The FirstAED project
Incorporates emergency dispatch, GPS technology, first responders with distinct roles, smartphones and an AED network

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Declaration of interest

• Teaching for MSD and AstraZeneca.
• Developed FirstAED GPS technology and applied for patent.
Background – the Langeland Island

- ~13,000 inhabitants.
- Long distances to the two nearest hospitals; (55 km, 90 km).
- Long ambulance response times (40 % ≥ 15 minutes, 13 % ≥ 20 minutes).
- Bystander CPR provided by 215 trained first responders
- 95 AEDs available around the clock
- Lay rescuers response times (8-10 minutes)
Purpose

• GPS tracking of trained volunteer first responders.
• At least one of the first responders and the AED need to arrive not just earlier than the traditional ambulance, but within 5-6 minutes of the initial call.
• The system establish an emergency team of 3 first responders with distinct roles.
FirstAED activate trained volunteer first responders
FirstAED

• An IT-system (FirstAED app).
• All first responders are provided with an rescuer smartphone (iPhone 4S/5).
• FirstAED organizes the three first responders in a team with distinct roles.
• The IT-system activate the AED cabinets (unlock, sound & flash light).
First responders involved in all 1-1-2 emergency call

- Cardiac Arrest
- Disease
- Traffic accident/ fire
- Accident
- Others
Action: Emergency call – Cardiac Arrest

Dispatch Center iPad – GPS tracking

1. All first responders
   (n= 215 (purple pushpins) (GPS-tracking))

2. AED’s
   (n= 95 (green pushpins))

3. Emergency Call
   Activate iPad – GPS Tracking
   (touch red marker)
Action: GPS tracking

- The 9 closest first responders are alarmed (push message).
- The 3 most optimally located first responders are organized in a team.
- The IT-system activate the AED cabinets (unlock, sound & flash light).
Responder no.1 & no. 3 accept

Responser no.1 & 3 (purple pushpins) recieve the location of the emergency call (red pushpin - GPS advice).

*Responder no.1 reaches the patient to give first aid/HLR and responder no. 3 is the onsite coordinator.*
Responder no. 2 (purple pushpin) receive the location of the nearest AED (green pushpin) and next the location of the emergency call (red pushpin - GPS advice).

Responder 2 brings the AED to the emergency place.
Key results of the first 21 months: Dispatch categories

<table>
<thead>
<tr>
<th>Alarm type</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td>484</td>
<td>~82.3%</td>
</tr>
<tr>
<td>Accident</td>
<td>45</td>
<td>~7.7%</td>
</tr>
<tr>
<td>Cardiac Arrest</td>
<td>26</td>
<td>~4.4%</td>
</tr>
<tr>
<td>Traffic accident/fire</td>
<td>21</td>
<td>~3.6%</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
<td>~2.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>588</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Results: Response times

<table>
<thead>
<tr>
<th></th>
<th>Time seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median</strong></td>
<td><strong>Response time – Langeland n = 588</strong></td>
</tr>
<tr>
<td>First Person On Site</td>
<td>249 sec. [1-1200 sec.]</td>
</tr>
<tr>
<td>AED On Site</td>
<td>358 sec. [1-1813 sec.]</td>
</tr>
<tr>
<td>Ambulance/paramedic On Site</td>
<td>714 sek</td>
</tr>
</tbody>
</table>
Response times first responders and ambulances/paramedics

- 0-240 Sec.: 313
- 241-480 Sec.: 282
- 481-720 Sec.: 110
- 721-960 Sec.: 60
- 961-1200 Sec.: 170
- 1201-1440 Sec.: 172
- 1441-1680 Sec.: 2
- 1681+: 1
- Ambul.: 9, 110, 60, 2, 1, 12, 3
<table>
<thead>
<tr>
<th>Number first responders</th>
<th>Arrival On Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 first responders</td>
<td>89.1 %</td>
</tr>
<tr>
<td>2 first responders</td>
<td>7.1 %</td>
</tr>
<tr>
<td>1 first responders</td>
<td>3.1 %</td>
</tr>
<tr>
<td>0 first responders</td>
<td>0.7 %</td>
</tr>
</tbody>
</table>
Results: Arrival

<table>
<thead>
<tr>
<th>Arrival</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Before ambulances/paramedics/ doctors</td>
<td>95 %</td>
<td></td>
</tr>
</tbody>
</table>
Key results of the first 21 months – FirstAED Emergency Call

- 6 Cardiac arrests - 3 survived.
- 6 Respiratory insufficiency - 5 survived.
- 3 Hangings - 1 survived.
- 2 Divers with decompression sickness (Complete restituted)
- 1 Subarachnoid haemorrhage (Restituted)
- Positioning of more than 10 traffic accidents
Conclusion:

• The FirstAED GPS app technology entails a significant reduction in first responder median response times from more than 8 minutes before to 4 minutes 9 seconds after.

• FirstAED organizes the three first responders in an emergency team with distinct roles.

• FirstAED activate the AED cabinets (unlock, sound & flash light).