

**XXXIII**  
CONGRESSO PORTUGUÊS DE  
**CARDIOLOGIA**

**HOW TO IMPROVE  
PRE-HOSPITAL  
TRANSPORTATION**



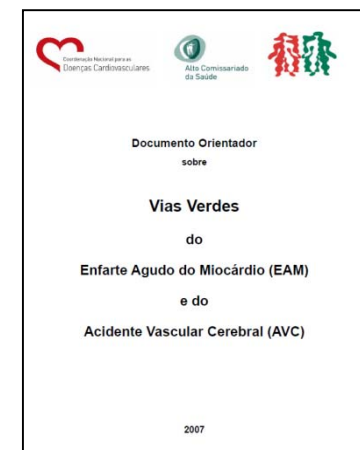
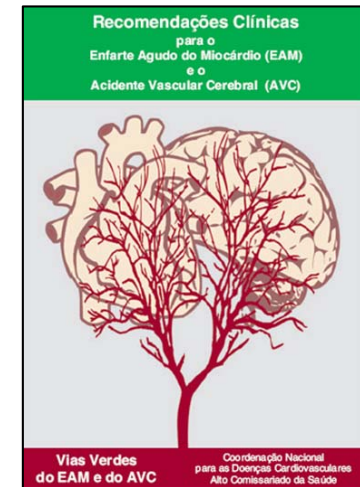
JORGE MARQUES





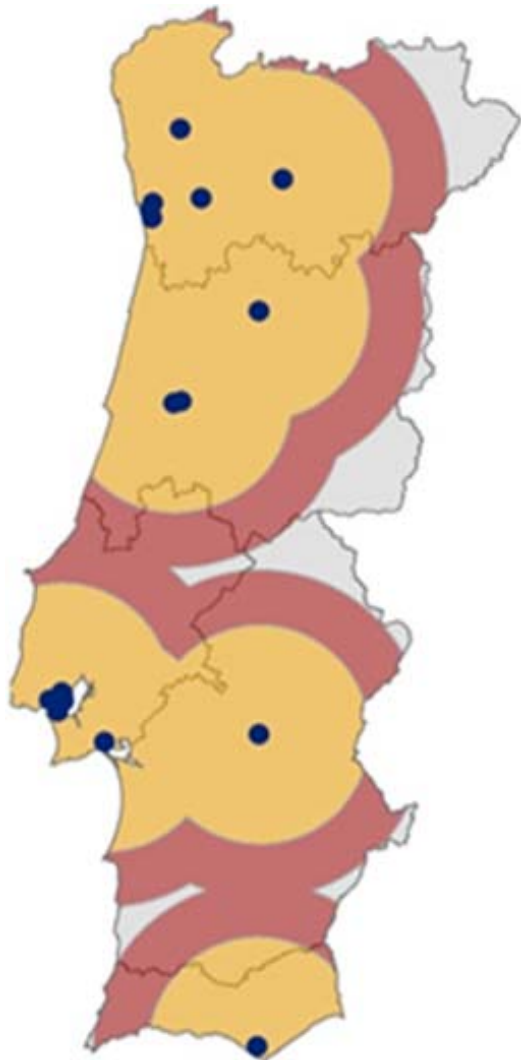
# NATIONAL HEALTH PLAN 2004 - 10

- CHD Standardized mortality rate reduction under 65 years from 16,1 (2001) to 11,0( 2010);
- CHD in-hospital death rate reduction from 6,6% (2001) to <5% (2010);
- In the NHP 2004-10 the increase of admissions through EMS is a considered a major goal in the improvement in the care of Cardiovascular Diseases;
- The NHP aimed at an increase from 2% to 80% of such admissions.





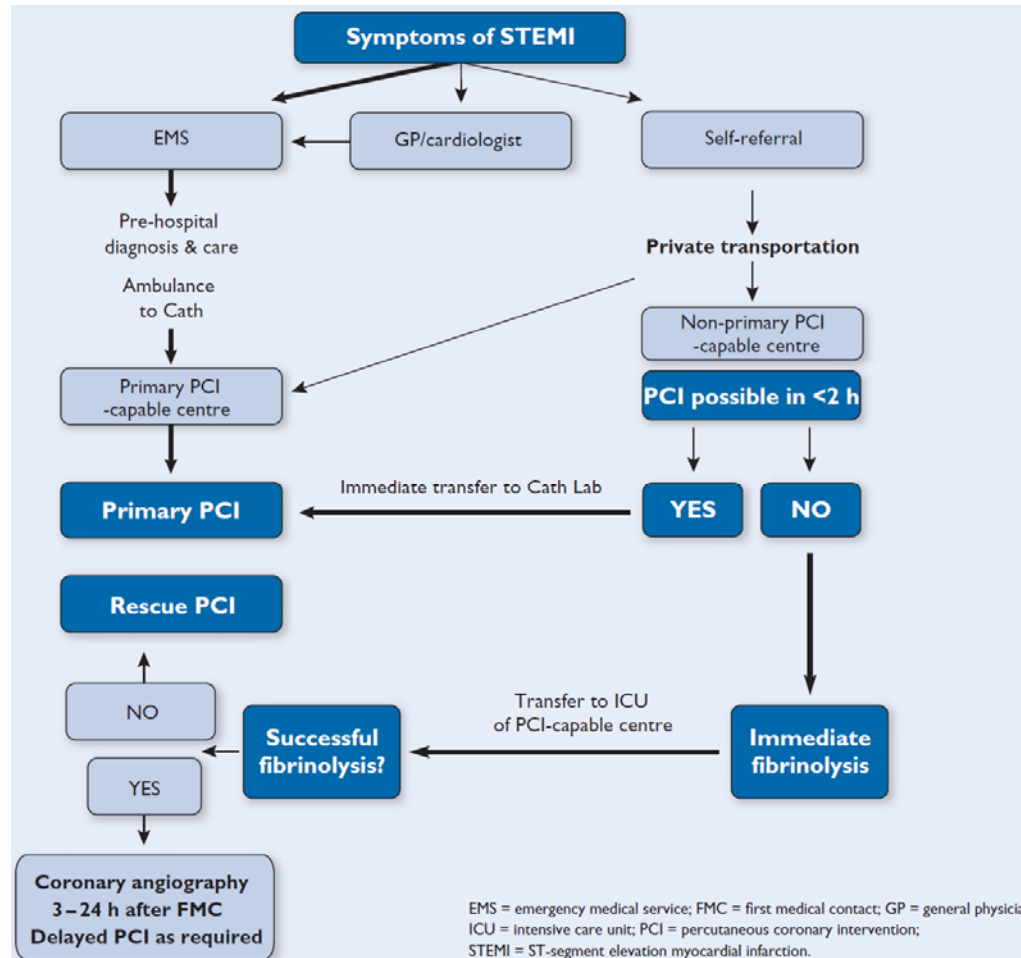
# Primary PCI in Portugal



Region	Population
Minho	1'100'000
Grande Porto	2'500'000
Trás-os-Montes e Alto Douro	400'000
Viseu/Guarda	550'000
Coimbra	1'100'000
Grande Lisboa	3'500'000
Évora	400'000
Algarve	500'000

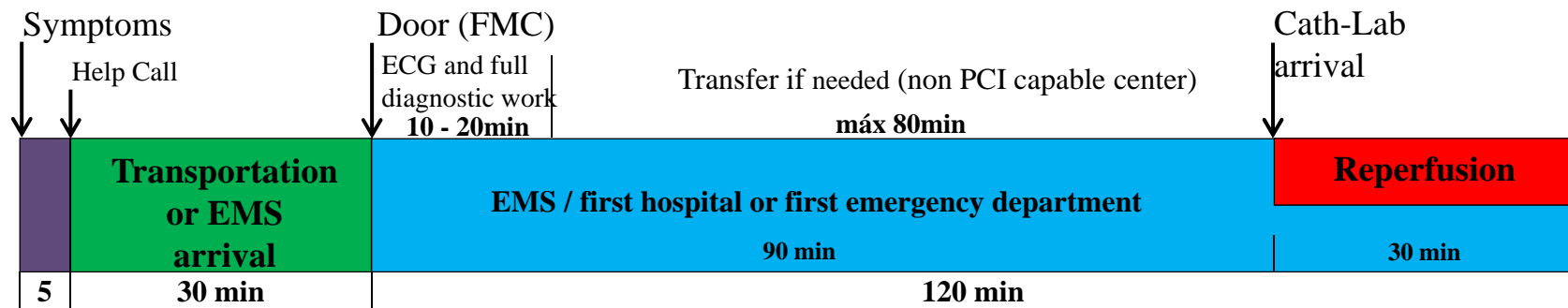


# AMI Reperfusion – ESC/EACTS guidelines



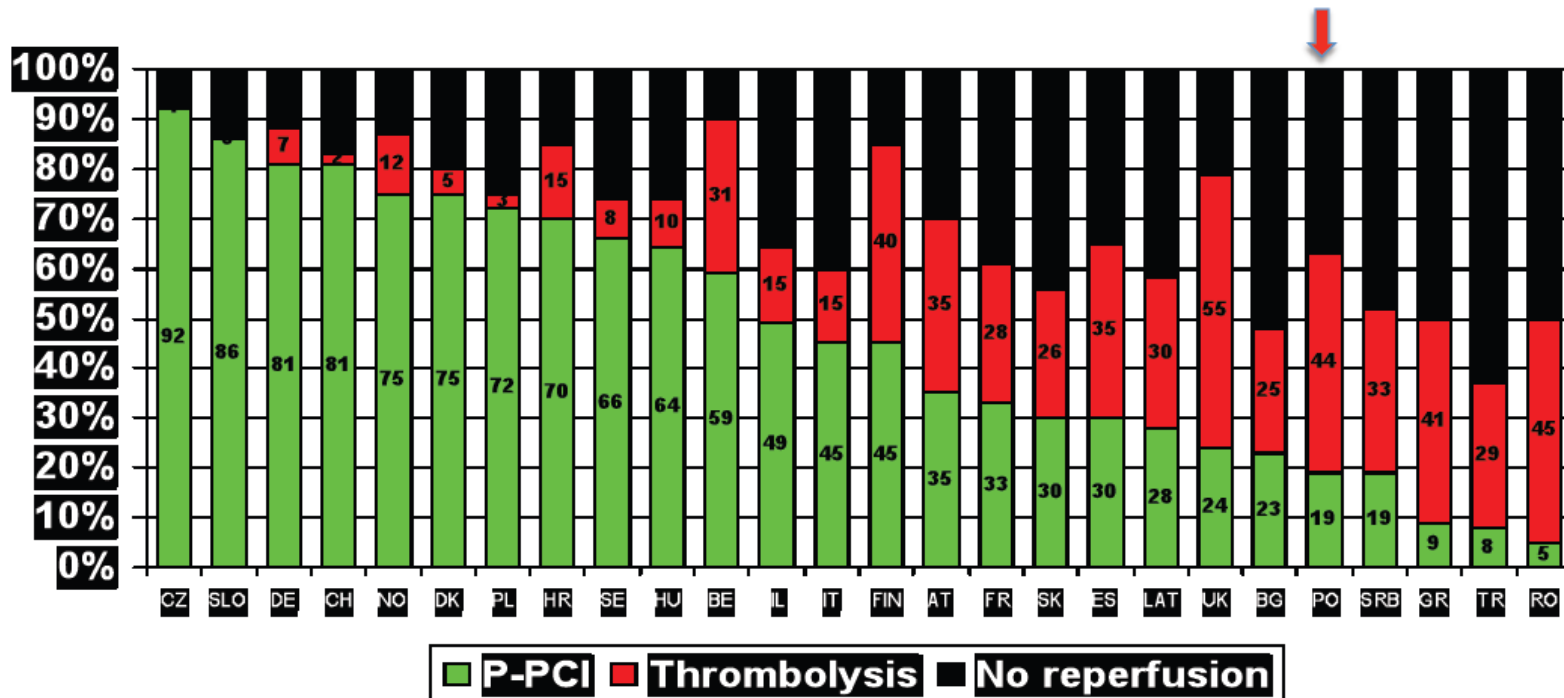


# Time to Reperfusion





# Reperfusion and incidence of STEMI - Portugal



Annual incidence of AMI 1040/million



# Incidence of STEMI in Portugal

REGISTOS

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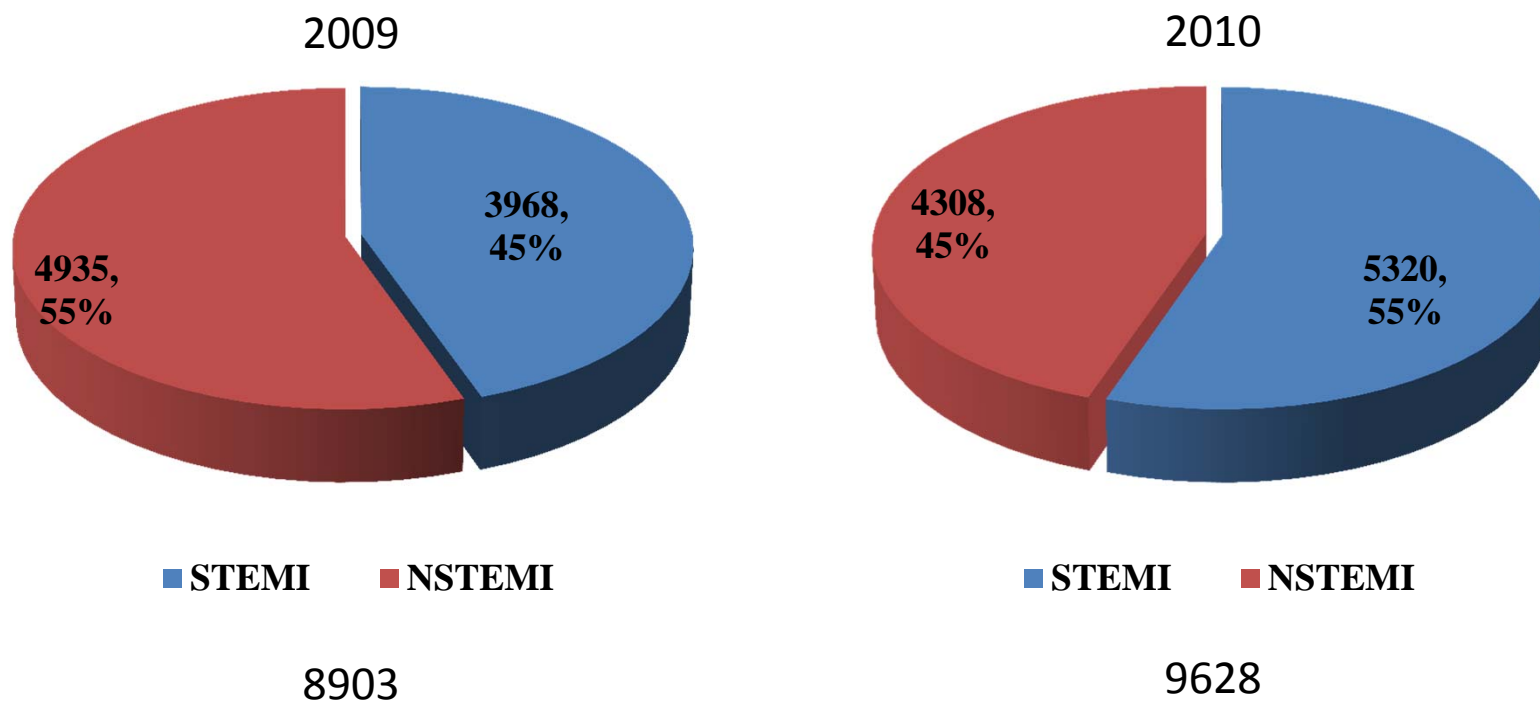
## **Registo nacional de síndromes coronárias agudas: sete anos de actividade em Portugal [114]**

JOSÉ FERREIRA SANTOS, CARLOS AGUIAR, CRISTINA GAVINA, PEDRO AZEVEDO, JOÃO MORAIS,  
EM NOME DOS INVESTIGADORES DO REGISTO NACIONAL DE SÍNDROMES CORONÁRIAS AGUDAS  
DA SOCIEDADE PORTUGUESA DE CARDIOLOGIA, LISBOA, PORTUGAL

Annual incidence of AMI 1370/million

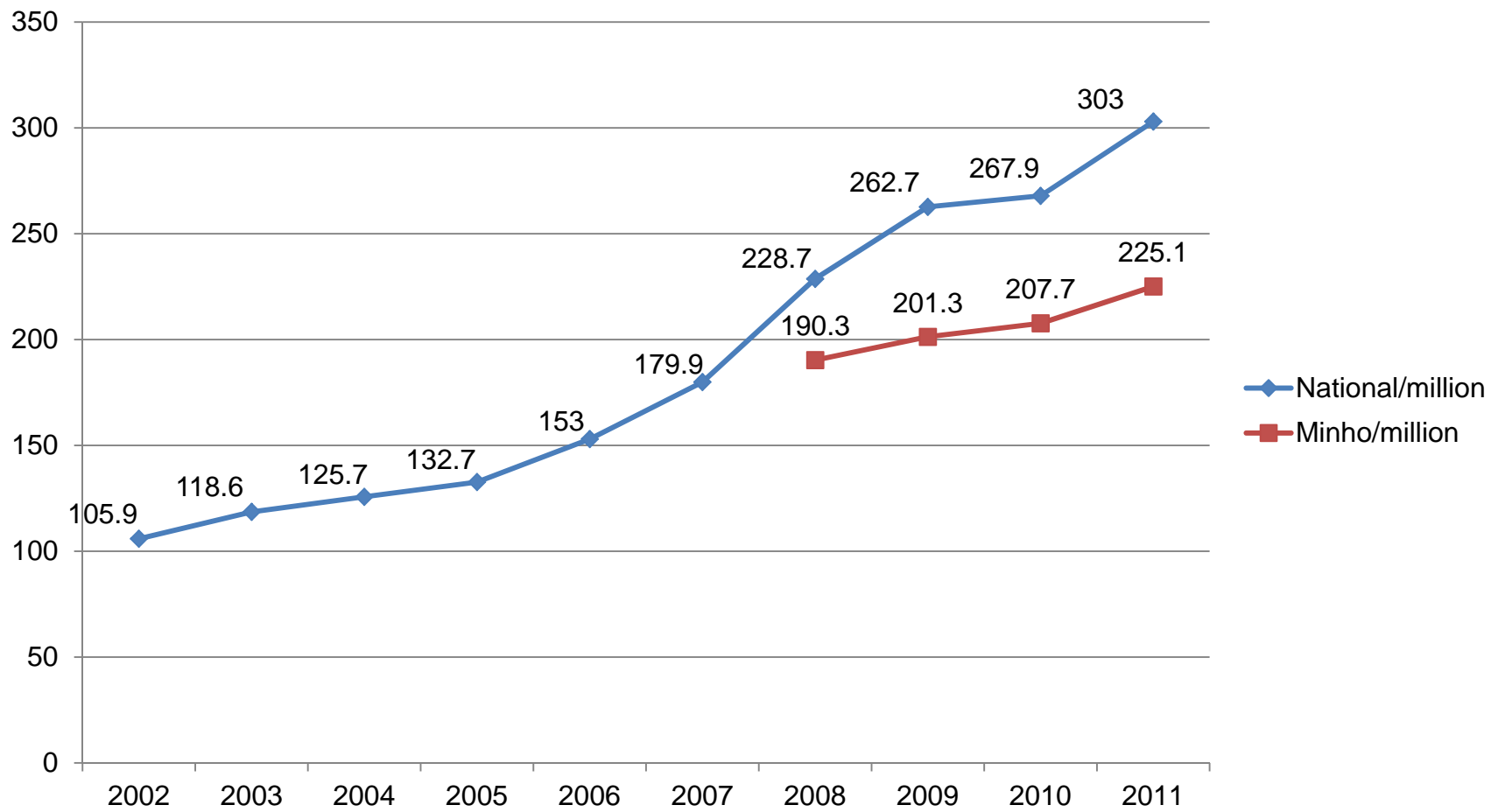


## AMI incidence (admissions in Acute Coronary Care Units)



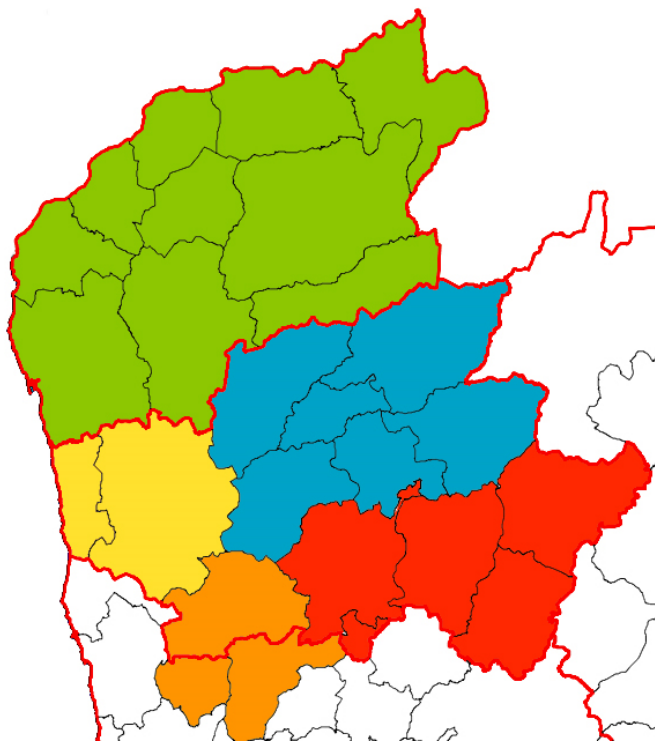


# STEMI – Primary PCI





# Referral Area for Primary PCI in Minho



Área Hospitalar	Concelho	População*	Urgência	UCIC	ICPP
Hospital de Braga	Amares	18'889	290'387	823'700	1'093'001
	Braga	181'474			
	Póvoa Lanhoso	21'886			
	Terras Bouro	7'253			
	Vieira do Minho	12'997			
	Vila Verde	47'888			
Centro Hospitalar Alto Minho	Arcos de Valdevez	22'847	244'836		
	Caminha	16'684			
	Melgaço	9'213			
	Monção	19'230			
	Paredes de Coura	9'198			
	Ponte da Barca	12'061			
	Ponte de Lima	43'498			
	Valença	14'127			
	Viana do Castelo	88'735			
	Vila Nova Cerveira	9'253			
Hospital de Barcelos	Barcelos	120'391	154'645		
	Esposende	34'254			
Centro Hospitalar Médio Ave	Famalicão	133'832	133'832		
	Santo Tirso	0			
	Trofa	0			
Centro Hospitalar Alto Ave	Guimarães	158'124	260'301	260'301	
	Fafe	50'633			
	Cabeceiras de Basto	16'710			
	Celorico de Basto	20'098			
	Vizela	23'736			

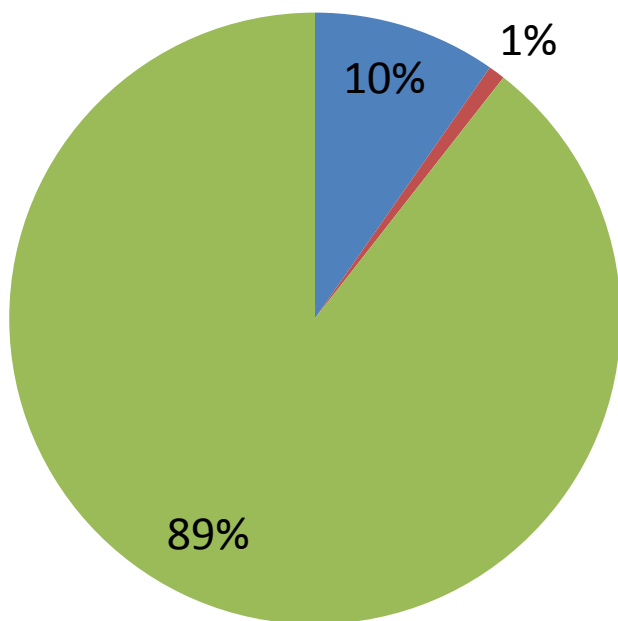
\* Dados dos Censos 2011



# EMS referral in Minho

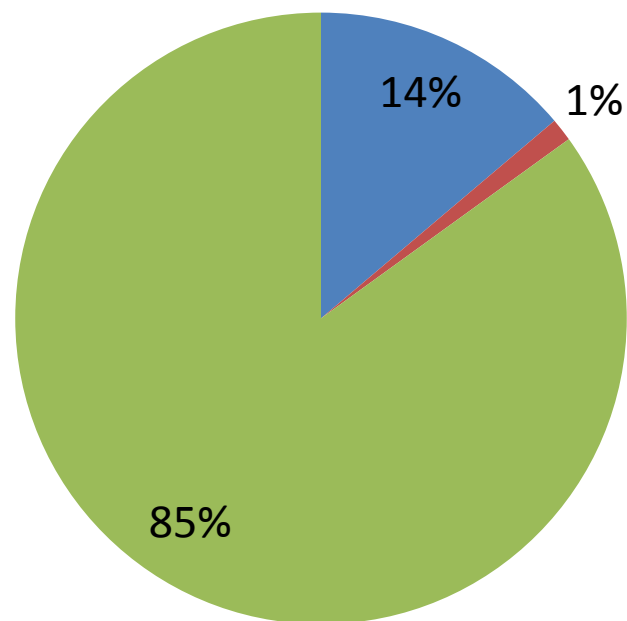
**2010**

■ INEM ■ INEM sec ■ Serv.Urg.



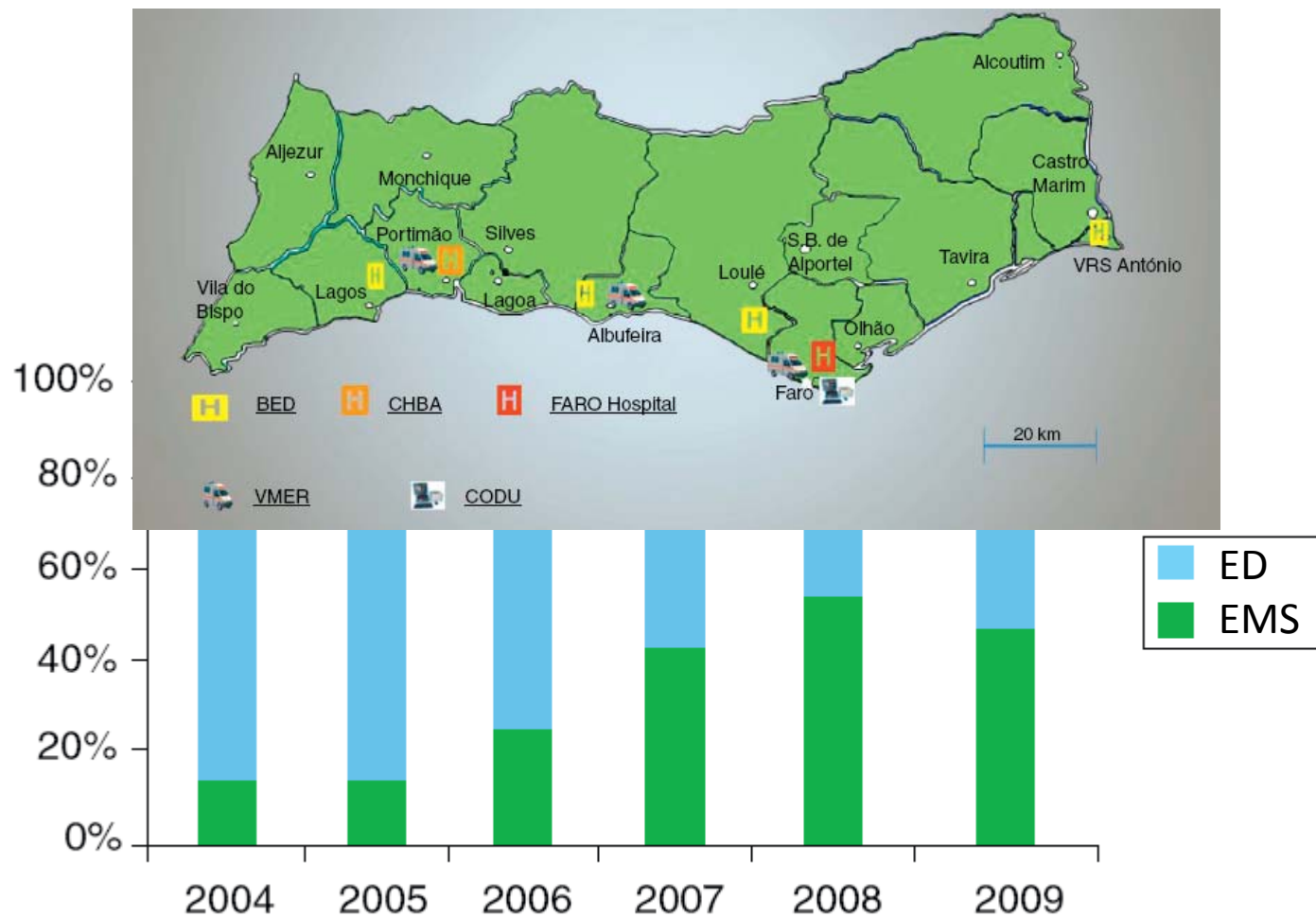
**2011**

■ INEM ■ INEM sec ■ Serv.Urg.



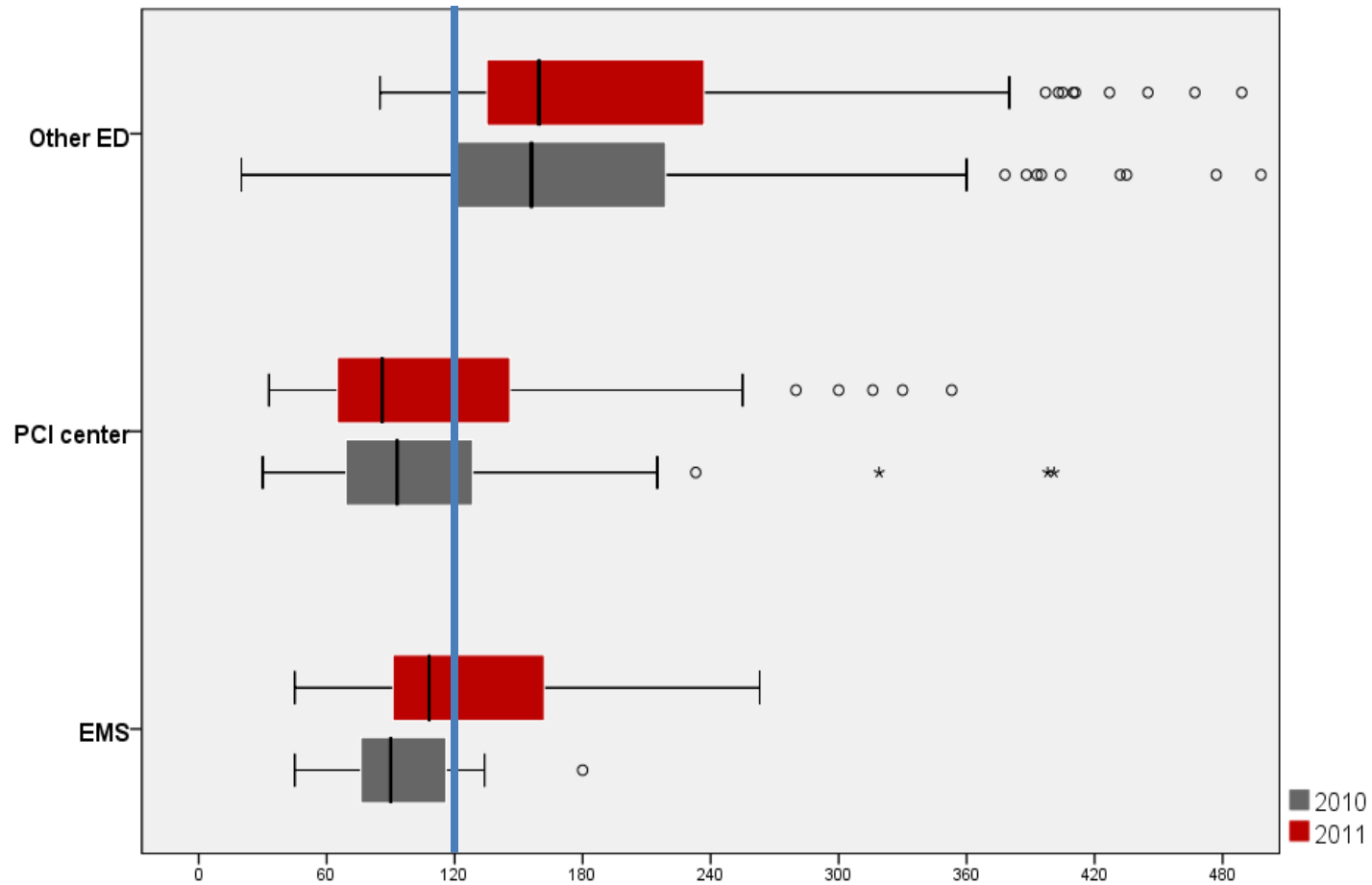


# Admissions by EMS in Algarve



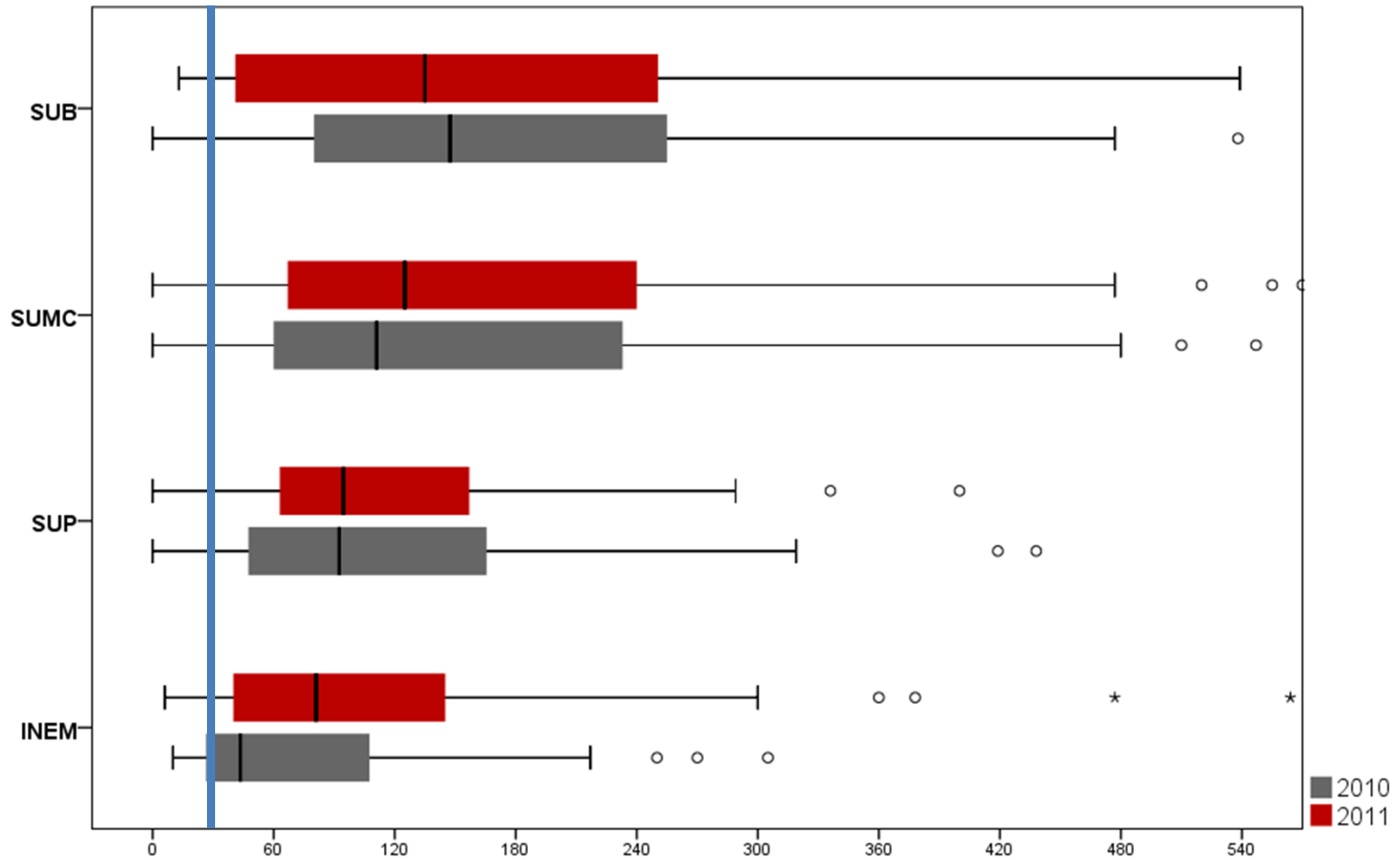


# FMC to reperfusion times in Minho





# Time from symptoms to FMC





# Media campaign for patient education



SEJA MAIS RÁPIDO QUE UM ENFARTE

- dor, peso ou queimadura no peito
- suores frios • náuseas e vômitos

**LIGUE DE IMEDIATO 112**



# “STENT FOR LIFE” in Portugal



Patients



CONHECE OS SINTOMAS DE UM ENFARTE? ESTEJA ATENTO!



NÃO PERCA TEMPO.  
SALVE UMA VIDA  
O ENFARTE NÃO PODE ESPERAR



SABE O QUE FAZER EM CASO DE ENFARTE?



DOR NO PEITO, POR VEZES ACOMPANHADA DE SUORES E NAUSEAS SÃO SINTOMAS DE UM ENFARTE!



SE SENTIR DOR NO PEITO, SUORES E NAUSEAS, LIGUE 112!



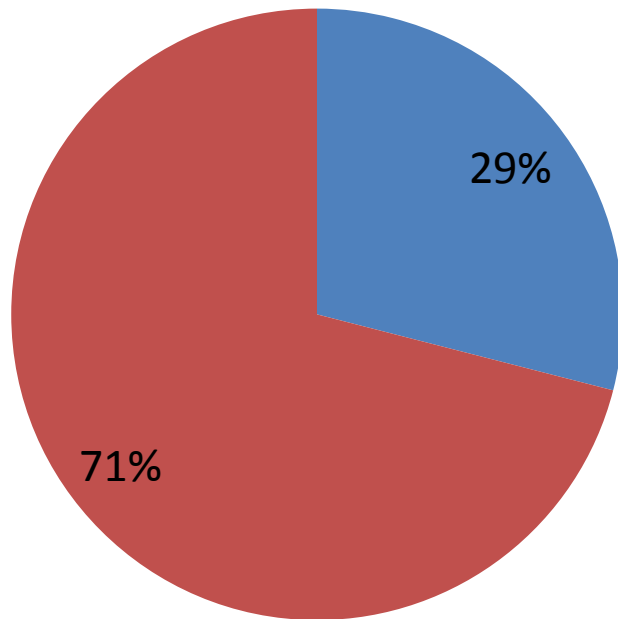
DOR NO PEITO, SUORES E NAUSEAS SÃO SINTOMAS DE ENFARTE! LIGAR PARA O 112 PODE SALVAR-LHE A VIDA! SAIBA COMO



# EMS referral - National

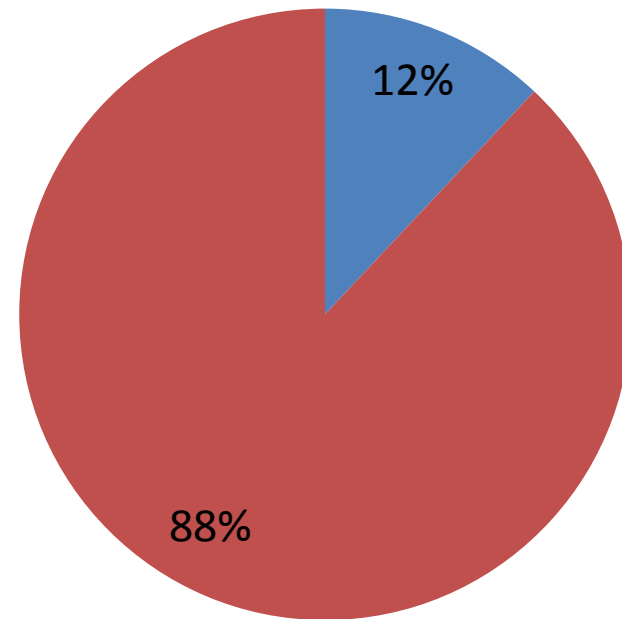
## Contact with the EMS (112)

■ EMS ■ Other



## Arriving with EMS to PCI

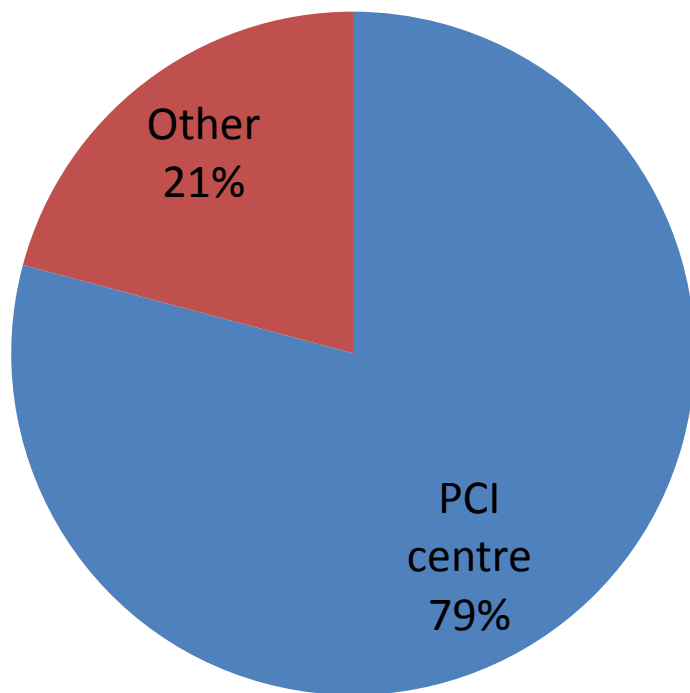
■ EMS ■ Other





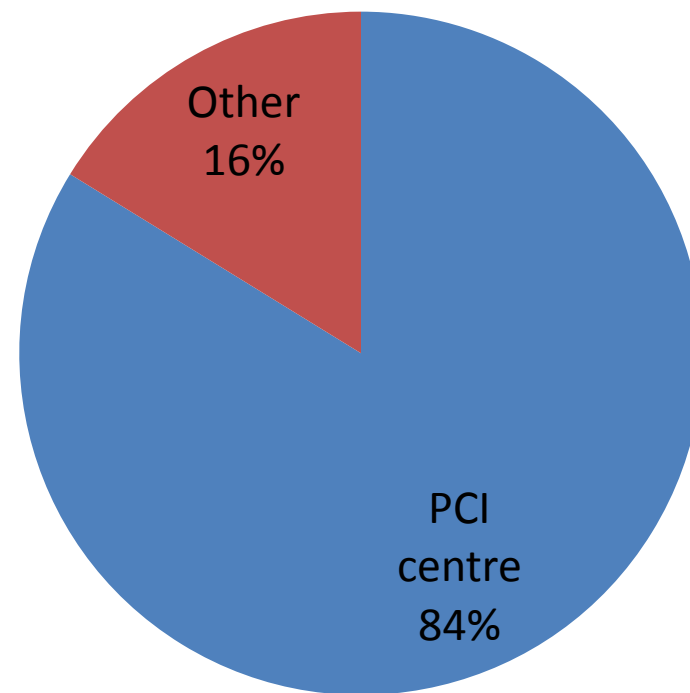
## EMS orientation in Minho (on scene)

**2010**



n=25

**2011**



n=37



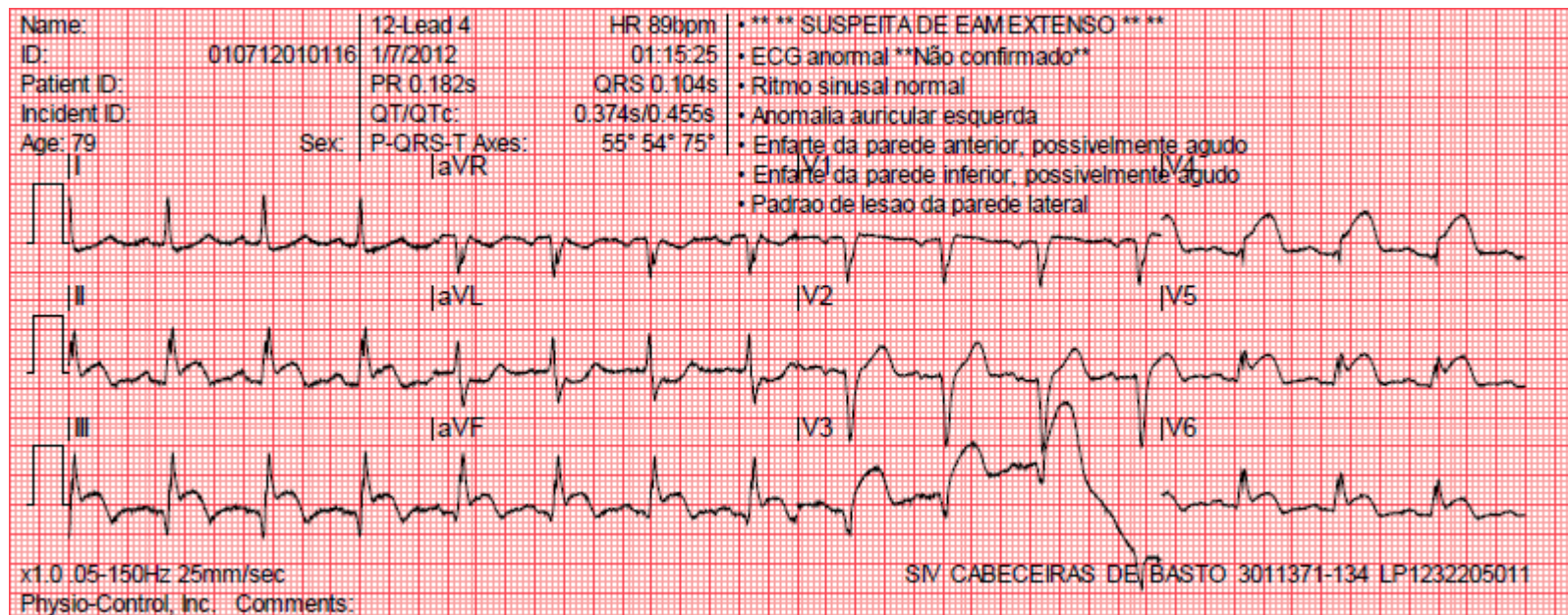
# ECG transmission

## LIFENET® System



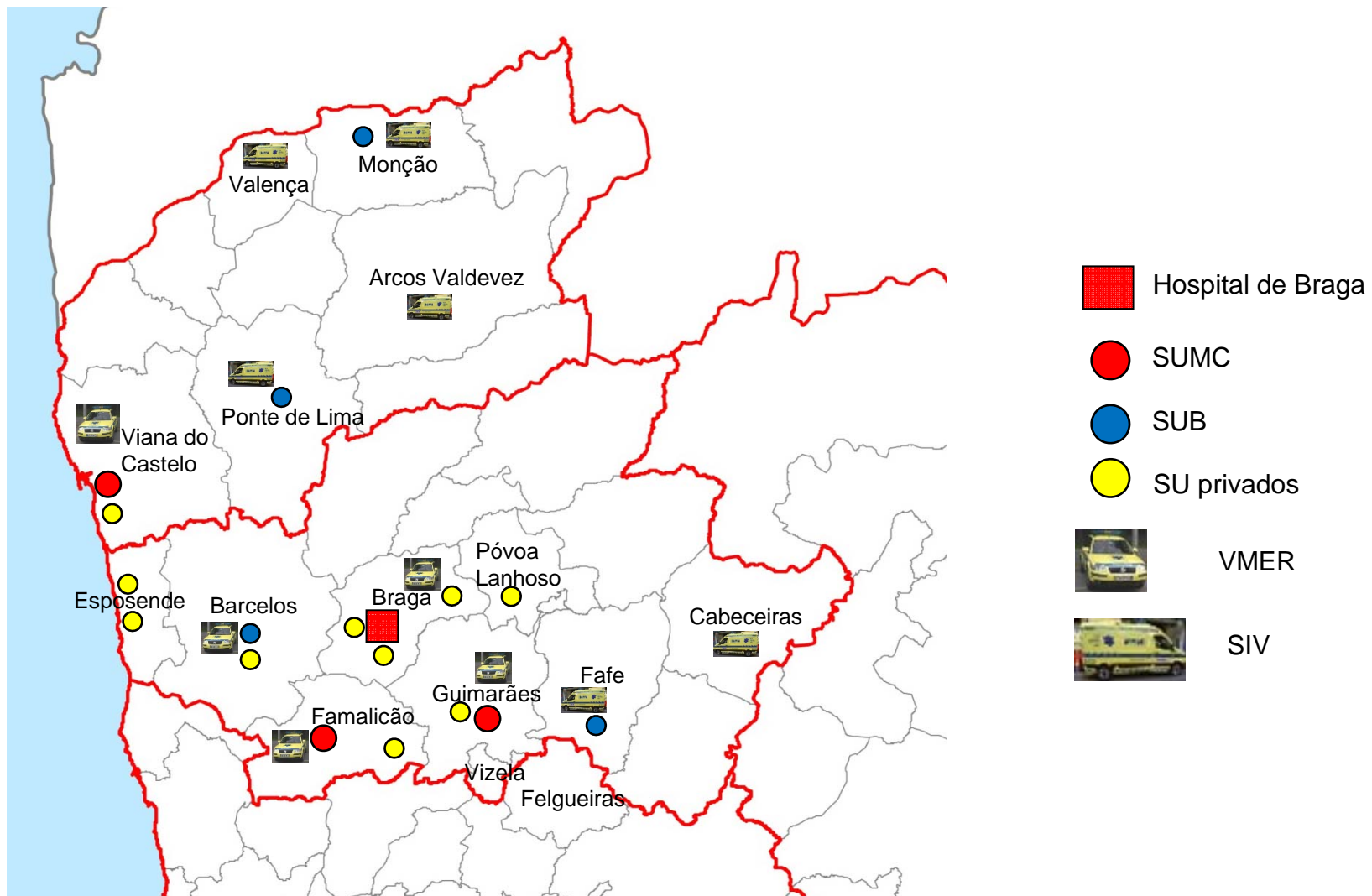
A report has been received at the CODU PORTO.

**Account Name:** Instituto Nacional de Emergência Médica (Portugal)



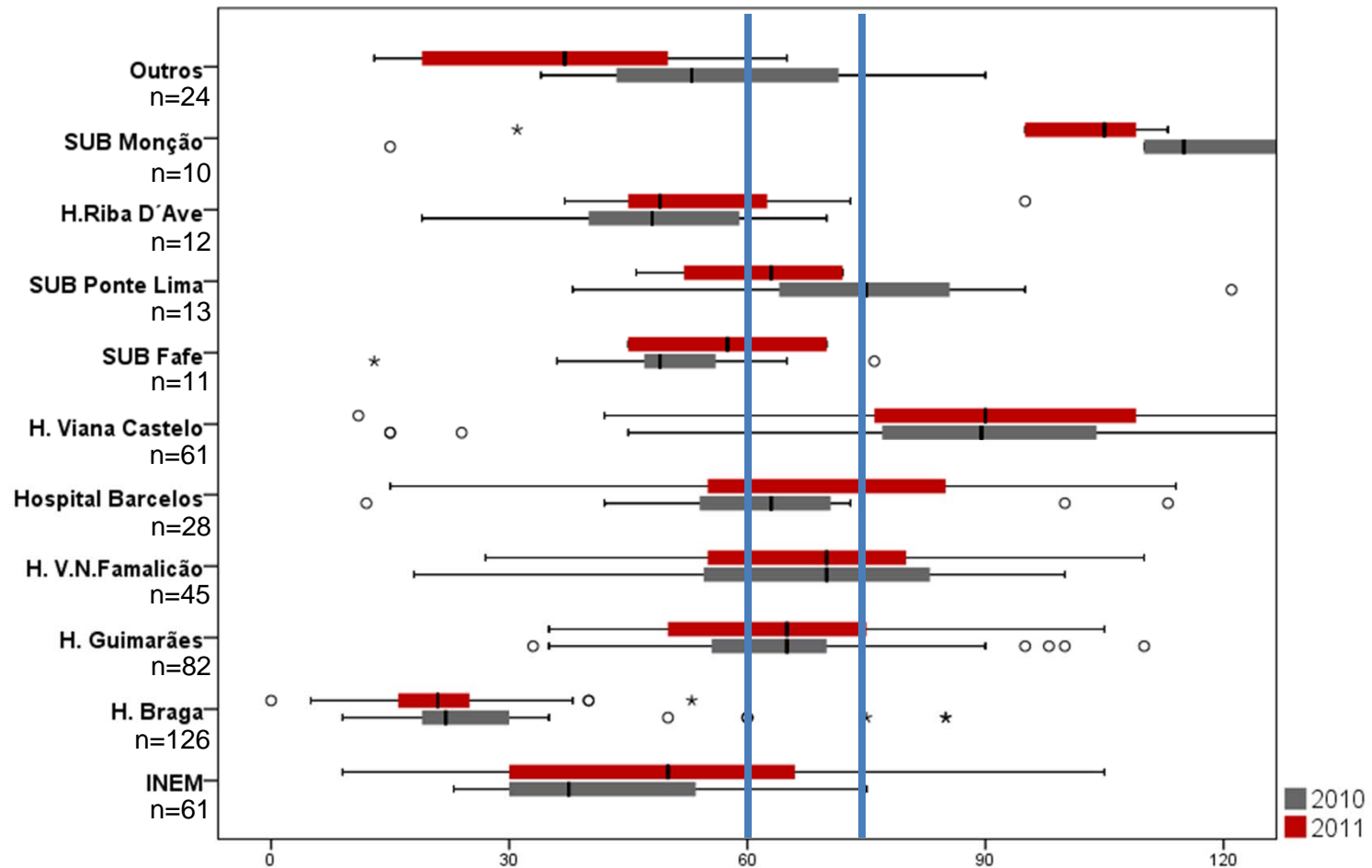


# EMS and Emergency Departments





# Transportation time





## EMS collaboration with inter-hospital transfer

INEM	National	Minho	Daily Calls 2009	Daily Calls 2010
VMER	42	5	3,8	3,4
SIV	29	6	2,7	2,5
Ambulâncias SBV	430	54	4,6	4,3

INEM | Relatório de Atividades | 2009 |

INEM | Relatório de Atividades | 2010|

- To reach 450 PCI's per year, 350 transportations would be needed;
- 100 patients per year are already either transported by INEM or enter Hospital de Braga directly;
- INEM would have to do more one transportations per day;
- Each VMER would have to do one more transportation in 5 days.

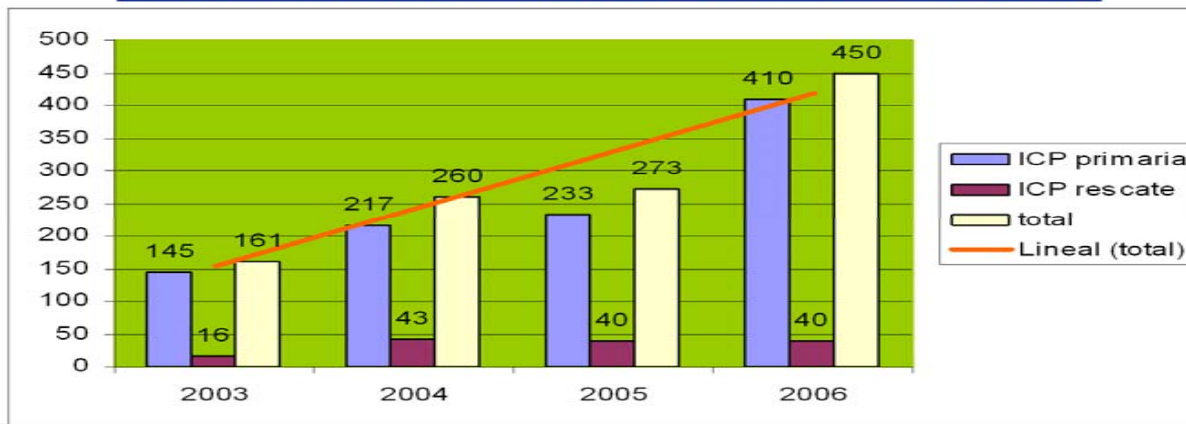


# Progaliam – Sud Galicia

HOSPITAL DO MEIXOEIRO

SERGAS

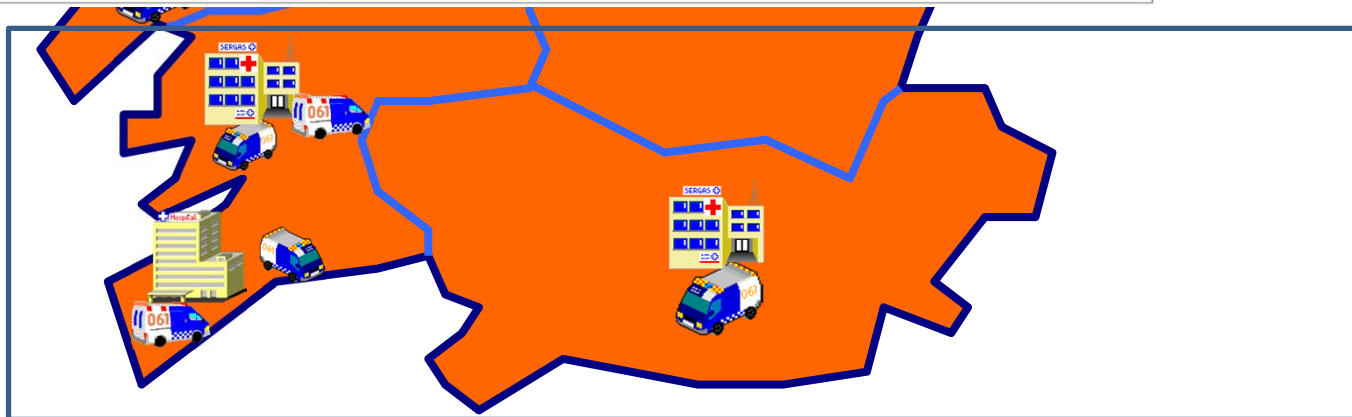
## Actividad de la Unidad de Hemodinámica del CHUVI en el IAM



ICP

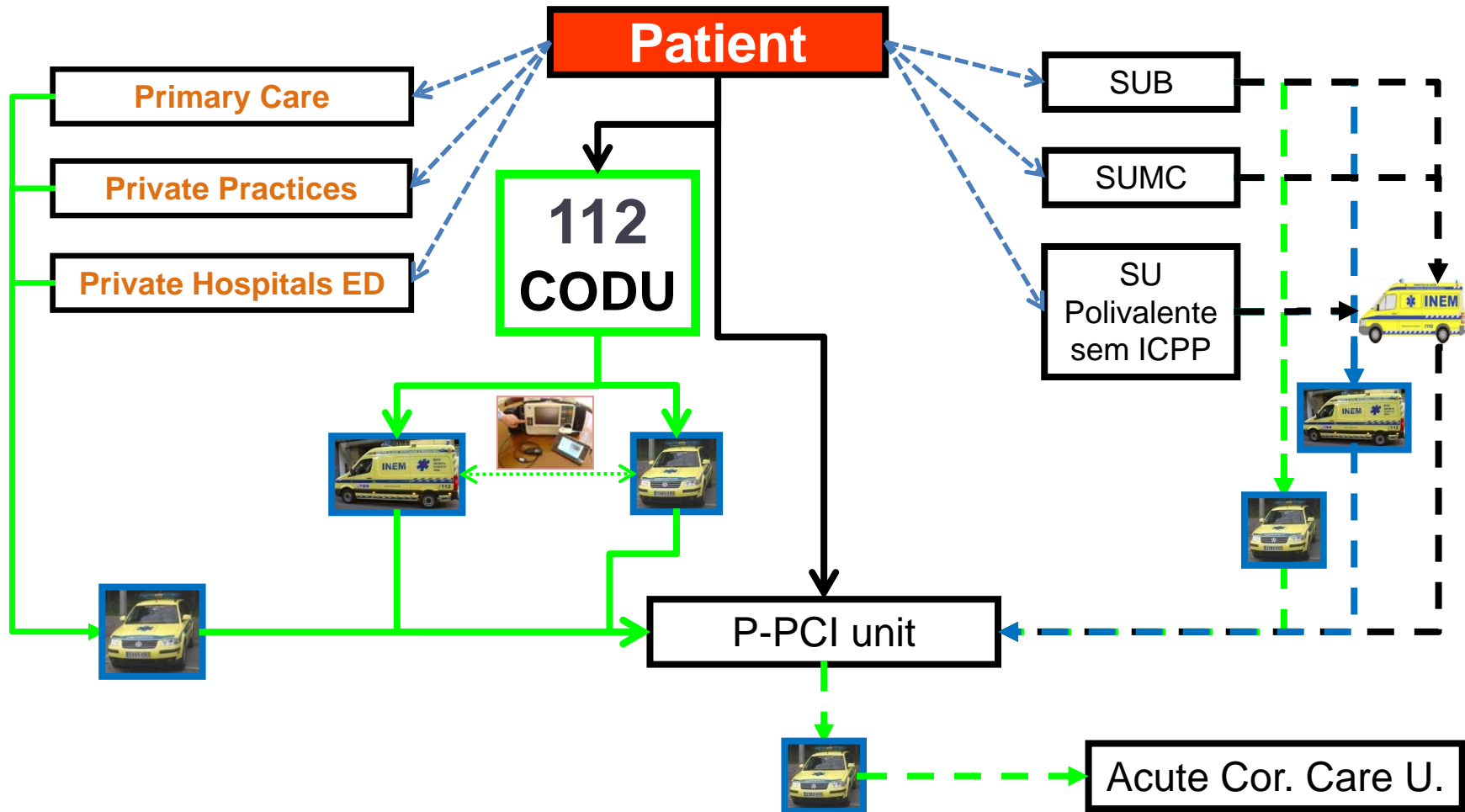


No ICP





# STMI – referral





# Patient already in “EMS stretcher” when ambulance and transfer team arrives

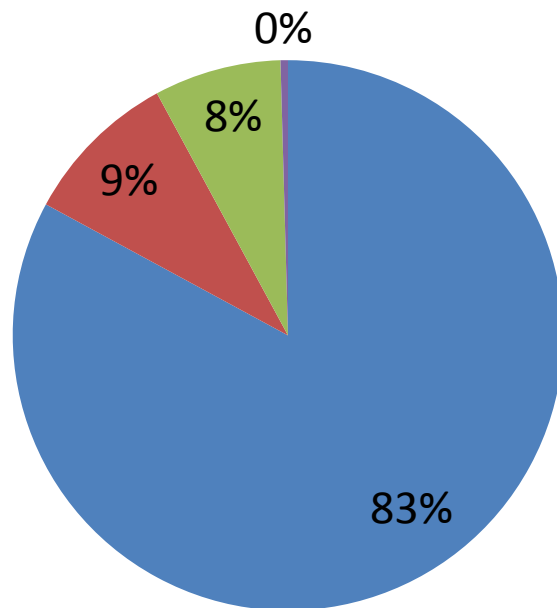




# Vascular Access P-PCI in Minho

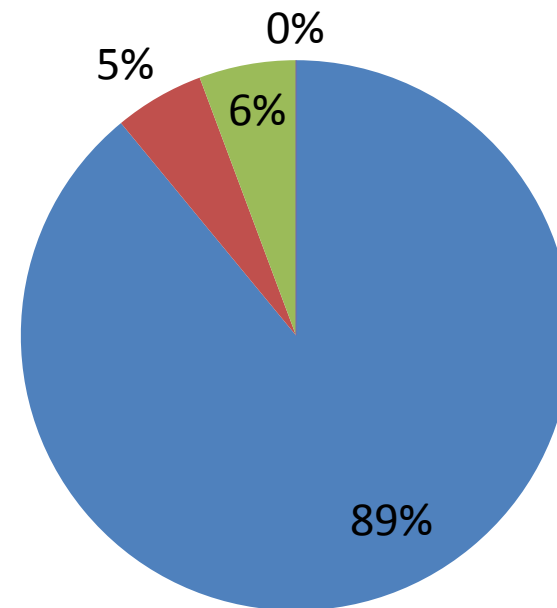
**2010**

■ Radial      ■ Femoral  
■ Femoral (conv.)   ■ Braquial



**2011**

■ Radial      ■ Femoral  
■ Femoral (conv.)   ■ Braquial





## Conclusions

- To increase and improve primary referral via EMS
  - Maintenance / reinforcement of campaign to population
  - Review with de EMS the decision flowcharts
  - Ensure permanent availability and systematic use of ECG transmission
  - Active formation of EMS professionals in diagnosis workup
  - EMS arriving to an local hospital with a patient with chest pain without clear ST elevation, wait to confirm diagnosis.
  - Information to all clinicians (mainly primary care physician) and other health professionals about the collaboration with de EMS in case of STEMI suspect



## Conclusions

- To increase and improve inter-hospital transport (secondary referral)
  - Establish a national protocol with the EMS
  - Ensure permanent availability of ECG transmission between ED and the EMS (e.g. FAX transmission)
  - STEMI patients for transfer to reperfusion must have priority.
  - Patient already in “EMS stretcher” when ambulance and transfer team arrives
  - Maintain regular contact and exchange of information between local EMS, STEMI-referral hospital, STEMI-receiving hospital (PCI capable).