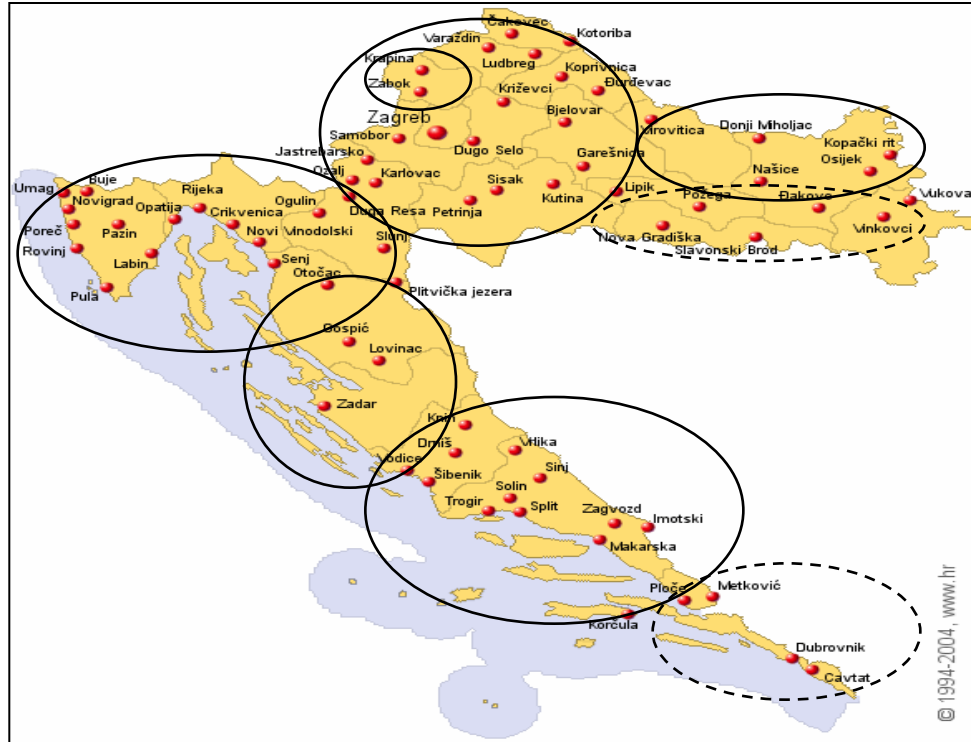


# LESSONS FOR THE NATIONAL PPCI NETWORK – CROATIA



**CROATIAN  
CARDIAC  
SOCIETY**



Assist. Prof. Zdravko Babic, M.D., Ph.D.  
Working Group for Acute Coronary Syndrome  
Croatian Cardiac Society

Dubrovnik Highlights 2013



**Prof. Vjeran Nikolic Heitzler, M.D., Ph.D.,<sup>1</sup> Academician Davor Milicic M.D., Ph.D.,<sup>2</sup> Prof. Hrvoje Pintaric, M.D., Ph.D.,<sup>1</sup> Assist. Prof. Boris Starcevic, M.D., Ph.D.,<sup>3</sup> Assist. Prof. Maja Strozzi, M.D., Ph.D., Prof. Alexander Ernst, M.D., Ph.D.,<sup>2</sup> Vjekoslav Tomulic, M.D., Zeljko Plazonic,<sup>4</sup> Lovel Giunio, M.D., Assist. Prof. Ivo Vukovic, M.D., Ph.D.,<sup>5</sup> Assist. Prof. Robert Steiner, M.D., Ph.D.,<sup>6</sup> Prof. Robert Bernat, M.D., Ph.D.,<sup>7</sup> Jozica Sikic, M.D., Ph.D.,<sup>8</sup> Assist. Prof. Albino Jović, M.D., Ph.D.,<sup>9</sup> Deiti Prvulovic, M.D.,<sup>10</sup> Damir Kozmar, M.D.<sup>11</sup>**

<sup>1</sup> University Hospital Sestre milosrdnice, Zagreb, Croatia

<sup>2</sup> University Hospital Center Zagreb, Zagreb, Croatia

<sup>3</sup> University Hospital Dubrava, Zagreb, Croatia

<sup>4</sup> University Hospital Center Rijeka, Rijeka, Croatia

<sup>5</sup> University Hospital Center Split, Split, Croatia

<sup>6</sup> University Hospital Osijek, Osijek, Croatia

<sup>7</sup> Special Hospital for Cardiovascular diseases Magdalena, Krapinske toplice

<sup>8</sup> University Hospital Sveti Duh, Zagreb, Croatia

<sup>9</sup> General Hospital Zadar, Zadar, Croatia

<sup>10</sup> General Hospital Slavonski brod, Slavonski brod, Croatia

<sup>11</sup> University Hospital Merkur, Zagreb, Croatia



# FACTS ABOUT CROATIAN pPCI NETWORK

Started in **2005**

**Step-by-step** implementation

**Proportional allocation** in all parts of Croatia

Continuous mutual **communication**

## Reperfusion therapy in acute myocardial infarction: the current situation in Europe

Petr Widimsky\*, William Wijns<sup>†</sup>, Lars Aaberge, George Andriantsaholainaina, Marc Claeys, Nicholas Danchin, Kurt Huber, Petr Kala, Milka Josephina Mauri Ferre, Bela Merkely, Grzegorz Opolski, Miodrag Stanojevic, Ulf Stenestrand, Martin Studer, Franz Weidinger, Adam Witkowski, and the European Association for Percutaneous Coronary Intervention

Cardiocenter, 3rd faculty of Medicine, Charles University Prague, Czech Republic; \*Department of Cardiology, Faculty of Medicine, Masaryk Memorial Cancer Institute, Prague, Czech Republic; <sup>†</sup>W. Wijns, SFL Initiative Founder and past-Chairman

**Aims** Patient access to reperfusion therapy (TL) varies considerably across Europe. This study provides a contemporary picture of how patient access to reperfusion therapy varies across Europe.

**Methods and results** The chairpersons of the national and/or regional registries were collected about their current practice and treatment in each country. Data were collected from the national and/or regional registries and hospital admission for acute myocardial infarction. The prevalence of STEMI alone ranged from 0% to 55%. Any reperfusion treatment (p-PCI or t-PCI) was used in 8 countries. The mean population per p-PCI centre varied between 0.3 and 7.4 million inhabitants. In those countries offering p-PCI, the mean population per p-PCI centre varied between 0.3 and 7.4 million inhabitants. In those countries offering p-PCI, the mean population per p-PCI centre varied between 0.3 and 7.4 million inhabitants. In those countries offering p-PCI, the mean population per p-PCI centre varied between 0.3 and 7.4 million inhabitants.

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### EVALUATION OF REPERFUSION TIME IN ACUTE MYOCARDIAL INFARCTION TREATED WITH PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Vjeran Nikolić Heitzl, Željko Plazonić, Lovro Vukobratović, and the European Association for Percutaneous Coronary Intervention

<sup>1</sup>Sestre milosrdnice University Hospital Center, Split; <sup>2</sup>Sveti Duh University Hospital Center, Split; <sup>3</sup>Osijek University Hospital Center, Osijek

**SUMMARY** The aim of the study was to evaluate the reperfusion time in acute myocardial infarction (AMI) patients treated with primary percutaneous coronary intervention (PPCI) in Croatia. The study included 100 patients with AMI who were treated with PPCI in 8 Croatian hospitals. The mean time from symptom onset to PPCI was 145 minutes (range 45-360 minutes). The mean time from PPCI to reperfusion was 180 minutes (range 120-360 minutes). The mean time from symptom onset to reperfusion was 325 minutes (range 165-600 minutes). The mean time from PPCI to reperfusion was 180 minutes (range 120-360 minutes). The mean time from symptom onset to reperfusion was 325 minutes (range 165-600 minutes).

**Key words:** reperfusion time, primary percutaneous coronary intervention, acute myocardial infarction

Correspondence to: Zdravko Vukobratović, Unit, Sestre milosrdnice University Hospital Center, c. 29, HR-10000 Zagreb, Croatia. E-mail: zvukob@net.hr  
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Original Scientific Paper

## Simultaneous Coronary Stent Implantation in ST-Segment Elevation Myocardial Infarction

Stjepan Mihaljević, PhD<sup>b</sup>, Miro Bercović, PhD<sup>c</sup>, and the European Association for Percutaneous Coronary Intervention

<sup>d</sup>

Grand Dossier

### Stent for Life in 2011

**Stent for Life (SFL) initiative is a key project addressing inequalities in acute coronary syndrome (ACS) patient access to the life saving indication of primary PCI (PPCI) in Europe.**

SFL was launched two years ago by the coalition of the European Association of Percutaneous Cardiovascular Interventions (EAPCI) and EuroPCR. SFL continues to expand with three new countries, Egypt, Italy and Romania, joining in 2010. Portugal joined at our first Countries Meeting in Prague in February 2011. This brings the total number of countries involved to 10.

Based on the past two years experience, we have developed the SFL How-to-Guide, containing step-by-step guidelines describing how to set up the initiative and implement it at a country level. We are ready to share our best practice example with more countries interested in SFL in a near future.

#### SFL as an inspiration to other countries

We are very pleased to see that more countries are initiating similar programmes locally. Croatia is not one of the pilot country members of SFL, nevertheless, under the leadership of their Working Group, there has been a strong focus on prioritising PCI for acute CAD in the country.

Resources are limited, but preferentially targeted to life-saving indications of PCI. Colleagues have reported two waves of consecutive registries. They have implemented pathways and a sufficient number of 24/7 cathlab facilities. At this point in time in the evolution of their programme, they have identified patient delays and insufficient public awareness as the main obstacles to further improving the delivery of PPCI.



W. Wijns, SFL Initiative Founder and past-Chairman

They have also noticed and experienced that setting up the PPCI network spills over to acute coronary syndromes and they now have a very timely policy of early angiography in patients with high-risk non-STEMI (NSTEMI) and high-risk ACS. The decision was taken by the Working Group, in collaboration with some of their national authorities, to launch awareness campaigns targeting the general public.

Croatia can be seen as a best practice example as to prioritisation of allocation of resources, inspiration by the SFL initiative without formal involvement. It is truly rewarding to see that the call for action was taken on in many cities, regions and countries, indicating the strength of the SFL brand, as well as engagement by all stakeholders in the initiative.

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o treating trends and atian Carcutaneous healthcare al was to n all parts s through-

out Croatia are included in this network and cover about 75% of the population (Figure 1).<sup>4</sup>

The main goals of the present investigation were to (1)



# **TRENDS OF TREATMENT RESULTS IN CROATIAN PPCI NETWORK (2005-2012)**



# PATIENTS AND METHODS

- retrospective multicentric study
- time period: Sep 1st 2005 - Aug 31st 2007 (first phase), Jan 1st 2008 - Dec 31st 2009 (second phase), Nov 1st 2010 - Nov 1st 2011 (third phase)
- 11 PCI centres in all parts of Croatia
  - UHC Sestre milosrdnice, UHC Zagreb, CH Dubrava, UHC Rijeka, UHC Split, SH Magdalena, CH Sveti duh, UHC Osijek, GH Zadar, GH Slavonski brod, CH Merkur
- patients: -5650 acute STEMI patients treated with primary PCI;
  - 1161 in first phase, 2543 in second phase and 1946 in third phase of investigation
  - 1578 acute NSTEMI patients treated with primary PCI;
    - 401 in second phase and 1177 in third phase
- patients were transferred from outside hospitals or directly admitted in PCI centres

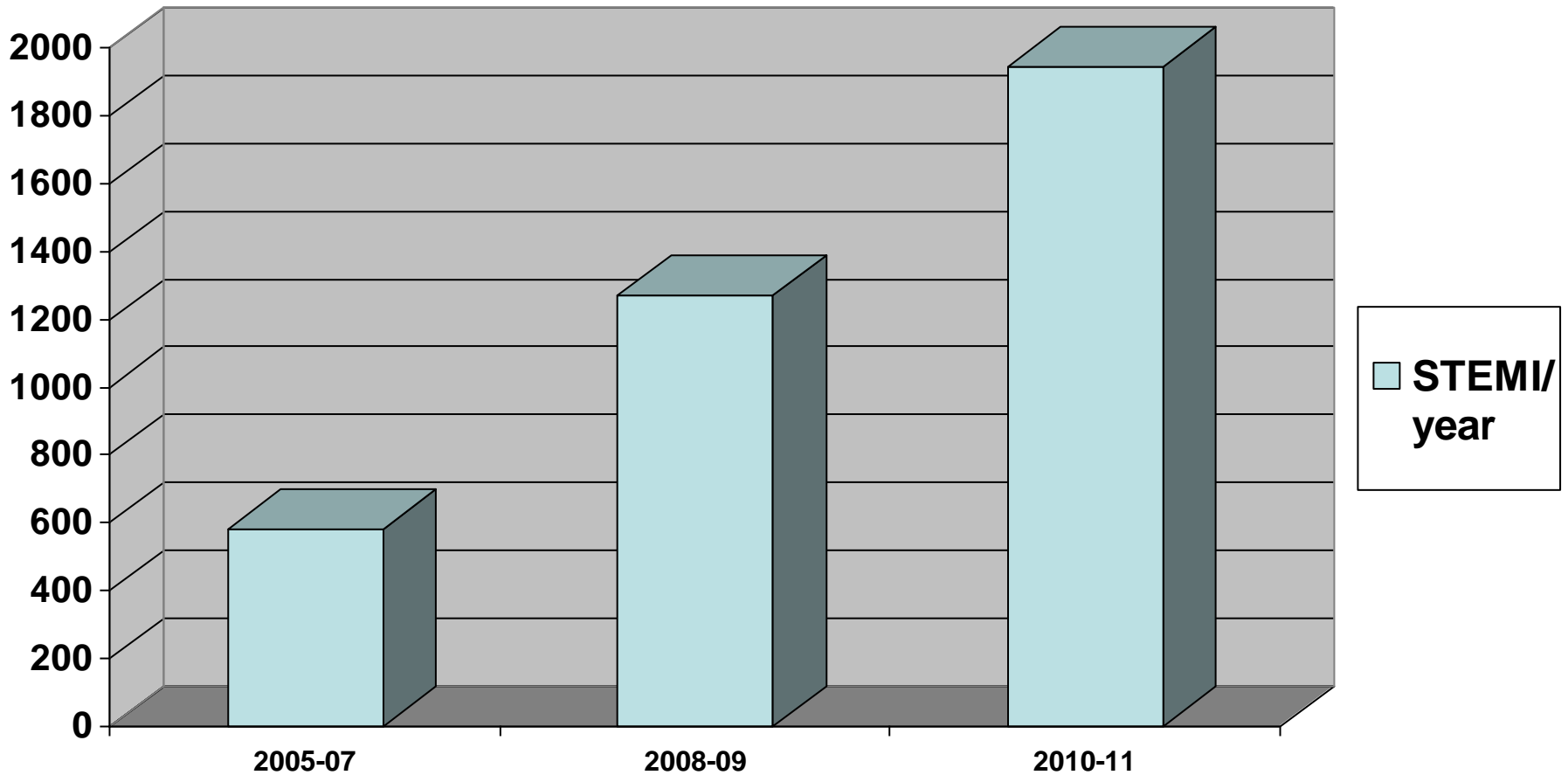


**STEMI**

# RESULTS

## Croatian PPCI Network

### No.of STEMI/year





# RESULTS

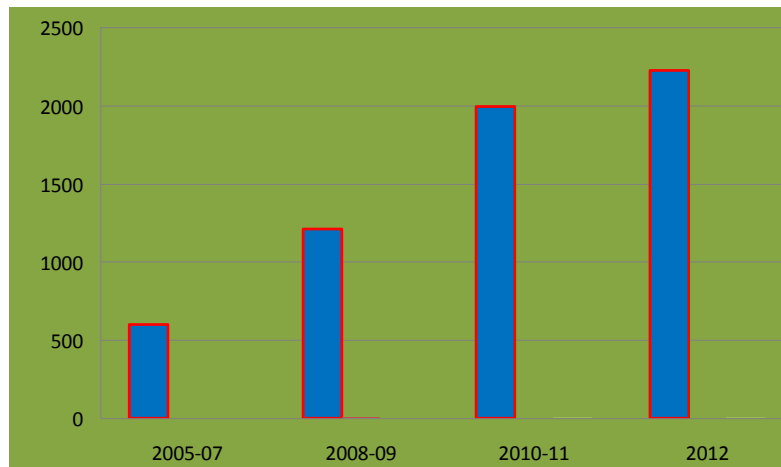
## Croatian PPCI Network

### No.of STEMI/year



-455 PPCI/million inhabitants/year (2011)

- > 90% of population covered with PPCI 24/7 system

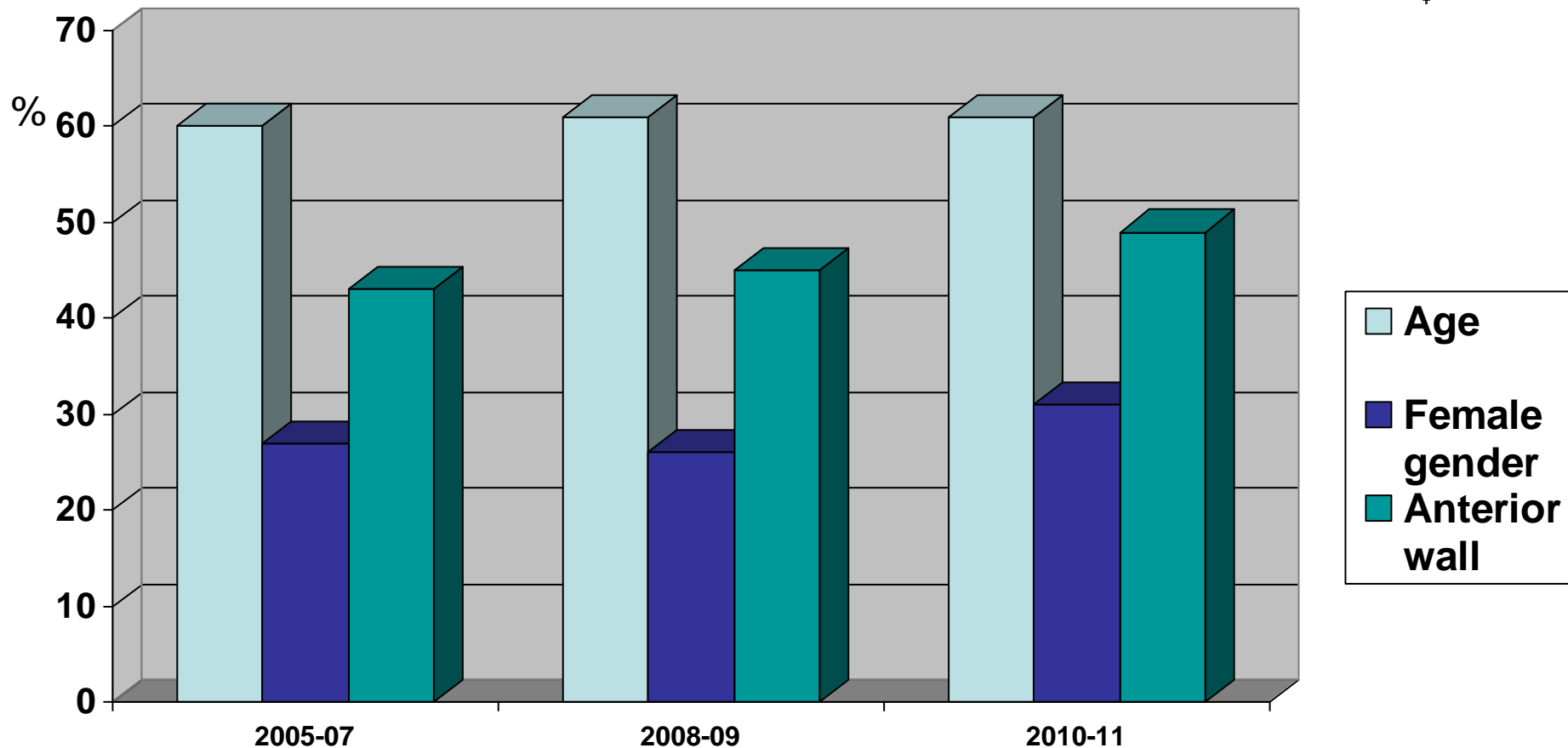


-520 PPCI/million  
inhabitants/year (2012)

# RESULTS

## Croatian PPCI Network

### Risk profile - STEMI



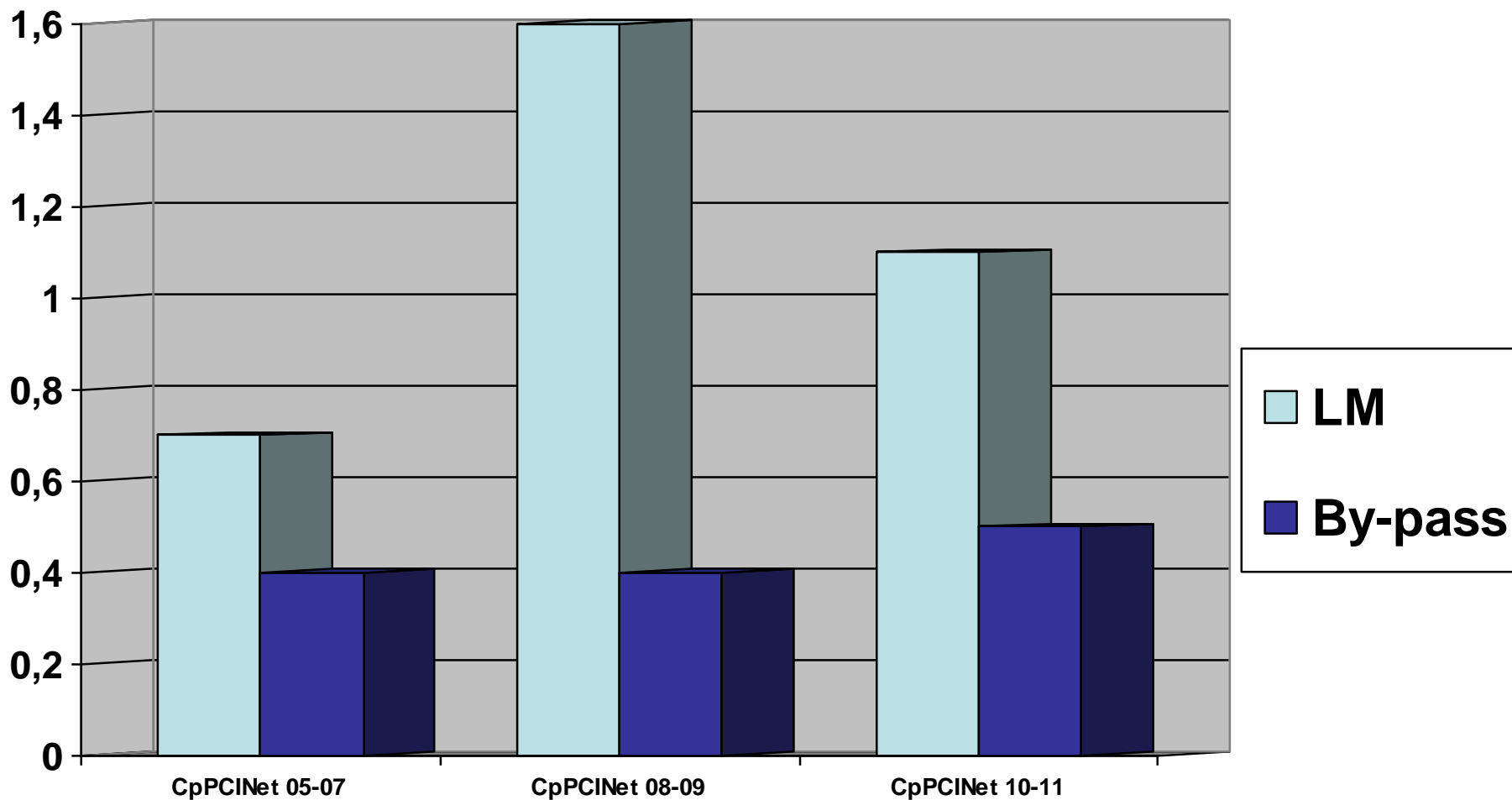
Age  $p < 0.01$

Anterior wall  $p < 0.01$

# RESULTS

## Croatian PPCI Network

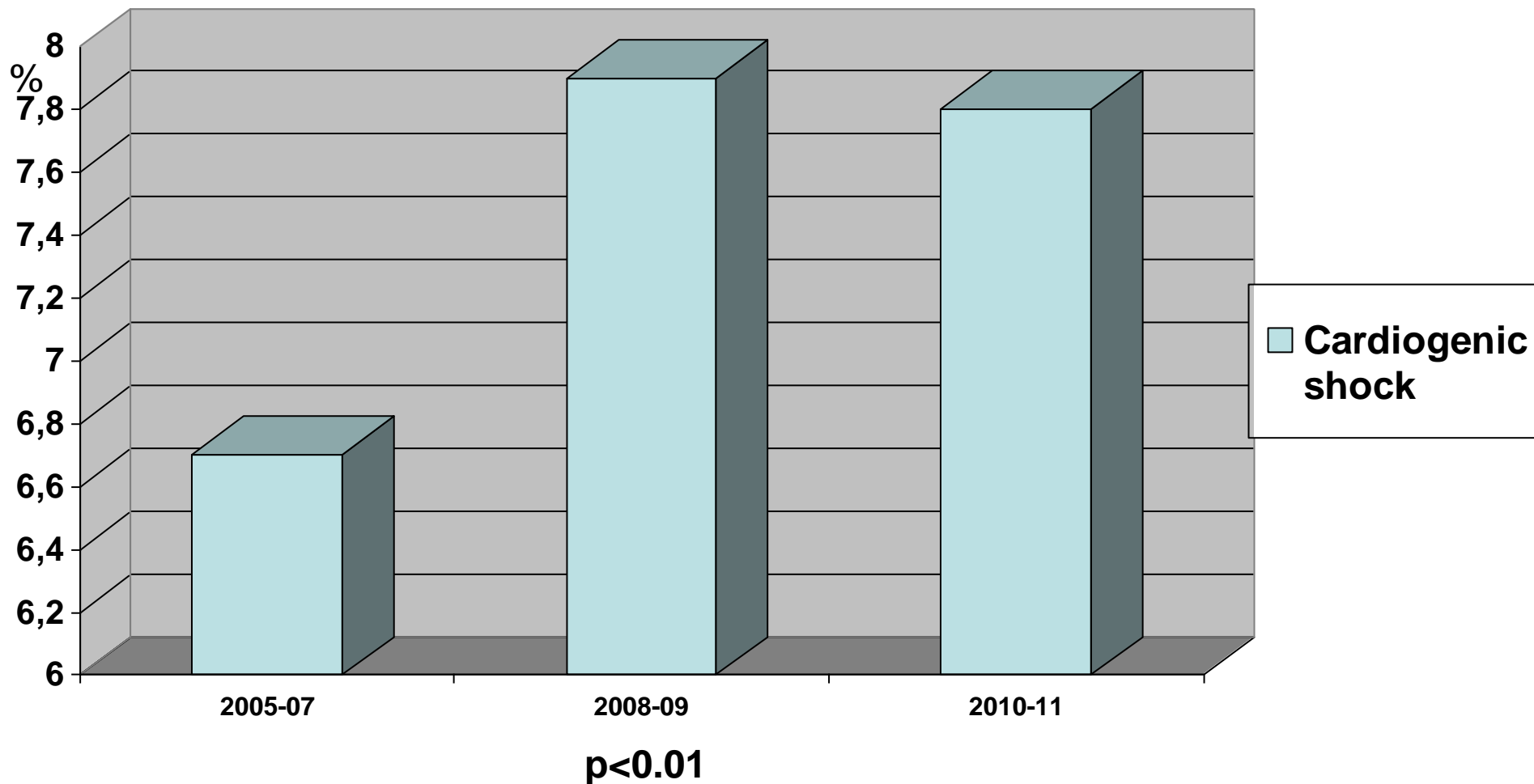
### Risk profile- STEMI



# RESULTS

## Croatian PPCI Network

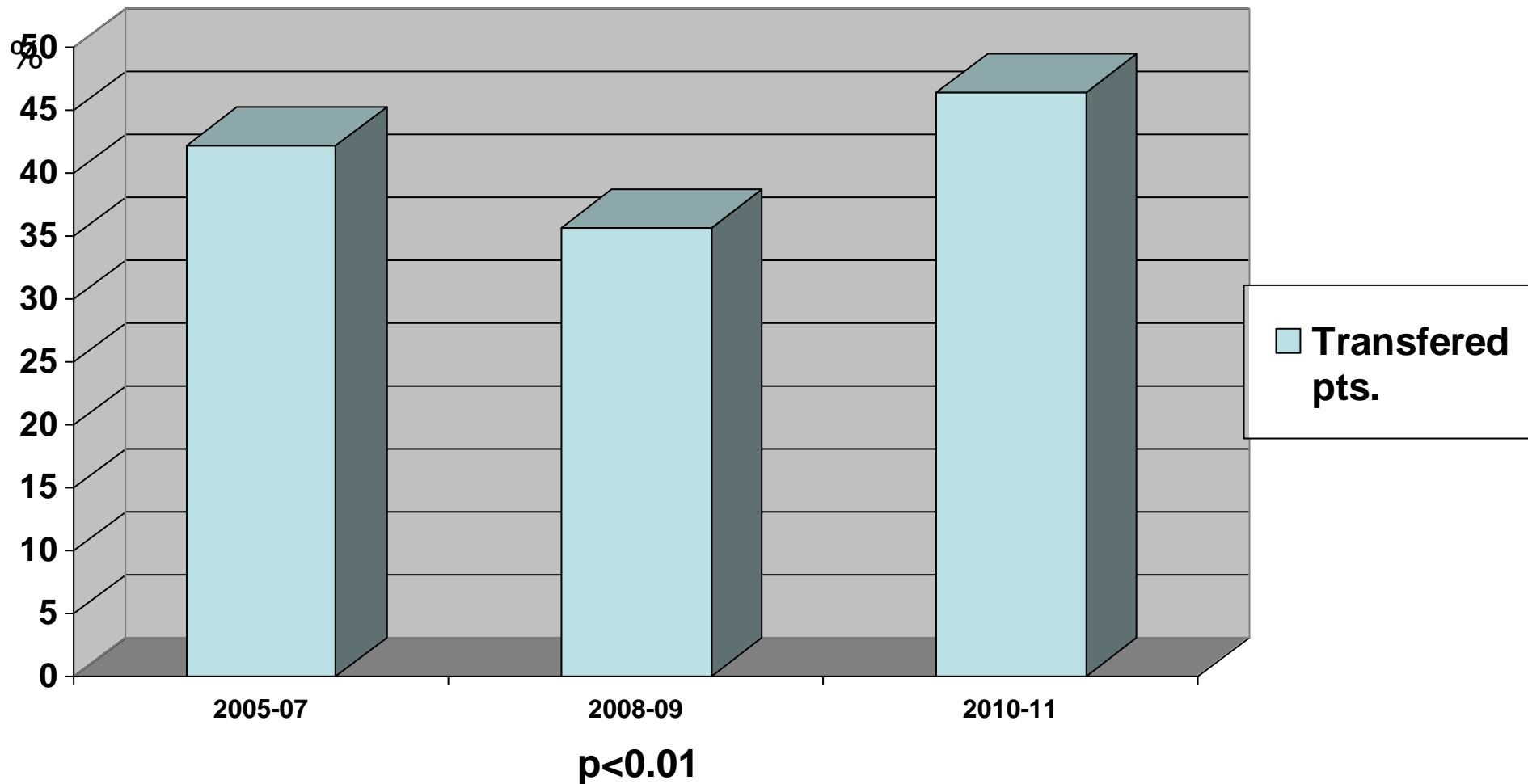
### Risk profile - STEMI



# RESULTS

## Croatian PPCI Network

### Risk profile - STEMI





# RESULTS

## Croatian PPCI Network

### STEMI

STEMI pts.	2005-07	2008-09	2010-11	p
<i>Symptom onset-to-door (min.)</i>	130	175	195	<0.01
<i>Door-to-balloon (min.)</i>	108	90	75	<0.01
<i>Symptom onset -to-balloon (min.)</i>	265	277	270	0.24

# RESULTS

## Croatian PPCI Network

### STEMI



STEMI pts.	2005-07	2008-09	2010-11	p*	p**
Postprocedural TIMI 3 flow (%)	87.1	82,1	84.5	<0.01	0.85
Mortality (in-hospital) (%)	4.4	4.9	7.6	<0.01	0.37
Mortality (6 month follow-up)	1.2	1.9	2.3	0.41	0.76
Pectoral angina (6 month follow-up)	12.1	21.6	36.0	<0.01	<0.01
MACE (other) (6 month follow-up)	6.4	23.2	14.0	<0.01	<0.01

\*  $\chi^2$  test

\*\* multivariate log-linear analysis



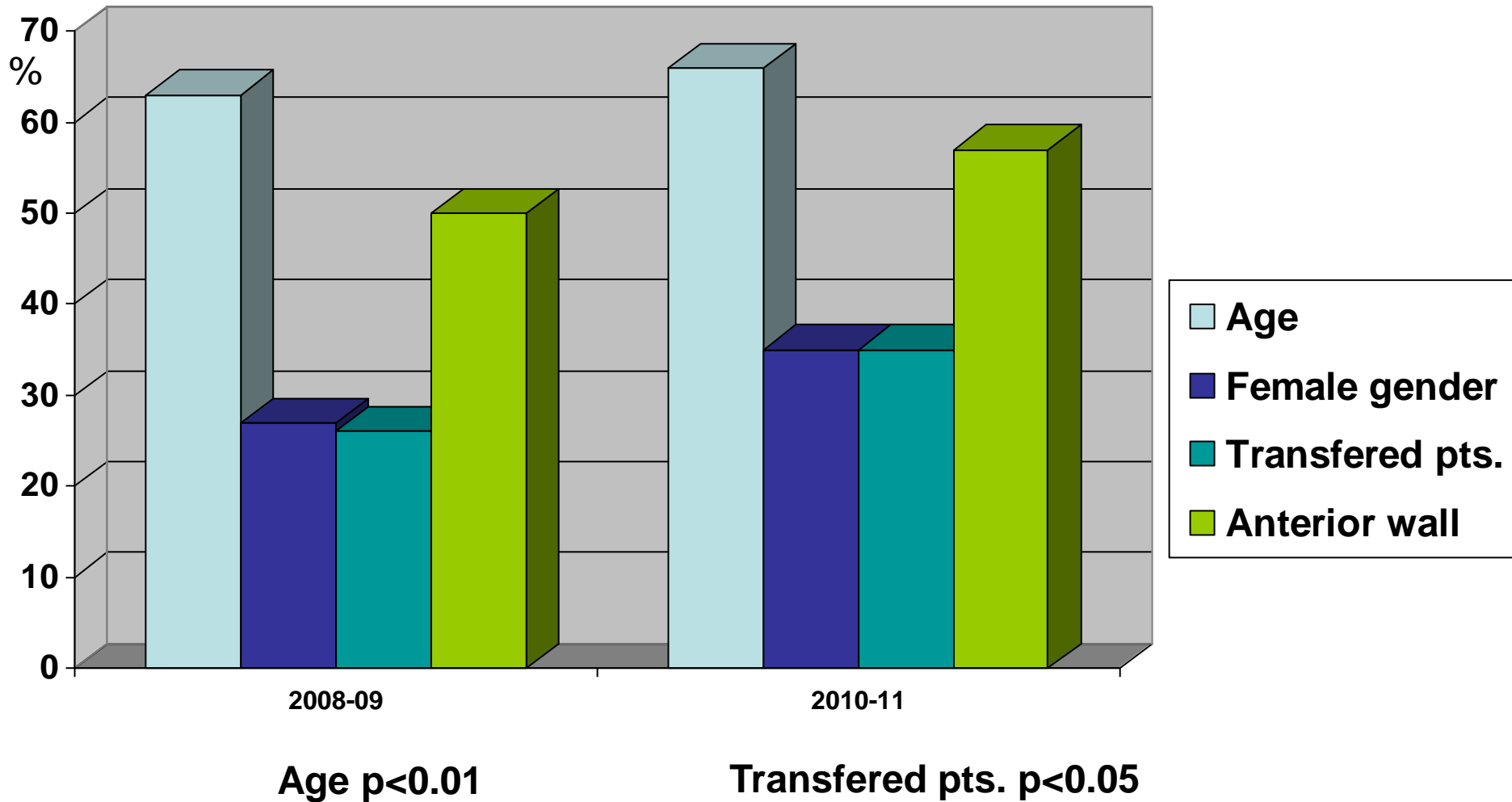
**NSTEMI**



# RESULTS

## Croatian PPCI Network

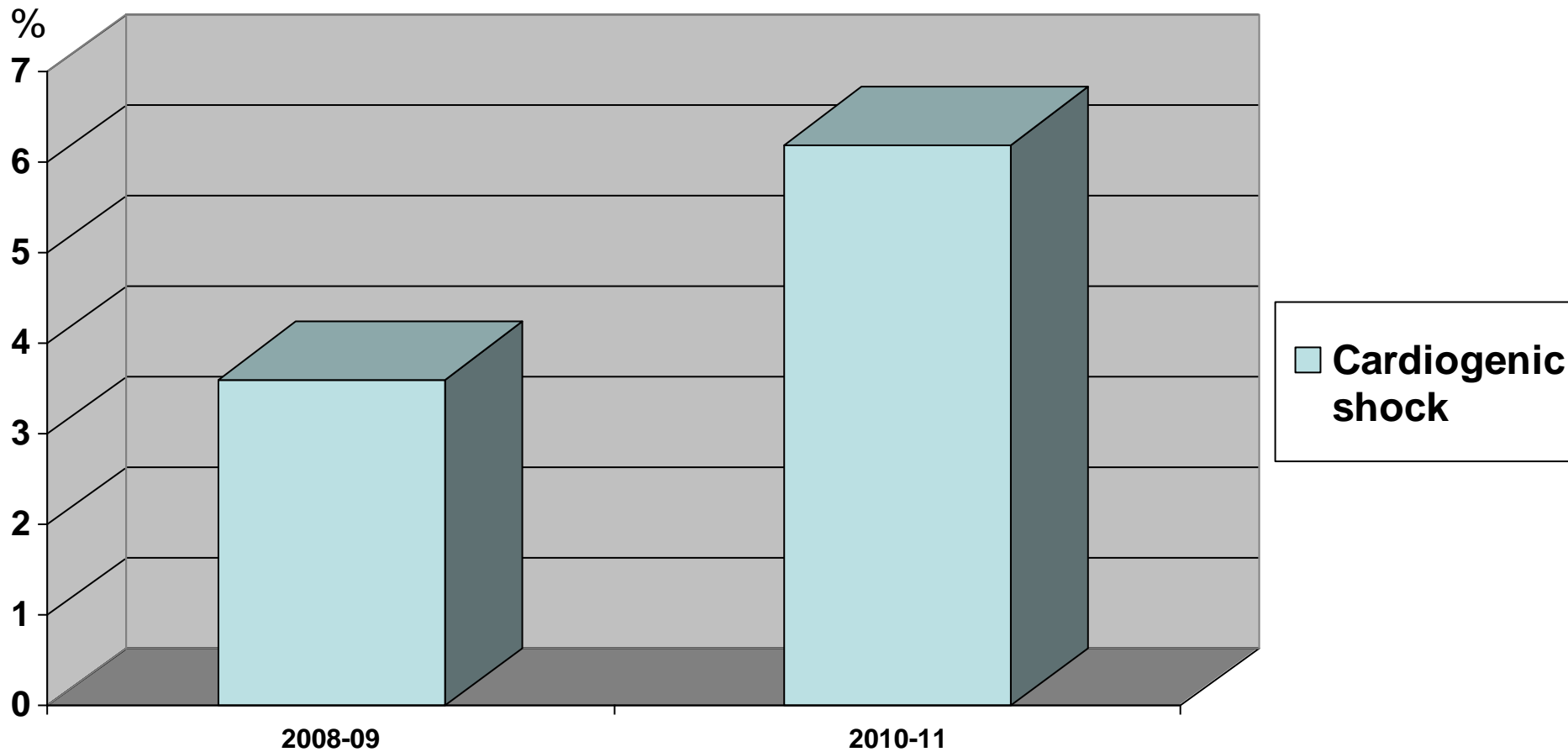
### Risk profile - NSTEMI



# RESULTS

## Croatian PPCI Network

### Risk profile - NSTEMI





# RESULTS

## Croatian PPCI Network

### NSTEMI

<b>NSTEMI pts. 2010-11</b>	<b>Pain-to-balloon &lt;2h</b>	<b>Pain-to-balloon 2-72h</b>
<b>Age (y)</b>	70	66
<b>Gender (M/F) (%)</b>	64/36	65/35
<b>Myocardial wall (% ant./inf.)</b>	55/45	44/56
<b>Cardiogenic shock (%)</b>	10.6	2.5
<b>Postprocedural TIMI 3 flow (%)</b>	89.2	92.1
<b>Mortality (in-hospital) (%)</b>	2.1	2.1

# RESULTS

## Croatian PPCI Network

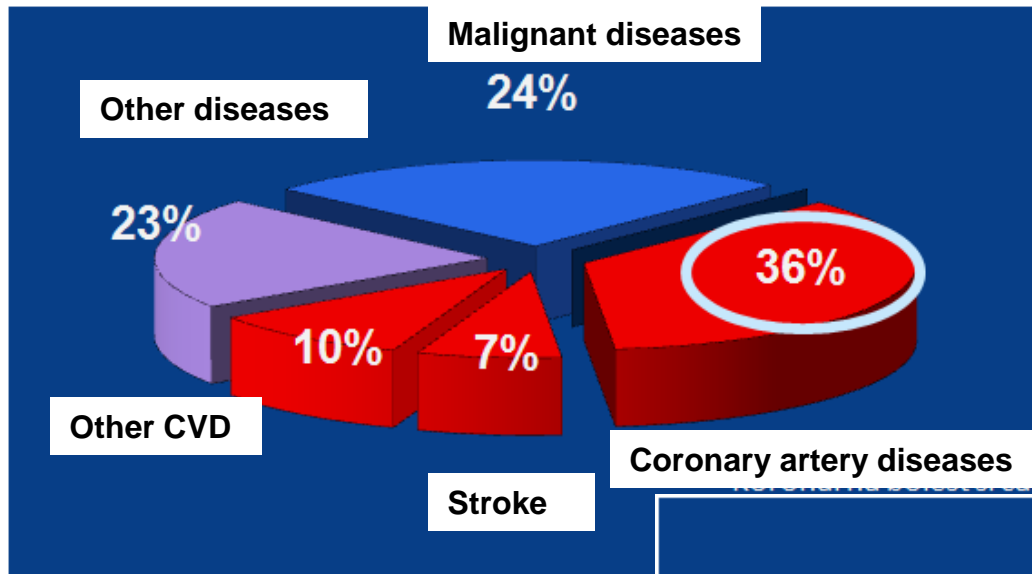
### NSTEMI



<b>NSTEMI pts.</b>	<b>2008-09</b>	<b>2010-11</b>	<b>p*</b>
<b>Postprocedural TIMI 3 flow (%)</b>	83.1	84.9	0.74
<b>Mortality (in-hospital) (%)</b>	2.2	4.9	0.07
<b>Mortality (6 month follow-up)</b>	2.2	4.7	0.13
<b>Pectoral angina (6 month follow-up)</b>	21.6	31.5	<0.05
<b>MACE (other) (6 month follow-up)</b>	16.6	29.2	<0.01

\*  $\chi^2$  test

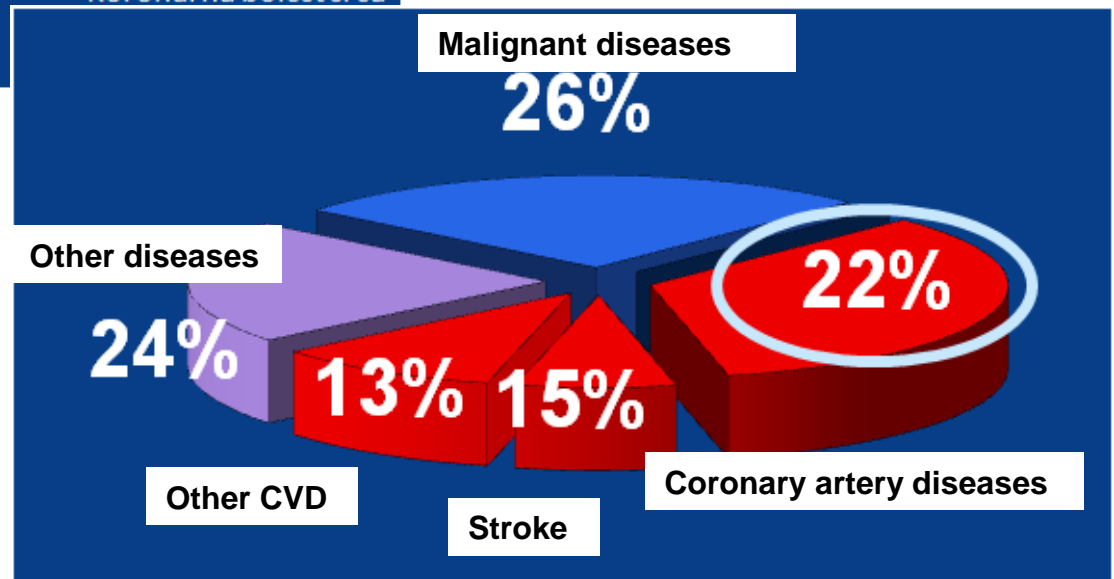
# CARDIOVASCULAR MORTALITY IN CROATIA



Year 2005  
**53%**

Year 2009  
**50%**

Year 2011 **49.3%**



# PROBLEMS OF CROATIAN PPCI NETWORK



- training and equipment to identify STEMI on ambulance level
- strategies to minimize early cardiac arrest (AED, CPR)
- therapeutic hypothermia
- funding reduction
- symptom onset-to-door time
- gray zones without 24/7 service (<10% population)

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- training and equipment to identify STEMI on ambulance level
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- symptom onset-to-door time
- gray zones without 24/7 service (<10% population)

Future actions: - funding increase

- continuous education of all network participants,
- media campaign and education of population about MI and adequate treatment of sudden cardiac death
- introduction of continuous register
- additional development of PCI centres in gray zones

# CONCLUSION



## CROATIAN PRIMARY PCI NETWORK

Despite higher risk profile of treated patients, new centers introduction and other problems:

- still ensures excellent results of STEMI/NSTEMI treatment

- at least one of the reasons for decrease of cardiovascular mortality



An aerial photograph of the island of Rab, Croatia. The image shows a coastal town with numerous buildings featuring red-tiled roofs. A large harbor area is visible, filled with many sailboats and yachts moored at various piers. The water transitions from a deep blue in the open sea to a clear, shallow turquoise near the shore. In the foreground, there are more residential buildings, a swimming pool, and a parking lot. A road winds through the town. The overall scene is a picturesque coastal town with a vibrant maritime atmosphere.

**THANKS!**

**ISLAND RAB, CROATIA**