

SAFETY **S**CIENCE *M o n i t o r* **E**

ISSUE 1 2001

Article 7
ISSN 1443-8844

VOL 5

A NATIONAL APPROACH FOR PREVENTION

KARIN TORSTEINSRUD

AMF Insurance

MICHEL NORMARK

AMF Insurance

TORE J LARSSON

Monash University Accident Research Centre

ORGANISATION AND PREVENTION POLICY

AMF Insurance is the umbrella organisation of the three insurance companies AFA, AMF Health insurance and AMF No-Fault Liability insurance. Its main activity is to handle insurance schemes reached through collective agreements, covering redundancies, illness, and occupational accidents and fatalities.

AMF Insurance is managing the collective insurance scheme for occupational injuries (TFA) reached through agreements between The Swedish Employers' Confederation, SAF and the two trade union federations LO and PTK¹ and a similar scheme negotiated for the municipality and county sectors (TFA-KL). 3 million employees and 200,000 self-employed persons are covered by these schemes. AMF Insurance is also entrusted with handling and settling occupational injuries according to the agreement about public and personal injuries, which covers civil servants.

Prevention is undertaken by AMF Insurance's own resources. These kinds of activities are in the expressed interest of our principles. Article 38 of the terms states: "AMF No-Fault Liability insurance is to assist and support corporate activities related to industrial health and safety..." The board of the company have given the president mandate to initiate prevention projects up to a fixed sum in industry branches given that these branches are in high priority compared to others. Projects can also be initiated for a specific injury problem which bridges over several branches where the solution of the problem can be used generally. These activities are based on computerised injury information related to the different insurance products. The prevention concept of AMF Insurance consists of collecting information about injuries and sicknesses and (screening of the database) :

¹ LO = blue-collar workers, PTK = white-collar workers

- identify problems such as machines, activities, jobs etc
- quantify the problems with help of risk assessment using frequencies, costs etc
- make priorities
- suggest solutions in close co-operation with industry branch representatives
- implement solutions in the workplaces
- evaluate results

External projects are often undertaken in collaboration with joint partite bodies. Within certain branches collaboration directly with companies and/or trade union organisations has evolved. Another partner in this work is the Joint Industrial Safety Council.

THE INJURY INFORMATION SYSTEM

Information about injuring elements – risk exposure at work – is collected as part of the settlement of severe occupational injuries. This data bank which has been established since 1 January 1988 provides AMF Insurance with a unique basis for setting priorities for systematic injury prevention work in Swedish working life.

Every settled accident injury with a loss of time exceeding 30 days contains the following information:

- sex and age
- claims type, differentiating between accident, commuting accident and diseases
- union or organisation code
- insurance policy number, identifying the employer
- occupation of the injured according to NYK, Nordic classification system
- preliminary severity, that differentiates between:

- 1) temporarily disabling injuries with a loss of time less than 31 days
- 2) temporarily disabling injuries with a loss of time more than 30 days
- 3) permanently disabling injuries with a degree of medical disability less than 16%
- 4) permanently disabling injuries with a degree of medical disability between 16% and 30%
- 5) permanently disabling injuries with a degree of medical disability between 31% and 100%
- 6) fatalities

- medical diagnosis for disease/accident trauma
- number of days lost caused by the injury
- number of days in hospital
- final degree of permanent medical disability (when settled)
- total compensation paid

The stored risk information improves the possibilities to identify jobs, tasks, activities and machines especially associated with severe injuries and medical disability. The point of departure is that prevention activities should be concentrated on those problem areas in the working life that produce many injuries per employee, the most serious medical effects and the most expensive injuries for the insured.

The injury information system contains all reported and approved occupational injuries. Each individual injury is tried separately against the insurance conditions where the financial reimbursement is linked to certain types of injury effects. This procedure provides detailed and reliable information about harmful effects and the cause of the accident, participating and involved machines and equipment, the diagnosis of the injury as well as medical and financial consequences.

The injury information comprising all occupational accidents since 1992 (except accidents on the way to or from work) is divided according to preliminary severity as follows (data as per September 1998):

Table One : Occupational accidents since 1992

Preliminary severity	1992	1993	1994	1995	1996	1997
Sick-leave less than 30 days (temporary)	12236	12811	13292	12152	12302	12815
Sick-leave more than 30 days (temporary)	9150	8808	8295	7595	7326	6829
Medical disability 1-15%	4549	4514	4455	4307	3770	2876
Medical disability 16-30%	208	195	151	127	89	44
Medical disability 31-100%	71	62	48	37	26	14
Death	73	65	264	61	57	68
Total number of occupational accidents	26287	26455	26505	24279	23570	22646

Medical disability represents 18-19% of the total number of injuries in the material from the period 1992-1995. The insurance is subject to retroactive injury reporting which means that the figure tends to change somewhat over time. The share of disability injuries for the last few years will probably increase somewhat during the course of the next few years, when medical problems with some "old" injuries will turn out to be permanent, resulting in the claimant submitting a retroactive report, or when the claims adjuster has to adjust his assessment of the severity of the reported injury.

SEVERE OCCUPATIONAL ACCIDENTS 1996-97

Injuries that occurred during the years 1994 and 1995 have been documented in an earlier report ("Severe occupational injuries in Sweden 1994-95" AMF, 1997). The syntheses that follow are based on occupational accidents occurring during the period 1996 and 1997 and resulting in death, medical disability and/or sick leave of more than 30 days. In order to facilitate comparisons and identify possible trends in the material, the analysis has been limited to a parallel period of time (two calendar years) and the moment of measuring has been selected on then same basis as in the earlier report (September the following year).

EXPOSURE

In the claims documentation, injuries at work are classified by occupation in accordance with the Nordic job classification ("NYK, Swedish basic standard", Arbetsmarknadsstyrelsen (National Labour Market Board) 1983). In the current analysis of severe occupational accidents for the years 1996-97, as in that of 1994-95, the so-called labour surveys of 1996 (AKU 96) have been used as comparative figures. Statistics Sweden continuously undertakes the AKU surveys. Some 17,000 people are interviewed each month. The basic objective of these surveys is to describe the current terms of employment but also to provide information about the evolution of the labour market. Using selection methodology instead of a complete census does of course render it more difficult to draw any conclusions about the relative importance of the injury risks, notably for small occupational groups.

The 2-digit NYK 83 provides the basis for the job classification, thereby corresponding to the classification used within AKU-96. The risk of being subject to an occupational injury within a specific occupational group is described as the number of accidents in relation to the number of employed according to the AKU.

RISK OF DEATH

It emerges that, out of the 125 persons reported killed as of August 1998 in occupational accidents during the period 1996 and 1997, people employed within mining, quarry and mineral oil industries, defence, fishing and forestry, as well as within transportation and communication (exc. post, telecommunication and road work) are constituting the highest occupational fatality risks.

Among those who died during military service, 4 were killed in flight crashes and one was burnt to death in a house-fire. Within the field of transportation and communications, 3 persons drowned from shipwreck, 2 were killed by train, one was killed in a helicopter accident and one died under unclear circumstances. One fisherman was killed while loading ice. Two lumberjacks were killed by falling trees, one broke through ice with his scooter and one lumberjack was killed while using a motor saw. Within mining, quarrying and petroleum extraction one person was crushed to death by a railway engine and one was killed by falling rocks.

When grouping all the fatalities according to major event, 35% of the number of people killed died in traffic accidents during working hours. The victim had either been driving or been passenger in a car, lorry or motor bike. In 20% of the fatalities, the victim had been crushed by a rolling, falling or loosened object. The third largest group – 13% - comprised falls from lower levels, e.g. from roofs, scaffolds or ladders.

RISK OF DISABILITY

The table below shows the occupational groups representing the highest and most severe risks of medical *disability* due to occupational accidents. The risk of suffering a severe occupational injury within a certain profession is described as the number of occupational accidents leading to a permanent injury in relation to the number of employed within the profession. The annual disability risk per 1 000 employed within the profession has been based on information from the 1996 labour market survey (AKU 96). The annual average risk of medical disability due to occupational accidents in Sweden for 1996-97 has been estimated at 0,79 per 1 000 employed.

Table Two : Occupational Groupings with severe risk of disability due to occupational accidents

Occupational group	Number of disabilities claims year 1996 and 1997	Annual risk per 1000 employed
Mining, quarrying and petroleum extraction work	38	4,52
Wood work	375	4,38
Building and construction work	603	3,43
Metal processing work	111	2,67
Civilian security and protection work	199	2,26
Metal machine work and building metal work	1056	2,16
Pulp and paper mill	76	2,11
Food processing	133	1,94
Fishing, forestry	72	1,88
Motor vehicle drivers and delivery	366	1,79
Total number of injuries with medical disability	6819	0,79

Workers within mining and quarry industries, woodwork, building and construction, and metal processing industries are exposed to the highest risk of disability due to occupational accidents.

Changes in the incidence figures, expressing the specific occupational disability risk, between the years 1994-95 and 1996-97, based on the claims material as per 1st September 1996 and 1998 respectively, are pointing at a somewhat increased proportion of severe injuries in many occupations. At the same time many occupational

groups show a reducing number of disability injuries. For the whole labour market insured through AMF Insurance, the number of injuries, likely to lead to permanent disability has on average increased from **0,75** per 1 000 employed during the period 1994-95 to **0,79** per 1 000 employed for the period 1996-97. This represents an average increase of the disability risk of disablement through work of 5%.

Table Three : Percentage Change in disability risk factor for various occupational groupings

Occupational group	No. of Claims 94/95	Risk factor 94/95	No. of Claims 96/97	Risk factor 96/97	Percent change (%)
Wood work	368	3,96	375	4,38	+11
Building and construction work	545	2,93	603	3,43	+17
Pulp and paper mill work	86	2,64	76	2,11	-20
Metal processing work	97	2,28	111	2,67	+17
Mining, quarrying and petroleum extraction work	20	2,22	38	4,52	+63 ²
Food processing	147	2,14	133	1,94	-9
Metal machine work and building metal work	999	2,03	1056	2,16	+6
Civilian security and protection work	177	1,89	199	2,26	+20
Glass, pottery, brick etc. work	42	1,75	34	1,73	-1
Fishing, forestry	66	1,71	72	1,88	+10
Motor vehicle drivers and delivery	309	1,56	366	1,79	+15
Chemical processing, rubber, plastics industry	81	1,55	94	1,78	+15
Electro work	191	1,40	190	1,04	-26
Paintwork and flooring	83	1,37	66	1,10	-20
Handling of goods, driving of machines	121	1,35	134	1,46	+8
Agriculture, horticulture, forestry and cattle breeding	261	1,20	181	0,91	-24
Packaging, warehouse work	151	1,14	129	0,90	-21
Transportation, communications (sea, railway)	69	1,12	58	0,91	19
Printing/Graphical work	60	0,95	31	0,54	- 43
Post, tele, mail and clerical work	117	0,68	109	0,64	-6
Caretaking and cleaning	165	0,58	192	0,70	+21
Educational work	223	0,51	259	0,43	-16

² To Mining, quarrying work 1994-95 have been added accidents with petroleum extraction as well as boring and diamond-boring (since these groups are included in the period 1996-97) which results in 25 injuries and a risk factor of 2.78. This risk factor has been used when calculating the increased/reduced risk.

Hotel, restaurant, catering	145	0,51	151	0,53	+4
Social work, child minder, medical orderly, domestic aid	289	0,44	298	0,48	+9
Domestic, sanitary and beauty care, laundry and pressing, sports, other services	32	0,38	26	0,32	-16
Technical work, engineers	191	0,35	234	0,42	+20
Health and medical services	157	0,28	191	0,34	+21
Purchasing, sales	177	0,27	244	0,37	+37
Religious, literary, journalistic and art work	50	0,23	50	0,23	0
Misc. administrative and office technical work	53	0,22	60	0,25	+14
Accounting, secretarial, typing work	98	0,19	90	0,19	0
Social and business administration, financial and statistical work	37	0,10	34	0,09	-10

Large occupational groups, which have had a significant increase of the number of disability injuries between 1994-95 and 1996-97, are

- Purchasing, sales
- Health and medical services
- Technical work and engineering

It is however more difficult to determine if the increase in other occupational groups, with a relatively small number of employed or with low absolute claims data, e.g. Mining, quarrying and petroleum extraction works, is significant.

A clear *reduction* of the share of disability injuries can be noted within the following occupational groups:

- Printing/graphical work
- Electro work
- Agriculture, forestry
- Packaging
- Pulp and paper industry

Even if the size of these groups within the AKU and the small differences in absolute claims figures renders it more difficult to statistically confirm the reduction.

THE RISK OF LONG-TERM SICK LEAVE (>30 DAYS) AND/OR DISABILITY

If we include temporary injuries that have resulted in more than 30 days' sick leave in the analysis, the table changes slightly.

Table Four : Claims requiring greater than 30 days sick leave by occupational group

Occupational groups	Number of claims 1996/1997	Annual risk per 1000 in the occupation
Civilian security and protection work	997	11,30
Mining, quarrying and petroleum extraction work	93	11,07
Transportation and communications (sea, railway)	579	9,10
Wood work	760	8,88
Metal processing work	329	7,91
Building and construction work	1248	7,09
Motor vehicle drivers and delivery	1273	6,22
Metal machine work and building metal work	2901	5,95
Fishing, forestry	216	5,63
Food processing	382	5,57
Total number of injuries with a sick-leave of more than 30 days and/or medical disability	20974	2,65

One out of 100 persons with a civilian *security and guardian job* (firemen, police, security officers) is injured every year, which means that they have as high a risk as for those working within the *mining and quarry sector*.

Transport work (sea, rail) entails injuries both for those on the sea as well as a relatively high number of reported claims due to suicides involving trains. *Roadwork* comes high up on the list, very much due to a high proportion of vehicle accidents within these groups. *Building and construction work* also comes high up, with a high proportion of falling accidents. *Game preservation, hunting, fishing, forestry* are representing still high and well-known risks of physical occupational injuries.

On an average, taken for the whole labour market insured through AMF Insurance, the share of injuries resulting in at least 30 days' sick-leave and/or permanent medical disability has reduced from **2.73** per 1,000 employed for the period 1994-95 to **2.46** per 1,000 employed for the period 1996-97, hence a reduction of the average risk by 10%. Hence, the total number of severe injuries in relation to the number of employed seems to be going down, with a simultaneous shift towards a higher severity in the effects of the injuries. It is important to underline that the calculations have been based on estimates of the total employment which, according to the AKU, fell by **0.6%** between the two measurements.

FREQUENT AND SEVERE CAUSES OF ACCIDENT

The company uses Heidenströms system of language-based recording system to register the accident sequence. The system is based on the answers to three questions on the claims form:

- "What were you doing immediately before the accident?" (activity)
- "What went wrong?" (mechanism)
- "How was the injury inflicted" (contact).

Given the answers to these three questions on the form the claims settlers record a verb and a noun for each question. The system supplies different literal catalogue of verbs for activity, mechanism and contact and a literal catalogue of codes for nouns.

The intention with the registration system is that an open language in the reporting code of the claims report is more suitable for specifying details that are important for preventive measures.

There is a slight delay in the coding of the cause of the accident. Hence, at the time of preparing this analysis (September 1998) approximately 1.6% of the claims material for 1996 and 6.1% of that for 1997 were still to be coded. The analysis has been prepared on the basis of the coded material, i.e. 96.3% of the claims material from 1996 and 1997.

Below follows an account for the most frequent and severe causes of accidents as a combination of the nouns and verbs described above.

TO FALL AND GET HURT

To fall and get hurt has probably been the most common accident through the history of mankind. This description still accounts for one third of all occupational accidents in the Swedish labour market. This trivial accident, linked to almost all kinds of physical activities, often represents far more severe injuries than generally believed. To fall and get hurt is particularly common among nursing staff, domestic assistants and child minders as well as among cleaners and transport workers. A total of **2 389** claims due to falling were reported for the years 1996 and 1997. Approximately 26% of the injuries in the analysis have resulted in permanent disability.

62% of the most serious accidents from falling outdoors result in fractures, approximately evenly spread among upper and lower extremities, and fewer ribs, collarbones, shoulders and back injuries (6%). 76% of the falls indoors result in fractures, 56% in the upper and 36% in the lower extremities.

FALLS FROM HEIGHTS

All injuries that occurred due to falls from heights were identified in the claims material. The prerequisite was that the contact verb in the claims report was "fall to a lower level" and that the description of the activity, mechanism or contact contained one of the nouns: Ladder (separate), scaffolding, roof, scaffold (platform), stand, stepladder, ladder (fixed), roof truss, sky-lift (machine ladder) or chimney. Separate ladders represent the clearly dominant risk factor for this kind of accident. As expected, various occupations within the building industry are predominant within this claims area.

A total of **887** claims due to falls from heights were reported for the years 1996 and 1997. Seven casualties were reported associated with some of the equipment listed above. 46% of the claims resulted in permanent disability

As for the period 1994-95, painters are by far the group hardest hit by falls from heights: 41% of the total number of injuries concern falls from ladders or scaffolds.

Out of the falls from heights with more than 30 days' sick leave and/or disability, 60% are fractures; 45% in the upper and 29% in the lower extremities.

ACCIDENTS WITH VEHICLES (DRIVING OR BEING DRIVEN)

Traffic accidents tend to lead to severe medical consequences and this does of course also apply to accidents during working hours. Occupational drivers, mailmen, nurses and domestic aids are occupational groups which more than others are subject to occupational traffic injuries. The most common types of vehicles represented in the claims material are divided as follows: Car 50%, bicycle 25%, lorry 10%.

Out of **831** accidents involving drivers of, or passengers in, vehicles, there were 36 casualties. 42% of other reported claims of this type led to permanent disability.

Approximately 32% of the serious accidents resulting in more than 30 days' sick leave and/or disability were whiplash injuries. 26% consisted of fractures, relatively equally divided between the upper and lower extremities.

ACCIDENTS WITH WOODWORKING MACHINES

Machines for woodworking often stand out in the analysis of severe and disabling occupational injuries. Workers within woodworking and building industries are those mainly affected. The most common types of machines represented in the claims material are different kinds of saws and planes.

Out of **781** accidents with woodworking machines, there were two casualties, 62% of the injuries resulted in permanent disability.

The major part of the injuries in connection with woodworking machines were injured fingers, hands and arms (88%), out of which 46% were amputations and fractures.

ACCIDENTS WITH METALWORKING MACHINES

Metalworking machines are, like those for woodworking, among the most common factors for injuries within Swedish industry. Engine mechanic is the most exposed occupational group. The most involved machines are grinding, file, cutting, polishing machines (manually held workpiece), drilling, broaching- screwing machines and lathes and saws.

Out of **958** accidents with metalworking machines, there were two casualties, 50.5% of the injuries resulted in permanent disability.

As expected, the majority of the injuries in connection with metalworking machines are injured fingers, hands and arms (79%), out of which amputations and fractures are 48%.

ACCIDENTS WITH FOOD PROCESSING MACHINES

In this group of claims, the description on the claims report indicated that the injuring contact was some kind of a food-processing machine for example cutting, slicing machines, band-saws, packaging, wrapping machines, rolling machines and mixing, kneading machines.

The most exposed occupational groups are butchers, bakers, catering /restaurant assistants and salesmen (retail trade).

Out of **293** accidents with food processing machines, 53,6% resulted in permanent disability.

As expected, the majority of the injuries in connection with food processing machines are injured fingers, hands and arms (84%), out of which there are amputations 28%, contusions 22%, wounds 19% and fractures 15%.

INJURIES DUE TO THREAT OF VIOLENCE OR PHYSICAL VIOLENCE

For this group of injuries, the response on the second question on the claims form ("what went wrong?") has been indicated as aggression (deliberate or unintentional) from another person, patient, child or guardian. Injuries resulting from people jumping in front of a train or metro as well as injuries due to robbery have been excluded. This group of claims also includes injuries that did not result in longer sick-leaves. Indemnity can be paid during the acute period of the injury (healing period) even if the injured person is not signed off sick, which is fairly common for this type of injury, where the physical consequences are mostly not of a severe kind. A total of **2 389** claims due to threat of violence or physical violence were reported for the years 1996 and 1997. 27% of the claims material refers to mental problems due to violence or threat of violence. Contusions accounted for 23%, sprains 13% and fractures 9%.

The most exposed groups are police, social workers, security officers, medical orderlies (mental care), medical orderlies (domestic aids), assistant nurses and medical nurses.

INJURIES IN CONNECTION WITH ROBBERY

This group of injuries was identified from "robbery" having been indicated on the claims report. Sales staff in retail trade, post office cashiers and bank officers are often exposed to this kind of injury. As was the case with the group above, this analysis also includes injuries that did not result in longer sick-leaves since indemnity during the acute period can be paid out even if the injured person was not signed off sick. A total of **676** claims due to robbery were reported for the years 1996 and 1997. Mental problems were diagnosed in 95% of the cases.

THE DANGEROUS JOBS – THE CAUSES OF THE ACCIDENTS AND THEIR CONSEQUENCES

A profound analysis of all the occupational groups with a disability risk exceeding 2.0 per 1,000 man-years and of certain occupational groups within transportation and communications shows that the typical causes of accidents were, by and large, the same as established in the earlier report “Severe occupational injuries in Sweden 1994-95” (AMF, 1997).

Severe injuries within **Mining, quarrying and petroleum extraction industries** occur through the use of various machines for stone handling or through sliding or falling rocks. 30% of these injuries were fractures. The severe injuries of **woodworkers** are to 40% caused by various types of woodworking machines and mainly result in fractures or amputations of arms, hands and fingers. The severe injuries of **building and construction workers** are mainly injuries due to falls from ladders and scaffolds but also quite a few due to accidents with hand-held tools. Fractures are the usual diagnoses. Workers within **Metal processing work** suffer the most severe injuries through machines for metal production. Contusions and burns are the most usual consequences. The **civilian security and safety** occupational group comprises interalia, firemen, police and security officers. Firemen are those running the highest risk of injuries during physical training. Violence by third parties is the dominating claims factor among police and security officers. The most severe injuries of **metalworkers** occur at machines for metal production/processing, with a large portion of resulting fractures. Machines for paper production are causing most of the severe injuries among **pulp and paper workers**. Within the group transportation and communication work we find **railway staff** for which the largest single risk for occupational injuries seem to be that something (vehicle or person) comes in the way of the train which the person is driving or working on. 2/3 of the occupational injuries of railway staff are mental effects due to collision with a person. **Drivers of trams and metros** are subject to similar risks and 70% of all reported severe injuries from this occupational group have been given the diagnosis “neuroses” due to either having run into a person who was on the track or who jumped onto the track, or having been subject to physical violence or threat.

CONCLUSIONS

In comparison with earlier inventories of severe occupational risks on the Swedish labour market (“Severe occupational injuries 1994-95”, AMF, 1997) these risks appear fairly stable. The proportion of work related disabilities has not changed considerably in Sweden during the 1990’s. The analysis of the severity and spread of the occupational injuries is by and large a repetition of well-known deficiencies in the working environment.

Military personnel in flight crashes, drowning among *fishermen*, machine and felling accidents within *forestry* and slides and vehicles within mining represented high casualty risks during 1996/97.

The proportion of *traffic casualties at work* increased significantly from 24% 1994-95 to 35% 1996-97.

There was a high risk of occupational disablement within *mining, quarrying and petroleum extraction work, woodwork, building and construction work, metal processing work, civilian security and safety work, metal machine work and building metal work* as well as within *pulp and paper work*. The typical causes of accidents and the machinery involved in the highest risk groups were more or less the same as in earlier years.

These activities which have been representing the highest disability risk lead to between 2 and 5 disabilities per 1,000 employed per year. Since there do not seem to be any obvious reductions of these claims figures, this claims production seems to be an expression of the accepted risk level within these activities.

Within several large occupational groups where the injury risk is considerably below the average - *purchase/selling, health and medical care, technical / engineering* – there has been a considerable increase in the share of disability claims compared to 1994-95. There are several possible explanations, e g increased work intensity, deteriorated rehabilitation results or changes in the claims reporting.

The increased reports about threat and violence as well as the exposure to (and non-deliberate participation in) third party suicides implied a certain shift in the panorama of occupational injuries. An injury in connection with physical training, among occupational groups where such is required, is also an increasingly salient feature in the AMF Insurance claims documentation.

The earlier inventory of severe occupational injuries in Sweden during the period 1994-95 proposed injury preventive activities within a number of priority areas. A number of examples of research and development projects initiated since 1997 on the basis of those priorities can be told. The claims information contained in the material of AMF Insurance has been adjusted to provide support and a basis for comparisons for local risk analyses. A profound and concentrated analysis of the conditions mostly associated with severe occupational injuries is a necessity for efficient prevention.

Against the background of the information contained in the AMF Insurance claims material about severe occupational injuries for the period 1996-97, further priorities within the field of injury prevention are proposed:

- Deepened analysis of disability injuries within purchase and sales work, health and rehabilitation as well as technical work/engineering in order to clarify trends and changes,
- Risk analyses and a broadly based practical inventory in order to reduce the number of accidents due to falls among people working within domestic assistance and child care,
- Development and introduction of functional and safe physical training in the basic and further training of staff within fire brigades and rescue services,
- Development of practical methods for improved personal safety and suicide prevention at stations and on tracks of long-distance trains, commuter and underground trains;
- Industries with high occupational risks – mining, woodwork, building, steel and food – should coordinate and concentrate their reporting and analysis of claims and risks into systems adapted to the specific branches and linked to the claims information of AMF Insurance.

PRESENTATION OF PROJECTS

The earlier inventory of severe occupational injuries in Sweden 1994-1995 proposed injury preventive activities within a range of priority areas. A number of research and development projects have been initiated in collaboration with companies and industry organisations.

Before AMF Insurance decides to participate and/or support a project some criteria must be fulfilled.

- The problem must be well defined and appear as a problem in AMF Insurance's injury information system.
- It must be a profitable solution at least for AMF Insurance. An investment in safety or other preventive matters does not have to contribute to a company's bottom line in the annual report to be profitable for the insurance collective. Often, the marginal rate of return on preventive investment is higher for the collective than single members. This is due to well known insurance problems such as adverse selection and moral hazard. An easy way to make a cost-benefit analysis is to calculate how many injuries you will have to prevent within a certain pay-off time to make the investment profitable. Then you can conclude if that is credible with respect to chosen solution.
- Branch-representatives for employers and employees function as door-openers to intervene in the workplaces. These people must have good knowledge about and good contacts with companies involved.
- Proposed solutions must be credible in the workplaces to get accepted among people working there. That includes both management as well as workers. Sometimes these parties comprehend the problem differently.
- AMF Insurance have to be involved in the project at least at management level.

TECHNICAL INTERVENTION

Modifying vacuum packaging machines within the food industry

Severe hand injuries due to food processing machines motivated AMF Insurance and the industry to develop a system for improving safety of old machines. These old machines, manufactured in the early seventies, are very reliable and do not break down. Therefore the industry uses the machines since new machines are comparably much more expensive. Hence the safety standard also is from the seventies they produce a lot of accidents. After consulting a technical expert working in the industry the machines were made safer with the help of adding protective shields and safety circuits. If companies within the branch upgrade the safety AMF Insurance subsidise their costs up to 50%.

Development of a drilling rig within the stone industry

Quarrymen work are carried out by heavy, hand-held, vibrating machines with high risks of accidents, musculo-skeletal injuries, hearing impairments and vibration injuries, The large machine manufacturers cannot meet the demand for new machines due to customer base being too small. AMF Insurance has financed the development of a drilling rig, which enables the work to be managed through remote control, thereby greatly eliminating the occupational risks within this operation. As an unexpected side-effect productivity increased when using the rig compared to working the traditional way.

INFORMATION SYSTEMS

The information system support that AMF Insurance provides have some common features.

- Based on internet technology, which means that theoretically all employees with a computer available can get access to the systems.
- Built on a common platform but individually designed to meet branch-specific needs
- High security with special protocols, unique user-ids and passwords to meet security demands.
- Developed in direct co-operation with end-users
- The idea that aggregated information of the whole industry branch provides better knowledge for decision-making on preventive action.

“Landstingsguiden”, information system for the county councils

In collaboration with the Swedish Federation of County Councils, AMF Insurance has developed an information system which easily presents claims information from the data bank

of AMF Insurance. The information is used as the basis for preventive actions such as internal audits etc. Every council can compare themselves with other councils.

PIA, the Paper Industry’s Accident Information System

This system is based on local registration of claims in order to compile injury and accident information to be accessed by the whole industry. The industry has also developed a special code-list to identify where in the papermaking process injuries occur. AMF Insurance add information about medical consequences as a measure for priorities. The information is used as the basis for risk-analyses at internal controls and as an additional source of know-how for reconstruction and development of the papermaking process. 70% of all paper and pulp mills are connected to the system. The diminishing incidence of injuries for paper workers by 20% cannot solely be explained by use of PIA. Though AMF Insurance would like to think that the use of the system has contributed to high-light problems in the working environment and functioned as a catalyst in preventive matters since the system has been much appreciated from both employers and employees.

Information system about occupational injuries for the metal industry

This system is built on the same principles as PIA for the paper industry. Some features differs such as variables, and the code-list is unique for the metal industry.

Interactive educational program about blood contamination

This system is about how to avoid blood contamination for employees in health care professions. It will also be accessible through the internet. Video-clips from authentic situations in the workplace are the bearing idea. Users should be able to test their own knowledge and if failing get tips on what moments to study in.

EDUCATION

Risk analysis training for two public medical services of the County Council of Norrbotten

This project aims at providing training in risk analysis and risk management in accordance with the requirements of internal audits and based on the claims information from AMF Insurance. The goal is action plans with proposals for practical improvements for reducing injuries and sick-leave.

Training in conflict management for security officers in public places

AMF Insurance has financed three pilot courses for security officers from the two largest security companies in Sweden. The training is aimed at teaching security officers how to handle certain situations without using violence and preventing their own injuries, as well as avoiding injury for the persons taken in custody. The training was conducted at the police academy with specialists such as very experienced policemen, psychologists and behavioural scientist. As a result of the activity the industry has prolonged the basic training for security officers. The prolonged training have focus on conflict management.

Action programme against accidents within the sawing and wood industry

This is a project targeting all companies within the sawing and wood industry with less than 50 employees. The action programme consists of training in risk analysis for managers and safety representatives, focusing on accident and risks in connecting in connection with woodworking machines. Follow-up of machine accidents also form part of the programme in order to provide direct feedback about accidents occurred. The programme will be conducted nation-wide and companies with more than 50 employees can participate but they will have to cover their own costs.

CAMPAIGNS

Creating awareness with the help of injured construction workers, so-called building pilots

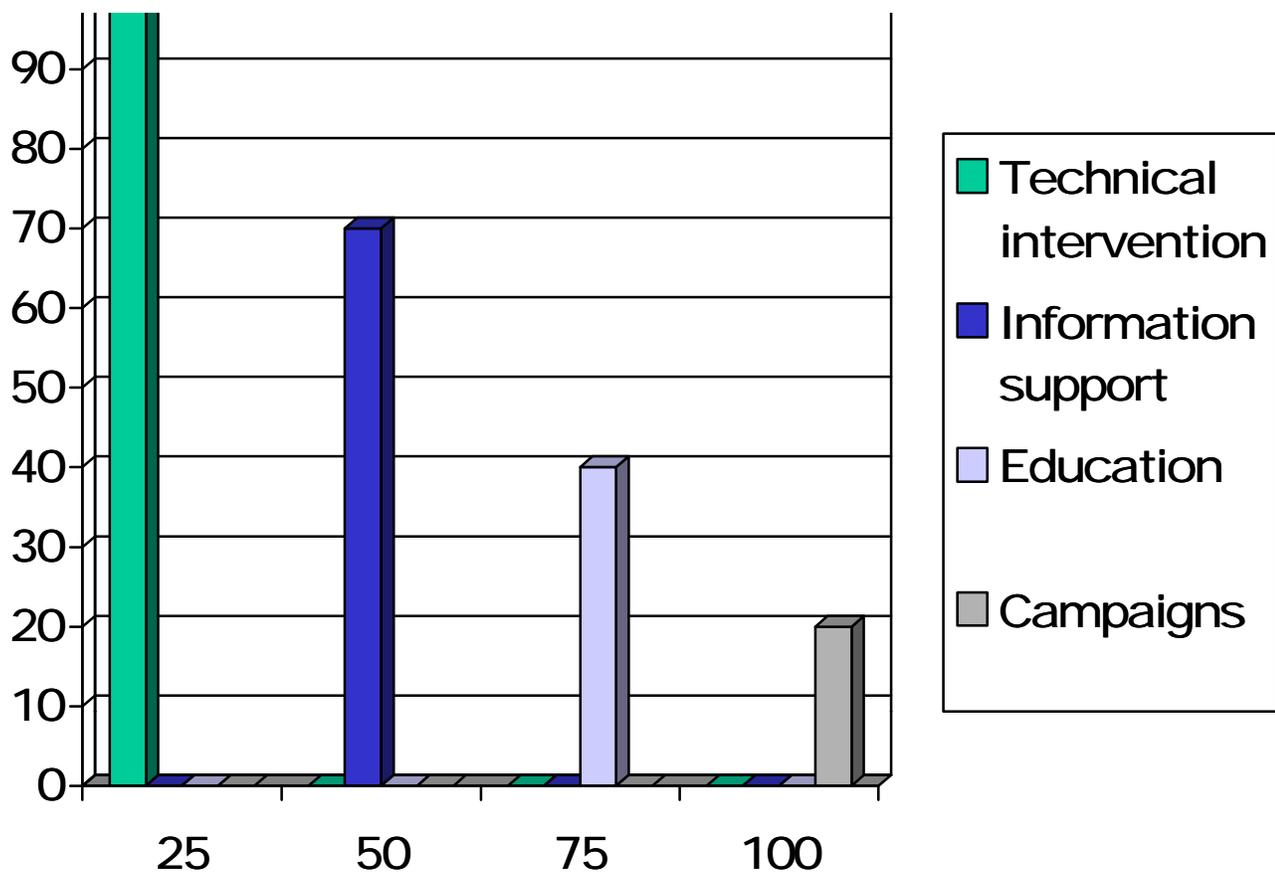
In order to create awareness and reduce the number of accidents due to falls in the future, construction workers whom have been injured at work, so called building pilots, have been visiting building sites and sharing their experience with their fellow workers. The building pilots have informed about and demonstrated safety tools such as scaffolds, ladders, benches, etc, This was a nation-wide campaign reaching some 25.000 construction workers with an hour of information and demonstration on these matters. All pupils in the Swedish programme for construction workers have received the same information.

Experience from prevention projects

The figure below shows a relationship between effectiveness and persistence on one hand and coverage on the other. Our experience is that campaigns can have effects in the short-run but that impact diminishes as times goes by. The effectiveness of preventive action per employee or per exposed varies with the usability in the own workplace. The general experience is that the projects which seem to be most successful are the ones where the preventive action means that **risk disappear rather than information or education about risk.**

Such intervention is also measurable in the database, or risk incidence with some degree of certainty.

Within a couple of years when the projects have been implemented for a while, AMF Insurance can be more specific of conclusions and impact, due to project-evaluation and methods used.



y-axis = effectiveness and persistence
 x-axis = number of employees who benefits from the intervention

