

Prehospital and emergency department care in South Korea

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Introduction

South Korea came into existence in 1948, has an area of approximately 98 000 km² and a population of 48 million people. Prehospital care and emergency medicine have evolved rapidly in this country over the last 2 decades, both as a result of deficiencies revealed by several major disasters in the 1990s and in response to the needs of hosting major international sporting events. The Korea Emergency Medical Society was established in 1989, and emergency medicine was recognized as a specialty in 1996. There are now about 300 emergency medicine specialists working in South Korea (Fig. 1).¹

Prehospital care

History

In South Korea, dialing 119 activates the Emergency Medical Services (EMS) system. Originally, fire stations responding to 119 calls were only responsible for fire-fighting and life-saving activities; privately-owned ambulances were used to transfer patients and perform emergency rescue activities. In preparation for the 1988 Seoul Olympic Games, fire stations in South Korea were reorganized to include the provision of emergency rescue activities through a newly established Special Rescue Service.

In the 1990s, there were several major disasters that revealed various deficiencies in the EMS system. These disasters included:

- the collapse of Sung-Su Bridge in 1994, where 30 people were killed and 20 were injured;
- the collapse of the Sampoong Department Store² in 1995, where 500 people were killed and 900 were injured; and
- the gas explosions in Daegu in 1995 in which 100 people were killed and 200 were injured.



Fig. 1. A doctor and nurses in the Korea University Hospital Emergency Department.

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In response, the National 119 Rescue Service was created, with local 119 Rescue Services as subordinate organizations. In 1997, the 119 International Rescue Service Team was established, and has subsequently participated in rescue activities for a plane crash in Cambodia as well as major earthquakes in Turkey and Taiwan.

In preparation for the 2002 FIFA (Fédération Internationale de Football Association) World Cup, the National 119 Rescue Service reorganized prehospital care. This involved linking EMS with hospital emergency departments (EDs) through collaboration with the national Emergency Physicians' Association, which was established in 1996. The reorganization of prehospital care greatly contributed to the success of the FIFA World Cup in Seoul. The beneficial impact of this reorganization on primary care, triage and patient transfer was subsequently demonstrated by the effectiveness of the response to a disastrous fire at the Daegu subway station in 2003 that resulted in 190 deaths and 150 injuries.

Current status

The 119 Rescue Services are affiliated with about 150 local fire stations nationally and are now fully responsible for all aspects of emergency rescue activities (Fig. 2). In 2004 there were 943 378 rescue calls involving 975 240 people in South Korea; an average of 2585 calls daily. A disproportionate 35% of these calls (325 868) originated in Seoul, South Korea's capital, with a population of about 10 million. Seoul has an area of about 605 km², and 21 fire stations. There are 110 emergency rescue teams affiliated with these fire stations and they consist of ambulances, rescue personnel and equipment (Table 1). In Seoul, each

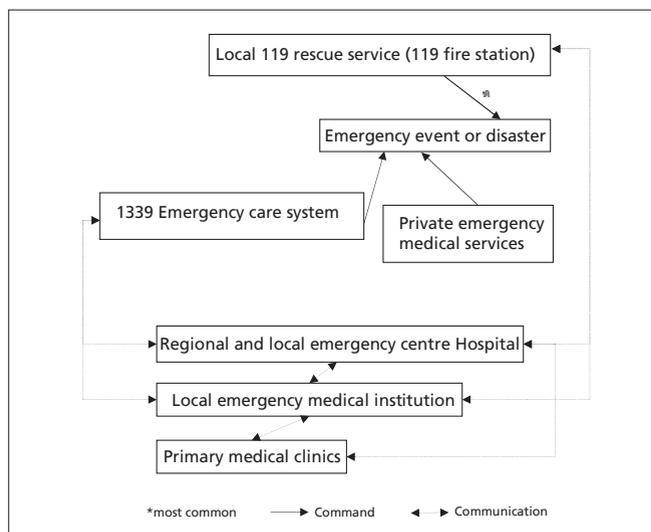


Fig. 2. The chain of command of the Seoul Emergency Medical Services system.

Emergency Rescue Service unit serves a population of about 100 000 people. The number of rescue calls in Seoul increased dramatically from 9430 in 1983 to 325 868 in 2004 due, in part, to a government advertisement campaign. The call volume has remained relatively constant, at

Table 1. Overview of EMS care in Seoul, South Korea

Rescue team personnel	
<i>Personnel</i>	<i>No.</i>
Nurse	18
EMT-1	130
EMT-2	325
Accredited specialist	223
Total	696
Ambulance	
<i>Type</i>	<i>No.</i>
Special ambulance	117
General ambulance	3
Total	120
Ambulance equipment	
Oxygen, intubation set, bag valve, MAST, splint, fluid, drugs (atropine, epinephrine, lidocaine, analgesics and antihistamine), wireless radio equipment, sphygmomanometer, AED, laboratory test equipment	
Patient's medical condition(s)	
<i>Condition</i>	<i>No. (and %)</i>
Internal medicine disease	131 867 (61.3)
Accidental injuries	49 681 (23.1)
Traffic accidents	19 644 (9.1)
Poisoning	2892 (1.3)
Pregnancy disorder	2465 (1.1)
Other	8635 (4.0)
Total	215 184
Patient's age	
<i>Age, yr</i>	<i>No. (and %)</i>
< 9	9051 (4.2)
10–19	9051 (4.2)
20–29	25 039 (11.6)
30–39	28 977 (13.5)
40–49	36 669 (17.0)
50–59	33 311 (15.5)
≥ 60	73 086 (34.0)
Total	215 184
Time of call	
<i>Time, h</i>	<i>No. (and %)</i>
0200–0600	23 132 (10.8)
0600–1000	38 056 (17.7)
1000–1400	62 708 (29.1)
1400–1800	36 400 (16.9)
1800–2200	38 149 (17.7)
2200–0200	16 739 (7.8)
Total	215 184

EMS = Emergency Medical Services; EMT = emergency medical technician; MAST = military antishock trousers; AED = automatic external defibrillator.

approximately 300 000 calls annually since 1999 (Fig. 3). This represents an average of about 822 calls and 600 patient transfers per day (about 8 calls per day for each emergency rescue team). Transfers to hospitals are predominantly to the overcrowded tertiary care centres (70%–80%), with the remainder involving secondary hospitals (10%–20%) and primary medical clinics (about 10%). Most transferred patients have medical diseases and about one-third of patients are older than 60 years of age. There are a relatively large number of transfers between 1000 and 1400 hours and fewer transfers between 2200 and 1000 hours the next morning, when other alternatives for acute medical care are less available (Table 1). Recently, the Emergency Service Centre set up a medical treatment guidance team for patients, providing real-time remote medical care guidance for emergency patients as well as a paging service to help cope with emergency situations involving elderly people living alone.³

The administration of emergency care in South Korea is 2-tiered. The 119 Rescue team is responsible for prehospital care, while the “1339 Service” Emergency Medical Information Center coordinates communication between ambulances, emergency medical facilities and hospitals. When transfer between hospitals is required, a private ambulance is used instead of a 119 ambulance.⁴ Further, the 1339 Service is generally more focused on rapid patient transfer to a hospital rather than on prehospital care (Fig. 2).

Emergency department care

Seoul has a mixture of private and public hospital EDs in-

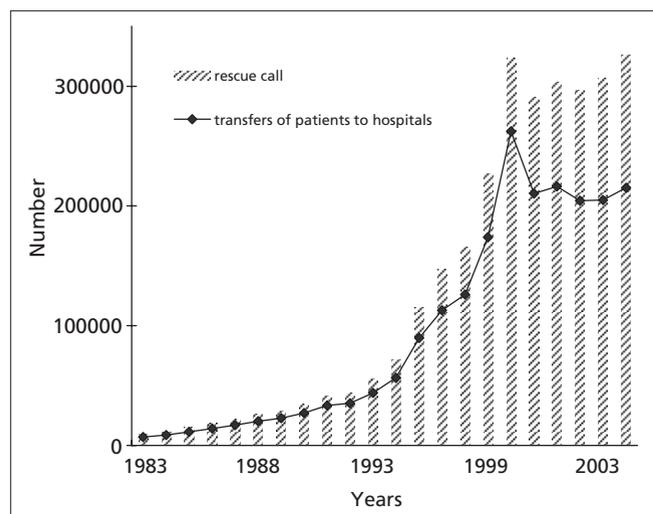


Fig. 3. Rescue calls and patient transfers to hospitals in Seoul.

volving 1 regional emergency medical centre, 2 professional emergency medical centres, 25 local emergency medical centres and 26 local emergency medical institutions. Since 2002, these institutions have been categorized by the National Emergency Medical Center using standards based on the available physical resources, equipment and medical personnel. As a result of the efficiency of the 119 teams, the time from the receipt of a call to patient arrival in an ED has been reduced to about 20–30 minutes, thus facilitating prompt treatment.

Future challenges

Prehospital and ED care in South Korea have vastly improved over the last 2 decades. However, ED overcrowding has become an increasing impediment to providing appropriate patient care and coordination with 119 rescue teams. Moreover, 119 emergency medical technicians in South Korea are currently capable of providing only basic life support treatments. Further improvements to the South Korean EMS system could be achieved by complete integration of the various components into one system, increased medical control, advanced emergency medical technician training, expanded medical capacity of primary and secondary hospitals and improved efficiency of medical care in tertiary hospitals.

Competing interests: None declared.

Key words: emergency medical services, prehospital care, emergency medicine, emergency department, disaster, ambulances, South Korea.

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