# Integrating EMS into the Health System


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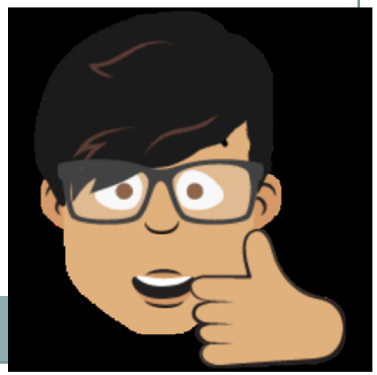
care • education • research

# Learning Objectives

1. Understand the role of EMS within the health system
2. Use the 'Framework of Survival' as a conceptual framework to understand how EMS can impact society and outcomes
3. Explore the role of evidence and health services research to translate into implementation and impact
4. Understand the wider global health role of EMS



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Clinician Practicing at SGH Department of Emergency Medicine

Scientist running a research program in Prehospital and Emergency Care

Director of Health Services Research program at Duke-NUS and Singhealth

StarHub 4G 7:18 AM 96%

HOME

PREMIUM

# SGH doctor on mission to boost CPR training


Associate Professor Marcus Ong, 48, has pushed for more people to be trained in cardiopulmonary resuscitation, including spearheading training sessions in schools, offices, community clubs and religious organisations through the Dispatcher Assisted first Responder programme. ST PHOTO: KEVIN LIM

PUBLISHED APR 05, 2018, 5:00 AM SGT

Providing immediate help can raise cardiac-arrest sur



Started Data Science research unit at Singhealth

National EMS Medical Director,
Unit for Prehospital Emergency Care (UPEC)

Chairman of Pan Asian Resuscitation Outcomes Study and Past President of Asian Association for EMS

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World Health Organization

SEVENTY-SIXTH WORLD HEALTH ASSEMBLY
Agenda item 13.1

WHA76.2
30 May 2023

# Integrated emergency, critical and operative care for universal health coverage and protection from health emergencies[1]

The Seventy-sixth World Health Assembly,

Having considered the consolidated report by the Director-General;[2]

Noting that emergency, critical and operative care services are an integral part of a comprehensive primary health care approach and are essential to ensure that the health needs of people are met across the life course without undue delay;

Recognizing that robust emergency, critical and operative care services are at the foundation of national health systems' ability to respond effectively to emergency events including all hazards; and to ensure the implementation of the activities required, both proactive and reactive, to minimize the danger and impact of acute public health events;

Concerned that the coronavirus disease (COVID-19) pandemic revealed pervasive gaps in capacity of emergency, critical and operative care services that resulted in significant avoidable mortality and morbidity globally;

Noting that integrated people-centred service delivery requires emergency, critical and operative care services that are linked to communities through primary care and by communication, transportation, referral and counter-referral mechanisms,[3] and that these components are interdependent: capacity failures in responsiveness of the emergency, critical and operative care system may result in disrupted primary care delivery and poor outcomes, while failures in primary care and social services may lead to increased use of emergency, critical and operative care services and result in delays in the appropriate provision of life-saving care;

**EMS is part of a system.**
**It's about understanding and improving the system!**

# It takes a system to save a life!

## *Frame of Survival*

*for improving OHCA outcomes in developing EMS systems*

Political commitment — Healtcare expenditure — Legislative environment — Basic state of preventive health — Traffic congestion solutions

Culture of excellence — Relationship w/ government, police, fire, hospitals — Quality improvement — Emergency care network

Strong EMS leadership

Cost-efficient smart technologies

Good Samaritan laws

EMS specialty development

Field to facility communication

Motivation of staff

Ambulance/ population ratio

Research projects

### *Chain of Survival*


Health seeking behavior
Appropriate use of EMS

Willing and competent
Pool of bystanders CPR/AED

Practice of giving way to ambulance

Cultural views of death and resuscitation — Cultural willingness to help strangers — Research environment — Road conditions — Reliable telecommunications

# Singapore: Then and Now

- **National Health Care Expenditure (Singapore) – 4.4% of GDP in 2017**
- **National Health Care Expenditure (US) - 17.7% of GDP in 2018**

| | Life expectancy[i] | IMR(/1000) [ii] | MMR(/100,000)[iii] | Estimated death due to cardiac cause[iv] (per 100,000)* |
|---|---|---|---|---|
| Korea | 79.05 | 4.16 | 18 | 71.8 |
| Singapore | 82.14 | 2.32 | 9 | 126.0 |
| Taiwan | 78.32 | 5.18 | NA | NA |
| Japan | 82.25 | 2.78 | 10 | 172.2 |
| Thailand | 73.6 | 16.38 | 48 | 128.8 |
| Malaysia | 73.79 | 15.02 | 31 | 112.8 |
| Australia | 81.81 | 4.61 | 8 | 174.5 |
| Turkey | 72.5 | 23.94 | 23 | 162.7 |
| UAE | 76.51 | 11.94 | 10 | 50.0 |

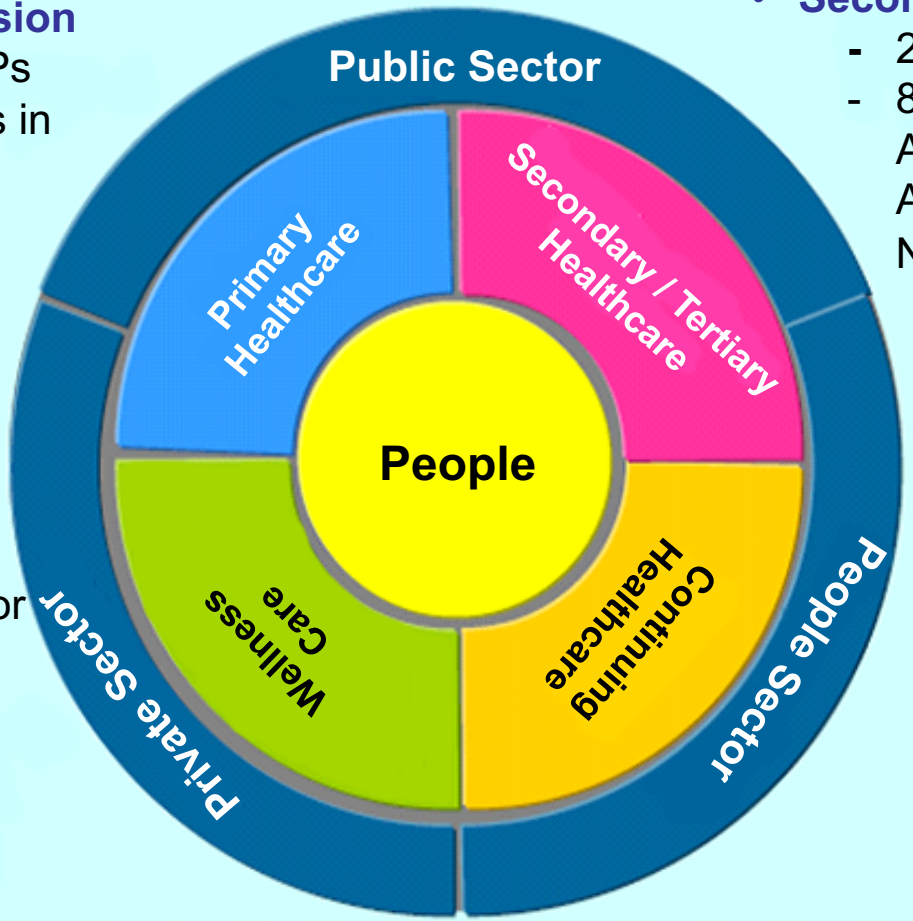
[i] The World Factbook by CIA, available in https://www.cia.gov/library/publications/the-world-factbook/rankorder/2102rank.html
[ii] The World Factbook by CIA, available in https://www.cia.gov/library/publications/the-world-factbook/fields/2091.html
[iii] Trends in maternal mortality: 1990 to 2008, World Health Organization, 2010
[iv] Estimated deaths per 100,000 population by cause, sex and Member State, WHO, 2008

# Our Public Healthcare System

**Healthcare delivery is provided by the *public, private* and *people* sectors.**

- **Primary care provision**
  - 80% private GPs
  - 20% Polyclinics in NHG and SingHealth

- **Secondary / Tertiary care**
  - 20% private
  - 80% SingHealth, NUHS, Alexandra Health, Eastern Alliance, Jurong Health & NHG.

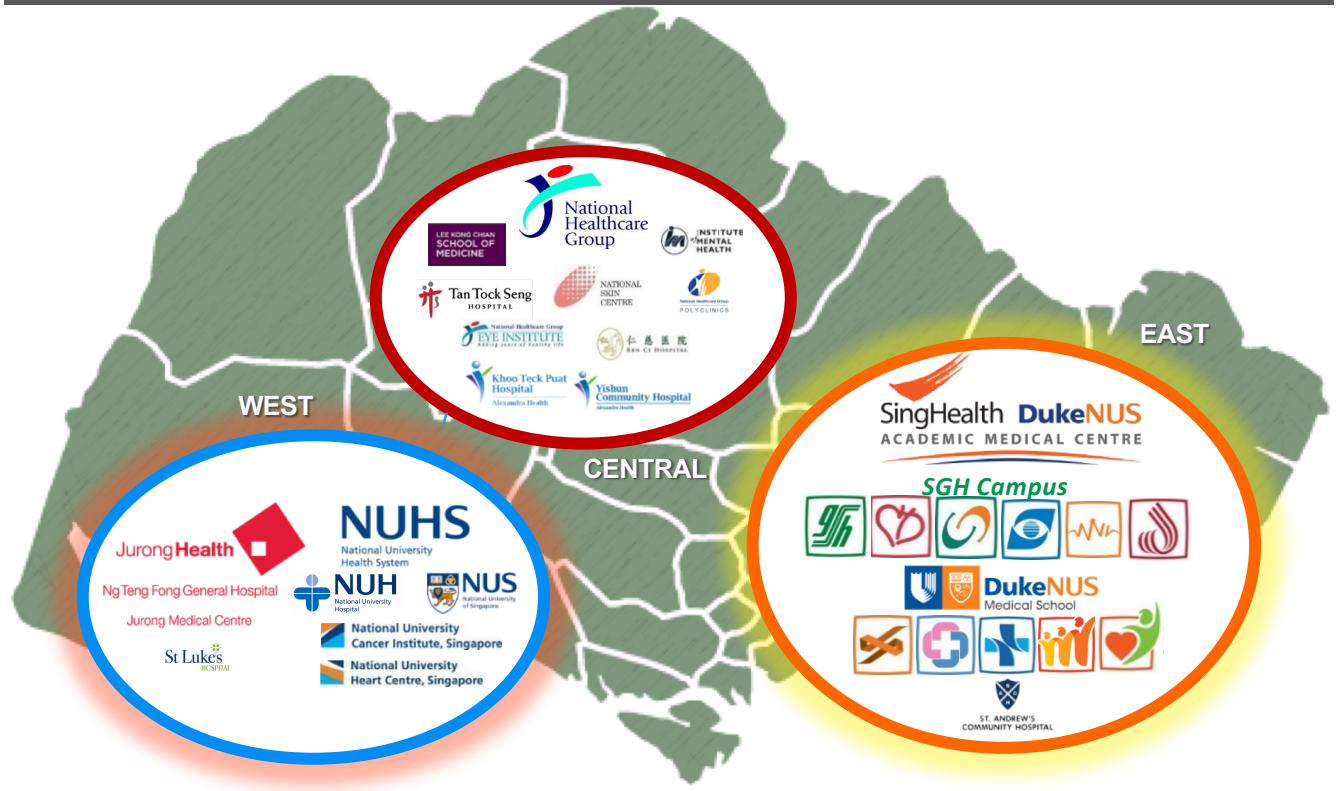



- **Wellness care**
  - Mainly private sector
  - Some public sector involvement, e.g. HPB

- **Continuing care**
  - Approx 70% by public sector, 30% by private sector
  - Community hospitals, nursing homes, hospices, day care centres, renal dialysis centre

# Public Healthcare Delivery Network

**3 Regional Health Systems including 2 Tertiary Centres of Excellence**



# EMS and the Care of Patients Across the Continuum

EMS

Community / Primary | Acute / Secondary | Tertiary / Quaternary | Intermediate / Long Term

NHGP

GP

Chinatown FMC, Tiong Bahru CHC

SHP Primary Care

Integrated Community Primary Care

Changi General Hospital

Sengkang General Hospital

Future SDDCs

Diabetes and Metabolism

Head & Neck

Breast

Blood Cancer

Lung

Liver Transplant

SGH Campus

Dental

Heart

Eye

Neuro-science

Transplant

MSK

Digestive Disease

Campus DEM
Campus Inpatient
Campus ASC

KKH Campus

Bright Vision Hospital

Outram Community Hospital
Post-Acute & Continuing Care

SengKang Community Hospital

Nursing Homes

Palliative Care

Homecare

Community Partners

**Regional Health System (RHS)**

** Collaboration with Pearl's Hill Care Home*

**Undergirding Enablers**
**Case Management | Operations | HR | Finance | IT | Education and Research Infrastructure**

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# Multi-Agencies involved in EMS

| Ministry of Home Affairs | Ministry of Health | Ministry of Education | Ministry of Defence |
|---|---|---|---|
| SCDF<br>CDA & PAD | Hospitals ED, UPEC, NRC, NFAC, IAN | NYP and ITE | SAF, SMTI and Medical Centres |
| • Provision of EMS<br>• Training and continuous education for Paramedics and EMTs<br>• Community training | • Medical oversight<br>• Oversight of ambulances & MTS<br>• Accreditation of PEC professionals<br>• Coordinating agency (UPEC)<br>• EMT training | • Academic training for Paramedics<br>• Continuing education for prehospital care professionals | • Primary training site for EMTs and Paramedics vocational training<br>• Largest employer of Paramedics and EMTs |

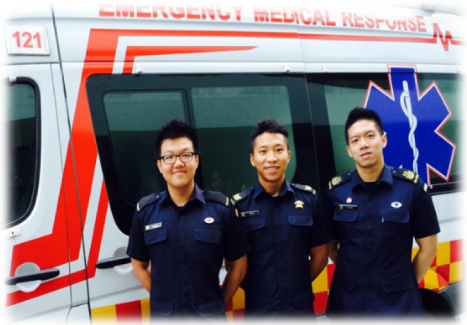
# We have come very far!




- 1917: A Motor Ambulance was acquired by the Hospitals Board
- 1928: An ambulance service for accident cases was established under the Fire Brigade
- 1977: Integrated both central ambulance and trauma ambulance service into one single-tier system manned by nurses and midwives from Ministry of Health
- 1998: Singapore Civil Defence Force officially took over the emergency ambulance service with trained paramedics

# Singapore EMS

- **Area 719 km²**
- **Urban / Suburban**
- **Population 5.47 mil**
- **Multi-racial/cultural/religion**
- **Currently *80* Emergency Ambulances**
- ***191,468 EMS calls in 2019***
- **Total about *300* Active Paramedics**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# UPEC- Who are we?

- In 2013, the **Unit for Pre-hospital Emergency Care (UPEC)** was established by the Ministry Of Health Singapore, comprising EM physicians & nurses, EMS professionals and healthcare administrators, to
  - coordinate, monitor and implement the various PEC strategies
  - provide clinical and operational oversight
  - assist in various operational PEC initiatives, such as quality audit for dispatch triage system, training and standards for PEC personnel, ambulance audits, etc.

# Areas of Focus

- Medical operations and oversight
- Training and Education
- Professional Standards
- Community Responsiveness
- Information Technology
- Policy, Research and Development

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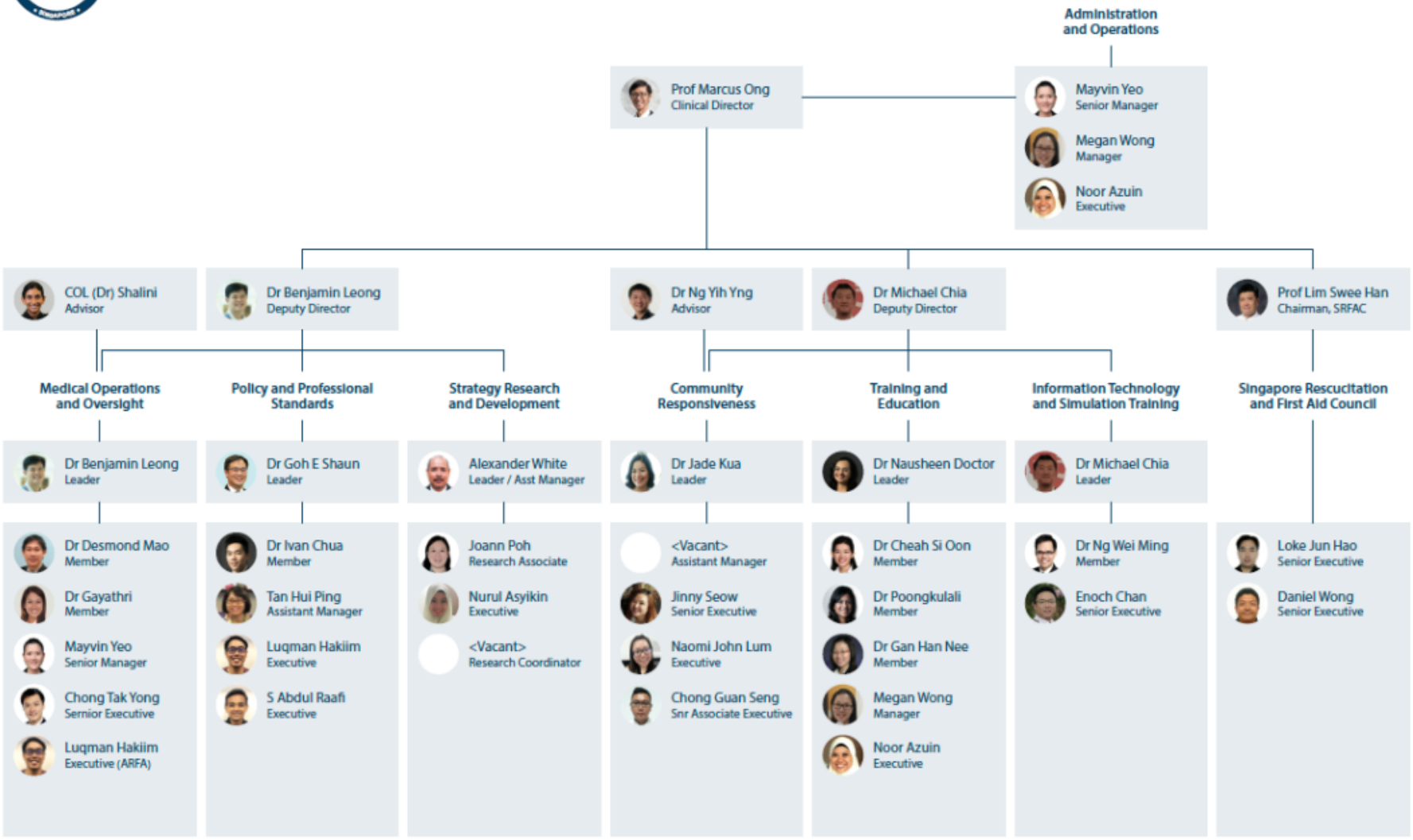
# UNIT FOR PRE-HOSPITAL EMERGENCY CARE / ORGANISATION CHART



# Singapore Healthcare Landscape

## Key Challenges

1. Rapid Ageing of the Population
2. Increasing Burden of Chronic Diseases
3. Rising Cost of Healthcare
4. Limited Health Workforce and Competing Demands
5. Challenges from COVID-19

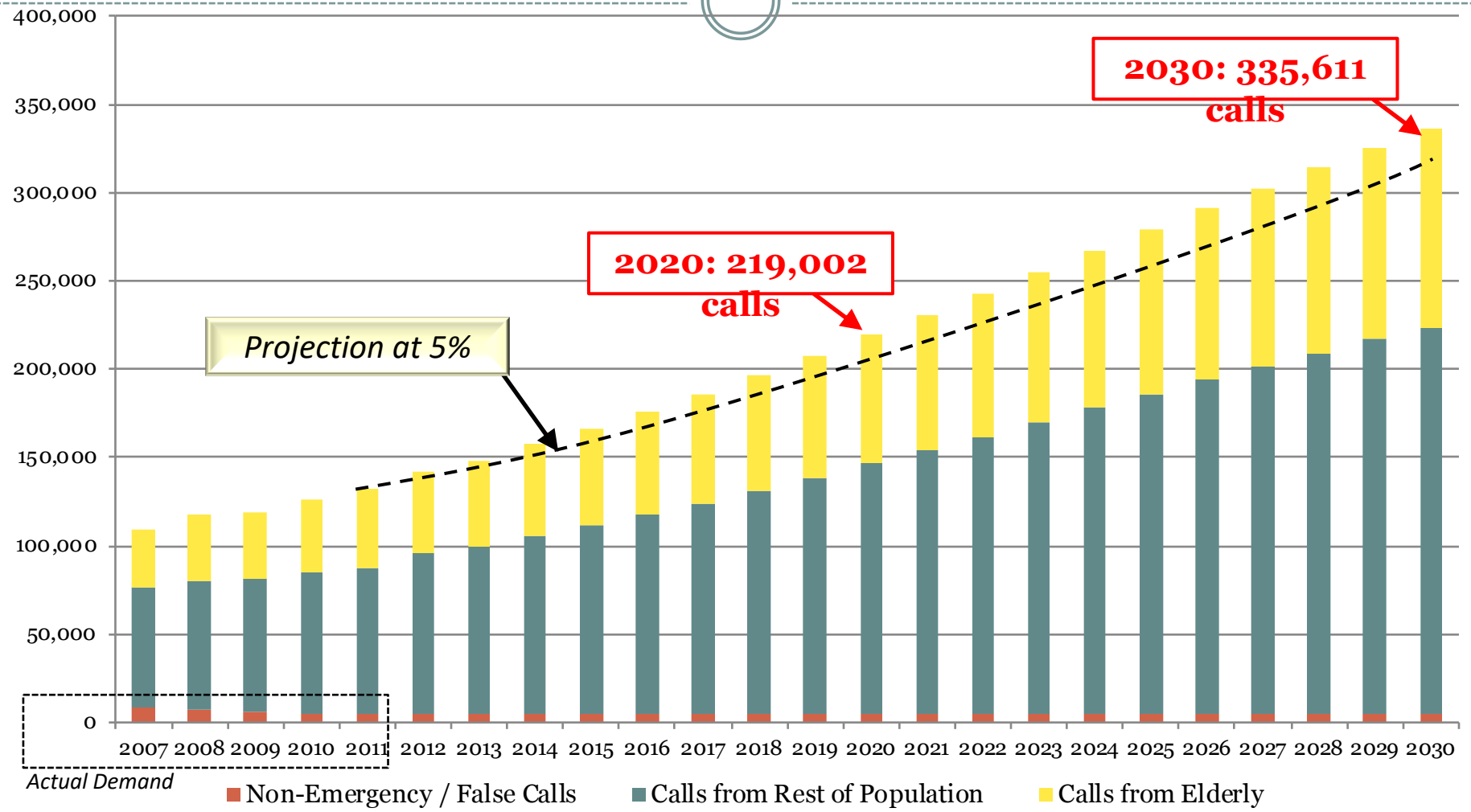
**Stresses on Our Resources**

People

Space


Money

# Projected EMS Demand

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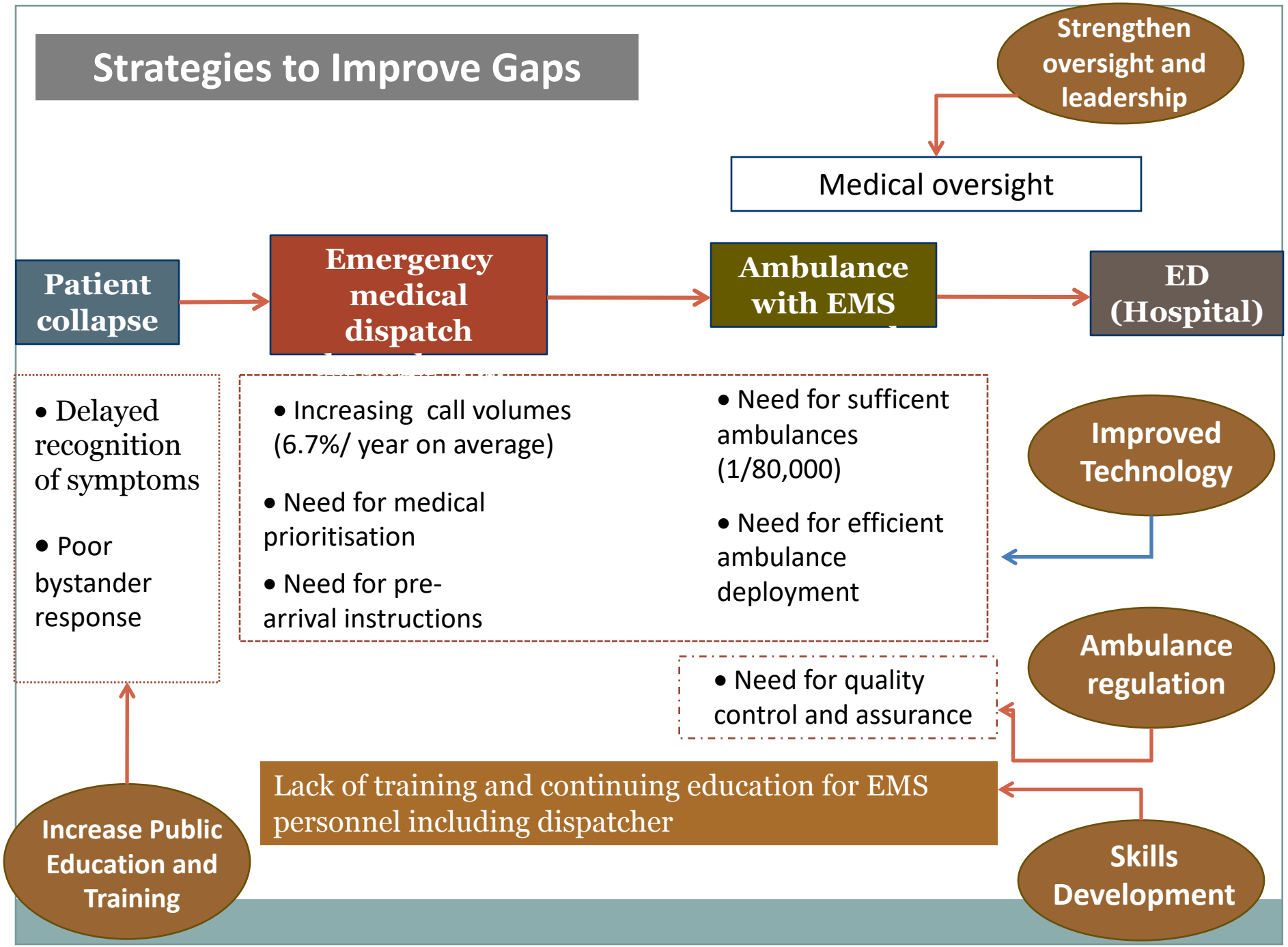
# Strategies to Improve Gaps



# 3 Important Shifts for the Future

**Beyond Hospital to Community**

*So Singaporeans can receive care in the community and nearer to home*

**Beyond Quality to Value**

*To give every Singaporean the best value, whilst keeping our system sustainable*

**Beyond Healthcare to Health**

*To help and support Singaporeans to live healthier lives*

**Better Health • Better Care • Better Life**

# PARAMEDIC TRAINING & EDUCATION

The Singapore Armed Forces (SAF) works closely with the Singapore Civil Defence Force (SCDF) and the Ministry of Health (MOH) to equip both SAF and SCDF medical personnel with professional skills and knowledge relevant for peacetime training and operations. The National Paramedic Training and Education Roadmap, leverages the four thrusts of SkillsFuture[1] initiative and provides career paramedics with many pathways to success, regardless of their educational background.

## Who are Paramedics?

- Allied Health Professionals
- First responders to the injured and sick
- Operate with a crew comprising a medic and a transporter, and in pre-hospital setting, often with limited resources

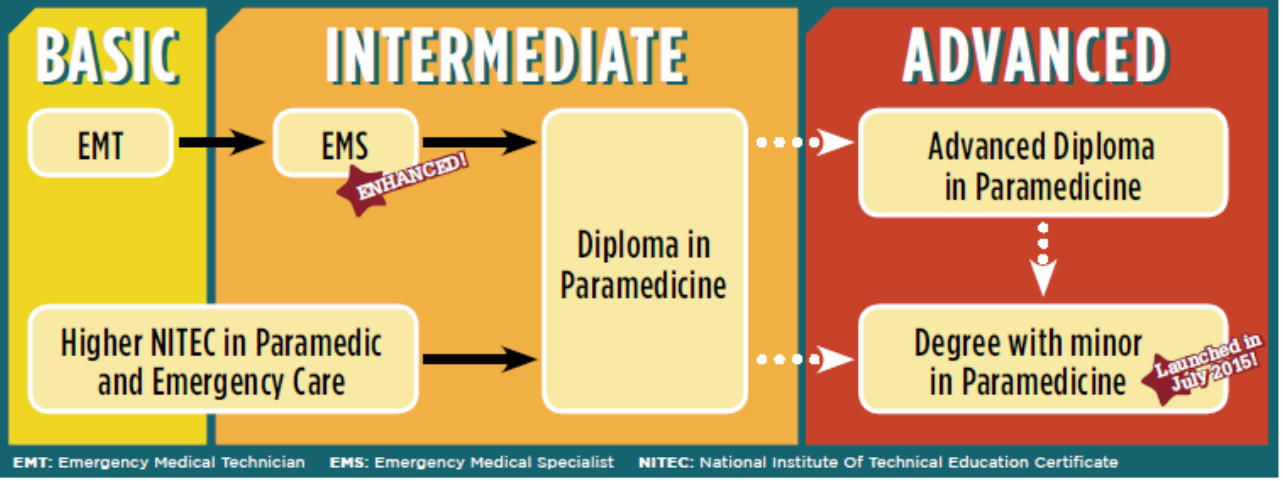
### Paramedic Professional Standards Committee

| | |
|---|---|
| Industry stakeholders | SAF and SCDF |
| Regulatory bodies | Unit for Prehospital Emergency Care (UPEC), Ministry of Education (MOE) and Workforce Developmental Agency (WDA) |
| Training educational providers | Institute of Technical Education (ITE), Nanyang Polytechnic (NYP) and SIM University |

**Looks at defining training competencies for Prehospital Emergency Care providers**

## THE NATIONAL PARAMEDIC TRAINING AND EDUCATION ROADMAP

The multi-agency Paramedic Professional Standards Committee, together with various paramedic training stakeholders, established this roadmap that allows paramedics to make well-informed choices about opportunities for career development.




**EMT:** Emergency Medical Technician **EMS:** Emergency Medical Specialist **NITEC:** National Institute Of Technical Education Certificate

## Milestones of Paramedic training in Singapore

**1996**
The Defence and Home Affairs Ministries collaborated with the Justice Institute of British Columbia (JIBC) to launch the Paramedic Training Programme in Singapore. SAF became the national institution responsible for all Paramedic training

**1996**
SAF and SCDF sent 7 officers and combat medics to JIBC for training

**1998**
The first local Paramedic Matriculation course was conducted at the School of Military Medicine (SAF) to a group of SAF and SCDF medics

**1998-2009**
SAF and SCDF continued to send operational paramedics to JIBC for enhanced training

**2008**
ITE starts the Higher NITEC in Paramedic and Emergency Care Programme

**2009**
SAF Paramedic course gains JIBC accreditation for medic and paramedic training

**2011**
NYP starts the Advanced Diploma in Paramedicine course

**2012**
SAF and JIBC co-develop the Diploma in Health Sciences (Emergency Medical Services) and Primary Care Paramedic Programme

[1] *The four key thrusts of SkillsFuture are: (i) help individuals make well-informed choices in education, training and careers, (ii) develop an integrated high-quality system of education and training that responds to constantly evolving needs, (iii) promote employer recognition and career development based on skills and mastery and (iv) foster a culture that supports and celebrates lifelong learning.*

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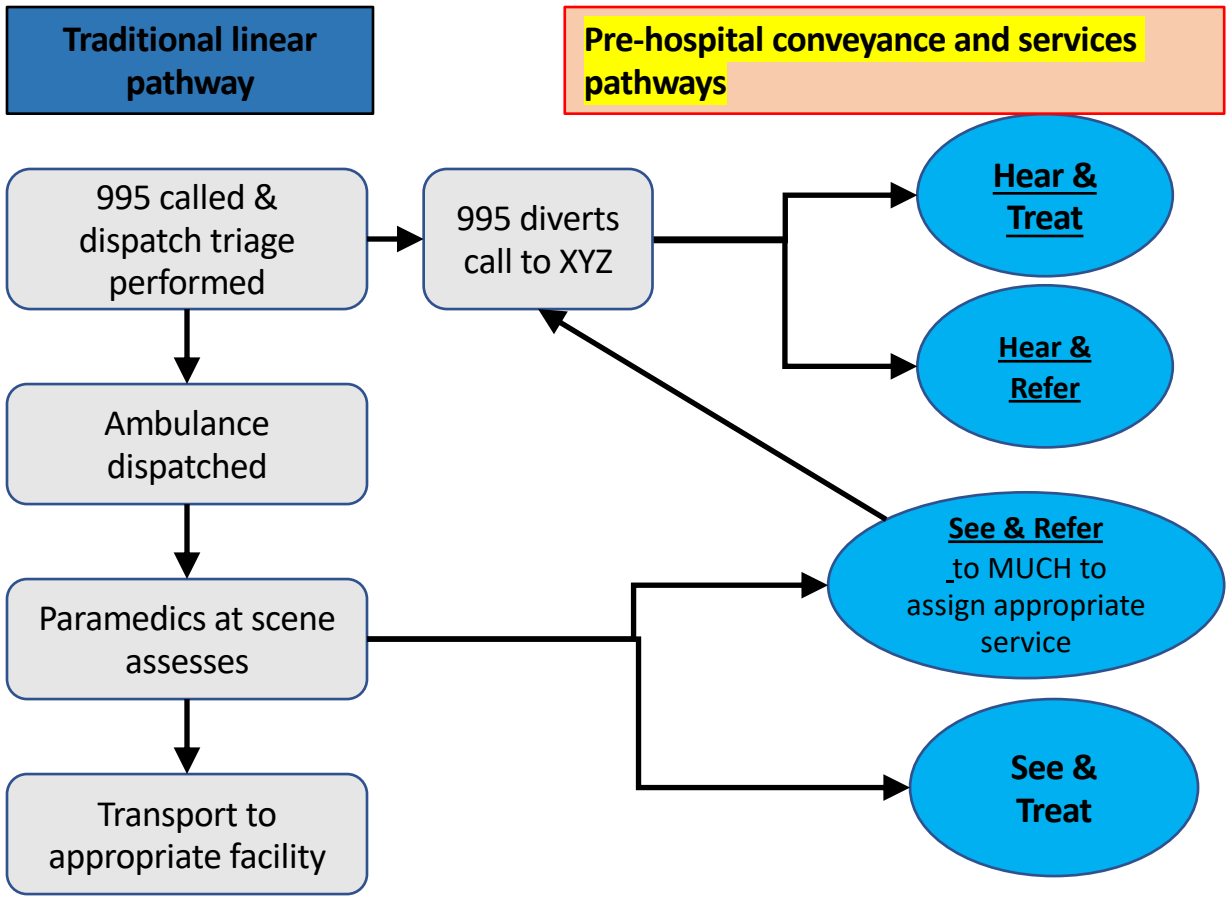
**Professionalisation** **Oversight** **Training**

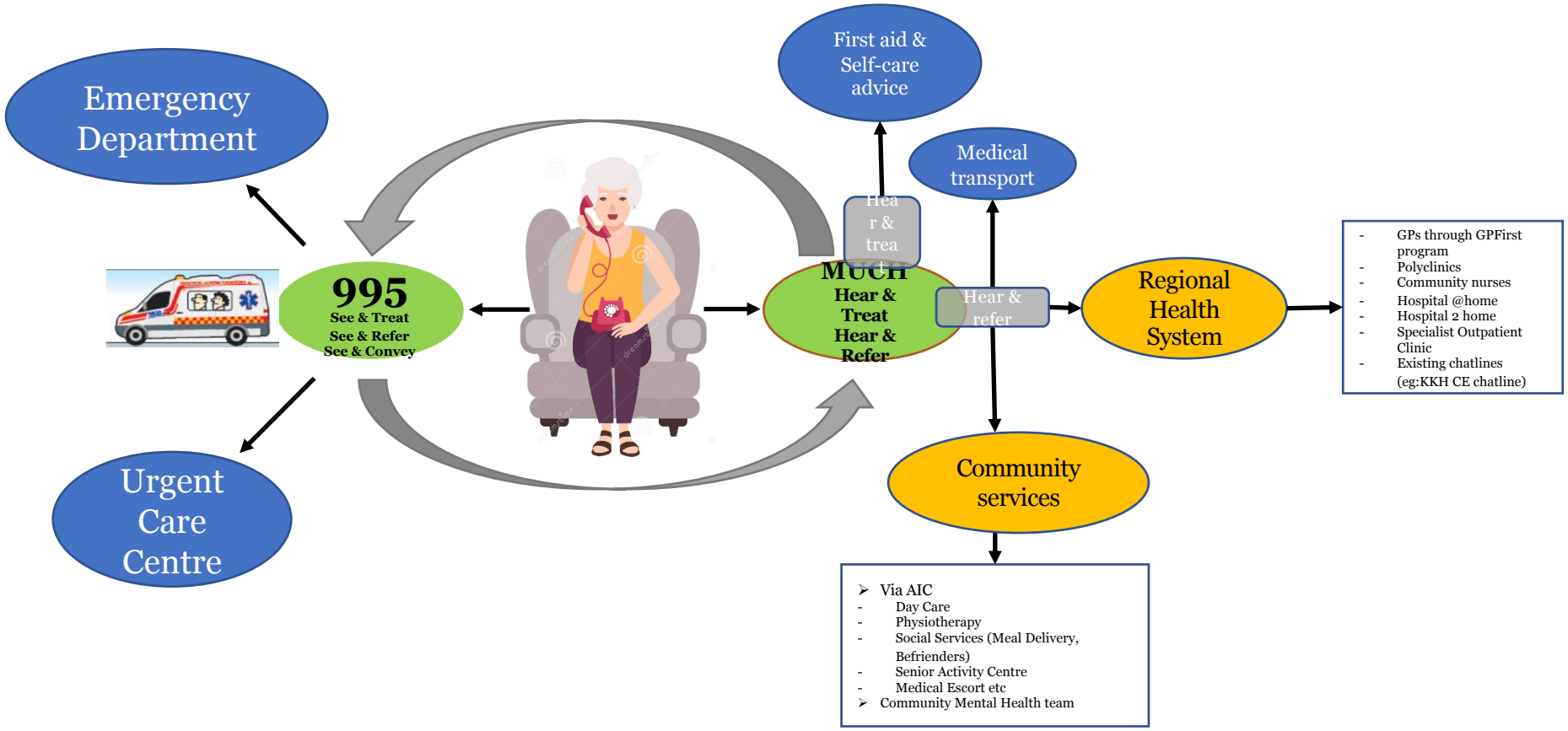
## We need to train the next generation of Prehospital Emergency Care professionals!


- **Critical Care Paramedics**
- **Clinical Experts (upcoming)**
- **Community Paramedic Clinicians**

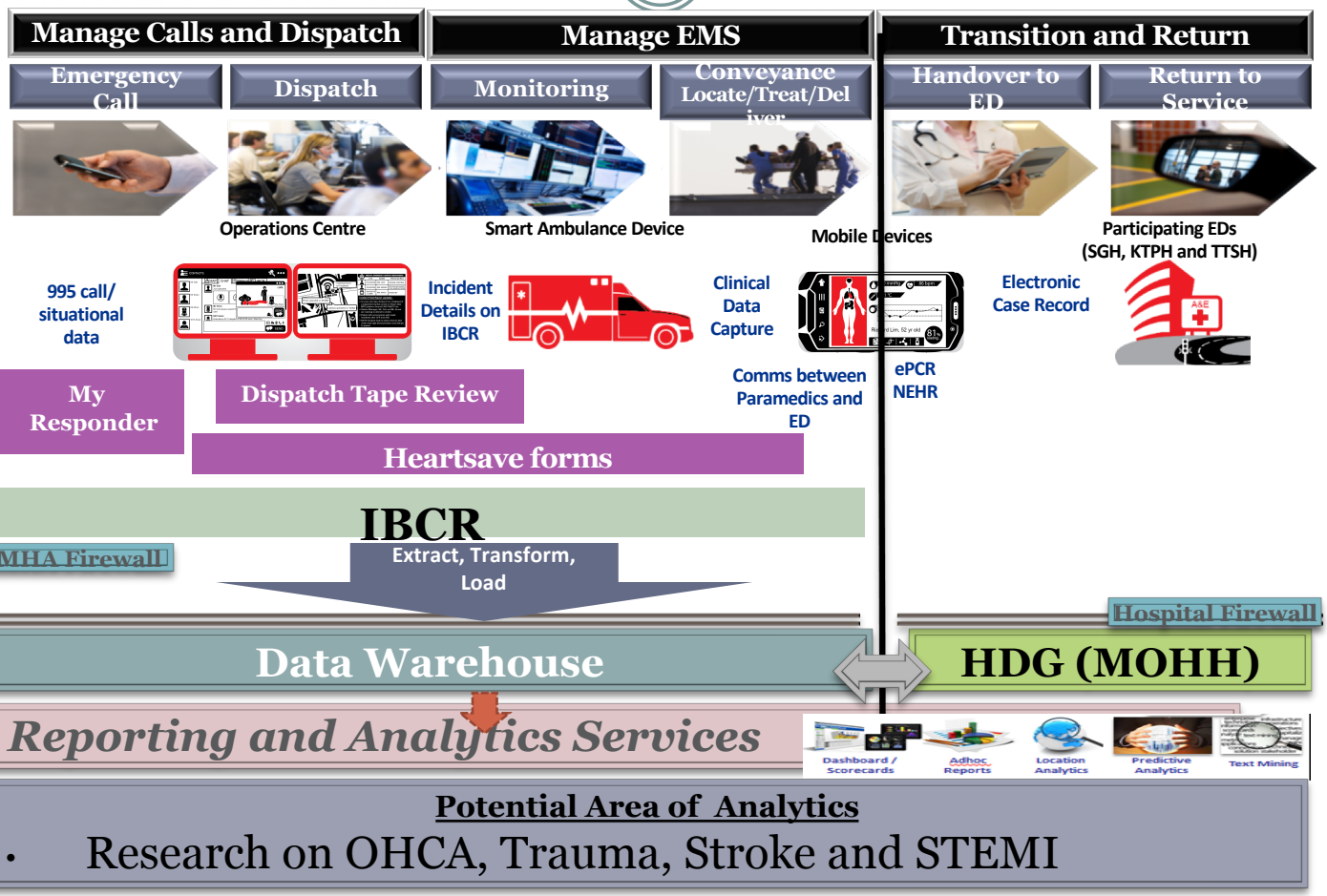
# Alternative Care Service Pathways when someone calls 995



# For Singapore: Medical Urgent Care Helpline (MUCH)

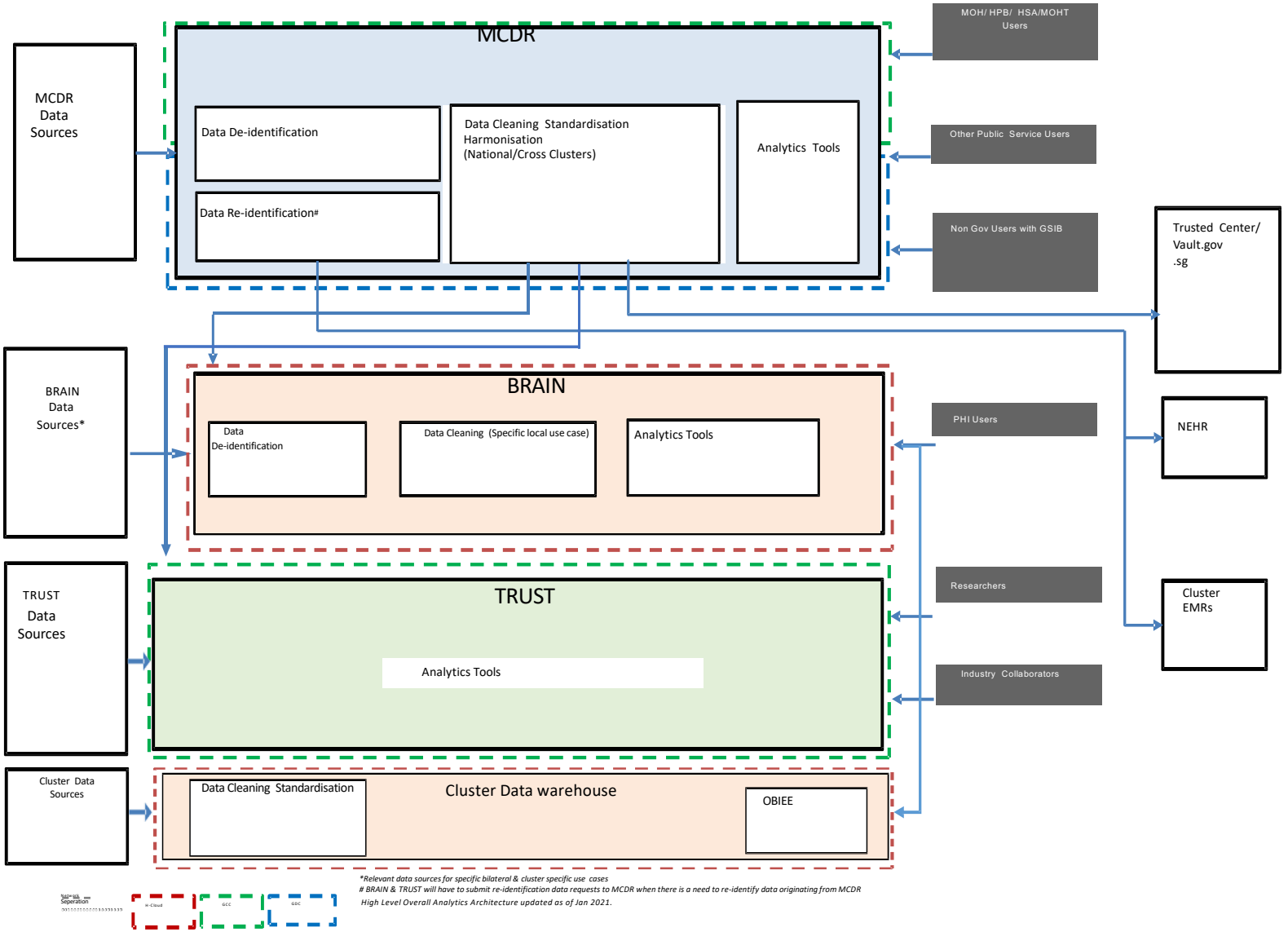


# PEC IT Blueprint and Analytics

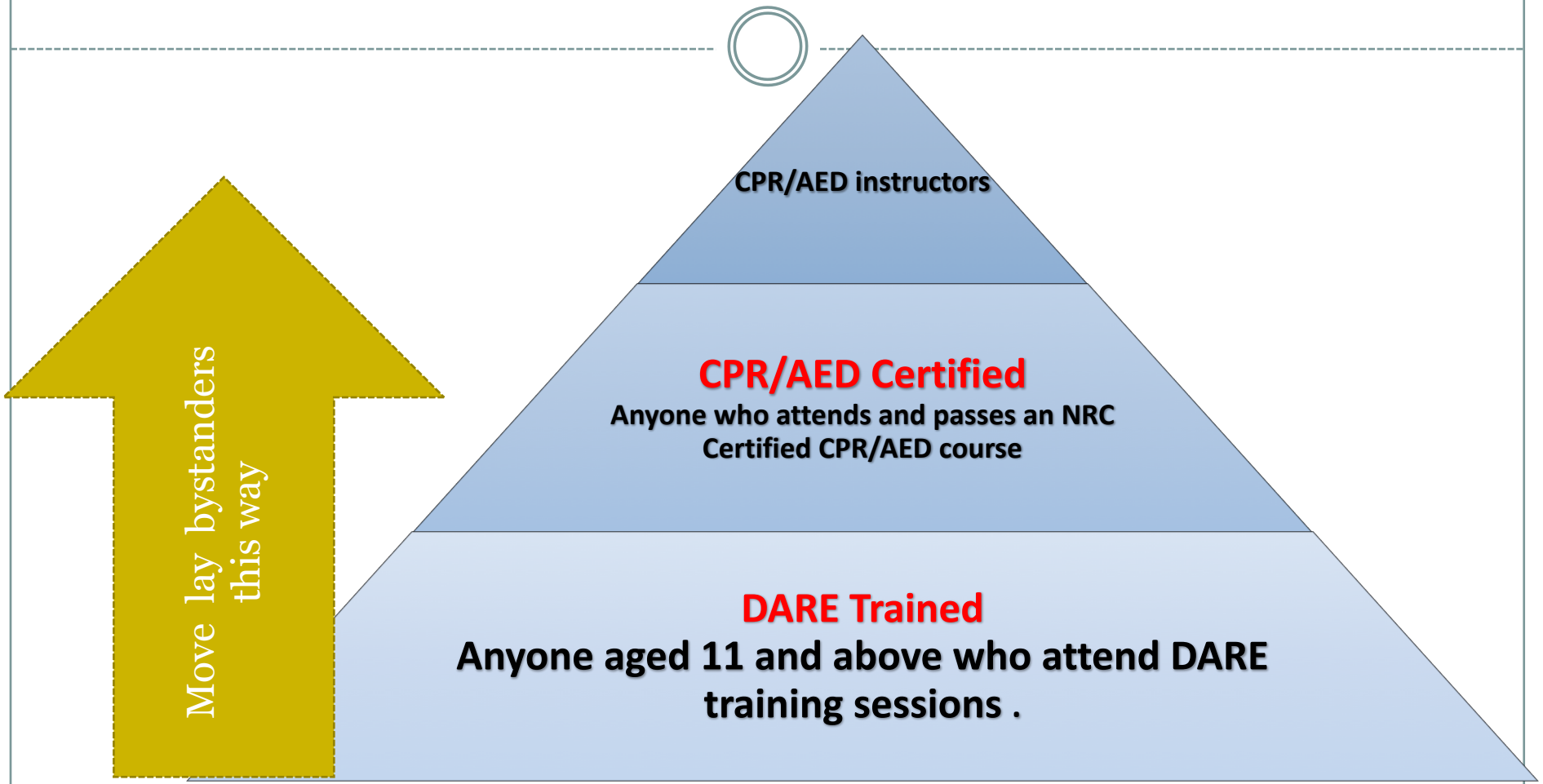



OMNI
SCDF

# MOH Analytics Framework – High Level Overall Analytics Architecture



# Pyramid of First Responder Preparedness




DARE Aware: Everyone becomes aware of what we teach in DARE through social media, traditional media, or by word of mouth.


1

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

myResponder

SCDF

The Life Saving Force

ANDROID APP ON Google play

Available on the App Store


2

Sign up as a volunteer responder


3

Know where the nearest AED is located

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# 我报 MyPaper

mypaper.sg MCI(P) 146/10/2014 星期五 2015年7月24日

» 国人对新加坡社会看法改善

咨询公司对新加坡公民和永久居民展开调查，让他们选最能形容新加坡社会的词汇。结果显示，与3年前相比，国人眼中的新加坡社会较正面，是享有“教育机会”、“和平”及“安全”的国家。**本地新闻B2**

» 希腊第2轮纾困投票通过

希腊国会从前晚就新纾困方案的第2轮投票进行辩论，一直讨论到昨天凌晨，终于以大比数顺利通过。当国会就纾困方案进行辩论时，约9000民众在国会外聚集，反对进一步财政紧缩。**世界新闻B4**

» 金秀贤同父异母妹妹沾光被批

韩国歌手金珠娜发行为韩剧献唱的插曲，自爆是“金秀贤同父异母妹妹”搏版面，间接曝光金秀贤歌手老爸金忠勋23年前疑“偷吃”往事，被网友狠批。**娱乐B12**

## 协助更多心脏病发者 救命App使用率待提高

**苏文琪**

通知公众就近协助疑似心脏病发者的手机应用软件，已推出超过3个月，用户使用率仍有待提高，以帮助更多患者，增加对方的存活机会。

民防部队于今年4月17日推出的“myResponder”应用软件，至今的下载量约2500次。该软件可指出设有自动心脏除颤器（AED）最靠近的地点，也可用于通知用户附近有心脏病发者。

当局接获疑似心脏骤停个案的通报后，会立刻用软件通知在事发地点400公尺内的用户。只有已注册为“社区急救员”的700多名用户才会接到通知。

过去3个月，民防部队共发出约1000则急救通知，当中六成确为心脏骤停个案。不过，仅不到5%的通知获公众回应。45起获回应个案中，有15起确为心脏骤停个案。

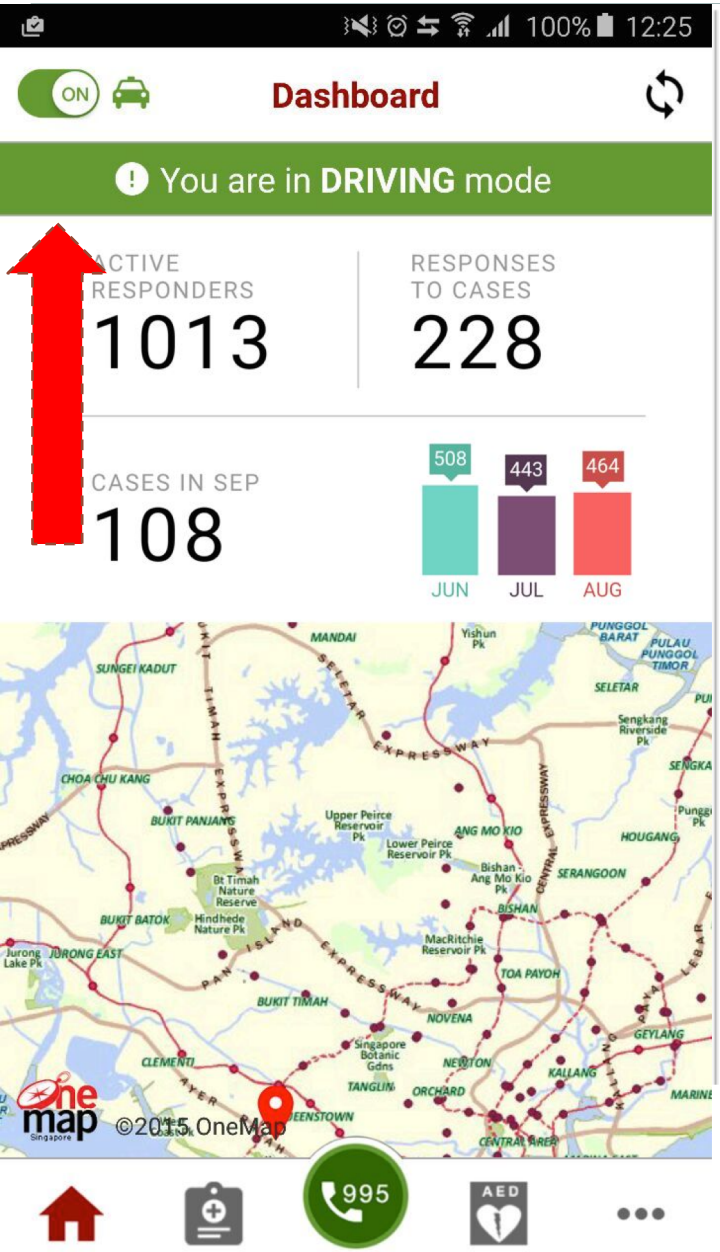
民防部队总医务官黄毅莹医生上校说，即使没有接受过急救训练，公众还是可以注册为急救员。接获通知时，他们可帮忙取来最靠近的自动心脏除颤器，或在民防接线员的指导下为患者进行心外按摩，或协助指引救护人员到事发地点。

他说：“心脏骤停的情况下，每一秒都非常重要，有人及时介入帮忙，将增加患者的存活机会。”

另外，软件现虽以处理心脏骤停个案为主，用户仍可借由软件通知民防部队其他紧急事故，当局会通过定位技术得知通报者的位置。

目前获回应个案中，未有心脏骤停者成功存活，但获援助的其他患者都从中受益。

邻里主动应急计划志愿者彭秀翠（左）和拉詹在接获“myResponder”应用软件的通知后，能赶在救护车之前到场，及时为患者提供援助。（周柏荣摄）




SINGAPORE

# Automated External Defibrillators installed on 100 SMRT taxis

The initiative is part of a three-year pilot programme called SMRT-Temasek Cares AED on Wheels, which aims to increase the availability of AEDs within the community.

**POSTED:** 27 Nov 2015 21:43 **UPDATED:** 27 Nov 2015 23:59

VIDEOS PHOTOS

SMRT taxi driver Simon Ngiam Shu Leng with the AED which will be installed in his taxi. (Photo: SMRT)

UPEC

# Public Housing AED Program: 70% of cardiac arrest cases occur in the 10,000 public housing estates!

# **D**ispatcher-**A**ssisted First **Re**sponder Programme (**DARE**)

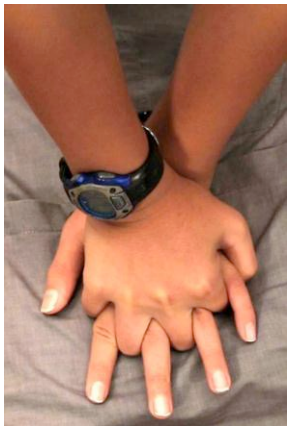
ST PHOTO: DESMOND FOO

HOME B8

## LEARN CPR? THEY'RE ALL EARS

You are never too young to learn how to save lives.

Pupils at St Anthony's Primary School proved just that yesterday when they learnt how to administer cardiopulmonary resuscitation (CPR) and use an automated external defibrillator. About 2,300 students have attended this life-saving programme so far.

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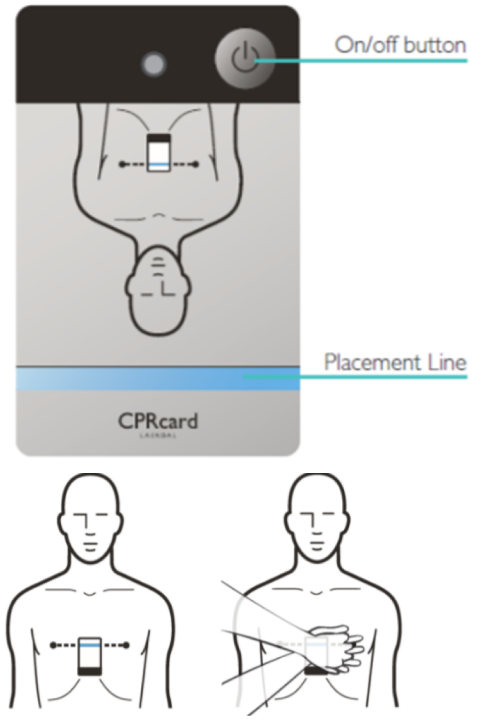
# 5-YEAR NATIONAL COMMUNITY EMERGENCY AND RESILIENCE (NCER) ROADMAP

| Projects | Publicity & Awareness / Education | Training | Community Responsiveness & Resources | Technology | Research & Data Analytics | Policy & Legislation |
|---|---|---|---|---|---|---|
| Project 1 | Awareness Engagement – Storytelling at National Library Board<br>(Partner: National Library Board)<br>▪ Kick-started 2 sessions in Dec 2021<br>▪ To continue conducting storytelling sessions at NLB | DARE training for NSmen during In-Camp Training (Partner: SAF)<br>Spoken to SAF. SAF has agreed to explore the feasibility. Will follow up with SAF to conduct a few good training & subsequently seek SAF's buy-in on TTT model. | Optimize the number of AEDs to cover whole Singapore<br>(Partner: SCDF)<br>The guidelines for optimal AED placement in Singapore, is currently being finalized. Thereafter, it will be shared with the stakeholders. | Increase Social Media presence (Tik Tok & Linkedin) – To raise awareness on DARE & CPR AED<br>Tik-Tok to engage the younger population while using Linkedin to reach out to the corporate community. | Conduct census-related surveys : Proportion of Singapore population trained in CPR+AED/First Aid (HPB)<br>UPEC has provided CPR/AED questions to HPB through MOH, for inclusion in National Population Health survey 2021. Results have not been shared. | Good Samaritan law<br>One of the reasons that bystanders are not willing to perform CPR on a stranger, is the fear of being sued for inadvertently causing death or injuries.<br>To propose introducing Good Samaritan Legislation in Singapore. |
| Project 2 | Cardiac Arrest Survivors & Supporters Club<br>(Partner: SHF & SCDF)<br>Aims to provide information, care and support to cardiac arrest survivors, their caregivers & families as well as volunteers responders. It will also comprise advocates and community activists of cardiac arrest support.<br>SHF has agreed to partner while SCDF is still considering. This club is envisioned to sit under and supported administratively by SHF, with steering committee led by lay persons and advised by experts from the stakeholders. | Provision of DARE Training to post-secondary schools and Institutes of Higher Learning (Partners: MOE, IHLs)<br>(i) DARE moved a notch higher with MOE's introduction of CPR/AED refresher for Sec 3. Thus, MOE rejected proposal to train post-secondary in DARE, e.g. JCs.<br>(ii) IHLs have autonomy to decide on program & curriculum. Polys cited issues of not having enough qualified people to conduct DARE.<br>(iii) NUS & SUSS will be organizing DARE TTT for their students. | | | National Registry of Electronic Certificates for Life-saving courses (Partner: SRFAC)<br>To centrally issue certificates of life-saving courses, via national digital platform, Singpass<br>Facilitate tracking of the status of certificates<br>Allow tracking of the number of people who have been trained/certified in Singapore<br>SRFAC will be proposing specifications and parameters to GovTech for further discussion. | Forming a Workgroup that is made up of the stakeholders of NCER Roadmap and to meet regularly for coordination, progress update and discussion on issues.<br>(Partner: MINDEF, MHA, MOH, MOE, SHF, SCDF, SRFAC)<br>To seek endorsement from DS |
| Project 3 | CPR Race at Singapore Science Centre for visitors<br>(Partner – Singapore Science Centre)<br>There will be a CPR Race station at Science Centre from 08 to 10 Apr 2022. If it works out well, we will find opportunity to conduct such activities at Science Centre for the visitors. | To train NIE students in DARE TTT<br>(Partners: NIE, MOE)<br>UPEC's DARE Training Team will be having a meeting with NIE's Associate Dean on 22 Mar 2022 to discuss further on this initiative. | | | | |
| Project 4 | Events – School competition in CPR & AED<br>(Partner: MOE & SHF)<br>SHF and MOE have agreed to partner UPEC for this project.<br>Students will be tested on their knowledge of CPR & AED/cardiac arrest and CPR & AED practical skills. | Revamping of annual fire drills to incorporate medical emergency basics, such as CPR & AED (Partner: SCDF)<br>SCDF will keep in view UPEC's proposal for SCDF to engage building managers to organize life-saving courses and promote myResponder app when arranging fire drills as there are no fire drills currently. | | | Legend:<br>Green Box: To be actively handled by UPEC<br>Light Blue Box : Farming out to partners<br>Black Font colour : With progress<br>White Font colour : Have not yet kick-started<br>Please refer to appendices in slide pages 12 to 26 for more details of the 5-year NCER Roadmap projects. | |
| Project 5 | Enhancing DARE program with optional add-on component - Child & Infant CPR & AED Awareness<br>Re-purposing contents for Child & Infant CPR/AED | | | | | |

# 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

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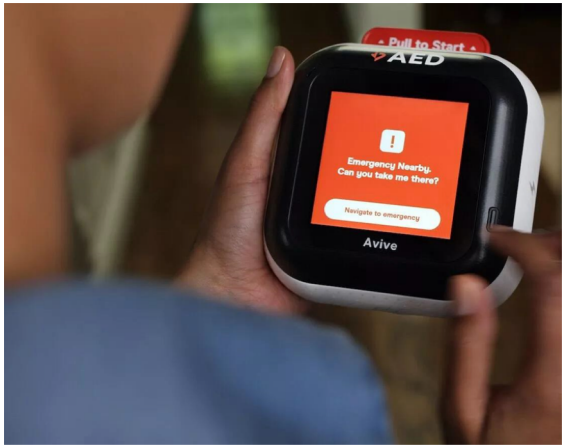
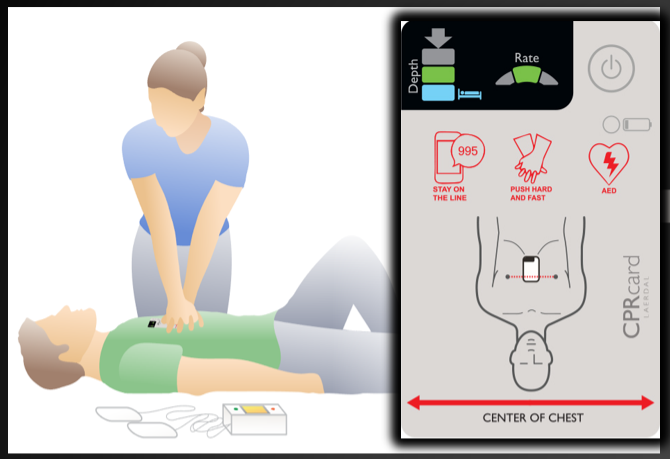
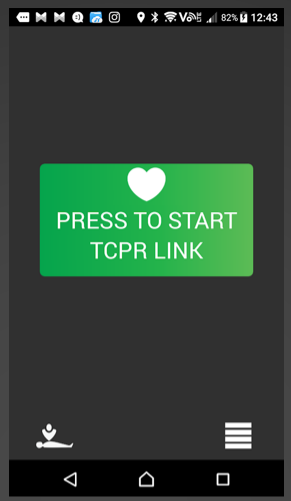
## Personal or Home Access Defibrillation

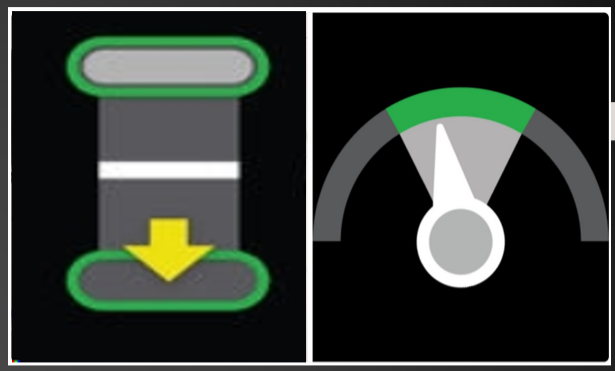


- Next gen defibs
  - Rebirth of the home AED?
  - Miniaturization
  - Improved affordability
  - IoT connectivity




**Compression telemetry to dispatcher**

***"You're doing great…push harder… ambulance is on the way."***

**DA-CPR coaching to reinforce quality compressions**

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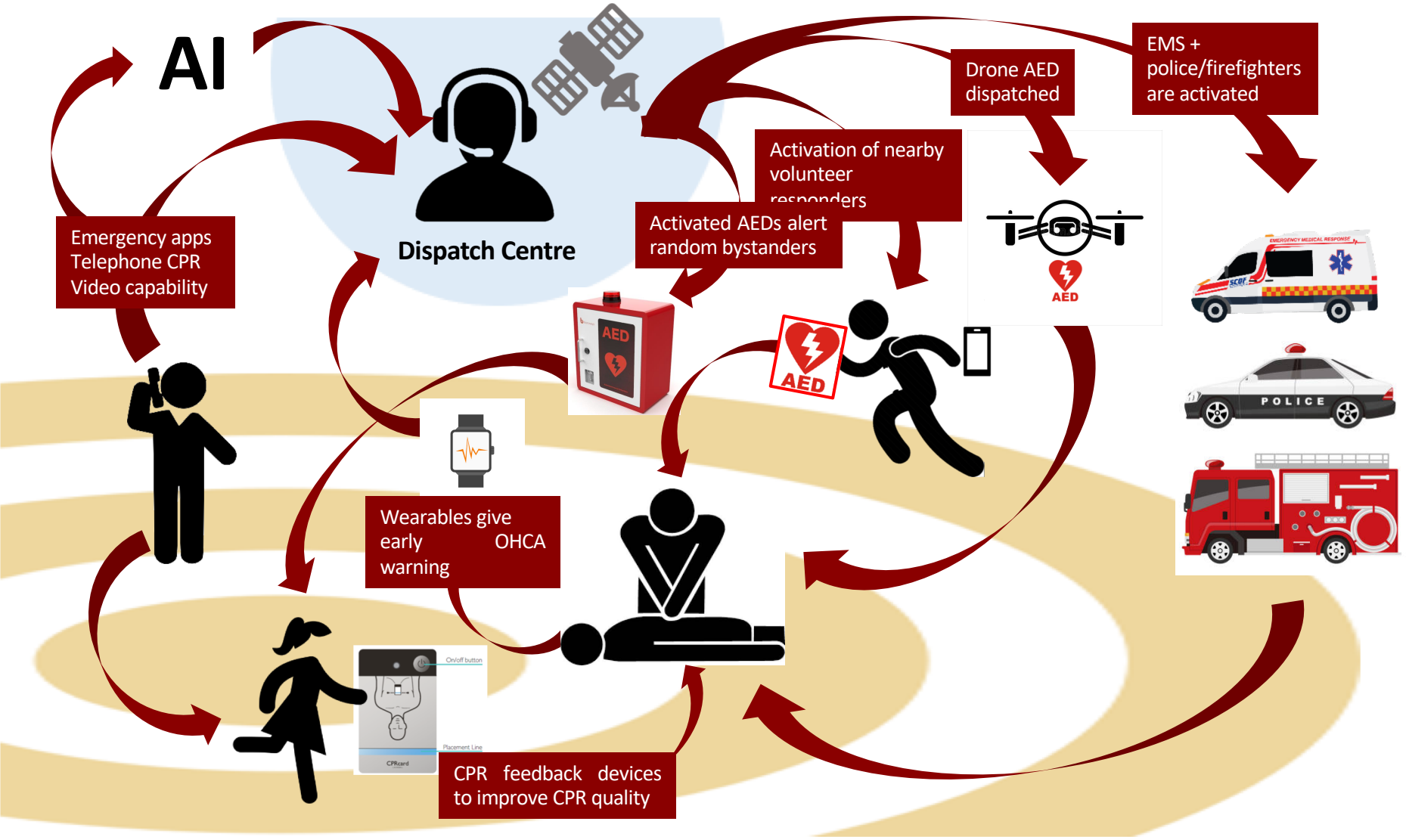
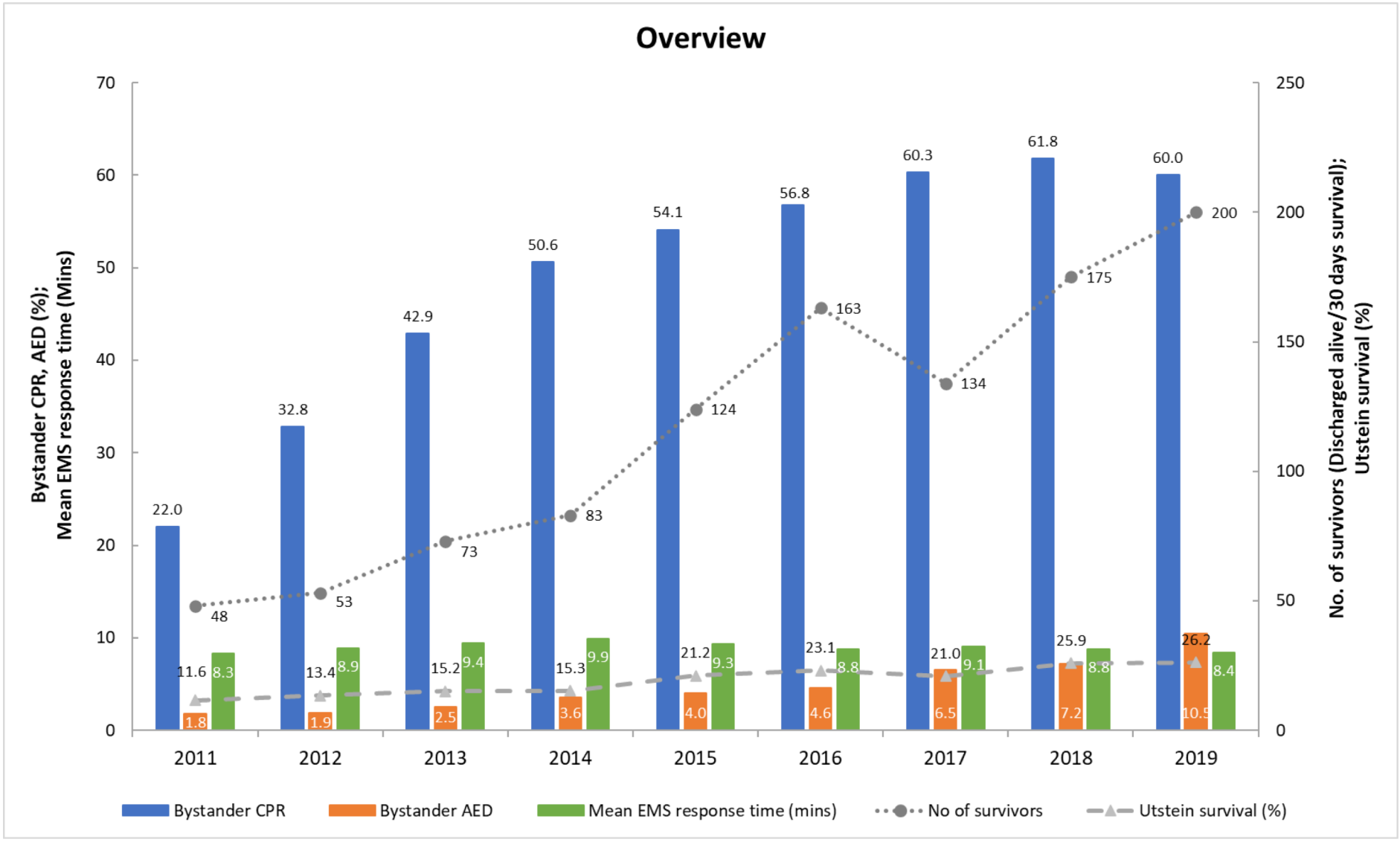

AI
Dispatch Centre
Emergency apps
Telephone CPR
Video capability
Activation of nearby volunteer responders
Activated AEDs alert random bystanders
Drone AED dispatched
EMS + police/firefighters are activated
AED
AED
POLICE
Wearables give early OHCA warning
On/off button
Placement Line
CPRcard
CPR feedback devices to improve CPR quality

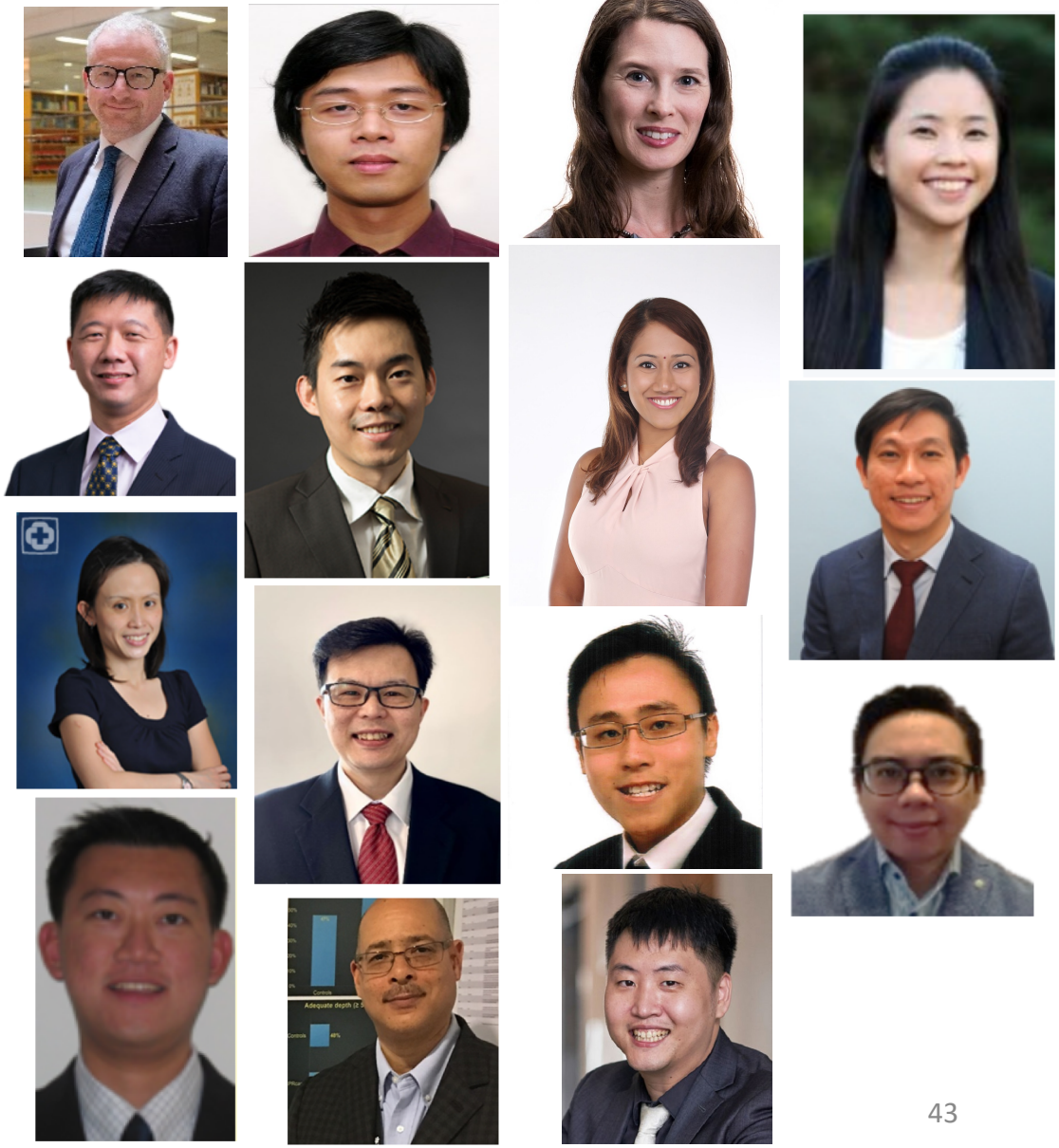

Overview
Bystander CPR, AED (%); Mean EMS response time (Mins)
No. of survivors (Discharged alive/30 days survival); Utstein survival (%)
70
60
50
40
30
20
10
0
250
200
150
100
50
0
2011
2012
2013
2014
2015
2016
2017
2018
2019
22.0
32.8
42.9
50.6
54.1
56.8
60.3
61.8
60.0
1.8
1.9
2.5
3.6
4.0
4.6
6.5
7.2
10.5
11.6
13.4
15.2
15.3
21.2
23.1
21.0
25.9
26.2
8.3
8.9
9.4
9.9
9.3
8.8
9.1
8.8
8.4
48
53
73
83
124
163
134
175
200
Bystander CPR
Bystander AED
Mean EMS response time (mins)
No of survivors
Utstein survival (%)


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

DukeNUS Medical School | Pre-hospital & Emergency Research Centre

## Pre-Hospital and Emergency Research Center (PERC)

To be a centre of excellence in pre-hospital care and emergency medicine, while improving lives through emergency medical services research.



*Lead PI*

*Prof Marcus ONG*

## Theme IV:
## Global Resuscitation Alliance

Disseminate best practice for Cardiac Arrest management through the Global Resuscitation Alliance

**Community**

**995**

**Ambulance**

**Hospital**

### Theme II: Future Ready SMART Community interventions

Develop and Implement Future Ready SMART Community interventions to improve the quality of CPR (increase optimal compressions (rate/depth) by20%)

### Theme III: Future Ready Ambulance based interventions

Increase number of neurologically intact survivors by 20% through a bundle of Future Ready Ambulance based interventions

### Theme I: Data Science and AI Driven Clinical Policies

Build a Data Science Platform to support AI Driven Clinical Policies

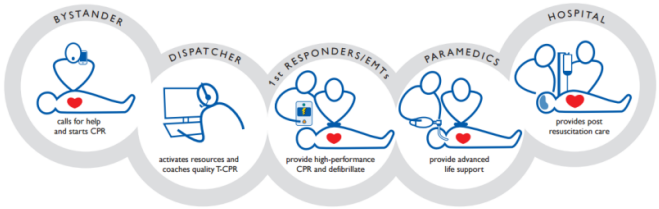
# Future-Ready Interventions for Survival after Cardiac Arrest (FRISCA): From Quantity to Quality Survivorship

# Global Health Programs: Resuscitation Academy Asia

TEMASEK FOUNDATION

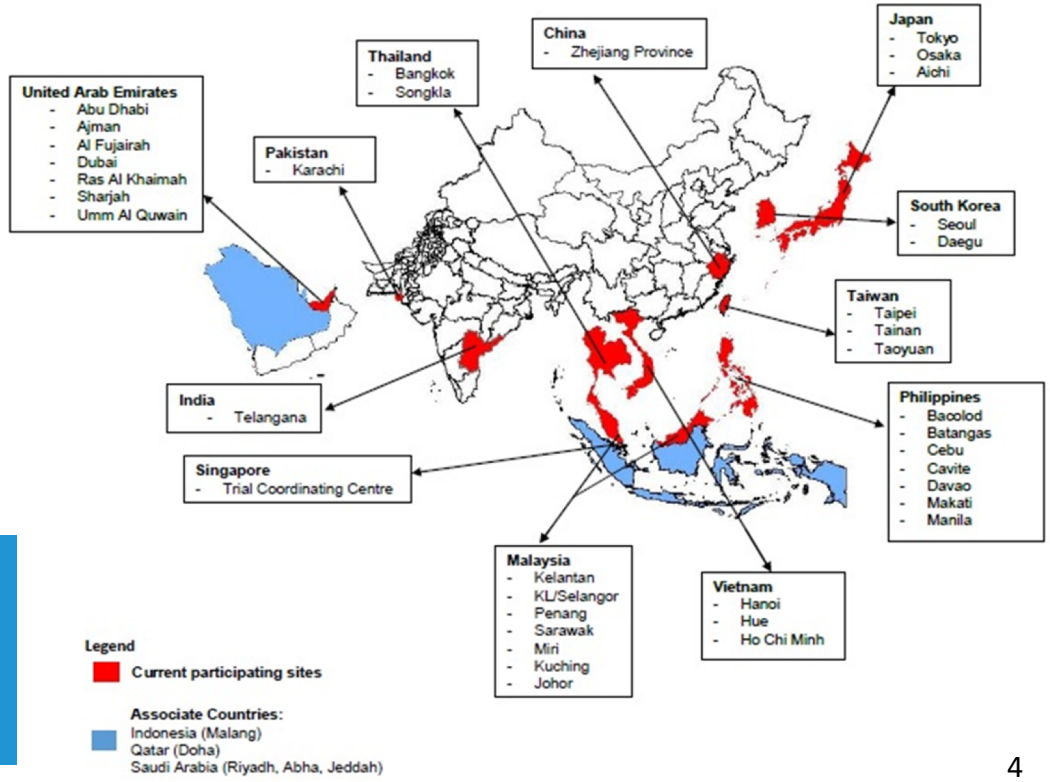
# **PAROS/GRA :** Development of an Assessment tool for Developing Pre-Hospital Emergency Care systems in collaboration with the GRA

**Pan Asian Resuscitation Outcomes Study**

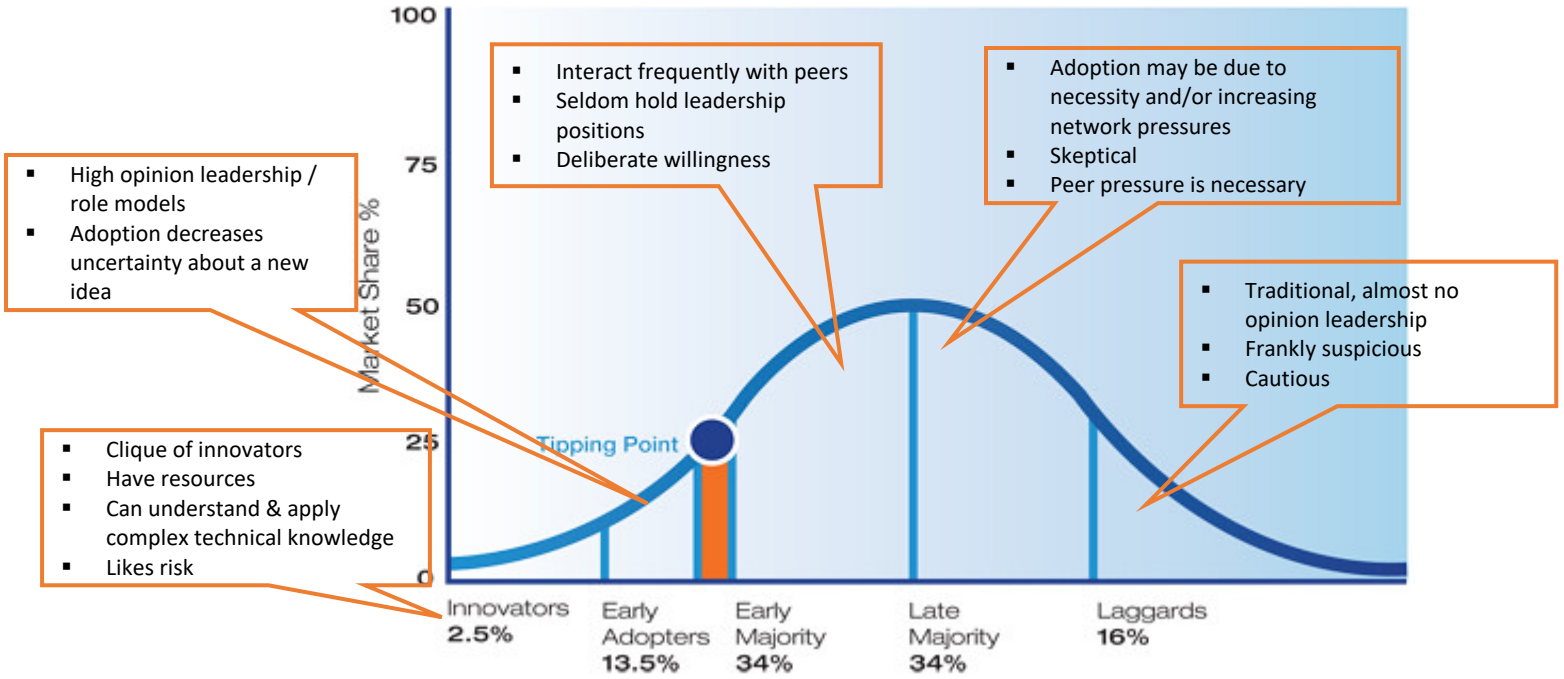



Global Resuscitation Alliance

World Health Organization



# How does change occur: Innovation adoption curve

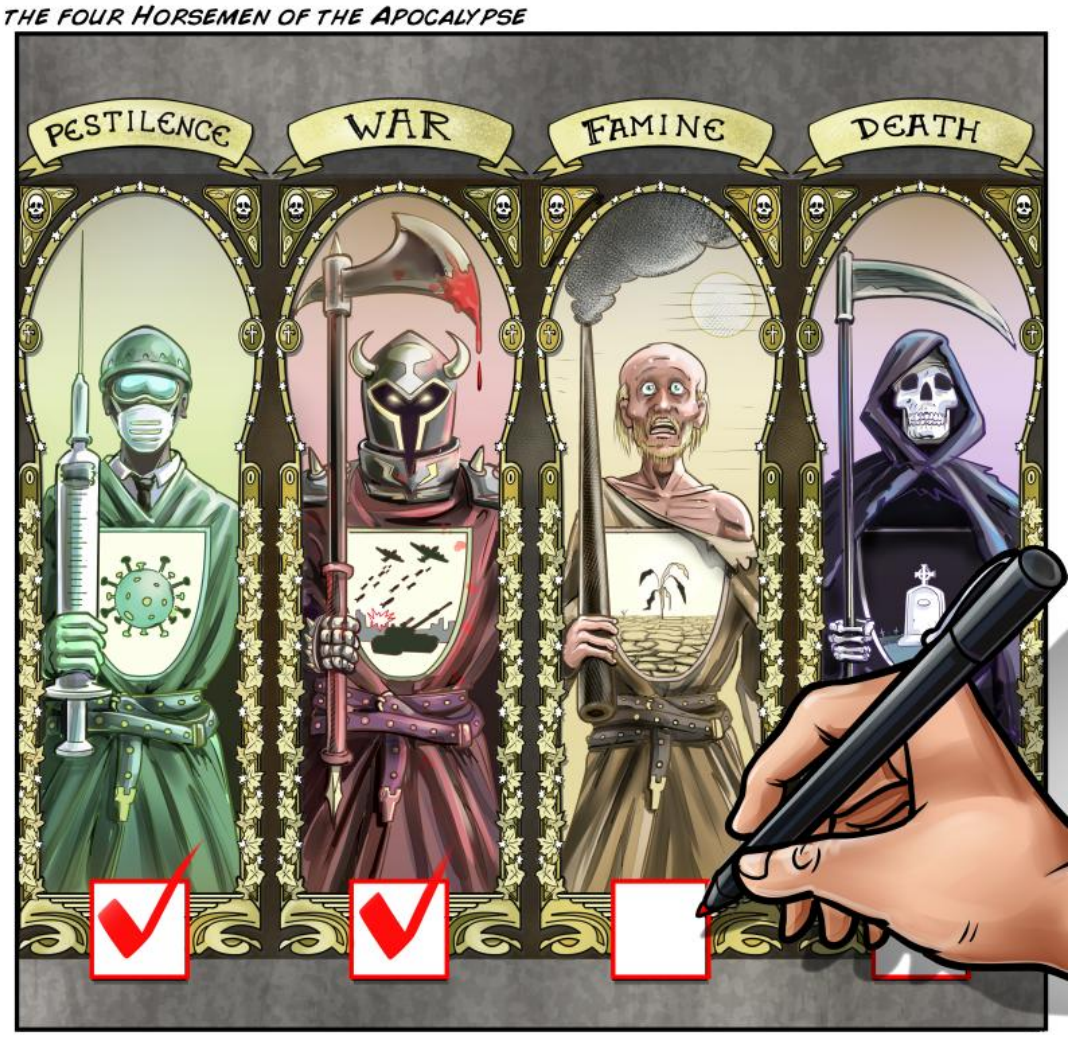




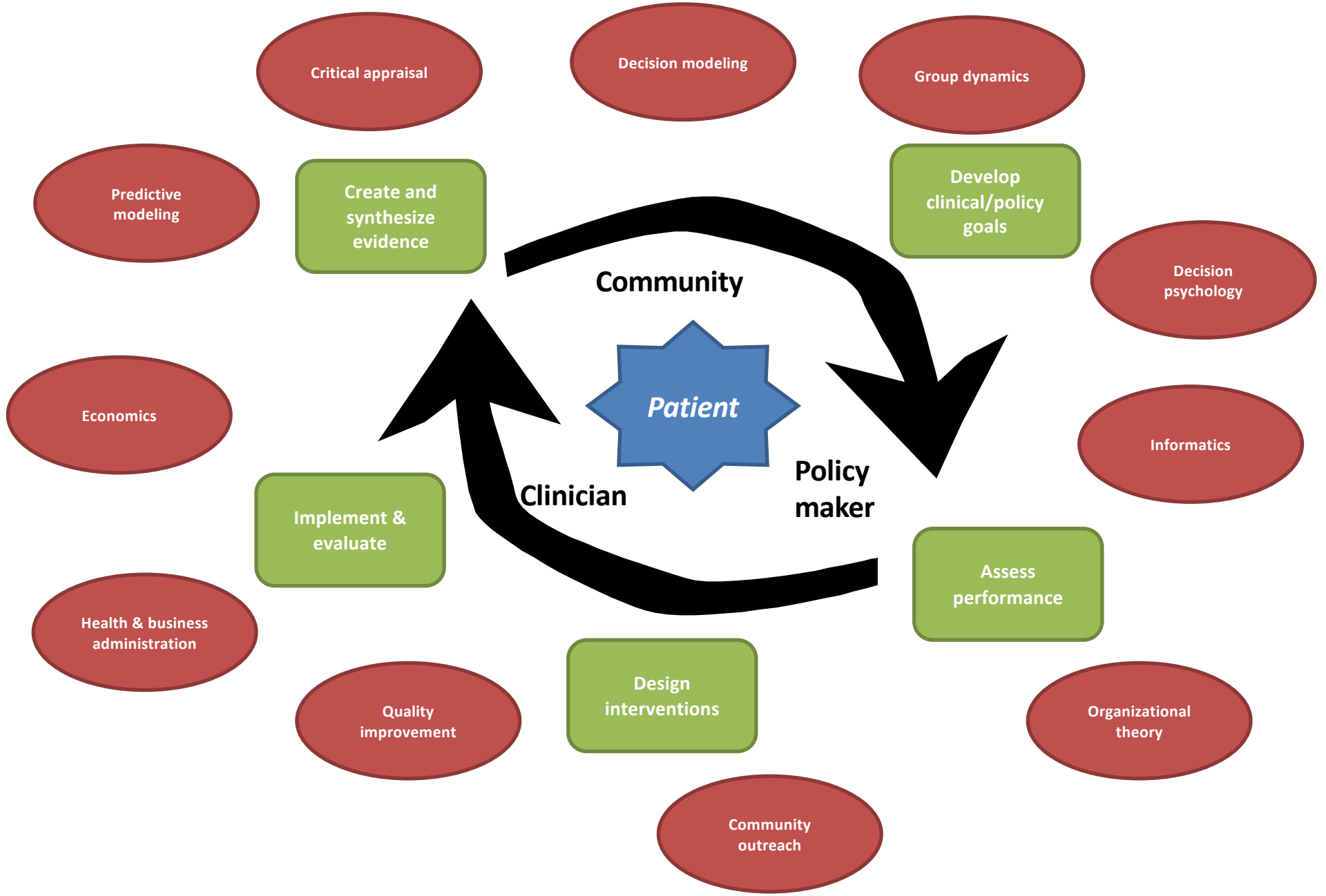

Slide adapted from Dr Asheley Skinner

DukeNUS Medical School | Health Services & Systems Research

# Global Healthcare Landscape




| | | | |
|---|---|---|---|
| Pandemics<br>Drugs | Trauma<br>Mental health | Inequities<br>Climate change<br>Disasters | Aging Tsunami<br>Non-communicable disease<br>Infant mortality |


Critical appraisal
Decision modeling
Group dynamics
Predictive modeling
Create and synthesize evidence
Develop clinical/policy goals
Decision psychology
Community
Economics
Patient
Informatics
Clinician
Policy maker
Implement & evaluate
Assess performance
Health & business administration
Design interventions
Quality improvement
Organizational theory
Community outreach

# Let's save lives together!

**Research/Data should drive/impact policy!**

Pre-hospital Emergency Care

5 Year Plan (2009 – 2014)
5 Year Plan (2018 – 2022)

**Next 5-Year Plan for Pre-hospital Emergency Care 2023 - 2027**

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