PRE HOSPITAL CARE SYSTEM IN MALAYSIA

DAEGU, SOUTH KOREA
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Malaysia is located in South East Asia

Bordered by Thailand in the north and Singapore in the south

Consists of 15 states and has a democratic government

Comprises of multi-ethnic groups, the Malay group being the majority (70%) and others such as Chinese and Indians

The land area is 330,252 square kilometers with a population of just over 25 million
Life expectancy at birth in 2008 for males was 70.3 years and for females, 75.2 years

The health facilities are provided by the Ministry of Health (MOH), Ministry of Education (university hospitals), and private sectors

Each of the 15 states are provided with a General Hospital that perform as referral center
**INTRODUCTION**

- Total number of doctors of 17,442
- The ratio of doctors to population as in 2002 is 1 to 1,474
- MOH allocation to National Budget is 6.33%, amounting to Malaysian Ringgit (RM) 5,765,553,410
- 80% of which was for the operating budget and the other 20% for the development budget
# INTRODUCTION

<table>
<thead>
<tr>
<th></th>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal Delivery</td>
<td>14.91%</td>
</tr>
<tr>
<td>2</td>
<td>Complications of Pregnancy</td>
<td>12.39%</td>
</tr>
<tr>
<td>3</td>
<td>Accident</td>
<td>9.11%</td>
</tr>
<tr>
<td>4</td>
<td>Diseases of the Respiratory Systems</td>
<td>7.30%</td>
</tr>
<tr>
<td>5</td>
<td>Diseases of the Circulatory Systems</td>
<td>7.26%</td>
</tr>
<tr>
<td>6</td>
<td>Perinatal Conditions</td>
<td>6.57%</td>
</tr>
<tr>
<td>7</td>
<td>Diseases of the Digestive Systems</td>
<td>5.20%</td>
</tr>
<tr>
<td>8</td>
<td>Diseases of the Urinary Systems</td>
<td>3.74%</td>
</tr>
<tr>
<td>9</td>
<td>Ill-defined Conditions Diseases</td>
<td>3.43%</td>
</tr>
<tr>
<td>10</td>
<td>Malignant Neoplasms</td>
<td>3.13%</td>
</tr>
</tbody>
</table>

Total admission = 1,905,689  
*Figures from Ministry of Health Malaysia 2007*
INTRODUCTION

Principal Causes of Deaths In Government Hospitals Malaysia in 2007

<table>
<thead>
<tr>
<th>Rank</th>
<th>Cause</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Septicemia</td>
<td>16.87%</td>
</tr>
<tr>
<td>2</td>
<td>Heart Diseases &amp; Diseases of Pulmonary Circulation</td>
<td>15.70%</td>
</tr>
<tr>
<td>3</td>
<td>Malignant Neoplasm</td>
<td>10.59%</td>
</tr>
<tr>
<td>4</td>
<td>Cerebrovascular Diseases</td>
<td>8.49%</td>
</tr>
<tr>
<td>5</td>
<td>Pneumonia</td>
<td>5.81%</td>
</tr>
<tr>
<td>6</td>
<td>Accident</td>
<td>5.59%</td>
</tr>
<tr>
<td>7</td>
<td>Diseases of Digestive System</td>
<td>4.47%</td>
</tr>
<tr>
<td>8</td>
<td>Perinatal Conditions</td>
<td>4.20%</td>
</tr>
<tr>
<td>9</td>
<td>Kidney Diseases</td>
<td>3.83%</td>
</tr>
<tr>
<td>10</td>
<td>Ill-Defined Conditions</td>
<td>3.03%</td>
</tr>
</tbody>
</table>

Total death = 49,586

Figures from Ministry of Health Malaysia 2007
Pre-Hospital Care System in Malaysia

- Hospital based: Emergency department
- Emergency only
- Medical assistant/nurses as main providers
- Common 999 entry point (October 2007)
- Free
- 24 hour on demand service
Malaysia Emergency Response System

Major step........
June 2007
i. One number – “Client focus” (response to 999 calls within 10 sec or 4 rings)

ii. “Automatic routing system” with zero defect

iii. Standardization of client interaction protocol for all call centers

iv. Single “Communication network” for all agencies involved

v. “Online incident management protocol” before arrival of response team

vi. Trained EMD at call center
Special Situations

- Partners in providing the service:
  - Civil defence Malaysia
  - St John’s Ambulance
  - Malaysia Red Crescent
  - Volunteer Fire & Rescue Services
Problems in EMS in Malaysia:

- Cities are getting bigger with worsening traffic congestion.
- Existing hospital ambulances struggle to cope with increase demand and area of coverage: increase response time.
Accessibility to medical care in Malaysia is considered excellent:

- 81% is within the 3 km from the health care facility
- 88% within 5 km
- 93% within 10 km

Emergency services in many rural health clinics are rudimentary:

- Resuscitative equipment & skill
- Roles during emergencies
- Roles of emergency transport

Although accessibility to medical care is excellent, accessibility to emergency care is still lacking.
Can the ED alone cope with the emergency ambulance services?

Can the hospital alone cope with service?

Can the MOH alone cope with the service?

Can the government alone cope with this?

COMMUNITY INVOLVEMENT is the key to any emergency ambulance service, serving the community
STEPS TAKEN:

RURAL AREAS

- Rural Health Clinic must play primary role
  - Accessibility and community participation
  - Primary response to emergencies
  - Providing first aid and as first responder
  - Transporting emergency patients to nearby health center
SMALL TOWNS

- Hospitals & Health Clinic Sharing
  - Mapping of coverage areas
  - Common system and communications
  - Sharing of resources and supplies

Training
Equipment supplies
Ambulances
LARGE CITIES/TOWNS

- Multi agencies involvement
  - NGOs cooperation needed
  - “Centralize Call Center”
  - Decentralize ambulances
Pilot Projects:

- Penang State
  - Within & among districts
    - MOH hospitals + Health Clinics + NGOs

- Johor state
  - Within district
    - MOH hospitals + Health clinics

- Klang Valley (KL)
  - Zones
    - MOH Hospitals + University Hospitals + Health Clinics + NGOs
DISTRICT OF KOTA BHARU
NETWORK FOR CALL CENTER

KK PENAMBANG
KK BADANG
KK PENAMANG
KK TENDONG
KK WAKAF CHE YEH
KK LUNDANG PAHU
KK PEROL
KK KETEREH
KK WAKAF BARU

HKB

KK KEDAI LALAT
KK BERIS PANCOR
KK BALAI
KK BACHOK
KK PERINGAT
KK KUBANG KERIAN

HUSM/JPA3
In the past time......

Health Centers

No doctors

Time?
Transportation problems

District hospital

Small ED
Limited no of doctors

Tertiary Hospital

Equipped ED
Emergency Physicians

OUTCOME POOR

Beyond the Golden / Platinum Hours: SURVIVAL POOR
In the present time.....

Doctors/MA present

Health Center

District hospital

Acute hospital care

Transportation Time
Communication Time
REDUCED

Tertiary Hospitals

Emergency Medicine developing
Better equipped ED
Better transportation
MOH FOCAL ACTIVITIES:

- Designated PHC units
- Call center development
- Ambulance purchase
- Radio communication and network
- Clinical protocol/medical direction
- Motorcycle squads
- Training - first responder, BLS, BTLS
Malaysia Emergency Response System

Call center - Hospital based
Vehicles (staff & equipment)

Manned by non paramedics
Ambulance driver with nursing staff
Minimally trained & equipped

Scoop & Run Concept

Old Days !!!!
Vehicles (staff & equipment)

Better equipped
Trained nursing staff
Accompanied by doc
# Response time (dispatch)

Ambulance Response Time (ART) Before and After Emergency Medical Dispatcher (EMD) Training Program (Statistics January Till December 2007 from Call Center Hospital Universiti Sains Malaysia)

<table>
<thead>
<tr>
<th>GROUP</th>
<th>Call Processing Time (CPT)</th>
<th>Time Taken to Prepare Team (TTP)</th>
<th>Time Taken To Arrive At Scene (TTTS)</th>
<th>Ambulance Response Time (ART)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without EMD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>117.00</td>
<td>203.91</td>
<td>1325.29</td>
<td>1646.21</td>
</tr>
<tr>
<td>Number of Calls</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>Std Deviation</td>
<td>54.93</td>
<td>115.24</td>
<td>1572.30</td>
<td>1609.39</td>
</tr>
<tr>
<td>With EMD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>117.67</td>
<td>117.00</td>
<td>676.83</td>
<td>911.50</td>
</tr>
<tr>
<td>Number of Calls</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>Std Deviation</td>
<td>55.20</td>
<td>54.93</td>
<td>1451.08</td>
<td>399.34</td>
</tr>
</tbody>
</table>

Mean Time in seconds

\[
\text{ART} = \text{CPT} + \text{TTP} + \text{TTTS}
\]

\[P = 0.002\]
# Response time (dispatch)

## Mean Ambulance Response Time At Tertiary Hospitals In Three Different Cities in Malaysia

<table>
<thead>
<tr>
<th>Cities</th>
<th>Mean Call Processing Time (CPT)</th>
<th>Mean Time Taken to Prepare Team (TTP)</th>
<th>Mean Time Taken To Arrive At Scene (TTTS)</th>
<th>Mean Ambulance Response Time (ART)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kota Bharu</td>
<td>117.67</td>
<td>117.00</td>
<td>676.83</td>
<td>911.50</td>
</tr>
<tr>
<td>Penang</td>
<td>154.07</td>
<td>218.56</td>
<td>896.33</td>
<td>1268.96</td>
</tr>
<tr>
<td>Kuala Lumpur</td>
<td>135.48</td>
<td>196.22</td>
<td>1208.08</td>
<td>1539.78</td>
</tr>
</tbody>
</table>

Mean Time in seconds

P<0.05
# PRESENT & FUTURE CHALLENGES

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>i.</td>
<td>Multiple providers</td>
</tr>
<tr>
<td>ii.</td>
<td>Non standard training program/certification</td>
</tr>
<tr>
<td>iii.</td>
<td>Poorly or untrained EMS staff</td>
</tr>
<tr>
<td>iv.</td>
<td>Poor public comprehension about EMS</td>
</tr>
<tr>
<td>v.</td>
<td>Non uniformity of allocation in services</td>
</tr>
<tr>
<td>vi.</td>
<td>Poorly equipped ambulances</td>
</tr>
<tr>
<td>vii.</td>
<td>Poor quality ambulances</td>
</tr>
<tr>
<td>viii.</td>
<td>Lack of EMS research and quality control</td>
</tr>
<tr>
<td>ix.</td>
<td>Privatizing the service ???</td>
</tr>
</tbody>
</table>