

Levels and Trends in Injury Mortality and Morbidity in Sweden Since 1978

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Abstract

Sweden has after the Second World War established itself as a Welfare State, with a high life expectancy. However the reputation of a leading statistical system goes even further back. All citizens are covered in the national population register, since 1749. Death diagnoses are known since 1911, but there are reports on mortality pattern as early as in the late 18th century. The population is now 8,700,000, with 18 percent above 65 years of age.

Overall mortality has decreased substantially after the second world war. Injuries are the leading cause of death up to 45 years of age. However the rate of fatal injuries has decreased from above 100 per 100,000 mean population for men 1977 to 75 the year 1991. The corresponding figures for women are from 70 to 40. All types of injuries, intentional as well as non-intentional, have decreased about the same, for both genders.

Forty people per 100,000 cars in traffic (14 per 100,000 population) were killed in traffic injuries the year 1975. Corresponding figures 1992 were 19 (9 per 100,000 population). The number of work related fatal injuries were around 400 in 1955, and in 1992 it was less than 80.

About 10 percent of hospital care is due to injuries. About 1/3 of care days for males and more than 1/2 for females are caused by femoral fractures.

This means that there are new priorities above the traditional in injury prevention. A National Injury Prevention Programme has been established since 7-8 years ago.

Background

Sweden has after the Second World War established itself as a Welfare State, with a high life expectancy. However the reputation of a leading statistical system goes even further back. All citizens are covered in the national population register, since 1749.

Life expectancy at current rates in Western Europe, the United States, Canada, Australia, New Zealand and Japan exceeds 75 years; in Japan and the Scandinavian countries (and in some states of the United States such as Hawaii and Minnesota) life expectancy for women is around 80 years. The most reliable data on mortality rates up to the most advanced ages over a long period of time pertain to Sweden. Excellent data exists for Sweden since 1750; "superlative" data have been achieved since 1895 (Vaupel and Lundström 1993). Death diagnoses are known since 1911, but there are reports on mortality pattern as early as in the late 18th century.

The Swedish population is now 8,700,000. Twenty-four and six-tenths percent (1990) are below 20 years of age, 17.8 percent 65 and above. The projection for the year 2025 is 23.2 percent and 21 percent respectively.

Injury Mortality Trends

After heart disease and cancer injury is the most common cause of mortality, while in the age groups <45 years injury is the number one cause of death. Looking at a *long term* perspective nonintentional injuries have been increasing as a cause of death since the beginning of this century but has constantly decreased since 1971 (figure 1). However that development is basically due to the traffic mortality, while drownings has constantly decreased and falls increased during this century.

Looking at a *short term* perspective there has been a decrease in the overall fatal injury rate from around 100 per 100,000 of mean population for males 1976 to 75 per 100,000 in 1991 (figure 2). Corresponding rates for females are 70 per 100,000 and 40 per 100,000. Looking at causes for males all show a decrease during this period with the exception of homicide, which however stays on a very low level (figure 3).

Suicide, falls and motor vehicle dominate as causes. For females there is a corresponding decrease of all causes, however falls are by far the dominating cause of mortality (figure 4).

In general the current picture of mortality is for intentional injuries dominated by suicide. The non-intentional injuries as a cause of death are dominated by falls, about 40 percent, motor vehicles and other traffic, about 30 percent, drownings, another 10 percent, while fire only causes 3 percent (figure 5).

Looking into some *specific* causes *traffic* injuries has decreased substantially both per population and per vehicles (table 1). In 1975 40 persons per 100,000 vehicles were killed, 1992 the rate had decreased to 19. The corresponding rates per 100,000 mean population were 14 and 9 respectively.

These rates places Sweden among the leading countries in the world together with Norway and Great Britain (table 2). There is a more intermediate group with Denmark, Italy and Finland, while countries like USA and France shows the double rate. The bicycle injury rate is high but is now slowly decreasing (figure 6).

There is a remarkable decrease of *work* related fatal injuries (figure 7).

Fatal *drownings* are to 1/3 related to boats activities, 29 out of 167 are related to activities on ice or with snowmobiles and only 18 of 167 are related to bathing (table 3). The figures have varied during the last decade from 145 to 203, with an average of 172.

In general there has been a remarkable decrease of *childhood* injuries in Sweden. A comparison made by Bergman and Rivara shows that USA and Sweden had the same injury mortality in the age group 5-14 years 1957-59 and Sweden had a higher rate for age 1-4 years, while 30 years later Sweden showed a rate of 1/4 to 1/3 of that of USA (figure 8).

Falls account to a major part of the mortal nonintentional injuries. Looking at trends (figure 9) for females as well as for males (figure 10) there is a remarkable decrease from 1980 to 1986. This is explained by changes in coding routines. However there seems to be a decrease for females from 1988 onwards, but an increase for males during the same period.

Injury "Morbidity" Trends

Hospital discharge registers is the main source of information on injuries besides the mortality register. By far the most dominating cause of hospital in-patient care due to *non-intentional injuries* is falls, 57 percent in 1988, thereafter transport, 13 percent (figure 11). Actually about 1/3 of the hospital care days for males and more than 1/2 for females in Sweden were caused by femoral fractures (table 4).

There has since long been an increase in the rate of non-intentional injuries leading to hospital care for females, dominated by falls (figure 12). However there is now a levelling of, even a decrease. There is also a corresponding development for males (figure 13).

Looking at hospital care due to *intentional injuries* shows that almost 60 percent are caused by suicide attempts and 20 percent by assaults (figure 14).

During the last 15-20 years there is a growing source of information on injuries through local surveillance systems based on all kinds of doctor's and hospital visits. In table 5 are reported percent distribution of registered injuries

in two counties and one municipality. About 1/3 of injuries occur at home, 1/6 at transport, production/commerce and sports environment respectively.

Looking at a similar surveillance in Falköping 1978 (Schelp and Svanström 1986) indicates an injury incidence in total of 113 per 1,000 inhabitants and year out of which 27 per 1,000 are home injuries, 22 per 1,000 are work related injuries and 9 per 1,000 are transport injuries. The surveillance system from Motala municipality shows for 1983-84 that 38 percent of *traffic-related injuries* are caused by cyclists and another 29 percent by pedestrians (figure 15). A similar study from Lidköping municipality 1984 shows that the dominating age group is 15-24 followed by 0-14 (table 6).

The study from the Motala surveillance system also shows that 40 percent of *sports injuries* are caused by soccer, 10 percent by basket/volleyball/handball and 10 percent by bandy and ice-hockey.

Summary and Conclusion

The rate of fatal injuries has decreased from above 100 per 100,000 mean population for men 1977 to 75 the year 1991. The corresponding figures for women are from 70 to 40. All types of injuries, intentional as well as non-intentional, have decreased about the same, for both genders.

Forty people per 100,000 cars in traffic (14 per 100,000 population) were killed in traffic injuries the year 1975. Corresponding figures 1992 were 19 (9 per 100,000 population). The number of work related fatal injuries were around 400 in 1955, in 1992 it was less than 80. Actually more people are now killed in bicycle injuries yearly than at work!

About 10 percent of hospital care is due to injuries. About 1/3 of care days for males and more than 1/2 for females are caused by femoral fractures.

This means that there are new priorities than the traditional in injury prevention. A National Injury Prevention Programme has been established since 7-8 years ago in order to formulate national targets and strategies as well as to support regional and local preventive activities. There is also a priority to improve the quality of national, regional and local registers and surveillance systems.

References

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Table 1. Fatal traffic injuries in Sweden 1975-1992, by 100 000 vehicles in traffic, 100 000 mean population and year. Source: Traffic Injuries 1991. Stockholm: Statistics Sweden 1992.

	Year				
	1975	1980	1985	1990	1992
Killed/100 000 veh	40	28	24	20	19
Killed/100 000 pop	14	10	10	9	9

Table 2. No. of killed in traffic injuries per 100 000 inhabitants in some selected countries, by year. Source: Traffic Injuries 1991. Stockholm: Statistics Sweden 1992.

	Year			
	1975	1980	1985	1990
Norway	13	9	10	8
Sweden	14	10	10	9
GB	12	11	9	9
Denmark	16	13	15	12
Italy	18	16	13	12
Finland	19	12	11	13
USA	21	22	18	18
France	27	25	21	20

Table 3. Number of fatal drownings in Sweden 1992, by cause and age. Source: Drowning statistics 1993. Stockholm: Press Information, Swedish Life Saving Society, 1994.

Cause	Children			Adults	Total
	0-4	5-9	10-14		
Ice/ snowmobile	1	2	1	25	29
Bathing	0	2	0	16	18
Sport boats	0	0	2	52	54
Vessels	0	0	0	2	2
Other	6	0	1	57	64
Total	7	4	4	152	167

Table 4. Number of hospital discharges and care days caused by injuries in Sweden 1989, by diagnosis and gender. Source: Hospital Discharge Registry. Stockholm: National Board of Health and Well, Centre for Epidemiology, 1994.

Diagnosis	Gender	No. discharges	No. care days	%
Scull fractures	M	2 846	19 558	
	F	1 080	8 400	
Femoral fractures	M	6 599	196 069	31
	F	18 117	693 081	54
Other fractures	M	18 234	181 319	
	F	21 292	366 627	
All other injuries	M	38 796	243 653	
	F	28 850	209 285	
Total	M	66 475	640 599	100
	F	69 339	1 277 393	100

Table 5. Injuries by environment in two Swedish counties and one municipality. %- distribution. Source: Strategies for a Safe Sweden. Stockholm: National Board of Health and Welfare, 1991.

Environment	Geographical area		
	Bohus county	Lidköping municip	Västmanland county
Transport	12	16	15
Home	37	33	29
Production/ Commerce	14	20	16
School	7	7	11
Sport	15	16	18
Entertainment	3	2	4
Nature	6	3	3
Sea,lake etc	3	1	1
Other	2	1	3
Total	100	100	100

Table 6. Traffic injuries in Lidköping, Sweden, 1984, by age group and gender. In numbers, % and per 1 000 mean population/ year. Source: Lindqvist K. Towards Community- Based Injury Prevention. The Motala Model. Linköping: Linköping University, Dept. of Community Medicine, 1993. Thesis.

Age	Gender		Total	%	Per 1 000 pop/year
	M	F			
0-14	25	27	52	29	8
15-24	34	23	57	31	11
25-34	8	3	11	6	2
35-44	5	9	14	8	3
45-54	8	7	15	8	4
55-64	3	10	13	7	3
65-74	6	9	15	8	4
75-	3	2	5	3	2
Total	92	90	182	100	5

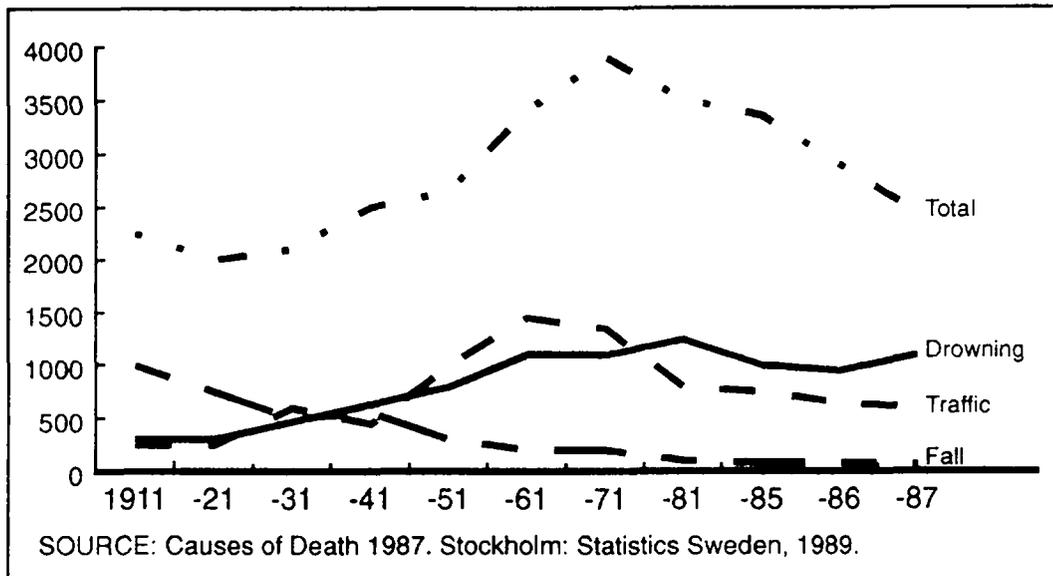


Figure 1. Number of non-intentional injuries in Sweden 1911-87, by cause and year

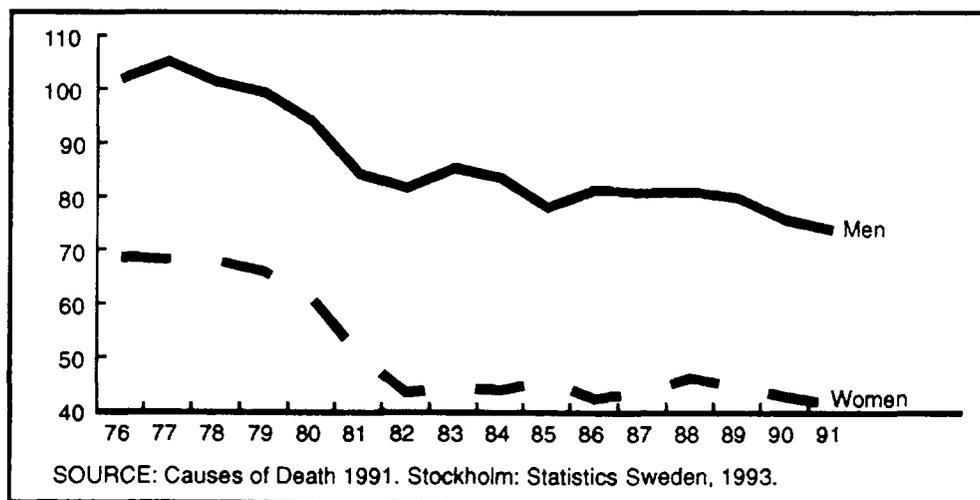


Figure 2. Fatal injuries in Sweden 1976-91, by gender and year. Rate year 100,000 of mean population.

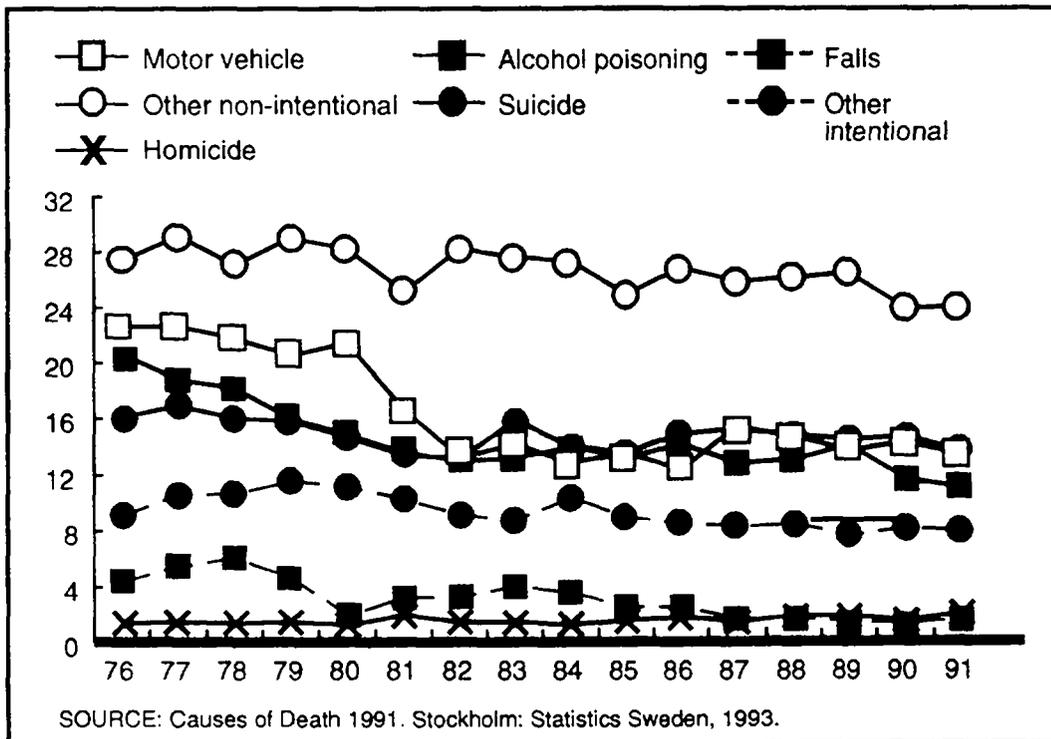


Figure 3. Fatal injuries in Sweden 1976-91, by cause and year. Rates per 100,000 of mean population. Males.

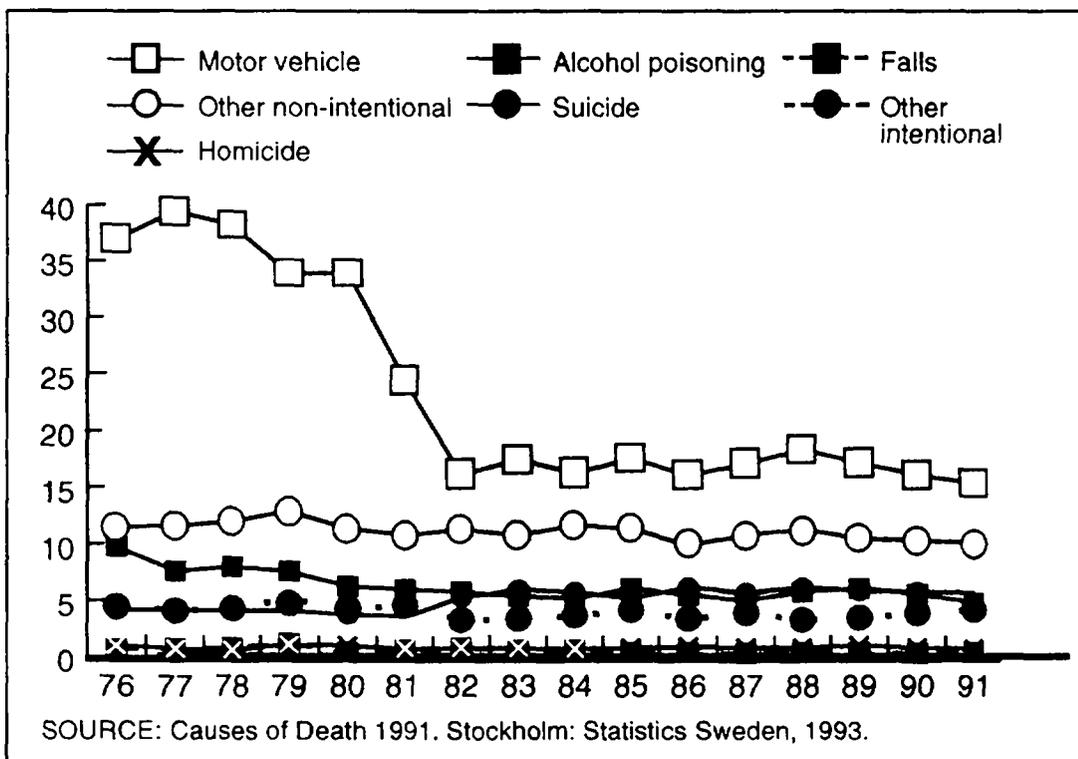


Figure 4. Fatal injuries in Sweden 1976-91, by cause and year. Rates per 100,000 of mean population. Females.

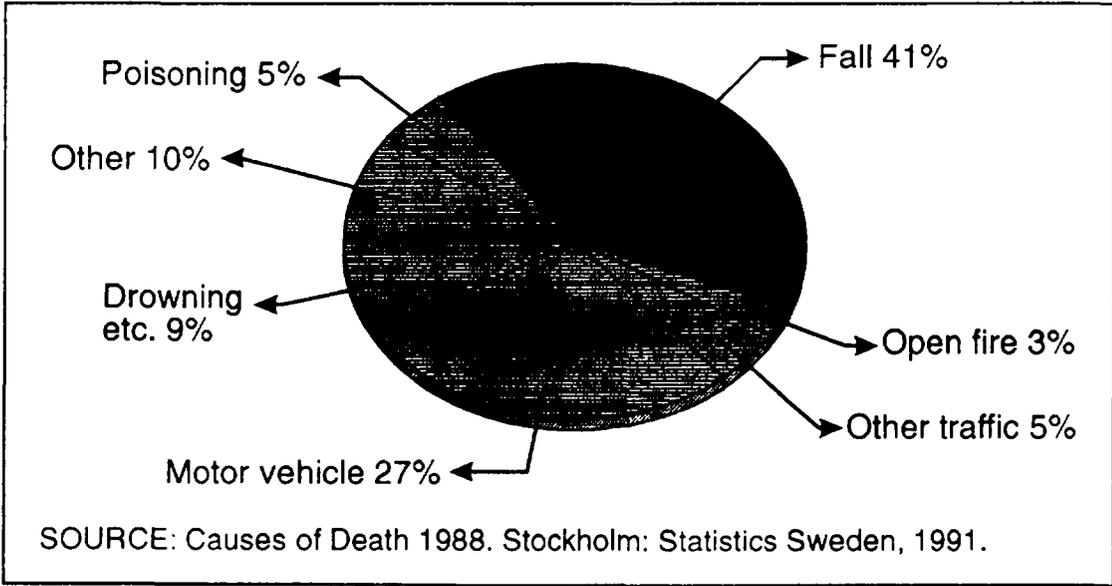


Figure 5. Fatal non-intentional in Sweden 1988, by cause. Number (n=1804) and percent.

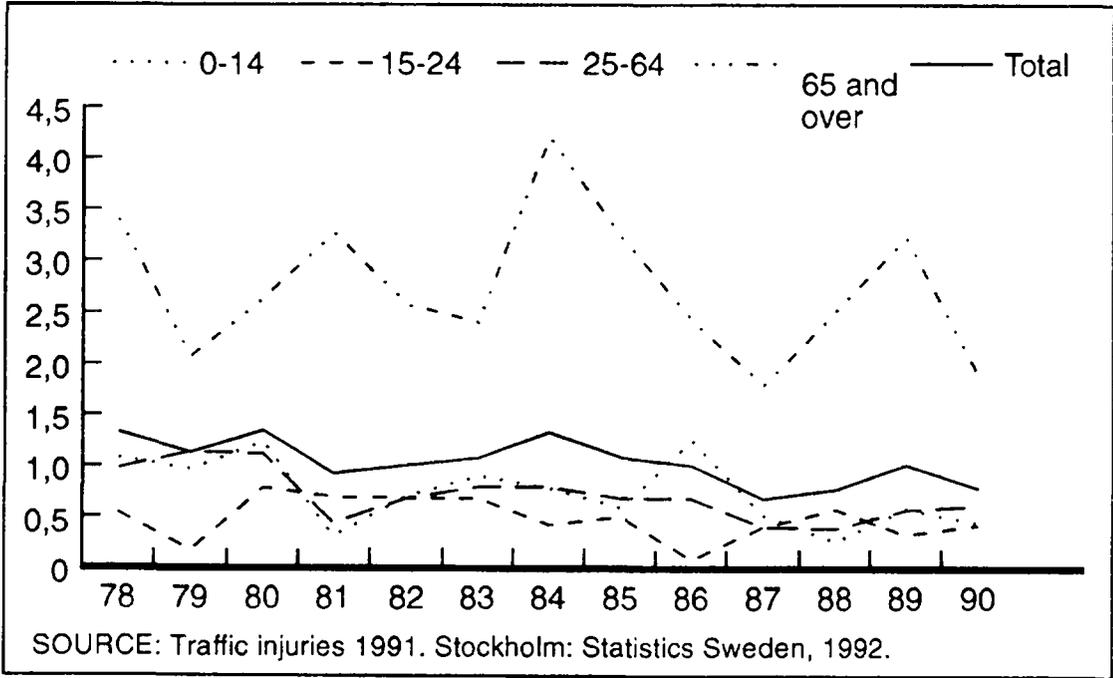


Figure 6. Fatal bicycle injuries in Sweden 1978-90, by age group and year. Rates per 100,000 of mean population

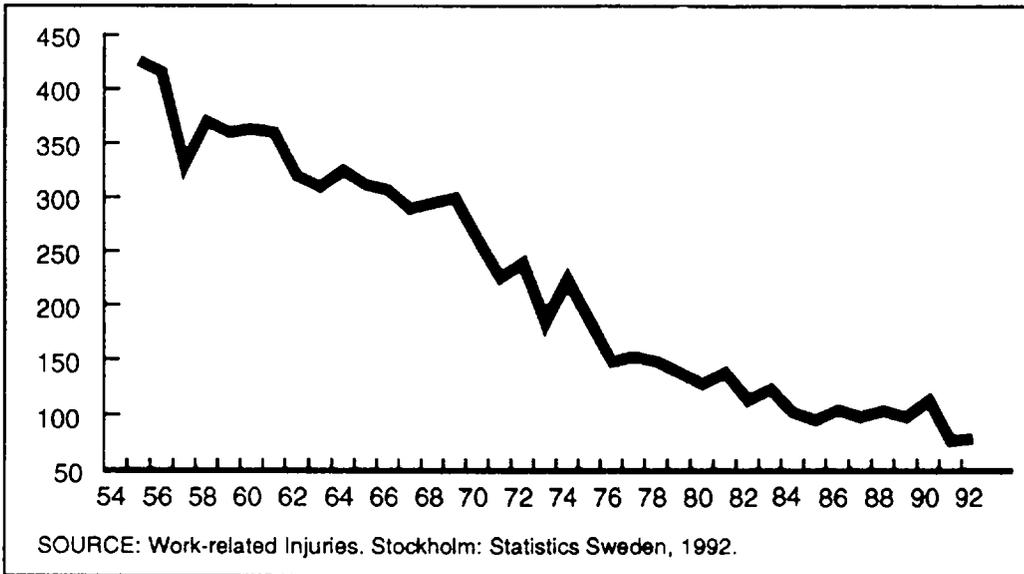


Figure 7. Number of work related fatal injuries in Sweden 1955-92, by year

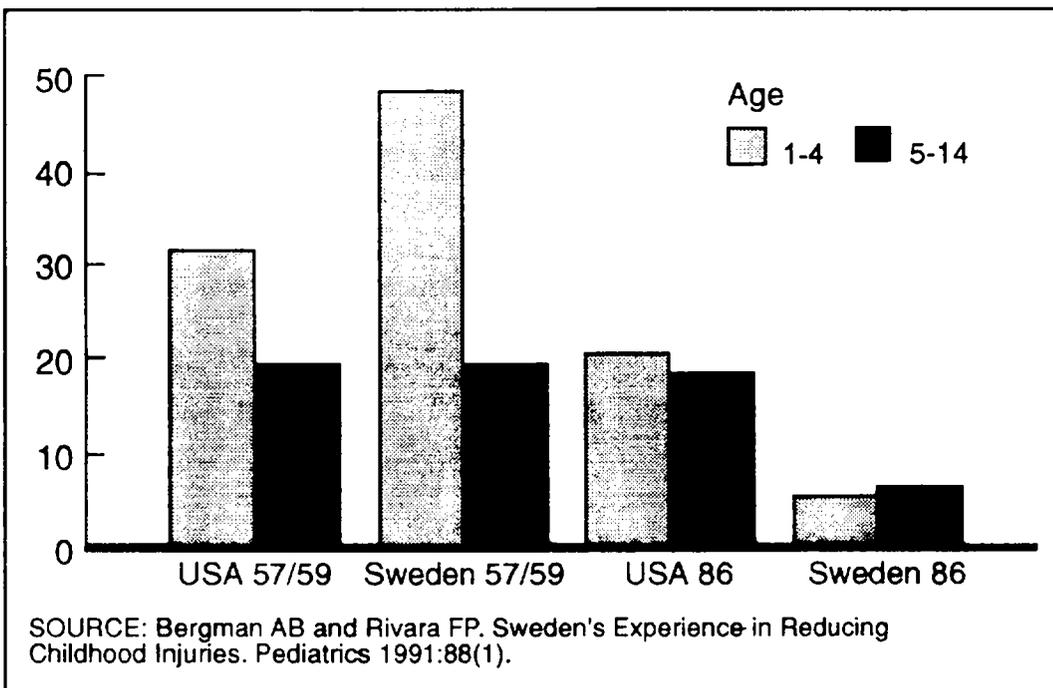


Figure 8. Fatal child injuries in USA and Sweden 1957-59 and 1986, by age group and year. Rates per 100,000 of mean population

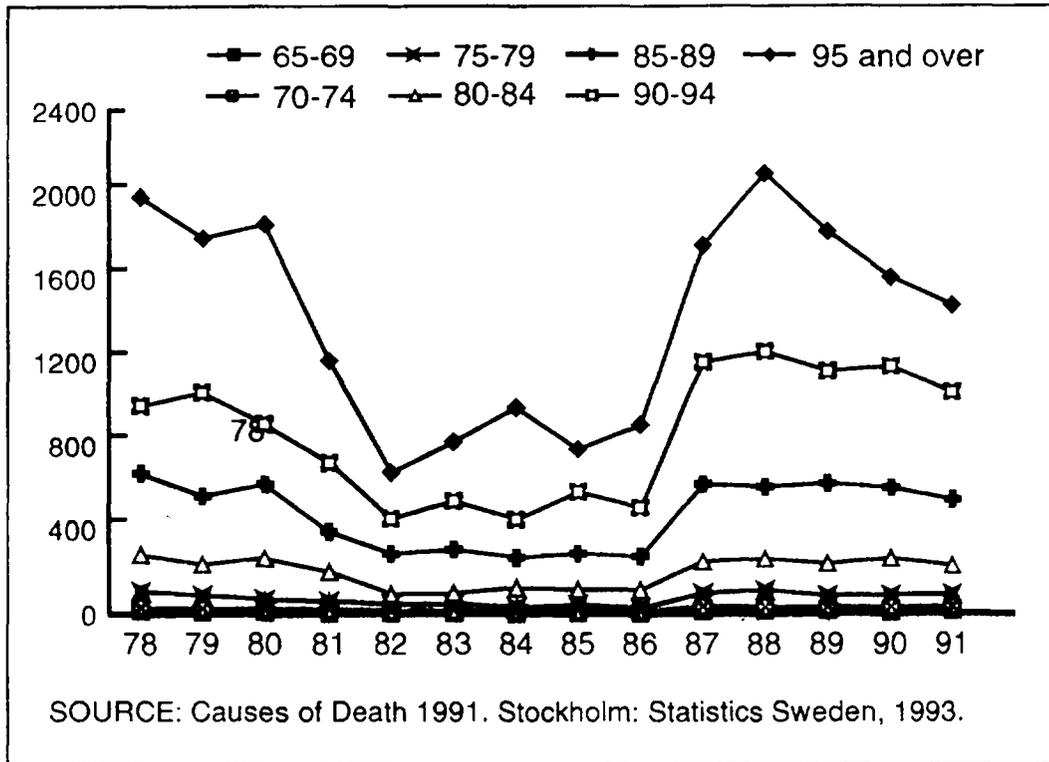


Figure 9. Fatal injuries in Sweden due to falls 1978-91, by age group and year. Rates per 100,000 of mean population

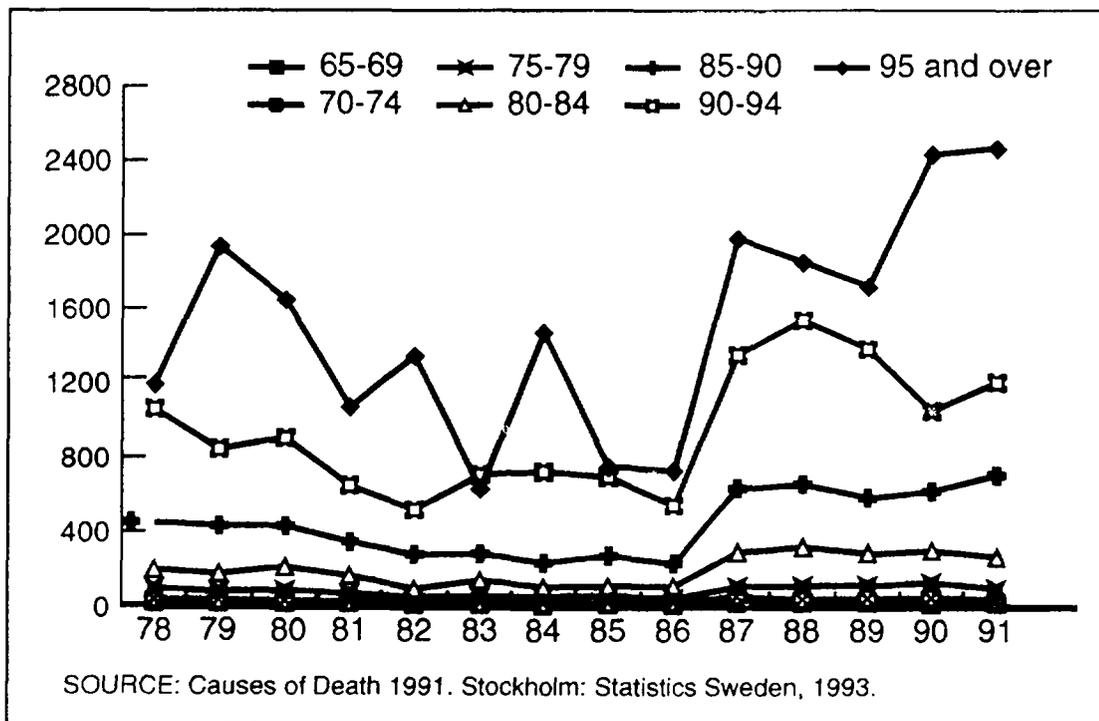


Figure 10. Fatal injuries in Sweden due to falls 1978-91, by age group and year. Rates per 100,000 of mean population

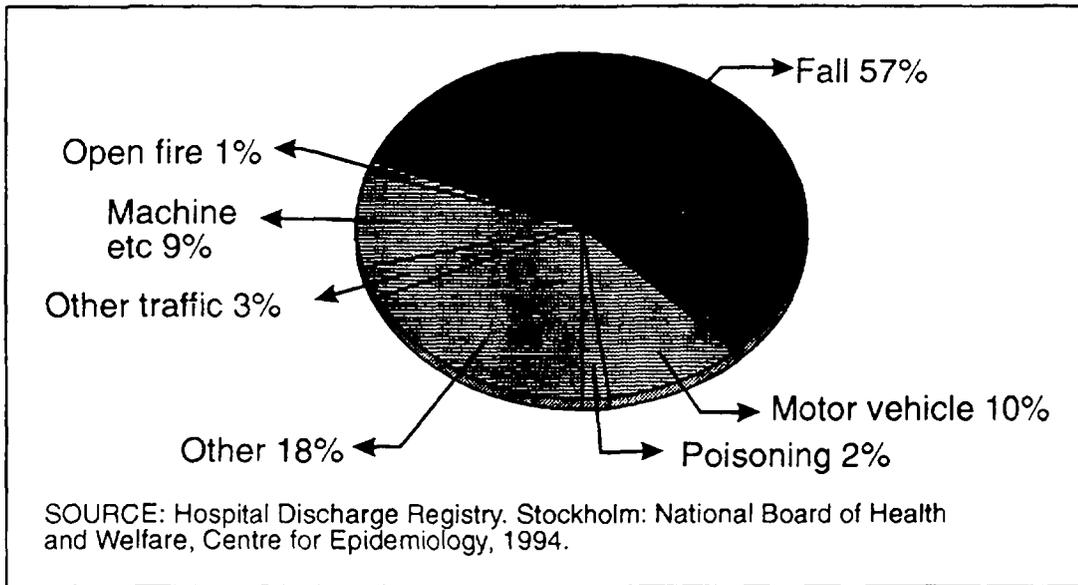


Figure 11. Hospital discharges in Sweden due to non-intentional injuries 1988, by cause, number (n=143,589) and percent

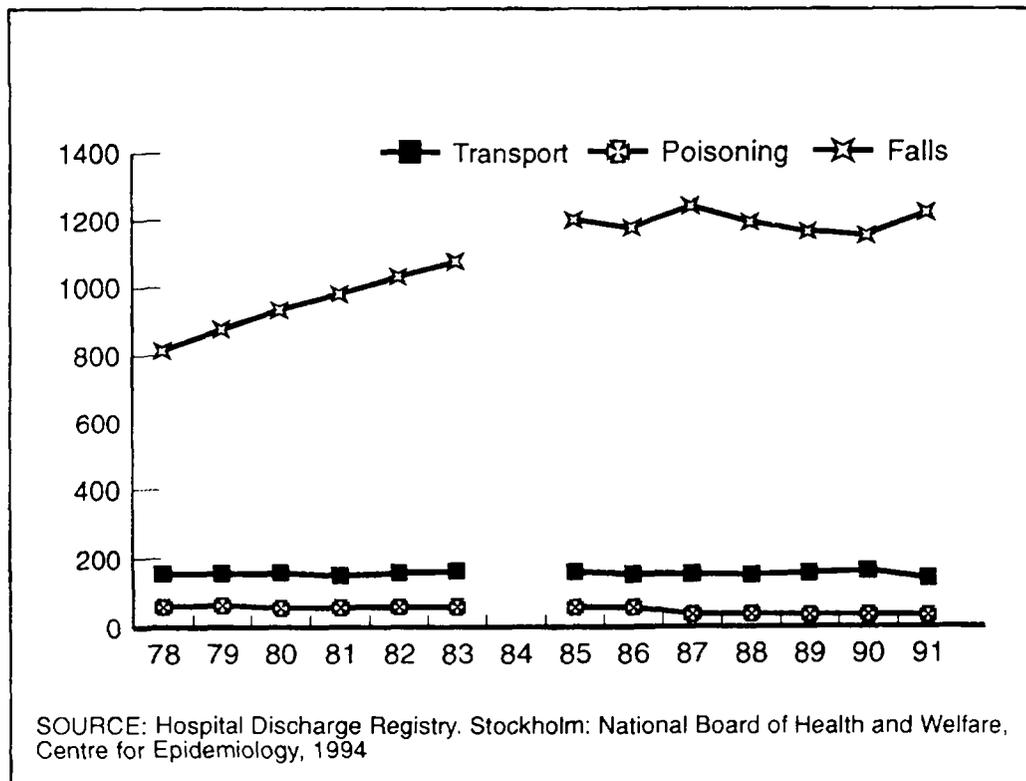


Figure 12. Hospital discharges in Sweden due to non-intentional injuries 1978-91, by cause and year. Rates per 100,000 of mean population

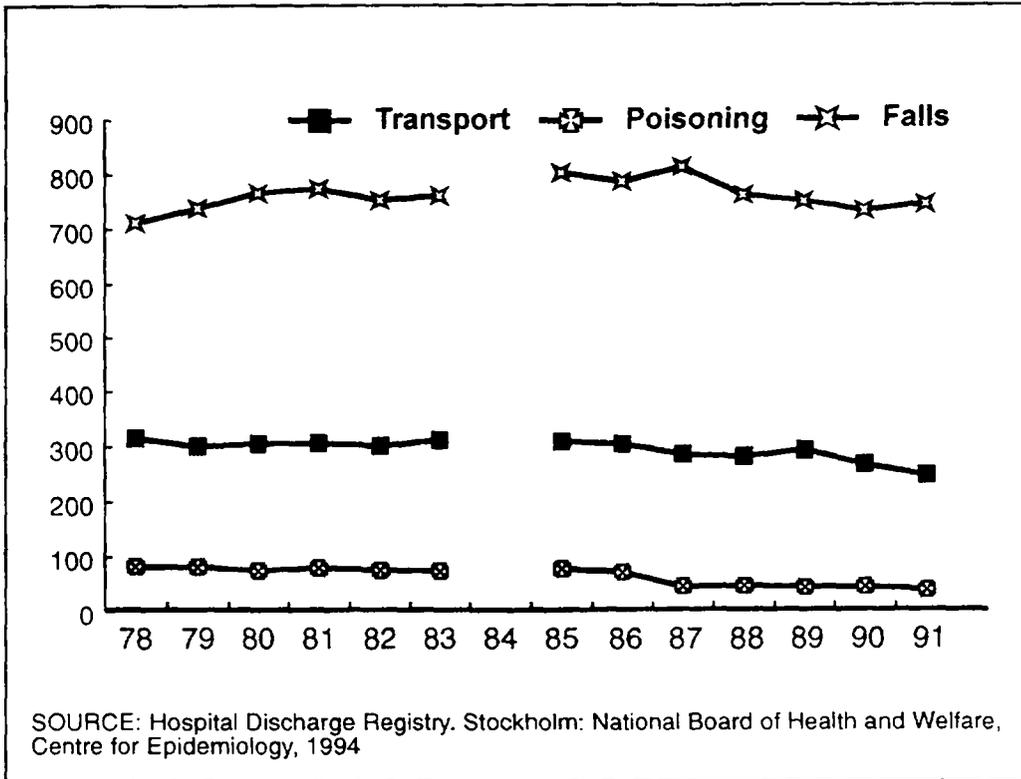


Figure 13. Hospital discharges in Sweden due to non-intentional injuries 1978-91, by cause and year. Rates per 100,000 of mean population

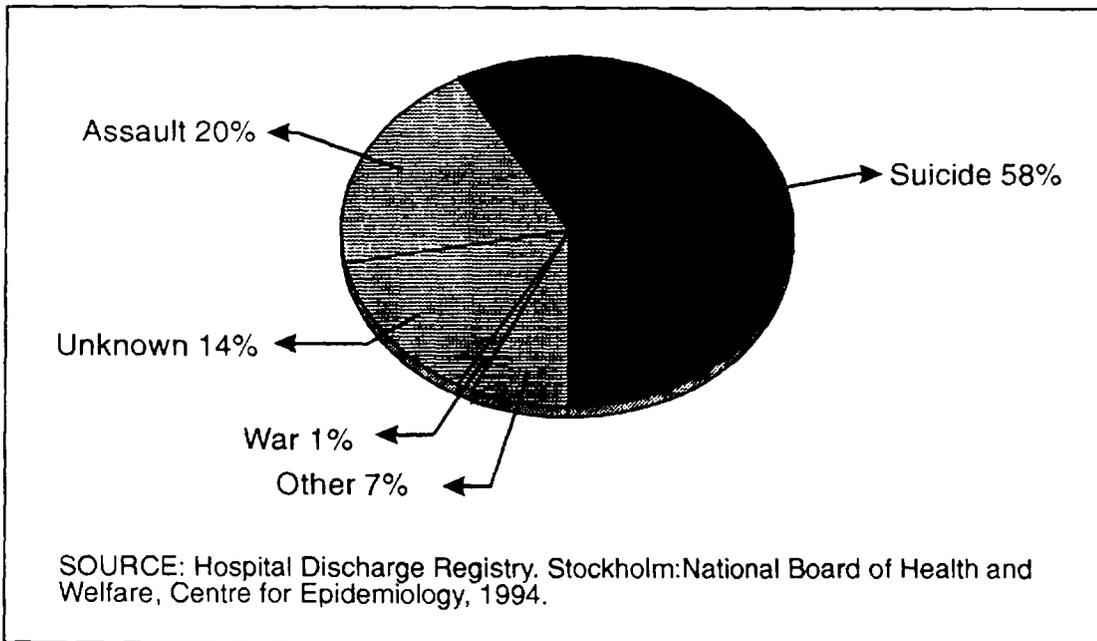


Figure 14. Hospital discharges in Sweden due to intentional injuries 1991, by cause, number (n=14,069 and percent)

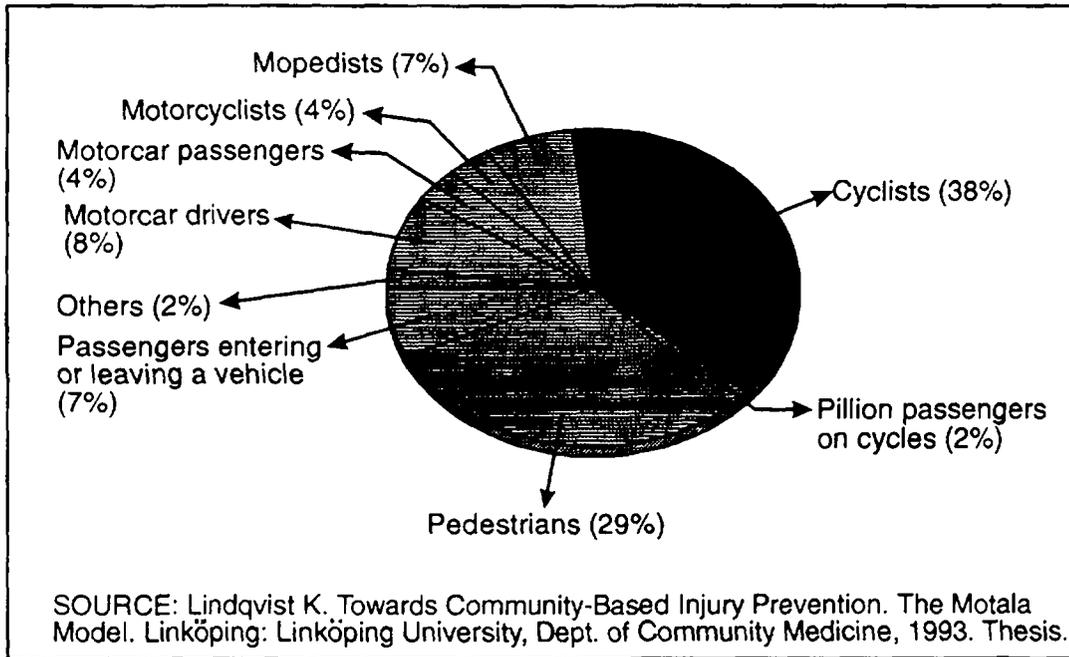


Figure 15. Traffic injuries in Motala, Sweden 1983-84, by category and percent (n=632)