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A LEAGUE TABLE OF

CHILD

DEATHS

BY INJURY

IN RICH

NATIONS

This publication is the second in a series of *Innocenti Report Cards,* designed to monitor the performance of the industrialized nations in meeting the needs of their children. Each *Report Card* presents and analyses league tables ranking the performance of rich nations against critical indicators of child well-being.

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The UNICEF Innocenti Research Centre in Florence, Italy, was established in 1988 to strengthen the research capability of the United Nations Children's Fund (UNICEF) and to support its advocacy for children worldwide. The Centre helps to identify and research current and future areas of UNICEF's work. Its prime objectives are to improve international understanding of issues relating to children's rights and to help facilitate the full implementation of the United Nations Convention on the Rights of the Child in both industrialized and developing countries.

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"In the world's rich nations,

more than 20,000 children will

die from injuries in the next

twelve months."

Key findings

- Injury is the principal cause of child death in all developed nations – accounting for almost 40 per cent of deaths in the age group 1 to 14.

- Taken together, traffic accidents, intentional injuries, drownings, falls, fires, poisonings and other accidents kill more than 20,000 children every year in the OECD nations (Figure 2).

- Sweden, the United Kingdom, Italy and the Netherlands occupy the top four places in the league table of child injury deaths. At the bottom of the league are the United States and Portugal, where the rate of child injury deaths is over twice the level of the leading countries, and Mexico and South Korea where the rate is three to four times higher (Figure 1).

- At least 12,000 child deaths a year could be prevented if all OECD countries had the same child injury death rate as Sweden.

- Boys are 70 per cent more likely to die by injury than girls (Box 2).

- The number of child deaths by injury in OECD nations fell by about 50 per cent between 1970 and 1995 (Figure 4). The share of injury deaths in total deaths rose from 25 to 37 per cent (Figure 5).

- Traffic accident deaths account for 41 per cent of all child deaths by injury (Figure 6).

- There is a need for a better 'fit' between research findings and current practice in injury prevention strategy. Many proven strategies for injury prevention are inadequately implemented.

- Although most countries lack data, it appears that the risk of child injury death rises steeply with poverty (Figure 12).

- The likelihood of a child being injured or killed is also associated with single parenthood, low maternal education, low maternal age at birth, poor housing, large family size, and parental drug or alcohol abuse.

- In developing countries, an estimated one million children under 15 die each year from injuries (Box 3).

EDITORIAL

Anguish beyond measure

This second *Innocenti Report Card* focuses on child deaths by injury in the member countries of the OECD. It presents, for the first time, a standardized league table ranking 26 of the world's richest nations according to their injury death rates for children aged 1 to 14.

In every single industrialized country, injury has now become the leading killer of children. Taken together, traffic accidents, intentional injuries, drownings, falls, fires, poisonings and other accidents kill more than 20,000 1 to 14 year-olds every year in the OECD.

Despite these statistics, and the rising worries of parents everywhere, the likelihood of a child dying from intentional or unintentional injury is small and becoming smaller. For a child born into the developed world today, the chances of death by injury before the age of 15 are approximately 1 in 750 – less than half the level of 30 years ago. The likelihood of death from abuse or intentional harm is smaller still – less than 1 in 5,000. On the roads of the industrialized world, child deaths have been declining steadily for more than two decades (though whether this decline is caused by improved safety on the roads or by reduced exposure and better accident and emergency treatment remains an open question).

The case can therefore be made that child injury deaths represent a small and diminishing problem. Indeed it can be argued that the issue receives not too little attention but too much. The dangers to children regularly make headlines and some child safety organizations are voicing concern that parents may be becoming overprotective – at the cost of the child's freedom to extend the bounds of independent action and take the kind of risks that are a normal and necessary part of growing up.

Such arguments oversimplify the issue.

The true scale of the childhood injuries tragedy should be gauged by its depth as well as its breadth – by asking not only how many families are affected but also how severely. And in this case the multiplier – the depth of grief and anguish involved in the death of a child – is beyond all measuring.

Furthermore, injury deaths are but the mortality tip of a morbidity iceberg; for every injured child who dies, many more live on with varying degrees and durations of disability and trauma.

Lastly, although it is true that child injury death rates have been falling for more than two decades, it would be wrong to conclude that the problem is simply melting away in the warmth of progress. To the extent that deaths have been reduced, they have been reduced not by some invisible hand of progress but by a long process of research, lobbying, legislation, environmental modification, public education, and significant improvements in accident and emergency services. And as the international comparisons in these pages dramatically demonstrate, most countries still have a long way to go.

It is this potential for policy change leading to further reductions in child injuries that is the real subject of this report.

In broad terms, it is a potential that can be measured by the gap between current practice and best practice. If all industrialized countries had the same child injury death rates as the country heading the league table, for example, then approximately 12,000 child deaths a year could be prevented.

Finally, an analysis of child injury deaths in industrialized nations carries with it vital lessons for the developing world (see pages 22-23). The rate of child deaths in traffic accidents is today more than five times higher in Africa than in the European Union, and more than three times higher in India than in the United States – even though Africa and India are still at the beginning of the growth curve in vehicle ownership.

If the developing world simply follows the trajectory traced by the industrialized nations, then many millions of its children are destined to die on its roads in the decades immediately ahead. The majority of those deaths – and the anguish and devastation they will cause – could be prevented. The lessons acquired so painfully by the industrialized nations are there to be learned. ■

The child injury death league

Figure 1

The table shows the annual number of deaths from injuries (unintentional and intentional) among 1 to 14 year old children during 1991-95, expressed per 100,000 children in the age group (details of the data and calculations are given on page 25).

Country	Deaths per 100,000 children
SWEDEN	5.2
UK	6.1
ITALY	6.1
NETHERLANDS	6.6
NORWAY	7.6
GREECE	7.6
DENMARK	8.1
SPAIN	8.1
FINLAND	8.2
GERMANY	8.3
IRELAND	8.3
JAPAN	8.4
FRANCE	9.1
BELGIUM	9.2
AUSTRIA	9.3
AUSTRALIA	9.5
SWITZERLAND	9.6
CANADA	9.7
HUNGARY	10.8
CZECH REPUBLIC	12.0
POLAND	13.4
NEW ZEALAND	13.7
USA	14.1
PORTUGAL	17.8
MEXICO	19.8
KOREA	25.6

Deaths per 100,000 children

Commentary

The table opposite (Figure 1) presents the first standardized league table of child deaths by injury in the world's industrialized nations.

Injuries, intentional and unintentional, are now the leading cause of child death in all of the world's more developed countries, accounting for almost 40 per cent of deaths in the age group 1 to 14. Drawing on World Health Organization mortality data, the league table ranks 26 nations by the number of injury deaths for every 100,000 children for the period 1991 to 1995 – the latest five-year period for which comparable data for all countries in the table are available.

Sweden, the United Kingdom, Italy and the Netherlands occupy the top four places – all with child injury death rates below 7 per 100,000. At the foot of the league table are the United States and Portugal, where child injury deaths are running at more than twice the level of the leading countries, and Mexico and South Korea where child injury death rates are three to four times higher. In order to avoid the volatility of year on year changes, the child injury league is based on the latest complete five-year period. Child injury deaths – principally traffic accidents, fires, drownings, poisonings, and assaults – are rare events; small yearly changes in absolute numbers can therefore have a significant impact on annual rates, particularly in less populous

countries. A single school-bus accident killing 20 children in Norway, for example, would raise the child injury death rate for that year from 7.6 to 10.2 per 100,000 and demote Norway from fourth to nineteenth place in the league table (assuming the number of child injury deaths for that year to be the same as the 1991-95 average).

Unless otherwise stated, the data in this report refer to children aged 1 to 14. From the age of 15 the picture becomes complicated by the rise in deaths from homicide, suicide, drug and alcohol abuse, and by a changing traffic accident picture as young people themselves begin taking to the roads in vehicles.

Figure 2 shows the absolute number of child deaths from injuries in each OECD country during the same five-year period. It also shows (column 3) the total number of child deaths that would have been prevented in each country if the prevailing child injury death rate during that period had matched that of the leading country – Sweden.

Over 125,000 children aged 1 to 14 died of injuries in the OECD nations during the five-year period under review. The United States accounted for almost one third of those deaths, Mexico for almost one quarter.

About 60 per cent of these deaths would have been prevented if all OECD nations had achieved Sweden's rate of child injury deaths. If the United States, for example, were to bring its injury death rate down to the Swedish level then the lives of more than 4,700 American children would be saved each year. Similarly, if the European Union were to achieve the same safety levels as its

The nations of the OECD

The *Innocenti Report Cards* investigate child well-being in rich nations. The countries that form the focus for the series are the 29 members of the Organisation for Economic Co-operation and Development (OECD), the countries that produce two-thirds of the world's goods and services.

The OECD member countries, as at December 2000, are: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, the Republic of Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

leading member, then child injury deaths would be reduced by a third, saving approximately 1,600 young lives annually. France and Germany would each prevent approximately 400 child deaths a year. (These examples assume that current child injury death rates remain unchanged from 1991-95 levels.)

Figure 2 Number of child injury deaths, 1991-95

The table shows the total number of injury deaths among 1 to 14 year olds during the five years 1991-95. The OECD totals exclude Iceland (37 deaths), Luxembourg (34 deaths) and Turkey. Were Turkey to have had the average child injury death rate of other OECD members over the period, another 12,500 deaths would have been added to the total.

	Child injury deaths 1991-95	Share of injury deaths in all deaths (%)	Lives saved with Sweden's child injury death rate
AUSTRALIA	1,715	42	786
AUSTRIA	608	42	269
BELGIUM	781	40	337
CANADA	2,665	44	1,233
CZECH REPUBLIC	1,138	42	638
DENMARK	334	36	120
FINLAND	368	43	133
FRANCE	4,701	41	2,004
GERMANY	5,171	38	1,949
GREECE	666	40	211
HUNGARY	982	36	507
IRELAND	357	39	133
ITALY	2,563	28	405
JAPAN	7,909	36	2,617
KOREA	12,624	53	9,996
MEXICO	29,745	30	21,965
NETHERLANDS	864	30	186
NEW ZEALAND	519	47	324
NORWAY	294	37	93
POLAND	5,756	44	3,507
PORTUGAL	1,524	40	1,071
SPAIN	2,643	33	931
SWEDEN	391	33	–
SWITZERLAND	537	40	246
UK	3,183	29	454
USA	37,265	49	23,555
OECD TOTAL	125,303	39	73,872

Figure 3 The injury 'iceberg'

For every one death among children aged 0 to 14 in the Netherlands during 1991-95 (home and leisure accidents) there were:

• 160 hospital admissions

• 2,000 accident and emergency department visits

ONE DEATH

160

2000

Overall, the league table shows a clear relationship between child injury death rates and national wealth; but it also shows that this relationship is far from fixed. Korea, Mexico, and the three former communist countries of central Europe all find themselves in the bottom third of the league table. But so do the United States and New Zealand. Greece and Portugal have a similar GDP per capita, but Greece has a child injury death rate less than half that of Portugal. Similarly, Hungary and Mexico have comparable levels of wealth but the child injury death rate in Mexico is almost twice as high as in Hungary.[1]

Measuring tragedy

Mention has already been made of the human misery by which these statistics must be multiplied. But there are also more measurable ways in which the problem could be said to be larger than the statistics suggest.

First, each death represents a very much larger number of non-fatal injuries, traumas, and disabilities. There are at present no internationally standardized methods of defining the severity or longevity of such disabilities, and international comparison is further confounded by different patterns of health service provision and use. But to take the example of home and leisure accidents in the Netherlands, there are approximately 160 hospital admissions and 2,000 accident and emergency visits for each child death (Figure 3). Were this ratio to prevail for all child injury deaths in the OECD nations, then the toll would amount to approximately 50 million accident and emergency visits and 4 million hospital admissions per year.

Second, a broad measure of the child injury problem is offered by the concept of 'disability adjusted life years' (DALYs) developed by the World Health Organization and the World Bank as a

guide to the rational allocation of health resources. The DALYs system gives a weighting to every health problem from death to dental caries and combines this with an estimate for the potential life years lost or affected. The result is a unified system for assessing the significance of any particular health problem in relation to the total burden of disease. On this DALYs scale, childhood injuries account for approximately 30 per cent of the total burden of disease among the industrialized world's children (aged 5 to 14).[2]

Finally, although the economic cost of child injuries is a different consideration, a Massachusetts study has estimated the average cost of treating an injured child (age 0 to 14) in hospital at just over $4,000, implying an annual bill of more than $2.8 billion for the United States as a whole (in 1987 dollars and including out-patient costs). In a more detailed British study making allowances for lost output, the value of preventing injuries (at all ages) was estimated at more than $27,000 for a serious injury and almost $2,600 for a minor injury requiring hospital treatment.[3]

More important than all of these calculations is the fact that the loss of a child is every family's worst nightmare – a nightmare that becomes a daylight reality for more than 20,000 families every year in the industrialized world.

Declining danger
The good news is that child injury death rates in the OECD nations have fallen steeply in recent decades – halving between 1970 and 1995. This means that approximately 25,000 fewer children are being killed every year than would have been the case had the rates prevailing in the early 1970s remained unchanged.

Figure 4 shows that fall for each individual country. It reveals not only

how far we have come in the last quarter of the 20th century but also how much further there is to go.

It might be assumed that the lower the child injury death rate at the beginning of the period the greater the difficulty in

Figure 4 Rate of child injury deaths in the 1970s and 1990s

The longer bars show annual injury deaths per 100,000 children aged 1 to 14 in 1971-75 (the basis for the ranking) and the shorter bars show the rates in 1991-95 (as Figure 1).

Country	1991-95	1971-75
SWEDEN	5.2	13.0
GREECE	7.6	13.5
SPAIN	8.1	13.7
UK	6.1	14.3
HUNGARY	10.8	16.1
ITALY	6.1	16.3
IRELAND	8.3	17.2
FRANCE	9.1	19.4
CZECH REPUBLIC	12.0	19.6
DENMARK	8.1	19.9
BELGIUM	9.2	20.0
NETHERLANDS	6.6	20.1
NORWAY	7.6	21.6
AUSTRALIA	9.5	22.3
JAPAN	8.4	22.4
POLAND	13.4	22.5
SWITZERLAND	9.6	22.5
AUSTRIA	9.3	23.7
NEW ZEALAND	13.7	23.7
FINLAND	8.2	24.7
USA	14.1	24.8
CANADA	9.7	27.8
GERMANY	8.3	28.4
MEXICO	19.8	29.3
PORTUGAL	17.8	31.1

Deaths per 100,000 children

bringing about further reductions; but the data show that 16 OECD nations more than halved child injury death rates over the period including five countries – France, Ireland, Italy, Sweden and the United Kingdom – where the rate at the beginning of the period had already been brought below 20 per 100,000.

But Figure 4 also shows that these nations have been progressing at very different speeds. Australia and New Zealand, for example, registered similar rates of child injury deaths in the early 1970s (22.3 and 23.7 respectively), but by the mid 1990s Australia is seen to have pulled away, lowering its rate to 9.5 and leaving New Zealand trailing at 13.7. Similarly Belgium and the Netherlands began the period with almost identical rates of child injury deaths (20.0 and

20.1), but by the 1990s the Netherlands (6.6) had risen to fourth place in the table while Belgium (9.2) had fallen to fourteenth place. The United States and Canada also began the period with similar levels of child injury deaths (24.8 and 27.8 respectively) but by the 1990s Canada had reduced its rate to 9.7 while the United States languished at 14.1.

Over the twenty years under review, the steepest fall of all has occurred in Germany. The figure given in the table for the beginning of the period (28.4 per 100,000) is a weighted average of East and West (at that time, surprisingly, it was West Germany that had the higher rate). By 1991-95, the child injury death rate for the re-united nation had been reduced to 8.3, a drop of more than 70 per cent that has promoted Germany

from twenty-third to tenth place in the child injury league table. More recently (1997), the German health ministry has launched *Aktion Kindersicherheit* (Action Children's Security) to bring child injury death rates down further with the aim of achieving one of the lowest levels in the European Union.

Figure 5 shows the total effect of these changes over the twenty-five years from the early 1970s to the mid-1990s. The dark blue area reveals the rapid decline – an approximate halving of child injury deaths – over this period. But as the pale blue area shows, child deaths from other causes have declined even more rapidly. As a result, the share of injury deaths in total deaths for the age group 1 to 14 rose from 25 per cent to 37 per cent in the last quarter of the 20th century.

Figure 5 Deaths from injuries and other causes since the 1970s

The graph shows death rates from injuries and from all other causes among children aged 1 to 14 in the OECD member states taken as a whole (excluding Czech Republic, Germany, Korea and Turkey). The rates are 22.8 and 67.2 respectively per 100,000 children in 1971 and 11.5 and 19.4 in 1995.

This is neither surprising nor in itself alarming. Most of the forces affecting child deaths from disease have been pulling in the same downward direction; and once a disease has been brought under control it has proved relatively easy to maintain that control. In the case of childhood injuries, by contrast, the forces influencing death rates are not all pulling in the same direction; nor are such deaths as susceptible to once-and-for-all scientific intervention. Accident and emergency services, for example, may have made remarkable improvements, but they have had to face a steep and sustained increase in the number of vehicles on the roads.

In this turbulent and often unconducive context, the halving of child injury death rates over this twenty year period is testimony to the work of thousands of individuals and organizations who have researched, educated, lobbied, legislated, and implemented changes at local and national level to protect the lives of children in homes, on the roads, and in schools and play areas.

Overall, this progress appears to be being maintained (despite worrying signs of a possible recent increase in the rate of road accident deaths in some countries). This means that in all probability the current rate of child injury death rates in OECD nations will be lower than the rates for 1991-95 given in Figures 1 and 2.

Nonetheless, it remains the case that even more rapid progress in reducing child deaths from disease has left injury as the principal cause of child death in every one of the developed nations at the beginning of the 21st century.

Traffic deaths

To this point, injuries have been discussed as a single agent of child deaths. In practice, they are the result of several quite different causes. Figure 6 presents a breakdown of those causes for the OECD as a whole. And it clearly shows that the spectrum of child injury deaths is dominated by road traffic accidents – a finding that also holds true for every individual OECD nation.

Figure 7 presents traffic accident death rates for individual countries in the form of a league table. Given that traffic deaths make up 41 per cent of all injury deaths, significant differences in rank order between this 'traffic death league' and the overall child injury death league are not to be expected. Nonetheless, there are interesting differences between the two. Greece can be seen to have dropped from sixth to nineteenth place when ranked by traffic deaths, whereas Japan has been promoted from twelfth to fourth. Portugal is seen to have a child traffic death rate almost twice as high as the next-worst country in the European Union. Sweden and the United Kingdom remain in first and second places whichever league table is used.

Again, trends over time appear encouraging. Following the appearance of the automobile at the end of the 19th century, road deaths in the industrialized nations began to rise, reaching a peak only in the 1970s and 1980s (later in countries such as Greece and Portugal). Since then, traffic accident deaths have begun to fall, often steeply, contributing significantly to the overall decline in child injury death rates. In the Netherlands, for example, the rate of child traffic deaths declined from 13 per 100,000 in 1970 to 4 per 100,000 in 1995 (children aged 5 to 14). Similarly, the traffic accident death rate for children in Japan fell from 13 per 100,000 in 1970 to 3 per 100,000 in 1997 (children under 10).[4]

All of this is in keeping with the overall trend of declining road accident deaths for all age groups in the OECD nations. In total, traffic death rates fell 30 per cent between 1970 and 1999, despite a 50 per cent increase in the number of vehicles and a rise in use per vehicle.[5]

Figure 6 *Causes of child injury death in the OECD*

The graph shows the causes of deaths from injuries among children aged 1 to 14 in 1991-95 for the OECD as a whole (excluding Turkey).

- 41% Transport accidents
- 15% Drowning
- 7% Fire
- 4% Falls
- 2% Poisoning
- 1% Firearm accidents
- 16% Other unintentional
- 14% Intentional

As a result of these trends, governments and bodies associated with the motor vehicle industry have concluded that the roads of the industrialized nations are becoming steadily safer. But lurking behind the impressive statistics of declining road deaths is a less well-publicised body of evidence that finds this conclusion too convenient.

A decline in traffic deaths may be the result of accident prevention strategies such as drink-driving laws, lower speed limits, or other traffic-calming measures; or it may be the result of cars being made safer by seat-belts, air-bags, crumple zones, and side impact protection systems; or it may be due to reduced exposure as a result of fewer children travelling on foot or by bike; or it may be a function of improved ambulance response times, paramedical training, and hospital treatments.

All of these changes have probably played an important part in the story of the recorded decline in road accident deaths. But very little is known about their relative contributions.

It is known, however, that the majority of children who die on the roads are not car occupants but pedestrians and cyclists. And fragmentary evidence does suggest that reduced exposure to road traffic has played a significant part in the decline of traffic accident deaths. In one study of child road use in England and Wales between 1985 and 1992, for example, it was found that the average distances walked and cycled each year by children under 14 had fallen by 20 per cent and 26 per cent respectively. The authors concluded: *"Changes in children's exposure to risk as pedestrians appear to account for a large part of the decline in these death rates"*.[6] (Such trends need not be regarded as inevitable; in an experiment in Odense, Denmark, for example, safe cycle routes and a sustained safety campaign led to two-thirds of children using bicycles to travel to school – and an 80 per cent reduction in accidents.)[7] The effects of such changes – which may include lower exercise and fitness levels, rising obesity, increasing restrictions on independence and declining freedom to play and interact with the world – are largely unstudied. Better documented is the rise in air pollution and asthma levels among children as a result of increasing vehicle use in urban areas – a trend that

Figure 7 The traffic death league

The table shows annual deaths among children aged 1 to 14 caused by transport accidents during 1991-95, expressed per 100,000 children in the age group.

Deaths per 100,000 children	
SWEDEN	2.5
UK	2.9
NORWAY	2.9
JAPAN	3.0
ITALY	3.3
NETHERLANDS	3.4
GERMANY	3.6
FRANCE	3.8
DENMARK	4.0
SPAIN	4.0
AUSTRIA	4.0
IRELAND	4.1
FINLAND	4.2
BELGIUM	4.3
CANADA	4.3
SWITZERLAND	4.3
AUSTRALIA	4.4
CZECH REPUBLIC	4.6
GREECE	4.7
HUNGARY	4.8
USA	5.8
POLAND	5.9
MEXICO	6.1
NEW ZEALAND	6.9
PORTUGAL	8.7
KOREA	12.6

is reinforced by the rise in the numbers of children being driven to school.

Similarly, there have been almost no studies assessing the role of advances in accident and emergency services. Such progress is extremely difficult to measure (although one study has reported a decline of 16 per cent a year in the trauma case fatality rate).[8] But best estimates suggest that accidents resulting in injuries rose by 12 per cent between 1970 and 1995 in the 17 OECD nations for which figures are available (all age groups). More recent evidence suggests that this upward trend is continuing; in 1999 a 1.5 per cent increase in traffic injuries was recorded for the OECD nations as a whole.[9] In Japan, for example, non-fatal injuries to children (aged 0 to 5) rose by more than 50 per cent between 1994 and 1998.[10] Improved survival rates following road accidents would therefore also seem to be a significant factor in reducing rates of road accident deaths.

If, as some believe, these two factors – reduced road use by child pedestrians and cyclists, and improvements in accident and emergency services – account for a large part of the decline in traffic injury deaths, then the conclusion that roads are becoming safer is more difficult to sustain. Since studies in many nations have shown the two factors most strongly associated with road accident injuries to be the traffic volume and traffic speed, some researchers are prepared to argue that the roads of most industrialized nations are becoming more, not less, dangerous and that falling death rates are a result of declining road use by pedestrians and cyclists, greater protection for the occupants of cars once an accident has happened, and improvements in accident and emergency services leading to a lowering of fatality rates. Telling parents that they are being overprotective and that the roads are

becoming safer for their children is, in this context, like telling them that they can let their children play with matches again because deaths from fire have been falling.

The question of whether roads are becoming safer for children is therefore too complex to be answered merely by monitoring changes in the rate of traffic accident deaths. The Netherlands and the United Kingdom, for example, have brought down child traffic death rates to very similar levels (3.4 and 2.9 respectively); but the level of children's exposure to traffic is very different in the two countries, with 60 per cent of Dutch children (aged 12 to 14) travelling most places by bike as opposed to less than 10 per cent of children in the United Kingdom.[11] The similarity in levels of child traffic accident death rates therefore suggests not similar levels of road safety but very different levels of danger masked by very different attitudes and behaviour by parents and children.

Further mitigating the good news on declining road deaths are some recent signs that limits may be being reached. In a number of countries with impressive records, year-on-year progress appears to be slowing and may even be being thrown into reverse. Between 1998 and 1999, total traffic deaths (all age groups) rose by 12.0 per cent in Austria, 7.3 per cent in Sweden, 6.8 per cent in Finland, 4.6 per cent in Italy, and 2.3 per cent in the Netherlands.[12]

Other causes
The other principal causes of child injury deaths are intentional harm, drownings, fires, falls, poisonings, and firearms accidents (Figure 6).

Intentional deaths, accounting for approximately 14 per cent of all child injury deaths, lie outside the scope of this *Report Card*, except to note in passing

that the line between intentional and unintentional death is subject to considerable blurring. One study in the United States, for example, found that between 7 per cent and 27 per cent of child deaths from abuse or neglect had been incorrectly classified as 'unintentional' ('abuse or neglect' is classified as 'intentional' in standard data collection systems).[13] Such figures therefore need to be treated with caution, and some researchers have gone so far as to question whether 'intent' is a useful classification at all, preferring to focus instead on the heavily overlapping risk factors that are common to all injury deaths, regardless of intent.[14]

The large category labelled 'other', accounting for 16 per cent of all child injury deaths, includes deaths by choking, misadventure during surgical and medical procedures, accidents involving machinery, and adverse reactions to drugs and medicines. It also includes 'intention undetermined', a category which may include a significant proportion of suspected but unproven cases of intentional deaths, including suicides.

Taking the five most important specific causes of child injury deaths, Figure 8 examines the record of the 15 largest OECD nations (population over 10 million). Under each cause, each nation has been assigned a tint according to whether that country has a poorer than average record of child deaths (dark blue), an average record (medium blue), or a better than average record (light blue). With this formulation, it is possible for each nation to identify the areas in which it lags or leads, and to cross-compare its child injury death rates by individual cause. Germany, for example, might ask why its child death rate from drowning is almost three times higher than in Italy; France might question why its child death rate from fires is almost twice as high as in the Netherlands.

The table also shows that even those countries in the top half of the child safety league table could do better in preventing child deaths from specific causes – fires in the United Kingdom, falls in Italy, drownings in the Netherlands, traffic accidents in Greece.

Poisonings and firearms accidents have been omitted from this analysis because of the very small numbers involved. Unintentional firearm deaths are uncommon outside the United States and Mexico where they account for 3 per cent and 1.7 per cent, respectively, of childhood injury deaths. However it is worth pointing out that, in the case of the United States, firearms are responsible for 42 per cent of intentional deaths among 10 to 14 year olds and 1 in 6 of all injury deaths in this age group, whether intentional or unintentional.[15]

Intentional child deaths have been included in Figure 8 in order to show that the five nations with the lowest overall child injury death rates also have the lowest rates of intentional deaths. This finding supports the argument that the dividing line is often blurred and that there is considerable overlap in the underlying risk factors known to be associated with both intentional and unintentional deaths.

Reducing the risks

For all of these major areas of risk, there are proven ways of reducing both the likelihood and the severity of child injury. Traffic deaths have been reduced by technical innovations and legislative changes including drink-driving laws, traffic calming measures, safer car design, the use of child seats and rear seat restraints, and the wearing of cycle helmets. Fire related fatalities can be reduced by smoke alarms, flame resistant nightwear, electrical safety standards, and by legislation against furniture made of materials emitting toxic fumes in fires. Poisoning and ingestion-related deaths have been reduced by childproof packaging of pharmaceuticals and the imposition of safety standards for toys and games. Deaths from falls have been prevented by safety glass, window bars, stair gates, and playground safety standards. Drowning deaths have been lowered by campaigns to ensure that most young children learn to swim and by the fencing of swimming pools.

Many such measures across the legislative, environmental and educational spectrum have been applied with varying degrees of rigour by the industrialized nations and have clearly contributed significantly to the lowering of child injury death rates.

Unfortunately it has rarely been possible to evaluate these individual interventions with any great precision. Because child injury deaths are rare events, studies of the effectiveness of safety campaigns demand large sample sizes and prolonged evaluation periods. Add to this the fact that the effects of any one measure can seldom be isolated from other social and environmental changes and it is easy to see why hard evidence for the effectiveness of these different safety campaigns is hard to secure.

Despite these difficulties, studies in several OECD countries have provided

Figure 8 Injury deaths in large countries

The table shows annual death rates for all injuries and for the five major identified causes among 1 to 14 year olds in 1991-95, expressed per 100,000 children. The table is restricted to the 15 most populous OECD member states (excluding Turkey). These countries account for 95 per cent of the deaths shown in Figure 2. Dark blue denotes the worst performing countries, medium blue the average performers and light blue the best.

	All injuries	Transport	Drowning	Fire	Falls	Intent
UK	6.06	2.91	0.39	0.66	0.26	0.80
ITALY	6.14	3.30	0.46	0.18	0.51	0.50
NETHERLANDS	6.59	3.42	1.24	0.26	0.24	0.56
GREECE	7.64	4.71	0.56	0.35	0.41	0.26
SPAIN	8.12	4.02	1.12	0.30	0.39	0.33
GERMANY	8.32	3.64	1.33	0.62	0.39	1.07
JAPAN	8.36	3.04	1.93	0.48	0.33	1.12
FRANCE	9.05	3.81	0.81	0.47	0.39	1.58
AUSTRALIA	9.53	4.37	1.97	0.68	0.22	0.85
CANADA	9.68	4.33	1.26	1.01	0.20	1.45
CZECH REPUBLIC	11.95	4.64	2.23	0.34	0.61	1.61
POLAND	13.41	5.89	2.84	0.36	0.60	1.14
USA	14.06	5.76	1.74	1.65	0.23	2.74
MEXICO	19.75	6.05	3.30	0.62	1.09	2.90
KOREA	25.57	12.59	5.14	0.91	1.18	1.08

fragmentary evidence of the effectiveness of some of the more common and obvious child safety measures.

The promotion of cycle helmets in the Australian State of Victoria, for example, has been shown to be associated with a significant reduction in child head injuries. Seven years of campaigning raised helmet use among secondary school students from under 2 per cent in 1983 to almost 20 per cent by 1989. In 1990, legislation made the wearing of cycle helmets compulsory and pushed usage rates to more than 80 per cent. Even though the period under review also saw a decline in cycling, especially by teenagers, a halving of head injuries in Victoria demonstrated the importance of helmets. Similar studies in the United States showed cycle helmets to be associated with reductions of between 66 per cent and 90 per cent in serious head and brain injuries.[16]

Lowering speed limits in areas where children are at particular risk has also been shown to be effective. In one experiment in the United Kingdom, the introduction of 20 mph (32 kph) speed limits brought a 70 per cent fall in child pedestrian accidents and a near halving of accidents involving children on bicycles. Similarly, the proper use of child seat restraints has been linked to injury prevention by research in Scotland and elsewhere. In Greece, studies suggest that child seat restraints could prevent as many as two thirds of serious injuries to children in vehicle accidents. In Tennessee, a 50 per cent fall in deaths of children under four followed legislation requiring child seat restraints.[17]

Various controlled studies have also demonstrated the value of some of the more obvious interventions to prevent accidents in the home. In the United States, for example, research in the 1970s showed safe-packaging legislation to be

associated with a 75 per cent reduction in ingestion-related child deaths. More recently, studies in Australia, New Zealand, and Canada have shown the effectiveness of pool fencing regulations in reducing deaths by drowning.[18]

Smoke alarms also have a proven track record. In one US city, an 80 per cent reduction in injuries from residential fires was reported following a highly targeted campaign involving a smoke-alarm give away programme. Two other American states have also achieved measured reductions in fatal fires following legislation requiring homes to be fitted with smoke-alarms.[19]

Child deaths from falls, the fourth most important cause of non-intentional child injury deaths, have also been measurably reduced by specific interventions. In New York City, a campaign to promote the use of window guards in apartments – using mass media, landlord legislation, and the issuing of free guards – succeeded in reducing falls by approximately 50 per cent and child deaths by 35 per cent.[20]

Despite the difficulties of evaluation, sufficient piecemeal evidence is therefore available to show that each of these well-known safety measures can reduce the risks, and that together they can make a very significant contribution to saving lives.

The extent to which nations of the OECD have legislated in favour of such measures could therefore be said to be a test of commitment to the cause of child safety.

Figure 9 represents an initial attempt to begin tabulating that commitment in such a way as to allow each nation to see where it stands and how it compares in relation to several of the more obvious child safety measures discussed above.

The table, covering all the OECD nations except Finland, Mexico and Poland, has been compiled for the UNICEF Innocenti Research Centre by Elizabeth Towner and John Towner of the Department of Child Health at the University of Newcastle (UK). It shows whether legislation exists (with the date of the legislation where known) in relation to seven representative areas of safety – cycle helmets, speed limits in built up areas, child safety seats in cars, seat-belt wearing by children, child safety packaging for pharmaceuticals, smoke detectors in homes, and playground safety standards.

Overall, Figure 9 shows that only three countries – Australia, Canada, and the United States – have legislated in six out of the seven test areas featured in the table. A further 16 countries have acted in four or five areas. Six countries – Belgium, the Czech Republic, Greece, Hungary, Korea and Switzerland – have acted in only three, and Turkey in only two.

Such a table does not of course document the details of the legislation or the rigour and consistency of its application. And it is conceded that the degree of child protection involved may depend heavily upon such factors (one study for example has shown that poorly fitting cycle helmets are associated with a doubling of the risk of head injury).[21] But the table does represent the beginning of an effort to document and compare the extent to which industrialized nations have implemented some of the most obvious policies that are known to be effective in protecting children's lives. The table is therefore an important initiative which should now be developed and extended. Other comparisons might spotlight, for example, legislation to ensure that cigarette lighters cannot be operated by young children. (Australia, Canada, and

the United States have already enacted such laws; yet in no country of the European Union is such legislation to be found on the statute books despite the fact that a third of fire deaths and a fifth of fire-related injuries are caused by the paraphernalia of cigarette smoking.)[22]

Figure 10 takes this kind of international comparison a stage further by comparing actual seat-belt use by young teenagers in 14 OECD nations. As the chart shows, compliance varies from 33 per cent to 72 per cent.

Social gradient
Analysing child injury deaths by individual cause and specific means of prevention can therefore inform debate and policy. But there is also a sense in which the breakdown of injury deaths by immediate cause can distract and mislead. Too exclusive an emphasis on compartmentalising injuries can lead to a blizzard of statistics that blinds policy-making to the common underlying risk factors associated with child injuries from all causes. Whether the proximate cause be traffic accident, assault, drowning, fire or poisoning, the likelihood of a child being injured or killed appears to be strongly associated with such factors as poverty, single parenthood, low maternal education, low maternal age at birth, poor housing, large family size, and parental drug or alcohol abuse.

The attempt to analyse and prevent child injury must therefore be informed by knowledge of 'who' as well as 'what'.

Unfortunately, the analysis of 'who' is an underdeveloped field of research.

Internationally, the more than 20,000 children aged 1 to 14 who die of injuries each year are disaggregated only by age and gender. Box 2 touches on this topic and shows that being born male or female can be an even bigger factor in the risk of injury death than the country of birth. A boy born in the United States or New Zealand, for example, has a higher chance of dying from injury in childhood than a girl born in Mexico.

Figure 9 The legislation record

A blue tint in the table shows whether national legislation has been enacted, and in what year, in seven areas where legislation has been shown to be effective in reducing child injury deaths. The table has been compiled for the UNICEF Innocenti Research Centre by Elizabeth Towner and John Towner of the Department of Child Health at the University of Newcastle (UK) on the basis of completed questionnaires received from correspondents in 26 countries. The correspondents were selected from personal contacts, membership lists of the International Society for Child and Adolescent Injury Prevention, and from delegate lists of the three International Conferences on Injury Prevention and Control held between 1996 and 2000.

	Cycle helmets for children	Child safety seats	Seat belts for children	Speed limits – urban areas	Childproof packaging	Home smoke detectors	Playground safety standards
AUSTRALIA	1990	1976	1970		1979	1991	
AUSTRIA		1994	1994				
BELGIUM		1975					
CANADA							
CZECH REPUBLIC							1999
DENMARK							
FRANCE		1992					1994
GERMANY		1992	1993	1952	1976		1999
GREECE		1999	1997	1962			
HUNGARY		2000	2000				
ICELAND	1997	1990	1981	1988			1998
IRELAND						1994	
ITALY					1984		
JAPAN		2000	1985				
KOREA		1997	1990	1999			
LUXEMBOURG			2000				
NETHERLANDS							
NEW ZEALAND	1993	1994	1994	1962	1984		
NORWAY			1997			1990	1996
PORTUGAL		1995	1994				1997
SPAIN			1976				
SWEDEN		1998	1988			1999	
SWITZERLAND		1981	1981	1959			
TURKEY			1985	1983			
UK		1987	1983	1934	1976		
USA	1986						

Disaggregation by region, where data exist, can also reveal significant discrepancies. Figure 11, for example, breaks down Spain's child injury death rate by province and shows that the risk of injury death (in 1975-94) was twice as high for children in Galicia as in Aragon.

But when it comes to the key issue of relating child injury deaths to family background, appropriate national data are usually absent or inadequate. Of the six OECD countries contacted specifically for the purpose of this commentary – France, Germany, Japan, Portugal, Spain, and the United Kingdom – researchers in five reported that no national data were available to link the risk of child injury death with the social and economic circumstances of the family.

Figure 12 presents the results of one of the very few national studies ever undertaken into this issue. During 1979-83 and 1989-92, all child injury deaths in England and Wales were analysed by parental occupation. And as the chart shows, children of parents in unskilled manual jobs were found to be three or four times more likely to die of injury than children whose parents were skilled non-manual workers. Moreover, although child deaths from injury fell for children in all occupational groups over the period, the differences in injury death rates between the different groups have persisted and may even have widened over the ten years under review. Interestingly, if this trend were to continue then it would mean that the United Kingdom government's targets for reductions in child injury deaths would be met for the higher socio-economic groupings but not for the lower.

Looking more closely at Figure 12, it is the steepness of the increase in relative risk that most surprises. It has long been known that risk of death in all age groups and from all causes tends to increase with

poverty. But it appears here that the increased risk is more pronounced for child injury deaths than for any other category of risk or age group. Clearly, the vulnerability of children sharpens the edges of poverty.

A more detailed social and economic profile of injury risk could therefore inform the attempt to reduce child injuries and child deaths from all causes.

In the study referred to above, for example, it became clear that the relative risk among different occupational groups varied according to the proximate cause of death. The risk of a child dying from fire, for example, was found to be 16 times greater for the lowest occupational class than for the highest. For pedestrian deaths the level of risk was found to be five times higher and for homicide 17 times higher.

Figure 10 Children aged 11 to 13 who always use a seat belt
The data were collected during the 1993-94 school year.

Figure 11 Regional variation in child injury death: Spain
The table shows annual injury deaths per 100,000 children aged 1 to 14 over the period 1975-94.

Elsewhere in the industrialized world, evidence linking child injury death rates to social and economic circumstance is sparse. In Germany, a study involving more than 20,000 Brandenburg children showed those from poorer families to be almost twice as likely to be involved in traffic accidents. In the United States, research in eight different regions has demonstrated that the injury risk is approximately twice as high for the children of lone-parent families. In Canada, a study of children from birth to age three has similarly shown that lone parenthood is the strongest single predictor of risk to the child. More detailed research in the United Kingdom has shown that the link between lone parenthood and risks to children is most probably explained by the far greater likelihood that lone parents, usually lone mothers, will be living in poverty, in poor housing, and in social isolation.[23]

In Australia, Canada, New Zealand and the United States, separate studies have shown children of indigenous peoples to be at significantly higher risk (the Australian study showing a 75 times greater risk of death by fire among Aboriginal children). Among Hispanic children in the United States, a study has shown the risk of traffic injury to be more than three times higher than the rate for non-Hispanic white children.[24]

Such findings are not in themselves surprising. On the roads, poor children are more likely to live in built up areas with greater traffic densities, and more likely to travel on foot or by bike. For child car occupants, the economic differential intervenes in the form of newer, larger, heavier cars and the greater likelihood of modern, properly installed child restraints, passenger air bags, crumple zones, and side-impact protection bars. Similarly the risk of injury and death in fires is more likely in poorer housing conditions where furniture, heating equipment, and electrical appliances are likely to be cheaper and older, and where smoke alarms are less likely to be installed.

It is therefore not difficult to see why economic poverty alone would increase the risks to children. But the risk is ratcheted up still further by the social problems with which poverty is so closely associated. Single parenthood and teenage child-bearing, low levels of parental education, large family size, lack of adequate child-care facilities, unsupported and depressed mothers, deprived neighbourhoods – all conspire to increase the stresses of parenting and to reduce the resources of money, time, knowledge, and support necessary to safeguard children. The higher rates of drug and alcohol abuse associated with such circumstances obviously propel the risk to still higher levels.

Weak link
It might, conversely, be argued that an overemphasis on the link between childhood injuries and socio-economic status also has its dangers. It may, for example, provoke an apathetic rather than a dynamic response, leaving the problem to the slow mercies of anti-poverty programmes rather than to available and proven risk-reducing interventions.

But whereas data on the link between poverty and injury risk adds a further argument in support of poverty reduction programmes, it also has a more specific and immediate role to play in injury prevention. At the most obvious level, for example, the fact that the great majority of fire deaths occur in temporary and public housing (in some OECD countries) is clearly important to formulating policy for the reduction of fire-related deaths. Similarly, more information on the proportion of child injury deaths associated with teenage parenthood or drug and alcohol dependence – information that is almost totally lacking in most OECD nations – would clearly help to target specific injury-prevention strategies.

Figure 12 Parental occupation and child injury deaths, England and Wales

The occupational groups are: 1 – professional, 2 – managerial/technical, 3 – skilled non-manual, 4 – skilled manual, 5 – partly skilled manual, 6 – unskilled manual. The rates shown are the total number of deaths in the periods concerned among children aged 0 to 15, per 100,000 children in the age-group, expressed as an annual average. The taller bars show the rates in 1979-83 and the shorter bars the rates in 1989-92.

More fundamentally, such data can also help in formulating prevention policies directed not towards particular causes of child injury death but towards families and communities where the risks from all such causes are known to be higher. Home visiting programmes by trained volunteers or health and social services, for example, have proved effective in reducing both unintentional and intentional injury (a not altogether surprising finding, given that, as already mentioned, there is a significant degree of overlap in the underlying risk factors for both categories of injury). Offering practical and emotional support, as well as advice about child development and home safety, such community-based initiatives have been pioneered – though rarely evaluated – in a number of OECD countries. One of the earliest community programmes, in Falköping Sweden, demonstrated the merits of bringing a wide range of participants and strategies to bear on injury prevention – including the health centres and the social services, schools and adult education centres, general practitioners, community and voluntary organisations, local government and environmental agencies, traffic departments, sports centres, and the media. The Australian National Safety Council has produced a guide to such projects, documenting the experiences of 10 community-based programmes in Australia with a view to identifying what does and does not work in practice and at local level.[25]

Lead agencies

Further study of risk in relation to social and economic circumstance could therefore be important reducing child injuries. *"Injury data,"* concludes the US National Committee for Injury Prevention and Control, *"can confirm, disprove, or refine an analysis of an injury problem and are essential for the design, implementation and evaluation of an effective injury prevention and control program."* [26]

For the countries of the European Union, an internationally standardized system of data collection has been in operation since 1993. Known as the European Home and Leisure Accident Surveillance System (EHLASS), it co-ordinates data collection on domestic and leisure-related accidents from households

EU applicants: in a different league? 1

The *Innocenti Report Cards* focus on the nations of the OECD as one convenient definition of the world's advanced industrialized countries. Within Europe an alternative definition is provided by the countries of the European Union, a 'club' that is explicitly committed to reducing disparities in living standards between its members.

Ten applicant countries from Central and Eastern Europe are now being considered for accession to the EU. What will be the effect of their eventual admission on the differences across the Union in injury death for 1 to 14 year olds?

The table shows that unless there is convergence in the meantime these differences will increase greatly. Only Portugal, among existing EU members, had a worse record over 1991-95 than the best-performing applicants. The three Baltic states – Estonia, Latvia and Lithuania – together with Romania have injury death rates that are higher than in Korea, the country bottom of the OECD league table, and over four times higher than the EU average. If the level of injury death were to continue unchanged at its 1991-95 level, then one child in every 200 in Latvia would die from injury between his or her first and fifteenth birthdays.

During the second half of the 1990s the Baltic states have seen a fall in injury death rates. Deaths in Estonia averaged 23.1 per 100,000 children each year in 1996-98 and 29.9 in Latvia. The cumulative risk of death during childhood for a Latvian child is therefore not quite as high as implied

by the calculation just made. But death rates still remain far above those in most of the current EU member states.

The lives of over two thousand 1-14 year olds would have been saved each year in 1991-95 if the 10 Central and Eastern European applicants had had injury death rates equal to the average level in the 15 current EU member states.

Child injury deaths in the EU and Central and Eastern Europe

Rates for both applicant countries (pale type) and member states (dark type) refer to 1991-95 and show injury deaths per 100,000 children aged 1 to 14.

	Rate
SWEDEN	5.2
UK	6.1
ITALY	6.1
NETHERLANDS	6.6
GREECE	7.6
DENMARK	8.1
SPAIN	8.1
FINLAND	8.2
GERMANY	8.3
IRELAND	8.3
FRANCE	9.1
BELGIUM	9.2
AUSTRIA	9.3
HUNGARY	10.8
SLOVENIA	11.6
SLOVAKIA	11.6
CZECH REPUBLIC	12.0
POLAND	13.4
PORTUGAL	17.8
BULGARIA	17.9
LITHUANIA	29.2
ROMANIA	32.1
ESTONIA	33.2
LATVIA	38.4

Boys and younger children at more risk

Death through injury is much more common for boys than for girls. In the OECD area as a whole, boys aged 1 to 14 were 70 per cent more likely than girls to die from injuries in 1991-95. The difference between the sexes is greatest for older children, those aged 10 to 14, a phenomenon explained either by boys taking more risks or by parents or schools being more permissive with boys than girls. But the difference is apparent even in the youngest age group – a boy aged 1 to 4 is already 40 per cent more likely to die of injury than a girl.

How does the picture vary from country to country? More deaths for boys were recorded in each age group in every country. As the graph shows, boys are at higher risk right across the OECD area. Reducing the rate for boys in each country to match the rate for girls would save 5,000 lives each year.

The smaller table shows clearly that younger children face the greatest risk. However, league table rankings for individual countries can vary substantially by age group. The larger table shows the injury death rates by age for each country, with the countries ranked on the death rate for 1 to 4 year olds. Japan has the lowest death rate in the OECD for 10 to 14 year olds, but plunges to eighteenth place in the league for those aged 1 to 4. Australia is another country that has a much better record among older than younger children: in seventh place for 10 to 14 year olds but in twentieth place for children aged 1 to 4 years.

It is notable that countries differ more in the risk of injury death for younger children than for older children. For example, Portugal ranks twenty-fourth for both 1 to 4 year olds and 10 to 14 year olds

while the UK is third in both cases. But the ratio between their injury death rates is 3.3 for the younger age group and only 2.4 for the older

one. This suggests that Portugal and other countries that perform poorly need, in particular, to tackle their problem of injuries among young children.

Injury deaths by age and gender

The table shows injury death rates in 1991-95 in the OECD member states taken together (excluding Turkey).

	Deaths per 100,000 children		
	Girls	Boys	Ratio
Age 1 to 4	14.4	20.3	1.41
Age 5 to 9	7.3	12.8	1.75
Age 10 to 14	7.3	15.7	2.15
All children aged 1 to 14	9.2	15.9	1.73

Injury deaths by age

The table shows injury deaths in 1991-95 per 100,000 children in the age group concerned. Countries are ranked by the rate for 1 to 4 year olds.

	Age of child		
	1 to 4	5 to 9	10 to 14
SWEDEN	5.6	4.5	5.5
ITALY	5.9	4.7	7.6
UK	7.3	4.6	6.4
FINLAND	7.3	7.7	9.1
NORWAY	8.0	6.2	8.7
NETHERLANDS	8.4	5.0	6.6
GREECE	8.7	6.4	7.9
DENMARK	9.1	7.1	8.2
BELGIUM	9.8	8.1	9.6
IRELAND	10.1	6.8	8.3
SPAIN	10.2	6.6	7.8
GERMANY	11.1	7.1	7.3
CANADA	11.4	7.7	10.2
AUSTRIA	12.0	7.3	9.1
FRANCE	12.0	7.3	8.4
SWITZERLAND	12.4	7.7	9.0
HUNGARY	13.1	8.8	10.8
JAPAN	14.1	7.4	4.8
CZECH REPUBLIC	14.5	11.5	10.2
AUSTRALIA	14.9	7.1	7.7
POLAND	16.5	11.7	12.5
USA	19.1	9.7	14.3
NEW ZEALAND	19.6	10.1	12.4
PORTUGAL	23.8	15.2	15.3
MEXICO	27.2	15.0	18.4
KOREA	37.0	25.1	16.6

2

Injury deaths by gender

The figure shows injury deaths for girls (dark bars) and boys (pale bars) in 1991-95 among 1 to 14 year olds per 100,000 children in the age group.

Country	Girls	Boys
SWEDEN	4.4	5.9
UK	4.3	7.7
ITALY	4.1	8.1
NETHERLANDS	4.8	8.3
GREECE	5.9	9.3
NORWAY	5.6	9.6
FINLAND	6.2	10.0
DENMARK	6.0	10.1
SPAIN	6.0	10.1
GERMANY	6.4	10.2
JAPAN	6.2	10.4
FRANCE	7.0	11.0
BELGIUM	6.9	11.3
IRELAND	5.0	11.5
AUSTRIA	6.9	11.6
AUSTRALIA	7.2	11.7
CANADA	7.4	11.9
SWITZERLAND	6.9	12.1
HUNGARY	7.8	13.6
CZECH REPUBLIC	8.9	14.9
POLAND	9.4	17.3
NEW ZEALAND	9.9	17.3
USA	10.4	17.5
PORTUGAL	12.5	22.8
MEXICO	13.7	25.6
KOREA	19.4	31.2

Deaths per 100,000 children

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or accident and emergency departments in hospitals of all 15 EU member countries. The resulting data on over 20 million home and leisure accidents a year are then used to highlight the accident risks of particular products and activities, and to relate those risks to the categories of people affected. The system has obvious weaknesses: only 6 of the 15 participating countries currently attempt to ensure that the data collected are representative, and quality control and methods of coding injury types can and do vary from nation to nation. Nonetheless, EHLASS has provided data for many accident prevention campaigns and for the drawing up of legal safety standards for a wide range of products including domestic pressure cookers, children's play equipment and playgrounds, ladders, bunk beds, toys, and fastenings and packaging. Although not fully developed, this is the first international injury data collection scheme of its kind and now needs to be extended in order to improve the current state of knowledge on what poses risks and to whom.[27]

As important as the need for better data, however, is the need for a better 'fit' between the results of research and current practice in injury prevention strategy. And probably more important than the paucity of evaluation studies for particular interventions is the inadequate implementation of already proven strategies for injury prevention.

This is a theme that has been taken up in a review of safety procedures in the United Kingdom by Elizabeth Towner, Yvonne Carter and Michael Hayes, on whose paper *'Implementation of injury prevention for children and young people'* this discussion draws.[28]

Towner and her colleagues conclude that the weakness of the link between knowledge and policy is partly a result of

19

the multiplicity of factors and agencies involved. By its nature, injury prevention strategies involve many different operational layers – research, policy formulation, public and political education, publicity campaigns, legislation, changes in manufacturing practice, environmental and road system modification, monitoring and data collection. This in turn can involve many different participants – including several different government departments at both national and local levels and, very often, a variety of voluntary or non-governmental organizations and community groups.

This diversity of agency and activity can at one level extend the outreach, effectiveness, and sustainability of injury prevention programmes. At another level it can lead to bureaucratic inertia, buck-passing, duplication of effort, lack of co-ordination, and poor 'conductivity' between research and on-the-ground practice. *"The few studies that have been carried out,"* conclude Towner, Carter and Hayes, *"show that local injury prevention activities often lack a sound scientific basis, are weakly evaluated, or fail to make use of expert advice."*

This problem appears to confront most OECD countries. A review of community-based programmes in the United States, for example, concluded that *"Most injury prevention efforts are scattered and uncoordinated, resulting in little impact on the overall incidence and outcome of injuries."* Similarly, a 1999 French study has reported that there are too many organizations responsible for accident prevention, and insufficient co-ordination of their activities. [29]

All this leads Towner and colleagues to argue the case for a recognized national agency in each country to take the lead in injury prevention. Such agencies would take responsibility for co-ordinating policy and ensuring that the expertise born of research and experience was effectively transmitted to policy-makers and practitioners. They might also prioritize research, co-ordinate funding, provide training, and act as a focal point both for the collection of better data and for the dissemination of information to politicians, press, and public. The establishment of such lead agencies in each country, Towner, Carter and Hayes believe, would demonstrate a serious commitment by government to injury prevention and could help to meet the urgent need for the promotion of evidence-based policy.

Overprotection

Finally, a lead agency for injury prevention might also take on the difficult challenge of co-ordinating and balancing the child safety message to parents, guardians, teachers, and others with responsibility for the safeguarding of children.

Among child safety campaigners there is today a widespread worry that perceived risks are being fanned into a blaze of unnecessary anxiety by media coverage of individual cases. The result may be not only increased stress on both parents and children, but also an increase in the very tragedies that such alarmism and anxiety is designed to forestall.

To take one current example of this growing dilemma, the United Kingdom's Royal Society for the Prevention of Accidents (RoSPA) has recently reported a 50 per cent year-on-year increase in the number of children drowned in pools, rivers, canals and lakes. The society has described this increase as 'very worrying' but argues that it cannot be blamed only on a hotter than average summer. According to a RoSPA spokesperson, the rise is at least partly due to *"children's poor judgement of the risks involved. Parents today are keeping their children too protected for them to be able to develop good risk awareness. They are not developing in the way that kids used to. Many are simply not aware of the dangers of the outside world."* [30]

In most industrialized nations today, parents are increasingly worried about the threats to children, whether from traffic accidents or predatory paedophiles. In response to high profile media treatment of selected cases, and more generalized warnings from organisations that have to compete for public attention

and public funds, it is natural for parents to want to increase the level of protection. In practice, this has meant that millions of parents now drive or accompany their children on journeys, prevent them from playing outside or exploring independently, and feel that every setting has to be sanitised and every activity supervised. As a result, children may be missing out on the necessary process of pushing the boundaries of their experience and judgement, developing their own sense of risk and danger, and taking progressive responsibility for their own lives. They are therefore likely to be at even greater risk when they eventually reach the age of independent action without having learnt some of its most essential skills.

Such trends are obviously difficult to monitor, and very few studies have addressed themselves to the question of changing parental behaviour. But in a remarkable investigation conducted in the UK it was found that the proportion of seven and eight year old children travelling to school without adult supervision had fallen from 80 per cent to less than 10 per cent between 1971 and 1990.[31]

Too little is known about such changes in the patterns of childhood and parenting to draw any overarching conclusions. But it may be that, in addition to the numbers of child deaths and injuries discussed in this report, a hidden price is also being paid by far larger numbers of children in the industrialized world whose lives and childhoods are being newly circumscribed by unprecedented levels of parental concern.

Communication of child safety messages to the public must therefore assist parents to maintain a sense of proportion. But it is unlikely that parents will change behaviour merely as a result of being told that the risks to their children are small. Parents will and should continue to make their own assessment of those risks in response to local circumstances. And it is important to acknowledge that such assessments are not always wrong. There is much evidence to suggest, for example, that anxious parents trying to protect their children from road accidents – by curtailing unsupervised journeys and driving or accompanying them to and from school – have played a very significant part in reducing traffic deaths. The appropriate response to this is not to tell parents that the roads are now safer; it is to make those roads safer so that parents' own assessment of the danger changes.

For most of the causes of child injury deaths there are now proven strategies for prevention. In most industrialized countries, those strategies have yet to be implemented in a comprehensive and consistent way and with a well-informed emphasis on those most at risk. ◼

Child traffic deaths in developing countries

The developing world

The *Innocenti Report Cards* focus on problems facing children of the industrialized nations. But UNICEF is of course aware that 98 per cent of all child injury deaths occur in the developing world.

This statistic reflects not only larger numbers of children but also higher risks. For every 100,000 children born in the OECD nations, fewer than 200 will die from injuries before the age of 15; in the developing world the corresponding figure is over 1,000.

Drownings vie with traffic accidents as the most important cause of the estimated one million child injury deaths a year in Africa, Asia, and Latin America. But whereas drownings and other causes of injury might be expected to decline as countries develop economically, the opposite is true for traffic accidents.

Most developing countries are still in the early stages of vehicle ownership; in the industrialized nations there are 500 cars for every 1,000 people; in the developing world there are only 30. Yet as the bar chart shows, Africa and India already have child traffic death rates four to five times higher than in the developed nations. China's overall rate of child traffic deaths surpasses North American levels even though China has only 5 motor vehicles per 1,000 people as opposed to 590 in Canada and 760 in the United States.

In absolute numbers, the comparison is even more stark: traffic accidents kill approximately 10,000 children each year in rich nations; in the rest of the world the figure is closer to 240,000 a year – the equivalent of two jumbo jets full of children crashing every single day.

Must these already alarming numbers of child road deaths follow the trend of the industrialized countries and rise for another fifty or sixty years? Or can millions of child deaths and injuries be prevented by learning lessons from the experience of the already motorized nations?

What works

Why are the roads of the developing world, with relatively few cars, so much more dangerous?

In large part the answer lies in the fact that roads in the poor world, although carrying fewer cars, carry many more pedestrians and cyclists. The lack of a well-developed safety infrastructure to keep the two apart leaves walkers and cyclists vulnerable to vehicles whose numbers are racing ahead of developments in traffic calming measures, law enforcement, and road safety culture. The result is not only a higher rate of road deaths but a significant difference in their distribution: in the United States pedestrians and cyclists account for less than 20 per cent of road deaths (all ages); in Ethiopia the proportion is more than 80 per cent .

By definition, poor nations cannot afford the immediate and wholesale implementation of the wide range of

Traffic accident death risk among the world's children

The figure shows injury deaths due to traffic accidents in 1998 among children aged 0 to 14 per 100,000 children in the age group.

High income countries	Deaths per 100,000 children
WEST PACIFIC	4.7
EUROPE	4.7
AMERICAS	4.8
EAST MEDITERRANEAN	8.0

Low and middle income countries	Deaths per 100,000 children
CHINA	6.5
EUROPE	7.2
EAST MEDITERRANEAN	9.2
AMERICAS	14.8
SOUTH-EAST ASIA	17.8
WEST PACIFIC	18.2
INDIA	18.5
AFRICA	23.2

Deaths per 100,000 children

safety measures that have lowered road deaths in rich countries. The question is therefore one of priorities – what safety measures will have the most effect, at the least cost, and have the most chance of working in developing countries?

In an attempt to answer this question, researchers Samuel Forjuoh and Guohua Li have attempted to evaluate the developing world potential of a number of known-to-be-effective road safety measures. Each possible intervention was considered from the point of view of efficacy, affordability, feasibility and sustainability. The result is the chart presented below - rating the potential of each safety measure as either poor (light blue), satisfactory (mid-blue) or excellent (dark blue).

As the chart shows, there are important road safety measures which score highly on all counts, including speed limits, seat belts, cycle helmets, cycle lanes, marked pedestrian crossings, lighting and visibility measures, safety education, and action against drunk driving.

Even these priority interventions need to be adapted to an individual country's needs. At the moment, for example, probably fewer than half of all cars in the developing countries are equipped with working seat belts and it may be unrealistic to make their use mandatory. Banning further imports of cars not fitted with seatbelts, on the other hand, is a realistic option.

Nor is it necessary for developing countries to implement road safety measures using exactly the same means as richer countries. Separating pedestrians and cyclists

from trucks and cars is clearly one of the most important priorities for saving lives; yet this can be achieved almost as effectively by wood or bamboo railings and fences as by metal barriers. Similarly, speed limits may be difficult to enforce where police-forces are over-stretched; but ramps and road bumps in high-risk areas are cheap to install and could bring significant reductions in deaths and injuries. Breathalysers may likewise be too expensive; but outlawing the sale of alcohol in lorry parks and from road-side stalls could begin to lower the toll from drunk driving.

Learning the lessons

The chart attempts to evaluate the potential for the developing world of various road safety measures that have proved effective in rich nations. Each safety measure is rated excellent (dark blue), satisfactory (medium blue) or poor (light blue).

Safety measure	Efficacy	Affordability	Feasibility	Sustainability
CAR OCCUPANTS				
seat belts	satisfactory	satisfactory	satisfactory	satisfactory
air bags	satisfactory	poor	poor	poor
child safety seats	satisfactory	excellent	poor	poor
occupant education	satisfactory	excellent	excellent	excellent
MOTOR CYCLISTS				
safety helmets	satisfactory	excellent	excellent	satisfactory
rider education	satisfactory	excellent	excellent	excellent
CYCLISTS				
safety helmets	excellent	satisfactory	satisfactory	satisfactory
bicycle paths and lanes	excellent	satisfactory	satisfactory	satisfactory
bicycle safety programmes	poor	excellent	excellent	satisfactory
PEDESTRIANS				
separation from vehicles	excellent	excellent	excellent	excellent
pedestrian crossing signs	excellent	excellent	excellent	excellent
road lightingway	excellent	satisfactory	satisfactory	satisfactory
one-way street networks	excellent	satisfactory	satisfactory	satisfactory
road user education	satisfactory	excellent	excellent	satisfactory
ALL USERS				
speed limits	excellent	excellent	satisfactory	satisfactory
speed bumps	satisfactory	satisfactory	satisfactory	satisfactory
conspicuity enhancement	excellent	excellent	excellent	excellent
drink driving laws / checks	excellent	satisfactory	satisfactory	satisfactory

Notes

1 The comparisons of injuries with national income in this paragraph draw on data for GDP per capita (in purchasing power parity US dollars) for 1995, taken from United Nations Development Programme, *Human Development Report 1998*, Oxford University Press, New York (p. 128).

2 Information on injury share of child DALYs supplied by the Violence and Injury Prevention Unit, World Health Organization, Geneva. The concept of a DALY is described in World Bank, *World Development Report 1993*, World Bank, Washington D.C. (pp. 25-29), and World Health Organization, *The World Health Report 1999*, World Health Organization, Geneva (p. 15).

3 M. Malek, B. Chang, S. Gallagher and B. Guyer, 'The Cost of Medical Care for Injuries to Children', *Annals of Emergency Medicine*, 1991, 20(9): 997-1005; I. Roberts, C. DiGiuseppi and H. Ward, 'Childhood Injuries: Extent of the Problem, Epidemiological Trends, and Costs', *Injury Prevention*, 1998, 4(suppl): S10-S16.

4 J. Micklewright and K. Stewart, *The Welfare of Europe's Children*, The Policy Press, Bristol, 2000 (Figure 4.3), and information from M. Tokoro, Osaka City University, Japan (average of rates provided for 0 to 4 and 5 to 9 year olds). Micklewright and Stewart discuss trends in traffic deaths since 1960 for 5 to 14 year olds in all EU countries. See also R. Ellsäßer

and R. Berfenstam, 'International Comparisons of Child Injuries and Prevention Programs: Recommendations for an Improved Prevention Program in Germany', *Injury Prevention*, 2000, 6:41-5, for comparison of trends since 1980 in Germany, Austria, Switzerland, Netherlands and Sweden (including separate figures for 1 to 4 year olds).

5 'Road Deaths Fell in OECD Countries in 1999, But Injuries Rose', *OECD News Release*, 20 April 2000 (www.oecd.org/media/release). Detailed cross-country data on traffic accidents in OECD countries (including fatalities) and on vehicle ownership and road usage is contained in the International Road and Traffic Accident Database (IRTAD), available at www.bast.de/irtad/index.htm.

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10 Information provided by M. Tokoro, Osaka City University, Japan, based on statistics of the National Police Agency (www.npa.go.jp).

11 M. Hillman, J. Adams and J. Whitelegg, *One False Move: A Study of Children's Independent Mobility*, Policy Studies Institute, London, 1990 (p. 73).

12 *OECD News Release*, 20 April 2000, ibid, and 'Gli Incidenti Stradali in Italia nel 1999', ISTAT *Statistiche in Breve*, 25 settembre 2000 (www.istat.it/anotizie/aaltrein/statinbrev/incidenti.htm).

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Figures 1, 2 and ***4 to 8*** are based on analysis of the World Health Organization (WHO) Mortality Database undertaken for the UNICEF Innocenti Research Centre by the London School of Hygiene and Tropical Medicine. (Information on how to access these data is given at http://www.who.int/whosis/ mort/). The WHO Mortality Database includes data reported by WHO member states on numbers of deaths by cause (based on the International Classification of Diseases, Injuries and Causes of Death) and population totals. The analysis of the data for this Report Card uses information on deaths from all 'external causes' for 1 to 4, 5 to 9 and 10 to 14 year olds for 1991–95 (and other years for ***Figures 4 and 5***). In order to allow for differences among countries in the distribution of the 1 to 14 population between the three age groups, mortality rates for each country were calculated separately for each age group and then weighted with a common set of weights reflecting a standard OECD population. This results in an 'age-standardized' mortality rate for 1 to 14 year olds for each country. (The five-year death rates for each age group were calculated by dividing the sum of deaths across the five years by the sum of the population in each year.) Data for Belgium and Switzerland refer to 1991–94 (the total deaths for these countries for 1991–95 in ***Figure 2*** have been adjusted upwards accordingly while the calculation of the rates in all cases was based on four rather than five years).

A discussion of the reliability of the data in the WHO Mortality Database can be found in the yearly *World Health Statistics Annual* published by WHO (see http://www-nt.who.int/ whosis/statistics/menu.cfm) and in the report written by London School of Hygiene and Tropical Medicine (LSHTM) for the UNICEF Innocenti Research Centre, available at http://www.lshtm.ac.uk/ centres/ecohost/publicns.htm #2000. The LSHTM report also describes other cross-national sources of data on injuries and has an extensive discussion of the literature on injuries in industrialized countries (some of which is referred to in the Notes to the Commentary in this Report Card).

The WHO Mortality Database does not contain appropriate child injury data for Turkey. (See http://www.die.gov.tr/ CIN/main-e.html for a joint initiative of the Government of Turkey and UNICEF to publish statistics relating to child well-being.) Luxembourg and Iceland were excluded from the analysis in the Report Card since the numbers of child injury deaths in 1991–95 in these countries were too small for any disaggregated analysis (a total of 37 and 34 deaths respectively). The age-standardized death rates calculated on the same basis as described above were 9.9 (Luxembourg) and 12.0 (Iceland) per 100,000 children. Results for these two countries for a number of the topics covered by the Report Card's tables and graphs are contained in the LSHTM report

Box 1

written for the UNICEF
Innocenti Research Centre.

Figure 3 is based on
information in the
Management Report 1997 of
the Consumer Safety Institute,
Amsterdam (p. 6).

The 1971–75 figure for Poland
in **Figure 4** refers only to
1971. The 1971–75 figure for
Germany is a weighted
average of the rates for West
and East Germany and is
based on data for 1971–74
only. Data for the Czech
Republic in 1971–75 are
drawn from various
publications of the statistical
office of former
Czechoslovakia.

The heading 'other
unintentional' in **Figure 6**
includes deaths where
intention was 'undetermined'.

Figure 10 is based on data
published in A. King, B. Wold,
C. Tudor-Smith and Y. Harel,
*The Health of Youth: A Cross-
National Survey*, WHO
Regional Publications,
European Series No. 69,
World Health Organization
Regional Office for Europe,
Copenhagen, 1996 (Figure 7.9
p. 126, average of data for
boys and girls and for 11 and
13 year olds). The survey
concerned is The Health
Behaviour in School-Aged
Children survey which
collected in each country data
from samples of on average
1,500 children of each of three
ages, 11, 13 and 15. The
figure for Belgium is a
weighted average of figures
for French and Flemish
speaking areas. France and
Germany are represented only
by certain regions.

Figure 11 is based on an
analysis of Spanish data by
Miguel Ruiz Ramos
(Consejería de Salud, Junta
de Andalucía). The regions
identified in the graph are the
18 Autonomous Communities
that make up the territory of
Spain. The mortality rates
have been calculated from
data for 1971–94 on injury
deaths among 1 to 14 year
olds (Spanish residents only)
and on the child population
during this period. (The
sources used were
*Movimiento Natural de la
Población Española.
Defunciones según la causa
de muerte. Tomo III. Años
1975-1994*, Instituto Nacional
de Estadística, Madrid, and
*Proyecciones de la población
española 1971-2005*, website
of the Instituto Nacional de
Estadística, http://www.ine.es.)
The injury death rate that is
presented in the graph is the
average of those for boys and
girls (both rates were age-
standardized, using the
standard European
population, drawing on death
rates for 1 to 4, 5 to 9 and 10
to14 year olds). The total
number of injury deaths
among 1 to 14 year olds
during 1971–94 varied from 66
in Ceuta and Melilla and 133
in Rioja to 2,131 in Catalonia
and 2,889 in Andalusia – with
a total for Spain as a whole of
17,593.

Figure 12 draws on I. Roberts
and C. Power, 'Does the
decline in child injury vary by
social class? A comparison of
class specific mortality in 1981
and 1991', *British Medical
Journal*, 1996, 313: 784–6
(available from www.bmj.com).
The original source presents
death rates for four year

periods: (a) 1979–80 and
1982–83, and (b) 1989–92;
these were converted into
annual averages for
presentation in the graph. The
occupational class is that of
the father, or the mother if the
father's class was missing.

The graph excludes deaths
among the group of children
whose parental occupation is
classified as 'other' in the
Roberts and Power paper. The
injury mortality rate was 23.4
per 100,000 for these children
in 1979–83 but only 12.8 per
100,000 in 1989–92. Roberts
and Power comment that in
1981 approximately 80 per
cent of parents in this
category were single mothers
without paid employment, and
the high rate of child injury
deaths reflects the poverty
that is usually associated with
such circumstances. More
surprisingly, it is in this 'other'
group for which the child
injury death rate fell most
steeply between 1981 and
1991. Roberts and Power
argue that the most likely
explanation is the fact that the
numbers of children in this
category almost trebled over
the same period. In the course
of this expansion, the
composition of this group
changed so that a smaller
proportion of children lived
with poor and economically
inactive single mothers – the
category associated most
strongly with injury risks.

The child injury death rates for
the 10 applicant countries
from Central and Eastern
Europe are from the WHO
Mortality Database and are
calculated in the same way as
those for other tables in the
Report Card that draw on the
same source. (The data for
Slovakia are for 1992–95.)
Childhood injuries in Central
and Eastern Europe (including
all the republics of the former
Soviet Union) are analysed in
detail in London School of
Hygiene and Tropical
Medicine, 'Childhood Injuries:
A Priority Area for the
Transition Countries of Central
and Eastern Europe and the
Newly Independent States',
final report under contract
97/C/29 for the UNICEF
Regional Office for
CEE/CIS/Baltics, Geneva,
1998, available from
http://www.lshtm.ac.uk/centres
/ecohost/injuries.pdf.
Differences in various
dimensions of child well-being
between current EU members
and the 10 Central and
Eastern European applicants
(including injury death among
15 to 24 year olds) are
analysed in J. Micklewright
and K. Stewart, 'Child Well-
Being in the EU – and
Enlargement to the East',
Innocenti Working Paper 75,
February 2000, available from
http://www.unicef-icdc.org.

Box 2
Boys and younger children at more risk

The tables and graph are based on data from the WHO Mortality Database and are calculated in the same way as those for other tables in the Report Card that draw on the same source.

Box 3
Child traffic deaths in developing countries

The calculations of injury death totals and rates in this box refer to children aged 0 to 14 and are for 1998. The necessary data were provided by the Violence and Injury Prevention Unit, World Health Organization, Geneva. Some of these data are contained in *Injury: A Leading Cause of the Global Burden of Disease*, World Health Organization, Geneva, 1999 (available from the Unit's website, http://www.who.int/ violence_injury_prevention/ index.html). This report lists the 15 leading causes of death in 1998 for children aged 0 to 4 and for those aged 5 to 14 (as well as for other age groups) in each region of the world, separately for 'low and middle income' and 'high income' groups of countries. (Figures are also given for the 15 leading causes of the burden of disease, measured in DALYs.)

The WHO estimates that worldwide 1,129,697 children aged 0 to 14 died from injuries in 1998 (excluding injuries sustained in war) of whom 1,109,032 died in 'low and middle income' countries (including 236,744 in traffic accidents) and 20,665 in 'high income' countries. These totals (which are not given in the WHO report described above) are the basis for the statement in the box that the developing world accounts for 98 per cent of child injury deaths worldwide and for the figure of one million child injury deaths a year in Africa, Asia and Latin America. The injury mortality rates in 1998 for 0–14 year olds implied by these data (not age-standardized) were 13.0 per

100,000 children for 'high income' countries and 68.0 per 100,000 children for 'low and middle income' countries (implying that 195 children out of every 100,000 will die before age 15 in the former group of countries and 1,020 in the latter). Appendix 2 of *Injury: A Leading Cause of the Global Burden of Disease* lists the countries in the income groupings in each region identified in the graph and Appendix 3 gives the population totals used for the denominators of the mortality rates. (The OECD members are classified by the WHO as 'high income' countries with the exception of those from Central Europe, Turkey and Mexico.)

The car ownership rates quoted in the text for industrialized and developing countries, taken as groups, refer to 1989–90 and are from United Nations Development Programme, *Human Development Report 1994*, Oxford University Press, New York (p. 161). The rate for China is taken from I. Roberts, 'Letter from Chengdu: China Takes to the Roads', *British Medical Journal*, 1995, 310:1311–3; those for Canada and the USA refer to 1997 and are from the International Road and Traffic Accident Database (IRTAD) (http:// www.bast.de/irtad/index.htm). ('Americas high income' in the graph in the box is defined as Canada, USA and the Bahamas.) The figures for the percentages of road deaths of all ages that are accounted for by pedestrians and cyclists in the USA and Ethiopia come from P. Barss, G. Smith, S. Baker, and D. Mohan, *Injury*

Prevention: An International Perspective, Oxford University Press, 1998.

The discussion of what could work in developing countries to bring down traffic injury rates, together with the diagram rating the potential of each safety measure, is based on S. Forjuoh and G. Li, 'A Review of Successful Transport and Home Injury Interventions to Guide Developing Countries', *Social Science Medicine*, 1996, 43(11): 1551–60.

Acknowledgements

Innocenti Report Card, No.2

A league table of child deaths by injury in rich nations

In every one of the world's wealthier nations, injury is now the
leading killer of children aged over one. This second *Report Card*
presents, for the first time, a standardized league table ranking 26
of the world's industrialized nations according to their injury
death rates for children aged 1 to 14.