooks rather than functional requirements (Elvebakk, 2015).

Furthermore, accountability is a central issue in safety work, as regulations typically task certain actors with the responsibility of securing the quality of a given service, and these actors are accountable to the authorities. Defining and designating relations of accountability, is therefore essential to the authorities' safety work. This is a challenge for the newly established Road Supervisory Authority (2012). An informant from the Authority observed in a recent study (Elvebakk, 2015) that they have a limited amount of safety regulations related to management, and that their inspections and recommendations were more readily understood by those working on a higher level in the NPRA, who are probably more used to thinking in terms of organisation and management tools. Also, the Road Supervisory Authority is responsible for supervising and regulating the NPRA, but at the same time are part of and report to the NPRA, so they have a limited authority and impact when it comes to recommendations and sanctions (Elvebakk, 2015). However, in January 2017 the Road Supervisory Authority became an independent regulatory authority, under the Ministry of Transport and Communication (Samferdselsdepartementet, 2016, 2017). It has been suggested that this will allow them to sanction the NPRA and follow up regulations in a more efficient manner than they could when they were subordinate to the NPRA. Further focus on a system-based approach, where both the infrastructure owner (NPRA), the transport organisations and clients are held accountable for organisational factors which may lead to work-related accidents, may shift the responsibility and accountability from the operators to organisations. A stronger focus on the fulfilment of requirements from the Work Environment Act may be a step in the right direction.

Measures to improve reporting rates in all sectors

In Sweden and Denmark, risk-based industries have a shared internet-portal for employers to report incidents, and this information is available to all relevant public authorities. In Norway, however, all authorities maintain their own registers, and one informant saw this sharp sectorial division as a problem, as it made learning across sectors more difficult.

Other suggested measures to improve the knowledge-base in the area included a coordinated effort from several authorities to make the police improve their reporting practices, and attempts to supplement police-reported data with other sources, such as research and information from insurance companies. One suggested approach was to try to create a more complete picture for certain groups, and use this as a basis for estimates for the total population.