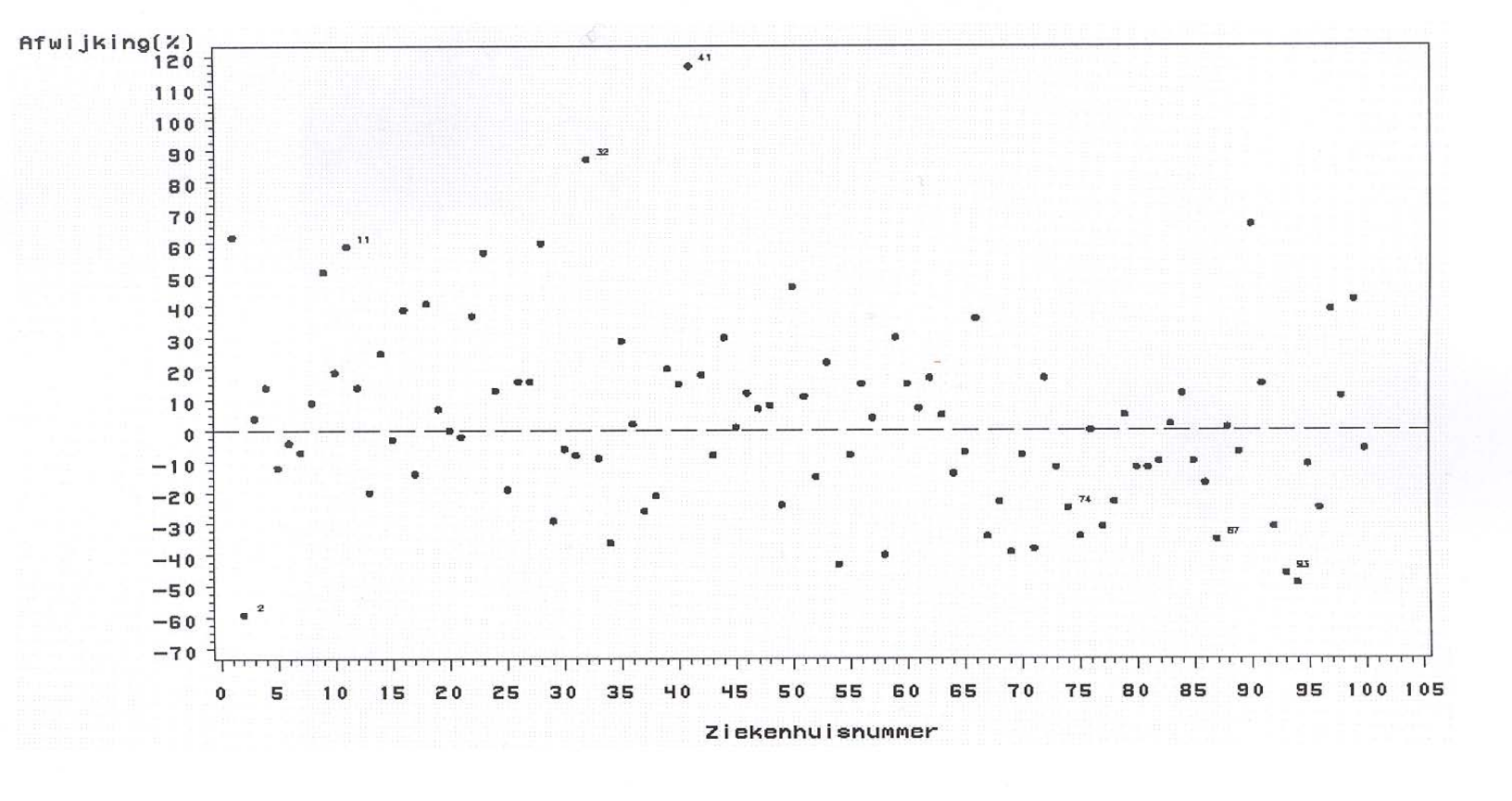
Quality assessment in STEMI patients:

the Belgian STEMI registry : 2007-2014

Belgian Interdisciplinary Working Group on Acute Cardiology (BIWAC)

College of Cardiology

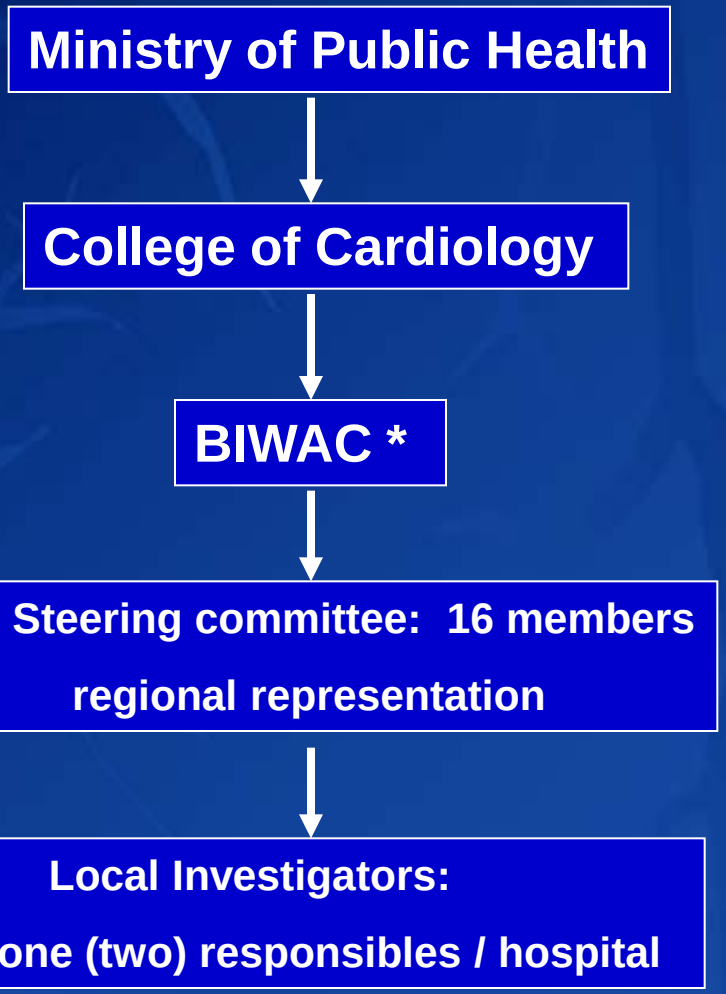
Lethality of AMI 2000-2003: MKG data



N= 44782 AMI **in hospital lethality: 15.9%**

From dr W Aelvoet, RIZIV/ENAMI

STEMI registry : Organisation



•Belgian Interdisciplinary working group of acute cardiology

Minimal Data Base

Patient characteristics (TIMI risk score)

Reperfusion strategy

In Hospital Outcome

Electronic CRF

ST-Verheffing hartinfarct registratie Naam ziekenhuis:	Crf nummer: Naam van de verantwoordelijke geneesheer:

Patiëntenkarakteristieken bij opname

Opnamedatum: (dd/mm/yyyy)
De patiënt heeft zijn toestemming aan de gegevens behandeling gegeven: Ja Nee
Geboortedatum: Leeftijd:
Patiënt postcode: Patiënt initialen:
Geslacht: Man Vrouw Gewicht: <67 kg >=67 kg
Cardiovasculaire voorgeschiedenis:
- Ischemisch hartlijden Ja Nee
- Perifeer vaatlijden Ja Nee
- Arteriele hypertensie Ja Nee
- Diabetes mellitus Ja Nee

Killip Klasse: 1 (geen hartfalen) - 2 - 3 - 4 (shock)
Cardio-pulmonale reanimatie: Ja Nee
Bloeddruk: <100 mmHg >=100 mmHg
Hartritme: <100 hartslagen/minuut >=100 hartslagen/minuut
ECG: anterior - non-anterior - linkerbundeltakblok

Reperfusiebehandeling binnen de eerste 24 uur

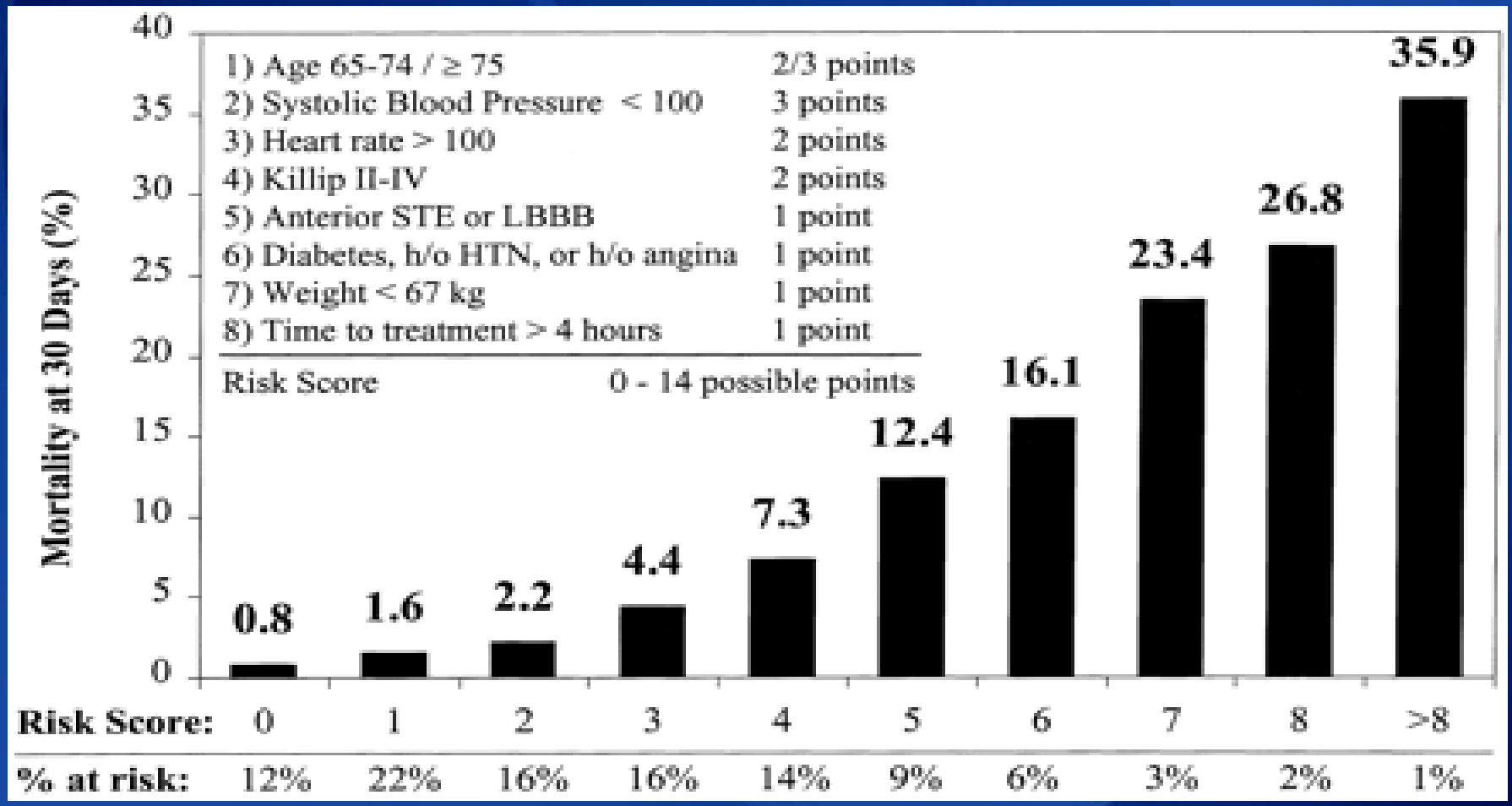
Totale ischemietijd: <4u / 4-8u / 8-12u / 12-24u
(tijd vanaf begin klachten tot behandeling)
"Door-to-balloon/needle" tijd: <30min / 30-60 min / 60-90 min / 90-120 min / >120min
(tijd vanaf eerste medische contact tot begin reperfusiebehandeling)
Reperfusiebehandeling:
Trombolyse Primaire PCI
Rescue PCI Gefaciliteerde PCI
Geen reperfusiebehandeling
Reden:
Prehospitale trombolyse: Ja Nee
Transport naar PCI centrum: Ja Nee

Klinisch Verloop tijdens hospitalisatie

Electieve (>24u na opname) coronarografie: Ja Nee
In-hospitaal mortaliteit: Ja Nee
Indien JA, datum: (dd/mm/yyyy)
Mortaliteit aan 30 dagen: Ja Nee

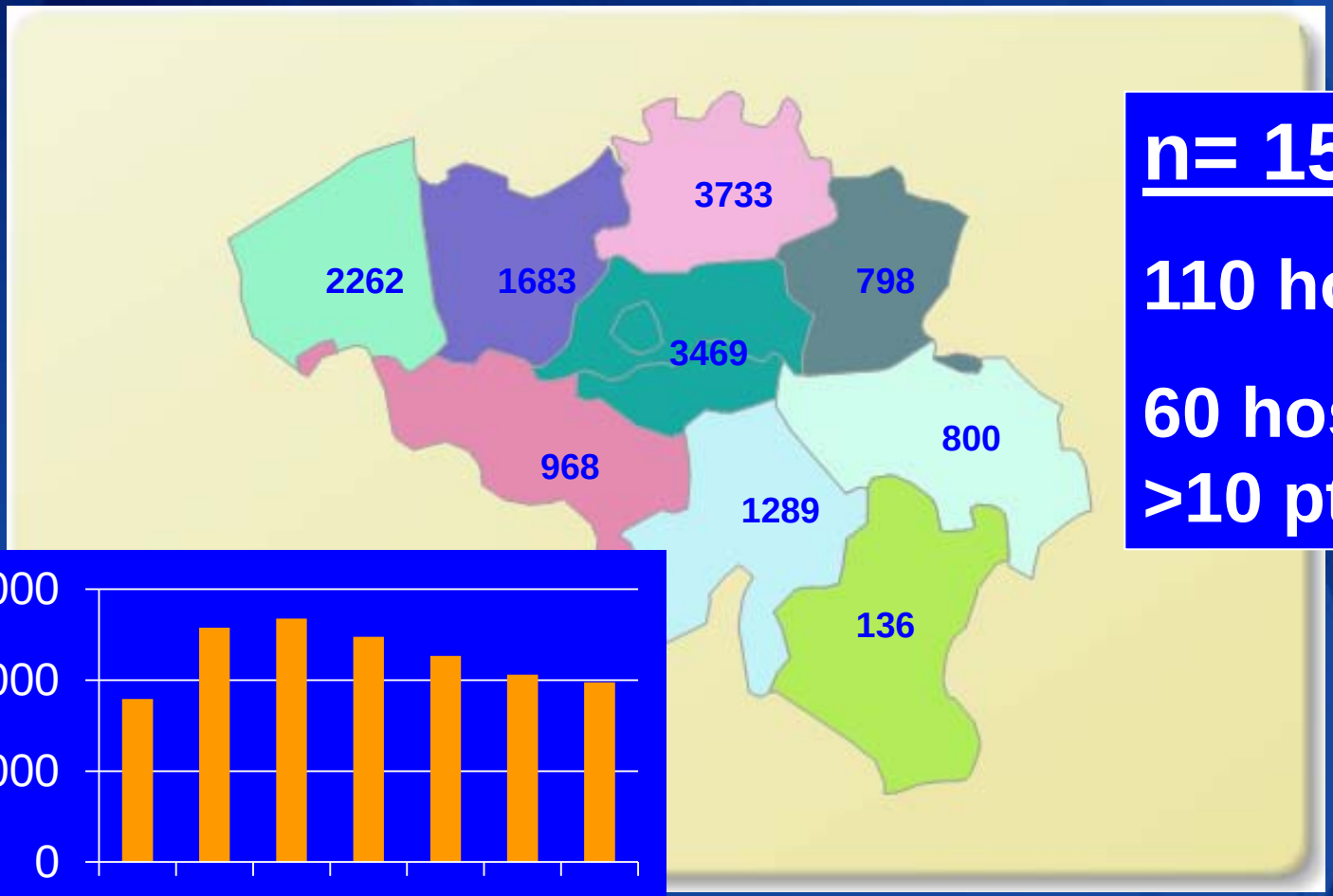
TIMI Risk score :

TIMI risk score (automatically calculated)



Circulation: 2000;102:2031

Enrolment STEMI patients 1/1/2007 – 31/12/2013



n= 15816

110 hospitals

60 hospitals with >10 pts/y

AUDIT STEMI REGISTRY:2007-2013

Centre	Source doc.	Correct item
2007-2008 (16)	2468/3255= 76%	2356/2468=95%
2008-2009 (15)	2541/2877= 88%	2460/2541=97%
2009-2010 (14)	2445/2793= 88%	2349/2445=96%
2010-2011 (14)	2427/2877= 84%	2348/2427=97%
2011-2012 (10)	1763/2100= 84%	1714/1763=97%
2012-2013 (10)	1733/2058= 84%	1683/1733=97%
2013-2014 (10)		

*** prize: ESC textbook of Intensive and Acute cardiac care**

Publications – abstracts/reports

- 2008:
  - ACC (Versaille): STEMI in PCI vs non-PCI
  - Activity report: focus on time
- 2009:
  - BSC: PCI vs TT
  - ESC (Barcelona): PCI vs TT
  - ESC (Barcelona): DM vs non-DM
  - ESC (Barcelona): STEMI and gender
  - Activity report: focus on cardiogenic shock
- 2010:
  - BSC: no reperfusion vs reperfusion
  - ACC (USA): STEMI and gender
  - ESC (Stockholm); STEMI and elderly
  - ACC (Kopenhagen): STEMI and no reperfusion
  - Activity report: focus on gender

Publications – abstracts/reports

- 2011:
  - BSC: STEMI and no reperfusion
    STEMI and young patients
    Door to balloon time revisited?
  - ESC: STEMI and octogenerians
    door to balloon time revisited?
  - Activity report: focus on elderly patients
- 2012:
  - BSC : interhospital variation in length of hospital stay
  - Activity report: focus on PCI vs no-PCI centres

Publications – abstracts/reports

- 2013:
  - ESC: Impact of transition of thrombolysis to primary PCI on door-to-balloon and mortality
  - ACC: Impact of transition of thrombolysis to primary PCI on door-to-balloon time and mortality
  - Activity report: evolution of reperfusion therapy in Belgium
- 2014:
  - ESC: impact of mode of arrival on reperfusion therapy
  - Activity report: quality indicators for STEMI

Publications

1. Claeys et al, Contemporary mortality differences between primary PCI and thrombolysis ina community-based STEMI population**.**
   Arch Intern Med. 2011;171(6):544-549
2. Claeys et al, STEMI mortality in community hospitals versus PCI-capable hospitals: results from a nationwide STEMI network programme.
   EHJ: Acute Cardiovascular Care 2012;1(1) 40–47
3. Claeys et al; Inter-hospital variation in length of hospital stay after STEMI patients: results from the Belgian STEMI registry,
   Acta Cardiologica 2013: 68(3); 235-239
4. Gevaert et al. Renal dysfunction in STEMI-patients undergoing primary angioplasty : higher prevalence but equal prognostic impact in female patients; an observational cohort study from the Belgian STEMI registry
   BMC nephrology 2013-14; 62
5. Gevaert et al.: Gender, TIMI-risk score and in-hospital mortality in STEMI patients undergoing primary PCI, *results from the Belgian STEMI registry*
   Euro-intervention 2014;9: 1095-1101
6. VandeCastele et al : Reperfusion therapy and mortality in octogenarian STEMI patients: Results from the Belgian STEMI registry,
   Clinical Research in Cardiology 2013; 102; 837-45

Mortality versus Reperfusion strategy

ORIGINAL INVESTIGATION

Contemporary Mortality Differences Between Primary Percutaneous Coronary Intervention and Thrombolysis in ST-Segment Elevation Myocardial Infarction

Marc J. Claeys, MD, PhD; Antoine de Meester, MD; Carl Convens, MD; Philippe Dubois, MD; Jean Boland, MD; Herbert De Raedt, MD; Pascal Vranckx, MD; Patrick Coussement, MD; Sofie Gevaert, MD; Peter Sinnaeve, MD, PhD; Patrick Evrard, MD, PhD; Christophe Beauloye, MD; Marc Renard, MD, PhD; Christiaan Vrints, MD, PhD

Claeys et al, Arch of Intern Med 2011

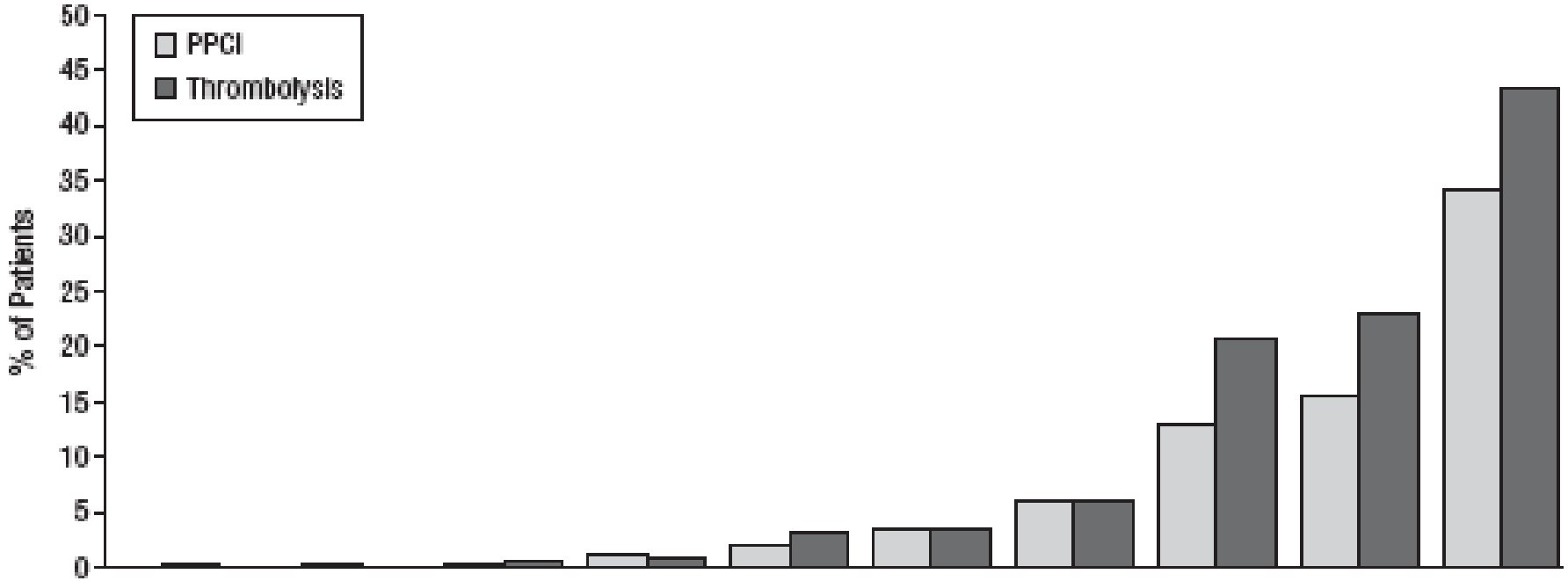
Mortality versus Reperfusion strategy

Table 1. Baseline Patient Characteristics[a]

Characteristic	PPCI (n=4574)	Thrombolysis (n=721)	*P* Value
Age, mean (SD), y	62.2 (12.9)	62.0 (12.7)	.70
Male sex	77.2	75.5	.30
Weight <67 kg	17.5	19.0	.33
Previous CAD	20.0	17.2	.09
Previous PAD	9.9	7.9	.10
Arterial hypertension	43.3	45.3	.31
Diabetes mellitus	13.9	14.4	.76
Killip class >1	21.6	16.4	.001
Heart rate >100 bpm	13.5	13.2	.86
Blood pressure <100 mm Hg	20.7	14.7	<.001
Cardiopulmonary resuscitation	12.3	10.8	.27
Infarction location, anterior or LBBB	42.9	40.2	.03
Time from symptom onset to treatment, h			
<4	68.4	79.1	<.001
4-8	23.7	15.7	
>8-12	7.8	5.3	
Door-to-needle/balloon			<.001
Early	56.0	48.0	
Intermediate	33.1	18.6	
Late	8.6	19.8	
Not available	2.3	13.6	
TIMI risk score, mean (SD)	4.1 (2.8)	3.8 (2.7)	.06
TIMI risk score group			
Low (0-2)	36.2	38.3	.36
Intermediate (3-6)	45.0	45.0	
High (7-14)	18.7	16.8	

Claeys et al, Arch of Intern Med 2011

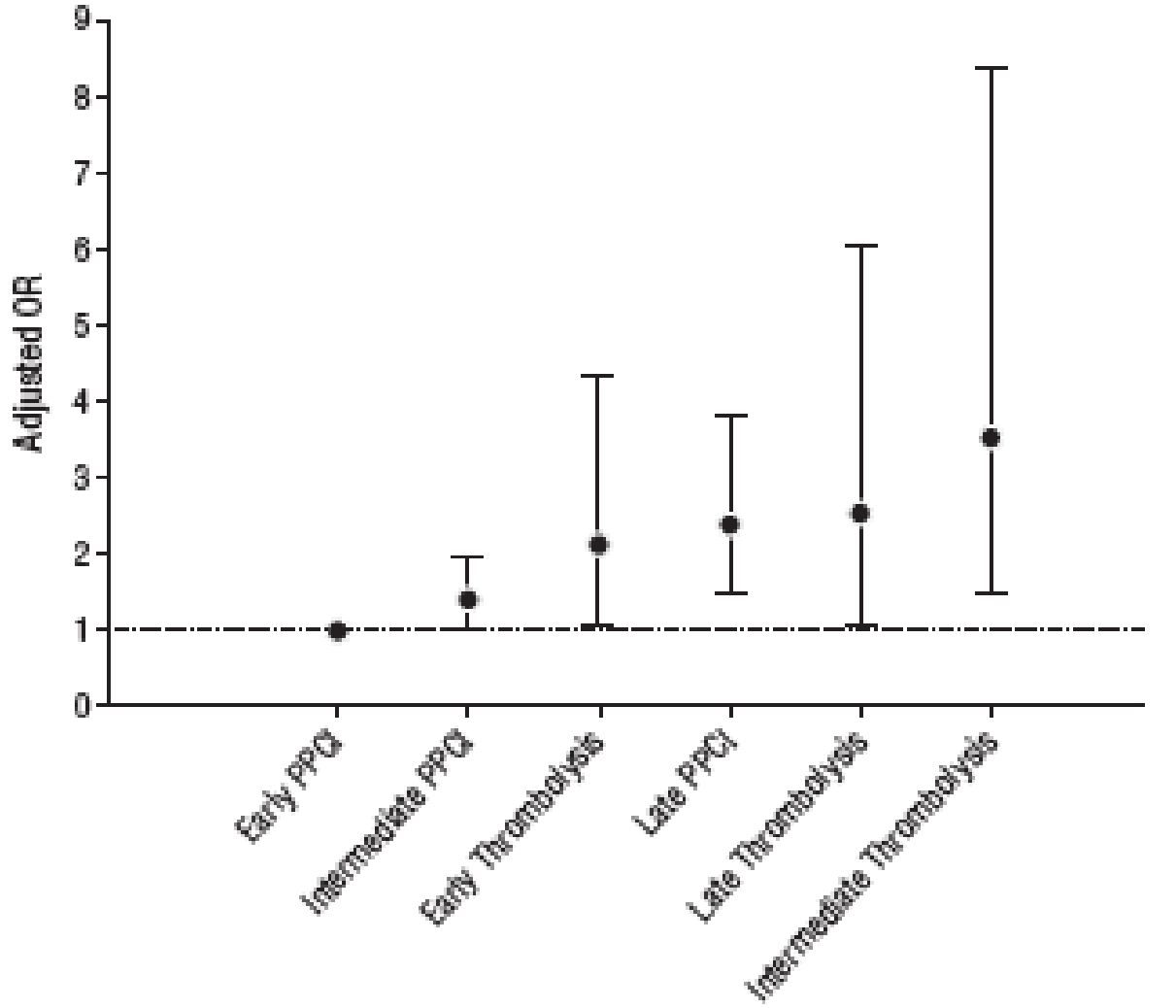
Mortality versus Reperfusion strategy



No. of patients										
Thrombolysis	34	95	147	95	124	55	50	48	22	51
PPCI	235	682	741	584	606	526	342	254	187	417

Claeys et al, Arch of Intern Med 2011

Mortality versus Reperfusion strategy



Early PCI: < 60 min

Interm PCI: 60-120

Late PCI: > 120 min

Early TT: <30 min

Interm T: 30-60 min

Late T: > 60 min

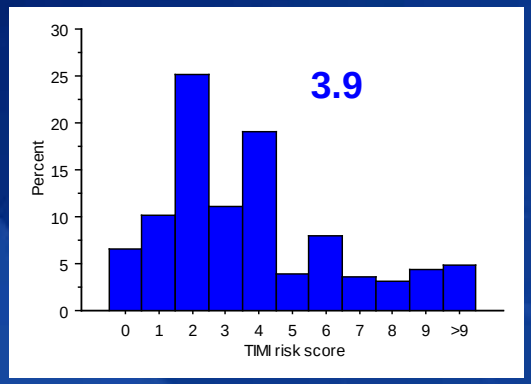
Door-t- balloon time should be less than 60 min to obtain lowest mortality rates !!

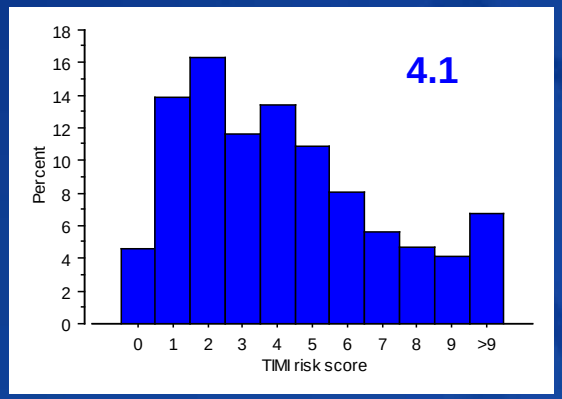
Claeys et al, Arch of Intern Med 2011

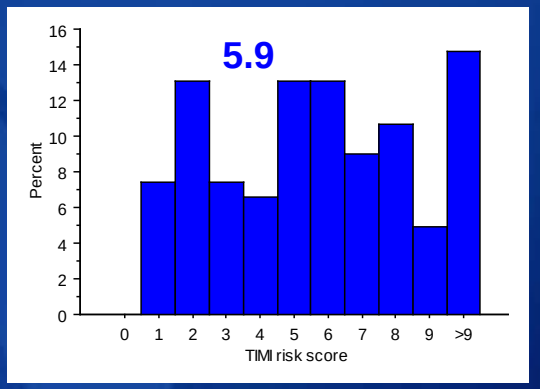
Mortality versus Reperfusion strategy

N= 11467

Trombolysis N=665	Rescue PCI N=299	PCI N= 9617	Faciliated PCI N=250	No Reperfus. 636
N = 954 (8%)*		N=9867(86%)		N= 636 (6%)





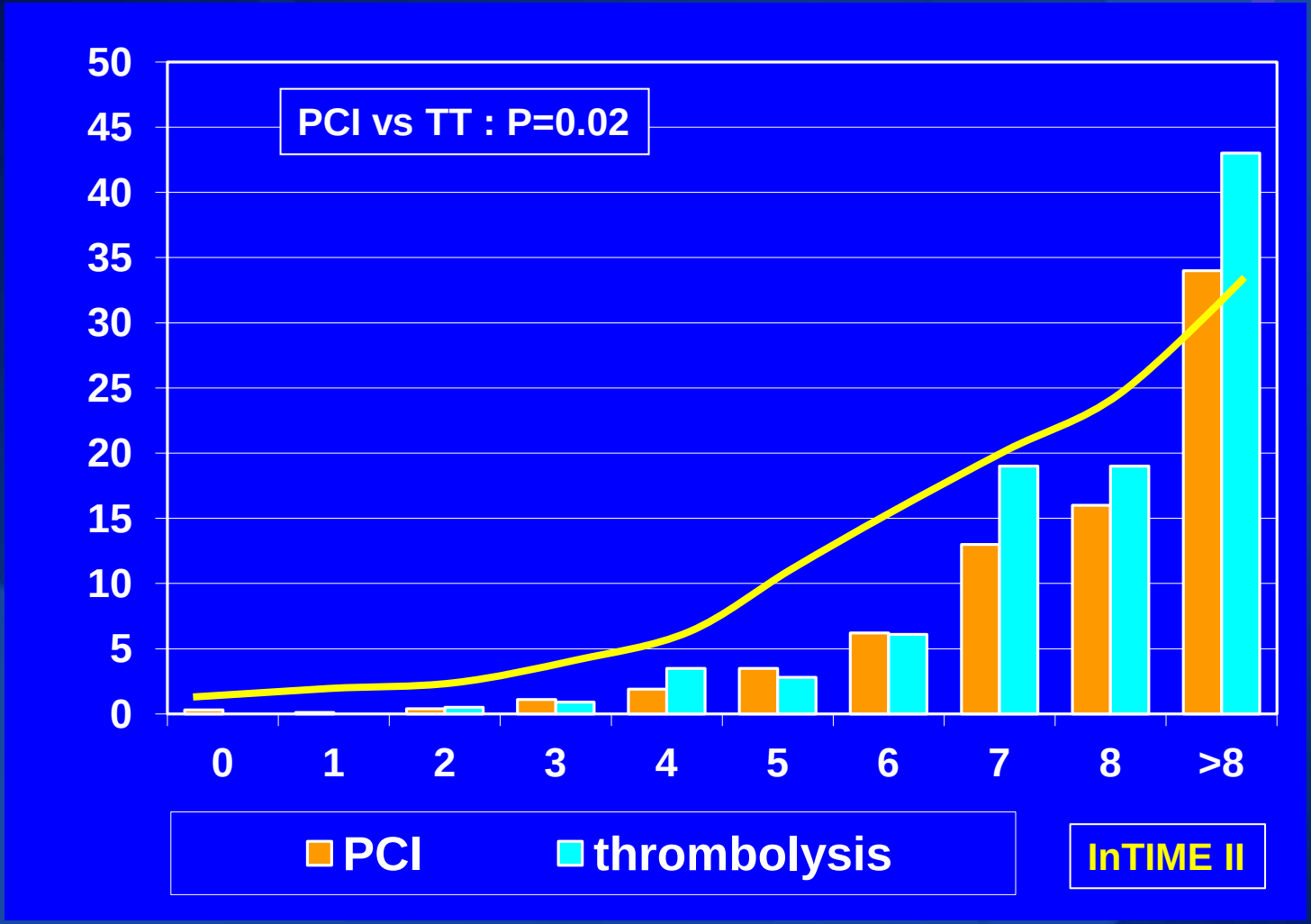


MORTALITY

6,7%	6.0 %	19%

*Elective Invasive evaluation:502+299=801(84%)

Attenuation of mortality benefit PCI over TT



Claeys et al, Arch of Intern Med 2011

mortality in octogenarian STEMI

Clin Res Cardiol (2013) 102:837–845
DOI 10.1007/s00392-013-0600-3

ORIGINAL PAPER

Reperfusion therapy and mortality in octogenarian STEMI patients: results from the Belgian STEMI registry

Els H. Vandecasteele · Marc De Buyzere · Sofie Gevaert · Antoine de Meester · Carl Convens · Philippe Dubois · Jean Boland · Peter Sinnaeve · Herbert De Raedt · Pascal Vranckx · Patrick Coussement · Patrick Evrard · Christophe Beauloye · Marc Renard · Marc J. Claeys

Vandecasteele et al, Clinical Research in Cardiology 2013

Mortality in octogenarian STEMI

	<80 years	≥80 years	*p*
n	7,984	1,092	
Treatment			$p < 0.001$
TL, *n* (%)	791 (9.9 %)	101 (9.2 %)	
PCI, *n* (%)	6,818 (85.4 %)	840 (76.9 %)	
Conservative treatment, *n* (%)	375 (4.7 %)	151 (13.8 %)	

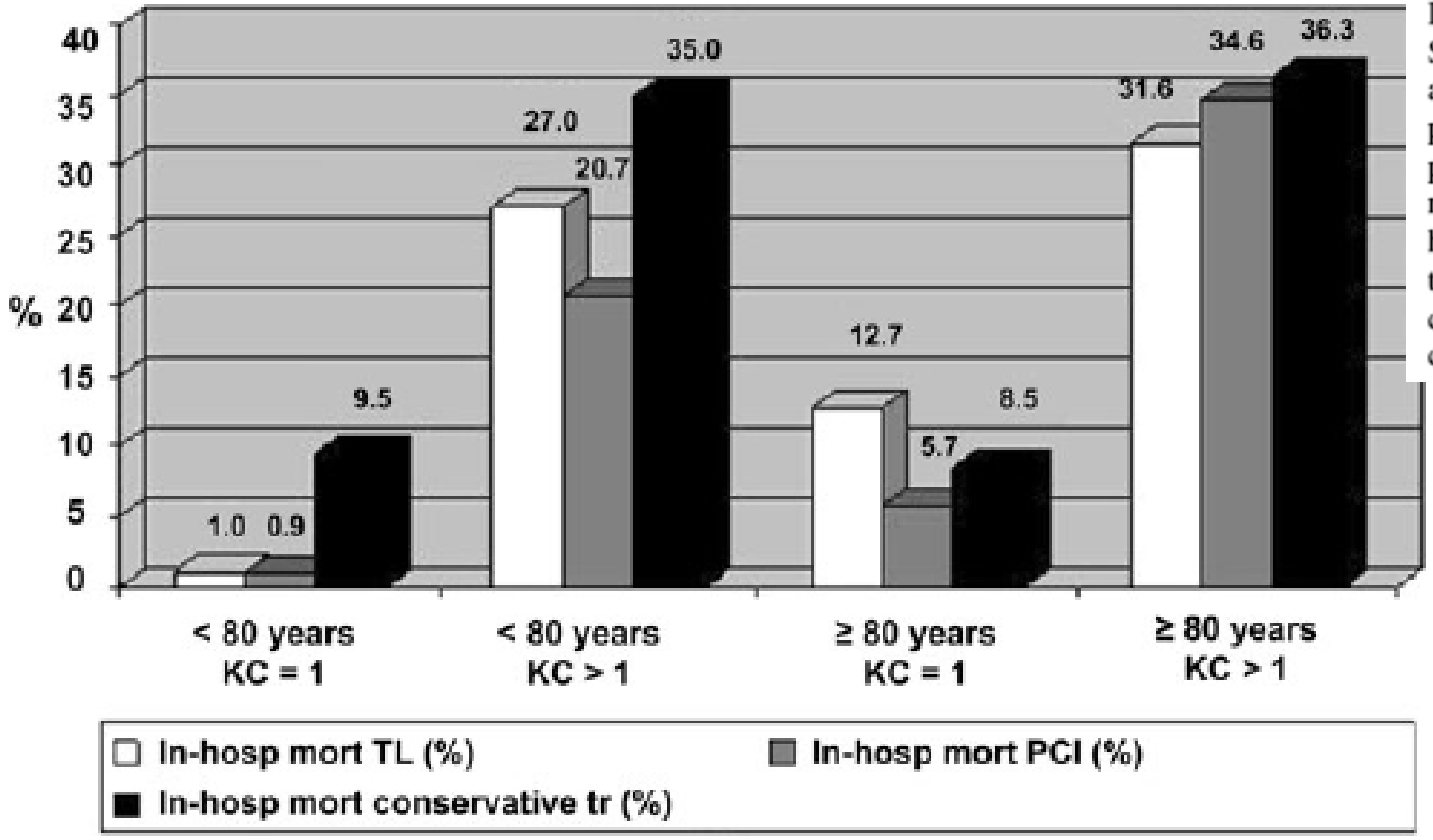


Fig. 1 In-hospital mortality for STEMI patients <80 years old and octogenarian STEMI patients (stable and unstable patients) depending on type of reperfusion therapy. *In-hosp* in-hospital, *mort* mortality, *TL* thrombolysis, *PCI* percutaneous coronary intervention, *KC* Killip class

Vandecasteele et al, Clinical Research in Cardiology 2013

Mortality versus Acute cardiac care program

European Heart Journal
Acute Cardiovascular Care

EUROPEAN SOCIETY OF CARDIOLOGY®

Original scientific paper

European Heart Journal: Acute Cardiovascular Care
1(1) 40–47

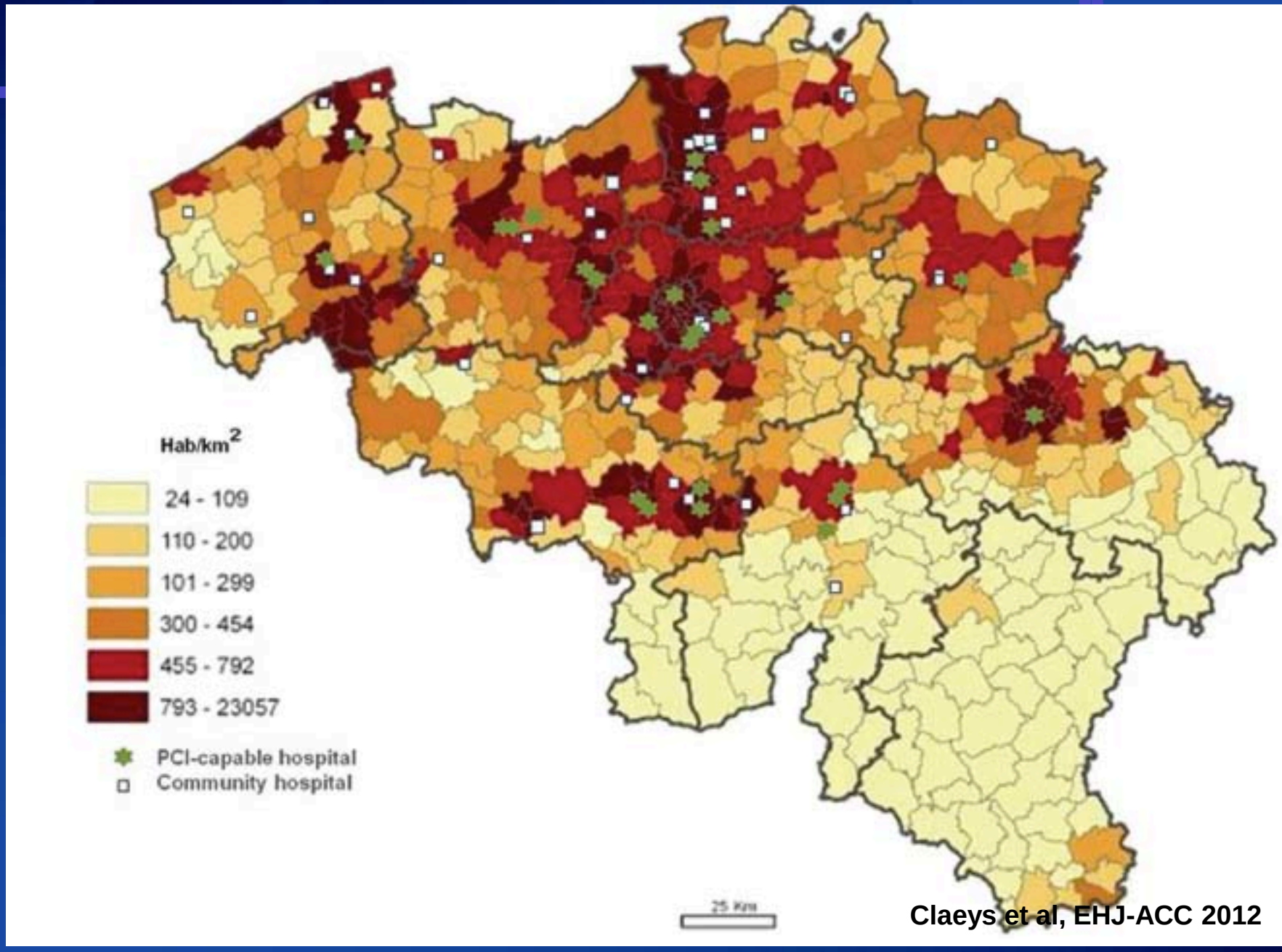
DOI: 10.1177/2048872612441579
acc.sagepub.com
SAGE

STEMI mortality in community hospitals versus PCI-capable hospitals: results from a nationwide STEMI network programme

Marc J Claeys,[1] Peter R Sinnaeve,[2] Carl Convens,[3] Philippe Dubois,[4] Jean Boland,[5] Pascal Vranckx,[6] Sofie Gevaert,[7] Antoine de Meester,[8] Patrick Coussement,[9] Herbert De Raedt,[10] Christophe Beauloye,[11] Marc Renard,[12] Christiaan Vrints[1] and Patrick Evrard[13]

Claeys et al, EHJ-ACC 2012

Mortality versus Acute cardiac care program



Claeys et al, EHJ-ACC 2012

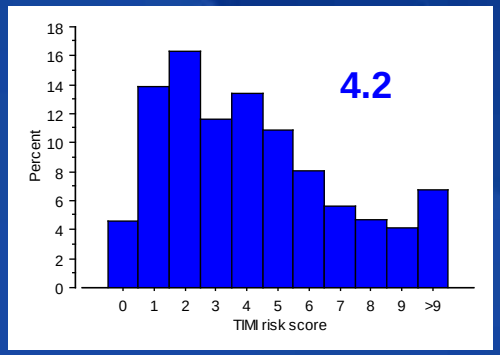
Mortality versus Acute cardiac care program

PCI centre
N=7024(60%)

- trombolysis: 2%
- Rescue PCI: 1%
- Prim –facilat PCI: 93%
- No reperfusion: 4 %

No-PCI centre
N=4443 (40%)

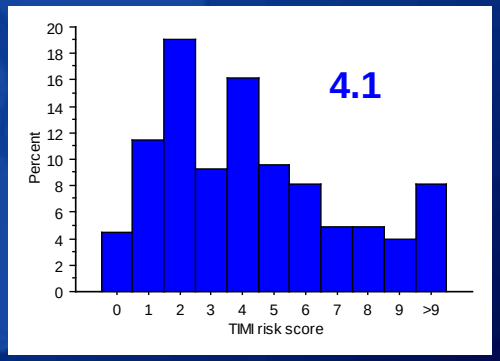
- trombolysis: 15%
- Rescue PCI: 5%
- Prim –facilat PCI:75%
- No reperfusion: 8 %



MORTALITY

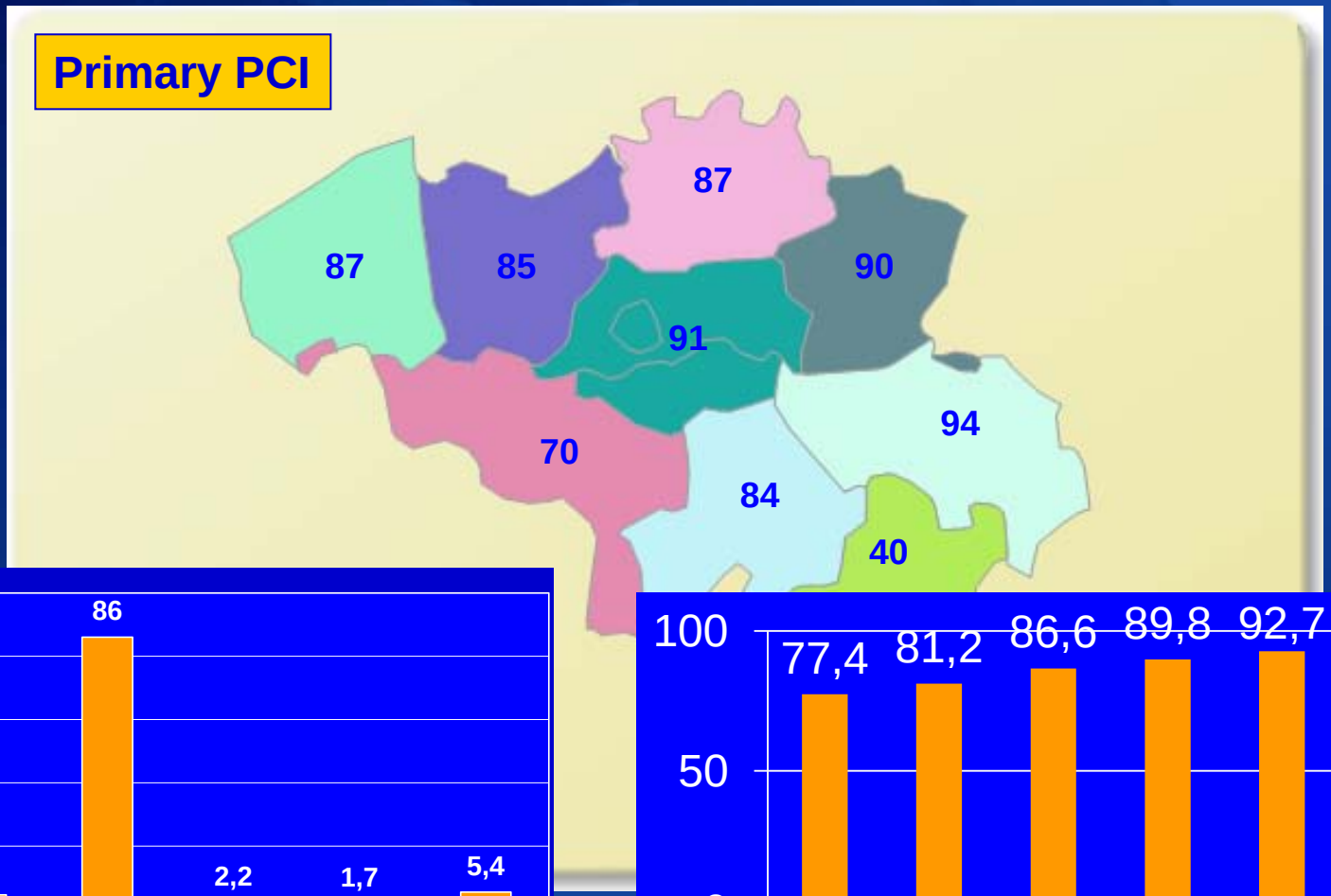
6.7%

6.9%

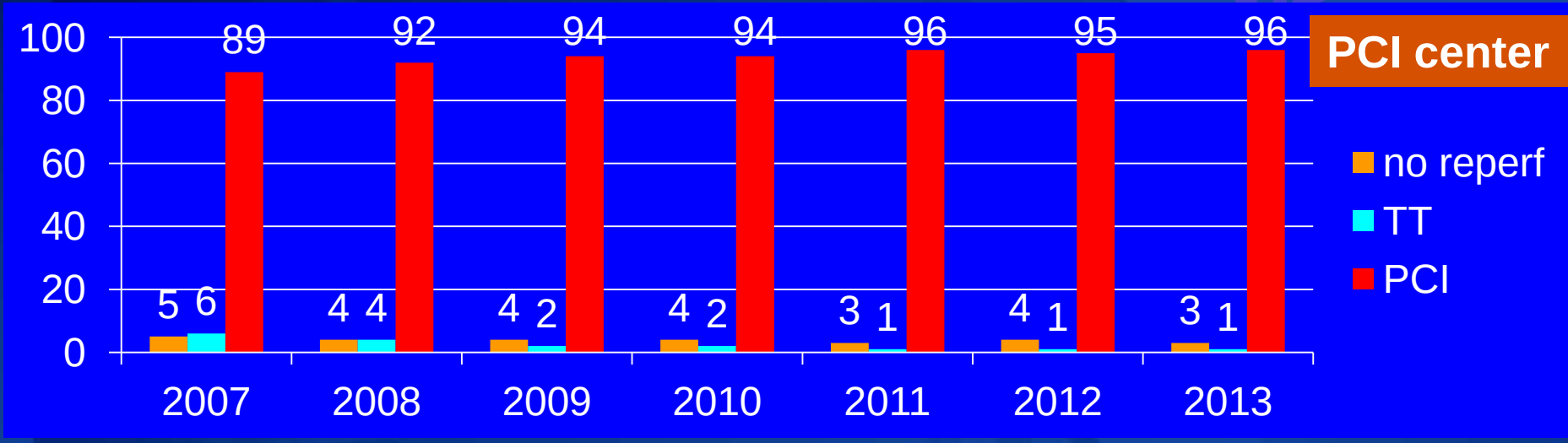


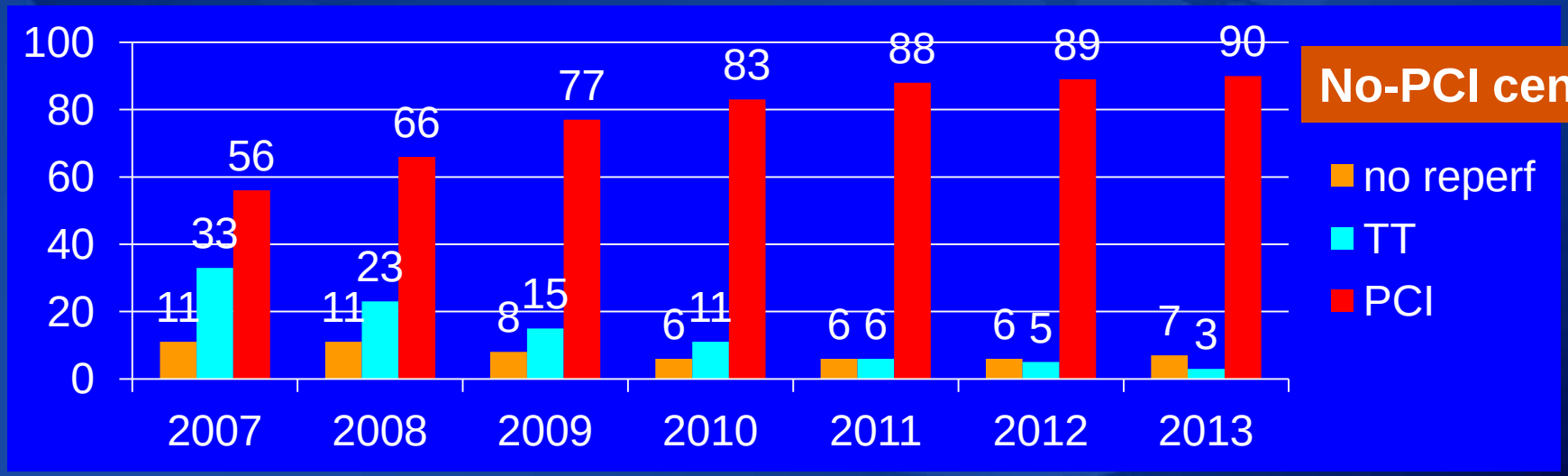
Claeys et al, EHJ-ACC 2012

Regional data on Reperfusion therapy

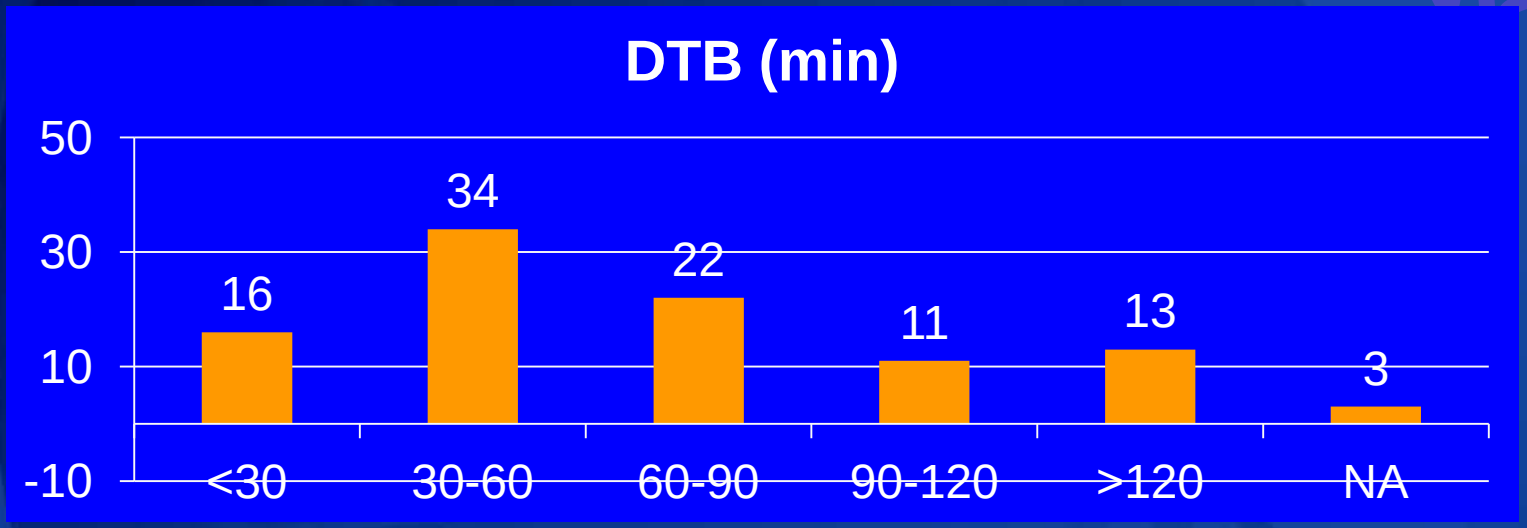


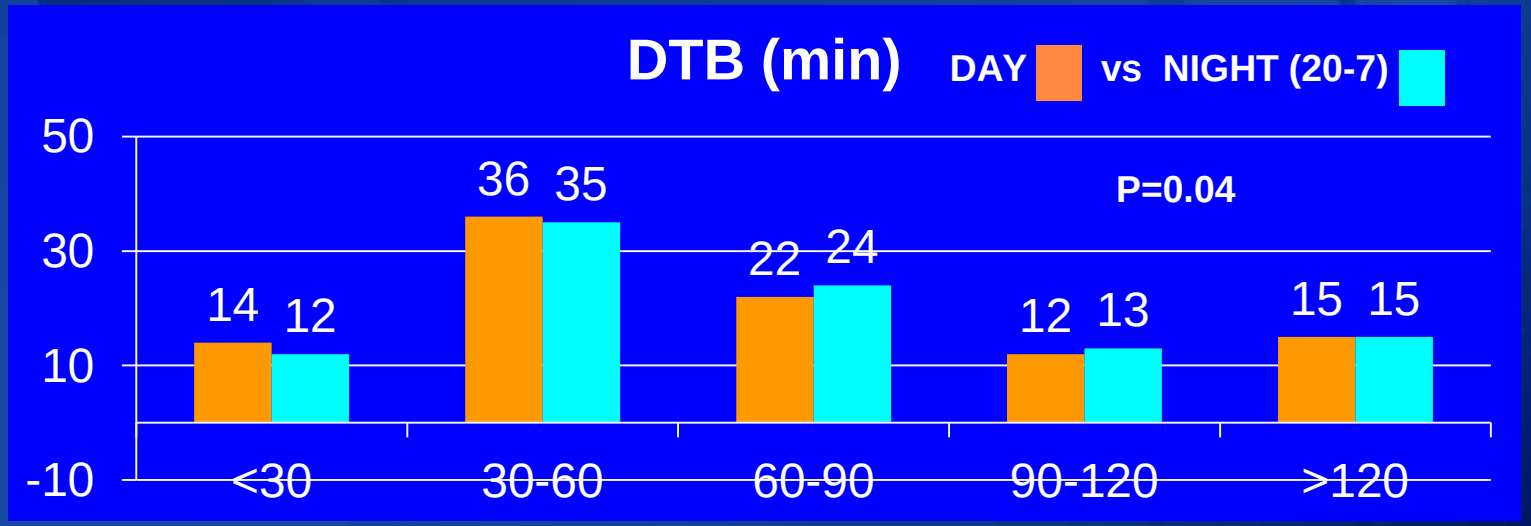
Evolution reperfusion therapy



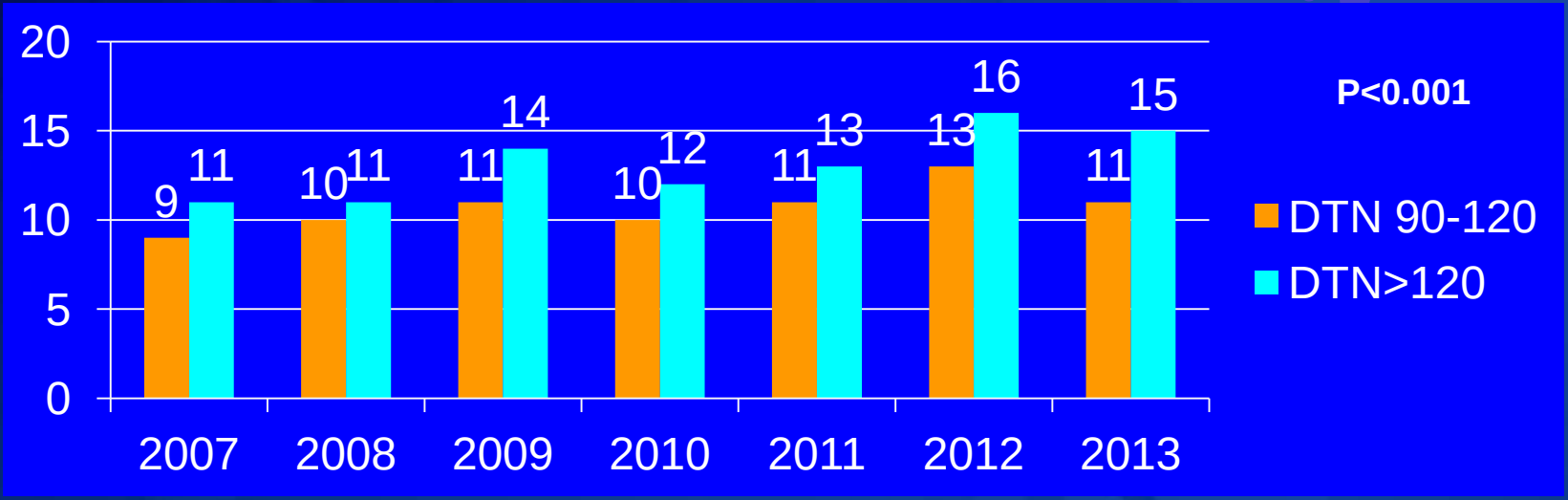


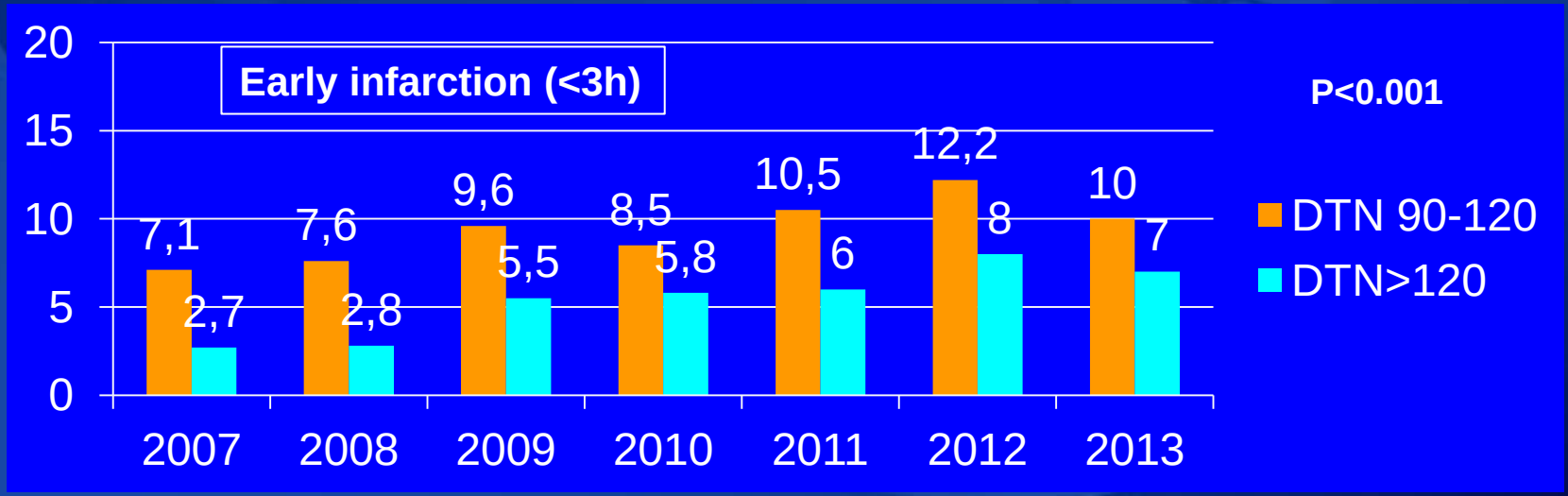
Reperfusion time: diagnosis to balloon time



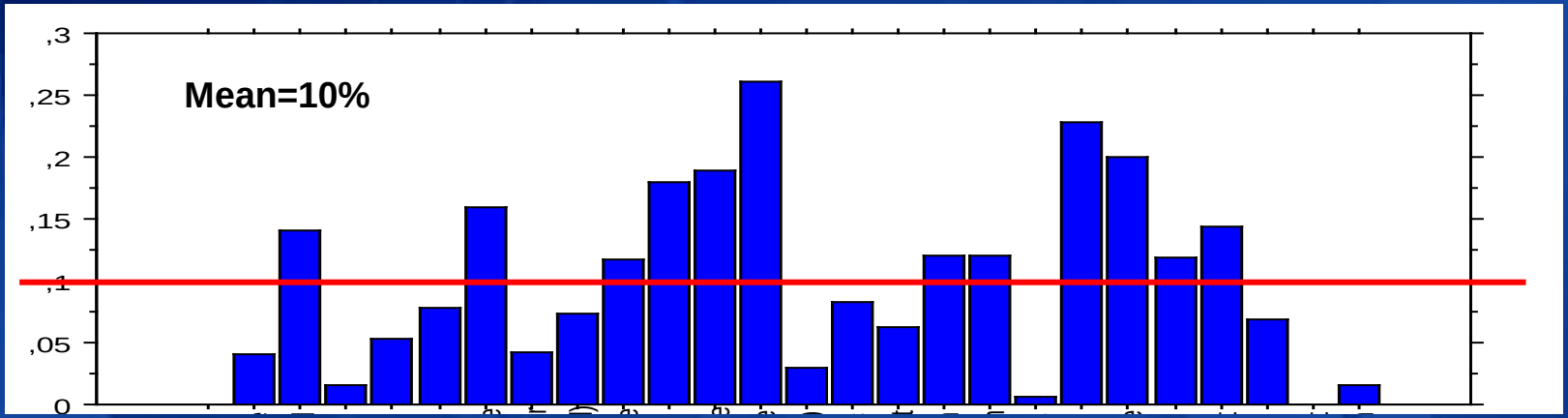


Reperfusion time: diagnosis to balloon time



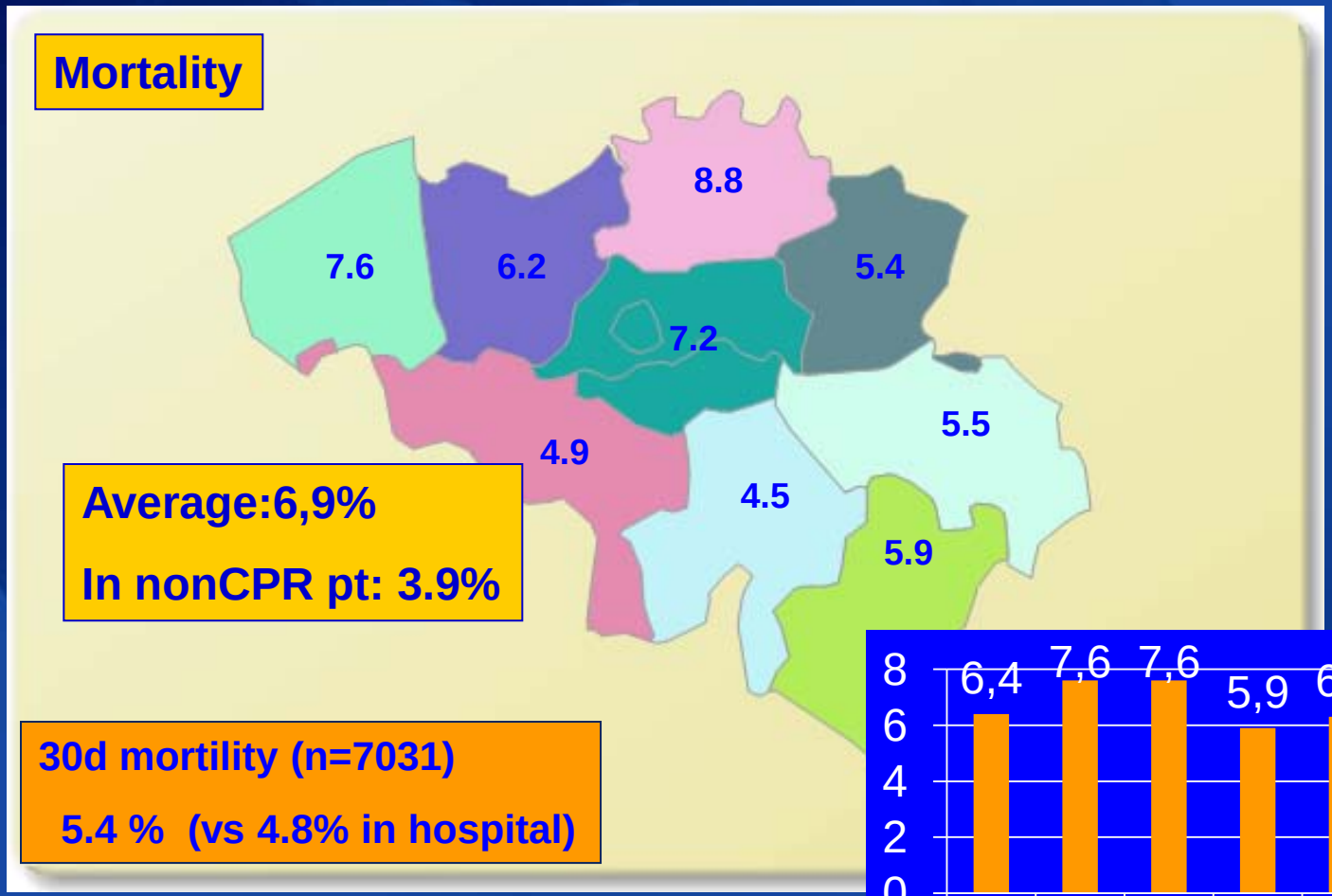


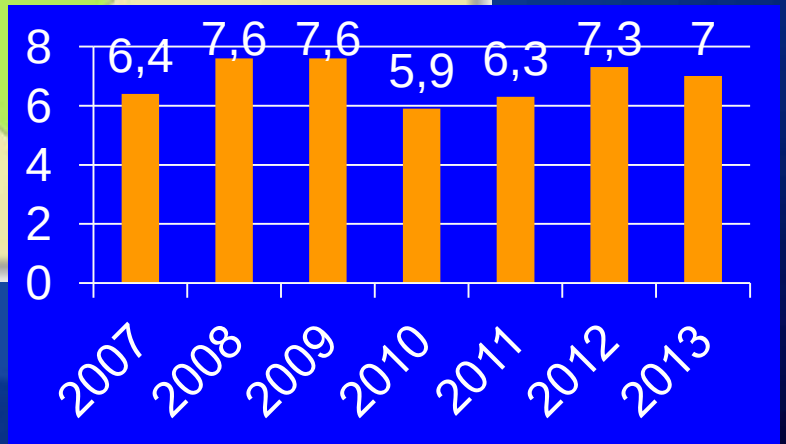
Quality indicator: DTB>120 in PCI centres



% DTB>120 in non-PCI centres: 20%

Regional data on in hospital mortality





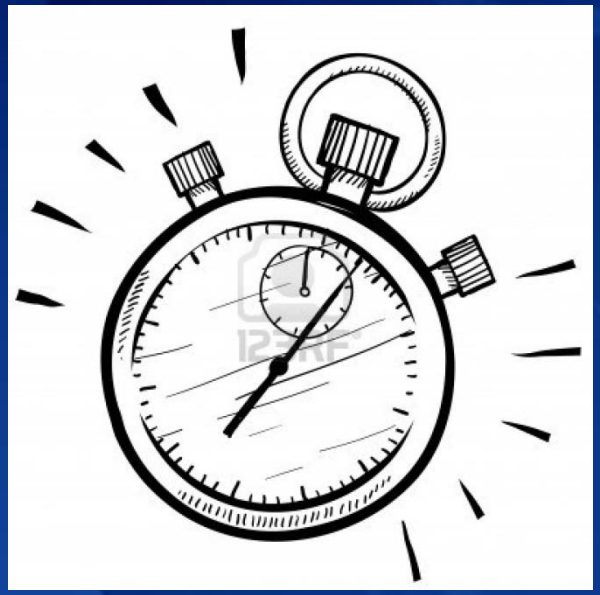
Indepedent predictors of mortality

	P value	0R (95%CI)
Killip > 1	<.0001	5 (4 - 7)
CPR	<.0001	5 (4-6)
age	<.0001	1.04 (1.03-1.05)
PCI vs TT No reperf	0.02 <0,0001	1.5 (1.1 – 2.7) 2,3 (1,7-3,1)
Ischemia>4h	0.0001	1.5 (1.3-2.0)
PAD	<0.0001	1,8 (1.4-2.4)
female	0.01	1.3 (1. 1-2.0)

Conclusions

- The present study demonstrates that thanks to the promotion and implementation of the concept of STEMI network in Belgium, PCI rate increased significantly, particularly in the community hospitals, and reached a penetration rate of >90% which is in line with European recommendations.
- The transition of thrombolysis to transfer for pPCI in the setting of a STEMI network was, however, associated with almost 50% increase of the proportion of patients with prolonged diagnosis-to-balloon time.

ESC guidelines



European guidelines on STEMI, from Steg et al., Eur Heart J 2012;33:2569-2619

Delay	Target
Preferred for FMC to ECG and diagnosis	≤10 min
Preferred for FMC to fibrinolysis ('FMC to needle')	≤30 min
Preferred for FMC to primary PCI ('door to balloon') in primary PCI hospitals	≤60 min
Preferred for FMC to primary PCI	≤90 min (≤60 min if early presenter with large area at risk)
Acceptable for primary PCI rather than fibrinolysis	≤120 min (≤90 min if early presenter with large area at risk) if this target cannot be met, consider fibrinolysis.
Preferred for successful fibrinolysis to angiography	3–24 h

European guidelines on revascularisation, from Windecker et al., Eur Heart J 2014

Symptom Onset

Patient Delay

FMC→STEMI diagnosis

Total Ischaemic Time

FMCTB <90min

DTB <60 min

FMCTB <120min

Primary-PCI capable centre

EMS or non primary-PCI capable centre

DI-DO

PCI with FMCTB ≤120 min and DI-DO ≤30min

Immediate transfer to PCI center

Yes

No

Primary PCI

Rescue PCI

Immediate

No

Yes

Successful Fibrinolysis?

Immediate transfer to PCI center

Immediate Fibrinolysis

3-24h

Coronary angiography

EMS = SMUR

If cardiogenic shock, Immediate transfer to PCI center

Project 2014-2015

- Quality indicators in STEMI patient
  - Diagnosis to-balloon time (system time)
  - Door-to-balloon time
  - Reperfusion therapy
  - Discharge medications