ISTITUTO DI MEDICINA DELLO SPORT DI FIRENZE

"dal 1950 al servizio dello sport"

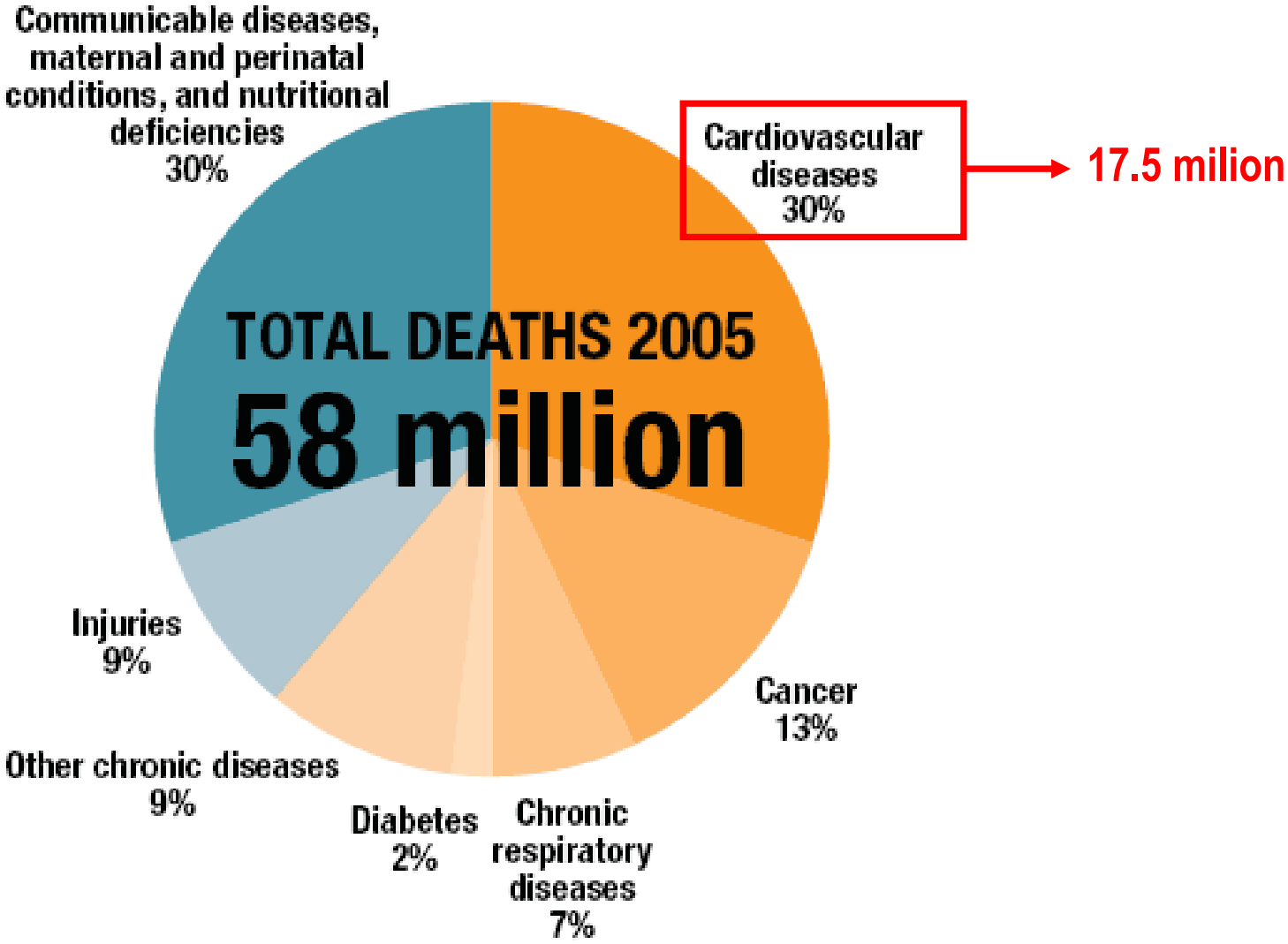
AMES

Prevenzione cardiovascolare
e cambiamento degli stili di vita

Prevenzione cardiovascolare e cambiamento degli stili di vita

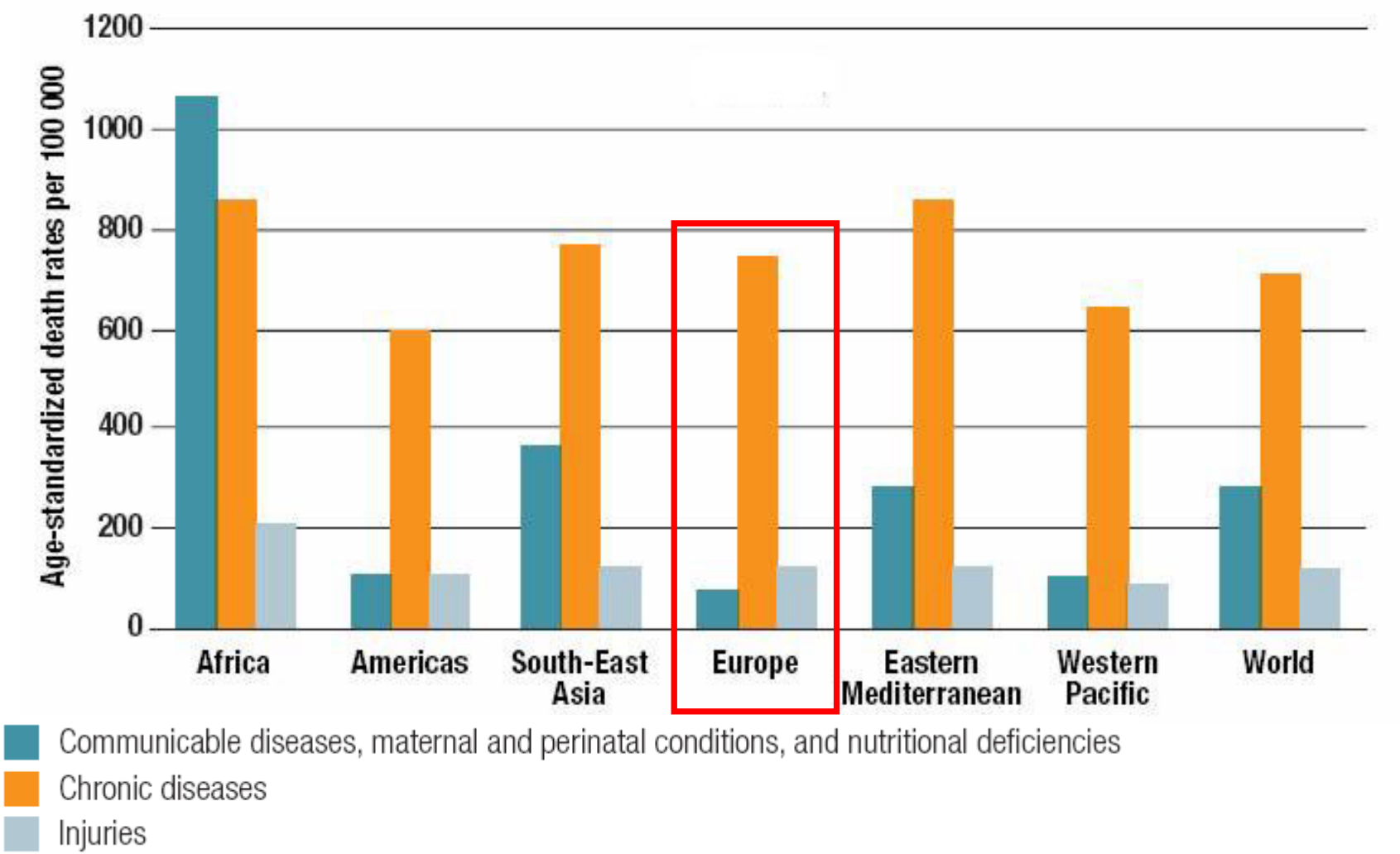
Gian Franco Gensini

Main causes of death worldwide at all ages (year: 2005)



Preventing Chronic Diseases – A vital investiment. WHO global report 2006

Main causes of death by WHO region (year: 2005)



Preventing Chronic Diseases – A vital investiment. WHO global report 2006

Cardiovascular diseases in Europe

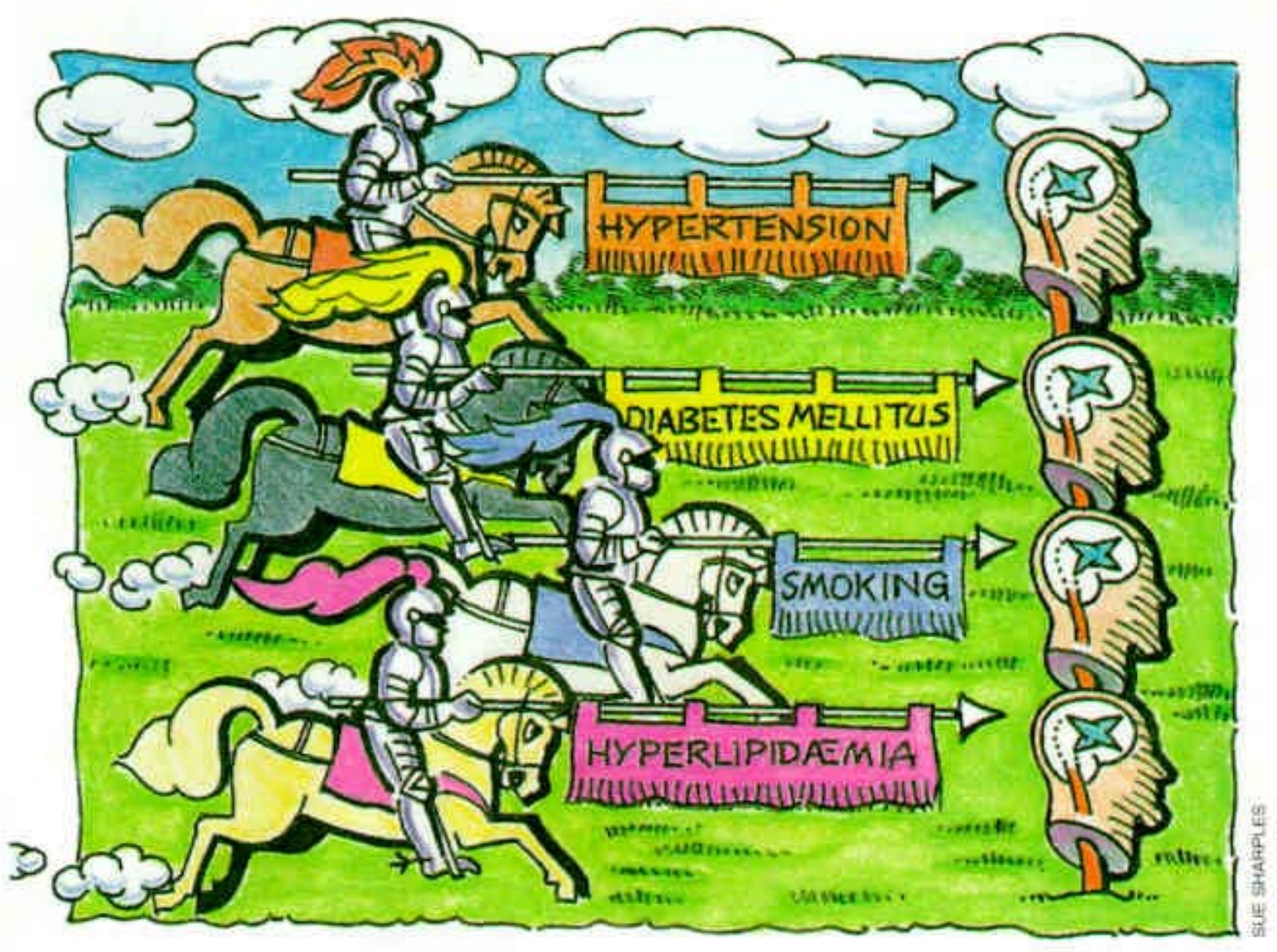
Incidence: (number of events per 100,000 patients per year in 1997)*	**35–64 years** (men/women)	**75+ years** (men/women)
Myocardial infarction		
European Mediterranean countries† (average):	163/26	991/811
European Nordic countries‡ (average):	290/86	1,666/1,327
Ischemic stroke		
European Mediterranean countries† (average):	148/51	1,486/1,264
European Nordic countries‡ (average):	101/60	1,317/1,401

*According to patient age, sex and country of origin

†Spain, Italy, France

‡UK, Germany, Netherlands

1. Guillot F, Moulard O. *Circulation* 1998; 98(abstr suppl 1): 1421.

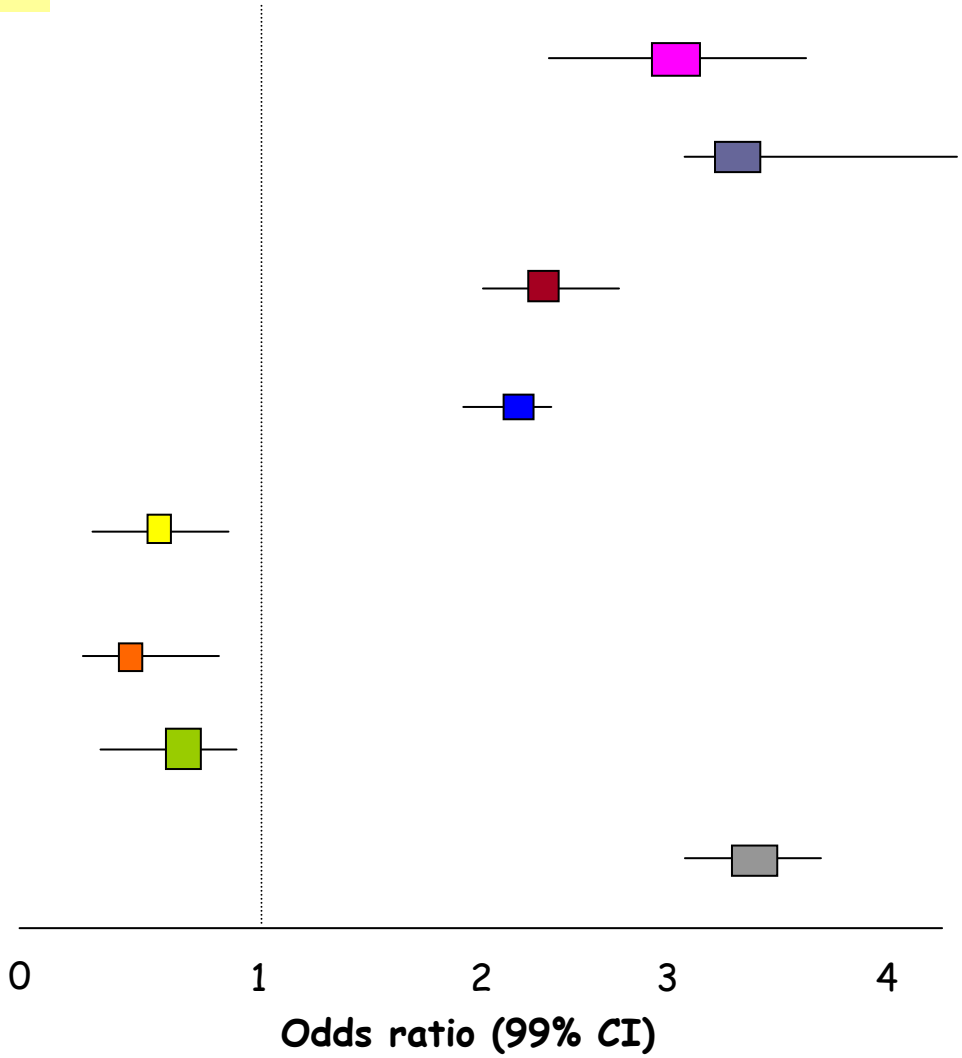


Barnett: BMJ, Volume 318(7197).June 5, 1999.1539-1543

Modifiable risk factors for MI in 52 countries (the INTERHEART study)

Cases: 15,152; Controls: 14,820

Current smoking	3.01 (2.36-3.43)
Diabetes	3.60 (3.15-5.18)
Hypertension	2.60 (2.15-2.95)
Abdominal obesity	2.20 (1.95-2.40)
Fruits and vegetables	0.60 (0.45-0.80)
Exercise	0.55 (0.39-0.83)
Alcohol	0.65 (0.32-0.85)
ApoB/ApoA1 ratio	3.85 (3.23-4.38)



Yusuf et al. Lancet, 2004

Figure 4.9 Global distribution of burden of disease attributable to 20 leading selected risk factors

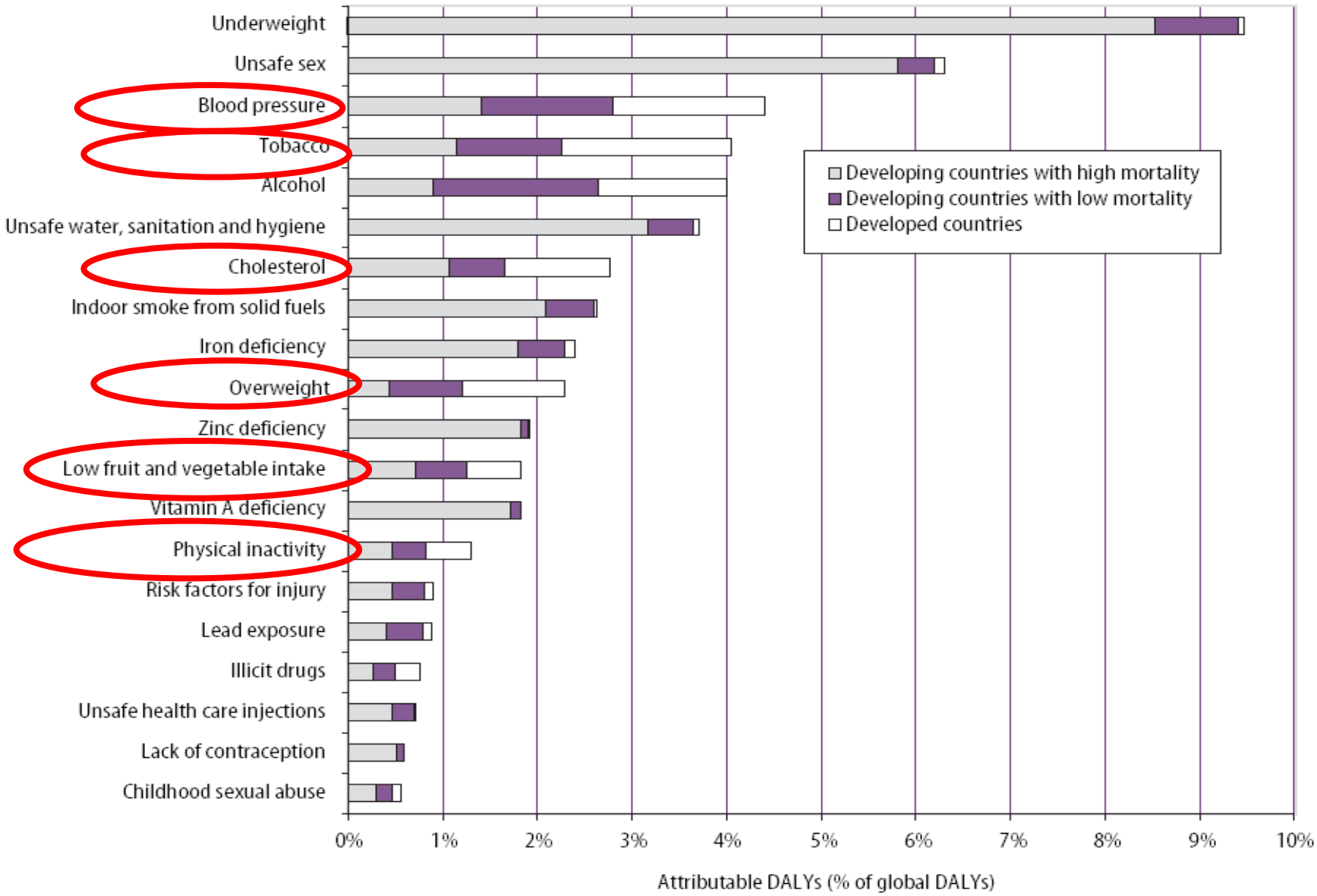


Table 4.11 Ranking of estimated attributable and avoidable burdens of 10 leading selected risk factors

Rank	2000	Estimated attributable burden in 2000 DALYs (millions)	% total	2010	Estimated avoidable burden after 25% distributional transition from 2001 in 2010 DALYs (millions)	% total	2020	Estimated avoidable burden after 25% distributional transition from 2001 in 2020 DALYs (millions)	% total
1	Underweight	138	9.5	Unsafe sex	42	3.0	Unsafe sex	71	4.8
2	Unsafe sex	92	6.3	Blood pressure	25	1.7	Blood pressure	27	1.9
3	Blood pressure	64	4.4	Underweight	23	1.6	Tobacco	22	1.5
4	Tobacco	59	4.1	Tobacco	17	1.2	Cholesterol	17	1.2
5	Alcohol	58	4.0	Cholesterol	15	1.1	Underweight	16	1.1
6	Unsafe water sanitation and hygiene	54	3.7	Alcohol	15	1.1	Alcohol	16	1.1
7	Cholesterol	40	2.8	Overweight	13	0.9	Overweight	15	1.0
8	Indoor smoke from solid fuels	39	2.6	Iron deficiency	9	0.6	Low fruit and vegetable intake	9	0.6
9	Iron deficiency	35	2.4	Low fruit and vegetable intake	9	0.6	Iron deficiency	7	0.5
10	Overweight	33	2.3	Unsafe water, sanitation and hygiene	8	0.6	Physical inactivity	6	0.4
Total DALYs		*1 455*			*1 417*			*1 459*	

Preventing Chronic Diseases – A vital investiment. WHO global report 2006

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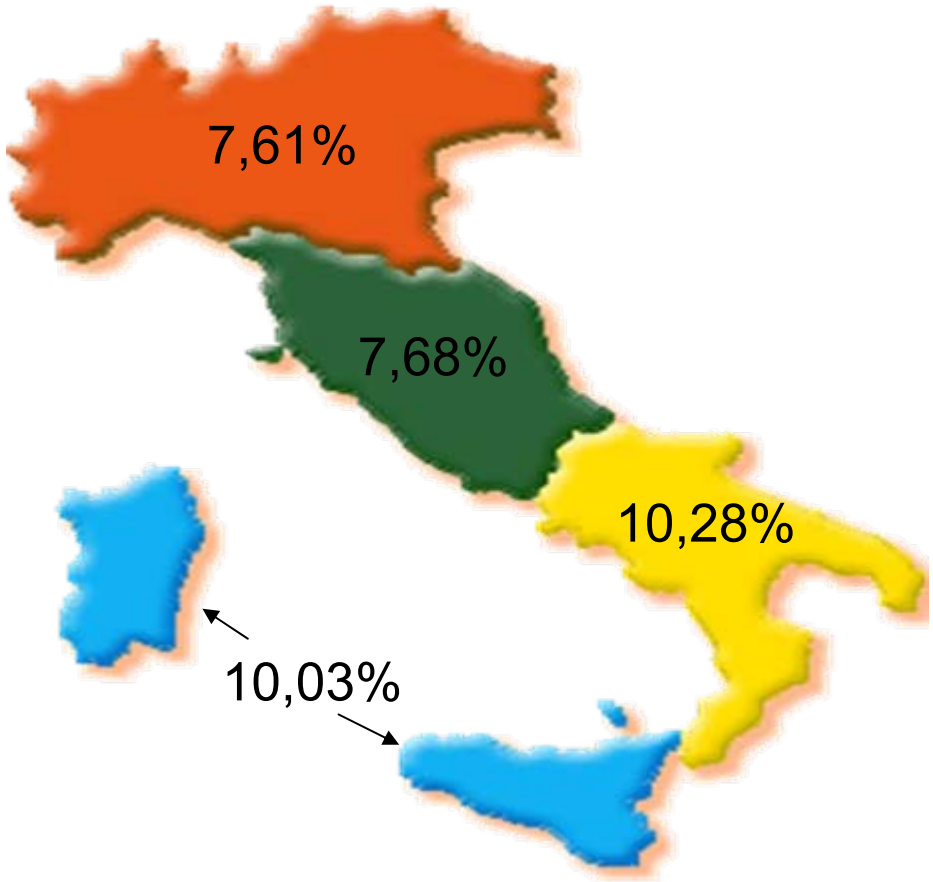
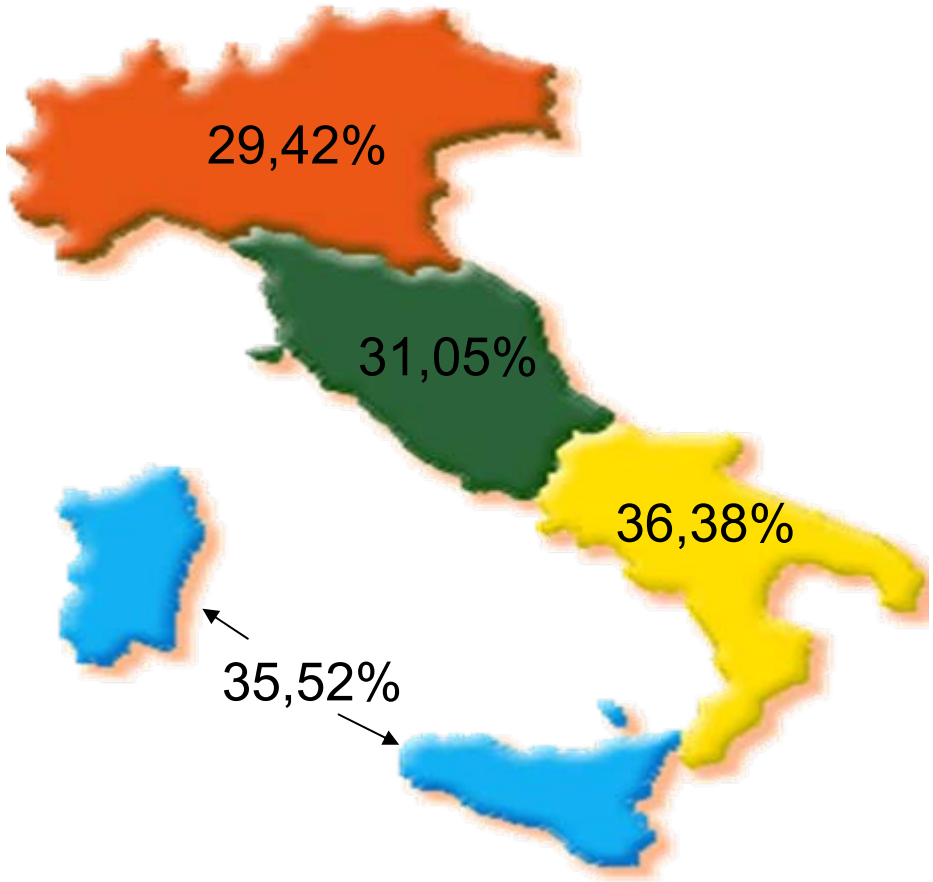
Obesity

Persone obese nel 2000 (tassi per 100 persone)



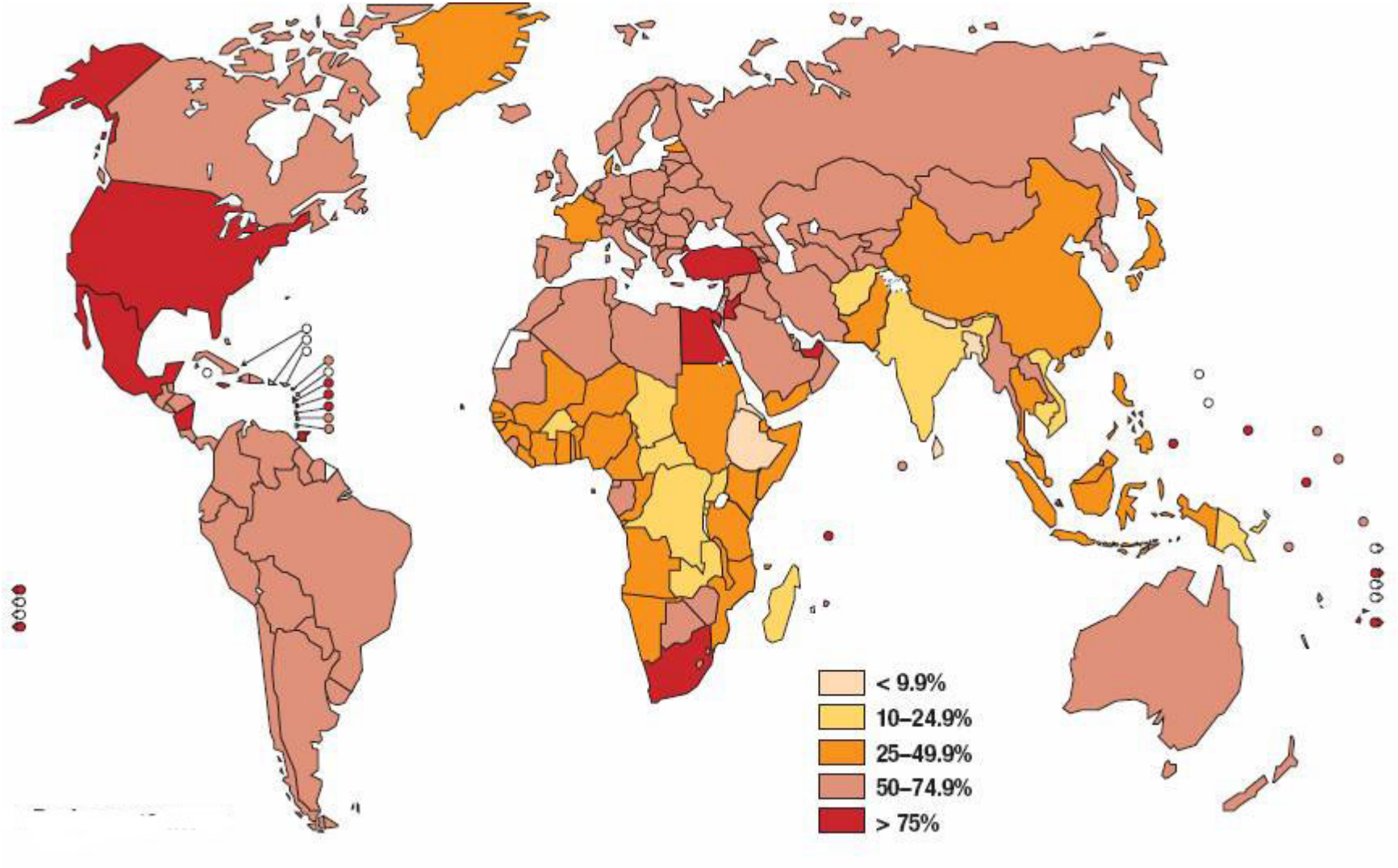
Fonte:Istat, Servizio “Struttura e dinamica sociale” 2000

Persone sovrappeso nel 2000 (tassi per 100 persone)



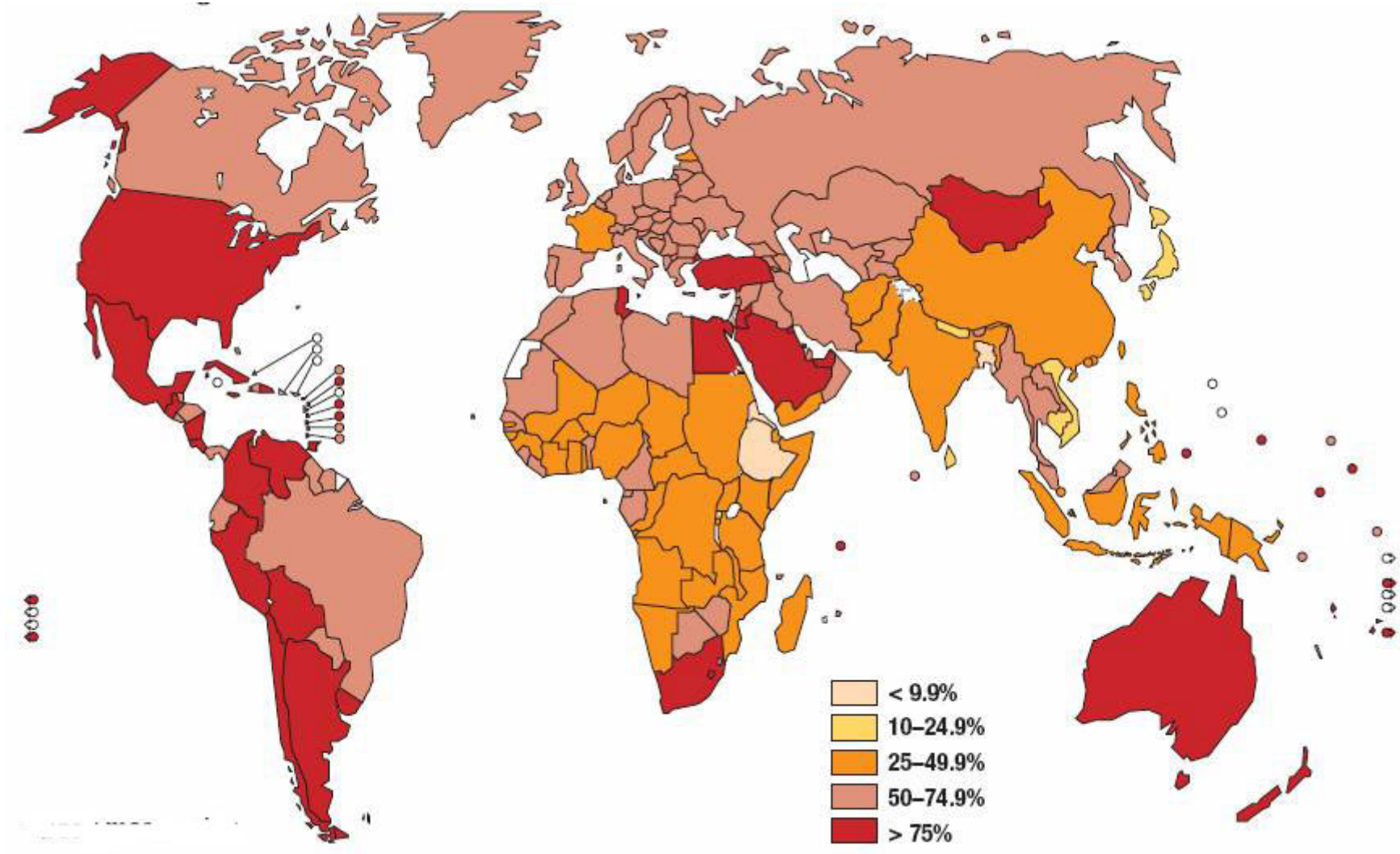
Fonte:Istat, Servizio “Struttura e dinamica sociale” 2000

Prevalence of overweight (BMI>25 kg/m_2) (year: 2005)



Preventing Chronic Diseases – A vital investiment. WHO global report 2006

Prevalence of overweight (BMI>25 kg/m_2) (year: 2015)

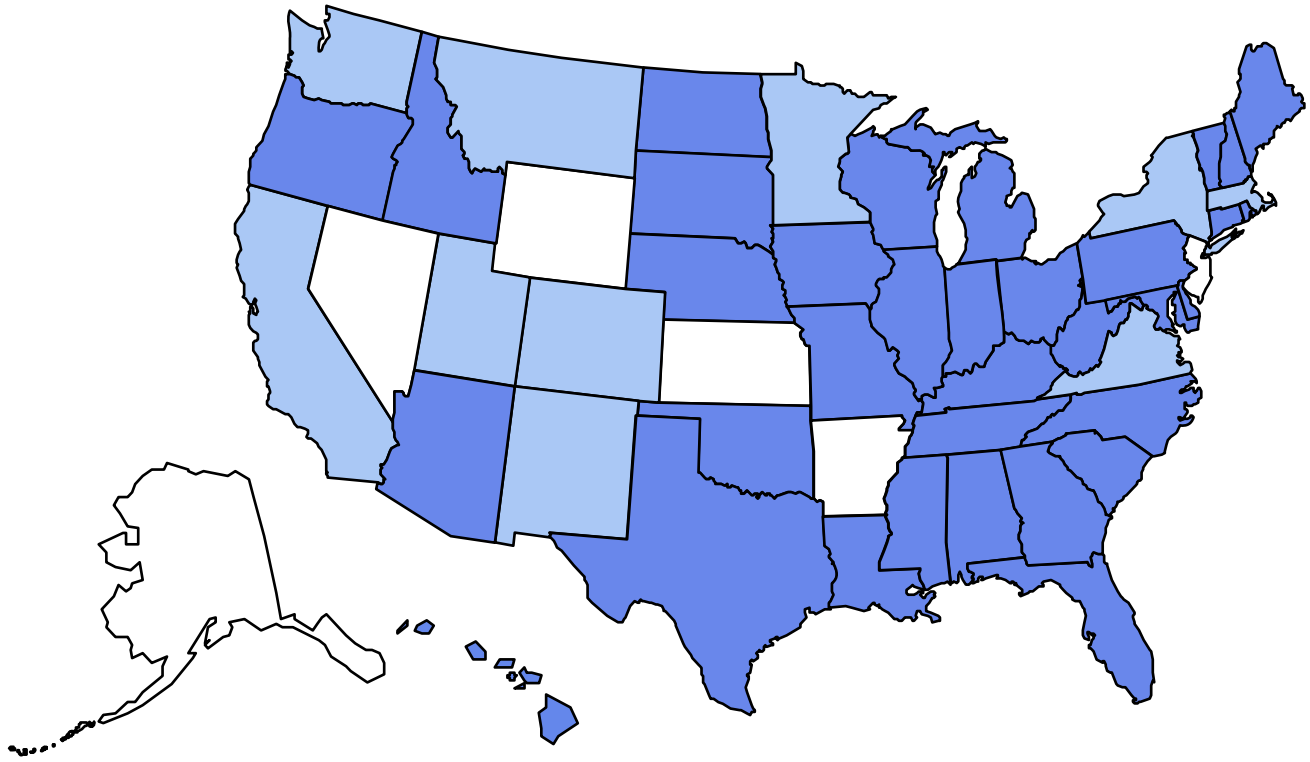


Preventing Chronic Diseases – A vital investiment. WHO global report 2006

Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)



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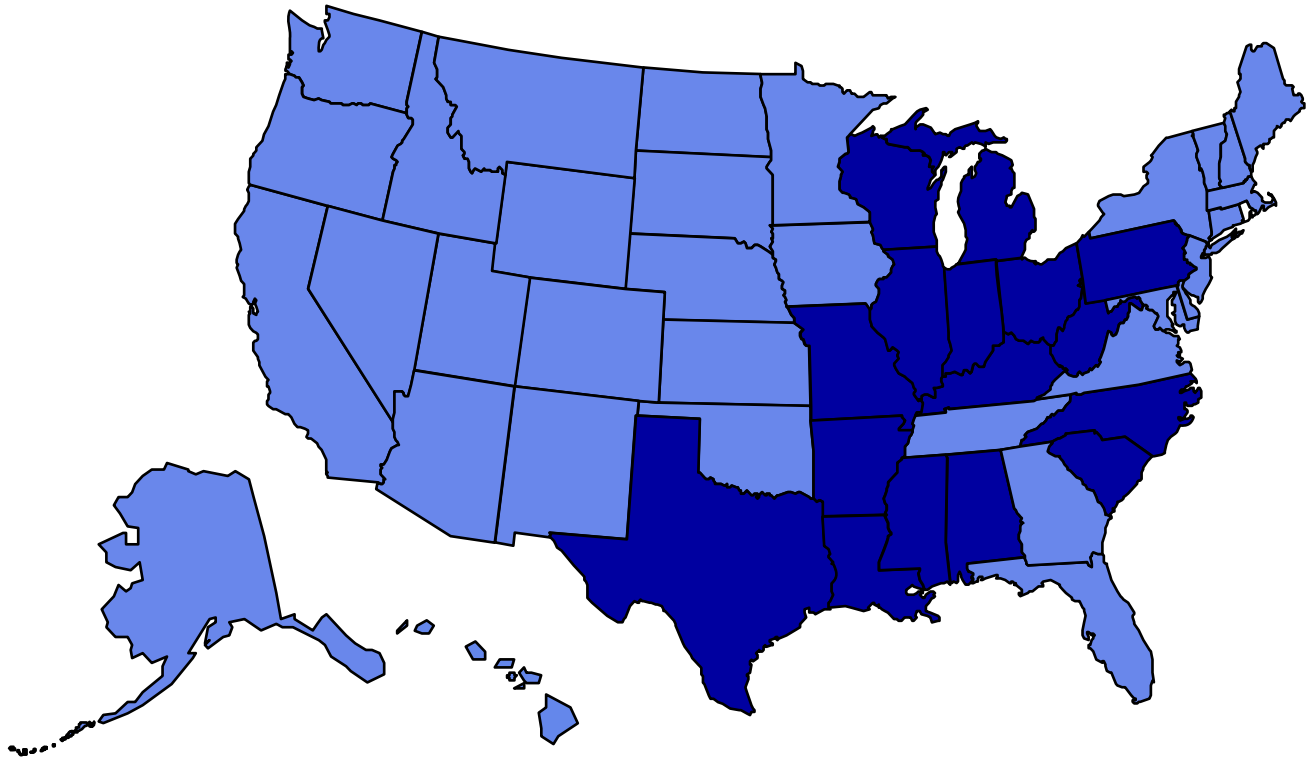

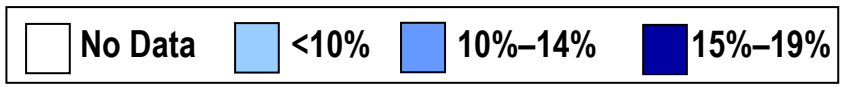

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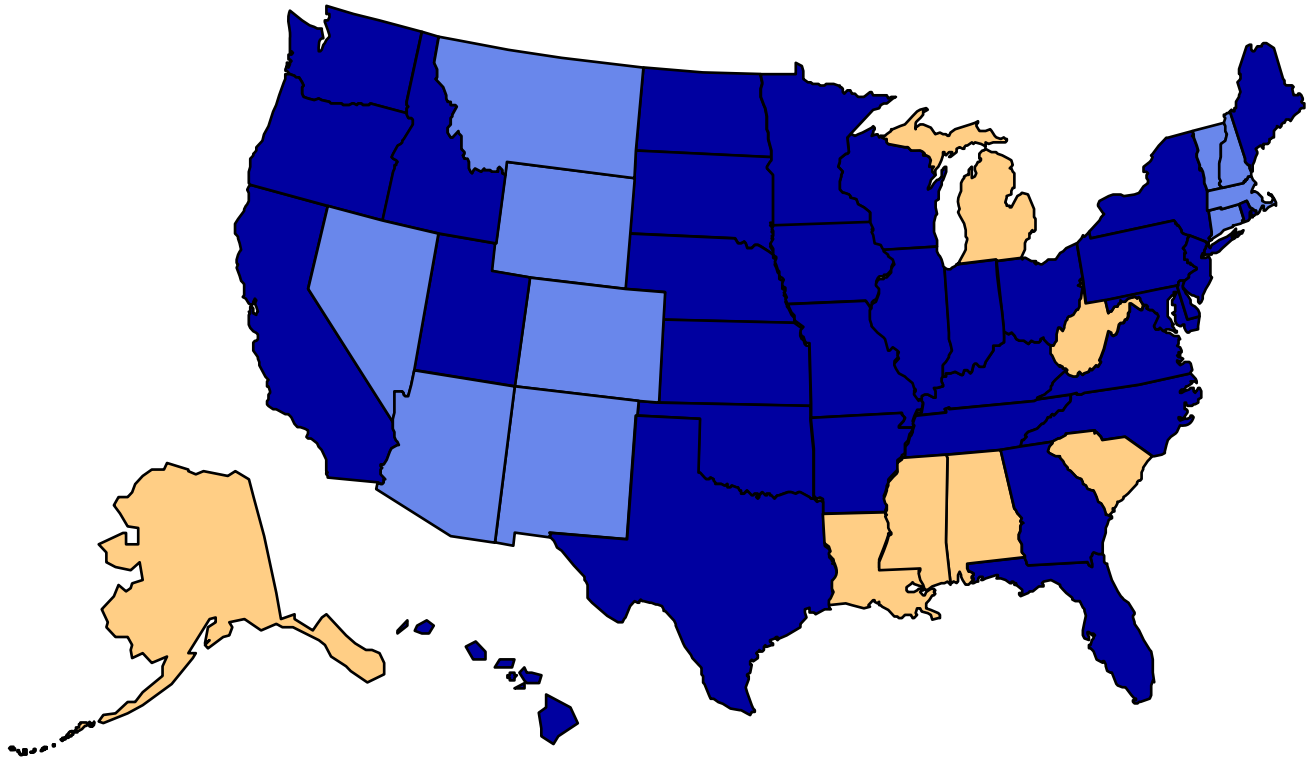

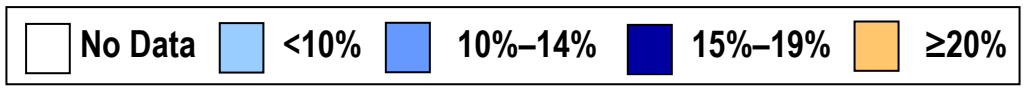

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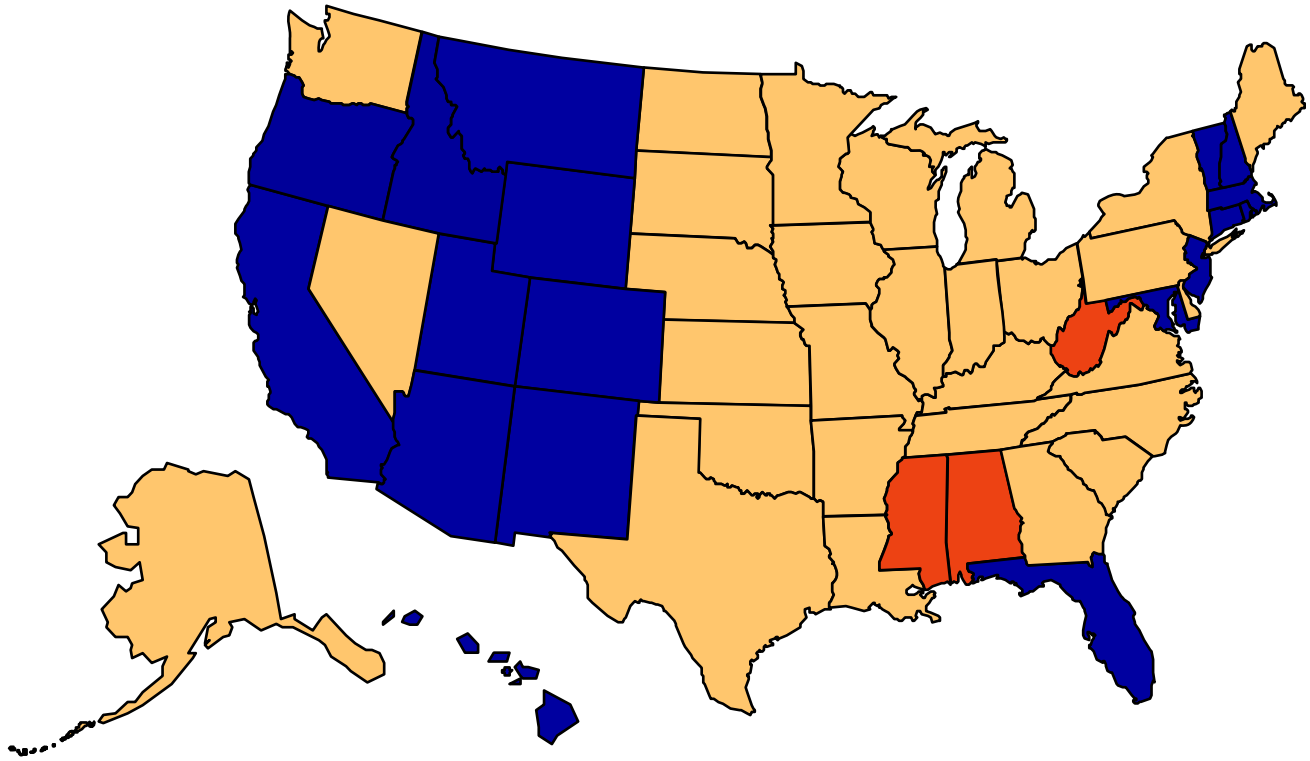

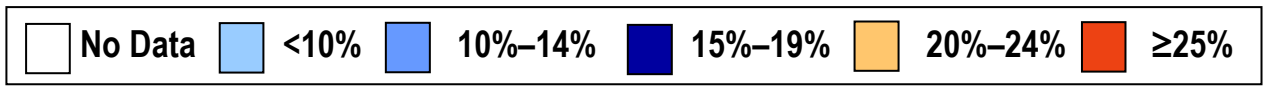

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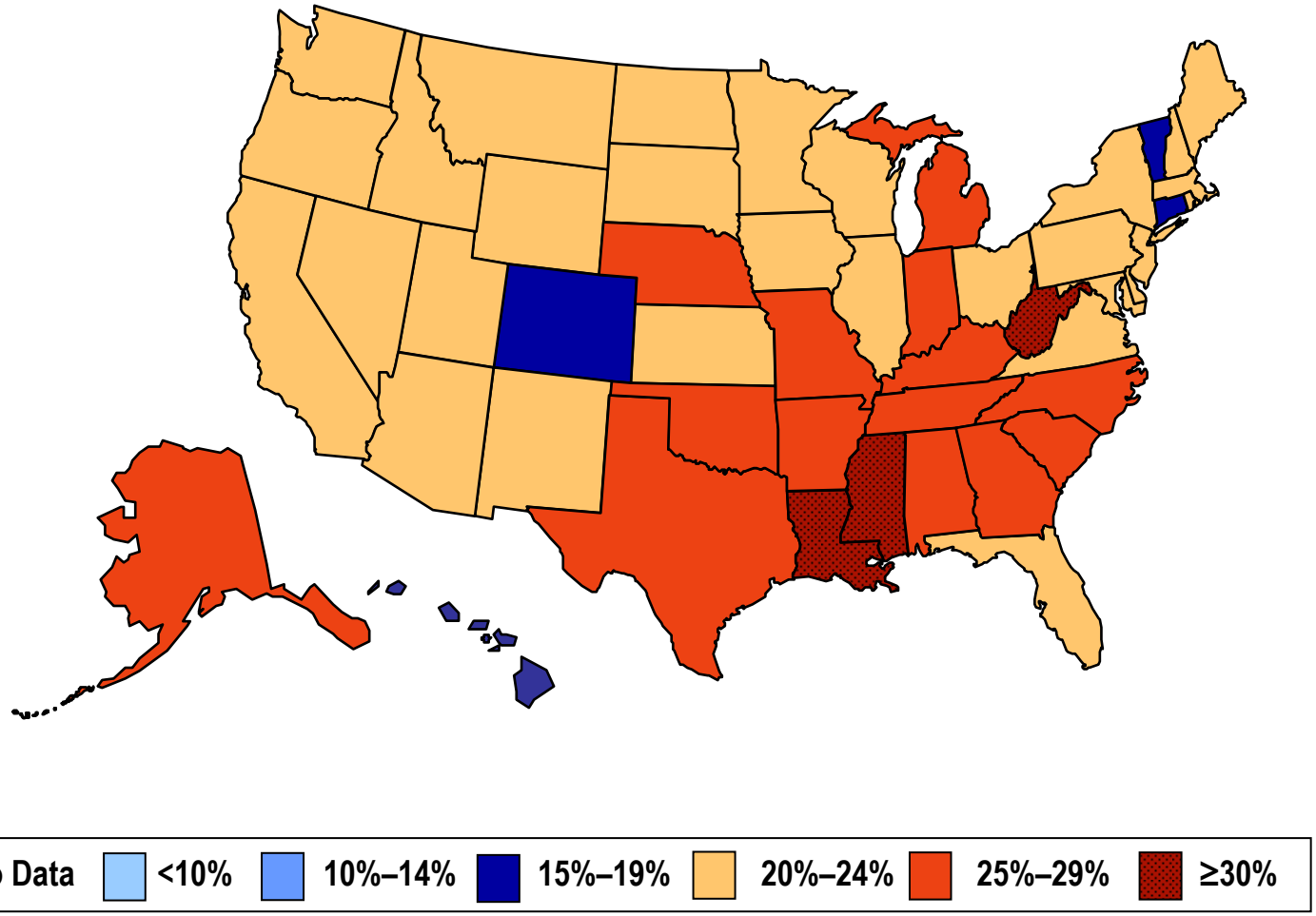
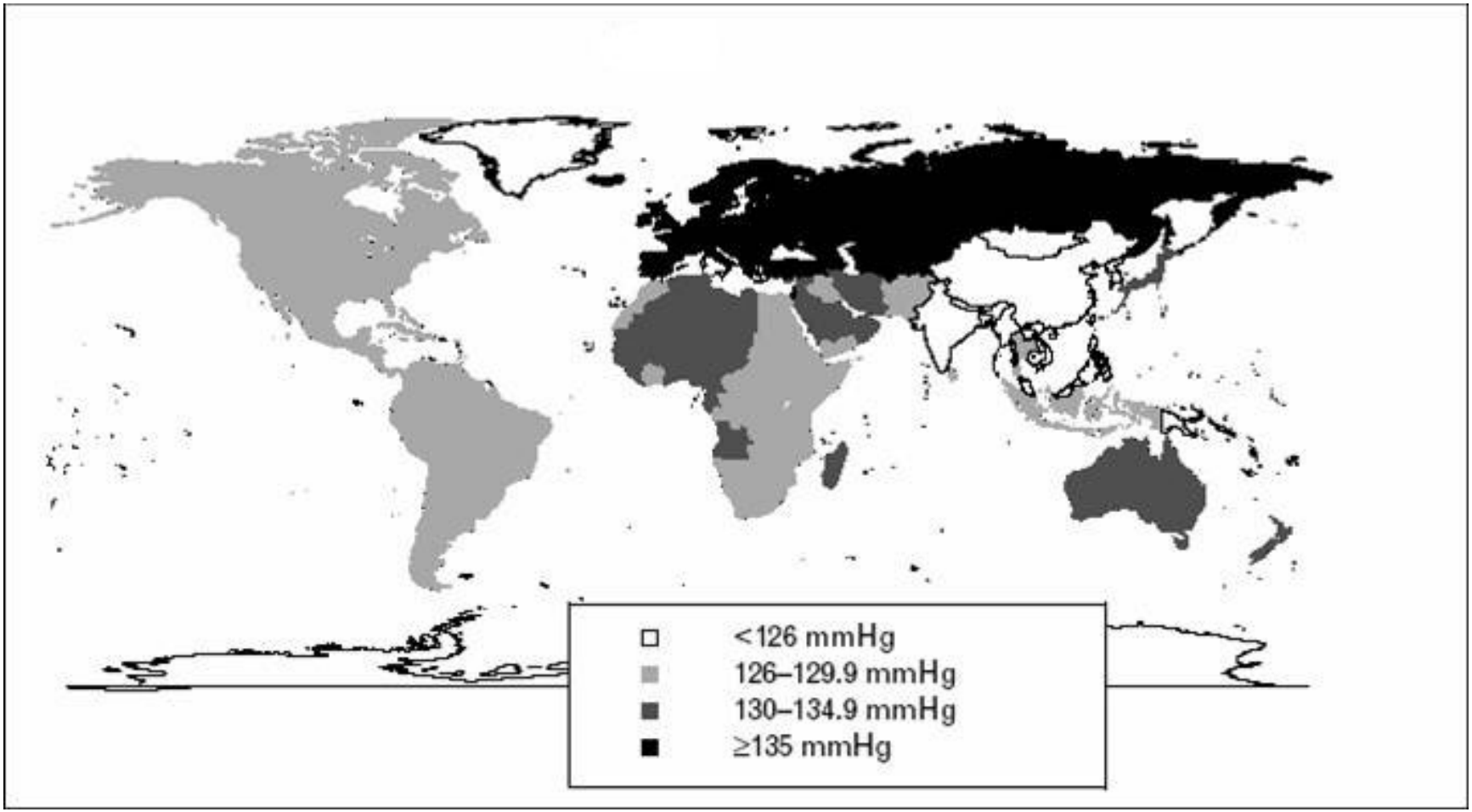


Hypertension

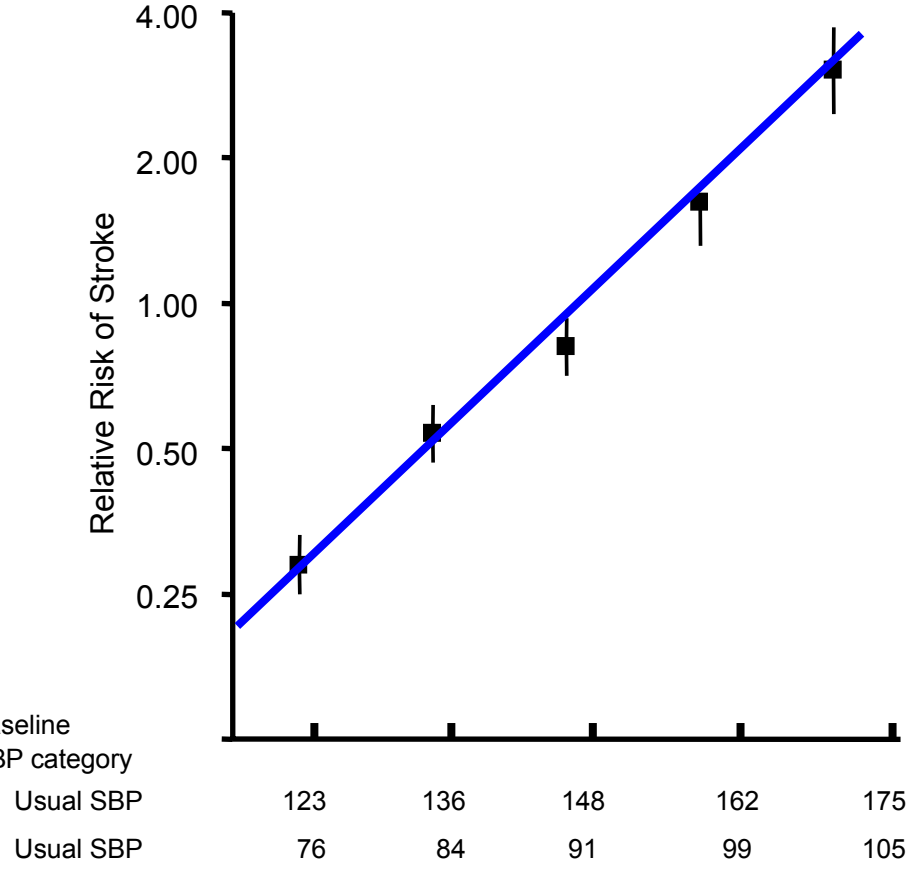
Worldwide age-standardized blood pressure



Harrison et al., J Human Hypert 2006

Stroke and usual BP

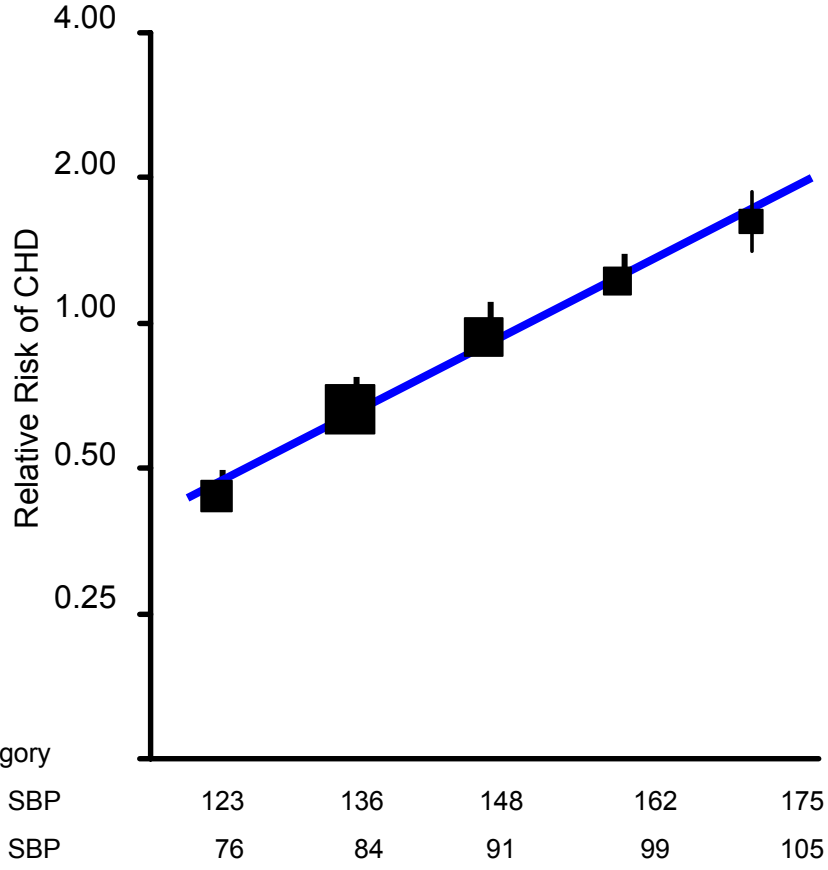
(in 5 categories defined by baseline DBP)
7 prospective observational studies (843 events)



Approximate mean usual BP
(estimated from later remeasurements in the Framingham study)

Coronary Heart Disease and usual BP

(in 5 categories defined by baseline DBP)
9 prospective observational studies (4856 events)



Approximate mean usual BP
(estimated from later remeasurements in the Framingham study)

Collins R and McMahon S, British Medical Bullettin 1994

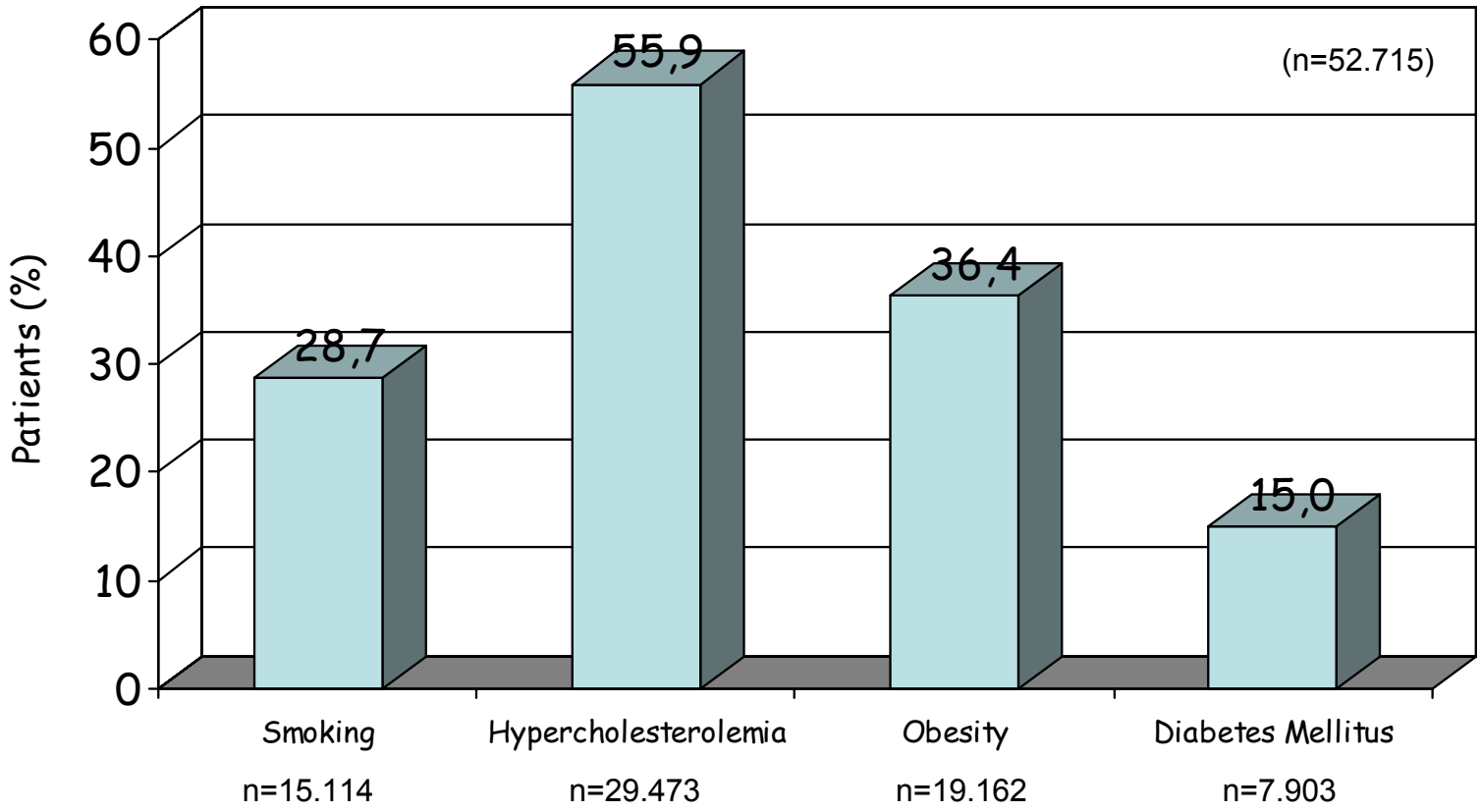
The benefit of antihypertensive treatment: an overview of 17 randomized trials (active treatment vs placebo)

SBP difference	- 10/12 mmHg
DBP difference	- 5/6 mmHg

	Risk reduction	
	expected	observed
Stroke	- 35/40%	- 38 (31-45%)
CHD	- 20/25%	- 16 (8-23%)
CV mortality		- 21%
Total mortality	- 12%	

Collins P. et al. Lancet 1990

Prevalence of cardiovascular Risk Factors in Italian hypertensive patients

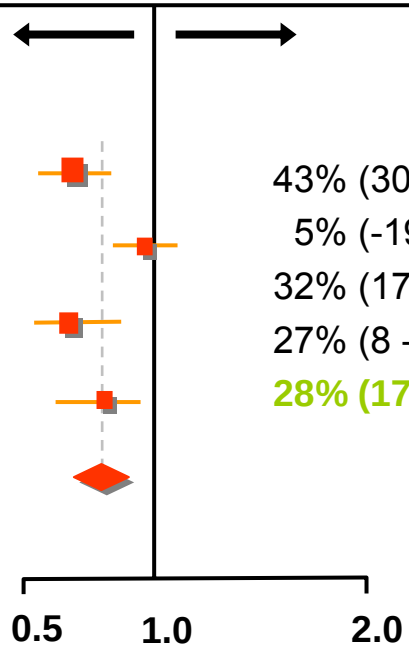


Volpe M, et al. J Hypertension 2007;25(7):1491-8

PROGRESS Study

Lowering of BP and Secondary Prevention of Stroke

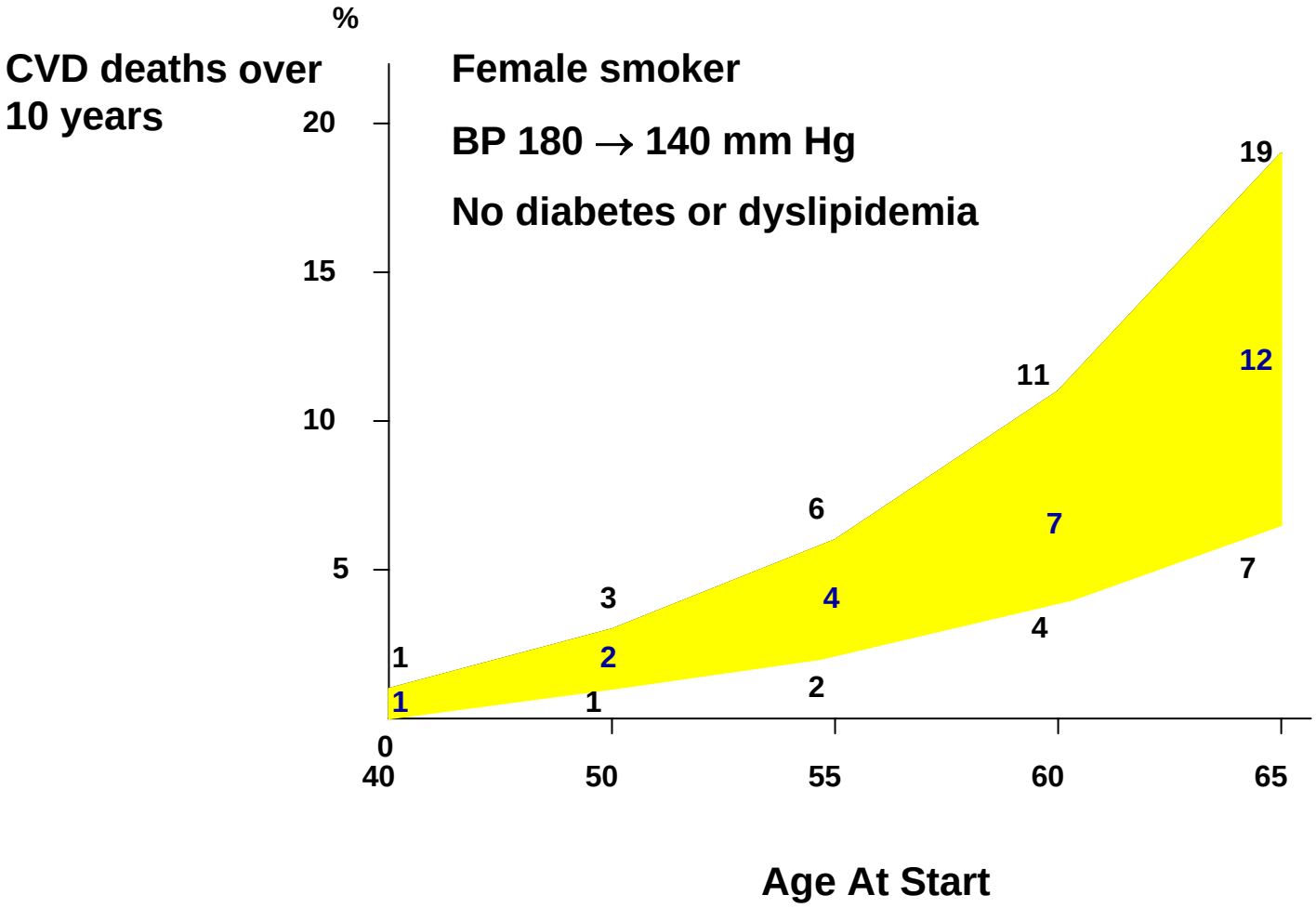
Stroke Prevention	Treat (n= 3051)	Placebo (n= 3054)	RR (CI 95%) reduction
Combination	150	255	43% (30 - 54)
Monotherapy	157	165	5% (-19 - 23)
Hypertensive	163	235	32% (17 - 44)
Non-Hypertensive	144	185	27% (8 - 42)
Total	**307**	**420**	**28% (17 - 38)**



BP reduction vs. placebo:
Monotherapy: 4.9/2.8 mmHg
Combination: 12.3/5.0 mmHg

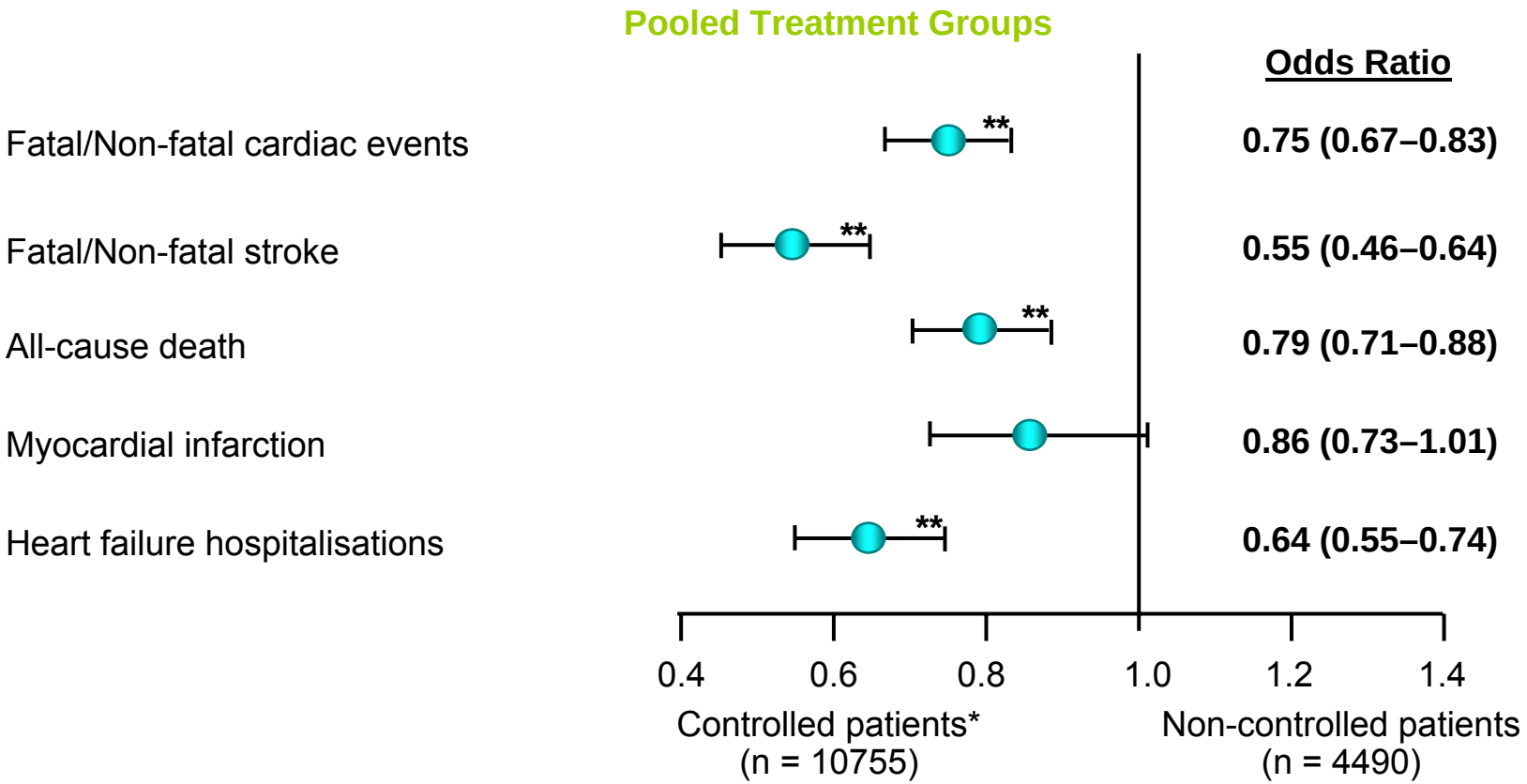
Lancet 2001;358:1033-1041

The Earlier, the Better: Early Intervention Reduces Events



SCORE High Risk Region

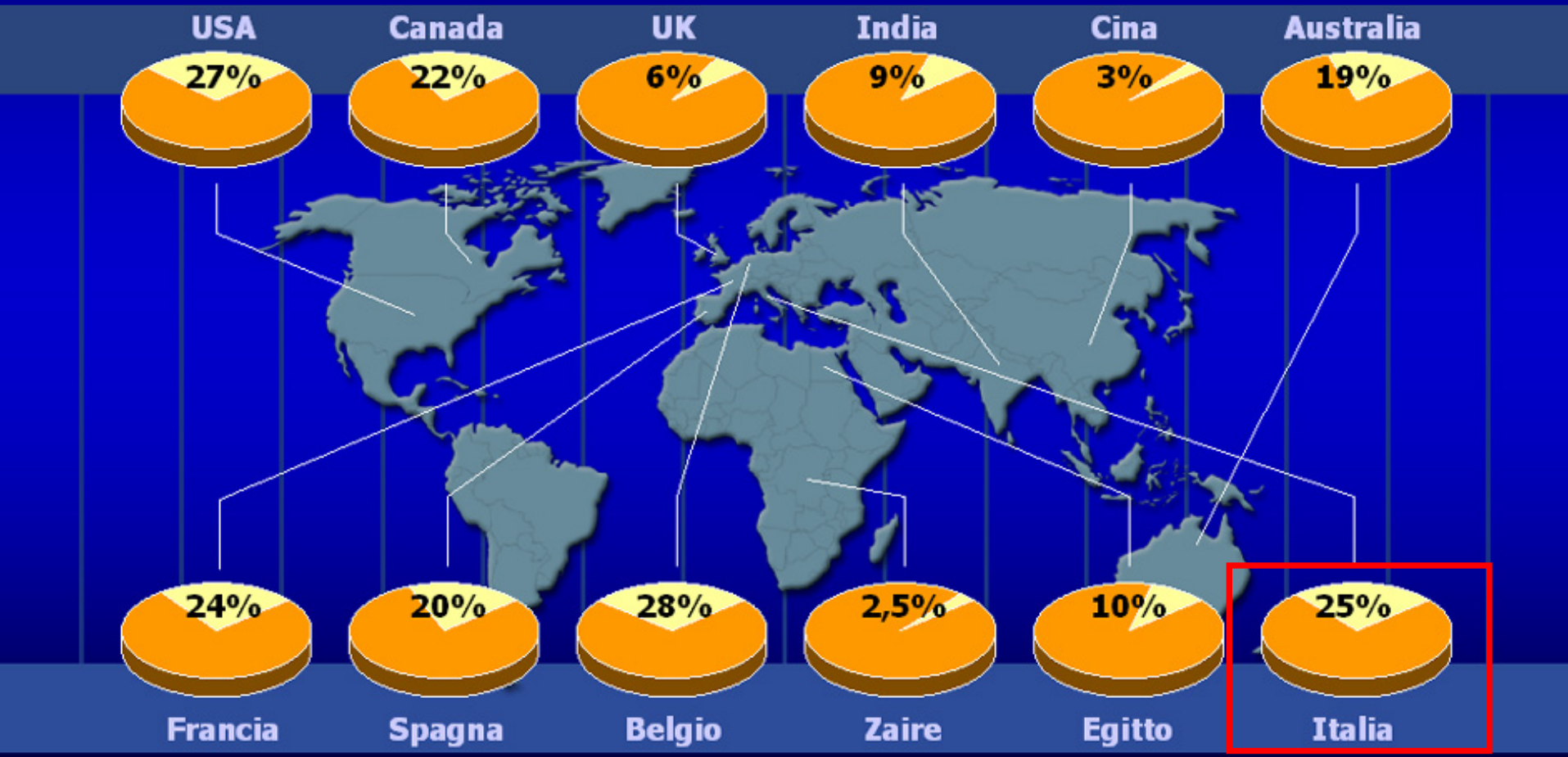
Analysis of Results Based on BP Control at 6 Months



*SBP < 140 mmHg at 6 months.
**P < 0.01.

Weber MA, et al. Lancet 2004;363:2047–49

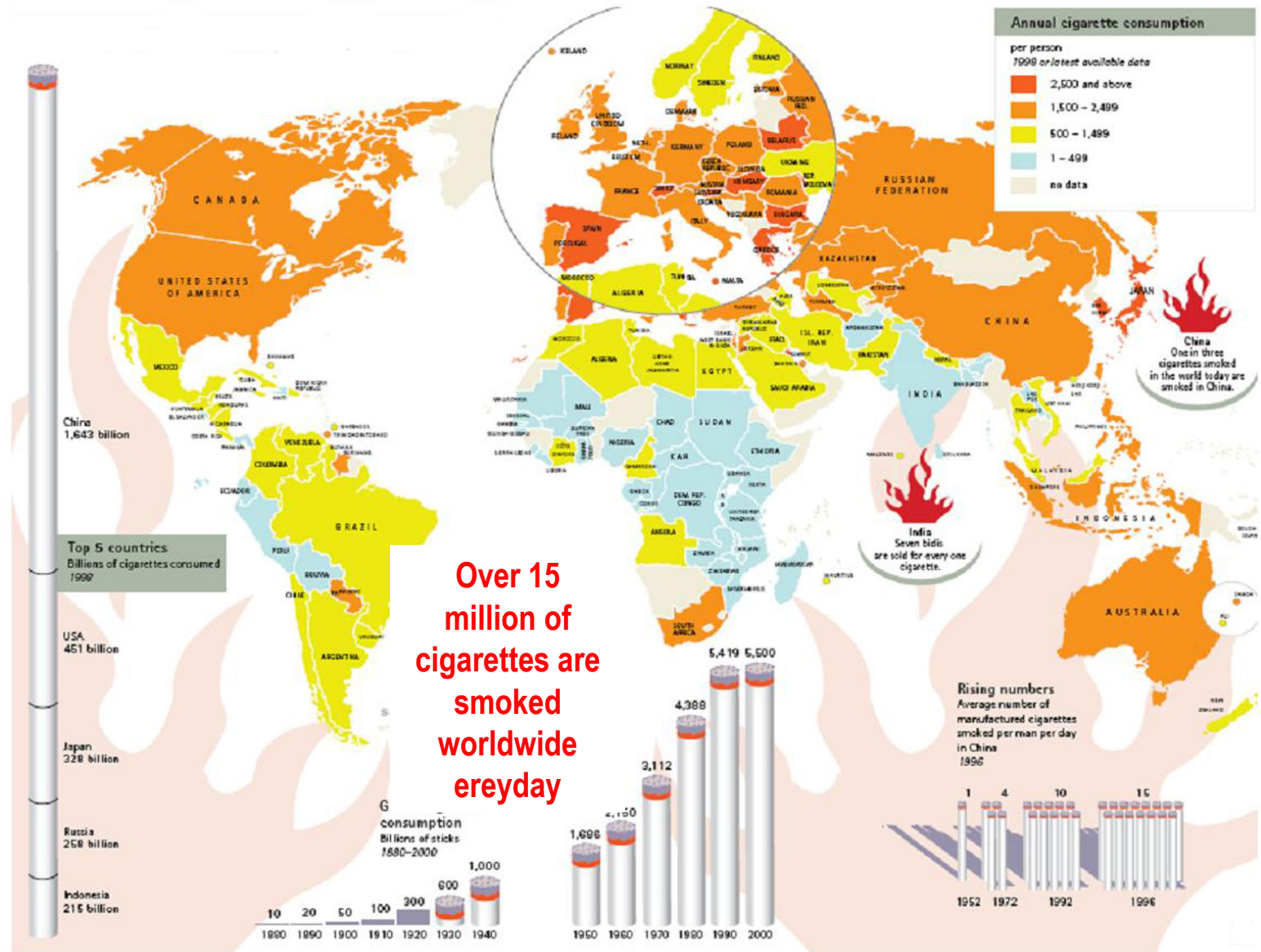
Controlled hypertension by treatment



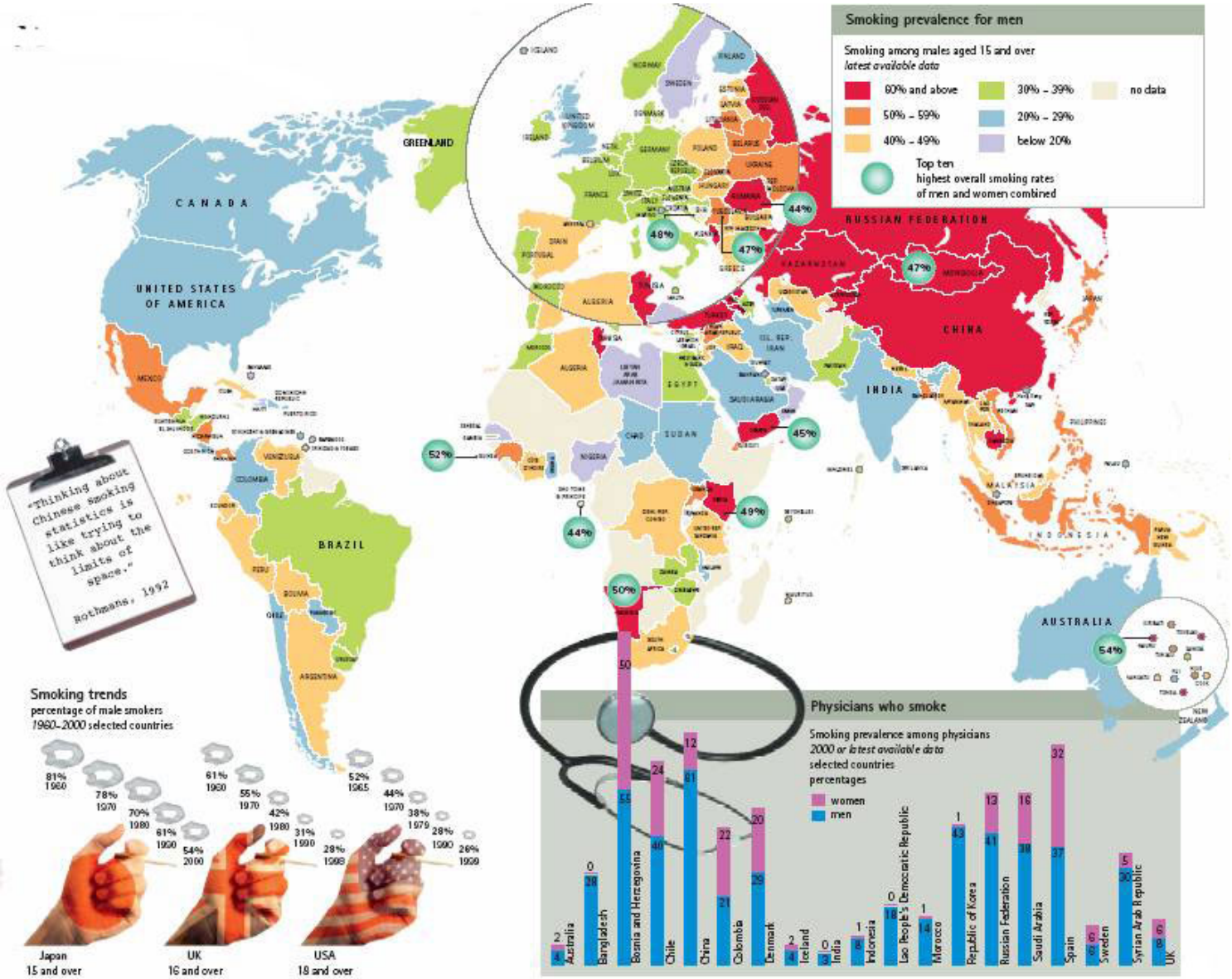
Mancia, SIC 2002

Cigarette Smoking

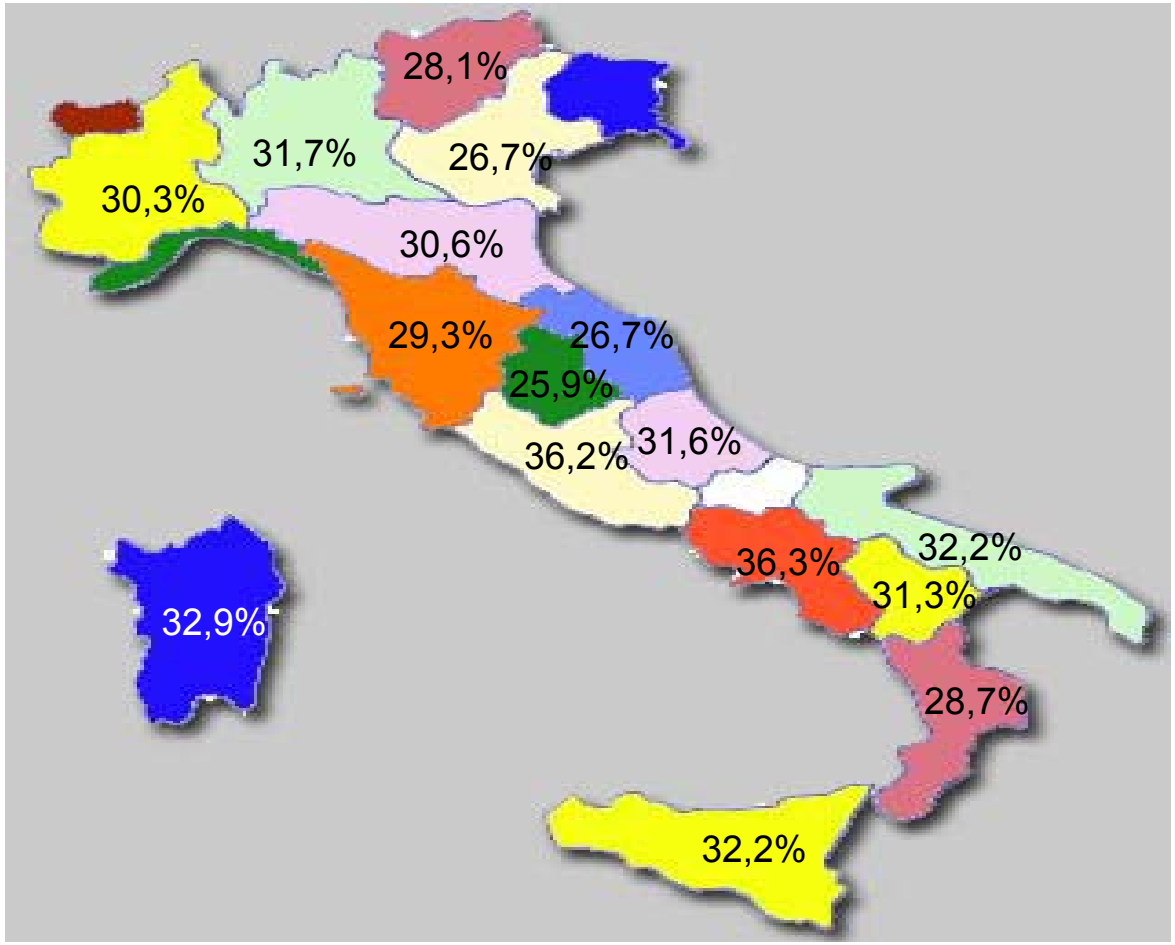
Worldwide cigarette consumption



Smoking prevalence in the world



Percentuale di fumatori nel 2003 in Italia (tassi per 100 persone)



Fonte:Istat, Servizio “Struttura e dinamica sociale” 2003

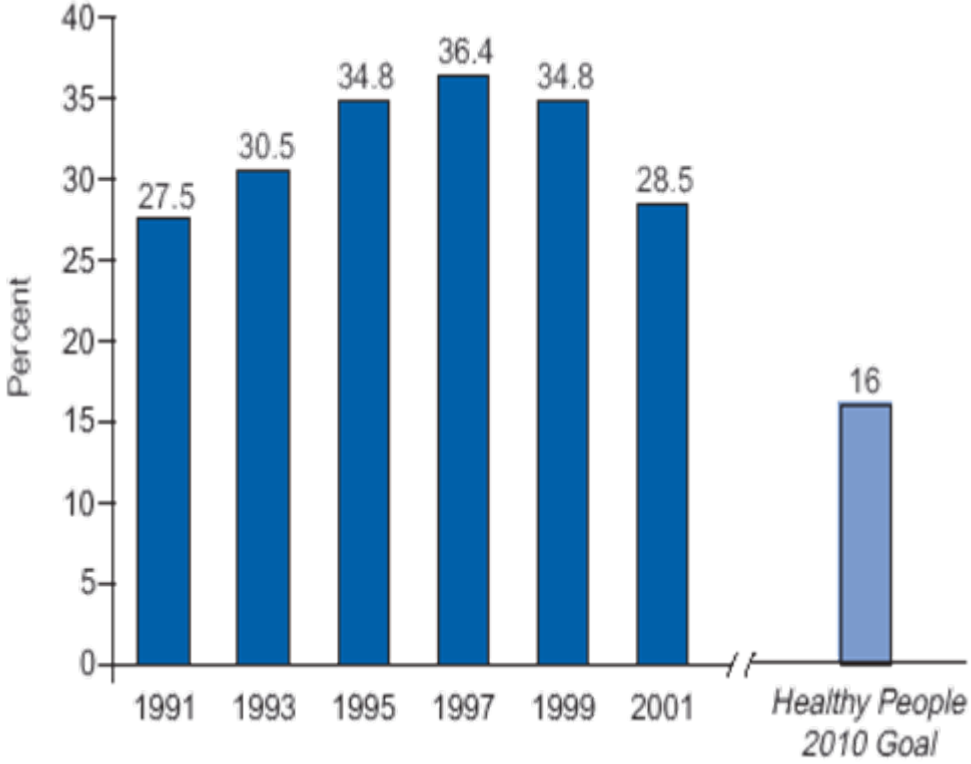
MI risk of current smoking, overall and by level of exposure

Smoking frequency	Odds ratio
Overall	3.02
1-9 cigarettes/day	1.49
10-19 cigarettes/day	2.68
20+ cigarettes/day	4.71

Ounpoo S et al. Presented at the XIVth World Congress of Cardiology. May 2002.

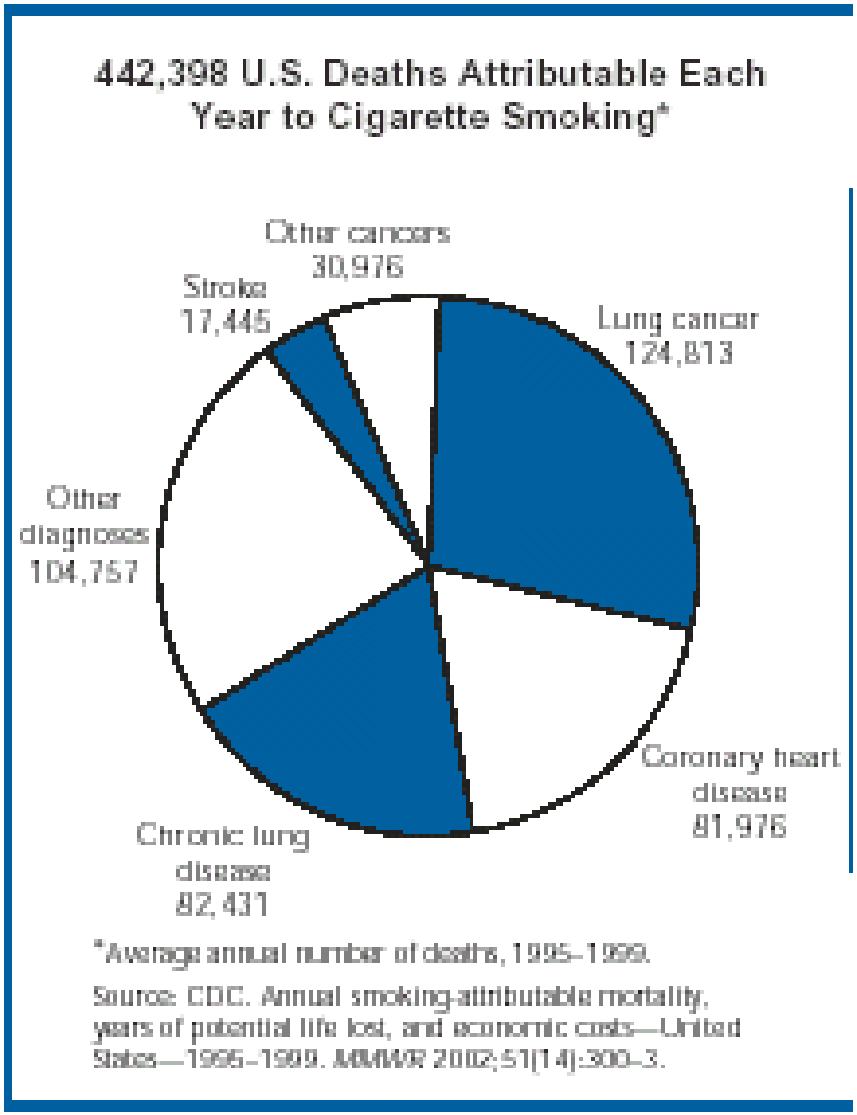
Targeting Tobacco Use: The Nation's Leading Cause of Death At A Glance, 2003

Percentage of High School Students Who Reported Current Cigarette Smoking—United States, 1991–2001*



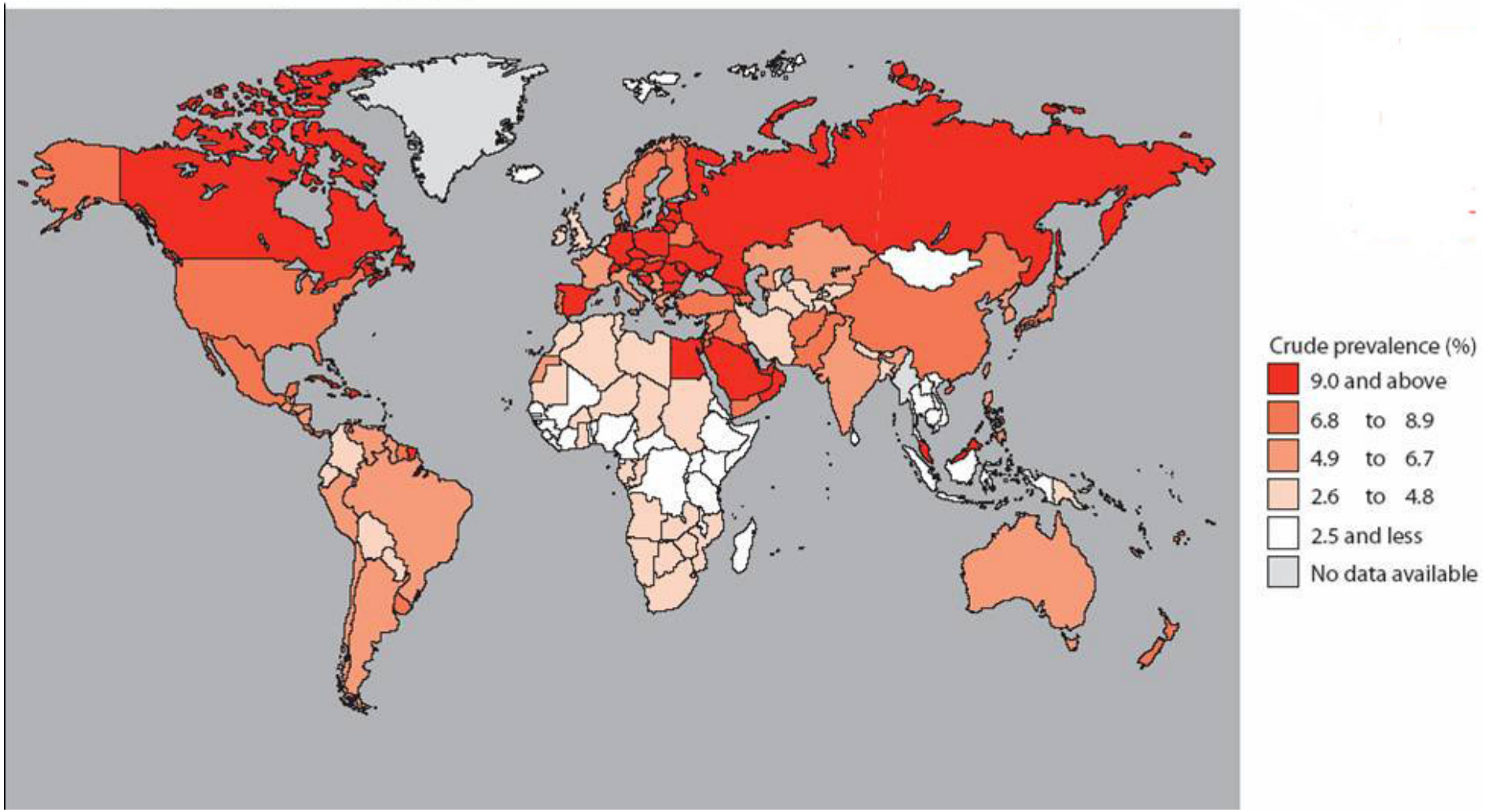
***Smoking one or more cigarettes during the previous 30 days.**
Source: CDC, Youth Risk Behavior Surveillance System (*MMWR* 2002;51(19):409–12).

Smoking-related illnesses cost the nation more than $150 billion each year.

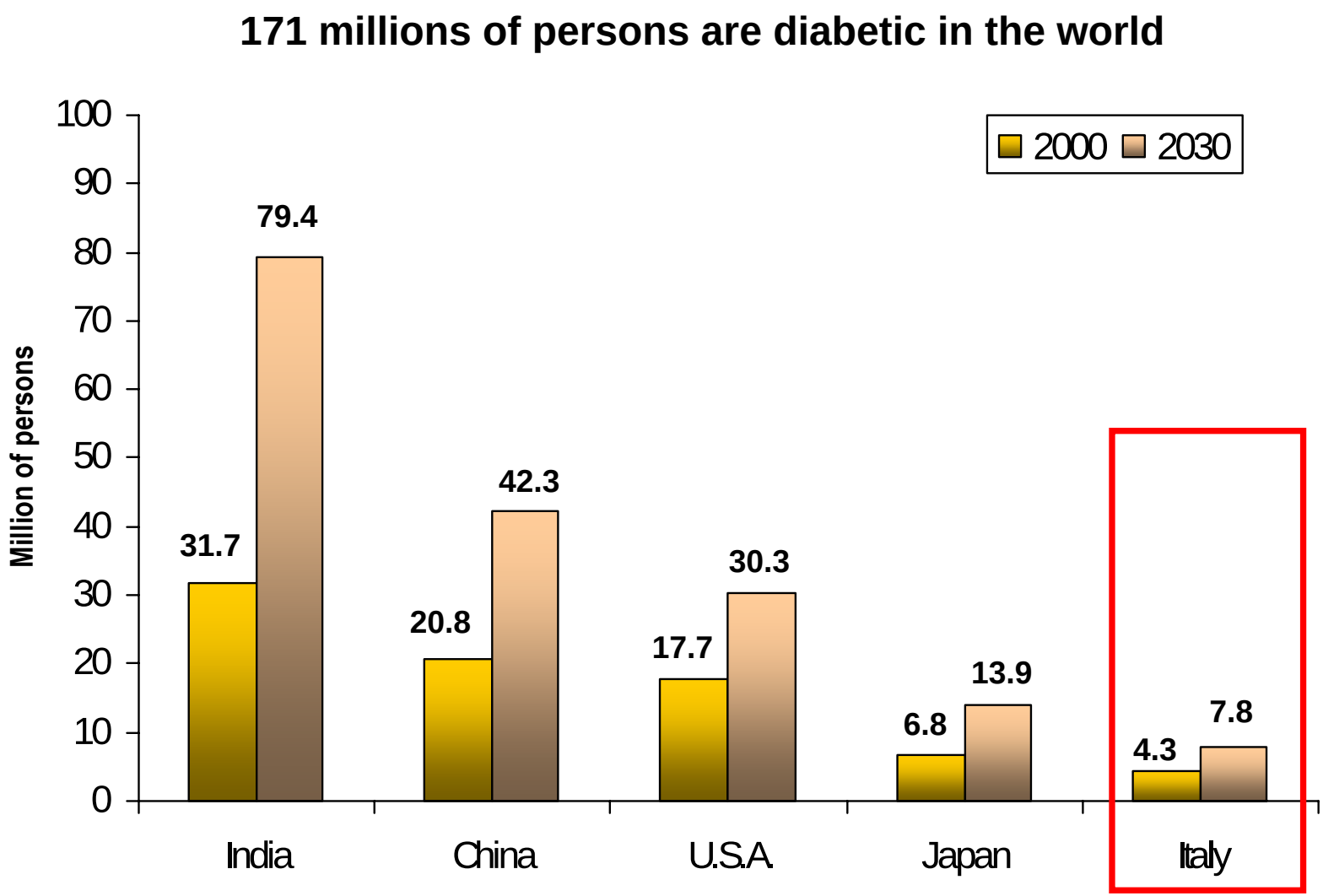


Diabetes

Prevalence of diabetes worldwide (year: 2003)

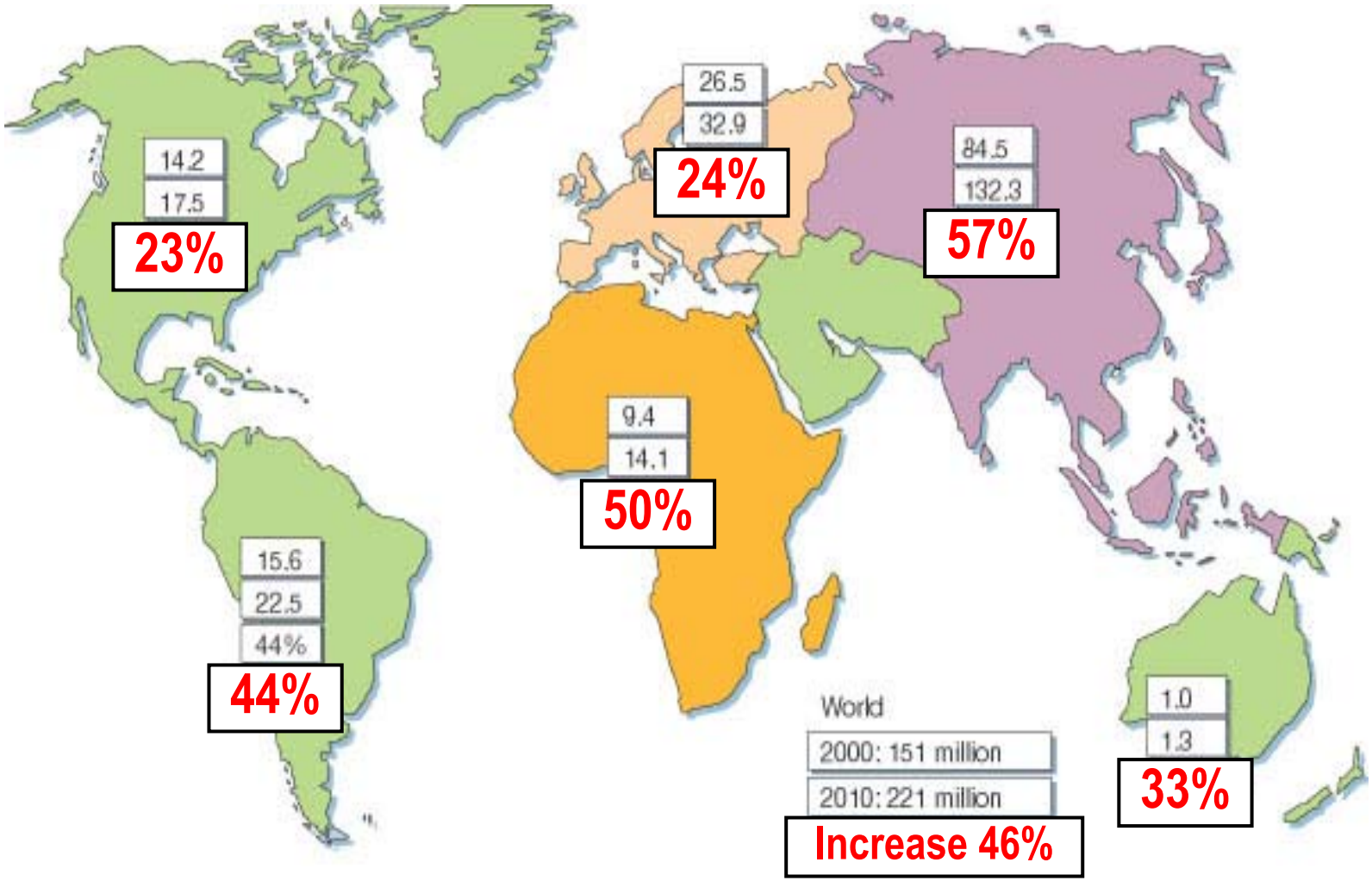


Number of persons with diabetes in the world



Global burden of diabetes. WHO 2004

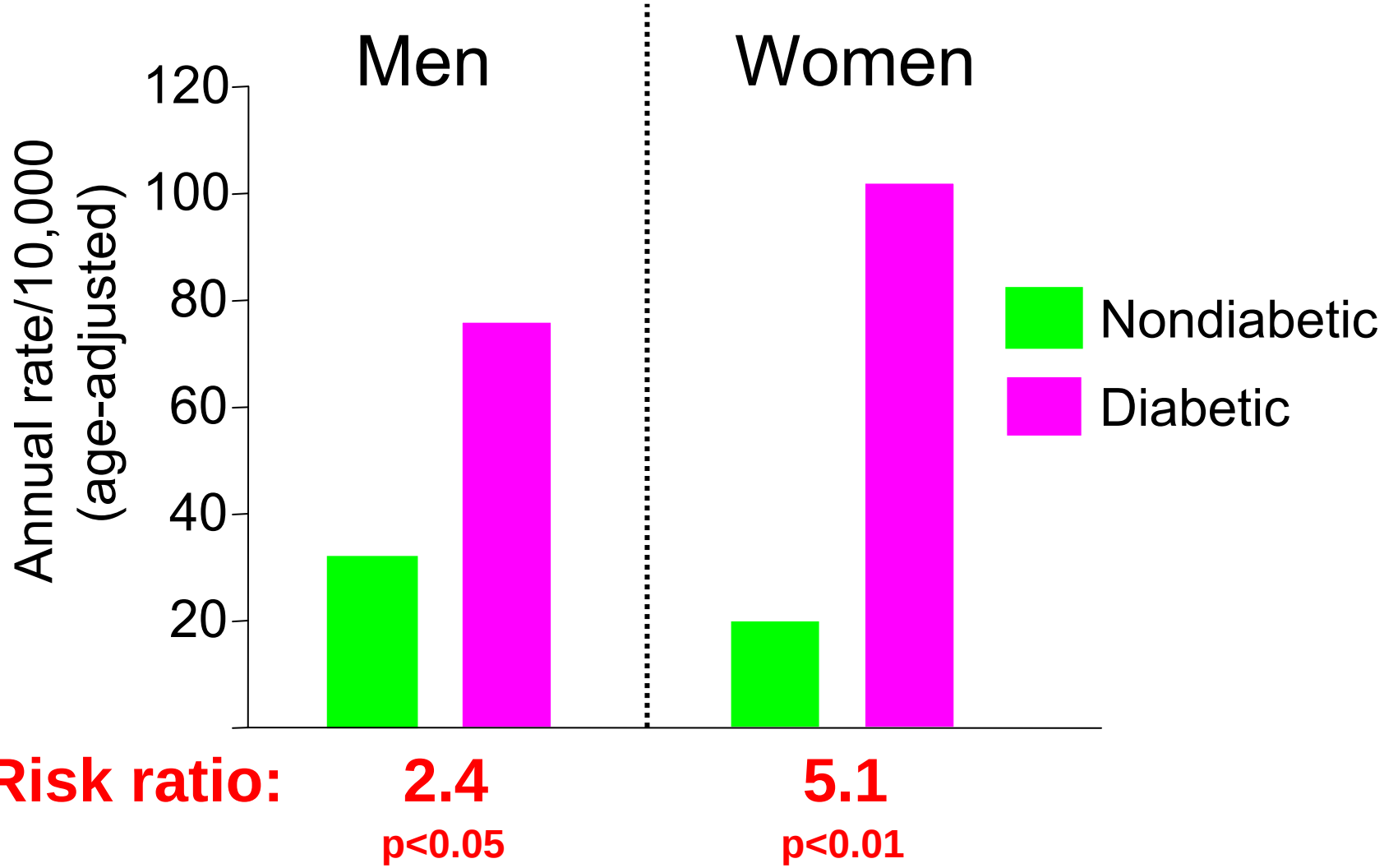
Millions of people with diabetes for 2000 and 2010 (top and middle values, respectively), and the percentage increase



Zimmet P et al. Nature 2001

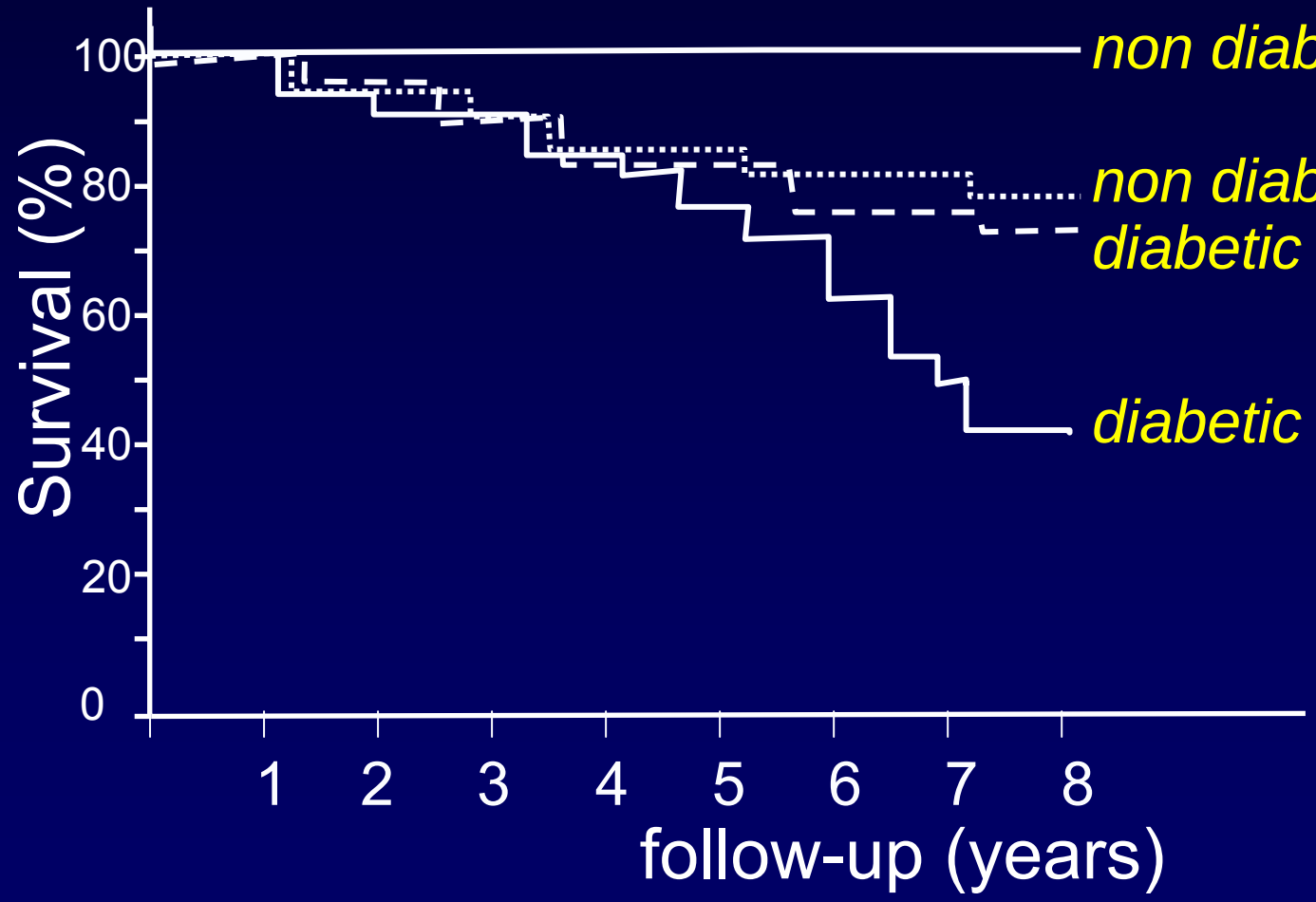
Risk of CHD in patients with NIDDM

(subjects aged 45-74 yr, Framingham study, 18-yr. follow-up)



Kannel et al., Am Heart J 1985

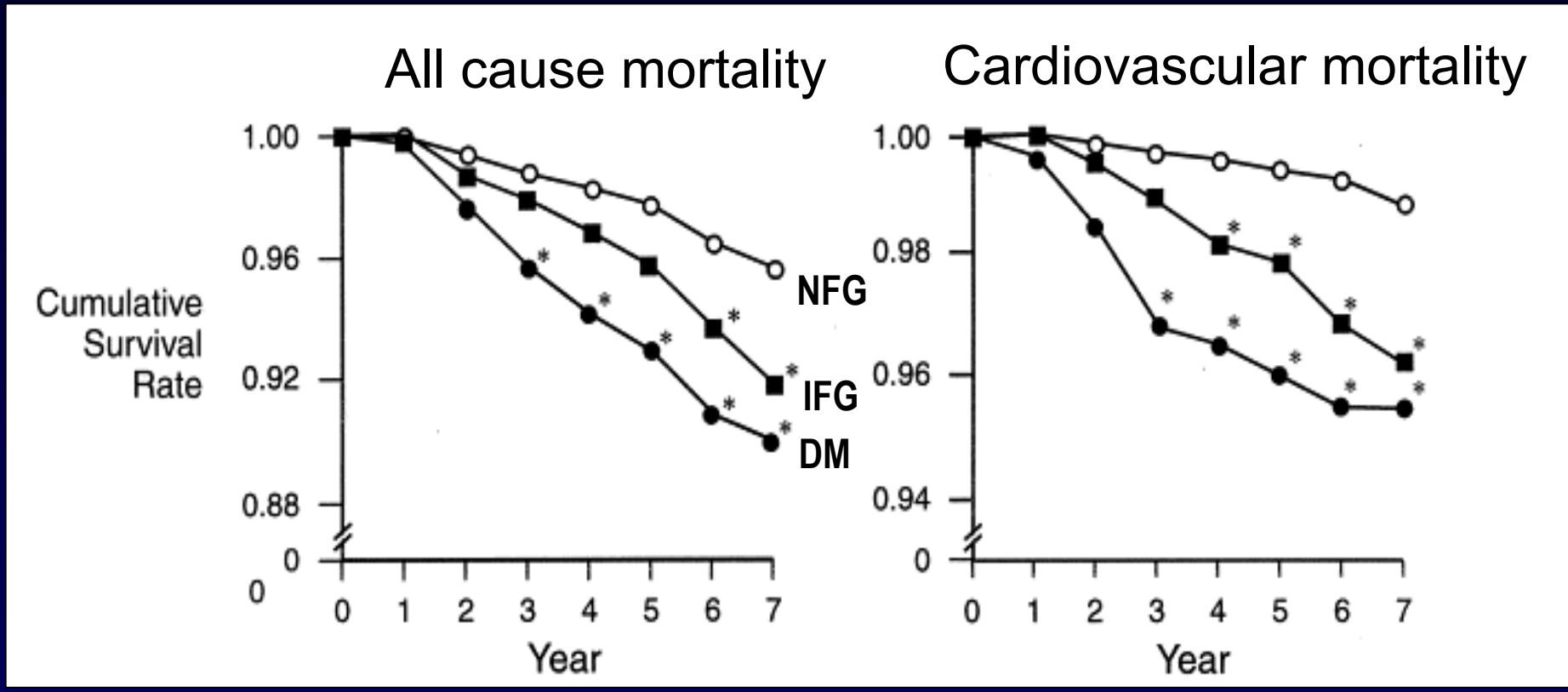
Probability of death from Coronary Heart Disease in 1059 subjects with type 2 diabetes and 1378 non diabetic subjects with and without previous IMA



Clin.Med.Card.FI

Haffner et al NEJM 1998

Survival rates in the Funagata study



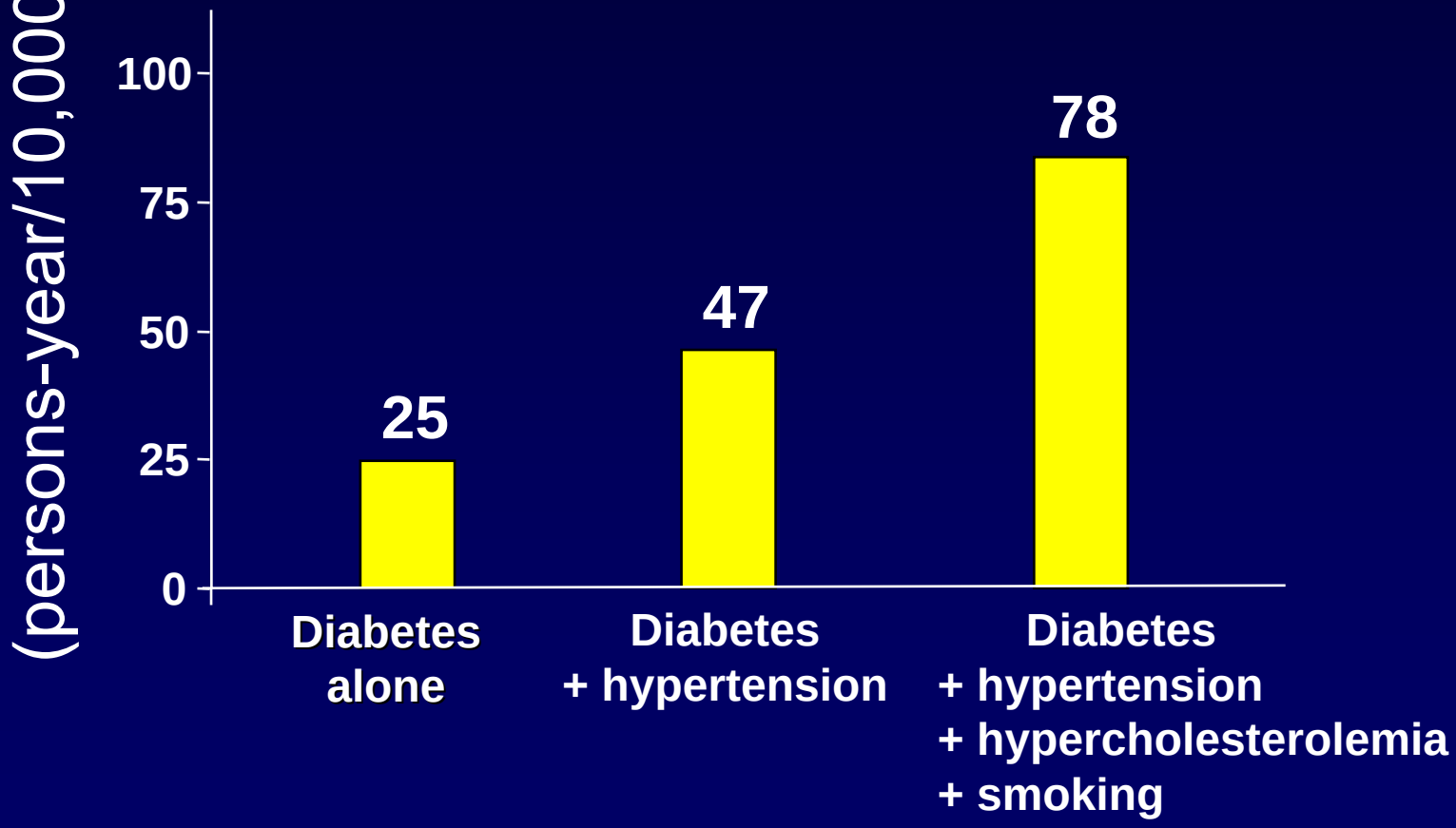
ADA 1997 recommendations:

- Normal fasting glucose (NFG)	<110 mg/dL
- Impaired fasting glucose (IFG)	>110 mg/dL and <126 mg/dL
- Diabetes (DM)	> 126 mg/dL

Tominaga M. et al. *Diabetes Care* 1999

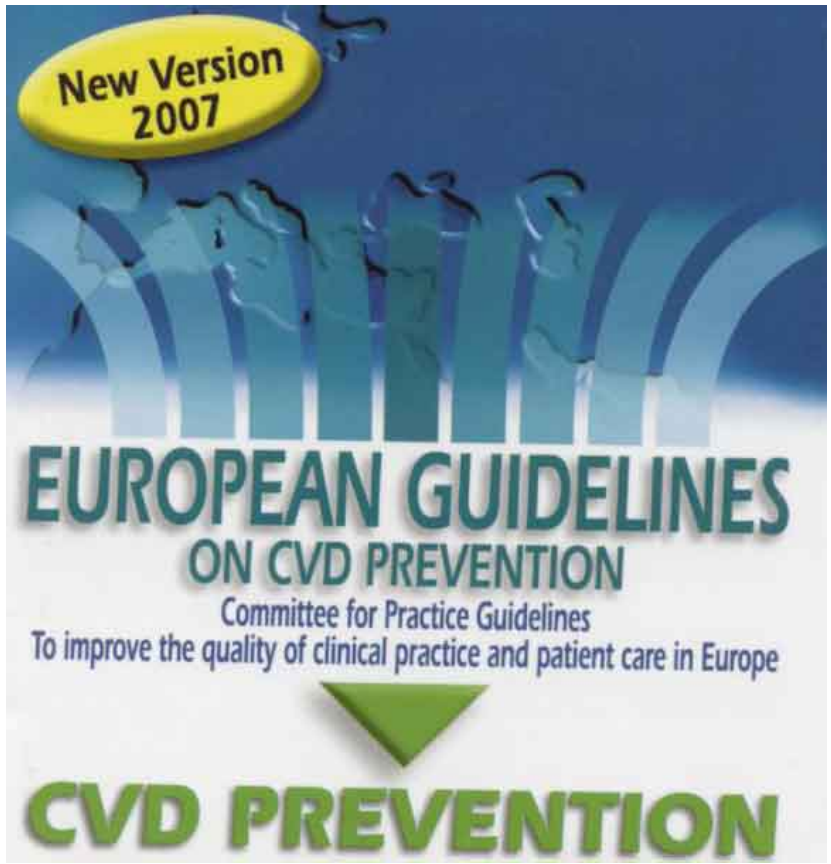
Effects of additional risk factors on the absolute excess risk of CHD death

(Multiple Risk Factor Intervention Trial)



Stamler et al. Diabetes Care 1993

Cardiovascular prevention… updated guidelines



Fourth Joint Task Force Guidelines on cardiovascular disease prevention in clinical practice

European guidelines on cardiovascular disease prevention in clinical practice: executive summary

Fourth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (Constituted by representatives of nine societies and by invited experts)

Objective:

Prevention of disability and early death from cardiovascular diseases through lifestyle changes, management of cardiovascular risk factors and, where needed, the prophylactic use of certain drugs

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Why develop a preventive strategy in clinical practice

1. Cardiovascular disease (CVD) is the major cause of premature death in Europe. It is an important cause of disability and contributes substantially to the escalating costa of healthcare
2. The underlying atherosclerosis develops insidiously over many years and is usually advanced by the time that symptoms occur
3. Death from CVD often occurs suddenly and before medical care is available, so that many therapeutic interventions are either inapplicable or palliative
4. **The mass occurrence of CVD relates strongly to lifestyles and to modifiable physiological and biochemical factors**
5. **Risk factor modifications have been shown to reduce CVD mortality and morbidity, particularly in high risk patients**

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

What's new in the Fourth Joint Task Force Guidelines on the Prevention of CVD

1. **Increased input from general practice** and cardiovascular nursing
2. **Increased emphasis on exercise, weight, and lifestyle**
3. More detailed discussion on the limitations of present systems of grading evidence
4. **Re-defined priorities and objectives**
5. Revised approach to risk in the young
6. **Total events considered as well as mortality**
7. More information from score on total events, diabetes, HDL cholesterol, and body mass index (BMI)
8. New sections on gender, heart rate, BMI/waist circumference, other manifestation of CVD, and renal impairment

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

What are priorities for CVD preventions in clinical practice

1. **Patients with established atherosclerotic CVD**
2. **Asymptomatic individuals who are at increased risk of CVD** because of:

- Multiple risk factors resulting in raised total CVD risk (≥ 5 % 10 years risk of CVD death).
- Diabetes-type 2 and type 1 with microalbuminuria;
- Markedly increased single risk factors especially if associated with end organ clamage

3 Close relatives of subjects with premature atherosclerotic CVD or of those at particularly high risk

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Objectives of CVD prevention

1. **To assist those at low risk of CVD to maintain this state lifelong**, and to help those at increased total CVD risk to reduce it
2. To achieve the characteristics of people who tend to stay health:
   - **No smoking**
   - **Healthy food choices**
   - **Physical activity: 30 minutes of moderate activity a day**
   - **BMI < 25 kg/m^2**
   - **Blood pressure < 140/90 mmHg**
   - **Total cholesterol < 190 mg/dL**
   - **LDL cholesterol < 115 mg/dL**
   - **Blood glucose < 100 mg/dL**

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Characteristics of CVD prevention

0 3 5 140 5 3 0	
0	No tobacco
3	Walk 3 km daily, or 30 minutes any moderate activity
5	Portions of fruit and vegetables a day
140	Blood pressure less than 140 systolic
5	Total blood cholesterol < 5 mmol/L (190 mg/dL)
3	LDL cholesterol < 3 mmol/L (115 mg/dL)
0	Avoidance of overweight and diabetes

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

When total CVD risk need to be assessed?

1. If the patient ask for it
2. If during a consultation:
   - The person is a middle-aged smoker
   - One or more risk factor such as a raised blood cholesterol is known
   - There is a family history of premature CVD or of major risk factors
   - Symptoms suggestive of CVD

What to do for assessing the risk?

1. Medical history
2. Physical examination (BP, HR, BMI, heart and lung auscultation)
3. Lab tests (urine, lipid profile, blood glucose, creatinine)
4. ECG and exercise ECG if angina suspected

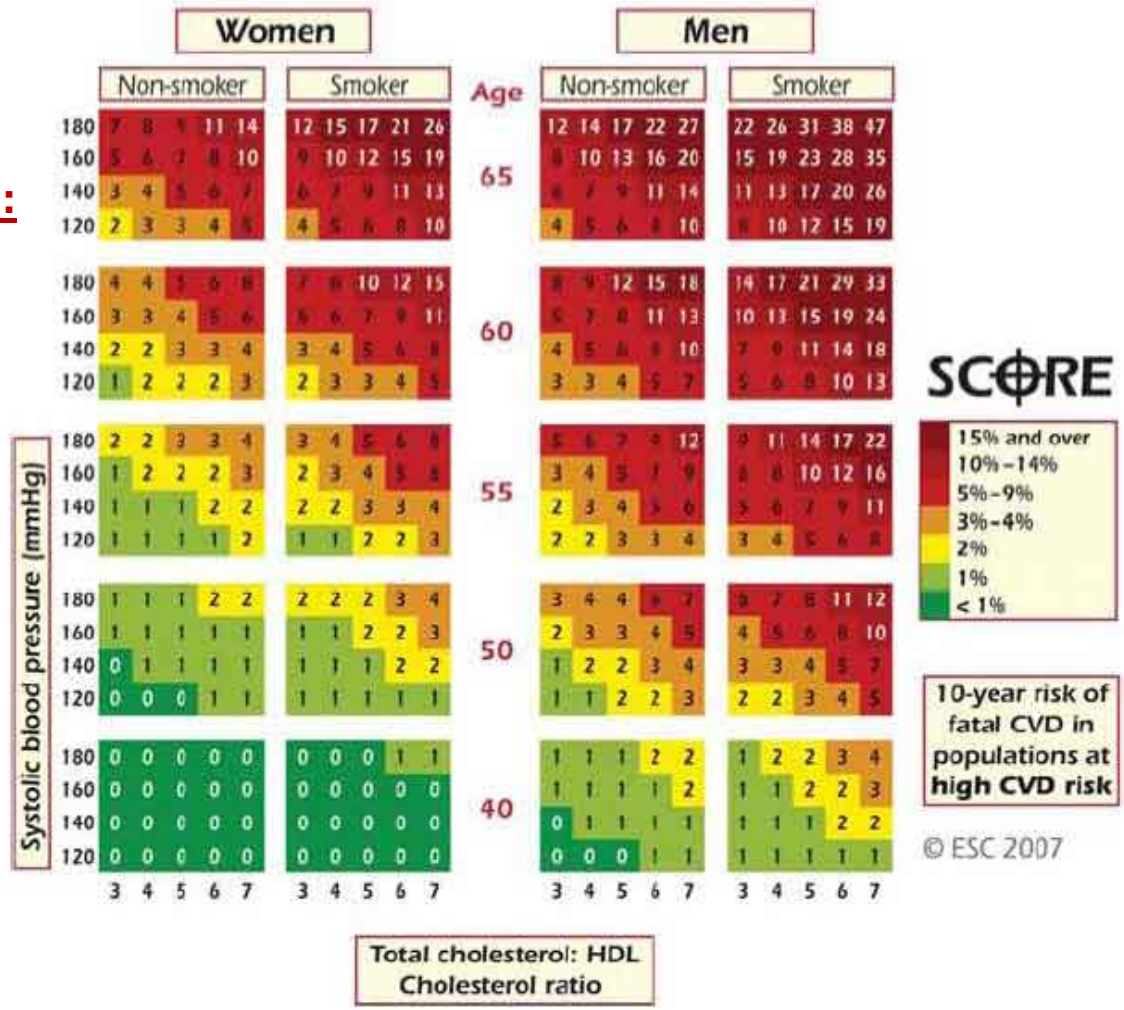
European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Fourth Joint Task Force Guidelines on cardiovascular disease prevention in clinical practice

SCORE system

Advantages in using the SCORE chart:

- Intuitive, easy to use tool
- Takes account of the multifactorial nature of CVD
- Estimates risk of all CVD
- Allows flexibility in management
- Allows a more objective assessment of risk over the risk
- **Establishes a common language of risk for clinicians**



European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Managing total CVD risk

SMOKING

The five A's

A- **ASK**: Systematically identify all smokers at every opportunity

A- **ASSESS**: Determine the person's degree of addiction and his/her readiness to cease smoking

A- **ADVISE**: Unequivocally urge all smokers to quit

A- **ASSIST**: Agree on a smoking cessation strategy including behavioural counselling, nicotine replacement therapy and/or pharmacological intervention

A- **ARRANGE** a schedule of follow-up data

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Managing total CVD risk

HEALTHY FOOD CHOICES

1. **A wide variety of foods should be eaten**
2. Energy intake should be adjusted to avoid overweight
3. Encourage: **fruits**, **vegetables**, **wholegrain cereals and bread**, **fish** (especially oily), **lean meat**, **low fat diary products**
4. **Replace saturated fats** with the above foods and **with monounsaturated and polyunsturated fats** from vegetable and marine sources to reduce total fat to <30% of energy, of which less than 1/3 is saturated
5. **Reduce salt intake** by avoiding table salt and salt in cooking, and by choosing unsalted foods

European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Managing total CVD risk

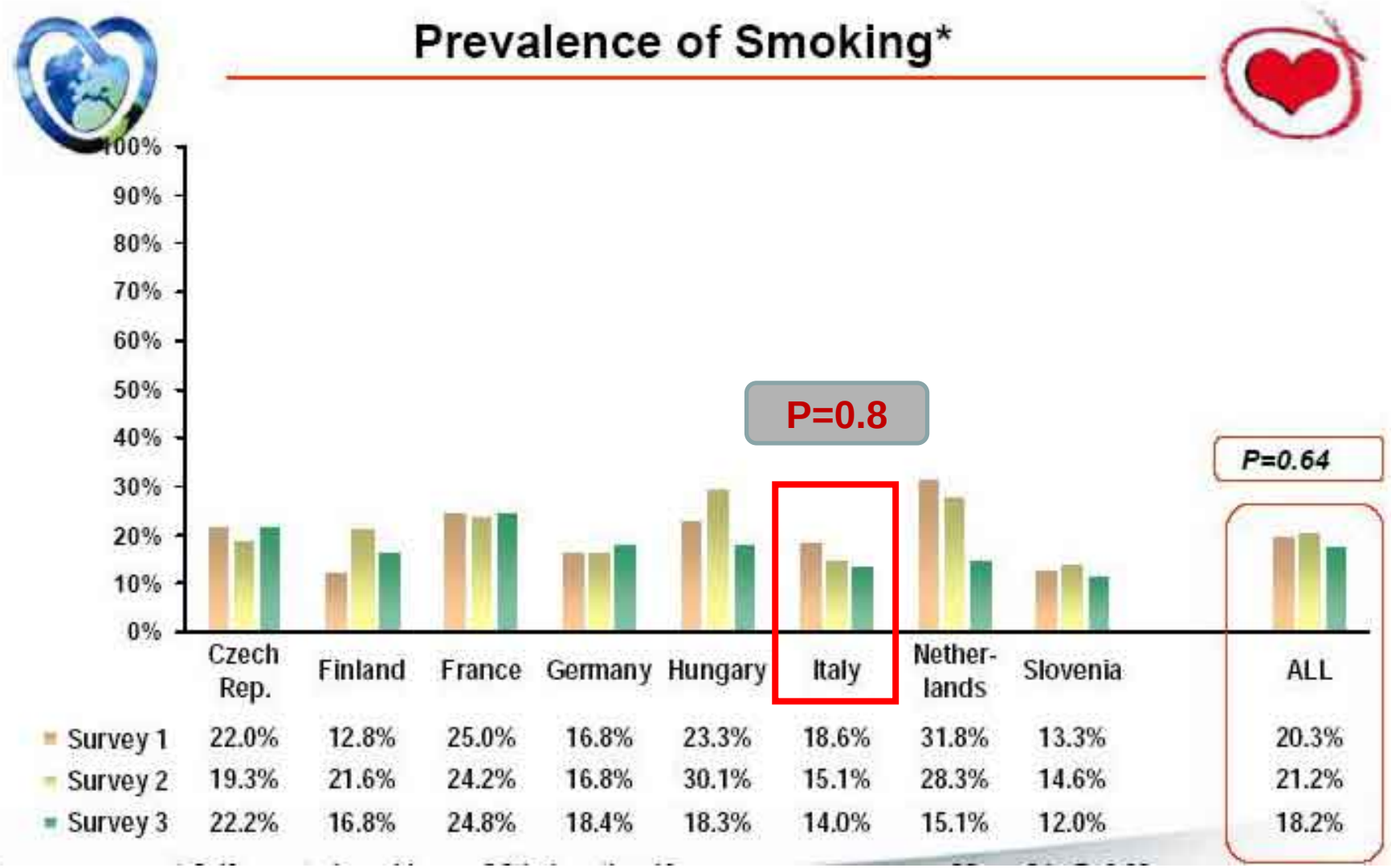
PHYSICAL ACTIVITY

1. **Stress that the positive health benefits occur with almost any increase in activity**; small amounts of exercise have an additive effect; **exercise opportunities exist also in the workplace** (e.g. stairs instead of lift)
2. **Try to find leisure activities that are positively enjoyable**
3. 30 minutes of moderately vigorous exercise on most days of the week will reduce risk and increase fitness
4. **Exercising with family or friends tends to improve motivation**
5. Added benefits include a sense of well-being, weight reduction and better self-esteem

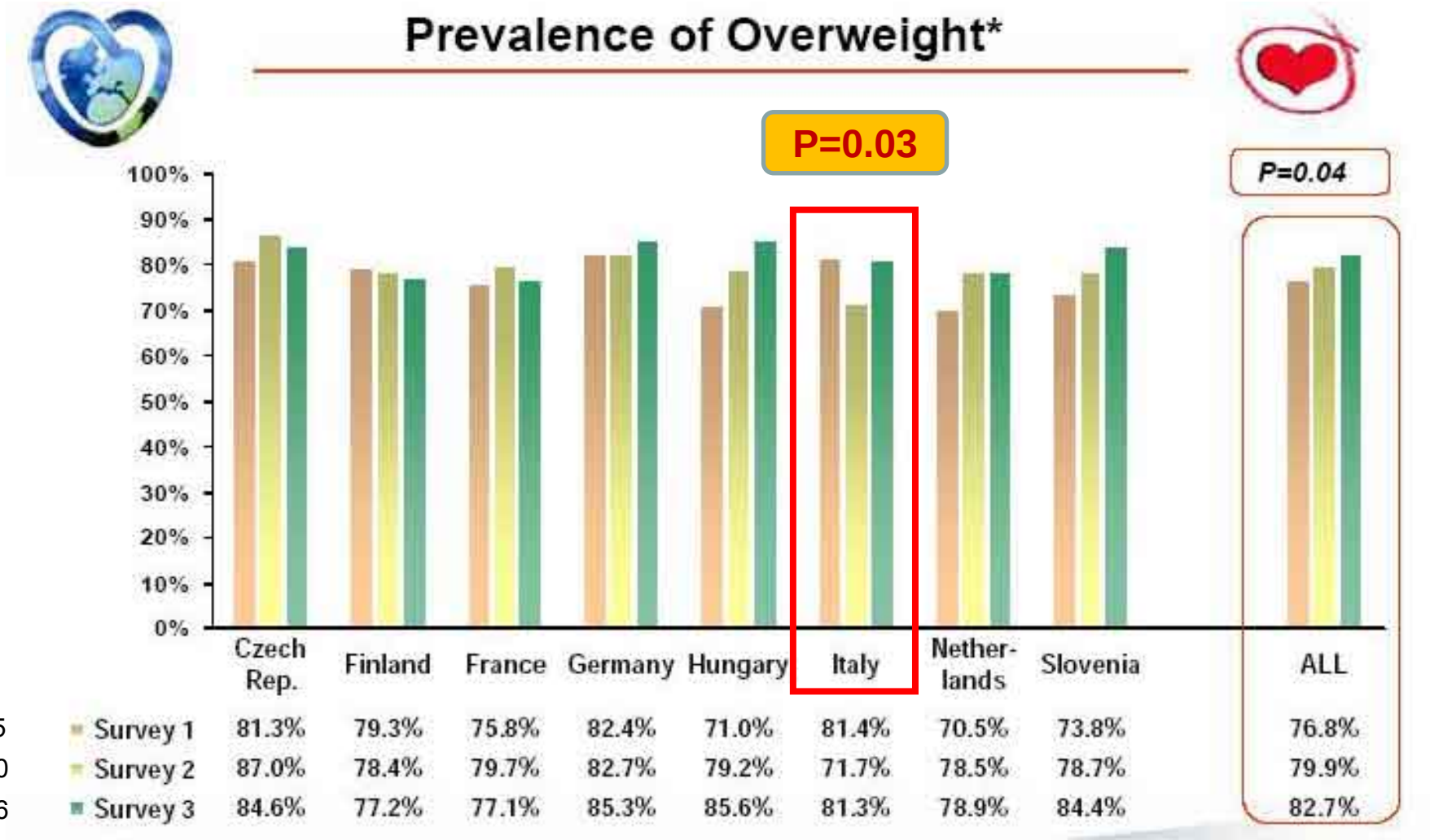
European guidelines on CVD prevention in clinical practice. Eur J Cardiovasc Prev Rehabil 2007

Cardiovascular prevention… where are we now?

Euroaspire III



Euroaspire III



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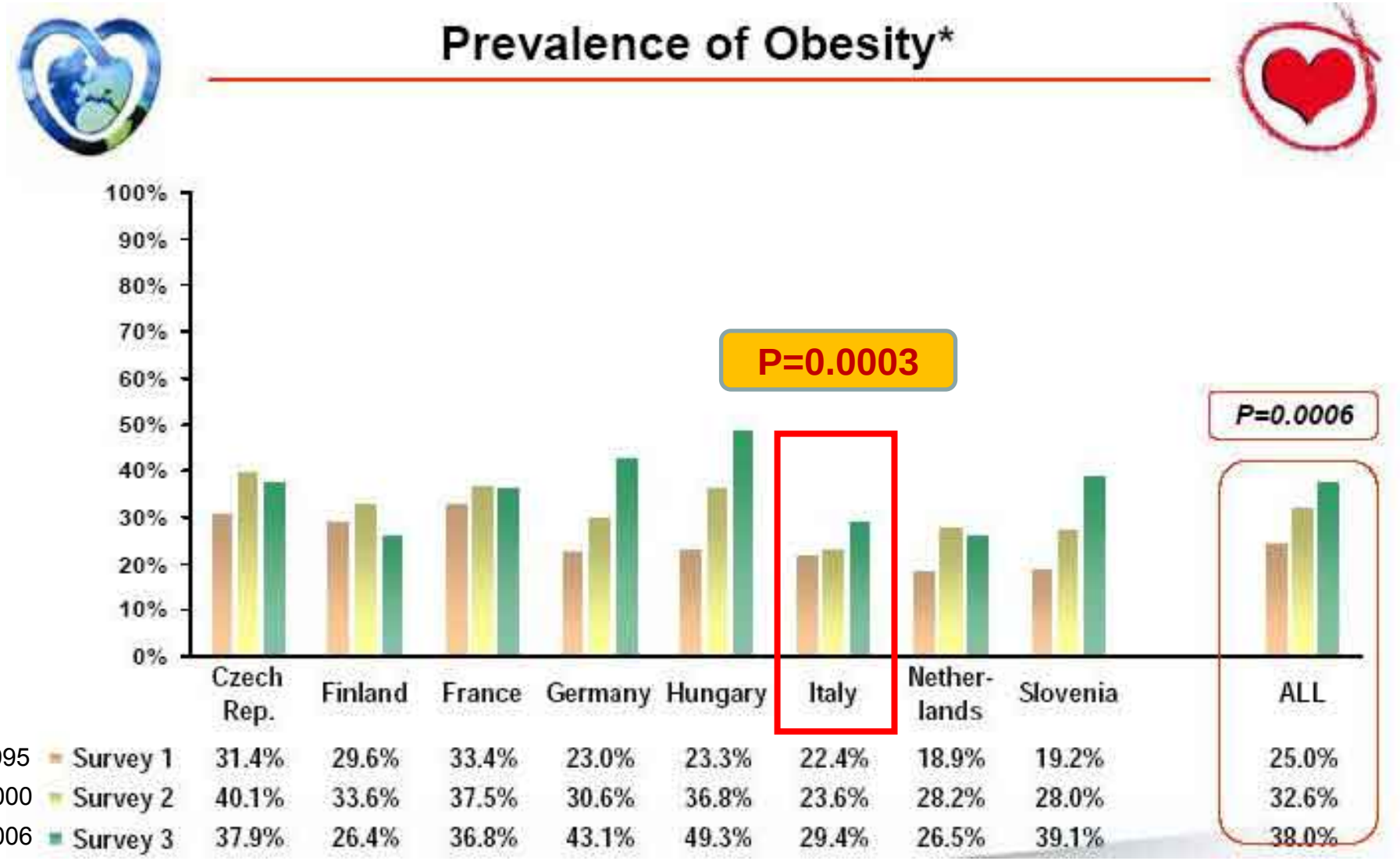

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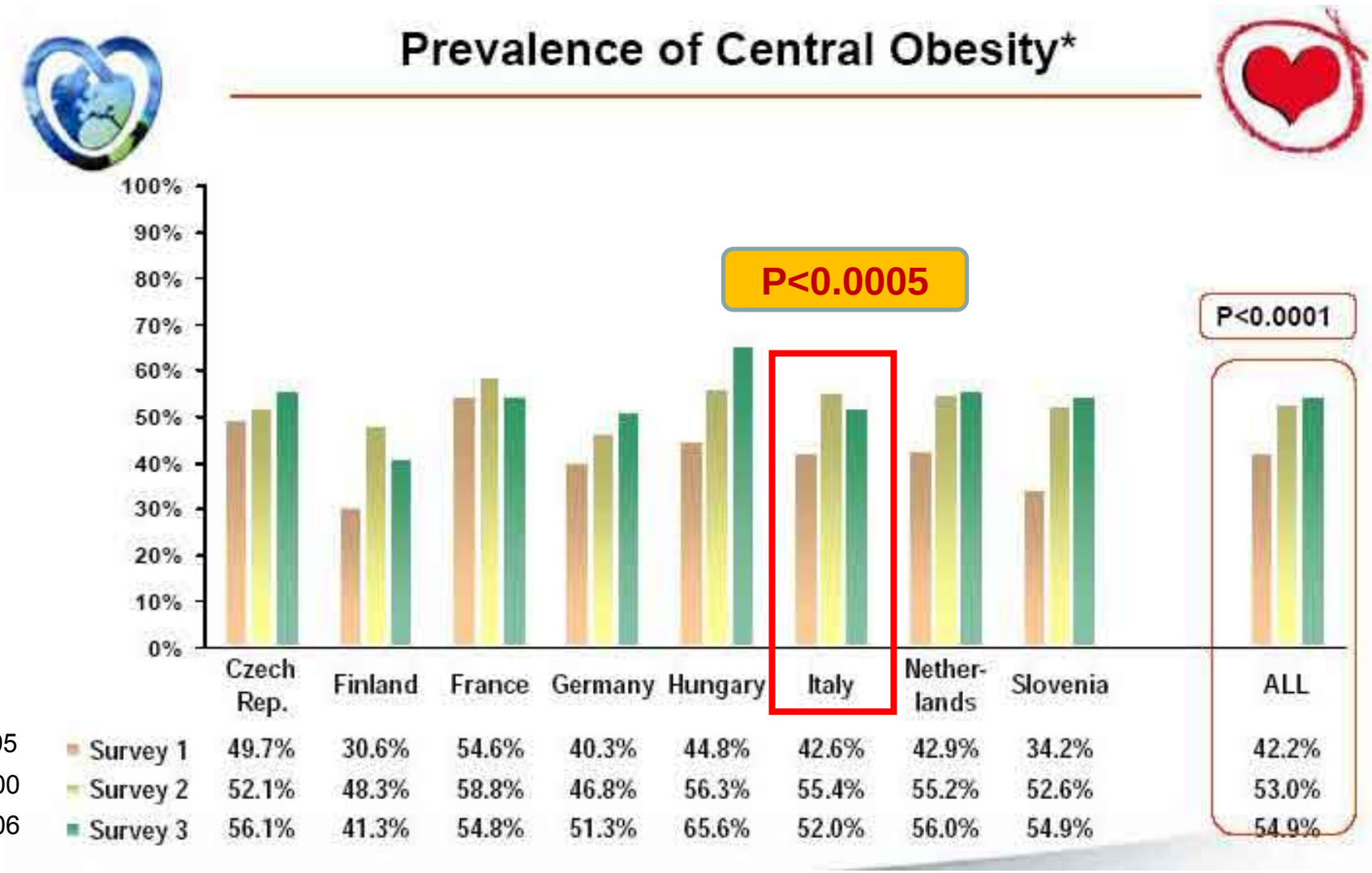

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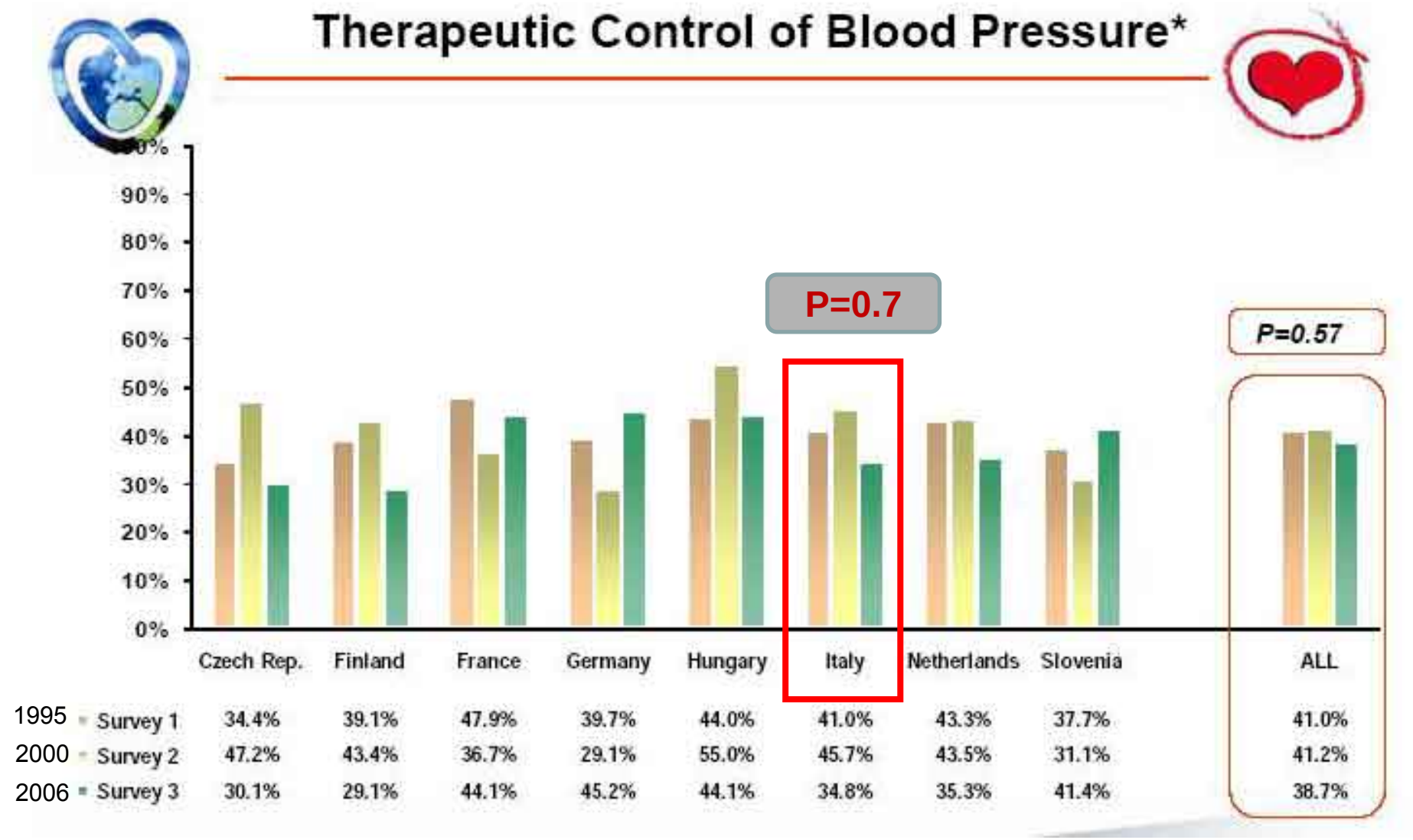

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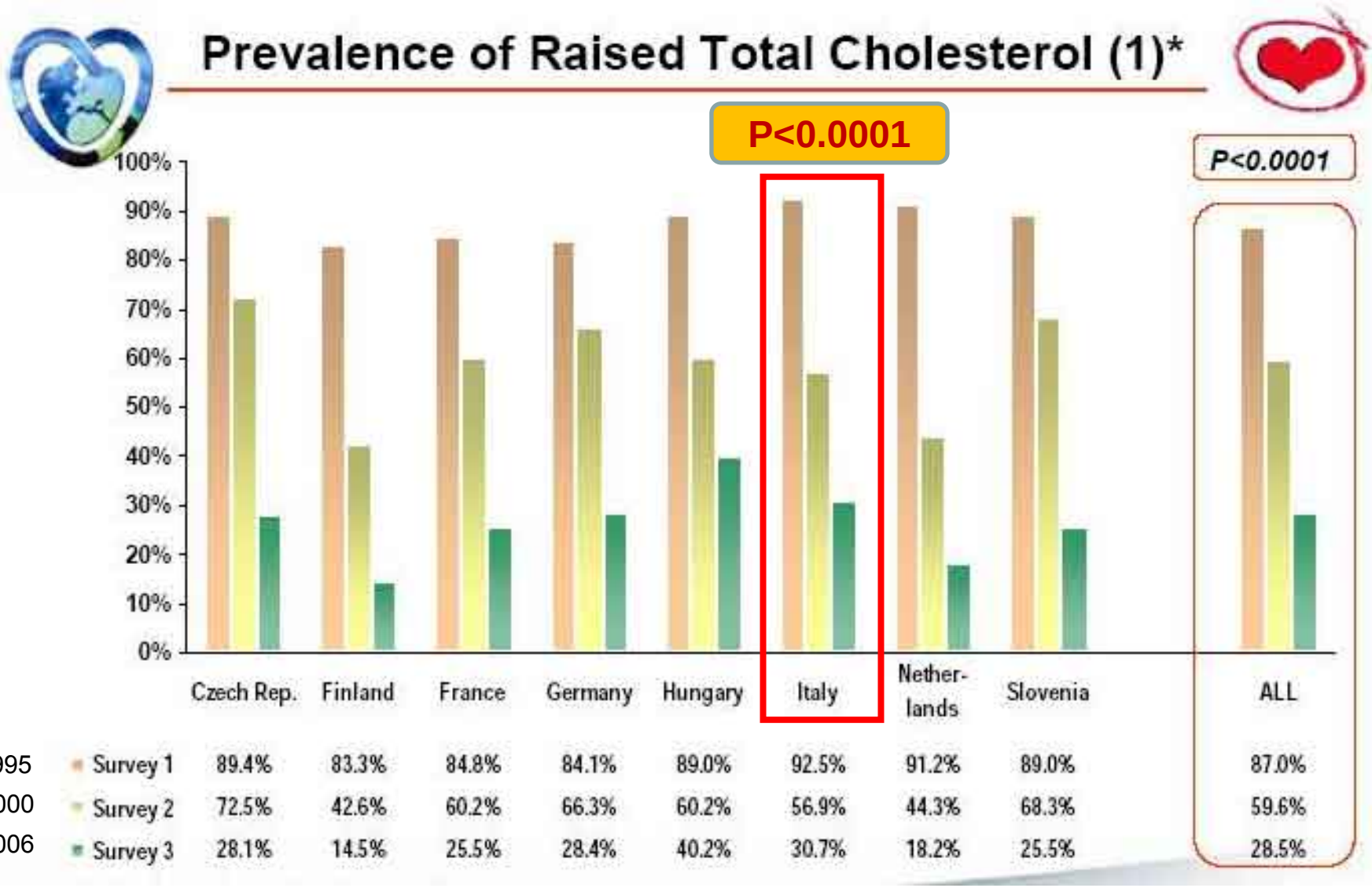

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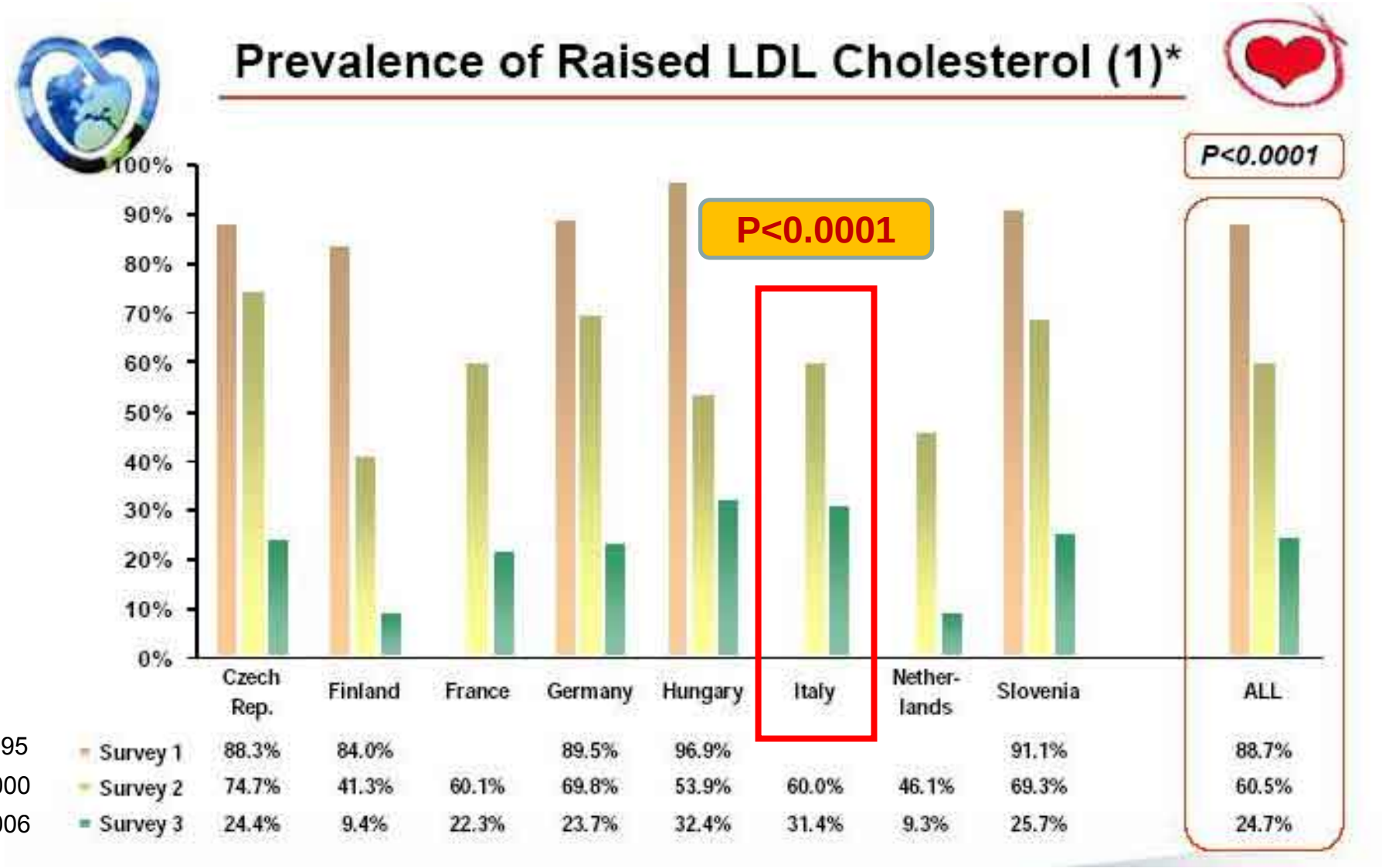
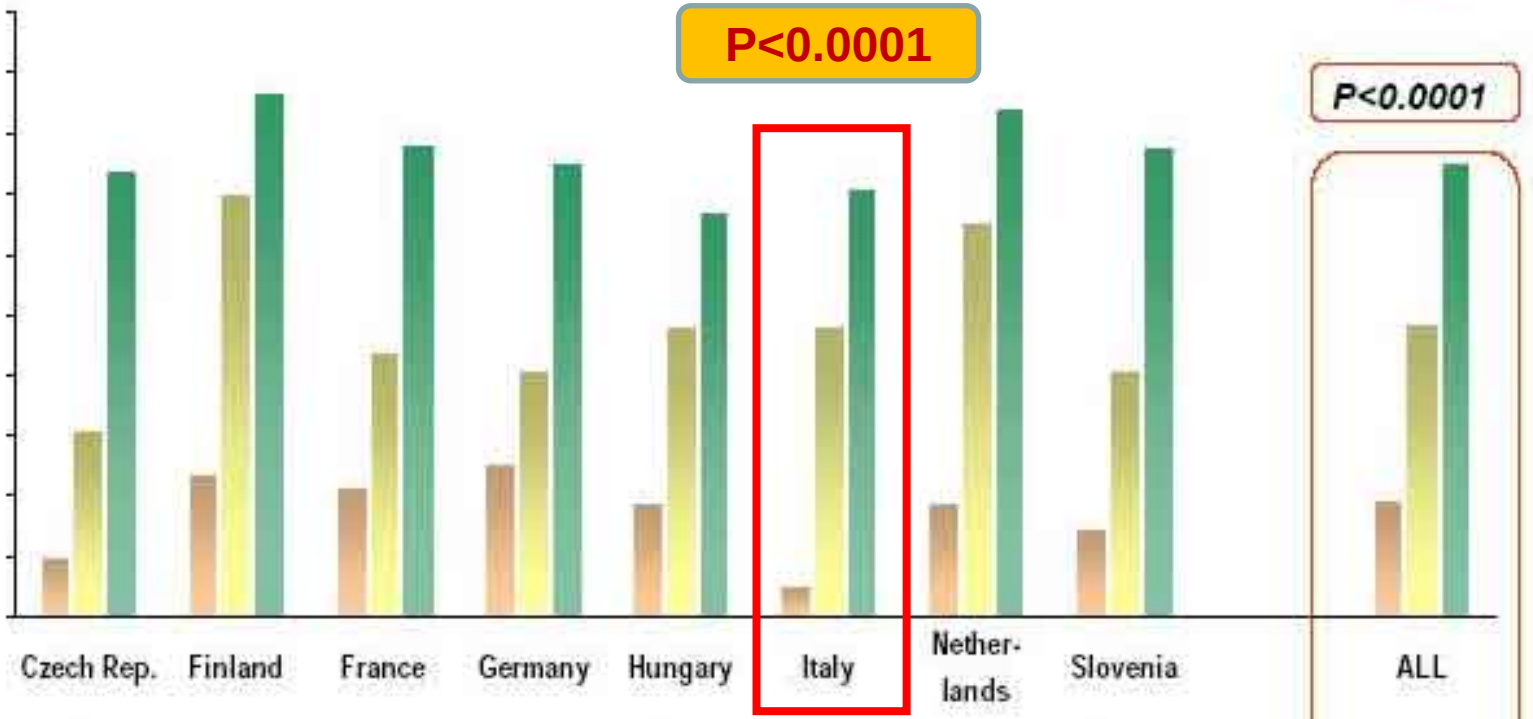


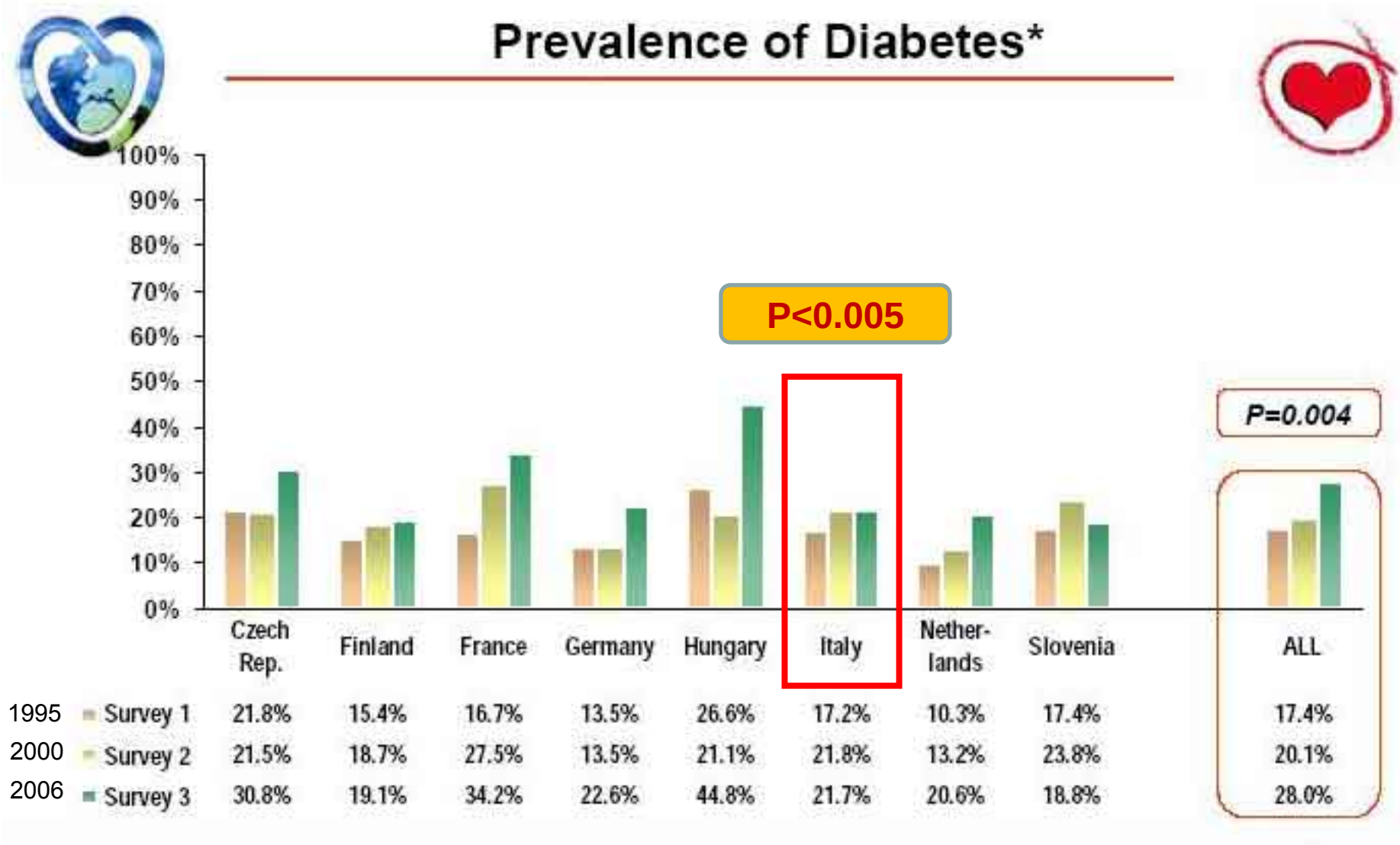
Euroaspire III

Therapeutic Control of Total Cholesterol (1)*



		Czech Rep.	Finland	France	Germany	Hungary	Italy	Nether-lands	Slovenia	ALL
1995	Survey 1	10.3%	24.2%	21.6%	25.9%	19.0%	5.4%	19.0%	14.6%	19.5%
2000	Survey 2	31.2%	70.1%	44.0%	41.1%	48.4%	48.5%	65.7%	41.0%	48.8%
2006	Survey 3	74.3%	86.8%	78.1%	75.2%	67.1%	71.3%	84.4%	77.9%	75.3%

Euroaspire III



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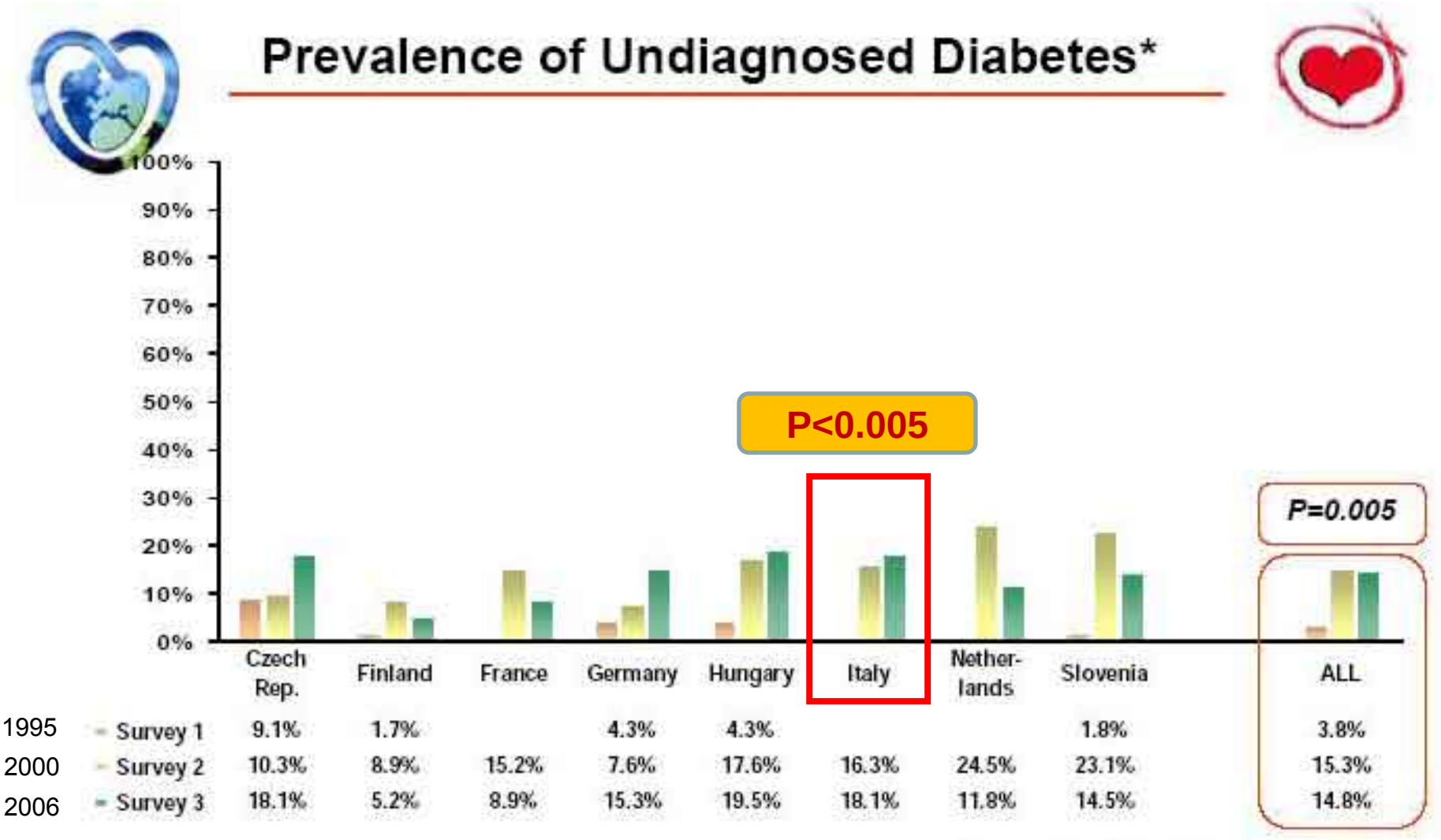

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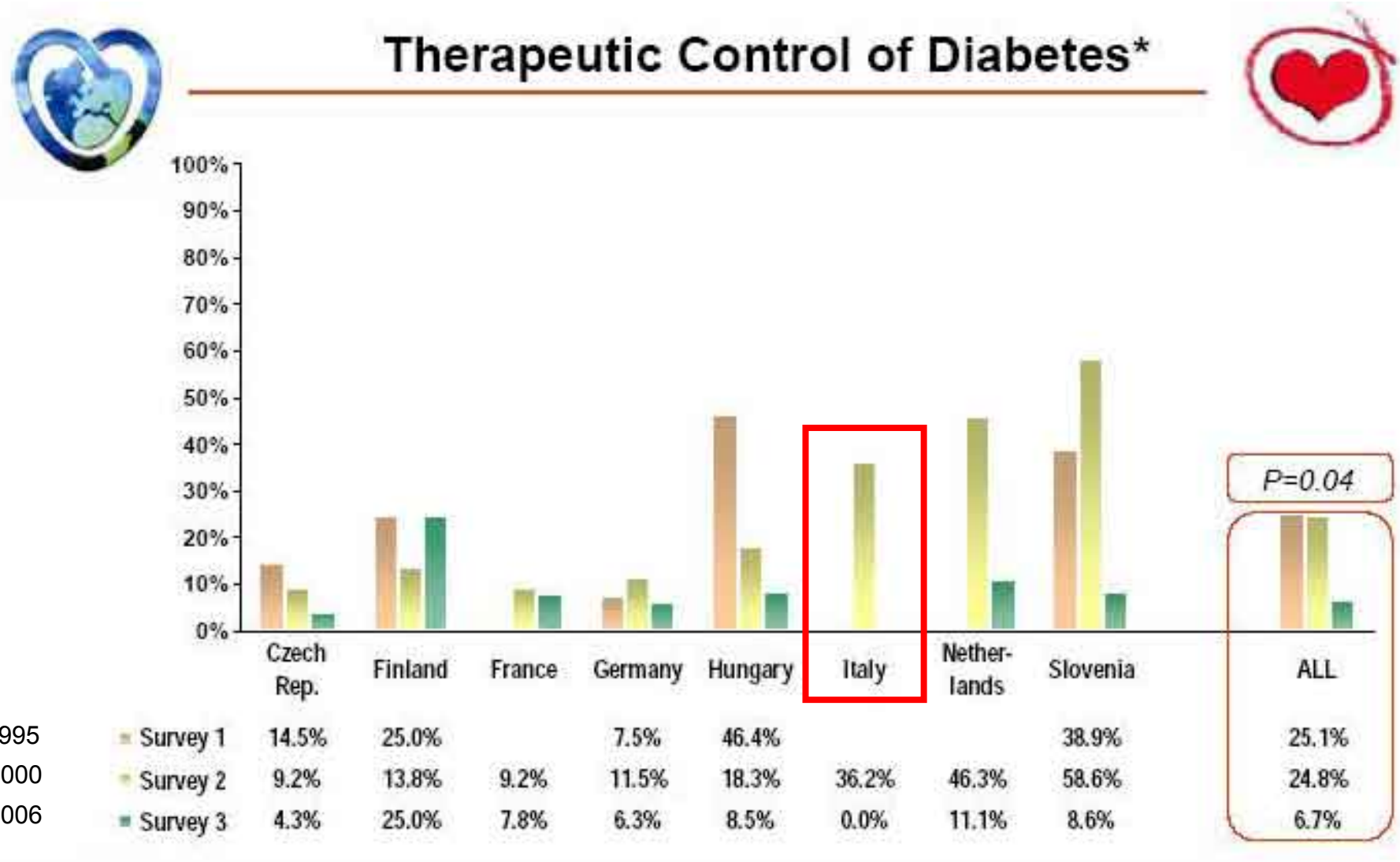

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

SHATTUCK LECTURE

We Can Do Better — Improving the Health of the American People

Steven A. Schroeder, M.D.

Table 1. Health Status of the United States and Rank among the 29 Other OECD Member Countries.

Health-Status Measure	United States	U.S. Rank in OECD	Top-Ranked Country in OECD*
Infant mortality (first year of life), 2001			
All races	6.8 deaths/ 1000 live births	25	Iceland (2.7 deaths/ 1000 live births)
Whites only	5.7 deaths/ 1000 live births	22	
Maternal mortality, 2001†			
All races	9.9 deaths/ 100,000 births	22	Switzerland (1.4 deaths/ 100,000 births)
Whites only	7.2 deaths/ 100,000 births	19	
Life expectancy from birth, 2003			
All women	80.1 yr	23	Japan (85.3 yr)
White women	80.5 yr	22	
All men	74.8 yr	22	Iceland (79.7 yr)
White men	75.3 yr	19	
Life expectancy from age 65, 2003‡			
All women	19.8 yr	10	Japan (23.0 yr)
White women	19.8 yr	10	
All men	16.8 yr	9	Iceland (18.1 yr)
White men	16.9 yr	9	

* The number in parentheses is the value for the indicated health-status measure.
† OECD data for five countries are missing.
‡ OECD data for six countries are missing.

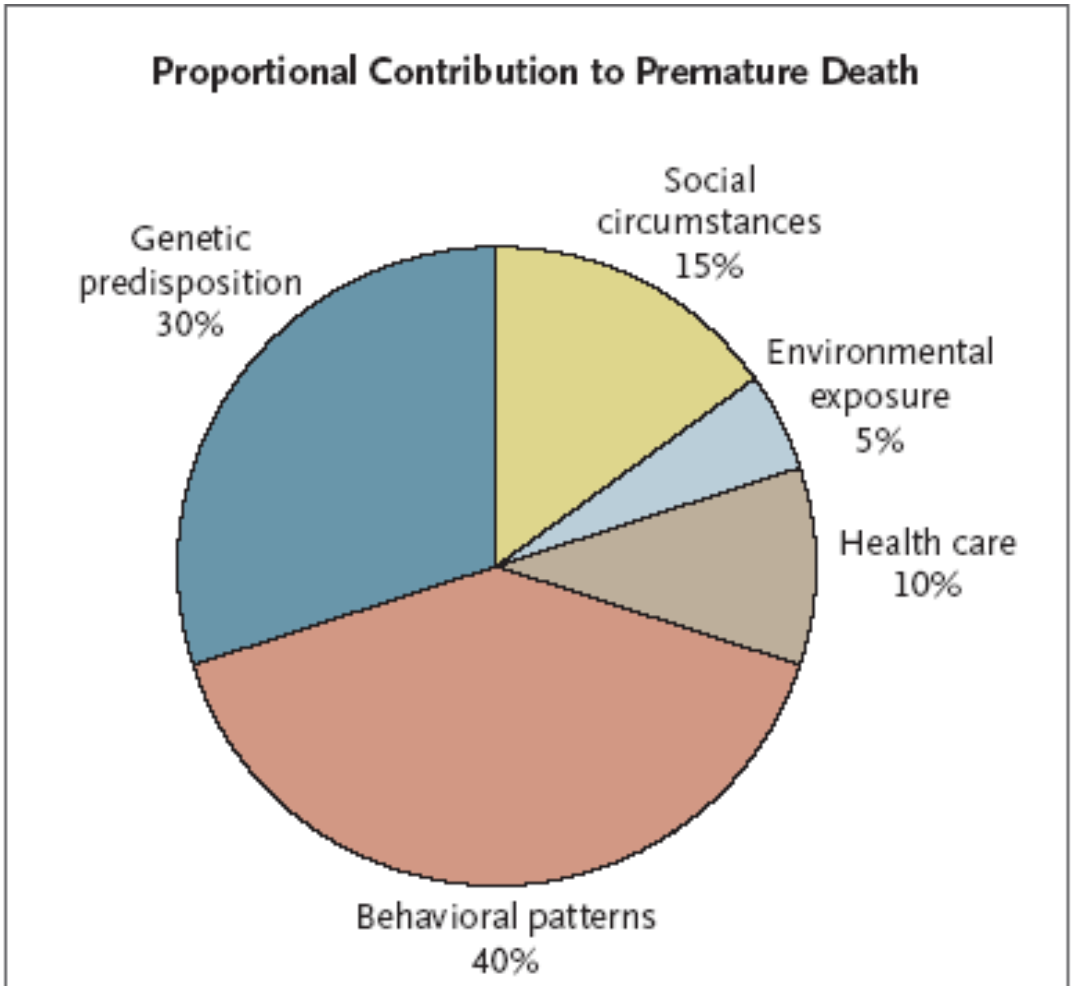

Figure 1. Determinants of Health and Their Contribution to Premature Death.

Adapted from McGinnis et al.[10]

SPECIAL ARTICLE

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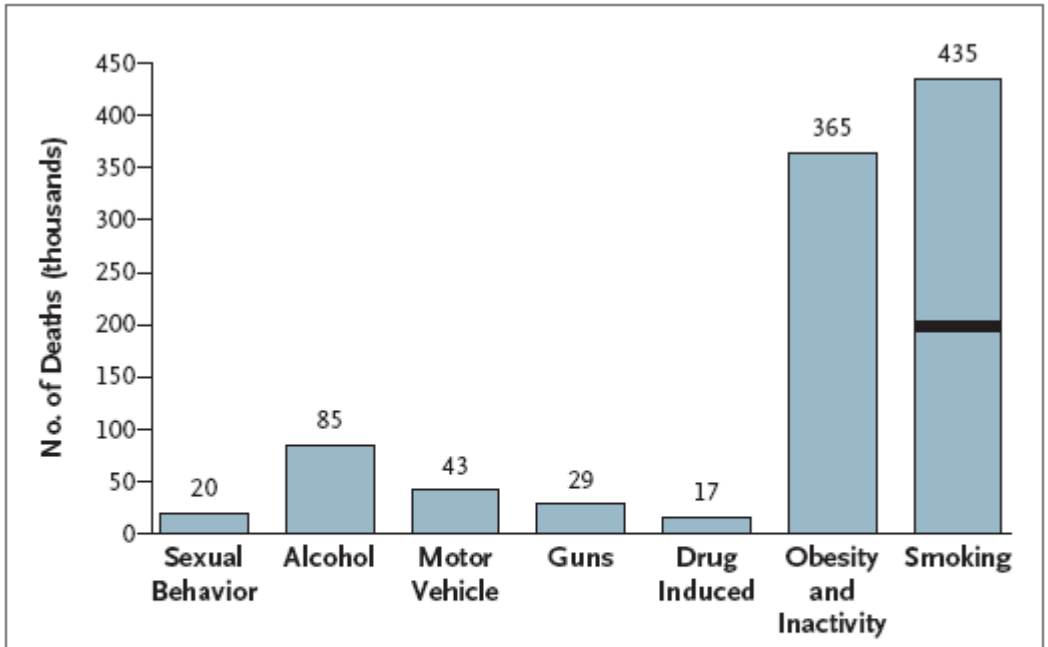

Figure 2. Numbers of U.S. Deaths from Behavioral Causes, 2000.
Among the deaths from smoking, the horizontal bar indicates the approximately 200,000 people who had mental illness or a problem with substance abuse. Adapted from Mokdad et al.[12]

Table 2. Similarities and Differences between Tobacco Use and Obesity.

Characteristic	Tobacco	Obesity
High prevalence	Yes	Yes
Begins in youth	Yes	Yes
20th-century phenomenon	Yes	Yes
Major health implications	Yes	Yes
Heavy and influential industry promotion	Yes	Yes
Inverse relationship to socioeconomic class	Yes	Yes
Major regional variations	Yes	Yes
Stigma	Yes	Yes
Difficult to treat	Yes	Yes
Clinician antipathy	Yes	Yes
Relative and debatable definition	No	Yes
Cessation not an option	No	Yes
Chemical addictive component	Yes	No
Harmful at low doses	Yes	No
Harmful to others	Yes	No
Extensively documented industry duplicity	Yes	No
History of successful litigation	Yes	No
Large cash settlements by industry	Yes	No
Strong evidence base for treatment	Yes	No
Economic incentives available	Yes	Yes
Economic incentives in place	Yes	No
Successful counter-marketing campaigns	Yes	No

The largest potential for further improvement in population health lies in behavioral risk factors, especially smoking and obesity. We already have tools at hand to make progress in tobacco control, and some of these tools are applicable to obesity.

Americans take great pride in asserting that we are number one in terms of wealth, number of Nobel Prizes, and military strength. Why don't we try to become number one in health?