

How can registries contribute to guidelines?

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Pros and cons of registers

- Prospective randomised trials constitute the cornerstone of "evidence-based" medicine, and they therefore form the basis of guidelines.
- However, they include only a very small proportion of patients presenting with a given disease and the populations thus selected do not necessarily represent the patients we manage "in the real world".

Pros and cons of hospital registers

- Registers provide important epidemiologic data on the incidence and prevalence of diseases and on their actual management.
- Importantly, they include *all* patients with a given condition and therefore provide observational data on subgroups who are not, or poorly, represented in RCTs: elderly, patients with CKD, patients with comorbidities.

Applicability of the results of RCTs

- Registers constitute a means to determine whether the recommendations drawn from the populations included in randomised trials also apply to everyday practice:

Are the conclusions of RCTs applicable to real-world populations?

Pros and cons of registers: bidirectional interaction with guidelines

- Registers constitute a way to measure how we apply current recommendations: can be used as a bench marking tool.
- They can verify that recommendations are appropriate and realistic.

Methodological considerations: two types of registers

- Registers with a voluntary participation:
 - Questionable representativeness
 - But more medically-centered: collection of numerous medical parameters allowing better characterisation of the populations
- Administrative databases and registers
 - Excellent representativeness
 - But limited ability to characterise the populations from a medical point of view

Methodological considerations

- Sophisticated statistical tools (e.g. propensity score analyses) can help comparing populations with similar characteristics.
- However, there are biases inherent to registers that cannot be overcome even by the most sophisticated statistical tools:

Conclusions from registers should be confirmed by multiple sources of data, using different methodologies or settings

**Utilisation of registries to get
epidemiologic data:
providing background for the
guidelines**

Incidence of AMI in France

- A common figure found in media and some scientific papers is that of 100 000 MIs each year in France.
- FAST-MI is a nationwide survey carried out over one month at the end of 2005 in 223 ICUs representing 60% of all ICUs providing care for AMI patients, regardless of the type of institutions (University hospitals, general hospitals, private clinics).

Annual incidence of AMI admitted to intensive care units. Figures from a voluntary register

In 2005, 3059 patients admitted for AMI ≤ 48 hours
in 60% of ICUs



61 000 patients on a yearly basis



Taking into account MIs > 48 hours, silent MIs, iatrogenic MIs, AMIs not hospitalised in ICUs (very elderly), and a slight bias toward participation of more high volume centres

Probably 65 000 recent AMIs are admitted to hospital each year in France

Annual incidence of AMI in France: Figures from an administrative database

- 24 075 patients hospitalised with AMI-related diagnosis in the CNAM-TS database in first half of 2006
- CNAM-TS represents approximately 70% of the French population

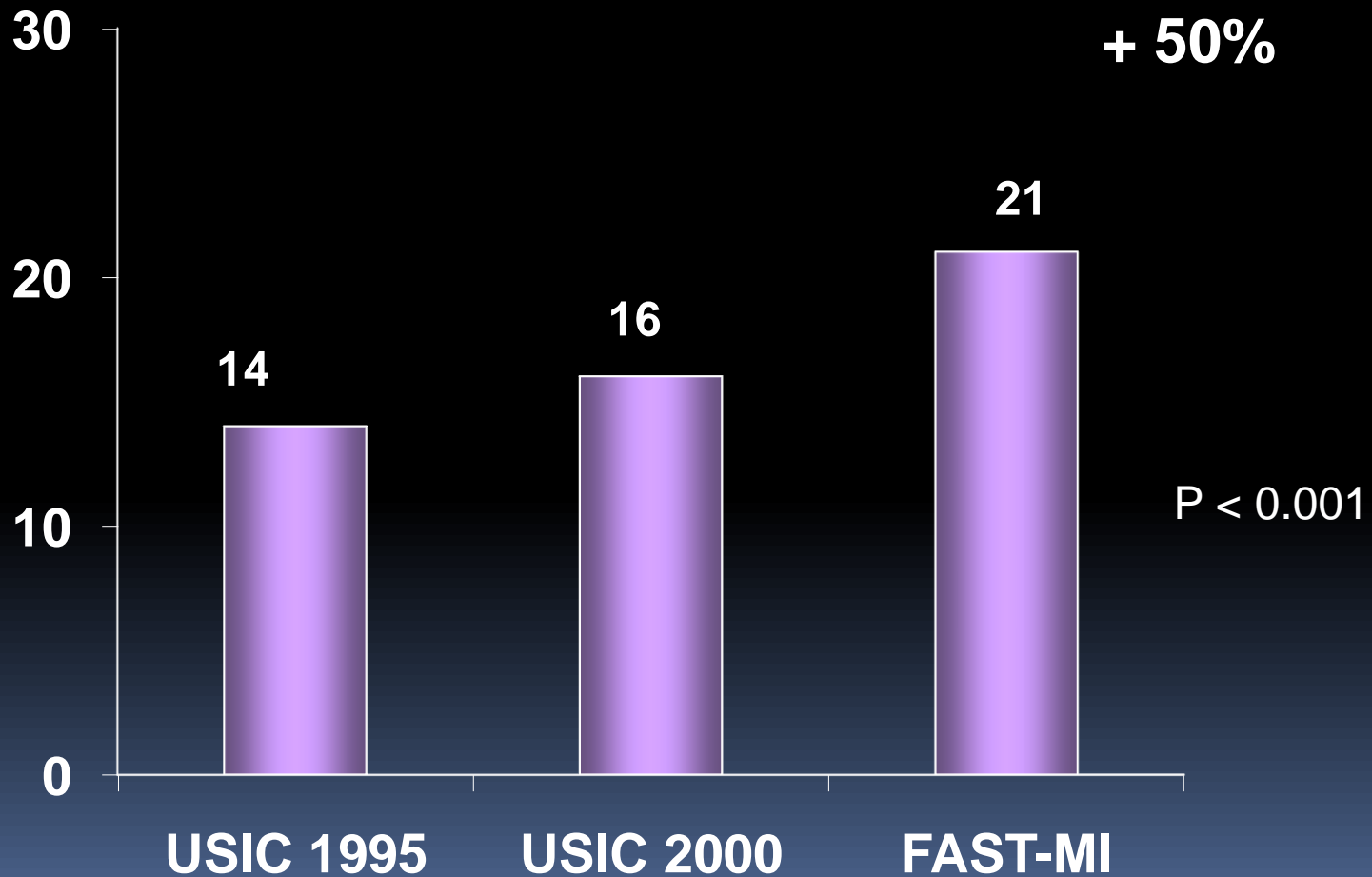


48 000 CNAM-TS patients on a yearly basis

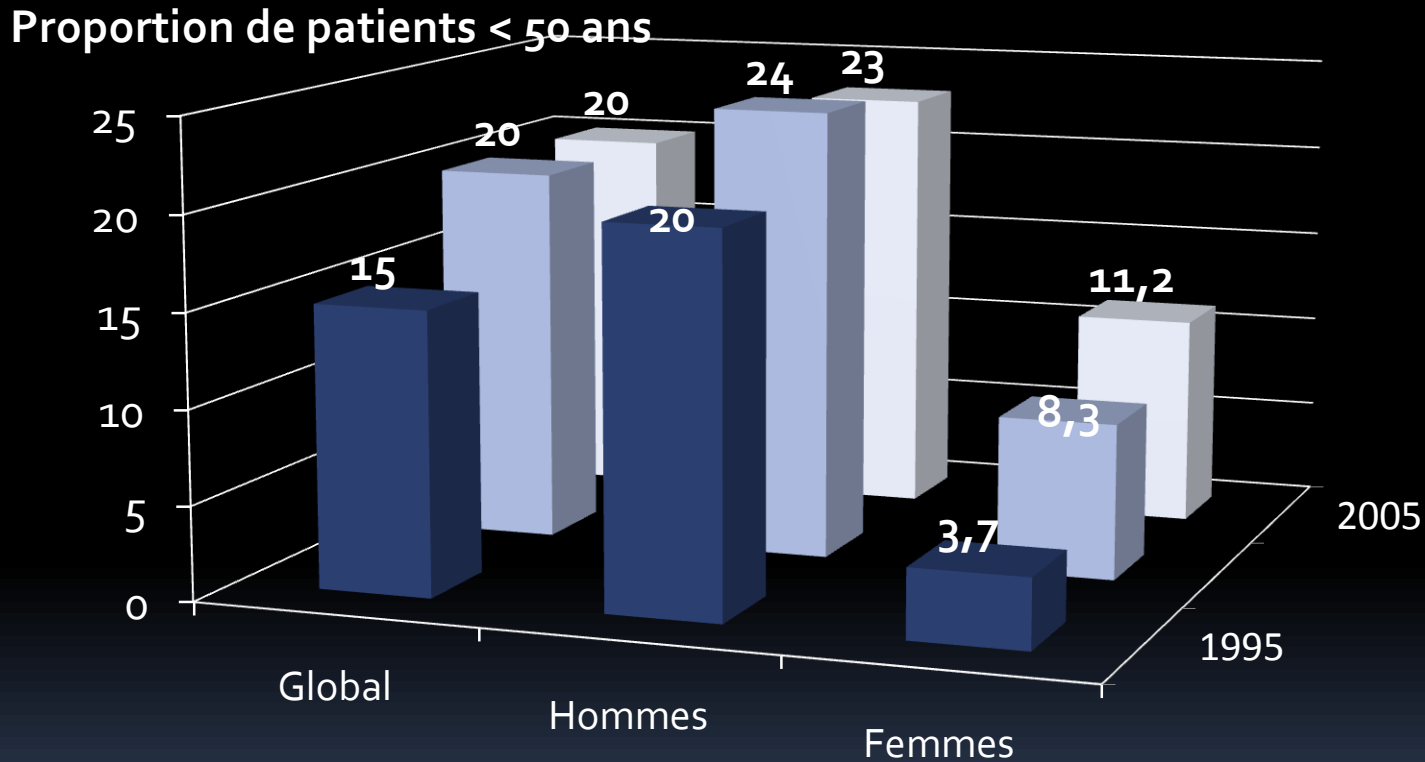


69 000 patients hospitalised on a yearly basis

Epidemiologic data: Obesity in French AMI patients



Trends in patients with STEMI

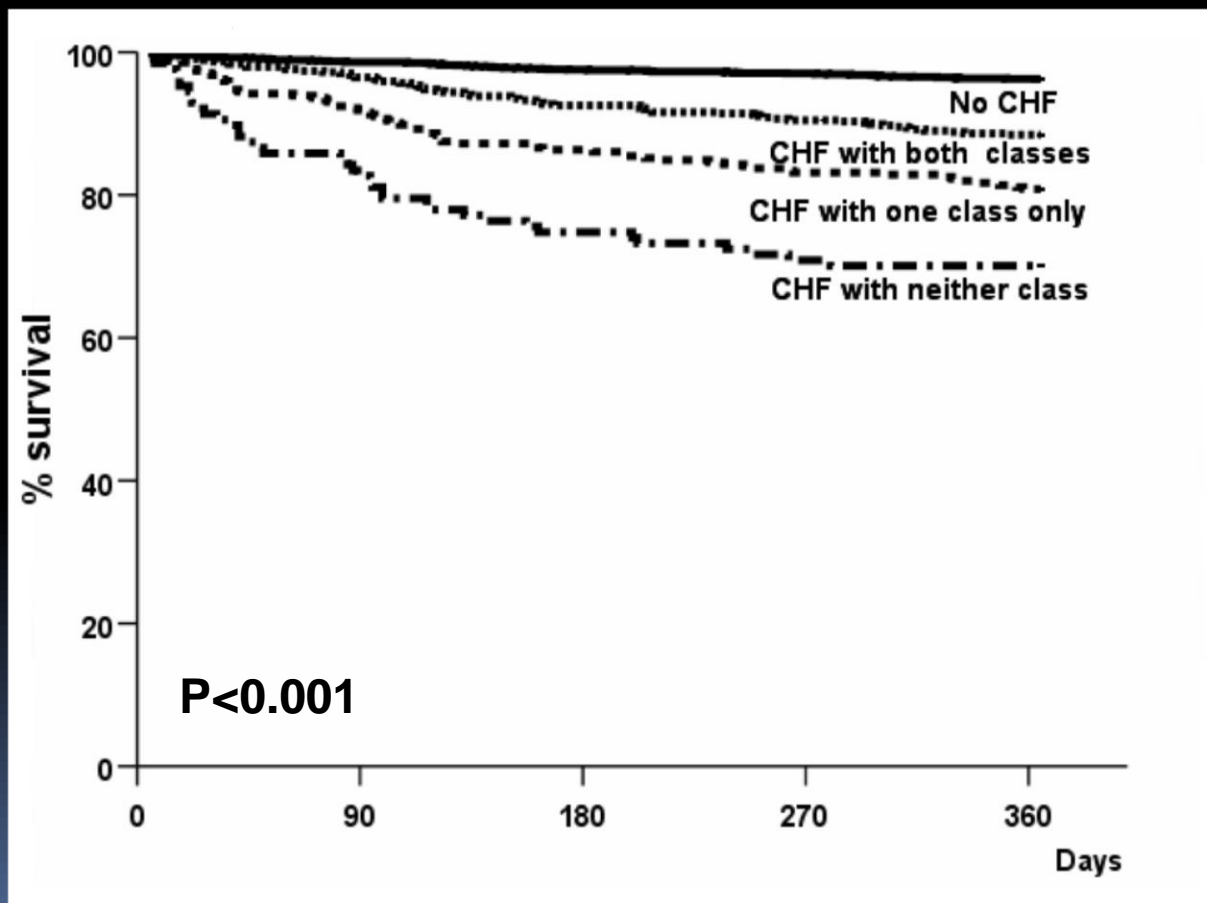


Applicability of the results of RCTs in a real-world setting

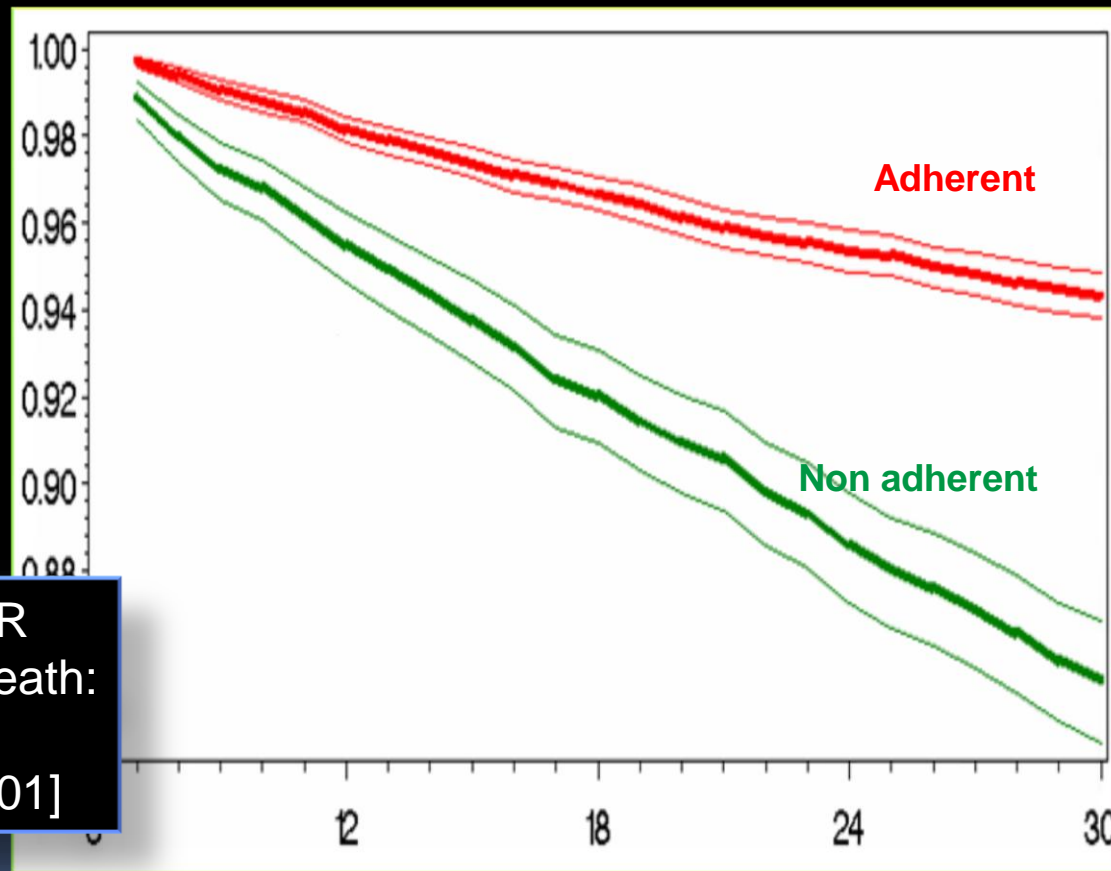
Confirmation of RCTs results

Confirmation of RCTs results

Impact of recommended medications (β -blockers and RAS inhibitors) in AMI patients with heart failure



Survival according to adherence to statins: National health insurance (CNAM) database

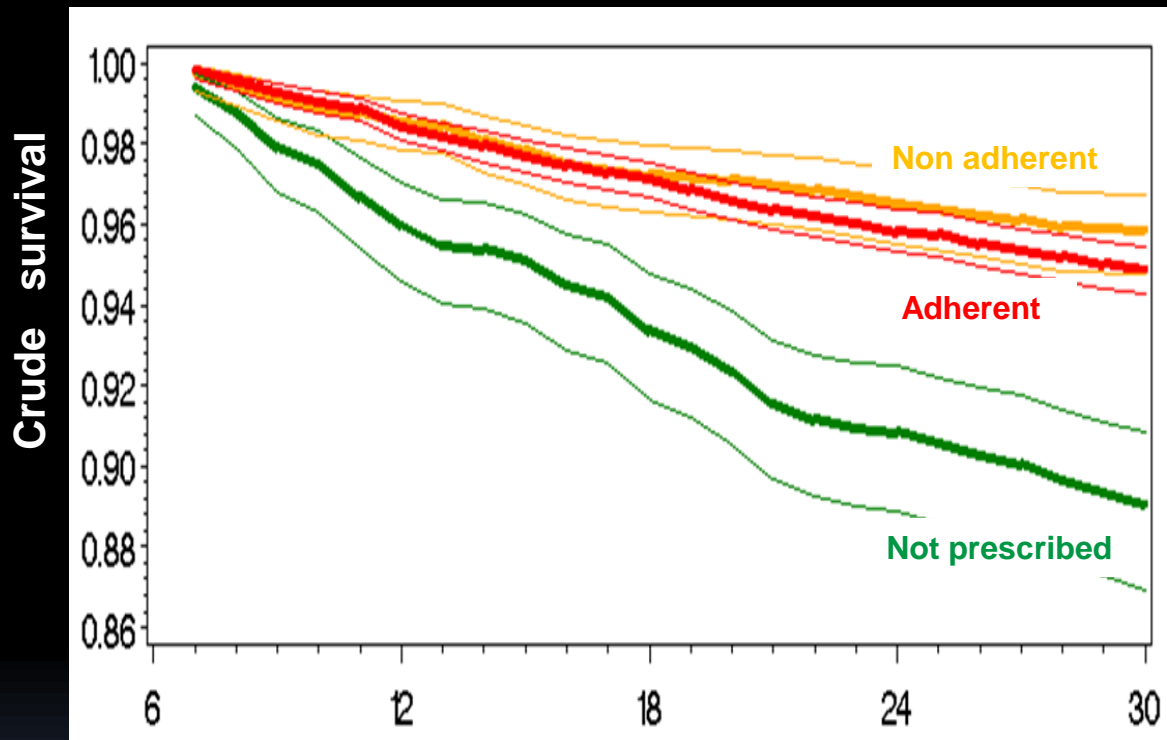


Adjusted HR
for all-cause death:

1.71 [1.45-2.01]

Contestation of results of RCTs?

Adherence and long-term survival: Beta-blockers, CNAM database

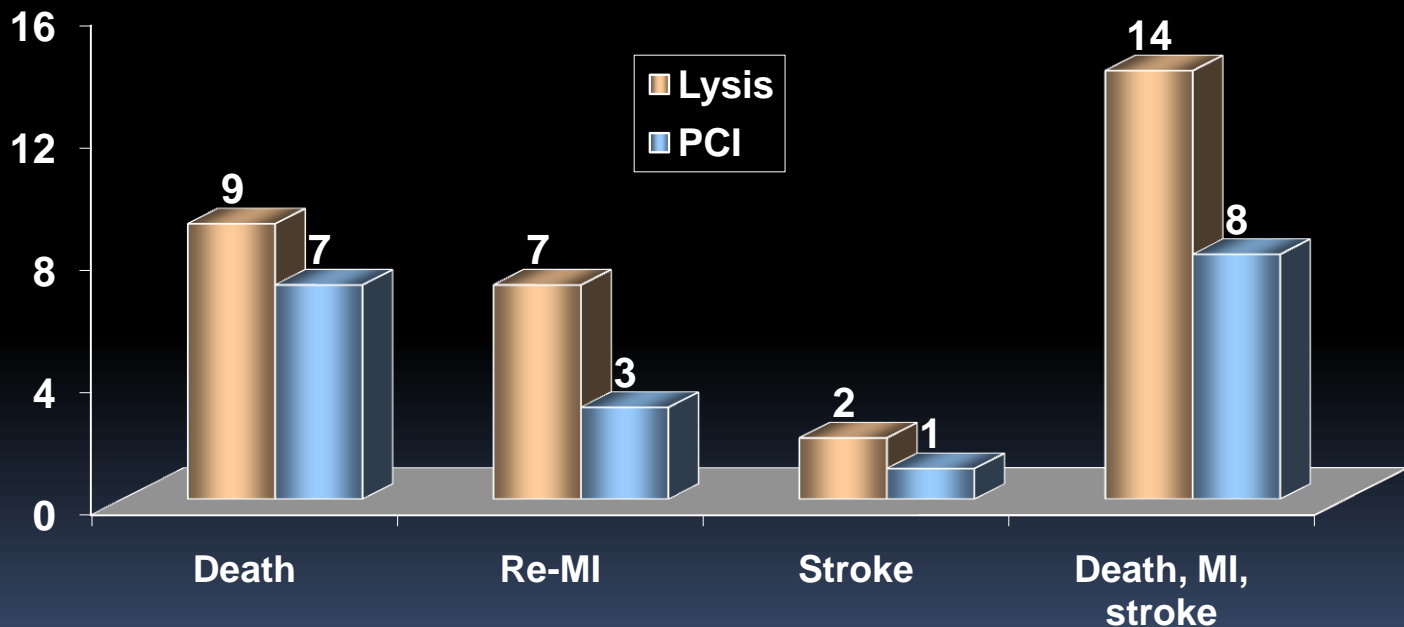


	Adjusted HR for death
Initially prescribed. adherent	1.00
Initially prescribed. non adherent	0.83 [0.63-1.10]
Not prescribed	1.33 [1.04 – 1.70]

	Crude % death	Adjusted % death
Not prescribed	11.0% [9.2% - 13.1%]	7.2% [5.9% - 8.6%]
Initially prescribed. non adherent	4.1% [3.2% - 5.3%]	4.5% [3.5% - 5.6%]
Initially prescribed. Adherent	5.1% [4.6% - 5.7%]	5.4% [4.8% - 6.0%]

Conventional evidence-based medicine

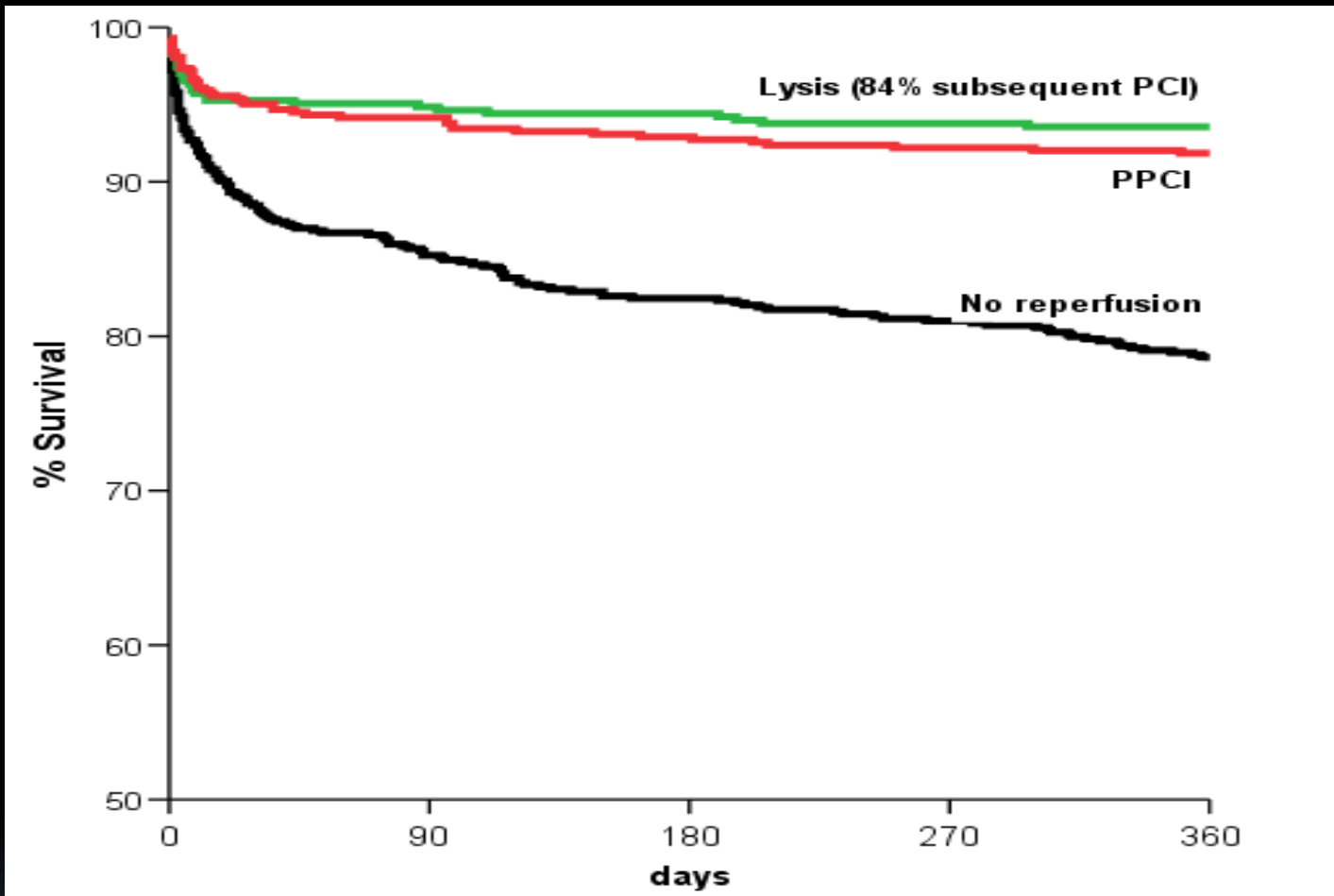
- Randomised controlled trials have shown the superiority of primary PCI over fibrinolysis.



FAST-MI. Management of patients after thrombolysis: a pharmaco-invasive approach

- 96% of the patients undergo coronary angiography after IV thrombolysis:
 - 84% subsequent PCI (87% after PHT)
 - 58% PCI within 24 hours

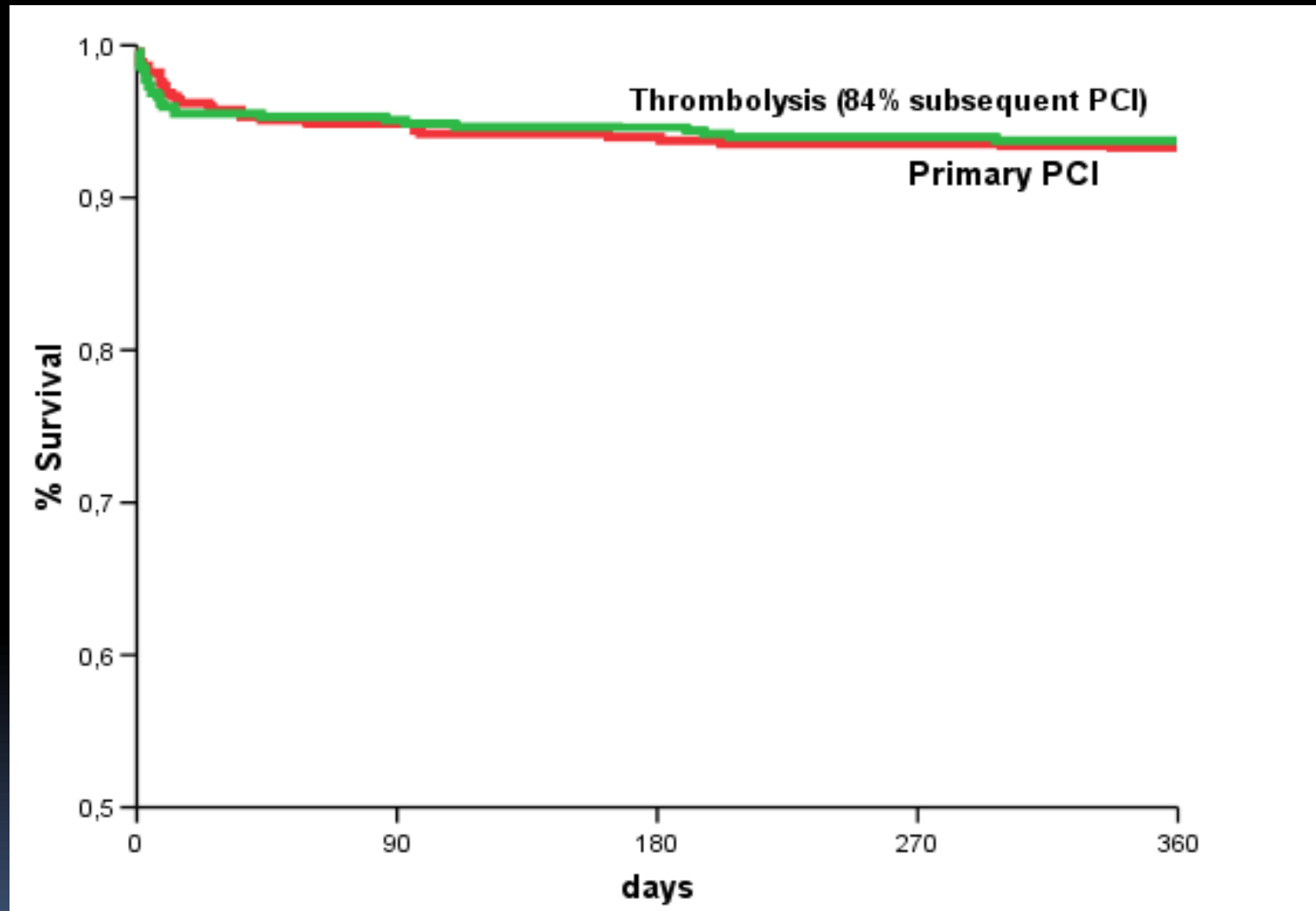
FAST-MI registry



at risk

No reperfusion	581	562	552	534
Thrombolysis	440	437	434	433
PPCI	529	522	518	512

One-year survival in propensity score-matched cohorts



Bidirectional interaction with guidelines

Implementation of guidelines

Implementation of guidelines

EHS ACS 3: benchmarking improved results over 2 years

- Improved rate of reperfusion, with increased use of primary PCI:
77% to 81% (52% to 64%)
- Improved time delays to reperfusion
20 to 15 min (lysis)
60 to 45 min (pPCI)
- Decreased in-hospital mortality:
8.1% to 6.6%

FAST-MI: multivariate determinants of lack of reperfusion therapy

	OR	95% CI
Age	1.02	1.02-1.03
Time onset-to-call > 6 hours	2.01	1.29-3.17
Hx of stroke	2.44	1.22-4.89
Hx of CKD	2.27	1.07-4.86
Typical chest pain	0.31	0.21-0.43
Cardiac arrest	0.30	0.09-0.95
LBBB on first ECG	9.72	4.63-20.8
PCI capability at receiving institution	0.37	0.26-0.52
First call to SAMU	0.53	0.39-0.72
Admission to ICCU/cath lab vs ED	0.60	0.44-0.81

Appropriateness of robustness of recommendations

GRACE: Trends in time delays 1999-2006

Table 2 Delays in reperfusion therapy by discharge year in GRACE

	April 1999 to June 2000	July 2000 to June 2001	July 2001 to June 2002	July 2002 to June 2003	July 2003 to June 2004	July 2004 to June 2005	July 2005 to June 2006
Prehospital delay (min)	120 (71–210)	129 (80–215)	125 (77–225)	130 (75–210)	125 (75–210)	126 (80–230)	133 (80–226)
Treatment delay (median min [interquartile range]) From hospital arrival to PCI or fibrinolytic therapy							
PCI only							
PCI only							
Fibrinolytic therapy only							
Fibrinolytic therapy only							

Door to reperfusion

2000-2001

2005-2006

PCI only

75 (45-125)

80 (45-119)

Fibrinolytic
therapy only

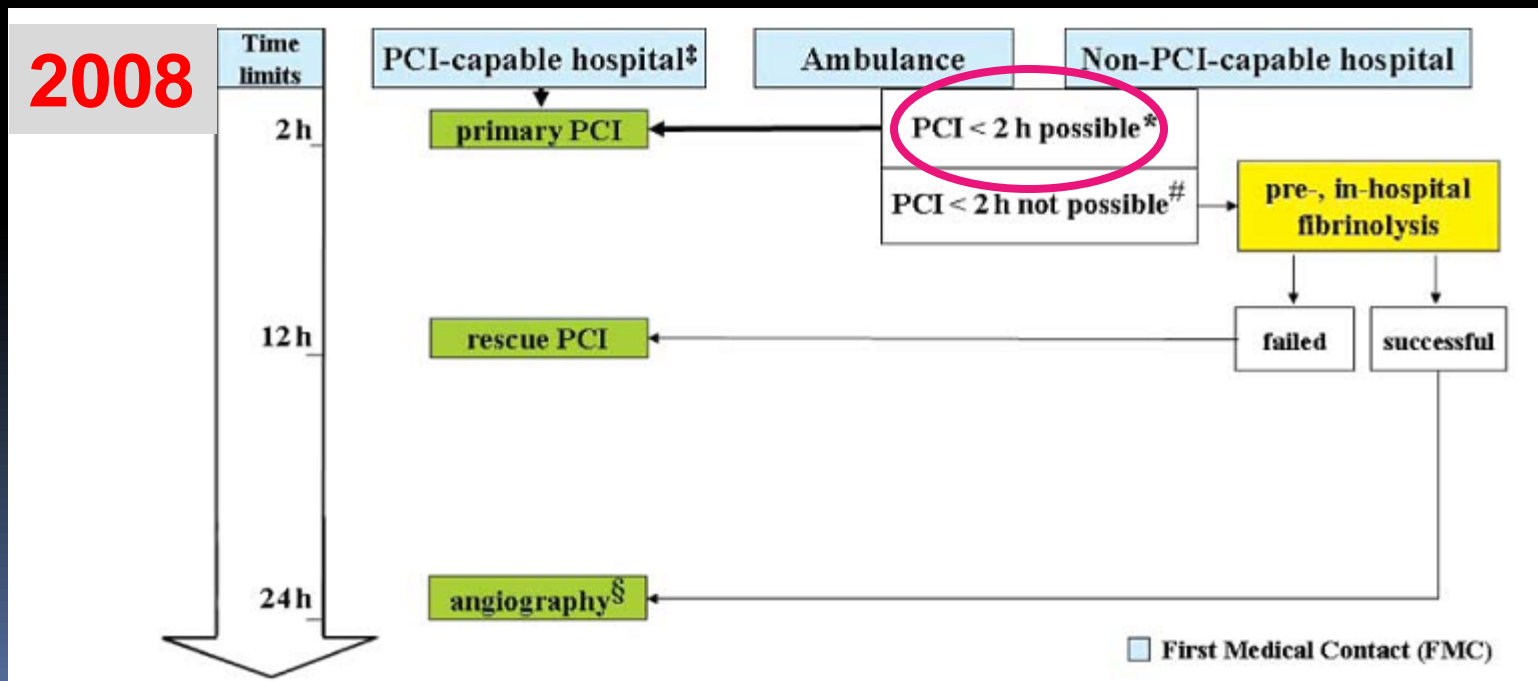
35 (21-62)

34 (17-62)

PCI, percutaneous coronary intervention.

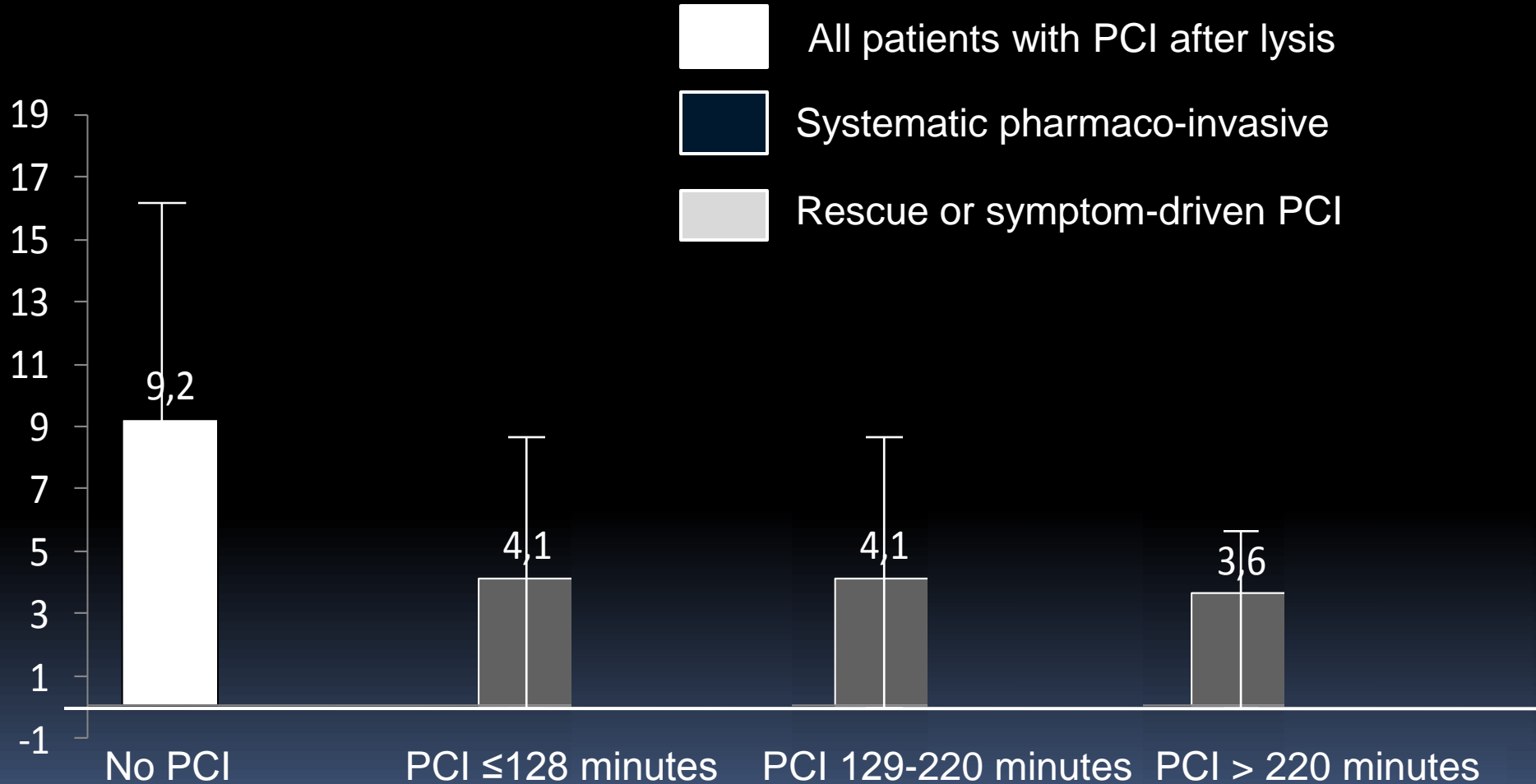
Evolution of ESC STEMI guidelines

Reperfusion therapy		2003				
Recommendations		Class I	IIa	IIb	III	evidence
Reperfusion therapy is indicated in all patients with history of chest pain/discomfort of <12 h and associated with ST-segment elevation or (presumed) new bundle-branch block on the ECG		X				A
Primary PCI						
• preferred treatment if performed by experienced team <90 min after first medical contact		X				A

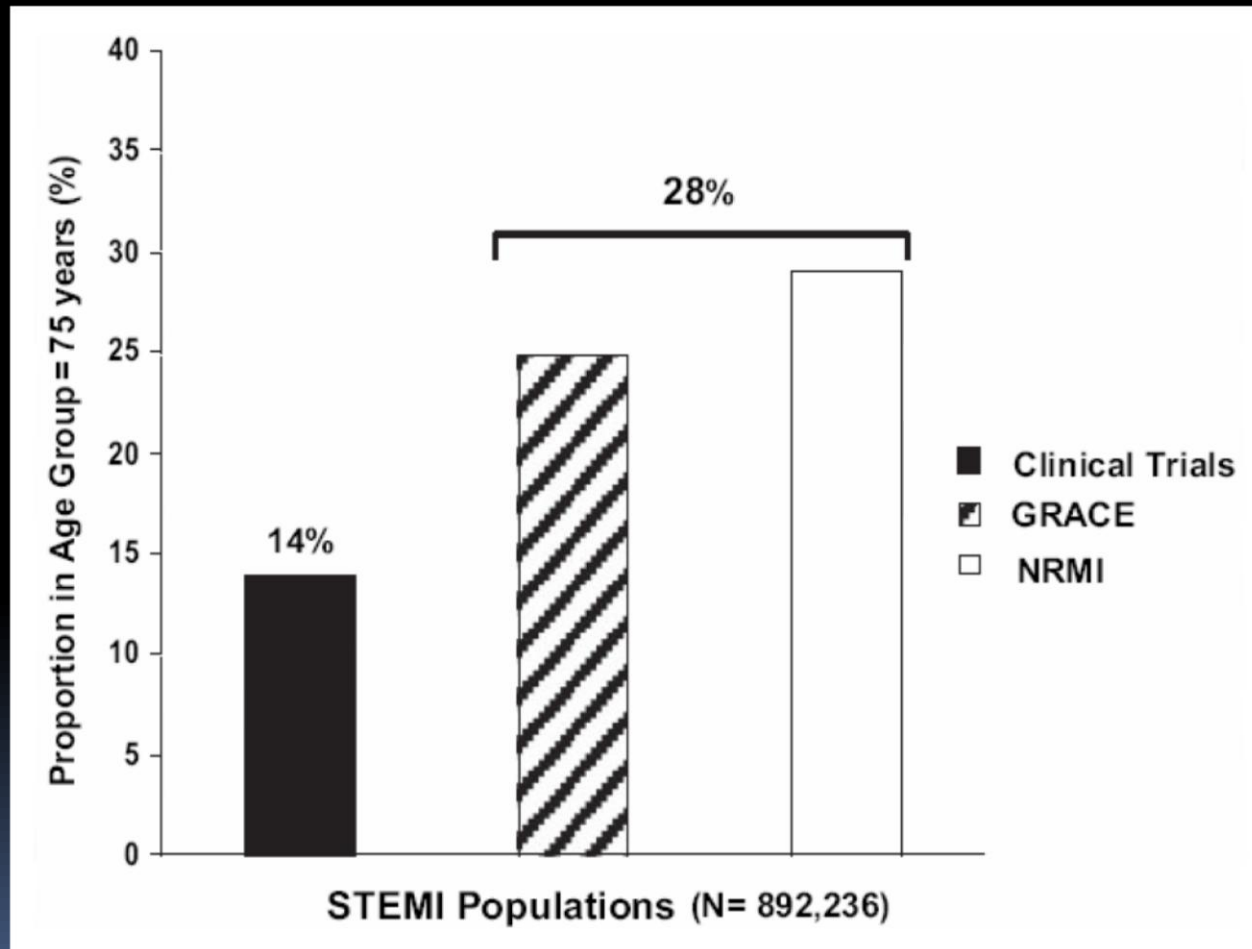


**New answers
to unresolved questions**

Timing of PCI after thrombolysis



Twice as many people > 75 years in registries compared with RCTs

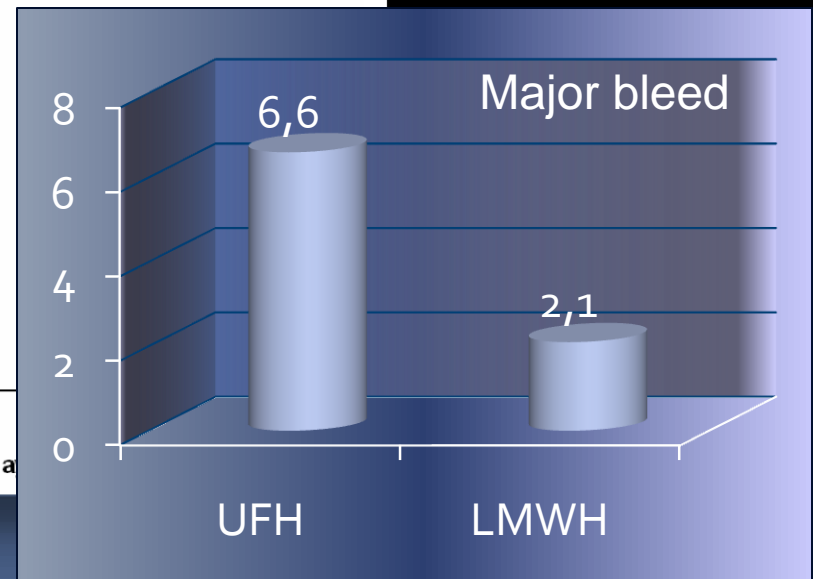
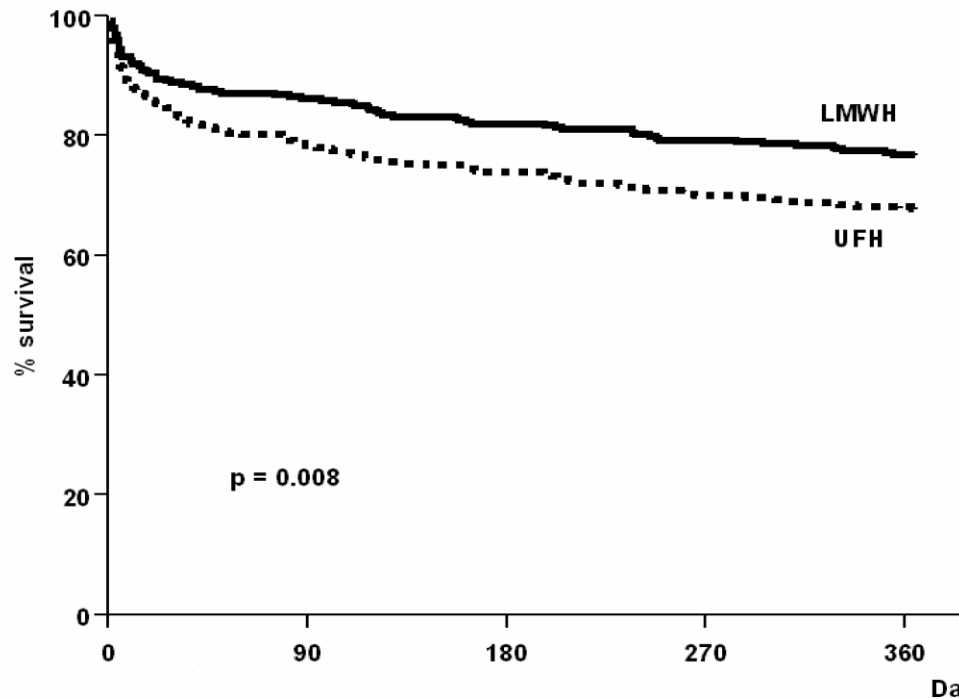


Specific statistical tools: propensity score-matched cohorts

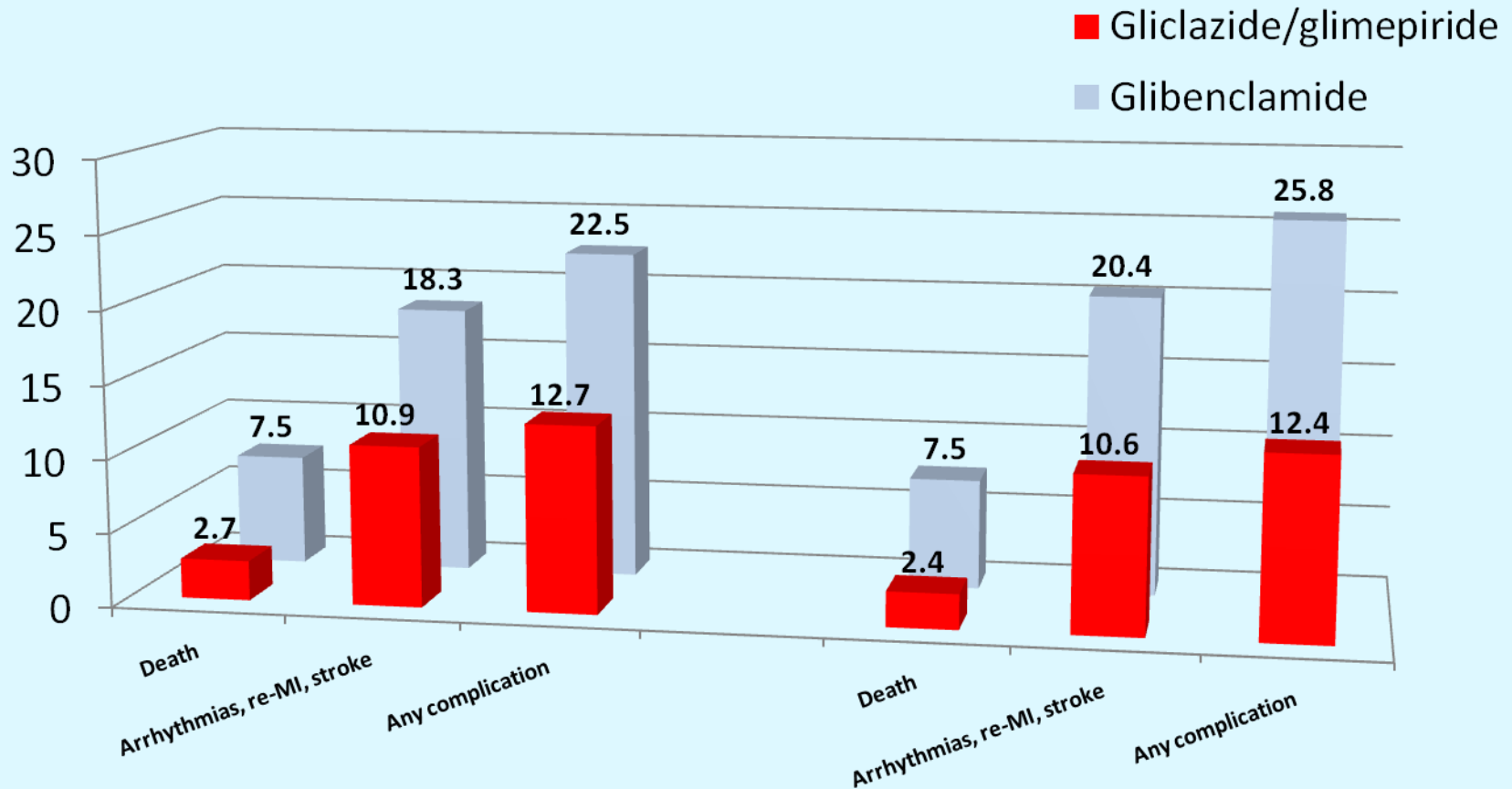
	UFH (n=332)	LMWH (n=332)	P value
	N (%)	N (%)	
Age (years) (mean ± SD)	82.8 ± 4.9	82.6 ± 5.2	0.708
Sex (women)	153 (51.2)	167 (53.0)	0.647
BMI (Kg/m²) (mean ± SD)	25.7 ± 4.7	25.7 ± 4.2	0.897
Hypertension	231 (77.3)	244 (77.5)	0.952
Diabetes mellitus	78 (26.1)	83 (26.3)	0.941
Current smoking	25 (8.4)	23 (7.3)	0.625
Hyperlipidemia	134 (44.8)	132 (41.9)	0.467
History of MI	65 (21.7)	76 (24.1)	0.482
History of PCI	44 (14.7)	37 (11.7)	0.277
History of CABG	22 (7.4)	21 (6.7)	0.737
History of heart failure	31 (10.4)	30 (9.5)	0.727
History of stroke	26 (8.7)	28 (8.9)	0.933
Peripheral artery disease	47 (15.7)	44 (14.0)	0.542
Chronic renal insufficiency	26 (8.7)	28 (8.9)	0.933
Presence of severe non CV condition	57 (19.1)	43 (13.7)	0.069
Type of MI:			0.953
- NSTEMI	162 (54.2)	167 (53.0)	
- STEMI without reperfusion	75 (25.1)	80 (25.4)	
- STEMI with reperfusion	62 (20.7)	68 (21.6)	
GRACE score	195 ± 33	193 ± 30	0.585

Specific statistical tools: propensity score-matched cohorts

Use of LMWH vs UFH in the very elderly



FAST-MI: impact of type of sulfonylureas in AMI



A: Whole diabetic population on SUs

B: Propensity score-matched cohorts

Conclusion

- Registers can provide solid epidemiologic data.
- The "scientific" use of register data can bring information complementary to that of RCTs.
- Registers can interact with guidelines:
 - Help for implementing recommendations.
 - Verify that guidelines are appropriate.
- Guidelines should probably give greater consideration to registers data

