

**Table 1. Different types of SPAD's caused by human actions.
Number and percent. 2000 – 2005. Norway. n=265**



Causes	Number and years					2001-2005	
	2001	2002	2003	2004	2005	nos	Percen t
Lack of attention from train driver	20	30	23	32	20	125	47,2
Breaking driving rules	5	23	7	4	3	42	15,8
Traffic controller sets signals in "stop"	7	4	15	19	15	60	22,6
Train driver underestimate braking distance	7	2	4	1	9	23	8,7
Misunderstanding. Others	6	2	3	0	7	15	5,7
Average per year	9,0	12,2	10,4	11,2	10,8	53,0	100,0



 Jernbaneverket
not lead to

Table 2. Distribution of outcomes of 157 SPAD's in 2002-2005. Norway. The six grave incidents did accidents due to ATC.

Year	Number and consequences			
	Grave	Moderate	Low	Total
2002	0	8	40	48
2003	1	6	30	37
2004	4	4	27	35
2005	1	4	32	37
Total and percent	6 (3,8)	22 (14,0)	129 (82,2)	157 (100,0)

percent



Figure 1. Nos of SPAD's per 10.000 departures distributed on weekdays. 2002 – 1. half 2006. Norway. n=157

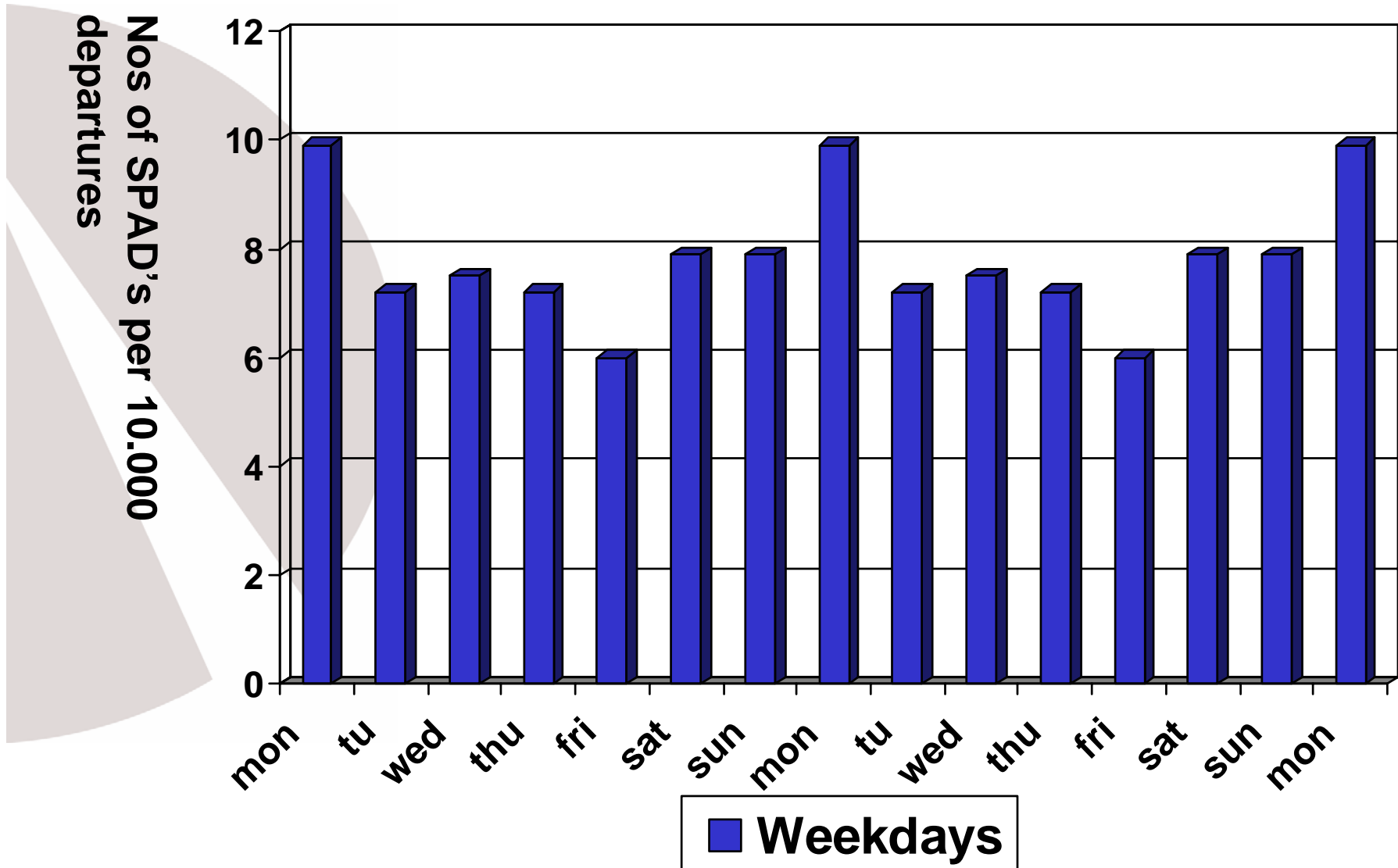




Figure 2. Nos of SPAD's per 10.000 departures distributed

on months. 2002- 1.half 2006. Norway. n=157

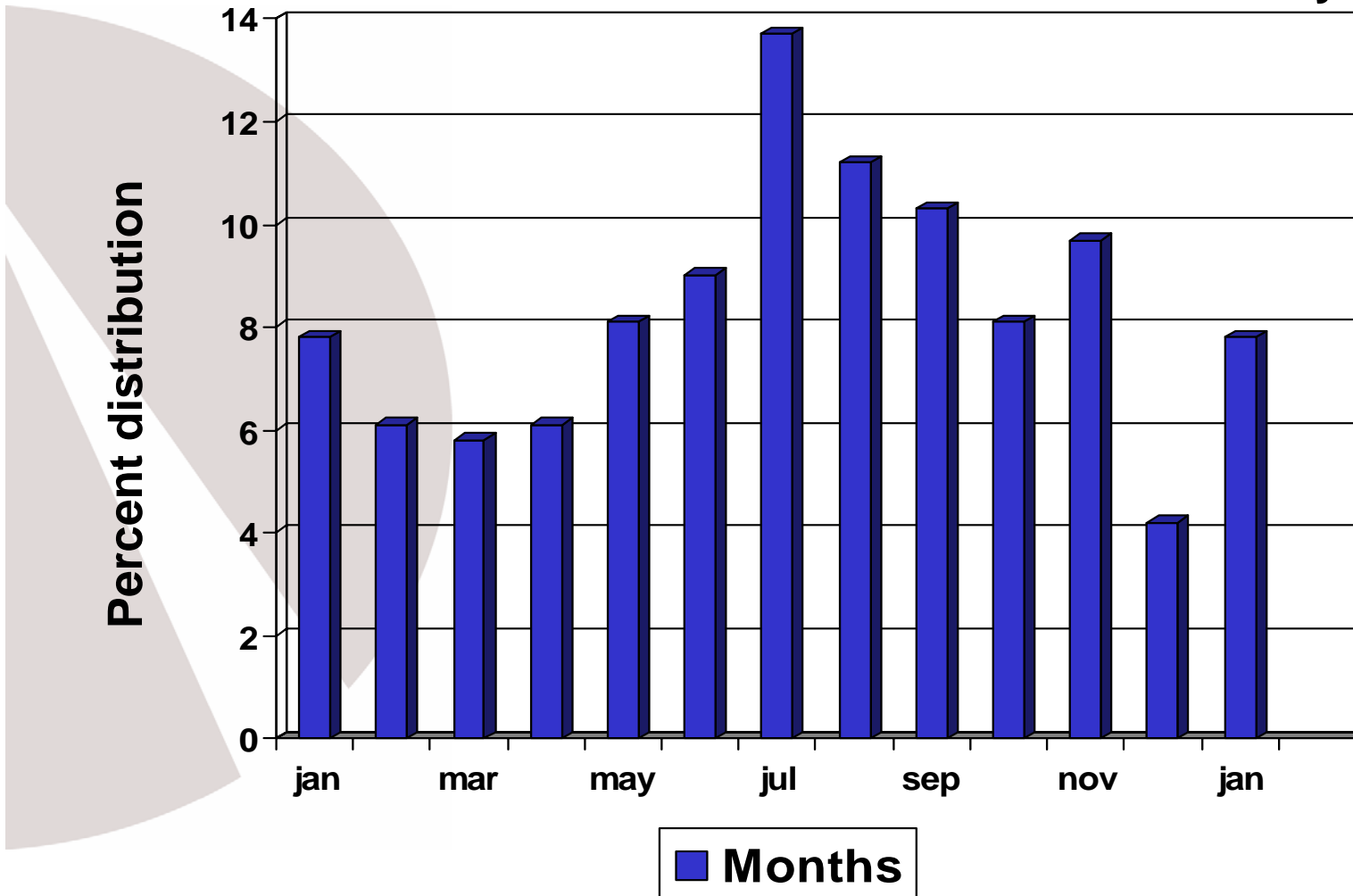
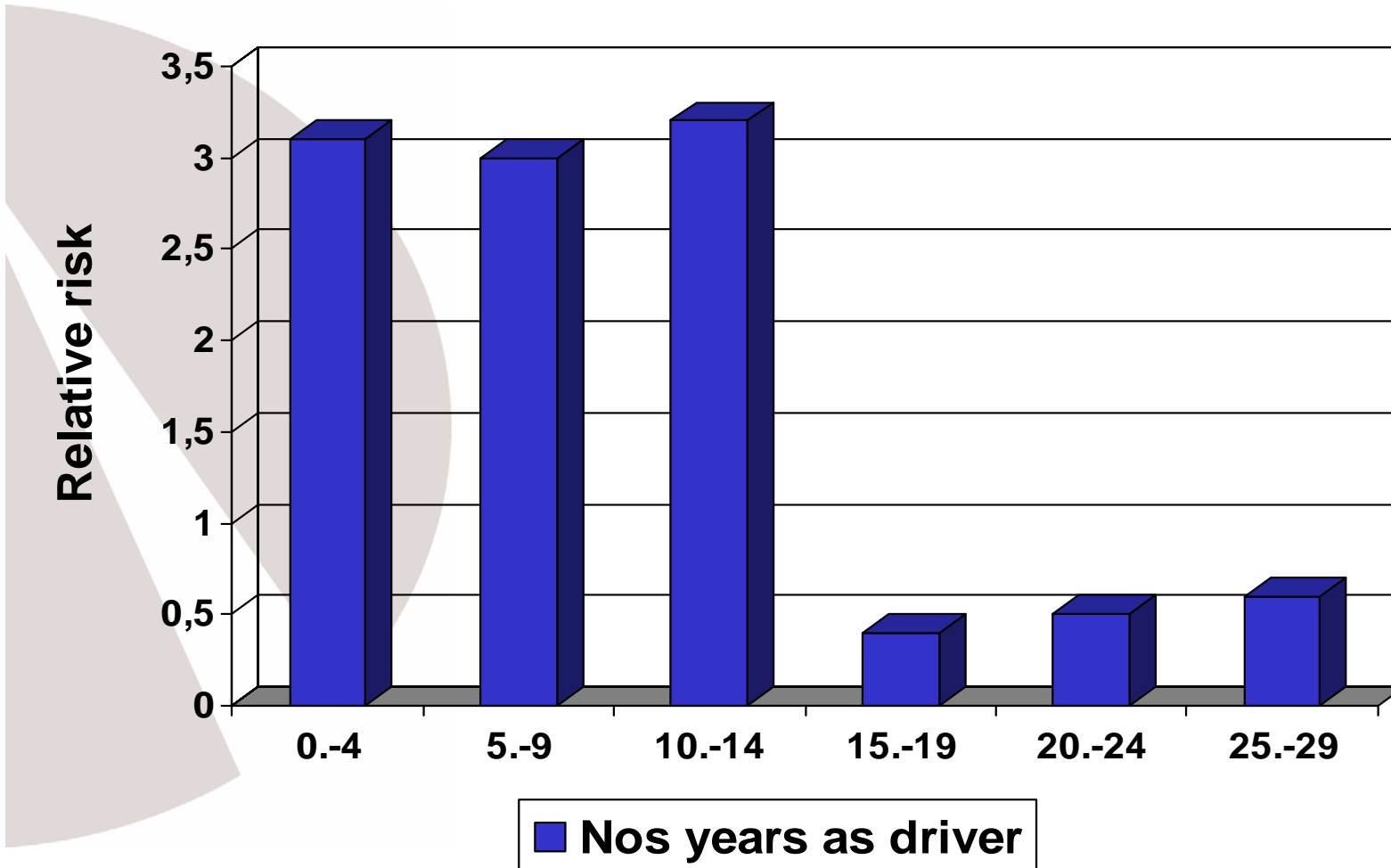




Figure 3. Relative risk for a train driver to produce a SPAD according to the number of years of service





Measures and activities	Scor	Relevance
Adopting a “zero-tolerance” policy	e 7	Important signal from top management
Implementing the policy in a transparent way. Use of statistics to document the safety and risk levels in annual reports etc.	10	Shows the level of commitment of the company and its practical experiences
Training of the managers in being role-models, and in detection of early stages of addictions among the staff	10	Training of managers. Quality assurance and improved safety standard
Pre-employment medical examination	4	General screening procedure
Pre-employment testing for drugs and illegal substances according to recent standards	6	Specific screening procedure
Regular medical check-ups at age dependent intervals	3	General screening procedure



Measures and activities	Score	Relevance
Questionnaires on drugs and alcohol linked with the medical examinations (AUDIT, CAGE)	5	Specific screening procedure. Obtaining standardised information on drinking habits
Medical examination with relevant biological testing (CDT) on suspicion or referral	10	Important in follow-up of risk groups. Improved verification.
Compulsory medical and biological testing of involved personnel after accidents and specified types of near-accidents	10	Will give important information on the role of alcohol, narcotics and drugs as part of the “Human factor” in accident causation and “Incidents”/ “Near accidents”
Random testing of at least 25 percent of all employees in safety critical jobs each year	10	Internal control and screening. Random testing is the only method to document and quantify the level of misuse of such substances in safety operations related to “human factor”
Alcohol lock in trains	10	Efficient barrier with direct risk-reduction
Max score	85	Total company score