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J. S. Papadopoulos

2nd edition with extensive revisions and new material

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A guide to accident prevention

2nd edition – with extensive revisions and new material

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A number of doctors have assisted me with various chapters in this book: Tatiana Grigori, V. Karantzoulis, D. Krentiris, Aikaterini Hamakou. I have also been assisted by Angeliki Verykokaki (Mobility instructor for the visually impaired)

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Close relations are maintained with State universities, technical schools, as well as with the communities in the cement plants' vicinity, welcoming plant visits, providing assistance and encouraging further collaboration.

I wish to express a debt of gratitude to the German Federal Association of Accident Insurance Funds (Bundesverband der Unfallkassen - München) who kindly allowed me to use information and some illustrations from their very valuable publications. Wherever I have used this material the source has been acknowledged.

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Preface to 2nd edition

Like its predecessor, this new edition is intended not only to convey useful knowledge of safety issues, but also to show how this knowledge can be put into practice in everyday school life in order to prevent accidents to students.

I have made radical changes to this second edition, and added new material, while conscious of the need to keep the book to a practical size. Unfortunately, precautions not properly implemented can create more dangers than they eliminate, and so I have been very careful to research the measures proposed and to explain them clearly and fully.

I have made extensive use of photographs because they demonstrate the – often incredible – neglect of safety measures in Greek schools, and the dangers all around us of which we are so often unaware; I hope they will also persuade the reader of the urgent need for improvement in our safety awareness.

This English-language edition is designed for use outside Greece, and I have tried to ensure that the issues raised and the proposed safety measures are of general application. Nevertheless, the reader will need to remember that there are cultural, social and legal differences between countries, and that the existing levels of accident prevention in various countries will also differ.

I am profoundly grateful to the TITAN Group for its unstinting support; I must also express my admiration for the respect and consideration the Group has always shown not only to its employees but to all those with whom it does business. I must single out for special thanks Mr. T. Papalexopoulos, Managing Director, Mr. P. Papavasileiou, Director of Human Resources - Greece, and Mr. S. Xenos, Manager of Public Relations. I have much appreciated their wholehearted support for this project.

Athens, June 2005

J. S. Papadopoulos

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1. Introduction

■ Making effective use of this book

This book is intended as a tool which can be used to improve standards of safety in schools by preventing accidents and fostering a better understanding of risks and accident prevention in the mind of the schoolchild. Its purpose is not so much to instil knowledge as to ensure that the relevant knowledge is **put into practice**. It is designed to be read by all those responsible for school safety (buildings, equipment, behaviour of students and so on). Many different persons and agencies may be involved in school safety issues, including the teaching staff, local authority officials, safety officers, school doctors, local government and, in certain cases, the police and fire brigade¹.

The content of the book is intended to be practical, useful and easy to apply. It does not cover all the complex safety specifications issued by, for example, the European Union, however necessary they may be, since such an approach would inevitably fail to secure the desired objective, i.e. a reduction in the number of accidents. We are all only too well aware that an unrealistic endeavour to achieve perfection is often the greatest enemy of real improvement – and this is particularly true in the area which interests us here.

Accident prevention requires creative imagination (as opposed to fantasy), by which we mean the ability to see the possible consequences of existing conditions, so that such consequences can be averted. It also requires a willingness and ability to put into practice decisions based on the findings of research or empirical observation.

Practical prevention is not a matter of continual observation and description. We already have a wealth of research and statistics on which to base our actions; let us wait until this material is outdated or no longer adequate before we embark on further research.

Whenever an accident occurs or criticism of safety standards appears in the press, the usual reaction of government officials is to issue some involved and grandiose statement of policy – policy sometimes never implemented. Sometimes indeed the main purpose of such policy statements is to stifle criticism and create the impression that action will be taken.

¹ Central government has sometimes delegated responsibility in this area to local authorities but has failed to equip them with the necessary knowledge and financial resources. It is extremely difficult for the mayor of a small village, for example, to familiarize himself with all the rules concerning safety in children's recreation grounds, or the principles of safety at school.

The need for a systematic approach to accident prevention in schools is quite clear from the fact that legislation on school safety is already in place in most European countries, in the USA, Japan and elsewhere, and from the substantial number of special publications on school safety available in many countries. The need is also evident from the sheer number of children injured at school or in traffic accidents on their way to and from school and, finally, from the significant number of international conferences and seminars organized to discuss the problem of accident prevention at school.

In writing this book we have followed a simple principle: 'think globally – act locally'. In other words, our concern here is to improve conditions in our own community, our own area of responsibility – we have not set out to change the world! Although if the truth be told, the most effective way of making the world a better place is for each of us to improve his own little corner; unfortunately the cumulative effect of a number of small-scale actions is insufficiently appreciated.

Every country, and often the different regions of the same country, will of course have its own distinctive features (different economic resources, different standards of safety, different administrative arrangements, a different overall culture); these features must be taken into account in the work of accident prevention at school. This modest guide to school safety is based on a general philosophy which should be valid almost anywhere.

Most of the photographs in the book are from Greece and have been selected to illustrate some point made in the text; in some cases they offer extreme and rare examples of poor safety practice or risk. But let no one be complacent: where children are concerned, the improbable can become probable, the least likely accident can be the one which occurs – in any society or state in the world.

The reader may detect a note of pessimism at certain points in the book. If we have succumbed to pessimism we hope it is at least an active form of pessimism, and we should not forget that all too often it is the pessimist who is more fully cognizant of the facts!

The author would welcome any comments on the book or suggestions for improvement in future editions. Correspondence should be addressed to:

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12 ■ The right environment

The creation and maintenance of the right school environment – well designed and cared-for, attractive and secure – will not only ensure the desired level of safety but will also instil in the children an invaluable sense of caring, which in its turn will help to shape their attitudes and behaviour.

The right environment will foster an appreciation of the value of life and the importance of caring; it will help persuade the children that they are being taught something of real meaning and importance, not just useless theories; and as a consequence it will make them more likely to trust their teachers when it comes to other - equally serious – issues, like substance abuse. It will enhance the children's awareness of accident prevention, instilling an understanding of safety in the community and laying the foundations for attitudes to risk and accident prevention that can be passed on to future generations².

Practical action, however modest in scale, is worth more than whole libraries of theory – and it is precisely this practical action which our society needs so badly.

² In contemporary Germany a mother will have grown up with an adhesive warning sticker on the glass door to the balcony; she will have played when she was a child in a properly regulated children's recreation ground. There is therefore no need for the State to take any special measures to teach her about keeping her own children safe: accident prevention has already become second nature.



As well as the objective risks threatening children in these school playgrounds, the general air of neglect makes the introduction of safety measures even more difficult.



At a recent educational visit to a hazardous work-site, the only people wearing protective helmets are our own students! When you're in the business of accident prevention, you have to practice what you preach (University of Athens Medical School, 1998).

2. A general profile of accidents in Greece

■ 2.1 Road accidents³

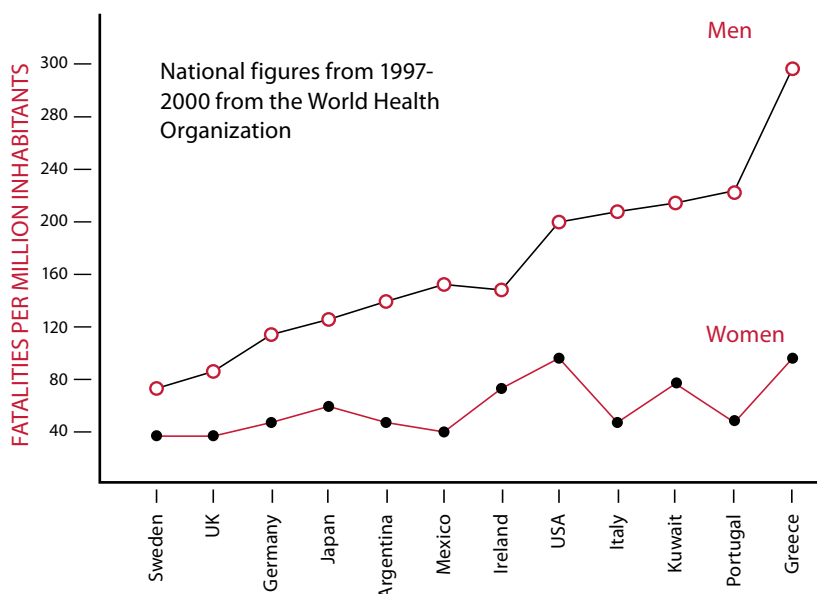


Heavy-duty factory-manufactured fenders, and even more so the kind of bars attached to this vehicle, can cause terrible injuries to pedestrians, especially children. (The EU is expected to bring in legislation to prohibit them, probably from the year 2007).

Road accidents are the most serious class of accident, accounting for many deaths and serious injuries:

- Deaths in 1993: 1,830; in 1998: 2,182 (+20%) and in 2002: 1,654 (-32%).
- Comparison with other countries (deaths per million inhabitants) places Greece top of the league for road accident fatalities, easily outstripping the second most dangerous country, Portugal.

Road accident fatality figures for selected countries. The table shows men at much greater risk than women!



³ - Greek National Office of Statistics: Monthly road accident figures, Athens 1993 to 2002.

- Greek National Office of Statistics: Road accident statistics, Athens 2003.

- Papadopoulos J. S.: Functional analysis of road accidents. Greek Ambulance and First Aid Service (EKAV) – Accident Prevention Division, Athens 2000.

- Com. of the European Commission (DGVII B-3): Road Safety - Guide Indicator, 1996.

- Papadopoulos J. S.: Accidents: Prevention is feasible. ASPE, Athens 1996.

- Injuries (serious and minor) in 1993: 22,910; in 1998: 33,721 and in 2002: 22,332.
- In terms of the seriousness of road accidents (fatalities per 100 accidents) the rate in Greece for 1999 was 8.8 – once again the highest in Europe, compared with 1.7 in Belgium, 1.5 in Germany, 2.5 in Sweden and 3.0 in Portugal. Greece may not have so many accidents, but those we do have tend to be more serious.
- There are large differences in serious road accident rates for different parts of the country. In 1999 the regions of Thessaly, Thrace and Evoia reported a frequency of serious accidents disproportionate to the size of the local population.
- The 15-24 age group is particularly at risk of fatal involvement in road accidents. 81% of all deaths in this age group are due to road accidents, only 19% to illness or disease!
- The 8% of motorists driving with blood alcohol levels in excess of 0.5% (0.5 g/l of blood) cause about 45% of road accident fatalities! (France 29%, Germany 19%).
- Most deaths per 100,000 vehicles are caused by buses/coaches and motorcycles!
- Lateral collisions (in which a motorist at an intersection ignores the right of way of other traffic, colliding into the side of the other vehicle) are the most common type of accident and cause the most fatalities (in absolute terms).
- Greece has the highest fatality rate among pedestrians in all of Europe (1996: Greece 2.5%, Germany 0.4%). 51% of pedestrian fatalities (in the period 1985-1994), a total of 2,037 for the whole period, were from among the over-65 age group (total for all age groups: 4,037 pedestrian fatalities).
- Between 1996 and 1999 hit-and-run accidents involving fatalities increased by 274% (159 → 416) although there was no overall increase in the number of accidents!
- The makes of car most frequently involved in fatal accidents were Mercedes (9.3 fatal accidents in each 100) and BMW (9.2). The manufacturer whose vehicles were involved in the fewest fatal accidents was Zastava (1.7)! This is one of the most important of all these statistics, showing that cars which are objectively 'safe' in technological terms are rendered dangerous by their high-performance features (speed, stability) and by the behaviour of their drivers.

16 ■ 2.2 Workplace accidents⁴



A scene showing a variety of violations of health and safety legislation: the ladder is set at the wrong angle and not properly supported, either at the top or the bottom; the workman is unsecured and is not wearing protective clothing, boots or helmet. And worst of all – the workman in the picture is setting up the loudspeakers for a rally organized by the General Confederation of Greek Labour!!!

Of all the unjustifiable accidents which occur in Greece, it is those in the workplace for which there is least excuse. There is excellent legislation in place, but all too often the proper precautions to safeguard employees are just not taken. For example, the law requires that there be a workplace physician⁵ and safety officer at all workplaces above a certain size, but far too frequently this requirement is ignored.

In the year 2002 the Greek Social Insurance Institute (GSII)⁶ (only one of Greece's many insurance and pension funds) recorded 16,031 workplace accidents, of which 103 (6.4%) were fatal. For many years now the accident rate has been falling, thanks to improved working conditions, safer machinery and the decline in Greece's heavy industry. 85% of accidents involve men and 15% women. The 25-34 age group is most at risk (32% of accidents). Most accidents involve injury to the upper limbs (48%), with the fingers the most vulnerable body part of all (24%). 26% of all industrial accidents involve some sort of fracture. Most accidents occur in the manufacturing and building industries (25%). In 26% of cases the injured person requires hospital treatment. Machine assembly workers, unskilled mine workers and industrial operatives are all at particularly high risk (87 accidents per 1,000 workers). Unskilled labourers and foreign workers are far more vulnerable (83 accidents per 1,000 workers, compared with an GSII average figure of 31/1,000 [in 20-24 age group]). Salaried workers are much less likely to be injured at work than their wage-earning fellows (11 accidents per 1,000 employees).

-
- ⁴ - Papadopoulos J. S.: Accidents: Prevention is feasible. ASPE, Athens 1996.
 - Annual Workplace Accident Statistics: Greek Social Insurance Institute (GSII), Athens 1999.
 - Workforce Statistics: Greek National Office of Statistics (E.S.Y.E.), Athens 2003.
 - Papadopoulos J. S.: Health and safety at work in the Olympic Village. Report to the Olympic Committees (International and Greek), Athens 2002.
 - Construction Workers' Union
- ⁵ It is absurd a) that despite the overcrowding in other medical specializations, medical students continue to spurn this area; b) that students and trade unionists continue to regard workplace medicine as a 'second-class' discipline; and c) that the state continues to undermine efforts to develop the discipline, making very few places available in hospitals (the current waiting time is 12 years!).
- ⁶ Report on Workplace Accidents 2002. GSII, Athens 2004. In practice, the only figures available for the public sector are the GSII statistics, supplemented by those from a number of private sector companies: TITAN Cement S.A. (a company with an exemplary accident prevention policy), the Power Company and Phone Company. There are no statistics for the whole public sector, or for Greek agricultural workers!

■ 2.3 Accidents involving poison⁷

In 2001 no fewer than 44,809 emergency calls were made seeking help in cases of poisoning (1976: 4,086; 1985: 23,634; 1995: 34,214). 20,711 cases involved victims in the < 1-14 age-group (46%). 46% of cases involved the accidental ingestion of medicinal drugs (not safely locked up in the home); 23% involved cleaning agents, 5% cosmetics and 3.3% agro-chemicals. Drugs prescribed for mental conditions, antibiotics and painkillers accounted for 9,075 cases of poisoning (44% of poisoning by pharmaceutical products, and 20% of all cases of poisoning). 99% of all cases occur in the home and in 78% ingestion of the poison is by mouth. In 6,633 (15%) cases the poison is taken in attempts at suicide (for many years now this has been the most rapidly rising statistic!).

Poisoning emergency centre, open 24 hours a day: A. Kyriakou Hospital. Tel. 210 7793777 The centre also has the facilities to carry out blood tests to identify poisonous substances



Forest fires – the scourge of the Greek countryside (Malakasa - Attica).



A fire-fighting station – in name only! All too often in Greece the letter of the law is obeyed but the spirit forgotten.

■ 2.4 Fires⁸

In 2001 no fewer than 35,962 fires (20,612 urban fires, 15,350 forest fires) were reported to the Greek Fire Brigade, compared with 33,166 in 1998. The scale of the problem of fires can be seen from the sheer size of the Fire Brigade in Greece: it employs 112,332 fire-fighters, its vehicles travelled a total of 2.6m kilometres in the year and it spent a total of 262,861 hours fighting fires.

⁷ Poisoning Emergency Centre, A. Kyriakou Hospital: Annual Report 2001, Athens

⁸ Fire Brigade Activities in 1999. Fire Brigade Statistical Service, Athens 2000

In 1999, the most recent year for which we have detailed figures, there were a total of 35,704 fires, in which 75 lives were saved; 5,365 fires were caused by carelessly discarded cigarettes, 2,153 were caused by naked flames and 1,705 by heated surfaces. Less well known is the fact that 5,614 fires were reported in houses and apartments, 328 in restaurants, 109 in cafés, 119 in school buildings, 44 in hospitals (!), while 2,596 fires occurred in motor vehicles and 47 on board ships. In Attica alone fires caused damage costing 8.2 billion drachmas, while the figure for Crete was a staggering 17.6 billion drachmas. The total number of casualties in fires was 238: 59 fatalities, 63 cases of burns and 116 cases of other injuries).



Where else in the EU would people stand for this state of affairs? (Athens, 2003).



It's not just the state which is to blame. Private individuals, too, often fail to act responsibly (Athens, 2002).

■ 2.5 Falls (on the same level)

Falls on a same level surface (not, for example, from a ladder) are a kind of accident often overlooked which nevertheless involves large numbers of small children (usually without ill effects) and elderly people (often with serious consequences). Among the elderly, women outnumber men by a large margin. WHO figures for 1999 give the following statistics for deaths as a result of falls per million inhabitants (male and female)⁹:

Deaths from falls for each 1 million inhabitants of selected countries (for 1999)

Ireland	25	Greece	98
Argentina	35	Sweden	130
Mexico	50	Germany	180
Portugal	75	Italy	360!
USA	90		

The commonplace is taken for granted and is accepted without protest as a part of our daily lives. Thus our quality of life deteriorates without our even noticing it! (Athens, 2004).



⁹ The figures have been calculated from charts with an accuracy of $\pm 3/1$ million inhabitants

An issue worth exploring is why there are no significant differences in national statistics for the 65-74 age group, while the differences are pronounced among those aged 75 and over. Is it perhaps the large number of incidents involving young children which distort the result? In the USA (1977) deaths caused by falls increase dramatically after the age of 75, occurring many times more frequently than deaths in road accidents or from accidental poisoning.

On the island of Cos¹⁰, in a thirty-month period from 1997-1999, 650 persons aged over 65 were admitted to hospital (93 cranial injuries, 451 fractures, 134 miscellaneous injuries). In a study of 4 hospitals in Attica in 1996 there were 2,945 cases of accidents involving falls out of a total (all accidents in all age groups) of 17,908¹¹. 13% of workplace accidents dealt with by GSII (2001) involved a fall¹². In a study conducted by students at the University of Patra¹³, out of a total of 8,794 persons seeking out-patient treatment at the University Orthopaedic Clinic, 427 had sustained injury in a fall (excluding falls from a height), suffering fractures in 218 cases.

Main causes of falls

In the home: rugs and mats on slippery floor surfaces, trailing cables, dogs, toys, slippers without proper heel support (!), absence of handrails for support in the bathroom or of non-slip rubber mat, getting up hastily at night, inadequate lighting.

In the street: uneven paving stones, remains of posts and columns, motorcycles, oil on pavement.

On the bus: sudden stopping and starting, excessive speed, high steps. Medical factors: heart problems, neurological problems, sensory impairment, mental problems, senility.

Drugs: tranquillizers (!!), sedatives, muscle relaxants and in general any drugs that impair mobility.

All falls should be looked at from both the medical and environmental perspective, whether or not the individual incident has serious consequences

¹⁰ KaranGSII, E., Papadopoulos J. S. : Same-level falls among the elderly on the island of Cos. Panhellenic Geriatric Conference, Athens 1999.

¹¹ Annual EHLASS Report Greece, 1999. Ministry of Health and Social Solidarity

¹² Annual Workplace Accident Statistics: GSII, Athens 1999.

¹³ Elective class in «Applied Accident Prevention»: Recording of accidents involving falls reported to the out-patients department of the University Orthopaedic Clinic, Patra 2003-2004 (Panhellenic Medical Conference, May 2005).

20 ■ 2.6 Accidents at the seaside



Despite numerous tragedies we still fail to appreciate the many dangers of the seaside. The photograph shows a small craft with too many people on board (Sikinos, 1998).

In 1999 there were 368 cases of death by drowning, of which 37 involved persons under 24 years old. Figures for other countries in the same year were as follows: Germany 597, Portugal 26, Sweden 104, Ireland 56, Italy 361 and Argentina 710 (we must remember, of course, the different population sizes of these countries). Equally frequent are accidents caused by speedboats (in which the victim is often left to his fate by the crew of the boat) and jet skis; in both cases the underlying cause of the accident is human carelessness).

Young children (and elderly people) can drown in silence, without calling for help, in water as shallow as 40cm. This is why parents and relatives must show constant vigilance!

■ 2.7 Details of accidents involving children

Location of accidents involving children in Greece¹⁵

Location	Age		
	< 1	1-4	5-14
Home	635	3,606	2,354
Near home	88	943	1,218
School ¹⁶	11	254	3,370
Sports facility ¹⁶	6	37	1,047
On the road	40	441	2,210
Other	78	1,728	3,504
Total	858	7,009	13,703
Overall total : 21,570			

¹⁴ Annual World Health Organization (WHO) statistics.
¹⁵ Annual EHLASS Report Greece, 1999. Ministry of Health and Social Solidarity.
¹⁶ If we combine the categories 'School' and 'Sports facility' for all age groups, they represent 21.91% of all accidents involving children of these ages.

Location of accidents involving injuries to children < 1-14 years old (♀♂) in Greece

Locations (selected)	1993 ¹⁷	Percentage of total injuries (10 locations)	1996 ¹⁸	Percentage of total locations of injury (10 locations)
School	468	(29.8%)	4,260	22.1%
Places of recreation	69	(4.4%)	1,109	5.7%
Sports locations	509	(32.5%)	1,310	6.8%
Home	235	(15%)	7,119	37%
On the road	149	(9.5%)	2,603	13.5%

Types of injury to children aged <1-14 (♀♂) in Greece^{17,18}

Type of injury (selection)	1993 (N=4,476)	Percentage of total injuries	1996 (N=19,214)	Percentage of total injuries ¹⁹
Fractures	621	13.8%	2,709	14.0% (39.3%)
Dislocations	90	2.0%	595	3.0% (2.4%)
Damage to nerves	113	2.5%	390	2.0% (3.2%)
Amputations	4	0.08%	21	0.1% (-)

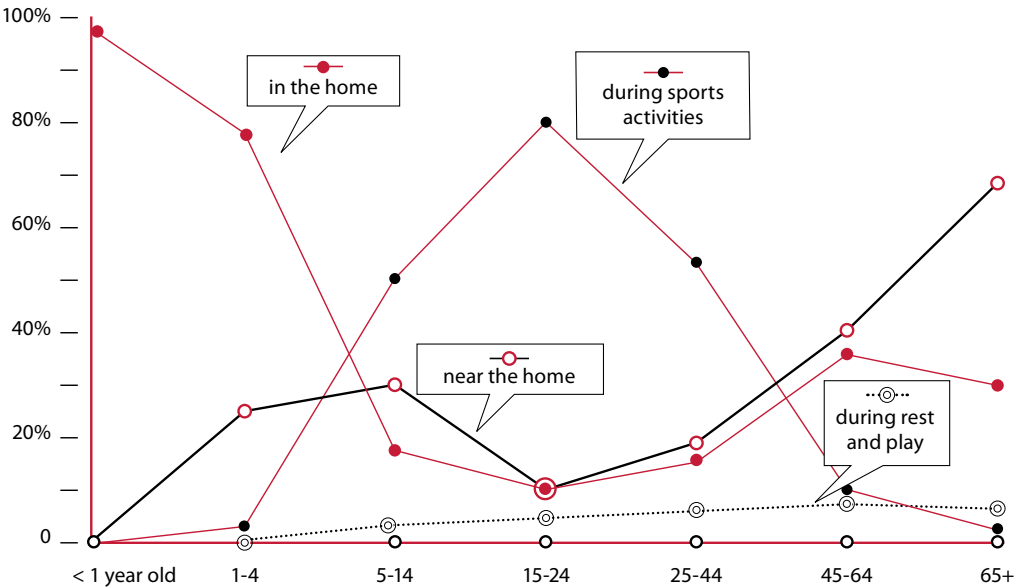
Locations of accidents involving children in 3 European countries

Location of accident	Countries		
	Portugal (1999) ♂ (N=4,503)	Ireland (2001) ♀	Austria (2001) ♀♂ (N=8870)
Indoors	32%	31%	26%
Public locations and roads	24%	-	18%
Near house	20%	20%	14%
School	9.3%	-	1%
Sports facilities	-	38%	22%
Places of recreation (leisure time)	-	5.6%	12%
Other locations	14.5%	6.2%	3%

¹⁷ Data compiled by General Hospital in Attica. Annual EHLASS Report Greece 1993. Greek Ministry of Health and Social Solidarity.

¹⁸ Data compiled by four hospitals (2 General Hospitals, one hospital specializing mainly in injuries, and one paediatric hospital). Annual EHLASS Report Greece 1996. Greek Ministry of Health and Social Solidarity.

¹⁹ In brackets we give the percentage for this type of injury among those aged over 65; the biggest difference is in the number of fractures.



The graph shows the distribution of accidents by location for the age groups <1 to 65+ (EHLASS-Report). The percentage distribution does not represent the true reality, because it does not take account of the time spent at each location (young children spend most of their time at home), or the fact that different age groups in the population are more likely to be found at different locations (14-25-year-olds spend more time at sporting facilities); different countries also categorize accidents in different ways.

We reproduce the graph in order to show the different distribution of accidents among age groups depending on the different frequency of their presence at different locations (97% of accidents involving children under one year old occur in the home, 80% of accidents in the 15-24 age group occur at sporting facilities).

■ 2.8 Schools and student numbers

Population of Greece in broad age groups²⁰

Year of census	Total	Percentage		
		0-14	15-64	> 65
1920 ²¹	5.0 m.	34%	60%	6%
1928 ²¹	6.2 m.	32%	62%	6%
1951	7.6 m.	29%	64%	7%
1961	8.4 m.	27%	65%	8%
1971 ²²	8.8 m.	25%	64%	11%
1981 ²³	9.7 m.	24%	63%	13%
1991	10.3 m.	19%	67%	14%
2001	10.9 m.	15%	68%	17%

²⁰ Greece in numbers, Athens 2003. Greek National Office of Statistics (E.S.Y.E.).

It is evident that Greece has a demographic problem, with the school-age population declining and the percentage of elderly people rising. In each of the last three years the number of deaths has exceeded the number of births. Most of western Europe is facing a similar demographic problem.

Schools, teaching staff and students²⁰

	Year	Primary schools	Secondary schools	Secondary vocational schools ²⁴	Technological vocational colleges (TEI)	Universities
Schools	1980 ²⁵	9,461	2,243	799	109	13
	2001 ²⁵	6,074	3,244	677	68	18
Teaching staff	1980	37,315	31,737	7,834	3,413	6,924
	2001	49,842	54,123	13,980	10,652	10,708
Pupils-students	1980	900,641	639,633	100,425	28,810	85,718 ²⁶
	2001	647,041	589,669	161,222	112,605	163,256 ²⁶

Special education (for the handicapped)²⁰

Data for school year 1994-95

State schools	Pupils	Schools	Teaching staff
Kindergartens	171	31	51
Primary schools	3,137	134	782
Secondary schools (12-15)	201	6	64
Secondary schools (15-18)	122	5	48
Vocational schools	31	3	27
Special programme schools	52	3	19
Special classes at primary schools	9,489	*	631

* These classes are taught within ordinary schools

²⁰ Greece in numbers, Athens 2003. Greek National Office of Statistics (E.S.Y.E.).

²¹ E.S.Y.E. data: Not including individuals who failed to state their age.

²² E.S.Y.E. data: Sample processing of 25% of census returns

²³ E.S.Y.E. data: Sample processing of 10% of census returns.

²⁴ Significant reforms to the education system were introduced in the years 1997 and 1998.

²⁵ Data for beginning of the school year.

²⁶ Data do not include students who have completed the ordinary course of studies but still not taken their degrees.

3. The philosophy of accident prevention

There is a tendency to deride the idea of philosophy, as if it were something vague, a theoretical activity indulged in by scholars in their ivory towers, far removed from ordinary life and its problems and demands.

The fact is, however, that 'philosophy' – understood to mean a way of thinking and acting, the moral and legal foundation on which we base our public policy or regulate our individual lives – is absolutely indispensable. Our philosophy offers the support and serves as both a reason to act and a map by which our actions are guided.

We are speaking, of course, of a practical philosophy, since accident prevention is a matter of practical action – only thus does it acquire any real meaning, just as morality acquires meaning through its practical application.



The objective must not become an instrument. The sign in the photograph was put up by the local association dedicated to improving the environment – and has become a major eyesore in its own right! Note also how the name of the association is in much larger letters than the message it is seeking to convey (Thrakomakedones, Attica, 2002).



Tasos Merkouris, Ph.D. – biologist and junior high school teacher. Tasos lives in an eight-bed ward in the Liosia Institute for Rehabilitation of the Disabled (Athens), relying entirely on the institute's support systems. Completely paralyzed, he still manages to lead a useful life. He should make many healthy people reflect on how little they do with their sound limbs, and feel ashamed at their excuses for inaction.



It's not always easy to predict the impact of man's activities on nature. The plastic rings from a Coca Cola 6-pack have proved fatal to birds at a landfill site! Many birds died before the problem was appreciated and action taken. It's often only in practice that we realize the dangers we are creating.

'TRAGEDY AT BASKETBALL GAME: REFEREE STUMBLES INTO CHILD AND KILLS HIM!'

The newspaper reports an 'incredible' accident in which a basketball referee stumbled into a young toddler during a game, causing fatal injuries. The child had wandered onto the basketball court while his father's attention was elsewhere. Effective accident prevention involves imagining the incredible – and trying to prevent it (Athens, 1989).



But the sad truth is that in the modern world all too few individuals or institutions take the trouble to organize their ideas into a philosophical framework on which they can base their activities and make conscious, deliberate decisions on what actions to take.

Although we shall be concentrating here on the prevention of accidents, and specifically the prevention of accidents in our schools, the basic philosophy of prevention is the same for all kinds of accident.

■ 3.1 Principles of applied prevention:

- Prevention is not just a matter for administrators and technicians. First and foremost it is a **matter of attitudes**.
- Usually there is more than one factor responsible for an accident; there are usually a **number of underlying causes, and one event which finally triggers the accident**.
- The most common and fundamental cause of accidents is human behaviour (whether that of the victim, those around him, or those responsible for prevention).
- Effective prevention requires **continual enforcement** of safety measures and appropriate behaviour.
- It is in the nature of good prevention **not to impress**: it is only when an accident occurs that people appreciate the importance of preventive measures.
- Those engaged in prevention are delighted when they can avert just one accident. **It's rare for prevention to have wholesale results.**
- Every accident or 'near-miss' must be analyzed and the results used as input for future planning.
- All too often it is the 'unlikely' event which actually occurs.
- **Common sense can be misleading**; we must always examine carefully the results of our precautions. One cannot just assume that 'rational' precautions will automatically reduce the number of accidents; they may actually increase it. It's the results which count!
- Accidents often have their root cause in **social inequalities**, social conditions, patterns of behaviour and quality of life in a particular location.
- 'Insignificant' causes can lead to serious accidents.
- Prevention isn't just a matter of vigilance, or the putting up of warning signs. Prevention means **eliminating dangerous conditions** and patterns of behaviour
- Prevention coincides with **implementation**.
- The key to prevention is to think globally, but **act locally**.
- The Prevention Officer must acquire a thick skin and **learn not to be upset by teasing and sarcasm from the ignorant**.

26 ■ 3.2 Objective: Creating an attitude of prevention

In the prevention of accidents – as in most social issues – there are certain attitudes which play a vital role:

- A willingness to help others, an appreciation that other people's rights are as important as our own, and a realization that we are not the centre of our own private universe.
- A conviction that in this world which we have been given (or which we have created) our only hope lies in solidarity with others.

These attitudes must of course be supplemented by knowledge, ideas and experience. No one can be expected, of course, to familiarize himself with all the infinite circumstances which might lead to an accident; however:

- if an individual has some knowledge
- if he has a fully developed sense of other people's needs and rights
- if he appreciates the value of all human life
- and if he wishes to offer something back to the community, instead of just taking from it

then this individual will always be aware of potentially dangerous situations, even if the dangers have not been described to him, and will take the necessary precautions. In other words, he will have developed the right accident prevention awareness. If a person cares about his workmates or his fellow students, then almost without conscious effort his mind will always be on the look-out for possible dangers to them – and always ready to take preventive action.

■ 3.3 Children don't need wrapping in cotton wool

When I pointed out to a friend of mine that the cable running from her telephone to the wall socket was a potential hazard, and that one of her staff could easily trip over it (my fears were realized within a few days; my friend herself tripped and broke a finger – with some permanent loss of mobility) her reaction to my warning was that I 'should stop worrying about accidents all the time'. I have been surprised to find that in fact most people regard a concern with accident prevention as little short of neurosis, requiring counselling or psychiatric treatment!

In fact prevention, and in particular the prevention of accidents, has nothing whatsoever to do with fear, anxiety and abstention from any activity that might involve risk. The last thing we want to do is lead our lives, or make others lead their lives, wrapped in cotton wool!

In fact the opposite is true: it is those who take sensible precautions who can afford to take risks, who live their life with a more real awareness of its value, who are con-

cerned for others (remember how important it is not to imagine that the world revolves entirely around you!), who enjoy a broad range of activities – including some that only a small minority of people indulge in – and above all who enjoy a better quality of life (no disabilities, no visits to the doctor, no arms in plaster, no expensive stays in hospital).

Does anyone really believe that sky-divers - who check the packing of their parachute 15 times before a jump, who always have a second chute in reserve and who regularly comply with the most rigorous safety rules – are timid personalities whose lives are ruled by fear and anxiety? Will anyone really claim that mountaineers must be pathologically fear-ridden characters because of their obsession with safety measures, because they never attempt to climb a vertical rock-face without rope and crampons? Is Michael Schumacher ever accused of cowardice when he dons his helmet and fire-resistant suit, or demands that Formula One organizers comply with the appropriate safety standards?

No one concerned with accident prevention has ever claimed that we should give up all activities which involve a (reasonable) level of risk. What we do ask is that these activities should be accompanied by all the appropriate safety measures – precisely so that those participating can enjoy themselves without anxiety! By all means ride a motorbike – but make sure you have the proper training and always wear your helmet. By all means try hang-gliding – but observe all the safety rules, always check the weather forecasts and keep your equipment in good repair. By all means enjoy scuba-diving or underwater exploration – but don't dive along busy sea lanes, always make sure there is a marker buoy on the surface to alert others to your position, and never dive alone. All the precautions we suggest are straightforward measures which don't detract in any way from your enjoyment and are easy to implement at all times.

We have absolutely no desire to see the younger generation brought up wrapped in cotton wool and afraid of their own shadows. Heaven forbid! Those of us who care about accident prevention like to see strong, independent young people, not frightened creatures tied to their mother's apron strings! When we talk about accident prevention we are obviously not thinking of risk-free activities (because in these no precautions are necessary²⁷); we are interested in precautions to keep children and young people safe when they engage in 'hazardous' activities. We are not interested in avoidance of danger so much as facing up to danger through the appropriate safety measures. This is the basic philosophy of the book: not avoiding danger, but coping with it sensibly.

²⁷ Of course the anticipated injuries must not be serious. The system (cycling, motorcycling, etc.) must be 'user-friendly', i.e. allow mistakes that do not lead to disaster. If someone has a disabling or fatal accident, then it means he has not learnt from the system and from his mistakes. This is why we are opposed to play areas where everything is sheathed in foam rubber padding. The child does not learn what it means to fall, what pain is, and thinks that in any recreation ground he will be able to jump from a height without ill effect, without learning how to fall safely. We do not believe that these over-protected play areas provide proper exercise or learning for the child.

■ 3.4 What accident prevention isn't

Covering **frayed** wire with insulating tape..

Asking motorists to be extra-careful when driving near a school.

Putting up notice warning of slippery floor

Excluding²⁸ children aged under 14 from an elevator.

Banning sports with (reasonable) levels of risk

What accident prevention is

Replacing the wire immediately.

Introducing a 30km/h speed limit.

Replacing the floor.

Constructing safe elevators.

Proper education and taking of all appropriate safety measures..

■ 3.5 Near-misses

An important concept in the philosophy of accident prevention is that of the near-miss; experience teaches us that the same events and conditions may sometimes lead to an accident entailing material damage and/or injuries, and sometimes lead to a 'near-miss', owing to a chance set of circumstances on whose recurrence it would be rash to depend.

There are occasions when a vehicle crosses the central barrier into the opposite stream of traffic and yet there is no collision, no victim, because luckily no vehicles happened



A gypsy home. Note the clear danger from all the electric cables. Many kinds of accident are more frequent among the less privileged and less well educated (N. Liosia, Attica, 2004).



If the truck turns suddenly or overturns, these passengers could be killed. Again, the poorer members of society are at greater risk (Gypsies – Irakleio, Crete, 2000).

²⁸ All the instructions posted in elevators (in Greece at least) forbid use by unaccompanied children under 14. This is absurd.

to be travelling in the opposite direction. Sometimes a lorry driver will fall asleep at the wheel but luckily his vehicle veers to the left, into the field at the side of the road, instead of crashing into another vehicle on the road. Two planes may have a near-miss because of a mistake in the traffic control tower; the collision is avoided by the quick reactions of the pilots²⁹.

There are thousands of near-misses every day, events which could have proved costly in terms of injury or death but which thanks to sheer chance or rapid human intervention involved no casualties. But whether or not there are casualties, the importance of such an event remains the same; the near-miss must be studied carefully to identify which actions or omissions were responsible and what precautions should be taken, because the next time there may well be victims; it may well happen, for example, and to return to our examples above, that:

- Another vehicle is coming in the opposite direction, resulting in a head-on collision.
- The lorry with the drowsy driver veers to the right and collides head-on with another vehicle.
- One of the airplane pilots fails to react in time

In school, too, near-misses require thorough investigation, and the taking of whatever action is necessary to prevent their recurrence. A near-miss should never be ignored because 'luckily no one was hurt'. Next time someone could very well be hurt!.

■ 3.6 The economic factor

Economic status is a vital factor in the incidence of accidents. All the studies³⁰ which have compared population groups of different degrees of wealth or poverty³¹, or compared countries and even continents on the basis of their economic status, have come to the conclusion that more accidents, of all kinds, occur in the lower socio-economic groups. There are many reasons for this correlation between accidents and poverty: lack of information, different life priorities, the need (under economic pressure) to accept more dangerous jobs and working conditions, harsher living conditions, use of poorly maintained vehicles, greater consumption of alcohol, and so on).

It is the responsibility of the good teacher to protect his students from the dangers which may be inherent in their economically disadvantaged homes, or the poverty of the state or region in which they are growing up.

²⁹ Pilots are required to report any 'near-misses'

³⁰ - Sagan LA: Die Gesundheit der Nationen. Rowolt, Reinbeck 1992.

- Mare RD: Socioeconomic effects on child mortality in the United States. Am. Journal of Public Health 72, P540 (1982).

- Papadopoulos JS: Accidents: Prevention is feasible. ASPE, Athens 1996.

³¹ Depending on the profession of the father.

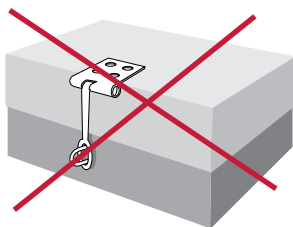
30 ■ 3.7 Teaching by example



An example of individual failure to help combat social problems. Note how the mother, collecting a child from school, has blocked the pavement – forcing other people's children to step out into a busy road (Zographou, Athens, 2000).

The best-taught lesson can be undone in moments when a poor example is set by the teacher or parents. Absolutely nothing will be achieved for safety if, for example, we preach the importance of motorcyclists wearing their helmets, and yet the children see their teachers arriving at school every day riding a motorbike without wearing a helmet, or driving their cars without fastening their seatbelts. Or if the children realize that the accident prevention measures they have been taught are not being applied on school trips. Setting a good example in practice is a more powerful lesson than a hundred hours of teaching.

■ 3.8 “How could it have happened?”



A trunk can be a death-trap for a young child: the lid falls, the catch mechanism locks the trunk – and the child is trapped inside!



A tragic tale from a newspaper: a young boy crept inside an old ballot box left lying around in his school, couldn't get out, and suffocated. If anyone had had the foresight to anticipate this accident and ask the school to remove these boxes, he would have been denounced as 'excessive'. (Athens, Loutsa, 29/8/1988)



Incredible but true!

This musician has failed to keep his electric guitar properly maintained. Result: an electric shock, a badly burned finger which subsequently became infected.

‘How could it have happened?’ – a phrase we hear all too often, people expressing their surprise and disbelief when an accident has occurred. It is precisely this belief that an accident cannot happen which is the cause of many accidents. Too many of our fellow citizens seem incapable of understanding the idea of probability, of

the degree of likelihood of various events occurring. The phrase 'How could it have happened?' also expresses the ordinary person's belief that accidents only happen to other people, that we ourselves are always safe. Changing these attitudes is a key element in the work of accident prevention.

■ 3.9 Accidents are often “programmed” to happen



The earthquake which struck Aigion in the Peloponnese in 1994 was not the reason the column collapsed; the underlying cause was poor maintenance (right – before the earthquake).

What we usually refer to as the 'cause of the accident', and is recorded as such in the accident statistics, is often just the final event which triggers the accident, not the underlying cause. Behind the falling asleep at the wheel, the 'cause' of so many traffic accidents, lie a whole variety of underlying factors: the driver's punishing work schedule, his fatigue, the failure of his trade union to secure safer working conditions, the lack of proper supervision by the state, the greed for profits of the haulage contractor who employs him.

■ 3.10 Inconsistent enforcement of safety measures

It's not unusual for accident statistics to show a year-on-year rise or fall in the frequency of accidents. This is best explained by the failure of those responsible to enforce relevant safety precautions consistently. When accident prevention is properly implemented there will be a decline in the number of accidents; but when people become complacent and the measures are not enforced with the necessary rigour, then the accident figures will rise again. Accident prevention means sustained, consistent vigilance.

■ 3.11 The key parameter in accident prevention

The key to accident prevention does not lie in the hands of the administrators and technicians – however valuable their input may be. The only really effective way to limit accidents is to change the attitudes of ordinary people and of those responsible for safety matters. Even safety regulations and measures depend – in the final analysis

– on the way of life and attitudes of those administering them.

And when we speak of way of life and attitudes, we are really focusing on two key elements:

- The degree to which people are aware of their responsibilities to others (because accident prevention is really all about consideration and support for others) and
- The degree of maturity of those involved, which will determine the extent to which they make good use of the available knowledge

According to Ministry of Public Order figures, 80% of road accidents in Greece can be attributed to human error of some kind.

■ 3.12 Prevention must be comprehensive in nature

No piecemeal approach to accident prevention can be effective. We'll never instil the right attitudes in our children if we keep the playground clear and free of hazards but forget to have the fire extinguishers checked regularly; or if we lecture them on the need for motorcyclists to wear a helmet but allow students to drink alcohol on school trips. The essence of accident prevention is respect for human life – sound in mind and limb; and that respect needs to inform every aspect of our daily routine.

■ 3.13 Basic elements of methodology for the teacher

- **There is no more effective way of impressing a lesson on the mind of the student than the everyday example of his or her teachers.** *Practicing* what we preach is the main (if not the only) way of earning credibility in the eyes of the class. Only when you really believe something enough to put it into everyday practice are you likely to communicate that belief to others. And the process must be comprehensive, applied in all areas of daily life; there can be no piecemeal approach to earning the students' confidence. Credibility cannot be fragmentary.
- The teacher **must have absorbed and pondered** the material he intends to communicate; only thus will he be able to highlight and underline the really important points. The teacher who is just regurgitating half-digested material he has skimmed through in a book will never convince anyone.
- Short cuts and half-measures are most certainly not the way to proper accident prevention; they will only lead to erosion and breakdown of all safety measures. We should never be afraid to insist on scrupulous compliance with safety regulations.
- Good relations between teacher and class are vital if the teacher is to influence his students in any area, including accident prevention. The teacher-student relation-

ship is not something which develops by itself; it cannot be rushed and requires the following conditions:

- A consistent stance on the part of the teacher
- Treating the students fairly
- Willingness to help on the part of the teacher (this will be evident to the students, if it is genuine and not forced)
- Competence in the teacher's area of knowledge
- Endurance and determination
- Maintaining the necessary distance between teacher and student
- Good relations with other teachers
- The students need to be **actively involved** in the work of accident prevention (they will understand the process better if they are personally involved)
- Elements of accident prevention must be incorporated into a number of different lessons. Some examples (from the field of road safety):
 - Overtaking (how much space is required to overtake another vehicle safely, at different speeds), in the physics lesson
 - The force with which a passenger will strike the windscreen in a collision (importance of wearing seatbelt), in the physics lesson
 - Effect of alcohol on driver (impairment of skills), in the biology lesson
 - Showing off / the dangers of trying to impress others, in the psychology lesson
 - Visibility – ability to see pedestrians, in the physics lesson



Allende, (the socialist president of Chile, 1974) photographed on the last day of his life, after the Pinochet coup. When this picture was shown to medical students in 2005, their reaction was to laugh. For those who lived through these events – even at a distance – the image can only cause sadness. This is a classic example of the 'generation gap'. The teacher must always bear this in mind if he wishes to communicate effectively.



A church in Hania, Crete. A remarkable example of peaceful co-existence – an Islamic minaret and a campanile in the same Orthodox Church.



The 'Greek formula' – an ironic comment on the Greeks' failure to realize the potential cumulative effect of many people's individual efforts in solving social problems.

- Tyres (surface grip – especially with reference to cycle tyres), in the physics lesson
- Braking distances at different speeds, in the physics lesson
- Concern and solidarity, in the religious education or sociology lesson
- Driving and human behaviour (causes of road accidents), in the sociology lesson
- Special characteristics of children and adults (in their behaviour as pedestrians), in the anthropology/biology lesson
- Importance of wearing helmet for motorcyclists (collisions, brain damage), in physics and biology lessons.

■ 3.14 Means of comparison

The objectives set by an individual or a government department depend to a great extent on the means of comparison available. These – together with the sensitivity and abilities of the individual in question – will determine how high his standards are set.

Since as far back as 1979 the little state of Luxembourg has had a school safety code, enshrined in legislation introduced by the Ministry of Education. The safety regulations were devised by M. Jacqué, the country's national safety officer, who approaches his work with great enthusiasm and a keen sense of responsibility.

We set out below the main headings of the Luxembourg legislation on school building safety. It represents a comprehensive and practical code of safety regulations, covering all key areas of accident prevention. States without a code of this kind would do well to adopt the Luxembourg model (with minor modifications where local conditions differ) or use it as the basis on which to develop their own national regulations³². The articles are numbered in the same order as that of the Luxembourg legislation.

Legislation on safety of school buildings - Luxembourg (Grand Duché de Luxembourg. Ministère de l' Education Nationale, Règlement de 13.06.1979. Service national de la sécurité dans les écoles, Luxembourg).

1. General provisions

1.1 General remarks – **1.2** Definition of terms – **1.3** Standards – **1.4** Exceptions – **1.5** Grants – **1.6** Force of legislation – **1.7** Evaluation and handover of new school buildings – **1.8** Approval (upgrading) of existing school buildings – **1.9** Research into accidents and near-misses – **1.10** Education and supervision.

2. Health and hygiene in the school environment

2.1 General remarks – **2.2** Measurements of space and furniture/work stations – **2.3** Ventilation – **2.4** Elimina-

³² In fact – with the consent of the Luxembourg government – the legislation might well be adopted in toto. It seems pointless to set up committees to draft new legislation when a perfectly adequate model already exists. There is no room for chauvinist pride in important areas like accident prevention.

tion of noxious or offensive substances – 2.5 Heating – 2.6 Protection from glare – 2.7 Noise prevention – 2.8 Lighting.

3. Selection of location³³

3.1 Site and orientation – 3.2 Isolation from other buildings in the vicinity – 3.3 Access for emergency vehicles and evacuation access to street.

4. External areas and facilities

4.1 General provisions – 4.2 Access, stopping points and parking spaces for vehicles in vicinity of school – 4.3 Playgrounds – 4.4 Playing fields – 4.5 Prevention of accidents outside the building.

5. Fire prevention

5.1 General remarks – 5.2 Incorporating fire prevention in the design of the building – 5.3 Fire-resistant building materials – 5.4 Fire- and smoke-proof doors – 5.5 Fire-resistant qualities of materials used.

6. Lay-out of interior and fire safety zones

6.1 General remarks on lay-out of space – 6.2 General remarks on fire safety zones – 6.3 Safe areas for those remaining inside building after outbreak of fire – 6.4 Technically defined areas – 6.5 Shafts and manholes – 6.6 Exits – 6.7 Fire-proof materials for interior fittings.

7. Exits and corridors

7.1 General remarks – 7.2 Positioning of exits – 7.3 Width and height of exits – 7.4 Exits required by legislation, and additional exits – 7.5 Direction in which doors should open; number of exits – 7.6 Additional regulations on doorways – 7.7 Additional regulations on stairways – 7.8 Signs.

8. Technical constructions, general and common provisions

8.1 Definition of terms and general remarks – 8.2 Hazardous constructions – 8.3 Technical constructions intended for safety purposes – 8.4 Standardization, handover and operation – 8.5 Maintenance – 8.6 Supervision – 8.7 Inspections – 8.8 Access and signing – 8.9 Emergency power supply – 8.10 Ventilation of areas containing hazardous constructions and equipment – 8.11 Cable ducts and wiring.

9. Technical constructions, additional provisions

9.1 Central heating – 9.2 Air conditioning – 9.3 Free-standing heating appliances – 9.4 Central heating fuel store – 9.5 Storeroom – 9.6 Gas storeroom – 9.7 Storage of containers holding dangerous and inflammable gases – 9.8 Elevators – 9.9 Alarm and alarm systems – 9.10 Emergency lighting.

10. Fire prevention

10.1 General remarks – 10.2 Supervision of the building complex – 10.3 Keeping buildings clean and tidy – 10.4 Ban on smoking – 10.5 Inflammable materials – 10.6 Explosive substances.

11. Fire-fighting equipment

11.1 General remarks – 11.2 Portable fire extinguishers – 11.3 Various fire-extinguishing materials.

12. Evacuation of building and prevention of panic

12.1 General remarks – 12.2 Alarm plan – 12.3 Evacuation plan – 12.4 Evacuation drill.

³³ When a new school is to be built in Luxembourg or Germany, the location is decided on specific criteria and with the involvement of the accident prevention officer, the architect, the local police chief and commander of the local Fire Brigade. In Germany the director of the new school (appointed before building completion) will also be involved in the planning.

36 13. Interior equipment and accident prevention

13.1 General remarks – **13.2** Floor and stair surfaces – **13.3** Handrails and railings – **13.4** Wall surfaces – **13.5** Windows – **13.6** Doors – **13.7** Window panes – **13.8** Lockers – **13.9** Ceilings and suspended ceilings – **13.10** Bearing capacity of floors and fittings – **13.11** Furniture – **13.12** Maintenance.

14. Safety in laboratories³⁴

14.1 General remarks – **14.2** Safety education – **14.3** Access to hazardous machinery; hazardous tasks – **14.4** Lay-out of space and equipment – **14.5** Access and movement in the labs – **14.6** Keeping the lab clean and tidy – **14.7** Use and maintenance – **14.8** Individual equipment – **14.9** Personal means of protection – **14.10** Switches, levers, pedals etc. used for operating equipment – **14.11** Emergency switch – **14.12** Power supply – **14.13** Gas containers – **14.14** Protective equipment – **14.15** Additional equipment – **14.16** Hazardous substances.

15. Special school equipment

15.1 General remarks – **15.2** Assembly rooms – **15.3** Canteen – **15.4** Dining room and kitchen – **15.5** Indoor gyms – **15.6** Classrooms.

16. Road safety on the way to and from school

16.1 General remarks – **16.2** Road safety education – **16.3** Traffic and road safety in the vicinity of the school.

17. Bussing of students

17.1 General provisions – **17.2** Organization – **17.3** Condition of buses – **17.4** Boarding and bus movements – **17.5** Supervision and discipline on buses and at bus-stops – **17.6** Location and equipment.

18. Access and movement for the disabled

18.1 General remarks – **18.2** Access to external areas – **18.3** Construction and furnishing of internal areas.

19. First Aid

19.1 General remarks – **19.2** First aid equipment.

The Greek School Buildings Agency (OSK) has also drawn up technical specifications for school buildings; these are based on the Agency's own building plans and the specifications it has laid down for accident prevention, as well as the building regulations and legislation by the Greek state. The points of most interest have been incorporated in the text of this book, with acknowledgements to the School Buildings Agency.

A summary of the main points is presented as an appendix to the book.

³⁴ This section has been compiled with remarkable thoroughness. Those familiar with the work of the school laboratory will be impressed by the knowledge demonstrated here.

4. School safety in practice

■ 4.1 Safety checklist

Every school must have an official checklist of points for regular inspection:

- **Road signs:** Including the warning signs (vertical and horizontal) to motorists that they are approaching a school and the speed restriction signs; these will be located on all approach roads to the school.
- **Access points:** Roads around the school must be safe; if possible, the local police should be asked to help control traffic in the vicinity of the school.
- **Pedestrian crossings:** There should be the appropriate signs by the roadside and white markings on the road surface.
- **Railings at the main entrance:** a barrier should be installed on the pavement at the school gate to prevent children running out of school straight into the road (see illustrations).
- **Fire extinguishers:** There should be two - >3kg in weight - on each floor, placed where they can easily be seen. Staff must be trained in operating the extinguishers and they need to be checked annually. There should be extra extinguishers for libraries, canteens, physics and chemistry labs and storerooms. The teachers should be trained in their use by officers from the Fire Brigade.
- **Fireproof or fire-retardant materials:** Buildings must be checked to verify that fire-resistant and retardant materials have been used where possible. In 1989 a school building was gutted by fire in just 10 minutes, because flammable materials had been used in construction.
- **Doors:** These must open outwards.
- **Window panes:** The glass panes in doors and windows below a height of 2 metres must be of safety glass (to the relevant specifications).
- **Power supply:** Sockets should be earthed; there should be an automatic cut-out switch; cables should be properly secured and not hanging loosely or trailing across floor; sockets in kindergartens and primary schools should be set high in the wall; meters should be set high off the ground and not be left open; there should be no exposed wiring. «Modifications» to the wiring or additions/extensions must be carried out to the highest standards.

- 38 making schools safer
- **Gyms:** Equipment and surfaces must meet the relevant specifications. Gymnastics equipment must be properly maintained.
 - **Schoolyards:** Staff should check the playgrounds for possible dangers, ascertaining whether there is uneven ground or broken glass which might injure a child in the event of a fall, whether there are any areas where an injured child might lie unnoticed by staff. The schoolyard should be properly fenced and the children's play area must be safe (the ground should be level and any play equipment kept properly maintained).
 - **Immediate environs of the school:** The vicinity of the school may hold serious dangers (e.g. building sites, rail lines).

■ 4.2 Road safety around the school

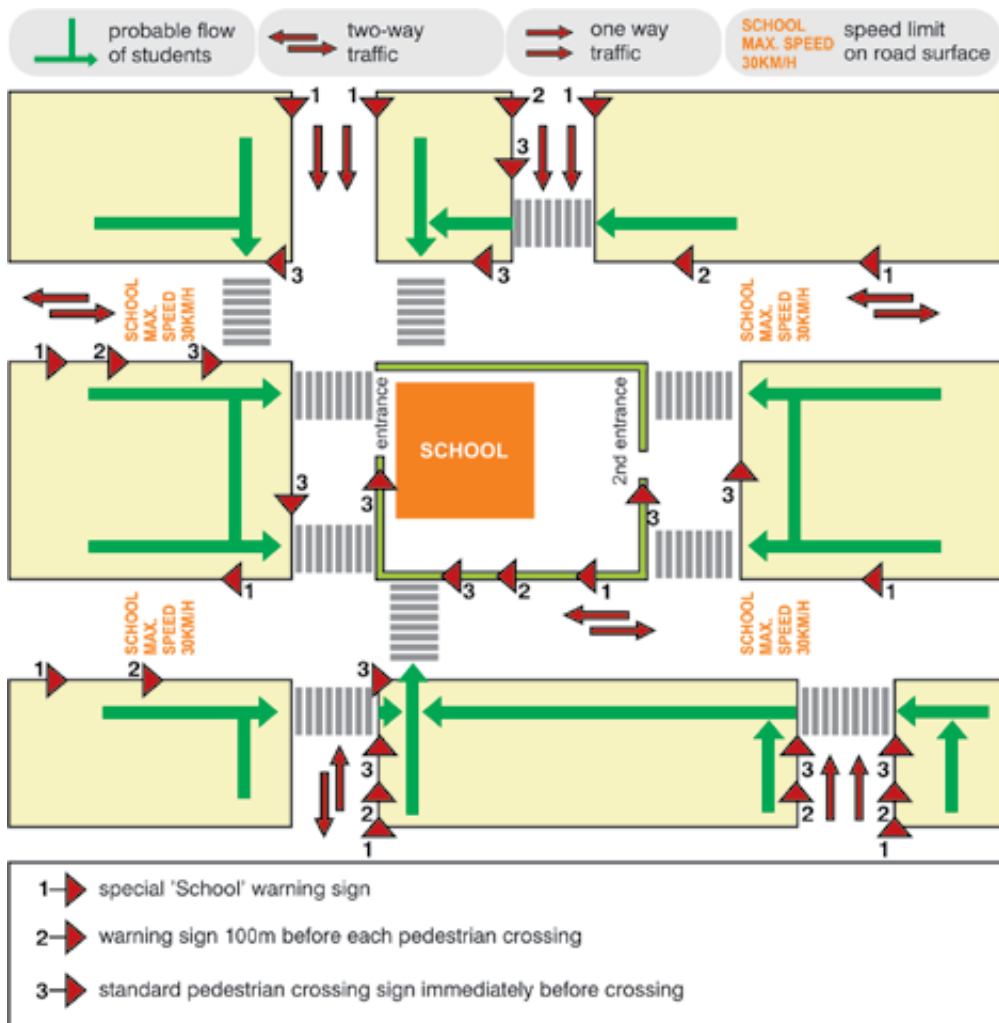
All around the school, and especially along the routes taken by the children on their way to and from school, the necessary safety measures must be taken:

- The usual vertical traffic signs envisaged in the national legislation of the country in question.
- Markings on the surface of the road (e.g. School – Maximum Speed 30km/h).
- Vertical and horizontal signing (white strips on road) to mark pedestrian crossings.

If agreement is secured from the Ministry of the Environment, the local council and police, roadside flashing lights might be installed, switched on by the school to warn motorists *when children are arriving at or leaving* the school.

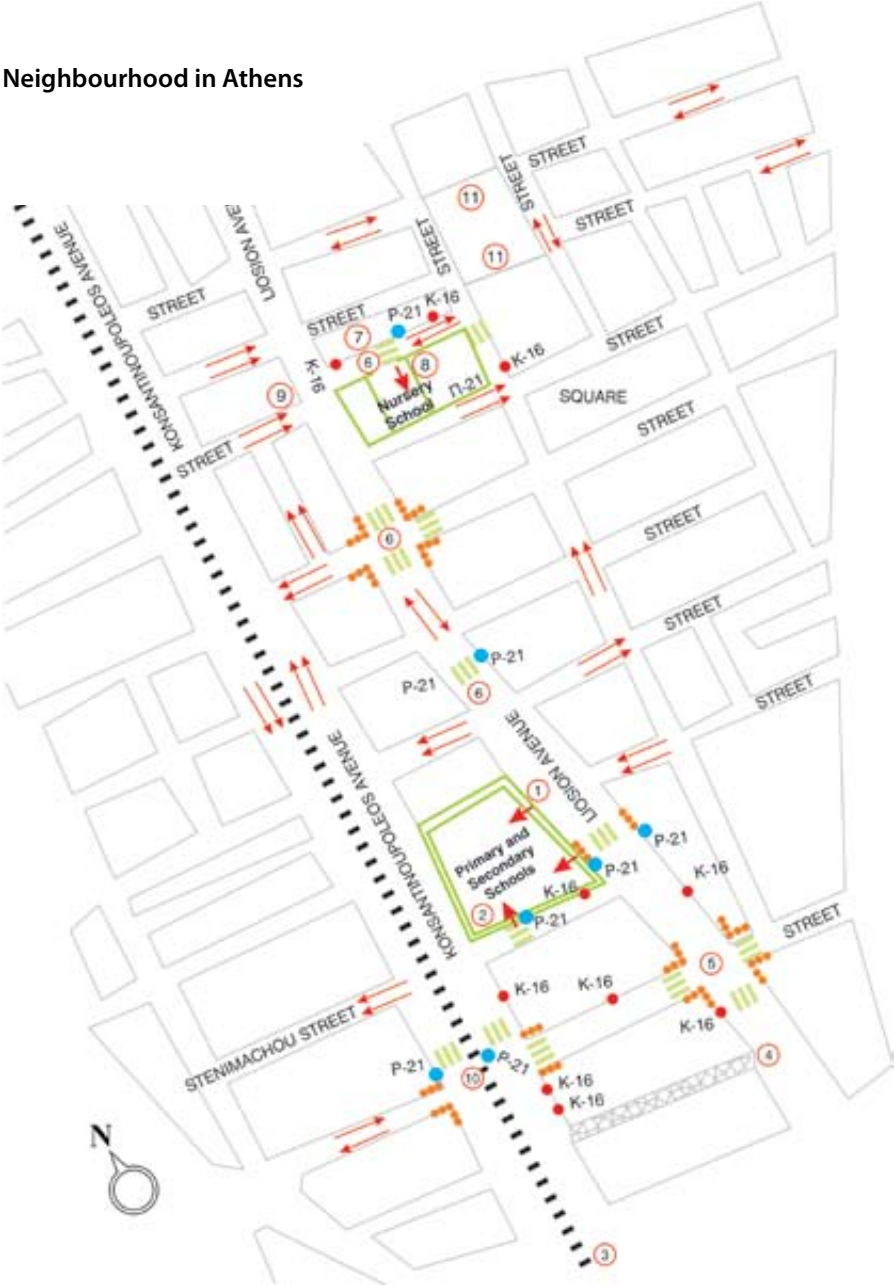
4.2.1 Road safety (two practical examples)

The first example is that of a school with demanding requirements in terms of road safety for its children. It might be used (with modifications as appropriate) as a model for schools with a wide variety of road safety requirements and local traffic conditions.



Our second example is based on a realistic case study of two schools in Athens, with the appropriate comments. In this study³⁵, road safety was examined in a wide area around the schools. It demonstrates vividly the problems and the measures which need to be taken; the observations of the team carrying out the study correspond to the circled numbers on the diagram:

Neighbourhood in Athens



- ① Wide pavement; access for fire engines; ample barriers; heavy traffic along the road in front of the entrance
 - ② Removable barriers; parked cars in front of the entrance; this is a secondary entrance
 - ③ Railway lines
 - ④ Pavement with parked cars
 - ⑤ At all three crossings the crossing markings have faded away
 - ⑥ Faded crossing markings
 - ⑦ There is no school here; the school is located opposite this point
 - ⑧ There is no access for fire engines; non-removable barrier; busy road
 - ⑨ The prohibition sign is obscured by trees
 - ⑩ There are crossings for pedestrians and vehicles
 - ⑪ On the original map, the roads continue
- **Liosion Ave. and Steni-machou St.** There are two school crossing attendants on Liosion Ave. and Konstantinoupoleos Ave.
 - **22nd Kindergarten**
It is not clear whether there is a crossing attendant



School building



Pedestrian crossings



Traffic lights



School entrance



Railway line



Direction of traffic



Highway Code sign P-21: Pedestrian Crossing (here)



Highway Code sign K-16: Danger: Children Crossing!

Highway Code sign K-15:
Danger: Pedestrians Crossing
(none in the area studied)

³⁵ Accident Prevention Team of students attending course in 'Real Medicine' at the University of Athens Medical School, in association with the City of Athens Road Safety Agency: Study of road safety at 144 schools in Municipality of Athens – Medical School, Athens 2003.

42 4.2.2 Safety measures for students travelling to school by cycle or motorbike

There are three fundamental rules to prevent accidents and reduce injuries:

- The rider must be easily seen (the vehicle should have lights and the rider should be wearing clothing in light colours).
- A helmet must always be worn – by motorcyclists and cyclists!
- Riders must realize that they have THE SAME RIGHTS AND OBLIGATIONS as all other users of the road!

Clarification: Cycles must have a battery-powered white light in front and a flashing red light in the rear, as well as yellow reflector lights to the side (spokes, pedals), a red reflector light in the rear (as well as the flashing light) and a white reflector at the front (in addition to the main light). Covering the lights on a motorbike with dark-coloured paint is illegal and extremely dangerous, reducing as it does the visibility of the vehicle.

Helmet: Life-saving helmets are available for both cyclists and motorcyclists. White is the most sensible colour to choose – it is highly visible and keeps the head cooler in summer. Make sure you buy a helmet manufactured to proper safety specifications! Helmets do not last for ever; most will require replacing after about five years, and remember that they need proper maintenance.

All road-users have the same rights and obligations – there are no special dispensations for cyclists and motorcyclists.

All students should be taught – perhaps with input from the local police – at least the following basic principles:

- Traffic lights. Don't proceed when the light is amber, whatever other motorists may be doing. Proceed only when the light is green – and carefully, because a driver on the other road may be coming through against a red light.
- Signs and rules of right of way, importance of giving way.
- Make sure you are familiar with the signs for one-way streets. Observe the one-way rules – for your own safety.
- Always keep to the right (or left in UK). If a bus stops in front of you, stop and wait.
- Do not try and weave your way through the stream of traffic.
- Be very careful when you pass a stationary car – a door may open without warning.
- At railway and pedestrian crossings dismount and cross on foot, wheeling your cycle!

4.2.3 Road safety for children – special risks and precautions

The teacher is the person who best understands the special risks facing children out on the streets, and he is therefore best placed to advise them and take the necessary precautions:

- Most fatal and serious road accidents involving children, in all countries, occur as children are crossing the road!
- Children don't have brakes.
- Children have a narrower field of vision than adults; a vehicle approaching from the side has to be quite close before a child will be aware of it.
- Children have their own way of understanding and perceiving traffic, which adults don't always appreciate. We have to put ourselves in their place and understand the way they think.
- Children hear as well as adults, but don't always understand as well as we do exactly WHERE the sound is coming from.
- Children focus on what interests them (e.g. the ball game they are playing) and pay no attention to the traffic. A good slogan for motorists is: When you see a ball, step on the brakes, because there's sure to be a child close behind
- Children don't estimate how serious a danger is.
- Children can't assess the speed of a vehicle, because the shape of the vehicle doesn't change as it moves (unlike that of a running animal, for example).
- Children imitate grown-ups.
- Children always assume that the motorist must have seen them.
- Children rarely ride their bikes safely.
- Children think that a car can stop instantly.
- Children are always in a hurry on the way to school (because they are usually late), and in a hurry to get home (to go out to play). And because they're almost always in a hurry, they don't pay sufficient attention to traffic.
- Let's not forget: The highway code was written by adults, not children, and was framed to meet adult requirements.

4.2.4 Safety tips for children walking to and from school³⁶

- Children's anoraks and satchels should be in bright, striking colours, so that they can be seen easily by motorists – one of the key elements in road accident prevention.

³⁶ Teachers should stress the main rules of road safety to parents, too – whenever they have the opportunity.

- In Germany, Holland and other countries children in the three first years of school are supplied with luminous safety vests.
- If children are making the journey after dark, then their coats and satchels should have reflector lights attached to them, and the children should be given a flash-light.
- Special care must be taken on roads where there is no pavement. If the traffic is on the right, pedestrians should walk on the left, facing the oncoming traffic. Always insist children have brightly-coloured clothes and bags.
- Make sure the children wake up in good time so they won't be in a hurry to make it to school on time. We all tend to become careless when we are in a hurry.
- Parents need to work out and explain to their children the best route to take to school, pointing out the danger points along the way (and explaining to the children what they should do at these points). Remember: the shortest route to school may not be the safest.
- On the way to and from school children should never hold a ball in their hand. It should be kept in a bag so the child isn't tempted to play with it on the street – with all the attendant risks of the ball rolling out into the stream of traffic. Because when the ball rolls away, the child's instinctive reaction will be to run after it – which might mean a reckless dash into the traffic.
- Children must never be allowed to hang around in groups outside the school gate, but must enter the school grounds immediately.
- When there is a crossing attendant outside the school, the children must wait until he or she decides the time is right to cross. Neither the attendant nor the children should be in a hurry to cross.
- More parents should volunteer to work as school crossing attendants.
- Remember: it isn't just children who aren't at their most alert early in the morning. Motorists too may still be sleepy and slow to react!

4.2.5 Satchels and school bags

Back in 1990 the German authorities issued a set of specification (DIN 58124) for school satchels, which should be designed:

- To be clearly visible in traffic (with light-reflecting surfaces of a certain size)
- To be ergonomically efficient for children
- To be waterproof and durable.

It is worth noting that the German authorities also laid down a maximum weight for the books etc. to be carried by a schoolchild: 10% of his or her body weight. It is time that teachers and parents realized that much of what the children carry to school is not needed every day. Only what is required for any particular day should be taken to school.

4.2.6 School crossing attendant

The crossing attendant can make a valuable contribution to safety, especially at schools which are in a dangerous location. But in some countries, unfortunately, too few parents are willing to volunteer for the job.

Perhaps in those cases where no crossing attendant can be found, the teachers might help out, after receiving the necessary training from the local police.

For over forty years now in Germany students (over 13) have been used as crossing attendants, as well as adults – but this is not permitted in Greece. The fact remains that no other measure has so dramatically reduced road accidents and injuries among schoolchildren as the use of crossing attendants.

Some countries have employed crossing attendants for decades now, in others they are a relatively new phenomenon. For the sake of completeness we offer here some basic advice:

- The attendants should receive proper, practical training (6-12 hours) from the local police.
- New attendants should be supervised by the police for at least a week.
- There should be signs and road markings warning motorists that they are approaching a crossing, both **immediately** before the crossing and **100m away**.
- The crossing should be lit at times of day when the light is poor and in bad weather.
- The attendant should **never** be asked to oversee two crossings, however close they may be.
- The attendant should not stop the traffic in full flow, but should wait until a gap occurs in the stream of vehicles before stepping into the road.
- All the children should have reached the other side of the road before the attendant gives the waiting vehicles the signal to proceed
- The attendant should not accompany groups of children across the road, but should take up his/her position in the centre of the road, holding up the STOP sign.
- The traffic police has to determine the number of school traffic guards required at each intersection.

- The children must be taught not to step into the road before the attendant gives the signal, even if the traffic has come to a stop.
- The attendant must never use the children to force the motorists to stop.
- The children must only step into the road when the traffic has come to a complete standstill.

These recommendations represent basic principles of crossing safety; they may need to be adjusted to reflect special local conditions, but only with the consent of the local police and without compromising safety.



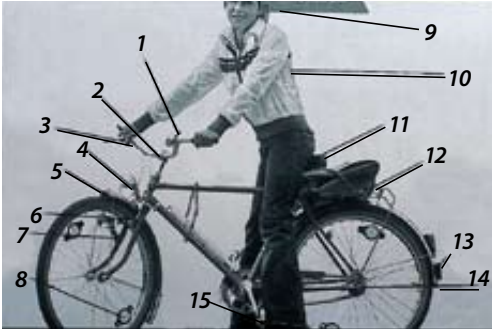
Young pupils wearing safety vests (Erlangen - Germany 2005).



Here the pavement outside a school has been blocked by a kiosk (with visibility for motorists obscured). The school entrance is directly behind the kiosk. Why has the local council allowed the pavement to be taken over in this way? (Papagou, Athens, 2004).



Safety vest for children.



The main features of a safe bicycle:

- 1 Bell handle made of soft plastic
- 2 Conventional handlebars (not those we see on racing bikes, or antler-style) with soft plastic grips at each end
- 3 Ergonomically designed brake handles
- 4 Powerful front light, with white reflector light
- 5 Mudguard without a sharp point, and covered with plastic
- 6 Rim-brake (front and rear)
- 7 Sturdy wheel-fork
- 8 Yellow reflectors front and rear
- 9 Helmet
- 10 Light-coloured clothing, in conspicuous colours
- 11 Slim-line, rounded saddle
- 12 Luggage rack with elastic holding straps
- 13 Red light at rear, plus red reflector (ideally there should be a flashing light at the rear)
- 14 Both feet should be able to reach the ground
- 15 Pedals with yellow reflectors



Unfortunately dedicated cycle lanes like these have yet to be introduced to some countries (Brussels, 2003).



The boy on the right is much easier for motorists to see, because of the colours of his satchel. Making a small child as visible as possible is a key element in road safety.



Twilight – the most dangerous time of day! Note how much more visible the lady in the white dress is (Attica, 2001).



Poor visibility (in this picture, mist and rain) is responsible for many accidents, especially on roads without pavements. At least in this photograph the pedestrians are on the right side of the road, facing oncoming traffic (Attica, 2000).



Students gathered on the pavement outside the school, on the curve of a busy road – where drivers may not see them. Shouldn't the school administrators be concerned? (A high school in Athens, 1999).



Students walking recklessly on a road with fast-moving traffic, 50m from the school entrance. Note the absence of warning signs (Patra, 1997).



An alarming scene on the pavement at the school entrance! (Athens, 1998). Did this mother really have to drive right up to the school gates?



Road close to a school. Sleeping policemen should be designed to the proper specifications for height and curve; they should be clearly visible and there should be signs warning motorists of their presence! (A school in Patra, 2002).



School gates with no protective railings or bar to stop children running straight out into the road (Attica, 2002).



This school has a protective barrier at the gates – but it's too short and too low for real safety (Patra, 2002).



In this road with dense car traffic and frequent pupil crossing, the municipality made the passage of the pupils safe on a narrow sidewalk by erecting a low wall barrier (→ 1) which allows for passage through only at the location of the traffic lights (→ 2).



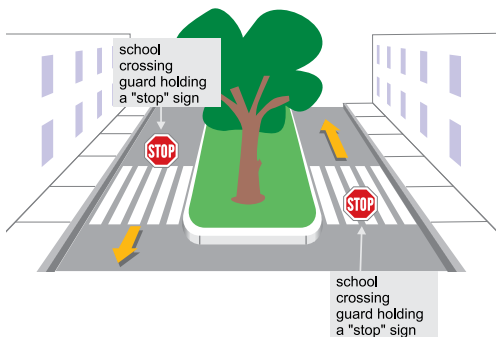
Here the 'School' warning sign is obscured by foliage.



A very dangerous school entrance. The angle of the turn-off makes visibility poor for both students and motorists. No signs or other safety measures (Halkidiki, 1997).



Flashing yellow light near school. These are only effective if turned on (switch within the school building) only during the hours when children are arriving at or leaving the school. If they are left on all day, motorists will soon cease to pay attention to them (Thessaloniki, 2005).



The school crossing guards must interrupt traffic in both directions at the same time. In Greece, students are not allowed to act as school crossing guards.



Some schools actually close the road used by their students to arrive at and leave the school (note the yellow barrier). Obviously roads should not be closed without consulting the local police (Thessaloniki, 2005).

50 ■ 4.3 Fire prevention and protection

4.3.1 General points

The danger of fire breaking out in a school is by no means as negligible as people might think. We may not hear of fires in school very often, but this doesn't mean that fires never occur. The table below shows the number of times local fire brigades were called out to fires at schools and other places of education, in 1999:

Fires at schools and other educational institutions (1999)

Primary and secondary schools, colleges and universities	198
Kindergartens	9
Private coaching schools	6
Day care centres	6
Total	219

Main causes of fire (Greek Fire Brigade statistics for 1999)

Discarded cigarettes	5,365	15%
Naked flames	3,152	8.8%
Electricity	2,133	5.9%
Heated surfaces	1,996	5.6%
Explosions – Gas leaks	705	1.9%
Other causes	22,153	
Total	35,704 excluding forest fires	

Key elements in fire prevention and protection in schools

- Preventing the outbreak of fire.
- Ensuring students and teachers can be evacuated quickly and safely.
- Having those on the spot take immediate action to extinguish the fire if possible.
- Alerting the fire brigade immediately.

There are all sorts of activities which might cause a fire at school:

- Laboratory experiments in science lessons.
- Carelessly discarded cigarettes.
- Defective or poorly maintained electrical appliances.
- Short circuits.
- Explosion of gas bottles (used in heating or in the school canteen).
- Poorly supervised repair work (e.g. oxyacetylene welding).
- Arson.

To reduce the risk of fire, inflammable materials should never be used in those parts of the school most vulnerable to fire. We are not referring only to the building materials used in construction of the school, but also to objects used by students and teachers. For example:

Smoking should not be allowed in rooms containing inflammable material (e.g. the chemistry lab). This prohibition should apply to teachers as well as students, and to any workman who might be carrying out repairs in these rooms³⁷. The smoking prohibition is not merely a matter of school discipline; it is of critical importance for the health and safety of all those working in the school.

Greek legislation on fire prevention in schools (Presidential Decree 71/ 15.02.1998) requires:

- Safety lighting and clearly marked fire escape routes.
- Hand-operated alarm system.
- Automatic fire detection system.
- Portable extinguishers.

Other safety features are equally important:

- Sprinklers in high-risk areas.
- Extra doors to retard progress of fire through building.

The technical specifications issued by the School Buildings Agency of Greece (OSK) do not allow basement rooms to be used as classrooms. These areas of the school building may only be used for auxiliary functions (boiler rooms, storerooms, etc.).

We cannot stress too emphatically the importance of **keeping fire prevention systems in good repair**, and ensuring that staff understand their importance and know how to use them. For example: there is no point in the school having fire-resistant doors - which will close automatically in the event of fire, to prevent it spreading, and can open only in one direction, to allow the students to escape. the building - if the teachers or the school caretaker use cord or rope to tie the door permanently open.

IMPORTANT: It's no good just installing fire extinguishers and then never giving them another thought. They need regular inspection, otherwise they might as well not be there! Each extinguisher should have a card attached to it on which we note the date of the last inspection, and the date when it is due its next inspection. The dates should be recorded by the person carrying out these inspections. All the extinguishers should never be removed for inspection at the same time; the inspection should be carried out on a rotating basis, so that the school is not left without extinguishers even for a short time.

³⁷ We assume that by now all EU countries have banned smoking in public spaces (and that the ban is enforced).

Both in new schools and in older buildings not designed to the same specifications, it is important that certain basic fire safety measures be scrupulously observed:

- There must be an adequate number of regularly inspected extinguishers, and the staff must be trained in their use.
- Safe escape routes must be planned and clearly marked.
- The telephone number of the local fire station should be posted where it can be clearly seen beside each telephone in the school and beside each fire extinguisher.
- The use of inflammable materials should be avoided; where possible, such materials should be replaced.
- Gas bottles must always be stored away safely (special attention is required in the canteen³⁸!).
- It is doubly important to observe the fire safety regulations in those schools working in prefabricated buildings (still used in Greece where funds are not available for permanent buildings).
- Every school must ensure there is at least one entrance wide enough for fire engines to pass through.
- Special precautions are required in areas containing inflammable material (libraries, etc.).

Across the European Union some 5,000 people lose their lives in fires each year, and 50,000 suffer injuries.

In the first minute of a fire, it can be extinguished with a glass of water; after five minutes, whole buckets of water will be required; and after ten minutes only the fire brigade will be able to extinguish the flames.

4.3.2 Extinguishers

- Every single school must be suitably furnished with enough fire extinguishers. We believe a safe level would be one 5-6 kilo extinguisher for each floor of each building. However, more extinguishers will be required in a large building with more than 4-5 classrooms on each floor.
- It is essential that the extinguishers not be kept all together in the staff room, as is too often the case, but distributed around the school so that one will always be near at hand if needed.
- It is advisable that all the rooms at greater risk of fire (chemistry lab, other labs or workshops containing inflammable materials, classrooms where there are a lot of

³⁸ When changing the gas bottle, always fit a new washer and then check for leaks with soapy water, not matches.

electrical appliances, the canteen) should have extra extinguishers, in addition to those serving the floor as a whole, kept in the room where the risk is greater.

- In classrooms where there are computers, there should be extinguishers containing CO₂, to avoid water damage to the computers.

There are European standards (EN European Norms) for fire extinguishers, which incorporate national requirements. The letters CE on an extinguisher mean that it satisfies European standards.

Selected European Standards

- EN2: Classification of fires (according to material burning).
 EN3: Specifications for hand-held extinguishers.
 EN 1860: Trolley-based extinguishers.
 EN 671: Requirements for fire-fighting systems.
 EN 615: Specifications for dry powder.
 EN 1089-13: Signing specifications.
 Pr EN 12367: Instructions for maintenance of extinguishers.

Hallon-type extinguishers are no longer approved, because of their use of halogenated hydrocarbons (damage to the ozone layer).

Categories of fire (according to burning material)³⁹

- a) Solid, mainly organic material (e.g. wood, paper).
- b) Liquids or semi-solids (e.g. heating or vegetable oils, paints).
- c) Gases (e.g. propane, liquid gas, acetylene).
- d) Minerals (e.g. potassium, sodium, aluminium filings).

Types of fire, combustible material and most appropriate material for extinguishing each category of fire⁴⁰

Category	Combustible material	Extinguishing material
A	Non-mineral solids: paper, wood, plastic, cloth, etc.	Water, foam, dry powder
B	Liquids: petrol, heating oil, paint, tar, oils, fats, etc.	Foam, dry powder, CO ₂ , Hallon substitutes

³⁹ Pefanis M. et al.: List of fire-extinguishing equipment and methods. National Power Company (DEI) of Greece, Athens 2000.

⁴⁰ Dimitriou A., Tolaki M.: Instructions on extinguishing fires. National Power Company (DEI) of Greece, Athens 1997.

C	Gases: industrial gases, propane, butane, hydrogen, acetylene, liquid gas	Dry powder, Hallon substitutes
D	Minerals: sodium, magnesium, aluminium powder, potassium, etc.	Dry powder
E	All the above where live power lines are involved	Dry powder, CO ₂

Tackling a fire using an extinguisher:

- Stand with your back to any breeze or wind, not facing it.
- With fires involving liquid fuels we direct the extinguisher at the base of the flames, in front of the fire.
- With fires involving liquid fuels leaking from a pipe, we direct the extinguisher first at the point of leakage.
- Do not leave the scene after putting out the flames (the fire may start up again) until the fire brigade arrive (unless you must flee to avoid danger!).
- 2 or 3 extinguishers used simultaneously are more effective than when used one at a time.
- Refill the extinguishers as soon as possible.
- At all points where fire extinguishers are kept there should also be a flashlight and a special fire blanket (for wrapping people whose clothes have caught fire).
- Invite your local fire station to send someone to offer training in the use of extinguishers.
- During a fire some of the teachers should concentrate on trying to put out the flames, while their colleagues make sure the children leave the building safely.

Signing of fire extinguishers

Each appliance should have the following markings⁴¹:

- Fire extinguisher: substance used, capacity, weight
- Instructions for use.
- Precautions to be taken: e.g. maximum electrical current, release of any hazardous fumes.

⁴¹ ELOT (Hellenic Organization for Standardization), EN 3-5

- Inspections-Maintenance: Details should include the propellant gas used, the weight, certification and type.
- Manufacturer's details.

4.3.3 Escape routes

When a fire breaks out in a school it is essential that everyone – teachers and students – should know how to get out of the building safely. When a school has more than one floor, an escape route must be planned and marked in advance. If there is more than one stairway, the students must be divided into groups using different escape routes, to ensure the building is evacuated as rapidly as possible. Needless to say, elevators must never be used when there is a fire in the building. From the very beginning of the school year teachers and students should know exactly which stairway to use in the event of fire; drills should be held, without prior warning, to familiarize them with the escape route they should take (caution is required during fire drills, to make sure that no accidents occur on the stairs).

It is important that the drill be made as realistic as possible, in order to test the readiness of teachers and students, to identify possible obstacles to a smooth evacuation and any inappropriate behaviour by students that might endanger them during a real fire. If the students take the wrong escape route, if the stairways become blocked with students and minor accidents occur, if the evacuation of the building takes too long – then the whole drill should be repeated until the result is satisfactory.

Apart from escape routes, there are other matters that need to be resolved right from the beginning of the year:

- Which teacher will be responsible for the safe evacuation of each section.
- Who will be responsible for students who have a free period when fire breaks out and are not all assembled in one room.
- Who will operate the fire extinguisher.
- What should the teachers pay special attention to if fire breaks out during a break.
- What will the escape route be for students with impaired mobility (even if there are no permanently handicapped students on the school roll, provision must still be made – children of school age are frequently victims of sports injuries which may cause temporary mobility problems) and who will take responsibility for these individuals.
- Where should the students assemble after leaving the building.
- Who will call the fire brigade.

However insignificant or self-evident these things may appear, it's advisable to sort them out in advance: when a fire has broken out, people tend to panic – and even adults will overlook the obvious.

Aspects of the building requiring attention/repair to ensure smooth evacuation in case of fire:

- **The state of the stairway:** the stairway may be old and the steps slippery; if a large number of students try to descend at the same time, hurrying and pushing each other, there may well be accidents. Spiral staircases are particularly dangerous, because their steps are broad at the outer end, narrowing towards the centre. People hurrying down can all too easily miss their footing on the narrow part. Fortunately stairways of this type are not common in school buildings.

Safe stairways in schools will descend along a straight axis, not a spiral, and with a landing where the stairs change direction. The School Buildings Agency (OSK) allows spiral staircases only under certain conditions (there is a specific minimum depth for each step). They must also have strips of non-slip material along the edge of each step. Stairways with more than 5 steps and more than 5m in breadth must have intermediate rails supporting a handrail.

Stairways must have a handrail along both sides, continuing around the side of the landing. It must be designed in such a way that children cannot attempt to slide down it (School Buildings Agency specifications - OSK).

- **Doors:** All school doors must open outwards, to prevent blockages and accidents. Doors sited along the escape routes must never be locked, however easy it might be to find the key when needed. Also, the escape route should never pass through another classroom – which might be locked at the time of the fire. In big cities many schools don't have a spacious courtyard in front of the building, and the road on which the school is situated may be a busy one. In these cases, if the whole student body has to leave the school quickly in event of a fire, there is the danger of children running out into the road and being injured. It might be a good idea in these circumstances for teachers (wearing safety jackets!) to stop the traffic. Where there is a courtyard in front of the school, if the fire has not spread to this courtyard it is better for the children to pause here for a moment rather than risk injury by rushing out into the street.

Ideal width of door openings, according to School Buildings Agency (OSK) specifications: Classroom > 110cm, washrooms > 100cm, WC > 80cm, elevator > 110cm, disabled WC > 100cm.

Some other suggestions to make evacuation run more smoothly in event of fire:

- A simple diagram can be posted in each classroom showing the escape route from that particular room. Students who see the diagram every day will be more familiar with the route to take.

- There should, without fail, be signs, lit by emergency lighting, pointing to the exits, as envisaged in national or EU legislation.
- The youngest students in the school should be assigned the easiest escape route, especially in primary schools, where the composure and reaction speeds of the younger and older children will differ enormously. But in secondary school, too, it's sensible for the youngest children to be taught in rooms with easy escape routes, because at the beginning of the school year – at least – they will still not have had time to learn their way about the building.
- Under no circumstances should a basement ever be used for classrooms (this is, in any case, explicitly forbidden by law). Children in a basement room will have no means of escape if the fire has spread to the stairway, whereas from upper floors they can always be helped down by the firemen using ladders, hydraulic platforms, etc. In the worst case there is always the safety blanket held by firemen into which children trapped on an upper floor can jump.
- Some schools have barred windows to protect the glass panes. These are not forbidden by safety regulations, but fire officers are never happy to see them – they may make it more difficult to rescue people trapped inside the building. A better option is to stick with sturdy, old-fashioned shutters.

Much of what we have said about evacuation in the event of fire is also good advice if the building is struck by an earthquake. Here too, the school needs a proper evacuation plan. It's possible that here in Greece we are more attuned to the risk of earthquakes, which makes it easier to implement, and secure compliance with, the appropriate precautions. Of course, it is not unusual for an earthquake to be followed immediately by an outbreak of fire – caused by damage done in the quake. Special instructions on how to react in the event of an earthquake are issued by the Ministries of the Environment or Internal Affairs of each country.



Note the narrow diameter of the hose – providing far too weak a jet of water in case of fire.



Πανικός σε σχολεία από πυρκαγιά

ΕΓΓΥΣ: Η πυρκαγιά στο σχολείο της Μουσικής Σχολής στην Αθήνα. Η φωτιά που ξέσπασε σε το πρωί, στη διπλανή



'BUILDING REDUCED TO ASHES BUT CHILDREN SAVED' (Left), 'FIRE CAUSES PANIC AT SCHOOL' (Right)
 Fires have broken out at schools and other educational institutions – and some of them have been serious!
 Just because there have been no victims (so far!) doesn't mean we can afford to be complacent!



It's no good having fire extinguishers if they aren't ready for use.



A picture of indifference and neglect.



Fire extinguishers left all in one place; they should be distributed at different points around the school (Thessaloniki, 2005).



The extinguisher is placed too high for easy use (school in Thessaloniki, 2005).



The fire extinguishers are attractively displayed – but the cases are locked and valuable time will be wasted finding the key if a fire breaks out! Even if someone breaks the glass the extinguishers cannot be removed easily (Patra, 2001).



An exemplary fire point (Thessaloniki, 1999).



Stairways (there should be at least two for each floor) must never be blocked by doors or other obstacles (Thessaloniki, 2005).



A deplorably dangerous example of poor safety thinking – the exit is blocked by this pile of old furniture (Thessaloniki, 2005).



Stairways and fire points must never be used for storage; there must always be unimpeded access (Athens, 1993).



Bars on the windows not only make the atmosphere in school unpleasant for students and teachers, they may also hinder the fire brigade in its rescue work (Patra, 2000).



It is dangerous to build a closed area like this within a school – and a violation of building regulations (Patra, 2000).



The school gates are obstructed and would cause delay in evacuating the building (Thessaloniki, 2005).



Note how the boiler (arrow) falls outside the range of the sprinkler. The arrangement inspires little confidence in respect of safety. The reader is reminded of two key points in the safety specifications:

- the boiler room must be divided

by a wall from the fuel tank (see next illustration) and,

- the boiler room must have direct access to the exterior of the building (Thessaloniki, 2005).



A wall about 40cm high surrounds the whole fuel area, even across the foot of the door (this is the correct arrangement - Thessaloniki, 2005).



A dangerous state of affairs – leaking heating oil and a breach in the wall surrounding the fuel area (Thessaloniki, 2005).



Here the fire extinguisher is suspended by a thin length of wire (Thessaloniki, 2005).

■ 4.4 Power supply and wiring

Here too, regular maintenance is essential. All too often in our schools we come across frayed wiring, broken light fittings with their plastic covering loose and ready to fall, cracked or broken power sockets and neglected plumbing allowing water to leak into the wiring system. All problems like this need to be identified and corrected without delay.

4.4.1 Basic safety principles

- There should always be safety coverings on sockets, especially in schools with younger children.
- The fuse board should always have a general cut-off to prevent electrocution. But beware: installing one of these switches doesn't mean that you can ignore the rules for maintenance and safe use of the power system.
- The main fuse board is best kept locked.
- Fuse switches should never be held in place with adhesive tape 'to stop them cutting out' (a practice observed in a number of buildings). The whole point of these switches is that they should 'cut out' when there is a problem; if they keep cutting out, the electrician should investigate and solve the problem.
- Exposed wires and cables should never be allowed to hang unsupported from walls and ceilings. Wiring must always be properly insulated and held firmly in place. Frayed insulation and cracked or broken plugs must be replaced immediately.
- We hope there is no need to mention heating appliances with unguarded elements and frayed insulation – surely such dangerous objects are no longer to be found in our schools! If any school still possesses such appliances, it should get rid of them immediately.

4.4.2 Preventing electric shocks⁴²

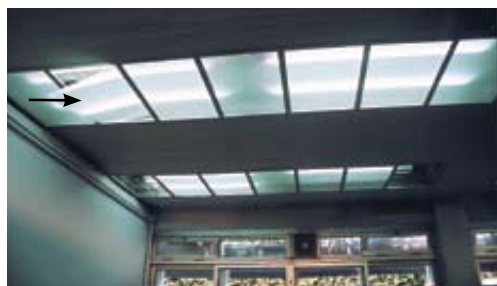
- Only the appropriate fuses should be used. No makeshift fuses with wire. Needless to say, in most countries the practice of ignoring a burned-out fuse and completing the circuit with a piece of wire would be unthinkable.
- Use high-quality sockets and plugs (not the cheap kind which break easily).
- Wiring and cables must be checked frequently. Frayed insulation should not be patched up with tape – the whole length of wire or cable should be replaced immediately.

⁴² From National Power Company (DEI) leaflet, with additions

- The power must always be turned off before machinery (e.g. photocopiers, when replenishing paper stock) is opened up for maintenance.
- Whatever appliance we are using, the manufacturer's instructions must be followed faithfully.
- Call in the electrician as soon as a problem occurs.
- Don't overload the power supply by plugging too many appliances into one socket.
- Avoid amateur, makeshift repairs. All too often, temporary repairs are allowed to become permanent.
- Never change a fuse without turning off the main switch (keep a flashlight next to the fuse-box).
- Never remove a plug from the socket by pulling on the cable.
- Never allow cables or wires anywhere near water or areas of damp. Damp patches on walls or leaking water require immediate attention!
- Cables should never be allowed to hang loose, multi-way adaptors and cables should never be left lying on the floor (apart from the electrical hazards, people may trip on them and fall).

4.4.3 Lighting (recommended Greek School Buildings Agency specifications) –

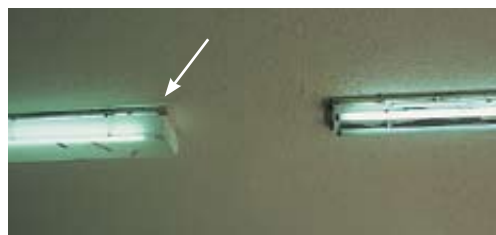
- | | |
|----------------------------|---------|
| • Classroom | 300 LUX |
| • Laboratory | 300 LUX |
| • Library | 500 LUX |
| • Multiple purpose rooms | 300 LUX |
| • Corridors | 150 LUX |
| • Boiler room - storerooms | 150 LUX |
| • Canteen | 300 LUX |



Note how the panels covering the light fittings have become detached; this is seen all too often in Greek schools and can be dangerous – what would happen if the fluorescent tubes were also to become detached and fall? (Patra, 2000).



Here a short circuit in a badly manufactured light fitting has caused a dangerous fire.



Poorly manufactured light fittings. Note the rust and the casing, which is working loose. The department of the School Buildings Agency overseeing construction needs to be more energetic in checking manufacturers' production standards (Halkidiki, 1997).



This is supposed to be a fuse-board! Apart from the danger of live current in the exposed wiring – what a terrible example for the schoolchildren to see!



A damp patch in the wall where the fuse box is installed – the school administration should be seriously concerned about this.



A fuse board with no safety covering – in the middle of a school playground! (Thessaloniki, 2005).

■ 4.5 Glass in school windows and doors

4.5.1 Basic information

The glass used in school windows and doors (at least in those areas where children are playing or moving from room to room) must be of a kind which will reduce or eliminate the danger of injury. Accidents involving glass are by no means rare and can cause serious injury or even death. Only special safety glass should be used, checked for quality in standardized tests.

Accidents with glass may occur when children stumble or are pushed by another child; inattention and poor lighting may also cause accidents, as may poor eyesight, perhaps undiagnosed; children may run into glass when they panic, and may collide with glass doors because they simply have not noticed the door is there in front of them. Remember: large glass panes are often invisible when clean.

Experts in school safety have concluded that effective prevention is not feasible through education alone, and that it is unrealistic to hope to curb the natural boisterousness of young children. The only effective approach is through 'passive' safety measures – i.e. through use of specially manufactured safety glass⁴³.

⁴³ - Active safety = measures to stop an accident happening (e.g. non-slip strips on steps).
- Passive safety = measures to reduce effects of accident (e.g. safety glass).

In practical terms, safety glass is recommended wherever there is a likelihood of a child coming into contact with the window or door.

We are all aware of how frequently window panes are broken at school, either accidentally (during ball games) or deliberately (when stones are thrown at windows).

The problem is particularly acute in summer, when there are no teachers on hand to supervise the children. In some countries protective bars are placed in front of the windows, especially on the ground and first floors.

This is not a solution we can approve: firstly, the bars make the building feel more like a prison than a school, and secondly, they will impede the work of the firemen⁴⁴ if they need to rescue people from the building in the event of a fire or earthquake.

We recommend instead that windows be fitted with old-fashioned shutters, which occupy very little space when open. Their only drawback is that someone must endure the daily chore of opening and closing them!

It is likely that different countries will have legislated different specifications for the glass to be used in school buildings. Here we simply offer the reader some general guidelines on the kind of glass which will enhance school safety.

Essentially, the glass needs to be of extra strength: if a ball or a child collides with the glass, the impact should not cause it to shatter; and when the glass is broken under impact, the fragments should not cause injury⁴⁵:

- a) either the glass should shatter into many tiny and relatively harmless pieces (like the older type of car windscreen - Securit).
 - b) or the glass should shatter without fragmenting into pieces which might fall and cause injury (as in the modern type of car windscreen - Triplex).
- Where there are large window panes it is a good idea to place some kind of obstacle in front of them to prevent direct impact: a row of plants, for example, or a ledge or sill below the window.
 - Large glass panes in areas where children are moving around should have large, brightly-coloured adhesive stickers placed at the eye level of both adults and young children.
 - Windows set high in the wall (e.g. over 2m from the ground) may not be accessible to students, but they still need to have panes of safety glass; they might be broken by a ball and the falling glass could be very dangerous.
 - In the gym the use of safety glass is essential; if games like hockey are to be played in the gym, glass made to even more rigorous specifications will be required.

⁴⁴ A Fire Brigade officer told us that although there is no law against such bars, 'generally we would prefer they not be used'.

⁴⁵ There are specifications for testing safety glass. In Germany, for example, the: DIN 52337, DIN 18032 Part 3, DIN 58125, DIN EN 12600, DIN 18175.

- It should be remembered that in addition to safety standards for the kind of glass to be used in schools, there are also specifications for the safe installation of the glass within the window or door frame.

4.5.2 Types of safety glass

(The information we present here is taken from material published by the German Association of Accident Insurance Funds in the public sector: GUV 20.27, GUV-SI 8027 - Bundesverband der Unfallkassen - Germany - www.unfallkassen.de)⁴⁶.

- **One-layer safety glass:** on impact the glass will fragment into small, relatively harmless pieces. This kind of glass is robust and less likely to break than ordinary glass. It should carry a special quality stamp.
- **Glass with two or more layers, separated by transparent membranes, the various layers bound together by pressure and heat-sealing.** This glass is difficult to break, but if it does shatter the pane remains in one piece and fragments do not become detached and disperse. This kind of glass too should be stamped with a special quality sign. This is the only kind of glass which should be used in parts of a building where it is necessary to prevent people falling from a height. These panes must be installed in compliance with the manufacturer's instructions.
- **Wire-reinforced glass:** this is not a kind of safety glass.
- **Glass bricks (hollow or solid):** these offer a measure of safety, because the way in which they are used together means that we have a large number of small glass surfaces instead of one single, large surface. They can be used to provide a limited degree of safety, provided that they are manufactured to meet certain specifications (for use in Germany, DIN 12600 and DIN 18175).
- **Special transparent retaining membranes:** these can be applied to cover ordinary glass and will prevent it fragmenting on impact; they need to be applied by trained workmen following special procedures. For adequate protection in school buildings the membranes should be of a thickness over 100mm. The main purpose of these membranes is not to prevent a window breaking, but to prevent the dispersal of sharp pieces of glass after a breakage. For use in Germany the membranes must meet standards DIN 52337 or DIN EN 12600.

If there is a danger of the glass being struck from either side, then the membrane must be applied to both sides of the pane.

- **Mirrors:** If a mirror is placed where a child could run or fall into it, then it should be made of safety glass or covered with retaining membrane.
- **Any cracked glass** in windows, mirrors, etc. must be replaced without delay!

⁴⁶ German Federal Association of Accident Insurance Funds.



'WINDOW KILLS NINE-YEAR-OLD' Windows can be lethal: the newspaper story tells how a 9-year-old child was killed running into a glass door – the pane was so clean it was invisible! (Athens, 1987). The dangers in school are even greater.



Small panes of wire-reinforced glass are less likely to break on impact but even so they only offer a relative measure of safety. Notice that where panes are missing there are still jagged pieces of glass left around the edge of the frame (Patra, 1997). These windows have failed the 'ball and window' test. They are unsuitable for any environment where they might sustain direct collision with a student. (German specifications DIN 18032 section 1: a ball weighing 425–475 grams is thrown from various directions at the glass at a speed of 87km/h, a total of 54 times. The test also involves impact from hockey balls, weighing 156–163 grams, thrown from various directions at 68km/h).



Glass bricks (maximum size 190x190mm and minimum thickness 8mm) have been subjected to the 'ball test' (German specifications DIN 18032 section 1: a ball weighing 425–475 grams is thrown from various directions at the glass at a speed of 87km/h, a total of 54 times. The test also involves impact from hockey balls, weighing 156–163 grams, thrown from various directions at 68km/h). But the rigours of daily life (and childish high spirits!) are very different from laboratory trials.



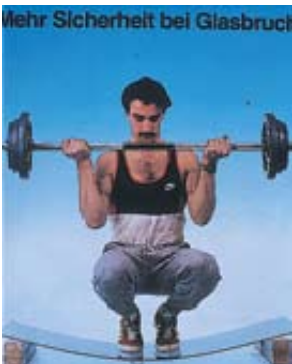
Highly dangerous classroom situation (broken glass shown by arrows). This window is a serious risk and should have been spotted immediately by the school administration.



A cracked window pane which should be replaced immediately. The makeshift repair must only be a temporary measure until the glazier arrives. The window sill, which keeps children at some distance from the window pane, is useful but offers only limited protection (Patra, 2000).



Example of an arrangement preventing children from coming into direct contact with glass panes (from: Weichsebaum M: Sicherheit bei Glasbruch. Bundesverband der Unfallkassen. GUV-SI 8027, München 2001 (D)).



The cover of a special manual on glass safety in German schools (Kraft P: Mehr Sicherheit bei Glasbruch. Bundesverband der Unfallversicherungsträger. BAGUV 56.3, München 1994 (D)).



Large window panes like these, in areas where students are moving around or playing, must without fail be of safety glass (Patra, 2002).



Safety glass helps prevent falls from the stairs in this example, at Athens Airport. We have yet to see this idea introduced into a Greek school.

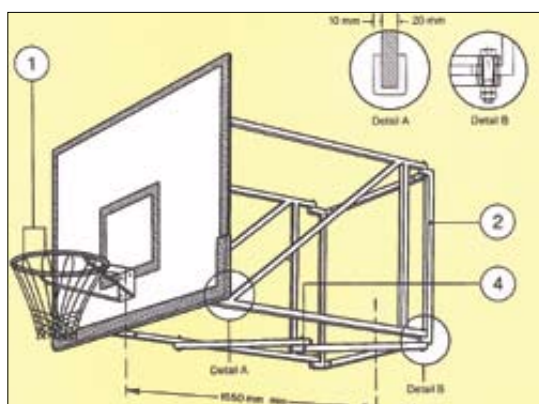
68 ■ 4.6 Safe sport at school

4.6.1 General information - Accidents

Not a few countries have experienced difficulties in the construction of suitable gyms, basketball courts etc. and P.E. areas. Unfortunately even in schools built post-1989 the conditions, while better than those in older schools, are still far from ideal in terms of accident prevention.

It has been calculated that 5% of all German students will sustain an injury at some point while playing games or doing P.E. at school. Some countries boast very low figures for accidents during gym at school, but this is because schools in these countries devote fewer hours to gym or sports, or offer fewer high-risk activities. If Greek schools offered properly furnished gyms, trampolines and full-scale track events – the accident statistics would be much, much higher!

In Europe there are now specifications for every kind of equipment used in gym and games. For example, the illustration below shows the points to be aware of in a basketball back board.



Key points in a basketball back board, as covered by safety specifications in Germany [from Gut-sche E.: *Sicherheit im Schulsport-Sicherheit von Sportgeräten und Einrichtungen in Sporthallen. Schriftreihe des BAGUV, Nr 5. Bundesverband der Unfallkassen. München 1988 (D)*]. The numbers refer to the notes in the original German text.

The following points deserve comment:

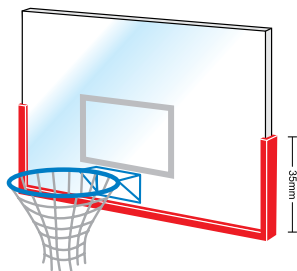
- The specifications describe the way the basket must be fastened to the board (even specifying the kind of screws to be used and how they should be placed for maximum safety).
- Note 1 states that the hooks holding the net must be in good repair, otherwise there is a danger of players injuring their fingers when dropping the ball into the basket. Detail A shows the special protective covering to be fitted to the lower corners of the board, to soften the impact if a player should collide with the board (not a feature to be found on any basketball board in a Greek school!) These points are offered as an example of what minute details are covered by the experts who have prepared the specifications! And they go into similar detail for all the equipment which can possibly be used in games and gym at school (trampolines, horizontal bars, basketball baskets, mats, climbing frames and ropes, rings, vaulting horses, parallel bars, tennis and volleyball nets, goalposts etc.). We set out below the main points requiring attention in respect of the equipment most commonly found in schools.

- It is highly doubtful, however, whether this kind of construction can be robust enough to bear the weight of a player hanging on to the basket ring, and simply warning players against this is unlikely to help.

NOTE: Instructions on the dimensions of back boards, nets, courts etc. are issued by the appropriate department of the Ministry of Education in each country, and by the national athletic associations. In Greek schools the size of nets, boards, and courts differs substantially from those laid down in international regulations and specifications.

We present below some basic information on the main forms of games equipment

4.6.2 Basketball – basket and board



- The basket must be very securely attached to the board (this may seem self-evident, but is nevertheless extremely important)
- The distance between the basket and the wall (or the supporting post) must be no less than 1.65m, to allow players approaching at speed sufficient space to come to a halt.
- The hooks holding the net must be in good condition (to avoid injury to hands of players dropping ball into basket).
- The lower edge of the board must have a rubber covering (shown red in the illustration).
- There should be a covering of foam padding (thickness at least 5cm) around the support column (usually made of metal).
- The area around the board must be kept clear.

In Class A boards (lower edge of board 3250mm from the ground) and Class B boards (lower edge of board 2250mm from ground) the lower edge of the board and the lower 350mm of the sides must be covered with shock-absorbent material (see illustration).

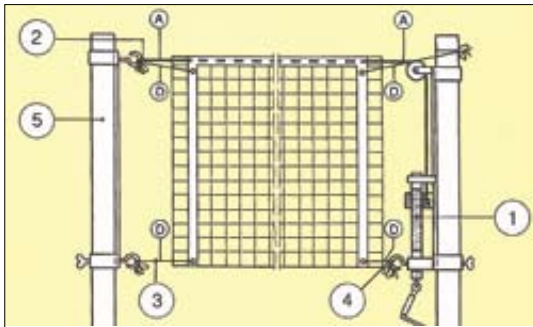
Although in theory players are not allowed to hang from the basket hoop (a notice should be posted to this effect) tall players will nevertheless attempt to do so, and the structure must be sturdy enough to support their weight.

Specifications for manufacture and instructions on the use and maintenance of different kinds of sports equipment can be found in specialist publications.

4.6.3 Volleyball net

- The posts supporting the net must be absolutely vertical, even when the net is stretched tight; if the posts are leaning inward it means that their foundations have loosened.
- The supporting wire (D in illustration) should not be the same as the wire used to stretch the net (A in illustration).
- Sudden release of tension should be prevented with a special braking mechanism.
- The post sockets must be properly covered when the posts are removed.

Normally the court will be lit at the level required for training. But provision must be made for more powerful illumination for regular games (the School Buildings Agency specifications cover the kind of cables and supporting posts to be used).



Specifications for volleyball nets in German schools.

These specifications are so rigorous that they even require that the wires supporting the net be covered in protective material to prevent the athletes suffering scratching (point 4). The numbers correspond to the comments in the original text (by Gutsche E.: Sicherheit im Schulsport - Sicherheit von Sportgeräten und Einrichtungen in Sporthallen. Schriftreihe des BAGUV, Heft Nr 5 München 1988).

4.6.4 Gymnastics mats (Some basic facts)⁴⁷

There are different kinds of mat for different purposes.

- The under-side of the mat – that resting on the floor – should not be of material likely to slip and slide when the mat is in use.
- Mats should be discarded when frequent use has reduced their thickness.
- When several mats are used to form a wider surface there must not be any blank spaces between them.

European specifications lay down a particular type of mat for the various kinds of exercise, as well as the number of mats to be used and the way they should be arranged on the floor.

Below the reader will find some examples of the different uses of various kinds of mat. The scope of the presentation is:

⁴⁷ The illustrations of mats and basic information have been taken from: Baumann N., Marktscheffel M., Wagner-Hauthal B.: Matten im Sportunterricht. GUV-SI 8035 (Sicherheit im Schulsport). Bundesverband der Unfallkassen. München 2002 (D).

- a) the need to use the mats in different ways when performing different exercises, and
- b) the different levels attained by different countries in the management and regulation of school sports.

In deciding which mat is appropriate for a particular activity we must take into account:

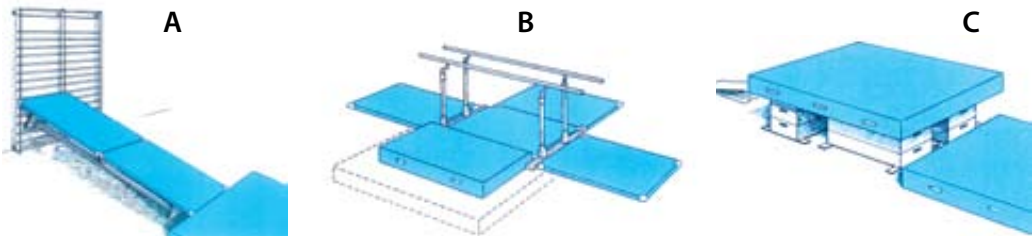
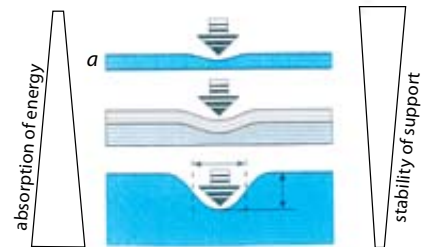
- The type and number of mats available
- The age and body-weight of the students
- The way the student will land on the mat
- The type of movement involved
- The abilities and training of the students
- The height and length of the jump

Thickness and properties of 3 main kinds of gym mats used in German schools (the illustrations are taken from: Baumann N et al: Matten im Sportunterricht. GUV-SI 8035. Bundesverband der Unfallkassen, München 2002 (D)).

a. Mat used with gym equipment (Geräteurnmatte)

b. Mat to absorb impact of fall from modest height (Niedersprungmatte)

c. Soft-surface mat (Weichbodenmatte)



A-D: Examples of mats used for safe use of various items of equipment.



E-F: Example of mats being used for exercise: carrying or balancing objects on mat (e.g. ball), lifting mat (supporting it along long sides, not ends), turning the mat over, etc. Note: the mat should never be supported on the head. These exercises require at least 4 students. The gym teacher should choose the type of exercise best suited to the age and experience of the class.

4.6.5 Horizontal bars⁴⁸

- Must be firmly supported at floor level.
- Remove any rust on handles.
- If tension wire is used for support, replace if signs of wear become apparent (creasing, fraying, tangled cable, etc.).
- Suitable falling surface.

4.6.6 Parallel bars

- Must be firmly attached to wall.
- Wooden parts should not be cracked or splintered.
- Suitable falling surface.

4.6.7 Gymnasium floor (also for indoor gyms)

- The floor must be clear of anything which might cause students to trip and fall.
- Special polishes are available for parquet floors to give a non-slip finish.
- All openings in the floor surface (e.g. sockets for volleyball posts) must be covered when not in use. They must also be checked regularly to make sure they are clear of obstructions and that no water has gathered within them.
- Wooden floors must be checked to ensure there are no splinters.
- There must always be free access for fire engines.

4.6.8 Walls and roof of indoor gym

- There should be no sharp projections at a height below 2m
- All objects attached to the walls or ceiling (e.g. loudspeakers, lights) must be securely fastened and not lie in the likely path of the ball.
- All glass surfaces, including mirrors, must be of safety glass.
- Light fittings must have a protective casing (to avoid breakage by balls).
- A layer of protective padding must be attached to all points where students might come into contact with the wall.
- There must be unimpeded escape routes from the gym.

⁴⁸ More information on suitability and specifications of gymnastics equipment can be found in: Gutsche E et al.: Sportstätte und Sportgeräte. GUV-SI 8044. Bundesverband der Unfallkassen. München 2002 (D).

4.6.9 Equipment storage

- The storage cupboard should not be overcrowded with equipment (to save space balls can be kept in a special basket).
- The entrance to the storage area should be wide enough for the equipment to be put away and removed with ease.
- Each piece of equipment should have its own special space; where possible the outline of the equipment should be marked on the ground or the floor.

4.6.10 Athletic footwear

- P.E. instructors and parents must make sure children understand the importance of suitable footwear. Safe and comfortable footwear should have the following characteristics⁴⁹:
- It should allow the wearer to move his feet comfortably in all directions.
- It should protect the joints, tendons and ligaments.
- It should absorb impact when the feet strike the ground forcefully.
- It should be sufficiently pliable to allow ease of movement.
- It should be durable
- It should allow the feet to breathe
- It should be easy to clean and maintain

Special footwear requirements for different activities:

- Ball games:
 - Support for ankle joint
 - Good surface grip
 - Ease of turning
- Gymnastics:
 - Flexible sole
 - Good surface grip
 - Lightweight
- Track:
 - Good surface grip
 - Ease of turning
 - Protection for heel
 - Water-repellent



This covered area in an Athens school is used for breaks and P.E. lessons; note the pool of water left lying on the ground (2003).

⁴⁹ Makers of 'trainers' introduce all sorts of features which have no real value in terms of safety or performance. School sports do not require expensive trainers, with all sorts of special 'features'.

4.6.11 Optimal temperatures (Greek School Buildings Agency specifications)

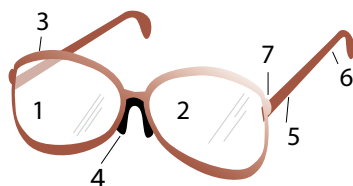
- | | |
|--|------|
| • Classrooms | 20°C |
| • Labs | 18°C |
| • Library | 20°C |
| • Multiple-purpose (and gymnastics) area | 18°C |
| • Corridors | 16°C |

4.6.12 Clothing and appearance

- Students need to have explained to them the advantages of special athletics clothing over ordinary garments, in terms of ease of movement and safety when exercising.
- Track suits should not be too baggy; when all that surplus material is flapping around as the children exercise it can make it hard to see what the children are doing and gets in the way when children are doing exercises together.
- During P.E. and games the children should not be wearing wristwatches, large earrings or necklaces/chains. Such accessories can cause injury during exercise.
- Long hair should be tied back during exercise, so as not to obscure the child's vision and distract him from what he is supposed to be doing; there is also a danger of unsecured hair being pulled out during certain exercises!
- For those who need spectacles, the special plastic lenses are recommended, which will not shatter on impact.
- No food or sweets should be eaten and no gum chewed during exercise (these are bad habits which – unfortunately – the children pick up from professional athletes!).

4.6.13 Spectacles suitable for wearing during P.E. and games⁵⁰

1. Robust lenses which will not shatter easily
2. Minimum interference with field of vision.
3. Elastic, robust frame.
4. Soft, well-fitting nose rest.
5. Soft covering on arms.
6. Snugly-fitting arms.
7. Spring-joints applying pressure to arms.
8. Lightweight.

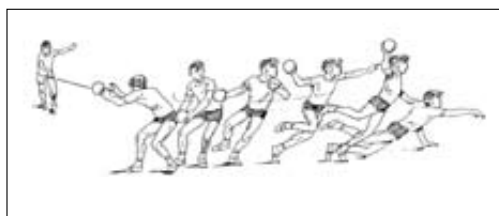
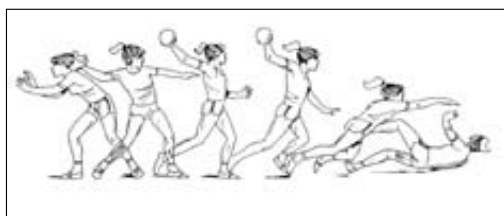


⁵⁰ Die Schulsport gerechte Brille. GUV 20.29. Bundesverband der Unfallkassen. München 1987 (D). The instructions were compiled with the help of the German Association of Ophthalmologists.

4.6.14 Education for safe P.E. and games

Safety is not just a matter of getting the construction and equipment right: an equally important role is played by the way in which the children are taught by their P.E. instructors and games coaches:

- Every kind of exercise and sporting activity has its own risks and special safety requirements. Children must be taught by their instructor how to jump, land, speed up and slow down safely, using the techniques appropriate to each sport or exercise. This instruction is all the more important in the more demanding exercises, those using the trampoline, rings and vaulting horse, the long jump, and so on).



Example: Learning to shoot and fall safely when playing handball [from Dannenmann F.: Sicherheit im Schulsport - Unfallverhütung beim Handball. Bundesverband der Unfallkassen. BAGUV, Heft Nr 3, München 1984 (D)]. Note how the techniques are differentiated between those appropriate for girls (left) and boys.

- There are valuable exercises (some of them can be done as games) designed to improve the general physical condition of the child and to speed up his/her reflexes, to teach the child how to fall safely, what grip to use in helping another child, and so on. The better the child's physical condition, the less likely he is to be hurt; the fit child will have quick reactions and will fall without sustaining injury.
- The German school safety manuals contain advice on designing and laying out the changing rooms in such a way that the children will start the P.E. lesson in the right frame of mind. They also offer advice on the best methods of moving, setting up and tidying up the various pieces of equipment, with instructions on how to use each individual piece (for example: 'the posts of the horizontal bars should always be carried by two people, not because of their weight, but because the end of the pole is less likely to collide with other objects or persons when two people are carrying it')⁵¹.
- Special teaching approaches are recommended to ensure effective communication of the philosophy of accident prevention; for example, how the P.E. teacher can achieve a balance between a lax and dangerous atmosphere and one which is strict but safe. It is recommended that the teacher video the children and then use the recording to identify movements which are awkward or unsafe; he must also deal with aggressive behaviour in the children, and so on.

⁵¹ Perhaps the Ministry of Education might commission a translation of the basic Specification and Accident Prevention Manuals – it seems wasteful for each country to repeat the same research when an excellent model is available.



'BACKBOARD GUILLOTINE' It must be obvious even to the layman that the column supporting the back board in this picture was not properly supported (too little concrete, insufficient depth). Fortunately the student pictured was not crushed when the column collapsed, but he did lose most of a toe (Athens, 1987).



Here the board is dangerously close (just 80cm) to the edge of the basketball court (Folegandros Island - Greece, 1994).



Note the unusual arrangement of the boards, facing each other diagonally across the court! (Patra, 2000).



No comment! How can the school allow the board to remain in such a terrible state? (Kythnos Island, Greece 1993).



Hasn't the school ever heard of safety specifications? An additional danger here is that splinters might fall in players' eyes (Athens primary school, 1999).



Note the electric flex running above the basket (indoor gym, school in Thessaloniki, 2005).



The take-off line and its distance from the sandpit must be adjusted to the children's ability, to ensure that they land safely in the sandpit (Patra, 2000).



The sand in this pit is not being cleaned regularly. All too often in Greece the sand is neglected and allowed to solidify, causing danger of injury (Naxos Island, Greece 1991).



In all our travels we have hardly ever found a volleyball net properly suspended. Note the danger here from projecting ends of wire (Patra, 2001).



If the volleyball court is located within the recreational area (there are not always separate areas) there is a danger of children falling violently on the net while running and thrown backwards injuring themselves (Patra, 2001).



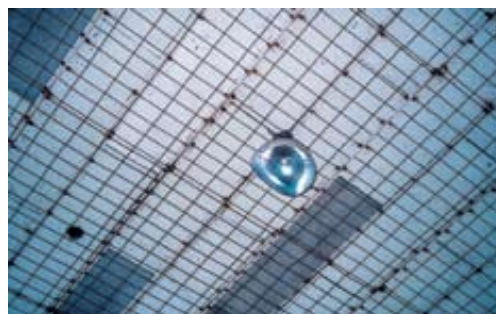
The volleyball posts have been left lying on the ground, instead of being properly stored away. This is a playground used for the break as well as for organized games, and the posts could cause injury if a child fell on them (Thrakomakedones, Attica, 1996).



Here the basketball court is laid out on an inclined surface! (Athens, 2004).



Inappropriate storage and poor maintenance of gym mats is all too common (at 3-4cm these mats are also too thin) (Thessaloniki, 2005).



The light fitting is wrongly attached and inadequately protected against impact from a ball (indoor gym, Thessaloniki school, 2005).



The balcony railing in this indoor school gym is dangerously low.



Poor design: note how the stairs and stair-rails are much too close to the playing area, and how there is no protective material around the basket support (Thessaloniki, 2005).



Note the dangerous position of the air conditioning units in this indoor gym (Thessaloniki, 2005).



Three fatal accidents in Greece within a period of 12 months (2005-2006) regarding fall of handball goal posts not properly attached to the ground. This happens in cases the goal posts are temporarily situated in the courts ment for other sports (the photo is from a school at Thessaloniki).



Volleyball net inappropriately suspended. Edge of the playing area much too close to the wall (Thessaloniki, 2005).



Another danger: the bars installed right under the back board and basket (Thessaloniki, 2005).

■ 4.7 The school courtyard

4.7.1 General remarks

Our **intention** in this section is not to recommend a standard playground design for all schools, because local conditions and capacity will always differ from school to school, as will the needs of the students (nationality, age, gender). But we do believe certain basic principles are applicable to all playgrounds.

The playground must meet two basic **requirements**.

- a) educational needs (physical activity, relaxation, play, regular teaching)
- b) prevention of injury (accidents can be prevented by correct design and encouragement of appropriate behaviour).

Difficulties arise when children of different ages share the playground (when the difference is greater than 3 years), when the playground is too small for the number of children, when different groups of children are engaged in significantly different activities (passive and active break activities), when different games are being played in the same area (usually in poorer countries, where the schools cannot afford separate courts for basketball and volleyball) and – of course – when the optimum technical specifications have not been respected.

4.7.2 School courtyard accidents

65% of school accidents occur in the playground⁵². Most of the victims are aged 8 to 12 (14). The number of accidents is by no means negligible.

In Germany, for example, there are some 140,000 each year. The table below shows the German figures for types of accident and part of the body injured⁵².

⁵² Unser Schulhof – Probleme einer kindergerechten und sicheren Gestaltung GUV 57.1.11. Bundesverband der Unfallkassen. München 1999 (D).

80 Accidents to children in German schools

Part of the body injured	Frequency %
Head	38
Arms	27
Knee	10
Ankle joint and foot	13

Type of injury	Frequency %
Contusions	47
Sprains	19
Ruptures	19
Fractures	9
Various	6

Out of the total of 140,000 accidents, the 9% involving fractures represents 12,870 cases. Most of the accidents are caused by falls on level ground.

A study of 46 schools in Athens (29 primary schools and 11 junior high schools – 6,500 students) carried out over five months in 1996 yielded the following figures for accidents⁵³:

- Total number of accidents = 114 (Boys 72, Girls 42). A surprisingly small overall number.
- Most accidents occurred during the breaks (63%), with 10% during arrival at or departure from school, and 10% during class time.
- Type of accident: falls account for 71%, blows 12% and cuts 8%. Road accidents accounted for just 3% of the total.
- 46% of the accidents occurred in the school grounds, 21% in the classroom, 10% on stairs and 7% on the way to or from school.
- Circumstances: 49% occurred during play, 28% during arguments (!), 24% were caused by slippery surfaces and 14% occurred during games or exercise⁵⁴.
- Nature of injury: 77% involved injury to the limbs, 4% of cases involved concussion, 4% injury to internal organs and 18% fractures.

If certain basic conditions are met, the number of courtyard accidents can be reduced:

- Technical safety (nature of ground, removal of objects which might cause collisions, protection from falls).

⁵³ City of Athens Public Safety Agency: Inventory of accidents in schools in Municipality of Athens, Athens 1996.

⁵⁴ There could be more accidents if exercise at schools was more intense.

- Segregation of different activities (passive/active breaks – organized games). This is not always easy, particularly in schools with limited space at their disposal.
- Different break times for different age groups (where there is an age difference of more than 3 years, children should not be in the playground together. Staggering the break times also reduces playground overcrowding.
- Provision of simple forms of activity.
- Measures to reduce aggression (aggression is a major cause of accidents).
- The children should be allowed to run around and burn off excess energy without restraint, but the appropriate safety measures must be in place.
- The attitudes, training, disposition and active involvement of the teaching staff are all vitally important.

From the Greek School Buildings Agency specifications:

- School buildings should only be used for the children of the level (primary/secondary) for which they were designed.
- The right conditions must be in place so that the children are not encouraged to indulge in behaviour that might cause accidents.
- The building must be lit with external floodlights.
- School buildings must be furnished with a Faraday-cage lightning conductor attached to all metal parts of the building.

The playground is one of the areas where children learn to socialize with others, and this process can contribute to accident prevention. There are simple measures which can assist in the process.

The following technical aspects of the playground area are vital in accident prevention:

- Suitable ground surface, not too hard.
- Large objects (e.g. refuse bins) to be suitably placed and, above all, should never have sharp edges or projecting points; metal surfaces should be free of rust.
- The surface should be as even and free of obstacles as possible; it should be checked for broken drains, steps, the bases of removed posts, open sockets (e.g. sockets for volleyball posts). It is extremely important to allow rain water to drain off the surface; puddles can cause accidents.
- Where young children are using the playground, the gate to the street must always be locked and there should be no gaps in the fencing⁵⁵.

⁵⁵ There is a high school in secondary Athens where the students have turned the busy road in front of the school into an extension of the school playground! This kind of situation is dangerous and highly disturbing!

- As far as possible, organized games should take place in their own part of the playground, away from the general play areas.
- There must be ample space for the children to run around freely and let off steam.
- It is not advisable for too many children to be using the playground at the same time, even if there is space for them. Overcrowding leads to stress and aggression. The canteen must be in a part of the playground where large groups of children gathering together will not involve risk. Nowhere in the school should there be any small space where a young (or older) child might hide and become trapped, without any adult being aware of his whereabouts⁵⁶.
- Nowhere should it be possible for a child to fall from a height. Far too often protective railings are too low to eliminate the risk.
- Railings with pointed tips must have the sharp points removed or covered! They do not deter children from climbing and they can cause very grave injuries!
- Some primary schools have children's recreation grounds, many of which are unsafe.
- Just like schools, recreation grounds must be sited and constructed in line with safety specifications.

For more information see the publication «Safer children's recreation grounds» issued by the University of Athens in association with the Municipality of Korydallos, and the EU specifications (pr EN 1176 1-9 PR and EN 1177), which have been translated by the EL0T (Hellenic Organization for Standardization).



Safety is not just a matter of conscientious supervision.

The teacher can't be everywhere at once.

The important thing is to neutralize the main risk factors.

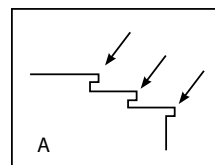
Falls (on the same level) – one of the most common causes of injury

Some of the causes of falls (in and around the school):

- Water on surface one expects to be dry (e.g. pool of water formed by dripping air conditioning unit).
- Curling plastic floor tiles or broken and dislodged ceramic tiles.
- Trailing cable (electric flex or phone wires).
- Unfastened laces on athletic shoes (the latest 'fashion').

⁵⁶ A particular danger is posed by abandoned fridges. At least twice in the past 5 years kids trapped in old and abandoned ice boxes and died of suffocation.

- Waste and litter.
- Uncovered sockets in the ground (e.g. volleyball post sockets).
- Broken stairs and frayed or ripped stair covering.
- Raised edges on steps (particularly dangerous for the elderly and those with impaired mobility).
- Stairs in poorly lit areas. A strip of brightly coloured material at the edge of each step will do much to make the stairs safer. (See figure A)



- A particularly dangerous habit is that of people who come in from bright sunlight and fail to remove their dark glasses.
- Lack of provision for people with impaired sight.
- Aggressive behaviour by children – one of the main causes of accidents.



'LORRY CRUSHES SIX-YEAR-OLD IN SCHOOL PLAYGROUND' The newspaper headline tells how a 6-year-old child was crushed by a lorry in his school playground. Vehicles should never be allowed to maneuver in school playgrounds when children are nearby (Report of accident in northern Greece, 1987).



Incredibly, this water tank has been allowed to remain supported on a totally inadequate frame right above the children's heads in a school playground (Thessaloniki, 2005).



Another shocking newspaper story: a fuel tank fell on a child in the school playground, causing serious injury (Athens 1992).

Playgrounds which are too small and do not allow the children to run around and let off steam can cause 'overcrowding stress' – leading to an increase in aggression and the number of accidents.





Note how the support for this overhanging roof is quite inadequate.



A job left unfinished! Note how only some of the columns have been sheathed in protective padding – an essential safety feature around stairways (Athens primary school, 2005)



Note the dangerous jagged edge of this litter bin (Athens, 2000).



Dangerous projecting supports behind the railings of a school playground (Oropos, Attica, 1999).



Dangerously low lintel on a gateway (Thessaloniki 2005).



Note how the grid covering the drain has become dislodged. A child could easily stumble over it and fall – right at the entrance to the building! (Thrakomakedones, Attica, 1999)



This photograph was taken, unbelievably, in the area where the children play during their break (Naxos, 1991).



A dangerous opening in the railings around a playground – with a 5m drop on the other side! It's not enough for the school just to fill in a form asking for a repairman to be sent round. This is the kind of risk that needs to be tackled immediately! If the school funds won't stretch to the 30 Euros needed for the gap to be filled, the teachers should pay out of their own pockets. "We're waiting for the repair men" is an excuse that often heralds an accident.



A rusting stove pipe ends just at the level of the children's heads, in the area where they play during their breaks (Philippiada, 1993).



Old, makeshift fencing – harbouring all sorts of hidden dangers (Patra 2002).



Dangerous roof made of asbestos sheets – cut with a saw to make room for the top of the tree! Asbestos should only be removed by qualified workmen (Thessaloniki, 2005).



Spiked railings never deter children – but often injure them! Serious injuries to the genitals have been reported (Nafpaktos, 1992).



Firemen work to free a young child impaled on railings in Larisa (from Greek TV news, 2003).



A good method of eliminating the danger of pointed railings (Nafaktos, 1992).



This narrow gap between two school buildings is the sort of place where an injured child might lie unnoticed. Areas like this need to be securely fenced off (Patra, 2002).



Playground used by local people as a car park! (Thessaloniki, 2005).



Note how this wooden post, supporting a roof, is beginning to rot (Thessaloniki, 2005)



What kind of impression will this make on the students? Poor construction and maintenance do not create the right atmosphere for good behaviour (Thessaloniki, 2005)



Insecure handrail and railings, with large gaps (Patra, 2002).



Note how the sides of the stairway are properly protected (Nafpaktos, 1992).



Poor construction and makeshift repair work!



The headmaster of a primary school demonstrates how a child was fatally injured: as the child slid down the handrail, the weight of his satchel pulled him to the ground below (Kalymnos Island - Greece 1991).



This is a good way of preventing children from sliding down the handrail – although there could be more hoops, placed closer together (Patra, 2002).



Definitely not the right way to prevent sliding – children's fingers might be caught under the strips of metal (Thessaloniki, 2005).



A common sight in Greek schools – the original rails were too low and have had to be raised.



Here the handrail needs to be provided with something to prevent sliding, and should be extended right to the bottom of the stairs.



Just raising the height of the hand-rail will not prevent students sliding down! (Thessaloniki, 2005).



The diameter of the handrail is too large for a child's hand to grip. The ideal diameter is 3cm (Thessaloniki, 2005).



This iron post could easily cause injury.



It can be hard to see where each step begins and ends, so yellow strips along the edge of each step are essential for safety (Steps leading to Brussels underground railway, 2003).



The marble (arrow) pieces should be fixed in place with special screws, not adhesive (Thessaloniki, 2005).



Installing radiators within a recess in the wall can prevent accidents (Thessaloniki, 2005).



Fixing clothes' hooks on a length of wood facing the wall means they are less likely to cause injury (Thessaloniki, 2005).



Radiator held in place with wire – a makeshift and dangerous arrangement (Thessaloniki, 2005).



Classroom doors should never be directly opposite to each other (Thessaloniki, 2005).



Dislodged floor tiles and tiles with curling edges are a common cause of falls (Thessaloniki, 2005).



Prefabricated classrooms rarely meet safety specifications.



There is insufficient clarity about the safety specifications for multi-purpose areas. Frequent problems: inadequate provision of fire extinguishers, no exit signs, insufficient exits to allow rapid evacuation.



This bust could easily fall on someone's head during an earthquake (Thessaloniki, 2005).



The medicine cupboard is not kept locked, is inadequately supplied and some of the drugs it does contain are dangerous if taken without medical supervision.



Dangerous crack in wall of school building, perhaps an example of earthquake damage (Thessaloniki, 2005).



Damaged lightning conductor (Thessaloniki, 2005).

■ 4.8 The school environs

The area around the school may harbour various dangers (open wells, construction sites) to the children, who pass through the area on their way to school and may stop to play there.

Although not part of the school grounds, the surrounding area must be checked by the teachers to guard against dangers. They should be on the look out for abandoned fridges in which children can be trapped (a number of young children have been trapped in this way and died) as well as inadequately fenced building sites in which there is a danger of children falling).

The law says that building sites must be secured by the contractor in charge (failure to do so should be reported to the local police).

Examples of specific dangers in the school environs:

- Building sites and unsecured building materials.
- Foundations left uncovered.
- Movement of heavy vehicles in and out of construction sites.
- Wells.
- Water tanks or tanks containing other materials – equally dangerous whether full or empty (also tanks collecting resin in rural areas).
- Busy parking areas.
- Pavements obstructed with café tables, displays, etc. These obstructions force children to step into the road (this can be reported to the local council).
- Unsafe children's recreation grounds (again, the responsibility lies with the local council).
- Abandoned and derelict buildings (children injured playing in old buildings may lie for hours waiting for help – because no one knows where they are!).
- Railway lines (dangers should be reported to the railway company, who can also provide information on timetables).

NOTE: If there is a railway line near the school, the children will become used to seeing trains passing and there is a risk of their forgetting or underestimating the dangers!



'TEN-YEAR-OLD IMPALED ON IRON BAR'

The article reports an accident involving a child playing on a building site (Thessaloniki, 1989).



Inadequately fenced building sites are an irresistible magnet to children – and all too often their games end in terrible injuries (Athens, 1995).



In rural areas there may be other dangers to the children – in this case a tank for collecting pine resin (northern Evoia, 1999).



When a railway line is an everyday feature of the landscape there is a danger of children feeling too comfortable around the lines and trains (Peloponnese, 2000).



The young man is pointing to an abandoned industrial refrigerator in which 3 young girls became trapped and died of asphyxiation – tragically, they were the granddaughters of the man who owned the refrigerator! Potential dangers like this must be eliminated from the area around the school – and from any area where children might be playing.



There could be danger of electrocution here in wet weather, if children pull on the cord attached to the kite.



Spiked railings are not just a danger in the playground. They should not be found anywhere where children play (Thessaloniki, 2005).

■ 4.9 School laboratories

4.9.1 Points requiring special attention

Next only to the playing fields and playground in the dangers they pose, laboratories in EU countries are subject to detailed regulations and safety measures.

Points requiring special attention from teachers are as follows:

- The kind of precautions appropriate to the materials being used (need for safe storage, inflammable substances, noxious fumes which may be generated during experiments, danger of explosions, etc.).
- The lay-out of the laboratory space must conform to the existing specifications.
- Personal protection for teacher and students (gloves suitable for materials being handled, goggles, protective aprons, transparent protective screens, etc.).
- Immediate access to an emergency shower - for cleansing whole body, not just eyes - with easy-to-operate handles. The shower should be tested every six months, *and* before each experiment.
- The lab must have fire-fighting equipment, and the staff must be trained in its use.
- There must be planned and clearly marked escape routes.
- The teacher must be aware of the risks inherent in each experiment.
- The teachers must have at least a basic knowledge of first aid.
- There must be a fully equipped first-aid cabinet (not just a box with some iodine and a few pieces of gauze!), and it must be checked twice a year.

We present below some of the guidelines for laboratories drawn up by the German Federal Association of Accident Insurance Funds [Richtlinien für Laboratorien. GUV 16.7 Bundesverband der Unfallkassen, München 1983 (D)]. Although the specifications apply mainly to laboratories handling hazardous substances, the introduction to the guidelines does recommend their use in labs handling less hazardous or even innocuous materials.

4.9.2 Space and equipment

Lab doors should always open outward and be provided with a small window of safety glass (for visual inspection of laboratory). The floor surface must be absolutely waterproof and water-resistant; there must be adequate ventilation (400 cubic m. of air/hour; in certain circumstances up to 700 cubic m./hour). Fresh air (pre-heated if necessary) must be supplied to replace air extracted by ventilation system. No draughts should be allowed.

Working areas with a fume hood must use safety glass; otherwise the interior must be constructed in such a way that, in the event of an explosion, the force of the blast will be absorbed. There should also be a device to indicate whether the extractor system is working.

Work benches must be of waterproof material. Each gas supply line must have its own on/off valve, in addition to the general on/off valve for the whole system. The emergency shower must be easily accessible and easy to operate.

There must be separate electrical circuits for the lighting, ventilation and power systems. Sockets and switches must be well protected and not vulnerable to interference from any liquid that may be spilled.

The interior of the fridges must be protected against explosions. The lighting and lighting switch must be disconnected; the thermostat must be on a circuit with its own fuse and the automatic de-froster must also be disconnected. In these cases the fridge is de-frosted by leaving the door open.

In labs where students are working back-to-back at separate work benches, there must be a distance of at least 1.5m between them (School Buildings Agency specifications). The main switch for the power and gas supplies must be in a central position.

4.9.3 Working in the lab

Avoid using glass vessels with rubber tubes attached to special apertures (these tend to break easily). Insertion and removal of rubber tubing from these vessels must be carried out carefully by someone experienced. If there has been any difficulty in removing the tube, it should be replaced at once. Hosing supplying gas must be inspected regularly. Bunsen burners must have special hoses.

Complex arrangements of instruments must be set up without being subjected to tension or strain and in such a way as to permit full, regular inspection.

Containers must be labelled and be suitable for the substances they contain. For example: don't use aluminium containers for chlorinated hydrocarbons. Note: some substances can eat their way through plastic containers. Poisonous substances must be kept under lock and key. Be sure the lab is well ventilated when conducting experiments which generate caustic fumes (e.g. bromine). Volatile and inflammable substances must be kept separately. Don't use delicate glass vessels for inflammable substances (e.g. acetone, isopropanol, etc.).

4.9.4 Behavior of staff and students

Beware of wrongly or inadequately labelled containers. The member of staff in charge must never leave the lab until the experiment is complete and the equipment cleared away.

Care must be taken when cleaning vessels which contained hazardous substances. Corks should never be forced into the top of glass vessels. Tightly-fitting corks should be removed with great care, by experienced persons, heating the vessel gently to release the cork. No food may be consumed in the lab. Clothes/aprons of inflammable material must not be worn. Long hair must be fastened back tidily. Loose, baggy or flowing clothes are best avoided.

4.9.5 Waste

Special care must be taken with:

- Waste liable to self-combust (e.g. filters contaminated with inflammable substances, catalytic agent or polymer residue, etc.).
- Wastes which react with water to produce a hazard (e.g. alkaline metals).
- Waste liable to generate inflammable fumes (not in the wash basin!).
- Glass and other sharp-edged waste products.

Hazardous waste should be disposed of by trained staff following an agreed methodology (contract with specialist waste disposal company).

4.9.6 Fire prevention

The lab must be furnished with suitable extinguishers; drills must be held regularly; fire blankets must be available to smother burning clothes.

4.9.7 Personal protection

Wearing of glasses protecting side as well as front of eyes, and gloves appropriate for material being handled; special protective clothing where there is any risk of fire; breathing masks where appropriate, and so on.

4.9.8 Protection of machinery

All moving parts must have suitable protective covering. Machinery should never be used unless the specified protective measures are in place, and should only be operated by trained staff.

These examples were taken from the German specifications for labs handling hazardous materials, but they are equally applicable to school labs. They demonstrate a healthy respect for safety issues and show how detailed the German specifications are. Remember, what seems a minor detail may one day be the cause of major tragedy.

4.9.9 Practical instructions for carrying out experiments and demonstrations in the school laboratory⁵⁷

We have compiled a list of the basic points requiring attention. This is not intended as a comprehensive guide to lab safety – which would be beyond the scope of this volume.

a) General instructions for teachers

- Hazardous substances, if absolutely necessary in the lab, must be kept under lock and key, stored in the appropriate conditions and only in small quantities.
Examples of hazardous substances:
 - Poisons, e.g. compounds of cadmium, atropine, 1-bromopropanoic acid (to be stored in ventilated cupboards), nitrobenzene, trinitrophenol (danger of explosion!) etc.
 - Carcinogenic substances, e.g. benzene, methyl iodide, nitrosamines, acetaldehyde, etc. (a detailed list of hazardous substances is available from the Ministry of Health).
- Substances which give off corrosive fumes should be stored in ventilated cupboards.
- In using and maintaining gas bottles the supplier's instructions must be followed! They should always be placed on proper supports and never along an emergency escape route. No more than 14kg of liquid gas should ever be stored in one room! Gas bottles have an expiry date and are subject to inspection by the gas suppliers).

The students must be warned not to repeat the experiments at home!

- Before the experiment begins, the students must be reminded where the main power switch is, and must be wearing their personal protective gear (apron-goggles-gloves etc.).
- The teacher may not leave the lab until the equipment has been cleared up, the materials put safely away and any waste disposed of.
- Old-fashioned oral pipettes must not be used.
- When handling volatile materials:
 - Use protective shield.
 - Use special goggles.

⁵⁷ Based on Nr GUV 57.1.29 - Bundesverband der Unfallkassen, München 1986 (D), which also contains the Decision of the German State Ministers of Culture (Education) of 30.12.1985.

- Use only small quantities of the volatile substance.
- Never exert pressure on the mixture of substances.
- Do not use hard objects to handle the mixture.
- Avoid overheating and proximity to a naked flame, sparks or friction.
- Never attempt to store combinations of different substances!
- When using potentially carcinogenic substances (although such experiments are not recommended):
 - Always wear gloves.
 - Always work under a fume hood.
 - Remove soiled clothing immediately.
 - Shower after experiment.
- Instructions for use of pressurized gas containers.
 - These should never be placed where they are at risk of over-heating (in bright sunlight, for example)
 - Avoid extreme changes of temperature.
 - Do not allow any objects to strike the containers.
 - Take appropriate precautions when affixing or removing valves or pressure meters (never strike the container).
 - Never subject the container to forceful handling which might damage the valves.
 - Use hosing made of suitable material.
 - Keep valves, hosing, meters, washers etc. free of grease, oil, glycerine etc. Do not even wipe the container with a cloth soiled with these substances.

b) Experiments with plants

- Remember that some plants may cause allergies
- Allergic students should be excused the class.
- Hands and forearms must be washed thoroughly.
- Use only bacteria and fungi procured from a university or state laboratory.
- Special methods must be used to destroy cultures of bacteria and fungi.

c) Waste management

- Special knowledge is required (Ministry of the Environment).
- Never dispose of chemical compounds by flushing down the lavatory!

d) Specialized lessons (with special safety requirements)

- Certain lessons (Mechanics – Thermodynamics – Acoustics – Optical science)

e) Not allowed:

- Experiments on students.
- Use of radioactive materials: special licence and precautions required.
- Lasers may only be used under certain conditions and require specialist knowledge on the part of the teacher (German Regulations DIN 58126, part 6).
- No experiments are allowed using highly poisonous substances (e.g. bromine, nitrobenzene), explosive or carcinogenic substances.
- Electrical experiments are not allowed using current greater than 25V or resistance greater than 50kΩ with students under the age of ten. In general terms, no electrical experiments are allowed which involve danger of the student coming into contact with the power supply.

Those interested in more detailed information can consult the relevant German legislation:

DIN 58126	Technical safety requirements for teaching methods and materials. Section 2- Hazardous substances. Section 6- Lasers.
DIN 57100	Manufacture of electrical constructions up to 1000V. Section 410- Safety measures (UDE 100, section 410). Section 723- Laboratories (VOE 100, section 723).
DIN 57105	Use of electrical constructions. Section 12 (VDE 0105, section 12).
DIN 57510	Batteries - accumulators (VDE 0510, section 2).
DIN 57551	Section 1 safety transformer (VDE 0551, section 1).
DIN 58125	School building: construction requirements for accident avoidance.



'15-YEAR-OLD STUDENT BLINDED BY EXPERIMENT' The story tells how one student was blinded and three classmates injured in an accident in the school chemistry lab. There can be no excuse for the kind of carelessness that leads to such accidents (Athens, 1998).



Unacceptable situation for a school lab. Total absence of protective equipment (gloves, goggles, masks, eye showers, transparent protective shields, etc.) (Thessaloniki, 2005).

Also the following publications: GUV 2.20-16.17-19.10-20.5-20.26-29.6-29.9-29.10-20.22-57.1.2-40.0.1

The above can be purchased from: Beuth GmbH (publishing house) Burggrafenstr. 4-10, D-100 Berlin 30 Germany (the DIN material) and from: Eigenunfallversicherung, Bundesallee 199, D-1000 Berlin 31, Germany (the GUV material) tel. 0049-30-7833881.

Every state will have its own regulations and legislation on the type and scale of experiment appropriate in school labs, and the substances that can be used. Teachers should familiarize themselves with their own national legislation.



An eye shower (the student leans forward with his eyes between the two jets of water; the flow of water is operated with a pedal) for use when the eyes have come into contact with chemicals. This photograph was not taken in a school lab.



Full-size shower outside rooms where chemical substances are used (University of Athens, Medical School).



Poorly maintained storage cupboard in school lab (Thessaloniki, 2005).



Note the unsupported gas cylinders, as well as other safety problems (Thessaloniki, 2005).

100 ■ 4.10 The school bus

School bus services are an essential part of school life in Greece, for two reasons:

- a) Because many children need transportation to private schools located outside the city.
- b) Because (owing to the falling birth rate) many schools in villages and small towns have been closed; the few children remaining in the villages have to be bussed to larger towns, often a considerable distance from home⁵⁸.

Some private and even some state schools have their own buses, but it is also permitted for schools to hire buses (usually from travel agents). Local communities may employ taxi services when just a handful of children need transporting to school, or else they use the public bus service. This combination of different forms of transport leads to certain dangers:

- a) It is not possible to ensure that all these different vehicles meet the appropriate safety specifications.
- b) The drivers often don't have any special training in transporting children.
- c) It is not possible to ensure that all the vehicles in use are of suitable colours and suitably marked to be seen easily on the road⁵⁹ (at least, no legislation has yet been introduced to require this).
- d) It is not always possible to provide an escort for the children.

4.10.1 Some provisions of the Greek Traffic Code (KOK)

We list below some of the provisions of the Highway Code and other Ministry of Transport regulations of particular relevance to the safe movement of schoolchildren:

- Schoolchildren and children attending kindergarten must wear safety belts (Government Gazette 3/B/9.1.1978). Government Gazette 1290/B/14.12.1977 sets out the specifications⁶⁰.
- Within built-up areas school buses may not travel at more than 50km/h, regardless of the signed speed limit on any particular stretch of road. Decision 16900/76.
- The Highway Code (article 20) sets a maximum speed (outside built-up areas) of 60km/h for school buses or other buses carrying schoolchildren⁶¹.

⁵⁸ I've been told by those old enough to remember that in some villages of Arcadia in the 1950's the children had to walk five hours each day (2.5 to school, and 2.5 to return home) to get to a larger village or town with a school. I wonder if they appreciated the lessons more in those days?

⁵⁹ Making school buses conspicuous is a vital element in accident prevention (especially in countries where, when the school bus has stopped, no other vehicle is allowed to drive past it).

⁶⁰ The type of belt (3-point?) and how it should be supported remains unclear!

⁶¹ According to this article of the Code, this limit even applies to coaches used on school trips!

- A 'bus' is defined as a vehicle carrying 10 persons or more (article 2).
- School crossing attendants are appointed by the school headmaster and trained by the local police (article 41 of Highway Code).
- Drivers of school buses must have a Class IV licence (Highway Code, article 94). The licence must be renewed every five years (article 95).
- There is special legislation detailing medical conditions which disqualify a driver from acquiring a Class IV licence.
- Bus and coach drivers must not remain at the wheel for longer than the periods allowed in the relevant legislation.

4.10.2 Some provisions of the German Traffic Code (stvo)⁶²

We present below some extracts from the German legal provisions, taken from a guide issued by the German Automobile Association and the German Public Sector Accident Insurance Funds Association (Bundesverband der Unfallversicherungstraeger der oeffentlichen Hand). We shall not dwell on details here; the essential thing is to ensure that the problems and the various factors involved are clearly understood.

- There are special bus stops for buses taking children to state schools. The advantages of this system are: greater safety, fewer stops by the buses, the possibility of parents taking turns to supervise the children⁶³ and so on).
- Any vehicle with more than 8 seats must have a special licence, for both vehicle and driver (skills, good character of driver).
- The step up to the door of the bus must not be more than 40cm from the ground (even this might be regarded as a little high for young children, we feel).
- The driver must be able (using large mirrors, suitably positioned) to watch the movements of all the children all around the bus).
- For children shorter than 150cm **special** safety seats must be provided (in taxis as well as buses!). Children taller than 150cm must wear standard safety belts.
- Vehicles carrying children must undergo an annual MOT test.
- The German Highway Code waives some of the safety requirements (e.g. safety belts) for ordinary public buses which are used by schoolchildren.
- The regulations require extra brake and indicator lights, mounted to the side of the vehicle and as high as possible.

⁶² Schrödel H.: Mit dem Bus zur Schule. GUV 57.1.33. Bundesverband der Unfallkassen, München 1999 (D).

⁶³ It is very difficult to persuade parents to play an active part in accident prevention. They seem happier when demanding to know 'what the government is doing'.

- Article 14 of the Code sets out the responsibilities of the children using the bus and the behaviour expected of them.
- Article 33 specifies the livery of school buses and the signs to be painted on them.

We have selected here rules and regulations of general interest and value. Each country will, of course, have its own rules and laws which schools should be aware of.

4.10.3 School buses in the USA – points and observations

- In a whole year's observation of school bussing in the USA not a single incident was recorded of a stationary school bus being passed by another vehicle⁶⁴.
- There is an extra emergency door at the rear end of the bus (the rear end is rarely obstructed in accidents).
- If a student is not waiting at the bus stop, the driver is instructed to notify the school, so that the parents can be telephoned (this means that a young child late for the bus is not left alone on the street).
- Every child has his own assigned seat on the bus (averting arguments).
- If students misbehave the driver stops the bus and does not set off again until the problem is resolved.

4.10.4 Accidents involving school buses

A survey of accidents in Germany in 1986 found that 41% of accidents occurred inside the bus, 23% at the bus stop, 23% during boarding or alighting from the bus, and 14% while crossing the road to or from the bus. The importance of safety measures can be appreciated when one compares these figures with those from the USA, where school bussing is a highly regulated, orderly affair, and where – taking account of difference in population size – accidents are 14 times less frequent than in Germany (In the USA in 1986 a total of 21 million children were bussed to school every single day). Most accidents involve children aged 11-15.

⁶⁴ In many countries (in Greece too – but few motorists seem aware of it!) it is strictly forbidden to drive past a school bus which has stopped to pick up or put down schoolchildren.

Traffic accidents involving buses/coaches in Greece in 1999⁶⁵

Type of vehicle	Fatal accidents	Accidents causing injury
Vehicles in private use	50	38
City buses	17	292
Rural and long-distance buses	12	105
School buses	2	29
Tourist coaches	20	86
Buses used by organizations/companies	5	36
Total	106	586

A study of 3,131 accidents in Germany involving school buses (in 1997) yielded the following distribution of types of accident [Bundaverband der Unfallkassen.GUV 57.1.54. München 1999 (D)]:

- Accidents while waiting for bus 23.5%
- Accidents during boarding or alighting 23.9%
- Accidents on the bus 48.9%
- Accidents to children crossing road to or from bus 3.7%

4.10.5 Proposals for improving safety and comfort of children on their way to and from school

a) Four basic principles of accident prevention

- Technical specifications (internal lay-out of bus, mirrors, seats, colour schemes, etc.).
- Organizational measures (boarding-alighting, organized bus stops, etc.).
- Educational measures (training of driver and escort, teachers and parents; encouraging friendly relations between driver and children – this is an essential point).
- Suitability of driver and co-driver (skills and personality).

b) Technical aspects of school buses

Key points:

- Appropriate, brightly coloured (usually yellow) livery, with signs designed to proper specifications and in contrasting colours for easy visibility.

⁶⁵ Traffic Accident Statistics for 1999, National Office of Statistics, Athens, 2000. The figures do not include accidents occurring within the bus.

- Light-reflecting strips on main surfaces.
- Special mirror allowing the driver to see the area immediately in front of the bus, where young children can easily pass unnoticed. There have been tragic accidents in Greece in which the driver has released the brake not realizing there were small children right in front of him).
- Special wide-angled lens⁶⁶ (or even a TV camera and monitor on large buses) allowing the driver to see the area at the rear of the bus (reversing is one of the most dangerous of all driving maneuvers).
- Interior safety: 3-point belts or special seats for children below 150cm in height; seat handles padded with special shock-absorbent material; rear of seats designed to cushion impact like the air bags in an ordinary car; wide doors and low steps; non-slip upholstery on seats.
- Clearly marked emergency exits and hammer to break glass.
- Annual MOT.
- Special 'child' symbol at front and rear of bus, as well as the words 'School Bus' (these should also appear on each side of the bus).
- Buses which are hired by the school must also display the signs described above (front, rear and sides).
- Equipment (minimum):
 - 2 triangular traffic warning signs (heavyweight)
 - 2 safety vests (luminescent)
 - 4 coloured warning cones
 - Full medical kit (not the small first-aid kits sold at car accessory shops).

c) Boarding and alighting at school



The drawing shows the special mirror allowing the driver to see the area directly in front of the school bus. [Gliewe R et al: Der Schulbus. GUV 57.1.33 Bundesverband der Unfallkassen, München 1989 (D)]

- This is one of the most worrying areas of school transport in Greece. At some schools you will see as many as 10 buses with students alighting or boarding at the same time.

⁶⁶ We've started seeing these recently in the rear window of the large new 'eco-friendly' city buses in Athens. All the drivers we asked had a positive response to the new mirrors.

- Some observations: no real supervision; no defined pedestrian routes to and from the buses; drivers maneuvering their vehicles far too close to students; no railings to separate children from buses and provide safe passage.
- Each school needs to carry out its own study (the lay-out of each school will require its own special measures).

d) Necessary qualifications for school bus drivers (legislation should be introduced to make these mandatory)

- Aged over 25 and under 55.
- Special coach driver's licence.
- Should be suitable person to drive passenger-carrying vehicles (doctor's certificate).
- Should have successfully completed first-aid course.
- Full medical check-up every three years.
- We would also add that the right attitude is required for the job (psychological evaluation).

e) Training of co-driver (apart from conventional driving skills)

- Familiarity with children's behaviour (especially behaviour on board buses, where most accidents occur).
- Awareness of main legal requirements.
- Awareness of appropriate behaviour and precautions to be taken during boarding/alighting of students.
- Vigilant supervision of students during journey.
- Knowledge of how to react in the event of an accident (e.g. how to set up safety zone).
- Knowledge of the route and any particular dangers it poses to children (as far as possible, the same driver and co-driver should work the same route each day).

f) Parents

- Parents must advise and inform their children.
- They should not approach the bus until the door has been opened.
- When collecting children, they should not cross the road until the bus has driven off.
- If the bus driver is leaving children in the space between the bus and parked cars, they should advise the children on what to do and *report the driver to the school*.

106 g) School buses for disabled children

- The step should be lower than in the ordinary bus.
- There should be a special platform for wheelchairs (with a motor, if possible).
- Special restraints for passengers and wheelchairs.
- Seats adapted to the children's needs.
- An adequate number of seats with 3-point seatbelts (many disabled children cannot stop themselves being thrown forward even when the driver brakes normally).
- The bus must be suitably painted and signed.

h) Other points to be borne in mind:

- Suitability of vehicle for carrying children.
- State of repair of vehicle.
- Suitability of driver.
- Mandatory use of seatbelt.
- Special seats for young children.
- Maximum number of passengers.
- Should standing passengers be allowed?
- Possibility of special training for driver and co-driver?
- Arrangements for movement of buses and boarding/alighting of children at school.
- Training of driver and co-driver in handling of children, first aid and accident response.
- Safety training for children.

4.10.6 Basic rules for school bus drivers and co-drivers (advice on what to do and what to avoid)⁶⁷:

1. Never accelerate to beat the traffic lights; you'll have to brake suddenly when you're through the lights, putting the children at risk (remember: most accidents take place within the bus).
2. If you can't carry the agreed number of children without breaking the law, you must inform the school of the problem.

⁶⁷ Should also be read and noted by headmasters.

3. A school bus driver should not be doing another job in the evenings. It's up to the schools to pay a decent wage so the drivers won't need to moonlight in another job.
4. Be alert to changes in the bus route which might compromise safety and report them to the school.
5. Always tell the school if you think there are safety problems with the bus, or if it fails to meet the current regulations.
6. NEVER reverse without sending your co-driver to the rear to guide you. NEVER rely on the mirrors alone when reversing.
7. No alcohol should touch your lips for **at least** 12 hours before you take the wheel.
8. Remember that some pharmaceutical products can make you drowsy or slow your reactions. You need to tell your doctor that you are a professional driver working with children!
9. Never let the children cross the road in front of or behind the bus. They must always wait until the bus has driven off!
10. Never set off if you can't see WHERE the children you have just let off the bus are standing.
11. Never set off when children are still standing close to the bus, or between the bus and parked cars (where it is forbidden to leave children!).
12. Never leave children in the gap between the bus and parked vehicles.
13. Even on quiet roads children under ten should be taken across by the escort. On busy roads, all children under twelve must be escorted across.
14. The escort must wear warm, waterproof clothes in winter so that he/she can see the children across the road even in the worst weather.
15. Primary school and kindergarten buses must be equipped with suitably attached seatbelts meeting all the relevant technical specifications.
16. Buses carrying very young children must be equipped with special seats, with safety belts, firmly strapped to the bus seats.
17. Children should never be allowed to hold sharp objects when on the bus. They should not be chewing gum or eating sweets.
18. When the bus brakes even slightly more abruptly than usual, children can strike their heads on the seat handles. The driver must always brake smoothly and the handles must be covered with suitable padding.
19. Smooth driving at a consistent, reasonable speed will ensure the children do not arrive home or at school feeling shaken up and dizzy.

20. When stopping the driver should pull up as close as possible to the pavement. Too large a gap might invite cyclists to come through on the inside of the bus.
21. The children should always be in their own seat, never sitting on an escort's lap.
22. The bus should have large, good-quality mirrors on both sides, and mirrors providing a clear view of the area in front of the bus.
23. There should be a wide-angled lens in the rear window or (in the case of larger buses) a TV camera and monitor.
24. The bus must always be in an excellent state of repair.
25. The bus must always carry a powder extinguisher, at least 3 kilos in capacity, heavy-duty warning triangles, a first aid kit and warning cones.
26. The emergency door or window must be clearly marked and there should be a hammer for breaking the glass.
27. Never forget: the top speed (in Greece) for school buses in built-up areas is 50km/h, in other areas 60km/h.

4.10.7 What to do if a school bus is involved in a road accident

1. Secure the scene of the accident. Warning triangles should be placed 100m on each side of the accident. Note: those helping at the scene are in particular danger on major highways and unlit roads.
2. The children should be removed from the immediate vicinity of the scene and kept under supervision. Curiosity will tempt them to stay nearby, where they will be in danger⁶⁸. Count the students and make sure no one is missing!
3. First aid for the seriously injured.
4. Call an ambulance, and also the fire brigade if people are trapped on the bus⁶⁹.
5. Continue first aid.



What to do in the event of an accident is set out in article 43 of the Greek Traffic Code.

⁶⁸ People at the side of the road are often not easily seen. Oncoming traffic colliding with people at the side of the road can turn a simple breakdown or minor accident into a full-scale tragedy!

⁶⁹ We need to tell the emergency services: WHERE the accident has occurred; WHAT has happened (briefly); HOW MANY people have been injured, and WHO is giving the information. Be sure to give them the number of the phone you are calling from, and wait for them to hang up before you finish the call.

Points to note

- The driver and co-driver must be trained in accident response. Should they both be injured, of course, whether or not the right steps are taken will depend on the degree of expertise possessed by any bystanders present at the scene.

The sequence of actions is simply a recommendation – a plan which those assisting at the scene can adjust to meet the circumstances of each individual accident (number and age of children involved, time of day, type of road and volume of traffic, seriousness of accident, local legislation, and so on).

- We recommend that students be removed to some distance from the scene if the accident has occurred on a major road or road with fast-moving traffic.
- Delegate particular actions to those wishing to help, emphasizing that they must be careful. It's better to delegate relatively safe actions such as making the 999 call – although you should make sure that they really have got through to the emergency services!
- In the event of fire the first step is to get all the children off the bus. Remember to exercise great care in moving the injured!).
- Every bus should be carrying two safety vests, which should be kept in a prominent position.
- Buses should also have special hammers for breaking the glass in the emergency windows – which should be clearly marked.
- A large rear window should also be available as an emergency exit, since the rear of the vehicle is only rarely obstructed in accidents.



‘SCHOOL BUS KILLS SEVEN-YEAR-OLD’

The article relates how a child was killed by the very bus which was supposed to be taking her safely to school. The accident occurred in Athens in 1993, and involved a combination of factors:

- A driver untrained in carrying children.
- No escort to see the children safely across the road.
- The child walked out in front of the bus without waiting for it to depart.
- The driver set off without checking the position of the child who had just alighted.
- There was no special mirror providing the driver with a view of the area directly in front of his vehicle.



Incredible – a school bus going through a red light! (Athens, circa 1990).



Wide-angled lens in rear window providing view of area behind bus (Athens, 2005, ordinary city bus).



Disorderly boarding of school buses by the side of busy road (Athens city centre). Note that the teachers are not wearing safety vests and are not even protecting the students approaching the bus (circa 1993).



Exemplary bus stop design: spacious, attractive, transparent – and set back three metres from the kerb (Germany, 2004).



State-of-the art mirror on tourist bus: provides view of right side of road, pavement and area in front of bus. All school buses should be fitted with mirrors like this.

■ 4.11 Disabled children at school

4.11.1 Basic observations

The term 'disabled' is a broad one, covering individuals with a wide range of special problems: defective sight, impaired mobility, speech or hearing disorders, mental handicaps. The remarks which follow apply mainly to students with impaired mobility, since children in the other categories usually need special teaching (Braille, sign language) and rarely attend regular schools, although the current fashion is to end the isolation of these children and try to reintegrate them into 'normal' education. Of course we shouldn't forget that there are temporary disabilities, too: for example, a child with a fractured leg in plaster.

It's rare to find children with seriously impaired mobility studying at 'normal' schools. This is not due to the small number of these cases so much as to the entrenched attitudes to minorities (including disabled children) which requires them to be kept apart, to be sent to 'special schools'. Other factors are the unwillingness of teachers to shoulder extra responsibility, the laziness of those who would otherwise have to pay special attention to these children, and problems of access to school buildings (steps, toilets, etc.). Finally, perhaps the key factor is just that there is no tradition of finding a place for the disabled child in the mainstream teaching process.

There are even still places of higher education with no proper access for the disabled; they can't get to all the lectures and fall behind their classmates. Moreover, not all countries have regular transport services for the disabled.

It is now common international practice (at least in those countries with a certain level of resources) for disabled children (even the mentally handicapped) to be integrated into mainstream schooling. Both sides benefit – the sound of limb and the disabled. When children who are mentally quite normal are forced to attend a 'special school' because of their impaired mobility, they tend to suffer from a lack of stimuli, their abilities atrophy and they do not realize their intellectual potential. From the age of just six this system of segregation condemns the disabled child to a life of misery and disadvantage.

Sad to say, the parents must bear a share of the blame for this policy of segregation, especially in poorer countries: they too often take a fatalistic attitude to their child's misfortune and are not sufficiently demanding; they are often also ill-informed about services and options available to the disabled. They tend to accept too easily the reluctance of the headmaster to take their child, when the time comes for him or her to start school. Social class plays a role here too: a simple labourer is more likely to accept the headmaster's decision than a doctor or architect.

According to European legislation, ALL public buildings are obliged to have access and special amenities for the disabled – and that includes schools!

When we speak of the disabled we are not only referring to children who are confined to their wheelchair. There are other children who, despite serious mobility problems, can manage to walk, with a degree of support. We stress this point to make it clear that it is not only ramps or elevators which a school will need if it is to take disabled students, but also handrails to provide support at strategic positions around the building.

4.11.2 Buildings and access

Ideally school buildings should be designed in such a way that:

- A disabled student can make *his way unaided* into the main classrooms, assembly rooms, gym and sports areas.
- There is a suitably modified restroom area with safe access (Greek School Buildings Agency specifications).
- The disabled student will be able to leave the building quickly in an emergency (fire, earthquake).

Some observations on the above:

It is not essential that the disabled person have access to all areas. If the school has no lift, for example, then a classroom on the ground floor can be reserved for use by classes with a disabled student. Modifying a restroom for disabled use is not difficult if the original room is not too narrow. We have stressed the point that the disabled person should be moving unaided because this is the main objective: as far as possible he should be able – alone, without constantly seeking help – to make his way wherever necessary. It's hard to appreciate – fortunately or unfortunately – what a burden it is for the disabled to be forever seeking assistance! Minor aids which for the sound of limb may seem negligible, for a disabled person may be of vital importance. It is not always possible to install ramps next to steps, especially when the school buildings are old and there isn't enough space for the ramp to have the necessary gradient. But there will always be a solution, even if it isn't ideal. If there are spiral staircases between the floors of the building, a suitable handrail must without fail be fitted along the internal side of the stairway, against the wall, all the way down. Builders aren't always used to these aspects of construction and don't appreciate how vital these details are – details which, if overlooked, can render the whole structure useless. This is why the building work must be closely supervised by people who understand these special features.

The Greek regulations require that there be disabled access to all open areas of the school, with the possible exception of sites on a steep incline. Ramps should not have a gradient of more than 6% (Greek School Buildings Agency specifications). In schools with more than one floor there must be a lift, with a bearing capacity of 600kg or 8 persons, and dimensions of 1.40 x 1.30 (Greek School Buildings Agency specifications).

Attention must also be paid to the state of the pavements outside the school. A school which is – in other respects – accessible to the disabled, may in fact be inaccessible because of the poor condition of the pavement, unsuitable for wheelchair-users because of broken paving stones, parked cars and the absence of ramps. The pavement is not part of the school grounds, but nevertheless the administration has every right to require the local council to make the necessary repairs.

Detailed instructions would be beyond the scope of this book, but there are certain photographs and sketches in the relevant chapter which will allow the reader to form an idea of the approach required.

4.11.3 The value of having disabled children in mainstream schools

Students in schools that accept disabled pupils reap significant benefits in terms of character and social attitudes:

- They learn how to live and work alongside people who are 'different'.
- They learn to respect and make allowances for minorities and disadvantaged groups.
- They learn (a difficult, but more tangible lesson) to appreciate the value of good health and freedom of movement.
- They learn the virtues of simplicity appreciated so well by the disabled (a lesson taught by necessity) and which are so important in today's excessively complex consumer world.
- They learn not to see themselves as the centre of the world.

A mother (a relatively sophisticated woman) told me with great enthusiasm how, after the arrival of some disabled students at her son's school, the son began to come home from school not talking, as before, about himself and what he had done at school, but about his new classmate. In other words, the example of the disabled classmate had broken through the shell of egotism which causes us so many problems, often without our realizing it.

4.11.4 Visually impaired individuals (VII)

(The best way to help them)

In most countries a person is defined as blind if his vision is less than 1/20 of that of a normally sighted person, and cannot be improved by artificial aids. Total loss of sight in both eyes afflicts only a very small percentage of the visually impaired.

It is calculated that one person in a hundred in Greece is blind; the figure for the UK is one person in sixty.

- 114** Since most visually impaired persons have partial sight, there are some simple measures that can make their daily lives easier.

Some examples:

- Signs with large, easily legible letters in a colour contrasting clearly with the background, placed at all locations where a blind person might need to go (schools, public buildings, train and bus stations, etc.).
- Use of contrasting colours inside buildings to distinguish the floor from the walls, or to highlight the presence of some object (e.g. phone booth, cupboard) at a height which the blind person cannot detect with his cane.
- Suitable lighting in the places where the blind person lives and works allows him to utilize to the full what sight remains to him.

Meeting a visually impaired person

Below we set out some basic principles:

- On first meeting a person who is visually impaired we introduce ourselves, either taking the hand extended in greeting or giving the person a light pat on the back.
- When in company we should preface remarks to him with his name, and speak directly to him about subjects that concern him, not using his guide as an intermediary.
- There is no need to raise one's voice when speaking to a visually impaired person. Loss of sight does NOT entail loss of hearing.
- The words 'see', 'read' and 'look' are all used by blind people to express ways in which they perceive the world around them (by listening, smelling, touching) or read (using Braille or talking books).
- Light-hearted remarks like 'Who am I, then?', or 'Do you recognize my voice?' only serve to remind the person of his disability, and should be avoided.
- You should never leave the room without telling the visually impaired person that you are going out. Nobody likes to find out he's been talking to himself!
- A visually impaired person walking around on his own doesn't necessarily need your help. Only if there is good reason to believe the person would welcome assistance should you approach and offer to help.
- When giving directions to the visually impaired you need to be very precise. For example: say 'Go straight ahead and take the second turning on the left, that brings you into Tetrapoleos St. Twenty metres along the street is the bus stop you're looking for'. Don't say 'Straight on for 100 metres you'll come to Tetrapoleos; the stop is somewhere along there'.

- The best way to escort a blind person (if he seeks our help) is to proceed half a step in front of him, allowing him to rest his hand on our forearm and warning him of any steps or other obstacles coming up.
- When driving, we must always stop some distance before a pedestrian crossing – never actually on it or right in front of it, because this can make it awkward for even very well trained persons to get across.
- Always stop at the red light. Never park a motorbike or car on the pavement.

Special needs of the visually impaired student

Children with impaired sight may attend a special school for the blind, but contemporary educational theory is now encouraging more and more visually impaired children to attend mainstream schools, with the support of a specially trained teacher and aids like Braille and talking books. The idea is that attending a mainstream school is better for the social development of the visually impaired student, whose presence is also a good lesson for the sighted children in learning to live with people who are different from themselves.

But for this mainstream schooling of the disabled student to succeed and bear fruit, a safe and welcoming environment has to be created. Various modifications to the school will be required:

- Stairways must have protective railings and special coloured strips marking the edge of the steps.
- The playground must be designed to conform to specifications for the disabled.
- Windows must be placed at a height from the floor safe for children of the age using the space.
- Cupboard doors must never be left open or half-open (lest the visually impaired student walk into them).
- The disabled student must always be warned when any change is to be made in the lay-out of the room or arrangement of the furniture.
- The walls, ceilings, desks, seats and other furniture should all be painted in neutral, matt colours.
- There should be uniform lighting throughout the room, never so strong as to be dazzling.

Teaching process

(Some key points and examples)

- Close cooperation with the special needs teacher. For example: tests and photocopied material will have to be passed to the special teacher in advance so that he can convert them into a suitable format for the blind student.

- The blind student will need 1½ times longer than the average sighted student to complete his schoolwork. The workload must be adjusted appropriately. But experience has shown that once the visually impaired student has developed the requisite skills, he can cope with all the demands of his schoolwork.
- Remember that smiles and gestures won't be seen. Reward the blind student's efforts with a pat on the back or a verbal expression of satisfaction.
- Class activities should be organized to enable the blind student to take part. In gym, for example, a relay race can be organized in which the children run towards a sound-emitting device, with eyes closed, and then return to their team.
- The teacher can ask the children to go about some of their daily tasks with their eyes closed, e.g. making a phone call, filling a glass with water from a jug, or laying out clothes. The children can then be asked to propose practical solutions for the problems they encounter.
- Encouraging the sighted students to help their blind classmate. Such assistance can be very valuable and could take the following forms:
 - Guiding the blind student around various parts of the school and helping him to avoid possible dangers.
 - Making carbon copies or photocopies of their notes to be converted into suitable format for the blind student.
 - Welcoming the blind student as a full member of the school community.

It's vital to remember that children have no system of their own for evaluating disability; they will adopt whatever attitudes their elders (in this case, the teachers) seem to have towards it. For teachers the American Association for the Blind gives the following advice: 'The blind student is similar in more ways than he is different. Your attitude to him should reflect this fact'.



We all know what amazing things the disabled can achieve. Photograph from the Athens Paralympics, 2004.



Disabled people take part in a race around Athens (circa 2000).



Dance competition (from a TV broadcast).



Students from the Athens University Medical School on an excursion with disabled people in wheelchairs (Mount Parnitha, Flambouri refuge, circa 1996). The excursion was a memorable experience for both the disabled and their student escorts.



Across most of the European Union it is taken for granted that disabled people will be able to move around freely under their own steam (Erlangen-Germany 2004).



A heart-warming scene of solidarity and togetherness in Nuremberg, Germany. The boy in the wheelchair is just another member of the group (circa 2000).



Unsuitable ramp, gradient steeper than 10%, the sides uneven (dangerous for pedestrians, Thessaloniki, 2005).



An exemplary piece of design. The phone booth offers ease of access for the disabled (Barcelona, 1999).



The ramp at this Thessaloniki school is much too steep.



An impediment no more than 3cm above the ground can cause a significant problem for the small front wheels of the wheelchair.



A perfectly laid ramp – but unfortunately it's for cars! It seems we continue to attach more importance to our cars than to the needs of the handicapped (Loutraki, 2003).



Despite some efforts to improve the situation, too many churches still have no access for the disabled (Nafpaktos, 2003).



Note how the handrail goes all the way up the stairs from bottom to top. The stairs lead to a Brussels conference room.



At this pedestrian crossing in the Netherlands an audible signal tells the blind when it is safe to cross. Similar devices installed at some crossings in Greece have been damaged or removed! Even where these devices exist in Greece, it is not always safe to rely on them – too many vehicles ignore the lights!



This automatic ticket dispenser is too high for wheelchair users to use in comfort (Athens, circa 1998).



Blocked pavements – a serious hazard for the blind (Athens, 2005).



A restroom spacious enough for use by the disabled (University of Crete – Medical School).



A WC with handrails for the disabled (University of Athens – Medical School).



A small hand-rail in the right place is of great assistance to the disabled. Little details can make an enormous difference to people with a disability.

120 ■ 4.12 School trips

School trips can present serious safety issues, for the following reasons:

- The teachers often have no training in handling large groups of children outside the school environment.
- Students tend to become more difficult to control (especially on trips lasting several days).
- There is often use (and abuse) of alcohol, despite the fact that the sale of alcohol is prohibited to individuals under 18 or, in some countries, under 21.
- The concept of accident prevention is not well understood in respect of trips, and preventive measures are not easy to implement.
- Teachers and students do not always enjoy good relations.
- In Greece at least, the week-long school trip has lost much of its anticipated educational character.

4.12.1 Trips by coach or train

Particular care and supervision are required:

When boarding and alighting from the coach: it must be suitably parked so that the students are kept away from traffic. The teacher should be wearing a safety vest⁷⁰ as he supervises the students and warns oncoming traffic. The coach must always pull up as close as possible to the pavement. Particular care is required when there are several coaches at the same spot: none of them should try to move off until ALL students have boarded or alighted!

Extra vigilance is necessary at night. Reliance should never be placed on the coach lights alone: **extra warning is required to alert other traffic, in the form of coloured cones placed at suitable points on the road.** In the event of an accident or emergency stop (when the coach has to be evacuated) on a busy road, the teachers must secure the scene, wearing safety vests, and ensure the students are taken a safe distance from the road.

There is always serious risk when the coach has to be evacuated on a road with fast-moving traffic, whatever the time of day. It is a situation which can lead to serious accidents with many victims⁷¹.

⁷⁰ Two safety jackets on every bus. Greek law also requires that these be worn in the city, by teachers accompanying students in the street.

⁷¹ It must be remembered that drivers – especially at night, but in daytime too – do not see parked cars in time on highways and country roads, and react very slowly, if at all! This is the cause of many accidents, including multiple pile-ups.

Whenever the coach is on the road one of the teachers must watch the driver to make sure he is complying with all the requirements of the Highway Code, and particularly:

- that he is respecting the speed limits
- that he is only overtaking when absolutely necessary, and taking the necessary precautions, i.e. unimpeded field of vision, plenty of space ahead, vehicle being overtaken not travelling too fast, not overtaking on double lines, not overtaking on bridges, turns, etc.
- the teacher should also watch for signs of fatigue in the driver, who should not be exceeding his permitted number of hours at the wheel.

The teachers must also be confident that the driver is consuming absolutely no alcohol, and taking no medication which might affect his ability to drive. They should also make sure that the coach has passed the mandatory roadworthiness tests.

4.12.2 Necessary equipment (to be provided by school)

Apart from the items with which the hired coach should be equipped, the school must make sure there are:

- 2 strong battery-powered flashlights (batteries to be checked regularly).
- 2 (at least) safety vests for each coach; these should be red or orange in colour, not green.
- In our opinion coaches carrying students on long-distance trips outside the city should also carry 4 warning cones, and at least two warning triangles (heavy enough not to be blown away in strong winds, and meeting all other specifications).
- First aid kit (see list of contents below).
- There should also be radio communication between the coaches.

4.12.3 Trips by boat

Key points:

- Unfortunately, all too often passengers are expected to embark or disembark alongside cars and lorries. This is against the regulations and teachers should complain to the port authorities).
- Students need to be told where the life jackets are kept; the teacher should also open the cupboards and check that the jackets are in usable condition.

- The crew should be consulted and the students informed of where they should muster in an emergency!
- Disabled students should not be allowed to use the cabins below deck but should sleep in the seating area, always staying close to their teachers. The crew should be made aware that there is a disabled student in the group.
- Make sure the students understand they should not be consuming alcoholic drinks on board the boat (make sure the bar staff are aware that selling alcohol to young people is against the law!).
- For safe boarding/alighting from coaches, see 4.12.1.

4.12.4 Trips to islands and other destinations

Key points:

- The greatest danger to student safety lies in the consumption of alcohol – a danger which is grossly underestimated! Teachers must set an example of sobriety. The danger is particularly acute at night, when the teachers cannot realistically check on what their charges are doing.
- Hotel swimming pools are particularly dangerous at night. Ask the staff to cover the pool with a safety net.
- It might be wise for the teachers to take turns staying awake to patrol the hotel corridors at night, so that students do not sneak out of the hotel without an escort. This may sound excessive, but with some parties it is essential.
- We recommend that students should never be allowed to rent cycles or motorbikes when on island trips. The dangers include poorly maintained bikes, heavy traffic, high spirits leading to carelessness, use of bikes when under influence of alcohol, use of motorbikes by students with no driving licence, and so on.

4.12.5 Five essential conditions for a safe school trip

- 1) The existence of good relations and trust between teachers and students; this is the key factor in ensuring the trip has no unpleasant consequences! And of course, trust cannot be conjured up three days before the trip begins; it must be the result of good teaching and a well-run school all through the year.
- 2) The students must have all the safety precautions explained to them, so they understand why they are necessary. They must understand that the precautions you take are not a matter of discipline, but intended to ensure the students' own safety.

They must also be told what to do in various emergencies, and above all must be warned of the dangers of alcohol! ⁷².

- 3) Students must be enlisted to help with safety measures. Teachers' assistants can be appointed, wearing special safety jackets, and issued with clear instructions.
- 4) The students must be encouraged to help and look out for each other.
- 5) Teachers must be trained on how to handle students during outdoor activities.

Apart from safety legislation, technical specifications, checks and inspections, the most important factors in safety are the quality, sense of responsibility and vigilance of those directly responsible for student safety during the trip – the drivers and teachers.



Vehicles and passengers disembarking from a ferry boat together. Illegal and dangerous!



A serious breach of safety rules: passengers waiting in front of cars as the boat prepares to dock (Greece, 1998).



Note how the pool is covered with a securely attached safety net.



A Greek beach with a lifebelt – wonders will never cease!

⁷² This should not be phrased as a prohibition, a matter of discipline alone; instead the teacher should stress the unpleasant consequences of drinking: accidents, illness, death, divorce, even cases of gang rape by students from whom no one would ever have expected such behaviour.

124 4.13 Students with chronic health problems

The school must ensure that:

- A list is kept of students with chronic health problems. The list should be updated each year, and the parents' approval secured.
- A special file should be kept for each of these students, with a brief medical history and instructions (prepared by the student's doctor) on what to do in case of emergency. Obviously these files should be kept where teachers can find them easily and quickly⁷³.
- There should be a list of the medication the student needs to take, and the teachers must check that the student has enough medication to last through the trip.
- The teachers should have a number where they can contact the student's doctor.
- Parents should be advised to have a metal tag made with the name of the student and brief details of his medical problem (perhaps also the parents' phone number), to be worn around the student's neck.

Such a tag is advisable for students with the following medical conditions:

- Diabetes
- Enzyme deficiency (usually G6PD)
- Blood clotting deficiency
- Hormone deficiencies (mainly suprarenal)
- Renal deficiency
- Asthma
- Epilepsy
- Allergies (the substances triggering the allergy should be stated, especially medicines)
- Immune system deficiency
- Regular use of the following medication:
 - Glucocorticoids (cortisone)
 - Anti-coagulants (not likely to be needed by young people)
 - Insulin
 - Epilepsy medication
 - Psychiatric medication

⁷³ Remember the need to protect personal data.

None of these conditions should intimidate the teachers or deter the students themselves from participating in school and extra-curricular activities. These children should never be made to feel marginalized, nor should they be fussed over and over-protected by their teachers. This does not mean that their special needs should be ignored. In case of serious conditions, of course, the student's doctor should be consulted on the range of activities safe for the student and any points requiring special attention.

IOANNIS KARELIS
DIABETIC
Tel: 210-632053

metal tag to be worn around neck

4.14 Physical development and accident prevention

With younger children, at least up to the age of 8, and especially with children of pre-school age, accident prevention has much to do with the physical development of the child. Fit children with well-developed bodies do not fall so frequently and when they do have better control of themselves and fall less awkwardly, suffering injuries less frequently.

The physical qualities and skills to be developed include:

- Muscular strength (e.g. the ability to hold the body in the desired position, less likely to fall when struck).
- Speed (useful for crossing the road).
- Stamina (ability to make sustained use of skills; also depends on the child's motivation).
- Sense of balance (much less developed in children aged 3-4).
- Coordination (also less developed in young children).
- Dexterity.

All these physical skills can be developed by suitable exercises and games.

Accidents involving pre-school children (at kindergartens – day care centres)⁷⁴

Part of body	% frequency	Type of injury	% frequency
Head	70%	Abrasions, contusions	48%
Hand	3.1%	Fractures	7.0%
Trunk	4.4%	Ruptures	16.5%
Foot	5.4%	Concussion	3.9%
Leg	3.2%	Swelling	6.9%
Finger	8.6%	Various	18.2%

⁷⁴ Torsten K.: Voraussetzungen und Möglichkeiten der Sicherheitserziehung im Kindergarten. GUV Nr. 57.1.32. Bundesverband der Unfallkassen, München 2002 (D).

126 ■ 4.15 Aggressive behaviour at school

Without straying into areas (psychology) which are not our own field of expertise, we shall confine ourselves to pointing out that aggressive behaviour has been shown by research to be the most common cause of accidents at school.

Aggression at school is a global phenomenon, more serious in some countries than others. In some parts of the world it has taken an extreme form, witness the widespread carrying of firearms by students in American schools – sometimes with tragic consequences.

Aggressive behaviour may be the product of:

- The quality of society as a whole and the pressures (not always evident) which it exerts.
- The glorification of violence by the media (particularly the cinema).
- Continual reminders of the efficacy of the use of force and violence (whether physical or verbal, employed by individuals or the state).
- Socially acceptable forms of violence (martial arts, for example, and other forms of violence camouflaged as 'defence skills' and 'sports'). Boxing, for example, might be regarded as a legally sanctioned inflicting of grievous bodily harm (the object of the sport being to achieve a knock-out, i.e. to inflict a concussion-causing blow on one's opponent).
- The limited opportunities to let off steam in a safe way (modern life is too often lived in cramped apartment blocks; at school the playgrounds are often too small).
- Family problems.
- Learning difficulties (which can cause a sense of inferiority).
- The perception of other people as potential enemies.
- The availability and social acceptance of weapons.

Teachers should never accept aggressive behaviour as a fact of life. They must be on the look-out for aggression and, with the help of specialists, seek ways of alleviating the problem.

■ 4.16 Relations among teachers

Studies have shown that the atmosphere among the teachers has a significant influence on the behaviour of their students.

Children may be intuitively aware of tensions among the teaching staff, or may consciously observe them, and the effects will be seen in various forms of behaviour, including aggression and destructive tendencies.

When things are going wrong at school, the teachers must be prepared to engage in self-criticism and exercise self-control.

When relations among the teachers improve significantly, there will be a parallel improvement in the behaviour (and classroom performance) of the children.



Putting theory into practice. Medical students from Athens University take a driving safety lesson. Activities like this help to foster good teacher-student relations, while allowing the teacher to maintain the necessary distance from his charges.



Students at the Athens University Medical School have learned their lesson well. Educational visits and gatherings of old students are alcohol-free events; the students are so used to the rule that they don't even ask for alcoholic drinks. Consistency is everything when you are cultivating safe behaviour.

5. Accident prevention outside the school

The teacher's responsibility to teach accident prevention does not stop at the school gates; he must also ensure the children understand the need for safety in their life outside the school. Accident prevention, the protection of life and limb, is an ongoing and holistic undertaking, not a series of fragmentary initiatives. It cannot stop when the student steps off the school premises. An essential component in the child's development (and in his ability to protect himself out in the world) is his understanding of the need to protect others (e.g. younger siblings, grandparents, even his parents) and his ability to take on certain responsibilities. This is why we intend to offer here certain basic elements of accident prevention, not necessarily having any direct relation to school life, so that teachers can pass them on to students and parents.

■ 5.1 The car safety belt and its secrets

(for special children's safety seats, see chap. 5-3)

Too few of us are aware that if we all wore a safety belt on every journey, then the accident figures for, for example, 1999 (actual figures: 2,131 dead, 4,626 seriously injured, 27,685 slightly injured)⁷⁵ would show:

- 362 fewer driver deaths.
- 2,313 fewer cases of serious injury.

No other single measure could bring about such a dramatic reduction.

It's not enough just to put on the seatbelt; you have to wear it properly:

- Make sure the belt is pulled tight in front of the chest (when you put on the belt, pull the crosswise part towards the window)
- Take off thick jackets and overcoats (they stop the belt fitting the body snugly).
- Pregnant women should be wearing a belt, but in the correct way: the lower part below the belly and the cross-strap above the belly.
- Every passenger, front and rear, should be wearing a belt – even on short journeys.
- Don't be misled into thinking that the airbag is sufficient protection without a belt; in fact, the airbag can actually harbour its own dangers.

⁷⁵ Studies have shown that the wearing of seatbelts in the UK reduced driver fatalities by 17%, front-seat passenger fatalities by 25% and serious injuries by 50% (Source: Living with Risk. British Medical Association Guide, Willey & Sons, Chichester 1987).

- If the seatbelt has been worn at the time of an accident, it will need to be replaced.
- If the belt has often been caught in the door the strength of the material may have been compromised and it should be replaced.
- Persons over 110cm in height and under 150cm require a special approved elevated seat, as well as a seatbelt. The elevated seat is necessary so that the belt will pass low under the belly and not rest against the face or neck.



Passengers properly 'belted up' front and rear!



Dummies used in vehicle crash tests. Such tests have saved countless lives.



Seatbelts are even more important in working vans like this one, which offer little protection in a collision. However, one belt for two passengers is not a sensible idea! Vans like this offer far too little protection for children.



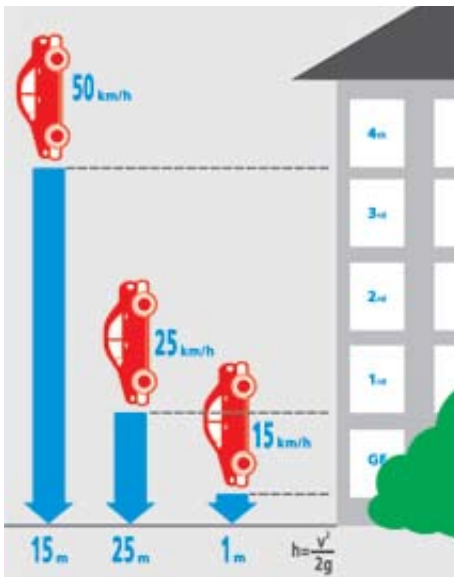
Image from a popular American TV police serial. The actors/detectives are seen wearing belts – an excellent example for their audience! Despite all our admonitions, Greek producers have failed to show the same sense of responsibility!



Belts are particularly important for pregnant women, but unfortunately the Greek Highway Code exempts them from the seatbelt rule – an omission we hope to see corrected (picture from a German Automobile Association publication).



This is a dangerous way to carry even adult passengers, let alone children. It's also against the law.



There is a widespread misconception that a seatbelt is unnecessary when driving in town or at low speeds. The fact is that most serious accidents occur in towns and cities, and at moderate speeds. Just remember that the impact of a car crashing into a stationary object at a 'mere' 50km/h is equivalent to that of a car hitting the ground from a height of ten metres – or the fourth floor of an apartment building!

■ 5.2 Motorcycle helmet⁷⁶

(Requirements and safety features are different for the – equally essential – cyclist's helmet).

No helmet offers total protection. It can only complement the protection provided by safe road usage on the part of drivers and riders.

Choosing the right helmet

- 1) The helmet must show that the manufacturer is certified as complying with international specifications!
- 2) Size is an important factor and the helmet must be tried on before purchase. If there's any doubt about which helmet fits, opt for the smaller size (provided, of course, that it's not uncomfortably tight).
- 3) The helmet will offer protection if the parts of the face and head are in contact with the interior lining of the helmet.
- 4) When trying on the helmet before purchase, fasten the straps and check that you can move your head from side to side and backwards and forwards. If the helmet is too loose and threatens to fall off, then it's too big; try the next size up.
- 5) Likewise, if the helmet moves too much when you nod your head, try a smaller size.
- 6) Always choose light colours. They are more easily visible to other road-users and cooler in summer.
- 7) The helmet must not impede your sideways vision. Those who wear glasses should always try out the helmet with their glasses on.

Proper use

- 1) Read carefully the manufacturer's instructions on the fitting of the mask, the detachable parts and the straps.
- 2) Also read carefully the instructions on keeping the mask in place while riding. It can be very dangerous if the mask becomes detached while riding; you should never ride with the mask up and the face exposed.
- 3) The straps must always be fastened, otherwise the helmet provides no protection!
- 4) You should never leave the helmet suspended from a mirror while riding!
- 5) The helmet should not be modified in any way!
- 6) Always bear in mind that the helmet makes it harder to notice changes in the weather, and reduces your ability to hear.

⁷⁶ Information gathered from manufacturers' instructions and reference works.

- 7) A helmet is designed to offer protection for about five years. After that it should be replaced with a new one.
- 8) If the helmet has been involved in a crash or a fall onto hard ground, it will need replacing. As in point 7 above, the helmet should be replaced whether or not there is visible damage. Small fractures in the material may not be visible to the naked eye!
- 9) When riding through a tunnel or in the mountains you may find the mask suddenly clouding over. If this happens, pull in immediately.

Keeping the helmet in good condition

- 1) A number of **substances can damage the helmet**, including detergents, paints, oils, petrol, heating oil, alcohol, even hot water.
- 2) Clean with cold water and a cloth with some mild liquid soap. Rinse well, also with cold water.
- 3) The interior lining of the helmet can be washed. Follow the manufacturer's instructions.
- 4) Check the helmet regularly for any visible damage.



Students riding home from school. Teachers should never allow students to take to the road like this with their heads unprotected (Patra, 2002).



The helmet is not intended to protect the handle-bars! Far too many riders carry around the helmet but don't wear it, or use cheap helmets which don't conform to safety standards (such helmets are manufactured illegally in Greece and cost a mere €6-15!). Cheap imitations aren't just not protecting you – they're actually putting you in greater danger!



Young motorcyclists and their pillion passengers are often guilty of many offences simultaneously. In this picture we see: no one wearing a helmet; 3 people on one machine, none of them wearing protective clothing (at risk of terrible burns and abrasions in an accident) (Athens, 2000).



In Greece, at least, these electric scooters are a new craze. We even see children as young as 8 using these machines in regular traffic!

■ 5.3 Basic instructions on children's safety seats⁷⁷

5.3.1 Legislation (National and European)

Children's safety seats are now manufactured to established European standards. A properly made seat will have a yellow label with black letters affixed to it.

ECE-R 44	The relevant European specifications
Universal	
9-18kg	Weight of children for whom the seat is suitable
E1	Test number for type of seat
03 30 10 27	
Firma....	Manufacturing company

European legislation lays down approved methods of restraining young children (under 12) when they are travelling by car. The methods specified are appropriate to different ages, heights and – above all – weights.

German law (article 21, 1a of the German Traffic Code) requires that even taxis should have at least one seat of class ECE I, II, and III. For categories 0 and 0+ (babies) parents must have their own safety seat with them!

5.3.2 Categories of seat

These have been defined by the European Commission and are set out below. The key criteria are the weight of the child and its approximate age. However, if the child

⁷⁷ Kinder sichern im Auto. Institut für Fahrzeugsicherheit München, Sept.2000 (German Institute for Vehicle Safety).

is from 110cm to 150cm in height, it can use a seatbelt in combination with an **approved**, elevated seat, designed to ensure the belt passes below its belly, with the cross-piece below the face. This arrangement should also be considered for adults shorter than 150cm. Some more expensive models of car allow the height of the seat to be adjusted. If possible, this solution should be tried; it might make a seat elevator unnecessary.

Categories of children's seats

Category "0": Children weighing under 10 kg (age up to 9 months approx.).

Category "0+": Children weighing up to 13 kg (age up to 18 months approx.).

Category "1": Children weighing from 9 to 18 kg (age 9 months to 3 years approx.).

Category "2": Children weighing from 15 to 25 kg (age 3 to 6 years approx.).

Category "3": Children weighing from 22 to 36 kg (age 6 to 10 years approx.).

5.3.3 Points to watch when buying safety seat

- The seat should have the yellow EC standards label (see 5.3.1).
- It should be the right weight category for your child (see table above).
- Try out the seat in your own car (space-use of safety belt for restraining seat, stability, freedom of movement for child's feet, etc.), with the child **in the seat!**
- With small or three/two-door cars check there is enough room for the belt to go round and enough space for the seat.
- Let the salesman **show you how to install** the seat in your own car.

5.3.4 Safety seats for disabled children

Usually commercially available seats will be safe to use, but in special cases consult a manufacturer.

5.3.5 Safe use

- Never install a seat in the front passenger position if the car has airbags. **Safety seats are always best installed in the back.**
- "0" and "0+" category seats are **always** installed so the child is facing to the rear (**not towards the windscreen!**).
- **Never** try to modify the seat or change the specified means of securing it.
- The child's head should **never** be higher than the top of the seat back (if a seat el-

evator is used for older children, the head should still be adequately protected by the spinal support provided by the car seat).

- Make sure the seatbelt holding the child's seat in place is **properly** fastened!
- The belt must fit snugly around the child (the child should not be wearing a thick coat or jacket).
- If there is a lateral airbag, the head and body of the child should not be blocking the airbag vent. Nor should any objects be placed between the vent and the child).
- Never let the child undo the belt while the car is moving.

Always read carefully the car manufacturer's instructions on airbags, children and children's seats.

5.3.6 Ready-installed children's seats

Many car manufacturers now offer children's seats incorporated into the actual car seat (European specifications ECE R 44).

There is also the ISOFIX system, which allows the child's seat to be permanently attached to the car seat.



Category "0" and "0+" seats (for children weighing up to 13 kilos and aged about 18 months, as in the picture) are not allowed to be placed so that the child is facing the front (danger of serious injury to child's upper spinal cord; in a collision the child will not be able to hold back its relatively heavy head). The way the seat has been installed in the picture is therefore mistaken (Athens, 2000).



Disgracefully irresponsible behaviour by parents, either ignorant of basic safety rules or criminally indifferent.



Child's safety seat manufactured to full EU specifications.



It's difficult to carry children safely in this kind of vehicle – and all too often the Romany population put their children in danger by carrying them in unsuitable vans (Athens, 2000).



Good intentions – poor implementation: The belt should never lie across the neck or touch the face. The child shown here needs a special cushion to raise his height (Athens, 2002).



Proper installation of seat with child's back to the windscreen – but all wrong in every other respect! The child's seat is placed in the front passenger position to the right of the mother (where it is doubtful if the car seatbelt will be an adequate restraint), and the mother, with no seatbelt, would be thrown onto the child in the event of a collision. Good intentions aren't enough! (Evia, 1997).

■ 5.4 Accidents in the home

5.4.1 Poisoning (more than 90% of all cases of poisoning occur in the home)⁷⁸

The most frequent cases of poisoning in the home involve pharmaceutical products (the number one culprit), detergents and cosmetics which 'adults' have foolishly left somewhere within easy reach of a child. A University of Athens study in 1993 ascertained that in many homes pharmaceutical products are left within reach of children (on the kitchen table, in low cupboards, unlocked drawers, etc.).

Accidental poisonings in Greece, 1992-2001

Year	Number
1992	33,263
1995	34,214
1998	44,060
2001	44,809*

* Increase of 35% between 1992 and 2001.

Age groups – accidental poisonings in Greece, 2001

Age	Number
< 1 year	2,584 (6%)
2-4 years	13,458 (30%)!
5-9 years	3,252 (7%)
10-14 years	1,417 (3%)
Total	44,809 (100%)

Type of substance involved in accidental poisonings

Substances	Number
Pharmaceuticals	20,823 (46%)!
Household goods	10,244 (23%)
Cosmetics	2,167 (5%)
Pesticides, fertilizers, etc.	1,460 (3,3%)
Total	10,115 (23%)

⁷⁸ Data from the Poisoning Emergency Centre, A. Kyriakou Hospital, Athens, 2001.

138 Location of accidental poisonings in Greece, 2001

Place	Number
Home	44,270 (98%)
Fields	423 (1%)
School	61
Workplace	55

Of the cases of poisoning in 2001, 6,633 were suicide attempts, mainly by young people. It is very likely that if these products were not left lying around the house, the attempt would never be made (pills are seen as an 'easy' way to commit suicide; they don't give the impression of any immediate threat to life).

Between 1991 and 2001 there was an increase of 77% in attempted suicides using dangerous substances – a rise so dramatic that there really should have been some official response in the form of effective preventive measures.

5.4.2 In the kitchen

(The most dangerous room in the house)



Detergents and other dangerous fluids should never be decanted into soft drinks bottles. The improvised label won't prevent accidental poisoning of children. Also, substances like this (pharmaceuticals, detergents and cosmetics) must be stored away from children's eyes and hands.

Possible factors in kitchen accidents include:

- Hot food and water in saucepans.
- Kettle.
- Electrical appliances.
- The oven and hob controls – especially when the appliance is connected to a gas bottle.
- Multi-way adaptors and cables.

Whenever you change the gas bottle, you should also change the washer and fit a new hose.

Extensive burns are a frightful experience for a child and its parents; the child can be left permanently disfigured. When saucepans are on top of the stove or on a table they should never be left with the handle projecting over the edge; children are naturally curious and will pull the handle to see what's in the pan.

Kettles pose particular dangers:

- Never extend the cable; it's short for good reason.
- Always shut the lid firmly (otherwise the automatic cut-off switch won't function and the water will boil away, creating a serious fire risk!).
- The kettle should be kept and used somewhere too high for children to reach.
- When you feel your children are mature enough to use the kettle themselves, first make sure you give them clear instructions.

General remarks on electrical appliances:

- Don't overload adaptors by plugging in too many appliances (the cable may over-heat; danger of a short-circuit).
- Check flex regularly for signs of wear and tear, especially those cables which lie on the floor; if you find signs of fraying, **replace the cable**, don't just patch it up with tape.



'FOUR CHILDREN BURNED ALIVE' The photo shows a newspaper report of a fire in which four children died. It tends to be the least affluent who are most careless with gas bottles. The new washer which comes with each new gas bottle must always be put in the place of the old one.

5.4.3 Bathroom

Most readers will be aware of the potential dangers here:

- Slippery floors and bath/shower stall.
- Danger of excessively hot water in child's bath: always check temperature with your hand, keeping your hand submerged long enough to be sure!).
- Electrical appliances should never be used in the bathroom – not even temporarily.
- Never leave children alone in a full bathtub.

140 5.4.4 Balconies and terraces

There are three main danger points here:

- Balcony railings too low.
- Children allowed access to the terrace unattended.
- Large window panes.

If there are young children in the house, the balcony railings should be raised by an extra 60-80cm, and this extension should be sturdily constructed of metal. There should be no horizontal cross-pieces linking the railings which children could climb on, nor should there be flowerpots by the railings which children could also use as steps. It is our belief that generally the balcony railings fitted to apartment building balconies in Greece are far too low, **even for adult** safety – there have been too many cases of adults leaning over the railings and falling. Access to the roof terrace should be impossible for unattended children, but padlocks are not a good idea as they may take too long to unlock in an emergency (fire). Warning stickers need to be attached to all large glass doors and windows **at both adult and children's eye level**.

5.4.5 Elevators

The elevator always has a warning saying use by unattended children under 14 is not allowed, but what child was ever put off by a written warning? And what parent can supervise his or her child so closely that it never gets into the building elevator alone. So, in practice we need to make sure the elevator is safe and children need to know how to use it (when the parents feel the child is sufficiently mature).

- A safe elevator:
 - Should be manufactured by a reputable company.
 - Should be regularly and conscientiously maintained. It should have its own maintenance log.
 - Where there are no double doors, there should without fail be a circuit breaker in the front part of the elevator floor (and it should be checked regularly).
 - The wall surface should be free of irregularities (if there is no elevator door).
 - It is best that there be both elevator and shaft doors, where technically feasible.
- Children should be taught:
 - How to use the alarm button (it should be marked with a bell symbol so children can identify it).
 - To stand well back from the doors.
 - Not to play with the Stop button, unless their arm or leg is trapped in the door.

It must be absolutely forbidden to carry cycles or large objects in the elevator. There is a danger of fatal accidents if the elevator has no internal door.

■ 5.5 Seasonal accidents

There are times of year when exceptional circumstances (weather – lights – unusual behaviour and patterns of movement) can play a part in seasonal accidents. And of course different cultural and climatic conditions in different countries will affect the type and frequency of accidents too.

5.5.1 Christmas / Easter

(or similar major holidays of other religions)

Special circumstances

- More pedestrians out and about – crowded pavements.
- Increased risk of fires (candles, Christmas trees and decorations).
- Increased danger of fire in large department stores (too many goods on display, too little space for people to move, stairways blocked by merchandise, large numbers of shoppers with young children, and so on).
- Increased danger at nightclubs, discotheques etc. (alcohol consumption, spaces overcrowded with people and supplies blocking potential escape routes, and so on).
- Heavy traffic on the roads as people leave for the Christmas and New Year holidays.
- More vehicles (especially motorcycles) on the pavements, posing danger of accidents to children and elderly pedestrians.

Prevention of traffic accidents

- Pedestrians are at particular risk at this time of year, and the main reason is that drivers, and other pedestrians, are in a hurry. Drivers (especially bus drivers and motorcyclists) bear the greater share of responsibility – and we appeal to them to slow down and be prepared to give way to others.
- Pavements are for pedestrians; there is no excuse for drivers and motorcyclists blocking the pavement.
- At this time of year watch out particularly carefully for children (their movements can never be predicted) and old people. Most accident victims fall within these two groups.
- If you can, do your shopping without taking the children or elderly relatives.

- Alcohol is the reason why so many families find themselves in mourning after Christmas and Easter. There is no safe alcohol limit for drivers. The safe driver doesn't touch alcohol at all.
- If you've consumed more than a very modest quantity of alcohol, it will be at least ten hours before you are capable of driving safely again. Don't believe people who tell you that after 3-4 hours sleep you'll be right as rain.
- To sum up, in five simple safety rules: slow down; don't overload the car; don't overtake just to show off; wear your seatbelt and make sure all your passengers do too; make sure children are properly protected with seatbelt and safety seat. And for motorcyclists: always remember your helmet and protective clothing.

When the city is empty during the major holidays, there are dangers for those who have stayed behind:

Some drivers are tempted to go through red lights, assuming that there will be nothing coming the other way – a mistake that can lead to serious accidents.

Fireworks and fire-crackers

Despite legislation in many countries (including Greece) banning these dangerous devices, youngsters and even young children still like to celebrate Easter by letting off fireworks and fire-crackers (there are parts of Greece where real dynamite is used!). There is a terrible toll in deaths and serious injuries every year. A 'custom' which leads to so much human suffering has no place in the 21st century!

Fires

Holiday times are associated with candles, and special care is required:

- When people are crowded together in church holding candles; it is all too easy for someone's hair to catch fire.
- Young children need particularly close supervision.
- In the home candles must be properly supported and placed on a non-inflammable base (like a china plate). Never stand a candle on a plastic surface.
- Never leave candles alight when you go to bed or are leaving the house.

Winter sports

- Don't try skiing without some suitable preliminary training. Straight from the office to the ski slopes is the fastest route to the operating theatre!
- People who are out of condition are much more likely to fall awkwardly and to suffer serious injury to the knees, pelvis or spine.
- Most people's weak point is the knee, which is often placed under excessive strain.

- Good muscle tone is vital for skiing. Torn ligaments can prove more serious than fractured bones.
- Protective headgear is considered essential. It can prevent serious injury, even in a nasty fall.
- Young children need to be watched carefully on high-speed slopes.
- The automatic fall-release mechanism must be carefully set by an expert, calculating the body weight and size of the knee (any good winter sports shop will have the necessary tables for use in calculation).
- Another source of danger (and cause of many accidents) – just as in traffic accidents – is alcohol. The legal limit is the same (0.5%), but we feel that the ski slopes should be an alcohol-free zone, so skiers can enjoy their sport in total safety, and can drive home safely at the end of the day. Perhaps it is time breathalyzer tests were introduced for skiers?
- The journey home requires great caution on the part of the driver (fatigue, poor road surfaces, snowfalls, poor visibility).
- Make sure you catch the latest weather bulletin to avoid being stranded in bad weather. If in doubt, better to postpone the journey and depart the following day.
- When you've been having fun you often don't notice how tired you are; fatigue will slow your reactions and dull your driving skills, which is why towards the end of the day accidents are more frequent. Always take a break immediately if you begin to feel tired.
- When skiers collide, they do so at high speed and the damage the impact can do should not be underestimated.

School holidays

- During the holidays children spend more time at home, often without supervision and without much to do; the danger of fire and poisoning (pharmaceuticals, cosmetics, alcohol, detergents) is increased.
- Children shouldn't be left in charge of elderly people with impaired mobility.
- Parents shouldn't go out at night (New Year's Eve, etc.) without leaving someone to look after the children, or without telling the children. There are always students who are happy to baby-sit.
- Be careful when taking children to recreation grounds, some of them harbour a number of dangers.

- Beware of heating appliances with an exposed element or naked flame⁷⁹. Better on the whole not to use this kind of appliance. There are limits to how vigilant a parent can be.
- Keep very young children out of the kitchen – the most dangerous room in the house.
- Parents, please: **make sure your child's bicycle has good lights**, and warn your child of the risks. Buy a helmet on the same day you buy the bike or motorbike – and make sure it's made to international specifications, not a cheap imitation.

Shopping

- Leave plenty of time: when you're in a hurry and worried about the shops closing, you feel stressed and will start ignoring the safety rules.
- Never go shopping, especially in big department stores, with children or elderly people. In an emergency (fires in overcrowded stores lead to panic and people being crushed) the young and elderly are particularly vulnerable.
- Whenever you're in a big store make sure you know where the stairs and emergency exits are.
- When buying games and toys, make sure they are appropriate for your child's age. The manufacturer will have assessed the safety of the game in terms of the age of the child playing it.
- Toys and games should never have sharp, projecting pieces, metal aerials or dangerous electronic circuitry.
- Make sure the toys don't have any small, easily detachable parts – these can all too easily be swallowed by young children.
- Paints, plastic pieces, plasticine, etc. must be certified as safe by the country of manufacture.
- Never buy a bike without buying a helmet at the same time (and make sure your child realizes it must be worn whenever riding).
- Never buy a skateboard without buying a helmet and special protective knee and elbow pads.
- And please: never give children replica weapons of any kind as 'gifts'.

Too many parents buy lots of expensive toys and let the child throw them away (even though he is aware of the cost) after 10 days or so. Expensive toys don't stimulate the child's imagination or develop skills; and throwing them away sets a bad example of wasteful consumerism.

⁷⁹ Once again, it is the poor who are most likely to be dependent on such appliances, and most likely to suffer accidental injury.

5.5.2 Summer

A number of factors are involved in the type and frequency of accidents we associate with summertime:

- High temperatures (fatigue).
- Bright light (the sun's glare can be dazzling; impaired vision when entering tunnels).
- The sea and seaside (dangers when travelling by sea, jet-skis, drowning).
- Holidays and bank holiday weekends (heavy traffic, overcrowded public transport).
- School holidays (children stay at home longer, visit playgrounds).
- Elderly people spending more time outdoors (parks, walks).
- Heavier consumption of alcohol (a major factor in all types of accident).
- Dangers at the pool (drowning of young children).
- Excalation of forest fires.
- Bicycle and motorbike rental during vacations in some countries (poorly maintained bikes are often rented to young people without a licence; strong winds on the islands; unfamiliarity with traffic conditions; failure to wear helmet).

5.5.2.1 Traffic accidents

- **Foreign tourists renting cycles and bikes:** This causes a lot of accidents. Danger points: no helmet supplied; no driving licence required; badly maintained bikes; tourists unfamiliar with roads and driving conditions; alcohol; elderly people unused to bikes; too many people riding pillion, etc.
- **Mass exodus from cities:** Many accidents occur at the beginning of the holiday periods; the main causes are: impatience to get away; overloading of vehicles – affecting braking distances and altering behaviour of the vehicle; alcohol; failure to use seat belts, helmets, child seats. Investigation is also required of accidents caused by reducing number of lanes in opposite direction to main volume of traffic.
- **Alcohol:** the scourge of Greek roads. It's not enough for the government to run campaigns in the media; the police need to stop and breathalyse motorists more frequently. Under-aged drinking also needs to be curbed at clubs, discos, etc.
- **Overloading of motorbikes:** All too common in summer – small bikes (50cc.) loaded down with passengers and equipment for a picnic or the beach. This is a particularly common phenomenon in poorer countries and among less affluent families.

- **Pedestrians:** There are obviously far more people on the street in summer, especially children on school holidays and elderly people attracted out by the good weather. In some countries pedestrians are the most generally despised class of road user!
- **Special dangers in summer:**
 - Bright light – the glare of the sun, which can blind drivers and lead to accidents (e.g. failure to see red lights).
 - Heat, which causes fatigue and loss of concentration, slower reaction times.
 - Thirst – leading to consumption of alcoholic drinks. Alcohol consumption by drivers is the main cause of road accidents, way ahead of the other causes.
 - Heat + tiredness after swimming + even a tiny quantity of alcohol will seriously impair your ability to drive safely.
 - Heat can also lead to bad temper – especially in city traffic and in jams.
 - For motorcycles: the asphalt can melt in the midday sun, making the surface very slippery.
 - Showers on dusty roads with patches of oil can be a treacherous combination.
 - On certain days many thousands of cars are heading to the beach all at the same time, grossly overloaded with luggage for the holidays (an important factor in accidents, which tends to be overlooked).
 - Bathers walking at the side of the beach road, which often has no pavement.
 - Lots of children out and about on bikes.
 - Lots of elderly people about.
 - The windscreen must always be immaculate, because dust will refract the light when you are driving into the sun, **obscuring your vision**.
 - Never leave white objects on the dashboard because they will be reflected in the windscreen and may confuse you.
 - Be extra careful when the sun is in front of you; it makes it hard to see signs, traffic lights, cyclists, etc.
 - We don't recommend very dark sunglasses. If in doubt, consult your optician. Glasses worn when driving should be neutral in colour, so as not to confuse colours on signs and traffic lights.
 - Don't leave your glasses on in the afternoon when the sun is down and they are no longer necessary.

5.5.2.2 Tunnels

- When entering an underpass or tunnel, take off your sunglasses immediately and don't put them back on till you emerge into the light. This is a moment for great care, especially if you weren't wearing glasses before, because the eye needs time to adjust to the weaker light. It will be very easy not to notice a motorcyclist, for example. In general, exercise great caution on entering any kind of tunnel.
- For the same reason, motorcyclists must turn on their lights when entering tunnels, and keep to the inside edge of the lane. Cyclists should avoid tunnels and underpasses whenever possible.
- We recommend you switch on the headlights before entering an underpass or tunnel longer than 100m, or one with a curve, or generally one with poor visibility. Don't forget to turn them off on exiting the tunnel.
- Keep a distance of at least 30m between yourself and the car in front.
- Never stop inside a tunnel or underpass. If you have a puncture, **it's better** to keep going (even at the risk of damaging the tyre) to the exit – unless there's a bay set into the side of the tunnel where you can pull in safely. This is my own personal advice – and is not offered with any guarantee!!
- Some tunnels have a notice at the entrance giving a radio frequency drivers can use to hear instructions in an emergency. Alternatively instructions can be given over loudspeakers by the tunnel management (so drivers should be prepared to lower the window a little to hear clearly).

There are special instructions available on driving in tunnels, and particularly on what to do in case of accident, which you can obtain from your own country's Ministry of Transport.

5.5.2.3 Sea and beach

- Drowning: Japan, Greece and Argentina rank first in the (selected) WHO figures. Most people are aware that it is unwise to eat before swimming, but very few realize how often alcohol is a factor in drowning – a factor identified as responsible for many deaths in countries which have conducted detailed research.

Alcohol and drowning:

- America: 11 out of 14 drowning victims had blood alcohol levels twice as high as the limit allowed for driving⁸⁰.

⁸⁰ Living with risk. The British Medical Association Guide. Willey & Sons, Chichester 1987.

- Finland: 4 out of 7 victims had raised blood alcohol levels. The authorities estimate that half of all drownings can be attributed mainly to alcohol consumption⁸⁰.

- Deaths by drowning and inhalation of water (WHO figures):

- Japan (1990)	2.56 (deaths / 100,000 population)
- Greece (1989)	2.36
- Argentina (1987)	2.14
- Austria (1990)	1.51
- Canada (1989)	1.46
- France (1989)	1.35
- Sweden (1988)	1.26
- Portugal (1990)	0.57

Alcohol consumption is an important but unknown factor for deaths by drowning.

The consumption of alcohol is an important but often overlooked factor in many cases of drowning.

- Basic safety rules:

- Do not eat for three hours before swimming.
- Never drink alcohol before swimming.
- Come out of the water if you begin to feel tired.
- Never dive into unfamiliar water; disabling injury (spinal injury leading to paraplegia) can result from hitting the sea bed or concealed objects under the water.

- Powerboats and jet-skis:

The main danger is to people swimming or fishing underwater. There is no proper evaluation of suitability for those seeking a powerboat licence, and the nature of the sport tends to lead to a dismissive attitude to the risks and to other people's safety. State controls are inadequate; as so often, commercial interests are paramount. Between 1984-1993 there were 191 accidents in Greece, with 134 injuries and 53 fatalities. By their nature these accidents tend to **have terrible consequences**, with 27 fatalities for each 100 accidents (compare the rate for road accidents: 8.2 fatalities for 100 accidents involving victims [1993 figures]).

Some safety advice:

- For powerboat owners: Never take out the boat after drinking alcohol; make sure the boat has life jackets (and passengers know how to use them) and distress flares; watch child passengers closely (special life jackets); never overload the boat; never maneuver close to swimmers; have a small radio on board for warning of storms.

Children should put on their life jackets as soon as they board the boat!

- For swimmers seeing powerboats being used close to shore: Warn the harbour authorities or protest to the owners of the boat or jet-ski, together with other concerned bathers. Mass protests usually prove effective.
- For those fishing underwater: Make sure you are attached to a buoy clearly visible on the surface of the water!
- Never let inexperienced children use a jet-ski.
- When using ferryboats etc.:
 - Make sure you know where the life jackets are kept.
 - And where the children's life jackets are (if you can't find them, complain to the port authorities).
 - Know your way around the boat (position of muster stations, lifeboats, etc.).
 - Always know where the children are.
 - If you have a car with you, never take sea sickness pills (they impair your ability to drive safely).
 - Take great care when embarking/disembarking.

5.5.2.4 Children and older people

- a) When schools are closed for the summer, children spend more time at home, on the streets or at the recreation ground.



Jet-skis too close to the beach. This is forbidden by law but unfortunately the prohibition is rarely enforced. Other safety measures are also ignored (licence-life jackets-age-special marked areas at distance from beach-etc.).



The authorities really shouldn't be allowing this sort of thing: too many passengers on a small boat, no one wearing a life jacket, too many young children (Kythnos Island - Greece, 1995).



Litter gathered on an area of beach measuring 20x5m (Evia, 2000).



Students should be encouraged to help tackle social problems. Here a teacher (right) and her students have undertaken to clean up a beach (Evia, 2001).



'FLAMES THREATEN DISCO DANCERS' In summer-time bars and discos with inadequate measures for fire prevention are full of young people, many of them under-age drinkers. It all adds up to a dangerous cocktail.



Always use a conspicuous marker buoy when fishing underwater (Kefalonia, 2003).

- Dangers in the home: poisoning (by pharmaceuticals, cosmetics or detergents); falls from balconies; scalding by hot water in the kitchen.
- Dangers at the recreation ground: recreation grounds can conceal a number of serious dangers, as they are often neither constructed nor maintained properly. Parents must be vigilant and report problems to the local council:
 - hard surfaces in areas where children might fall
 - projecting concrete in areas where children might fall
 - rusty slides (if slides are made of metal and not in shade, there is a danger of children being burned)
 - projecting screws
 - broken swings and seesaws

- poorly maintained wooden constructions
 - syringes left lying around by substance abusers
 - absence of proper fencing; dangers from traffic
- b) When the weather is warm and the days longer, elderly people leave the house more often. Risks they are exposed to include:
- traffic accidents (especially when they are walking)
 - losing footing on badly-maintained pavements
 - falling in the park (knocked over by dogs, running children, stumbling over toys left on ground).

When an elderly person is to be left alone while the family is on holiday, provision must be made for:

- Meals
- Any medication they may need
- Someone to keep an eye on them
- List of useful phone numbers (easily legible)
- Perhaps a check-up with the family doctor before the family departs
- Brief medical history to hand in case another doctor has to be called in



Children should be encouraged to take an interest in, and take care of elderly people.

152 ■ 5.6 Accident prevention in rural areas⁸¹

5.6.1 Children should never be allowed to drive farming machinery

This is an area where parents need advice as much as children. Just like their offspring, parents can become so used to seeing tractors around that they tend to forget how dangerous they are. Accidents with agricultural machinery, particularly tractors, are more serious, and more often fatal, than accidents involving other vehicles. When a tractor overturns (a common type of accident) the driver and passengers are crushed under its enormous weight. Of all vehicles tractors are most likely to overturn (high centre of gravity-short distance between wheels)! Keys to tractors and other farm machinery must be kept locked away, never left in the ignition of the machine. Children must be kept well away from any machinery with moving parts (danger of severed limbs). You should never take a rest inside a tractor or harvester, and never sleep in its shade.



A common sight in the Greek countryside: young people with no driving licence used to driving tractors (Evia, 2001).

5.6.2 Poisoning with Agro - chemicals etc.

Children must not be used as helpers during spraying of crops (long exposure to chemicals: chronic poisoning). Pesticides and other chemical products should be kept locked away from children. Empty bags and other containers should be kept away from children, and the products always used in accordance with the relevant legislation. Equipment must be thoroughly cleaned after spraying. Never store food in bottles or cases which have held chemicals. Never keep chemicals in the kitchen or other parts of the house; never keep them in bottles or other containers that once held food.

⁸¹ More information in: Sarafopoulos N.: Protection of children in farm labour. Ministry of Labour and Social Security, Athens 2001.

In 1994, a total of 1955 people were treated in Greece for accidental poisoning by agro-chemicals, insecticides and fertilizers (see table). Of these, 1,209 were under 15, and 907 were aged between 1-4!.

Accidental poisoning with agro-chemicals. Cases requiring treatment in 1994⁸²

Age	<11 months	1-4 years	5-9 years	10-14 years	15-19 years	>19 years
Male	31	545	90	57	25	336
Female	29	362	49	46	43	286

Accidental poisoning with agro-chemicals⁸²

Year	Number	% of total accidental poisonings
1992	2,131	6.4%
1995	1,430	4.2%
1998	1,690	3.8%
2001	1,460	3.2%



Even in daylight, children should have safety vests when walking along country roads.

5.6.3 Dangers in the fields

Places like **wells, silos and cisterns** (whether containing grain or water) should be well secured, and the dangers explained to children and parents. When not in use, they should be securely locked. Closed places may be dangerous through lack of oxygen or concentration of chemical fumes and vapours (e.g. hydrogen sulphide, methane, carbon monoxide, etc.). There is particular danger in places where an injured child might not be seen. Never lie down to sleep in fields sown with crops (danger from farming machinery).

5.6.4 Electricity

Wiring and electrical systems must only be installed by competent, qualified electricians; there should always be an automatic cut-out to prevent electrocution. Wires and cables should never be left trailing along the ground or in damp places. When moving tall ladders or watering equipment, watch out for aerial power lines (danger of electrocution!).

⁸² Athanasopoulou P. et al. : Agro-chemicals: the medical attitude to their use in Greece. Pharmacology Laboratory, University of Athens Medical School, Athens 2003.

154 5.6.5 Walking on country roads

People don't realize how hard it is for motorists to see pedestrians at the edge of country roads with no pavements, particularly after dusk. People walking should wear light-coloured clothes, with reflecting patches, and carry a flashlight. Always walk facing the oncoming traffic. Farmers driving tractors or other vehicles with projecting parts must be particularly careful!

■ 5.7 Accidents with firearms (Possession of firearms by students⁸³)

5.7.1 Firearms in the home

The figures for accidents with firearms over a 2½-year period in Greece make disturbing reading (see table). Many suicides, too, could be prevented if the person involved did not have easy access to a gun, and had a chance to calm down and reflect before taking the fatal step! If guns must be kept in the house they should be stripped down and the various parts stored in different, locked drawers – **with the ammunition also stored separately!**

The German police are acutely concerned about misunderstandings that can be caused by replica guns and lead officers who believe they are under threat to fire their own weapons (see picture opposite page).

Students and parents need to be aware of the terrible dangers inherent in the carrying of replica weapons. (DER SPIEGEL Feb. 2006).

5.7.2 Possession and use of firearms - Accidents

The numbers of firearms in circulation, and reasons for their possession, vary from country to country. In Greece (except for Crete) it is almost unheard of for anyone under 18 to possess or use a gun, whereas in the USA (to take an extreme example) firearm possession is a very serious problem.

The situation in the countries of eastern Europe is unclear. What we do know is that there must also be a substantial problem in troubled countries like Albania and the countries of the former Yugoslavia, where almost every family possesses a weapon as a matter of course.

The table of figures from selected countries yields the following information:

- Figures for accidental deaths involving firearms vary widely, from zero (Kuwait, Ireland) to 96.5/20m population (Mexico).

⁸³ Air guns, too, can cause serious injury. In Greece's first ever organ transplant, the donor was a young man who had been fatally injured in an accident with an air gun!

- It is striking that Greece is ranked third among 12 countries, with 74 deaths per 20m of population, even though there is no general problem of violence in Greek society.
- It is also striking that in Germany, where possession of hunting guns is common, there were just 16 accidental deaths in a population of 82 million people! Japan, too, has very few such accidents, just 7 in a population of 125.4 million, while Sweden recorded just one fatal accident.
- It is depressing to see how many fatal accidents involve young people under 24: Mexico 43%, Argentina 42% and Greece 36%!
- Comparison with figures for 1990-93 shows a decline in accident numbers in many countries. Those in the table where an increase is seen are Argentina (+293%!) and Greece (+18%). Germany, the USA and Italy show an impressive fall in accident numbers (-57%, -43% and -54% respectively).

The table on page 157 presents the correlation between violent deaths (WHO ICD code = E 55) and accidents involving firearms (ICD code = E 524). The correlation is quite clear, but accidents with firearms are **proportionally** much more frequent in Greece, Argentina, the USA and Mexico. The figures are particularly high for Greece and Mexico. There are a number of countries where accidents are relatively frequent but there is no widespread use of guns or social problem of violence. The causes here lie not in violence but in ignorance and carelessness, and in the (illegal) custom of firing guns to mark special occasions and holidays (common in Crete). The table below sets out the causes of 58 firearm accidents over a 2-year period in Greece.



'THESSALONIKI STUDENT SHOTS TWO CLASSMATES IN SCHOOL'

The headline reports a shooting in a Thessaloniki school. It is utterly irresponsible for parents to buy firearms (including air guns) for their children. Teachers need to advise parents and students, and must try to strip firearms of their mystique as symbols of power, control and masculinity (northern Greece, 1998).



'BOY KILLS YOUNGER BROTHER IN ACCIDENT' Another newspaper story; a boy has accidentally shot dead his younger brother. There are far too many 'accidents' with hunting guns in Greece. We have to ask why parents have loaded guns in the house? And why do the authorities not call the 'tragic' parents to answer for their irresponsible behaviour in court? (Hania, Crete, 1991).



A



B



'DEADLY GAME WITH FIRE-ARM' Another tragic tale of a child killed while playing with a gun. How many children must we mourn before action is taken? In rural areas the school has a vital role to play (Fthiotida).

A. real gun (beretta)

B. replica gun

156 **Causes of firearm accidents in Greece (over 24-month period)⁸⁴**

Cause	Number of accidents	
Curiosity, 'playing' with guns	17	(29%)
Human error (5 in military service)	14	(24%)
Hunting	8	(14%)
Pranks and horseplay (1 in police, 2 in army)	6	(10%)
In police service (cleaning guns, etc.)	6	(10%)
Holidays (all in Crete)	4	(7%)
Unknown cause	3	(5%)

58 accidents with firearms in Greece (1992-93), causing 53 deaths (20 under age of 18)! 34 accidents caused by hunting guns!

5.7.3 Reasons for (illegal) use and possession of firearms⁸⁵

(the various factors are not necessarily listed in order of importance)

Firearms production in the U.S.A. (1946-1995) *	
Year	Production (in million)
1946	1.5
1950	1.9
1960	1.5
1970	3.8
1980	5.7
1990	4.4
1995	4.2

*Approximate calculations by Worldwatch Inst. 1988 (source: Amfire)

- Quality of society as a whole (its values and the extent to which these values are put into practice, ideals and goals, education, unemployment, degree of social solidarity, degree of equality, and so on).
- Ease of access to firearms (important).
- Human life seen as a disposable commodity as in the cinema, where dozens of deaths may be shown in a matter of seconds).

⁸⁴ Not all accidents in the army and police are disclosed to the public, in Greece at least. And, unfortunately, accidents without victims are not recorded. Source: Papadopoulos J.S.: Accidents: Prevention is feasible. ASPE Athens 1996.

⁸⁵ Of course these factors play a part in many other unpleasant aspects of modern society, not only the possession of firearms.

- Presentation of death (for example, the death of a father in cinema, on TV) divorced from its real consequences (orphaned children, mourning family, absence of father causing developmental problems for children).
- Character defects⁸⁶.
- Violence seen as an effective way of attaining one's objectives (a perception reinforced by movies and TV, which often show violence as not just acceptable, but necessary).
- General level of violence in society.
- The extent to which 'the Other' is present and acknowledged in the specific society⁸⁷.
- General glorification of violence: in films, martial arts (allegedly learned for 'self-defence'), the fashion for body-building, and the need for those without physical prowess to resort to guns
- Local circumstances: wars, changes in political system, influx of immigrants (fear of 'the different').
- The fact that firearms de-humanize both assailant and victim; a gun can be fired with a 1cm movement of the finger!
- Social tolerance of firearms (tacit acceptance).

Local conflicts and civil wars among warlords in various parts of the world (localized conflict seems to have taken the place of full-scale war – probably in order to keep the arms industry in business) have led to the ubiquitous use and social acceptance of firearms, even among young children! Never has it been easier (in Greece at least) to get hold of a gun!

5.7.4 What can the teacher do (in schools where there is a firearms problem)?

I have read in the papers that many American schools now have security guards, and that students pass through metal-detectors on arrival at school. These measures must create an atmosphere which it will be difficult for the teachers to counter; once the situation has deteriorated to this point (with children carrying guns at school) it is difficult to see what teachers can do. Only policing measures can prevent violence.

⁸⁶ I am always surprised when I see photographs in the paper of men who have been arrested for the revenge killing of a fellow villager. These are usually wretched individuals with nothing truly manly about them – exactly the sort of men who need a firearm as a psychological prop. Fortunately these vendetta killings have become very rare – I think it must be seven years since I last heard of such a case.

⁸⁷ Watzlawick P., Weakland J.H. (Hrsg.): Interaktion, Serie Piper, München 1980.

158 There are certain dangers inherent in teaching children about caution with firearms:

- In a perverse way the teacher may only succeed in stirring the children's curiosity.
- Lessons on firearms may help to make them socially acceptable.
- The children may ask themselves: 'since my dad has a gun, how can it be wrong?'. (It is the same question which arises in relation to lessons on substance abuse).

The correct strategy is to raise young citizens who do not feel the need to use either firearms or narcotics as a psychological prop; in other words, to teach the necessary lessons when the children are still young and impressionable. The chances of success will be determined, moreover, by the social factors we listed above.

One of the most important factors will be the relationship between teacher and child, and the long-term influence of the former on the mind of the latter. This influence is not always of the kind associated with conventional teaching. Briefly, the object of education should be to produce young people with self-confidence, unafraid of life, combining healthy self-esteem with consideration for others. Selfishness is just as damaging to the selfish person himself as to those around him.

5.7.5 Practical advice for the teacher

- Accidents invariably occur with 'unloaded' firearms (the students must be made to understand this).
- **Never** use firearms in games or pranks.
- Even when you think the gun is unloaded, there may still be a round in the chamber.
- Guns kept at home must be stripped down and their various parts stored in locked, **separate drawers!** Ammunition must always be kept under lock and key. And always ask: is there really any good reason to have a gun in the house?
- Air guns are just as dangerous as real guns. They do not make appropriate gifts!
- Never give toy or replica guns as presents. They familiarize the child with firearms and make them seem less dangerous.
- If you come upon a child examining or playing with a gun: never panic and try to snatch the gun away from him (this can make the gun go off); approach the child and speak to him calmly, keeping out of the line of fire, and cautiously reach out and take hold of the gun, always trying to ensure the barrel is not pointing at anyone.
- If you're at a party or celebration where people are firing off guns, leave immediately. In Crete, where letting off guns is a venerable tradition at celebrations, more and more reasonable people are choosing to leave the gathering when guns are

produced – and more and more hosts are banning guns because they find otherwise **all their guests will leave!**

There's another danger in having firearms in the house. If a young person is overtaken by suicidal feelings (and in some cases this can be triggered by apparently insignificant events) having a gun ready to hand can lead to tragedy. It is easier to pull a trigger than to throw oneself from a fifth-floor balcony. Where no firearm is to hand, the young person will have time for second thoughts, time to calm down, and the tragedy may be averted. Impulse suicides are often the result of an exaggerated perception of the consequences of some action by the suicidal person.

Fatal accidents with firearms – murders in various countries⁸⁸

Country (year)	Population (millions)	Fatal accidents with firearms (total figure)	Fatal accidents with firearms per 20m population	Fatal accidents with firearms among those aged 1-24	Fatal accidents with firearms among those aged 1-24 (%)	Homicides	Homicides per 1m population	For comparison 1991 figures	
								Fatal accidents with firearms	Homicides
Mexico (2000)	98.8	477 !	96.5 !	205	43%	10,726 !	108 !		
USA (1999)	272.6	824 !	60 !	43	5.2%	16,749	61,4 !	1,441 (1991)	26,254 (1991)
Argentina (1997)	35.6	302 !	169 !	128	42%	1,661	46,6	103 (1991)	1,407 (1991)
Greece (1999)	10.5	39 !	74 !	14	36%	130	12,3	33 (1993)	133 (1993)
Italy (1999)	57.6	27 !	9.3 !	2	7%	705	12,2	59 (1991)	1,627 (1991)
Sweden (1999)	8.8	1 !	2.2 !	0	0%	108	12,2	4 (1992)	117 (1992)
Kuwait (2000)	2.2	0 !	0 !	0	0%	25	11,3		
Ireland (1999)	3.7	0 !	0 !	0	0%	37	10	7 (1992)	23 (1992)
Portugal (2000)	10.2	6 !	11.7 !	2	33%	97	9,5	9 (1993)	149 (1933)
Germany (1999)	82.0	16 !	3.9 !	4	25%	719	8,7	27 (1993)	966 (1993)
UK (1999)	59.5	6 !	2.0	2	33%	440	7,4		
Japan (1999)	125.4	7 !	1.1	0	0%	788	6,3	3 (1993)	805 (1993)

NOTE: To highlight the difference, accidents with firearms have been calculated per 20m population, i.e. at a rate 20 times higher than the proportion of homicides to population. Source: World Health Statistics Annual. WHO Geneva, for 1999. (Figures correlated by author).

⁸⁸ World Health Statistics Annual. WHO Geneva, 1999.

Country	Population (in millions)	Suicides of all ages	Suicides per 1m of population	Suicides among those aged up to 24	Suicides among those aged up to 24 (%)
Mexico (2000)	98.8	3,475	35,1	1,219	35%
USA (1999)	272.6	29,180	107	4,143	14.1%
Argentina (1997)	35.6	2,215	62	403	18.1%
Greece (1999)	10.5	381	36,2	36	9.4%
Italy (1999)	57.6	4,115	71	909	22%
Sweden (1999)	8.8	1,219	138	113	6.6%
Kuwait (2000)	2.2	35	16	5	14.2%
Ireland (1999)	3.7	424	114	106	25%
Portugal (2000)	10.2	524	51,3	35	6.6%
Germany (1999)	82.0	11,157	136	762	6.8%
UK (1999)	59.5	4,448	74,7	185	4.1%
Japan (1999)	125.4	31,413	250	5,670	18%

■ 5.8 When alcohol becomes a problem

5.8.1 The scale of the problem in figures

The problems caused for individuals, families and society in general by the uncontrolled abuse of alcohol are serious, widespread and show no sign of diminishing. In fact, alcohol abuse is one of the world's most serious health problems.

In Germany⁸⁹ there are about 1.7m alcoholics needing treatment (and only about 3,500 places available in clinics)! The proportion of women with problems is also increasing steadily (1986=8%, 1990=35%). 65% of alcoholic women live alone. For purposes of comparison we should point out that the number of those dependent on conventional narcotics is calculated⁹⁰ at 80,000-120,000 (exact figures are unobtainable) and those dependent 'only' on mind-altering substances number around 450,000-800,000. In Greece there are about 200,000 alcoholics requiring treatment.

Alcohol plays an important part in **all kinds** of accidents: skiing, boats, small aircraft, fires (often caused by cigarettes recklessly discarded), workplace and, above all, road accidents. In Germany 19%, in France 29% and in Greece more than 60% of road accidents involving injuries or death can be attributed to the driver having taken alcohol⁹⁰. Another worrying phenomenon is the consumption of relatively modest amounts of alcohol by expectant mothers! More and more often we hear of unborn children being

⁸⁸ World Health Statistics Annual. WHO Geneve, 1999.

⁸⁹ Jahrbuch Sucht. Deutsche Hauptstelle gegen die Suchtgefahren e.V. Neuland. Geesthacht 2003.

⁹⁰ Source: Pathology Department, University of Crete Medical School (personal communication).

harmed by their mother's consumption of as little as 10g a day, or just one glass of wine (the children suffering retarded development, mental defects or even foetal alcohol syndrome).

The time required for dependence⁹¹ to set in varies from about 12 years for those aged 25, to about 5 years for those aged 20 and just 6 months for those aged 15! The interval between starting drinking and admission to a special clinic has been calculated at 6-13 years for women and 10-15 years for men.

Various problems are created by dependence (alcoholism) and abuse⁹²:

- Health problems (serious damage to all organs of the body).
- Family problems (at least 30% of alcoholics go through divorce⁹³).
- Social problems (accidents, trouble with the law, work problems).

German statistics for 1997 show that of 360,746⁹⁴ admissions to special addiction clinics, the official diagnoses cited 279,012 cases whose reason for admission was alcohol abuse and whose health problems included psychosis, dependence, cirrhosis of the liver and alcohol poisoning. The part played by alcohol abuse in the mortality rate for the general population is often overlooked. In England and Wales⁹⁵ alcohol played a part in 4% (men) and 6% (women) of all deaths with malignant tumours, 12% (men) and 3% (women) with strokes, 11% (men) and 2% (women) with diseases of the respiratory system, 12% (men) and 3% (women) with gastro-enteric disease, 80% (men/women) with chronic liver disease, and 40% (men/women) dying of poisoning.

There has been an alarming increase in alcohol consumption in some countries, but we do not yet know whether the consumption represents many people drinking a little, or a few people drinking heavily. But the increased consumption is followed as surely as night follows day by an increase in all the parameters we have listed above, and specialists conclude that from the rise in consumption we can anticipate with considerable confidence a rise in all the unpleasant consequences.

A new danger is posed by the latest invention of the food and drinks industry to tempt our young people– the so-called alcopops (5% alcohol content). The German government has recognized the danger and levied an extra tax on this kind of drink, significantly cutting their sales.

⁹¹ This is a very rough estimate. If other factors are at work (e.g. personal difficulties) dependence may occur much more rapidly.

⁹² Problematic use (see special paragraph), not necessarily accompanied by dependence (yet).

⁹³ Living with an alcoholic is extremely difficult; it can cause much misery and even ruin lives. It is hard for those who haven't experienced it to appreciate the difficulty. The main problem is the total inability of the alcoholic to show even the most rudimentary consideration for the 'other'.

⁹⁴ Jahrbuch Sucht. Deutsche Hauptstelle gegen die Suchtgefahren e.V. NEULAND, Geesthacht 2000, 2002.


⁹⁵ Kendell R.E.: The beneficial consequences of the United Kingdom's declining per capita consumption of alcohol in 1979-1982. *Alcohol and Alcoholism* 19:271-276, 1984.

162 5.8.2 Consumption

The table shows consumption of alcoholic drinks in terms of litres of pure alcohol per inhabitant, for 1999⁹⁶:

Country	Litres of pure alcohol	Country	Litres of pure alcohol
Ireland	11.6 (+97%)*	Belgium	8.2 (-7.6%)
Portugal	11.0 (+12%)	Slovakia	8.2 (-1.6%)
France	10.7 (-34%)	Italy	7.7 (-44%)
Germany	10.6 (-3.4%)	Poland	6.9 (+26%)
Romania	10.3 (+64%)	USA	6.7 (-0.5%)
Spain	9.9 (-15%)	Japan	6.6 (+44%)
Hungary	9.7 (+6.4%)	Sweden	4.9 (-15%)
Greece	8.9 (+70%)		

**In brackets, the percentage change between 1970-1999.*



1 litre of pure alcohol = 12 bottles of wine (750ml - 11%) or 3.5 bottles of whiskey (750ml - 40%) or 42 bottles of beer (500ml – 4.8%).

Ethyl alcohol content of various drinks⁹⁷:

Beer	4.8%
Wine, champagne	11.0%
Spirits	33.0%

5.8.3 Consumption by age group

First of all we should state that the supply or sale of alcoholic drinks to young people under 17 is illegal in Greece and other countries of the EU (in certain countries the limit is 18). It is clear that we are not talking about prohibition (to which we are most definitely opposed; we mention it only to prevent deliberate misunderstandings) but about sensible limits on alcohol sale to ensure that young people cannot start using alcohol until they are sufficiently mature and well informed.

The daily consumption the human organism can tolerate without damage (?) is 40g of alcohol a day (about 400ml of wine) for a man and 20g (200ml of wine) for a woman. These figures are an approximate estimate of what is safe, intended as a rough guide.

⁹⁶ Jahrbuch Sucht. Deutsche Hauptstelle gegen die Suchtgefahren e.V.Neuland, Geesthacht 2000, 2002.
⁹⁷ In Germany, state and private agencies and industry have agreed there should be consistent standards for measuring quantities. Of course there are differences in the content of different wines, beers and spirits. The figures express the average content.

However, the latest research is continually revising the figures downwards and how much is safe seems to depend on many individual factors in each case.

German consumption by age group is set out in the following table⁹⁸:

No alcohol consumed at all				
	Year			
Age	1995	1997	1995	1997
	♂		♀	
18-24	14.1%	13.3%	15.5%	16.0%
25-29	8.2%	7.4%	11.1%	14.7%
30-39	5.4%	8.5%	8.4%	10.8%
40-59	7.3%	7.6%	12.9%	13.4%

Substantial consumption (men over 40g and women over 20g per day)				
	Year			
Age	1995	1997	1995	1997
	♂		♀	
18-24	15.9%	10.1%	6.6%	5.6%
25-29	17.4%	12.3%	10.3%	5.8%
30-39	18.4%	13.3%	10.4%	8.0%
40-59	18.4%	18.8%	11.1%	10.0%

Another distressing development is the increasing number of underage individuals indulging in repeated bouts of drunkenness. In Germany between 1993-2002 there have been increases of 34 → 44% (boys) and 26 → 34% (girls) among young people aged just 15! (WHO figures).

In Greece a similar study was conducted in 1998 by the University Research Institute for Mental Health⁹⁹. The study identified those who 'used alcohol at least once a week'. The results appear in the table below.

⁹⁸ Jahrbuch Sucht. Deutsche Hauptstelle gegen die Suchtgefahren e.V. Neuland, Geesthacht 2000, 2002.

⁹⁹ A global study of health in the student population. Research conducted in Greece by Terzidou M. and colleagues at the University Research Institute for Mental Health, Athens 2000.

164 *Percentage of young people using alcohol at least once a week(Greece 1998)⁹⁹*

making schools safer

Type of drink	Age					
	11		13		15	
Beer	♂ 13%	♀ 4%	♂ 19%	♀ 11%	♂ 42%	♀ 21%
Wine	13%	5%	13%	7%	17%	6%
Whiskey	2%	1%	8%	3%	22%	13%
Ouzo	2%	1%	2%	1%	4%	1%
Intoxicated (once)	11%	7%	20%	16%	21%	22%
Intoxicated (twice or more)	5%	1%	9%	5%	24%	21%

Comment seems unnecessary; the figures speak for themselves, and show the serious dangers to which young people are exposed.

5.8.4 What we mean by ‘problematic use’

As well as alcoholics, there are ‘problem users’, who may become dependent¹⁰⁰ or may have to face serious ill effects of their drinking without ever meeting the classic definition of an alcoholic. Problem use involves:

- Excessive consumption (large quantities from time to time – frequent episodes due to use of alcoholic drinks – illness attributable to use).
- Use at unsuitable times and places (at work – in the morning – before driving, etc.).
- Use by vulnerable persons (with enzyme abnormalities – liver disease – personality disorders etc.).
- Use by individuals for whom alcohol is prohibited (children – members of religious groups).
- Use by individuals who have already experienced the harmful consequences of abuse.

⁹⁹ A global study of health in the student population. Research conducted in Greece by Terzidou M. and colleagues at the University Research Institute for Mental Health, Athens 2000.

¹⁰⁰ The best objective definition of dependence is the pharmacological one – the appearance of withdrawal symptoms when deprived of the substance, and the suppression of those symptoms when use of the same or a similar substance recommences. This definition works for alcohol because it does cause severe withdrawal symptoms (mental and physical). But perhaps a more correct definition is that which presents the characteristics of dependence: i.e. continued, anxious seeking for the substance, at whatever cost; the substance seen as the only purpose of one’s life; appearance of withdrawal symptoms; creation of tolerance (i.e. constantly needing larger dose for same effect); disintegration of personal and professional life and family; absence of any prospects. In brief, dependence is loss of control over the substance, loss of choices = loss of freedom.

¹⁰¹ Jahrbuch Sucht. Deutsche Hauptstelle gegen die Suchtgefahren e.V.Neuland, Geesthacht 2000,2002.

In Germany¹⁰¹ it is calculated that 16% of the population aged 18-59 indulges in dangerous use of alcohol (= 7.8 million), of whom 5% are actual abusers (= 2.4 million). Dangerous use is defined as behaviour which might lead to dependence (alcoholism), while abuse is defined as the stage before dependence.

The alcoholics themselves, with their own unhappiness and health problems, are only part of the phenomenon. They do not exist in isolation and their condition will have ramifications of misery extending out into the community around them (crime, accidents in which innocent lives are lost) and of course affecting most deeply their own family and friends (relatives, spouse, children¹⁰²). In Germany (and the same is probably true of other countries) it is calculated that some 10 million other citizens suffer as a result of alcoholism – not the alcoholics themselves, but their friends and relatives.

5.8.5 The state profits from the misery of its own citizens

In 1998 the German state collected 0.8 billion Euro in tax on beer, 0.5 billion in tax on champagne and 2.2 billion in tax on cognac (a total of 3.55 billion Euro!). Even the Soviet Union, with its massive problem of alcoholism, has taken no serious measures to combat it – mainly because of the huge revenue in tax which it stands to lose.

5.8.6 Addiction advertisements¹⁰³

Morally reprehensible advertisements for alcoholic drinks (which the EU has not succeeded in banning) glamorize a lifestyle which will bring misery to the consumer and massive profits to the drinks industry. Spending on advertisements amounted to¹⁰⁴:

- 421m Euro for beer.
- 121m Euro for whisky.
- 24m Euro for wine.
- 47m Euro for champagne.

(The spending cited was for drinks advertisements in Germany)

Total spending on alcoholic drinks advertisements = 613m Euro!

¹⁰² German studies suggest that for each alcoholic there will be another three people in his immediate circle who are suffering because of his addiction.

¹⁰³ In Greece and in other countries the law forbids the advertising of narcotics, without making an exception for alcohol! Advertisements for alcoholic drinks are illegal!

¹⁰⁴ World Drink Trends. Holland 1992.

¹⁰⁵ Incurable not in the sense that a person cannot stop drinking, but in the sense of a lifelong inability to control its use. Once he starts drinking, the alcoholic cannot stop. This is why the motto of every alcoholic is 'say no to that first glass'. The alcoholic is incapable of drinking in moderation.

¹⁰⁶ Fatal (through serious damage to all the body's systems) if not stopped in time.

It is not our purpose here to analyze the problem of alcoholism or alcohol dependence (alcoholism is a serious, incurable¹⁰⁵ and fatal¹⁰⁶ condition, perhaps the worst of all substance addictions (even worse than heroin if we compare the gravity of the consequences and the frequency/number of victims). Our purpose here is just to provide the information which will enable the reader to acquire some understanding of the problem.

5.8.7 Short questions and answers on alcohol and driving

Q: How many glasses can you drink without exceeding the 'legal' limit of 0.5%¹⁰⁷?

A: None! For a motorist there is no safe amount. Even with a level of 0.2% a driver's capacity to drive safely is seriously affected, even though the driver 'feels' fine! The medical safe limit is 0% (and this is the limit now enshrined in law in several European countries).

Q: Is alcohol really such a key factor in accidents?

A: Throughout the EU it is the primary cause of fatal accidents (In just 7 states of the EU about 17,000 deaths and 560,000 injuries are recorded each year).

Q: What are the figures for Greece?

A: Between 36-44% (over a number of years) of road accident deaths are due to drivers having consumed alcohol (even if it was 'just a sip').

Q: Some people say that they drive 'better' when they've had a drink. Can that be true?

A: They think they're driving better because of the warm glow of complacency the alcohol induces. The sad truth is that their ability to drive has been affected (a dangerous gap between perception and reality!).

Q: Is there any way for a driver to neutralize the effects of alcohol?

A: No. The idea that coffee will sober you up is a fallacy.

Q: What about if you sleep 3-4 hours before driving?

A: If your blood level is 1.2% (not an unusual amount) you will still have an illegal level of 0.5% after eight hours.

¹⁰⁷ 0.5‰ = 0.5g of alcohol in 1 litre of blood (the international standard for all measurements)



Q: *Is it true that good drivers, and people who are used (?) to drinking, are not affected?*

A: This is a big mistake. Tests on professional racing drivers have shown that their ability is every bit as impaired as that of the ordinary motorist.

Q: *Are there other factors which exacerbate the effects of alcohol?*

A: Yes, many: medication, heat, fatigue, worry, poor mental state, a full stomach, etc.

Recommended contents of a good school pharmacy¹⁰⁸

1. Tourniquet – **to be used by doctor or person proficient in first aid**
2. Aluminium covering to protect injured person.
3. Tongue depressor.  **to be used by doctor or person proficient in first aid**
4. Two haemostatic clamps. 
5. Cotton-wrapped adjustable splints for fractured limbs¹⁰⁹
6. Stethoscope
7. Blood pressure gauge
8. Triangular arm sling of soft material, about 80cm x 1m.
9. Safety pins and a black felt tip pen (with broad tip)
10. Balloon-type respirator – **to be used only by doctors or those proficient in first aid**
11. Sterilized gauze in various sizes.
12. About 200ml of pure alcohol
13. Three elastic bandages, 10cm wide
14. Five standard bandages, 10cm wide
15. Various sizes of adhesive plaster («Hansa/Tensoplast»).
16. Non-allergenic plaster, 2-3cm wide
17. Cards about 10 x 5cm to mark injuries on patient (with felt tip pen)
18. Medication. **To be administered only by doctor¹¹⁰**
 - Adrenalin ampoules 1.0mg (4 ampoules)
 - Atropine 0.5 mg (4 ampoules).
 - Theophylline 0,24 mg (3 ampoules).
 - Haloperidol 10 mg (1 ampoule).

¹⁰⁸ The school doctor, who will know individual student needs (chronic conditions), will want to add the necessary medication for these cases to the school medicine chest.

¹⁰⁹ Cotton-wrapped to avoid pressure of splint on nerves.

¹¹⁰ Fülgraff G., Palm D.: Pharmakotherapie - Klinische Pharmakologie. Gustav Fischer, Stuttgart 1997.

- Glucose 40% 10 ml (5 ampoules).
- Prednisolone 250 mg (3 ampoules, ready-packaged if possible).
- Colloidal volume substitute 500 ml (with injecting device).
- Aspirin and paracetamol 500 mg.

19. Two 2ml, two 5ml and two 10ml syringes

All the drugs and equipment should be kept tidily in a chest with 2 or 3 shelves, clearly marked on the outside and containing a list of contents. The pharmacy should be checked every six months. **Make sure none of the drugs have reached their expiry date!**



The pharmacy must be easy to find in an emergency. All the staff should know where it is kept. It should be stored in a cool, dry place - somewhere where students cannot interfere with it.

170 Recommended school safety checklist

Date of inspection Inspected by

Check point	Location	Type of ac- tion (repair/ main- tenance)	Responsi- ble for re- pair/main- tenance	Tel. of person re- sponsible	Result and date of re-in- spection
Fire extinguishers					
Doors					
Panes					
Escape route					
Sockets					
Lights					
Electricity system					
Stairs					
Labs					
Road signs					
Pedestrian crossings					
School entrance					
Gym					
Gymnastics equipment					
Playing fields					
School yard					

Epilogue

Good prevention requires *imagination* (not fantasy), and imagination is a creative process, an ability to use experience from past and present to picture the future. This is not a capacity which is encouraged everywhere. We tend to live nowadays in the present moment – not in itself always a bad thing, and in no way reprehensible – without remembering that life will continue beyond that present moment, and that the quality of that future life needs to be safeguarded.

Another factor militating against good accident prevention is the absolute certainty that ordinary people seem to demand before they will adopt any precaution. For example, people will not bother to put on a seatbelt because it offers no absolute guarantee of protection. And because a motorist has driven over the alcohol limit in the past, he believes that it will always be safe to do so. What people don't appreciate is that prevention is about *probabilities*. Precautions increase the probability of our survival, but ordinary people are too often uncomfortable with calculating probabilities, interested only in what they regard as certainties.

But neither knowledge nor imagination will be of any use if they do not lead to the *implementation* of practical precautions – the fruit of knowledge in synergy with imagination and experience, our own and others'. Here too we lag behind. There is usually no shortage of planners and administrators – it is the ordinary foot soldiers who are too few in number, those who have to put the safety measures in place in everyday life.

Finally, let me mention one other indispensable quality: passion, *motivation*. A passion for what we are doing acts on the system like a chemical stimulant, dramatically increasing our energy, strength, intelligence and efficiency. Passion and motivation are like magic potions – those lucky enough to possess them can only succeed.



Each of us dreams of creating his own oasis, a place of rest and renewal. Let it also be a place of creativity, contribution to the community and dedication to the work of prevention.

Appendix

We shall offer in this appendix a summary of the main Greek safety specifications for the construction of school buildings, as issued by the School Buildings Agency (OSK) (last updated 1996)

Specifications for construction of school buildings can be found in:

- Specifications for building design and specifications for safety and accident prevention (OSK plans)
- The 1985 General Building Code and the building regulations
- The building fire prevention regulations
- Various other regulations governing the siting and operation of installations.

1) Grounds and schoolyard

- **Entrance (from pavement level):** level access or by ramp with maximum gradient of 5% (see relevant paragraph). The gate on to the street must be provided with a barrier to stop children running out into traffic.
- **Floors:**
 - Must have non-slip surface and retain non-slip quality when wet.
 - There must be proper provision for the run-off of rainwater.
 - Surface to be kept free of hard objects.
 - Artificial surfaces to be free of projections or sharp edges; covering with fine or coarse gravel forbidden.
 - Solid ground surfaces of asphalt, concrete or other materials must be non-slip, drain rainwater effectively and have joints no wider than 1cm. Differences in surface height of more than 50cm not forming part of proper steps must have a low wall or other means of protection. Small differences in level (less than 1-2 steps) are not allowed.
- **Installations and equipment:**
 - Plinths, supports, lighting pylons, refuse bins, benches, sculptures, tanks, etc. must not be sited within areas of movement; they must be marked, painted and lit so as to be easily visible. All the above must have curved edges, smooth sur-

faces and no parts projecting at a height below 2.2m into areas where people are passing by; the material and paints used in their manufacture must be able to sustain heavy use and long-term wear and tear (i.e. not requiring much maintenance).

- The low walls or parapets used to surround the playground and enclose any danger points (differences in ground level, light shafts, protruding objects, large windows, etc.) should never be lower than 1.1m, measured from the level of the surrounding ground or floor. If made entirely or in part of railings, they must not allow climbing (see building regulations, art. 15, §3.2). These structures must also be able to sustain heavy wear and tear and remain in good repair without intensive maintenance. Any edges should be rounded, not sharp, and in general there should be no part of the structure able to cause injury. Where low walls are made of bricks the final surface must be plastered or cemented smooth with no projecting parts or coating likely to cause injury.

2) Interior

Level access or ramp with maximum gradient of 5%, as well as steps.

- **Floors:** Must have even, non-slip surface free of anything which might cause accident; must be durable, easy to clean and fire-resistant or self-extinguishing.
- **Walls – plinths etc.** Must have smooth surfaces free of any protrusions or any coating, panelling which might cause injury. Edges must be rounded or provided with chamfers or some other system of protection. Plinths, supports, etc. must not be sited in areas of movement, corridors, etc.
- **Frames:** These are subject to much wear and tear and must be made of durable materials. Should not be capable of causing accidents or minor injuries. Edges must be rounded and handles affixed away from jamb to avoid injury.
- **Doors:** Minimum clear opening 90cm. Must open outwards (out of classroom into corridor) and not positioned so that they collide with one another when opened (i.e. opposite one another in narrow corridor). To be constructed of fire-resistant, self-extinguishing material, with sound and heat insulation (if opening on to non-heated areas). The lower part of the door should be covered with a protective layer of suitable material. A window 15-20cm in width, of safety glass, should be set in the door 2/3 of the way up, so that anyone standing behind the door will be visible. Jambs must have rounded edges and be made of metal or other durable material.
- **Emergency exit doors:** Fastened only on the inside, using a mechanism easily opened by anyone, or when sufficient pressure is exerted.
- **Picture windows, large expanses of glass:** In general their use should be avoided in school buildings, especially in parts of building close to areas where children

play; when used they must be protected with additional safety features (e.g. railings of suitable size), especially when found in existing buildings where safety glass was not used.

- **Window panes:** All glass used in school buildings, especially in areas where children move around or play, must be made of appropriate material (laminated, triplex or other type) and manufactured in such a way as not to cause injury if broken. They should have Greek Standards Agency certification, or similar certification from the polytechnic school laboratories or the standards agency of the country of manufacture.
- **Equipment and furnishings:** All fixed and moveable furnishings must have rounded or chamfered edges and smooth surfaces. Corners and hooks of clothes racks, radiators and shelves below a height of 2m must be set into recesses and not in areas where children are moving about. Cupboards and showcases with glass fronts must be kept out of busy areas and be of safety glass or protected with suitable wire mesh. Connections with utility pipes and cables must meet the appropriate safety standards; moveable equipment must be suitably placed and in a position where it will be stable.

3) Common areas - halls, stairs, etc.

- **Corridors:** Floors must be made of non-slip material. Maximum permitted length for corridors is 30m; beyond that length the corridor must broaden out into a hallway, or there must be stairs, an emergency door or some other escape route. Corridors with classrooms on one side must be at least 3m in width and auxiliary corridors (to offices, storerooms etc.) must be at least 1.80m.
- **Stairs:** Each flight of stairs must comprise a series of parallel steps, with no tapering steps; the stairway may only change direction by means of a landing. Stairs must be 1.45m in width; there must be handrails on each side at 0.70m from the floor level, running uninterrupted down the stairs (including landings) and extending 0.30m from the top and bottom of the stairway. The steps must be surfaced in non-slip material, or have a non-slip strip at the edge of the steps. Colour contrast should be strong and there should be ample lighting. Coloured markings should indicate the top and bottom of the stairs. Stairs broader than 5m must have a handrail running down the centre. There should be no differences in level of just 1-2 steps. Spaces below the stairway at a height lower than 2m must be blocked off with a wall, railings or some other feature (e.g. plant stand).
- **Sloping surfaces (ramps):** The maximum gradient allowed is 5%, the maximum clear width 1.5m and the maximum straight length of ramp 10 metres. Wherever the ramp changes direction, there must be a level stretch of at least 1.50m x 1.50m. At each side of the ramp there must be a skirting or low wall 5-10cm in height. There must be two handrails running continuously along the ramp at a height of 0.70m and 0.90m from the floor level and extending ≥ 0.30 m beyond each end.

of the ramp. The floor surface must be of non-slip material; colour markings must indicate the beginning and end of the ramp; each different constructional feature must be marked by clear colour contrast, and the whole ramp must be brightly lit. Any difference in level must be bridged by both steps and an inclined surface, or an inclined surface alone. Transition from one floor to the next must be effected by both stairs and lifts.

4) Washrooms and WCs

- **Student washrooms:** Surfaces and fittings must be heavy-duty, capable of sustaining wear and tear and resistant to vandalism. The floors must be of non-slip material; the doors must open outward and different materials should be indicated by strong colour contrasts. The facilities should be easy to clean; partitions should be lightweight and raised ~30cm from the floor. There should be a water supply of sufficient pressure for cleaning and ample provision for draining of dirty water after cleaning. The mirrors must be of safety glass.
- **Disabled student washrooms:** The specifications above also apply for the disabled washroom. The dimensions of the interior must be at least 2.20m. x 2.20m; the minimum clear width of the door opening 0.90m, with the door opening outward and fitted with a horizontal-bar handle. There should be space for a handrail on either side of the toilet bowl. The washbasin should have an upper surface of at least 0.85m. and a lower surface of at least 0.70m. There must be enough space for a wheelchair to turn in (clear space with diameter of 1.50m.) and the room must be fitted with an alarm system.

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This book is intended as a tool which can be used to improve standards of safety in schools by preventing accidents and fostering a better understanding of risks and accident prevention in the mind of the schoolchild. Its purpose is not so much to instil knowledge as to ensure that the relevant knowledge is **put into practice**. It is designed to be read by all those responsible for school safety (buildings, equipment, behaviour of students and so on). Many different persons and agencies may be involved in school safety issues, including the teaching staff, local authority officials, safety officers, school doctors, local government and, in certain cases, the police and fire brigade¹.

The content of the book is intended to be practical, useful and easy to apply. It does not cover all the complex safety specifications issued by, for example, the European Union, however necessary they may be, since such an approach would inevitably fail to secure the desired objective, i.e. a reduction in the number of accidents. We are all only too well aware that an unrealistic endeavour to achieve perfection is often the greatest enemy of real improvement – and this is particularly true in the area which interests us here.