Professor Marcus Ong
Senior Consultant and Clinician Scientist, Dept of Emergency Medicine, Singapore General Hospital
Director Health Services and Systems Research (HSSR), Duke-NUS Medical School
Head, Health Services Research Center (HSRC), Singhealth Services
Director, Health Services Research Institute
Advisor Director Data and Analytics, Unit for Prehospital Emergency Care (UPEC)
Senior Consultant, Ministry of Health, Hospital Services Division
Vice Chair (Research), Emergency Medicine Academic Clinical Program
Chairman, Pan Asian Resuscitation Outcomes Study (PAROS)

Pan Asian Resuscitation Outcomes Study: Celebrating 15 Years

12th Anniversary of PAROS

- Dr Sang Do Shin and I had proposed the PAROS idea in 2009 (concept was born in a Korean restauraunt in Washington DC over Soju).
- The first PAROS concept paper - April 2009.
- CARES-PAROS collaboration was agreed on at NAEMSP Jan 2010
- Our first EXCO meeting was in Daegu Korea, April 14 2010
- First PAROS Open Meeting was in Singapore 9 June 2010

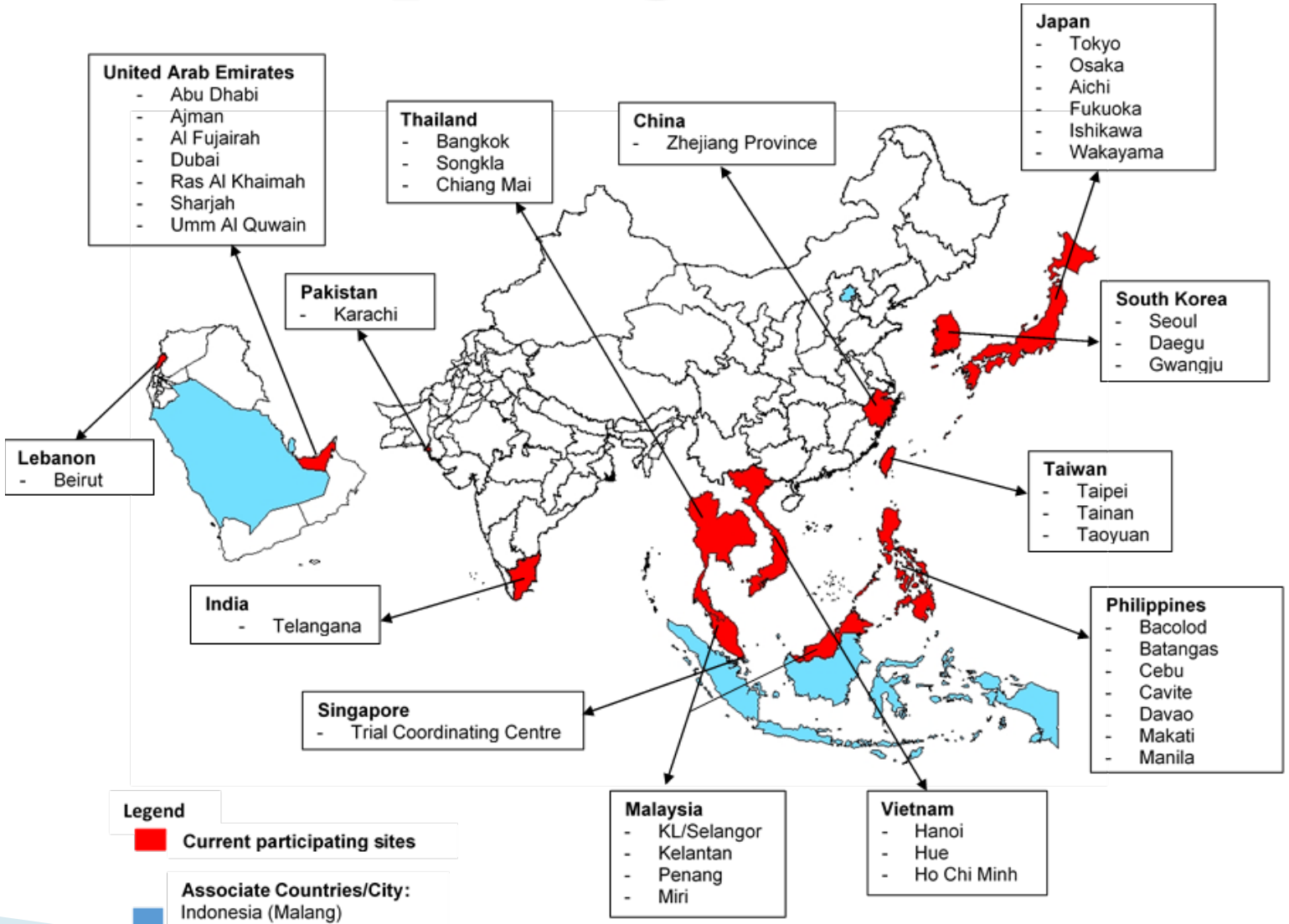
Objectives of PAROS

- In 2010, **Pan Asian Resuscitation Outcomes Study (PAROS)** Clinical Research Network (CRN) was established in collaboration with Japan, Singapore, South Korea, Malaysia, Taiwan, Thailand, and UAE-Dubai.
- This CRN aims to report the out-of-hospital cardiac arrests (OHCA) events and provide a better understanding of OHCA trends in Asia
- Led to starting the Pan Asian Trauma Outcomes Study (PATOS), Asian Association for EMS (AAEMS) and collaboration with the Global Resuscitation Alliance (GRA)

Global Resuscitation Alliance


ASIAN EMS
PAROS EXCO MEETING
Apr 14th ~ Apr 15th, Songsil Hall

Participating Countries

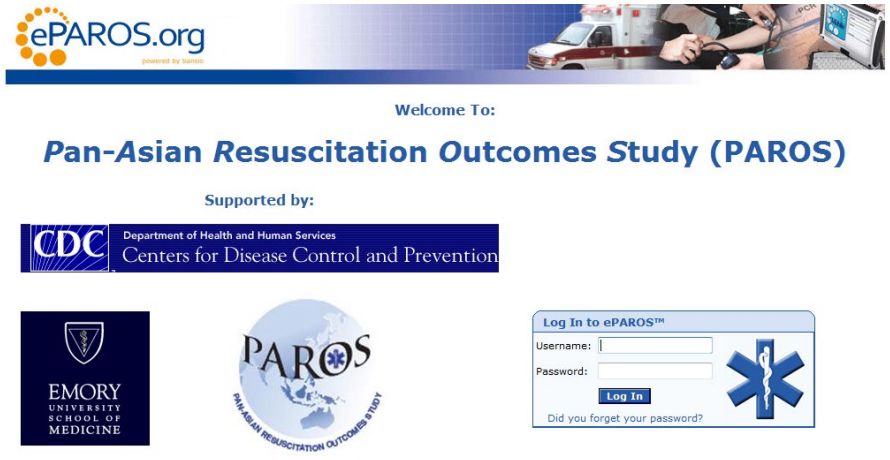


Methods of Data Contribution

There are two main methods of contributing data to PAROS CRN:

(i) Direct entry online via the online data capture system online training is conducted by the trial coordinating centre;

(ii) Export field entry which uses exported data from participating sites to auto-populate the PAROS registry.



http://www.scri.edu.sg/crn/pan-asian-resuscitation-outcomes-study-paros-clinical-research-network-crn/about-paros/

NETWORKS

- Overview
- Asian Thoracic Oncology Research Group (ATORG)
- Asia-Pacific Hepatocellular Carcinoma (AHCC) Trials Group
- Family Medicine Research Network (FMRN)
- Metabolic Research Network
- Pan-Asian Resuscitation Outcomes Study (PAROS) Clinical Research Network (CRN)
  - About PAROS
  - Research
  - Members
  - PAROS Publications
  - Source Documents
  - PAROS Presentations
  - Upcoming Events
  - PAROS Newsletters
  - Event Photos
  - PAROS FAQ
  - Asian EMS Council
  - How to Reach Us

About PAROS

The PAROS CRN is a collaborative research group formed in 2010 by dedicated Pre-hospital and Emergency Care (PEC) providers conducting PEC research in the Asia-Pacific region. It promotes collaboration by bringing together like-minded individuals to share experiences and develop joint initiatives for the betterment of PEC.

Currently, research into PEC in the Asia-Pacific region is largely inadequate and poorly coordinated owing to the marked variations in Emergency Medical Services (EMS) systems and outcomes reporting. With PEC conditions such as Out-of-Hospital Cardiac Arrest (OHCA) being one of the leading causes of death worldwide, the dearth in the understanding of trends and research in PEC underscores the urgent need for more collaborative research and good-quality intervention trials in PEC.

PAROS CRN endeavours to improve outcomes from PEC across the Asia-Pacific region through the creation of a platform to support and stimulate research into effective strategies to improve survival in PEC. The ability to reach out to countries across the Asia-Pacific region means that the Network can adopt a multi-pronged strategy that targets key stakeholders such as the community, EMS and the hospitals in its vision to improve PEC outcomes. By offering practical ways of monitoring and meaningful measurement of PEC outcomes, PAROS CRN has an enormous potential to contribute significantly to PEC research, regardless of whether they are epidemiological studies or clinical trials. As a first step, PAROS CRN has identified OHCA as one of its main thrusts. The Network will gather valuable information on OHCA and deepen the understanding of the EMS systems in the region to devise strategies that improve survival. An IRB master template of an OHCA study initiated by A/Prof Marcus Ong can be found here.

Mission

To improve outcomes from Pre-hospital and Emergency Care across the Asia-Pacific region by promoting high quality research into resuscitation

Vision

Improving outcomes from Pre-hospital and Emergency Care across the Asia-Pacific region

Value to Singapore and the Region

PAROS CRN endeavours to answer important questions for the development and revisions of Pre-hospital and Emergency Care (PEC) policies. This research has a major social value as it aims to improve outcomes from

Accomplishments so far…

1. 316,170 cases enrolled in the PAROS registry
2. 16 countries contributing data
3. >60 papers published as a group, in journals such as Lancet, Circulation, Resuscitation, Prehospital Emergency Care, etc.
4. Ian G. Jacobs Award for International Group Collaboration to Advance Resuscitation Science, Chicago, Illinois (AHA): PAROS
5. Improvement in survival for OHCA seen across many PAROS countries
6. Expanded into Trauma, Stroke and Heat Stroke initiatives

AHA ReSS International Group Collaboration to Advance Resuscitation

Collaborators from Malaysia, Taiwan, Korea, and Japan attending the award ceremony

Resuscitation Science Symposium

Ian G. Jacobs Award for International Group Collaboration to Advance Resuscitation Science

Presented to

Pan-Asian Resuscitation Outcomes Study
Clinical Research Network in Singapore

November 16, 2014 — Chicago, Illinois

Resuscitation Science Symposium

Ian G. Jacobs Award for International Group Collaboration to Advance Resuscitation Science

Presented to

Pan-Asian Resuscitation Outcomes Study
Clinical Research Network in Vietnam

November 16, 2014 — Chicago, Illinois

PAROS PHASE 1

Determining the Cost-Effectiveness of Strategies to Improve Survival from Out-Of-Hospital Cardiac Arrest

PAROS Phase 1

- A prospective, international, multi-center cohort study of OHCA across the Asia-Pacific.
- Provides a model for population based data collection which can aid quality improvement to increase survival
- Provides a baseline to measure the effect of subsequent interventions such dispatcher-assisted CPR and Public Access Defibrillation in this region.

Publications

Resuscitation 96 (2015) 100–108

Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Clinical Paper

Outcomes for out-of-hospital cardiac arrests across 7 countrie Asia: The Pan Asian Resuscitation Outcomes Study (PAROS)☆

Marcus Eng Hock Ong[a,b,*], Sang Do Shin[c], Nurun Nisa Amatullah De Souza[d,n], Hideharu Tanaka[e], Tatsuya Nishiuchi[f], Kyoung Jun Song[c], Patrick Chow-In Ko[g] Benjamin Sieu-Hon Leong[i], Nalinas Khunkhlai[j], Ghulam Yasin Naroo[k], Abdul Karim Sarah[l], Yih Yng Ng[m], Wen Yun Li[n], Matthew Huei-Ming Ma[o], for the PAROS Clinical Research Network[q]

Journal of the Formosan Medical Association (2016) 115, 628–638

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.jfma-online.com

ORIGINAL ARTICLE

Variation of current protocols for managing out-of-hospital cardiac arrest in prehospital settings among Asian countries

Chih-Hao Lin [a,*], Yih Yng Ng [b], Wen-Chu Chiang [c], Sarah Abdul Karim [d], Sang Do Shin [e], Hideharu Tanaka [f], Tatsuya Nishiuchi [g], Kentaro Kajino [h], Nalinas Khunkhlai [i], Matthew Huei-Ming Ma [c], Marcus Eng Hock Ong [j]

Academic Emergency Medicine

Official Journal of the Society for Academic Emergency Medicine

Pan-Asian Resuscitation Outcomes Study (PAROS): Rationale, Methodology, and Implementation

Marcus Eng Hock Ong, MBBS, MPH, Sang Do Shin, MD, PhD, Hideharu Tanaka, MD, Matthew Huei-Ming Ma, MD, PhD, Pairoj Khruekarnchana, MD, Nik Hisamuddin, NAR, MBChB, MMED, Ridvan Atilla, MD, Paul Middleton, MBBS, Kentaro Kajino, MD, PhD, Benjamin Sieu-Hon Leong, MBBS, FRCS Ed (A&E), and Muhammad Naeem Khan, MBBS, MSc

Abstract

Disease-based registries can form the basis of comparative research to improve and inform policy for optimizing outcomes, for example, in out-of-hospital cardiac arrest (OHCA). Such registries are often lacking in resource-limited countries and settings. Anecdotally, survival rates for OHCA in Asia are low compared to those in North America or Europe, and a regional registry is needed. The Pan-Asian Resuscitation Outcomes Study (PAROS) network of hospitals was established in 2009 as an international, multicenter, prospective registry of OHCA across the Asia-Pacific region, to date representing a population

EMERGENCY MEDICAL SERVICES/ORIGINAL RESEARCH

Modifiable Factors Associated With Survival After Out-of-Hospital Cardiac Arrest in the Pan-Asian Resuscitation Outcomes Study

Hideharu Tanaka, MD; Marcus E. H. Ong, MBBS*; Fahad J. Siddiqui, MBBS; Matthew H. M. Ma, MD; Hiroshi Kaneko, MBA; Kyung Won Lee, MD; Kentaro Kajino, MD; Chih-Hao Lin, MD; Han Nee Gan, MBBS; Pairoj Khruekarnchana, MD; Omer Alsakaf, PhD; Nik H. Rahman, MBCHB; Nausheen E. Doctor, MBBS; Pryseley Assam, PhD; Sang Do Shin, MD; for the PAROS Clinical Research Network†

*Corresponding Author. E-mail: marcus.ong.e.h@sgh.com.sg.

Study objective: The study aims to identify modifiable factors associated with improved out-of-hospital cardiac arrest survival among communities in the Pan-Asian Resuscitation Outcomes Study (PAROS) Clinical Research Network: Japan, Singapore, South Korea, Malaysia, Taiwan, Thailand, and the United Arab Emirates (Dubai).

Methods: This was a prospective, international, multicenter cohort study of out-of-hospital cardiac arrest in the Asia-Pacific. Arrests caused by trauma, patients who were not transported by emergency medical services (EMS), and pediatric out-of-hospital cardiac arrest cases (<18 years) were excluded from the analysis. Modifiable out-of-hospital factors (bystander cardiopulmonary resuscitation [CPR] and defibrillation, out-of-hospital defibrillation, advanced airway, and drug administration) were compared for all out-of-hospital cardiac arrest patients presenting to EMS and participating hospitals. The primary outcome measure was survival to hospital discharge or 30 days of hospitalization (if not discharged). We used multilevel mixed-effects logistic regression models to identify factors independently associated with out-of-hospital cardiac arrest survival, accounting for clustering within each community.

Results: Of 66,780 out-of-hospital cardiac arrest cases reported between January 2009 and December 2012, we included 56,765 in the analysis. In the adjusted model, modifiable factors associated with improved out-of-hospital cardiac arrest outcomes included bystander CPR (odds ratio [OR] 1.43; 95% confidence interval [CI] 1.31 to 1.55), response time less than or equal to 8 minutes (OR 1.52; 95% CI 1.35 to 1.71), and out-of-hospital defibrillation (OR 2.31; 95% CI 1.96 to 2.72). Out-of-hospital advanced airway (OR 0.73; 95% CI 0.67 to 0.80) was negatively associated with out-of-hospital cardiac arrest survival.

Conclusion: In the PAROS cohort, bystander CPR, out-of-hospital defibrillation, and response time less than or equal to 8 minutes were positively associated with increased out-of-hospital cardiac arrest survival, whereas out-of-hospital advanced airway was associated with decreased out-of-hospital cardiac arrest survival. Developing EMS systems should focus on basic life support interventions in out-of-hospital cardiac arrest resuscitation. [Ann Emerg Med. 2017;■:1-10.]

Please see page XX for the Editor's Capsule Summary of this article.

0196-0644/$-see front matter

http://dx.doi.org/10.1016/j.annemergmed.2017.07.484

PAROS PHASE 2

International Multi-Center Controlled Trial of Dispatcher-Assisted Cardio-Pulmonary Resuscitation Intervention Package

RESUSCITATION 171 (2022) 80–89

Available online at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation

Clinical paper

International multi-center real world implementation trial to increase out-of-hospital cardiac arrest survival with a dispatcher-assisted cardio-pulmonary resuscitation package (Pan-Asian resuscitation outcomes study phase 2)

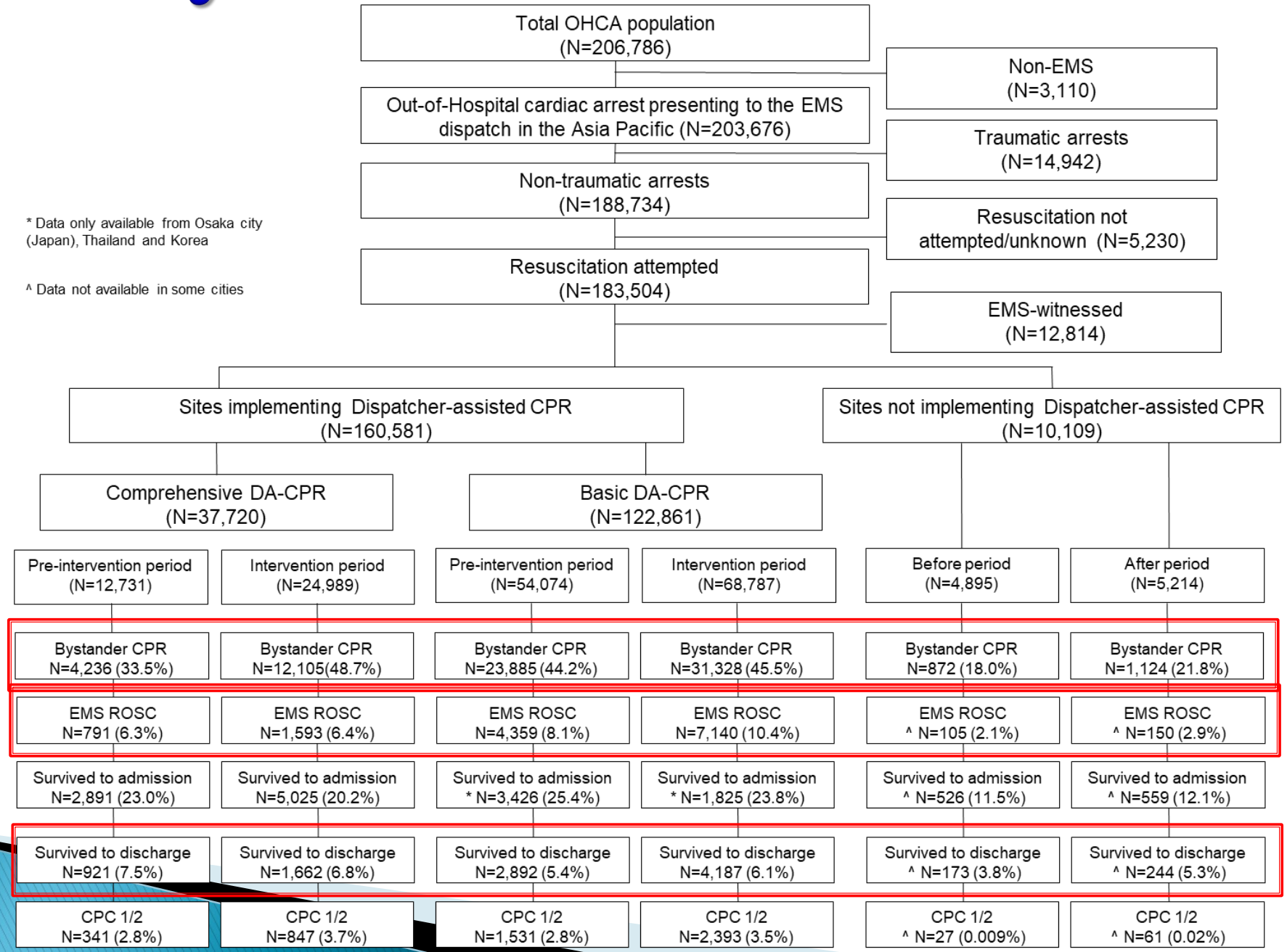
Marcus Eng Hock Ong[a,b,*], *Sang Do Shin*[c,d], *Patrick Chow-In Ko*[e], *Xinyi Lin*[f,g], *Matthew Huei-Ming Ma*[h], *Hyun Wook Ryoo*[i], *Kwanhathai Darin Wong*[j], *Jirapong Supasaowapak*[k], *Chih-Hao Lin*[l], *Chan-Wei Kuo*[m], *Ramana Rao*[n], *Wenwei Cai*[o], *Faith Joan Gaerlan*[p], *Munawar Khursheed*[q], *Do Ngoc Son*[r], *Karim Sarah*[s], *Mazen El Sayed*[t,u], *Saad Al Qahtani*[v,w], *Hideharu Tanaka*[x]

Resuscitation. 2022 Feb;171:80-89. doi:10.1016/j.resuscitation.2021.12.032.

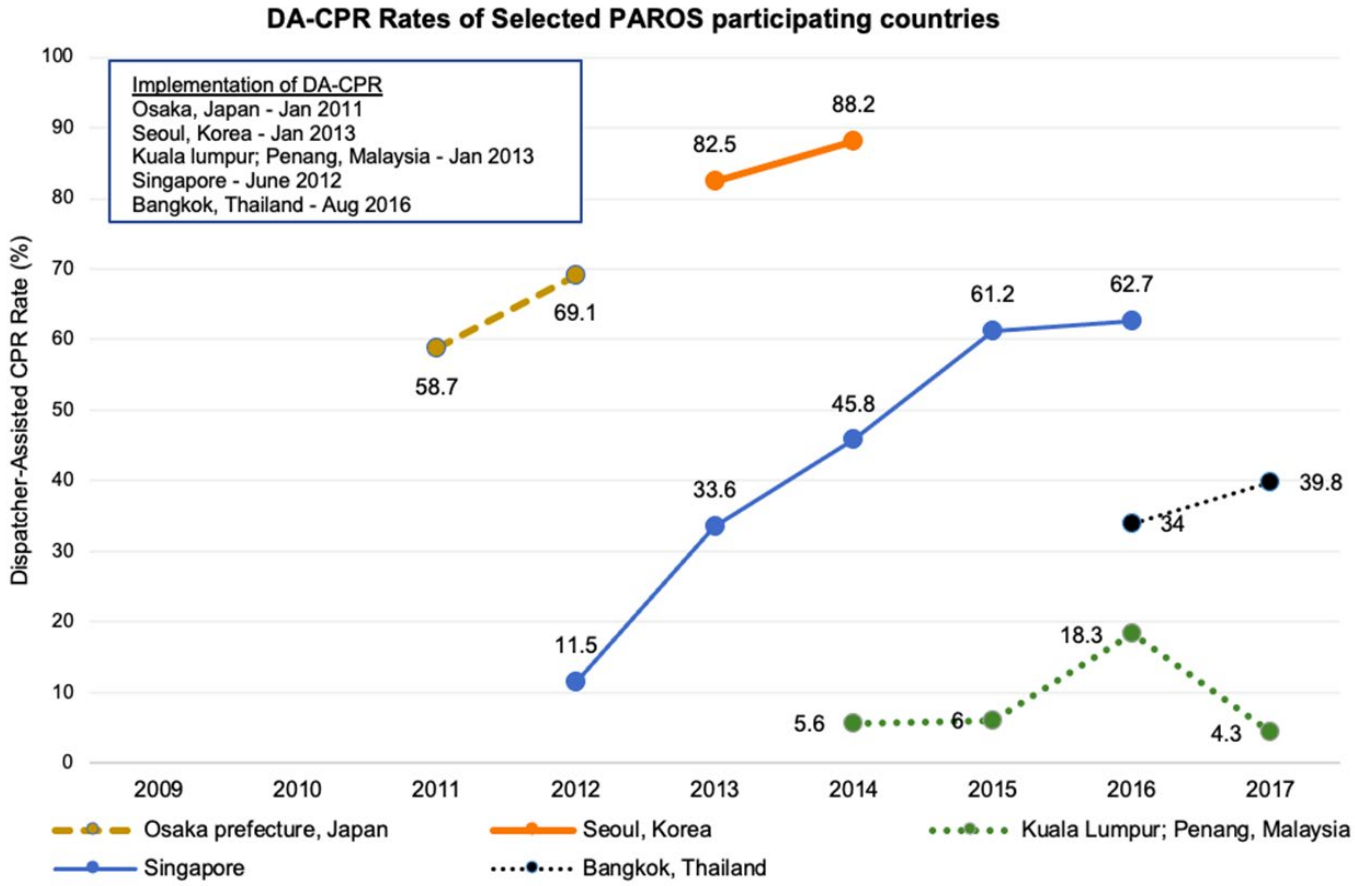
- http://cprlinktolife.com/language

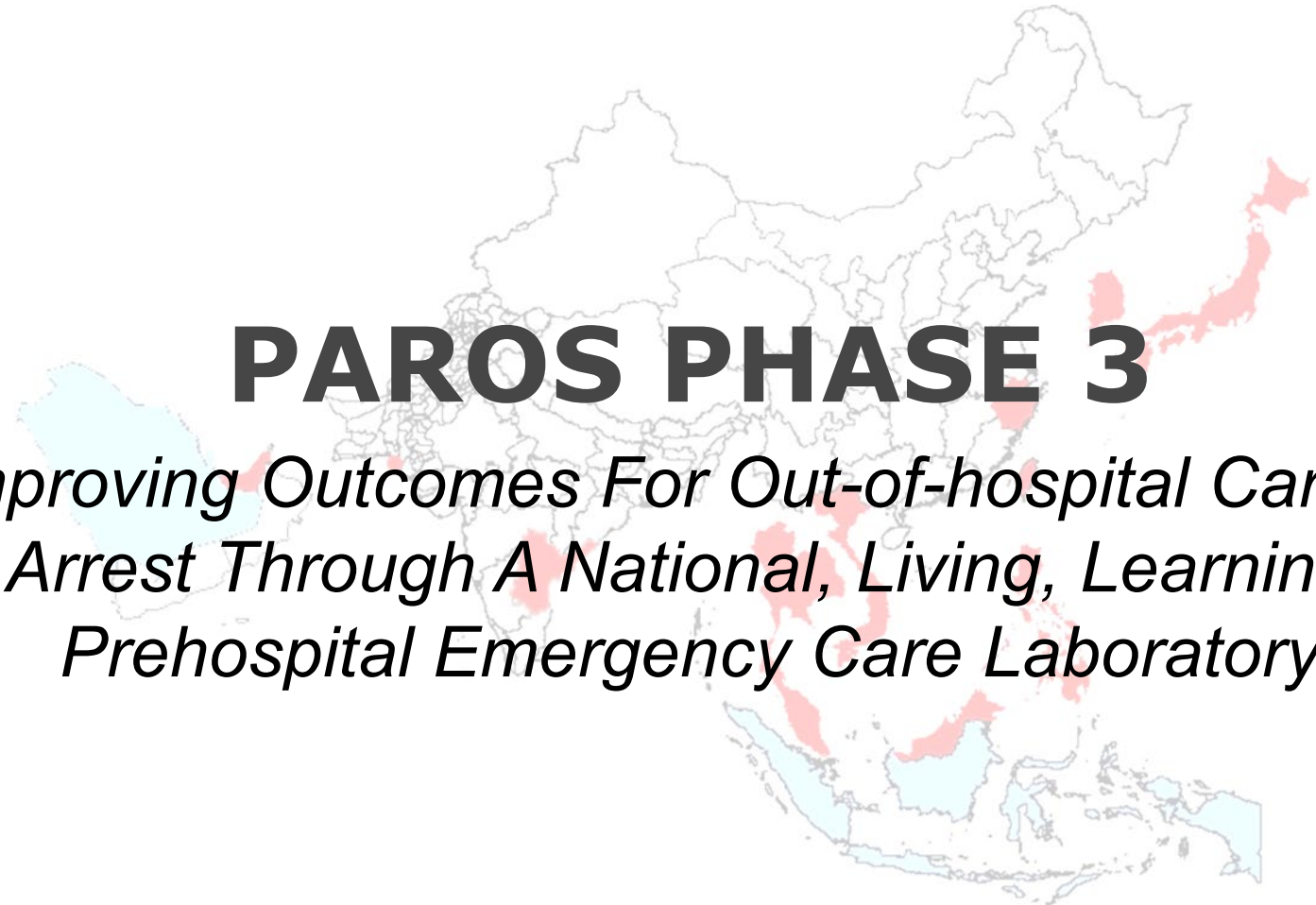
Dispatcher Course for Telephone CPR

Study results



PAROS Research - Phase 2





PAROS PHASE 3

Improving Outcomes For Out-of-hospital Cardiac Arrest Through A National, Living, Learning, Prehospital Emergency Care Laboratory

1

Dial 995 and send your geo-location at the same time

myResponder

SCDF

The Life Saving Force

2

Know where the nearest AED is located

ANDROID APP ON Google play

Available on the App Store

3

Sign up as a volunteer responder

UNIT FOR PRE-HOSPITAL EMERGENCY CARE
UPEC
SINGAPORE

DORE

SAVE A HEART SAVE A LIFE

PAROS Phase 3 - SG

- Develop and evaluate the effectiveness of a **bundle of ambulance based interventions** which include:

High performance team CPR

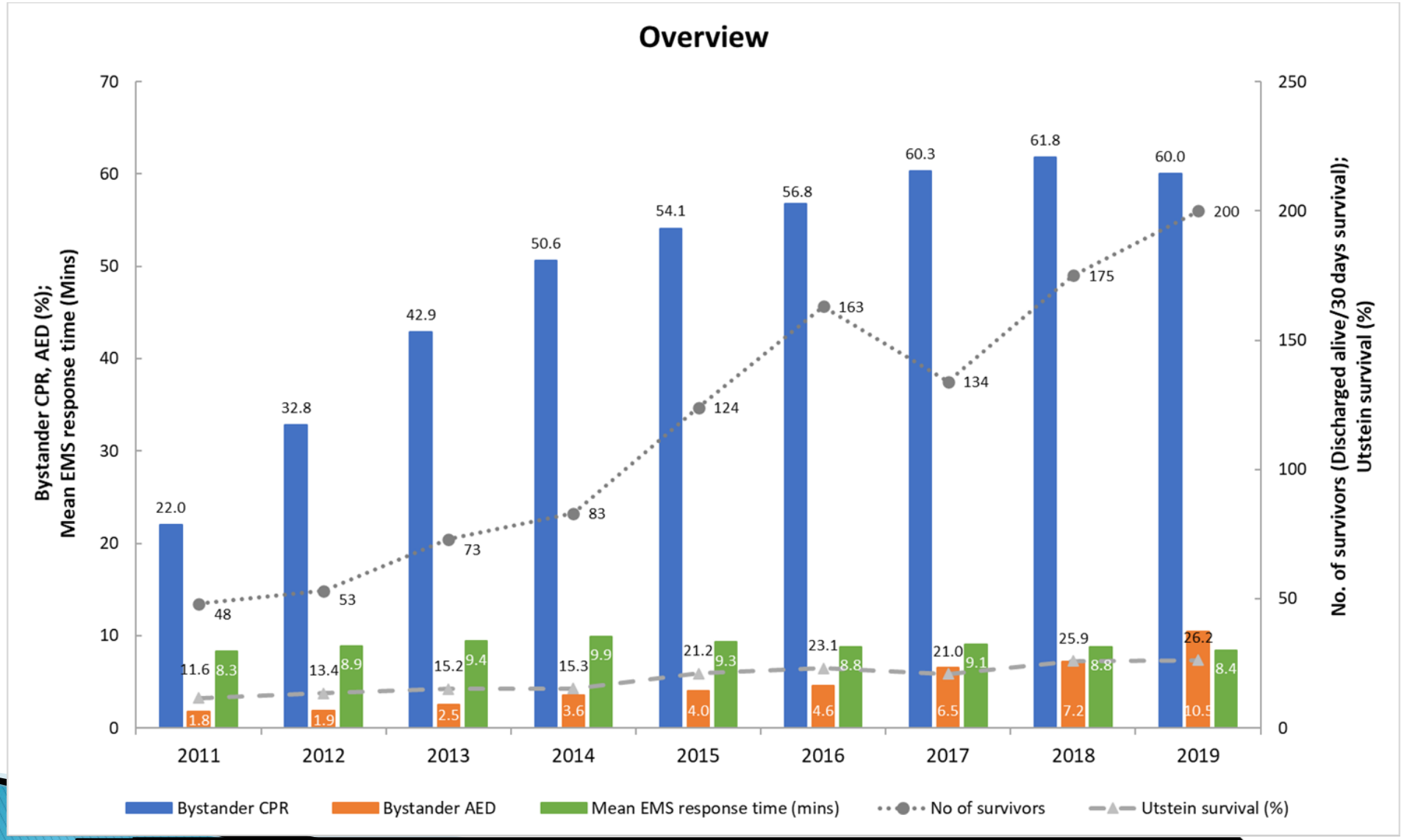
Impedance Threshold Device

Manual defibrillation by intermediate life-support providers

intravenous amiodarone

- We aim to increase pre-hospital ROSC rate from 5% currently, to 10% and survival to discharge rate by 5% compared to control sites through these interventions.

Singapore Progress: 2011 - 2019



TIMELINE | 2011 Mechanical CPR device | 2012 Fire Bikers Scheme | 2012 DA-CPR | 2014 RAEDi | 2014 DARE | 2014 I/O vascular | 2015 myRspndr | 2015 Save-A-Life | 2015 DARE Community Training | 2016 DARE with CPRcard

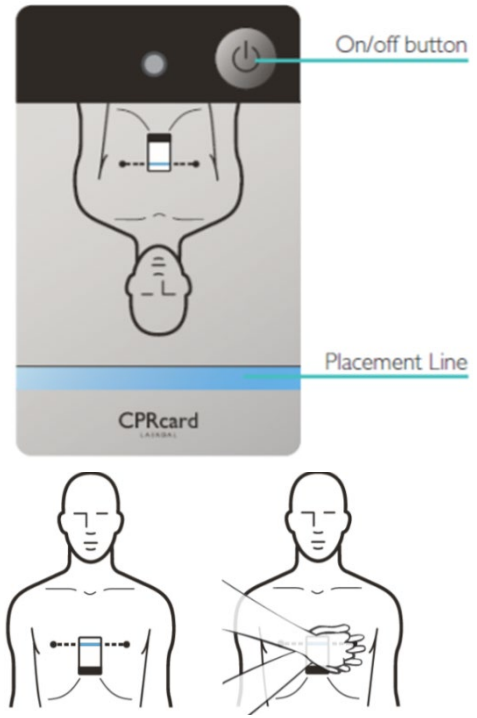
PAROS Phase 4 - SG

Future-Ready Interventions for Survival after Cardiac Arrest (FRISCA): From Quantity to Quality Survivorship

Vision
Enable OHCA patients to survive with good neurological function, leading normal/ near-normal, productive life

The CPRcard™

- Personal credit card size device
- Assists with land-marking
- Provides visual rate and depth range of compressions
- Collects data re: quality of chest compressions

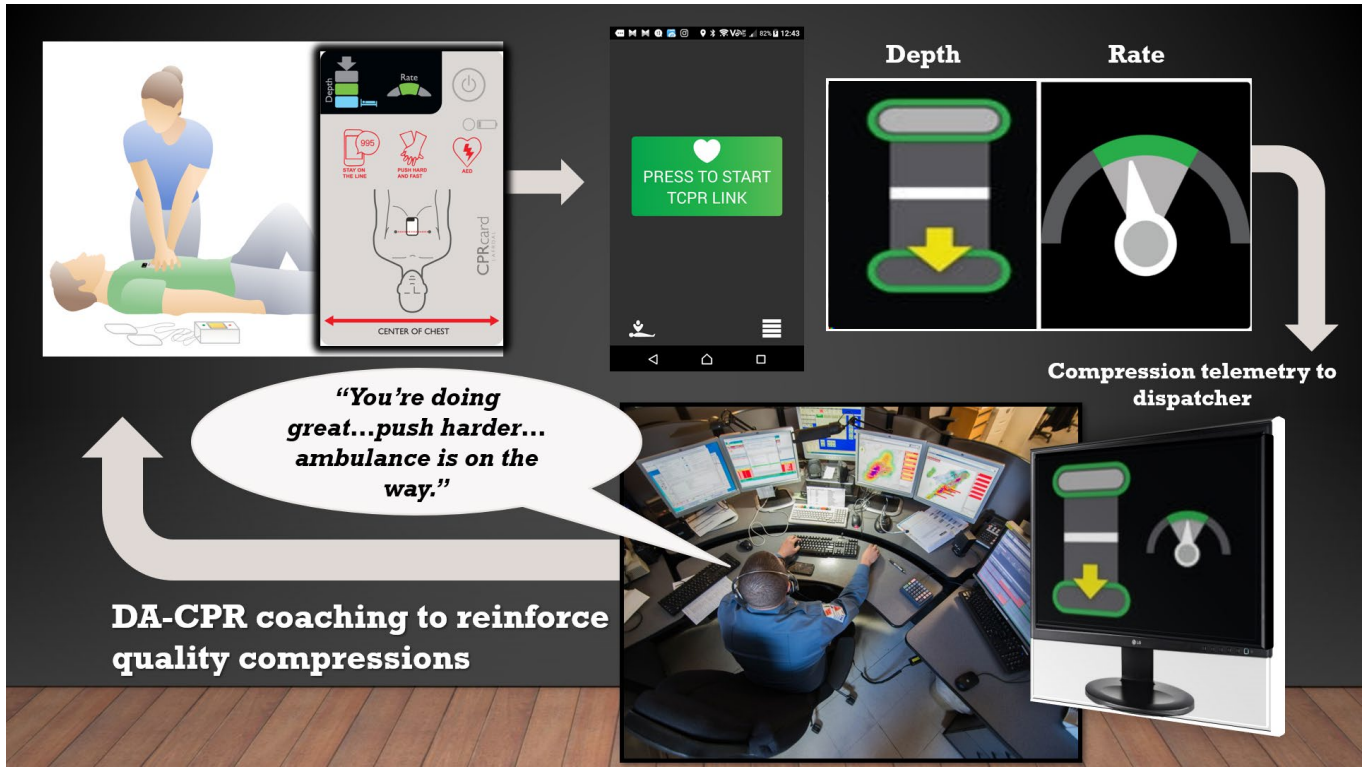


DORE
SAVE A HEART SAVE A LIFE


5
HD

Theme 2: Future Ready SMART Community interventions

Integrated MyResponder / CPR Card



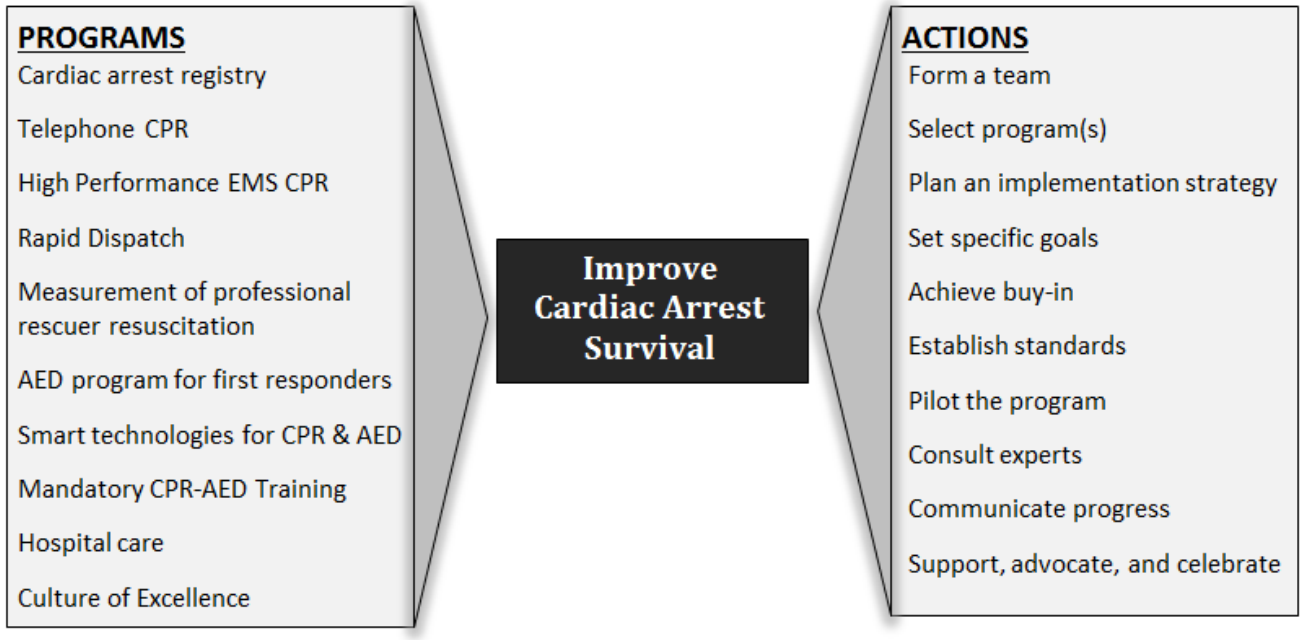
Cardiac Arrest Survivors' Club

The Sudden Cardiac Arrest Survivor Club met for the first time on Saturday, 18 Mar 2023 at our Bishan premise. The Club is a new collaborative endeavour among the Unit for Pre-Hospital Emergency Care (UPEC), Singapore Heart Foundation, Duke-NUS Medical School, SingHealth and the Singapore Civil Defence Force.

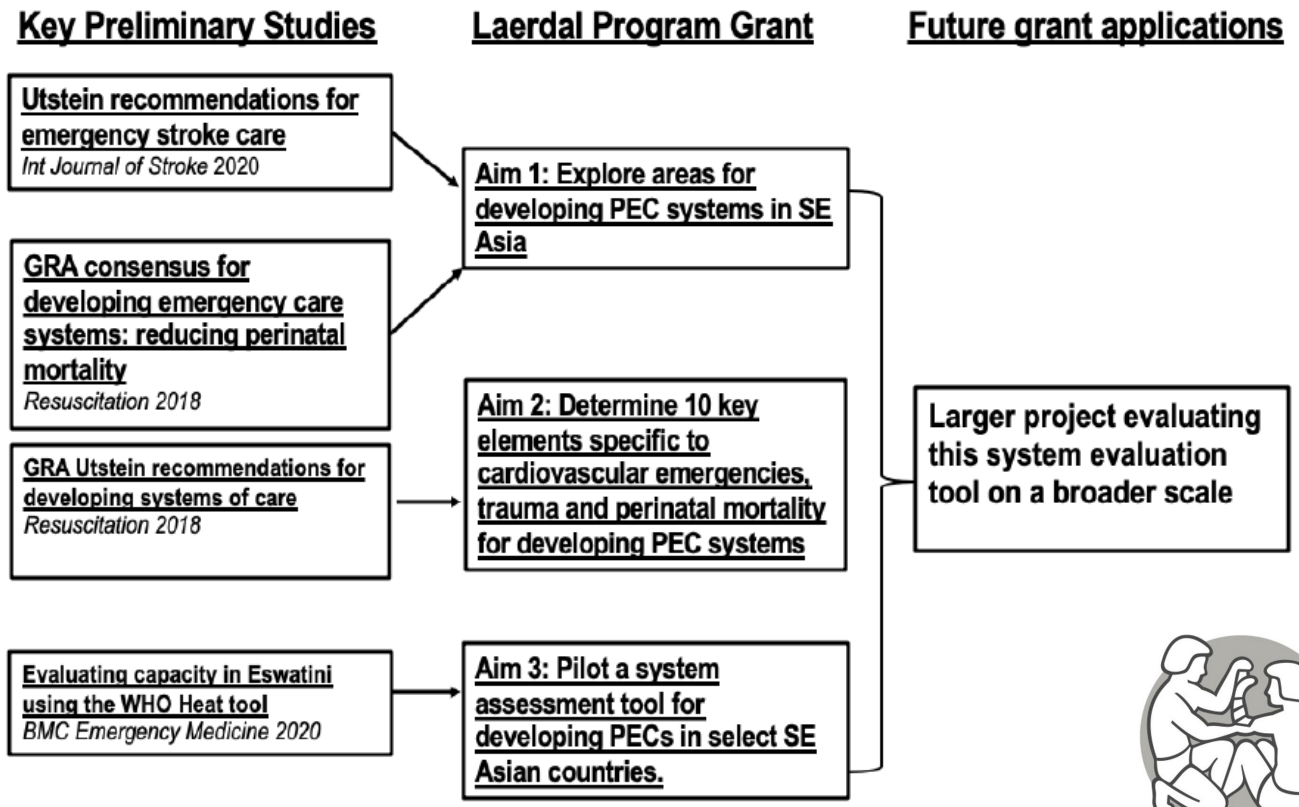
The nine cardiac arrest survivors exchanged stories of their survival experience and enjoyed a short tour of our Heart Wellness Centre and lunch. Cheers to being a peer support network for fellow survivors in Singapore to not only survive, but thrive!

Ongoing PAROS Research

- Resuscitation Academy (RA) 10-Step Implementations in the Pan-Asian Resuscitation Outcomes Study (PAROS) group



Systems Assessment Tool for Developing EMS Systems



Laerdal Foundation

helping save lives

Resuscitation Academy Asia:
Training Programme for Implementation of the PEC Systems Assessment Tool

TEMASEK FOUNDATION

Resuscitation Academy

Philippines workshop (26 – 27 April 2023)

26 – 29 July 2023 (Lombok, Indonesia)

- RA Workshop
- EMS Medical Directors Workshop

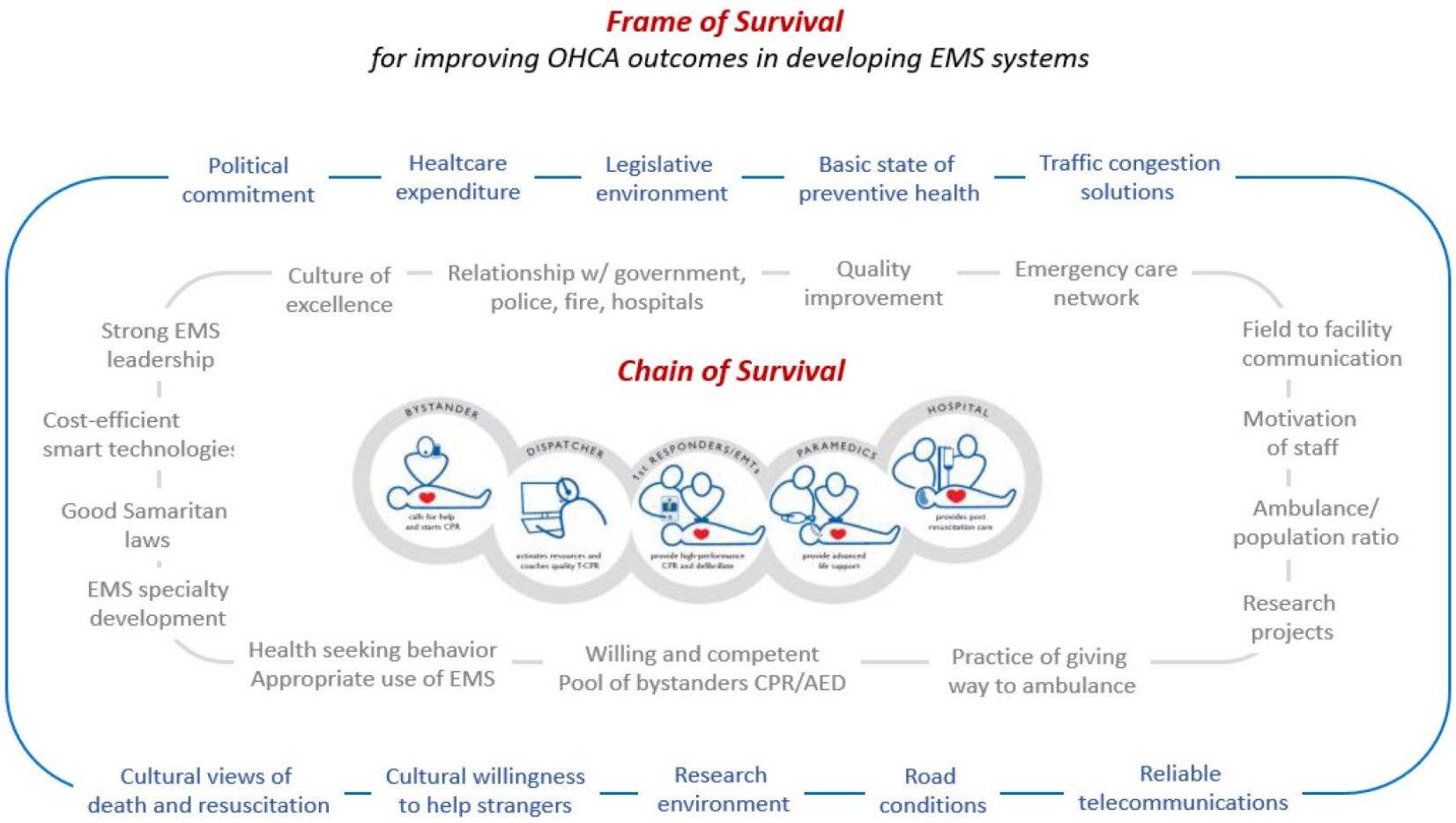
18 – 19 Dec 2023 (Bangkok, Thailand)

- RA Workshop

5-8 June 2024 Malaysia RA Workshop

Resuscitation Academy China : July 2024

Conceptual Framework Presented at WHO (Resuscitation 2018)



Pre-hospital Emergency Care Systems Evaluation Toolkit

- Allow PEC system in its early stages to benchmark and monitor their progress over time with the overall goal of achieving a quality PEC system that can reduce morbidity and mortality from time sensitive conditions.

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FGDs

Explore potential elements, barriers, facilitators, and performance indicators for PEC systems in LMICs in Asia

Delphi Consensus & NGT

Determine core elements for PEC system

Determine indicators to measure elements

Resuscitation Academy

Pilot toolkit in 5 Southeast Asian countries in conjunction with RA

Tool Evaluation

Assess acceptability, self-efficacy, usability, and change in outcome measurement over a year.

Benefits of PAROS

- Model for feasibility, implementation, cost-effectiveness and replication of system level intervention for OHCA
- Inform policy plans to improve pre-hospital emergency care
- Strengthen emergency treatment capability and research infrastructure
- Platform for low-cost community centered research
- Leading international research center and collaboration
- Robust scientific evidence

Questions?

Singapore General Hospital

CALL FOR USE CASES:
EM-RADAR

SingHealth DukeNUS ACADEMIC MEDICAL CENTRE
EMERGENCY MEDICINE

Submit your Research Proposals!

Write to emed.acp@singhealth.com.sg for the Data Request Application form

SingHealth Emergency Medicine Real-world Anonymised DAta Repository (EM-RADAR)

Data Scope

- Phase 1: SGH and SKH ED data
- Period: 1 June 2016 - 31 December 2022

Timeline

- Call for proposals are open!
- Data access on ODySSEy begins: Q2/Q3 2025 (after necessary approvals)

Selected teams will access

- 27 ED Datasets for SGH (De-identified) and/or
- 26 ED Datasets for SKH (De-identified)
- Comprehensive and robust ED Data: Include demographics, clinical information, lab results, outcome data etc