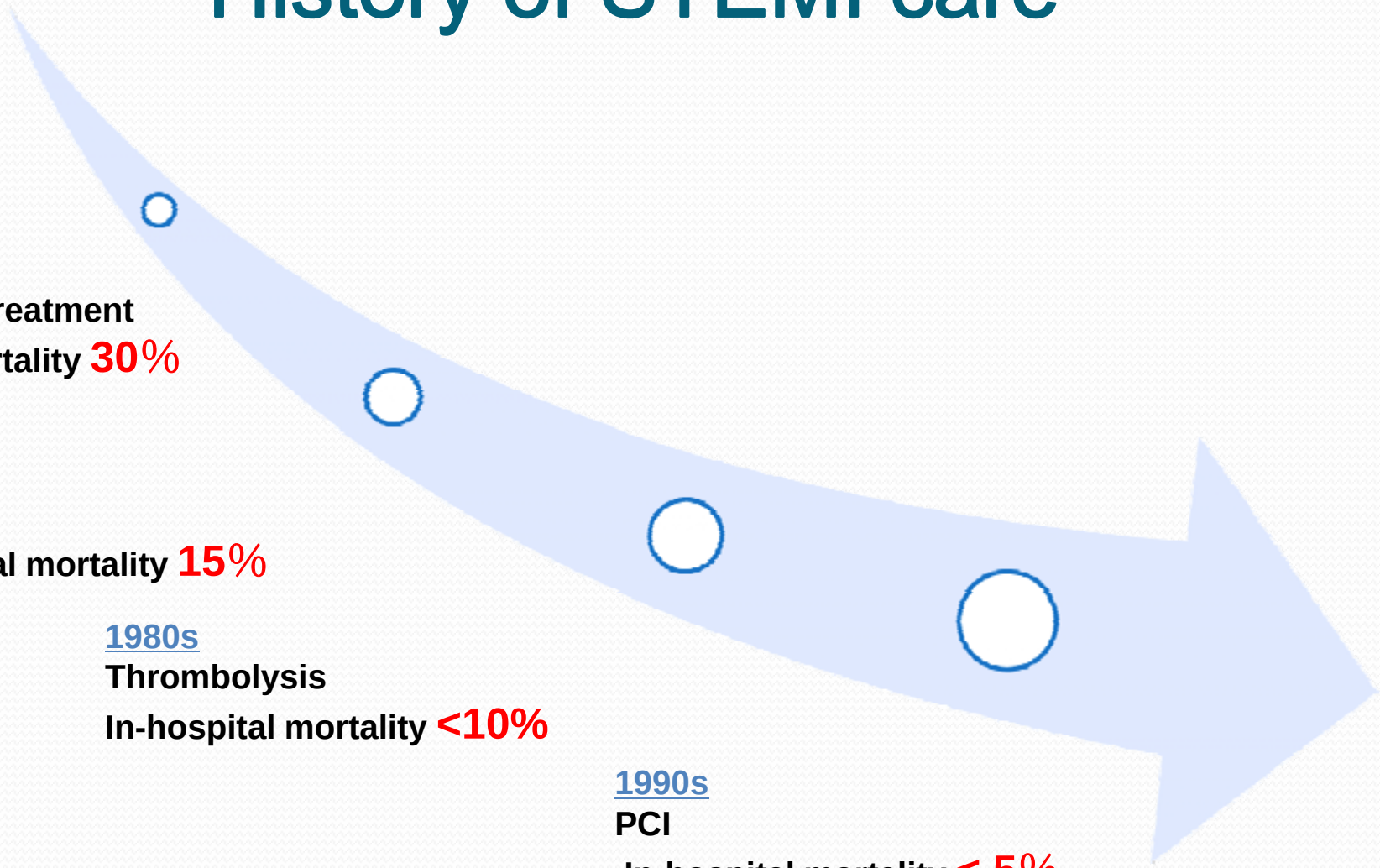
Improving STEMI care in China

China STEMI-PCI Program

Yong Huo, MD
Peking University First Hospital
2013-04-20

History of STEMI care



Before 1960s

Conservative treatment

In-hospital mortality 30%

1960s

CCU care

In-hospital mortality 15%

1980s

Thrombolysis

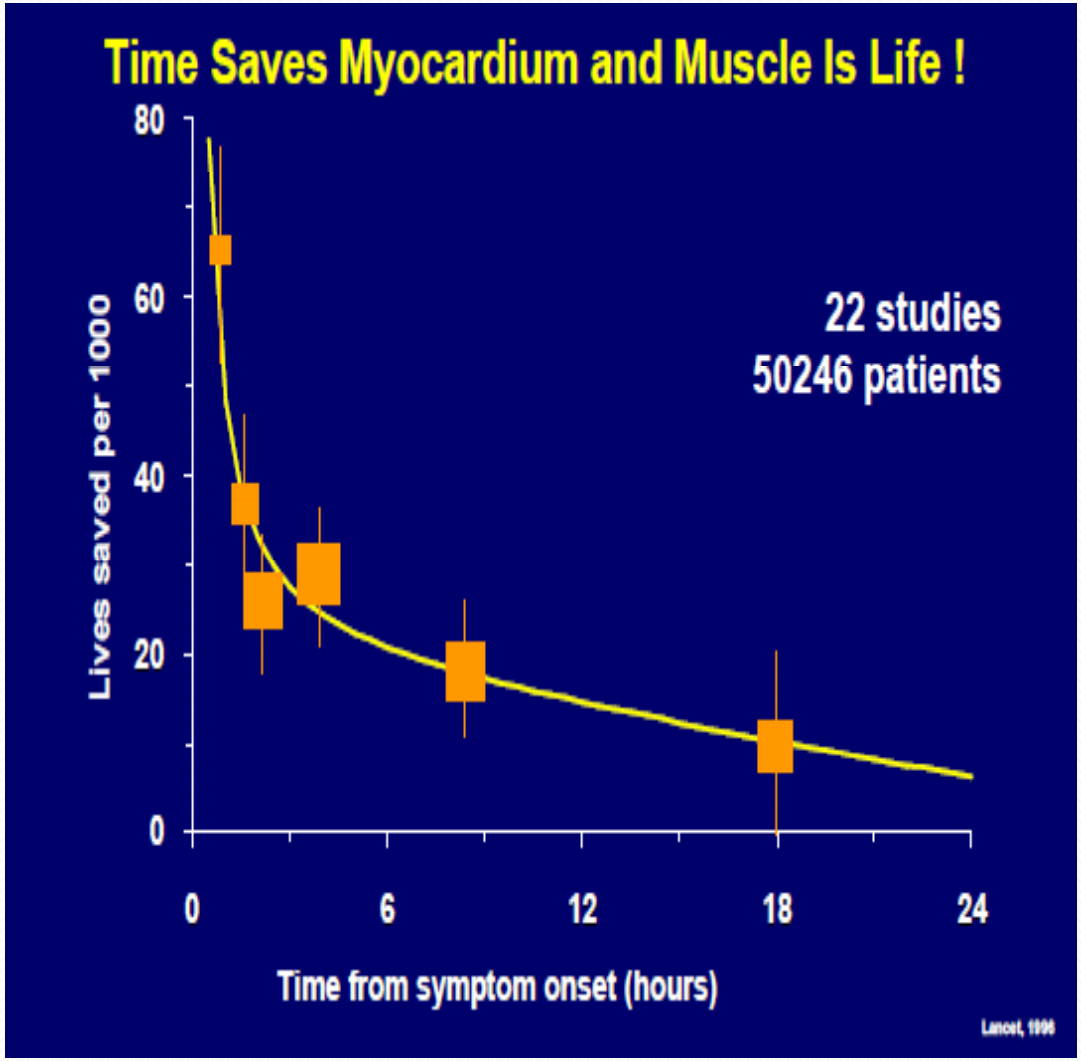
In-hospital mortality <10%

1990s

PCI

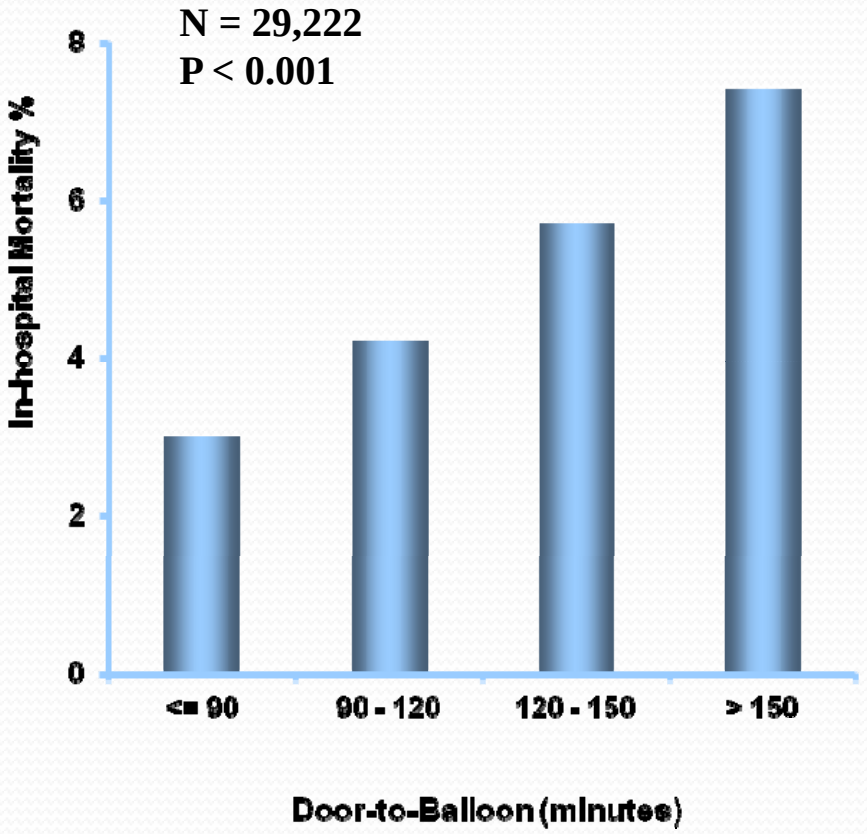
In-hospital mortality < 5%

Time Saves Myocardium and Muscle is Life



Boersma, et al. *Lancet* .1996; 348:771.

Door-to-Balloon Time: NRMI-3,4

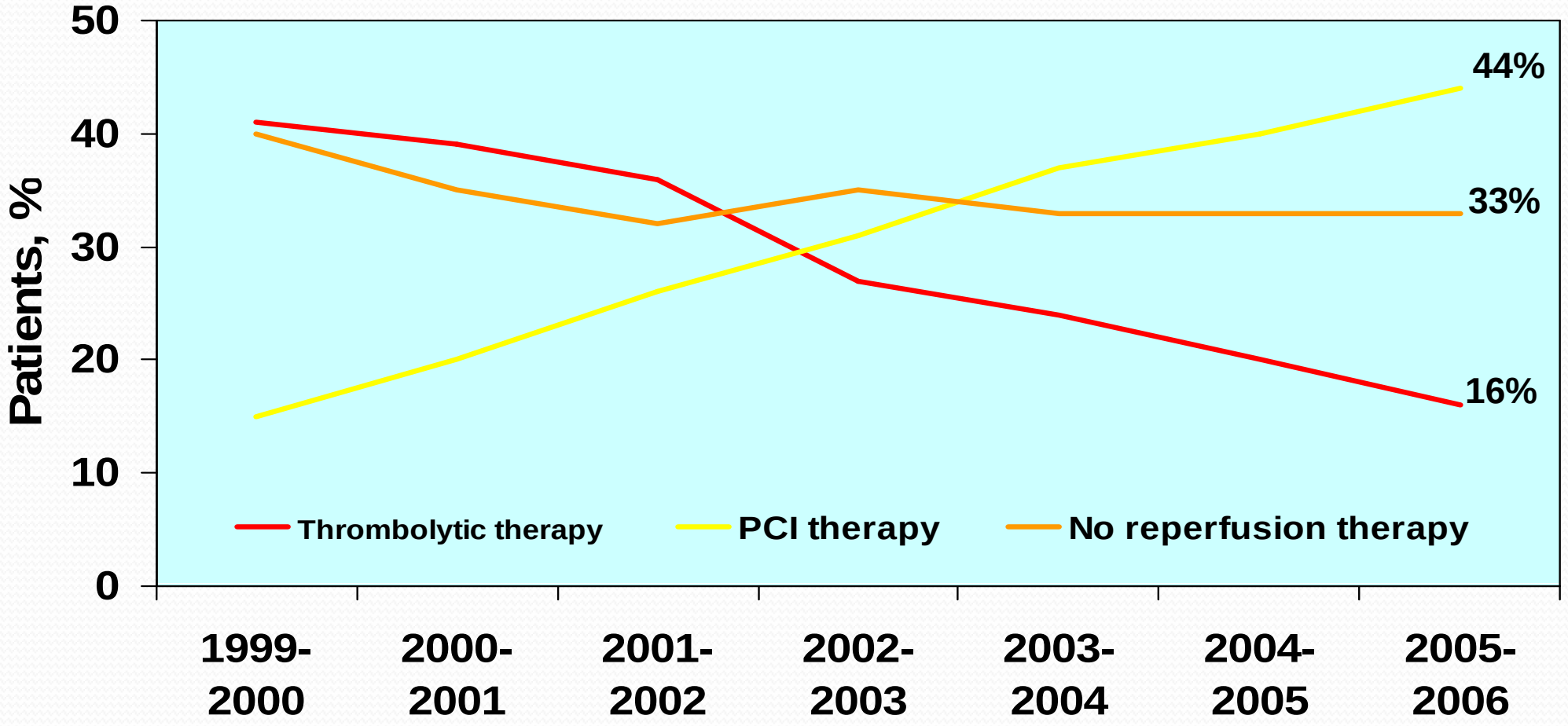


McNamara, et al. *JACC*. 2006; 47:2180.

What is happened in the real world?

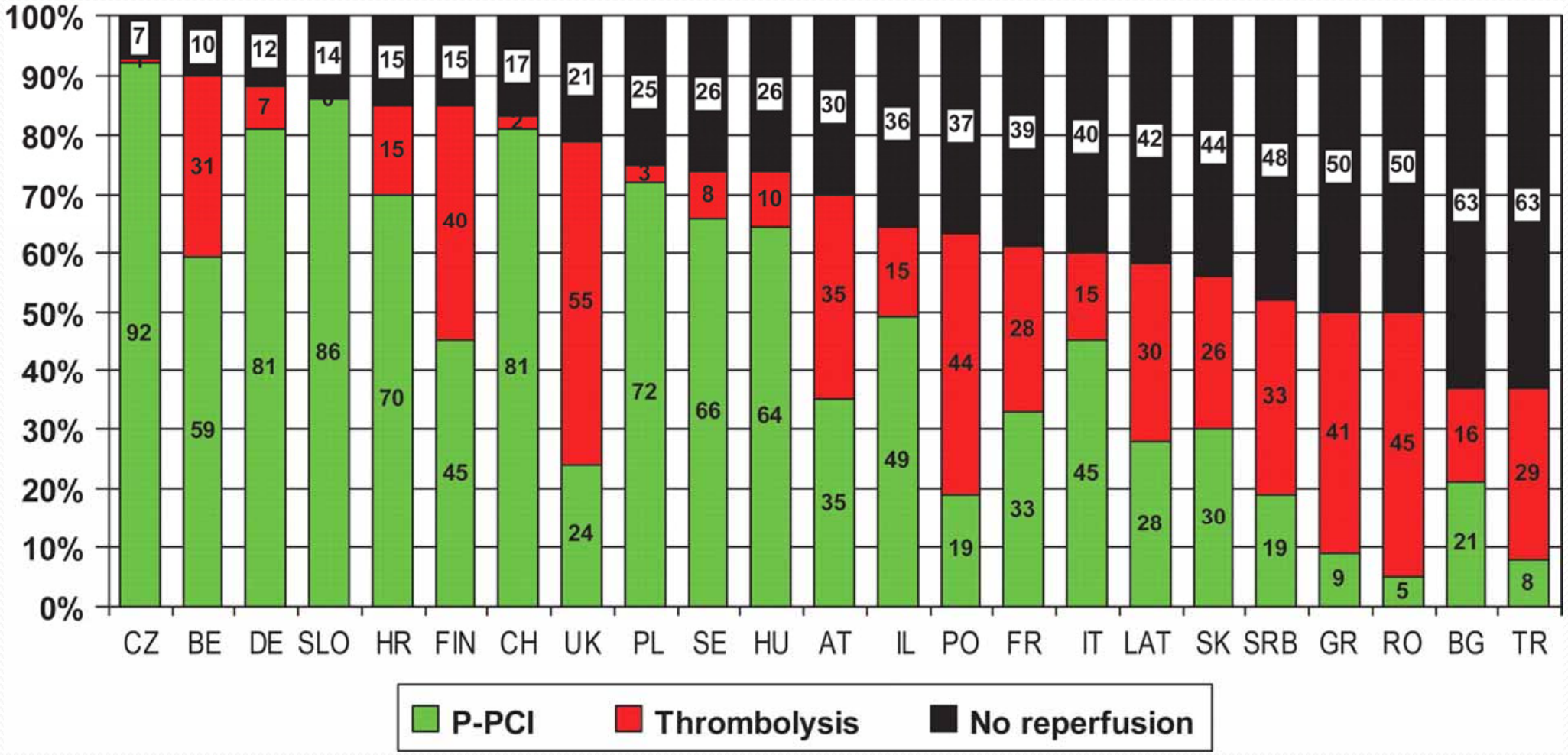
- Reperfusion
- D2B

GRACE：Trends of reperfusion therapy



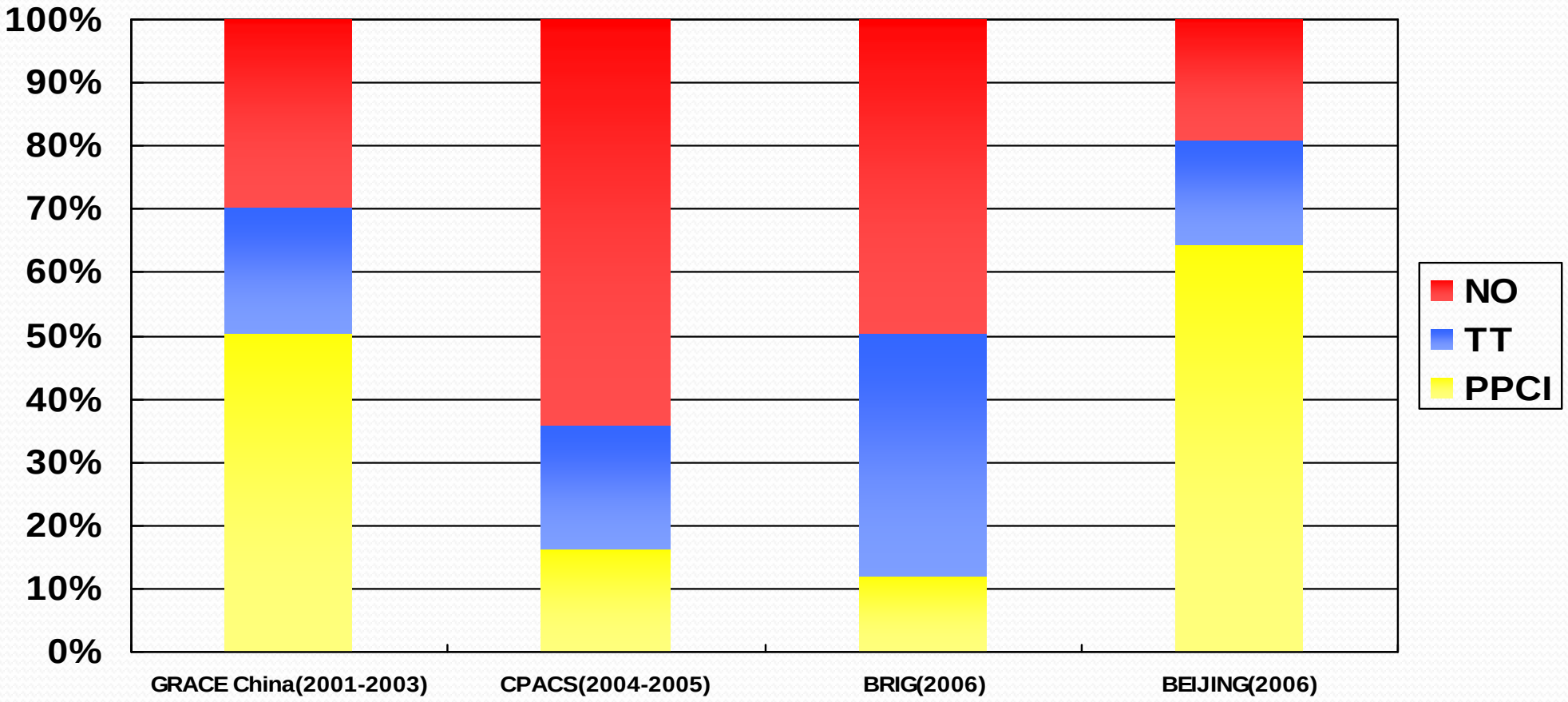
Eagle, et al. *Eur Heart J*. 2008; 29:609.

Reperfusion in Europe STEMI Inpatients (2007-2008)



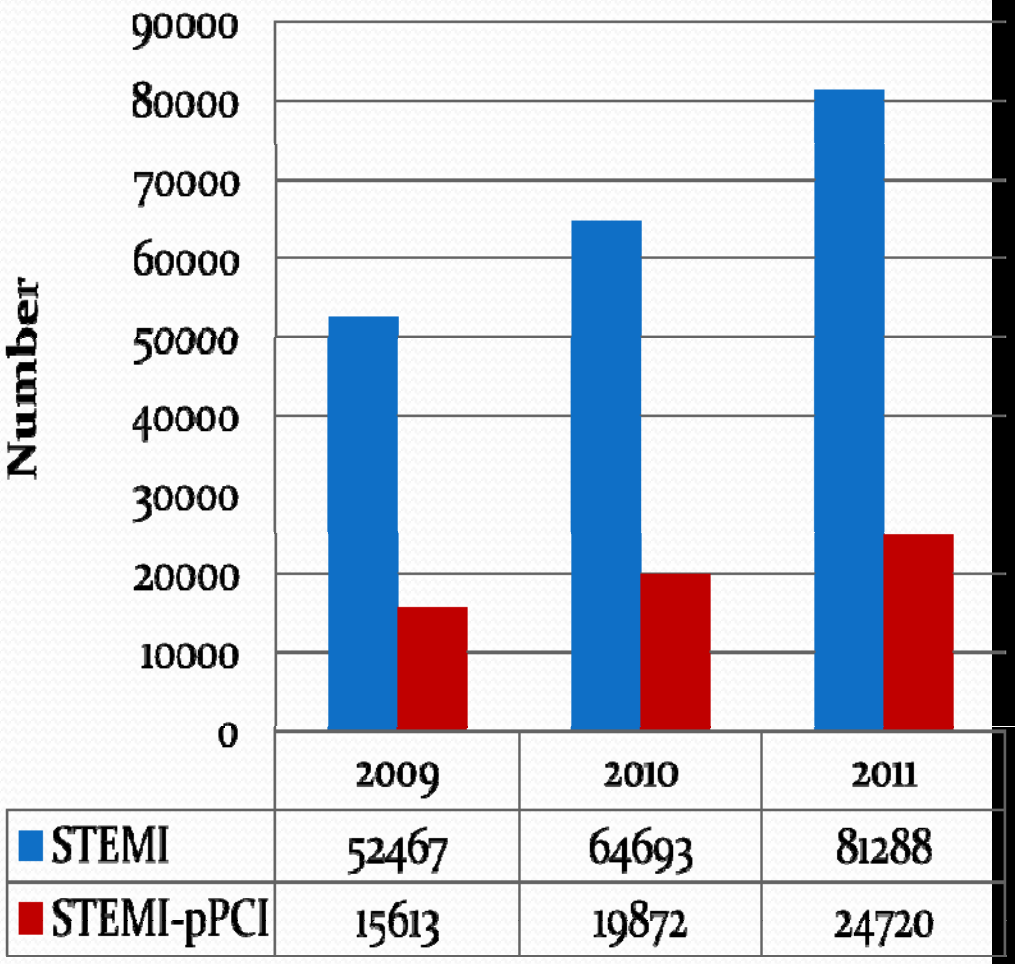
Widimsky P, et al. *Eur Heart J*. 2010; 31:943.

Reperfusion therapy of STEMI in China

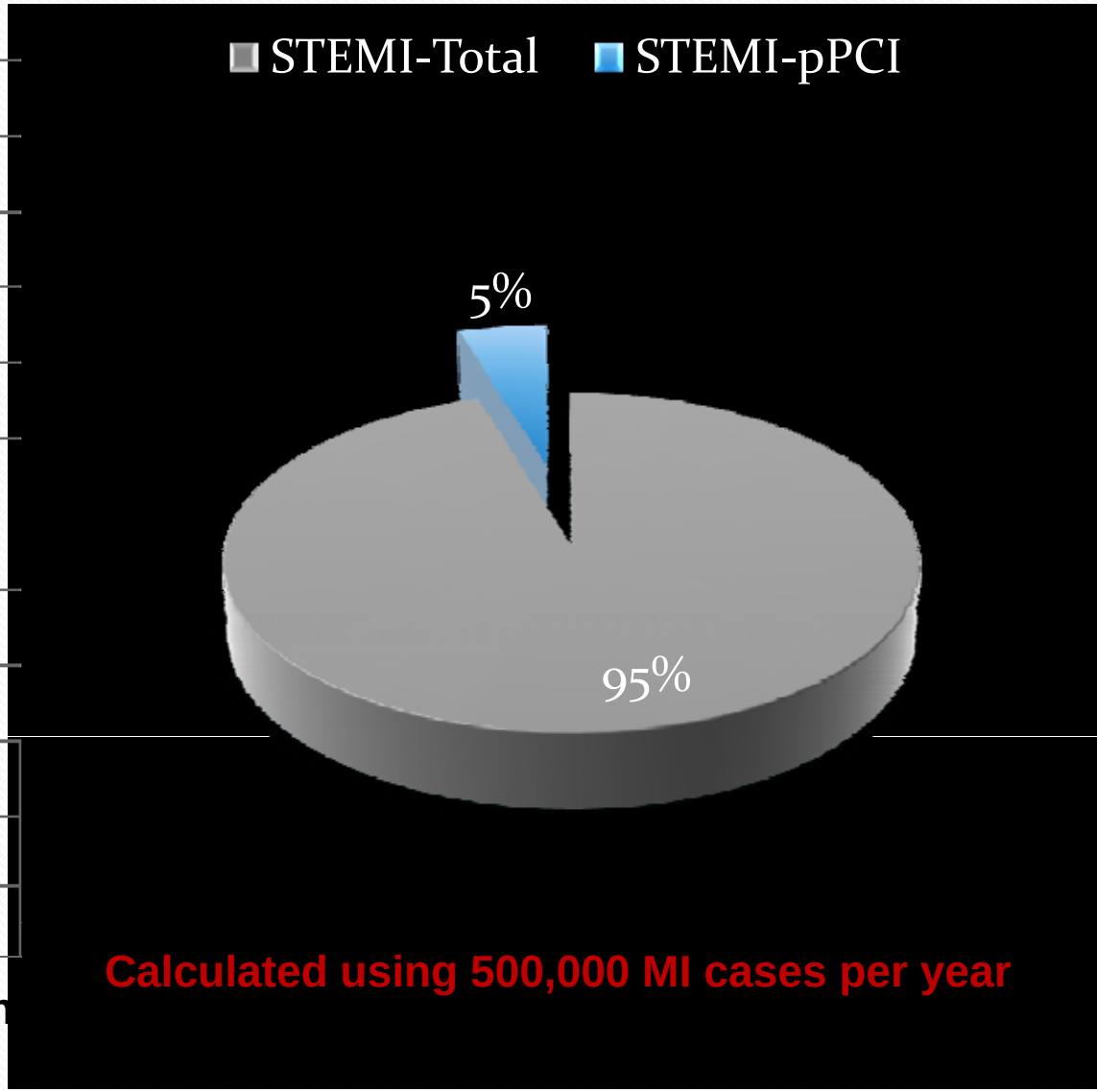


Eagle, et al. *Eur Heart J*. 2008; 29:609; Gao, et al. *Heart.* 2008;94:554; Zhao, et al. *Chin J Cardil.* 2009;37:213; Hu, et al. *Clin Invest Med.* 2008;31:e189; Lv,et al. *Chin J Cardiol.* 2005,33,789

STEMI and Primary PCI in China



Data from China National PCI online Registration

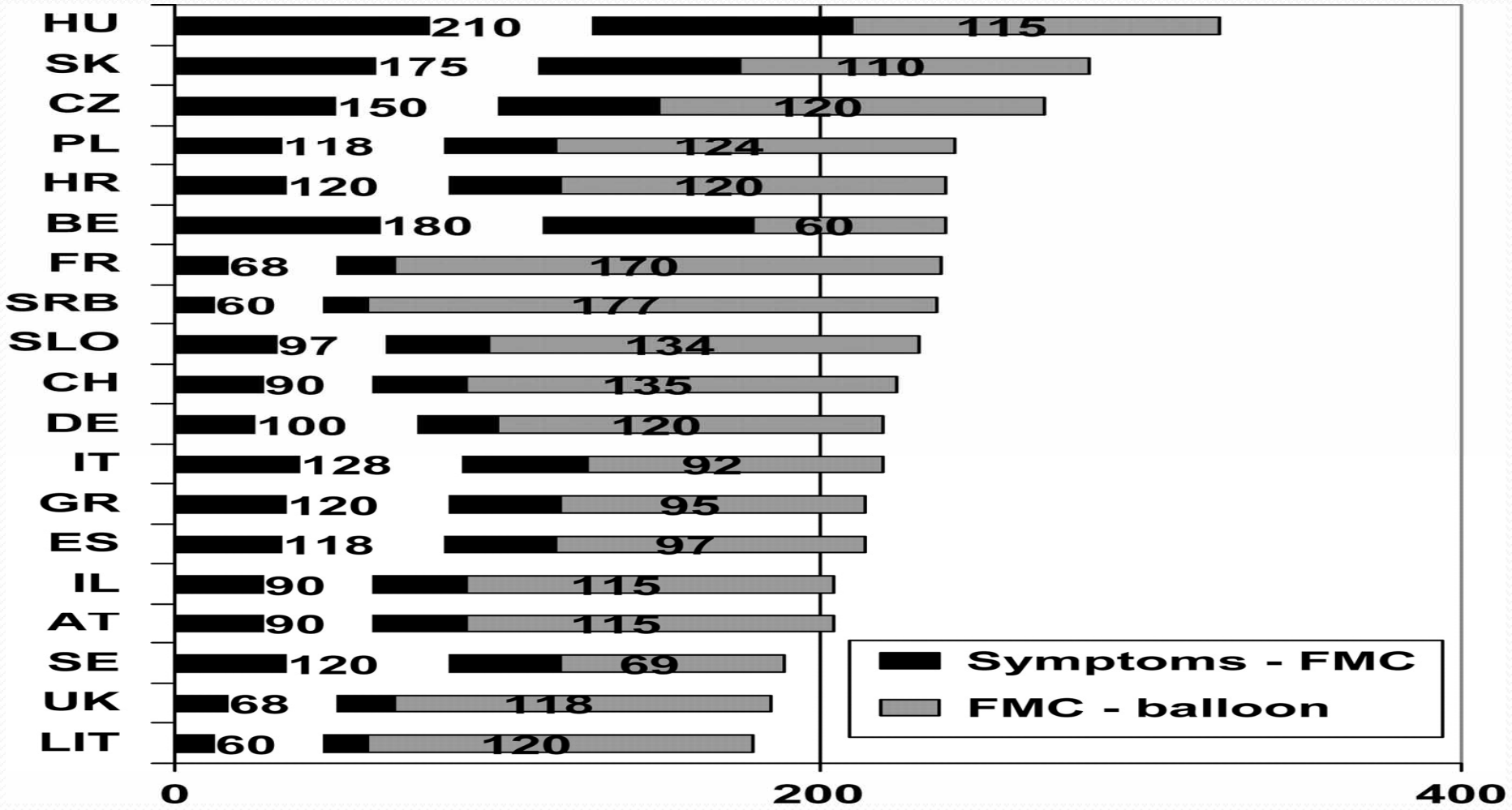


Calculated using 500,000 MI cases per year

What is happened in the real world?

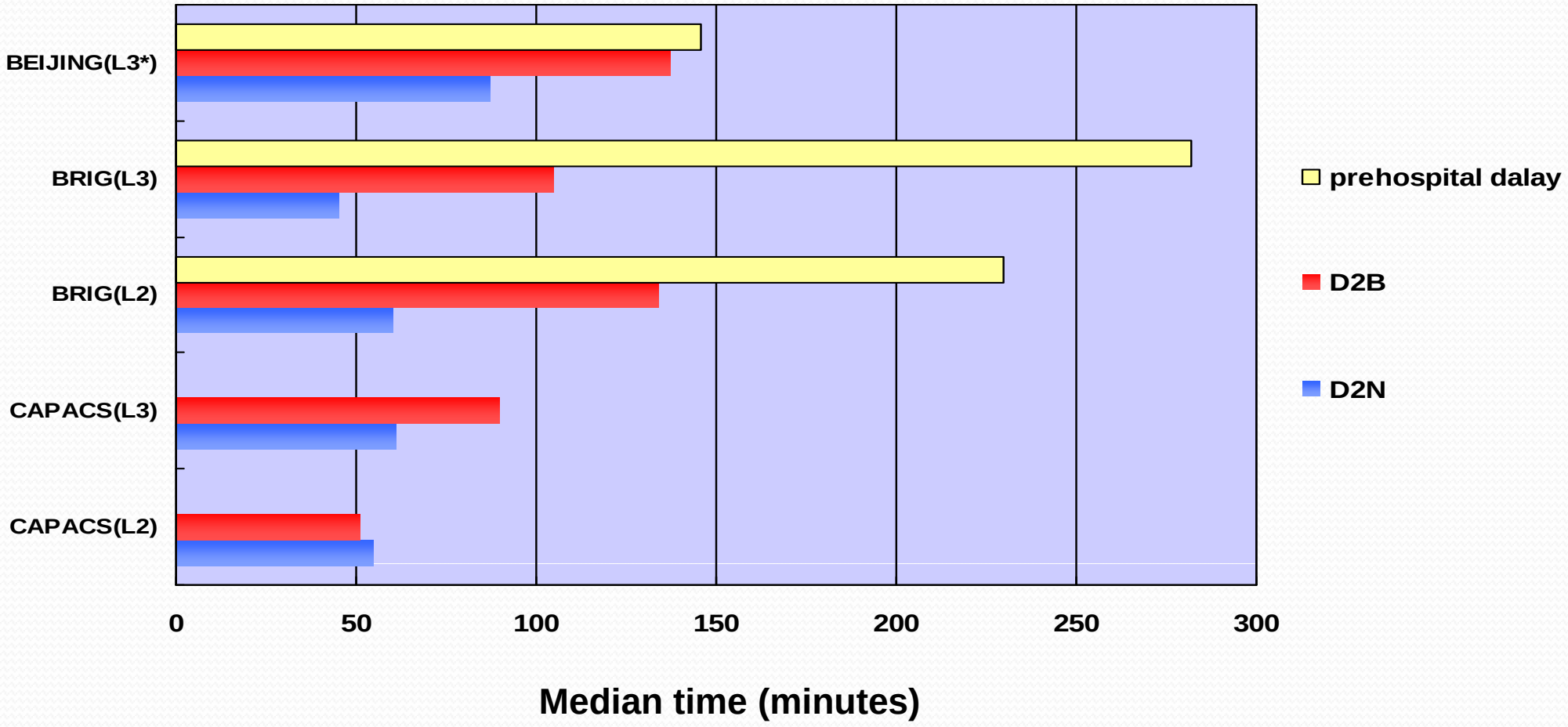
- Reperfusion
- D2B

Time Delay of Reperfusion Therapy of STEMI in Europe



Widimsky P et al. *Eur Heart J.* 2010;31:943.

Time Delay of Reperfusion Therapy of STEMI in China



Gao, et al. *Heart.* 2008;94:554; Zhao, et al. *Chin J Cardil.* 2009;37:213;
Hu, et al. *Clin Invest Med.* 2008;31:e189; Lv,et al. *Chin J Cardiol.* 2005,33,789

Major limitations in China

Why ?	Factors	Solutions
Access	• Transfer network	• Ambulance pre-hospital • Green channel in hospital
Affordability	• Cost	• Medical insurance policy • More BMS using
Awareness	• Public concept	• Public education
Adoption	• Physician's skill	• Physician training • Clinical pathway SOP

How to improve STEMI care in China?

Introduction of ongoing China STEMI-PCI Program

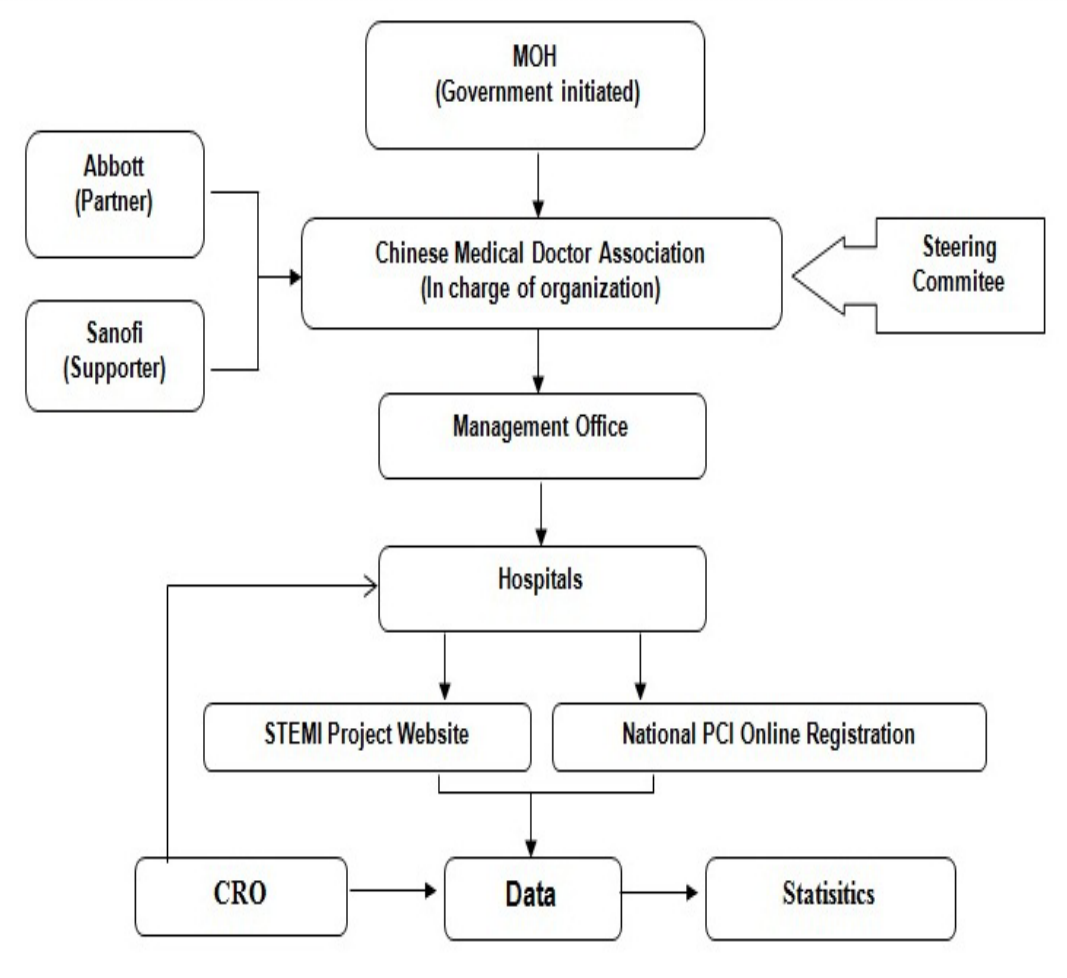
STEMI network construction

Contents	Practices	Aims
Pre-hospital system	• Public Health education • EMS training • Emergency network • Tele-ECG transmission	Transfer patients to the right hospital ASAP
Green channel in hospital	• Chest pain center • Bypass to cathlab • Cathlab 7/24	D2B < 90min
Clinical pathway of primary PCI	• PCI training & certification	SOP
CHD secondary prevention	• Patient education • Physician training • Guideline implementation	Decreasing MACE
Health economics evaluation	• Cost-effective ratio	Health policy

中国急性 肌梗死规范化救治项目

Project Management

- Conducted in three stages
- Providing more and optimal reperfusion in STEMI patients

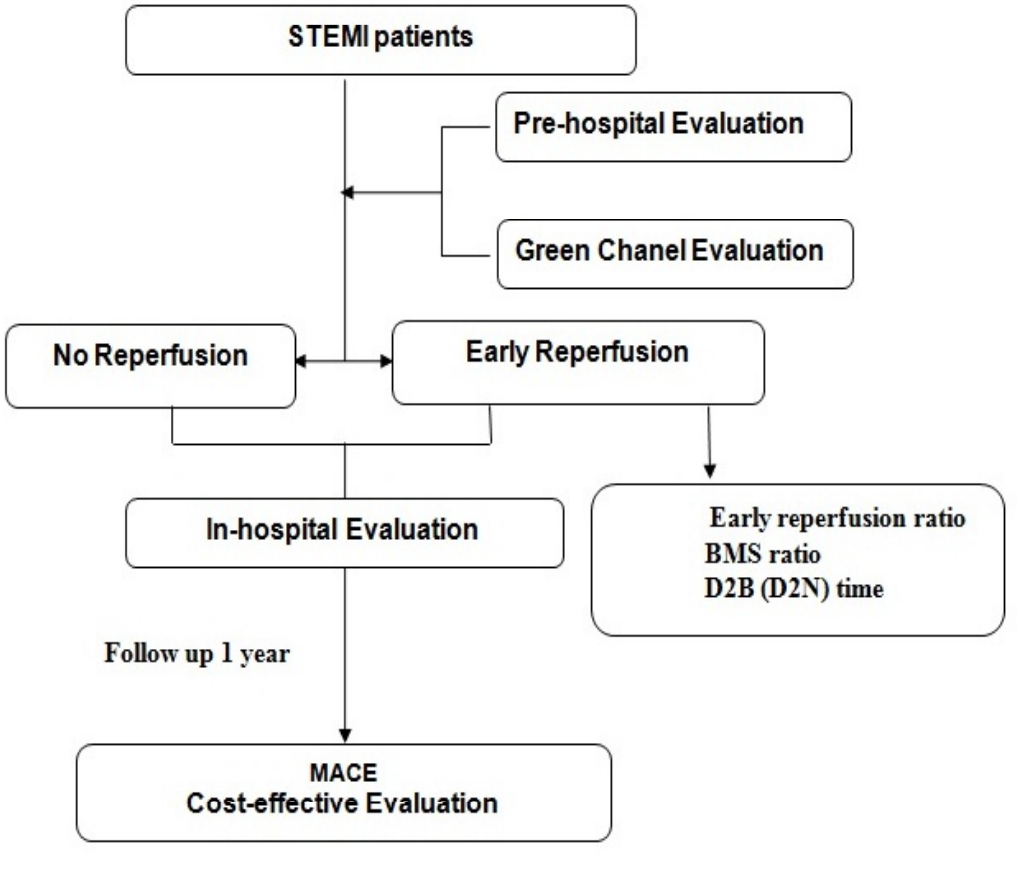


First Stage

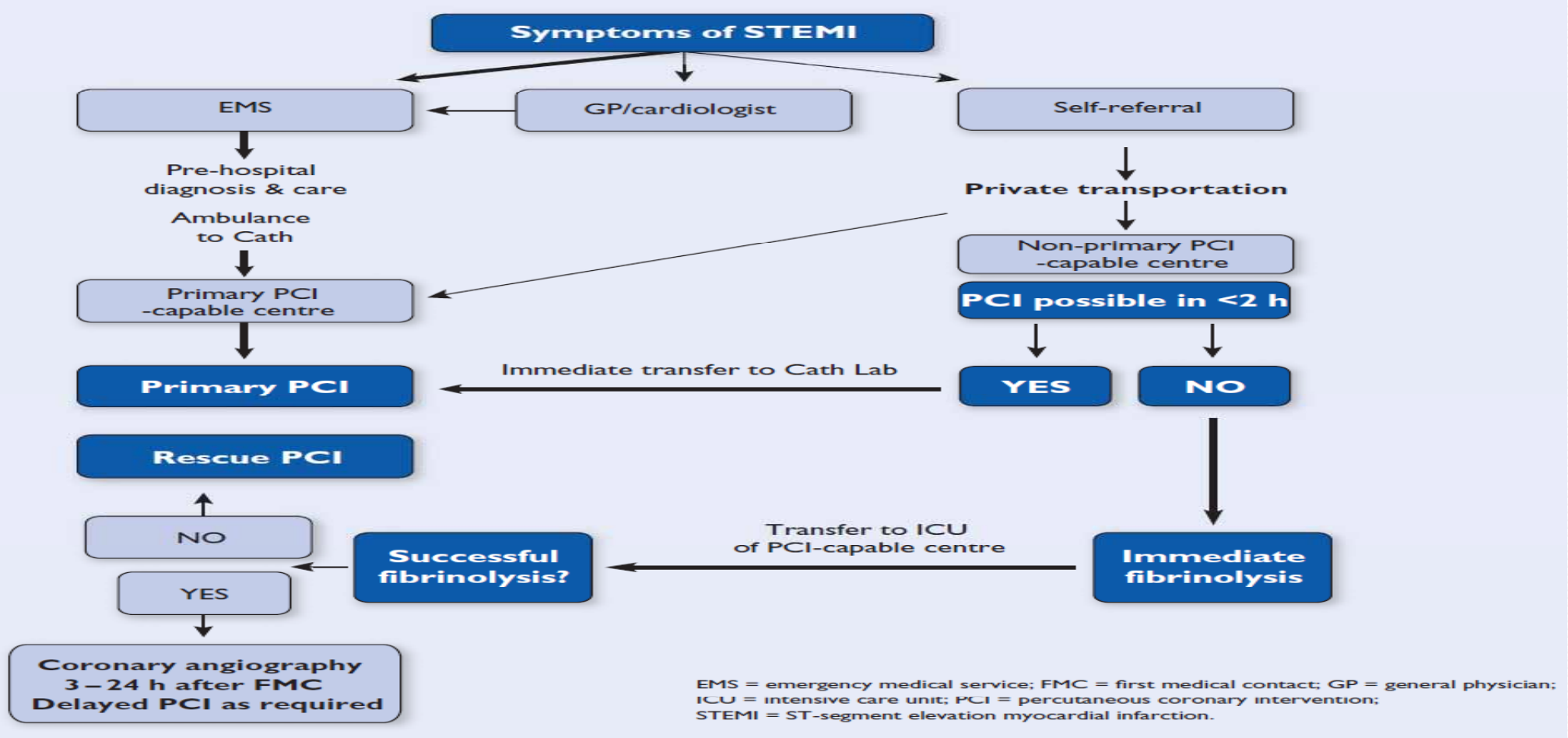
- 53 high-level hospitals qualified for p-PCI in 14 provinces
- Patients enrolled and followed up 1 year
  - ✓ Onset of STEMI within 12h
  - ✓ Onset of STEMI within 12-36h needing primary PCI
- Focused on in-hospital green-channel
  - ✓ Increasing reperfusion ratio
  - ✓ Shorten D2B/D2N time
  - ✓ Increasing BMS usage in primary PCI
  - ✓ Health economics evaluation

First stage site map

First stage flowchart



Reperfusion strategy



Wijns W, *et al. Eur Heart J. 2010,31:2501.*

Second and Third Stages

- Second stage:
  - ✓ About 200 hospitals including lower-level hospitals
  - ✓ Setting up local AMI transferring System
- Third stage:
  - ✓ Conducted nationwide
  - ✓ National and local STEMI Network construction

Project progress

- Signing ceremony on Sep. 26th , 2011
- Kickoff meeting on Nov. 28th , 2011
- Started enrollment on Feb 24th, 2012
- Ended first stage enrollment on Dec 31th, 2012

First Stage Baseline Information

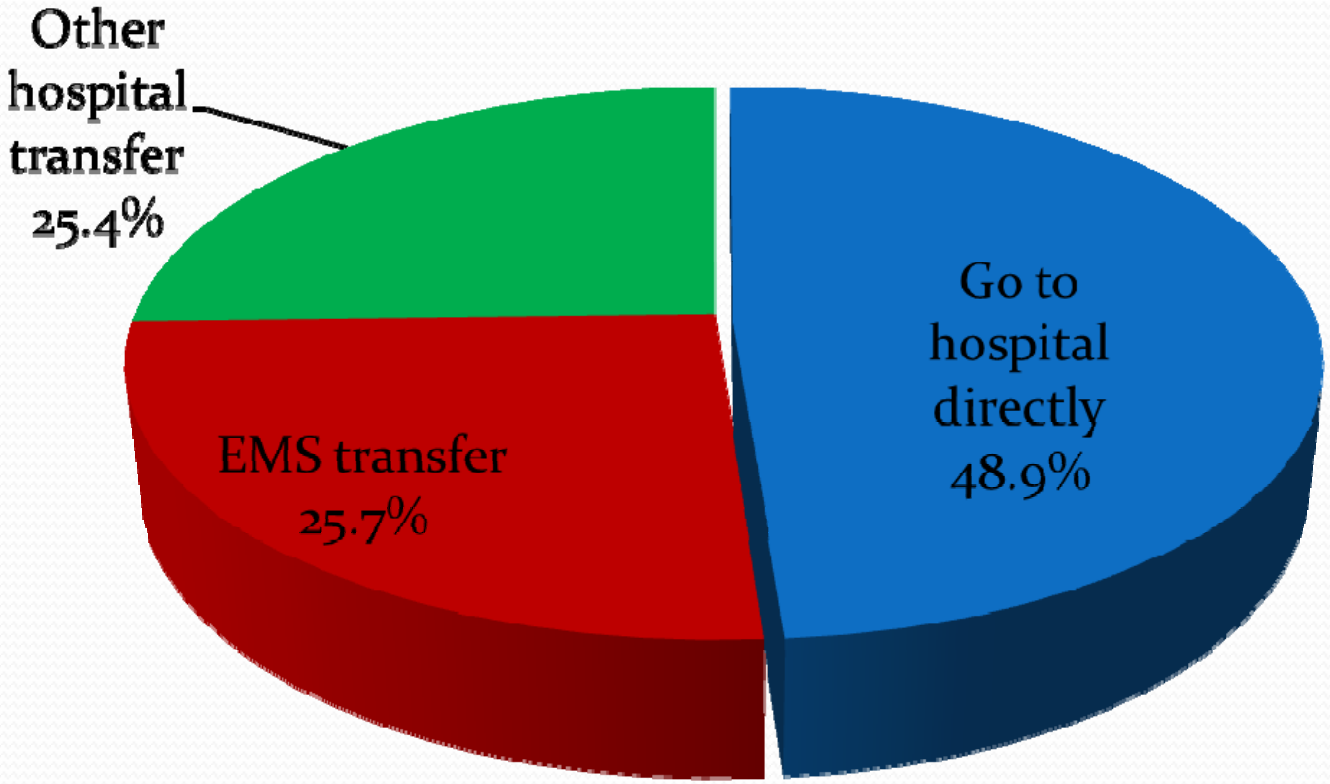
Based on current database

N=4389

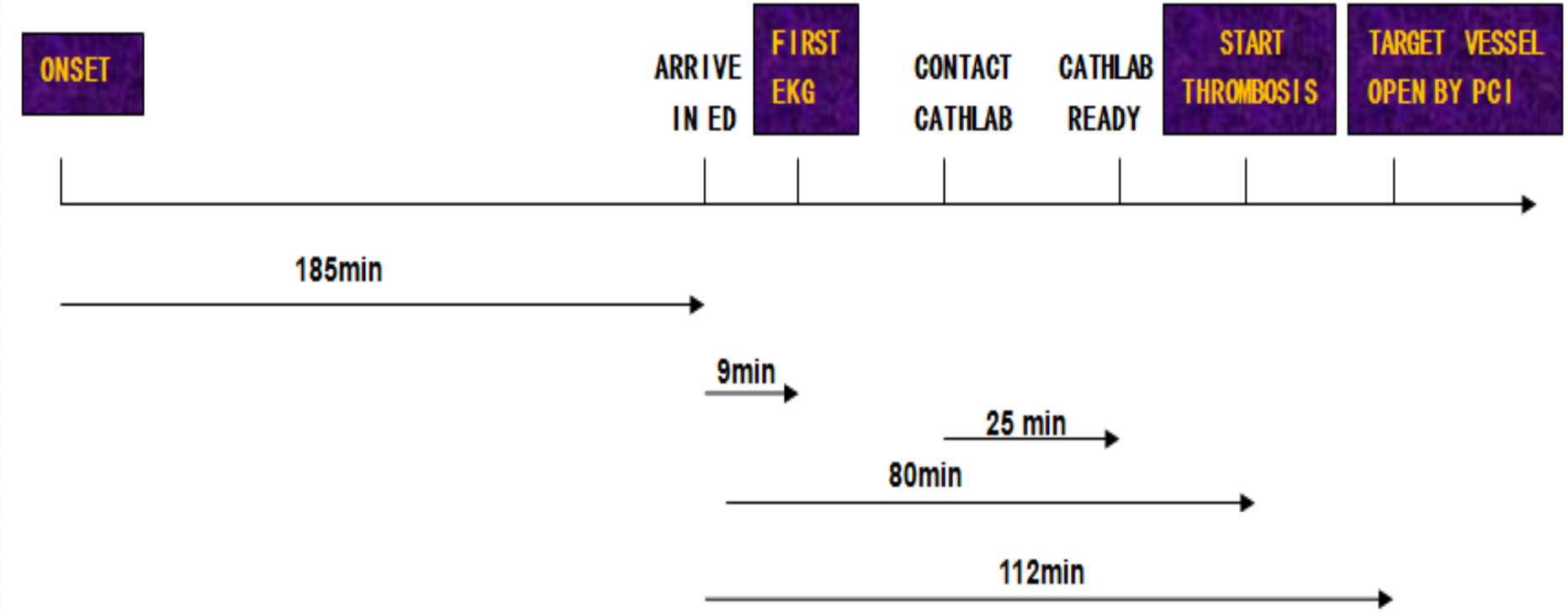
Patients Characteristics

			History	
Onset to hospital			Smoking	25.96%
within 12h	93.7%		HTN	38.75%
Typical chest pain	90.02%		DM	13.75%
Age	61.03±12.49		Hyperlipidemia	17.74%
Gender			Stroke	6.17%
male	80.76%		PAD	0.39%
Obesity	9.39%		OMI	22.27%
Inferior AMI	48.6%		PCI	2.86%
Cardiac shock	3.37%		CABG	0.22%

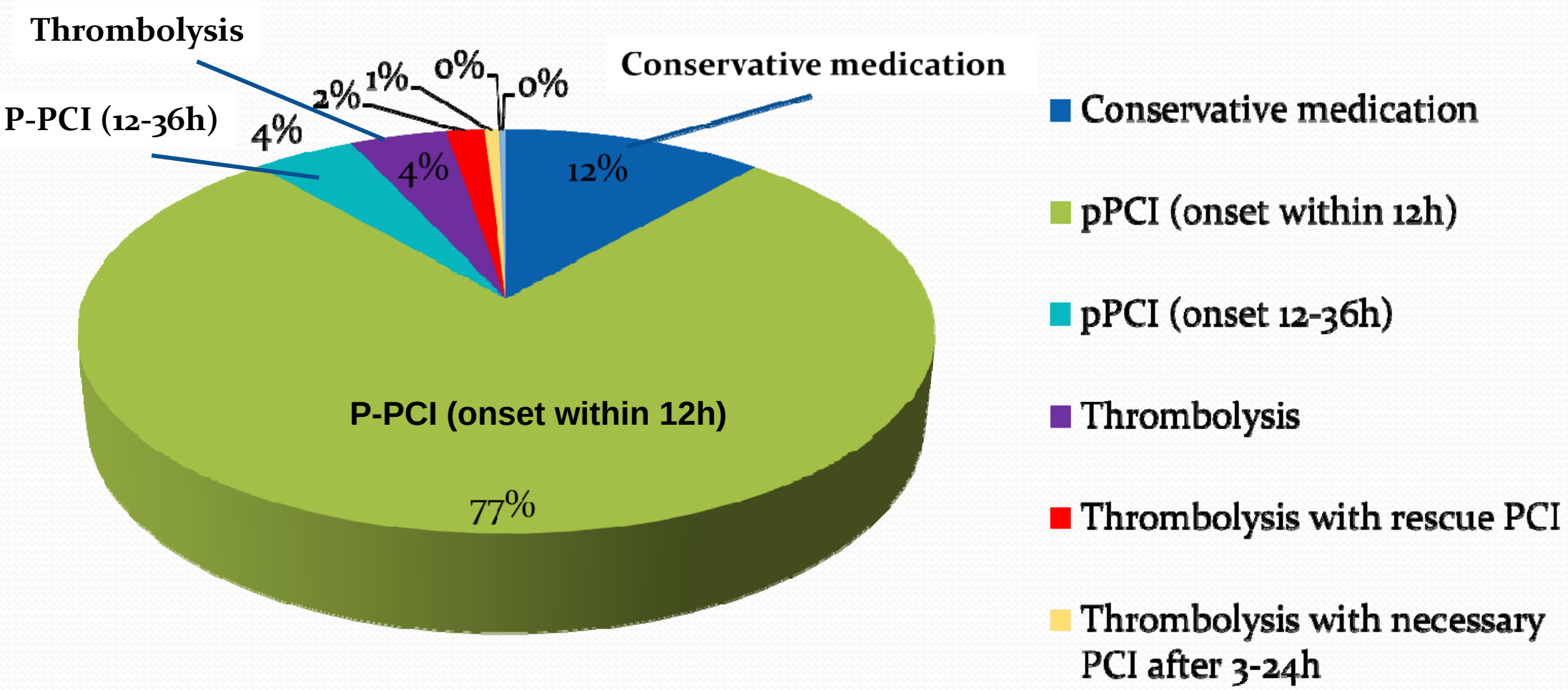
Methods of coming to hospital

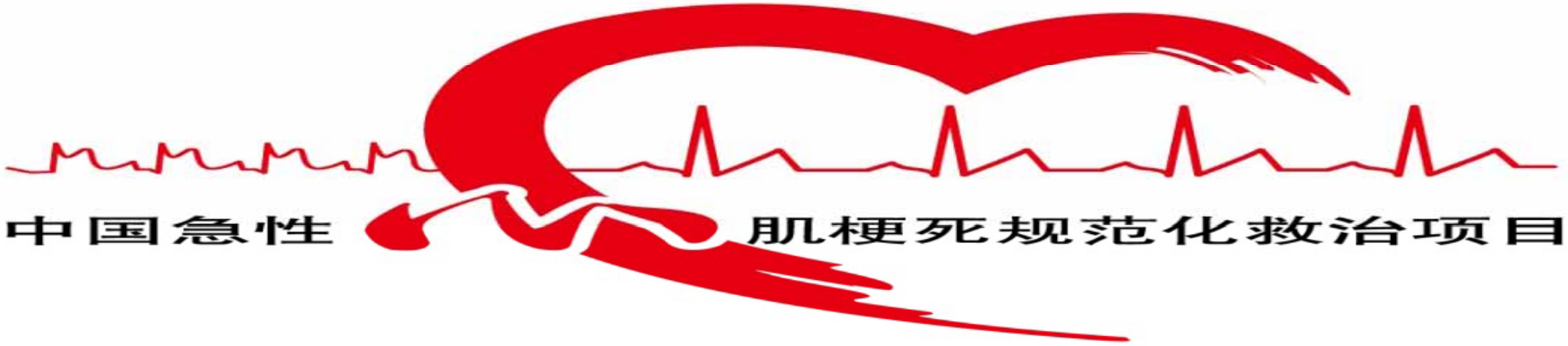


Time Delay of Reperfusion



Reperfusion ratio and type





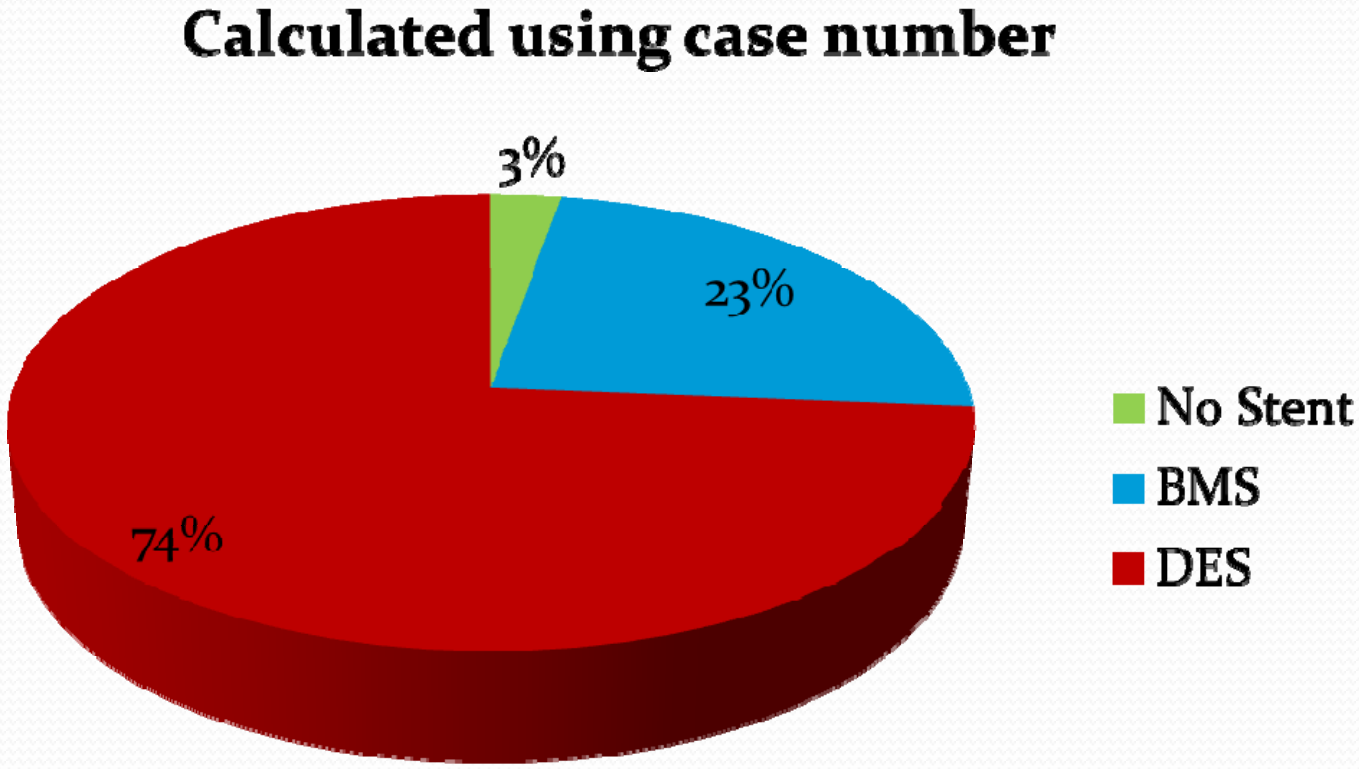
Reperfusion therapy

Primary PCI

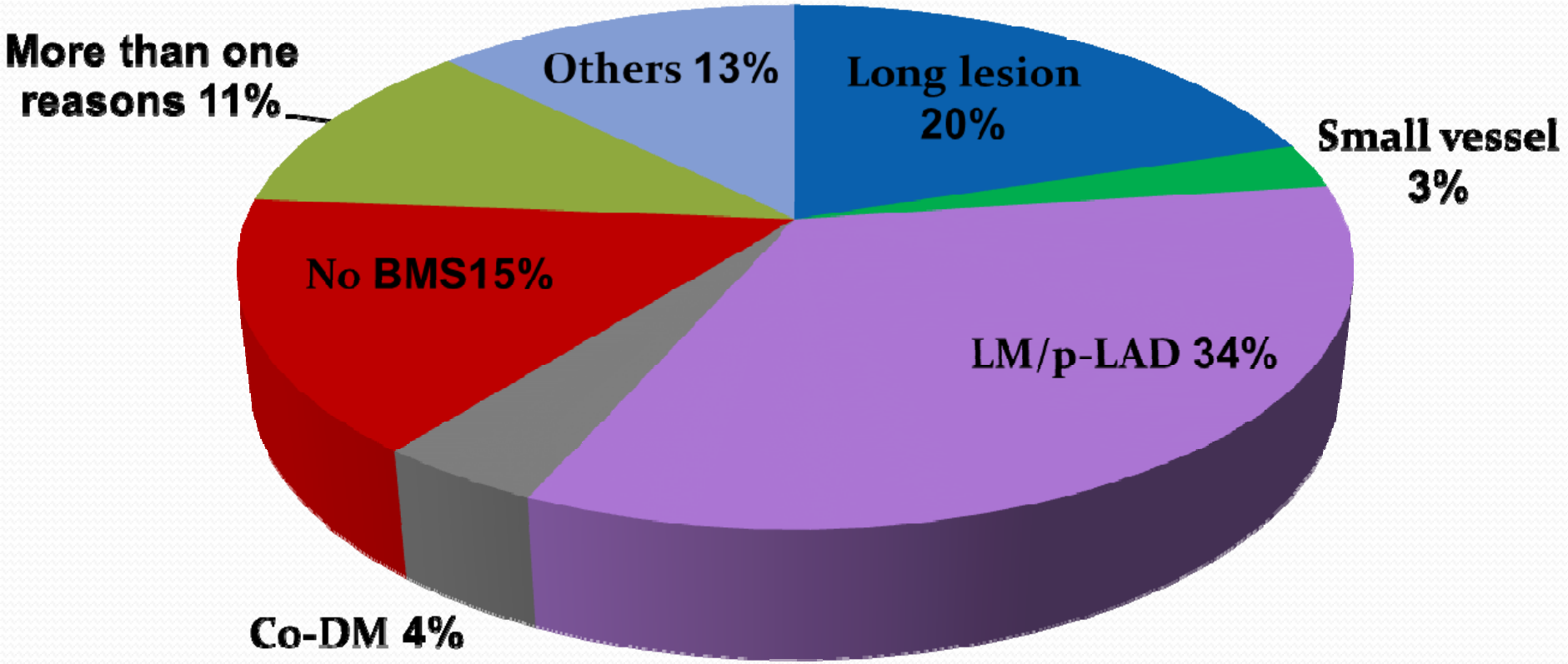
Primary PCI variables

Approaching			Stents per time	1.13±0.52
radial	85.94%		Balloon pretreatment	87.21%
Lesion			Balloon post-expansion	44.11%
1 vessel	38.81%		Target vessel	
2 vessels	20.55%		LAD	49.45%
3 vessels	33.46%		Non-target vessel treatment	2.21%
LM	3.90%		TIMI flow post PCI	
Thrombus	55.65%		Grade 3	95.28%
Aspiration	40.20%		IABP	7%
in thrombus	39.8%		in cardiac shock	46.8%
GP IIb/IIIa using	51.19%		Complications in operation	0.45%
			Mortality in operation	0.17%

Stent using in PCI



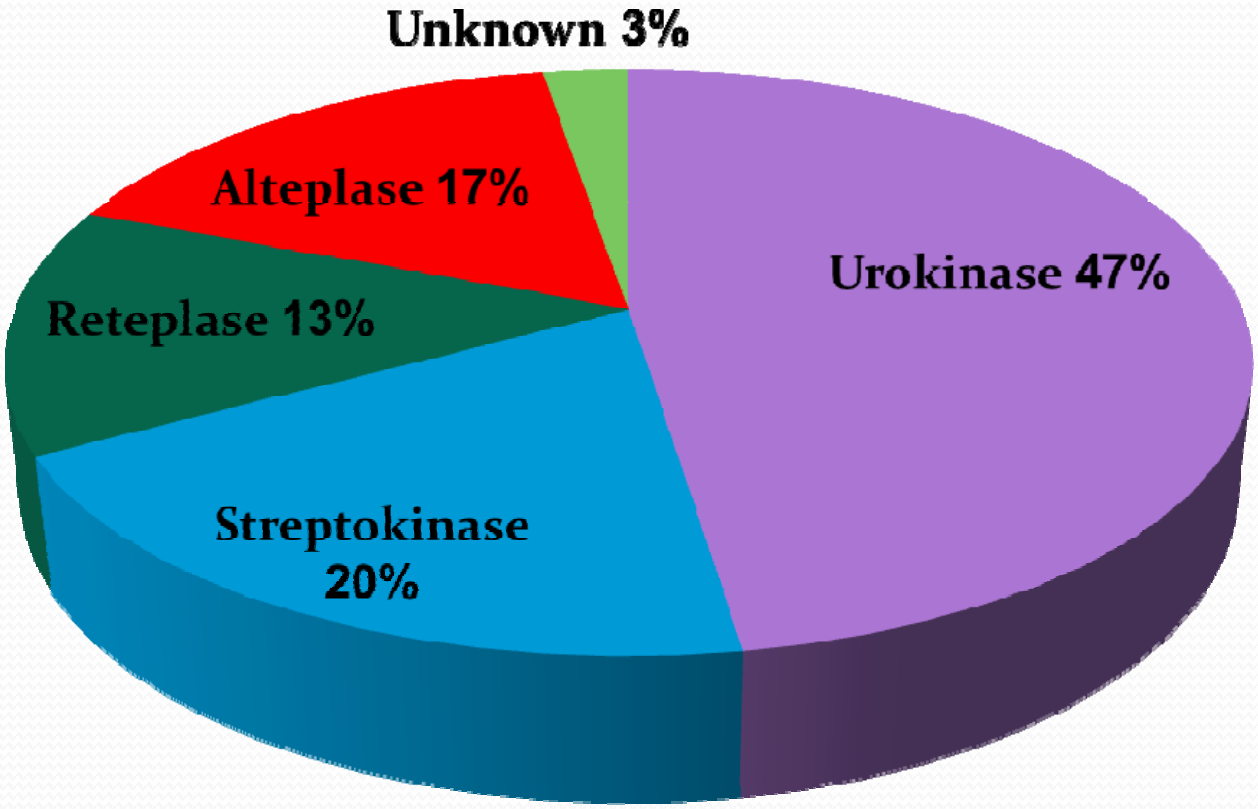
Why choosing DES



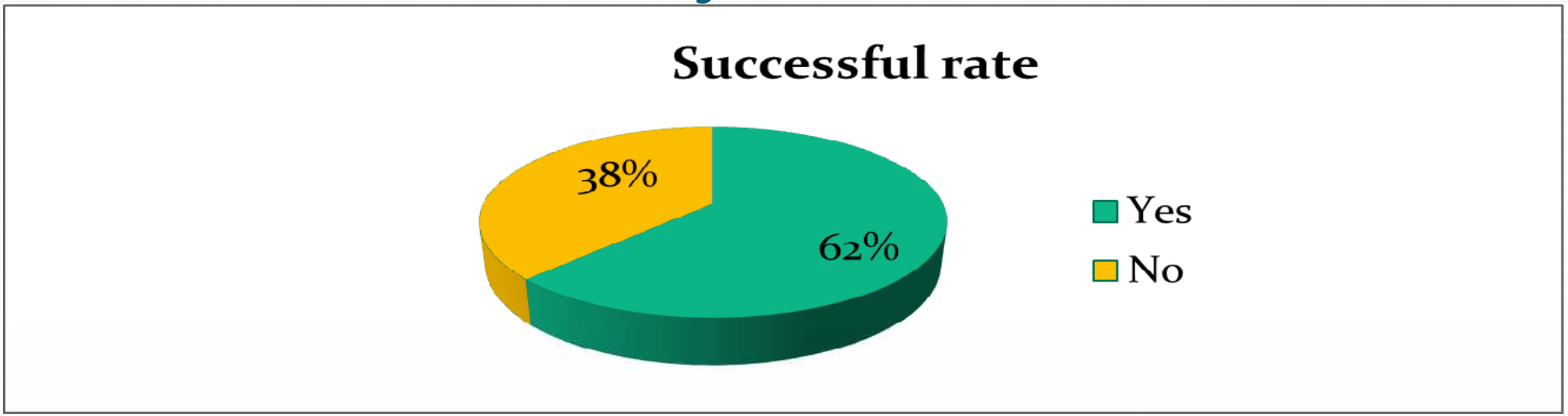
Reperfusion therapy

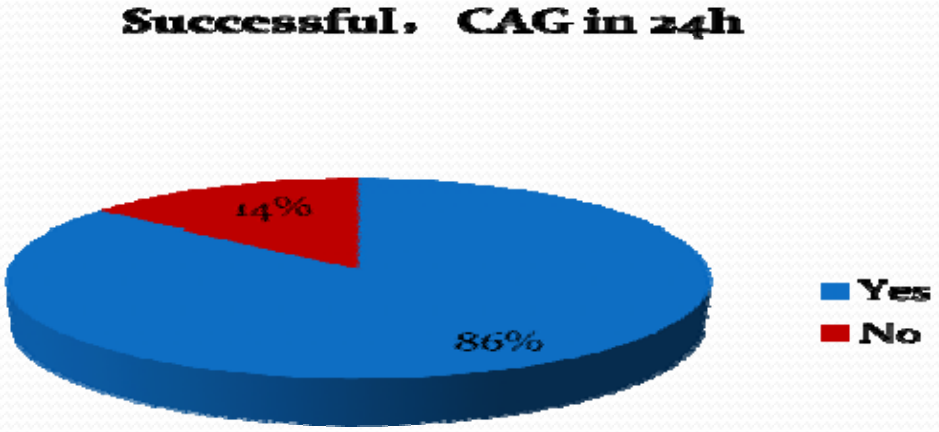
thrombolysis

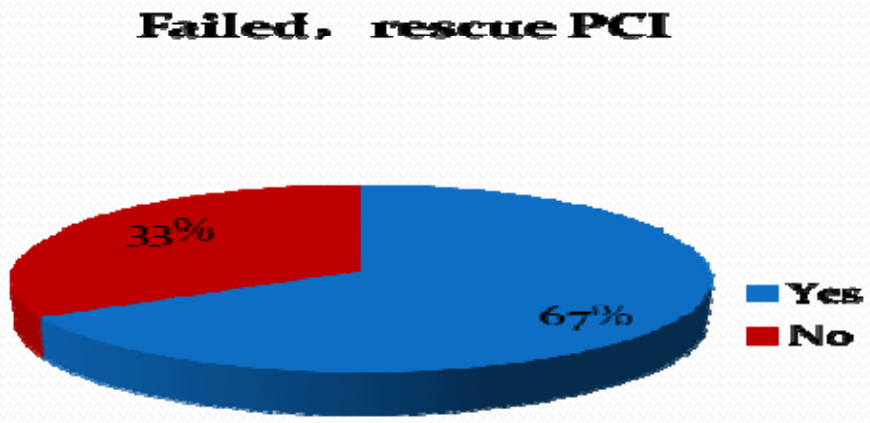
Thrombolytic medication type
(N=265)



Thrombolysis treatment

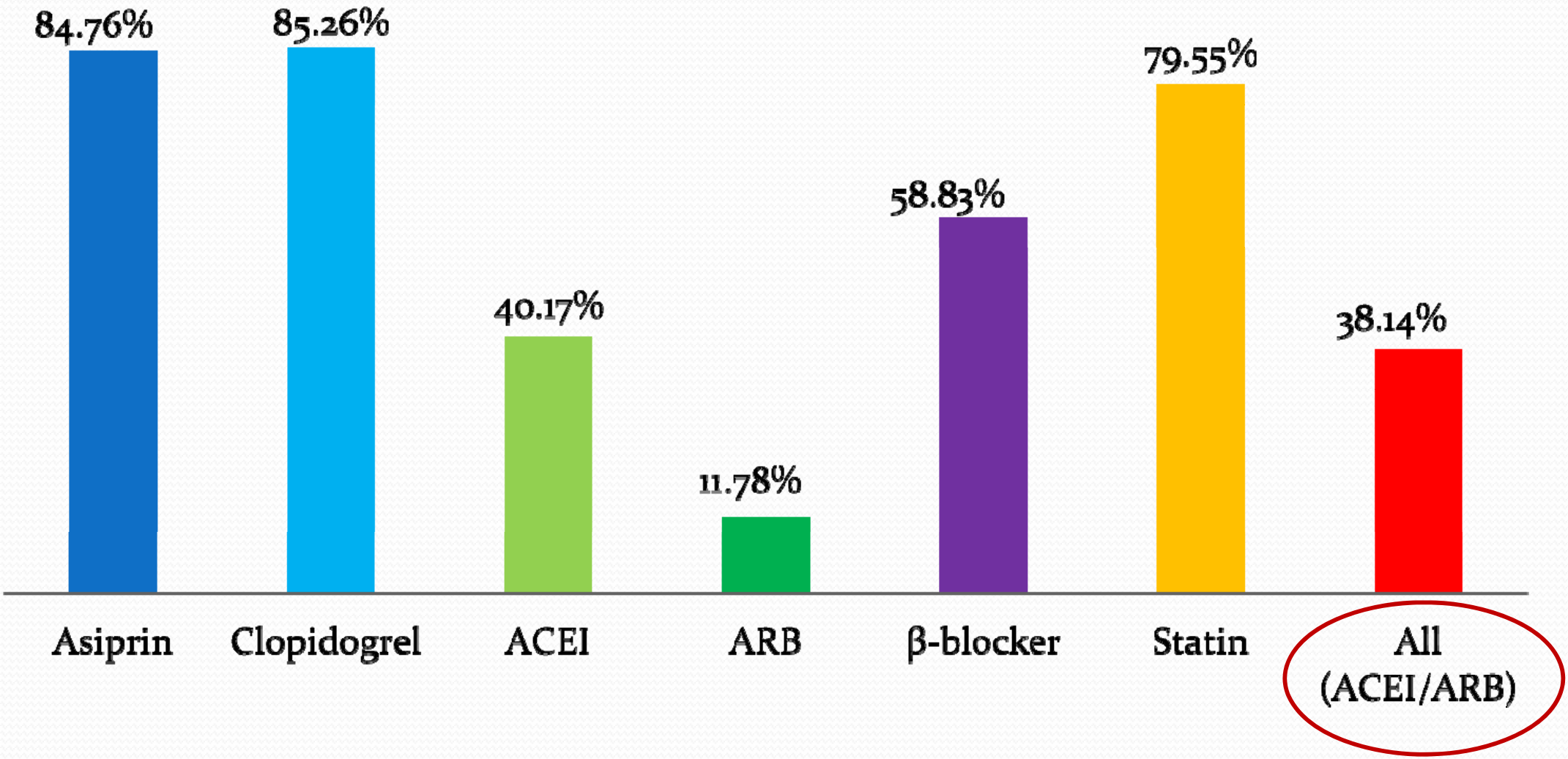






Secondary prevention

Medications at discharge



Summary

- Although existing some un-reported cases (mainly conservative cases), the reperfusion ratio is still higher than before
- D2B time is shorter than that of previous studies in China
- Much more BMSs were used in STEMI p-PCI
- Medications at discharge were still insufficient
- Patients will be followed up till Dec. 2013, final report will be released in 2014.
- Second stage work will be initialed in May, 2013