

# EMS in Seoul, Korea

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# EMS development in Korea

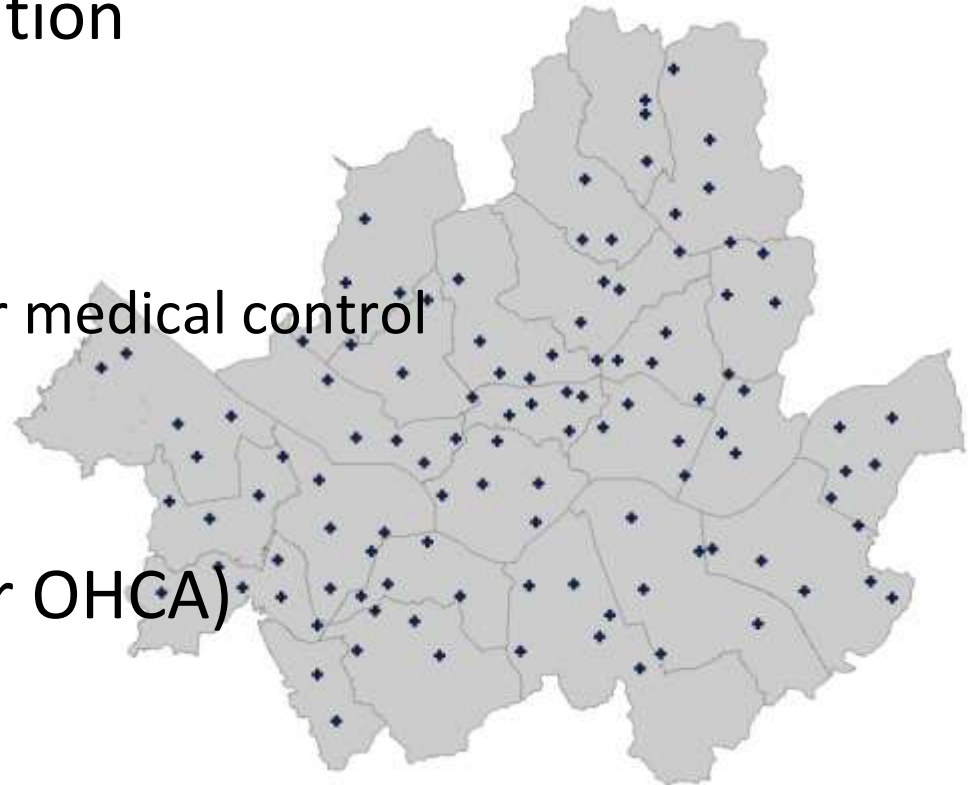
- Government leadership(Dept. Health welfare)
  - Core domain of public health
  - Cooperation with private-public
  - Based on EMS act and EMS fund
- Fire agency and local government
  - Prehospital EMS provider
  - Participation of local government and policy
- Medical director
  - 460 medical director course certified
  - 200 real practice in EMS

# Seoul, General information

- Population : 10,456,034 (2008)
- Area : 605.27km<sup>2</sup> (2008)
- Urban
- Pop. density : 17,283 person/km<sup>2</sup>
- Only one EMS agency(Fire department)

# Seoul, General information

- Free and tax-based
- Fixed ambulance operation
- BLS single-tiered
  - Advanced airway under medical control
  - Drugs not allowed
- Limited Multi-tiered for OHCA)



Community

# ***Home Education and Resuscitation Outcomes Study (HEROS)***

*New education program: DA-BLS*

1. Traditional BLS training module: chest compression, AED operation, and ventilation
2. DA-CPR module: 1) call ambulance service, receiving CPR instruction, 2) follow up the instruction

Training session

1. Dispatcher training of DA-BLS program: HEROS Version 1 video clips
2. Developed by Laerdal Foundation and translated in Korean

**Attendees can experience the roles of bystander and dispatcher and understand the whole process of DA-CPR.**

# CPR Education for layperson in Seoul

- 713,815 in 2015
- 7,065 per 10 thousand person



# Mass CPR Training (n=6,000)



Nov. 2012 Seoul

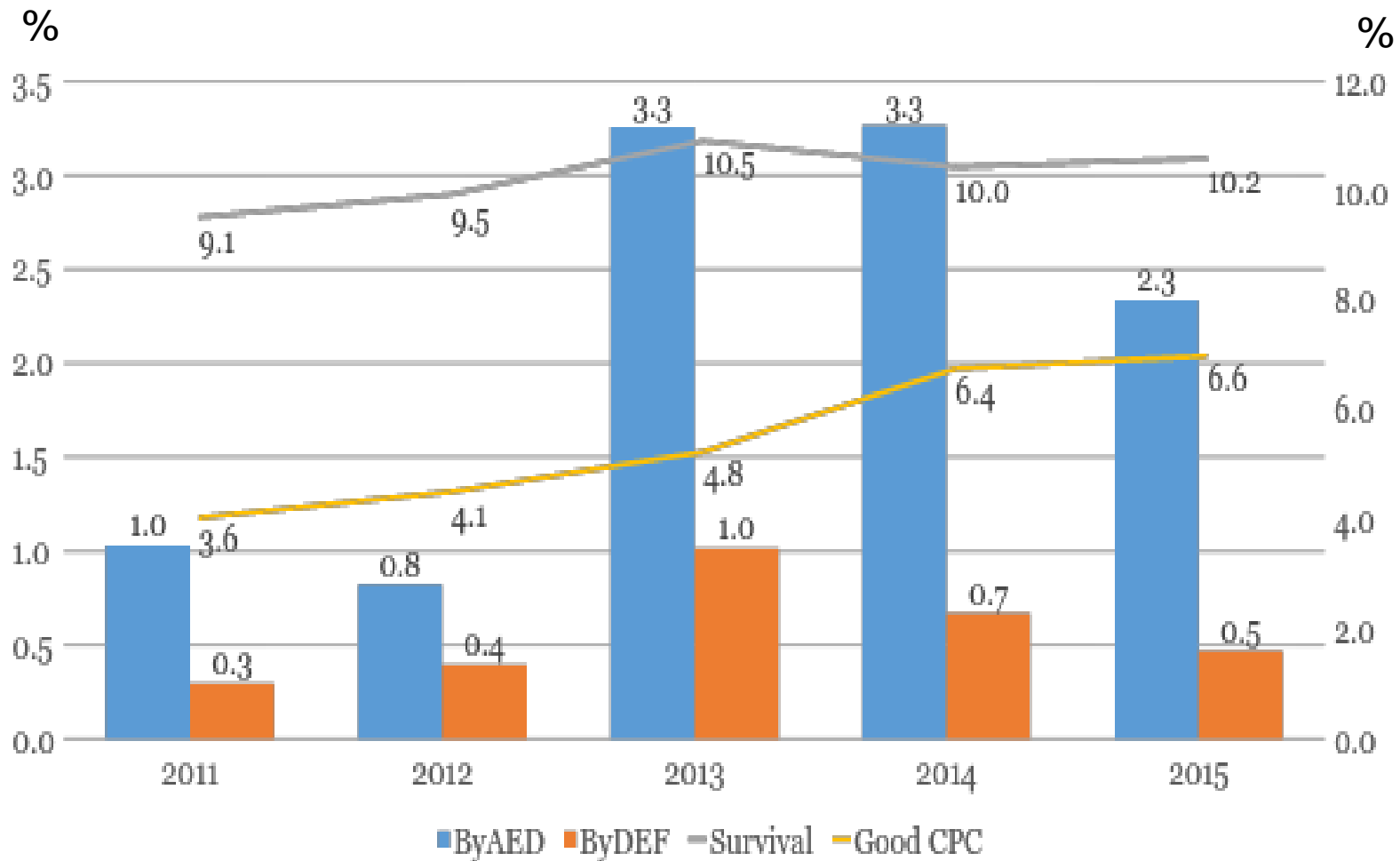


# PAD registration by year

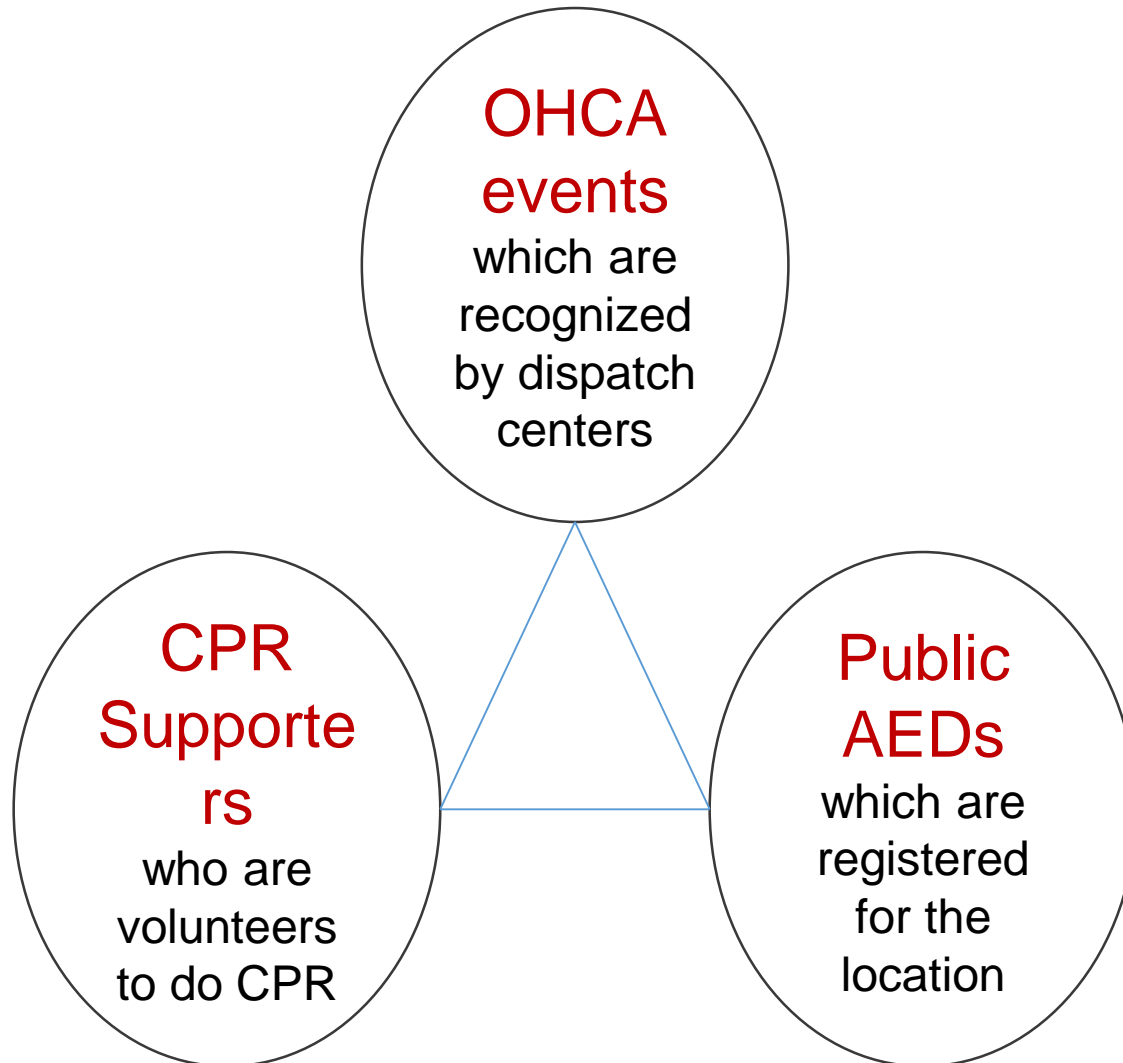


# Bystander AED application and defibrillation

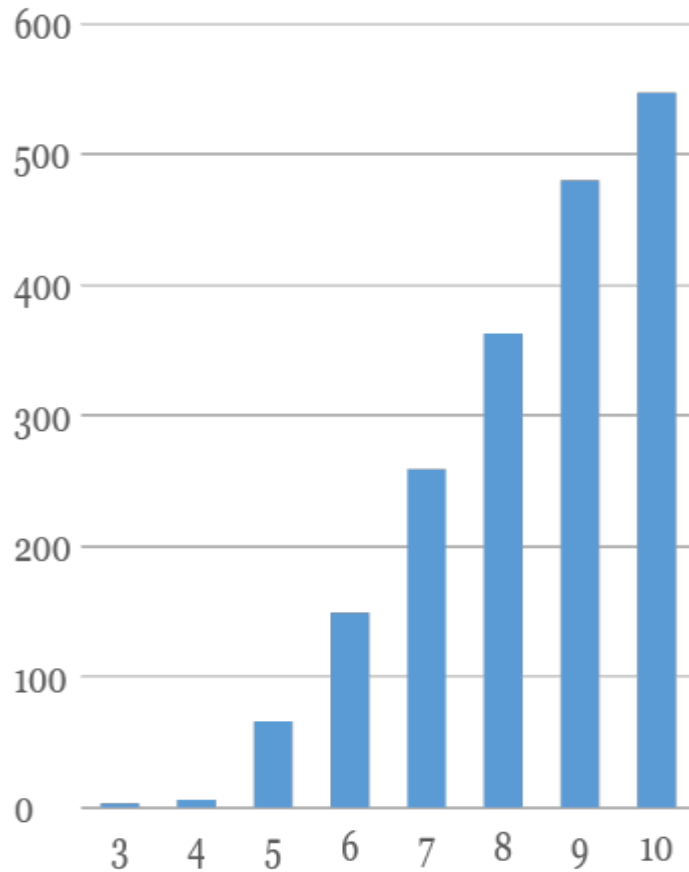
Cardiac OHCA (2011-2015) in Seoul



# Bystander Defibrillation Issues



# Activation of NAD CPR using Short Text Message Services

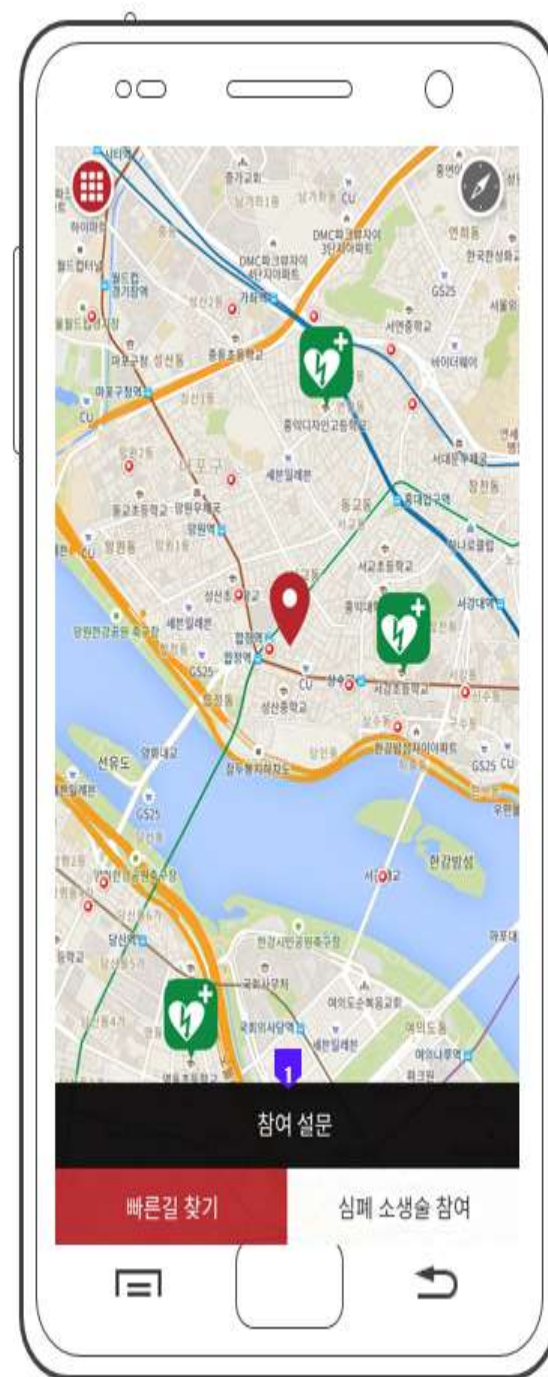


Cumulative call by month

Month number	Call number	Number of SMS to be sent						
		Average	STD	Min.	Q1	Med.	Q3	Max.
3	3	4	4	1	1	3	9	9
4	3	5	2	3	3	5	7	7
5	60	59	76	1	14	26	89	385
6	83	55	73	1	14	26	66	356
7	110	56	79	1	14	27	71	392
8	104	102	130	4	45	59	140	913
9	117	115	100	14	48	85	173	911
10	67	98	113	18	48	69	127	911

# Real-time activation App: “Seoul-Heart”

1. Call 119
2. Detect and recognize the OHCA event
3. Activate the CPR supporters by dispatcher
  - OHCA location
  - Nearest 3 PADs
  - Map for the shortest route from CPR supporter to AED and OHCA location
4. Run to the AED location and bring it and run to the OHCA location



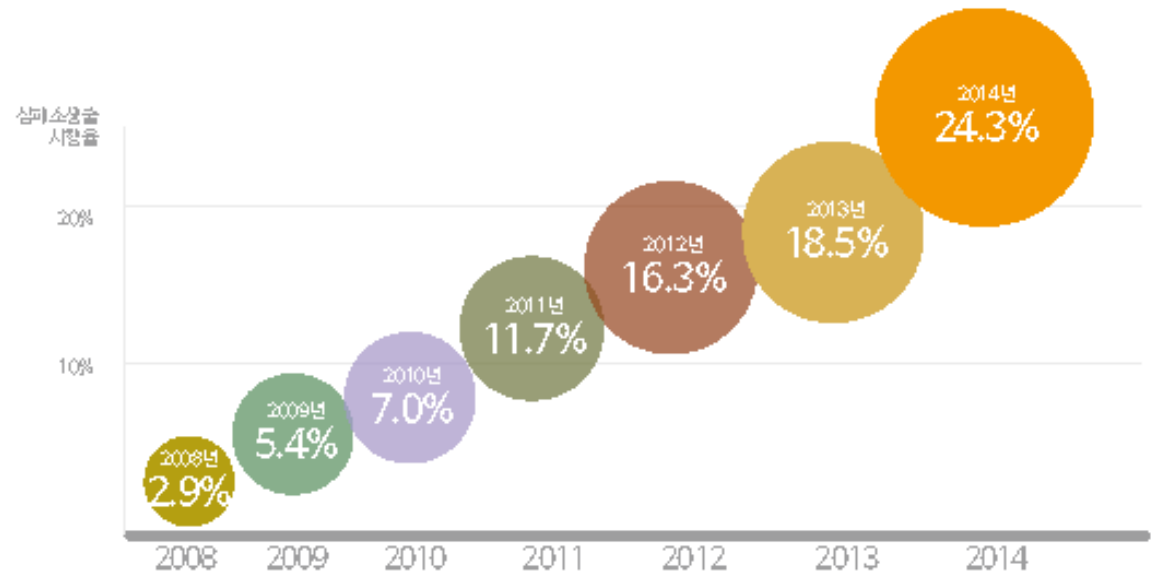
# Temporal Trend of Bystander CPR

- 21.7% (2015) from medical records review



병원전시정지환자에 대한

일반인 심폐소생술 시행율 (%)



**PREHOSPITAL**

# Seoul 119 EMS resource condition(2014)

## License

- Medical specialist 3 people
- Nurse 55 people
- Paramedic 546 people
- EMT-B 1,504 people



## Equipment

- Fire Helicopter 3
- Ambulance 140
- AED 199
- EMS equipment  
68sort 19,233EA



119EMS  
statistic

- **EMS dispatch : 433,852**(over last year 1.0% ↑) **daily average 1,188**
- **Transfer : 292,270**(over last year 0.3% ↑) **daily average 800**
- **Transfer people : 295,884**(over last year 0.01% ↑) **daily average 810**



**2% Improvement in Survival Outcomes after  
Out-of-Hospital Cardiac Arrest in Seoul  
“2% Project”**

CQI program for OHCA from 2015

# Background of 2% Project

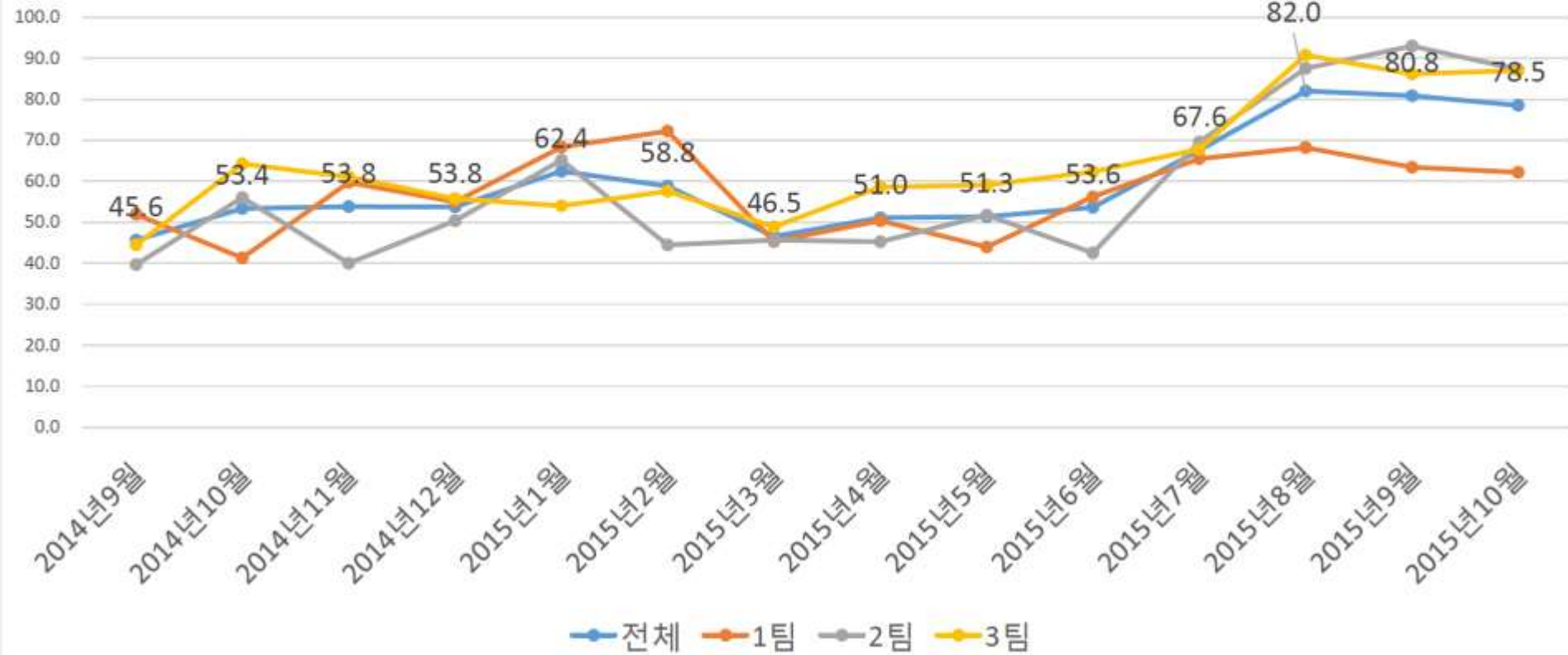
- Improvement in OHCA outcomes
  - 3.9% (2006) → 9.1% (2013)
- Two times experiences of 2% improvement
  - 4.9% (2008) → 6.4% (2009)
    - National Report of OHCA Outcomes (2008): CAVAS project
  - 6.3% (2010) → 8.3% (2011)
    - Initiate QA program of EMS CPR: CAREER Project
- Since 2011
  - 8.3% (2011) → 8.8% (2012) → 9.1% (2013)
  - 0.8% improvement during the last two years

# Main strategy and methods

- Increase of bystander CPR rate
  - Dispatcher-assisted CPR
- Improvement of EMS CPR quality
  - Team CPR (multi-tiered response to OHCA)
  - Feedback CPR

# OHCA recognition rate-Dispatcher

수보단계 심정지 인지 비율



# Multi-tiered response for OHCA

- Previous One Ambulance 3 crew
- Multi-tiered response
  - Pump car + limited ALS
  - BLS+ limited ALS
  - Plus motorbike response
  - 5 to 8 crews

# Real time feed back device

- 60% of all ambulance
- Performance measure and feedback
  - Compression depth, rate, recoil
  - Visual, audio feedback
  - Data storage and QI



too shallow



inappropriate  
decompression



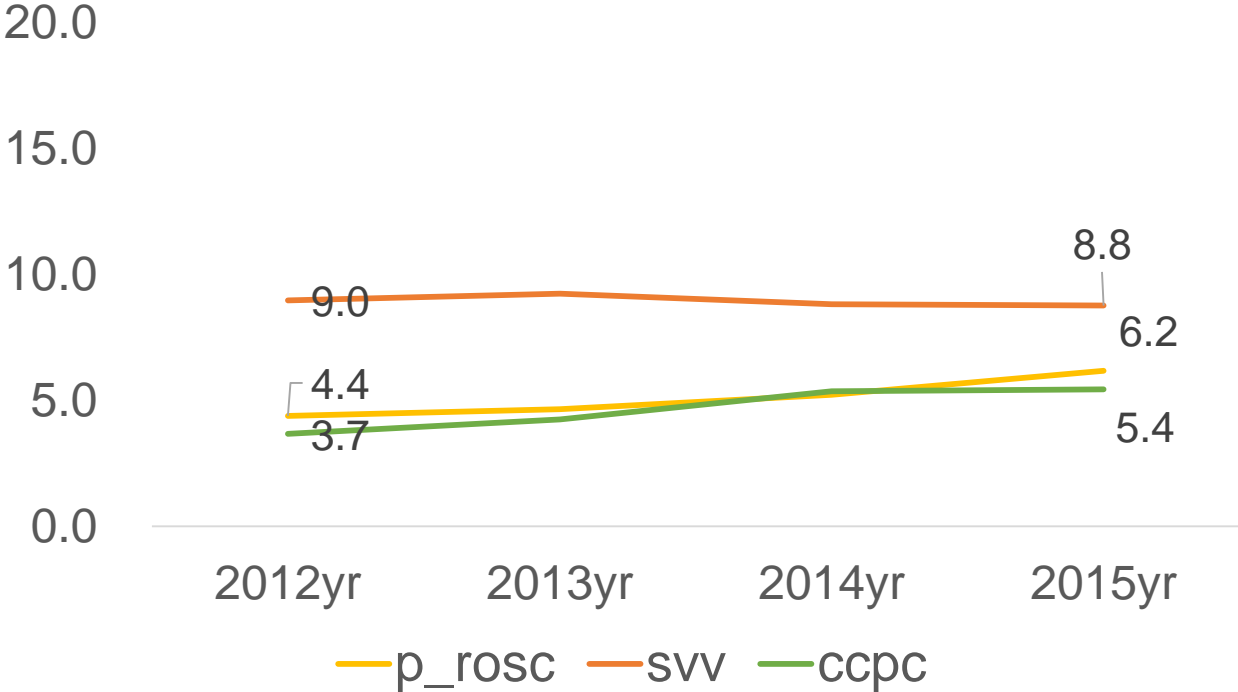
too fast



# Outcomes of OHCA in Seoul 2015

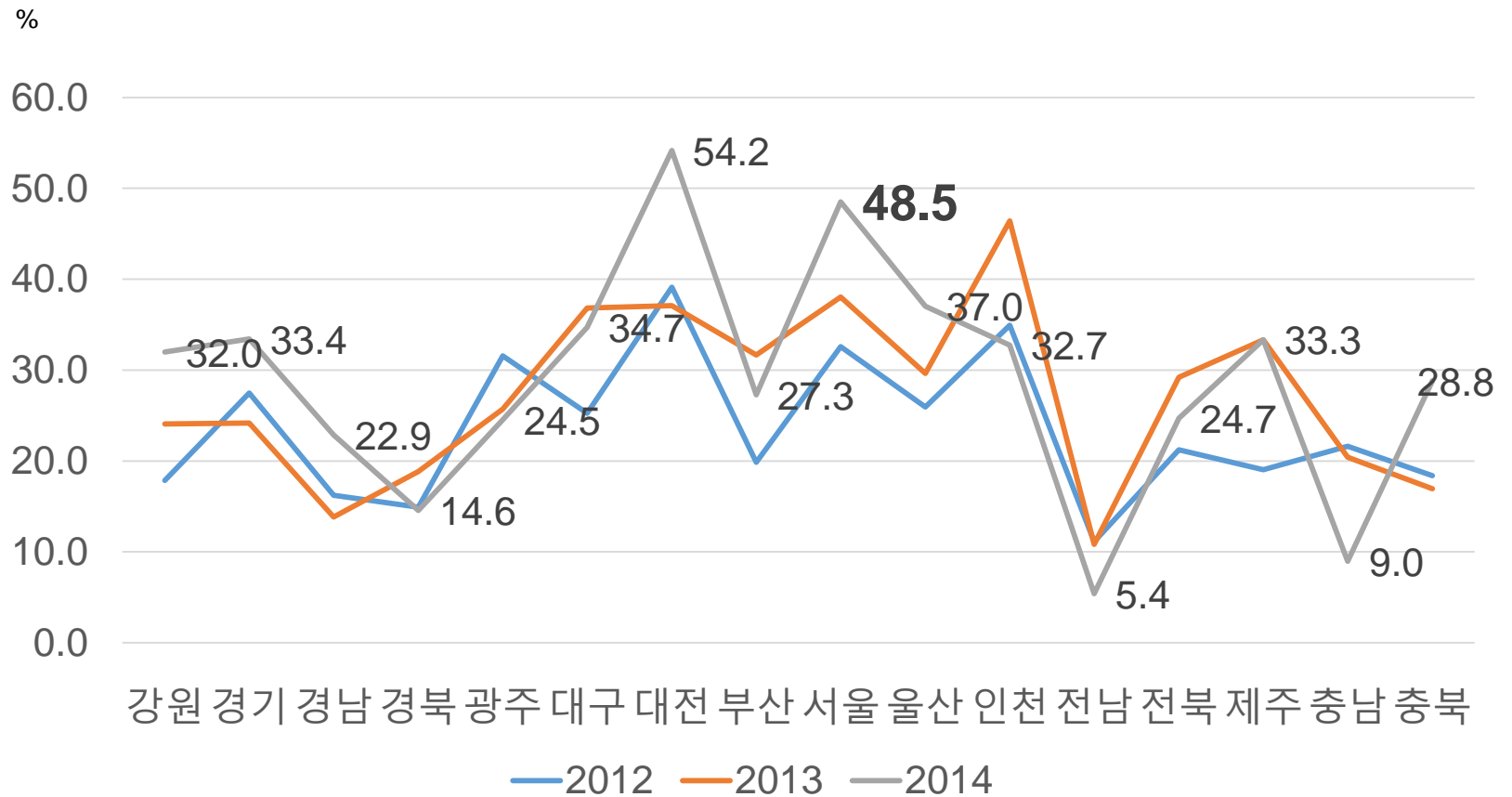
# Secular trend of outcomes of ALL OHCA

Outcome trends of OHCA in seoul



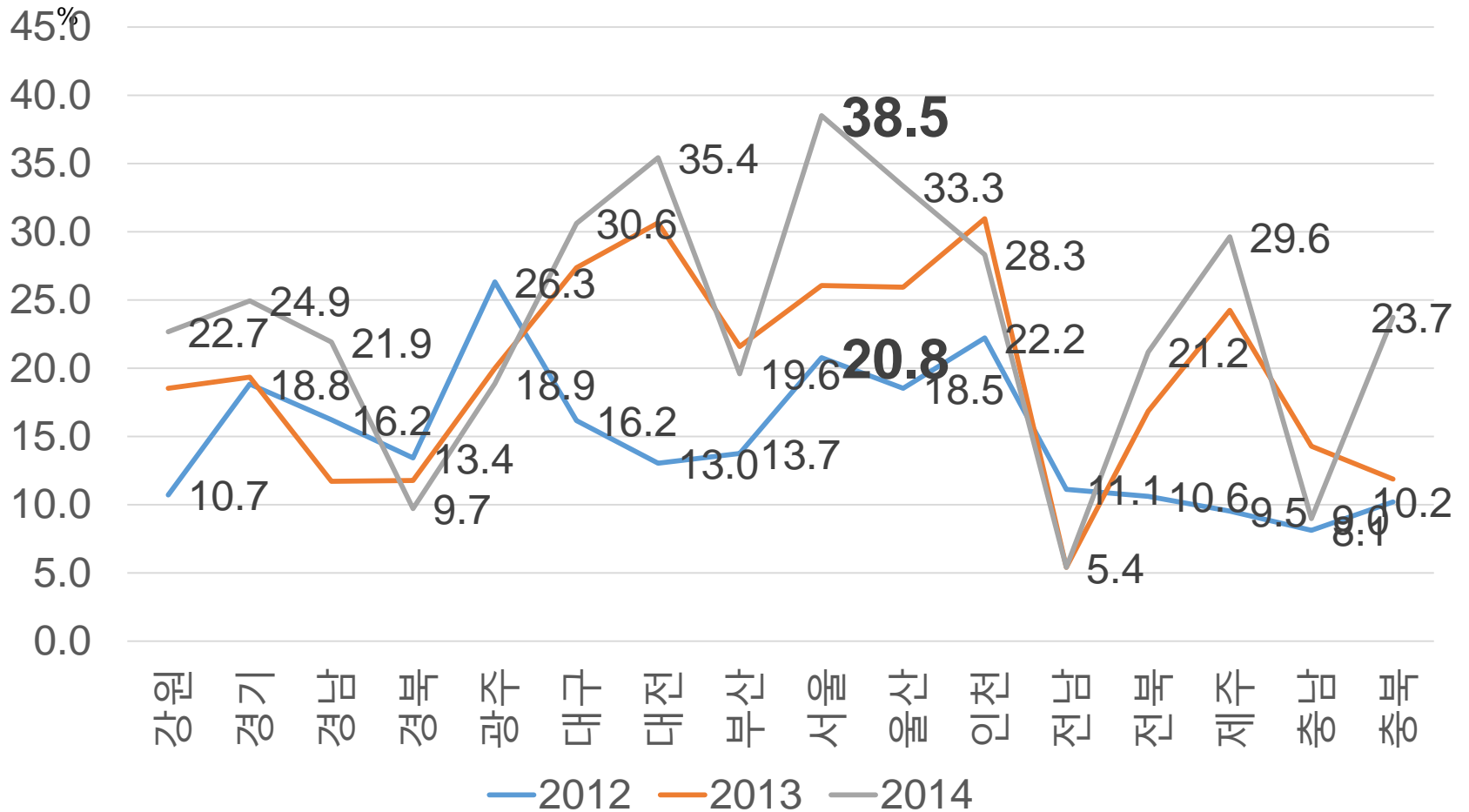


# EMS assessed OHCA Utstein Survival



# EMS assessed OHCA

## Utstein Good CPC



Thank you very much

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