



Mahidol University

# **RESILIENCE CAPACITY OF PRE-HOSPITAL EMS SERVICE PROVIDERS AND THE FUTURE AGENDA FOR SUSTAINABLE DEVELOPMENT OF RESILIENT EMS SYSTEM IN THAILAND**

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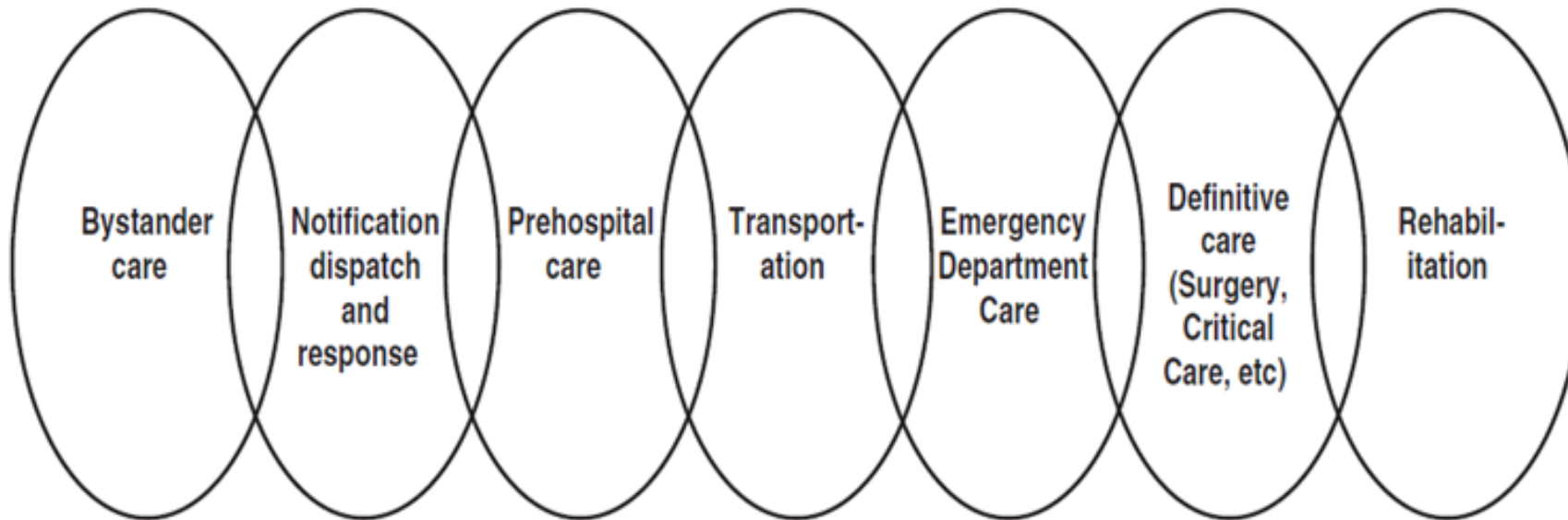
Thailand

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# Emergency medical service (EMS) system

A comprehensive system which provides arrangement of personnel, facilities and equipment for *effective, coordinated and timely* delivery of health services to victims of emergency events. (1)

**A COMPREHENSIVE EMS SYTEM IS READY EVERYDAY FOR EVERY KIND OF EMERGENCY!!**



2



# Pre-hospital EMS (PEMS) System

Pre-hospital care includes care provided at scene of injury, home, school, or any incident area until patient arrives at formal health facility <sup>(4,5, 8)</sup>

More than half of deaths occur in developing countries each year from emergency conditions

## **Why focus on the PEMS system?**

Availability of pre-hospital care can contribute >25% decrease in mortality and fatal injuries

Overwhelming PEMS during PHEs so improved system reduce ED flow (unnecessary transmission)

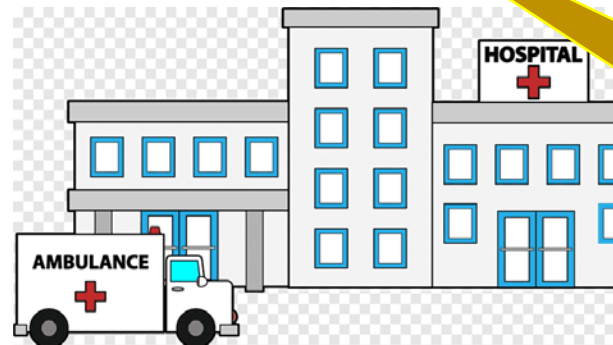
Estimated that 45% of mortality and 35% DALYs be reduced by appropriate pre-hospital care

SCENE  
TRANSPORT  
FACILITY

# Essential components of a comprehensive EMS



Pre Hospital  
EMS system



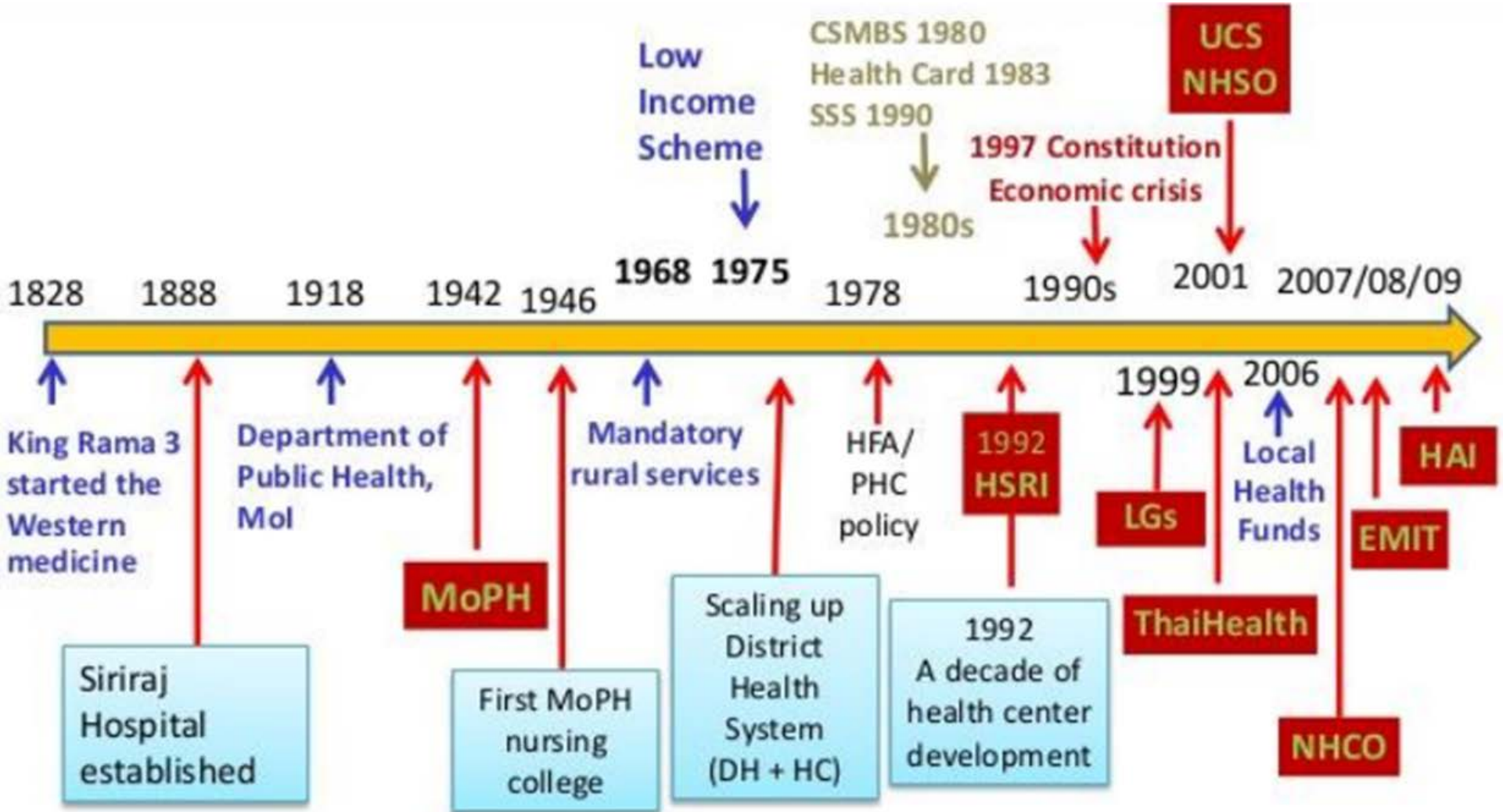
→ Prehospital care encompasses the care provided from the community (scene of injury, home, school, or accident area) until the patient arrives at a formal health care facility for the specific treatments.

→ Pre-hospital care is one of the important areas that need focus,  
→ lack of EMS could lead to thousands of deaths.

**FAST  
SAFE  
SEAMLESS**

**Access  
Coverage  
Quality  
Safety**

# EMS in Thailand



MoPH = Ministry of Public Health, HSRI = Health System Research Institute, LGs = local governments  
 ThaiHealth = Thai Health Promotion Foundation, NHSO = National Health Security Office,  
 NHCO = National Health Commission Office, EMIT = Emergency Medical Institute of Thailand,  
 HAI = Hospital Accreditation Institute

# Strength of Thailand health system

According to Thai health report 2020 by Mahidol, Thailand Health System is at a world-class standards, with total score 73.2/100

Thailand is regarded as one of the 13 countries with the best preparation for a pandemic

Ranked 6<sup>th</sup> in world and 1<sup>st</sup> in Asia in Health Security Index 2019



**Thailand's health system one of the best in the world**

# EMERGENCY MEDICAL SERVICE SYSTEM OF THAILAND

## THE NETWORK OF LIFE-SAVING

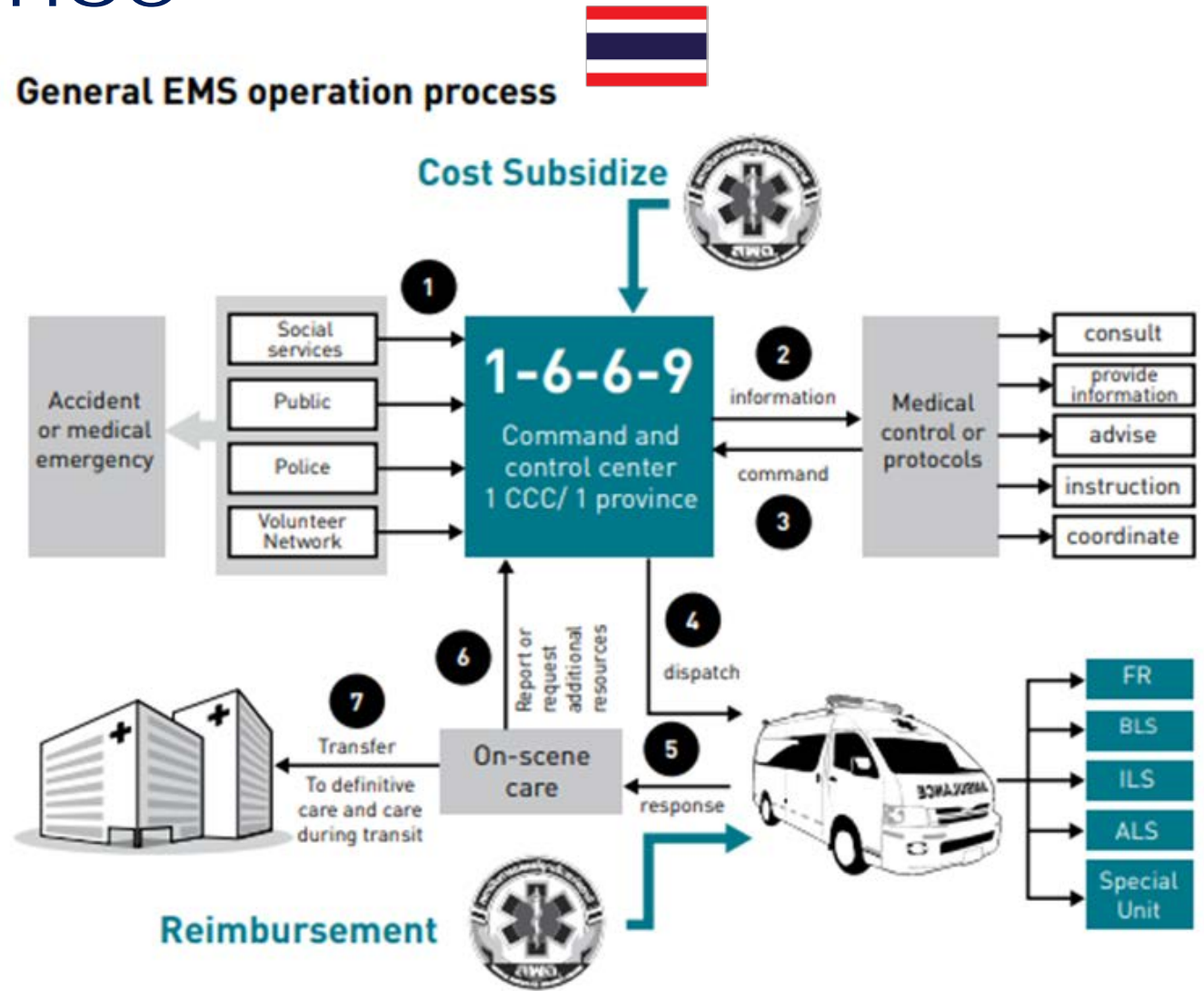


1669 Call and Dispatch Center  
80 Centers in 77 Provinces, 12 Health Region and BMA  
24 Hours service



# Gaps: EMS performance

- The number of advanced EMS agency is not enough, cannot cover all areas, leading to the inefficiency in response time -(within 8 minutes) which can result in more number of deaths.
- EMS accessibility rate is only at 25%.
- Lacks coordination with referral EDs.



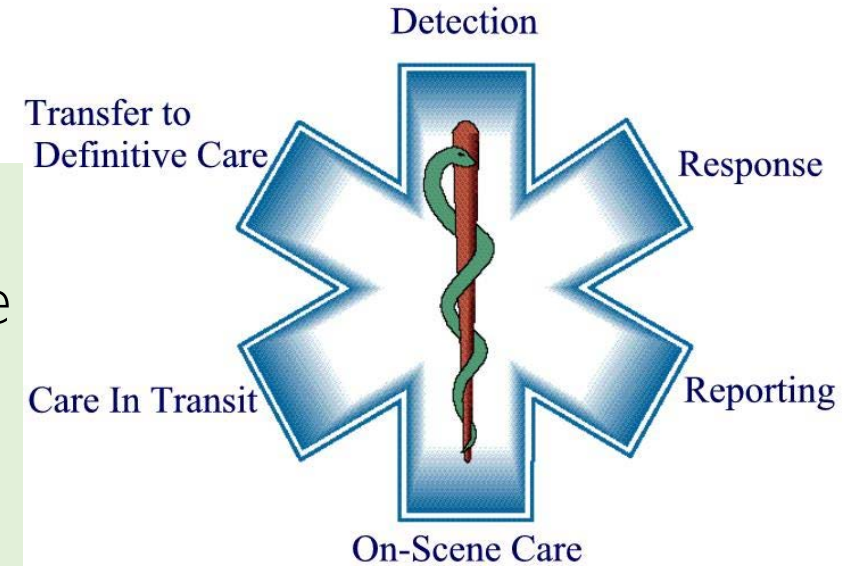
EM: emergency medical; FR: first response; BLS: basic life support; ILS: intermediate life support; ALS: advanced life support.

Source: Pangma, A (2012)



# Challenges in PEMS: Thailand

- Inequitable access across provinces.
- Fragmentation and less systematic approach in service delivery system.
- Lack of evidence in terms of triage to dispatch of pre-hospital ambulances.
- Communication between ambulance and hospital is still main issues reported by EMTs.
- Determining the response time for emergency patients.
- Lack of collaboration with other organizations.
- Lack of medical personnel at the ED.
- Limited perspective of health providers and receivers on the EMS of Thailand.
- Sustainability in the face of a high demand for services (3,4,6,8,10).



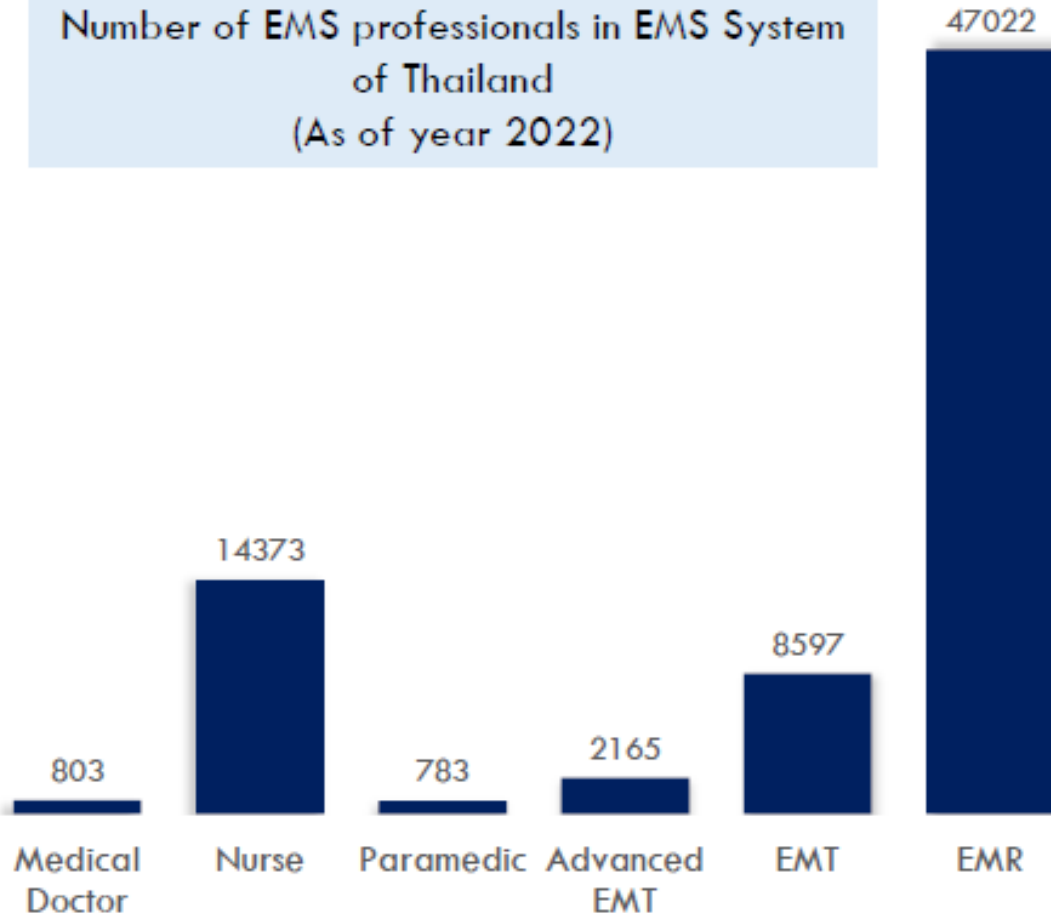
# EMS workforce

- Medical doctors/ physicians
- Emergency medical responder (EMR)
- Emergency medical technician (EMT)
- Advanced emergency medical technician (AEMT)
- Paramedics
- Emergency Nurse Practitioners
- Police
- Fire and rescue squads
- Volunteers with basic first aid training



# EMS workforce in Thailand

Number of EMS professionals in EMS System of Thailand (As of year 2022)



1. There are more than 90,000 EMS workforce (2024)
2. Thailand is in shortage of Advanced EMS medical operation agency.
3. The existing number of Advanced EMS medical direction agency cannot cover all health regions.
4. Thailand is in **shortage of paramedics**. *(NIEM, 2022 National plan, Thailand)*



# EMS workforce resilience

Workplace resilience is the mechanism to cope and adapt to preserve the vital components in the system and facilitate to provide effective emergency care services to the target people



Resilience capacities frame and related themes (12)

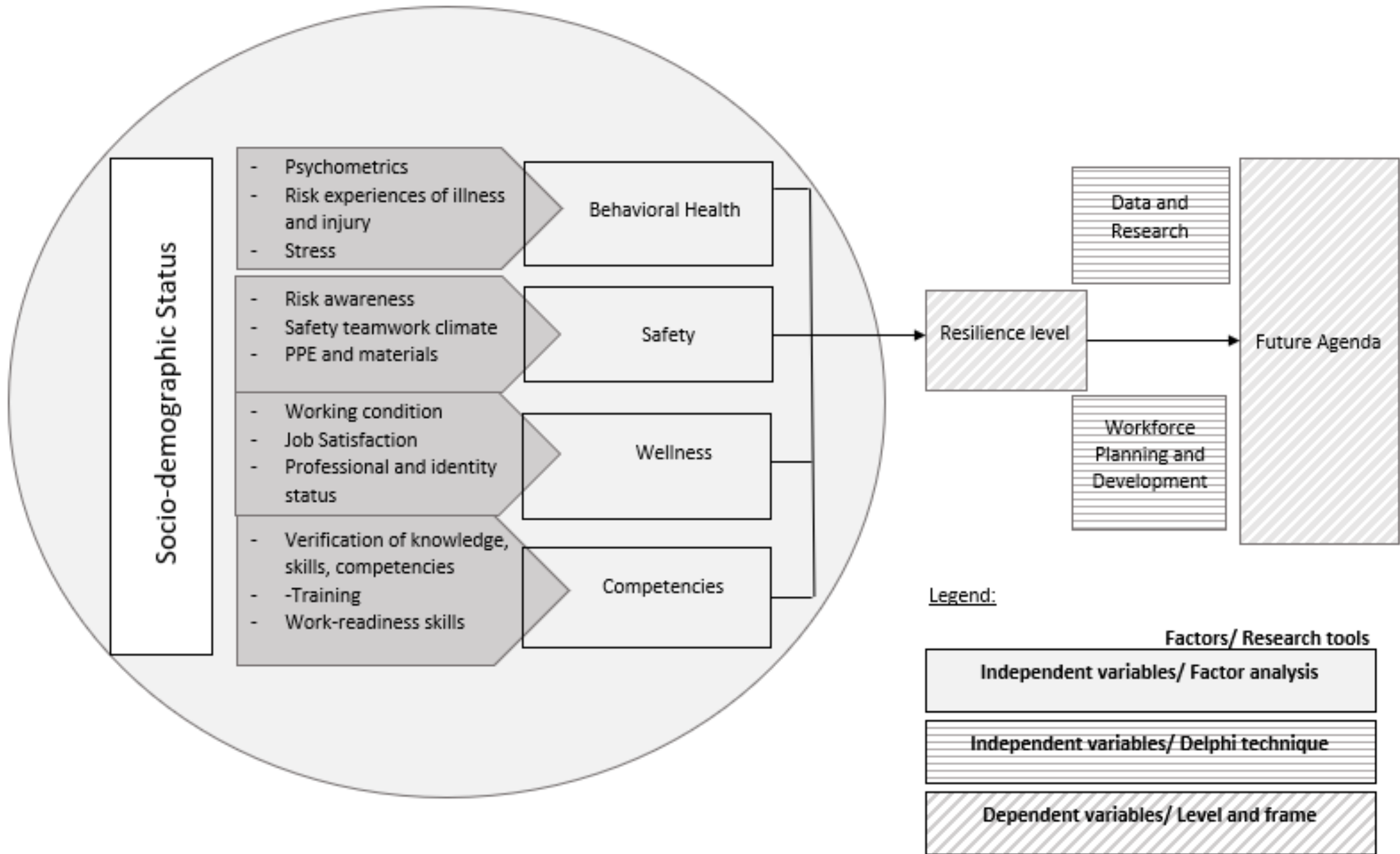


To explore the resilience capacity of emergency medical service providers focusing on pre-hospital setting responding to emerging and reemerging infectious diseases in Thailand.

To redefine the resilience components of pre-hospital EMS service providers of Thailand.

To explore the role of behavioral health, safety, wellness and competencies of EMS service providers in the pre-hospital EMS system.

To explore the policy and strategic views regarding workforce planning and development in the Thai EMS system.



# METHODS

- Mix method, both quantitative and qualitative study approach
- Explanatory Sequential Design
- Nation-wide voluntary, anonymous online survey started from January to May 2023.
- Key Informant Interviews (March to May 2024)

Study population:

- EMS frontline workers and dispatch team which includes paramedics and emergency medical technicians (EMTs) (frontline emergency service providers in Thailand)
- Decision makers of EMS system (qualitative study)
- Inclusion/ exclusion criteria
- Validity and reliability (IOC, pretest)
- Survey responses: 500, KII: 6



# MAP OF THAILAND

## North Region

Mercury is the closest planet to the Sun

## West Region

Venus is hot and its atmosphere is poisonous

## South Region

Saturn is a gas giant and has several rings

## Northeast Region

Mars is the fourth planet from the Sun

## Central Region

Neptune is the fourth-largest planet

## East Region

Jupiter is the biggest planet of them all



71 million population with 54.1 million adults

76 provinces, 878 districts, 7255 sub-districts and 74,954 villages

927 government hospitals, 9768 health centers, 363 private hospitals, 25615 clinics. (2022)



## Research Instruments

EMS workforce components: Safety climate, wellness and competences based on SAQ questionnaire (SEXTON, JB.et.al) 5 point Likert scale.

Behavioral health measurement-modified RS-25 item questionnaire (Wagnild & Young, 1993) to measure the degree of individual resilience. Items are scored on 7-point scale (1= disagree to 7= agree).

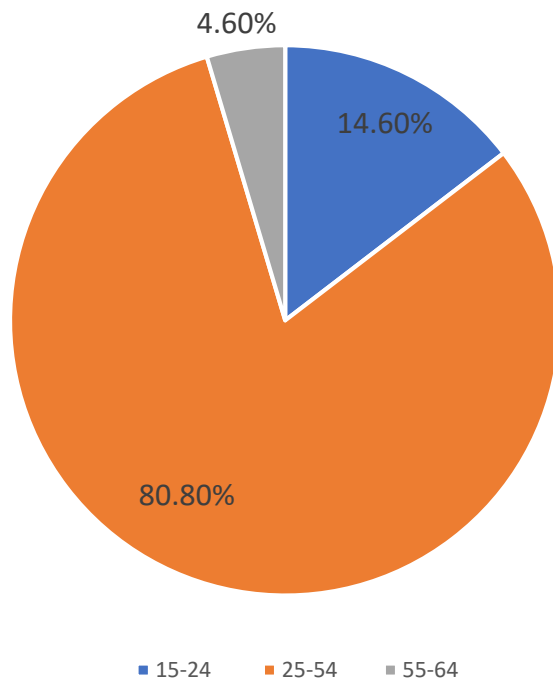
## Data Management and Analysis

Validation of indicators (Desktop review)  
Quantitative study design (Survey tool)  
Descriptive statistical analysis- SPSS Version 24  
Bivariate and multi-variate analysis

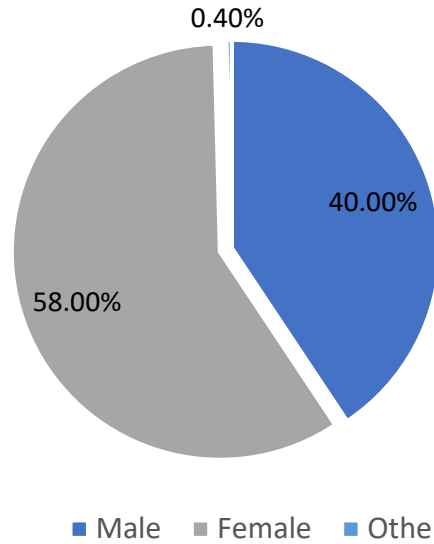
Thematic Analysis (Nvivo-14)  
Factor Analysis (SPSS AMOS)  
EFA/CFA

# FINDINGS

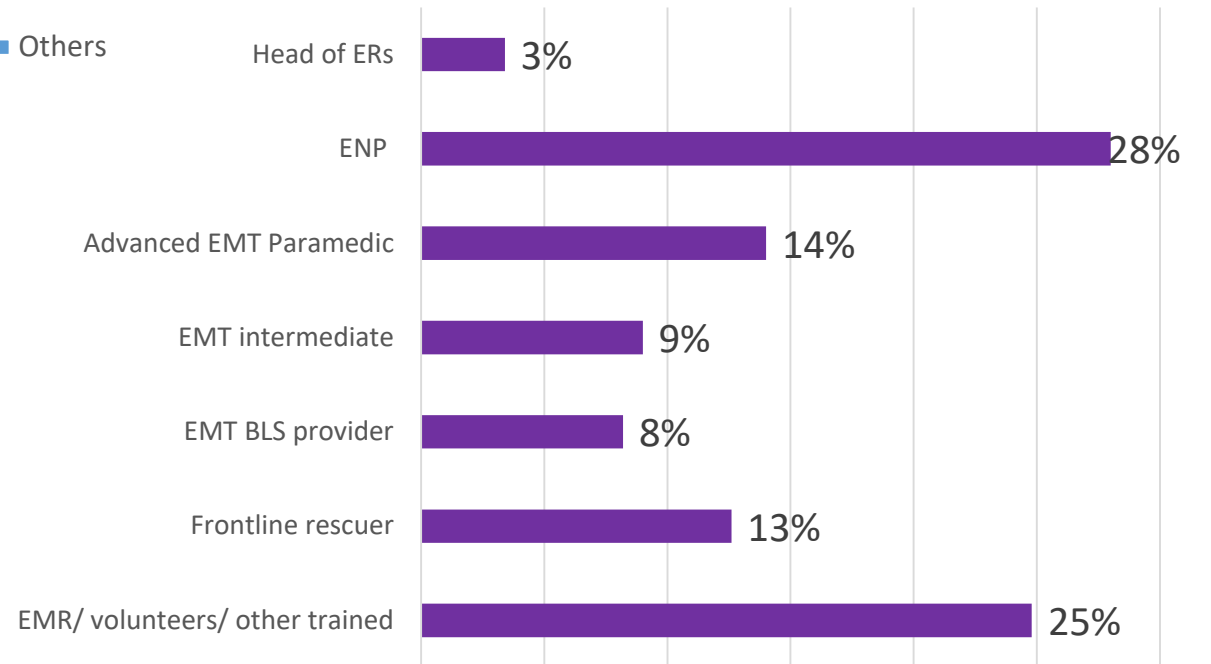
Age of EMS service providers



Gender of EMS service providers



Current position as EMS staff



# FINDINGS

Resilience components	TBH	TS	TC	TW
n=500	500	500	500	500
<b>Mean</b>	<b>139.8</b>	<b>19.4</b>	<b>19.2</b>	<b>23.5</b>
Median	143.0	20.0	19.0	24.0
<b>Std. Deviation</b>	19.81	2.9	3.26	3.86
Minimum	78	9	8	10
Maximum	175	25	25	30

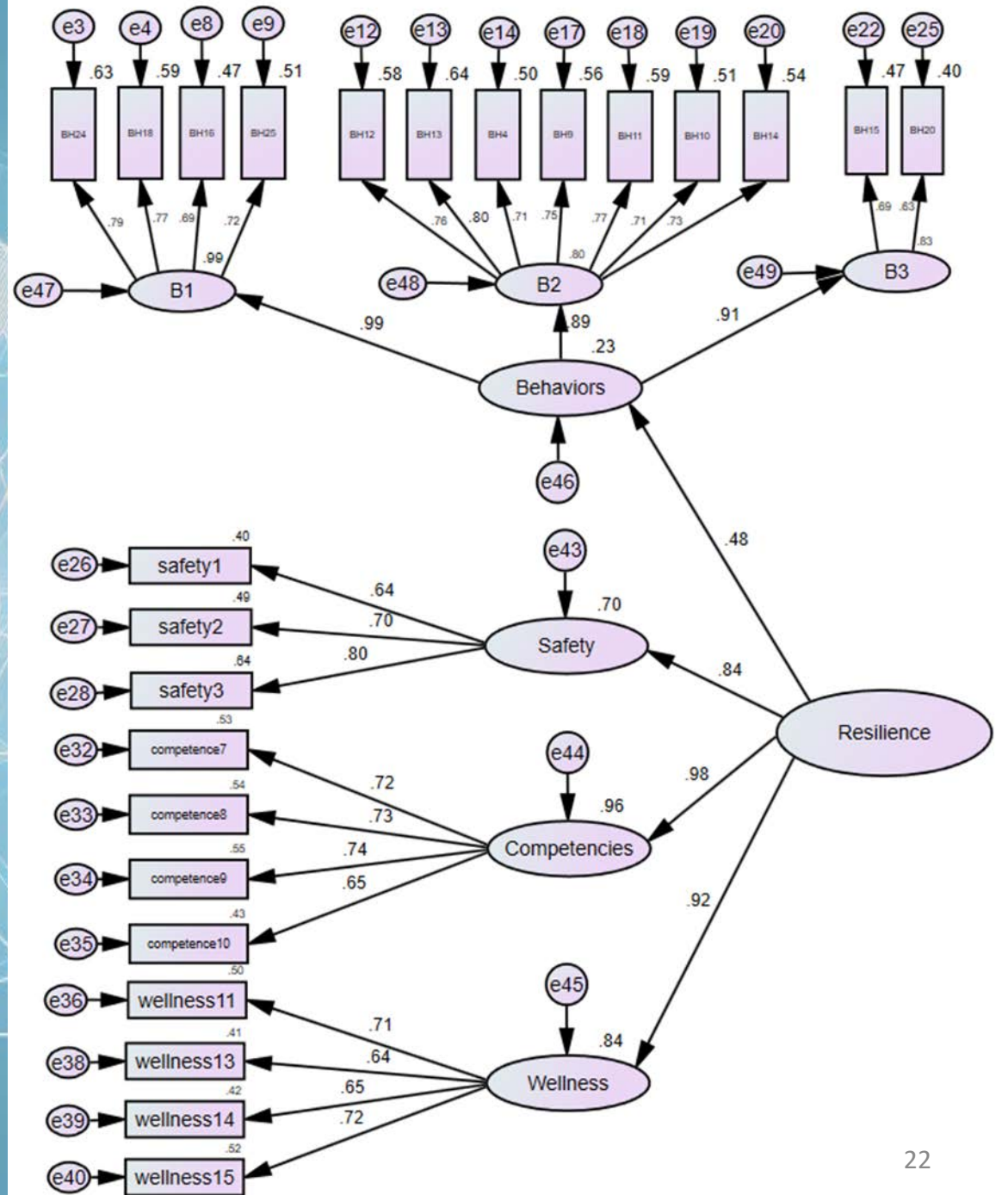
Resilience levels	n=500	Frequency	Percent
High resilience		127	25.4
<b>Moderate resilience</b>		<b>248</b>	<b>49.6</b>
Low resilience		125	25.0

S. N		Details of each dimension
1	<b>Behavioral Health</b>	Experiences of mental and emotional stress of EMS workers, including burnouts/ fatigue/ stress, leadership support emotional intelligence
2	<b>Safety climate</b>	Includes safety standards, PPE, information and communication on emergency events, including during disease outbreaks and pandemics, injury prevention.
3	<b>Competence</b>	Performance of service providers. trainings, relationship with coworkers and seniors, teamwork climate, interpersonal skills, crisis management.
4	<b>Wellness</b>	It includes overall personal health, physical, emotional and mental wellness. Job satisfaction Working condition Work-life balance Professional and identity status.

• **Exploratory Factor Analysis**  
**EFA**  
**Behavioral Health**  
**Psychometric properties**

Rotated Factor Matrix <sup>a</sup>				
Q. N		Factor		
		1	2	3
23	When I am in a difficult situation, I can usually find my way out of it	.702	.339	.237
22	I do not dwell on things that I can't do anything about	.694	.212	.099
19	I can usually look at a situation in a number of ways	.693	.182	.421
24	I have enough energy to do what I have to do	.661	.364	.244
18	In an emergency, I'm somebody people generally can rely on	.630	.320	.349
21	My life has meaning	.624	.325	-.012
17	My belief in myself gets me through hard times	.492	.364	.345
16	I can usually find something to laugh about	.492	.459	.151
25	It's okay if there are people who don't like me	.447	.392	.273
2	I usually manage tasks one way or another	.442	.246	.387
1	When I make plans, I follow through with them	.440	.322	.197
12	I have self-discipline	.281	.715	.198
13	I keep interested in things	.322	.703	.235
4	Keeping interested in things and work is important to me	.232	.671	.254
8	I usually take things in my stride	.370	.634	.286
6	I feel proud that I have accomplished things in life	.354	.589	.195
9	I am determined	.269	.577	.491
11	I take things one day at a time	.412	.576	.247
10	I seldom wonder what the point of it all is	.290	.527	.448
14	I can get through difficult times because I've experienced difficulty before	.501	.524	.196
3	I am able to depend on myself more than anyone else	.099	.131	.653
15	I feel that I can handle many things at a time	.490	.124	.556
5	I can be on my own if I have to.	.069	.343	.550
7	I am friends with myself	.262	.462	.522
20	Sometimes I make myself do things whether I want to or not	.349	.254	.428

# Confirmatory Factor Analysis



# FINDINGS

S. N	Themes	Sub themes for strengths	Sub themes for improvements
1	<b>Communication</b>	1. communication technology 2. notification and dispatch	1. communication system 2. notification and dispatch
2	<b>Coordination (Teamwork)</b>	1.collaboration and coordination 2.patient involvement and satisfaction 3.referral mechanism 4.team work	1.collaboration and coordination 2.patient involvement and satisfaction 3.referral mechanism
3	<b>Leadership</b>	1.accessibility of EMS services, coverage and responsiveness 2.safe system 3.rapid response	1.accessibility of EMS services 2.service delivery
4	<b>Learning (competencies)</b>	1.competent workers 2.trainings	1.competent workers 2.trainings
5	<b>Structure</b>	1.equipment and resources 2.funding 3.risk compensation 4.number of workforces	1.equipment and resources 2.funding 3.risk compensation 4.number of workforces

Themes generated for strength of EMS system and improvement areas in EMS of Thailand from workforce perception

# Conclusion and Recommendations

EMS in Thailand faces challenges such as lack of a comprehensive system, poor communication and coordination between service providers and hospitals, and inadequate training and certification for the frontline workers.

Strengthening the long established EMS requires a multifaceted approach that includes better workforce planning, enhanced emergency preparedness, support for EMS workers' well-being safety, improved coordination and networking.

1. Promoting policies for continuous training and refreshers
2. Enhancing government policies to support EMS providers, including better compensation and career development opportunities.
3. Ensuring seamless communication and patient transfer processes is crucial for effective EMS operations.
4. High workload and burnout are significant issues, highlighting the need for regular mental health screenings.

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THANK YOU 😊



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