

# Public attitudes to emergency medical services in Singapore: EMS day 2002

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## ABSTRACT

**Introduction:** In the year 2002, the Society for Emergency Medicine in Singapore Chapter of Paramedics organised the first emergency medical services (EMS) day, to educate the public about basic emergency response skills and to increase public awareness of the local EMS System.

**Methods:** This was an observational, cross-sectional study. A survey was conducted to find out about the knowledge and attitudes of the public and paramedic volunteer instructors towards the local EMS System.

**Results:** Two hundred and six (81.4 percent) out of 253 members of the public and 70 paramedics (100 percent) responded. For the public, the majority were females (86 percent), mean age (standard deviation [sd]) was 15.9 (7.9) years, range 11.0 to 67.0 years. For the paramedics, mean (sd) age was 26.6 (3.8) years. 61.9 percent were females. The public showed good knowledge of the emergency ambulance number and the indications for calling an ambulance. Public expectations of ambulance response times were significantly shorter than paramedics. They were also less comfortable with ambulance crews performing advanced life support interventions compared with the paramedics.

**Conclusion:** Continuing efforts should be made to increase public awareness of the EMS system as well as to manage public expectations regarding response times and the roles of paramedics. EMS day represents one such opportunity.

**Keywords:** ambulance, cardiopulmonary resuscitation, emergency medical services, paramedics

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## INTRODUCTION

Singapore, an urbanised country with a land area of 682.3 square kilometres, has a fleet of 32 emergency

ambulances attending to a population of 4.1 million<sup>(1)</sup>. The national emergency medical services (EMS) are run by the Singapore Civil Defence Force (SCDF), which stations the ambulances in 14 fire stations around the island. It is primarily a single tier system, able to provide basic life support (BLS) and defibrillation with automated external defibrillators (AED). Since 1998, ambulances have been manned by paramedics, a relatively- new vocation in Singapore. Prior to this, ambulances were manned by nurses seconded from the Ministry of Health. Previously-reported survival to discharge rates for cardiac arrest in Singapore was 1.9%<sup>(2)</sup> and 3.5%<sup>(3)</sup> from single hospital studies.

In the year 2002, the Society for Emergency Medicine in Singapore (SEMS) Chapter of Paramedics organised the first EMS day. This event was organised to educate the public about basic emergency response skills and to increase public awareness of the local EMS system. It was a one-day event, held in the downtown shopping area with participation from schools, religious and community organisations. The EMS day was in conjunction with the National EMS week in the United States.

The theme for 2002 was "Help is a heartbeat away". The programme consisted of live cardiopulmonary resuscitation (CPR) demonstration using mannequins, basic first aid training, CPR training as well as a poster exhibition on the local EMS system. All training comprised of demonstrations and small group practices with one instructor and four to five participants to one mannequin. Together with the training, a survey was conducted to find out about the knowledge and attitudes of the public and paramedic volunteer instructors towards the local EMS system.

## METHODS

This was an observational, cross-sectional study. A survey comprising of eight questions were given out to all participants during registration (Fig. 1). Demographic data were obtained. The participants were asked the national emergency and non-emergency numbers; recognition of emergency and non-emergency

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Fig. 1 Sample survey form.

1. The number to call for an ambulance in Singapore for an emergency is 999 / 911 / 995	
2. The non-emergency ambulance number in Singapore is 995 / 1777 / 1444	
3. I would call for an emergency ambulance in the following situations:	
a) Chest pain	Yes / No
b) Cough and colds	Yes / No
c) Breathing difficulty	Yes / No
d) Rash	Yes / No
e) Diarrhoea and vomiting	Yes / No
4. If my relative has a cardiac arrest (no breathing, no heartbeat), I would	
a) Rush them to the nearest clinic	
b) Call for an ambulance	
c) Rush them to the nearest hospital	
5. Ambulances in Singapore are manned by Doctors / Nurses / Paramedics	
6. After calling for an ambulance, I expect it to arrive <5 mins / <10 mins / <15 mins / <20 mins	
7. The job of an ambulance crew includes	
a) Bringing a patient to hospital as quickly as possible	Yes / No
b) Giving life saving medications	Yes / No
c) Performing life saving procedures	Yes / No
8. I would be comfortable with the ambulance crews (non-doctors) performing the following procedures if they were appropriately trained.	
a) Defibrillation (using electrical therapy to restart the heart)	Yes / No
b) Giving Intravenous (injection) medications	Yes / No
c) Inserting airway devices (breathing tubes) into the body	Yes / No

situations; first response during a cardiac arrest; knowledge and expectation of local emergency ambulances; and the level of comfort regarding paramedics performing certain procedures.

A similar survey was given to paramedics who served as instructors for this event. Paramedics' demographic data, their expectation of local emergency ambulances and the level of comfort regarding them performing certain procedures were obtained. Proportions, with 95% confidence intervals, of correctly answered questions were presented. Comparisons of the proportions of correctly answered questions between the subgroups in the public domain and the expectations of EMS between the public and medical personnel were analysed using the chi-square/ Fisher's exact tests with odds ratios presented where applicable.

## RESULTS

A total of 333 people participated in this event, of which 253 survey forms were distributed to members of the public and 70 to paramedic instructors. Two hundred and six members of the public (81.4%) and 70 paramedics (100%) responded. For the public, the majority were females (86%), mean age (standard

deviation [sd]) was 15.9 (7.9) years, range 11.0 to 67.0 years (Table I). For the paramedics, mean (sd) age was 26.6 (3.8) years, with 61.9% being females (Table II).

Members of the public were asked what the emergency ambulance number is in Singapore. 95.5% (95% CI, 92% to 98%) answered correctly that it was 995. 1.5% answered 999 and 3.0% answered 911. When asked what the non-emergency number was, 96.9% (95% CI, 93.1% to 98.6%) answered correctly that it was 1777. 2.1% answered 995 and 1% answered 1444. When asked what they would do if a relative had a cardiac arrest in their presence, 87.3% said they would call for an ambulance, 3.9% said they would rush them to the nearest clinic, and 8.8% would rush them to the nearest hospital using their own transport. Respondents were also asked if they would call for an ambulance in the following situations: chest pain, cough and cold, breathing difficulties, rash, diarrhoea and vomiting. Their responses are given in Table III. When asked who manned ambulances in Singapore, 97.5% (95% CI, 93.8% to 98.9%) answered correctly that the paramedics did so, 1.5% said doctors and 1% said nurses.

The public domain was sub-grouped into medical, non-medical and students. To the question regarding

**Table I. Characteristics of public surveyed (n=206).**

<b>Age</b>	
Mean (SD) years	15.9 ± 7.9
<b>Sex (n=193)</b>	
Male	27 (14.0%)
Female	166 (86.0%)
<b>Race (n=203)</b>	
Chinese	140 (69.0%)
Malay	47 (23.1%)
Indian	11 (5.4%)
Others	5 (2.5%)
<b>Education level (n=204)</b>	
PSLE (elementary)	5 (2.5%)
O levels (secondary)	183 (89.6%)
A levels (high school)	3 (1.5%)
Degree (tertiary)	9 (4.4%)
Others	4 (2.0%)
<b>Profession (n=200)</b>	
Medical-related	3 (1.5%)
Non-medical	11 (5.5%)
Student	186 (93.0%)

**Table II. Characteristics of paramedics surveyed (n=70).**

<b>Age (n=65)</b>	
Mean (SD) years	26.6 ± 3.7
<b>Sex (n=63)</b>	
Male	24 (38.1%)
Female	39 (61.9%)
<b>Race (n=64)</b>	
Chinese	25 (39.1%)
Malay	22 (34.4%)
Indian	10 (15.6%)
Others	7 (10.9%)
<b>Education level (n=64)</b>	
O levels (secondary)	20 (31.3%)
A levels (high school)	4 (6.3%)
Diploma (tertiary)	30 (46.7%)
Degree (tertiary)	4 (6.3%)
Others	6 (9.4%)

the number to call for an emergency ambulance, among the public responses, students were more likely to call 995 ( $p=0.002$ , OR=14.2, 95% CI 3.3 – 61.0) and less likely to call 999 (incorrect) ( $p=0.014$ , OR=0.033, 95% CI 0.003 – 0.392). Those in a non-medical profession were more likely to call 999 (incorrect) ( $p=0.008$ , OR=40.9, 95% CI 3.4 – 494.1) and less likely to call 995 ( $p=0.009$ , OR=0.089, 95% CI 0.019 – 0.424). To the question regarding the non-emergency ambulance number, students were again more likely to answer correctly ( $p<0.001$ , OR=32.8, 95% CI 4.8 – 224.8) and non-medical professions

**Table III. Situations to call for an emergency ambulance (n=206).**

	Yes	No	Do not know
Chest pain	173 (84.0%)	26 (12.6%)	7 (3.4%)
Cough and colds	3 (1.5%)	176 (85.4%)	27 (13.1%)
Breathing difficulty	197 (95.6%)	6 (2.9%)	3 (1.5%)
Rash	13 (6.3%)	166 (80.6%)	27 (13.1%)
Diarrhoea and vomiting	53 (25.7%)	130 (63.1%)	23 (11.2%)

Values are n (%).

**Table IV. Expected time for an ambulance to arrive.**

Expected time for an ambulance to arrive	Paramedics (n = 70)	Public (n = 197)
<5 mins	3 (4.3%)	82 (41.6%)
<10 mins	54 (77.1%)	88 (44.7%)
<15 mins	13 (18.6%)	24 (12.2%)
<20 mins	0 (0%)	3 (1.5%)

Values are n (%).

least likely to answer correctly ( $p<0.001$ , OR=0.027, 95% CI 0.004 – 0.185).

Chinese were more likely to rush a relative with cardiac arrest to the nearest hospital in their own transport compared to Malays, Indian and others ( $p=0.014$ , OR 8.7, 95% CI 1.1 – 67.0). We asked both the public and paramedics how long they expected an ambulance to take to arrive after calling. Responses are shown in Table IV. 41.6% of the public expected arrival to be less than 5 minutes compared to the paramedics (4.3%) ( $p<0.001$ , OR=15.9, 95% CI 4.8 – 52.4).

We also asked both groups if they agreed that the job of an ambulance crew involved bringing a patient to hospital quickly, giving life-saving medications, and performing life-saving procedures. 94.3% of paramedics and 91.7% of the public agreed that it included bringing a patient to hospital quickly ( $p=0.319$ ). 94.3% of the paramedics agreed that it included giving life-saving medications. However, only 62.6% of the public agreed ( $p<0.001$ , OR=0.102, 95% CI 0.036 – 0.290), 27.7% disagreed and 9.7% did not know. Similarly, 100% of the paramedics agreed it included performing life-saving procedures compared to 86.9% of the public ( $p=0.002$ , RR=0.719, 95% CI 0.665 – 0.777). 5.8% of the public disagreed and 7.3% did not know.

We also asked both groups if they felt comfortable with ambulance crews performing defibrillation, giving intravenous medications and inserting airway devices. 100% of paramedics were comfortable doing defibrillation while only 73.8% of the public were ( $p<0.001$ , RR=0.707, 95% CI 0.652 – 0.767). 63.6%

of the public were comfortable with paramedics giving intravenous medications compared to 98.6% of paramedics ( $p < 0.001$ ,  $OR = 0.025$ , 95% CI 0.003 – 0.186). 69.9% of the public were comfortable with paramedics inserting airway devices while 97.1% of paramedics with this ( $p < 0.001$ ,  $OR = 0.068$ , 95% CI 0.016 – 0.288).

## DISCUSSION

This was the first EMS day public event ever organised in Singapore. The organisers saw it as an opportunity to raise public awareness about EMS and give hands-on demonstration and training in life-saving skills such as CPR. Publicity for this event was through posters, flyers, community grassroots organisations, and the mass media. Paramedics as a vocation are relatively new in Singapore, being introduced in 1998. Ambulances were previously manned by nurses. They are currently capable of BLS and defibrillation using AEDs. There are ongoing plans for incremental introduction of pre-hospital advanced life support (ALS) interventions.

For this event, we found that a large proportion of participants were female and students. This is a limitation to the survey. Firstly, due to the exceptionally large number of young female students involved, the result may not be representative of the general population of Singapore. Secondly, cardiac arrests usually occur more in the elderly and from previous studies, we know this group tends to be less informed about what to do in an emergency<sup>(4)</sup>. Special strategies may be needed to educate the elderly. Family members of high-risk patients could also be targeted to learn CPR. Follow-up studies of a mail-in design could be done to obtain a sample more representative of the general population.

Overall, participants showed good knowledge of the emergency ambulance number. However, this could have been biased by the educational displays concurrent with EMS day. A 2001 study showed 11.0% of the public did not know the emergency ambulance number<sup>(5)</sup>. It was also of concern that 8.8% of participants would rush a cardiac arrest patient to hospital in their own transport and 3.9% would bring them to a nearby clinic. This group would be better advised to call for an ambulance, which all carry AEDs.

In this study, most participants were aware that patients with chest pain and difficulty in breathing required an ambulance. This may be due to consistent mass media campaigns to educate the public regarding emergencies. However, slightly fewer were aware that cough and colds, rash, diarrhoea and vomiting usually do not require an emergency ambulance.

One London study revealed 16% of ambulance calls were considered inappropriate<sup>(6)</sup>, with similar results (31.7%) found in a Taiwan study<sup>(7)</sup>.

Public preconceptions may also have an influence on the decision to call for an ambulance in an emergency<sup>(8)</sup>. Our survey suggests that racial and community factors may also influence this decision. This needs to be taken into account in any public education effort. We found a discrepancy between public expectations of ambulance response times and paramedics' expectations. The public expected the ambulance to arrive much faster than paramedics did. Realistic or not, these expectations will need to be addressed. There was also relatively higher public discomfort with paramedics performing ALS interventions. This information is especially useful as currently, paramedics are performing more ALS interventions. This discomfort will need to be addressed by public education on the training and capabilities of paramedics, and the potential of early interventions to save more lives.

In conclusion, continuing efforts should be made to increase public awareness of the EMS system, as well as to manage public expectations regarding response times and the roles of paramedics. Events such as EMS day represent such an opportunity.

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