services to use them, too. Citizens access emergency services by telephone. Roadside call boxes are located on most major roads. The unique central telephone number, 012, of the civil defense, may be called from any place and it can alert the emergency centers where emergency ambulances are located.

6. Transportation (Ambulances and Other Vehicles)

Federal regulations require ambulance vehicles to comply with certain specifications, which cover sirens, lights, etc.

7. Hospitals

In 1979 the Minister of Health outlined standards for medical care facilities wishing to participate in the EMS system. These standards were later formalized in a Grand-Duchal regulation, dated August 1979.

The main hospital in the City of Luxembourg corresponds to U.S. Level I of categorization. The other hospitals in the Emergency Medical Service are U.S. Level II. The country does not have a center for serious burns but has an agreement with the Burn Center at Metz, France, which is located 60 km. from the capital.

The Minister of Health reserves a certain number of emergency beds in different regions of the country for acute medical cases or disaster situations. Certain clinics and hospitals have full-time emergency services; others take turns handling emergencies on weekdays or weekends.

8. Personnel

No special training in EMS care is available for nurses or doctors except for EMS specialists, who receive training in anesthesiology and resuscitation. Although interest in advanced training is growing in the medical community, little has been done about reinforcing training requirements except for participation at a conference on acute intoxication in March of 1980.

Luxembourg has training programs for ambulance attendants covering such topics as shock, asphyxia, various types of injuries, transportation, and infection control.

9. Data Collection

Civil Defense in the Ministry of the Interior collects some information on emergency calls, and the Ministry of Health collects hospital data.

No research is currently underway.

10. Disaster Plans

Hospitals in Luxembourg have no formal plans for receiving victims in the event of a major disaster. A working group is developing a plan for dealing with mass casualties.

11. Special Features

Luxembourg is working with the European Community on Reciprocal Health Assistance, which is forming plans for dealing with disasters, major accidents and exceptionally grave illnesses.

• NETHERLANDS

1. EMS Authority/Responsibility

In the Netherlands, the Minister of Public Health and Environmental Hygiene is responsible for the overall operation of the health system. Reporting to him is the State Supervisory Public Health Service, which, in turn, appoints inspectors to ensure the adequate operation of health services including ambulance services.

Planning, organizing, administering, and supervising ambulance services within the provinces rests with the Provincial Executive Councils, in consultation with the inspectors. Municipalities or consortia of municipalities, in turn, provide for central points (dispatchers), which operate the day-to-day ambulance services. The person in charge of the central point authorizes trips and may also request help from other central point authorities. The Provincial Executive Councils issue licenses for ambulance operators.

2. Regionalization Programs

The Netherlands is divided into 50 areas with populations varying in size from 24,000 to over 1,000,000. The number of ambulances in each service area varies from one per 20,000 people to one per 30,000. Each area designates one central point to coordinate and operate ambulance services.

3. Laws and Regulations

The EMS system is regulated by the Ambulance Transportation Act of 1971. It is administered by the National Health Institution. There are also various acts which cover mutual agreements for special situations. For example, the Joint Arrangement Act addresses services shared between municipalities or provinces. Another act responding to similar special situations is the Municipalities Act.

4. Information/Education

The Ministry of Traffic and Public Works, the Ministry of Defense, and the Ministry of Education all provide prevention programs. The programs discuss accidents occurring at home, on the road, in

industry and in school. In addition, the Central Ambulance Station gives public instruction on methods of accessing the EMS system. The Industrial Plant Emergency Medical Care Teams provide first-aid courses for business and industry.

The Netherlands does not have any programs for specific audiences concerning the country's emergency medical services.

5. Emergency Communications

Requirements for emergency communications are covered in the Ambulance Transport Act, particularly with respect to defining the central role of control ambulance stations. The Ministry of Traffic runs a "radio control service," which has its own national frequency. There are nine frequencies for ambulance services.

6. Transportation (Ambulance/Emergency Vehicles)

The EMS system in the Netherlands is regulated by the Ambulance Transport Act, passed in 1971 and fully operative since July 1979. The main role of the Act is to approve treatment for acute care in out-patient situations (home, road, scene of the accident). Each of the Netherlands' eleven provinces is responsible for complying with the Act in accordance with its local situation. To date, the provinces have 50 ambulance regions to handle emergency cases.

In each region a "Central Ambulance Post" (dispatch center) is set up for coordinating the ambulance services. Currently the country has 49 municipal ambulance services, 137 private ambulance services, and 20 Red Cross ambulance stations. The Central Ambulance Posts are mainly located in the municipal health facilities. Where a municipal health facility does not exist, the Central Post is frequently located at the Fire-Brigade.

There are currently 737 ambulances operating in the Netherlands, which serve a population of approximately 14 million people. Helicopters are not yet used to support the emergency land vehicles.

The Ambulance Transport Act authorizes the provinces to establish standards for the number of ambulances. However, the Act specifies the design, fittings, furnishings, and inspections of ambulances, the numerical strength and nursing ability, and the certification requirements for ambulance attendants and the readiness of ambulances and attendants.

Regulations for emergency transport vehicles fall under the Ambulance Transport Act and within the sphere of the Ministry of Transport. The rules may specify standards for different categories of ambulances. The Ambulance Transport Act also establishes requirements to ensure sufficient ambulance services and delineates the proper methods for recruiting and licensing ambulance operators. Inspection is entrusted to the Chief Inspector, other inspectors,

and officials working under order from the State Supervisory Public Health Service as well as officials appointed by the Minister of Transport.

Ambulance attendants are trained male nurses and paramedics.

7. Hospitals

By regulation, hospitals in the Netherlands are divided into three categories. Categorization depends on the number of beds and the variety of specialists in the medical facility. There are no hospitals in the Netherlands which are exclusively emergency hospitals.

8. Personnel

There are no specific courses or certification requirements for emergency services personnel other than the items discussed under item (6) above. Nurses are trained in all the areas shown under item 8.2 of the survey. They are also trained in cardiopulmonary resuscitation, neurosurgery, cardiology, obstetrics, psychiatry, and burns treatment.

9. EMS Data Collection

According to the Ambulance Transport Act, the Minister of Public Health and Environmental Hygiene can order ambulance services to provide data about their activities. A suitable form for recording these data is now being prepared.

10. Disaster Plans

Currently, the Netherlands is developing municipal and hospital disaster plans, including procedures for ambulance services. Also, specific emergency plans for airfield and railroad disasters are being prepared. These plans include the formation of traumatology teams.

11. Special Features

The establishment of 24-hour traumatology teams for special emergencies is a special feature of the EMS system in the Netherlands.

- PORTUGAL

1. EMS Authorities/Responsibility

When Portugal's new EMS system is in operation, hospital emergency units will be governed by the state system. Ambulance services, on the other hand, will be directed by the National Ambulance Service.

2. Regional Programs

The EMS system in Portugal, a relatively small country, is organized on a regional basis with three regions for services, North, South, and Central.

3. Laws and Regulations

The two principal laws and regulations governing emergency medical services are the National Ambulance Service Public Law and the Ministerial Resolution, which established the Cabinet for Emergency Medicine. An Institute of Emergency Medicine is currently being proposed, for location within the Ministry of Health and Social Affairs.

4. Public Information and Education

Portugal has specific campaigns for accident prevention which include programs for the prevention of road accidents, the handling of emergencies at sea, and the prevention of accidents at the work place. First aid programs are operated by the Red Cross. Other EMS prevention programs are aimed at high school students.

5. Emergency Communications

In addition to the "115" central emergency telephone system, Portugal has a number of SOS call boxes for responding to emergencies in more sparsely populated rural areas. The SOS calls are relayed to the local police or fire departments. Portugal's response did not indicate whether specific radio frequencies are established for medical emergencies or civil defense emergencies in addition to the police radio communication frequencies.

6. Transportation (Ambulances and Other Emergency Vehicles)

The central government funds a national ambulance service, which was organized in 1975. Funding is based upon a one percent surcharge on certain classes of insurance, (automobile, life, and accident). Standards for ambulances and equipment have been developed at the national level.

7. Hospitals

Hospitals in Portugal are certified to receive emergencies, but there is no specific designation of hospitals or categorization by levels or specialties.

8. Personnel

Portugal does not have requirements for special training or certification of any of the personnel involved in emergency medical services with one exception. Ambulance attendants and members of the police and fire fighting forces are required to complete basic first-aid courses. Special training programs

for health care personnel in emergency medical care procedures are currently being proposed.

9. EMS Data Collection

The responsibility for EMS data collection rests with the National Ambulance Service and the Civil Defense Organization, which is currently being organized. Both the National Ambulance Service and the Cabinet for Emergency Medicine can sponsor EMS research. In the future, data will be collected through the Institute of Emergency Medicine and in the Health Department.

10. Disaster Plans

Portugal is beginning to organize a National Civil Defense System. No guidelines or policies are established for institutional or community disaster planning.

- UNITED KINGDOM

1. EMS Authority/Responsibility

The Secretary of State is the ultimate authority responsible for emergency medical services. National EMS policy guidelines are developed by the Department of Health and Social Security.

The major responsibility and authority for planning, organizing, staffing, and day-to-day operations of the emergency medical services rests with regional health authorities, who, in turn, delegate many of these responsibilities to area health authorities. In only seven cases do Regional Health Authorities become directly involved in the operations of the ambulance services: in the Greater London District and in the six other metropolitan urban areas in England.

The Home Office has a general responsibility for the police and fire services in England and Wales and, therefore, can have some effects on disaster planning.

2. Regional Programs

This country, by definition, is organized on a regional basis, with Regional Health Authorities and Area Health Authorities reporting to them. The sizes and populations of each region, however, vary greatly. Regional Health Authority populations range from 2,000,000 to 5,000,000 people. Area Health Authorities represent from one to six districts, each having a population between 150,000 and 300,000. The populations covered by ambulance services, however, also vary -- from 7,000,000 ir the London Ambulance Service to about 350,000 in smaller regions.

In urban areas such as the Greater London Area, and in the more populated regions, rationalization (limiting the availability of accident and emergency services) can be practiced, so that each hospital accident and emergency service unit can service a population of 150,000 or more. In the less densely populated parts of the country, however, rationalization is more difficult because of the large distances that each unit must cover to serve 150,000 people.

3. Laws and Regulations

Although the United Kingdom has no specific laws and regulations covering emergency medical services, these services come under the general authority of the National Health Services Act. Under the provisions of that Act, the Department of Health and Social Security issues specific guidelines for accident and emergency services. These documents include ambulance, vehicle, and equipment specifications; ambulance service and communications specifications; and ambulance training specifications. Radio frequencies are allocated separately.

4. Public Information and Education

The Royal Society for the Prevention of Accidents and the Health Education Council are responsible for accident prevention programs. However, comprehensive health education is a specific responsibility of the Health Authority. St. John's Ambulance Association and the British Red Cross Society are responsible for first-aid training.

5. Emergency Communications

The United Kingdom has a universal 999 system that can be used by any member of the general public in an emergency situation (and also by general practitioners in non-urgent situations). The Post Office Telephone Exchange is responsible for handling 999 calls.

Health authorities are given priority in the installation of radio linkages with ambulances to more readily dispatched ambulances to EMS facilities. Thirty channels in the VHF high band are allocated for ambulance use. An additional channel has been designated as the "emergency reserve" channel. In addition, four other channels are assigned for use by non-ambulance health services. The authority for radio frequency designation is the Home Office. The "emergency reserve" channel is used to enable ambulances from different areas to be controlled on one channel while at the scene of a major accident.

In addition to the above, private circuits connect the ambulance control station to police and fire departments, health centers, and hospitals, including the hospital ambulance liaison officer.

6. Transportation (Ambulances and Other Emergency Vehicles)

The Department of Health and Social Security has established national handwritten standards for vehicle design, identification, and equipment. However, Regional and Area Health Authorities are permitted to deviate from these standards. In all instances, the specifications for vehicles and telecommunications equipment are issued as guidelines rather than as strict policies. Thus the ambulance services' telecommunications document is listed as "detailed technical advice." The final authority to expend funds for specific pieces of equipment rests with the health authority concerned. The Purchasing Advisory Group for Ambulant Vehicles and Equipment is responsible for developing these standards.

There are no standards for special vehicles except in local circumstances, which appear to be restricted to the Brighton area. (In this area, the cardiac scheme operates on an experimental basis.)

The United Kingdom has no standards for air or sea rescue vehicles.

7. Hospitals

The only designation underway is the rationalization referred to above, in which accident and emergency services are provided only in certain hospitals so that each of these services has sufficient work to keep it busy. (Exceptions of course would take place in isolated rural situations.)

8. Personnel

In the United Kingdom, the development of physicians specializing in treating accident and emergency cases is growing rapidly. In 1977, there were 100 EMS medical consultants on the job. The organizational structure of emergency medical services in the United Kingdom was impacted profoundly by a report prepared by a subcommittee of the National Health Service in 1962. The report, referred to as the Platt Report, made wide-ranging recommendations for the reorganization of hospitals, ambulance services, and health care personnel. Specific recommendations were made concerning: (1) the rationalization of accident and emergency services; (2) the construction, staffing, and organization of hospital accident and emergency units; (3) the provision of accident and emergency beds within hospitals (30 to 35 per 100,000); (4) the duties of various medical personnel; (5) the designation of specific centers for burn treatment; and (6) the need to educate the public in prevention.

As a result, the Royal College of Physicians and the Royal College of Surgeons produced a training program for senior registrars, which included training in cardiovascular emergencies, respiratory emergencies, general surgery, orthopedic surgery, neurosurgery, plastic surgery, poisoning, psychiatric cases, pediatric emergencies, and general practice. For EMS specialists, experience in treating the following is considered essential: soft tissue injuries and infections, hand infections and fractures; and diagnosing ophthalmic and ENT conditions. Experience in abdominal emergencies, gynecological emergencies, multiple trauma and resuscitation, and administrative and teaching experience are also required. A&E specialist accreditation is open to those who complete the training program.

The United Kingdom has also established post-basic courses for both registered and enrolled nurses. These courses lrad to specific certification.

The National Health Service includes four advisory, or staff, committees and the National Training Council. These advisory committees, in turn, oversee committees for nurses, midwives, and ambulance personnel. The staff committees report to the Secretary of State on matters concerning recruitment, training, and development of the particular staff group concerned. The Training Council, on the other hand, advises on the general strategy, development, and coordination of training programs to be managed by the National Health Service.

There are currently twelve special schools for ambulance attendants, under the control of the Regional Health Authorities. There is some consideration being given to reducing this to four schools. However, if the number of schools is reduced, they may become answerable to a consortia of Regional Health Authorities.

Courses for ambulance attendants include six weeks of basic training and two weeks of refresher courses every three years. A few ambulance attendants are taking advanced training in techniques of cardiac resuscitation, including interpretation of EKGs, defibrillation, intravenous infusion, and intubation. This is still subject to evaluation.

Public health authorities and the Royal College of Nursing are responsible for developing special EMS courses for nurses.

Most of the emergency medical training for medical students is part of their basic training and remains the responsibility of the universities. Similarly, most of the courses in special post-graduate programs are the responsibility of the university and the Royal College of Surgeons.

9. EMS Data Collection

In the United Kingdom, responsibility for collecting and compiling EMS data rests with the Regional and Area Health Authorities, who forward some statistics to the Department of Health and Social Security.

The responsibility for funding and coordinating research projects and reports is divided between the Medical Research Council and the Department of Health and Social Security. The Medical Research Council is interested in doing more research work on improving data collection; studying the association of psychological factors and road accidents. In addition, the Council is interested in doing studies on the causes of domestic accidents in which children are involved, and accidents involving the elderly. Other research areas of interest are the effect of treatment and the development of more reliable long-term indicators of outcome as well as the management of multiple injuries involving more than one vital body system (where the ideal therapy for one system is in conflict with the ideal therapy for another).

Private research groups (e.g., the Nuffield Foundation) and the drug companies are involved in EMS research.

10. Disaster Plans

The Department of Health and Social Security issues guidelines for developing health service plans to deal with major accidents. Preparation of the plans is primarily the responsibility of Area Health Authorities. Regional Health Authorities are responsible for coordinating the plans among the service areas, particularly where geographic boundaries overlap. Also, each Regional Health Authority maintains lists of hospitals with the necessary capabilities to receive casualties on a 24-hour basis.

Planning for major disasters such as the transportation of dangerous chemicals is undertaken on a voluntary basis. There are no specific national requirements for preparing plans to respond to rail, air, or highway disasters.

11. Special Features

New Cross Hospital in London has established a centralized poison information service. In some parts of the country, general practitioners are organizing teams of physicians to provide on-the-spot medical care for road accident victims. The parent organization (British Association of Immediate Care) is supported financially by the Department of Health and Social Security.

• UNITED STATES

1. EMS Authority/Responsibility

The overall Federal EMS program for the pre-hospitalization and hospitalization phases is administered by several branches of

the U.S. Department of Health and Human Services (Public Health Service, Health Services Administration, Bureau of Medical Services, Emergency Medical Services Division). Transport during the pre-hospitalization phase is administered by the U.S. Department of Transportation.

Numerous other federal agencies and county, state, regional, and local agencies also set guidelines and develop accident prevention and EMS training programs.

2. Regional Programs

Although 304 EMS regions have been mapped out in various areas of the United States, geographic boundaries have not yet been clearly defined.

3. Laws and Regulations

The Emergency Medical Services Act of 1973 (Public Law 93-154), amended in 1976 and 1979, covers federal grant programs that fund comprehensive regional EMS systems.

4. Education Programs

Several federal agencies operate home safety programs -- the National Safety Council, the Consumer Products Safety Commission and the Food and Drug Administration (Division of Poison Control). The College of Orthopedic Surgeons and the American Red Cross run similar programs.

Highway and road safety is promoted by the National Highway Traffic Safety Administration.

Accident prevention and safety programs for the workplace are promoted by the Occupational Safety and Health Administration, the National Bureau of Mines and the Environmental Protection Agency (the latter particularly with regard to pesticides). Among nonfederal agencies, the Lions Clubs have been prominent in promoting eye safety.

The Department of Education is the primary federal agency for conducting safety programs in schools. The American Red Cross and the YMCA also sponsor water safety programs for young people.

In the private sector, in areas where a "911" system is operative, the telephone company is responsible for promoting its use. However, fire departments and the American Red Cross also sponsor programs for informing the public about accessing the emergency medical system.

All of the above public education programs are carried out at the national level. Many other safety, accident prevention and first-aid programs are provided by county, state, and sub-state agencies and organizations, both public and private.

For example, most public schools are organized on a county level. There usually will be a safety coordinator to determine training needs for school children. Generally the educational courses include programs on CPR, minor first-aid, and accident prevention. The Federal Drug Enforcement Administration and the Consumer Product Safety Commission produce materials to supplement local school course offerings.

The Red Cross, the American Heart Association, and the Department of Transportation conduct first-aid courses for business and industry. Trade unions promote these work safety and first-aid programs for their membership.

Training programs for paramedics are provided to the military, volunteer fire departments, and police personnel.

5. Emergency Communications

Ten duplex channels are available exclusively to EMS systems. Communications centers, ambulances, and hospital emergency rooms have full frequency capability. These communications centers also have public telephone interface and direct lines linking various agencies and other radio frequencies.

A "911" system currently operates in many areas of the U.S., but its adoption has been slow because of the many small, privately-owned telephone companies existing in this country.

6. Transportation (Ambulances and Other Emergency Vehicles)

Federal standards for ambulance vehicles were established by the Department of Transportation in 1974 and revised in April 1980. They encompass the design, size, construction, equipment, and identification markings of the vehicles. Identification consists of an orange band and a DOT Star of Life superimposed on a white background. Specifications for lights and signs denoting the special nature of the vehicle (e.g., "Paramedic") are also included.

Other vehicles used for mass casualties or cave-in rescue are not covered by these standards.

Air and sea rescue vehicles are also not standardized. The Armed Forces' MAST Program (Military Assistance to Safety and Traffic) has standards for communications and personnel, but aircraft and equipment vary. DOT is in the process of developing guidelines for air ambulances.

7. Hospitals

The current thrust to categorize and regionalize hospital trauma critical care services is being carried out by the Committee on Trauma of the American College of Surgeons and the EMS Division of the Department of Health and Human Services (DHHS). The federal guidelines are not regulatory in nature and compliance is progressing.

8. Personnel

The U.S. Department of Transportation has developed training courses for ambulance personnel, dispatchers, and first-responders, which are periodically revised. Professional associations provide training and certification criteria, on which registration for a wide variety of EMS specialities is based.

9. EMS Data Collection

The Division of Emergency Medical Services in DHHS has recently developed a management information system called the Regional Emergency Medical Management Information System (REMMIS). The purpose of REMMIS is to improve the assessment of federal EMS grant programs. The system will provide well-defined and pertinent information on each of the 304 regional EMS systems.

Both the U.S. Department of Health and Human Services and the Department of Transportation fund and coordinate EMS research projects and reports. Other research projects are funded through the National Center for Health Services Research. There is no central directory for such research, thus information on specific research projects must be obtained from each funding agency separately.

10. Disaster Plans

The Federal Emergency Management Agency (FEMA) has developed policy guidelines for mass disasters. Other aids have been developed by the American Hospital Association. In addition, the Nuclear Regulatory Agency requires mass evacuation plans for areas near nuclear reactors.

Hospitals prepare plans biannually in cooperation with regional EMS programs and county disaster-planning agencies. These plans are reviewed by the Joint Commission on the Accreditation of Hospitals, which also requires annual exercises.

11. Special Features

Some of the special features of the United States' EMS systems are: ambulance standards, hospitalization phase technology for speciality and trauma capabilities, communications technology with telemetry and repeater (or relay) linkages, regional poison information control, citizen CPR training, and specialized training for advanced cardiac and trauma care.

SUMMARY TABLE OF RESPONSES TO CCMS/EMS 1980 SURVEY

EMS Survey Number	COUNTRIES / RESPONSES (7)	BELGIUM	CANADA	FRANCE	GREECE	ICELAND	ITALY	LUXEM-BOURG	NETHER-LANDS	PORTU-GAL	U.K.	U.S.
1.	Source of Prime National Responsibility Indicated	Yes	Yes Adv. (1)	Yes	Yes	Yes	Yes	Yes	Yes Adv. (1)	Yes	Yes Adv. (1)	Yes Adv. (1)
2.	EMS Organized on a Regional Basis	No	Partly (2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.	Countries with EMS Laws or Regulations	Yes	Partly (2)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes (3)	Yes (4)
4.1	Education of General Public	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4.2	Education for Specific Audiences	Yes	Yes	No Reply	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5.2	EMS Dedicated Radio Frequencies	Yes	Partly (2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6.1	Ambulance Vehicle Design Standards	Yes	Partly (2)	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes (4)
7.	Hospital Designation or Categories	Note (2)	Pro-posed	Yes	No	Note (5)	Yes	Yes	Yes	No	Note (5)	Yes
9.1	Central Data Collection/Statistics	Yes	Note (2)	Partial	No	Yes	No	No	Yes	Yes	Yes	Yes

NOTES:
(1) National guidelines are of an advisory nature: No direct authority.
(2) In some provinces or states.
(3) Part of National Health Service
(4) Grant funding program.
(5) Partial designation: either by specialty or by size (regional, local). (SEE RESPECTIVE TEXTS)
(6) Hospital emergency visits by national agency; ambulance statistics by provincial agencies
(7) In all cases responses interpreted liberally: "Yes" answers do not imply comparable programs.