Management of hypertension and other risk factors in diabetes

Guidelines versus reality

Barcelona September 4, 2006

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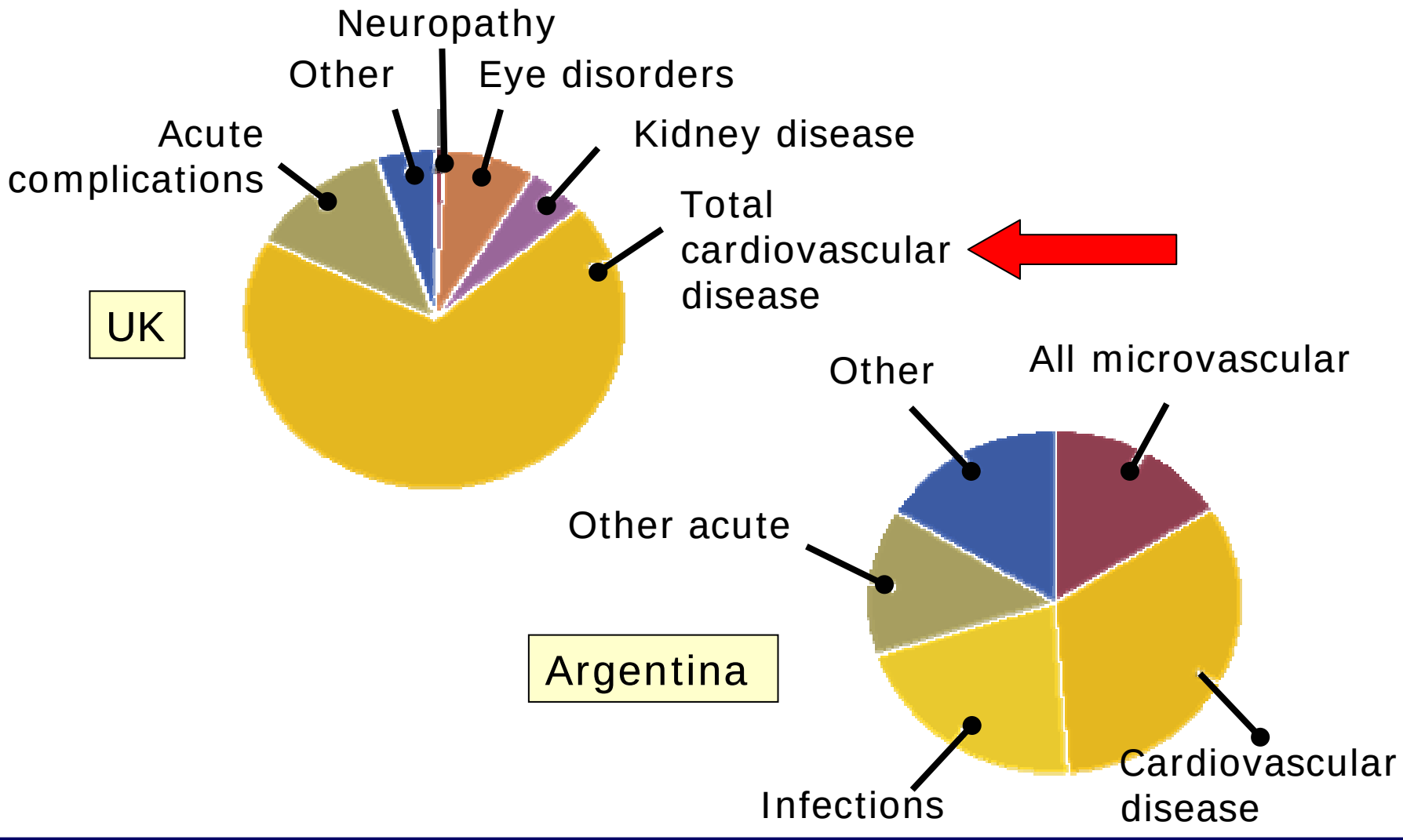
Current and predicted prevalence of diabetes and IGT in Europe

Variable	2003	2025
Population (millions)	871.8	862.6
Adult (20-79 years)	621.2	646.3
Diabetes		
prevalence (%)	7.8	9.1
numbers (millions)	48.4	58.6
IGT		
prevalence (%)	10.2	10.9
number (millions)	63.2	70.6

(Diabetes Atlas, International Diabetes Federation 2003)

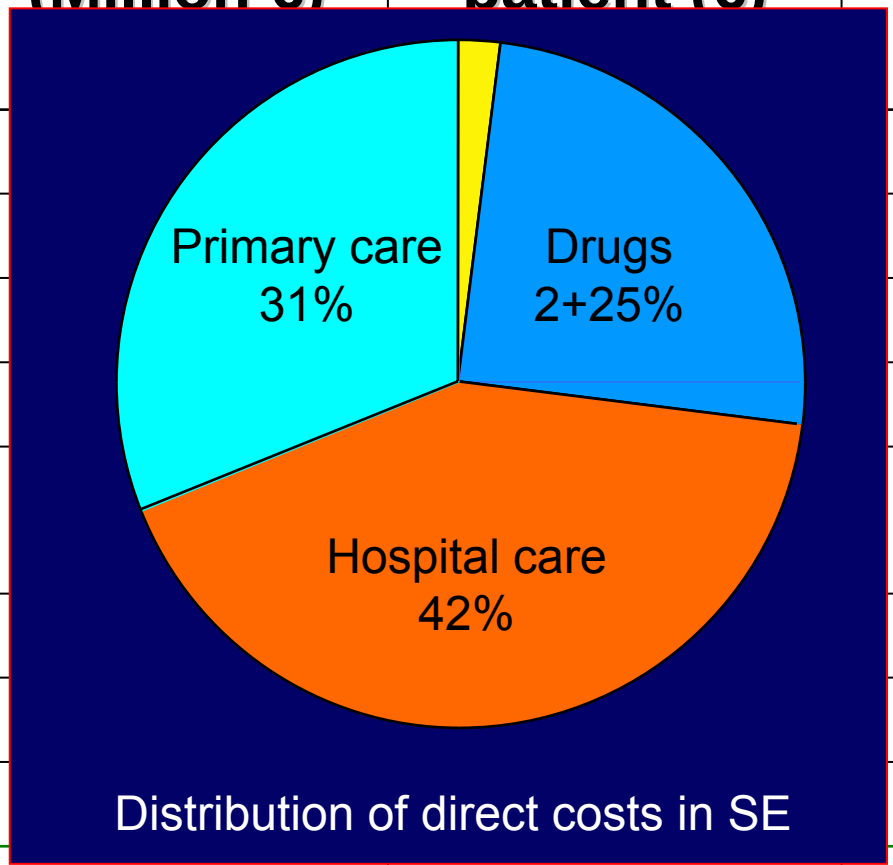
Proportion of hospital days used for the treatment of diabetic complications



(International Diabetes Federation 1999)

Direct medical costs for type 2 diabetes in eight European countries

Country	Total costs (Million €)	Cost per patient (€)	% of Healthcare expenditure
Belgium			6.7
France			3.2
Germany			6.3
Italy			7.4
The Netherlands			1.6
Spain			4.4
Sweden			4.5
UK			3.4
All countries	**29 000**	**2 895**	**5.0**

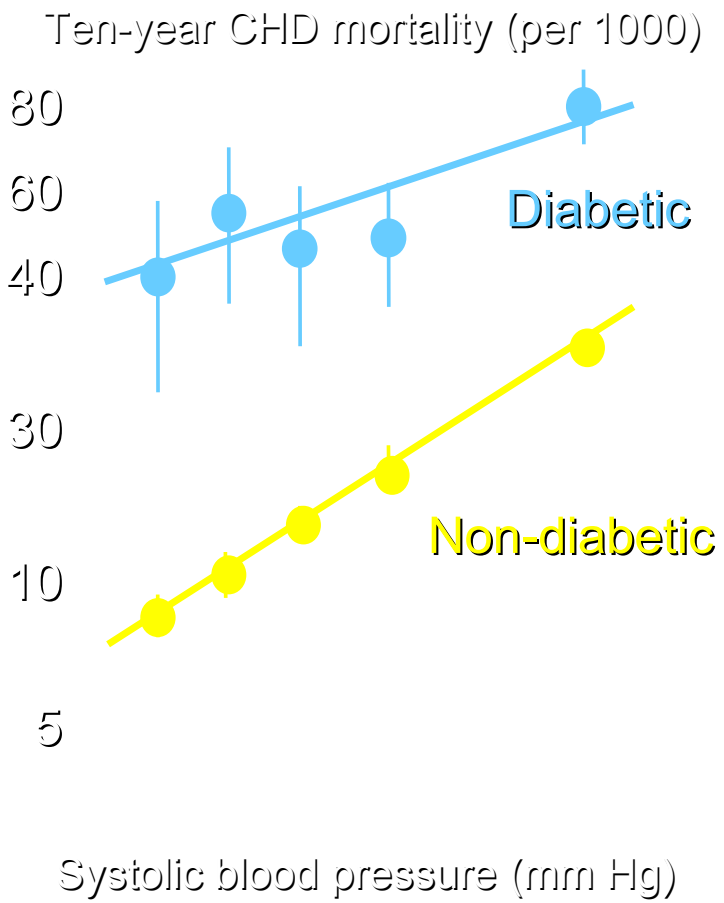


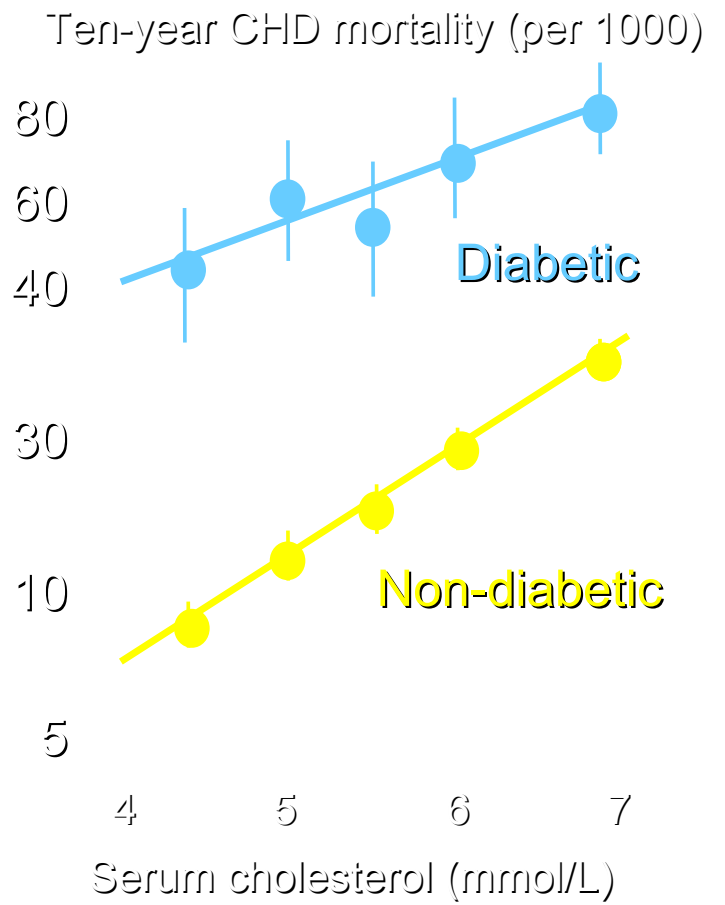
(Jönsson. Diabetologia, 2002. 45(7):S5-12)

About cardiovascular risk

Diabetes and cardiovascular risk

Relation to other risk factors



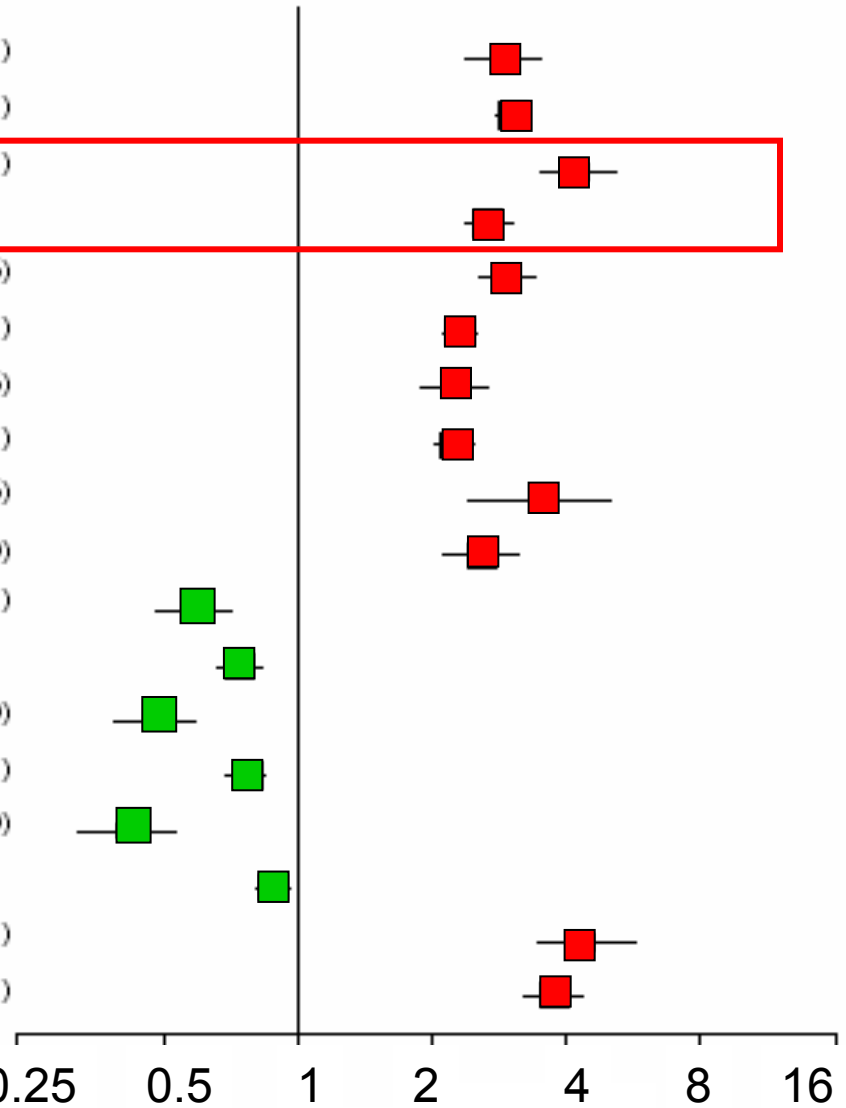


(Stamler et al: MRFIT. Diabetes Care 1993, 16:434)

INTERHEART

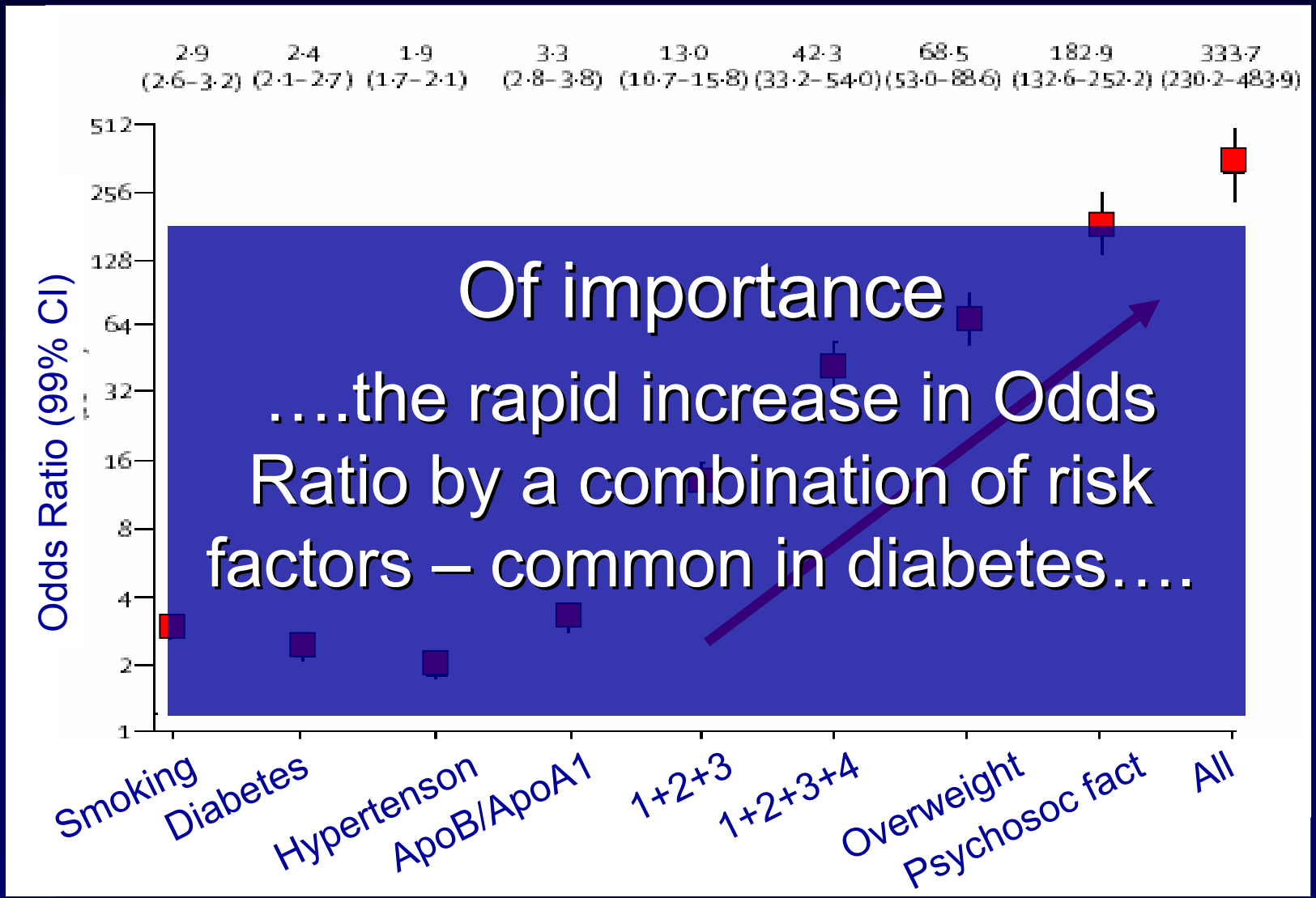
Age, sex and regional adjusted relation risk factors and MI

Risk factor	Control (%)	Case (%)	Odds ratio (99% CI)	PAR (99% CI)
Smoking	9·3	20·1	2·86 (2·36–3·48)	15·8% (12·9–19·3)
	33·0	53·1	3·05 (2·78–3·33)	44·0% (40·9–47·2)
Diabetes	7·9	25·5	4·26 (3·51–5·18)	19·1% (16·8–21·7)
	7·4	16·2	2·67 (2·36–3·02)	10·1% (8·9–11·4)
Hypertens	28·3	53·0	2·95 (2·57–3·39)	35·8% (32·1–39·6)
	19·7	34·6	2·32 (2·12–2·53)	19·5% (17·7–21·5)
Abd obesity	33·3	45·6	2·26 (1·90–2·68)	35·9% (28·9–43·6)
	33·3	46·5	2·24 (2·03–2·47)	32·1% (28·0–36·5)
Psykosocial factors	–	–	3·49 (2·41–5·04)	40·0% (28·6–52·6)
	–	–	2·58 (2·11–3·14)	25·3% (18·2–34·0)
Fruit & vegetables	50·3	39·4	0·58 (0·48–0·71)	17·8% (12·9–24·1)
	39·6	34·7	0·74 (0·66–0·83)	10·3% (6·9–15·2)
Physical activity	16·5	9·3	0·48 (0·39–0·59)	37·3% (26·1–50·0)
	20·3	15·8	0·77 (0·69–0·85)	22·9% (16·9–30·2)
Alcohol	11·2	6·3	0·41 (0·32–0·53)	46·9% (34·3–60·0)
	29·1	29·6	0·88 (0·81–0·96)	10·5% (6·1–17·5)
ApoB/ApoA1	14·1	27·0	4·42 (3·43–5·70)	52·1% (44·0–60·2)
	21·9	35·5	3·76 (3·23–4·38)	53·8% (48·3–59·2)



INTERHEART

Age and gender adjusted relation between risk factors and MI



(Yusuf et al. Lancet 2004; 364:937)

Prevention possibilities

Articles

Hansson L et al.: Lancet 1998; 351: 1755-62

Effects of intensive blood-pressure lowering and low-dose aspirin in patients with hypertension: principal results of the Hypertension Optimal Treatment (HOT) randomised trial

Patients

n = 18,790 with hypertension

Diastolic blood pressure <90, 85 or 80 mm Hg

ASA 75 mg or placebo

Outcome diabetic patients

Reduction of CV events = 51% with

DBP <80 compared to <90 mmHg

ASA reduced CV events by 15% and MI by 36%

Articles

HOPE Study Investigators: Lancet 2000; 355: 253-59

Effects of ramipril on cardiovascular and microvascular outcomes in people with diabetes mellitus: results of the HOPE study and MICRO-HOPE substudy

Patients

Diabetes + previous CV event or ≥ 1 CV risk factor

Ramipril 10mg/day or placebo

Ramipril reduced	%
Myocardial infarction	22
Stroke	33
Cardiovascular death	37
Total mortality	24
Nephropathy	24
Combined primary outcome	25

Articles

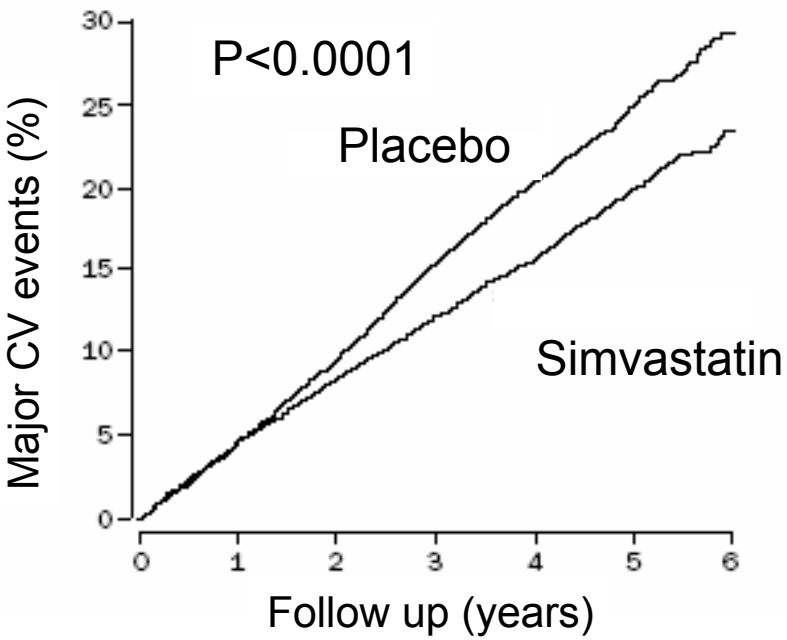
HPS Collaborative Group: Lancet 2003; 361: 2005-16

MRC/BHF Heart Protection Study of cholesterol-lowering with simvastatin in 5963 people with diabetes: a randomised placebo-controlled trial

Patients

Diabetes n = 5 963

Simvastatin 40 mg/day or placebo



Proportionate reduction	%
Coronary mortality	20
Stroke	24
Revascularization	17
Major vascular events	22

Shepherd et al: Diabetes Care 2006; 29:1220

Effect of Lowering LDL Cholesterol Substantially Below Currently Recommended Levels in Patients With Coronary Heart Disease and Diabetes

The Treating to New Targets (TNT) study

Patients Diabetes + CAD + LDL <3.4 mmol/l (<130 mg/dl)	n= 1 501
Atorvastatin	20 or 80 mg/day
Follow up (median)	4.9 years
Endpoint First major CV-event	

Shepherd et al: Diabetes Care 2006; 29:1220

Effect of Lowering LDL Cholesterol Substantially Below Currently Recommended Levels in Patients With Coronary Heart Disease and Diabetes

The Treating to New Targets (TNT) study

End of treatment LDL cholesterol

Atorvastatin 20	2.5 mmol/l (99 mg/dl)
Atorvastatin 80	2.0 mmol/l (77 mg/dl)

Total no of events

Atorvastatin 20	18%	
Atorvastatin 80	14%	p<0.026

Shepherd et al: Diabetes Care 2006; 29:1220

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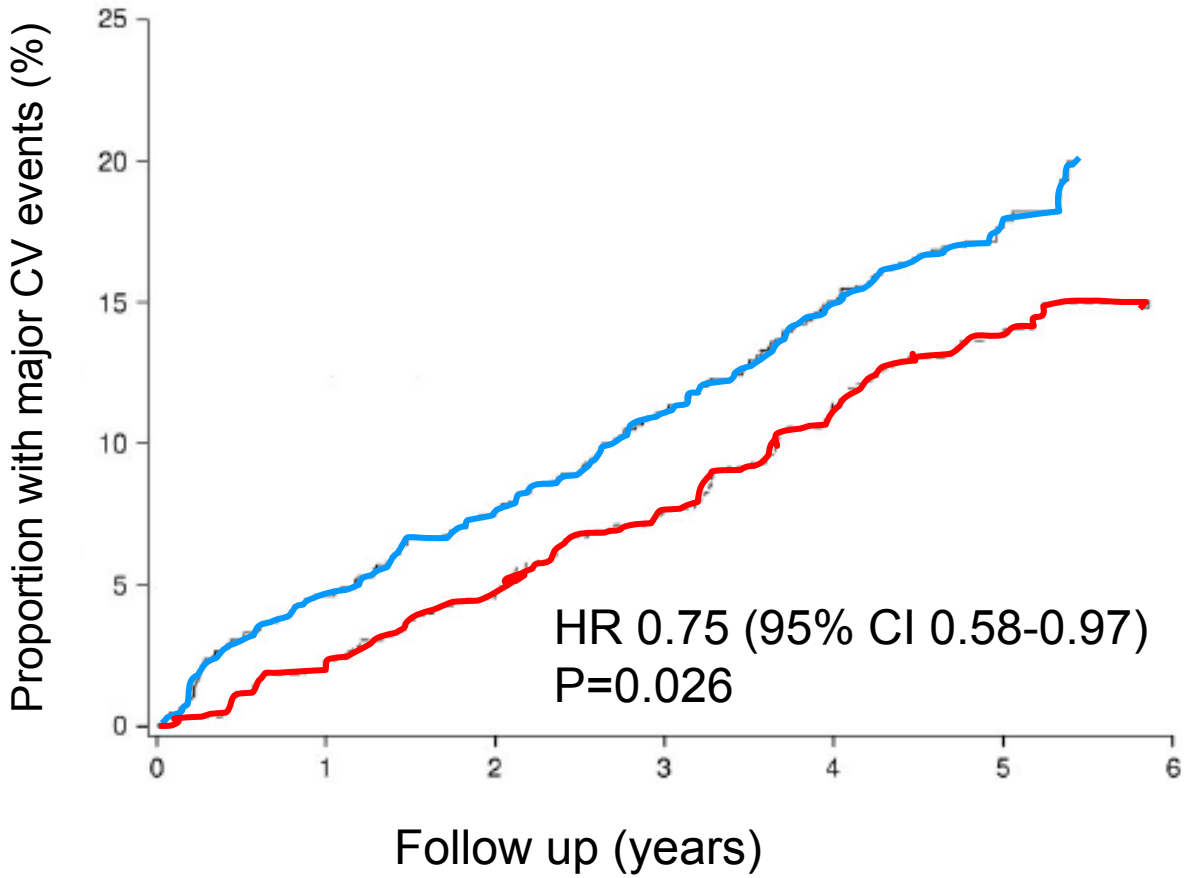
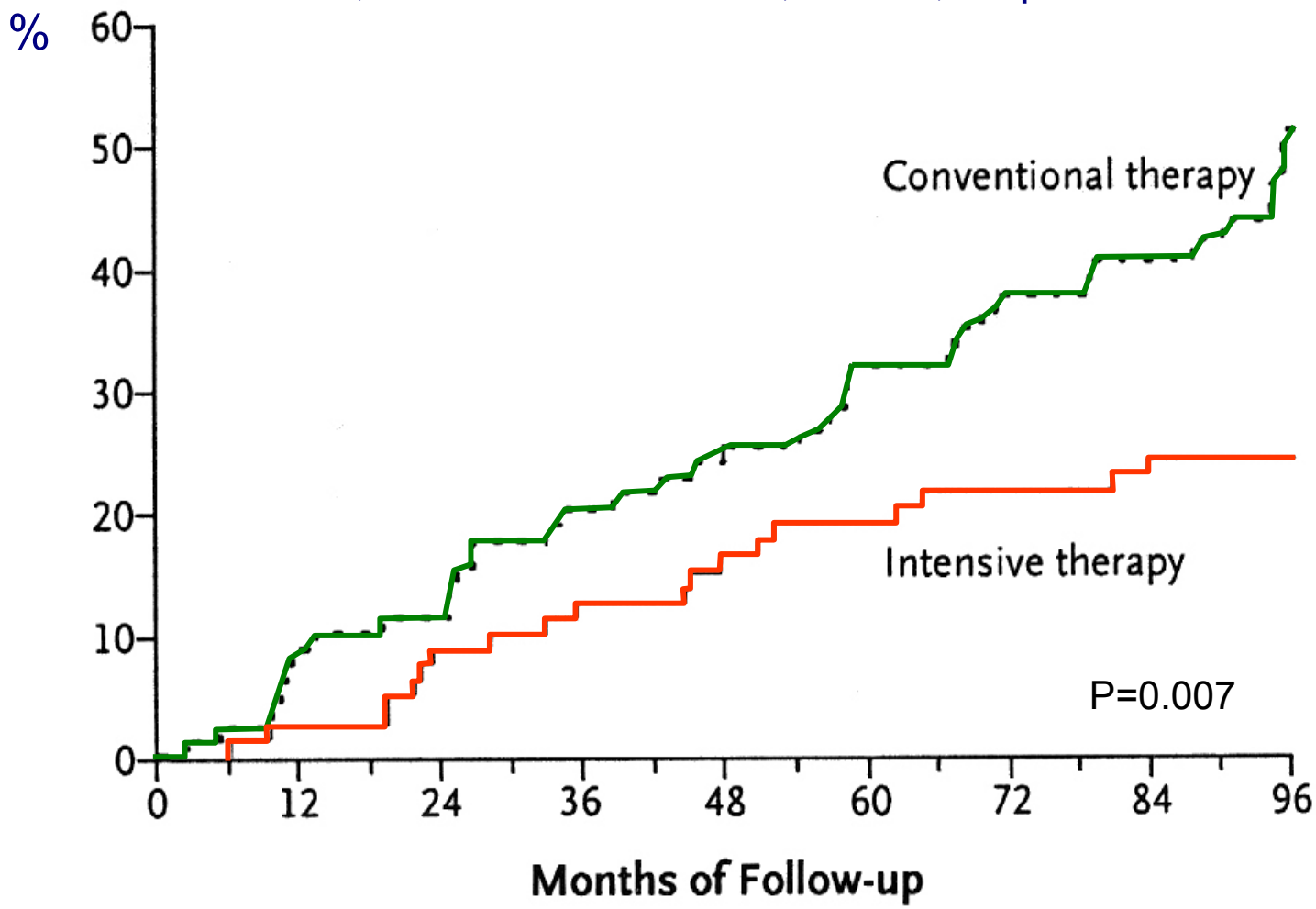


The NEW ENGLAND

Primary composite endpoint over time
CV death, nonfatal MI or stroke, revasc, amputation



Follow up time 6.6 – 8.8 years (mean 7.8)

Treatment targets

ESC/EASD guidelines for diabetes and CV disease

Europ Heart J and Diabetologia 2006; In press www.euroheartj.org

What about the situation in Europe

Euro Heart Survey Diabetes and the Heart

Participating centres

110

from 25 countries

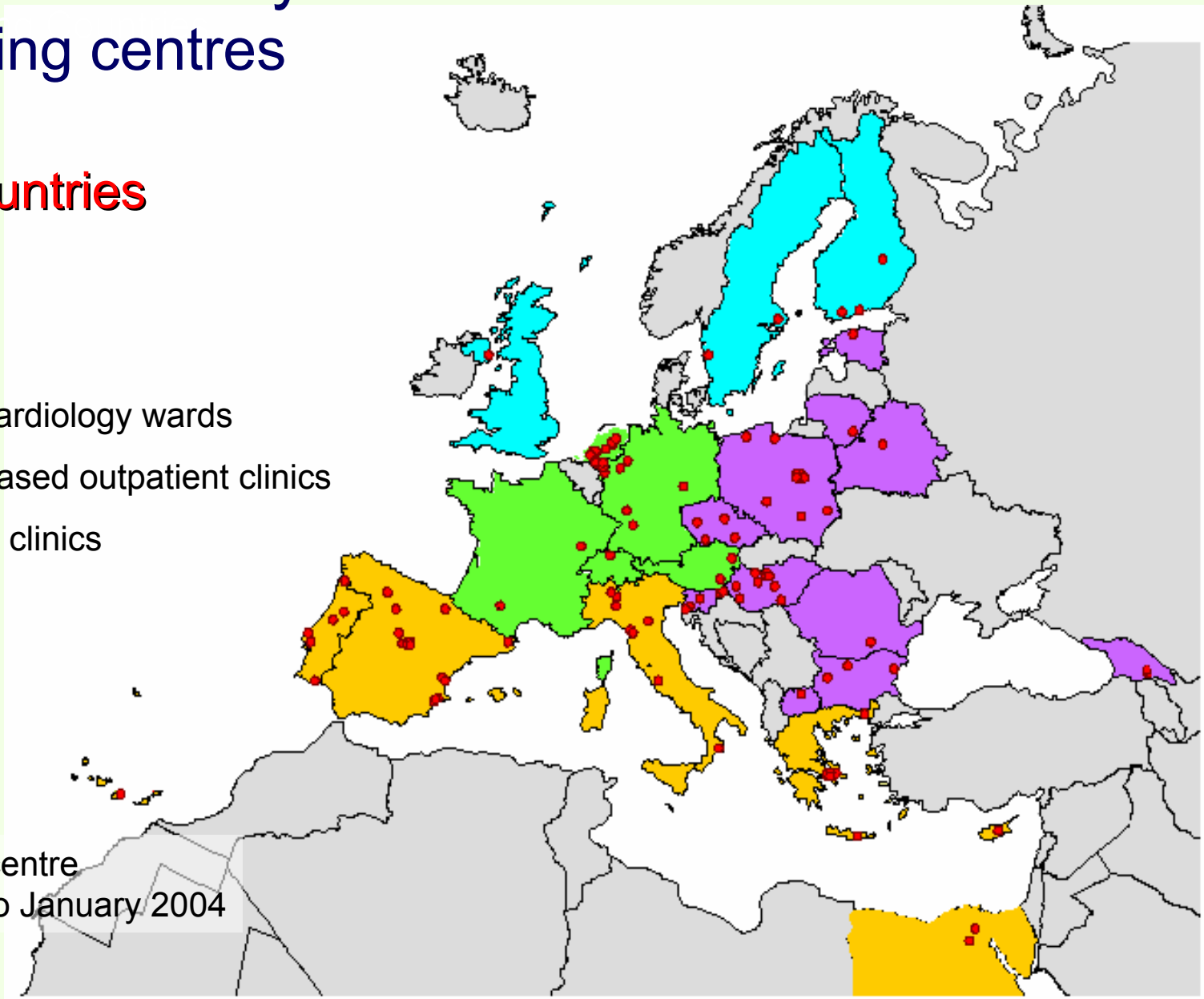
n= 4 961

Type of centre:

47% hospital cardiology wards

45% hospital based outpatient clinics

8% outpatient clinics



2- 6 weeks per centre
February 2003 to January 2004

(Bartnik, Rydén et al Europ Heart J 2004; 25; 1880)

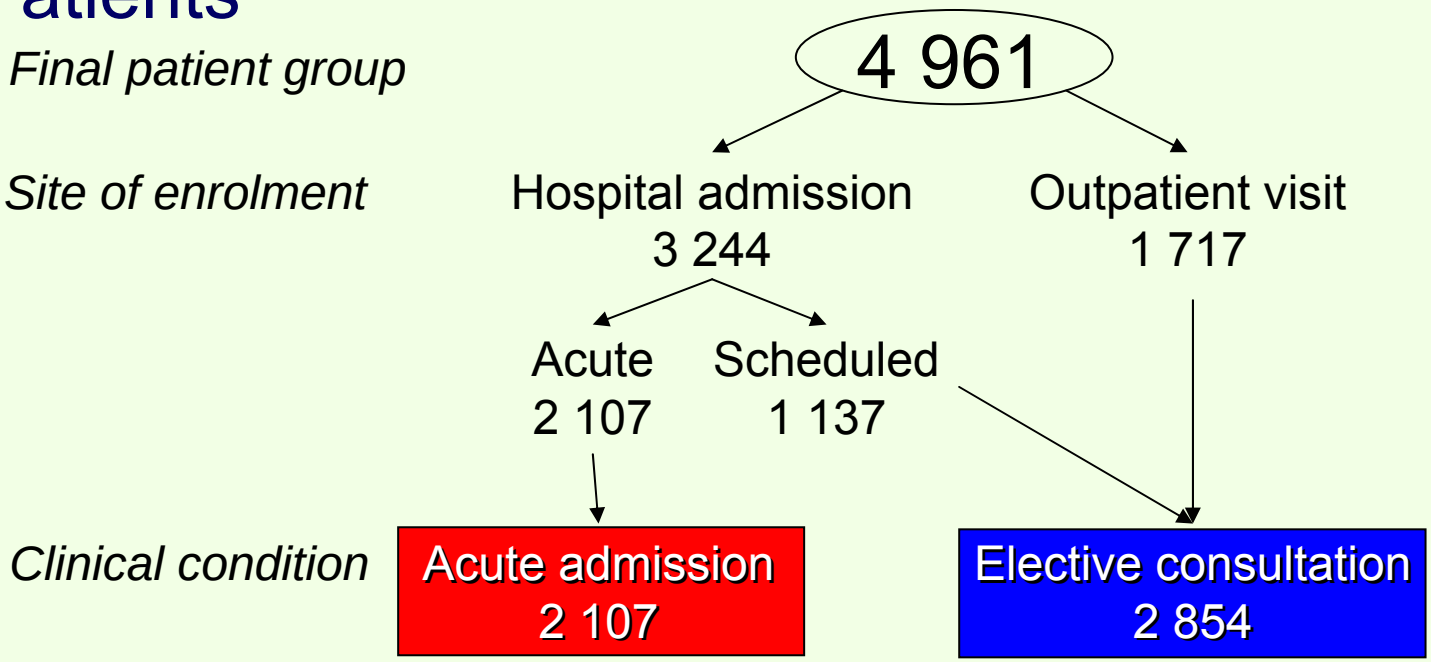
Euro Heart Survey Diabetes and the Heart
Data collection

Consecutive patients (>18 years) with established CAD
- with or without diabetes
- admitted to hospital (CCU or cardiology ward)
- seen in outpatient clinics

Web-based case record form
- medical history, risk factors
- medical procedures & treatment

Tests requested by the survey
- Fasting plasma glucose (FPG)
- HbA1c (at core laboratory)
- Oral Glucose Tolerance Test (OGTT)

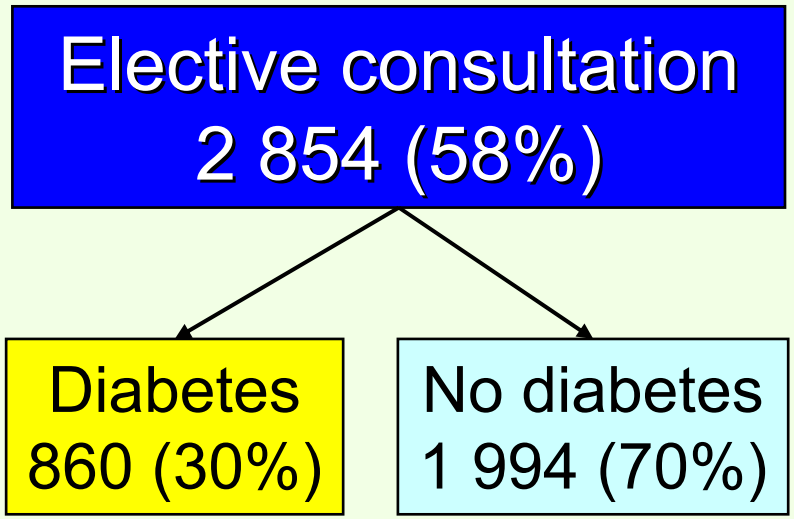
Euro Heart Survey Diabetes and the Heart Patients



(Bartnik, Rydén et al Europ Heart J 2004; 25; 1880)

What about patient management in Europe

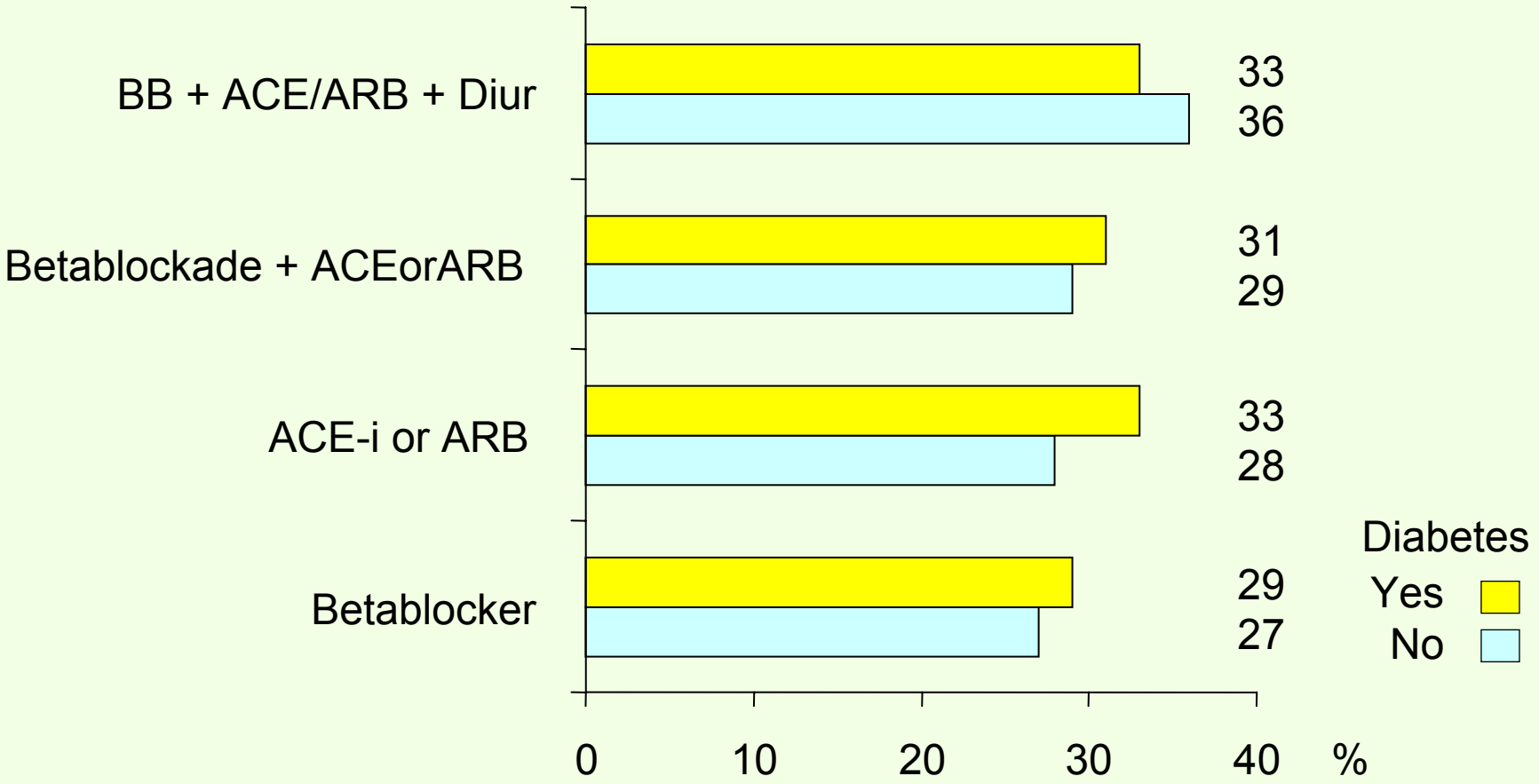
Euro Heart Survey Diabetes and the Heart
Patient material



(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

Euro Heart Survey Diabetes and the Heart

Blood pressure above target in elective patients on antihypertensive therapy (n = 2 127; 75%)



(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

Euro Heart Survey Diabetes and the Heart

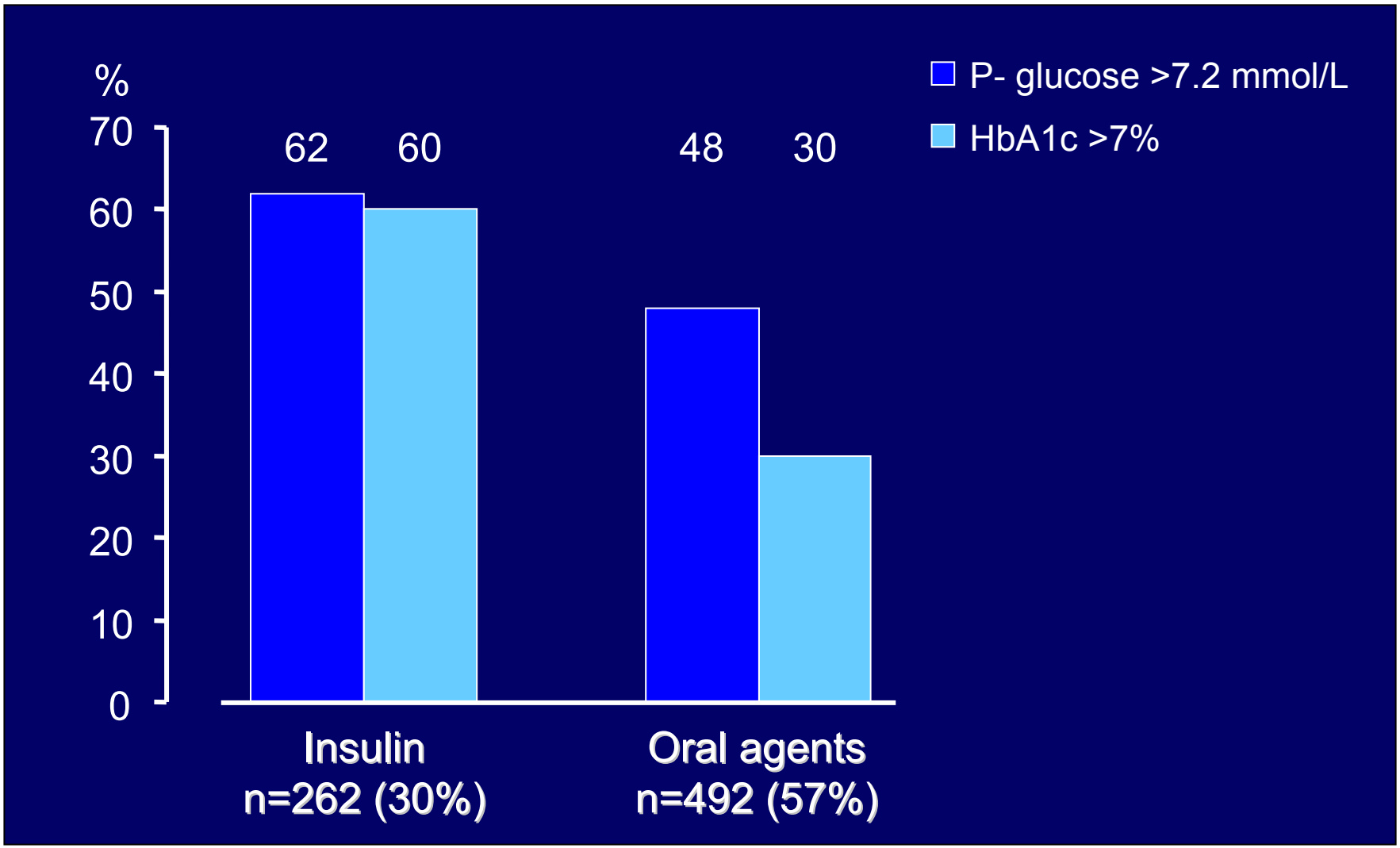
Use of glucose lowering agents (%)

Agent	ACS (n=547) Admission	ACS (n=547) Discharge	Stable (n=860) Enrolement
Insulin	31	41	30
Longacting	73	68	70
Shortacting	34	15	62
Both	26	30	48
Oral only	53	54	57
Sulphonylureas	75	73	75
Metformin	42	37	47
Both	25	19	31
Alfaglucosidase inhib	8	11	5
Non-SU secretagoges	2	3	7
Thiazolidinediones	2	1	3

(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

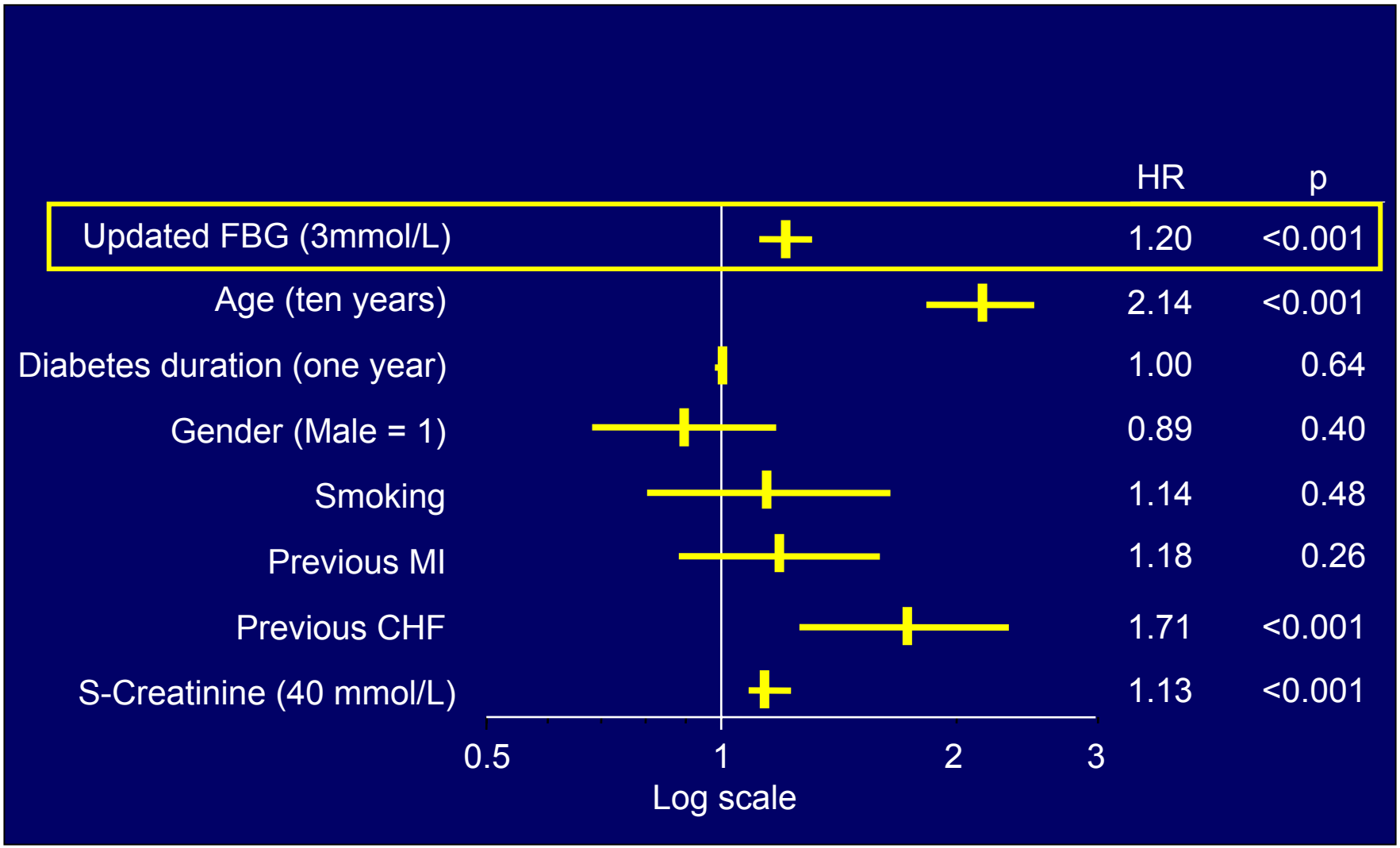
Euro Heart Survey Diabetes and the Heart

Elective patients above glucose targets (%)



(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

DIGAMI 2 Independent predictors for 2 year mortality in patients with AMI and type 2 diabetes



Euro Heart Survey Diabetes and the Heart

Characteristics of elective patients with vs. without DM

- ✓ Lipid control unsatisfactory in 50%, especially among patients with diabetes
- ✓ Blood pressure control unsatisfactory in 30% on BP lowering agents independent of the diabetic state
- ✓ Metabolic control unsatisfactory in about 50% of patients with diabetes

(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

Euro Heart Survey Diabetes and the Heart
Conclusions

- ✓ Acute management of patients with and without diabetes and ACS comparable. Discrepancies relate to baseline characteristics
- ✓ Secondary prevention unsatisfactory in patients with and without diabetes
- ✓ Management of patients with diabetes particularly poor taking their considerably higher cardiovascular risk into account
- ✓ Patients with diabetes and cardiovascular disease mistreated as regards glucose control

(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

Cardiovascular disease and diabetes

Concluding remarks

- Diabetes and coronary artery disease - more common and costly than imagined
- The negative impact of dysglycemia apparent before onset of diabetes
- The prognosis remains unfavourable
- These patients deserve increased attention and better treatment
- Therapeutic success depend on collaboration across speciality borders

Management of hypertension and other risk factors in diabetes

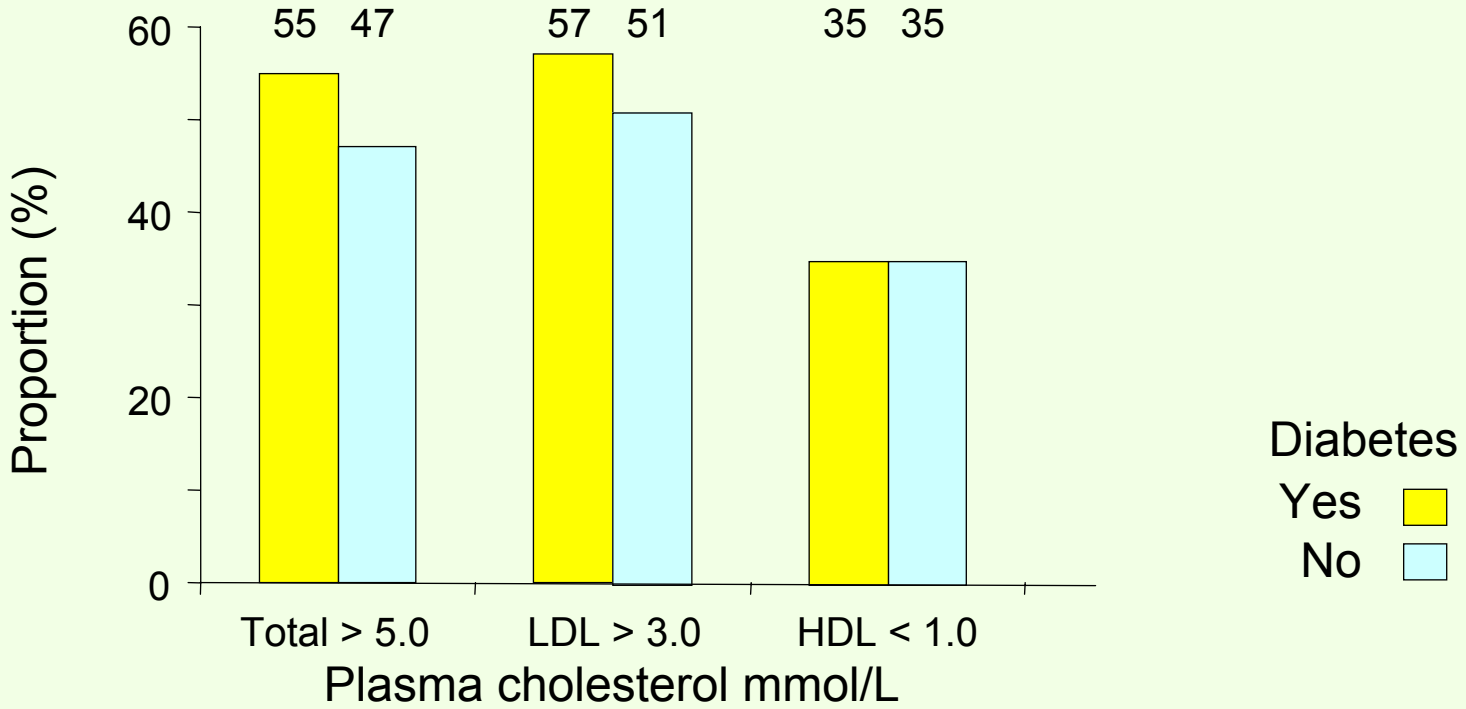
Guidelines versus reality

Thanks for the attention

Karolinska Institutet

Euro Heart Survey Diabetes and the Heart

Blood lipids above target in elective patients on statin treatment (n = 1 894; 66%)



	Diabetes	No diabetes	
Total cholesterol	5,2 (4,3-6,2)	4,9 (4,2-5,9)	p<0.01
HDL	1,1 (0,9-1,2)	1,2 (0,9-1,3)	p<0.01
LDL	3,3 (2,5-4,4)	3,1 (2,4-3,9)	p<0.01

(Anselmino, et al Eur J Cardiovasc Prev Rehabil 2006; In press)

Euro Heart Survey Diabetes and the Heart

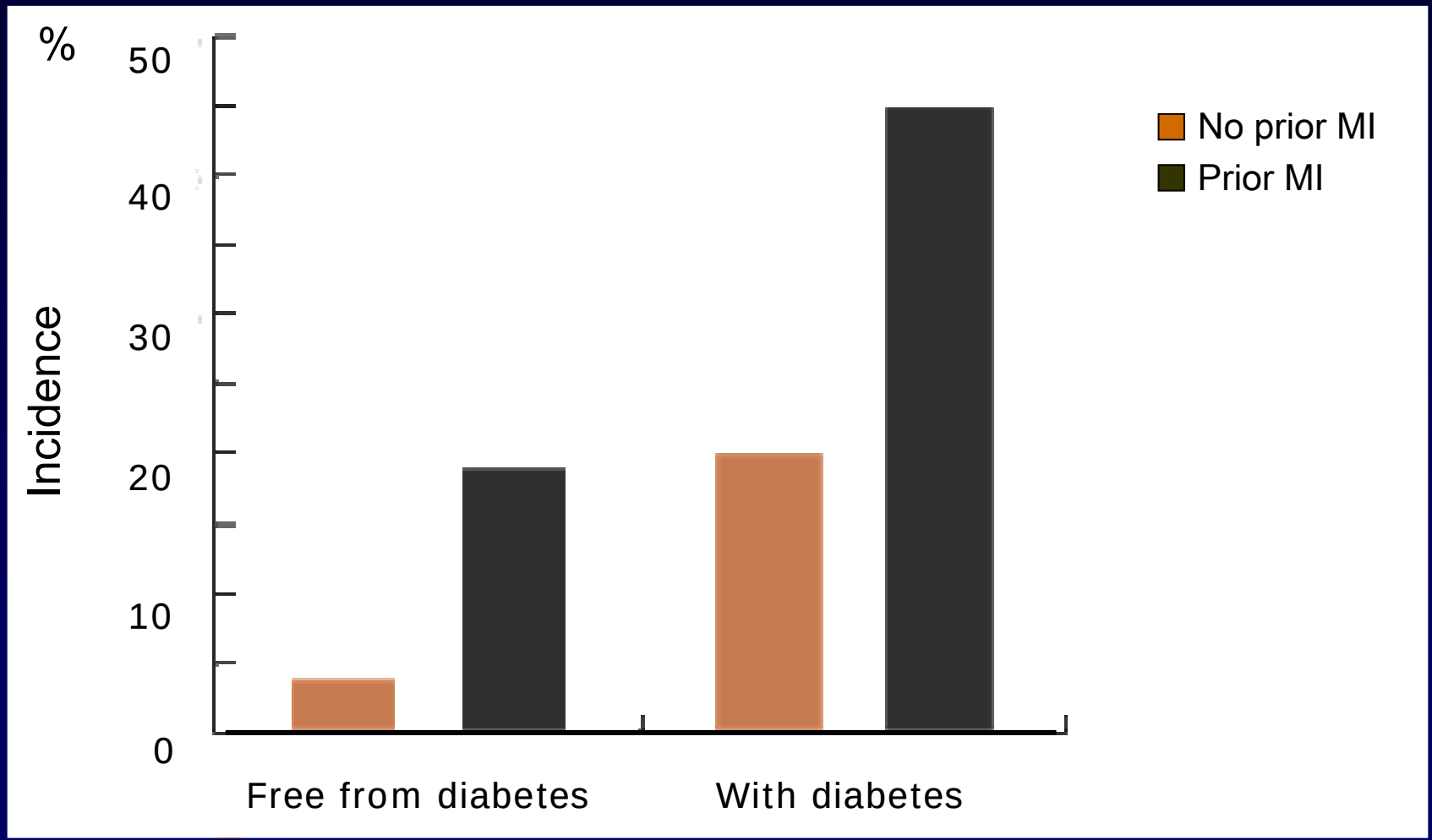
Targets for prevention at the time for the survey

Target recommended for	mmol/L	mg/dl
Total cholesterol	<5.0	190
LDL cholesterol	<3.0	115
HDL cholesterol	>1.0	40
Fasting plasma glucose	<7.2	<130
HbA1c (%)	<7	
Blood pressure (mmHg)	<140/90	

(Second Joint Task force of European and other Societes on coronary prevention. Eur Heart J 1998, 19: 1434)

(American Diabetes Association. Standards of medical care for patients with diabetes mellitus. Diabetes Care 2002, 25: S33)

Heart attacks in people with and without diabetes during seven years



(after: Haffner et al New Engl J Med 1998; 339:229)