

WORLD HEALTH ORGANIZATION
Regional Office
for the Eastern Mediterranean
ORGANISATION MONDIALE DE LA SANTE
Bureau régional de la Méditerranée orientale



مَنْظَرُ الصِّحَّةِ الْعَالَمِيَّةِ
المكتب الإقليمي
لشرق البحر المتوسط

REGIONAL COMMITTEE FOR THE
EASTERN MEDITERRANEAN

EM/RC34/13
June 1987

Thirty-fourth Session

ORIGINAL: ENGLISH

Agenda item 15(a)

PREVENTION OF ACCIDENTS

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1. INTRODUCTION

1.1. Literally, an accident is an event that is without apparent cause, or unexpected⁽¹⁾. This definition conveys the sense that it is an inevitable event and nothing could have been done to prevent it.

WHO has adopted the following definition of an accident: "an unpremeditated event resulting in recognizable damage"⁽²⁾. The event usually results from temporary imbalance between the individual's performance and the safety demands of the environment in which he or she is functioning. This environment could be the lodging place, with all its accident-prone areas and facilities (domestic), ways and means of transportation (traffic), playgrounds (recreational), or the workplace, be it industrial or agricultural (occupational). Damage to individuals usually results in injury.

Injury: Injury can be defined as an alteration of health status in response to an energy transfer, as a result of an event caused by a risk factor creating the possibility of an accident. In medical terms, an injury has been defined as a deformation of tissues beyond their limit of resistance, resulting in damage to anatomical structures or an alteration of physiological or biochemical functions⁽³⁾. The occurrence and outcome of events which may cause injury are predictable and subject in many cases to human control; hence an injury can be prevented, even where an accident cannot. Epidemiologically, injury does not differ from any other disease caused by exposure of the body to physical or chemical agents. It should be considered and dealt with according to its epidemiological triad of agent, host and environment and not as being the result of behavioural carelessness that could be counteracted by measures, which are often costly, time-consuming and unreliable, to change the behaviour of its victims. The host could be influenced by physiological factors such as physical illness, drugs, alcohol and fatigue, or psychological factors such as perception, attitude, behaviour and emotion. In addition, the host may be influenced by his socio-economic status and the extent of training and experience gained in carrying out specific tasks. The environmental factors implicated in accidents are usually located either in the home, in transport situations, playgrounds or the workplace. The contribution of the agent (article) involved in an accident is often small. However, the interaction between the host and the agent or the environment or all three of these has to be taken into account in the analysis of accidents.

1.2. The socio-economic impact of accidents and their sequelae could have a crippling effect on the development programmes of most countries of the Region, specially those with limited resources. Quantifiably, the economic impact may be calculated in terms of both direct and indirect costs. Direct costs comprise the goods and services actually used to manage the health impairment due to the accident, and administrative costs incurred by government agencies and insurance companies to promote safety measures and accident control, as well as the cost of public and private property damaged in such accidents. Indirect costs represent economic products (goods and services) not produced as a result of the reduction in productive manpower caused by accident morbidity and mortality. In addition, the unquantifiable social and psychological effects of accidents and their sequelae may be devastating to the morale of surviving victims and their associates.

1.3. Accidents represent a public health problem with an unacceptable toll all over the world. Accidents and infectious diseases constitute the two major causes of early death in developing countries. The relative importance of accidents as a cause of death and disability in the countries of the Eastern Mediterranean Region is rapidly increasing, concomitant with the disproportion between the individual's education and behavioural adaptation and the prevailing environment resulting from rapid socio-economic, industrial and transport development. Consequently, the risk of being involved in accidents in these countries, whether vehicular (transport), occupational or domestic, has become so high over a short period of time that accident mortality and morbidity rates currently exceed those in developed countries, and are moreover increasing every year.

2. SITUATION ANALYSIS

2.1. A prerequisite for the scientific study of accidents and consequent injuries, as well as for the planning necessary for their control, is the availability of data on which to base priorities and research. Despite the dramatic effects upon health of accidents and injuries, there are still inadequacies in understanding them as a public health problem necessitating organized programming. This is mainly due to (i) inavailability of epidemiological information that would determine their importance and (ii) the absence of central agencies, at either country or regional level, to monitor injury occurrence. (The problem is often considered as being a behavioural issue that can only be ameliorated through educational and legislative measures). Some countries have basic data on time, place, person and type of injuries, and deaths. However, information is often lacking as to the factors that influence causation. Detailed information on the groups vulnerable to injuries is inadequate, while information on long-term effects of accidents in general is almost non-existent.

2.2. Documented data available at the Regional Office show that accidents rank among the first five leading causes of death in most countries of the Region, even gaining priority over communicable diseases and, in a few Regional countries, constituting the leading cause of death. Measures to prevent accidents and injuries applied in developed countries were successful there in bringing down the toll of mortality from road traffic accidents to a rate of 10-20 per 100 000 population; comparatively, this rate currently ranges between 30 and 60 in countries of the Eastern Mediterranean Region.

Occupational accidents are of sizeable magnitude considering their toll in terms of life, human productivity and national socio-economic development: this last is reflected, *inter alia*, in the reported number of workdays lost and the sum of compensation paid to accident victims (See Table 1).

Most countries in the Region have developed the legislative instruments (labour and social security laws, occupational health and safety regulations, etc.) and the enforcement machinery (labour and factory inspectors, safety officers and occupational health personnel) necessary to promote occupational safety. Nevertheless, programmes directed toward prevention of accidents at the work place are rare in countries of the Region. Countries usually endeavour, within available resources to enforce protective and preventive measures to curtail the incidence of accidents. However, these measures are not always effective in view of prevalent constraints, including ineffective

legislation, defective enforcement, the cost involved, lack of coordination between the sectors concerned (health, labour, social security, etc.), lack of training in safe practices and shortage of trained personnel for inspection of the workplace, physical and psychological surveillance of workers and adequate management of occupational injuries.

TABLE 1. REPORTED OCCUPATIONAL INJURIES AND COMPENSATION PAYMENTS IN SOME COUNTRIES OF THE REGION, 1985

Country	Population at risk	Reported occupational accidents	Fatal accidents	Mortality rate per 1000 injuries	Number of workdays lost	Compensation payments
Bahrain	110 876	3 626	23	6.3	217 486	Bahraini dinars 347 432
Egypt	1 175 190	71 024	199	2.8	1 041 562	Egyptian pounds 2 615 000
Jordan	472 249	7 439	38	5.1	226 420	Jordanian dinars 5 150 000
Syrian Arab Republic	824 897	12 003	286	23.8	6 468 020	Syrian liras 121 132 542

It is interesting to note that burns constitute the major injury resulting from domestic accidents in the Region. They account for approximately 4% of mortality from accidents, and one patient usually dies out of every fifteen cases of burn injuries.

2.3. It has been arbitrarily estimated that for each accidental death there are about ten serious and thirty slight injuries. It has been found that accident patients in countries of the Region account for between 7.1% (in Bahrain) and 21.5% (in Egypt) of all hospital patient-days, which gives a high rank (between first and fourth) among the causes of morbidity in terms of length of hospital stay. This demonstrates the tremendous load that health authorities have to handle to cope with the morbidity resulting from accidents (see Fig. 1).

The gravity of accidents and resulting injuries is reflected in the potential years of life lost (PYLL) due to such accidents. This was found to be 304 000 years for people aged 1-65 years in Egypt (with a population of about 42 million in 1981) and estimated at 21 046 years due to road traffic accidents alone in Kuwait (with a population of about 1.35 million in 1979). These figures represent a presumed additional loss of human lives amounting to about 12 and 30 per 100 000 population in Egypt and Kuwait, respectively, due to the types of accidents indicated.

2.4. Many studies have estimated the economic loss caused by road traffic accidents at about 1-2% of the Gross National Product (GNP). However, the economic cost to the health services due to bed occupancy for management of injuries, as computed from Sa'ada Hospital, Yemen as an example, could reflect the cost of hospitalization of accident inpatients in the whole country in 1985: this amounted to 44.9 million Yemeni riyals, or US\$4.5 million at 1985 exchange rates, which constitute about 10% of the Ministry of Health's budget for that year. This example clearly demonstrates that injuries and their control are one of the most costly health problems.

2.5. In almost every country of the Region there are numerous bodies concerned with accidents: these include police, traffic and transport authorities, health services, insurance companies, labour offices, local organizations, both governmental and non-governmental, etc. However, there is often lack of coordination and cooperation between them. Possibilities for research studies, as well as individual plans of action for accidents and their prevention, may be available with each of the above sectors, yet are often not comprehensive, dealing only with one or another aspect of the problem. These sectors are usually working individually, without a coordinating national multisectoral body with the power and resources to ensure comprehensiveness of policy and to implement and supervise an agreed detailed national plan of action for safety and injury control. Even where such a body does exist, it is usually non-authoritative. The resulting lack of efficient organization, cooperation and coordination curtails the appropriate allocation of resources, with consequent duplication and poor utilization of the activities of the different sectors.

Action has been taken to a varying extent in countries of the Region, mostly directed towards road traffic accidents, including the following:

- Educational measures, through promotion of the use of passenger restraints, road traffic clubs for children, road traffic weeks for the public, and demonstration programmes in the mass media.
- Legislative measures; minimal requirements for safety standards of products in general and vehicles in particular have been enforced in a group of countries (Arab countries of the Gulf Area), traffic legislation is being enforced more effectively, and industrial safety requirements are followed up and monitored.
- Engineering measures, related to road construction and the appropriate use of road barriers, bridges, road signs and traffic signals.
- Management of injuries, with more attention being paid to organization of emergency medical services systems, especially along motor highways and in industrial sectors of the community.

2.6. Some studies have been undertaken on road traffic, occupational and, to a lesser extent, domestic accidents in a few countries of the Region. The most informative study was that on road traffic accidents carried out in 1980 for the Arab States of the Gulf Area. Results of these studies have been effective, to some extent, in initiating action to modify the magnitude and effect of accidents in the countries concerned. Moreover, the Regional Office recently became aware of two promising research activities in this regard: one is being conducted by the Saudi Arabian King Fahd City for Science and

Research on road safety, and the other by the Academy of Scientific Research and Technology, Egypt, on all types of accidents. These studies are primarily directed towards the problem as a whole in an attempt to identify areas of priority. However, such priority areas for research on accident prevention and injury control need to be identified according to the local circumstances in each country.

2.7. Emergency medical services, especially in the pre-hospital phase and at primary health care level, are not organized efficiently enough to be able to give the necessary service at the proper place and time, where they could make the difference between life and death and also affect both the immediate and the late outcome of accidents.

2.8. Within most countries of the Region, there is an evident shortage of qualified health personnel in most areas of accidentology, such as: programme management, safety promotion and professional management of injuries at different levels of health care, as well as in accident and injury research methodology. The health and medical education institutions do not include such topics to any great depth in their curricula, either at the under- or postgraduate levels.

However, specialized manpower in aspects concerning accidents other than health, e.g. road and traffic safety, may be available to a greater extent in some countries of the Region.

3. POLICY BASIS

Many communities and even some authorities consider accidents as a non-preventable fate. Hence, the term accident prevention might give the impression of a non-scientific programme with an unachievable target. "Injury prevention", on the other hand, is a scientific term that indicates the concept of a safer environment and behaviour that promotes health through the promotion of safety. Moreover, injury can be considered as any other type of traditional disease.

A review of the WHO programme on accident prevention by the Headquarters Programme Committee in November 1986 stated that:

"The programme should continue or put stronger emphasis on advocating for social and individual awareness of the seriousness of accidents, aiming at breaking the "tolerance" expressed with regard to accidents and stimulating a much more broad-based social value system of behaviour in line with the health promotion movement and its social value aspects.

WHO has a crucial advocacy role to show that there is a real health problem as, even if safety is now in process of acquiring better recognition, still in many circumstances the necessity to maintain economic growth can be stronger and usually is than the necessity for safety, particularly in developing countries where the consequences of accidents may be so severe due to insufficient infrastructure for the management of injury cases. The problem is very much related to lifestyle and health promotion issues. We have reached a stage where improvements are not possible if we do not fit them into the overall health promotion context - health and safety promotion in primary health care."

From the above several proposals can be drawn up for policy decisions by the health sector:

3.1. Information collection, analysis and exchange as a base for decision making

In spite of the scarce and inadequate information on accidents and injuries available in countries of the Region, enough evidence and considerable knowledge can be derived from developed countries and specialized agencies for accident prevention and control, provided the political will exists and community resources are properly utilized for this purpose.

However, it is essential to start by establishing an information system for the collection and integration of information derived from different sources dealing with accidents and injuries, to analyse this information in order to identify and plan for the study and subsequent control of specific types of injury and to indicate priorities for research. This should be consistent with the establishment of an appropriate system for the coding of causes of injuries to be used by hospitals and other health care facilities. This coding could adopt the WHO Ninth Revision of the International Classification of Diseases (see Annex). Other classifications of injuries that give more consideration to the severity of injury and the damage inflicted are available, but usually need professional skills for their application (see Fig. 2 and 3).

The system need not be costly, as feasible existing resources should be used to establish a sample of national hospital discharges and emergency receptions to enable health authorities to continue surveillance of injury incidence and severity. This should be completed by collection of information on fatal cases which do not reach the health facilities but may be reported in other systems such as police reports or death registers.

3.2. Evolution of injury care to promote safety and prevent injury

Programming for prevention of accidents and injuries should not undermine the need for efficient management in this field at all levels of health care. However, health policies should give prime concern to injury prevention and safety promotion within the context of the overall disease prevention and control and health promotion programmes, as an integral part of the existing health care system based on primary health care, and in line with country's commitment to HFA/2000 strategy.

The more aggressive prevention policy, called for by ministries of health of many developed countries in the mid-'60s to combat the alarmingly increasing number of traffic fatalities and morbidities, which were overloading medical care capacities, had by the mid-'70s lowered the trend and improved the situation with regard to the use of trauma treatment services.

Emergency and trauma care demands costly services and technology, as it is not often subjected to careful scrutiny with regard to the choice of the type of technology and service infrastructure most appropriate to the local socio-economic situation and level of development of the general health system. Hence, to enable allocation of available resources to prevention and not only to treatment of injury, as is the case in many countries,

consideration should be given to a thorough assessment of basic needs for injury treatment services, especially at primary health care level, including assessment of appropriate technology and management of services.

3.3. Multisectorality

An injury prevention and safety promotion programme involves several health divisions, besides other sectors not falling directly under the administrative influence of health authorities. These include environmental sectors, mainly controlling road and vehicle safety, urban planning, rural electrification, products' safety standards and industrial safety, etc.

The health of the population is the major victim of accidents and the injuries resulting from them. The challenge for health authorities in this respect is great, as health is affected by factors beyond the reach of health services. The health authority, besides undertaking its duty for injury management, is expected to wield the responsibility for protecting health against any kind of injury, through: (a) continuous surveillance of this public health problem and (b) increasing the awareness of, and coordination among, various components of the health system and other accident- and injury-related sectors, with a view to making decisions to modify the magnitude of accidents/injuries, through a well-defined and appropriate national plan involving all sectors concerned.

The question of a multisectoral national body for accident prevention and injury control, as well as its authoritative and implementary structure and constitution, is fundamental. Such a body should include councils concerned with public, home, traffic, occupational and agrochemical safety, committees for legislation enforcement, education and training, public relations and public education, as well as centres for research and safety education, with subcommittees for safety at the provincial and district levels (see Fig.4).

To establish this body, if it does not already exist, to initiate its activities on a continuous and comprehensive basis, and implement its recommendation if already available, are steps of paramount importance. Health authorities in this respect should play pioneer roles in the advocacy and promotion of safety, and be members and active partners, both politically and technically, of any type of body established to deal with safety matters. Assuming a leading role for the implementation of comprehensive activities, within their limited political influence and financial resources, might be difficult.

In this endeavour, injury prevention and safety promotion are ideal fields for a broad multisectoral policy for health promotion. Ministries of health should not only coordinate between technical and administrative divisions within their organizational structure, but also with other governmental sectors and non-governmental organizations providing health or controlling environmental accident-prone fields.

3.4. Integration of injury prevention and safety promotion into the health system

Integration of injury prevention and safety promotion into the health system can only be achieved by establishing an action-oriented, problem-solving functional unit within the health system for prevention of injury and

its control, as well as for promotion of safety. This does not necessarily entail additional significant resources on the part of the health sector. The activities of such a unit should be integrated with ongoing disease prevention and health promotion programmes of, for example, maternal and child health, occupational health, information and education for health, environmental health and all other areas of available curative and promotive health services.

The proposed functions of such a unit are:

1. Formulation of a policy and management of a programme for injury control and safety promotion as an integral part of the health care system based on primary health care.
2. Collection, analysis and dissemination of information on injuries and their sequelae, both within and outside the Ministry of Health, and assessment of resources devoted nationally to managing them.
3. Collaboration with and coordination between different programmes within the Ministry of Health and other health service providers in the country, which can contribute to safety promotion and injury prevention.
4. Ensuring active participation of the health sector, in coordinating national mechanisms for safety promotion and injury prevention, if available, or promoting and taking the lead in the establishment of such mechanisms.
5. Identification of expected relevant inputs from other sectors that are complementary to health inputs.
6. Development of training in accidentology for health manpower at different levels.
7. Identification of areas of priority for research in injury prevention and safety promotion.

3.5. Training of health personnel

If a shift has to be made, proceeding from care of the injured so as to include safety promotion and injury prevention, basic knowledge necessary in this respect should be incorporated into curricula for training of different categories of health personnel. Such curricula should cover, to a varying extent, knowledge related to programme management, information collection and utilization, safety education and technology and appropriate management of injuries, as well as research methodology. This should be enhanced by provision of guidelines and safety manuals and the organization of continued education training courses. Collaboration among countries of the Region and with international organizations and developed countries could be sought in this regard. For example, it is envisaged that, when adequately trained, maternal and child health workers should be able to advise mothers and families on safety related to close observation of the child; school teachers should provide education to their pupils so as to promote their safety in playgrounds, roads and homes; and primary health care workers should be able to provide life-saving measures to the injured and ensure their safe and appropriately managed referral to secondary and tertiary facilities.

3.6. Research

As the accident/injury sequence is multifactorial, research related to safety promotion and accident/injury prevention and control has to consider a wide range of disciplines and their interaction. Apart from research related to the health system, which could be either clinical/hospital-based or epidemiological/community-based, research should cover: ergonomics and biomechanics of trauma, safety economics, appropriate technology for safety psychobehavioural factors and environmental safety standards of products, as well as the socio-economic impact of accidents. Coordination among the various sectors concerned is essential for such research activity; it could be achieved through a central coordinating body for research on safety supported by intercountry, inter-regional and international collaboration.

4. RECOMMENDATIONS

4.1. At country level

4.1.1. To establish a unit for accident/injury prevention and safety promotion at the Ministry of Health, with a functional capacity as listed in paragraph 3.4.

4.1.2. To promote the establishment of an authoritative national multisectoral body, that can draw up a national multidisciplinary plan of action for safety promotion and injury prevention and control, with emphasis on integrating the components of this plan into the existing community service functioning programmes, especially those of primary health care and education (see paragraph 3.3).

4.1.3. To initiate community safety and injury control programmes in selected vulnerable areas, with stress on active community participation in the phases of planning, implementation and evaluation.

4.1.4. To establish a demonstration project on injury prevention in primary health care.

4.1.5. To increase the awareness of policy- and decision-makers as well as national non-governmental organizations regarding the social and economic consequences of injuries.

4.2. At WHO level

4.2.1. To support the development of a pilot project for injury prevention and safety promotion in one or two countries of the Region, preferably of different sociocultural and economic backgrounds, with all the necessary components, and to formulate guidelines for replication of such a project in other countries after evaluation.

4.2.2. To assist in the provision of training opportunities in safety promotion and care of the injured at different levels of health care services.

4.2.3. To develop guidance for the development of a simple effective surveillance system for collecting and recording information on injuries and for data management.

4.2.4. To assist in the provision and production of learning materials on safety promotion and injury prevention.

4.2.5. To support national and Regional meetings, workshops and seminars on the subject of Accident Prevention, Injury Control and Safety Promotion, and disseminate relevant information so as to guide and assist relevant country programmes.

4.2.6. To designate collaborative centres for research and training in safety promotion and injury prevention, and facilitate technical cooperation between concerned institutions in both developing and developed countries.

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2. Technical Report Series, No.118, 1957. Accidents in Childhood. Report of an Advisory Group (Geneva, 1956).
3. Report to the Director-General, ACHR 28/86.11 Report. Advisory Committee on Health Research, p. 27, para. 174.

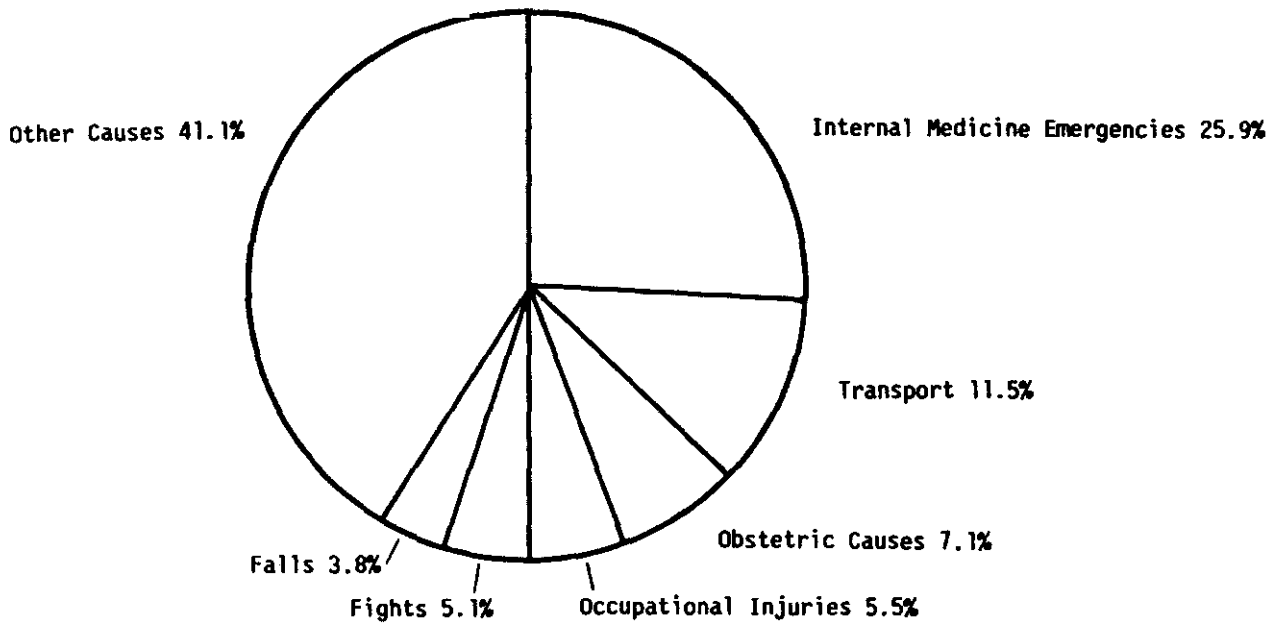


FIG.1. Percentage of Medical Emergencies
Reported by EMS Department, Egypt, 1983 (total 595 451)

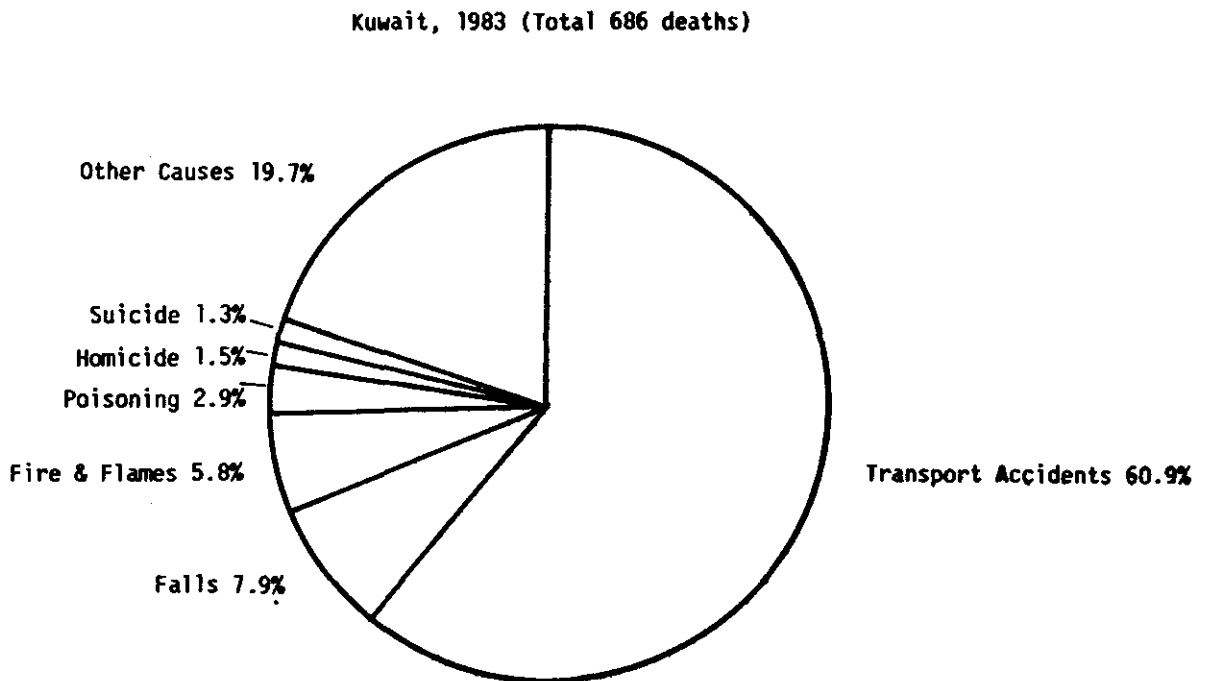
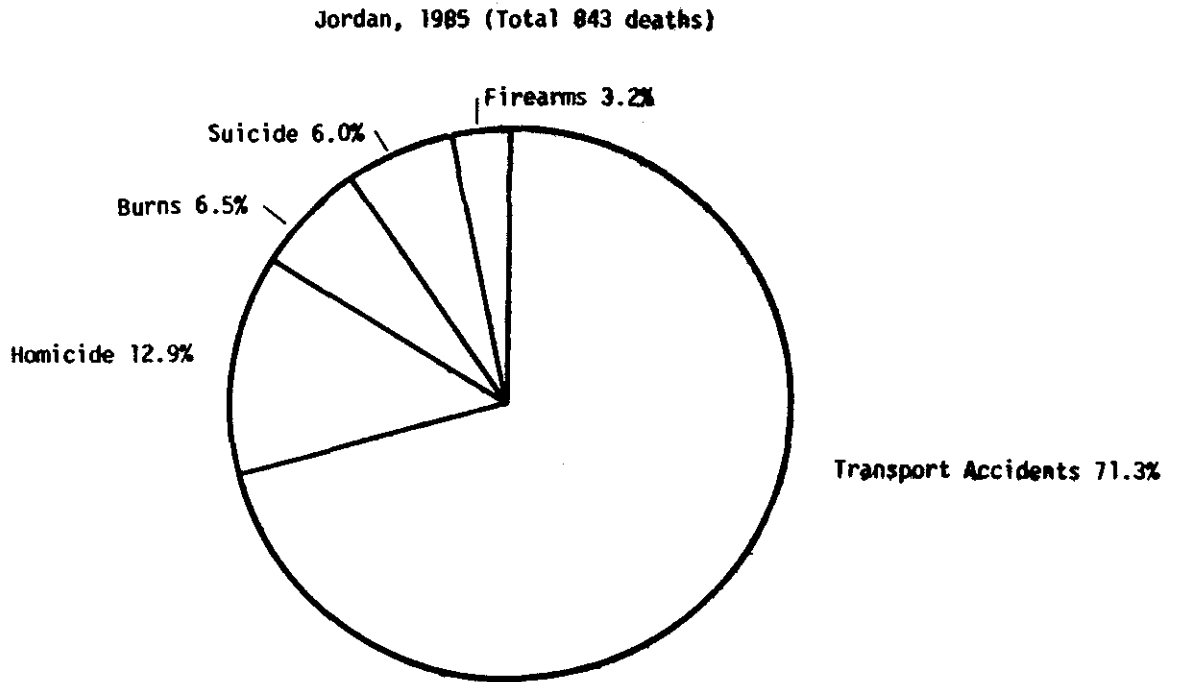
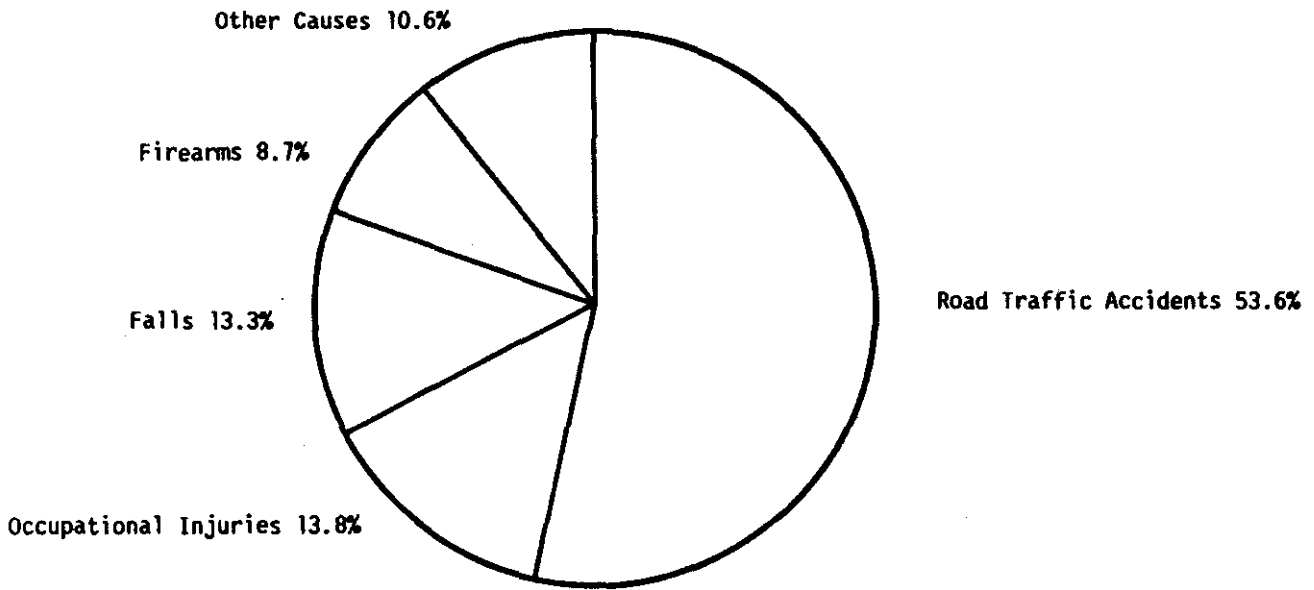


Fig.2. Mortality due to Accidents by Cause:
Jordan, Kuwait

Cyprus, 1985 (Total 196 deaths)



Qatar, 1985 (Total 185 deaths)

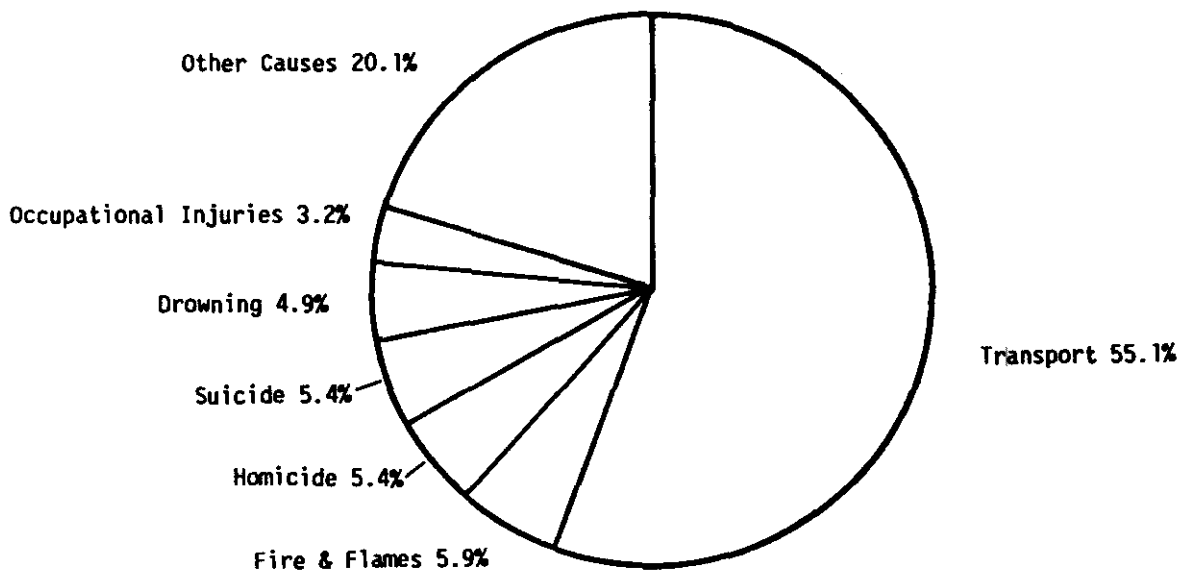


Fig.3. Mortality due to Accidents by Cause:
Cyprus, Qatar

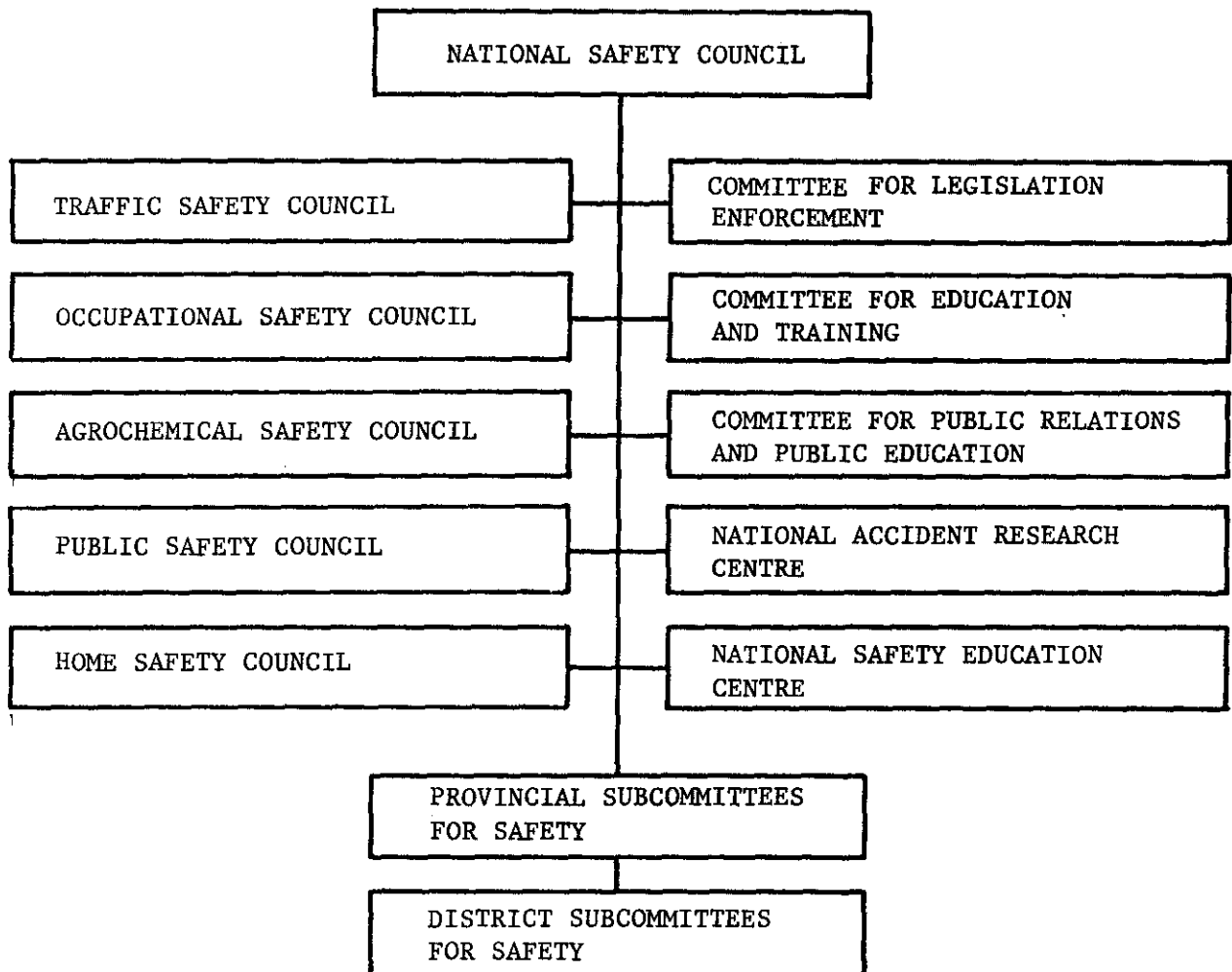


Fig.4. Proposed Multisectoral National Body for Accident Prevention and Injury Control

ANNEX

International Classification of Diseases,
Ninth Revision (ICD - 9)

(A) Main chapters

- I. Infectious and Parasitic Diseases
- II. Neoplasms
- III. Endocrine, Nutritional and Metabolic Diseases, and Immunity Disorders
- IV. Diseases of Blood and Blood-forming Organs
- V. Mental Disorders
- VI. Diseases of the Nervous System and Sense Organs
- VII. Diseases of the Circulatory System
- VIII. Diseases of the Respiratory System
- IX. Diseases of the Digestive System
- X. Diseases of the Genito-urinary System
- XI. Complications of Pregnancy, Childbirth, and the Puerperium
- XII. Diseases of the Skin and Subcutaneous Tissue
- XIII. Diseases of the Musculoskeletal System and Connective Tissue
- XIV. Congenital Anomalies
- XV. Certain Conditions Originating in the Perinatal Period
- XVI. Symptoms, Signs and Ill-defined Conditions
- XVII. Injury and Poisoning

(B) Classification of External Causes
of Injury and Poisoning
(Numbers between brackets correspond to
the ICD-9 categories)

- Railway accidents (E800-E807)
- Motor vehicle traffic accidents (E810-E819)
- Motor vehicle non-traffic accidents (E820-E825)
- Other road vehicle accidents (E826-E829)
- Water transport accidents (E830-E838)
- Air and space transport accidents (E840-E845)
- Vehicle accidents not elsewhere classifiable (E846-E848)
- Accidental poisoning by drugs, medicaments and biologicals (E850-E858)
- Accidental poisoning by other solid and liquid substances, gases and vapours (E860-E869)
- Misadventures to patients during surgical and medical care (E870-E876)
- Surgical and medical procedures as the cause of abnormal reaction of patient or later complication, without mention of misadventure at the time of procedure (E878,E879)
- Accidental falls (E880-E888)
- Accidents caused by fire and flames (E890-E899)
- Accidents due to natural and environmental factors (E900-E909)
- Accidents caused by submersion, suffocation and foreign bodies (E910-E915)
- Other accidents (E916-E928)
- Late effects of accidental injury (E929)
- Drugs, medicaments and biological substances causing adverse effects in therapeutic use (E930-E949)
- Suicide and self-inflicted injury (E950-E959)
- Homicide and injury purposely inflicted by other persons (E960-E969)
- Legal intervention (E970-E978)
- Injury undetermined whether accidentally or purposely inflicted (E980-E989)
- Injury resulting from operations of war (E990-E999)