

## Road safety of children in the Netherlands

### Summary

In comparison with other age groups, relatively few children of up to 14 years old are killed in traffic in the Netherlands. In addition, childrens' safety has increased considerably during the last few years. A lot more older children (12-14 years old) are killed than younger ones. The reason for this is that older children cycle a lot more. That is why it is important that road safety policy pays extra attention to the safety of cycling children. It is also in the interest of residential areas to relentlessly continue striving for slower driving speeds.

### Why children up to 14 years old?

Children form a vulnerable group of road users. After all, they are still developing their skills which, eventually, will enable them to become responsible, independent road users. The question is: how safe is it for children in traffic and have there been any improvements during the last few years? What are the explanations for these improvements, and are any further ones possible? In this fact sheet, we deal with these questions for children of up to 14 years old. The following age group (the 15-17 year olds) will be discussed extensively in the fact sheet about young mopedists which is also on our website. In a literature study, SWOV will deal with childrens' road safety in more ways than in this fact sheet. Here, you will not find any causal factors of road crashes; they will be in the literature study.

### How safe is it for children?

Each year in the Netherlands, 53 children of up to 14 years old are killed, and 906 in-patients are registered (the average of 1998-2002). The actual number of in-patients is considerably higher. We estimate that, during 1998-2002, the police registered only 44% of all in-patients among children of (in this case) 0-15 years. The average registration rate for all in-patients is about 60%. The explanation for this is that a relatively large number of childrens' bicycle crashes is registered poorly. For this reason, we only look at the number of children killed in traffic by using the *mortality*: the annual number of road deaths per 100,000 inhabitants.

Compared with the average for all ages, relatively few children are killed in traffic. This can be seen in *Table 1*, in which the annual numbers of road deaths in a particular age group are related to the numbers of inhabitants in that age group.

Age group (years)	Mortality (annual number of deaths/100.000 inh.)		Percentage reduction in 10 years
	Period 1989-1992	Period 1999-2002	
0-4	2.0	1.2	40
5-9	3.9	1.6	59
10-14	4.9	2.7	45
All ages	9.0	6.5	28

Table 1. *Development of mortality in time, per age group (Source: TRC Accidents and Network; CBS Population).*

Since the early 1990s, especially the mortality of children has declined markedly. In a 10-year period, the reduction was 40 to 60%, whereas the average reduction was 28%. The mortality increases with age, but that of 10-14 year olds was also below average. The statistics show that, at around the age of 12, the mortality is double that at 10 and 11 year olds. During 1996-2002, there was little mortality difference between boys and girls of up to 14 (TRS Accidents and Network, CBS Population).

Traffic has also become safer for children abroad. According to a recent Organization for Economic Cooperation and Development (OECD) study, the Netherlands has the sixth lowest child mortality in the 25 OECD countries. Sweden, Japan, the United Kingdom, Italy, and Norway take the first five

places. The Netherlands is relatively unsafe for the 10-14 year olds in particular. For this group, the Netherlands takes 15<sup>th</sup> place on this list (1996-2000; OECD, 2004).

### How are children killed in traffic?

In this Fact Sheet we will not go into road crash *causes*. We will, however, examine the childrens' mode of transport, the modal split, at the time of the crash, and the crash type.

#### Modal split

In general, children are usually killed as pedestrians, cyclists, or car passengers (see *Figure 1*). Child cyclists of 0-14 years old have the highest mortality. This is the age at which they increasingly participate in traffic as independent cyclists, especially when older than 12. At this age, their mortality while cycling does indeed go up. On the other hand, the mortality of children in a car decreases with age. The relatively high mortality of the 0-14 year olds appears to go together with a shift in modal split. With regard to the younger casualties, some of the cyclists were *passengers*; 26% for the 0-4 year olds and 8% for the 5-9 year olds.

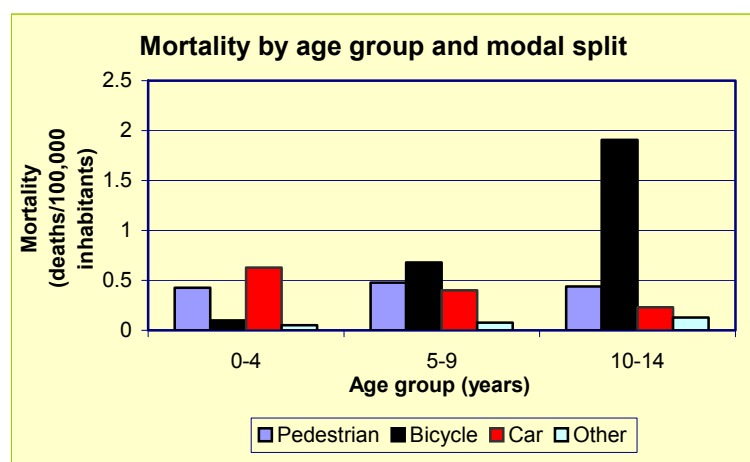


Figure 1. Source: TRC Accidents and Network; CBS Population. 1999-2002 averages.

#### Crash type

Fatal crashes with children are nearly always with a motor vehicle as crash opponent (see *Table 2*). More than average are: cars for young pedestrians, and heavy vehicles (vans and lorries) for young cyclists. Fixed objects are only crash opponents in car crashes. 'Other' crash opponents are light vehicles (such as bicycles and mopeds), light obstacles, and 'none' (single vehicle crashes).

Child's modal split	Crash opponent (percentage of total)				Total
	Car	Heavy vehicle	Obstacle	Other	
Pedestrian	52	31	-	17	100
Cyclist	35	57	-	8	100
Car passenger	29	43	20	8	100
Total	37	46	7	10	100

Table 2. The two crashing parties in fatal crashes with 0-14 year olds 1999-2003; TRC Accidents and Network.

### How much are children exposed in traffic?

The kilometres that children travel indicate a sort of exposure. By relating their kilometres to the fatalities, we can say something about their crash rates.

#### Distance travelled

The number of kilometres that children travel as car passengers appears to decrease with age, whereas their bicycle kilometres increase (1999-2002; CBS National Travel Survey). The increase in

mortality which we saw for young cyclists is indeed the consequence of a shift in modal split; 12-14 year olds cover as much as one-third of all their kilometres on a bicycle.

In general, children travel the farthest (75% of their total distance) as car passengers; bicycle kilometres are only 14%. Their distances walked only play a small part (3%) in their exposure to traffic dangers.

#### *Crash rates*

If we compare the distances travelled with the mortality data in *Figure 1*, it will come as no surprise that that car kilometres are the safest. The death rate for children travelling by car is less than 1 per billion kilometres. This death rate is 5-20 times higher for young cyclists and 20-35 times higher for child pedestrians.

Taking all modes of transport together, the death rate increases with age, as does the mortality. For each 1 billion kilometres travelled by children there are: 2.2 deaths among the 0-5 year olds, 2.6 among the 6-11 year olds, and 5.3 among the 12-14 year olds. The rate thus also doubles from 12 years old (1999-2002: TRC Accidents and Network, CBS National Travel Survey).

#### *Development of distance travelled*

During the last few years, the childrens' modal split has changed significantly. During 1994-2002, the number of bicycle kilometres and pedestrian kilometres decreased by 10% and 20% respectively. On the other hand, the number of car kilometres increased by 10%. This seems to indicate that parents transport their children more often by car, and less frequently allow them to be independent road users. The motives for this are probably the supposed unsafety of the route, or the distance. Anyway, these two motives were expressed by parents in their choice to always take their children to primary school (Van der Houwen, Goossen & Veling, 2002).

#### **Which measures contribute?**

During the last few years, a number of measures that can increase childrens' road safety have already been introduced, or are in preparation. Besides the above-mentioned shift in modal split to 'safer' car kilometres, these measures will have also improved 10-14 year olds' safety during recent years (see *Table 1*).

#### *Sustainable safety*

An important feature of a sustainably safe traffic and transport system is the separation of the modes of transport. If a mixture of different modes is necessary, this should only occur under certain circumstances, such as a safe speed of not more than 30 km/h. This aspect of Sustainably Safe is directly in the interest of all vulnerable groups of road users, such as cyclists and pedestrians, and thus, children as well. Measures that can be used here are 30 km/h zones, roundabouts, pedestrian crossings, and mopeds on the carriageway.

#### *Protection devices*

There is an ever-increasing supply of officially approved protection devices for children. However, parents do not always apply them. Slightly more than 70% of 0-12 car passengers are protected: 20% by a seatbelt and more than 50% by a child seat or a fastened cushion. The older the children are, the less they are used: 90% of the 0-4 year olds are protected, only 60% of the 4-8 year olds, and less than 60% of the 8-12 year olds. (Groenveld & Bodewes, 2003).

More and more children wear a bicycle helmet when cycling. However, this is only true for children of primary school age. This form of protection is not very popular among older children and adults.

#### *Vehicle safety*

Cars have become much more crash-friendly for their own occupants during the last few years. It is, however, important for vulnerable road users that the *car front* is constructed safer, so that crashes become less severe. Since late 2003, a EU regulation has come into effect, especially for the protection of *pedestrians*. Safer car fronts are extra important for the Netherlands because, due to the large numbers of cyclists, many more vulnerable road users are involved in crashes with cars than in most other EU countries. The regulation of car fronts could also be intensified for the safety of *cyclists* (Schoon, 2004).

*View improvement systems* for lorries are obligatory within the EU. Among these are the blind spot mirrors. This sort of system mainly has its effect on crashes with lorries turning right and cyclists. Unfortunately, this crash type has not yet disappeared. It is not clear whether this is because the view improving systems have not been applied properly, or because such crashes also have other causes.

### *Safety in residential areas*

In residential areas, a safe speed is a maximum of 30 km/h. Such a speed is being supported for the time being by infrastructural measures (speed inhibitors). These facilities have disadvantages for both road users (vehicle damage) and residents (noise nuisance). Technical 'intelligent' methods are being developed, such as automatic speed inhibitors. However, widespread implementation of such systems is, as yet, a long way away. That is why it is important that attention is paid to speed reduction when making infrastructural changes.

### **Conclusions and recommendations**

When all is said and done, relatively few 0-14 year olds are killed in traffic in the Netherlands, compared with other age groups. Moreover, during the past few years, there has been a considerable reduction in casualties, more than for other age groups.

However, there is a safety problem with older children (12-14 year olds). Considerably more children are killed in this age group than in the younger groups. This is because, at that age, they cycle much more as independent road users. The 'moderate' child safety in the Netherlands in comparison with other countries, also illustrates this. In no other country children cycle as much as in the Netherlands. We recommend that the road safety policy pays more attention to the safety of cycling children.

In the previous paragraph, many measures that influence childrens' road safety have already been mentioned. Improving safety in residential areas deserves a special recommendation. It is important to keep on striving for slower driving speeds, also when renewing or revising the infrastructure

### **Publications and sources (mainly in Dutch)**

[CBS – National Travel Survey NTS](#)

[CBS - Population](#)

Groenveld, J.P. & Bodewes, K. (2003). [Gebruik van beveiligingsmiddelen in 2002; Onderzoek naar het gebruik van autogordels, hoofdsteunen en andere beveiligingsmiddelen in personenauto's en bestelauto's](#). Ministerie van Verkeer en Waterstaat, Adviesdienst Verkeer en Vervoer AVV, Heerlen.

OECD (2004). [Keeping children safe in traffic](#). Organisation for Economic Co-operation and Development OECD, Paris.

Houwen, K. van der, Goossen, J. & Veling, I. (2002). [Reisgedrag kinderen basisschool; eindrapport](#). TT 02-95. Traffic Test, Veenendaal.

Schoon, C.C. (2004). [Botsingen van het type 'fietser-autofront'; Factoren die het ontstaan en de letselernst beïnvloeden](#). R-2003-33. SWOV, Leidschendam.

[TRC - Accidents and Network](#)