The outcome of emergency patient transported by public air ambulance service in Thailand

Flt.Lt.Atchariya Pangma, MD.
Background

FACTS IN EMERGENCY ROOM

- 200 MILLION OF HOSPITAL OUT PATIENTS VISIT IN THAILAND ANNUALLY
  - ER ~ 35 MILLION VISITS
  - EMERGENCY 28%
  - URGENCY 3%

\[ \approx 10 \text{ MILLION VISITS} \]

= Total estimated demand for EMS

- IN 2016 NIEM PROVIDED PREHOSPITAL CARE TO
  \[ \sim 1,500,000 \text{ PATIENTS (1 M of Emergency and urgency)} \]
  \[ \sim \text{ONLY 10 % OF TOTAL REQUIREMENT} \]

The rest (80-90%) of today still rely on friends/relatives/non-certified personals/bystanders
EMS System in Thailand

Emergency Call 1669
80 Call centers/ 77 provinces
13 regions MOPH+BMA
operation 24/7

- Land
- Air
- Sea

Royal Thai Navy
For Maritime
EMS region
(plan)
Aeromedical Transport Service in Thailand

- Military aeromedical service
  RTAF, RTN, RTA, RTP
- Civil aeromedical service
  - Private aeromedical service
    - Hospital-based
    - Non-hospital-based
  - Public aeromedical service
    - Thai Sky Doctor Service
THAI SKY DOCTOR SERVICE

- Founded in 2009 by the National Institute for Emergency Medicine.
- A public emergency aeromedical transportation service of Thailand.
- Offers Helicopter Emergency Medical Service (HEMS) and fixed wing operations for emergency patients.
- **Purpose:** Increase chances of survival for emergency patients in remote or inaccessible locations.
THAI SKY DOCTOR SERVICE: Integration between Aircraft Providers, Medical Teams and System Administrator
“There is very few study about Public air ambulance service in Thailand”

The first study is Model and policy recommendation for Thailand’s Aeromedical service (Jitisak T.)

After the Thai Sky Doctor Service implemented there is no study about provision of this service.

This study intent to study characteristic and outcome of public air ambulance service (Thai Sky Doctor Service) in Thailand.
General Objectives

• To describe outcome of emergency patient transported by Public air ambulance service (Thai sky doctor) in Thailand.

Specific Objectives

1. To describe general characteristics of Public air ambulance service (Thai sky doctor).

2. To describe immediate 1 day and delayed 3 days post air transport outcome of emergency patients transported by Public air ambulance service (Thai sky doctor) in Thailand.

3) To identify the factors associated with 1 day and 3 day outcome.
Research Questions

1) What is the characteristic of Public air ambulance service in Thailand (Thai sky doctor) ?

2) What are the 1 day and 3 days outcome of emergency patients that transported by Public air ambulance service (Thai sky doctor) in Thailand ?

3) What are the factors associated with 1 day and 3 days outcome?
Conceptual Framework

**Independent Variables**

Demographic data of patients
- Gender, age, health security scheme, nationality

Demographic data of Thai Public air ambulance service
- National EMS Dispatch Center
- Regional 1669 EMS dispatch center
- Flight medical director
- Referral / Receiving Medical facility
- Aircraft Type / Aircraft provider
- Airport / helipad
- Payer
- Type of mission

Associated factors of Thai Public air ambulance service
- Gender, Age
- Patient conditions
  - Disease group
  - Triage criteria and Level of Patient acuity
- Medical team
- Flight information
  - Flight response time
  - Flight time

Mission obstacle factors
- Weather condition
- No aircraft
- Dead before mission

**Dependent Variable**

1 day and 3 days post air transport outcome of emergency patients who transported by Public air ambulance service in Thailand
Method

- Cross sectional Descriptive study using Mixed method
- Qualitative Data and Quantitative data

Study Population

- Public air ambulance service (Thai sky doctor service) mission in Thailand

Sampling Technique

- Qualitative data use primary data from aeromedical decision maker (Flight director), aircraft provider, medical team, receiving hospital, payer and NIEM
- Quantitative data use secondary data of all patient record from NIEM
Data collection

• In-depth and Focused group interview

• Topic of interview:
  • What is their roles in Public air ambulance service?
  • What are facilitating factors or obstacle factors for Public air ambulance service?

• Secondary data were collected from NIEM by researcher with permission.

Data analysis

• Descriptive statistics: Percentages, mean, median and standard deviation.

• Inferential statistics: Chi square test, If more than 20% of the cells have expected frequencies less than 5 this study will use Fisher's exact test.
Eligible Criteria

**Primary Data:**

Inclusion criteria

• Medical staff who had work for EMS more than 5 years
• Medical staff who had work for Thai sky doctor service more than 1 year

Exclusion criteria

• Medical staff who not informed consent

**Secondary Data:**

Inclusion criteria:

• Patient Recorded during year 2010-2015

Exclusion criteria:

• Patient record that not permitted to reveal data
• Not complete Patient record
• Mission during disaster because of lack of complete data
Results (1)

- 205 missions of public air ambulance service were requested.
  - 184 cases were transported, while 33 cases were not.

<table>
<thead>
<tr>
<th>Data</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission</td>
<td></td>
</tr>
<tr>
<td>Request with transport</td>
<td>172(83.9)</td>
</tr>
<tr>
<td>Request with no transport</td>
<td>33(16.1)</td>
</tr>
<tr>
<td>Patients</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>184(84.8)</td>
</tr>
<tr>
<td>No transport</td>
<td>33(15.2)</td>
</tr>
<tr>
<td>Transport mission</td>
<td></td>
</tr>
<tr>
<td>Single patient</td>
<td>163(94.8)</td>
</tr>
<tr>
<td>Multiple patients</td>
<td>9(5.2)</td>
</tr>
</tbody>
</table>

33 Cases
Not being transported

Lack of aircraft
Weather condition
Patients’ death before transported
## Results (2) Demographic data of patients transport and not transport mission

<table>
<thead>
<tr>
<th>Variable</th>
<th>Transport mission</th>
<th>Not transport mission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n(%)</td>
<td>n(%)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>124 (67.4)</td>
<td>18 (54.5)</td>
</tr>
<tr>
<td>Female</td>
<td>60 (32.6)</td>
<td>15 (45.5)</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤1 month</td>
<td>9 (4.9)</td>
<td>3 (9.1)</td>
</tr>
<tr>
<td>2 mo.-1year</td>
<td>4 (2.2)</td>
<td>1 (3.0)</td>
</tr>
<tr>
<td>2-14 years</td>
<td>7 (3.8)</td>
<td>2 (6.1)</td>
</tr>
<tr>
<td>15-59 years</td>
<td>107 (58.2)</td>
<td>16 (48.5)</td>
</tr>
<tr>
<td>≥60 years</td>
<td>50 (27.2)</td>
<td>8 (24.2)</td>
</tr>
<tr>
<td>Unknown</td>
<td>7 (3.8)</td>
<td>3 (9.1)</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thai</td>
<td>167 (89.3)</td>
<td>32 (97.0)</td>
</tr>
<tr>
<td>None Thai</td>
<td>17 (9.1)</td>
<td>1 (3.0)</td>
</tr>
<tr>
<td><strong>Health insurance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gov</td>
<td>35 (19.0)</td>
<td>4 (12.1)</td>
</tr>
<tr>
<td>SSS</td>
<td>6 (3.3)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>UC</td>
<td>98 (53.3)</td>
<td>7 (21.2)</td>
</tr>
<tr>
<td>Other</td>
<td>23 (12.5)</td>
<td>20 (60.0)</td>
</tr>
<tr>
<td>None</td>
<td>22 (12.0)</td>
<td>2 (6.1)</td>
</tr>
</tbody>
</table>
## Results (3)  Demographic data of Patient condition in transport and not transport mission

<table>
<thead>
<tr>
<th>Variable</th>
<th>Transport mission</th>
<th>Not transport mission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n(%)</td>
<td></td>
</tr>
<tr>
<td>Disease group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neonate-Ped</td>
<td>2(1.1)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>Newborn</td>
<td>9(4.9)</td>
<td>2(6.1)</td>
</tr>
<tr>
<td>OB</td>
<td>8(4.3)</td>
<td>0(0.0)</td>
</tr>
<tr>
<td>STEMI</td>
<td>37(20.1)</td>
<td>6(18.2)</td>
</tr>
<tr>
<td>Stroke</td>
<td>21(11.4)</td>
<td>7(21.2)</td>
</tr>
<tr>
<td>Trauma</td>
<td>63(34.2)</td>
<td>6(18.2)</td>
</tr>
<tr>
<td>Other</td>
<td>44(23.9)</td>
<td>12(36.4)</td>
</tr>
<tr>
<td>Triage or Acuity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>55(29.9)</td>
<td>5(15.2)</td>
</tr>
<tr>
<td>Level 2</td>
<td>106(57.6)</td>
<td>25(75.8)</td>
</tr>
<tr>
<td>Level 3</td>
<td>23(12.5)</td>
<td>3(9.1)</td>
</tr>
</tbody>
</table>
Results (4)

1 day and 3 days outcome of emergency patients transported

<table>
<thead>
<tr>
<th></th>
<th>Admit</th>
<th>Dead</th>
<th>D/C</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 day outcome</td>
<td>182(98.9)</td>
<td>2(1.1)</td>
<td>0(0)</td>
<td>184(100.0)</td>
</tr>
<tr>
<td>3 day outcome</td>
<td>157(85.3)</td>
<td>10(5.4)</td>
<td>17(9.2)</td>
<td>184(100.0)</td>
</tr>
</tbody>
</table>

• Gender, age, disease group, patient severity, medical team, response time and transport time were not associated with one-day outcome after air transportation.

• Gender, age, disease group, medical team, response time and transport time were not associated with three-day outcome.

• **Patient severity** made a significant difference associated with the three-day outcome at the .05 statistical level (p = .033).
## Results (5)

### Facilitating factors and obstacles

<table>
<thead>
<tr>
<th>Group</th>
<th>Facilitating factors</th>
<th>Obstacles</th>
</tr>
</thead>
</table>
| National dispatch center, NIEM  | • Strong policy support  
                                | • Quick communication  
                                | • Financial support  
                                | • National medical director  
                                | • Clear guideline for public air ambulance service  
                                | • Regional 1669 dispatch center know to use service | • Lack of National medical director  
                                |                                                                                       | • Benefit for medical team were not clear  
                                |                                                                                       | • Inflight safety concern  
                                |                                                                                       | • Aircraft agencies could not support or delay support  
                                |                                                                                       | • Lack of long term financial support |
Conclusion

• There were identified characteristic of Thai sky doctor and factors associated with 1 and 3 day outcome post air transportation.

• Age, gender, disease group, medical team, response time and transport time were not associated with 1 and 3 days outcome.

• Patient severity was statistically significant difference associated with 3 days outcome.

• Further study may be necessary to improve patient outcome, and develop public air ambulance service.
THANK YOU FOR YOUR ATTENTION