

**Summary:**

## **What is the economic cost of injuries due to accidents at home, at school, in sports and other leisure activities in Norway?**

*In this report an answer is provided to this extensive enquiry – and the brief answer is approximately NOK167 billion, for the year 2002.*

*Reaching such an answer requires both detailed data and multifaceted methodology. The report describes the data and the methods, such that both ministers, commons and common men may check the foundation for the estimated billions. The report also provides a rather comprehensive uncertainty analysis of the estimated accident costs.*

*The indicated 167 billions will only to a limited extent be traceable back to accounts and transactions, in terms of medical expenses and administration. The lion's share of the amount is valuations of reducing accident risks ex ante. Alterations of accident numbers will affect the billion estimate primarily on the basis of changes in the so-called consumer surplus – valuations beyond what can be retrieved in markets/transactions. Even if this may seem strange for most people, it does constitute the foundation for economic analysis and assessments of economic costs.*

A large part of the population suffers an accident every year. Transport accidents have the main focus, both in the general public as well as in public registries. The injury severity and sector appurtenance may explain part of this fact. Other accident types are not that much made mention of, and not so easily tracked down to location and activity, possibly with an exception for accidents during work. However, the majority of accidents resulting in medical examination occur at home, and this is the dominating type of accidents among elderly and infants. Among larger children and youth injuries in sport activities are dominating. Some are also injured during education, and many suffer accidents when doing other leisure activities than physical sport (SHD 2004, Borgan 1997). Those accidents registered as “others” or “unknown” will also be either home accidents, school accidents, sports accidents or (other) leisure accidents. A total estimate of all these types of accidents in Norway, for the years 1990-2002, is displayed in *Table i*.

What is the economic cost of injuries due to accidents at home, at school, in sports and other leisure activities in Norway?

Table i: Total estimate of injured/killed in home accidents, school accidents, sports accidents and leisure accidents.

	Minor injury	Moderate injury	Serious injury	Severe injury	Critical injury	Fatality	Total
1990	202 167	53 509	16 259	389	204	1 267	273 794
1991	197 269	55 102	18 472	352	120	1 276	272 590
1992	200 037	58 407	19 750	361	139	1 206	279 900
1993	195 991	57 815	20 093	389	65	1 316	275 668
1994	188 519	59 519	17 620	352	28	1 233	267 270
1995	185 463	59 722	19 306	324	46	1 184	266 045
1996	181 454	56 639	20 417	389	74	1 254	260 226
1997	179 259	55 935	21 333	472	204	1 266	258 470
1998	191 027	60 076	26 212	463	109	1 199	279 086
1999	190 332	57 802	27 996	490	95	1 376	278 092
2000	192 960	56 904	27 846	912	177	1 258	280 057
2001	209 422	60 529	25 057	482	37	1 331	296 857
2002	204 937	61 437	25 668	334	74	1 312	293 762

Source: TØI report 880/2007

Simple curve fitting using different functions indicate an increasing trend in injuries and fatalities due to such accidents. Based on society's wish of targeting preventive measures towards all types of accidents, it is important to estimate societal costs of these accidents (HOD 1997). Elvik (1991) presented cost-of-injuries due to accidents for 1989, where home accidents, school accidents, sports accidents and leisure accidents accounted for approximately NOK7.6 billion, equivalent to at least NOK11.1 billion in 2006 values. Due to fundamental changes in methods for economic valuation and subsequent official values for the prevention of fatalities and injuries (in the transport sector), actual economic accident costs will be of quite another scale. In that respect it is important to stress that estimated accident costs will represent economic valuations of *preventing* fatalities and injuries in accidents (Veisten *et al.* 2007). Adapting official costs for road traffic accidents, unit costs can be estimated for fatalities/injuries due to home accidents, school accidents, sports accidents and leisure accidents, as displayed in *Table ii*.

Table ii: Estimated unit costs for fatalities/injuries due to home accidents, school accidents, sports accidents and leisure accidents. NOK, 2006-values. Source: Elvik 1991, 1993, 2004, Miller 1993, SV 2006, Veisten et al. 2007.

Cost component	Minor injury	Moderate injury	Serious injury	Severe injury	Critical injury	Fatality
Medical	2,779	32,055	95,953	171,011	213,193	5,474
Loss of output	6,509	74,049	979,556	3,166,779	3,947,902	6,090,198
Material damage	290	5,507	2,433	3,280	4,089	3,469
Administrative	317	3,999	3,352	5,895	7,350	3,548
Welfare effect	31,356	750,706	1,662,638	5,220,191	6,507,813	17,725,005
Total	41,251	866,316	2,743,932	8,567,157	10,680,347	23,827,695

Source: TØI report 880/2007

Evidently, the distribution of injury severity will be decisive for the total accident cost. Some cost components are more self-evident, in the sense that society spends (looses) resources in accidents that could have some alternative use, like costs of medical treatment and administration related to an accident. Notwithstanding this, economic values are principally based on what we are willing to pay (sacrifice) for something en lieu for something else, and the primary cost component for accidents is what can be termed the “welfare effect” (Elvik 1993). We are willing to pay relatively much for reducing the risk of pain, inconvenience and reduced activity options that accidents cause. Having estimates of annual injuries/fatalities and “unit costs” we can proceed to estimating total accident costs for the years 1990-2002, as displayed in *Table iii*.

Table iii: Total annual costs due to home accidents, school accidents, sports accidents and leisure accidents in Norway, mill. NOK, 2006 values.

	Minor injury	Moderate injury	Serious injury	Severe injury	Critical injury	Fatality	Total
1990	8,340	46,356	44,614	3,332	2,176	30,182	134,999
1991	8,138	47,736	50,687	3,014	1,286	30,396	141,256
1992	8,252	50,599	54,193	3,094	1,483	28,728	146,349
1993	8,085	50,086	55,133	3,332	692	31,349	148,677
1994	7,777	51,562	48,349	3,014	297	29,372	140,370
1995	7,651	51,738	52,973	2,776	494	28,204	143,837
1996	7,485	49,067	56,022	3,332	791	29,880	146,577
1997	7,395	48,458	58,537	4,046	2,176	30,166	150,777
1998	7,880	52,045	71,924	3,966	1,163	28,569	165,548
1999	7,851	50,075	76,818	4,200	1,018	32,787	172,749
2000	7,960	49,297	76,407	7,816	1,891	29,975	173,345
2001	8,639	52,437	68,753	4,128	396	31,715	166,068
2002	8,454	53,224	70,432	2,858	792	31,262	167,021

Source: TØI report 880/2007

Annual estimated costs are more than ten times as high as the estimates reported by Elvik (1991). It is important to stress that these estimates, like most economic estimates, represent values encumbered with considerable uncertainty. Primarily there is an uncertainty in the injury figures per se. These figures are based on injury samples collected by the Norwegian Institute of Public Health from 1990 to 2002, and these include uncertainty in the registration and the extrapolation to national figures. Fatalities due to accidents are given in the Vital Statistics by Statistics Norway, but large part of the fatalities cannot be connected to accident location and activity. It is only by assuming that fatalities in transport and work are known with certainty, that it can be deduced that a large group of non-specified fatalities can be attributed to either home accidents, school accidents, sports accidents or leisure accidents. Certainly, there is also uncertainty in the estimated unit costs, even if these are based on official valuations. We don't know exactly how much people are willing to pay to reduce risk of different accident types and injury severities, and nor do we know exactly how much costs accrue when an accident of a given extent occurs. However, we have included the dominating cost components in the analysis, and it should be considered more correct to provide an uncertain estimate on that basis than seeking an "exact" estimate of the part of the costs that is most easily "calculable" (Mishan 1988). Despite of the uncertainty, the estimates can be interpreted as implying that decision makers, from an economic point of view, can allocate considerable resources to prevent home accidents, school accidents, sports accidents and leisure accidents – presupposing that the measures will have an impact.