Drone AED Project - Phase I: Study of Out-of-Hospital Cardiac Arrest Geolocation.

Pilot study: Pattaya City, Chonburi, THAILAND

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Geographic distribution of Out-of-Hospital Cardiac Arrest:

To improve survival of Out-of-Hospital Cardiac Arrest (OHCA) patients, knowing the OHCA epidemiology and Geographic distribution are mandatory. Delayed time from collapse to first shock is one of major problem in EMS system despite of traffic jam in urban area, or far distance but limited resources in rural area. Thai Resuscitation Council (TRC) would like to conduct the feasibility study of using Unmanned Aerial Vehicle (UAVs) to deliver Automated External Defibrillator (AED) in Thailand. According to air safety regulation statement for UAVs in Thailand (i.e. the limitation of distance from buildings 50 meters, the distance from airport / Helipad 9 kilometres etc.), Pattaya City became the best choices for this pilot project as all the flight path can be done over the sea shore.

Pattaya City information:
Area 53.4 square kilometers. Population 117,371 (2017) inhabitants with non-registered population up to 400,000–500,000 (2018). Pattaya city also had 3 hospitals with Emergency Medical Services in the coverage area, providing the OHCA data. Pattaya City hospital (110 beds), Banglamung hospital (260 beds) and Bangkok Hospital Pattaya (300 beds) provided 44, 56 and 74 OHCA cases over 6-month duration. Pattaya city also had Basic life support education program for more than 3 years and over 8,000 local volunteers had been trained to perform CPR and using AED.

Objective Phase I study: to evaluate the geographic distribution of OHCA in Pattaya city.

Methods: The EMS records from participant hospital were reviewed for 6 month retrospectively. Non-traumatic OHCA location and outcome data were retrieved. Location data was transformed to geolocation using latitude and longitude coordinate data from google maps. Quantum GIS program were used to generate the geographic distribution maps. Limitation of the study was the original location data were recorded in description, not in GIS coordinate. Further prospective study using GIS coordinate data may improve prediction.

Result: Total 174 OHCA data from 3 hospitals. There’re 28 cases (16.09%) found death on EMS arrival and did not attempt resuscitation. 6 cases (3.44%) declared death at scene with unknown CPR attempts. 10 cases (5.74%) attempt CPR at scene but death and not convey to hospital. 37 cases (21.26%) was received CPR but unknown disposition data. 93 cases (53.44%) was attempted CPR and convey to hospital. There are 32 cases (18.39%) outlier from Pattaya city territory.

Conclusion: 80% of OHCAs had attempted resuscitation with distribution of geographic coordinates. 18.39% of cases happened outside pattaya city coverage. The further prospective study with survival outcome data would be beneficial.

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