

# Injury in Sweden





# Facts and definitions

## Facts about Sweden

<b>Area</b>	450,000 km <sup>2</sup> (174,000 sq. mi.), 3rd largest country in Western Europe
<b>Forests</b>	53%
<b>Mountains</b>	17%
<b>Cultivated land</b>	8%
<b>Lakes and rivers</b>	9%
<b>Longest north-south distance</b>	1,574 km (978 mi.)
<b>Longest east-west distance</b>	499 km (310 mi.)
<b>Capital</b>	Stockholm
<b>Population</b>	9 million inhabitants
<b>Languages</b>	Swedish. Recognized minority languages: Sami (Lapp), Finnish, Meänkieli (Tornedalen Finnish), Yiddish, Romani Chib.
<b>Form of government</b>	Constitutional monarchy, parliamentary democracy.
<b>Parliament</b>	The Riksdag with 349 members in one chamber
<b>Religion</b>	82% belong to the Evangelical Lutheran Church of Sweden
<b>Average life expectancy</b>	Men 77 years, women 82 years
<b>Export goods</b>	Paper products, electrical and computer equipment, motor vehicles, machinery, chemical products, pharmaceuticals, iron and steel, food
<b>Import goods</b>	Petroleum products, motor vehicles and accessories, machinery, electrical and computer equipment, food, textile products, footwear

## Definitions

An injury is a bodily lesion at the organic level resulting from acute exposure to energy (which can be mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts or rates that exceed the threshold of physiological tolerance. In some cases (e.g. in drowning, strangulation or freezing), the injury results from insufficiency of a vital element. The time between exposure and appearance of the injury must be short. Injuries are often classified as unintentional or intentional. Most traffic injuries, fire-related injuries, falling, drowning and poisoning are classified as unintentional. On the other hand, homicides, suicides and war are classified as intentional.

## Data Sources

### Cause of Death Register

Swedish statistics on causes of deaths are among the oldest worldwide. They go back to 1749 when a nationwide report system was first introduced. Statistics on causes of death have been published annually between 1911-1993 by Statistics Sweden. The National Board of Health and Welfare has been responsible for publication since 1994.

The main variables included in the register are social security number, home district, gender, date of death, underlying cause of death, nature of injury, multiple causes of death, marked if autopsied or not and if so what kind, marked if operated within four weeks before death, marked if injury/poisoning, marked if alcoholic related and marked if narcotic related.

The total number of deaths in Sweden in 2002 amounted to 95,071 of which 49,258 were females and 45,813 males.

## Hospital Discharge Register

Statistics on diseases and surgical treatments of patients has a long history in Sweden. Data of this kind has been published for more than 100 years and has been available for the whole of the 20th century.

There are four different types of information in the Hospital Discharge Register (HDR) including data on the patient, data on the hospital, administrative data and medical data such as diagnosis and external cause of injury and poisoning.

The National Board of Health and Welfare is responsible for the register. From 1987, the HDR covers all public, in-patient care in Sweden. Information to the HDR is delivered once a year from each of the 21 county councils in Sweden. For the period 1964-2003, the register includes 47 million discharges.

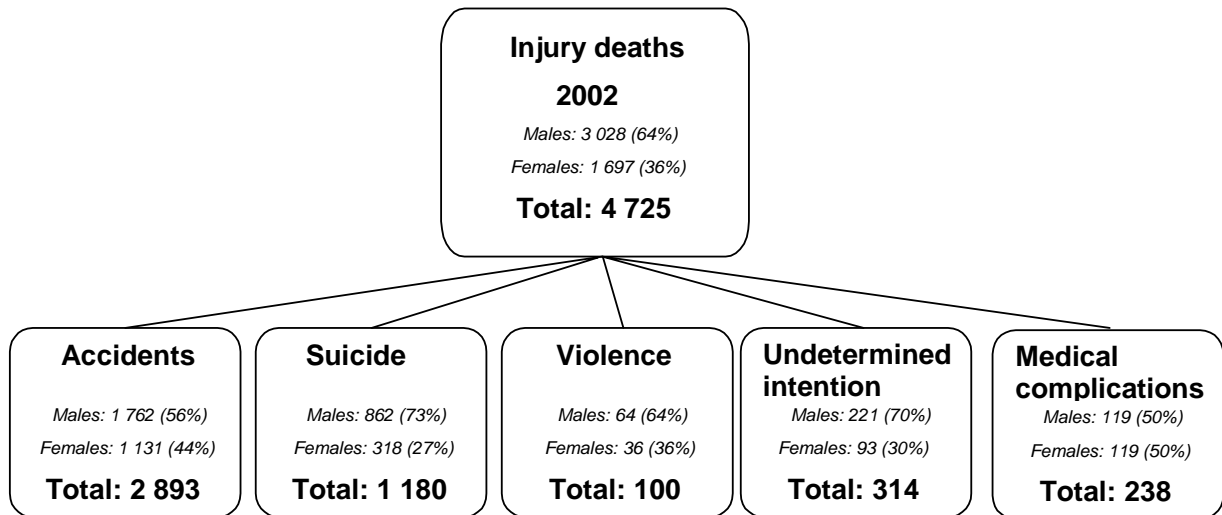
# Injury in Sweden

During the year 2002, injuries accounted for almost five percent of all deaths in Sweden and are hereby the fourth greatest cause of death after heart and cardiovascular diseases, tumours and respiratory diseases. Almost two thirds of those who die of injuries are males.

## Diagram 1

Injury deaths in Sweden, 2002

Source: Cause of Death Register, Centre for Epidemiology, National Board of Health and Welfare

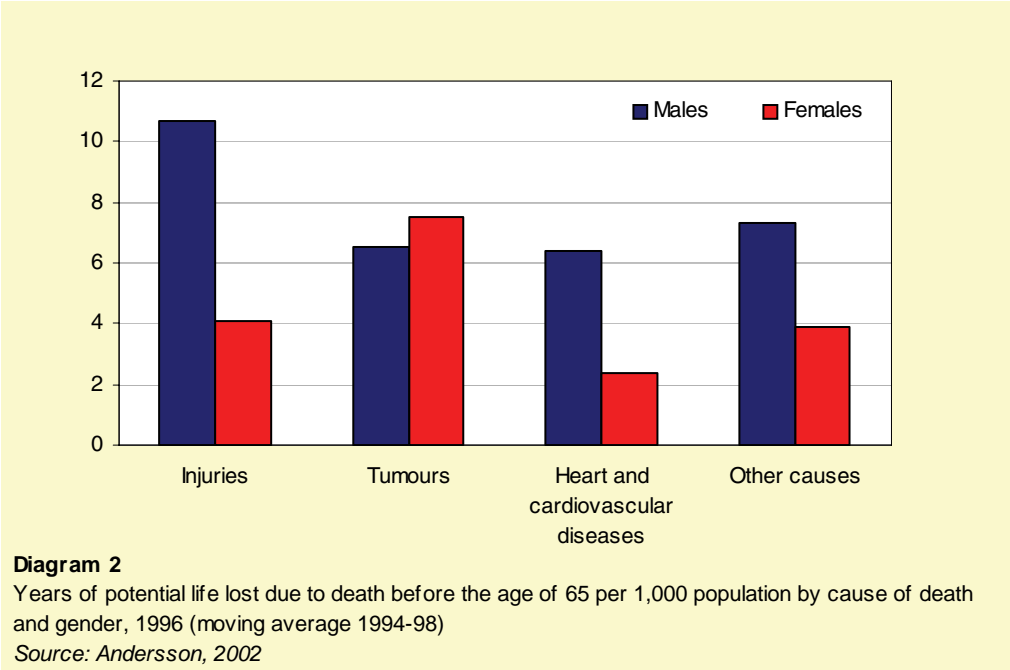


Every year 135,000<sup>1</sup> persons are hospitalised due to injuries or poisoning and about 900,000<sup>2</sup> persons are estimated to have visited outpatient care for the same reasons. The risk of suffering an injury requiring in-patient hospital care increases with age for both genders.

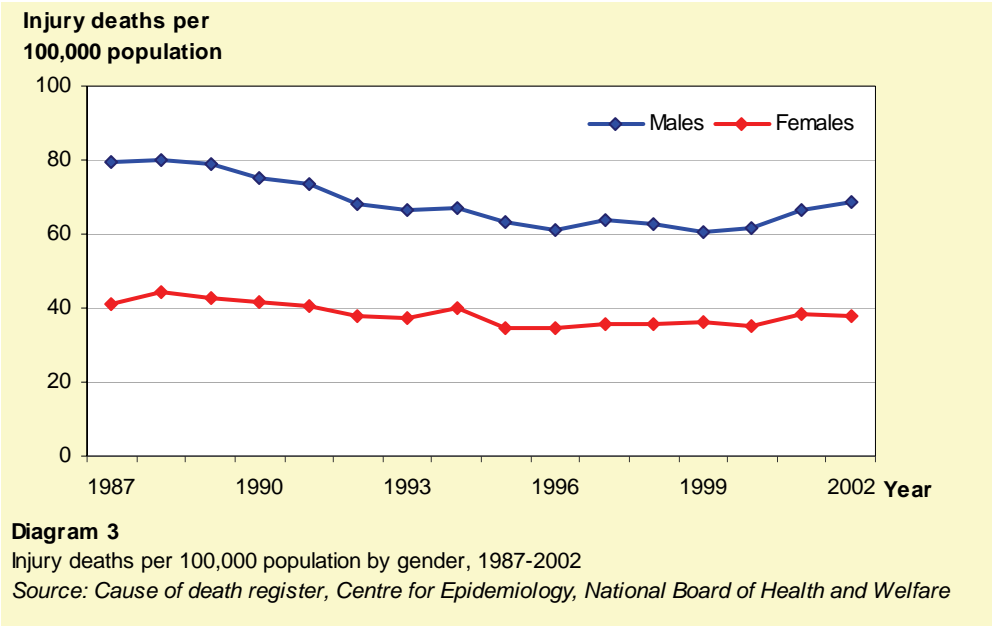
<sup>1</sup> Centre for Epidemiology, National Board of Health and Welfare

<sup>2</sup> *På väg mot ett skadefritt Sverige*, Swedish National Institute of Public Health, 1996

An important measure when comparing statistics for different causes of mortality is premature death. Mortality rates, the number of dead persons per 100,000 population and year, do not take into consideration if the victim is young or old. Calculations of the years of potential life lost (YPLL) take into consideration not only the number of deaths, but also the number of years lost compared to a certain age. As is shown in diagram 2, injury is the dominating cause of reduction of life expectancy among males while different types of tumours are the leading cause among females.



As can be seen in diagram 3, the number of injury deaths has decreased during the time period from 1987 to 1999. The decrease has been greater for males than for females. During the later years of the study, the decrease has been replaced by an increase for both genders.



**Table 1**

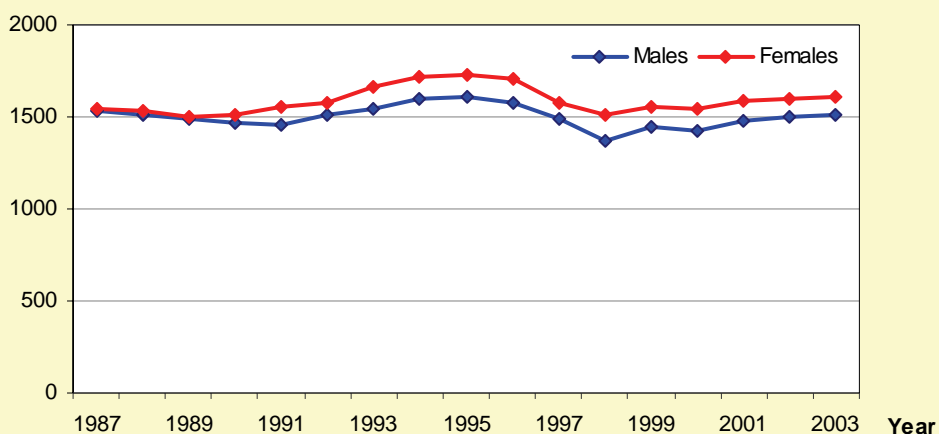
Hospital discharges due to injuries per 100,000 population by injury category, 1991-2003

Source: Hospital discharge register, Centre for Epidemiology, National Board of Health and Welfare

Hospital discharges per 100,000 population due to injuries	Year												
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>Total</b>	<b>1510</b>	<b>1544</b>	<b>1602</b>	<b>1658</b>	<b>1665</b>	<b>1644</b>	<b>1535</b>	<b>1444</b>	<b>1496</b>	<b>1486</b>	<b>1530</b>	<b>1547</b>	<b>1558</b>
<b>Accidents</b>	<b>1138</b>	<b>1138</b>	<b>1175</b>	<b>1211</b>	<b>1224</b>	<b>1204</b>	<b>1178</b>	<b>1116</b>	<b>1137</b>	<b>1124</b>	<b>1145</b>	<b>1143</b>	<b>1130</b>
thereof													
falls	733	726	769	784	802	801	801	781	783	766	788	773	766
road traffic	155	157	146	147	149	139	142	126	144	146	150	153	155
other object*	49	52	52	56	54	52	63	56	58	58	59	58	58
accidents with animals, insects, poisonous plants	15	19	18	21	20	22	21	19	21	22	20	23	22
poisoning	35	35	37	38	38	34	25	21	21	21	20	18	18
machine related accidents	37	35	37	40	39	38	22	17	17	17	15	14	13
other accidents	56	57	59	62	59	59	40	32	33	34	33	39	43
<b>Self-inflicted injuries</b>	<b>71</b>	<b>68</b>	<b>69</b>	<b>75</b>	<b>78</b>	<b>77</b>	<b>69</b>	<b>64</b>	<b>69</b>	<b>70</b>	<b>79</b>	<b>77</b>	<b>77</b>
<b>Violence</b>	<b>29</b>	<b>30</b>	<b>31</b>	<b>35</b>	<b>31</b>	<b>31</b>	<b>28</b>	<b>24</b>	<b>26</b>	<b>25</b>	<b>25</b>	<b>26</b>	<b>26</b>
<b>Undetermined intention</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>23</b>	<b>23</b>	<b>13</b>	<b>10</b>	<b>12</b>	<b>12</b>	<b>11</b>	<b>10</b>	<b>11</b>
<b>Medical complications</b>	<b>253</b>	<b>288</b>	<b>305</b>	<b>314</b>	<b>309</b>	<b>310</b>	<b>245</b>	<b>231</b>	<b>253</b>	<b>254</b>	<b>270</b>	<b>291</b>	<b>313</b>

\* contact with other object or person

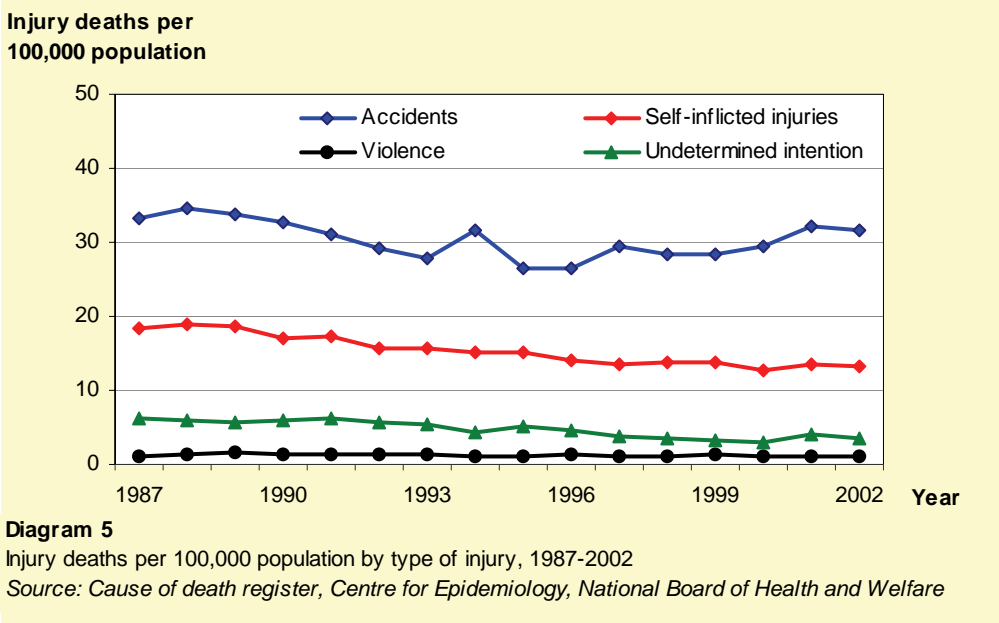
When it comes to the number of hospital discharges due to injuries (diagram 4), the same decrease as for the number of deaths cannot be observed. The difference between males and females is significantly smaller and is even reversed.

**Hospital discharges per 100,000 population****Diagram 4**

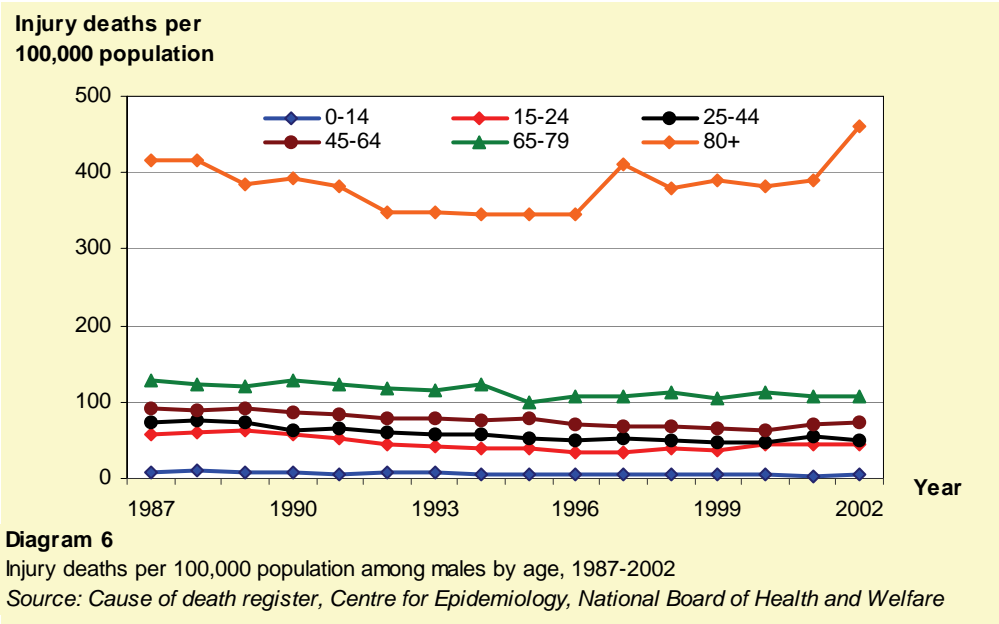
Hospital discharges due to injuries by gender, 1987-2003

Source: Hospital discharge register, Centre for Epidemiology, National Board of Health and Welfare

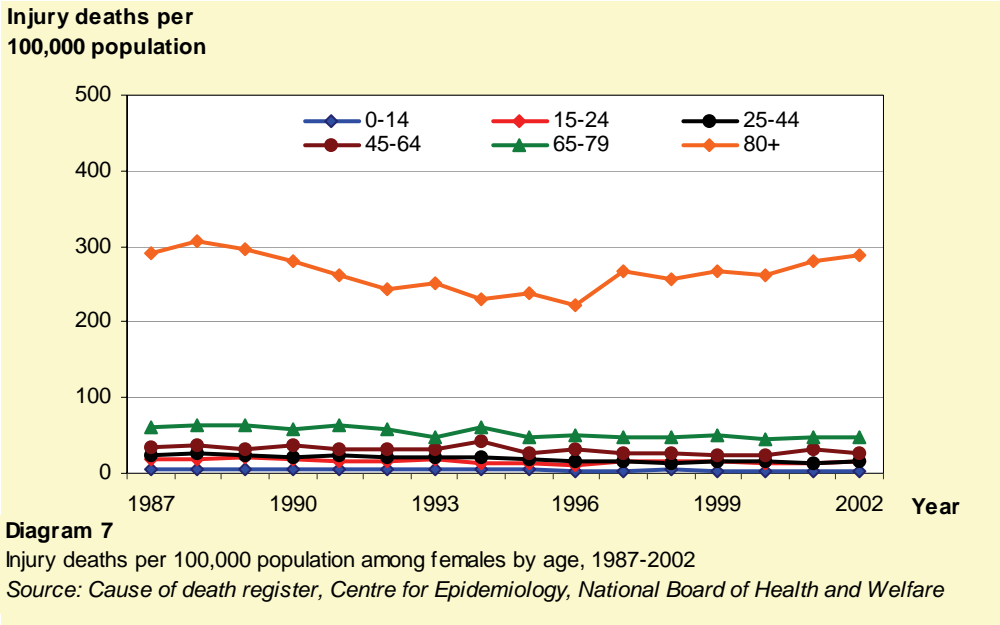
In diagram 5, injury deaths have been broken down into different categories. As can be seen, accidents dominate followed by suicides. Above all, injury categories like suicide and undetermined intention have decreased during the current time period.



If we instead look at the number of injury deaths per 100,000 population split up into males (diagram 6) and females (diagram 7) by age group, an increase of the incidence by age for both genders can be observed. During the whole period from 1987 to 2002, the incidence decreased for the age group 65 – 79 years for both genders, while there was an increase of incidence during later years for females aged 80 years and older. The drastic increase between the years 1996 and 1997 coincides with the transition of classification from ICD 9 to ICD 10.

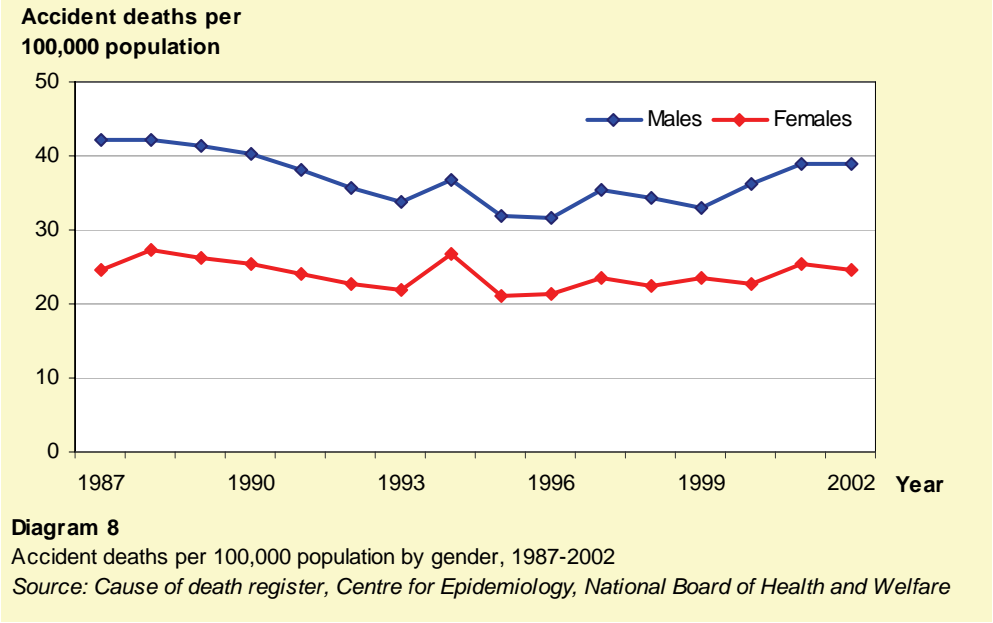




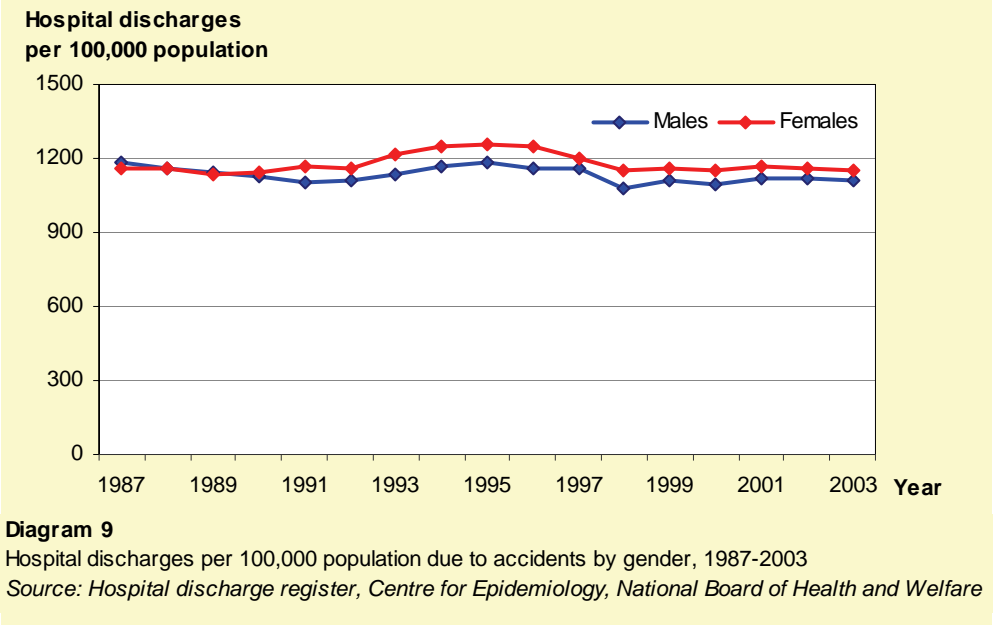


## Accidents

Accidents are the largest individual injury category and account for more than 60 percent of all injury deaths. The type of accident resulting in the majority of deaths is falls, followed by road traffic accidents. As can be seen in diagram 8, males dominate accident statistics. A weak decreasing trend has been replaced by an increasing trend the last two years.



When it comes to the number of persons discharged from hospitals due to accidents, (diagram 9), no changes can be observed over time. The difference between males and females is considerably smaller and even reversed when compared to accident deaths.



The distribution of the most common types of fatal accidents during the last decade is shown in table 2. The observed differences between various years are not only caused by actual changes in mortality patterns but also by minor changes of methods and coding instructions for injury classifications. In 1997, a major change in classifying *falls* occurred and from the year 2000, rules for classifying *poisonings* changed. The group *other accidents* includes accidents where the circumstances are not clear. In-depth studies of this group show that falling causes 75 percent of the cases.

**Table 2**  
Accident deaths per 100,000 population, 1991-2002  
Source: Cause of Death Register, Centre for Epidemiology, National Board of Health and Welfare

	Year											
Accident deaths per 100,000 population	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Total</b>	<b>31</b>	<b>29</b>	<b>28</b>	<b>37</b>	<b>26</b>	<b>26</b>	<b>29</b>	<b>28</b>	<b>28</b>	<b>29</b>	<b>32</b>	<b>32</b>
thereof												
falls	4.5	4.1	4.1	4.3	4.4	4.8	6.6	5.4	5.7	5.5	6.1	6.6
road traffic	8.3	8.3	6.9	5.9	5.9	5.7	5.7	5.7	5.7	6.3	6.3	5.5
poisoning	1.5	1.3	1.3	1.2	1.4	1.5	1.2	1.5	1.7	2.5	3.4	2.9
fire	1.2	0.9	0.9	1	0.8	1.1	1	1.6	0.8	1	1.1	1.2
drowning	2.1	1.5	1.7	7.4	1.6	1.1	1.7	1.6	1.4	1.5	1.7	1.8
suffocation	1.2	1.7	1.3	1.3	1.5	1.3	1.3	1.5	1.1	1.3	1.1	1.1
other accidents	10.3	9.4	9.5	8.6	9	9.1	9.8	9.4	10.3	9.8	10.6	11.4

The number of deaths due to **falls** continues to increase. The increase is higher for older females than what could be explained by an increase in the number of older females in the population.

The number of deaths due to **poisonings** has had a dramatic increase during the last two years, above all among males.

The number of deaths due to **fire** is unchanged. In statistics from the Swedish Rescue Services Agency, which also include deaths due to fires in vehicles, the number of deaths is stable within 100 to 130 cases per year.

There has been a decreasing trend of deaths due to **drowning**. During 2002 and 2003 a slight increase can be noticed.

The number of deaths due to **electrical accidents** has had a long-term decreasing trend, but seems to have stabilised at about five deaths per year.

The number of deaths due to **road traffic accidents** continues to decrease. During the last two years, however, a marginal increase can be observed, mainly among younger road users. Primarily large decreases in road traffic related deaths have in the last two decades occurred among vulnerable road users like pedestrians, moped drivers, cyclists and among car passengers. On the other hand, the number of injured persons reported by the police has increased.

The number of dead and injured persons due to accidents within the **railway system** is low and somewhat decreasing. Deaths (nowadays less than 20 per year) are primarily found at level crossings.

The number of deaths due to accidents within **civil aviation** is low. Fatalities occur usually within private aviation. In 2001 three private pilots were killed.

The number of deaths within the commercial **shipping** is very low. Nonetheless, every year a number of deaths occur due to accidents within the non-commercial shipping. The long-term trend for deaths related to non-commercial shipping is decreasing.

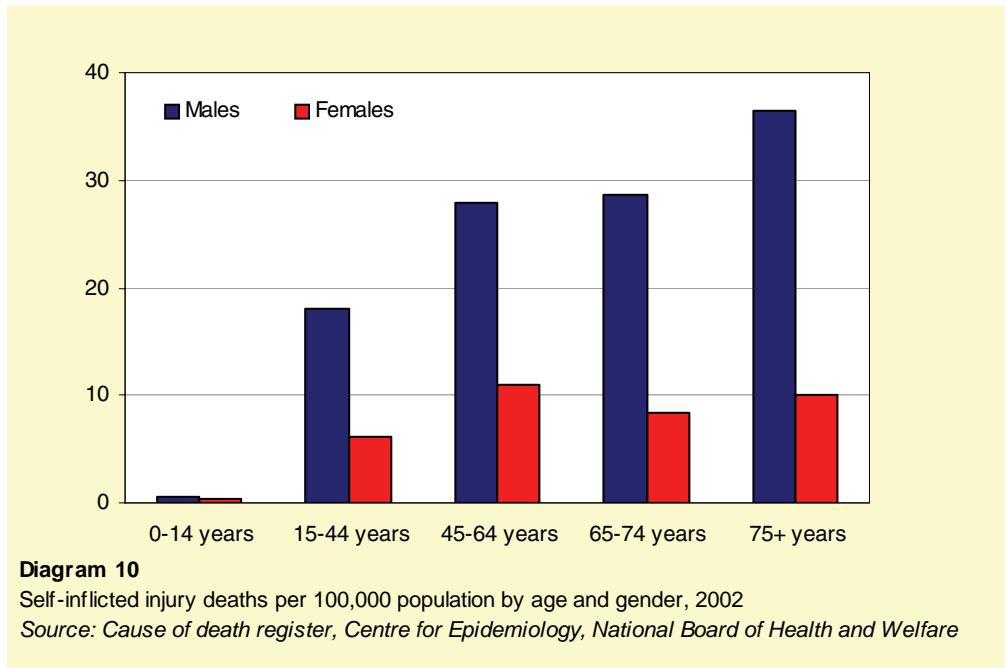
The number of deaths due to accidents at **workplaces** has been decreasing during the years. The decrease has levelled off in recent years. The number of deaths due to accidents among employees is below 50 fatalities per year and the number of deaths among self-employed is lower than 20 cases per year.

The number of **larger events**, which take many lives, have decreased both in number and extent.

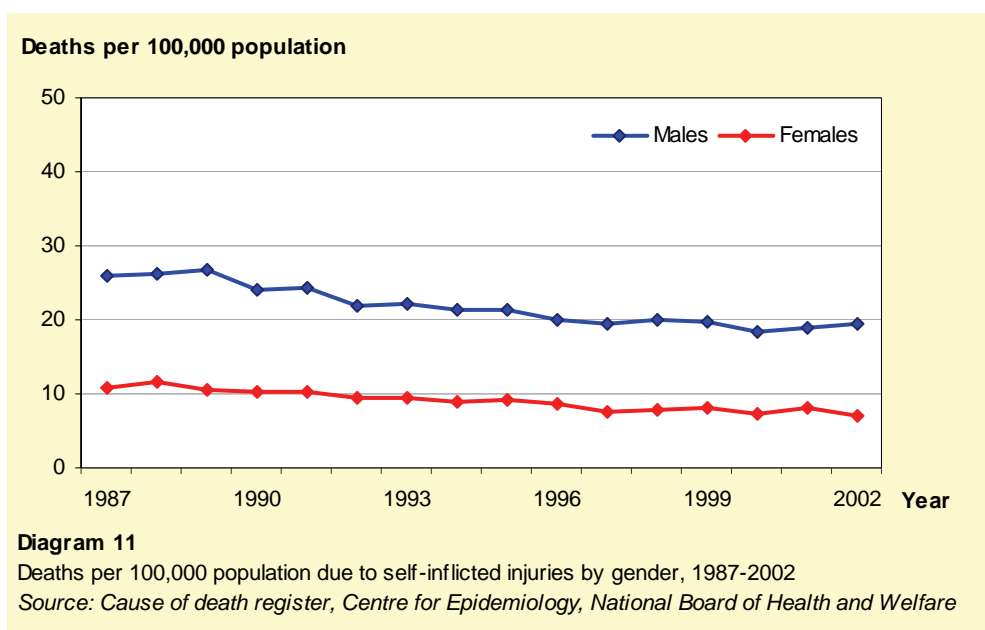
## Self-inflicted injuries

Self-inflicted injuries are the second largest injury category after accidents and account for almost 30 percent of all deaths due to injuries.

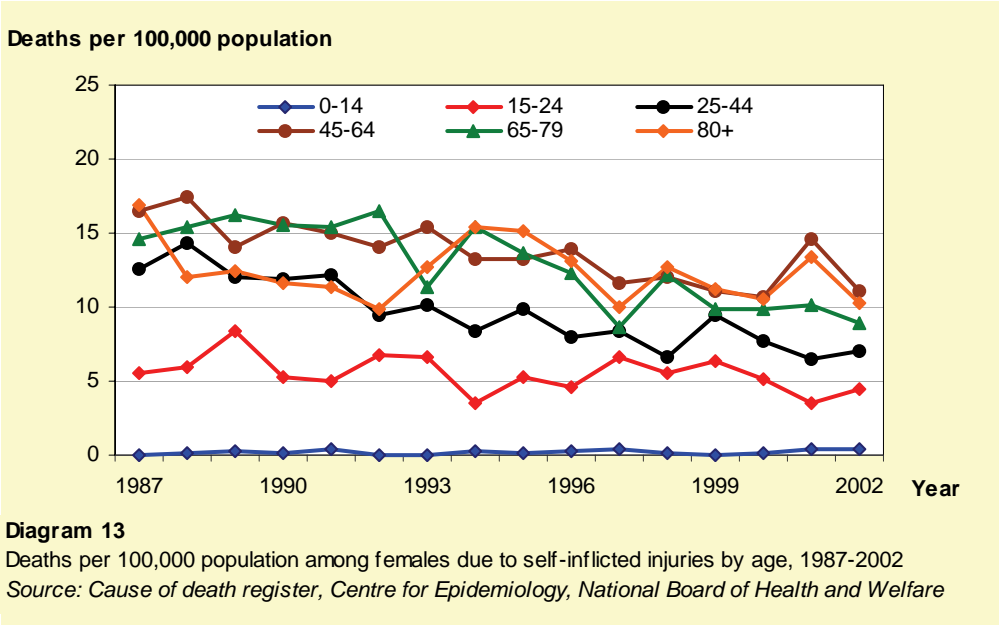
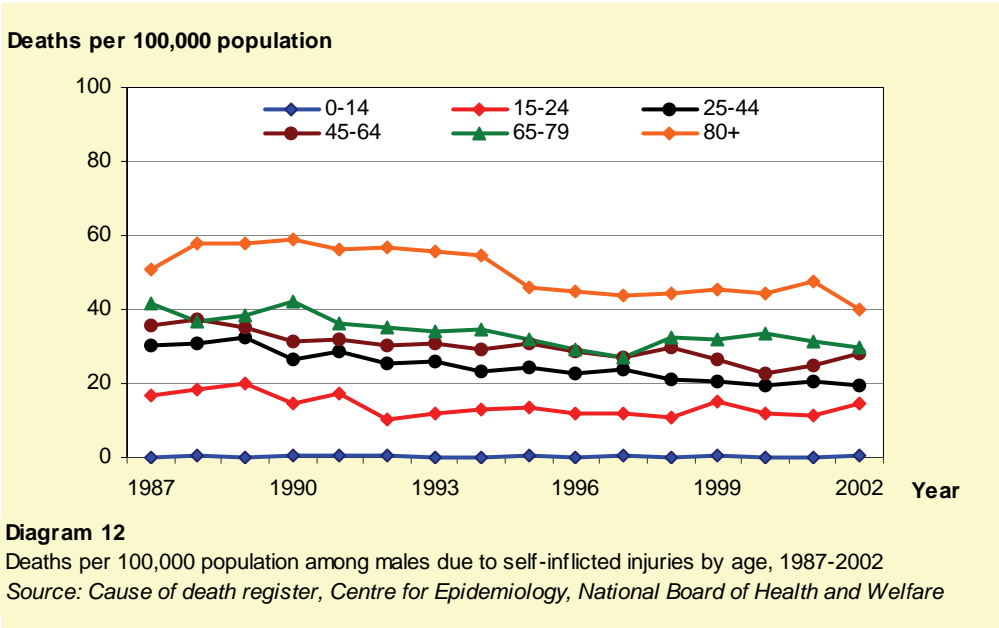
Diagram 10 shows that males are overrepresented and dominate this injury category. Suicide is a problem that increases with age, especially among males. Among adult females the incident-rates are relatively stable.



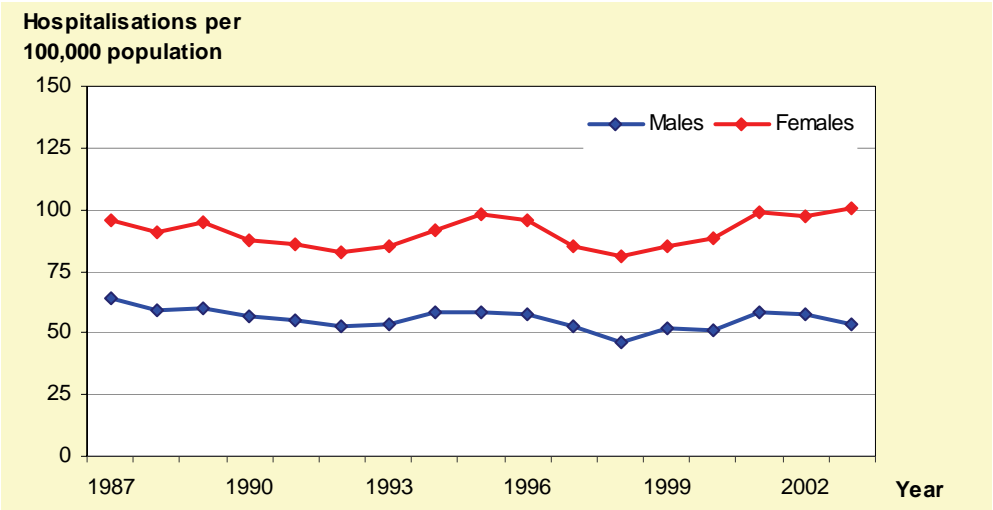
The number of deaths due to self-inflicted injuries has decreased during the time period from 1987 to 2002 for both males and females, but mostly for males (see diagram 11).



As can be seen in diagram 12, the largest decrease can be observed for males in the age group 65 to 79 years. In the other age groups the decrease is lower. Corresponding figures for females show a significantly lower decrease (diagram 13).

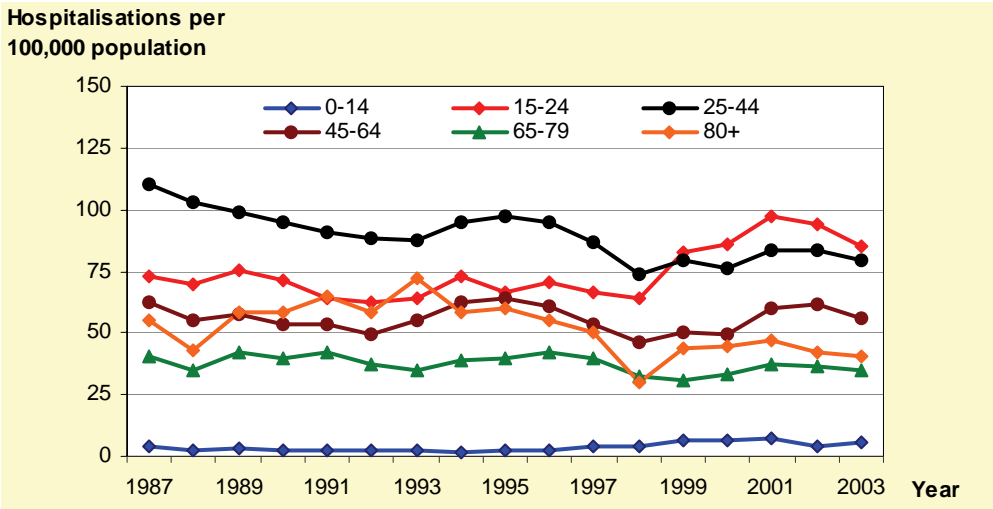


The decreasing trend that could be seen among deaths due to self-inflicted injuries cannot be observed among those treated at hospitals. As can be seen in diagram 14, females are overrepresented. For females, a certain increase with regard to hospitalisations can be noticed. There is a small increase among males in recent years.

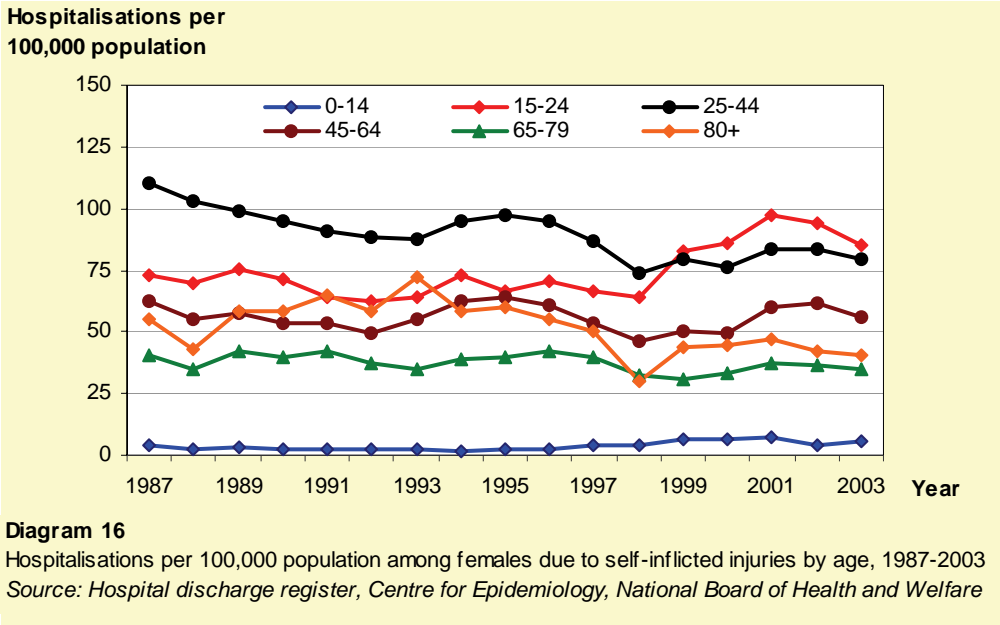


**Diagram 14**  
Hospitalisations per 100,000 population due to self-inflicted injuries by gender, 1987-2003  
Source: Hospital discharge register, Centre for Epidemiology, National Board of Health and Welfare

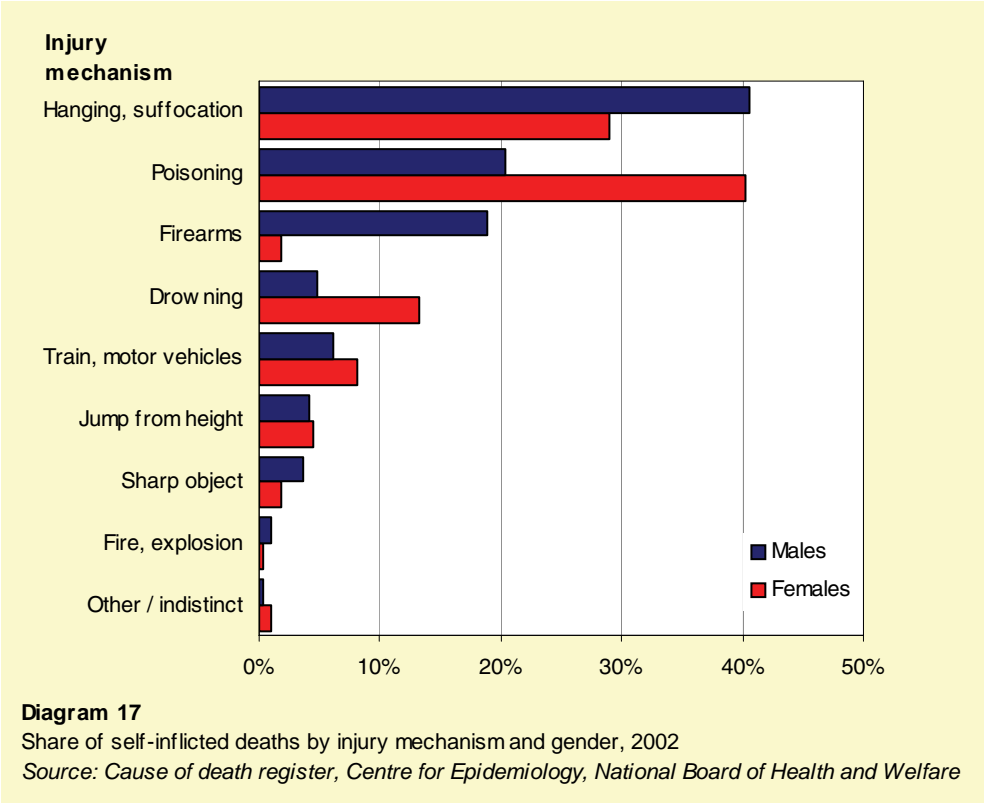
There is an increase of self-inflicted injuries among males in the age group 15 to 24 years and to some extent in the age group 25 to 64 years (see diagram 15). Among females there is an obvious increase in the age group 15 to 24 years (diagram 16).



**Diagram 15**  
Hospitalisations per 100,000 population among males due to self-inflicted injuries by age, 1987-2003  
Source: Hospital discharge register, Centre for Epidemiology, National Board of Health and Welfare

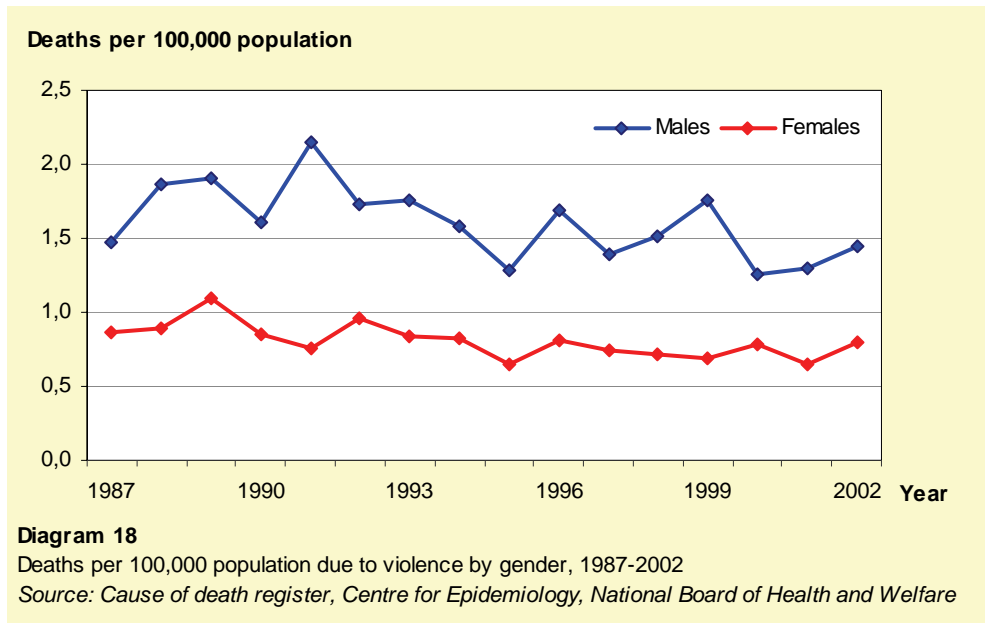


Self-inflicted injuries differ from those caused by accidents according to the distribution between injury mechanisms (diagram 17). The most common injury mechanism among males is hanging/suffocation while poisoning is the most common injury mechanism among females.

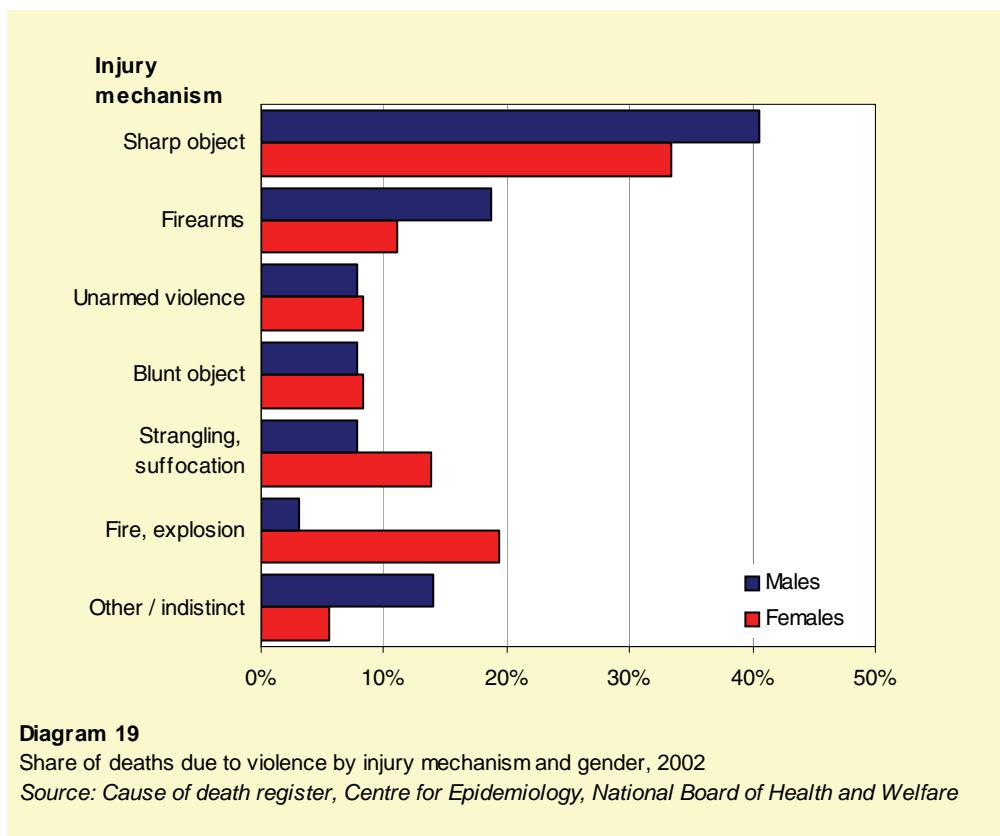


## Interpersonal violence (homicide)

Males are overrepresented in this category of injuries due to interpersonal violence. As can be seen in diagram 18, the number of deaths has been unchanged during the time period 1987-2002. In total, 100 fatalities occurred in 2002.

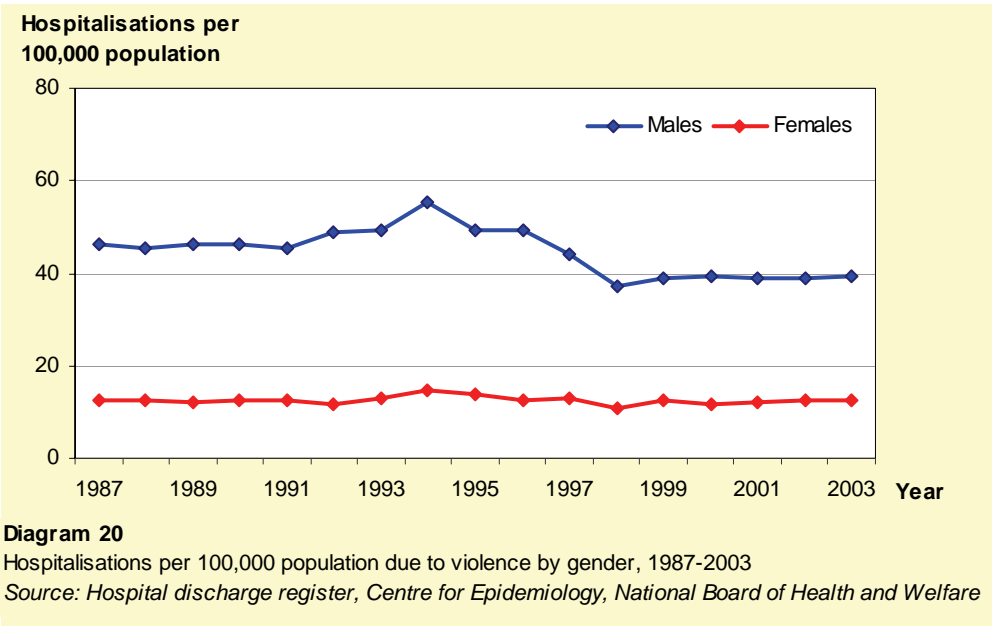


Violence also shows injury mechanisms that can be found among accidents and suicide as well. The distribution of the different types of injury mechanisms is shown in diagram 19.



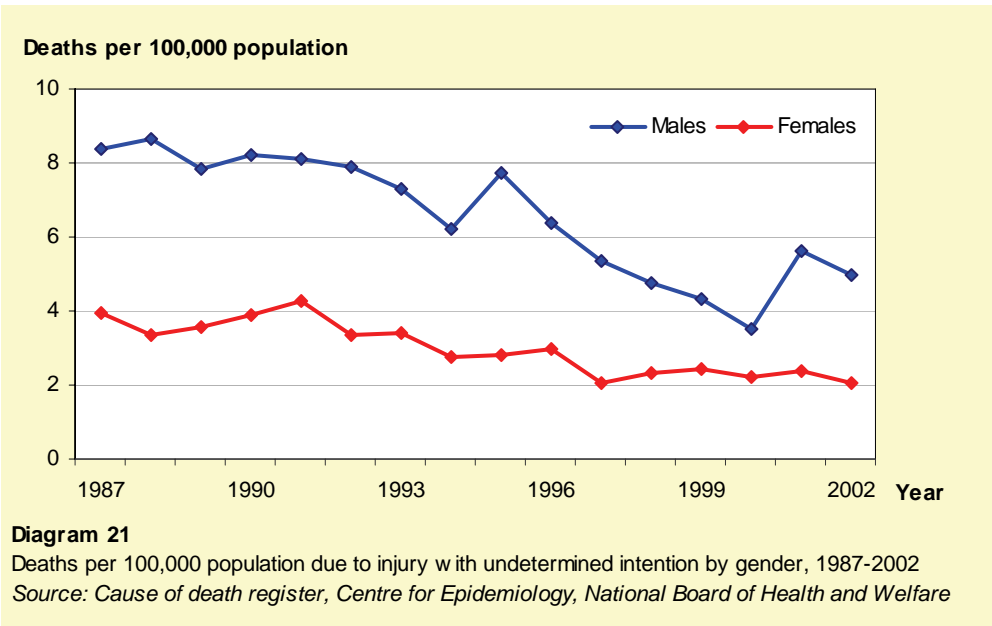


Males dominate even more in regard to persons treated as in-patients at hospitals due to interpersonal violence (diagram 20). The number of in-patients as well as the number of deaths has been unchanged during the time period. In total more than 2,300 persons have been so seriously injured that they needed in-patient hospital treatment.

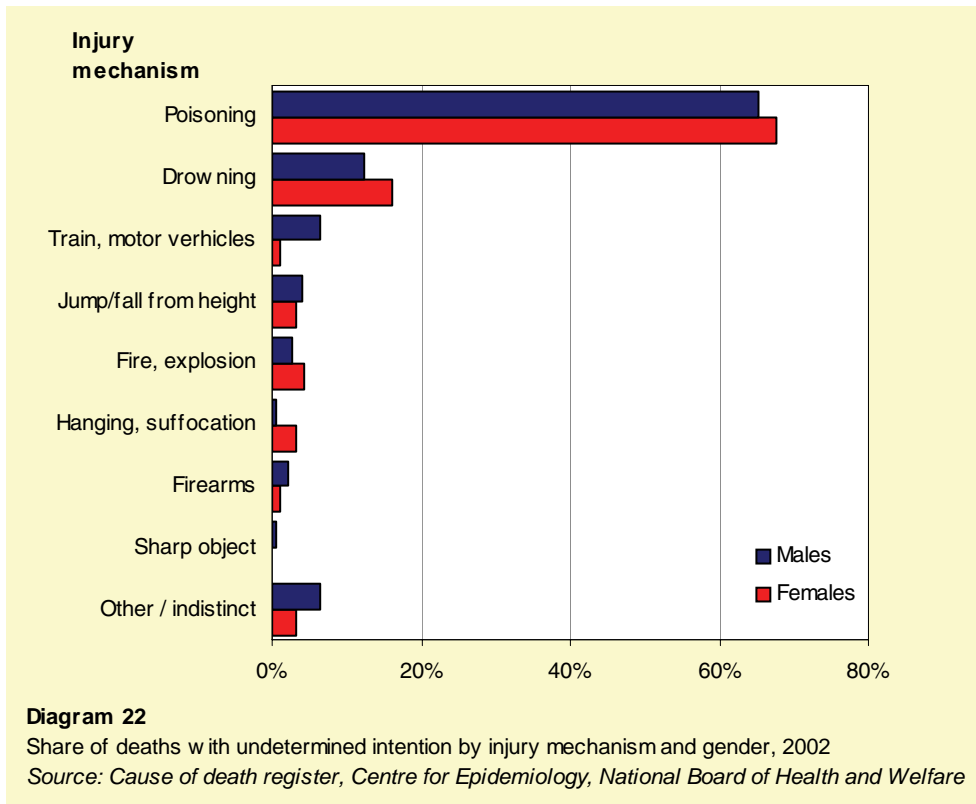


### Injuries with undetermined intention

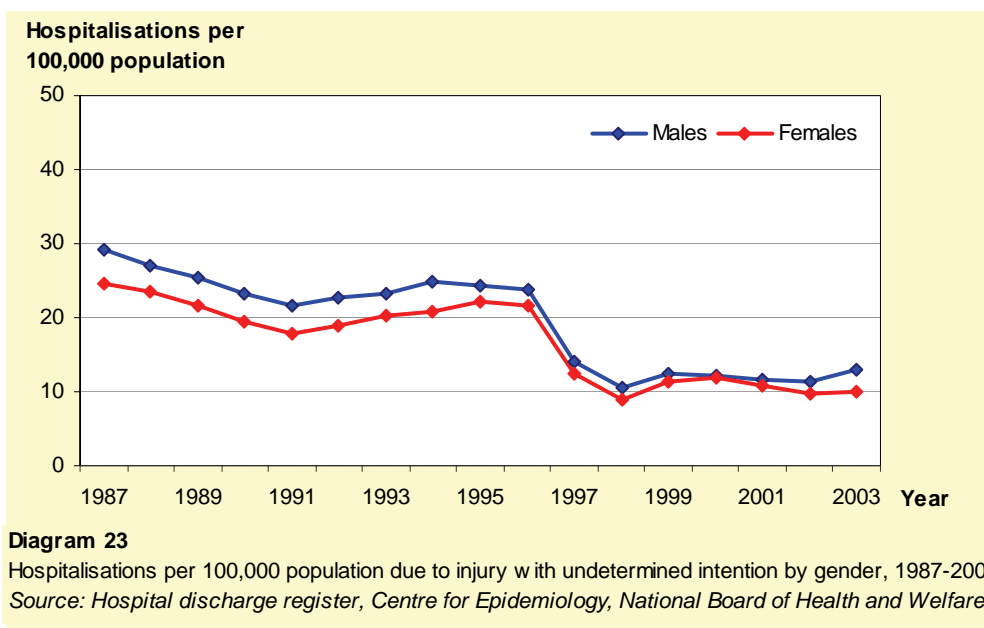
The number of deaths due to injuries with undetermined intention has decreased both for males and females during the period 1987 to 2002. As can be seen in diagram 21, males are overrepresented. The increase for males during 2002 is at large caused by an increase in poisoning.



The category of undetermined intention also contains injury mechanisms, the same types as within other categories of injury. During the year 2002, a total of 314 deaths were classified within this category. Poisoning is the dominating type of mechanism (diagram 22).



A decrease can be observed in regard to persons treated as in-patients at hospitals due to injuries with undetermined intention. There is no gender difference among those treated as in-patients at hospitals.



# Appendix

The National Board of Health and Welfare cause of death register only includes persons registered in Sweden. On the other hand, the death does not have to occur in Sweden. This means that for example people registered in Sweden who died in the loss of the ro-ro ferry Estonia are included in the statistics.

In the list below the different categories which have been used are shown, together with the criteria which have been the basis for this compilation.

<b>External cause</b>	<b>ICD-9 E-codes (1987-1996)</b>	<b>ICD-10 Chapter XX-codes (1997-2001)</b>
Road traffic	810-819, 826-829	V01-V79, V87-V89
Fall	880-886, 888	W00-W19
Poisoning	850-869	X40-X49
Drowning	830, 832, 910	V90, V92, W65-W74
Open torch, fire	890-899	X00-X09
Suffocation	911-913	W75-W84
Other object*	917-918	W21-W27, W50-W52
Machine accident	919-920	W28-W31
Accident with animals, insects or poisonous plants	905-906	W53-W64, X20-X29
Other accidents	887, 900, 902-904, 907-909, 926-928	W41-W43, W45-W49, W88-W92, W94, X30, X32-X39, X50-X59
Intentional self destructive act	950-958	X60-X84
Assault by another person	960-968	X85-Y09
Injury with indistinct intention	980-988	Y10-Y34

\*contact with other object or person

To improve the opportunities for comparison over time, the compiled material has been age standardised. This means that the deaths per 100,000 population and the number of institutionally cared for per 100,000 of the population have been calculated with a constant distribution. The observed trend still remaining is caused by other factors than changes in the age distribution of the population. The population in Sweden 2000 has been used as the standard population. Age standardised numbers have been calculated through so-called direct standardisation.





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