

# Trauma Epidemiology

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## Background:

### Avoidable deaths in autopsy material 1988-96

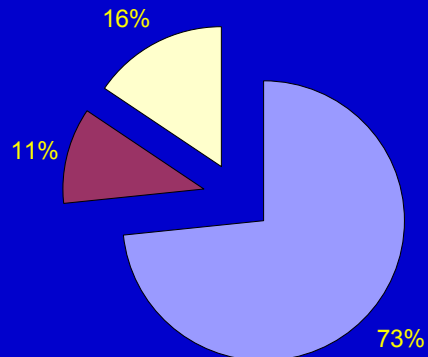
- 70 avoidable deaths (21%).
  - Among these, 15 (21%) died of head injuries, 17 (24%) of thoracic, abdominal, or pelvic injuries,
  - and 38 (54%) of medical complications.

Eur J Surg. 1999 Sep;165(9):828-3.

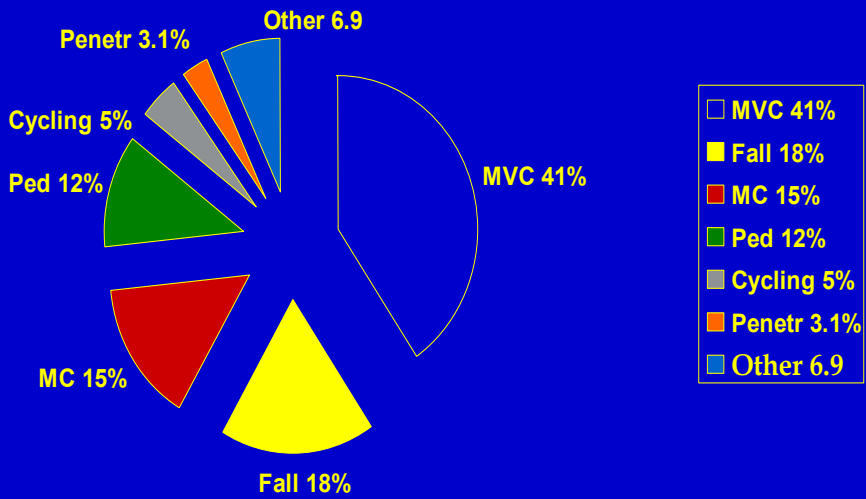
## Room for improvement!

## Accidental deaths per 100 000 Sweden 2003

•Falls	8
•Traffic	5,7
•Other	37,8



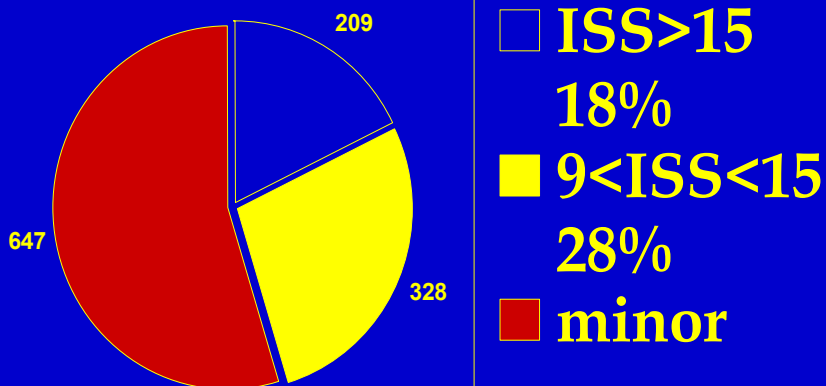
# Causes of trauma KS 2000



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# Trauma cases admitted at KS 2000, n total 1184



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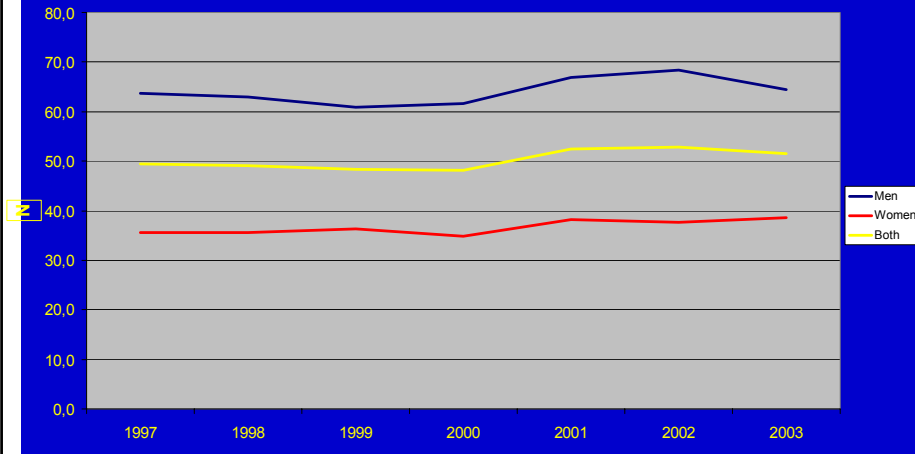
## Radiology findings may- june 2003, n=144

Skull	27%	Other abd	6%
Face	14%	Pelvis	6%
C spine	6% (3/9 unstable)	Upper Xtr	8%
T_L spine	13% (9/18 unst)	Lower xtr	20%
Thorax	24%	Incidental	15% (2 sign)
Pnths	9%	No finding	26% n=38
Liver	3%	GSW	3%
Spleen	6%	Knife	2%

One in three road accident deaths  
in Sweden involve people <25  
years old

# Sweden, Accidents

Deaths per 100 000

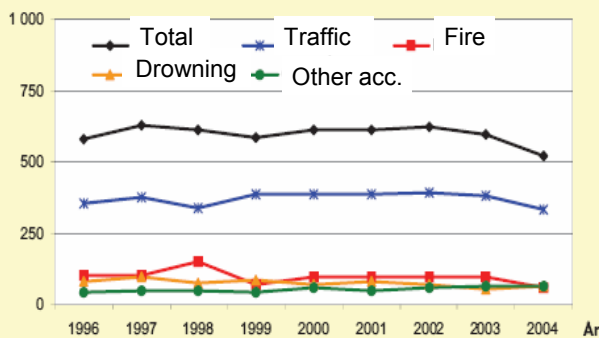


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# Accidental deaths, rescue statistics

N

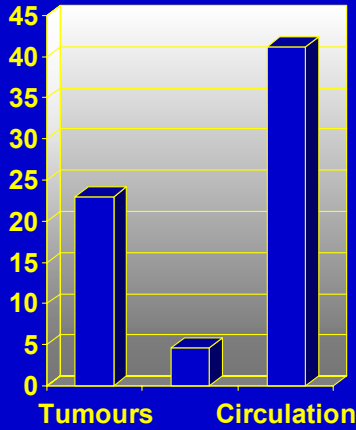


Disco fire 1998  
(statistical underestimation)

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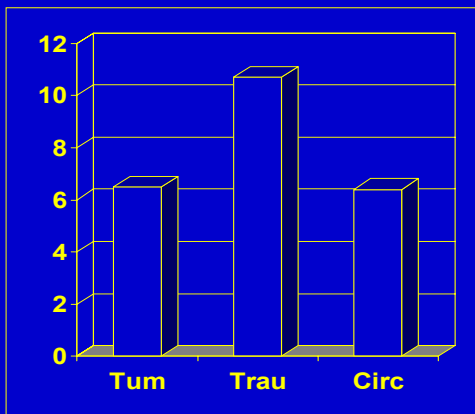
## Death causes Sweden 2003, thousands



Trauma 4600=

51/100 000 inhabitants

## YPPL (Years of potential life lost ) =Lost young lifeyears



Lost lifeyears  
younger than 65

## YPL (Years of potential life lost )

65 minus death age for those dead before age 65.

The sum of years is related to per 1000 inhabitants, age 1-64

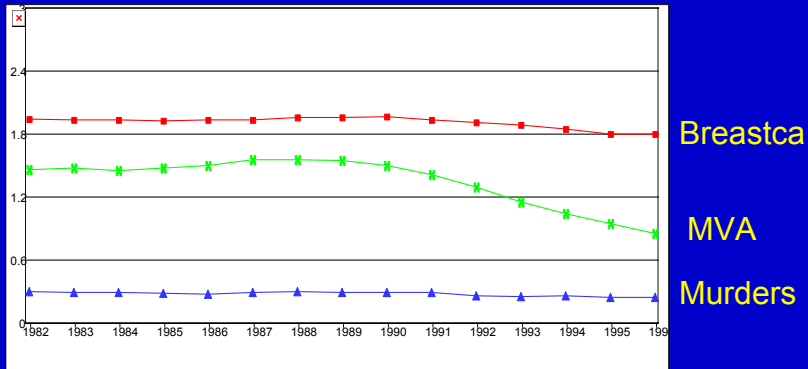
## Years of potential life lost (YPLL)

For routine publication of Table V, YPLL is defined as the number of years of potential life lost by each death occurring before a predetermined end point, set at age 65 years. CDC calculates YPLL over the age range from birth to 65 years using age-specific death rates for 15 selected causes and supplementary data on causes of infant mortality, provided yearly by the National Center for Health Statistics (NCHS) (12). For timeliness, these data are estimated from a 10% sample of all death certificates filed during the year. Causes of death are grouped by an algorithm devised by NCHS to reflect the underlying cause of death as reported on the death certificate and the pathophysiologic process or organ system involved (i.e., malignant neoplasms or diseases of the heart).

The cause- and age-specific death rate is multiplied by the estimated population in that age range (provided by the Bureau of the Census) to determine the number and age distribution of deaths attributable to a specific cause (13). The number of deaths for each age is then multiplied by the years of life lost (the difference between the designated 65-year end point and the midpoint of the age range) to give an age-specific YPLL. For example, in the population 15-24 years old, the midpoint is 20 years and the YPLL is 45 years. Finally, the age-specific YPLLs are summed to give a total YPLL for each cause. The resulting distribution of YPLL, by cause, appears monthly as Table V (Table 1).

CDC 1986

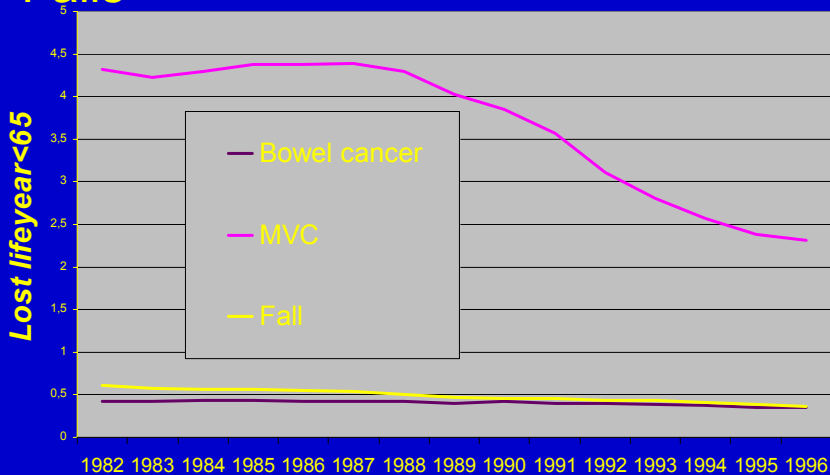
# Women lost lifeyears <65



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# Lost lifeyears men <65 colon ca, MVC, Falls



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## California 1993

In terms of potential years of life lost (years lost before age 65), the most important causes of death in 1993 were

- unintentional injury (756 years lost/100,000 population),
- cancer (632 years), and the
- acquired immunodeficiency syndrome (AIDS; 491 years).

Ragland et al West J Med. 1998 May; 168(5): 378–399



## US traffic situation

41,471 fatalities and  
3,192,000 injuries,  
414,960 of them serious.

The 1998 [NHTSA](#) report "[Traffic Safety Facts 1998 Annual Report](#)" reports



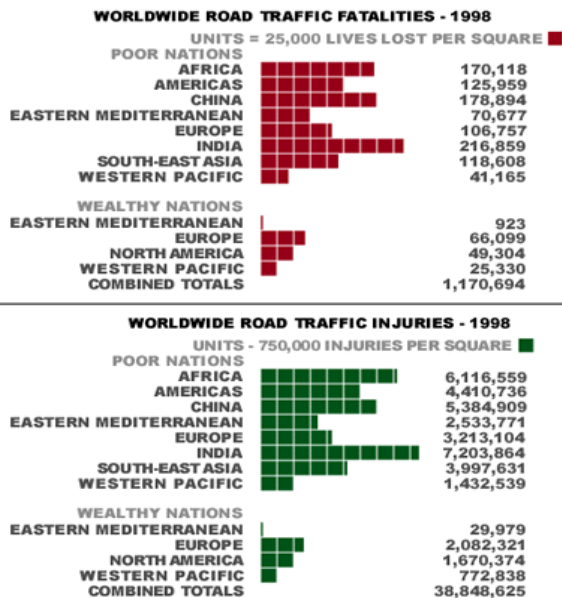
## WHO&World Bank report "The Global Burden of Disease"

Deaths from non-communicable diseases are expected to climb from 28.1 million a year in 1990 to 49.7 million by 2020 -  $\approx$  +77%.

Traffic accidents are the main cause of this rise. Road traffic injuries are expected to take third place in the rank order of disease burden by the year 2020.



## WHO report 1998



## WHO report 1998 traffic toll

Western Europe      66 000 deaths, 2,1 M injured  
Non Western Europe 107 000 deaths , 3,2 M injured  
North America      49 000 deaths 1.7 M injured

India                  217 000 deaths          7,2 M injured

Total    1,17 Million traffic deaths = 18/100 000 inh  
          38,8 Million injured

## Global burden of disease study

Injuries, which account for 10% of global mortality, are often ignored as a major cause of death and may require innovative strategies to reduce their toll.

Global burden of disease study

Lancet [Volume 349, Issue 9061](#) , 3 May 1997, Pages 1269-1276

# WHO

## Global burden of disease

### Avian influenza

207 cases

115 deaths

Cumulative worldwide since 2003

For every avian flu death there are 31 000 traffic deaths

## AGE impact, Swe 2002

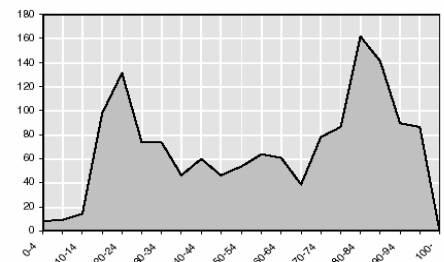
Many young die

For the injured  
elderly the prognosis  
is much worse

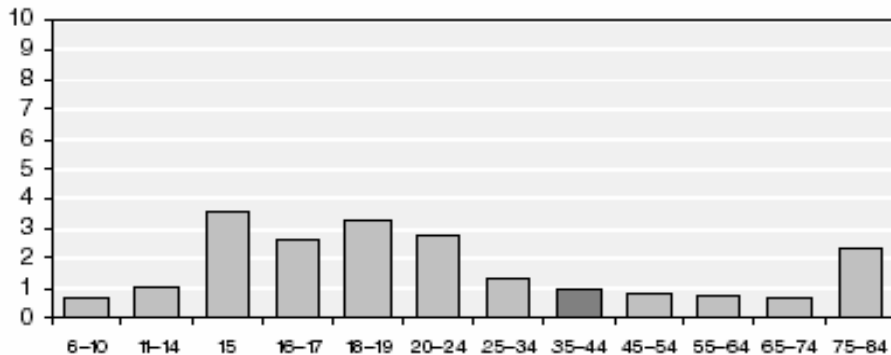
Antal svårt skadade per 100 000 invånare, år 2002.  
*Persons severely injured per 100 000 of the population*



Antal dödade per 1 miljon invånare (åldersintervall om 5 år)<sup>2</sup>, år 2002.  
*Persons killed per 1 million of the population*



## Relative severe injury risk, age 35-44=1



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## Hip fracture

### 2,3 times increased death risk

2,245 incident hip fracture cases and 4,035 controls 50-81 YO

896 hip fracture patients (40%) and 516 (13%) controls died

The relative risk (RR) of death, adjusted for age and previous hospitalization for serious disease, was 2.3 (95% CI 2.0-2.5).

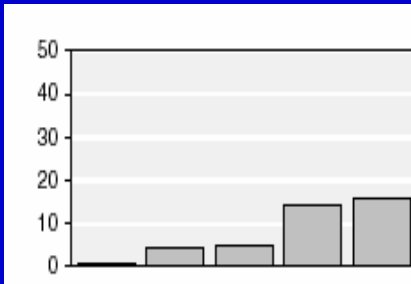
Osteoporos Int. 2005 Dec;16(12):1583-90. Epub 2005 Oct 11.

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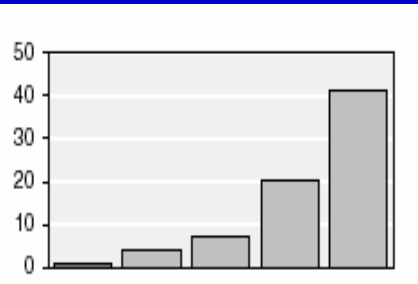
# Relative risks of death or injury

Relative death risk, car=1



Car pedest. Cyclist, MC Moped

Relative severe injury risk, car=1



Car pedest. Cyclist, MC Moped

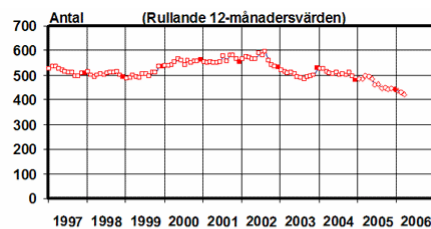


# Swedish Road statistics

-35%

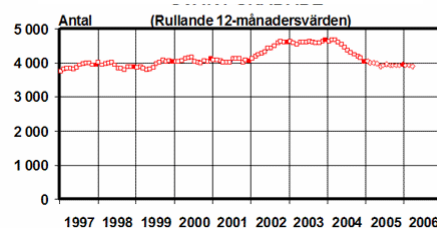
No change

## Deaths

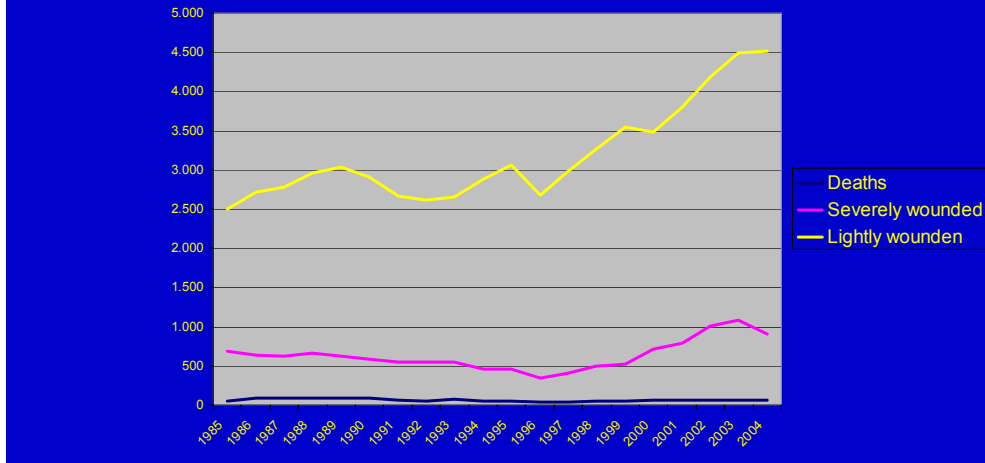


\*Personer som avlidit till följd av sjukdom är inte medtagna

## Severely wounded police statistics



## Deaths and wounded Stockholm



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## Socioeconomic differences

Relative risk of death through accident is 1.76 for boys from non educated working families than sons of white collar workers

Samhällets olycksbarn, 1998).

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## Boxing day Tsunami 2004

250 000 casualties

Ca 534 swedes

When disasters hit 3rd world countries  
the effects are often devastating

Lack of housing, medicine, infrastructure, clean  
water.....

Hospitalised trauma cases  
/100 000 inh.and year 2001-2003

Men 1.244

Women 1.317

SOS epc

## Hospitalised/100000 inhabitants Sweden 2001-2003

<b>Road accident</b>	<b>men</b>	<b>181,6</b>
	<b>women</b>	<b>120,3</b>
<b>Fall</b>	<b>men</b>	<b>654,2</b>
	<b>women</b>	<b>897,0</b>
<b>Other accident</b>	<b>men</b>	<b>278,0</b>
	<b>women</b>	<b>145,0</b>
<b><u>Intentional injury</u></b>	<b>men</b>	<b>106,1</b>
	<b>women</b>	<b>119,7</b>
<b>Commotio</b>	<b>men</b>	<b>171,1</b>
	<b>women</b>	<b>122,2</b>
<b><u>Hip fracture</u></b>	<b>men</b>	<b>120,5</b>
	<b>women</b>	<b>284,4</b>

## City vs countryside 1996

Accidents, YPPL (Years of potential life lost )

Area	Men	Women
Sweden	4.96	1.79
Stockholm	4.38	1.73
V. Götaland	5.13	1.91
Gotlands	9.51	1.61
Norrbottn	7.32	2.37

## Accidents

### City vs countryside 1996 Sweden

Relative risk of YPPL (Years of potential life lost )

Area	Men	Women
Sweden	1	1
Stockholm	0,88	0,97
V. Götaland	1,03	1,07
Gotland	1,92	0,90
Norrbottn	1,48	1,32

## Head injury deaths in the Nordic countries 1987-2000

Finland 21,2 per 100 000 per year.

Denmark 12,8,

Norway 10,5

Sweden 9,8 per 100 000 per year

- For Stockholm area ca 180 persons/year.

# Sweden 2001

Trauma largest cause of deaths < 45.

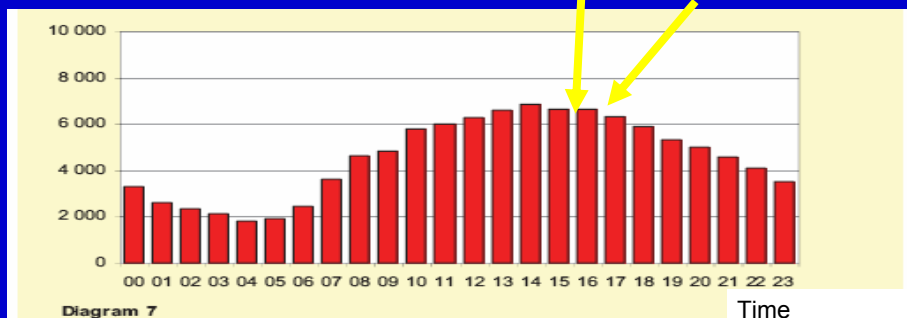
- Mortality reduced by 37 % for men and 50% for women since 1980
- Traffic is the domination cause of deaths causing 20% of trauma deaths.

Mortality is greatest in low populated areas

- SOS report

# When do accidents occur? Sweden 2004

Number of rescue events



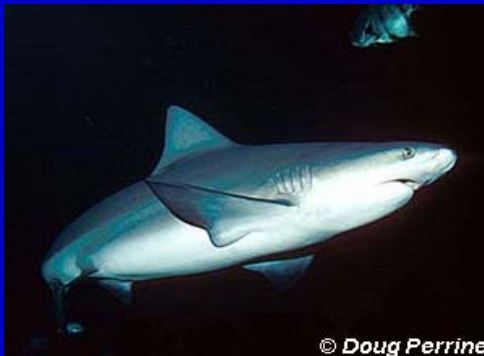
## Which is safer flying or driving?

	Fatalities per million trips	Odds of being killed on a single trip
Airliner (Part 121)	0.019	52.6 million to 1
Automobile	0.130	7.6 million to 1
Commuter Airline (Part 135 scheduled)	1.72	581,395 to 1
Commuter Plane (Part 135 - Air taxi on demand)	6.10	163,934 to 1
General Aviation (Part 91)	13.3	73,187 to 1

Sources: NTSB Accidents and Accident Rates by NTSB Classification 1995-2004 DOT Fatality Analysis Reporting System (FARS) 1995- 2004 Insurance Institute for Highway Safety



## Shark attacks worldwide



© Doug Perrine

Four fatalities occurred in 2005, the five-year average from 2001-2005 was 4.4 per year

6/10 billion inh

750 000/10 billion inh Traffic casualties



# Sharks vs traffic Australia

## SHARKS

2 fatal attacks 2005

10 attacks total

## Traffic

1600 deaths 2005

1997

1,768 fatalities in motor vehicle accidents

- 9/100 000

21,531 serious injuries that required hospitalization.

- 100/100000



oactive

ect,  
k.



## More real problem size



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## Prophylactic measures best!

Thank you!

Use a helmet!

