

# Psychosocial Factors Related to Accidents in Childhood and Adolescence

Report on a WHO Technical Group

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## INTRODUCTION

The Technical Group on Psychosocial Factors related to Accidents in Childhood and Adolescence was convened in Brussels, from 29 to 31 January 1980, by the WHO Regional Office for Europe in cooperation with the Belgian Government. The meeting was attended by 16 temporary advisers from 11 countries, and by three members of staff of the WHO Regional Office for Europe.

Professor E. Sand was elected Chairman and Professor R. Smith Rapporteur.

The meeting was opened by Dr M. Postiglione, Director, Disease Prevention and Control, WHO Regional Office for Europe, on behalf of the Regional Director. He reminded the Group that the report of the recent WHO Conference on the Child and the Adolescent in Society (*1*) stated that "one of the underlying causes of the high frequency of accidents, especially in adolescence, is psychosocial" and that "the origins of the problem lie neither in disease nor deprivation but rather in environmental conditions".

The participants were welcomed by Professor A. Lafontaine, Director of the Institute of Hygiene and Epidemiology, Brussels, who expressed the hope that the Technical Group would help in clarifying this important but difficult field.

Dr C. Romer, WHO Regional Officer for Accident Prevention, reviewed the background to the meeting. The fact that human factors play an important part in the etiology of accidents emphasized the role of psychological, social and cultural influences. One major population group in which psychosocial factors are believed to be predominant comprises children and adolescents. Since accidents are the leading cause of mortality and very possibly of morbidity and disability in this group, it is a matter of public health priority to try to define the problems and propose effective measures for their solution.

The Group focused on four objectives.

1. A review and analysis of available evidence on psychosocial factors in accidents among children and adolescents, with a view to its practical application in terms of preventive measures.

2. A review and analysis of methods used to meet the demand for medical and other support services in response to accidents in the community.
3. The development of an analytical framework outlining the relationship between psychosocial risk factors and other social and environmental risk situations, in order to consider appropriate strategies for intervention. (This permits a degree of conceptual and methodological clarity in the formulation of policies and plans, and in implementing preventive strategies.)
4. Suggestion of specific measures to minimize or prevent the occurrence of accidents, by selecting those psychosocial factors amenable to manipulation or modification. (Other factors may be less amenable to change because of their mediating influence, and therefore alternative strategies may be appropriate.)

## GENERAL PERSPECTIVE

Reviewing data relating psychosocial factors to accidents in childhood and adolescence requires an interdisciplinary approach, including clinical, ergonomic and epidemiological elements. In this context, clinical data contribute information on patients and the nature of their injuries. Ergonomics examine the interface between individuals and their environment (2). These approaches, in combination, permit a more comprehensive view of the multifactorial nature of accidents in children, and help clarify the role of psychosocial factors as they may be implicated in the process of cause and effect.

Adverse psychosocial influences stem from individual characteristics as well as from social-structural features in society. Some factors may have a more direct and immediate effect, such as driving while under the influence of alcohol. Other factors may be more indirect and have a mediating influence, such as family instability and its impact on parent-child relationships. The fact that it is difficult to ascertain the influence of a particular factor, or combination of factors, on accidents in society does not preclude its relevance concerning our understanding of the problem, nor its potential for modification through intervention.

It also needs to be pointed out that other adverse influences, such as a "near miss", have a positive effect by making people aware of risk situations and enhancing the likelihood of their avoiding risks. This kind of learning experience may serve a useful purpose: those who experience such events and acquire an awareness of risk in similar situations may tend to engage in preventive behaviour.

## Definitions

For the purposes of this review and approach to the problem, an accident is defined as “an unpremeditated event resulting in recognizable damage” (3, 4). Although the accident may be viewed as an unforeseeable event, psychosocial factors, among others, may be amenable to modification and thus the risk of accidents reduced.

Other definitions of an accident have been employed. One quite similar to that above states that “an accident is an event which – caused by some rapidly acting force, independent of man’s will – manifests itself in physical or mental damage” (5). Given a narrower approach, such as traffic accidents with the focus on recognizable damage to property, the definition changes. The one employed by the US National Crash Severity Study is an example: the emphasis in accidents is on the “vehicle in crashes severe enough to disable the car. Pedestrian accidents, and other accidents in which vehicles did not have to be towed away, were excluded from the study” (6). Like the definition used in this report, each tends to reflect the purpose served. Thus the working definition employed here serves the purpose of this report, primarily because of its inclusiveness.

In this report, the terms “childhood” and “adolescence” are based on chronological age; other indicators of development, such as an index of puberty demarcating one phase from another, are difficult to use, especially for accident statistics relevant to health policy and planning. Childhood refers to the period under 10 years of age; *early* childhood is sometimes distinguished from *late* childhood on the basis of age and school entry, i.e. those under 5 years of age from those between 5 and 10 years of age. Adolescence is defined as the age period 10-19 years. The individual is no longer viewed as a child but “is not yet considered by society to be fully adult” (7). It is useful also to distinguish between *early* and *late* phases of adolescence, i.e. 10-14 and 15-19 years, respectively (mainly for the purpose of collecting aggregate statistical data).

Psychosocial factors are defined as those influencing the accident or attendant risks associated with the accident, stemming from the psychology of the individual and the structure and function of social groups (8). They include social characteristics such as family kinship patterns and lifestyles, the social system’s institutionalized ways of coping with threats and solving conflict, cultural characteristics such as values and beliefs governing the socialization of children (including child-rearing practices), and psychological characteristics such as attitudes and personality.

Another definition of psychosocial factors is suggested by Kagan & Levi (9) and Kagan (10) in their discussion of “psychosocial stimuli” that may facilitate the expression of disease through the mediation of stress reactors. In this context, they offer a more inclusive definition encompassing social relationships in which psychosocial factors act as stimuli, together with

basic biological functions and physiological mechanisms of the human organism. However, it seems appropriate to re-emphasize the unique properties of social relationships in the analysis of psychosocial factors in accidents. According to Dean & Lin (11) the properties of all human groupings are seen to rest on the biological and psychological properties of the human animal. Conversely, group structures and processes significantly influence psychobiological variables. Groups tend to respond in various ways to the adaptive and adjustive contingencies of the human organism, the group, and the external environment. However, like psychological properties, groups have distinct structural elements and processes which are not reducible to biological observations or explanations. Consequently, although the definition of "psychosocial stimuli" is more inclusive of basic elements, the working definition employed places emphasis on psychosocial factors in social relationships, and less on psychomotor or neocortex functions.

## EPIDEMIOLOGY OF ACCIDENTS

The epidemiological study of the chain of events in accidents requires: (a) a definition of the problem; (b) identification of the population at risk and the amount of exposure (risk exposure), together with specification of population parameters (sociodemographic); (c) ascertainment of cases (the victim); (d) the circumstances surrounding the accident (personal, social, environmental); and (e) the consequences associated with the event, for the victim, the family and the service system (medical and support services).

The first aspect (item a) has been specified as a working definition, perhaps with some limitation in applicability. From the perspective of psychosocial factors related to childhood accidents, the definition of an accident as an unpremeditated event suggests an element of chance, and therefore it is unlikely to be influenced by the occurrence or presence of other events. However, psychosocial factors that may be implicated as risk factors suggest estimates of the likelihood of an accident occurring in a population, and these risk factors may be subject to influence or control. Marcusson & Oehmisch (5), who employed the same working definition in their analysis of accident mortality in childhood, point this out by stating "... the term 'unpremeditated' should be understood to imply that, while in the individual case, the event is unforeseeable, accident risks can be estimated and appropriate preventive measures can be taken on the basis of practical experiences, *ad hoc* surveys and statistical analyses". Furthermore the outcome of an accident as recognizable damage (physical and/or mental) may be suspect in our estimates of the prevalence and incidence of accidents, especially in

childhood. The definition of "damage" may vary according to the criteria employed by medical practitioners, by others such as the police and fire services, and by the victim or his guardian.

Additional care needs to be given to the aspect of population at risk and risk exposure (item *b*). In a given population, a certain percentage may be at risk because of exposure to a hazardous condition; of this group, some may be exposed more than others and hence have a different rate or amount of exposure to that condition. Road traffic accident fatalities among school-children may illustrate the significance of risk exposure, as well as the relative contribution of social patterns of behaviour and environmental conditions. Children living in urban communities may be exposed to traffic on their way to and from school, some during times of heavy traffic flow. Furthermore, some children may be more experienced and aware of the risks. A traffic fatality occurring in a "heavy traffic" group reflects a different risk exposure compared to such an event happening in a "light traffic" group. Also, the psychosocial and environmental factors involved are relevant to the assessment of risks in childhood accidents. These same factors are relevant in determining the type of intervention strategies that may be amenable to change, in order to minimize the occurrence of accidents.

The ascertainment of cases (item *c*) may be influenced by various service response patterns in the process of identifying and recording accident victims. Criteria of registration may vary according to the service (police, hospital, physician) involved; also, lack of coordination among services may further hinder ascertainment as well as reporting accuracy. Aside from these formal service contacts, there is the matter of case reporting by lay members in the community, including parents, especially following minor trauma or injury such as a fall or burn. The epidemiological evidence on accidents may have gaps in case reporting due to these psychological, sociological and service system factors. If systematic biases are present, the observed estimate of the magnitude of the problem, along with the sociodemographic characteristics that describe it, will be insufficient. In turn, these insufficiencies will influence intervention strategies and their potential effectiveness.

The circumstances (predisposing and precipitating) surrounding the accident (item *d*) are of central importance in this report and will be detailed to the extent that reliable evidence is available. Predisposing circumstances involving psychosocial factors are those contributing to the likelihood of a risk situation; precipitating circumstances are those more directly associated with the accident. Emphasis will be placed on the role of psychosocial factors, since these relate to the circumstances associated with childhood accidents.

Finally, the consequences of accidents in relation to the magnitude of the problem take on a special meaning in this particular age group. Mortality and morbidity data, including disability, suggest the extent of the burden placed on society (e.g. economic loss, years of life lost), but long-term effects are not easily measured and assessed. Personal loss, psychological

trauma, social deprivation, economic dependence and family disruption are part of the long-range negative consequences. These effects should therefore be assessed in order to estimate the relative contribution of intervention strategies that could have beneficial effects.

### Epidemiological facts

The main epidemiological evidence concerning accidents in childhood and adolescence may be categorized by (a) outcome in terms of mortality and morbidity/injury, (b) type of accident, and (c) basic population (demographic) and relevant social/environmental characteristics. Generally, data are presented across categories; a systematic approach incorporating all categories is not always evident. The evidence on psychosocial factors is presented later.

Accidents are the leading cause of death among those under 15 years of age and account for one half or more of all deaths in this age group (1, 5, 12). Death rates are higher for boys than for girls and, for each group, tend to decrease with age. The downward trend by age is more marked for girls, even though their overall mortality rate is lower, as shown in Table 1.

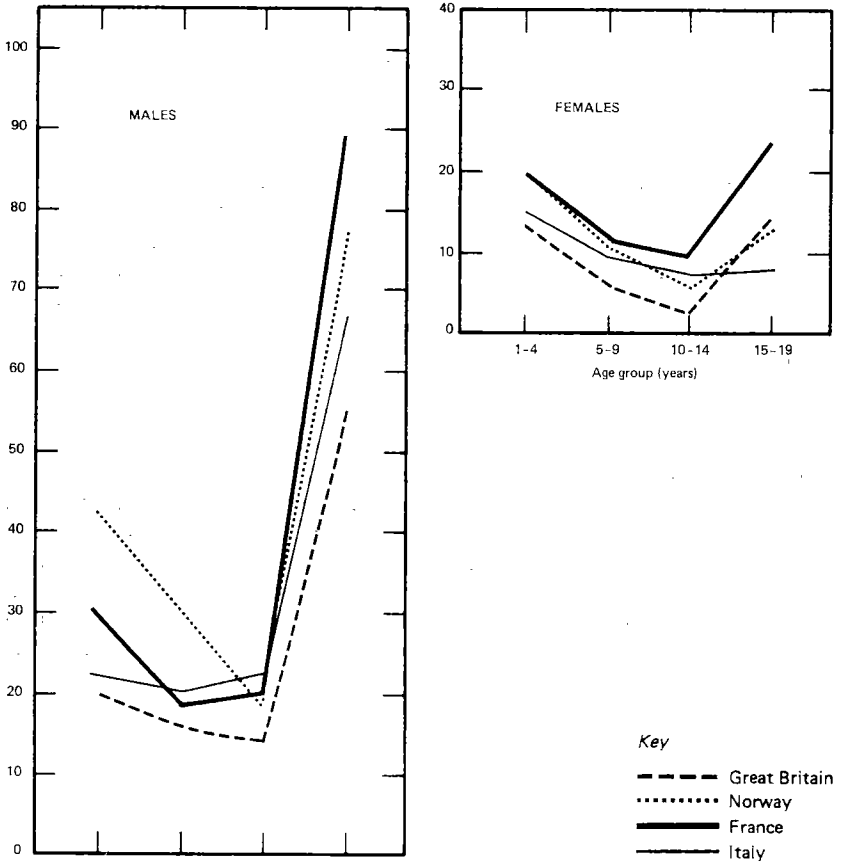
Table 1. Accidental deaths per 100 000 children aged 1-14 years in European countries in 1971 (weighted averages).  
From Marcusson & Oehmisch (5).

Age group (years)	Boys	Girls
1-4	31.2	19.4
5-14	22.6	10.5
1-14	25.0	13.0

Motor vehicle and other transport accidents account for the majority of deaths in these age groups, and these tend to be higher in industrialized countries. Accidental drowning, fires/burns, falls and poisoning are the other causes of death, but these in combination play a less dramatic role in the pattern of mortality among the young (13).

Although not representative of all European countries, Fig. 1 shows steep increases in accident mortality rates for 15-19-year-old boys and girls. The increase is particularly noticeable for boys and is due chiefly to road traffic accidents.

Fig. 1. Accidental deaths per 100 000 children by age and sex in four European countries, 1970-1974.  
From Lévy (14).



Accident morbidity in children and adolescents is less documented and reliable. One estimate of the magnitude of the problem suggests that for every child who dies from an accident, another will be permanently handicapped because of an accident, 10 other children will be hospitalized for approximately 30 days following an accident and 1000 other children will have an accident not requiring hospitalization (1). Even if these figures are approximate, the general trend indicates the magnitude and seriousness of nonfatal accidents among children.

Trends in accident deaths since the early 1950s show a decline for those aged 1-4 years, with Sweden having one of the lowest accident mortality rates in this age group. However, there appears to be a general increase in mortality rates for those 5-14 years of age; in Europe the average increase is observed for both sexes and this trend is observed more markedly for those aged 15-19 years (14). Motor vehicle accidents account for much of this increase in mortality, and between 1955 and 1971 the average percentage increase was higher for girls than for boys (5). This difference suggests that girls experience greater changes during their school years, or perhaps are exposed to more social change, but this is conjectural and the reasons remain elusive.

From the perspective of risk factors, boys aged 5-19 years, and particularly those between 10 and 19 years of age, are at greater risk of death from motor vehicle accidents than other age/sex groups. They constitute a heterogeneous "target group", since each person in this group is not at risk to the same degree. However, other psychosocial factors related to children's behaviour may be relevant to this target group. Examples in the literature include an increased likelihood of driving at an early age, learning to take risks (risk-taking behaviour) in the ordinary course of physical and social development, substance abuse (particularly the abuse of alcohol), and traits related to aggression, competition and identity crises (1, 3, 15-17). Different levels of risk exposure may characterize selective subgroups in this population. Thus, identification of basic demographic characteristics will further our ability to specify psychosocial factors that may be implicated in this problem.

## INDIVIDUAL CONTRIBUTORY FACTORS

Individual factors related to accidents in children were reviewed in terms of personality structures, psychological traits, and behavioural characteristics. Factors considered relevant include disturbed personality ("unbalanced" personality characteristics), maladaptive traits (excessive aggressiveness or passivity), and over-reaction to stimuli (adverse reaction to noise). It was

emphasized, however, that individual factors are conceptually part of a larger systems framework, i.e. the individual functions in a social and environmental context.

Furthermore, time-dependent factors such as age, developmental sequences in the growth process, and transitory characteristics such as fatigue are relevant and need to be taken into account in examining individual behaviour in accidents (16). In this context, relevant individual contributory factors are those personality characteristics and behavioural traits that can be identified and implicated in accidents (or associated with accident behaviour) and, once specified, could be considered amenable to modification through intervention.

Evidence presented suggests that an "unbalanced" personality, in terms of specific traits, may contribute to an individual's predisposition to risk. An unbalanced trait is meant to reflect extreme deviation, in either direction, from the socially accepted pattern of personality. Typical variation occurs for any given personality trait, and this variation is considered to fall within the normal range, i.e. within the bounds of a flexible "balanced" personality. The more unbalanced the trait, the greater the likelihood of instability and consequent negative effect on individual behaviour.

Also, compensatory behaviour by children is viewed as an over-reactive response to complexities associated with growth and development (self-identity, need achievement, recognition). This may be expressed by unusual risk-taking behaviour or by more extreme forms such as aggression and intolerance.

Another psychological factor cited is that of one's subjective estimation of risk in relation to the act of risk-taking in traffic, particularly by adolescent road-users. The individual's subjective estimation of danger — of the threat to himself — influences his degree of risk-taking behaviour. The higher the apparent risk and the lower the acceptable risk, the more likely that the individual will behave in a cautious manner, and vice versa. The child learns to relate his perceived risk more effectively with the act of risk-taking, and thus tends to engage in adaptive behaviour in traffic with the passage of time. Exposure to such situations, together with the experience acquired, implies a gradual decrease in the likelihood of an accident.

Other psychological factors reviewed included the traits of initiative, concentration and reliability as these relate to accidents among children. It was observed from the Newcastle upon Tyne longitudinal family survey (18) that schoolchildren with "below average" assessments for these traits, compared to children with "above average" readings, tended to have a higher incidence of accidents. Although this has yet to be explored further, it may suggest a pattern of deviation, indicating psychological maladaptation or an unbalanced personality that enhances the likelihood of an accident.

Only specific personality traits have been identified from the evidence available, strongly suggesting that no specific accident-prone personality type

can be implicated in analysing the psychology of accident behaviour. Furthermore, the extent to which a specific trait may be amenable to modification, and remain stable over time, is an open question.

## SOCIAL CONTRIBUTORY FACTORS

The Technical Group reviewed evidence presented by its members, which proved to be a synopsis of social indicators implicated in accidents involving children and adolescents. Social factors were seen primarily to have a mediating influence, operating indirectly through the child's development and social environment but nevertheless leading to increased risk of accident involvement. Mediating factors identified were family dysfunctions such as instability, social deprivation resulting from limited social resources, and the uprooting and disruption of socially supportive networks (1, 3, 16, 19). In other words, social deprivation and social deviance were seen to be related to an increased risk of accidents in childhood.

It appears that family integration may play an important role in enhancing or inhibiting accidents or accident-prone behaviour among children. This is observed by measuring the closeness of the relationship between parent(s) and child in terms of responsiveness to emotional needs, the level of responsibility taken by the parent toward the child's growth and development, and the development of self-identity and social responsibility through consistent child-rearing practices. Social inhibitors to family integration and sense of social unity include marital discord, marriage disruption (through divorce, separation, or death), substance abuse by a parent (especially alcohol abuse), serious illness of a family member, child neglect, and large family size (16, 20). Thus, instability in family life seems to have a negative influence on the child's social development and increases the risk of the child having an accident.

From another perspective, social deviance may be viewed as a mediating influence through the behaviour of late adolescents and young adults (between the ages of 15 and 25 years) who as drivers may contribute to the risk of an accident involving a child. There is evidence that socially maladjusted persons, as characterized by repeated criminal convictions, paroxysmal financial stress, attendance at venereal disease clinics, and other indications, constitute a large proportion of the drivers involved in road accidents (16).

Other adverse social conditions that characterize the family in relation to the broader social context appear to attenuate the level of social integration of the family in the community. Furthermore, these indicators of social deprivation are correlated with family dysfunctions. Low socioeconomic status, coupled with other social problems such as economic insecurity and

chronic unemployment, further reduce the family's social standing. Although likely to have an indirect influence on accidents, these mediating factors reflect greater exposure to adverse social conditions, along with exposure to adverse environmental conditions (such as high population and housing density as well as inadequate housing and recreational space) which in combination enhance the risk of accidents among children in the home and in traffic (18, 19).

The major social factors contributing to accidents in children and adolescents are related to secular trends in society as well as to cultural norms and values. These were seen as social-structural features and attitudinal-value orientations that probably add to accident risks in society.

Structural features such as socioeconomic differentiation in society tend to increase social inequality and perpetuate social disadvantages for some groups, and poor distribution of services and facilities tends to further service system inequities related to need. In addition, values and attitudes reflected in the social norms of competitiveness and individual achievement were considered to have adverse effects on maintaining a healthy social environment; in contrast, cooperative efforts toward social solidarity, responsibility to group goals, and non-exploitative behaviour were viewed as having preventive and therapeutic effects.

However, these major social-cultural factors are not considered readily amenable to modification for the purpose of preventing or reducing childhood accidents. This does not preclude social intervention as a means of controlling social behaviour.

Even though specific risk factors could be related to childhood accidents and, on another level, risk groups could be identified, no conclusive proof could be found that a distinct cluster of social factors contributed to accidents or increased the risk of accidents.

## COMMUNITY RESPONSE TO ACCIDENTS IN CHILDHOOD

The Technical Group considered society's response to childhood accidents, i.e. formal and informal support services in the community. Government agencies were regarded as facilitating the coordination and dissemination of accident data for the purpose of planning and implementing policies on accident reduction or prevention. Nongovernmental bodies, including voluntary organizations, were seen as contributing to information gathering and acting as a resource network that could complement various public programmes in the community. Action programmes, however, depend on the particular sociopolitical context in which they operate.

General components of the system's organizational response pattern were reviewed by the Group in order to examine efforts emanating from both sectors of society, the Swedish system of response to the problem being cited as a particular example. This should not be viewed as a typical example for other countries to follow, either those in the advanced stages of economic development or those less developed. However, certain features of this formal support structure and its related service systems may prove useful in other geopolitical contexts.

Hypothetically, components of the community's response through government structures include four basic systems that are linked in a sequential manner for the purpose of information gathering, processing, action, and feedback. These general systems are:

- (a) in-data system;
- (b) analysing and coordinating system;
- (c) action system; and
- (d) follow-up and evaluation system.

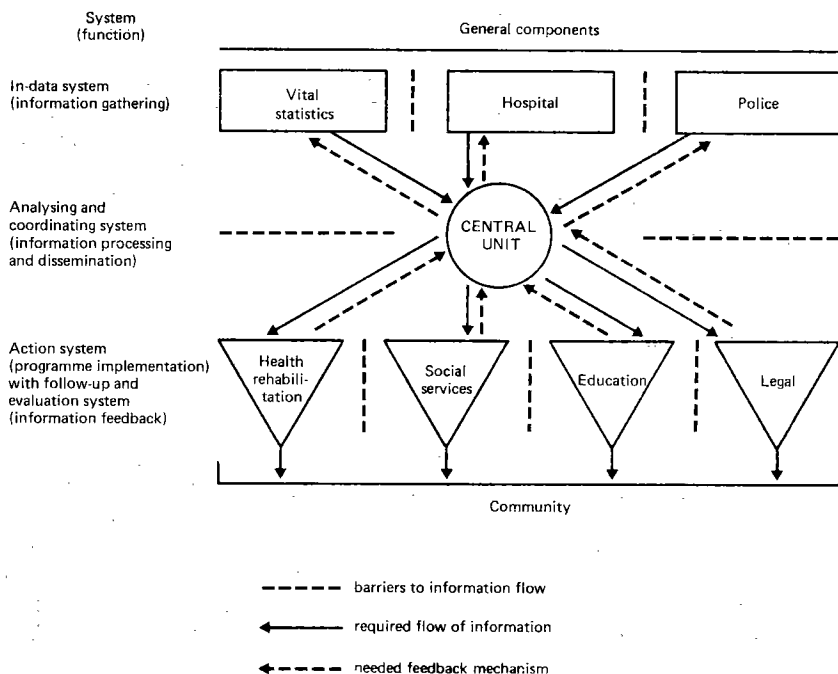
In relation to accidents in children, the hypothesized model of linked systems is only approximated in the community, as illustrated in Fig. 2. As an example, the public health service acts as an information gathering system, but not all data are collected in a systematic and standard way, even within a country, and some relevant information may be collected by other government bodies (e.g. the police).

Many European countries have a central statistical and epidemiological unit for the purpose of analysing health statistics. However, accident mortality data appear to be the more common type of information analysed, while morbidity and disability data are not readily available. Also, the coordinating function of this unit is absent and is not normally assumed by some other government body linked with these systems.

The action system in the community includes a number of subsystems. The most noticeable are education, health, social, and legal-judicial services. It is questionable whether these subsystems effectively link data on childhood accidents, accident prevention measures, and traffic safety programmes. In addition, to be more effective in the community, the action system should be linked to follow-up and evaluation systems providing feedback to all other systems. This function is not readily available as either a separate government service or as a generic service of one of the basic systems.

Nongovernmental structures were viewed as resource networks complementing the formal activities of public agencies and programmes. Voluntary organizations such as the Red Cross and automobile associations, as well as insurance and commercial enterprises, were considered information resources. These networks, however, do not seem to be adequately linked with the

Fig. 2. The community's response to childhood accidents:  
linkage and barriers



community's general effort towards accident control and prevention; rather, they appear to operate independently and at times duplicate the functions of other structures. This lack of integration may inhibit the community's efforts at concerted action toward alleviating the problem of childhood accidents.

In Sweden, it was observed that progress was being made towards coordinating and integrating the major components in the community. This includes improved registration procedures for gathering information on accident victims treated in hospital and the use of such data for coordinating government activities towards the prevention or reduction of accidents, especially traffic accidents.

Although information and linkage gaps exist in the overall system, the structural features of these systems (primarily governmental) are nevertheless designed to identify the magnitude of the problem, and to find ways of utilizing data for the purpose of implementing control and prevention measures, and instituting feedback procedures to evaluate programme impact. In general, the overall system seems to approximate the ideal model, yet information on psychosocial factors related to childhood accidents, along with relevant morbidity and disability data, appear inadequate.

The Technical Group's general observation was that the system's response is often fragmented and limited in its efforts; it also tended to duplicate work in some areas (e.g. mortality data collection). This is evident even in countries with extensive health, education and legal systems that are directed, in part, to monitoring childhood accidents. In the less economically developed countries, the gaps are more pronounced.

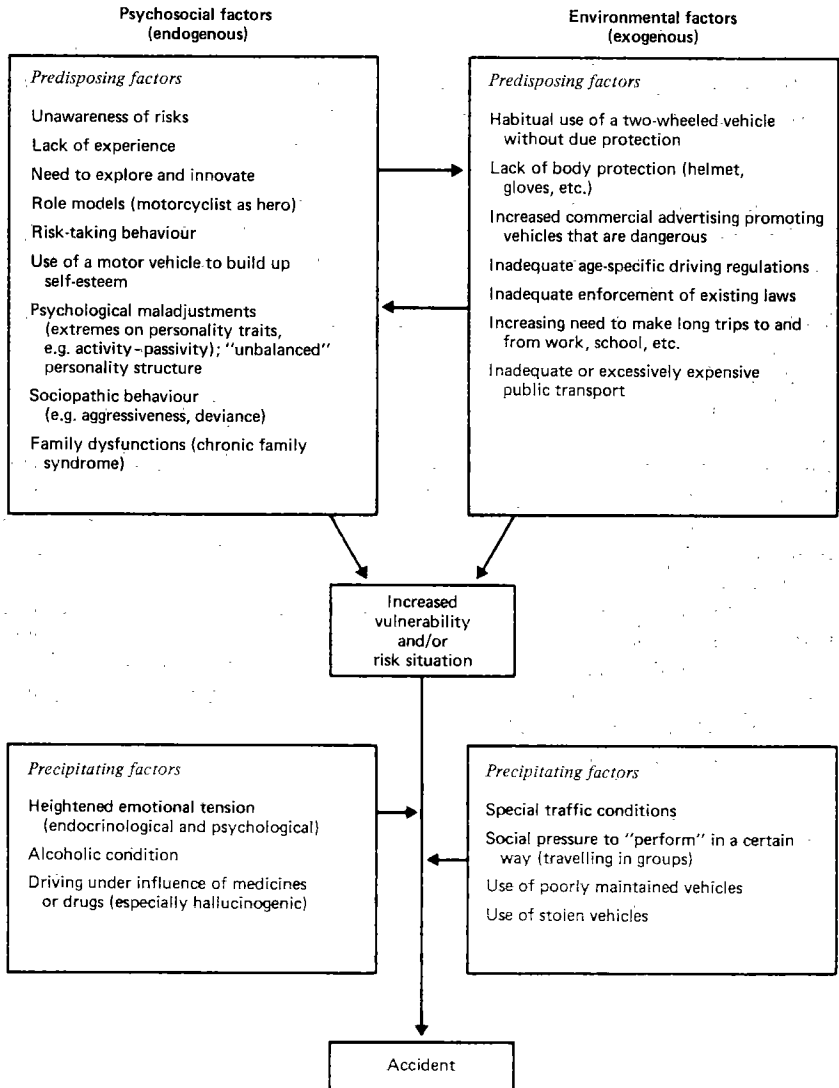
### ANALYTICAL FRAMEWORK: PSYCHOSOCIAL FACTORS RELATED TO ACCIDENT RISK

The Group focused attention on the development of a model that would incorporate individual, interpersonal and situational factors, together with social-structural features, into a general framework for the purpose of analysing the dynamics of childhood accidents. Basic environmental factors such as physical characteristics of the ecosystem, as well as transportation networks and engineering safety devices, were included in this framework; these factors have not been specifically dealt with in this report, but they have been covered by other expert bodies.

In formulating the analytical framework, the Group directed special attention to the process whereby psychosocial factors could be identified, the stages or levels at which this was possible, and the likelihood of their being amenable to modification with favourable results. Psychosocial (endogenous) factors related to accidents were distinguished from environmental (exogenous) factors, and each set of factors was further distinguished by stage, that is, as predisposing factors (those leading to a situation of increased risk, or increased vulnerability) and precipitating ones (those leading to the accident). This schematic outline should be viewed as a provisional model.

The framework is illustrated in Fig. 3, which outlines the principal factors in accidents involving adolescent drivers of two-wheeled vehicles. Primary predisposing psychosocial factors are shown together with predisposing environmental factors. At this stage, interaction occurs between these sets of factors and these in combination heighten vulnerability for the individual and/or increase the likelihood of a risk situation.

Fig. 3. Primary factors in accidents involving children and adolescents



Interaction occurs between stages as well, that is, between predisposing and precipitating factors. Moreover, the same factor may play a role in both stages; alcohol, for example, may be a predisposing factor (alcoholism) or a precipitating one (acute intoxication). At the level of precipitating factors, both psychosocial and environmental factors interact to influence the nature and severity of an accident.

Furthermore, a more dynamic model of risk factors in accidents may be introduced based on the analytical scheme illustrated in Fig. 3. As shown in Fig. 4 this can serve to (a) introduce the notion of a "near miss", such as an accident without injury, and (b) indicate the impact of an accident in terms of psychosocial and environmental consequences and their subsequent influence on predisposing factors through a feedback mechanism. This more generalized model seems appropriate for any type of accident and appears applicable to situations at any stage of economic development. The content of the enclosures in Fig. 4 may be different depending on the sociodemographic characteristics of the population and the social-structural features of the community, as well as the kind of accident.

One other important aspect of this analytical framework pertains to the notions of association, causation and manipulation (Fig. 5). In examining the role of psychosocial risk factors related to childhood accidents, an association may be observed such as the relationship between socioeconomic status and accidents among children (when exposure is controlled). In effect, socioeconomic status has a mediating influence on childhood accidents.

Another causal association — direct or indirect — may operate, such as with working mothers of lower socioeconomic status. "Working mothers" is a factor found to be associated with a higher incidence of accidents among schoolchildren. This factor, as it is, may be more of an indirect causal association; the presence or absence of "someone at home" is probably more directly associated with accidents among children, and may be even more directly related to the mother's feelings of responsibility and supervision over her child, whether present in the home or absent (direct supervision while at home; use of substitute supervision when away).

To the extent that an indirect or more direct causal association can be empirically verified, this provides a predictive element in society's effort to control or prevent accidents, or to modify risk factors associated with accidents. Thus, the management of childhood accidents stems from our ability to identify and measure psychosocial risk factors, to establish their position in the causal chain, and to determine the extent to which each factor, or cluster of factors, is amenable to manipulation or modification.

Fig. 4. Dynamic model of risk factors and consequences in accidents

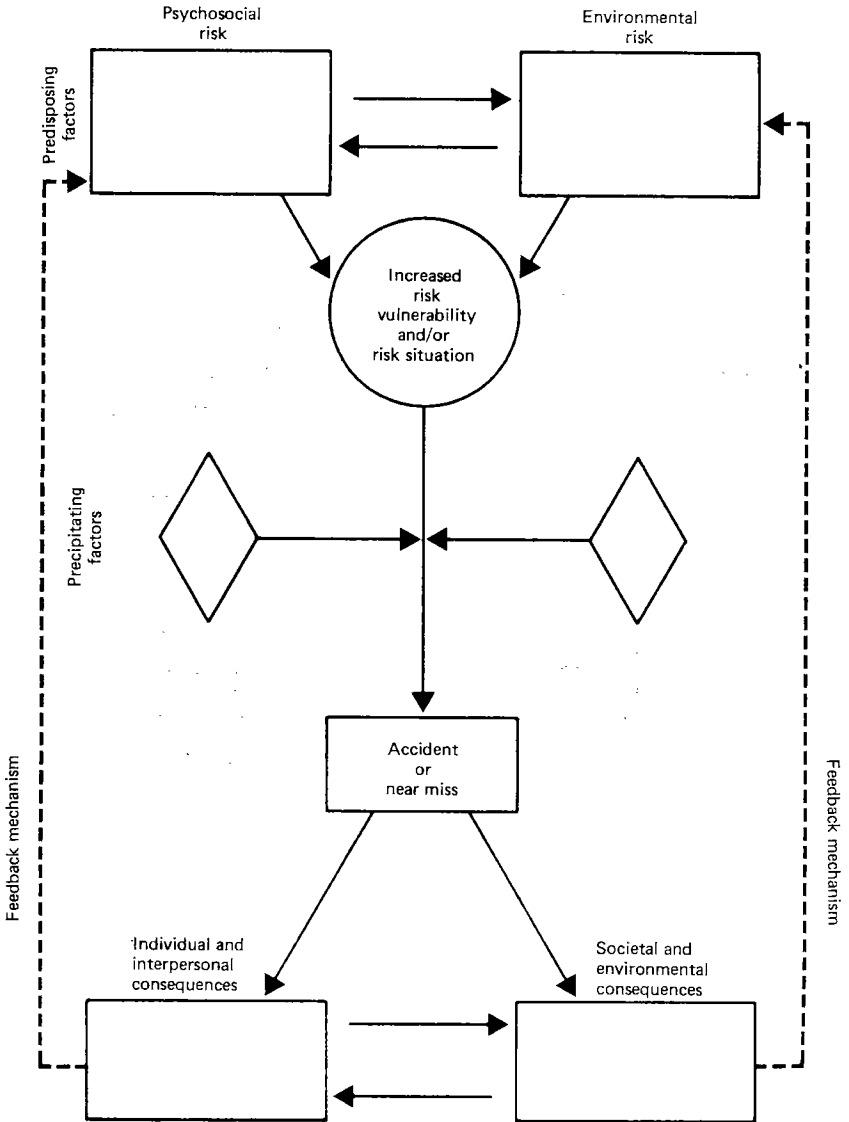
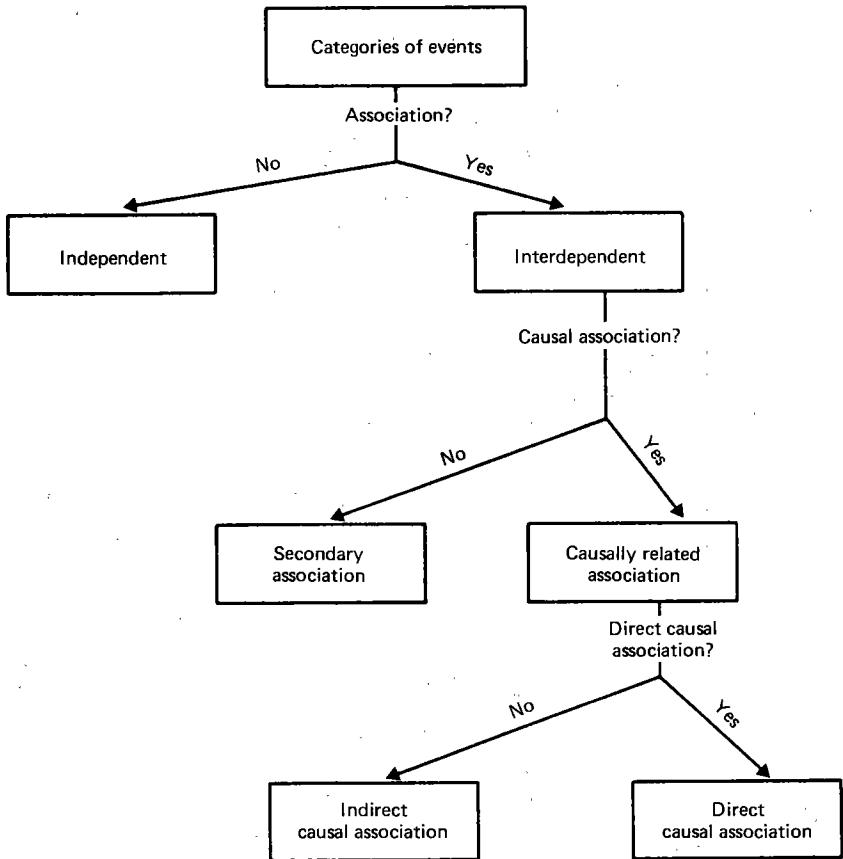


Fig. 5. Classification of statistical association of categories of events



## PSYCHOSOCIAL FACTORS AMENABLE TO CHANGE

In reviewing and analysing psychosocial risk factors in accidents involving children and adolescents, the Group found this particular area a most difficult one to tackle. Identifying those risk factors likely to be amenable to modification, as a practical application, involves a systematic assessment and evaluation of all relevant variables, a major task beyond the capabilities of the Technical Group. However, with this proviso, the Group made a number of observations that are relevant to the task at hand.

Intervention at the individual level is directed mainly towards modifying the child's behaviour in the home and in traffic, primarily by making the child aware of dangers and risks. During the stage of development and socialization, behaviour modification techniques are employed to bring about assimilation of cognitive cues and perceptual skills that enhance the likelihood of appropriate decisions and actions in risk situations. The emphasis is on the individual, and is directed towards influencing the child's behaviour in the different situations that may be encountered. The approach further implies that the child is the decision-making element in traffic and home accident prevention.

Thus, we observe extensive use of educational programmes designed to teach the child to perceive risks, to assess their degree of danger if action is to be taken, and to weigh the consequences of an action before engaging in the act itself. An example of this approach is that of task analysis applied to pedestrian behaviour in traffic, in which the elements of the tasks required are structured and the child learns how to engage in safe (risk-avoidance) behaviour under different conditions (21, 22). "Stepping off the curb" under appropriate circumstances is one example of a learning task. This approach is viewed by some as one of theoretical simplicity, in that only the most proximate elements to the task at hand, i.e. precipitating factors in the immediate situation coupled with the individual's actions, are considered relevant. The kinds of precipitating factor involved (see Fig. 3) may be quite different from those proximate variables in the task analysis situation and therefore may preclude recognition of known precipitating factors such as the effects of alcohol on an adolescent pedestrian or driver. Although individual behaviour is clearly important to injury causation, emphasis on personal responsibility ignores the important role of the social, political, economic, and physical environments that largely determine behaviour.

More general traffic safety education and injury prevention programmes, directed towards high-risk groups such as schoolchildren, are employed in some communities. The purpose of these programmes is to teach children the "dos and don'ts" of behaviour in traffic, at home and during play, and the emphasis is on control over behaviour through assimilation of norms and risk-avoidance attitudes. However, the efficacy of this approach has been questioned by some authorities in the field. It is argued that one common feature of high-risk

groups such as infants, adolescents, and people with alcoholic problems is that they tend to be hard to influence with approaches that require changes in individual behaviour. A case in point is legislation on the use of safety belts in cars, which apparently has had little effect on adolescents. These authorities argue that injury prevention or reduction can best be achieved through manipulation of the environment (e.g. simplification of road design features) and by improving product design to protect the general population.

In contrast to emphasizing individual behaviour and personal responsibility in accidents, other approaches focus on group behaviour and social responsibility. This includes target groups (e.g. adolescents), risk groups (e.g. motorcyclists), and aggregate populations (e.g. the community). Attention tends to be focused on the group as a whole, and accident prevention or reduction programmes are directed more towards alleviating social conditions related to risk (such as impoverished families living in high-density housing), modifying environmental conditions that enhance risk (such as controlling traffic flow near schools), and instituting rules and regulations for the safety and protection of the community.

Intervention at these levels may have a positive influence on the mix of predisposing psychosocial and environmental risk factors associated with accidents in children. By being directed at the more generic "ills" in society, it may decrease the group's vulnerability as well as its likelihood of encountering risks.

Contrasts can be observed between countries with relatively centralized political systems and traditions of social responsibility and those with more decentralized systems with an emphasis on individual responsibility. On the one hand, freedom from constraints and controls by the state is cherished; on the other, individual freedom is compromised by the need for group welfare. It is these sociopolitical contexts that must be taken into account in ascertaining those predisposing psychosocial risk factors that may be amenable to modification. Furthermore, these social patterns have an influence on the extent and intensity of precipitating psychosocial and environmental factors in childhood accidents.

In effect, action programmes would attempt to modify social and environmental conditions that pose risks to the group, and generally would require the imposition of external controls and adherence to rules and regulations in order to ensure individual compliance.

## CONCLUSIONS

In reviewing the objectives stated at the outset of this report, it is evident from the information and material presented that a systematic body of

knowledge does not exist on psychosocial factors related to accidents in childhood and adolescence. However, the available evidence does suggest that selected variables can be identified that are implicated in the expression of accidents in this age group. A number of psychological traits, together with social, structural and situational factors, were identified, such as maladaptive personality characteristics, chronic unemployment, and disrupted parent-child relationships. It remains to be seen, however, the extent to which these factors can be directly or indirectly linked to risk vulnerability or risk situations, which in turn precipitate accidents in childhood.

Concerning methods of identifying medical service and support system responses to accidents, the Technical Group focused its attention on the general problem of information flow and barriers to the effective utilization of available data. In general, it was felt that a central data unit should be established to facilitate information exchange and feedback. This notion was viewed as preliminary and needs to be refined, with further effort towards developing a more analytical model of community response to childhood accidents.

An analytical framework was presented outlining the relationship between psychosocial risk factors and other social environmental risk situations as these relate to accidents in childhood. In the context of developing appropriate intervention strategies, this scheme helps to clarify the stage at which intervention may be effective in mitigating the influence of psychosocial endogenous and exogenous risk factors.

It was not possible to identify specific psychosocial risk factors amenable to intervention and modification that would have practical results in terms of accident prevention or reduction involving children and adolescents. Nevertheless, specific risk factors were related to childhood accidents, and risk groups were identified and intervention strategies suggested.

A provisional checklist was drawn up to identify the psychosocial factors (at the individual, community and social system levels) that could be used in programmes for accident prevention or reduction (Annex I). This checklist serves to draw attention to the variety of strategies that can be employed, at different levels, in combating childhood accidents.

These objectives should be specified further in terms of known epidemiological evidence on age-related accidents in childhood and the psychosocial factors involved. Domestic accidents predominate in the very young and the psychosocial factors associated with these events are not the same as those related to late adolescence.

Different strategies of primary prevention need to be considered depending on the type of accident, the age group involved and the risk factors. Likewise, secondary and tertiary interventions are contingent on the nature of trauma and resulting disability for different age groups. Also, account should be taken of the different organizational systems involved in responding to accidents, as well as the support services and action programmes that are required to lend assistance.

From another perspective, uniform data are required to assess the influence of psychosocial factors in the expression of accidents in childhood and adolescence. Such information should be collected in a routine and systematic fashion using a standard protocol. To facilitate this effort, accident statistics should be improved, especially along the lines recommended by the *ad hoc* Technical Group on Road Traffic Accident Statistics (23). Furthermore, continued work should be directed towards the development of a standard protocol, including the specification of psychosocial factors.

## RECOMMENDATIONS

The Technical Group made recommendations concerning (a) an analysis of the current situation, including the organization of services, education and training programmes, and policy and legislation; (b) methodological issues involved in the collection and use of accident data; (c) fruitful avenues of research and evaluation in relation to the interventions employed; and (d) the convening of an international symposium.

### **Organization and coordination**

1. A documentation centre for the coordination and integration of accident prevention and child safety data, bringing together the existing evidence on psychosocial factors in childhood accidents, should be established as a central organ for the dissemination of information from all agencies concerned with childhood accident prevention and child safety programmes.

2. A central institution (governmental or nongovernmental) should be designated to deal with all aspects of child accident prevention and with the development of child safety programmes.

3. Coordination and the exchange of information and data on childhood accidents, especially psychosocial factors, among existing centres should be improved, with a view to standardizing definitions and implementing uniform measures of data collection.

4. To facilitate the coordination and dissemination of information on childhood accidents, a central data collection unit should be established. This unit would serve the purpose of linking organizations in the community currently engaged in information gathering and processing, and of minimizing the effects of structural barriers to information flow directed towards preventive actions.

5. To ensure the adequate dissemination of information on childhood accidents, and to facilitate informed decisions concerning policy and actions at the national or local level, accident data should be channelled through those institutions most directly concerned with accident prevention and safety. Such information should be disseminated in as simple and attractive a form as possible. Consideration should be given to encouraging the use of nongovernmental service agencies, such as voluntary organizations, in the dissemination of information.

6. Existing public health and educational services should be oriented towards accident prevention, and psychosocial factors that are known to be involved in childhood accidents should be emphasized. Such service systems include programmes in child development, parental education and school safety.

7. Local coordinating groups should be formed. These would enable research studies to be carried out in depth, including research into psychosocial factors, since such studies are difficult to undertake at the national level. These activities would also serve to heighten community awareness of the problem and would be a means of reaching certain target groups.

### **Methodological issues**

8. Work should continue on the development of a standard protocol for the collection of accident data on mortality, including uniform demographic data. Morbidity and disability data should be standardized and include more specific and uniform measures on psychosocial factors in accidents.

9. In connexion with childhood accident data, improvement in the collection of road traffic accident statistics should be continued.

10. The reliability and validity of accident mortality, morbidity, and disability data should include the testing of psychosocial variables by those centres currently working in the field of accident research.

11. Existing ICD rubrics for accidents should be modified to describe both the nature of the injury and the degree of severity in terms of its psychosocial implications. The revisions should be tested in a number of centres directly involved in childhood accident research.

### **Research and evaluation**

12. A WHO-coordinated multicentre research project should be undertaken for the purpose of identifying psychosocial factors related to the occurrence of childhood accidents.

13. A research project should be undertaken to determine the consequences of childhood and adolescent injuries, especially road accident injuries. This includes the demands placed on health and related support services, as well as on the individual and the family, including response mechanisms.

14. In traffic education and safety programmes for children, the level of their knowledge, comprehension and retention of accident safety and prevention should be assessed.

15. Intervention programmes designed to modify children's attitudes and their behaviour in risk situations should be evaluated. Relevant components of such programme evaluations should include an assessment of drivers' behaviour and of other significant environmental conditions. Evaluation of such programmes should be fed back to further enhance their effectiveness.

### Symposium

16. An international symposium should be convened to review and summarize the current situation with regard to childhood accidents and disablement patterns (severity, needs, services), with particular emphasis on psychosocial consequences of traumas.

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Annex I

CHECKLIST OF PSYCHOSOCIAL FACTORS

Personal-social level

Community level

*The child*

Stage of development

physical

intellectual

social

psychological

Sex

Awareness of risk

Experience

Overall personality

Handicap – motor and sensory

Housing patterns

School locations

Roads and transport networks

Playground facilities

Product safety measures; programmes

Planning of society

town planning

architects

engineers

*The family*

Social status (current)

Economic and educational  
background

Child-rearing practices

Family stresses and conflicts

Availability of health services

Availability of education services

Social system level

Society's value on wellbeing of children

Level of awareness about accidents as a problem

Commercial system

Political system

local authority

legislation

## Annex II

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