

WORLD HEALTH ORGANIZATION  
REGIONAL OFFICE FOR EUROPE

WELTGESUNDHEITSORGANISATION  
REGIONALBÜRO FÜR EUROPA



ORGANISATION MONDIALE DE LA SANTÉ  
BUREAU RÉGIONAL DE L'EUROPE

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ  
ЕВРОПЕЙСКОЕ РЕГИОНАЛЬНОЕ БЮРО

INDEXED

83

*Accidents Traffic - pour cause  
Automobile driving - cause*

EDUCATION IN TRAFFIC SAFETY

Report on a WHO Ad Hoc Technical Group

Essen  
2-4 October 1979



↓  
ICP/ADR 013  
3611B  
ENGLISH ONLY

1981

## CONTENTS

	<u>Page</u>
1. Introduction . . . . .	1
2. Aims of the Group . . . . .	1
3. Current situation in Europe . . . . .	2
4. Traffic education, health and education . . . . .	3
4.1 Traffic education in relation to other educational programmes . . . . .	3
4.2 Traffic education in relation to traffic safety measures . . . . .	4
4.3 Limits of the educational approach . . . . .	4
4.4 Traffic education and health education . . . . .	4
5. Major problems in traffic education . . . . .	5
6. Problems of special groups . . . . .	7
6.1 Children . . . . .	7
6.2 Adolescents including moped-drivers . . . . .	10
6.3 The elderly and the handicapped . . . . .	11
6.4 Motorists and learner drivers . . . . .	12
7. Contribution of health services to traffic safety education . . . . .	13
8. Research priorities . . . . .	14
9. Conclusions and recommendations . . . . .	15
References . . . . .	17
Annex . . . . .	19

## 1. Introduction

A meeting of an Ad Hoc Technical Group on Education in Traffic Safety was held in Essen from 2 to 4 October 1979. Fourteen temporary advisers from nine countries attended together with a representative of the League of Red Cross Societies and staff of the WHO Regional Office for Europe.

Dr Agnes Holtwick-Sinendonk was elected Chairman, and Dr R.H. Jackson Rapporteur.

The participants were welcomed by Dr Holtwick-Sinendonk on behalf of the Mayor of Essen, by Mr H.A. Zenk on behalf of the Federal Ministry for Youth, Family Affairs and Health, and by the Rector of the University of Essen, Professor P. Neumann-Mahlkau.

Dr C.J. Romer, Regional Officer for Accident Prevention, opened the proceedings by conveying the best wishes of the Regional Director, Dr Leo A. Kaprio, for the success of the meeting. He pointed out that the meeting was the first to be held on this important topic,<sup>a</sup> and was part of the European programme on road accident prevention. The results of the meeting would, however, have implications outside Europe, since the Regional Office had a global responsibility in WHO for activities in this field, and the recommendations could therefore well be used for the formulation of similar programmes in the other WHO regions.

There can be no doubt about the importance of road accidents as a cause of both mortality and morbidity in almost all countries of the world. As infections and malnutrition become less important, accidents and degenerative and malignant diseases become relatively more important. Among the latter, accidents have special importance as a cause of death in children and young people, and in many developed countries they are the commonest single cause of death between infancy and middle age, accounting for more than half the total number of deaths. It is not only as a cause of death that they are important, but also as a cause of disability in many countries. They are the cause of a significant proportion of the demands for health care and contribute considerably to the sum of both permanent and temporary disablement.

It is easy, too, to understand the importance of road accidents in countries that are not as highly industrialized as those of northern and western Europe and North America. In Egypt, for example, it has been shown (1) that, whereas accidents cause only 20% of deaths in those aged between 5 and 15 years, the death rate per 100 000 population in that age group is 46. The significance of these figures can be realized by comparing them with those of Sweden where, although accidents are the cause of nearly 50% of deaths in the same age group, the death rate per 100 000 population is only 15 - less than one third of the rate in Egypt. It is clear that there is already a serious accident problem; at present this tends to be hidden by other causes of morbidity, but over the remainder of this century its importance will become more easily recognizable.

Among accidents as a whole, road traffic accidents are a clearly definable group. They are less common than those that occur at home, but the magnitude of the forces involved makes those injuries that do occur more severe than in many other forms of accident, and the mortality rate is high.

## 2. Aims of the Group

The meeting focused on the interrelationship between health services and the traffic sector in the field of education, rather than on specific programmes of education and their results. It is recognized that, generally speaking, road traffic or transport authorities have the overall responsibility for accident prevention, and it is abundantly clear that environmental and engineering factors relating both to the road system and to vehicles are important in the cause of accidents and therefore also have a great part to play in their reduction. Yet the human factor is of fundamental importance too, and the modification of human behaviour by education must be seriously considered in attempts to reduce the number and severity of accidents. Education in accident prevention and health education are allied subjects, and the main purpose of the Group was to bring together people in the fields of road transport and health, with a view to finding a

---

<sup>a</sup> Prior to the present meeting, WHO had convened five technical groups to look at specific problems in the field of road traffic accidents. These concerned: the medical monitoring of road traffic accidents (Odense, 1978) (2); road traffic accident statistics (Prague, 1978) (3); the influence of alcohol and drugs on driving (Monaco, 1978) (4); the planning and organization of emergency services (Toulouse, 1979) (5); and protective devices and restraint systems in traffic accident prevention (Meknès, 1979) (6).

common ground between the two. It is, of course, not only in the field of education that road traffic authorities, engineers, health authorities and personnel meet on common ground. The internal and external designs of cars as a "package" in which the passengers can be safely transported has a clear relationship to human anatomy and physiology and to the ergonomic performance of the driver and passengers. The organization of emergency services and the management of injured persons are bound to have an effect on the ultimate outcome of injuries and on mortality and morbidity; however, these aspects of the interrelationship of road traffic engineering and health services were not discussed, since they and other matters have been covered by previous technical groups.

Even in the field of education in traffic safety, most of the initiatives at present emanate from road traffic authorities and road engineers. In order to bridge the gap that is felt to exist between public health authorities and road traffic authorities, the following aims were set:

- (a) to try to define strategies in traffic safety education appropriate to the public health field;
- (b) to promote the interest of public health authorities in coordinating medical resources, with a view to strengthening the activities already being promoted from the transport side;
- (c) to identify areas of common concern and interest between the two parties and to delineate target groups for educational programmes;
- (d) to consider the broad aspects of programmes for these target groups and the role that health personnel should play; and
- (e) to identify areas of research in which the public health authorities can play a significant part.

### 3. Current situation in Europe

Before the meeting, a questionnaire was sent to several European countries asking for information on their current programmes, and the replies were analysed by Professor W. Böcher of the Institute of Traffic Education of the University of Essen.

Historically, traffic education began with the training of drivers either by fellow drivers as a form of apprenticeship, or by road engineers. Gradually, as traffic grew more complex, it became clear that certain groups such as children were at special risk, and children began to be taught rules and regulations and the meaning of traffic signs. This approach is still the only method in use in some countries in which traffic remains relatively light, but in many countries a change has gradually taken place, from rules and regulations to a more comprehensive social learning approach, i.e., how to live cooperatively with other people and with traffic.

It was recognized that a comparison of different types of programme in the various countries and, in particular, an assessment of their effectiveness, present some fundamental difficulties. One major problem is that the methods of statistical recording vary from country to country; definitions may differ, as may the proportion of accidents reported to the national agency responsible for collecting the data (e.g., the proportions of accidents of different types, and in different age groups, that are reported to the police vary considerably). Accidents can be reported, for example, as overall numbers, as rates per unit of population, or as a function of the number of motor vehicles, traffic density, number of miles travelled, etc. The questionnaire revealed that there is no uniform trend in traffic accidents in Europe, either as a whole or within individual age groups, and that over time there are variations, both positive and negative, for individual years and individual countries. The frequency and seriousness of accidents seem to depend on a great number of variables, which makes it difficult to arrive at an unbiased evaluation of education programmes and, therefore, to design a rational traffic safety education programme that would be universally applicable to all countries and communities.

This difficulty in making satisfactory, comparative studies between countries, and even between different areas of one country at different times, is compounded by a lack of coordination and liaison between the various bodies concerned in this field. Although most countries have established central institutions for traffic safety, their designations, functions and responsibilities vary from one country to another. Moreover, in some countries, the institutions are governmental, in others they are private, and in others again they have a mixed status. It is therefore not surprising to find variations in their objectives, priorities and degree of competence and effectiveness. In general, this lack of coordination is recognized by the bodies

concerned, and there seems to be a willingness to improve matters. Nonetheless, improvements may not be so easy to bring about, since all institutions, whether governmental or nongovernmental, are likely to take up entrenched attitudes if their position and function appear threatened.

#### 4. Traffic education, health and education

##### 4.1 Traffic education in relation to other educational programmes

The Group considered a definition of traffic education as any measure conducive to influencing people as traffic participants in a positive way. It had a wide-ranging discussion on the nature of traffic education as a discipline and its relation to health education, on the one hand, and safety education and accident prevention, on the other. It was felt that although traffic education cannot be regarded as a pure, scientific discipline on its own, it is nevertheless an area of education in its own right, with inputs from many different disciplines. Its aims are broader than education in accident prevention or accident avoidance, although these are clearly important: other negative qualities or drawbacks which traffic education seeks to diminish include noise, pollution by gases, congestion, and asocial behaviour resulting from traffic-induced emotional stress. However, there are positive qualities which traffic education aims to encompass, including, in particular, the promotion of mobility among members of society as a means of increasing social intercourse and human wellbeing as a whole. The beneficial use of traffic must be encouraged in a fair manner so that the sometimes conflicting interests of different groups of people can be reconciled as far as possible. Traffic education is a long-term process aimed ultimately at improving the quality of existence. In this sense, many members felt that it was part of social education for living, though this concept was found by some to be so broad as to make it almost indefinable and limitless. The effects of traffic education must be evaluated, so some attempt at studying cost-benefit and cost-effectiveness is called for. Studying the social effects of traffic education, valuable though this may be, is clearly more difficult than measuring the effect on readily-measurable parameters, such as the numbers, types and severity of accidents. Health services in many countries have avoided facing up to the problem because it involves questions of social policy extending far beyond the health field, but it is now becoming realized more clearly that the attitude previously adopted - that traffic education does not involve health services - is mistaken. Certainly WHO's broad concept of health, which includes the promotion of positive wellbeing rather than the mere absence of disease, means that traffic education can be regarded as coming at least in part, within its brief. Health education at present is mainly concerned with the prevention of disease, but people other than health workers are gradually becoming much more involved in traffic education than formerly: administrators, road traffic and public health engineers, etc. Indeed, such professionals are already involved in the collection of data very relevant to the question of accidents, such as information on the degree of mobility of cyclists and pedestrians. Data of this nature are important for the purpose of measuring the degree of risk to which the different groups of traffic users are exposed. However, even though the Group acknowledged the important contribution of health services to traffic education, there are many aspects of traffic education, such as the effects of noise, pollution and increased mobility, that cannot be dealt with in health education proper. We must beware of trying to "over-medicalize" traffic education and realize that it has certain technical aspects which may require little health input.

In summary, activities in the field of traffic education are undertaken by transport departments and education departments, as well as by health authorities (through their health education activities).

The Group therefore summarized the aims of traffic education as follows:

- (1) to prevent accidents,
- (2) to increase people's mobility,
- (3) to ensure that the benefits of increased mobility are distributed fairly,
- (4) to limit the deleterious effects of traffic, such as noise and pollution,
- (5) to encourage the development and proper use of environmental and engineering technology,
- (6) to persuade people to accept other measures that arise either from engineering and environmental or enforcement (legal and police) requirements.

#### 4.2 Traffic education in relation to traffic safety measures

The classic approach to traffic safety has been through education, engineering and enforcement - something referred to as the three "E's". The preliminary survey showed that the degree to which these three components are used in the countries of Europe varies considerably; some countries tend to look for technical solutions, whereas others rely more on enforcement and education. The three approaches must, however, complement and reinforce each other, and the more they are integrated, the more effective they are likely to be.

Because of this vital need to coordinate approaches, the Group attached considerable importance to ways and means of ensuring cooperation. Many professional disciplines or systems must be involved, and education should not be regarded as an isolated measure, but be seen in the context of other countermeasures and of the contributions made to education by various disciplines such as medicine, psychology, sociology and environmental engineering. For example, it was felt desirable that town planners should be more aware of behavioural psychology and, conversely, that educationalists should be more aware of the external environment. At present, the solutions proposed for any specific problem depend upon the approach and discipline of the person whose opinion is sought: an educationalist will give one solution, the police another, and the traffic engineers yet another.

There is therefore a clear need to promote holistic strategies by the adoption of a multidisciplinary "system-oriented" approach. This is best applied to specific problems rather than as an across-the-board, overall approach; traffic problems affect a community directly and, in many cases, the people who are experts on problems are the people who have them. The nature of the problem would play a part in determining the extent to which a community would become involved so that, for example, a school or parent-teacher group, a local authority or even a government would need to be involved. However, in each case, the problem to be solved needs to be approached in a multidisciplinary way.

Coordination and cooperation between various disciplines are also important at international level. Organizations such as the OECD have already studied the problem of traffic and traffic safety in some depth, and in view of the contribution to the problem that can be made from the health field, it would seem appropriate for WHO to cooperate actively with that body.

#### 4.3 Limits of the educational approach

The Group had as one of its background papers the report (7) of a 1975 working group on the problems of children of school age (5-9 years), which had expressed the view that, following considerable emphasis on safety education for children in the past, the maximum effect of this factor had been achieved. The Group discussed that statement and found that it could not agree with it. Though it may well have represented the views of educationalists at the time, later recognition of the necessity for a wider approach has led to better liaison between educationalists and environmentalists and, indeed, the earlier group had indicated that new approaches might be of greater value, particularly by increasing the active participation of the children themselves. In addition to this change of approach by formal education, the importance of informal education is now more widely recognized. For example, the limitations of a rigid educational approach to the problem of persuading young motorcyclists to accept and abide by traffic rules and regulations is recognized, and an example of a successful, informal educational approach is given by various programmes in different countries, in which older children are made responsible for supervising younger children at traffic crossings.

Traffic education is one of many measures that are being adopted to increase traffic safety as a whole. Its place in this wider context needs to be evaluated, but it does seem that the limits of traffic education as a measure of improving traffic safety have not yet been reached.

#### 4.4 Traffic education and health education

The Group looked in detail at the interrelationship of traffic education and health education, and at the organizational framework in which traffic education should be delivered.

The replies received from European countries to the preliminary questionnaire showed differing views on the subject. Half of the countries feel that traffic accident prevention is an appropriate field for inclusion within health education, but traffic education as a whole is not considered to be a part of health education. They are seen to have many similar problems and to use very similar methods, and the majority of countries feel that a comprehensive approach encompassing both traffic and health education would be of value.

In some ways, the replies were surprising as, in the experience of many members of the Group, most countries do not include any aspect of traffic education in their health education programmes, which tend to be disease-oriented; the small part that is sometimes included relates almost exclusively to accident prevention.

The disease-oriented approach has meant that health education is, perhaps, less effective than it might have been, and it was considered that two different approaches might be more effective: (a) in eastern European countries health education is acceptable because it is conceived to be the duty of a citizen to maintain his good health as far as possible, and (b) because of the increasing recognition of the importance of primary health care in general, it might be possible to associate more closely than at present the delivery of health education with that of primary health care.

One area in which health education and traffic education might become more closely integrated is in the preschool age group, since all countries have a system of well-baby clinics or child welfare clinics in which much informal and formal health education is carried out. Greater use might well be made of this branch of the health services of the countries to introduce traffic education to mothers of young children - an aspect which is referred to again below.

Apart from preschool children, a significant proportion of formal health education takes place in schools and, here again, the picture differs from one country to another. In some countries, traffic education is compulsory, although the amount of time spent on it may be left to the discretion of the teachers. In other countries traffic education is given as part of safety education but, again, head teachers have discretion over the amount that is given. It was commented that there is often a difference between precept and practice: whereas 90% of teachers would agree that traffic education is useful, only 20% practise it. As far as health education per se is concerned, it is seldom a compulsory subject.

This striking variation in approach is indicative of a problem of organization. The existence of WHO resolutions requiring action to be taken on the problem of road traffic accidents means that Member States recognize road traffic accidents as being, at least in part, a health problem. The health component is important for many reasons: (a) the behaviour of people in traffic and the accidents they suffer are likely to be affected by their physical, emotional and mental health, and - especially in the case of children - by the stage of their development; (b) health care systems can help in delineating and reaching target groups such as preschoolers and schoolchildren, the handicapped and the elderly; (c) these special groups are already the subject of study by the health services in terms of child development and the process of aging, while the medical aspects of the problem of handicapped people are self-evident; (d) health care systems have or should have access to data on accidents which are probably the most important single parameter by which the success of traffic education programmes can be judged; (e) the health services already have experience in the implementation of large-scale preventive programmes in certain areas, e.g. immunization.

It is therefore suggested that consideration be given to the development of an institutional structure or organization at national level which would allow the input of expertise by health personnel and others. Such structure or organization must be flexible enough to allow the input of expertise as appropriate to the problem. It is essential that health authorities should recognize their responsibilities in the matter; in one country, a coordinating body in traffic safety with the authority to press for the implementation of policy already exists, but the health authority is not prepared to provide the expertise, even though the transport authority wishes it to do so. A pertinent comment was made that "it is surprising that in many countries the health services simply do not want to know about the No.1 killer in society".

An extension of the coordinated approach to traffic education would be to form multidisciplinary bodies from all branches of the local community, a measure that would help considerably by mobilizing public support for traffic safety.

#### 5. Major problems in traffic education

The Group considered in broad outline certain major problems or difficulties that had been recognized in the countries represented.

These can be grouped together under a number of headings as follows:

(a) Conceptual difficulties

The distinction between precept and practice is well recognized; whereas it is relatively easy to persuade people to adopt a certain attitude, it is much more difficult to persuade them to alter their own practice. For example, though people may accept the fact that it is safer to wear seat-belts, they do not always do so. This difficulty is, of course, that in health education people can accept the fact that it is dangerous to one's health to smoke cigarettes but they nevertheless continue to smoke.

There is a conflict between the necessity of making rules or regulations on the one hand, and of leaving people with individual responsibility and freedom of action on the other. This is again exemplified in the case of seat-belts: is it right to introduce legislation on this matter or should people be free to follow their own dictates?

(b) Problems of policy and organization

Politicians and governments must be persuaded of the necessity for traffic education, and this must be integrated in government policy. There must be a central organization as mentioned above, which holds the overall responsibility for planning and implementing a programme, and finance is needed for its organization and activities. Care must be taken to ensure that the administration is not "overweight" - the comment was made that in some countries the cost of administration exceeds the cost of the education activities themselves. Within the field of finance, some traffic education programmes have been developed as a cheaper way of appearing to tackle a problem than by, for example, environmental measures: it must be made clear that traffic education is but one way of increasing traffic safety and should not be regarded as a substitute for other means.

(c) Problems of defining the target groups to be educated

The target groups must not only be defined, but also reached, and these two processes are neither easy nor straightforward. Certain target groups, such as children, the handicapped and the elderly, are probably the most easily defined and reached, but adolescents and young drivers of both two-wheeled and four-wheeled vehicles are by no means easy to reach. It is true to say that, in general, apart from children, the people who stand the greatest need of traffic education are often the most difficult ones to get at.

One target group which the Group considered of great importance is that of doctors, medical students and other health workers. At present, all medical students are taught about the prevention of diseases that have now become uncommon, such as diphtheria, poliomyelitis and tetanus, whereas very few are taught anything about the prevention of road accidents or other accidents. This whole group is important in that it embraces people who are, or will become, leaders of thought and policy within health services.

Further target groups that can be readily identified are the police, who have an important role in helping to set community attitudes and approaches as well as in the enforcement of traffic laws (mentioned also under 6.2), and driving instructors, who are able to influence young drivers at a very impressionable time.

(d) Personnel problems

In some areas it is thought that there is already, or will soon be, a shortage of trained personnel able to carry out the educational programmes, and it is clear that training the necessary personnel will have to go hand in hand with expansion of the programmes as a whole.

(e) Methodological problems

Consideration must be given to the best ways of educating different groups - practical or theoretical, visual or auditory, etc., and the use of the mass media, especially television. It is important, too, to study the best ways of motivating people to act correctly, and to increase their factual knowledge, and to motivate people such as teachers or health workers so that they recognize the importance of traffic education and play their full part in implementing programmes.

(f) Evaluation problems

It is essential that programmes be evaluated so as to obtain the maximum cost-benefit from them. Ways and means of evaluation need to be developed, including an improvement of systems for collection of the data used for road traffic accident statistics. As mentioned above, this is a crucial role for the health services, but other criteria also need to be developed, e.g. objective

observations of driver and pedestrian behaviour. A change in attitude does not necessarily result in a change in practice, and it is essential that evaluation programmes should try to measure alterations in behaviour and practice as well as changes in attitude and an increase in knowledge.

## 6. Problems of special groups

### 6.1 Children

#### 6.1.1 Children as pedestrians

A review of the present situation in the countries represented in the Group showed that all countries have some form of programme for both preschool and young schoolchildren. In many cases, this is linked to safety education in the home and is given in kindergartens or playgroups, and in some cases parents are also involved. Some countries have special "safety clubs", which use a variety of techniques of education and encouragement. The general picture presented is one of involvement of many different groups but a lack of coordination between them and, perhaps, an insufficient appreciation of the part that health service personnel might play. Lack of finance and lack of appreciation of the importance of the programme were mentioned in the discussion. Indeed, there was a feeling that the importance and value of children in society as a whole is underestimated.

Four aspects of the problems were examined further:

#### Target groups

Where children are concerned, the target groups are probably wider than in the case of many other special groups because of the involvement of so many professions and disciplines in the upbringing of children. The following were identified: (a) the children themselves (preschool and school); (b) their parents; (c) teachers and youth leaders; (d) other adult road users; (e) health service personnel involved with children; and (f) designers of the environment in which children are brought up, e.g. architects, town planners and road engineers. Some of these target groups are, of course, common to other groups besides children as pedestrians, but are discussed here in more detail to avoid repetition. It was felt that the important role of the parents is insufficiently recognized. All programmes focus naturally enough on children as their prime target, but very young children are not capable of "learning" in an academic sense, and parental responsibility for their behaviour is absolute. The well-known Swedish studies of Stina Sandels (8) have led the way in improving understanding of children's behavioural characteristics in traffic and the limitation of their capabilities at different ages, but understanding and knowledge of this vitally important aspect of child development have scarcely yet reached psychologists and doctors concerned with children, still less educationalists and parents in general. The importance of recognizing the lack of parental understanding of child development and of their unrealistic expectation of children's behaviour in traffic is illustrated by the British studies of Sadler (9), who found that no less than 50% of mothers of children aged five, 19% of mothers of children aged three, and 13% of mothers of children aged two, would let them cross a main road outside their homes by themselves. It may well be, therefore, that greater attention should be paid to educating mothers and adult road-users in general and, perhaps, less time, effort and money be devoted to the younger children.

Indeed, the Group thought that traffic education for mothers could not begin too early. Pregnant mothers are receptive to help and advice on the management of the expected baby, and American experience has shown that they are prepared to accept advice on such matters as how to transport their baby safely as a passenger in a car (10). The danger of carrying the baby or toddler on the lap of the mother should be taught at this time, and advice be given on restraint systems. "The infant who starts safe stays safe" (11). All this can be taught along with other aspects of child care and illustrates the close relationship between traffic education and health education for the preschool child.

The importance of teachers and youth leaders is self-evident. Teachers, in particular, must be persuaded of the necessity for, and value of, traffic education and must be provided with appropriate information and teaching material. Although many countries have drawn up teaching "packs" and programmes, which are available nationwide from government or voluntary sources, there is, nevertheless, also room for considerable local initiatives, for example, in practical demonstrations or traffic studies. Other aspects of the role of teachers are discussed above in section 4.4.

A further group of adults whom it is felt needs further education about the limitations of children's abilities in traffic is that of other adult road users, particularly vehicle drivers. It should be realized that young children, in particular, must be expected to behave as children, i.e. unpredictably, and that for developmental reasons they are unable to manage reliably in traffic as pedestrians until at least the age of eight or nine. It has been pointed out that traffic is the most complex environment that a child can experience, that he is incapable of anticipating all types of situations and does not know how to adapt to them and that, in the end, adults are always to blame for traffic accidents involving children, and they therefore need to be informed about what types of behaviour they can expect (12).

The important role of health service personnel is clear. Detailed discussion of the role of "designers of the environment" is beyond the scope of this report, but it is clearly of the utmost importance in both this age group and the elderly (discussed under 6.3). The segregation of traffic, the design of pedestrian precincts, the slowing of traffic flows in certain residential areas, the siting of schools and playgrounds, and the appropriate design and siting of road traffic signs, road crossings and bus stops are all of great importance and fall within the domain of the road engineer and the town planner.

#### Message to be directed to children

It was clearly not within the scope of the Group to plan educational programmes in detail, but certain principles were enunciated: (a) the message should be tailored to the stage of development of the child; (b) it should be simple in itself and be expressed simply, particularly when directed at younger children; (c) it should aim to reduce accidents and to increase risk awareness; and (d) it should take into account those situations which occur most frequently. Much research has been undertaken in this field of child behaviour especially in respect of road crossings, and it has to be accepted that some programmes try to train children to cross the road in a way which they will certainly not continue with when they grow older - though the "children's way" of crossing may be safer for them while they are young. Again, target groups of children may be picked out for special "messages" - for example, Howarth (13), has shown that the risk of an accident per road crossing is twice as great for boys aged five as for girls of that age; however, this risk gradually decreases more rapidly for boys than girls, so that by the age of ten, boys have no greater risk than girls. Boys of five might therefore be regarded as a special target group for special educational efforts.

One further point about the actual programme is that it would be advisable, during the planning phase, to include some means of evaluating its effectiveness. Questions on understanding and knowledge, or observations on behaviour and attitudes, might well be included in the educational programme in such a way that sequential enquiry or observation would show whether the programme has altered practice and attitudes or increased knowledge. However, the fact that there might be uncertainty about the effectiveness of the programme should not prohibit its introduction, though it might be wise, initially, to introduce it as a pilot study at local level. Comparisons of different local programmes carried out as scientifically as possible might well indicate the programmes that are most cost-effective or of greatest cost-benefit and that might therefore be suitable for adoption on a larger scale.

#### The personnel involved in traffic education

The attitude of society as a whole towards the problem of road safety is made up of the sum of the attitudes of its members, and it is therefore justifiable to remind ourselves of each individual's responsibility in this field. Personal example is the best method of education and it is likely that, for better or for worse, children's attitudes towards risk-taking in traffic are coloured by the example set by adults. However, the main input into formal traffic education will be through institutions and organizations. There are already large numbers of these in existence, and it would certainly be wrong for the health services to appear to be "taking-over" or pre-empting their work. It is much more important for the potential input of the health services to be made clear, and for them to be ready and able to make their contribution at the appropriate time and place. The national coordinating body suggested in the foregoing must play a part in ensuring this.

However, it is not only at national level that a coordinating body is necessary. It has already been mentioned that local committees should be established to look at local problems. An example of local initiative was given, in which a group of people, meeting informally in the first place, and including traffic engineers, educational agencies, health personnel and voluntary bodies, has been building up a programme suitable for local needs. A further important point relating to the personnel conducting traffic education programmes is their training. Though the involvement of nonprofessional personnel is to be encouraged, certain people will need to be

trained professionally so as to be able to give expert advice to nonprofessional multidisciplinary groups. As far as the education of child pedestrians is concerned it is very important that such people should recognize the developmental aspects of traffic safety education for children. It is to be remembered that children react in a very different way from adults, and that the approach to their instruction in the safe use of the road system must be adjusted accordingly.

#### Media

The Group was more concerned with policy and planning than with the detailed design and execution of a traffic education programme and, for this reason, the question of the various methods of education and media of communication was not discussed in depth. It was felt that all varieties of educational techniques should be used and, as far as children are concerned, the use of simulated real-life situations is useful, though there is a need for continued research into the effectiveness of this type of programme. The great value of television as an educative medium for all age groups was stressed though three specific problems were identified: (a) the problem of persuading television authorities to make time available for traffic education programmes; (b) the problem of finance, which is obviously linked with (a); and (c) the necessity of trying to make cost-benefit and cost-effectiveness studies.

#### 6.1.2 Children as cyclists

Whereas solution of the problem of child pedestrians mainly calls for "education" and "engineering" (the segregation of vehicles, traffic and pedestrians), the problem of child cyclists introduces the question of "enforcement", i.e. legal restrictions. In Switzerland children are not allowed to cycle on roads under the age of 7, and in Austria the law prohibits a child from riding on public roads by himself under the age of 12, unless he has passed a cycling proficiency test, in which case the age limit is 10 years. These measures have naturally been effective in reducing the mortality rate of childhood cycling accidents and, as far as can be judged, they have been accepted by the people of the countries concerned as being sensible and as not imposing too severe restrictions upon the freedom of individuals. The implications of legislation and the legislature are discussed further below.

One engineering aspect of child cycle-safety that has been much discussed in the past five years is the design of bicycles. Certain styles of bicycle have been criticized from time to time as being unsafe but, although there is good evidence that their use is associated with an increased incidence of certain types of injury (14), it is not known whether this is due to inherent fault in the design or to children's difficulty in adjusting to it. The whole question emphasizes, however, the need for manufacturers to be safety-conscious in considering the introduction of new designs.

Cycling proficiency tests and special training courses, often conducted by the police, are offered in many countries. As with many other educational methods, their value and effectiveness have to be taken on trust; commonsense leads one to expect that improved physical dexterity in managing a bicycle, increased knowledge and experience of road traffic problems and an improvement in the physical standard of bicycle maintenance will result in better behaviour in real traffic and thus in a reduction in accidents. However, the complexity of the evaluation of any one programme is illustrated by the fact that United Kingdom studies have shown that improved behaviour may be temporary only, and also that the increased self-confidence engendered by the training is associated, at any rate in boys, with an increase in bicycle usage and mileage travelled. This results in a greater exposure to risk and thus in failure to reduce the actual number of accidents (15).

For comparative evaluation of educational and other approaches, the methods that study the diminution of actual accidents must always be critically assessed in view of the recognized problem of accurate data collection in childhood cycle accidents. Compared with other types of accident (car, pedestrian, etc.), cycle accidents are generally accepted as those most liable to be underreported. Road accident statistics collected by the police have been shown to underreport bicycle accidents to children by very considerable margins, e.g. in one study, only 11% of bicycle accident cases referred to local hospital accident and emergency departments were known to the police (14). This is, of course, because a significant number of the accidents do not involve another vehicle or pedestrian.

Finally, a possible change in the social and cultural patterns of the traffic situation might have an effect on bicycle accidents as a whole. It is at least possible that the sharp and apparently continuing rise in oil prices may result in a relative decrease in car mileage and an increase in bicycle usage, particularly in and around urban areas. In turn this might result in an increase in the number of cycle-lanes to segregate cyclists from other traffic and also in greater pressure on the motorists to come to terms with the bicycle as a means of transport in a community; these two factors might reduce the risk of bicycle riding.

### 6.1.3 Children as car passengers

The current situation regarding the safe transport of children as passengers in cars is a prime example of the interdependence of engineering, education and enforcement in effecting a reduction in the number and severity of accidents.

Engineering has contributed significantly in two ways: (a) in the design and testing of different types of child restraint systems (CRSs) to suit children of all ages from infancy onwards; and (b) in improving the interior design of cars by such products as burst-proof and child-proof door locks and by a reduction of potentially dangerous interior car fittings. United States regulations appear to be moving towards the adoption of airbags as the standard restraint system (16), and new techniques have resulted in the development of airbags which are said to be effective in protecting young children (17). However, it is also clear that adult-type lap or lap-and-diagonal belts are safe and effective down to a much younger age than has previously been thought - perhaps even at three years of age (18). The combined engineering and medical input into this area has been considerable and, while it is in no way suggested that the limits of improvement have been reached, there is no doubt that, if existing devices were used to the full, there would be a considerable improvement in the accident and injury statistics.

Education of parents about the necessity of considering the safety of children in cars is undoubtedly of the greatest importance. Much North American and Australian (19, 20) work has shown how reluctant parents and drivers are to acknowledging this problem. Young children allowed to stand in the front of the car and babies or toddlers held on their mother's laps on the front seat are unfortunately still a common sight in many countries. North American studies - which are not necessarily applicable to the European scene - have shown that the most effective means of educating mothers in this matter and of encouraging the use of CRSs is for a paediatrician to give personal advice to the mother of a young child in a one-to-one situation as part of general health education (21). There is undoubtedly a considerable potential for a health service input in this area of traffic education, and this is given added importance by the fact that the child who travels safely when young is likely to travel safely as he grows older.

The present limited success of educational methods highlights the importance of enforcement in this field. Many countries have already introduced legislation concerning the place in the car in which children must be seated: children under 10 in Austria and under 12 in Switzerland are prohibited from travelling in the front seats of cars, and Australia, Belgium, France, the Federal Republic of Germany, the Netherlands, New Zealand and many other countries have somewhat similar legislation. However, the situation is not simple: North American work has shown that children are safer in the front seats of cars if they are adequately restrained than if they are unrestrained in the back seats (22), and it is therefore possible that unless children are properly restrained in the back, blanket overall legislation which prohibits children from travelling restrained in the front seats of cars might result in an increase in the numbers of children injured. Aspects such as this need to be borne in mind in drawing up legislation. An important, secondary effect of education is to improve the acceptance of legislation: it has been shown in Australia, for example, that whereas acceptance of the necessity for adults to travel restrained is considerable, parents and drivers pay less attention to the laws where children are concerned (23).

It is pertinent here to comment generally on the role of legislation and the law in traffic safety. It is likely that the Austrian and Swiss laws, for example, on child cyclists and on the siting of children in cars have saved more lives than "advisory" methods of traffic education. However, the legislature which makes laws, although on occasion influenced by pressure groups or by expert advice to introduce special legislation, is usually more influenced by the gradual development of a climate of public opinion, which either positively desires a change or at least is willing to accept it. The Group, in recognizing this notion, felt that it indicates a need to give a higher priority to selecting as targets for traffic education those groups of people or individuals who influence and lead public opinion: people in control of policy in the media, legislators, doctors, teachers, and executives, etc. Traffic safety must be accepted as a matter of social policy, and certain desirable patterns of behaviour thus be regarded as the norm.

### 6.2 Adolescents including moped-drivers

The importance of this group is illustrated by the figures for the mortality of the age groups 15 to 25 from road traffic accidents: over half the deaths in this age group are the result of an accident, the majority of them on the roads. Moreover, with the increased use of the motorcycle, the numbers are rising in many countries (24).

However, the mortality and morbidity rates are unevenly spread among the adolescents in the various categories of road user. Adolescents are a low-risk group as pedestrians, but a high risk group as moped, motorcycle and car drivers. This illustrates the general rule that people tend to be a high-risk group when they commence a new activity. It must be accepted that adolescents have a need for adventure and a need to try themselves out in both emotional and physical senses, which means that risk-taking is inevitable at this age; the problem is, how to persuade them to draw the line between acceptable risk-taking and foolhardiness.

A difficulty which is more marked in this age group than in others is that of reaching the adolescents. Older schoolchildren do not present a problem in this respect, but it is not easy to find mechanisms for getting to groups of adolescents who have left school. Three main approaches were felt to be of use: (a) the use of industrial concerns since it would seem feasible to associate safety at work with safety on the way to and from work; (b) the use of existing young people's organizations bearing in mind that while the number of adolescents in organizations of one kind or another will vary considerably from one country to another, service organizations and youth groups should be used if possible; (c) with motorcycling being something of a craze, the use of motorcycle clubs or groups concerned largely with the engineering, maintenance aspects of the machine or with scrambling or trials across rough country, since many young people are members and this is an obvious way of gaining access to a significant group of risk-taking adolescents.

Coupled with the necessity of using unorthodox or ad hoc groups is the need to use unconventional approaches. With those still at school the orthodox means of formal education and informal practical training in motorcycle or car maintenance and driving can be adopted; after school, an approach that might be used is to exploit the fact that many teenagers model themselves on an "idol": the use of the national or group idol of the moment in this way might be helpful.

Another problem peculiar to the age group is the general anti-authority attitude of its members - in many cases to the parents and to organizations such as the police, whom they may regard as inimical to adolescents. The whole question of the relationship of the police with this group is, of course, complex and beyond the scope of the Group, but it was felt nevertheless that the local health service personnel working in this field should make themselves known to the police and explain what they have to offer in the specific field of education in traffic safety. This applies no less, of course, to school teachers and youth group leaders who are in contact with the groups mentioned above, but the police have a special role, in that they are not only concerned with enforcement of the law, but are also influential in forming the attitudes of society as a whole.

### 6.3 The elderly and the handicapped

In the Group's discussion on this question, the term elderly was not defined in terms of years of age; instead a commonsense definition was used, in that increasing age brings with it increasing physical frailty and a slowing of reaction times, often with a sensory handicap such as partial deafness or loss of vision, etc., which militates against the individual in question in his contacts with road traffic. "Handicap" was defined as a degree of physical or sensory handicap (blindness or deafness) of sufficient severity as to affect mobility. No attempt was made to include mental handicap or psychiatric disturbance in the discussion on this matter.

Although the Group accepted the fact that the elderly have greater difficulty than middle-aged adults in coping with traffic, it was felt that there is room for further research, particularly as regards the biometric aspects of aging; to some extent, the change in the elderly may be more apparent than real in that, whereas their abilities may be diminished to a small degree, the demands made on them do not remain static, but tend to increase as the complexity of the traffic situation increases. However, whatever the degree of limitation, some elderly people find it difficult to accept the fact that their abilities are less than they used to be - there is a psychological problem in nonacceptance of themselves as they are. This is, perhaps, of particular importance to the elderly car driver: the voluntary relinquishing of a driving licence not only results in a considerable diminution of mobility, but also forces on the driver the realization of the march of time.

The overall decreased physical faculties of the elderly lead to an increased risk to them in traffic, particularly as pedestrians, for it is at the two extremes of life that pedestrian traffic is most likely to be involved in an accident. One factor that is of importance to the health service is the diminished capabilities of tissue repair and increased fragility of the bones at this age, so that accidents have a higher mortality and morbidity, leading to an increased demand on the health services.

Although, as mentioned above, there is room for further research into the biometrics of aging, there is, nevertheless, a considerable body of knowledge about the aging process and elderly people. However, it was felt by the Group that some of this knowledge has not been made sufficiently known to road traffic engineers, in that many studies of the traffic problems of the elderly appear to have been performed without a sufficiently deep knowledge of the process of aging.

In looking at the overall approach to the problem, it would seem that while "enforcement" is seldom a problem in this group, there can be no doubt that the interrelationship of "engineering" and education is important. The "engineering" and environmental aspect includes an important component of town planning in that the siting of shops and supermarkets in relation to old people's homes, the siting and timing of crossings, and the appropriate siting of ramps, lifts and doorways are all important factors in maintaining the mobility of both the elderly and the handicapped.

As far as the educational aspects of traffic safety are concerned, there is to some extent a problem in reaching this target group. Health services and educational services have a statutory involvement with children, but less so with old people, with whom the national and local social services and pensions offices are more concerned. However, some communities have special courses for the elderly, given by the police, and in general these seem to be well accepted by the people themselves. Surprisingly, the example quoted above of a community approach to traffic education did not involve much contact with the elderly - apparently because the elderly themselves had not asked for help.

So far as the different approaches are concerned, television was again cited as probably the most effective medium. One area had had a series of 10 programmes on the problems of the elderly in traffic. A check on the understanding and recollection of the programme had shown satisfactory results, but there had been no further check on its ultimate effect on the behaviour of the elderly. Although no proven examples could be cited the potential value of face-to-face advice by the doctor was stressed (as in the education of mothers of young children): this is another example of the importance of recognizing traffic safety and education as an aspect of preventive medicine.

With respect to handicapped people, the problem is, in general, very similar to that of the elderly. The effect of different sorts and degrees of handicap on mobility patterns is not accurately known and further research is needed, though there is some evidence that, in traffic, deafness may not be so much of a handicap as might be thought, in that deaf people tend to compensate for it by more acute and perceptive use of their eyes. It is probably easier to gain access to these target groups than to the elderly because they are more likely to be known to health services. The rehabilitation and reintegration into society of handicapped people might well provide an opportunity for the input of traffic education.

#### 6.4 Motorists and learner drivers

The Group discussed two main problems here: (a) the scope and technique of training learner drivers and the driving test they are required to pass; and (b) the further training of drivers who have passed a test, including the training of driving instructors themselves.

(a) Learner drivers and the test procedure. In general, much more attention is paid to the education and instruction of learner drivers than to the further and continued training of qualified drivers. The provision for learner drivers is satisfactory on the whole, but some gaps were identified. It is thought that there is, perhaps, too much concentration on learning the rules of the road, with insufficient emphasis on the management and maintenance of the machine and on the recognition and management of hazard situations. In this sense, the training of learner drivers needs broadening. In some countries it is not mandatory to have training by a professional driving instructor but, as far as is known, there is no difference between the performers who have not received professional instruction and those who have. In Yugoslavia, however, it has recently been made compulsory for the learner driver to attend a series of lectures on the health aspects of driving, in which attention is drawn to such factors as alcohol, drugs and fatigue.

The extent to which the test itself can be regarded as really satisfactory seems to vary somewhat. The technique of driving required to pass the test was viewed with cynicism in some quarters, since it was felt that it does not really test the driver's ability to anticipate hazards and that the normal technique of driving after passing the test might differ from the extra-careful approach which, it was felt, might be used when passing it.

(b) Further training. Some form of continued or further training was thought to be of value by the Group, particularly in the first year or two after passing the test - a time when, in young drivers particularly, there is an increased risk of accidents occurring. This would help to

integrate the theoretical instruction received by new drivers with their increasing experience. The health field was thought to have a contribution to make in three particular directions: (i) by using "first aid" as a route by which other health aspects might be introduced; (ii) by using the seat belt issue as a problem for discussion and a focus for further training; and (iii) similarly, by using the very important issue of alcohol and other drugs. One problem discussed was how to reach the target group of newly-fledged drivers. If a system of provisional or temporary licensing for one year after taking the test were used, attendance for further instruction could be made a condition of granting a full licence. Otherwise, the use of voluntary "driver clinics" or of compulsory attendance at police instruction courses for drivers convicted of minor traffic offences seemed to be two alternative means of reaching the target audience. Television, radio and press education must be used as a blanket, overall channel of instruction. Finally, the question of advanced training and testing was discussed: this is obviously used as a prestige method of getting extra training, but is likely to reach only those who are highly motivated towards becoming good drivers.

Driving instructors themselves were considered to be a special target. It was thought that in many countries, there is room for improvement in the training of instructors, e.g. in teaching them how to teach. As mentioned above, they should be able to broaden the instruction they give to learner drivers to include more health and safety aspects, such as the effects of fatigue, drugs and alcohol, and the importance of seat belts and child car restraint systems, but if transport authorities are to be persuaded to accept this arrangement it might be necessary to introduce it gradually, and it would have to be recognized that there would be a cost element.

An important aspect of the relationship of health services to road safety is the health of drivers themselves, and the effect that disabilities or sickness might have on their driving capabilities. Doctors must teach drivers about this and must therefore know about the possible effects of coronary heart disease, epilepsy, diabetes, etc. An attempt to instruct doctors in this subject has been made in the United Kingdom, where every doctor has been given a booklet on the "medical aspects of fitness to drive" (25).

#### 7. Contribution of health services to traffic safety education

Some aspects of the contribution that health services can make towards traffic safety education have already been mentioned, but the situation was examined in greater detail by the Group.

There is no doubt that road traffic accidents are one of the major man-made problems of society. Transport and traffic involve every individual, and institutions that provide services to people, including health services, become involved in many different ways. There are, of course, variations in the picture from one country to another but, in general, it is true to say that a large body of knowledge on the environmental, social and behavioural aspects of traffic and traffic education is held by people outside the health services. Public policy decisions on many aspects of the problem, including traffic education, are taken by agencies concerned with road systems and traffic in general, without any input from health services.

The fact that this situation has arisen is, however, very largely the fault of the health services themselves. Although a detailed knowledge of child development and behaviour, of the aging process, and of psychology, is held by doctors and others, the application of this knowledge to accident prevention has not been looked at in detail by health workers, nor has the necessity of sharing it with road traffic engineers been sufficiently appreciated. Within the health field there is also considerable expertise in other aspects of traffic education: environmental factors, such as clean air, clean water and public health engineering in general, have much in common with traffic engineering. The gathering of facts and figures in the science of epidemiology and the delineation of special groups, such as children, old people and the handicapped, are health service problems, and, finally, there is the problem of the management of the injured person: the treatment, the outcome, the measurement of severity and the services required - emergency and rescue, hospital and rehabilitation.

However, within the health services themselves there is often a lack of concern and interest in preventive medicine as a whole, and there is a need for reorientation in this field. Support must be provided from within the health services for those who have the responsibility for traffic policy, and the question of what positive action can be taken within the health services needs to be discussed.

However, it must be recognized that a large number of institutions and individuals are involved and that this makes the problem of coordination more difficult. The health service contribution must be a real and definite one, but it must be accepted as being necessary by

colleagues already working in the field of traffic generally; in other words, it must come in slowly and gently so that it is seen as collaboration, cooperation and coordination - which should indeed be the true relationship between the health and traffic aspects. The principle of a national coordinating body for accident prevention has already been suggested above; but it may take some years before such a body is actually established, and there is no reason why smaller, local, coordinating groups should not be established in the meantime. Opportunities for a health input must be taken as and when they occur, and health services must continue to demonstrate that they have something to offer.

The question of improving the image of preventive medicine as a whole is difficult. There is no doubt that curative medicine is professionally satisfying, and the face-to-face contact of a doctor with a patient whom he is trying to help is, in some respects, the essence of medicine. Now that the struggle to safeguard the environment is becoming a central concern of government, it has been asked whether medicine can move its central emphasis to prevention, and give it the same degree of scientific attention as it has previously given to treatment. While recognizing that this will not be easy or professionally attractive since the social approval and emotional satisfaction of helping the sick is very precious, it is believed that the central question for medicine today is how to make the prevention of disease as professionally satisfying as its treatment (26).

A shift of emphasis such as this is unlikely to occur swiftly, but medical educators have a considerable responsibility to bear. Doctors and health workers are looked on as members of the target group previously classified as "people who shape public opinion". The education of doctors, including medical educators, must go on all the time - health services must put their own house in order and constantly inculcate the idea of preventive medicine as an important discipline. Within medicine, certain branches perhaps have a greater part to play than others: public health and community medicine, which is taught as a separate subject in many countries, is obviously one such branch, but child health (paediatrics) has already - or should have - a considerable component of preventive medicine and, in some areas, medical students are taught about accident prevention in this part of their course. The developing specialty of accident and emergency medicine tends at present to be more concerned with management than with prevention, but it has great possibilities as a branch of medicine through which the importance of accident prevention can be taught. The Group did not feel that there is a good case for traffic medicine per se to be a discipline in its own right though it might, of course, well be a proper subject for research and postgraduate study.

However, changes in medical education, like changes in other fields of education, will be slow to take effect; altering attitudes is a slow process, and altering behaviour as a result of a change in attitude is likely to take even longer. Accidents are a multidisciplinary problem and as such must be dealt with along multidisciplinary or "system-oriented" lines: the most important role of the health services lies in the application of previously accepted principles in the management of public health problems, and the sharing of information which they already possess, or can obtain, with the other professional disciplines involved.

#### 8. Research priorities

The participants indicated that a lot of research in traffic safety education is being undertaken (27). Aspects such as methodology, target groups and preparation of education material are covered but there is little health service input.

Fundamental to any planning of research should be the recognition that the problem of road traffic accidents is multifactorial in its causation and that the solutions therefore require a multiprofessional approach. It thus follows that any discussion of research proposals should include consideration of health factors and that health personnel should be directly involved in drawing up the proposals, whether related to target groups, to methodology or to the evaluation of an education programme. If, as was agreed, education is one of the major methods available to authorities in the prevention of road traffic accidents, and if this is also used extensively by health authorities in the prevention of diseases, then, by participating in the development of research proposals, health personnel would inevitably be drawn into the prevention of road traffic accidents. Moreover, current research on health education techniques and methodology might well be of benefit to traffic education, and vice versa.

Moreover, it was felt that whatever the research programme agreed upon evaluation should be built into the programme, and the budget should include follow-up studies.

Unfortunately, the results of research programmes are not necessarily widely disseminated, and this inevitably leads to some duplication of effort. In order to reduce this overlap, the Group felt that research programmes, particularly in the educational field, should include health personnel at the design stage as well as at the implementation and evaluation stages. In order to bring this about, health authorities should make contact with research establishments to ascertain what activities are being undertaken in their various areas. Priority should therefore be given to the attachment of health service personnel to research teams that are working on the development of educational material for different categories of road user.

One fundamental problem needs to be solved. The Group agreed that traffic education should include activities undertaken by transport departments, education departments and health authorities in the field of health education. It is therefore essential that the organizational and professional relationship between health education and traffic education be clarified.

## 9. Conclusions and recommendations

### Scope of traffic education

(1) Traffic education exists in its own right and includes activities undertaken by transport and education authorities as well as by health authorities through health education. The limits of its benefits have not yet been reached.

(2) The aims of traffic education include the following:

- preventing accidents,
- increasing the mobility of society in general,
- ensuring that the benefits of increased mobility are distributed fairly,
- limiting the deleterious effects of noise and pollution,
- encouraging the development and use of environmental and engineering technology,
- persuading members of society to accept traffic safety measures, including those involving the law and its enforcement.

(3) The approach to traffic education should encompass different systems, i.e. it should have inputs from health services (including health education), general education, social services, environmental planning, road traffic engineering and the legislature. In order to coordinate the inputs, consideration should be given to the formation of a national organization or framework for the purpose. Local groups involving different professions and organizations might also be of value and could be a means of increasing community interest and participation.

(4) Traffic education programmes should be structured with the problem of evaluation in mind, e.g. by including built-in evaluation schemes. As well as data on accidents, evaluation should include observations on changes in practice in addition to alternations in attitudes and increases in knowledge. Cost-benefit and cost-effectiveness studies must be carried out. The difficulty of such evaluation should not preclude the development of programmes especially at local levels.

(5) The needs of special groups were identified as follows:

- Children as road users. Target groups for education in relation to children in traffic include: the children themselves; their parents; teachers and youth leaders; other adult road users; health service personnel involved with children; designers of the environment. The messages to be put across to children must be simple, and suited to the age group aimed at. They should include the concept of increasing risk-awareness and must be directed at the child's behaviour in those situations which a child is most likely to encounter. Traffic education for the young child should be closely related to health education in child care; it should begin with the mother during her pregnancy and continue through childhood. In general, greater attention needs to be paid to the education of adults about the limitations of children's abilities to cope with traffic at different ages.
- Child cyclists. Educational programmes for child cyclists are used in many countries, but their value has yet to be fully proved. Legislation relating to the age at which children are allowed to ride bicycles on roads has been introduced in some countries and appears to be acceptable.
- Children in cars. The education of adult car users regarding the necessity and value of using car restraint systems for children is important, but its limited success suggests that legislation and enforcement are needed. Further consideration should be given to this problem.

- Adolescents. Much is known about problems and behaviour of adolescents, but they are a difficult group to influence by educational programmes. One way of reaching them is through their work situation, and the use of the "idol" approach might well be explored as a means of education. Adolescents are often in conflict with society as regards their behaviour in traffic, and the police have an important role to play in this field. The fact that adolescents are a low-risk group as pedestrians and a very high-risk group as moped, motorcycle or car learner drivers illustrates the general principle that people are a high-risk group when they commence a new activity but become less of a risk to themselves and to other road users as they attain competence in the new skills required.
- The elderly and handicapped. The problems of the elderly in traffic are related to their functional competence rather than to their chronological age, and the diminution of their competence leads to anxieties and inhibitions in traffic which are in conflict with their wish to remain as normal as possible. The main problem is the elderly person as a pedestrian, and the high rate of fatal and severe accidents is important because of the burden it puts on the health services. It is felt that many studies of the traffic problems of the elderly have been carried out without any real knowledge of the problems of aging, and health services clearly have an important task in this field, in drawing the attention of the environmental authorities to the problems of the elderly. The environmental engineering aspect of traffic safety with respect to the elderly is of great importance, though education can help them to come to terms with the reduction of their capacity for coping with traffic. The problems of the handicapped are similar in many ways, but less is known about the effects of the different types and degrees of handicap on their personal patterns of mobility and there is room for much more research in this field. In general, the considerable body of knowledge about the elderly and the handicapped needs to be made more readily available to road traffic engineers.
- Motorists and learner drivers. The Group considered training programmes, the training of driving instructors, the driving test itself and the question of the continued education of the qualified driver. It was felt that the training given to the learner driver, and the test itself, are too narrow and that the importance of the health and behavioural aspects of traffic safety needs stressing, e.g. in the field of fatigue, alcohol, drugs and sickness itself, as well as in the use of restraint systems at all ages. In order to put this message across to learner drivers, the driving instructors must themselves be more aware of such aspects. Some form of continuing education of qualified drivers, possibly in the form of "driver improvement activities", is thought to be advisable, and here again, the health component must be stressed.
- Others. A further important target group for education includes people who shape and influence public opinion and who help to establish social norms of behaviour. Reasonable behaviour in traffic must become the accepted pattern of behaviour, but public opinion also influences those responsible for legislation: this is an important aspect because of the part that legislation and its enforcement plays in traffic safety education. Further consideration needs to be given to improving the ways in which the importance of traffic safety as a matter of social policy can be brought to the notice of those who shape public opinion, and through them, the legislators, since the role of the law and its enforcement are of paramount importance in many areas of traffic safety.

(6) For all the above groups, it was stressed that television is probably one of the more effective media of education and means of influencing public opinion so as to accept reasonable behaviour in traffic as a norm. Ways of increasing the amount of time on television which is spent on traffic education (in any guise) must therefore be sought.

(7) As stated, the overall approach to traffic education must be multidisciplinary and multisectorial. Further consideration must therefore be given to the best means for bringing together such multidisciplinary groups. Further integration and cooperation are needed, for instance, between health education and traffic education, both at a national and at an international level. In general, coordination and cooperation between the many bodies involved in traffic education might well be improved at international level by a joint study group or meeting between WHO and other international bodies working in this field, such as the OECD.

#### Health service input to traffic education

(1) Health is an important factor in traffic education for many reasons:

- people's traffic behaviour is affected by their health in many ways;
- health systems can help in delineating and reaching target groups;

- the behaviour of some special groups, e.g. children and the elderly, is a subject of study by health services in terms of the processes of child development and aging, and the medical aspects of the problem of the handicapped are self-evident;
- health systems have access to data on accidents, which are one of the most important means of measuring the success of traffic education programmes;
- health services are already experienced in the planning and implementation of large-scale preventive programmes.

(2) In most countries traffic education policy is formulated without a satisfactory input from the health sector: the fact that this is so is to some extent due to the fact that health authorities themselves have not made their interest and expertise available. The epidemiological knowledge of populations, the access of medical services to all groups of people, and the knowledge of child development and the aging process, should be made available to those responsible for traffic and for research into its problems. It is not necessary for this to be done swiftly on a national basis, but it might be worthwhile developing the role of the health services in this field over a period of time. It is, of course, recognized that the health services input into traffic education is only one of many inputs, but it is one which appears to have been neglected in the past.

(3) In order to increase the part played by health services it is necessary to make doctors and health workers of all types and grades much more aware of the roles that they might play in the delivery of traffic education. In particular, doctors should be familiar with the effects of medical conditions and drugs upon the capabilities of car drivers and be prepared to educate their patients appropriately.

(4) Health services must recognize, and try to rectify, the deficiencies in their own training programmes for all categories of health worker, but especially in the undergraduate and postgraduate training of doctors in preventive medicine and in traffic education. The programmes may be organized on an individual or group basis.

(5) As a general principle, research programmes should be drawn up in which the role of the health services is recognized at the design and evaluation as well as the implementation stages. Closer contact between research institutes and health services therefore seems advisable. Health service staff should be attached to, and associated with, research establishments so as to ensure a satisfactory input from the health sector.

#### REFERENCES

1. Berfenstam, R. Childhood accidents as a public health problem. In: Prevention of accidents in childhood. University of Uppsala, 1977.
2. Medical monitoring of road traffic accidents: report of a technical group, Odense 1978. Copenhagen, WHO Regional Office for Europe, 1978.
3. Road traffic accident statistics: report on a WHO ad hoc technical group. Copenhagen, WHO Regional Office for Europe, (EURO Reports and Studies, No. 19).
4. The influence of alcohol and drugs on driving: report of an ad hoc technical group, Monaco, 1978. Copenhagen, WHO Regional Office for Europe, 1979.
5. The planning and organization of emergency services: report of a technical group. Copenhagen, WHO Regional Office for Europe, 1981, (EURO Reports and Studies, No. 35).
6. Protective devices and restraint systems in traffic accident prevention: report of a technical group, Meknés, 1979. Copenhagen, WHO Regional Office for Europe, (in preparation).
7. Problems of children of school age (5-9 years): report on a working group, Copenhagen, 1975. WHO Regional Office for Europe, Copenhagen, 1976.
8. Sandels, S. Children in traffic. London, Elek Books, 1975.
9. Sadler, J. Children and road safety: a survey amongst mothers. London, Office of Population Censuses and Surveys, Social Survey Division, 1972.
10. Kanthor, H.A. Car safety for infants: effectiveness of prenatal counselling. Paediatrics, 58: 320-322 (1976).

11. Scherz, R.C. Restraint systems for the prevention of injury in children in automobile accidents. American journal of public health, 66 (5): 451-456 (1976).
12. Sandels, S. An overall view of children in traffic. In: Jackson, R.H., ed., Children, the environment and accidents. Tunbridge, Pitman Medical Publishing, 1977.
13. Howarth, C.I. et al. An analysis of road accidents involving child pedestrians. Ergonomics, 17 (3): 319-320 (1974).
14. Craft, A.W. Bicycle accidents to children. In: Jackson, R.H., ed., Children, the environment and accidents. Tunbridge, Pitman Medical Publishing, 1975.
15. Risk, A. & Raymond, S. Child cyclists, safety instruction and accidents. University of Salford, 1976.
16. Department of Transportation, National Highway Traffic Safety Administration. Five year plan for motor vehicle safety and fuel economy rule making. Federal Register, Volume 44, No. 82, Thursday April 26, 1979.
17. Williams, A.F. Airbags and out-of-position children: a survey. Accident analysis and prevention, 8: 143-144 (1976).
18. Henderson, J.M. et al. Performance of child restraints in crashes and in laboratory tests. Traffic Accident Research Unit, Department of Motor Transport, New South Wales, 1976.
19. Williams, A.F. Observed child restraint use in automobiles. American journal of diseases of children, 130: 1311-1317 (1976).
20. Freedman, N. & Lukin J. Occupant protection for children: a survey of restraint use, attitudes and knowledge. Traffic Accident Research Unit, Department of Motor Transport, New South Wales, 1977.
21. Bass, L.W. & Wilson, T.R. The paediatrician's influence in private practice measured by a controlled seat belt study. Paediatrics, 34: 700-704 (1964).
22. Williams, A.F. & Zador, P. Injuries to children in automobiles in relation to seating location and restraint use. Accident analysis and prevention, 9: 69-76 (1977).
23. Broughton, C.J. Present situation of Australian legislation covering child restraints. (Paper presented at Royal Australian College of Surgery seminar on restraining the child in a car. Melbourne, 1978).
24. World Health Statistics Report (awaiting publication).
25. Medical aspects of fitness to drive. London, The Medical Commission on Accident Prevention, 1976.
26. Miller, F.J.W. et al. The school years in Newcastle upon Tyne. London, Oxford University Press, 1974.
27. Training objectives and techniques: report of a working group on road safety. Brussels, OECD, 1978.

Annex

LIST OF PARTICIPANTS

TEMPORARY ADVISERS

- Professor W. Böcher  
Institute of Traffic Education, University of Essen, Federal Republic of Germany
- Dr C. Conrad  
Academy of Public Health, Düsseldorf, Federal Republic of Germany
- Professor P. Delormas  
Faculty of Medicine, University Hospital Centre of Grenoble, La Tronche, France
- Dr Agnes Holtwick-Sinendonk  
Director, Office of Public Health, Essen, Federal Republic of Germany (Chairman)
- Dr I. Howarth  
Professor of Psychology, Department of Psychology, University of Nottingham, United Kingdom
- Dr R.H. Jackson  
Consultant Paediatrician, Department of Child Health, The Royal Victoria Infirmary, Newcastle upon Tyne, United Kingdom (Rapporteur)
- Dr H. John  
Chairman, Central Commission on Medical Evidence, Traffic Medicine Service of the German Democratic Republic, Berlin, German Democratic Republic
- Dr J.T. Jones  
Senior Medical Officer, Department of Health and Social Security, London, United Kingdom
- Mr M. Mäki  
Head, Research Department, Central Organization for Traffic Safety, Helsinki, Finland
- Dr C. Michalik  
Traffic Safety Council, Vienna, Austria
- Mrs M. Simonnet  
National Road Safety Organization, Arceuil, France
- Mr C.P.G. Tilanus  
Ministry of Transport and Public Works, Directorate of Traffic Safety, Woerden, Netherlands
- Dr P. Todorovic  
Chief, Department of Traffic Medicine and Environmental Hygiene, Institute of Public Health of the Republic of Serbia, Belgrade, Yugoslavia
- Dr K. Wegmüller  
Swiss Office for Accident Prevention, Berne, Switzerland

REPRESENTATIVES OF OTHER ORGANIZATIONS

League of Red Cross Societies

- Mr J. Weyand  
Chief First Aid Adviser, Geneva, Switzerland

ICP/ADR 013  
3611B  
page 20

WHO REGIONAL OFFICE FOR EUROPE

Dr W. Fritsche  
Regional Officer for Health Manpower and Management

Dr C.J. Romer  
Regional Officer for Accident Prevention (Secretary)