

XXVIII GIORNATE CARDIOLOGICHE TORINESI

**ADVANCES IN CARDIAC  
ARRHYTHMIAS  
and  
GREAT INNOVATIONS  
IN CARDIOLOGY**

**Directors**

Florenzo Gaita  
Sebastiano Marra

**Scientific Committee**

Malcolm Bell, Usa  
Martin Borggrefe, Germany  
Leonardo Calò, Italy  
Amir Lerman, Usa  
Jean François Leclercq, France  
Dipen Shah, Switzerland

**Organization Committee**

Matteo Anselmino, Italy  
Carlo Budano, Italy  
Davide Castagno, Italy

**Turin  
October 13-15, 2016**

Centro Congressi  
Unione Industriale di Torino



# STEMI-ACS network in South Piemonte

Torino, 14 Ottobre 2016

Dr. A. Dellavalle

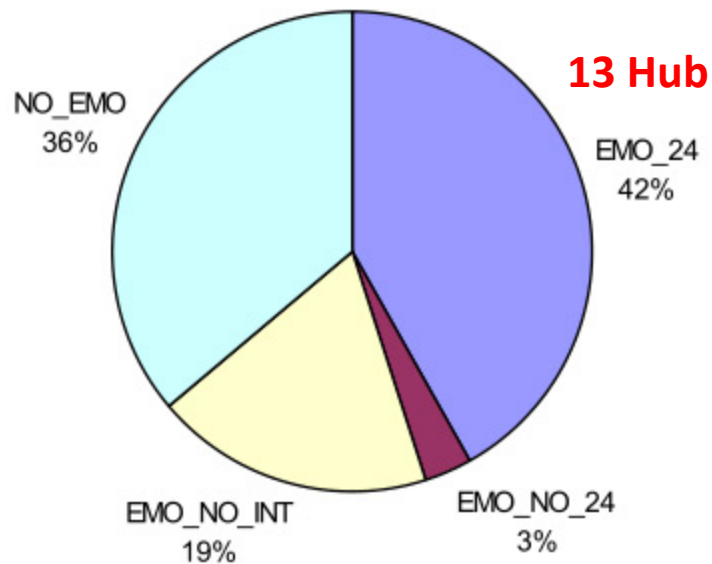
Direttore Cardiologia

Osp. S. Lazzaro - Alba

# FAST-STEMI 2013-14 vs Registro PRIMA 2005

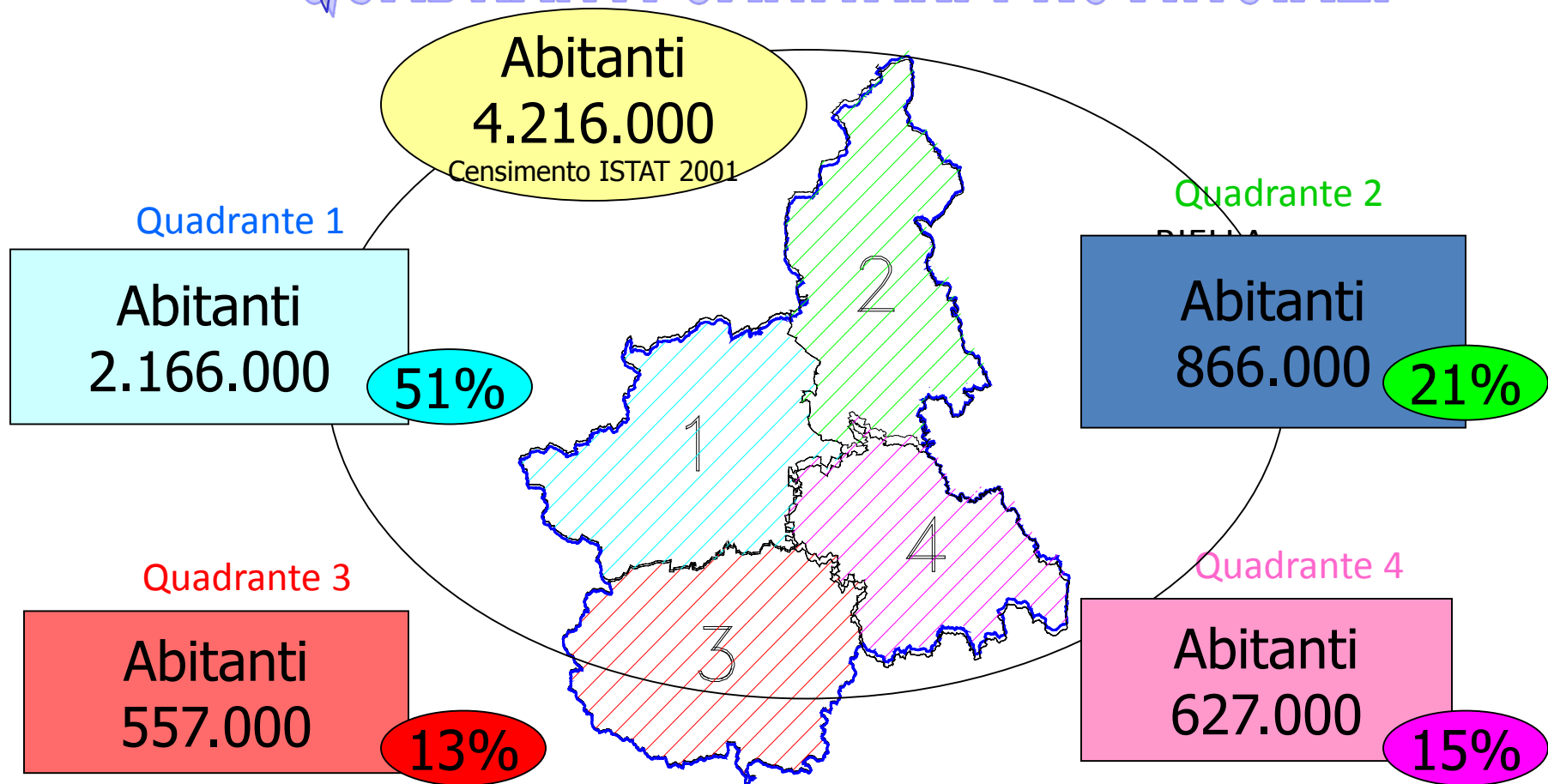
- Cosa ha cambiato nella nostra Regione la rete dello STEMI ufficializzata nel Gennaio 2011 nel percorso terapeutico del paziente con Infarto?
- Il Trattamento dello STEMI attualmente operato nella nostra Regione soddisfa le indicazioni delle Linee Guida?
- E nonostante la attuale pressochè assenza di trasmissione dell'ECG possiamo fare qualcosa per migliorare oggi la rete dello STEMI?

DISTRIBUZIONE TIPI STRUTTURE (n=31)





# REGIONE PIEMONTE

## QUADRANTI SANITARI PROVINCIALI







# Avvio Rete Regione Piemonte: 3 Gennaio 2011



 **UTIC HUB** **15**  
 **UTIC SPOKE** **15**

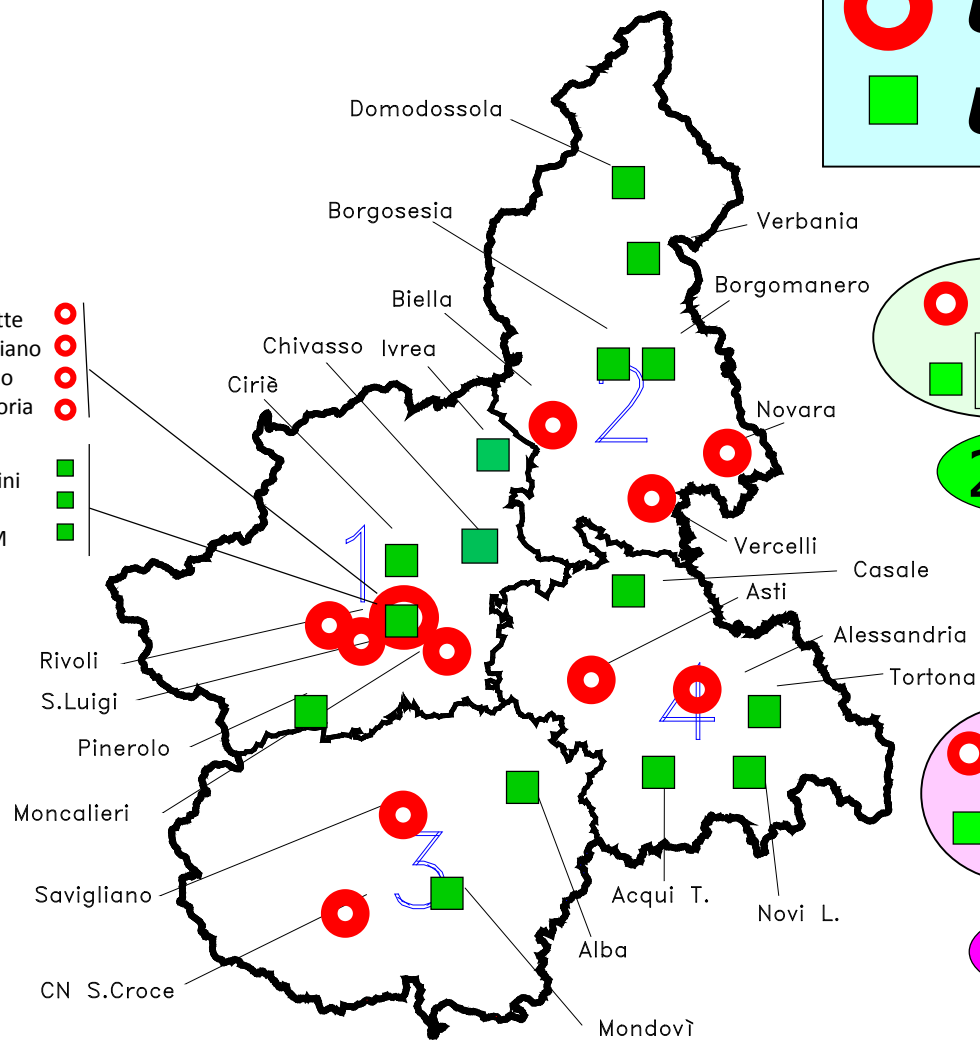
 **8**  
 **5**  
**51%**

TO Molinette  
 TO Mauriziano  
 TO G.Bosco  
 TO M.Vittoria  
 TO Martini  
 TO CTO  
 TO OIRM

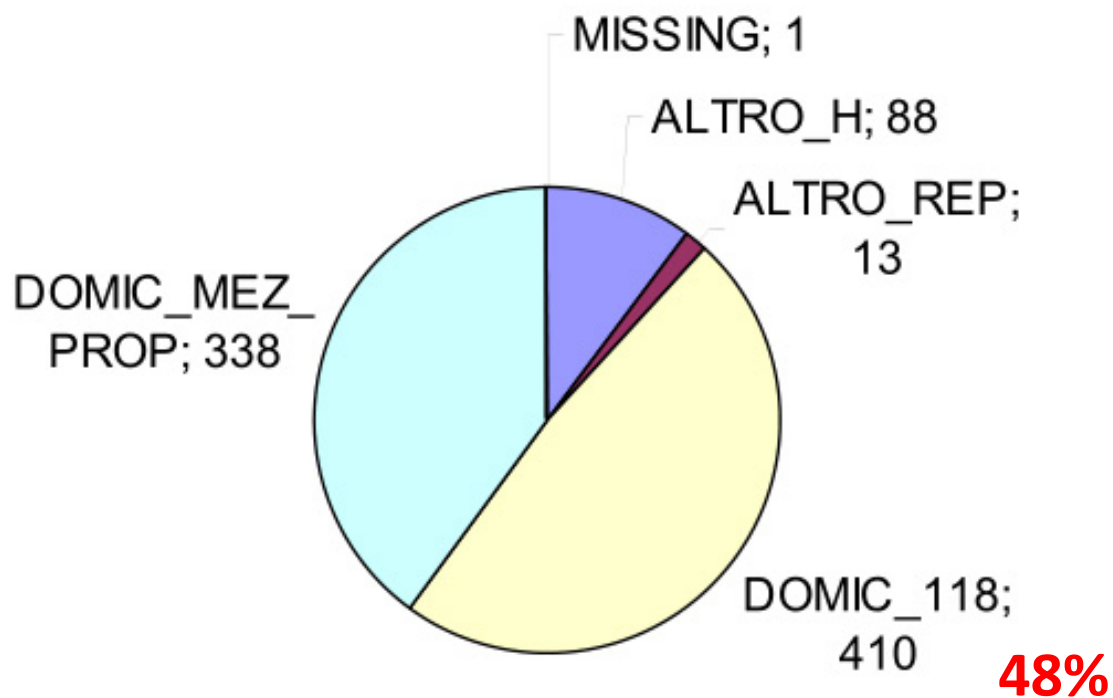
 **3**  
 **4**  
**21%**

 **2**  
 **2**  
**13%**

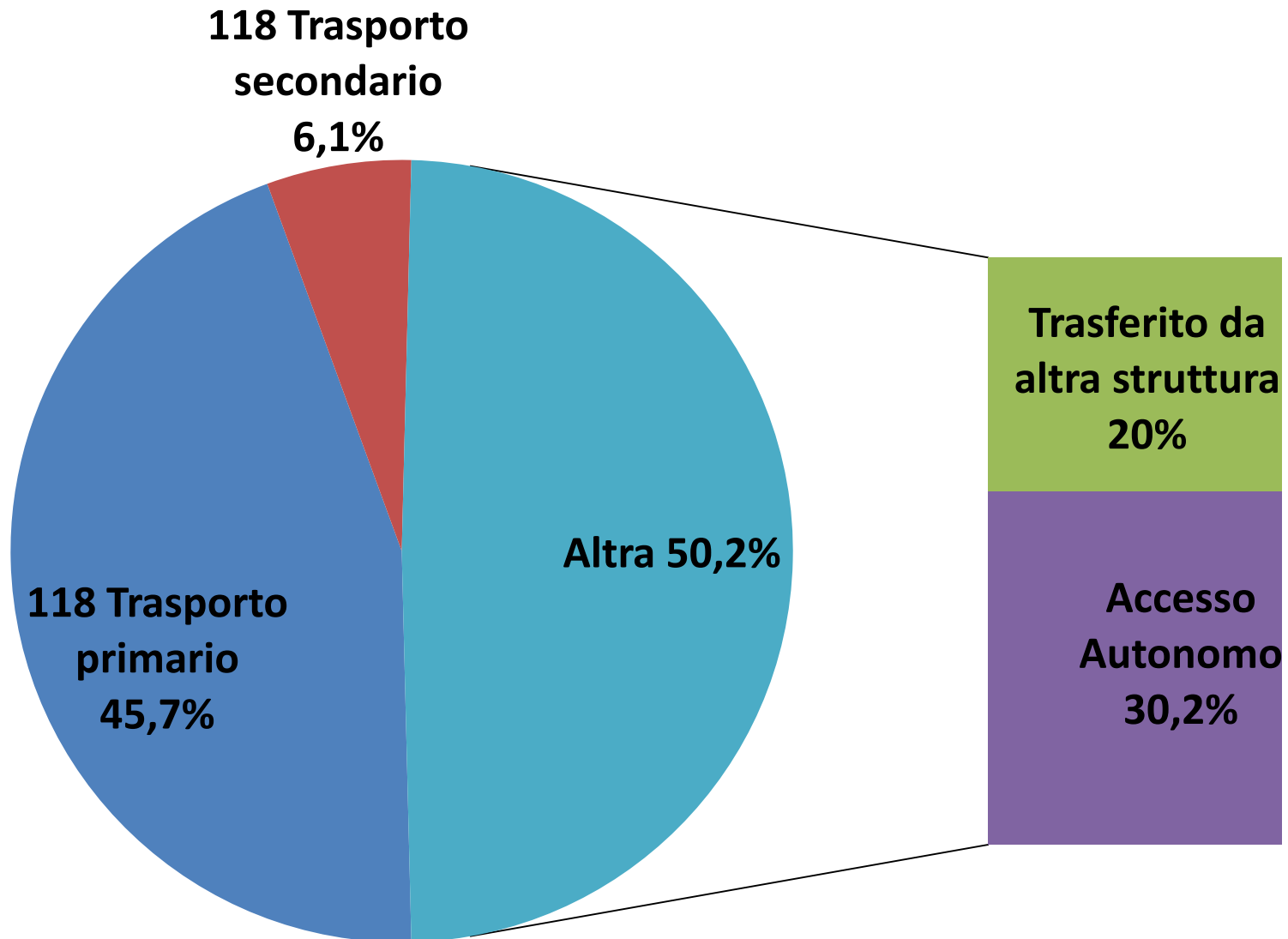
 **2**  
 **4**  
**15%**



### PROVENIENZA\_PZ (850)



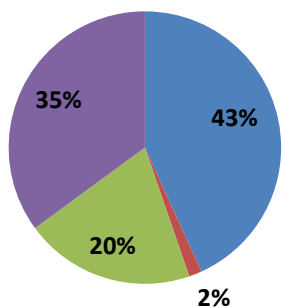
# FAST STEMI 2013: Accesso dei pazienti a struttura Hub.



Piemonte: Abitanti 4,5 milioni

•1232 schede

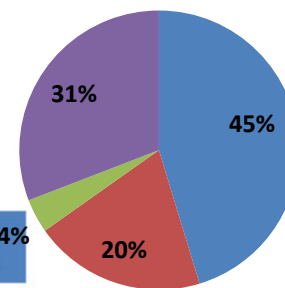
Quadrante 1



- 118 1°
- 118 2°
- Trasferito
- Accesso Autonomo

•457 schede

Quadrante 2



- 118 1°
- 118 2°
- Trasferito
- Accesso Autonomo

Abitanti

50%

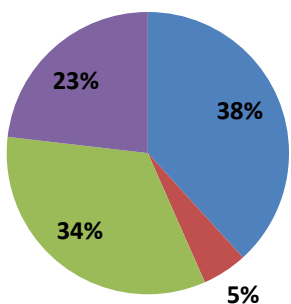
Abitanti

21%

quadrante	hub	spoke	hub+spoke
torino	9	4	13
novara	3	4	7
alessandria	2	4	6
cuneo	2	2	4
	16	14	30

•272 schede

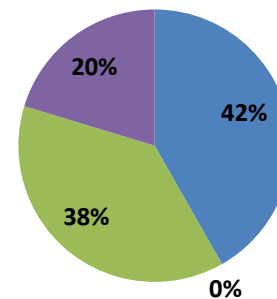
Quadrante 4



- 118 1°
- 118 2°
- Trasferito
- Accesso Autonomo

•261 schede

Quadrante 3



- 118 1°
- 118 2°
- Trasferito
- Accesso Autonomo

Abitanti

12%

Abitanti

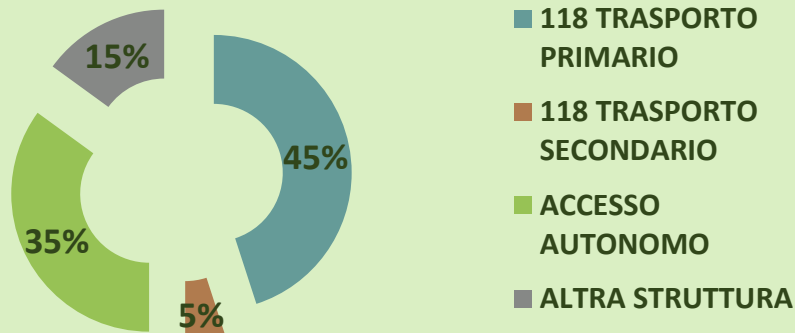
17%





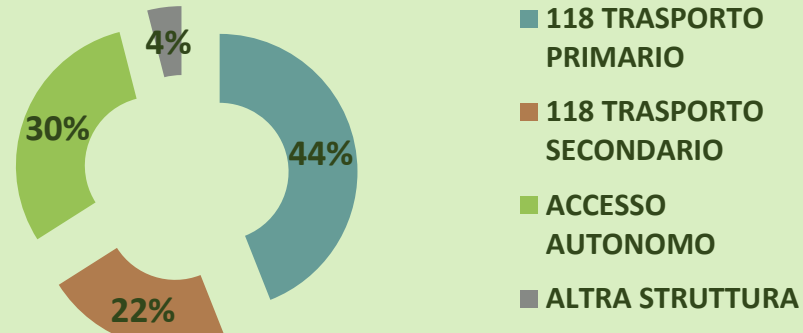
# Provenienza dei pazienti nei quadranti anno 2014

## Q1



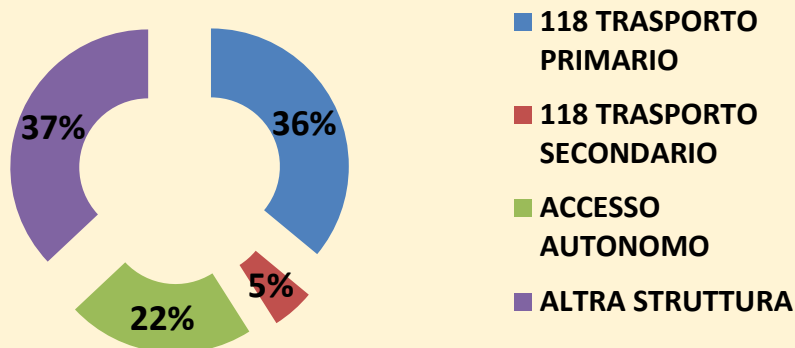
118: 45% → 50%

## Q2



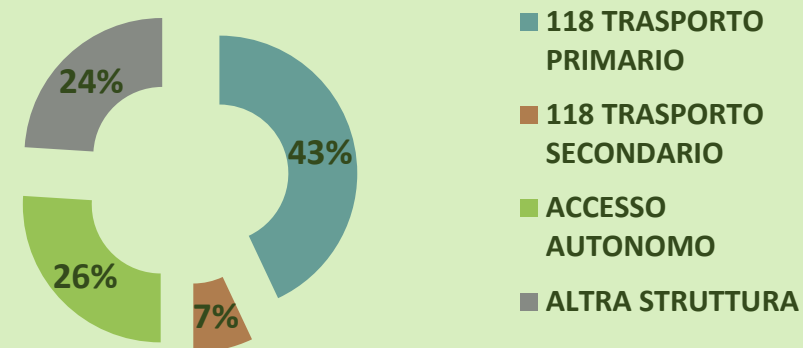
118: 65% → 67%

## Q3



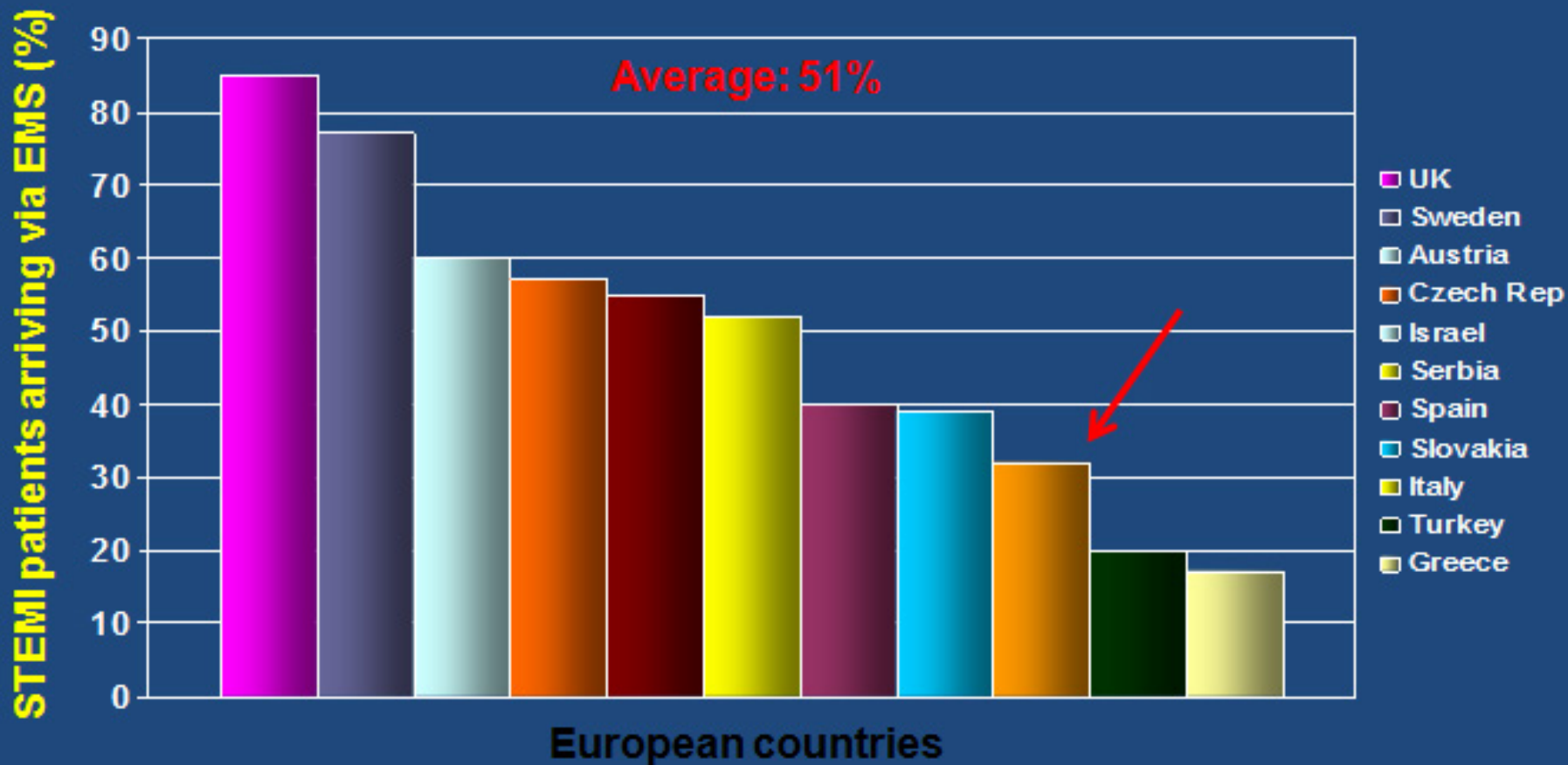
118: 42% → 41%

## Q4

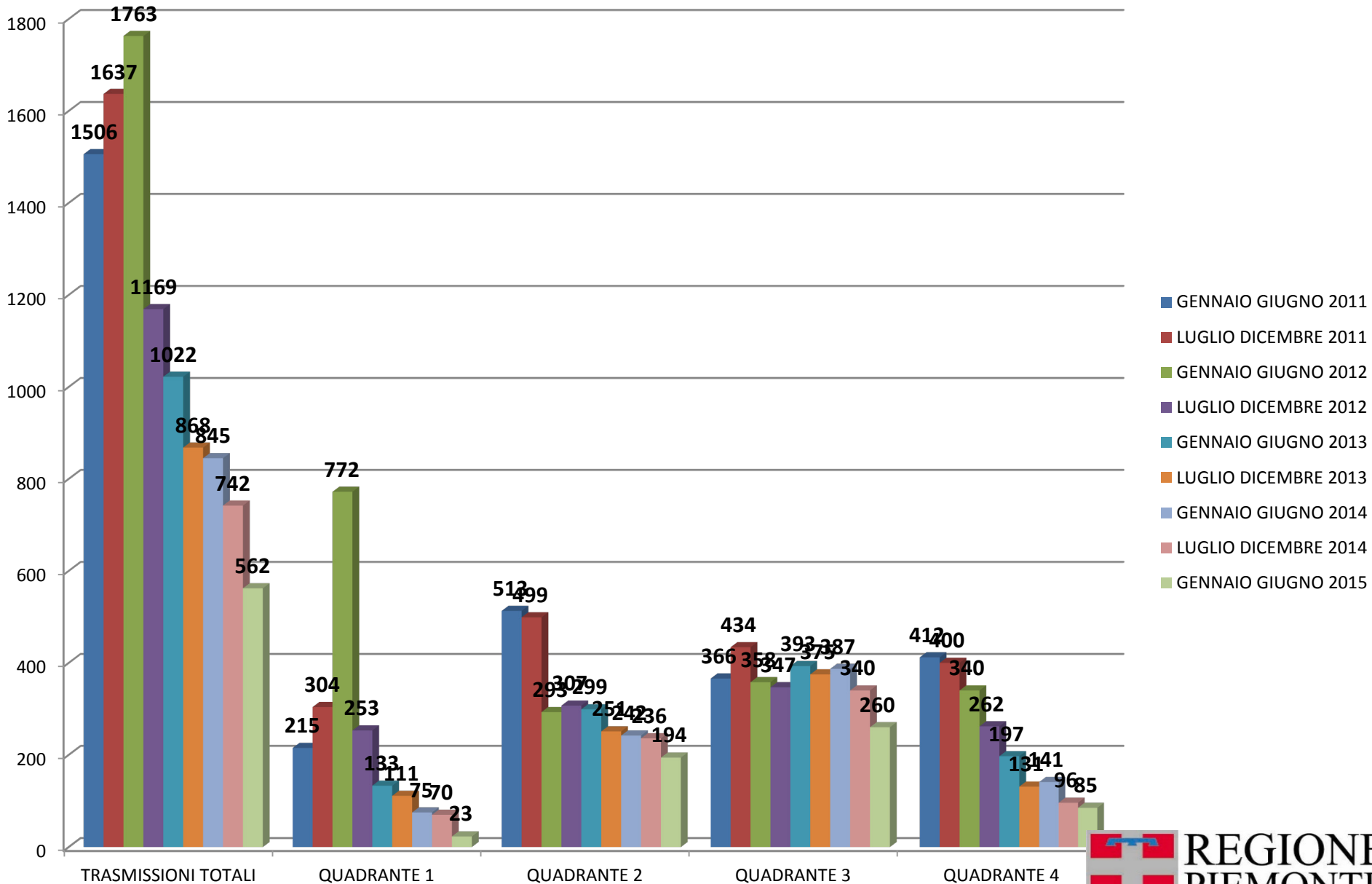


118: 43% → 50%

# Proportion of STEMI patients arriving at first hospital via EMS in Europe



# Teletrasmissioni ECG

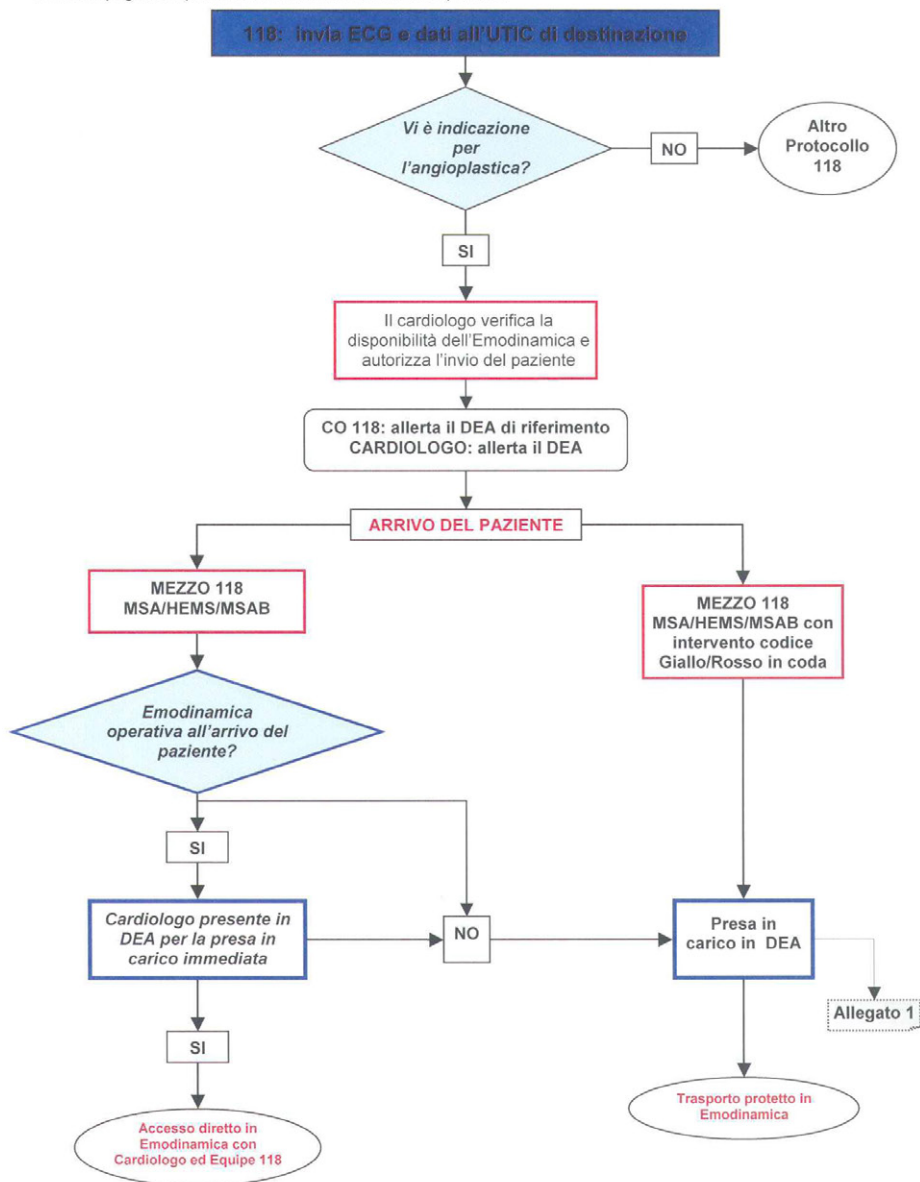


PERCORSO INTRAOSPEDALIERO PER LA GESTIONE  
DEI PAZIENTI CON STEMI CANDIDATI A PCI PRIMARIA O FACILITATA  
TRASPORTATI DAL SISTEMA EMERGENZA 118

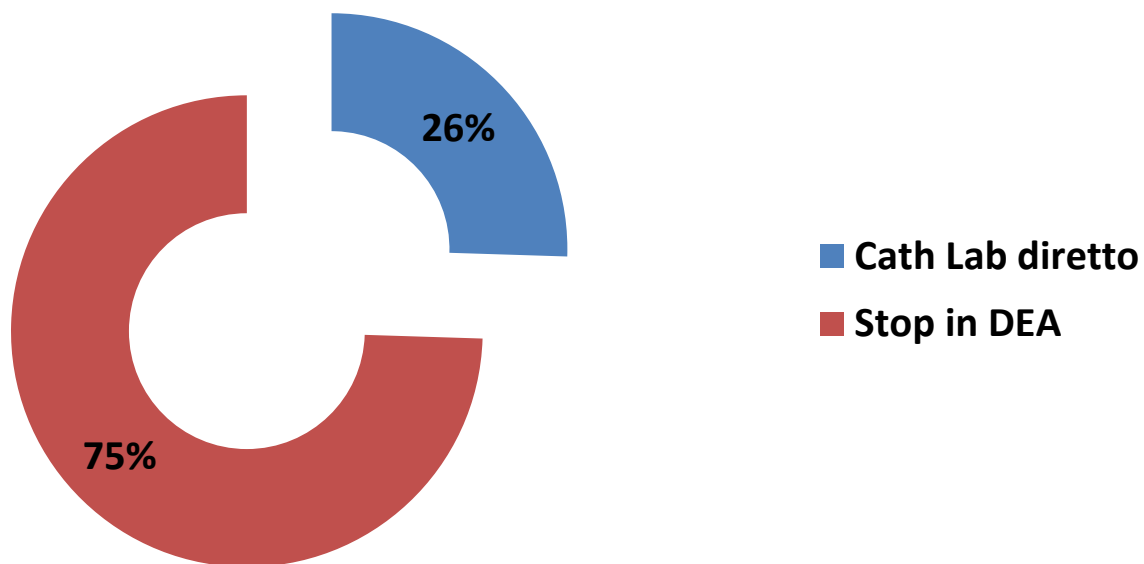
Obiettivi:

→ Ridurre al minimo i tempi "door to balloon".

→ Accompagnare il paziente in Emodinamica in modo protetto.



# 1281 STEMI portati dal 118



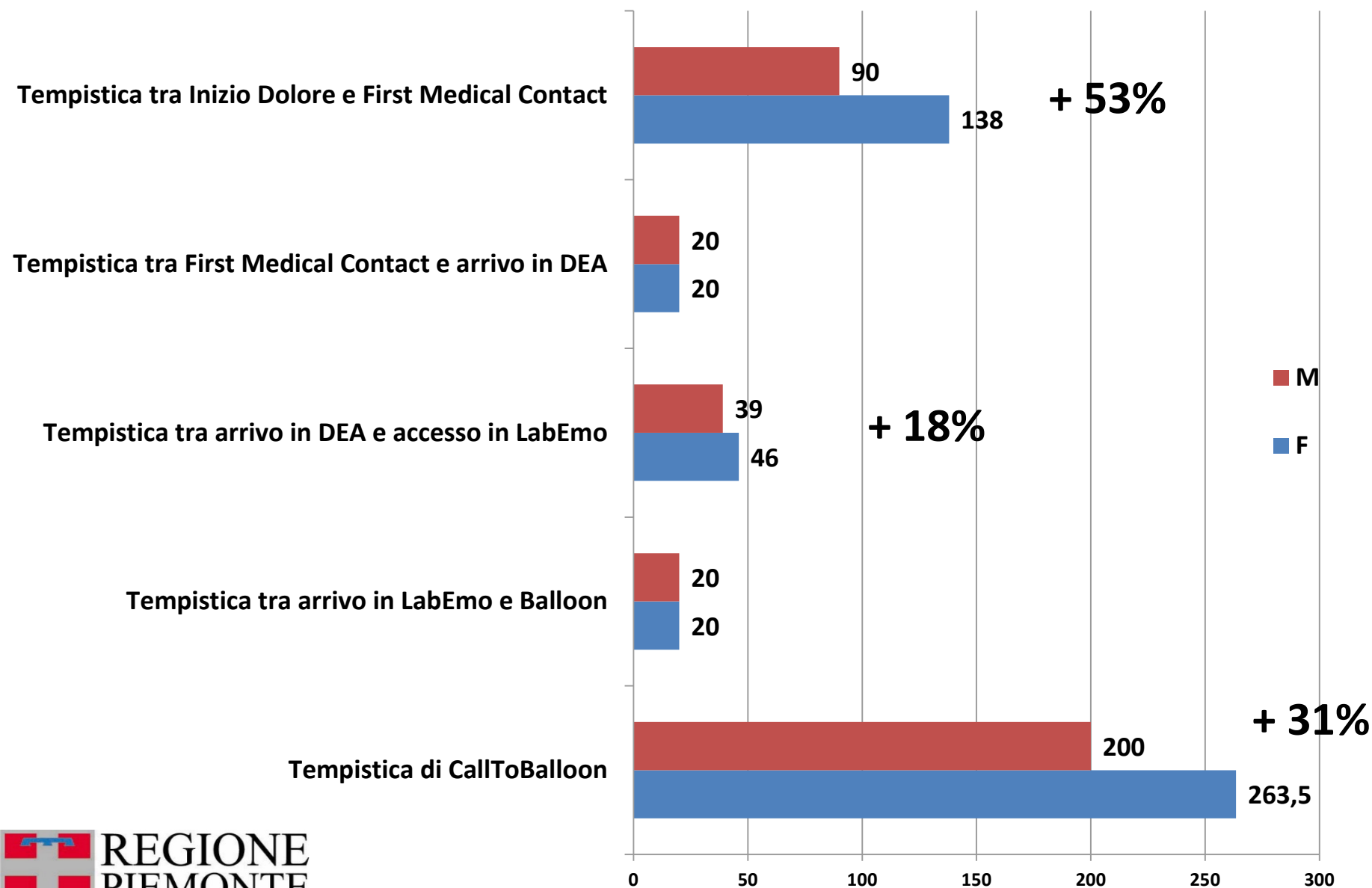
Top three:

- Novara 69,8%
- Alessandria 36,9%
- Maria Vittoria 35,8%

**Risultati: tempi di trattamento**

<b>TEMPO X LISI</b>					
LISI (CON/SENZA 2B3A) DOPO_ARRIVO	290				
TEMPO (MIN): PS - LISI	MEDIA	DS	MEDIANA	MIN	MAX
	59	100	35	4	1313
<b>TEMPO X PTCA</b>					
CON TEMPI COMPLETI, NON_TRASFERITI	269				
TEMPO (MIN): PS – INIZIO PTCA	MEDIA	DS	MEDIANA	MIN	MAX
	116	106	80	19	724

# Tempi di reazione allo STEMI in relazione al genere



# FAST-STEMI 2013-14 vs Registro PRIMA 2005

- Cosa ha cambiato nella nostra Regione la rete dello STEMI ufficializzata nel Gennaio 2011 nel percorso terapeutico del paziente con Infarto?
- Il Trattamento dello STEMI attualmente operato nella nostra Regione soddisfa le indicazioni delle Linee Guida?
- E nonostante la attuale pressochè assenza di trasmissione dell'ECG possiamo fare qualcosa per migliorare oggi la rete dello STEMI?





- What is Stent for Life Initiative
- Mission
- Objectives
- SFL @ International Congresses
- Participating organizations
- Project Executive Board
- Project Partners
- Scientific Evidence
- News and Press Release
- Contact



## Obiettivi del progetto

The project has been rolled out in ten countries so far. Each country is implementing an action programme to increase patient access to p-PCI. The following targets were set:

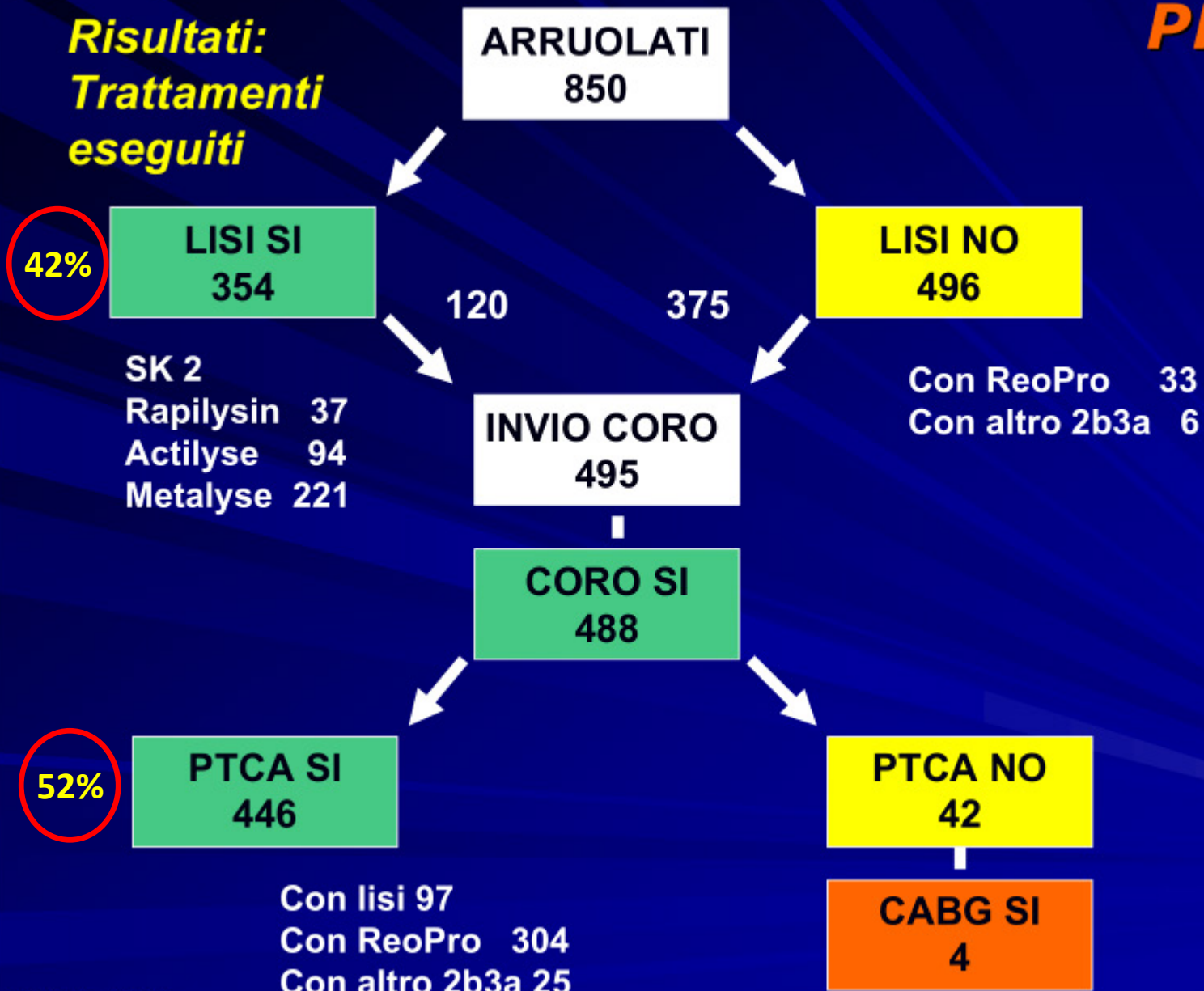
- To increase the use of primary PCI to more than 70% among all STEMI patients
- To achieve primary PCI rates of more than 600 per one million inhabitants per year
- To offer 24/7 service for PCI procedures at all invasive facilities to cover the country STEMI population need.

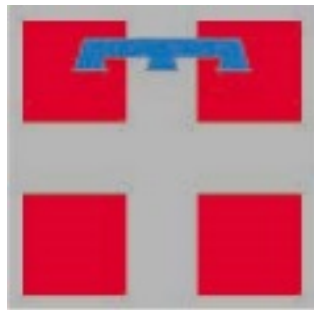


Stent for Life is a joint initiative between the European Association of Percutaneous Cardiovascular Interventions (EAPCI), a registered branch of the European Society of Cardiology (ESC), and EuroPCR



**Risultati:  
Trattamenti  
eseguiti**





# REGIONE PIEMONTE

Tutti gli STEMI

SDO 2014

3742 → 2584 (69,1%) pPCI

3337 → 2584 (77,4%) pPCI

STEMI solo  
Cardio

612 pPTCA x milione di ab.

FAST STEMI 2014

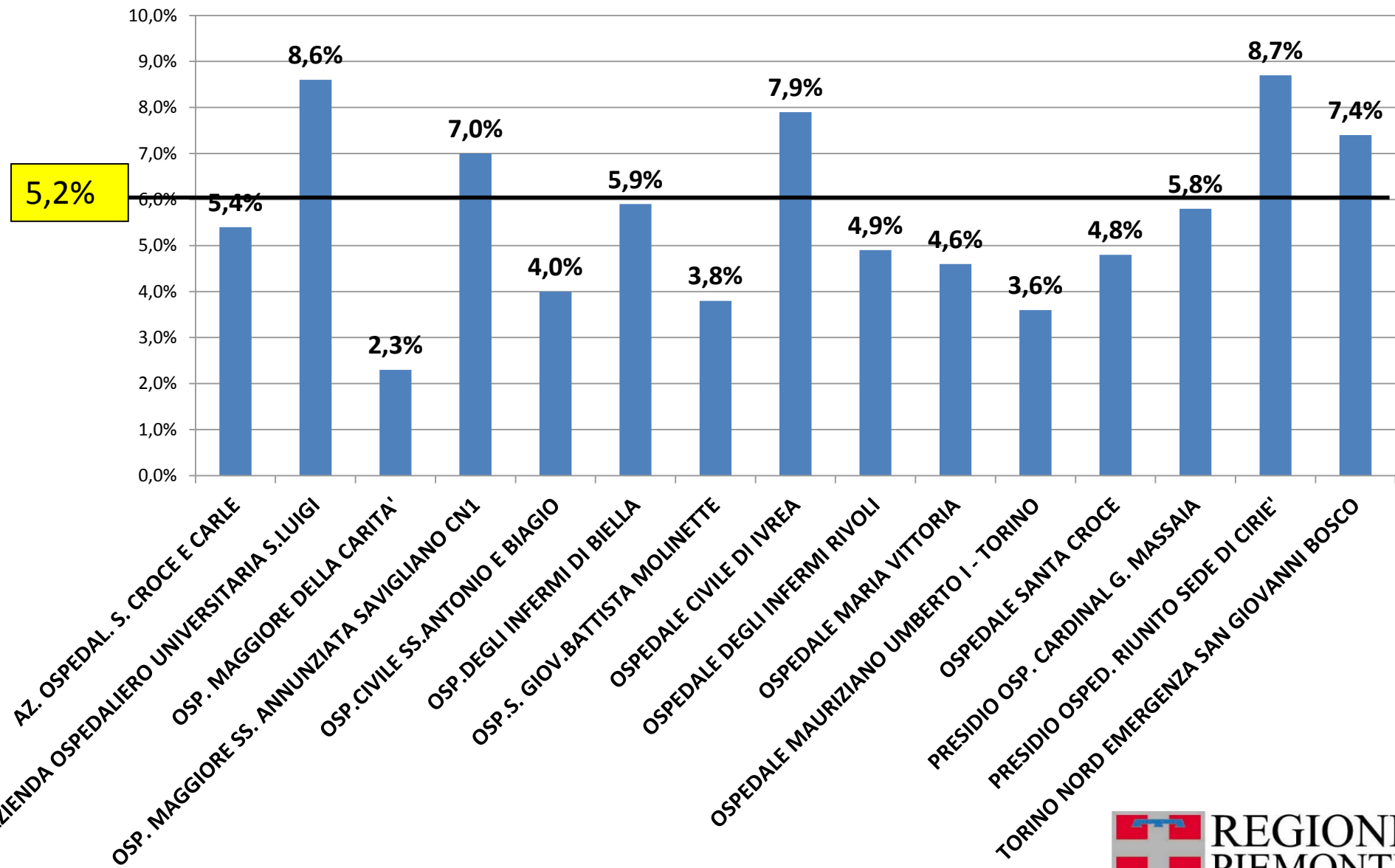
2595 → 2309 (89,0%) pPCI

## ***Outcomes generali***

**ARRUOLATI**  
**850**

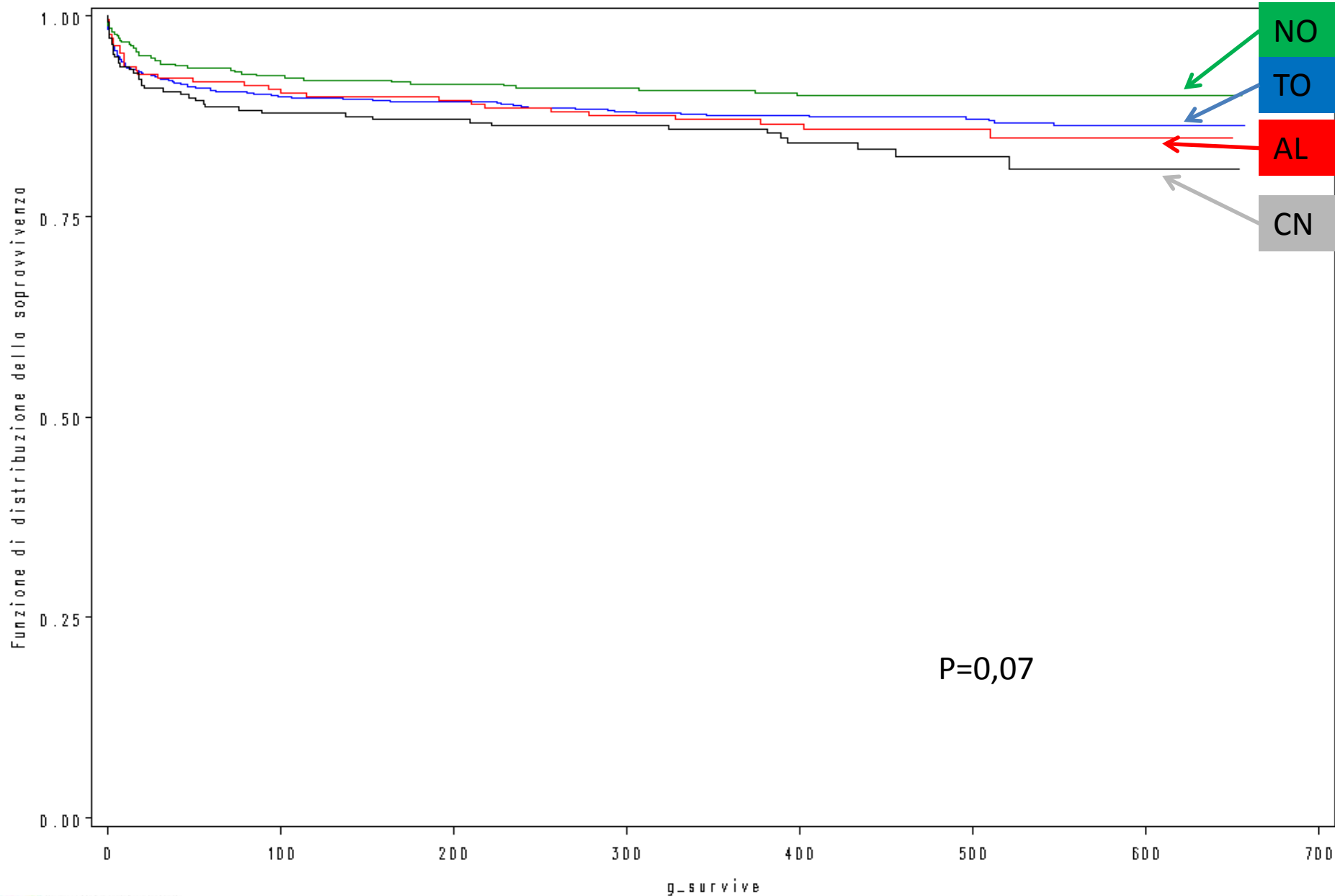
• <b>DECESSO</b>	<b>67</b>	<b>(7,9%)</b>
• <b>STROKE</b>	<b>11</b>	<b>(1,3%)</b>
• <b>RE-IMA</b>	<b>14</b>	<b>(1,6%)</b>
• <b>COMPL.MECC</b>	<b>16</b>	<b>(1,9%)</b>

# Mortalita' intraospedaliera (media regionale 5,2%)



# Curva di sopravvivenza al 20.10.2014 per quadrante

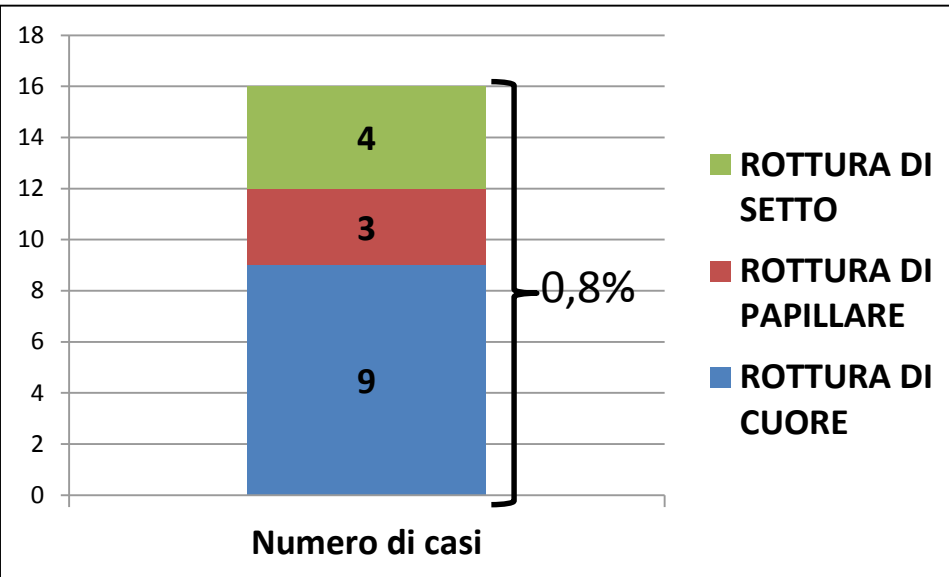
Corte 2013 Rete FASTEMI



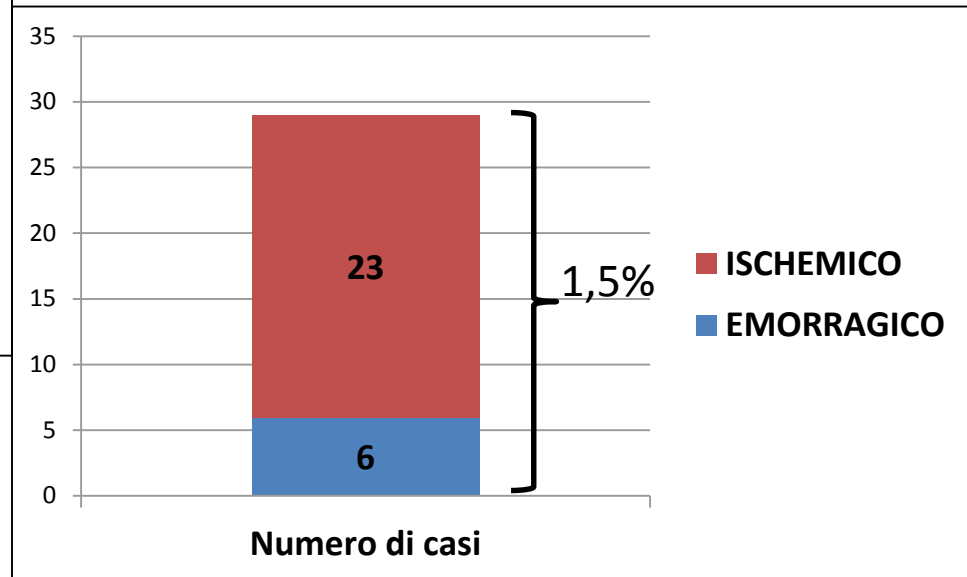
NO  
TO  
AL  
CN

# Complicanze intraospedaliere

## Complicanze Meccaniche



## Stroke

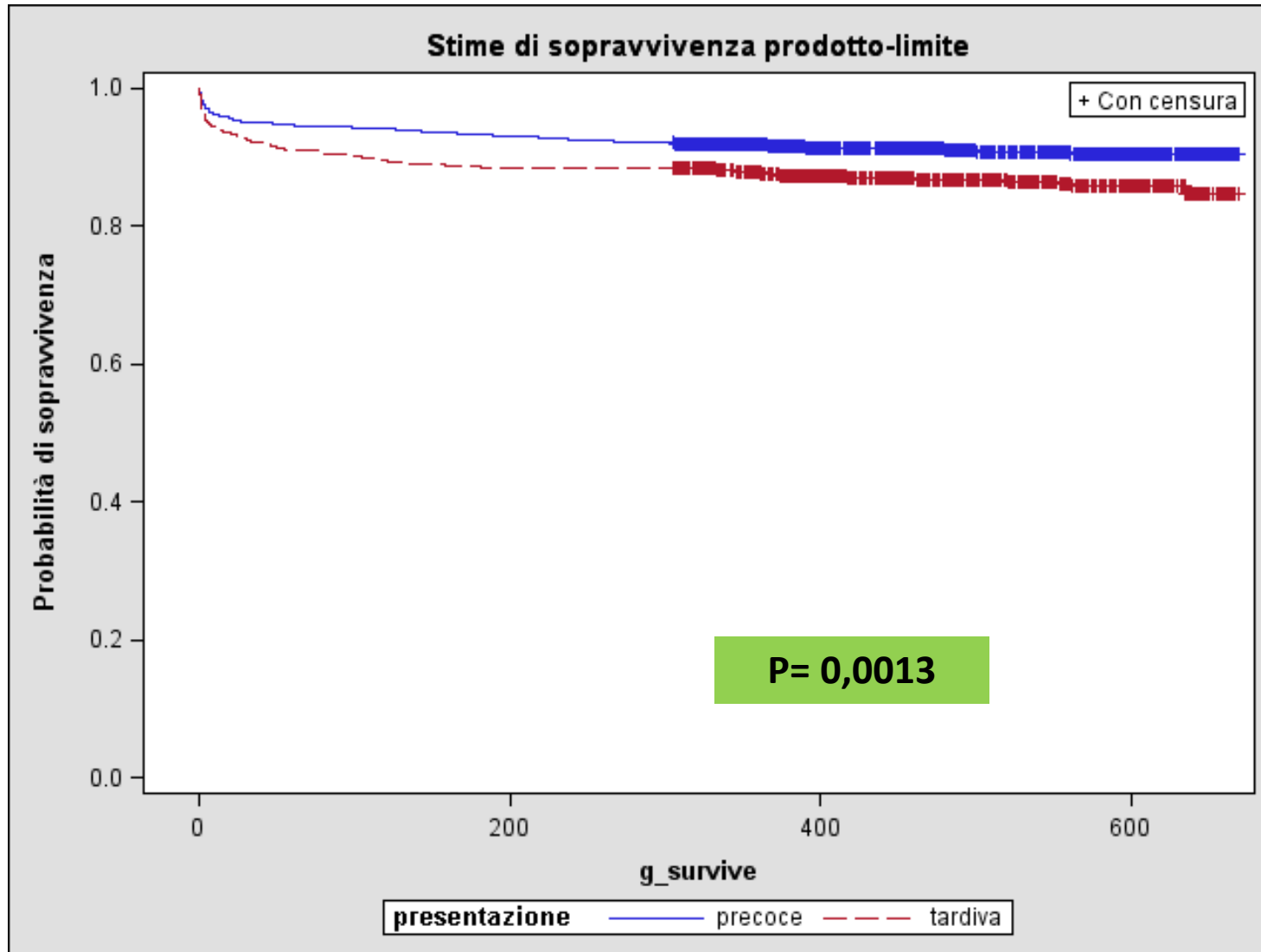


# FAST-STEMI 2013-14 vs Registro PRIMA 2005

- Cosa ha cambiato nella nostra Regione la rete dello STEMI ufficializzata nel Gennaio 2011 nel percorso terapeutico del paziente con Infarto?
- Il Trattamento dello STEMI attualmente operato nella nostra Regione soddisfa le indicazioni delle Linee Guida?
- E nonostante la attuale pressochè assenza di trasmissione dell'ECG possiamo fare qualcosa per migliorare oggi la rete dello STEMI?



# STIMA DI MORTALITA' PER CHIAMATA PRECOCE AL 118



# SHOCK CARDIOGENO

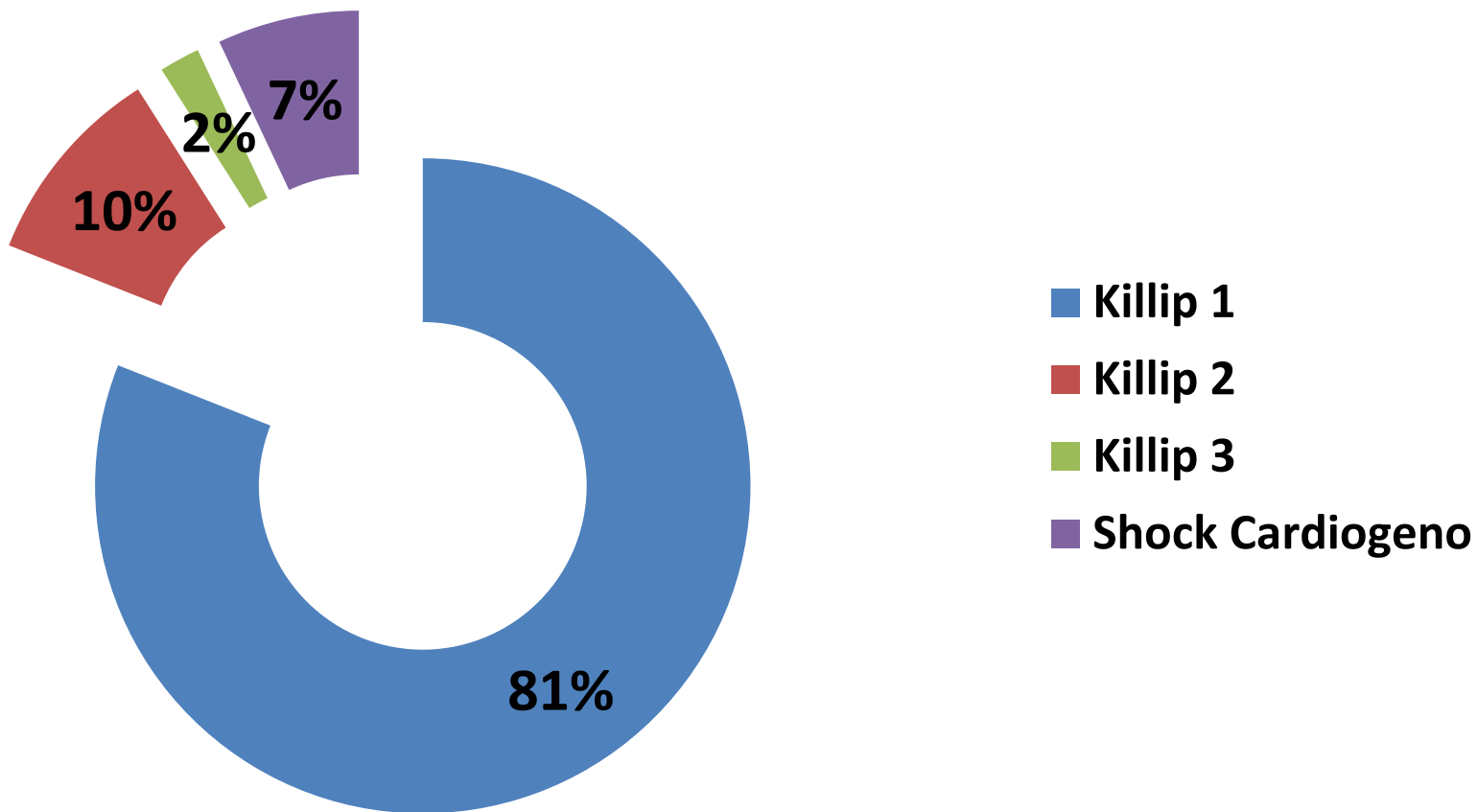
## PTCA PRIMARIA

- **Anni '80: inizio del trattamento aggressivo dell'IMA in presenza di SC; migliora la prognosi**

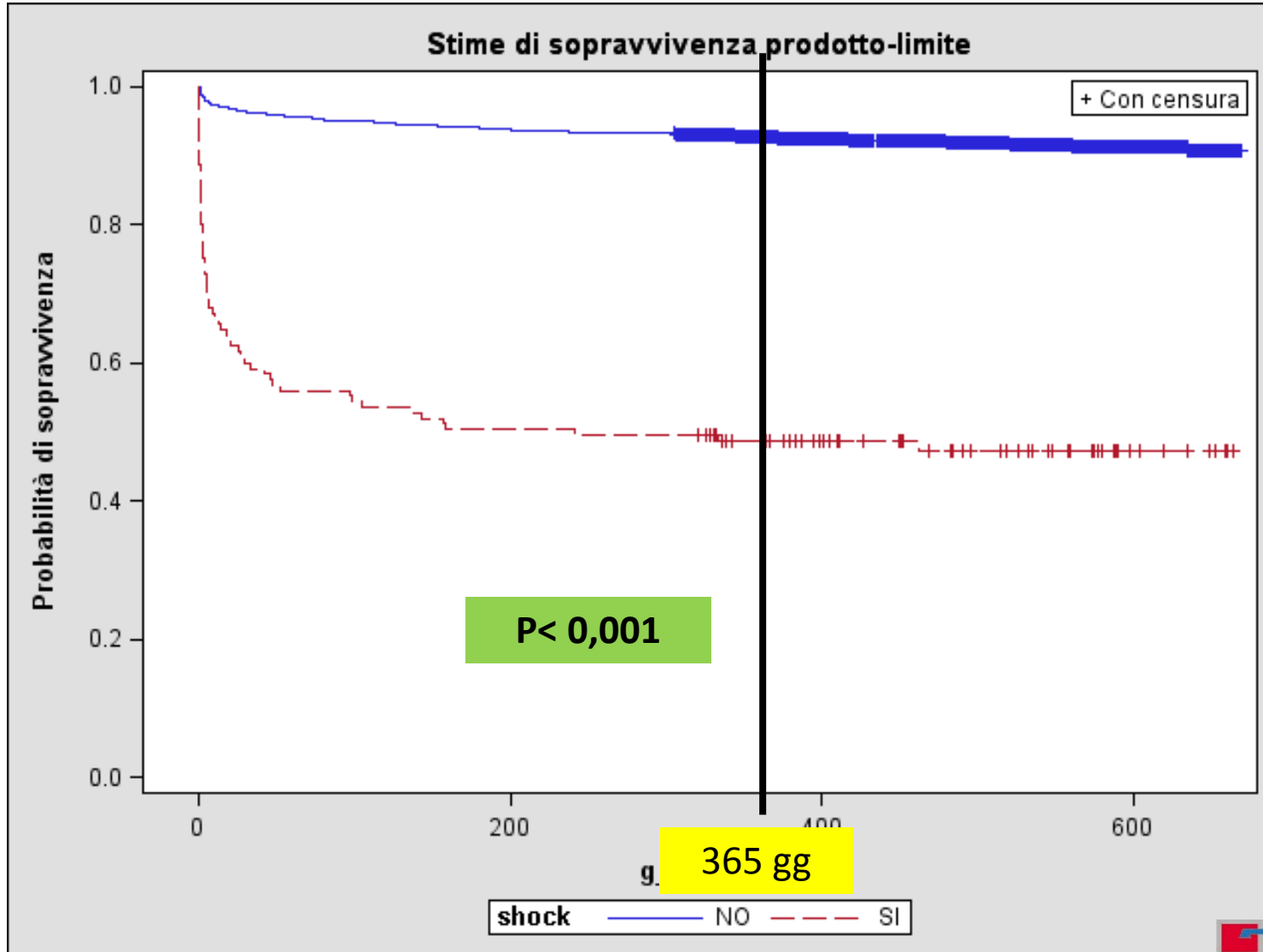
**PTCA primaria e SC (St. Luke Hospital, Kansas City) (1.000 pz) :**

- **un'incidenza di SC nella PTCA primaria 7.9%**
- **mortalità intraospedaliera 44%**
- **successo angiografico: mortalità 37%**
- **fallimento della procedura: mortalità 79%**
- **ripristino di flusso coronarico ottimale (TIMI 3) solo nel 73%**

# Classe Killip all'ingresso



# Mortalita' per shock



# Compiti e composizione delle commissioni di area vasta / macro-area

## COMPOSIZIONE

Le commissioni di **area vasta / macro-area** saranno composte da:

- Un referente del 118 dell'area;
- Un Cardiologo clinico (UTIC HUB);
- Un Cardiologo clinico (UTIC Spoke);
- Un Cardiologo Interventista;
- Un Responsabile di Pronto Soccorso;
- **Un Direttore sanitario di un Ospedale dell'area.**

## COMPITI

- 1) Compilare le check-list indicate dalla Commissione Regionale;
- 2) Proporre percorsi diagnostico-terapeutici specifici per le aree, sulla base delle specifiche esigenze logistiche e dotazioni strumentali, assegnando un percorso terapeutico ben definito sulla base delle distanze dal centro HUB;
- 3) Coordinamento delle varie unità di rete, con riunioni ad hoc per le aree a metà tra le diverse unità.

A panoramic view of a mountain range under a clear blue sky. In the foreground, a rugged, rocky peak is visible on the right side. Below the peak, a vast valley is filled with a thick layer of white clouds, creating a 'sea of clouds' effect. The mountains in the distance are layered, with some peaks appearing as dark silhouettes against the lighter sky. The overall scene is serene and majestic.

***Grazie per l'attenzione***



# Shock cardiogeno

## Registro Blitz 1 (Eur Heart J 2003):

IMA in shock: 7,1%

IMA ad alto rischio: 66%

### TM a 30 gg

- IMA in shock: 65%
- IMA non in shock: 2,9%

### TM a 30 gg

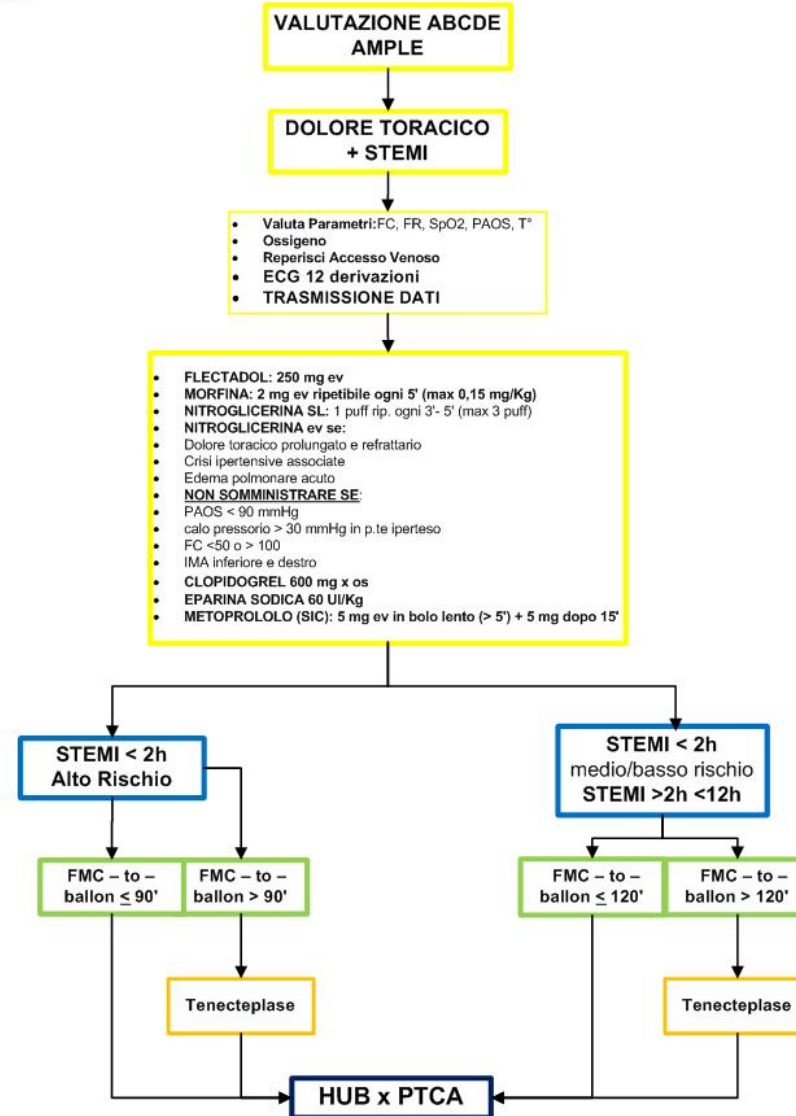
- Killip 1: 5,1%
- Killip > 1: 27,2%

### IMA in shock:

- 56% giunge in PS a < di 3 h
- 60% giunge in PS in Killip I
- 50% hanno > 75 anni



**STEMI < 2h / STEMI > 2h < 12h**



**NITROGLICERINA x infusione ev**  
(dose iniziale 0,15 y/Kg/min)  
3 ff (15 mg) in SF 250 ml (60 y/ml)

40 kg	6 ml/h
50	7,5 ml/h
60	9 ml/h
70	10,5 ml/h
80	12 ml/h
90	13,5 ml/h

EPARINA SODICA	
30 - 40 Kg	2500 UI 5 ml
41 - 50	3000 UI 6 ml
51 - 60	3500 UI 7 ml
> 61	4000 UI 8 ml
1 ff di Eparina + 9 ml di SF	

TENECTEPLASE	
60 Kg	6000 UI 6 ml 20 mg
>60<70	7000 UI 7 35
>70<80	8000 UI 8 40
>80<90	9000 UI 9 45
>90	10000 UI 10 50
1 flac. 50 mg (10000 UI) + solvente (10 ml)	

## Recommendations for antithrombotic treatment in patients with STEMI undergoing primary PCI

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
<b>Antiplatelet therapy</b>			
ASA is recommended for all patients without contraindications at an initial oral loading dose of 150–300 mg (or 80–150 mg i.v.) and at a maintenance dose of 75–100 mg daily long-term regardless of treatment strategy.	I	A	776,794
A P2Y <sub>12</sub> inhibitor is recommended in addition to ASA and maintained over 12 months unless there are contraindications such as excessive risk of bleeding. Options are:	I	A	–
• Prasugrel (60 mg loading dose, 10 mg daily dose) if no contraindication	I	B	828
• Ticagrelor (180 mg loading dose, 90 mg twice daily) if no contraindication	I	B	823
• Clopidogrel (600 mg loading dose, 75 mg daily dose), only when prasugrel or ticagrelor are not available or are contraindicated.	I	B	812
It is recommended to give P2Y <sub>12</sub> inhibitors at the time of first medical contact.	I	B	777,846–848
GP IIb/IIIa inhibitors should be considered for bail-out or evidence of no-reflow or a thrombotic complication.	IIa	C	–
Upstream use of a GP IIb/IIIa inhibitor (vs. in-lab use) may be considered in high-risk patients undergoing transfer for primary PCI.	IIb	B	271,834, 835,849
<b>Anticoagulants</b>			
Anticoagulation is recommended for all patients in addition to antiplatelet therapy during PCI.	I	A	–
The anticoagulation is selected according to both ischaemic and bleeding risks, and according to the efficacy–safety profile of the chosen agent.	I	C	
Unfractionated heparin: 70–100 U/kg i.v. bolus when no GP IIb/IIIa inhibitor is planned 50–70 U/kg i.v. bolus with GPIIb/IIIa inhibitor.	I	C	
Bivalirudin 0.75 mg/kg i.v. bolus followed by i.v. infusion of 1.75 mg/kg/h for up to 4 hours after the procedure.	IIa	A	243,840,841
Enoxaparin i.v. 0.5 mg/kg with or without GP IIb/IIIa inhibitor.	IIa	B	788, 842–844,850

# Terapia praticata dal 118

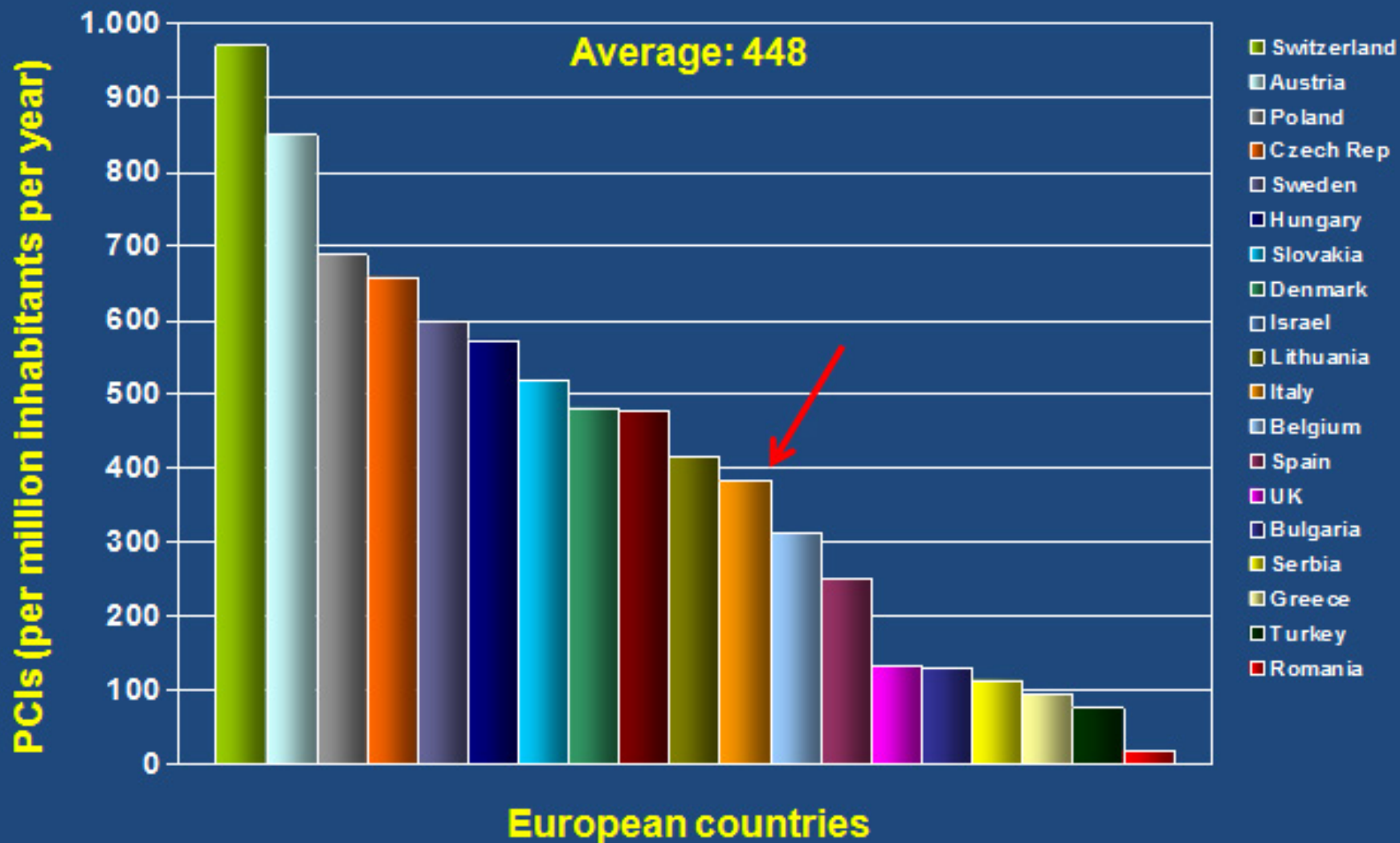
- Flectadol 250 mg iv
- Morfina 2 mg iv ripetibile ogni 5 min (max 0,15 mg/kg)
- Nitroglicerina s.l.: 1 puff ripetibile ogni 3-5 min (max 3 puff)
- Nitroglicerina iv se:
  - Dolore toracico prolungato e refrattario
  - Crisi ipertensiva associata
  - Edema polmonare acuto
  - Non somministrare se: PAOS < 90 mmHg; calo pressorio > di 30 mmHg in pz iperteso; FC < 50 o > 100 bpm; STEMI inferiore e destro
- Clopidogrel 600 mg per os
- Eparina 60 UI/kg
- Metoprololo (SIC): 5 mg 1 f iv in bolo lento (5'), + 5 mg dopo 15'
  - Non somministrare se: moderata/severa insufficienza ventricolare sin con stasi/edema polmonare; bradicardia < 60 bpm; ipotensione sistolica < 100 mmHg; segni di scarsa perfusione periferica; blocchi di conduzione atrio-ventricolare di I (se PR > 0,24"), II o III grado; malattie reattive delle vie aeree.

# Periprocedural anti thrombotic medication in primary PCI

Recommendations	Class	Level
<b>Antiplatelet therapy</b>		
Aspirin oral or i.v. (if unable to swallow) is recommended	I	B
An ADP-receptor blocker is recommended in addition to aspirin. Options are:	I	A
<ul style="list-style-type: none"><li>Prasugrel in clopidogrel-naive patients, if no history of prior stroke/TIA, age &lt; 75 years.</li></ul>	I	B
<ul style="list-style-type: none"><li>Ticagrelor.</li></ul>	I	B
<ul style="list-style-type: none"><li>Clopidogrel, preferably when prasugrel or ticagrelor are either not available or contraindicated.</li></ul>	I	C

ADP = adenosine diphosphate.

# Total primary PCIs performed in Europe



## 2009 Focused Updates: ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction (Updating the 2004 Guideline and 2007 Focused Update) and ACC/AHA/SCAI Guidelines on Percutaneous Coronary Intervention (Updating the 2005 Guideline and 2007 Focused Update)

A Report of the American College of Cardiology Foundation/  
American Heart Association Task Force on Practice Guidelines

**Table 5. Recommendations for Triage and Transfer for PCI**

2004/2005/2007 Recommendations	2009 Joint STEMI/PCI Focused Update Recommendations	Comments
<b>Class I</b>		
	<p>1. Each community should develop a STEMI system of care that follows standards at least as stringent as those developed for the AHA's national initiative, Mission: Lifeline, to include the following:</p> <ul style="list-style-type: none"> <li>● ongoing multidisciplinary team meetings that include emergency medical services, non-PCI-capable hospitals/STEMI referral centers, and PCI-capable hospitals/STEMI receiving centers to evaluate outcomes and quality improvement data;</li> <li>● a process for prehospital identification and activation;</li> <li>● destination protocols for STEMI receiving centers;</li> <li>● transfer protocols for patients who arrive at STEMI referral centers who are primary PCI candidates, are ineligible for fibrinolytic drugs, and/or are in cardiogenic shock. (Level of Evidence: C)</li> </ul>	New recommendation

# STEMI-ACS: fabbisogno di procedure (GISE 2008)

- 700-800 pz/milione abitanti giungono in ospedale con STEMI-ACS trasportati dal 118 o con mezzi propri entro un tempo compatibile per una riperfusione coronarica
- E' preferibile che la riperfusione coronarica avvenga tramite l'angioplastica
- Il fabbisogno previsto di PTCA per questa popolazione è dell'ordine di 550-650 /milione abitanti

**TRASFERIMENTI IN EMERGENZA (117)**

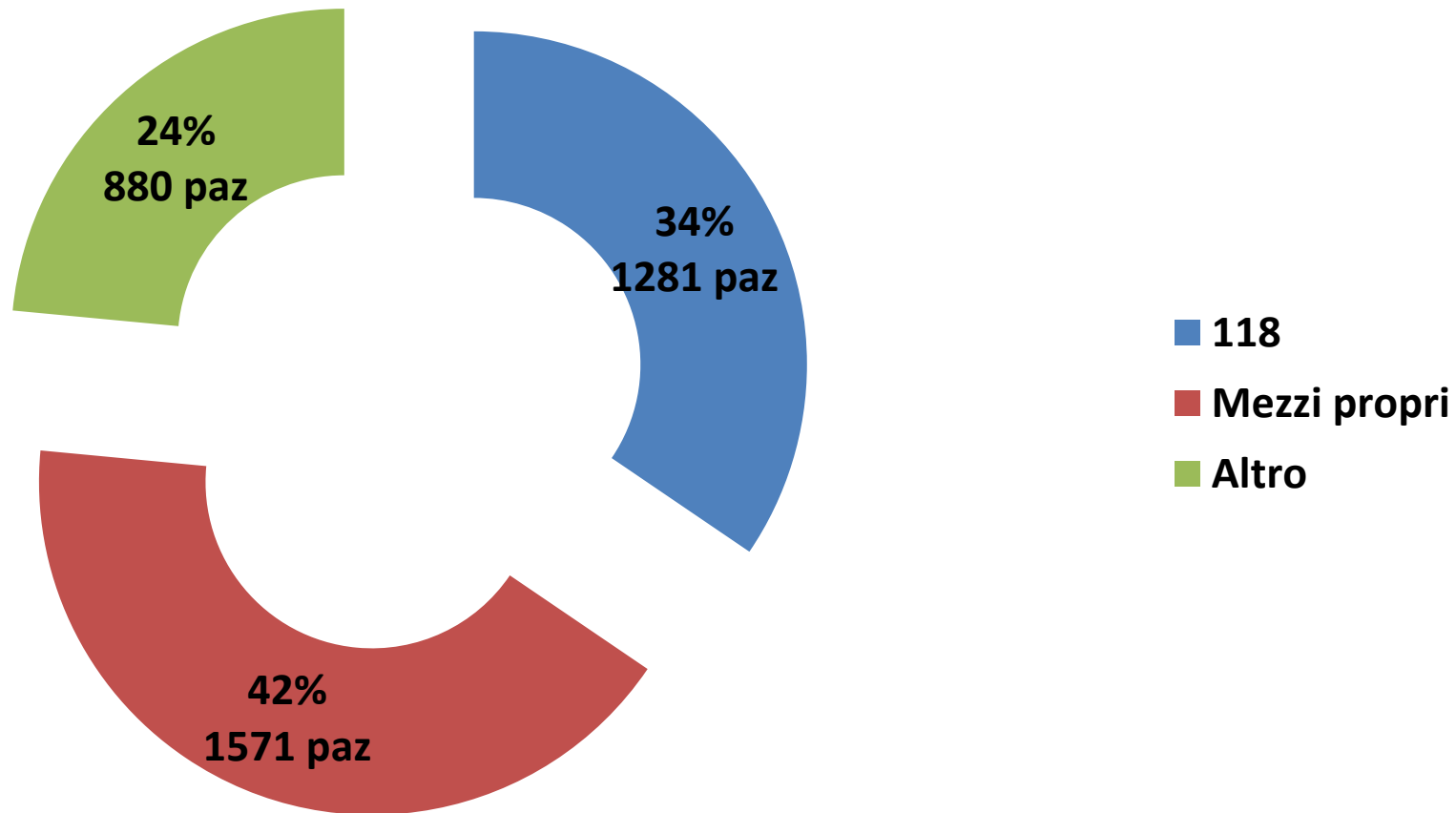
TEMPI TRASF.	MEDIA	DS	MEDIANA	MIN	MAX
CHIAMATA- PARTENZA (min)	55	67	<b>45</b>	10	615
CHIAMATA- ARRIVO (min)	107	56	<b>95</b>	20	655

**TRASFERITI = 28% DEI POTENZIALI CANDIDATI  
A PTCA NON DISPONIBILE IN SEDE**

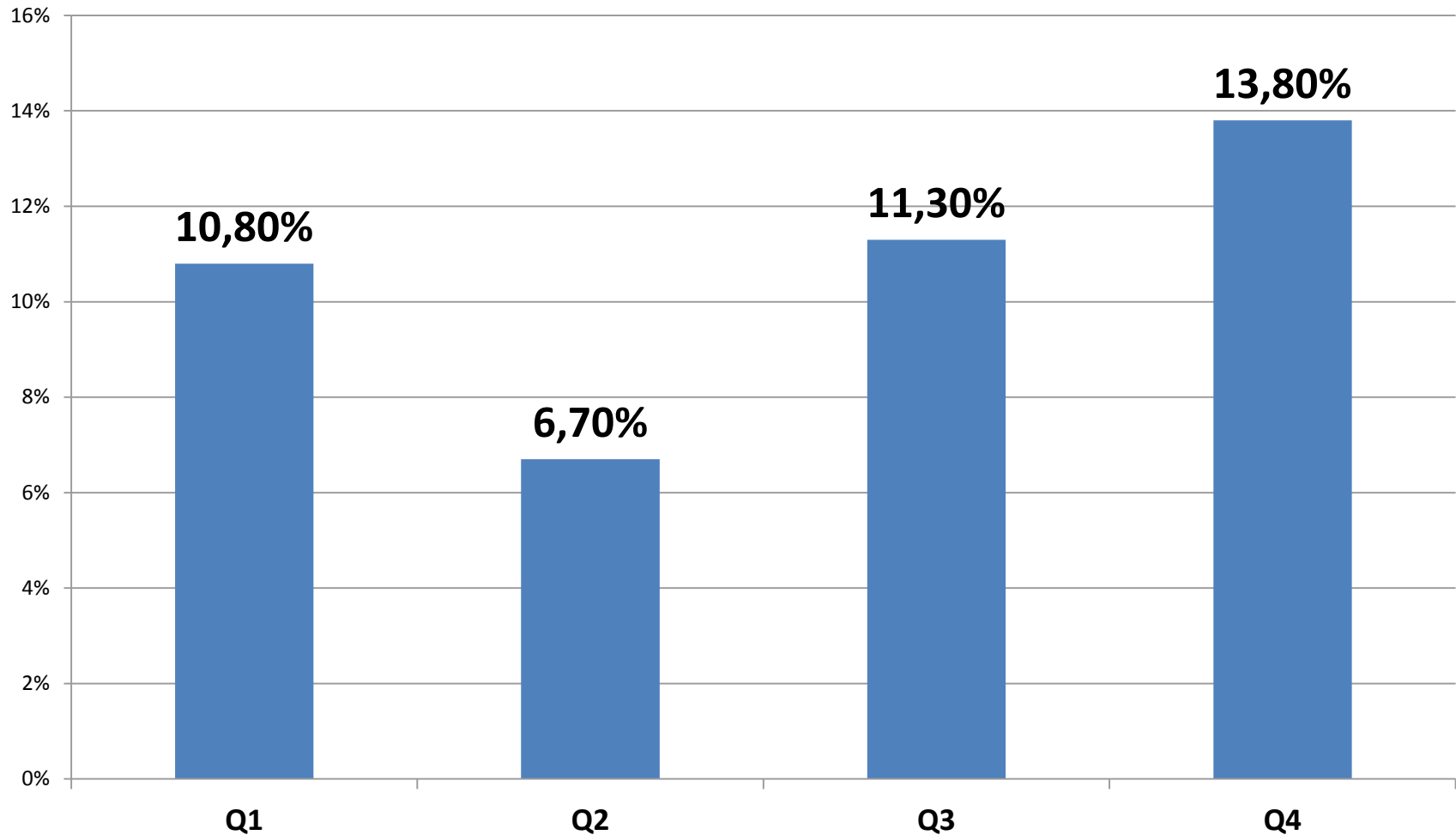


# Modalita' di accesso

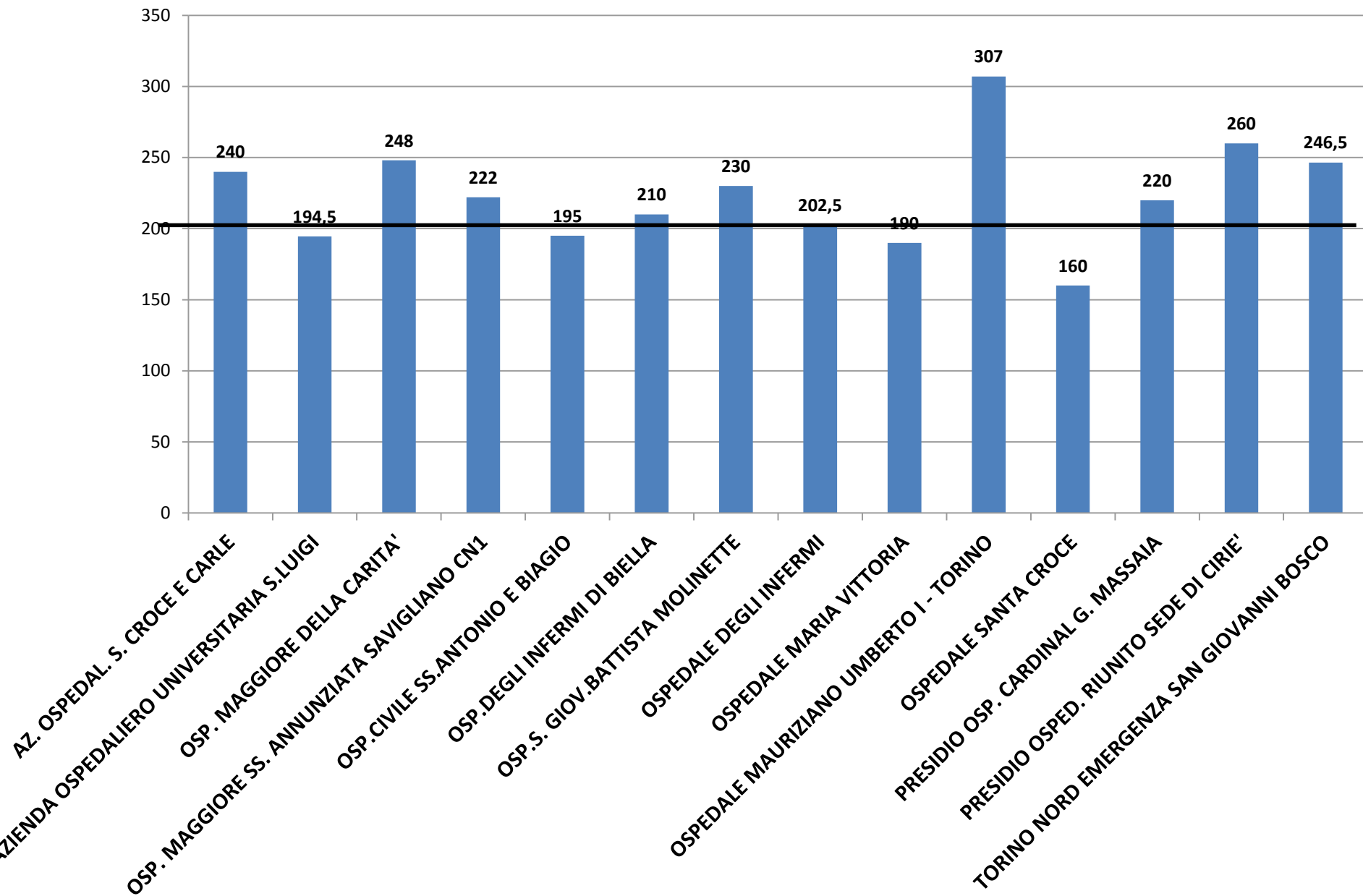
## 3742 STEMI



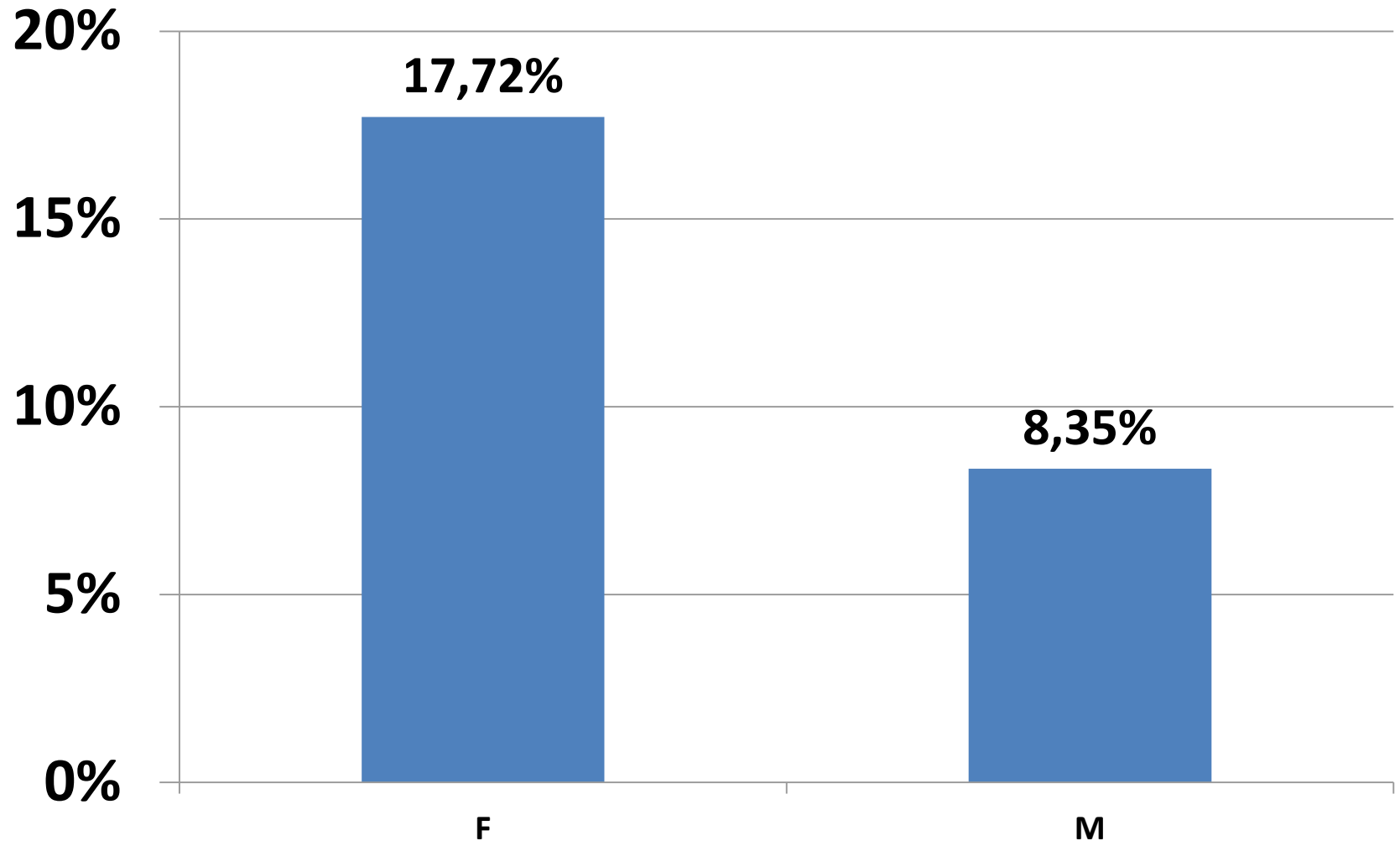
# Mortalita' intraospedaliera per quadrante



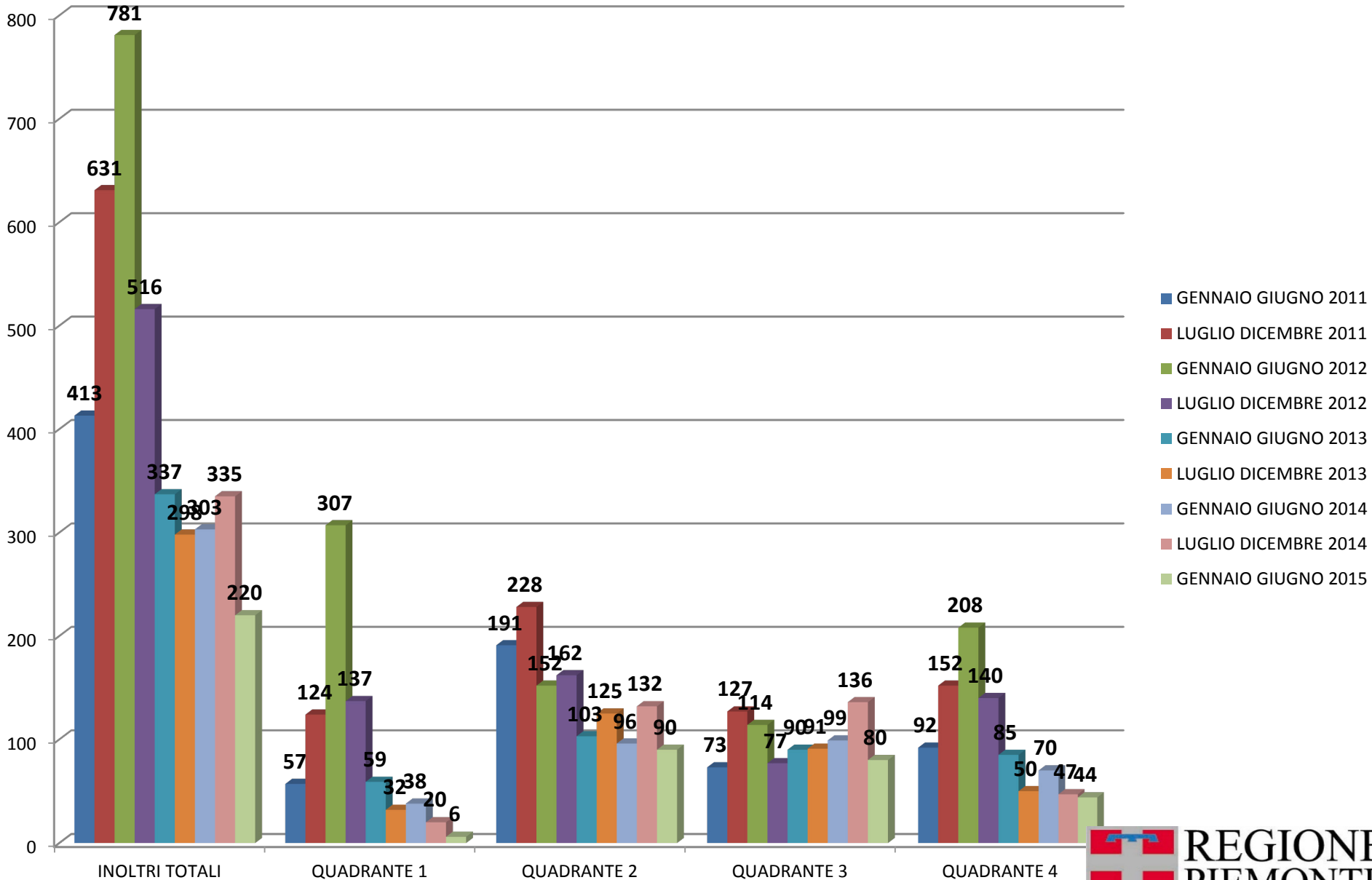
# Tempo di Ischemia (minuti)



# Mortalita' intraospedaliera per genere

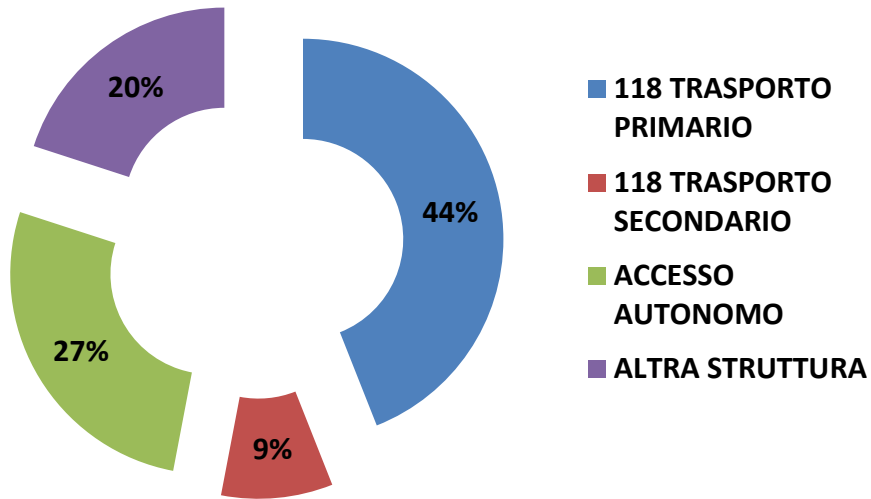


# Inoltri ECG

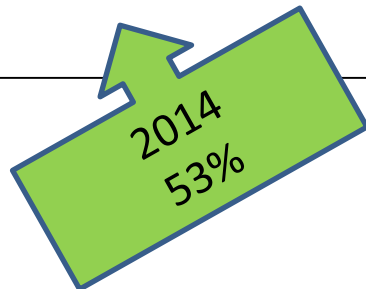
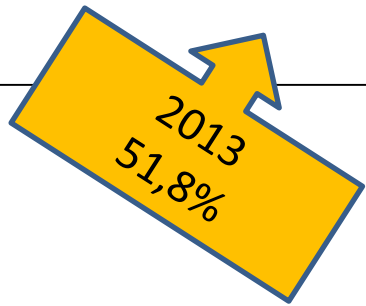


# Provenienza dei pazienti

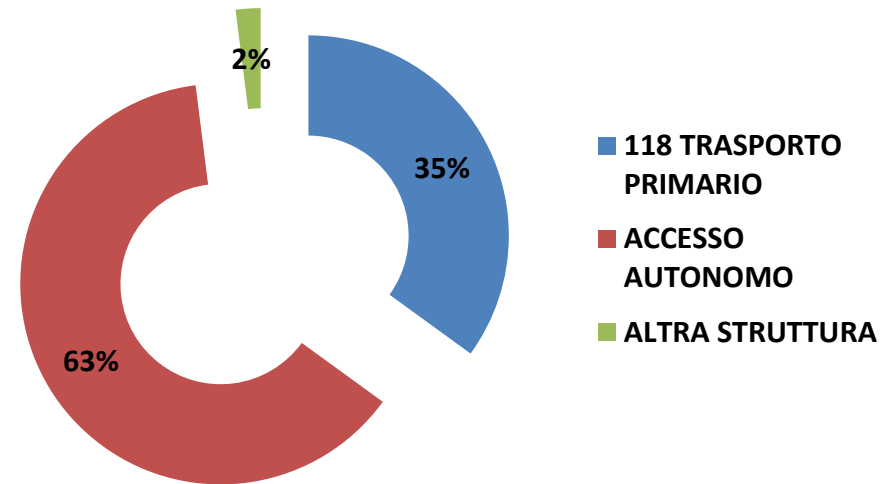
## UTIC Hub



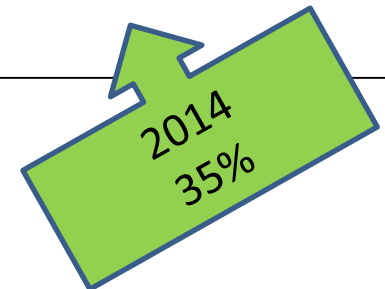
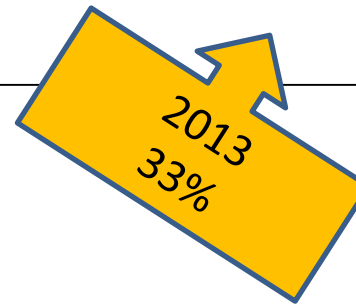
118



## UTIC Spoke

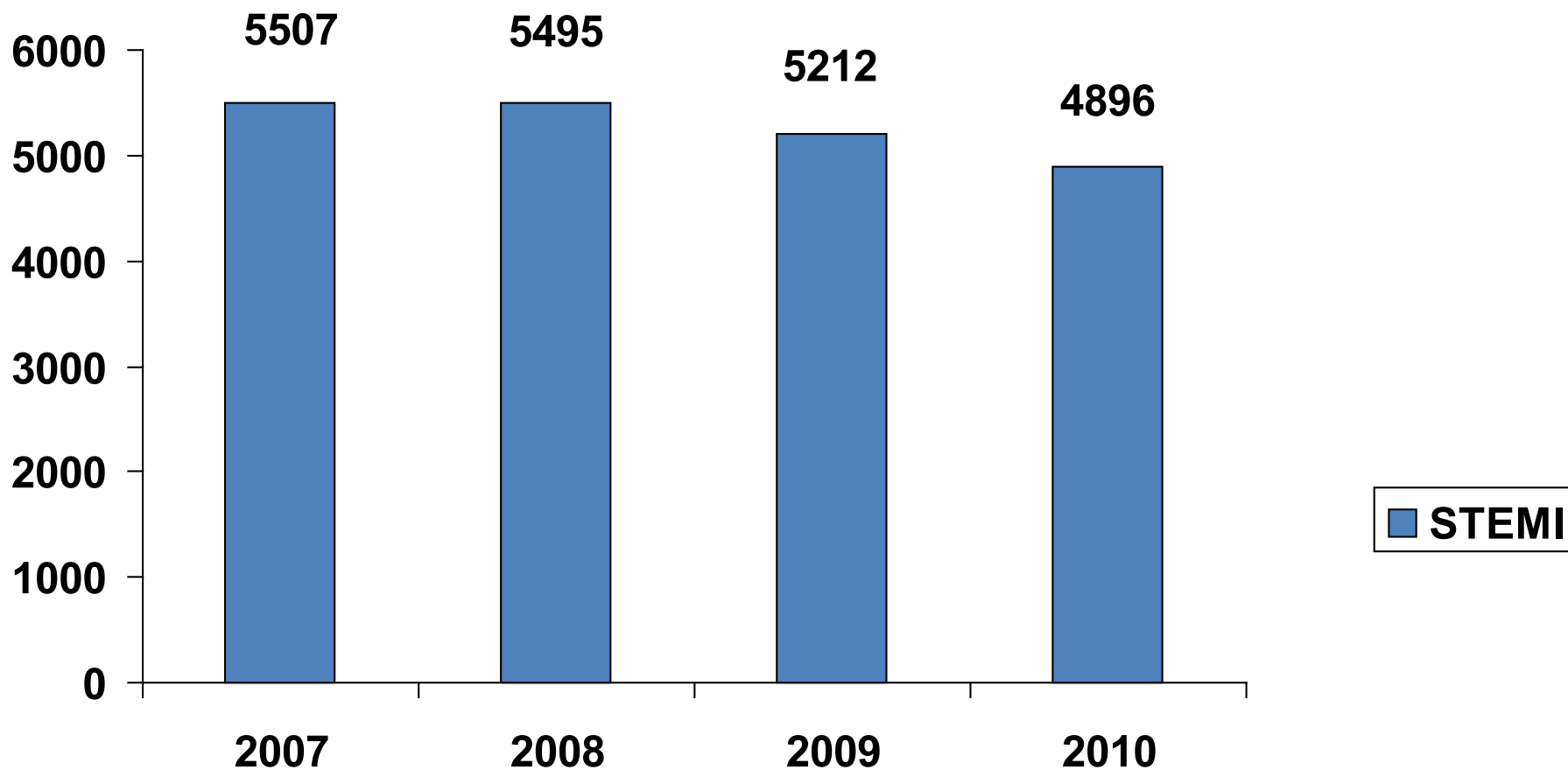


118



Dalla Programmazione di un Percorso alla sua Realizzazione Pratica:  
la Rete STEMI della Regione Piemonte

## STEMI 2007-2010 Regione Piemonte



# Tipologia di trattamento eseguito

