

20ο Πανελλήνιο Συνέδριο Νοσημάτων Θώρακος  
Στρογγυλό Τραπέζι: "Παθητικό κάπνισμα, τρομοκράτης της δημόσιας υγείας"

# Παθητικό Κάπνισμα και Καρδιαγγειακά Νοσήματα

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**Κωνσταντίνος Θ. Κωστίκας, MD, PhD, FCCP**  
Πνευμονολόγος, Διδάκτωρ Πανεπιστημίου Αθηνών

Επιστ. Συνεργάτης Β' Πνευμονολογικής Κλινικής Παν. Αθηνών  
Επιστ. Συνεργάτης Εργ. Υγιεινής και Επιδημιολογίας Παν. Θεσσαλίας

e-mail: [ktk@otenet.gr](mailto:ktk@otenet.gr)

# Γιατί είμαστε εδώ;

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**Στα 90 λεπτά που θα διαρκέσει αυτό το τραπέζι, περίπου  
1000 άνθρωποι θα πεθάνουν κάπου στον κόσμο από  
παθήσεις που σχετίζονται με το κάπνισμα\***

**130 από αυτούς δεν κάπνισαν ποτέ...#**

Τροποποιημένο από Flouris A et al., Am J Respir Crit Care Med 2009; 179: 1029-1033

\* Approximation based on 5 million per annum tobacco-induced global mortality

# Approximation based on 79 thousand per annum SHS-induced deaths in Europe

# Παθητικό Κάπνισμα και Καρδιαγγειακά Νοσήματα

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- **Πιθανοί μηχανισμοί**
- **Πειραματικά δεδομένα**
- **Μετά τη διακοπή της έκθεσης**
- **Γιατί συζητάμε ακόμα;**

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# Before the 2000s

## REVIEW ARTICLES

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### Passive Smoking as a Cause of Heart

A. JUDSON WELLS, PhD

*Kennett Square, Pennsylvania*

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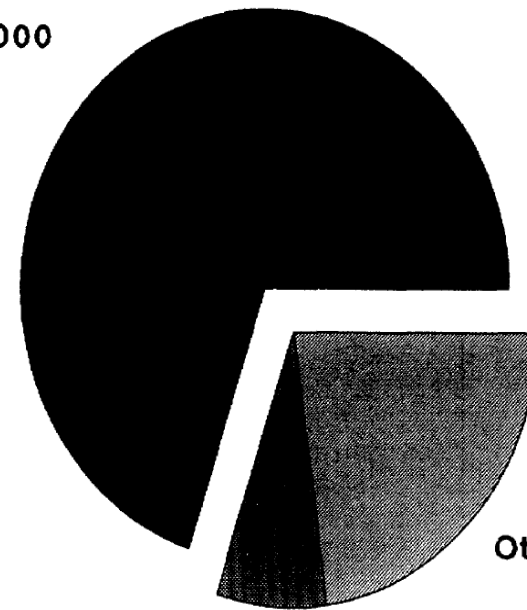
The effects of passive smoking on ischemic heart disease are reviewed. Short-term exposures of 20 min to 8 h result in increased platelet sensitivity and decreased ability of the heart to receive and process oxygen. Longer term exposure results in plaque buildup and adverse effects on blood cholesterol. The available epidemiology is reviewed, and it is concluded that passive smoking increases the coronary death rate among U.S. never smokers by 20% to 70%. The newest Environmental

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## Deaths from Passive Smoking

Total Deaths: 53,000

Heart Disease  
37000



Lung Cancer  
3700

Other Cancer  
12000

# Before the 2000s

REGULATORY TOXICOLOGY AND PHARMACOLOGY 21, 281–295 (1995)

## Environmental Tobacco Smoke Absence of

GIO B

*The Health Policy Center, 6704 Ba*

Received S

Concerns about possible cardiovascular and especially coronary effects of environmental tobacco smoke (ETS) derive from the reported effects of active smoking. Despite similarities, however, ETS has composition and physical characteristics different from the mainstream smoke (MS) that active smokers inhale and appears relatively more chemically inert and less biologically active. ETS doses to nonsmokers are small and often below the sensitivity of detection technologies. They are several orders of magnitude less than MS doses in active smokers. Numerous epidemiologic studies report that the active smoking of less than 10 cigarettes/day is not associated with measurable risk of coronary heart disease (CHD). Thus, even assuming that ETS and MS have equivalent biologic activities, conceivable ETS doses to nonsmokers are far below apparent no-effect thresholds for active smoking. Hence, it is no surprise that epidemiologic reports are inconclusive about a possible association of ETS exposure and CHD, some suggesting a slight elevation, others a reduction of risk. Often, the elevations reported are higher than the CHD risk values associated with active smoking. Such equivocations likely result from the presence of contrasting protective or aggravating confounders, of which more than 200 have been reported in the literature—confounders that were not and could not be adequately controlled by any epidemiologic study. By scientific standards, the weight of evidence continues to falsify the hypothesis that ETS exposure might be a CHD risk factor. © 1995 Academic Press, Inc.

# The 2001 Surgeon General Report Women and Smoking

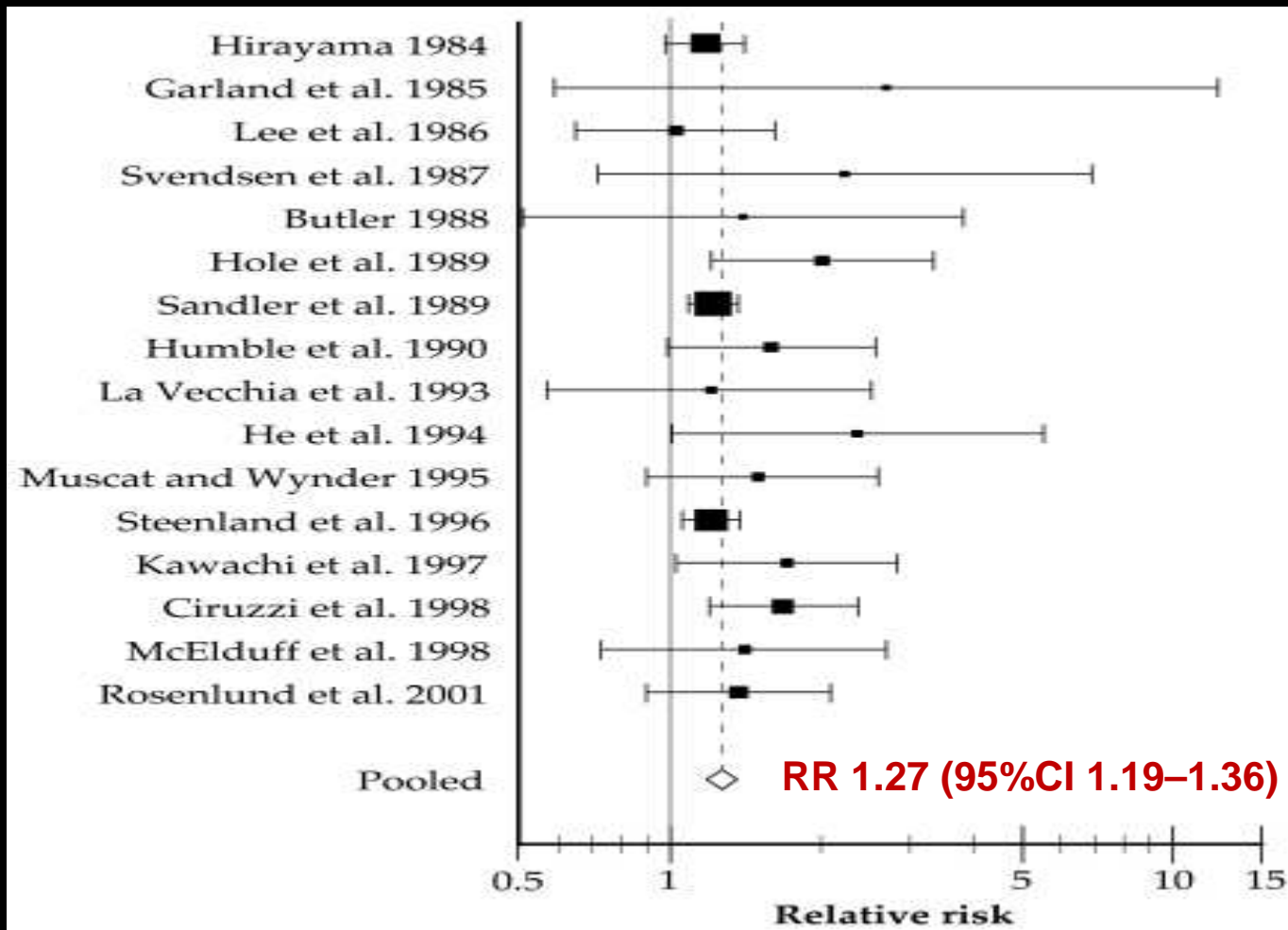
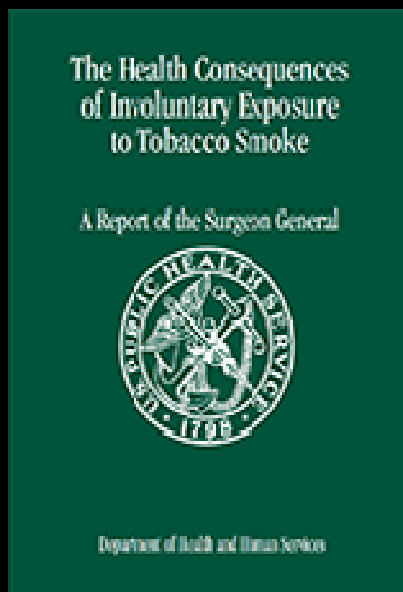
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Women and Smoking  
A Report of the Surgeon General



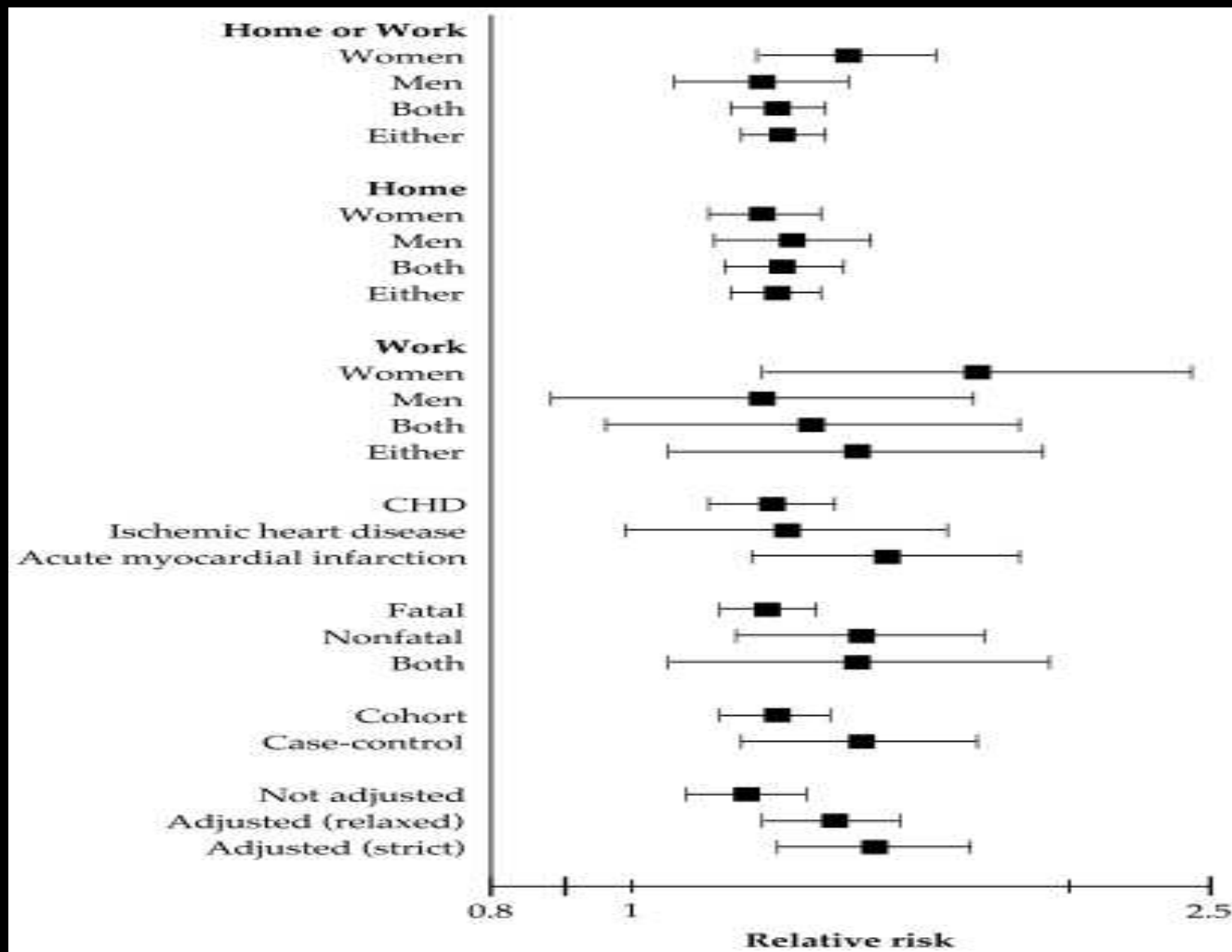
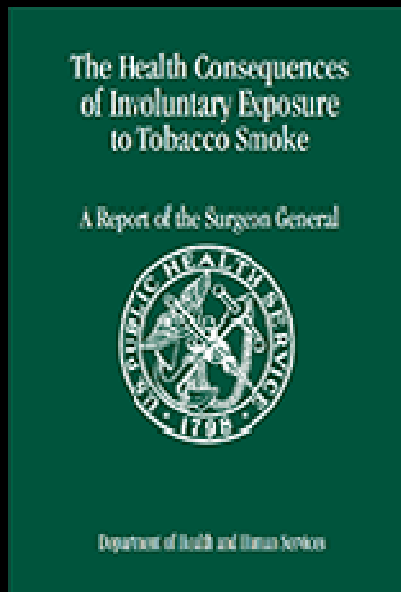
Department of Health and Human Services

# Relative risks of coronary heart disease (CHD) associated with secondhand smoke (SHS) exposure in nonsmokers



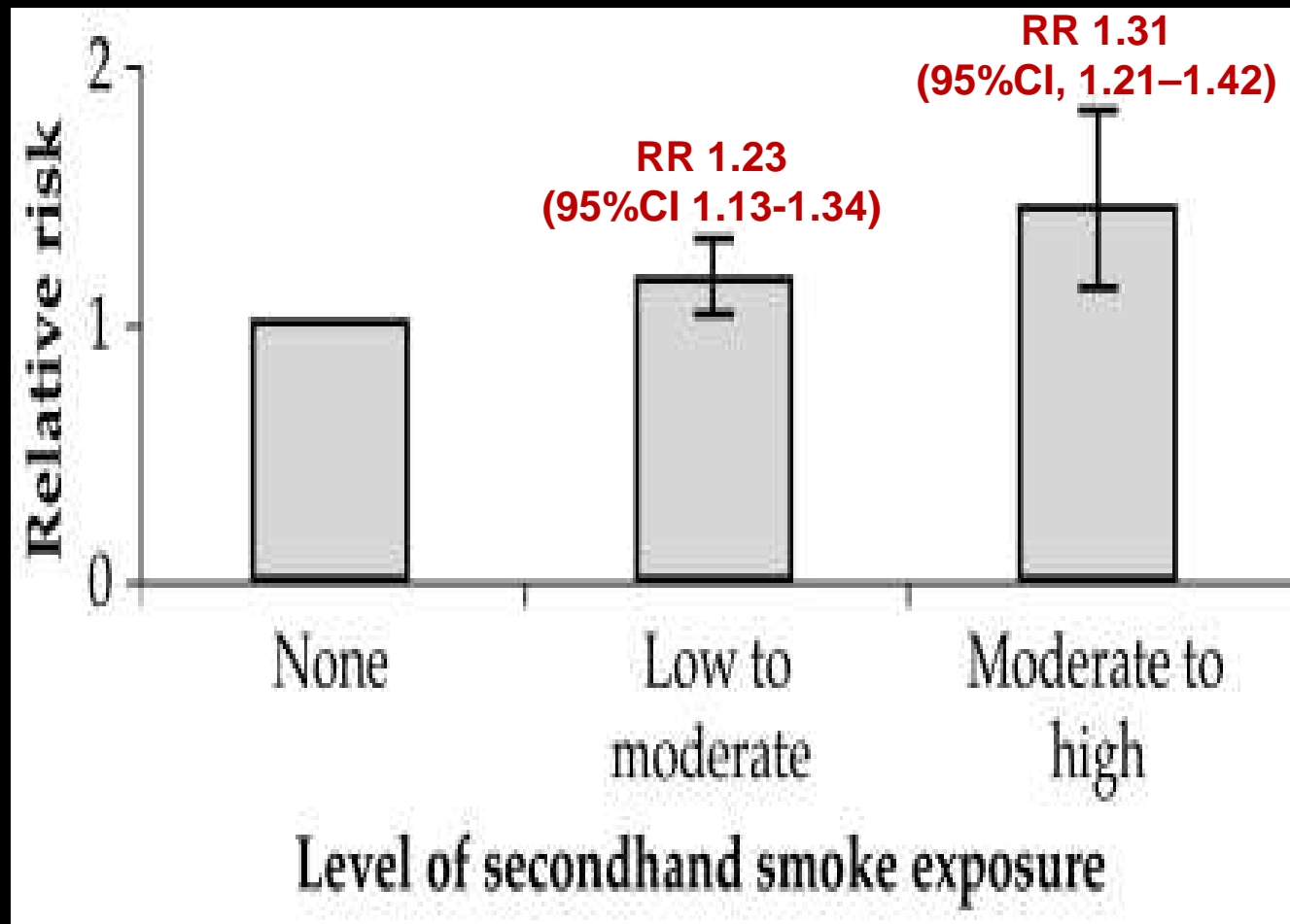
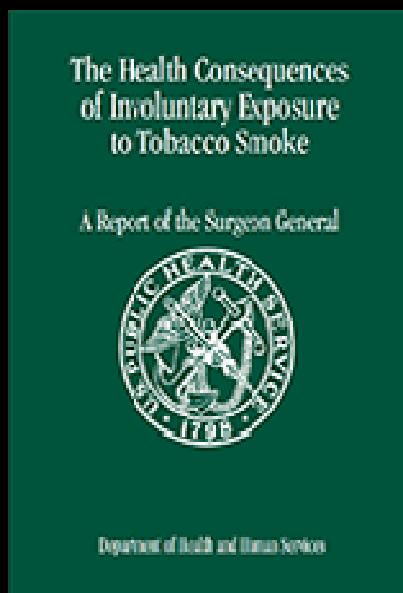
The Health Consequences of Involuntary Exposure to Tobacco Smoke:  
A Report of the Surgeon General (2006)

# Pooled relative risks of CHD associated with SHS exposure among nonsmokers in various subgroups



The Health Consequences of Involuntary Exposure to Tobacco Smoke:  
A Report of the Surgeon General (2006)

# Pooled relative risks of CHD associated with various levels of exposure to SHS among nonsmokers

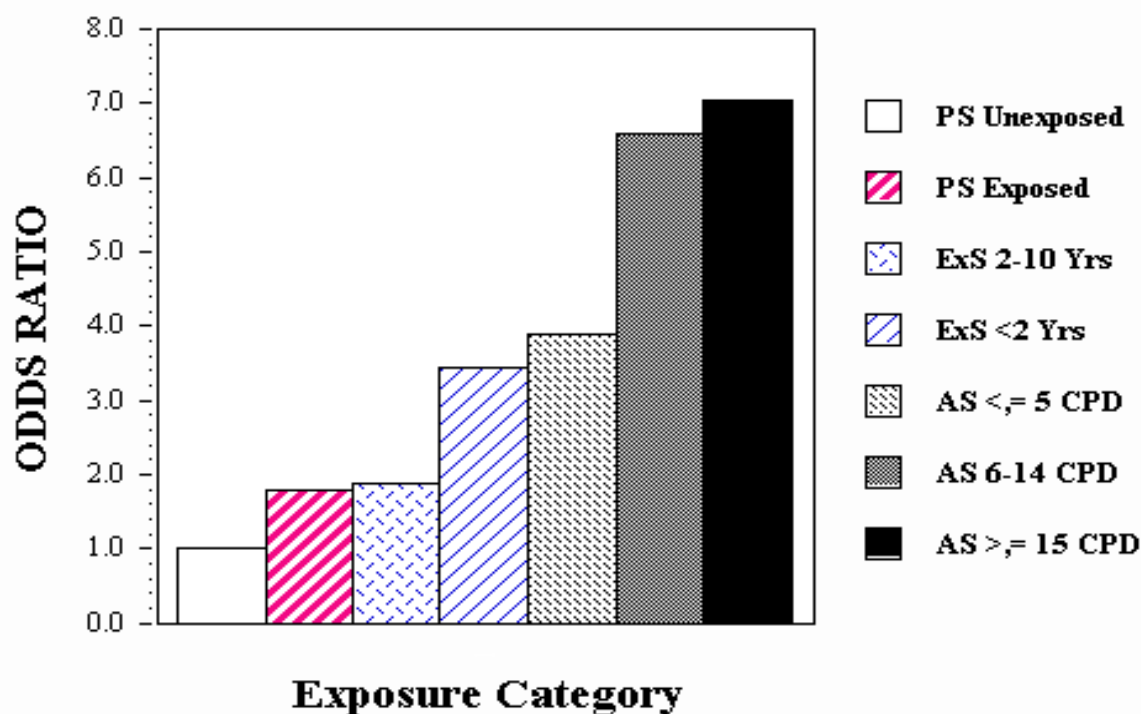


The Health Consequences of Involuntary Exposure to Tobacco Smoke:  
A Report of the Surgeon General (2006)

# The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General (2006)

Study	Design
Lee et al. 1986	Case-control Hospital-based  United Kingdom
Donnan et al. 1989	Case-control Hospital cases and community controls Australia
<b>Sandler et al. 1989</b>	Cohort study with 12-year follow-up United States
Howard et al. 1998b	Cross-sectional study of Atherosclerosis Risk in Communities Study participants United States
<b>Bonita et al. 1999</b>	Case-control Hospital case and community controls New Zealand
You et al. 1999	Case-control Hospital case and community controls Australia

## Passive Smoking as well as Active Smoking increases the risk of acute stroke



Bonita, et al., *Tobacco Control* 8:156-160 (1999)

## Risk for Stroke

# Παθητικό Κάπνισμα: δεδομένα από 192 χώρες

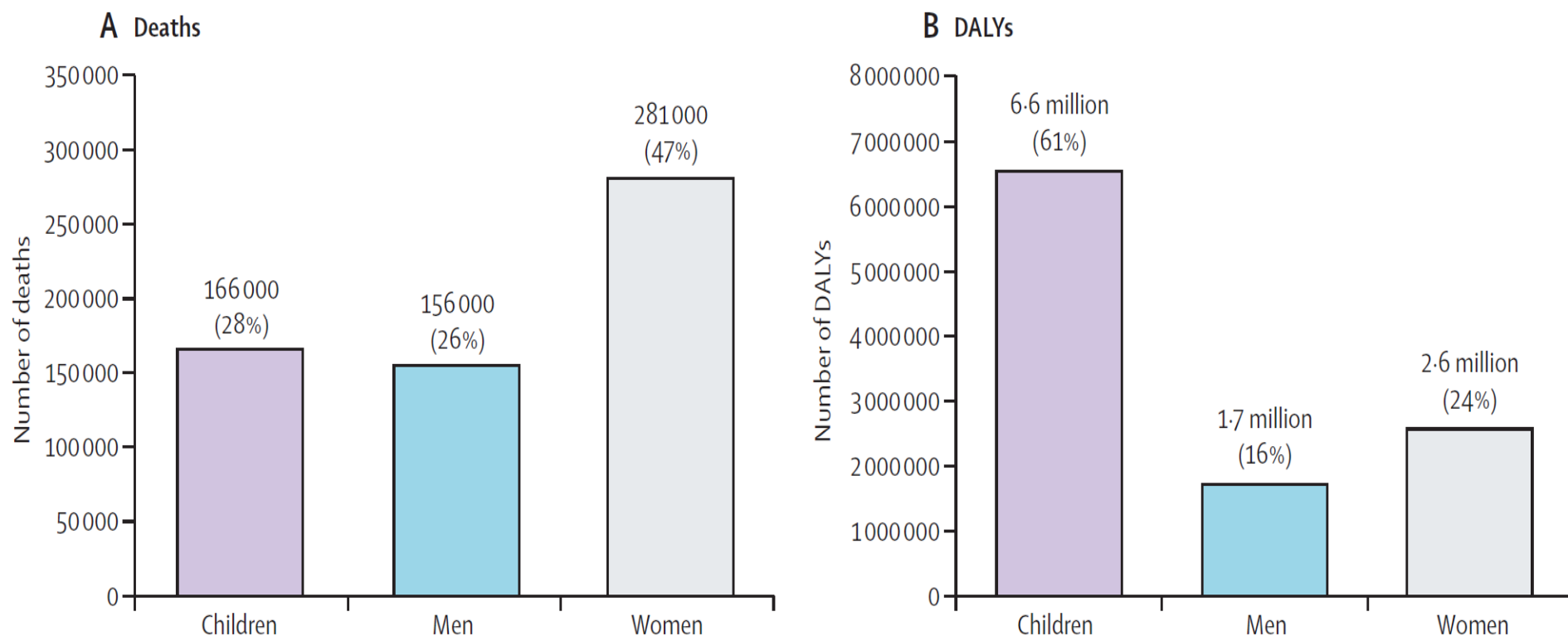
## Γενικά

- Έκθεση: **40%** των παιδιών, **33%** των ανδρών και **35%** των γυναικών που δεν καπνίζουν
- Θνησιμότητα: **603.000** θάνατοι το 2004 (1% συνόλου)
  - **379.000** θάνατοι από ισχαιμική καρδιοπάθεια
  - 165.000 θάνατοι από λοιμώξεις κατώτερου αναπνευστικού
  - 36.900 θάνατοι από άσθμα
  - 21.400 θάνατοι από καρκίνο του πνεύμονα
- Σημαντική νοσηρότητα: **10.900.000 DALYs (0,7%)**
  - Λοιμώξεις αναπνευστικού σε παιδιά <5 ετών (5.939.000)
  - Ισχαιμική καρδιοπάθεια σε ενήλικες (**2.836.000**)
  - Άσθμα σε ενήλικες (1.246.000) και παιδιά (651.000)

DALYs: disability-adjusted life-years

# Παθητικό Κάπνισμα: δεδομένα από 192 χώρες

## Ομάδες



DALYs: disability-adjusted life-years

# Παθητικό Κάπνισμα: δεδομένα από 192 χώρες

## Έκθεση ανά περιοχές

	Children†‡ (%)	Men (%)	Women (%)
Africa (D)	13	7	11
Africa (E)	12	4	9
The Americas (A)	24	16	15
The Americas (B)	29	14	22
The Americas (D)	22	15	19
Eastern Mediterranean region (B)	38	24	25
Eastern Mediterranean region (D)	33	21	35
Europe (A)	51	35	32
Europe (B)	56	52	54
Europe (C)	61	66	66
Southeast Asia region (B)	53	32	56
Southeast Asia region (D)	36	23	19
Western Pacific region (A)	51	50	54
Western Pacific region (B)	67	53	51
Worldwide	40	33	35

\*For country grouping see panel. †Children younger than 15 years. ‡Approximation based on having one or more parents who smoke.

**Table 2: Proportion of children and adult non-smokers exposed regularly to second-hand smoke based on survey data and modelling for 2004, by WHO subregion\***

# Παθητικό Κάπνισμα: δεδομένα από 192 χώρες

## Θνησιμότητα ανά περιοχές

	Lower respiratory infections in children <5 years	Otitis media in children <3 years	Asthma in children <15 years	Asthma in adults	Lung cancer in adults	Ischaemic heart disease in adults	Total
Africa (D)	23 219	2	63	1634	177	3063	28 200
Africa (E)	20 025	4	62	1796	276	2568	24 700
The Americas (A)	65	1	11	288	596	12 604	13 600
The Americas (B)	4169	12	60	932	681	11 427	17 300
The Americas (D)	1555	1	9	140	93	982	2800
Eastern Mediterranean regions (B)	1771	0	13	727	142	6223	8900
Eastern Mediterranean regions (D)	30 518	11	96	2243	318	22011	55 200
Europe (A)	60	1	10	1112	1993	32 283	35 500
Europe (B)	5367	1	106	1306	751	29 966	37 500
Europe (C)	818	2	3	3277	1096	94 109	99 300
Southeast Asia region (B)	4465	0	135	3681	631	18 433	27 300
Southeast Asia region (D)	55 956	23	333	9827	1864	67 095	135 000
Western Pacific region (A)	39	0	5	697	938	8769	10 400
Western Pacific region (B)	17 150	13	243	8113	11 850	69 659	107 000
Worldwide	165 000	71	1150	35 800	21 400	379 000	603 000

Totals provided are rounded to the nearest significant figure. \*For country grouping see panel.

**Table 3: Number of deaths from exposure to second-hand smoke in 2004, by WHO subregion\***

# Παθητικό Κάπνισμα: δεδομένα από 192 χώρες

## *Disability-Adjusted Life-Years (DALYs)*

	Lower respiratory infections in children <5 years	Otitis media in children <3 years	Asthma in children <15 years	Asthma in adults	Lung cancer in adults	Ischaemic heart disease in adults	Total
Africa (D)	816 314	816	22 006	39 237	1937	29 316	910 000
Africa (E)	698 731	966	29 433	52 135	3229	24 255	809 000
The Americas (A)	2428	442	27 550	28 727	5424	61 859	126 000
The Americas (B)	185 495	1725	66 575	73 437	7203	92 088	427 000
The Americas (D)	57 441	244	10 741	12 575	998	7786	89 800
Eastern Mediterranean region (B)	68 477	571	13 278	26 079	1633	60 083	170 000
Eastern Mediterranean region (D)	1 082 990	2057	39 202	97 177	3829	213 995	1 439 000
Europe (A)	2267	805	35 771	51 190	16 760	152 457	259 000
Europe (B)	184 938	696	22 571	33 044	7592	207 638	456 000
Europe (C)	28 191	502	8308	35 428	10 279	587 626	670 000
Southeast Asia region (B)	173 780	1477	25 651	71 700	7108	176 240	456 000
Southeast Asia region (D)	1 995 618	6655	129 772	323 801	20 515	683 310	3 160 000
Western Pacific region (A)	1421	275	18 146	44 057	7585	48 931	120 000
Western Pacific region (B)	641 279	7779	202 391	357 362	121 456	489 983	1 820 000
Worldwide	5 939 000	24 900	651 000	1 246 000	216 000	2 836 000	10 913 000

Data are the number of DALYs from exposure to second-hand smoke, by outcome. Totals provided are rounded to the nearest significant figure. DALYs=disability-adjusted life-years (a weighted measure of death and disability). \*For country grouping see panel.

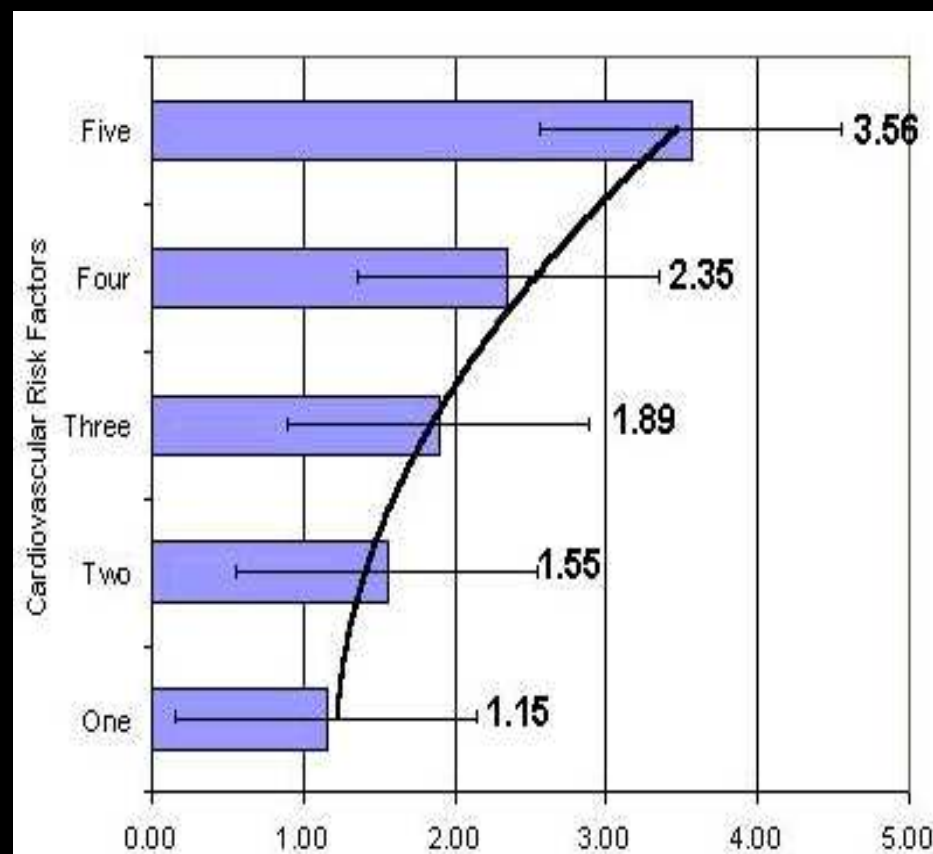
**Table 4: Number of DALYs from exposure to second-hand smoke in 2004, by WHO subregion\***

DALYs: disability-adjusted life-years

Oberg M. et al. Lancet. 2011;377(9760):139-46

# SHS and risk of acute coronary syndromes (ACS) among non-smokers: CARDIO2000

- 848 patients with first event of ACS and 1078 cardiovascular disease-free matched controls
- Exposure to SHS in non-smokers:
  - occasional (<3/week) → **26%** higher risk of ACS
  - regular (>3/week) → **99%** higher risk of ACS



Cardiovascular risk factors: **hypertension**, **hypercholesterolemia**, **diabetes mellitus**, **sedentary life** and **family history of premature coronary heart disease**

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# Known Cardiovascular Toxicity of Cigarette Smoke Constituents

Compound	Cardiovascular Toxicity	Risk Category <sup>b</sup>
Carbon monoxide	Moderate	Suppression of cardiac function, S-T depression in patients with stable CAD
Nicotine	High	Hemodynamic changes
Acetaldehyde	Low	
Acetic acid	Low	
Nitrogen oxides	Low	
Formaldehyde	Medium	Hypertension, atherosclerosis
Benzene	Moderate	Tachycardia, arrhythmia, arterial hypertension
Acetone	Low	
Catechol	Low	
1,3-butadiene	Moderate	Atherosclerosis
Toluene	Low	
Methanol	Low	
Hydroquinone	Low	
Phenol	Low	
Acrolein	High	Hypertension; atherogenesis, decreased plaque stability, increased thrombosis; suppression of coronary flow and cardiac contractility
Methylethylketone	Low	
Propionaldehyde	Low	
Pyridine	Moderate	
Carbon disulfide	Moderate	Hypertension, ischemic heart disease, thrombosis, hypercholesterolemia, arrhythmias, decreased cardiac output
3-vinylpyridine	Moderate	Atherosclerosis
Cholesterol	Low	
Crotonaldehyde	High	Hypertension, atherogenesis, decrease in plaque stability, increased thrombosis; suppression of coronary flow and cardiac contractility
Butyraldehyde	Moderate	Hypertension

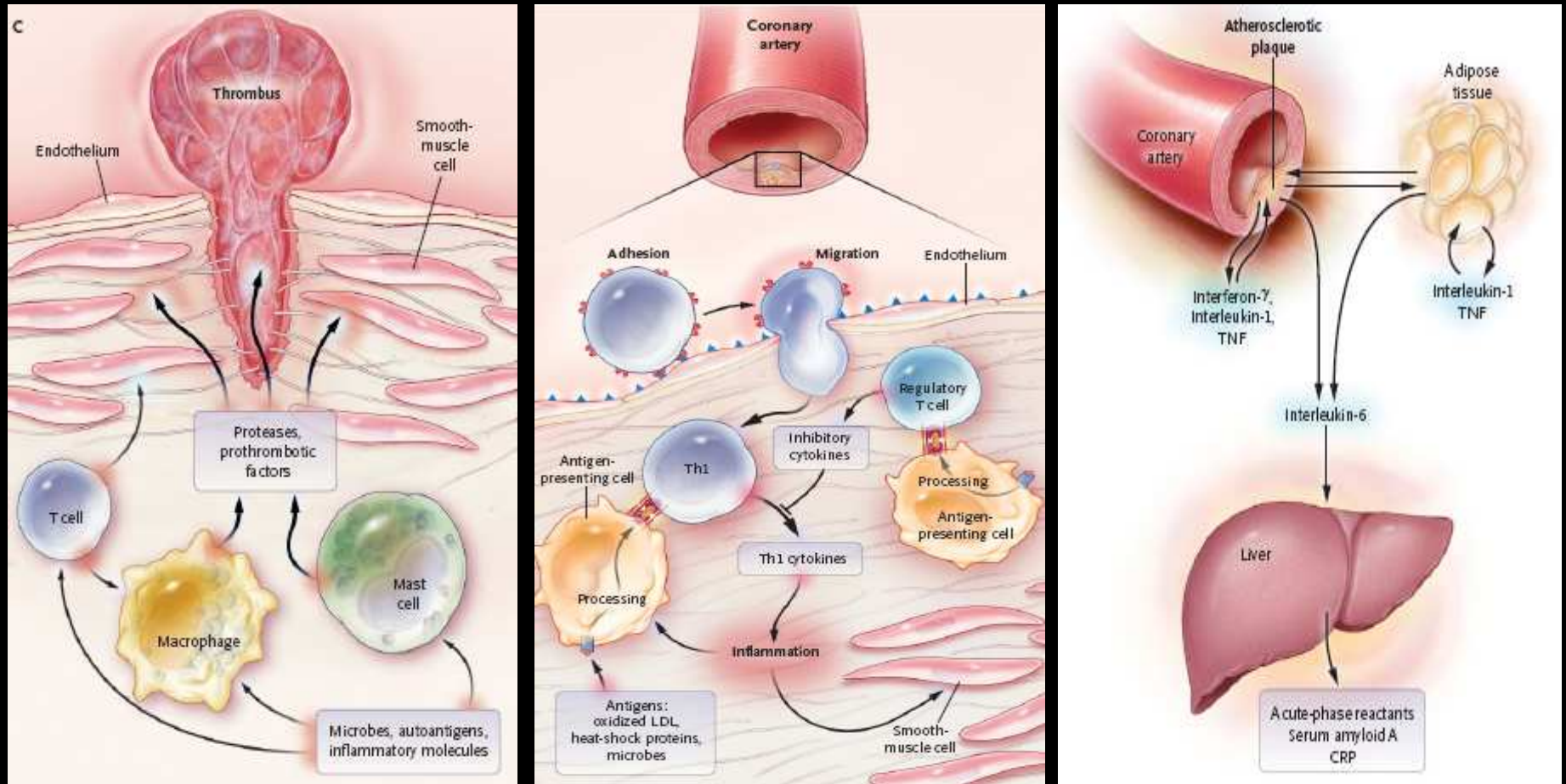
Compound	Cardiovascular Toxicity	Risk Category <sup>b</sup>
Cadmium	High	Endothelial dysfunction, inflammation, atherosclerosis
Lead	High	Hypertension
Benzo[a]pyrene	Moderate	Ischemic heart disease, atherosclerosis
1,3 butadiene	High	Increased CVD risk and atherogenesis
Particulate matter	High	Arrhythmias, atherosclerosis, ischemic heart disease, hypertension, heart failure, stroke, insulin resistance

**Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence.**

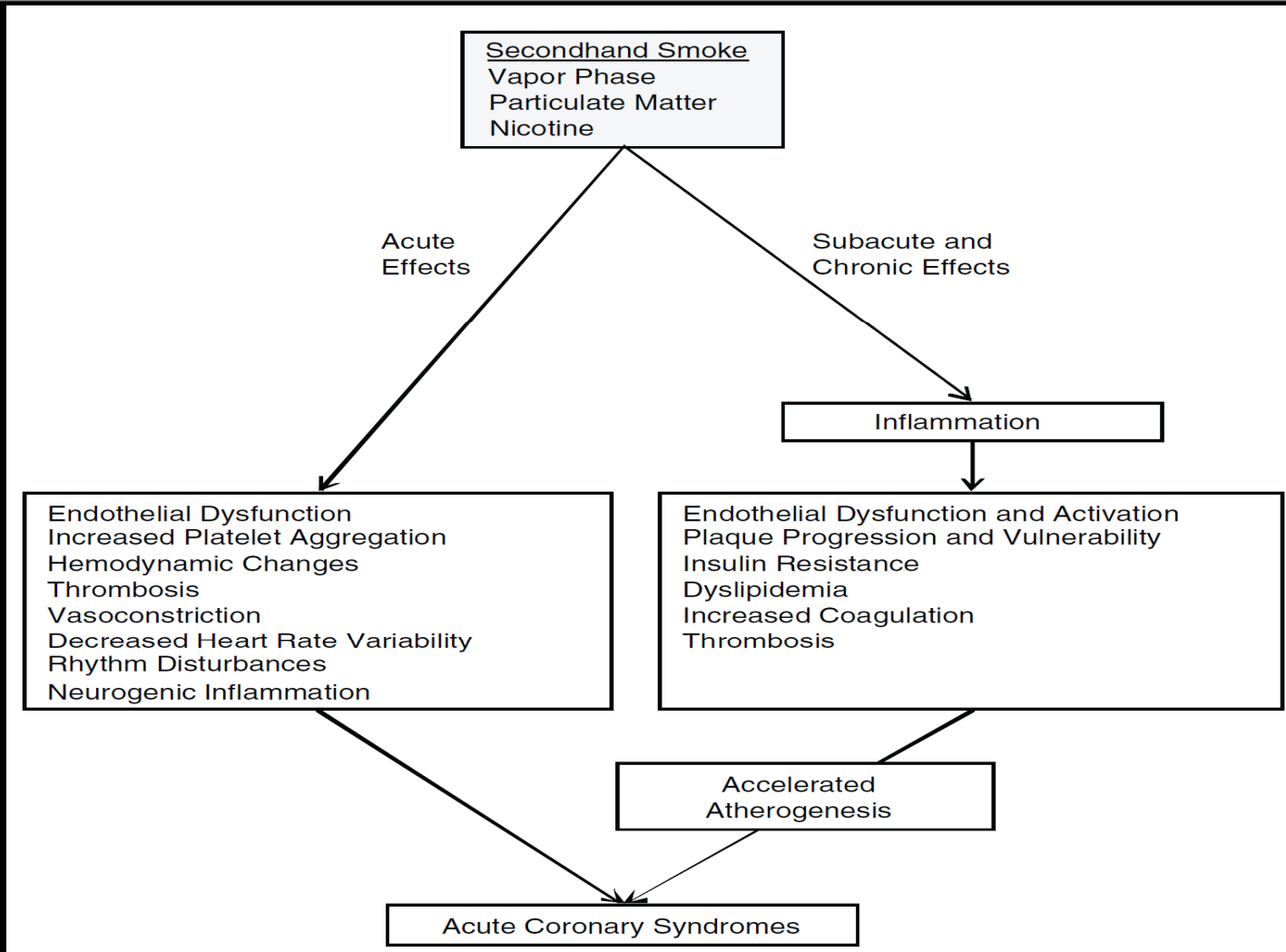
**National Academy of Sciences 2010.**

**Data compiled from Bhatnagar, 2006; HHS, 2006; O'Toole et al., 2009; and Smith and Fischer, 2001**

# Inflammation, Atherosclerosis, and Coronary Artery Disease

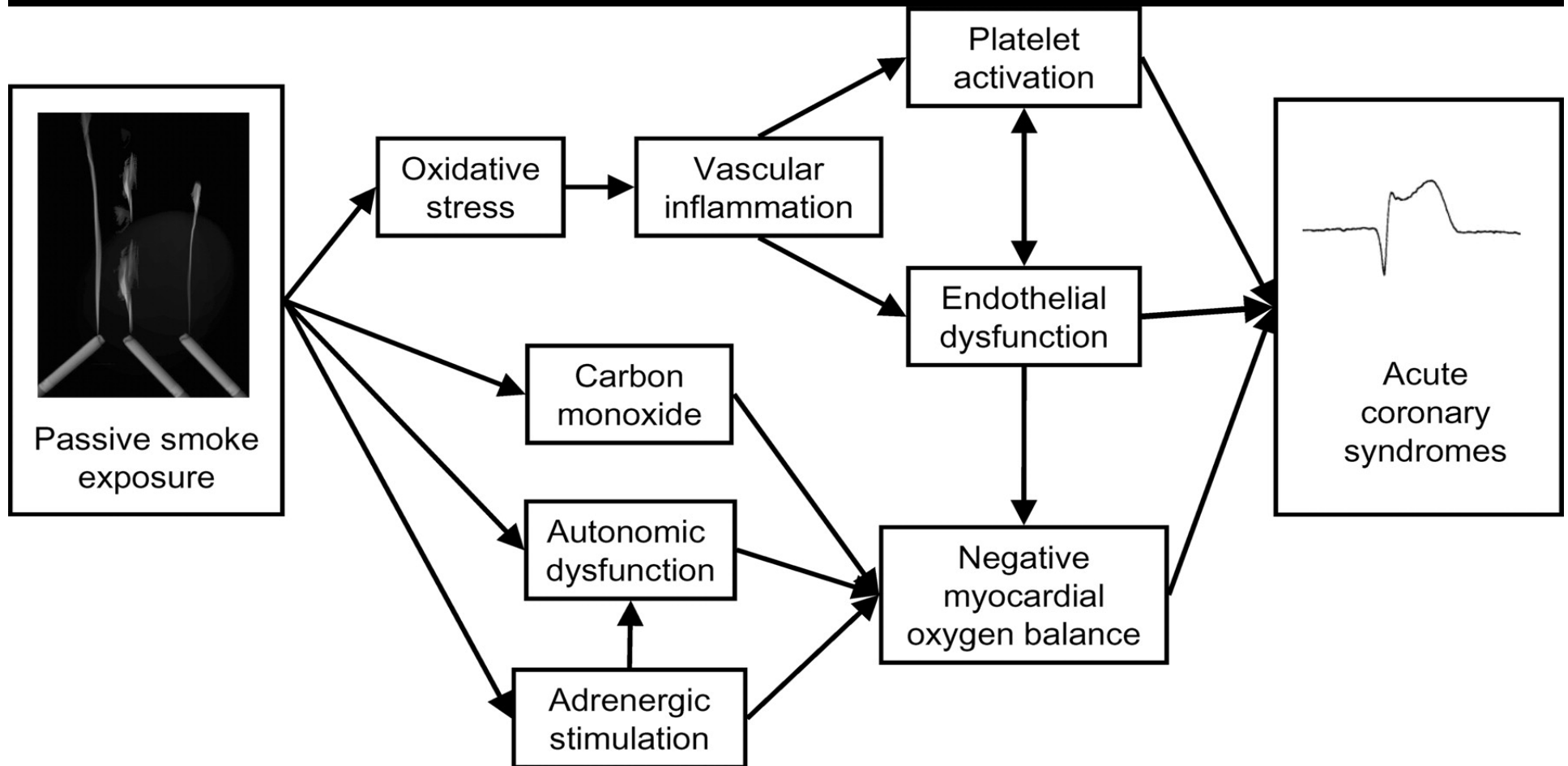


# Potential mode of action of secondhand smoke



**Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence.  
National Academy of Sciences 2010.**

# Mechanisms linking passive smoke exposure to acute clinical manifestations



# Effects of SHS on the Cardiovascular System

- **Platelet activation**
- **Endothelial dysfunction**
- **Inflammation & infection**
- **Atherosclerosis**
  - Low HDL levels
  - Plaque instability
  - Increased oxidized LDL
- **Increased oxidative stress**
- **Decreased energy metabolism**
- **Increased insulin resistance**
- **Outcome measures**
  - Increased infarct size
  - Decreased heart rate variability
  - Increased arterial stiffness
  - Increased risk of coronary disease events

## Special Report

### Cardiovascular Effects of Secondhand Smoke Nearly as Large as Smoking

Joaquin Barnoya, MD, MPH; Stanton A. Glantz, PhD

# Comparative Effects of Passive and Active Smoking

	SHS Effect†	Exposure	Active Effect‡	SHS/Active Effect,§ %
<b>Risk of heart disease (95% CI)</b>				
Figure 1	1.31 (1.21 to 1.41)	Chronic	1.78 (1.31 to 2.44)	40
20 y <sup>28</sup>	1.57 (1.08 to 2.28)¶	Cotinine at study entry	1.66 (1.04 to 2.68)	86
First 4 y <sup>28</sup>	3.73 (1.32 to 10.98)	Cotinine at study entry	3.32 (0.87 to 12.64)	122
<b>Platelet function</b>				
Platelet activation <sup>31</sup> (SI PGI <sub>2</sub> )#	0.55±0.059	20 min	0.54±0.069	96
Platelet aggregate ratio <sup>32,32a</sup> (change)	-0.09	20 min	-0.15	60
Fibrinogen, <sup>87</sup> mg/dL (95% CI)	5.2 (-1.2 to 12)	Chronic	6.9 (-0.9 to 14)	75
Fibrinogen, <sup>38</sup> mg/dL (SE)	11.2±4.1	Chronic	18.1±6.7	62
Plasma thromboxane <sup>49</sup> ng/ml	3.30±0.35	Acute	2.93±0.07	113

**These effects are, on average,  
80% to 90% that of chronic active smoking**

**Barnoya J and Glantz SA, J Cardiovasc Nurs 2006; 21(6): 457-462**

C-reactive protein, mg/dL	0.08 (0.02 to 0.1)	Chronic	0.1 (0.08 to 0.2)	80
Homocysteine, $\mu$ mol/L	0.4 (0.2 to 0.6)	Chronic	0.5 (0.1 to 0.9)	80
Oxidized LDL, mg/dL	3.3 (0.5 to 6)	Chronic	3.9 (1.4 to 7)	85
<b>Antioxidants</b>				
Vitamin C, <sup>120</sup> median (interquartile range), $\mu$ mol/L	53 (41 to 79)	Chronic	40 (25 to 58)	57
Hypovitaminosis <sup>120</sup> (vitamin C <23 $\mu$ mol/L), %	12	Chronic	24	50
Ratio of DHAA to ascorbic acid <sup>122</sup>	10.3±7.00	>6 mo	11.2±6.9	78
Vitamin C in children <sup>123</sup> (mean±SE), mmol/L	-8.8±1.5**	Chronic	-9.0±2.3	98
$\beta$ -Carotene <sup>125</sup> (mean±SE), $\mu$ mol/L	0.129±0.022	Chronic	0.155±0.021	174
$\beta$ -Carotene, <sup>127</sup> $\mu$ mol/L	0.15	Chronic	0.17	128
Red blood cell folate mean decrease, <sup>130</sup> nmol/L (95% CI)††	-50 (-69 to -31)	Chronic	-86 (-101 to -71)	58

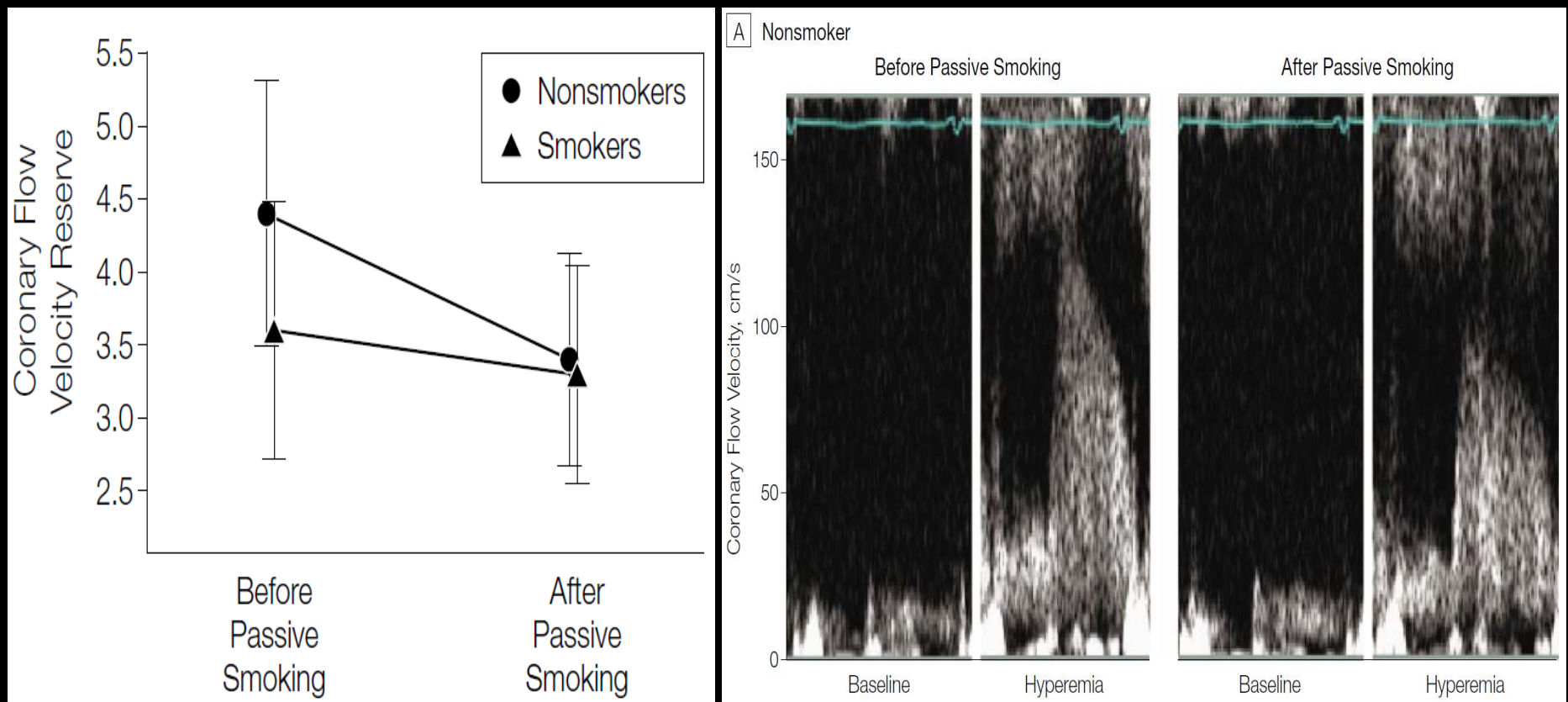
**Barnoya J, Circulation. 2005;111:2684-2698**

# Παθητικό Κάπνισμα και Καρδιαγγειακά Νοσήματα

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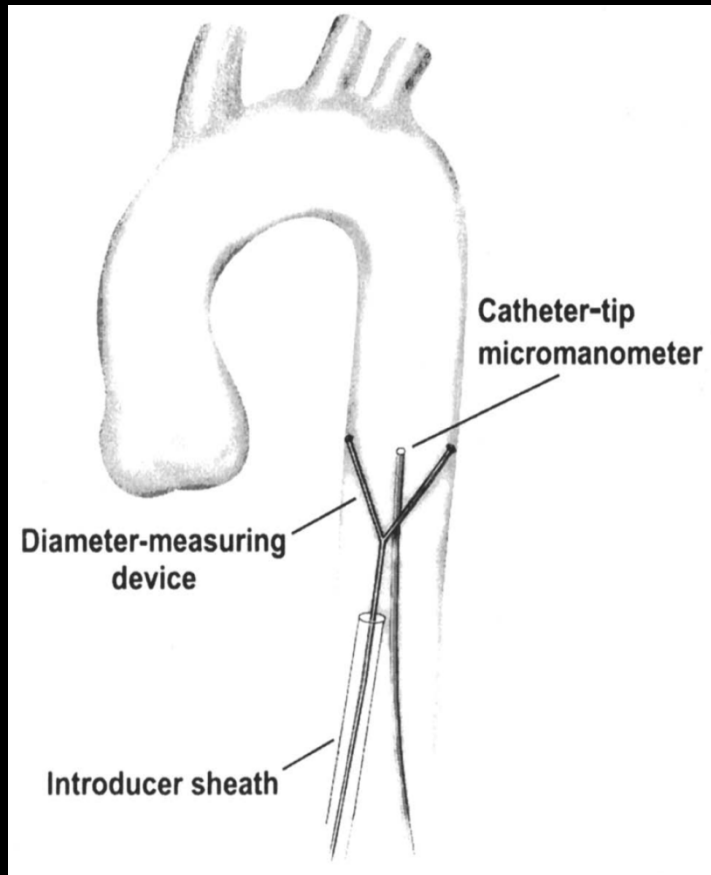
- Επιδημιολογικά δεδομένα
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# Acute Effects of Passive Smoking on the Coronary Circulation in Healthy Young Adults

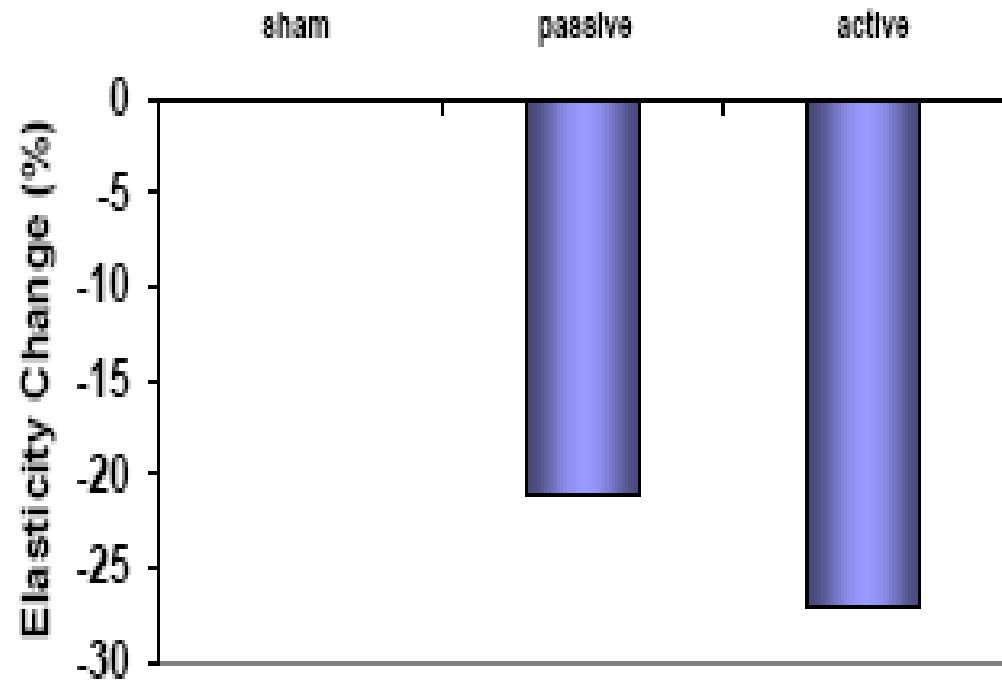


30 Japanese men (mean age, 27 years)  
15 healthy nonsmokers and 15 asymptomatic active smokers  
**30-minute** exposure to environmental tobacco smoke

# Effects of passive smoking on aortic function and elastic properties



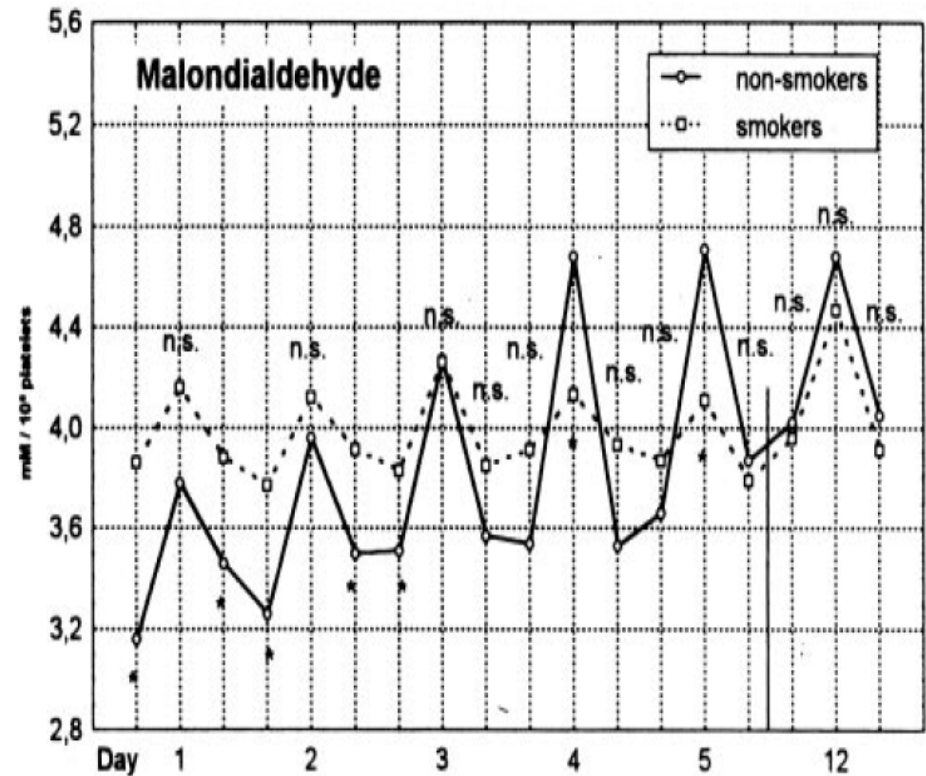
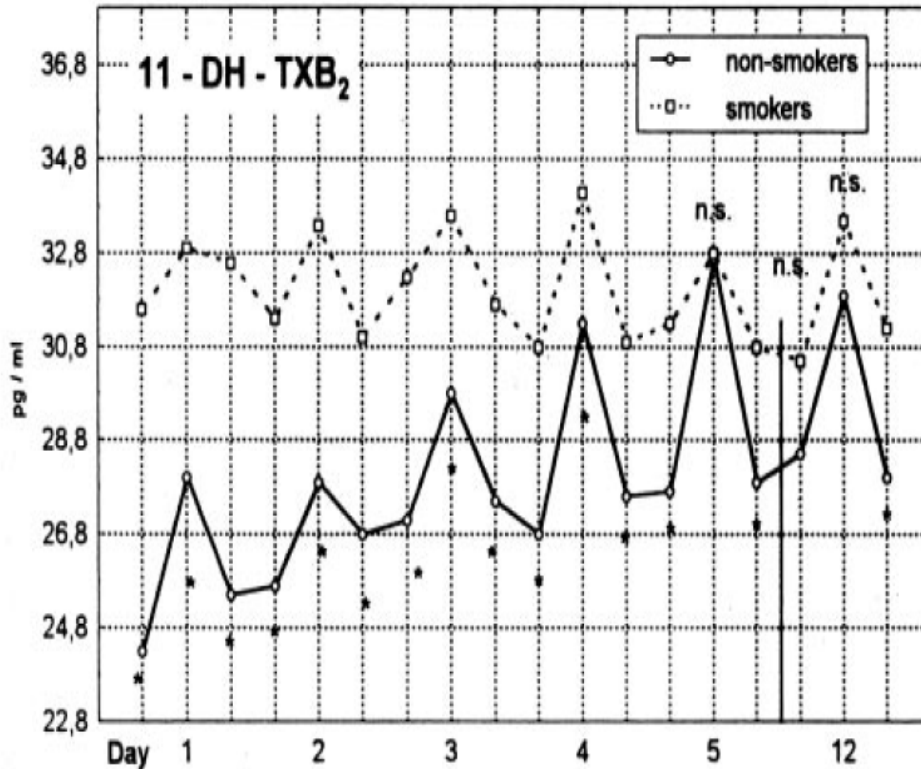
Loss of Aortic Elasticity with Active and Passive Smoking.



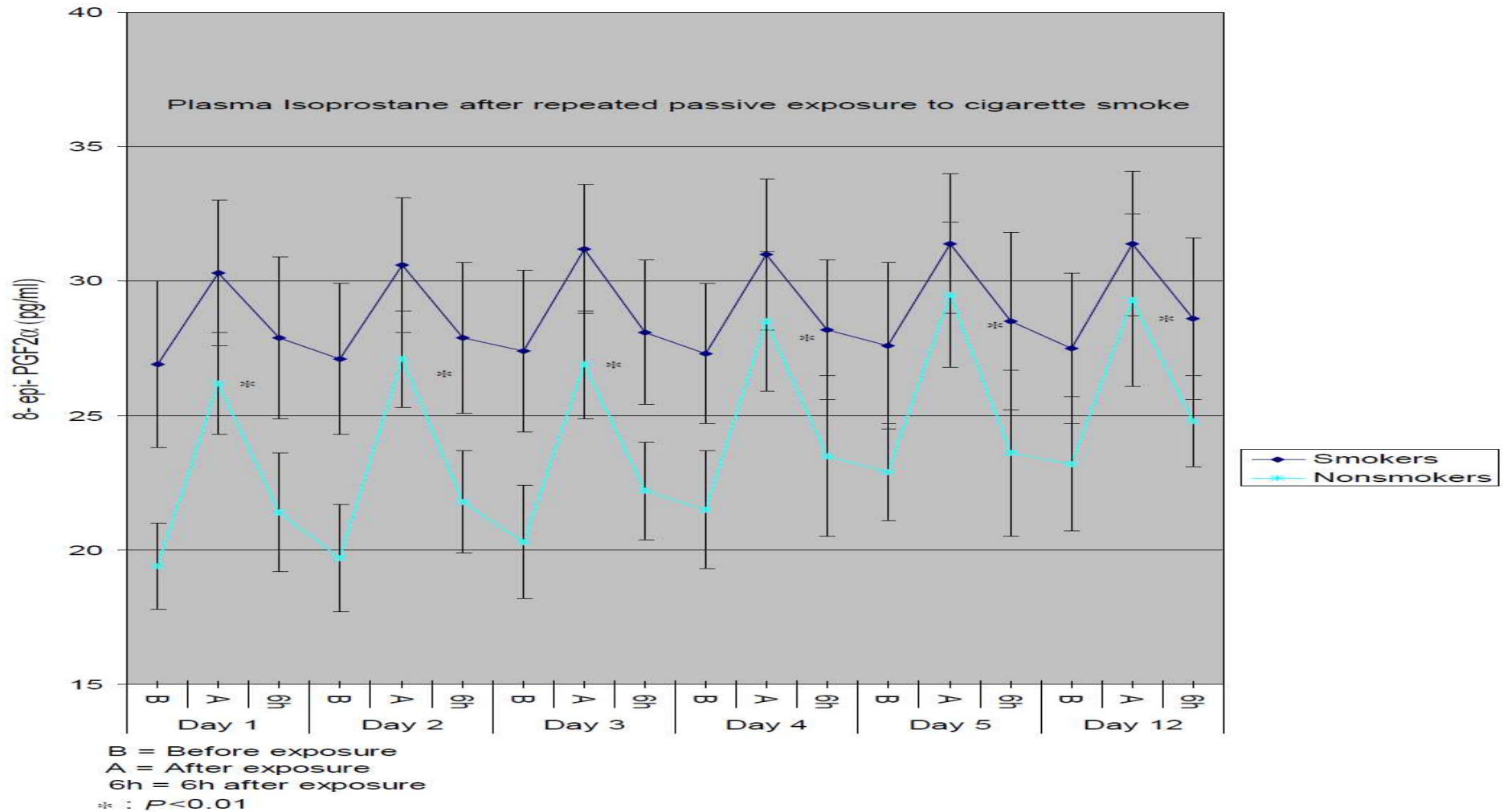
Stefanadis et al., 1998

Passive smoking was associated with changes in the aortic pressure-diameter relation - change in mean distensibility by **21%**, similar to active smoking (27%)

# Environmental Tobacco Smoke and Platelet Activation



# Passive cigarette smoking increases 8-isoprostane formation



# Effect of Exposure to Secondhand Smoke on Markers of Inflammation: the ATTICA Study

\*  $P < 0.05$ .

†  $P < 0.01$ .

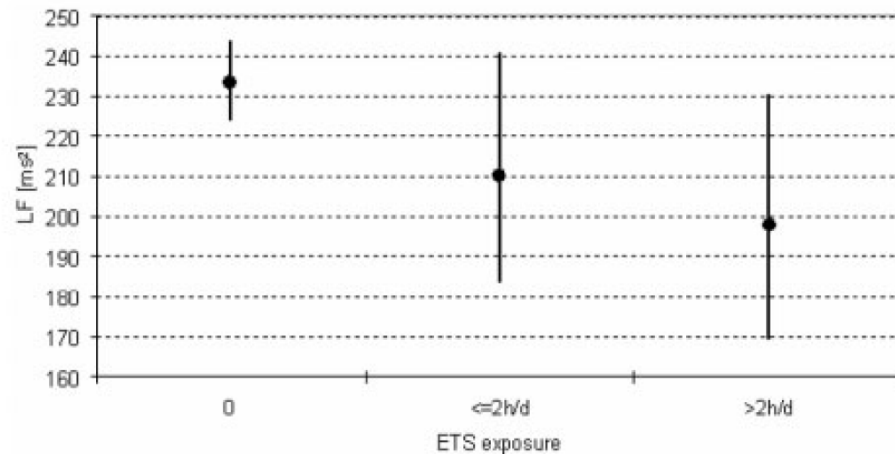
Comparison	White Blood Cell ( $\times 10^3$ per $\mu\text{L}$ )	C-Reactive Protein (mg/dL)	Homocysteine ( $\mu\text{mol/L}$ )	Fibrinogen (mg/dL)	Oxidized Low-Density Lipoprotein Cholesterol (mg/dL)
	Effect on Marker (95% Confidence Interval)				
Occasional vs. no exposure	0.2 (-0.2 to 0.6)	0.04 (0 to 0.06)	0.3 (-0.1 to 0.7)	4.8 (-1.4 to 11)	2.5* (0.3 to 5)
Regular vs. no exposure	0.6† (0.3 to 0.8)	0.08* (0.02 to 0.1)	0.4† (0.2 to 0.6)	5.2 (-1.2 to 12)	3.3* (0.5 to 6)
Age (per 10 years)	0.2 (-0.2 to 0.6)	0.9* (0.1 to 2)	0.6* (0 to 1)	11* (3 to 20)	2* (0.2 to 4)
Women vs. men	0.1 (-0.1 to 0.3)	0.3* (0.1 to 0.5)	3.3* (2 to 4)	31.5* (4 to 59)	-4.1 (-10 to 1.7)
Body mass index (per 5 $\text{kg/m}^2$ )	0.2* (0.1 to 0.3)	0.5† (0.35 to 0.5)	0.3 (-0.2 to 1)	11* (2 to 20)	1.5 (-1.5 to 4.5)
Physically active vs. inactive	0.1 (-0.1 to 0.3)	-0.2* (-0.31 to 0)	-0.6 (-1.4 to 0.2)	-16.8 (-38 to 6)	-2.7 (-6.5 to 1.1)
Diet score (per 10-unit increase)	1 (-0.4 to 3)	0.9 (0 to 2)	-0.9* (-1 to -0.7)	1.4 (-17 to 19)	-14* (-16 to -12)

357 men (38% exposed to SHS) - 638 women (33% exposed to SHS)  
All never smokers

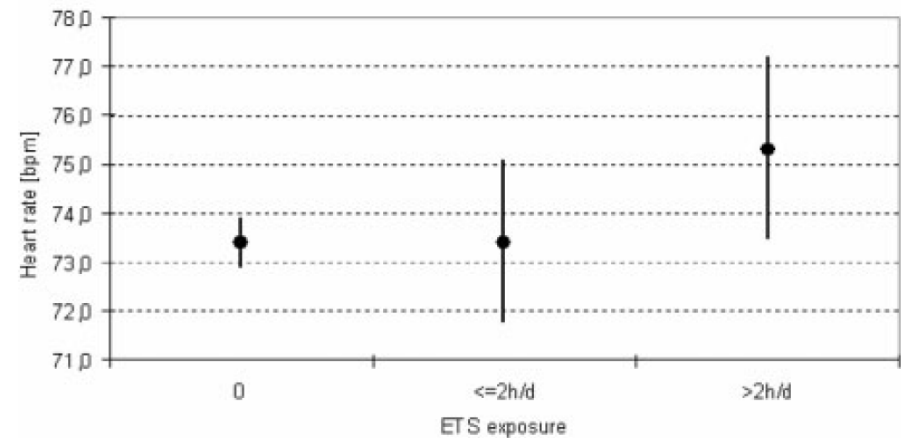
Panagiotakos DB, Am J Med. 2004;116:145-150.

# Effects of SHS on Heart Rate Variability, Heart Rate and Blood Pressure: an observational study

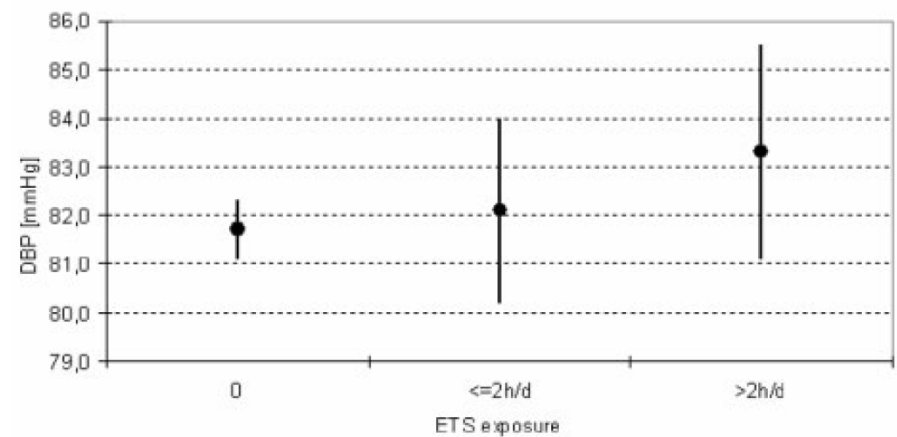
LF Power



Heart rate

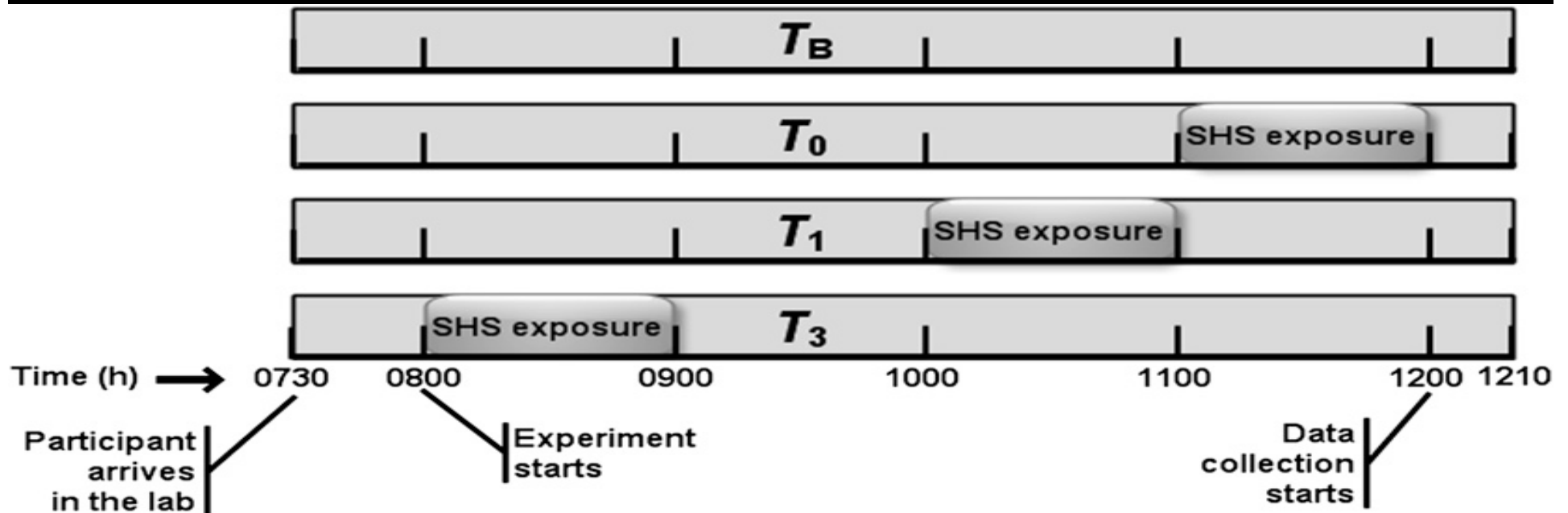


Diastolic blood pressure



1218 randomly selected non-smokers aged 50 and above who participated in 24-h electrocardiogram recordings

# Acute and Short-term Effects of SHS and Sex Differences on Cytokine Production



# Acute and Short-term Effects of SHS and Sex Differences on Cytokine Production

		$T_B$	$T_0$	$T_1$	$T_3$
Serum cotinine, ng·mL <sup>-1</sup>	M	8.5 ± 2.5	27.4 ± 12.1*	39.9 ± 14.1 <sup>†</sup>	38.0 ± 10.1 <sup>†</sup>
	W	9.3 ± 3.6	21.8 ± 8.3*	35.6 ± 9.7* <sup>†</sup>	32.9 ± 10.3 <sup>†</sup>
Urine cotinine, ng·ml <sup>-1</sup>	M	6.4 ± 2.2	21.1 ± 10.6	29.6 ± 13.0 <sup>†</sup>	29.4 ± 13.8 <sup>†</sup>
	W	7.9 ± 3.3	22.0 ± 8.3*	30.5 ± 8.8 <sup>†</sup>	28.3 ± 10.5 <sup>†</sup>
IL-4, pg·ml <sup>-1</sup>	M	44.9 ± 3.5 <sup>‡</sup>	49.6 ± 4.3*	46.4 ± 4.5	47.0 ± 4.6 <sup>†‡</sup>
	W	37.7 ± 6.4 <sup>‡</sup>	43.8 ± 5.3	43.3 ± 6.1	41.4 ± 4.3 <sup>‡</sup>
IL-5, pg·ml <sup>-1</sup>	M	37.2 ± 6.8	69.7 ± 7.5* <sup>‡</sup>	79.7 ± 5.2* <sup>†‡</sup>	65.7 ± 5.8* <sup>†‡</sup>
	W	35.1 ± 1.4	56.0 ± 8.0* <sup>‡</sup>	66.4 ± 2.6* <sup>†‡</sup>	54.5 ± 7.6* <sup>†‡</sup>
IL-6, pg·ml <sup>-1</sup>	M	2.4 ± 0.3	6.4 ± 2.5*	8.2 ± 1.3 <sup>†</sup>	9.0 ± 1.5 <sup>†‡</sup>
	W	2.5 ± 0.4	5.8 ± 1.9*	7.4 ± 1.2 <sup>†</sup>	6.3 ± 1.1 <sup>†‡</sup>
TNF-α, pg·ml <sup>-1</sup>	M	9.3 ± 1.6 <sup>‡</sup>	12.4 ± 2.4* <sup>‡</sup>	11.2 ± 2.1 <sup>‡</sup>	8.4 ± 0.9* <sup>‡</sup>
	W	6.4 ± 1.5 <sup>‡</sup>	8.0 ± 2.2 <sup>d</sup>	7.4 ± 1.8 <sup>‡</sup>	6.4 ± 1.2 <sup>‡</sup>
IFN-γ, IU·ml <sup>-1</sup>	M	0.3 ± 0.2	0.6 ± 0.2* <sup>‡</sup>	0.8 ± 0.2 <sup>†‡</sup>	0.7 ± 0.1 <sup>†‡</sup>
	W	0.3 ± 0.1	0.4 ± 0.1 <sup>‡</sup>	0.6 ± 0.2 <sup>†‡</sup>	0.5 ± 0.2 <sup>†‡</sup>

\* Significant difference from previous trial (time-point);  $P < 0.05$ .

<sup>†</sup> Significant difference of  $T_1$  and  $T_3$  from  $T_B$ ;  $P < 0.05$ .

<sup>‡</sup> Significant difference between sexes for the same measurement;  $P < 0.05$ .

# Sexual dimorphism in acute effects of SHS on thyroid hormones, vascular function & inflammation

- Randomized single-blind crossover study
- Measurements before and immediately after a 1-h SHS exposure in a controlled simulated bar/restaurant environment and a 1-h control trial
- Women (n=14)
  - ↓ **17 $\beta$ -estradiol (p=0.001) and progesterone (p<0.001)**
- Men (n=14)
  - ↓ **testosterone (p=0.019) and progesterone (p<0.001)**
  - ↑ **FT<sub>4</sub> (p<0.001) & T<sub>3</sub> (p=0.020) ↑ IL-1 $\beta$  (p<0.001)**
  - ↑ **systolic blood pressure (p=0.040)**
  - ↑ **resting energy expenditure (REE)**

# Παθητικό Κάπνισμα και Καρδιαγγειακά Νοσήματα

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- Επιδημιολογικά δεδομένα
- Πιθανοί μηχανισμοί
- Πειραματικά δεδομένα
- **Μετά τη διακοπή της έκθεσης**
- Γιατί συζητάμε ακόμα;

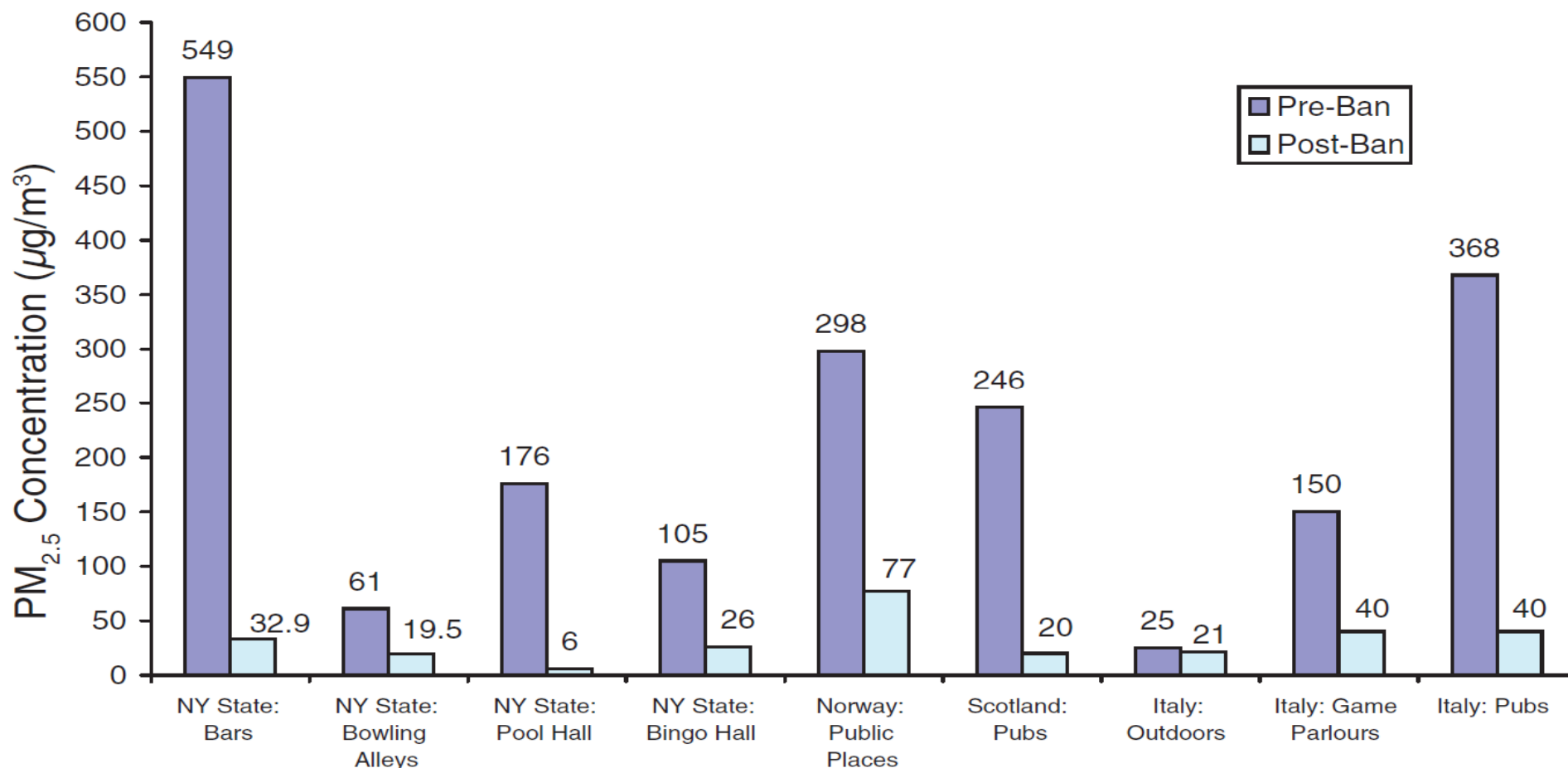
# Απαγόρευση καπνίσματος: η επόμενη μέρα...

On May 23, smoking in any New York City **park, beach, or pedestrian mall** — from Van Cortlandt Park in the Bronx to Brighton Beach in Brooklyn — became illegal. The city council passed the ban...



**“Families should be able to bring their children to parks and beaches knowing that they won’t see others smoking.”**

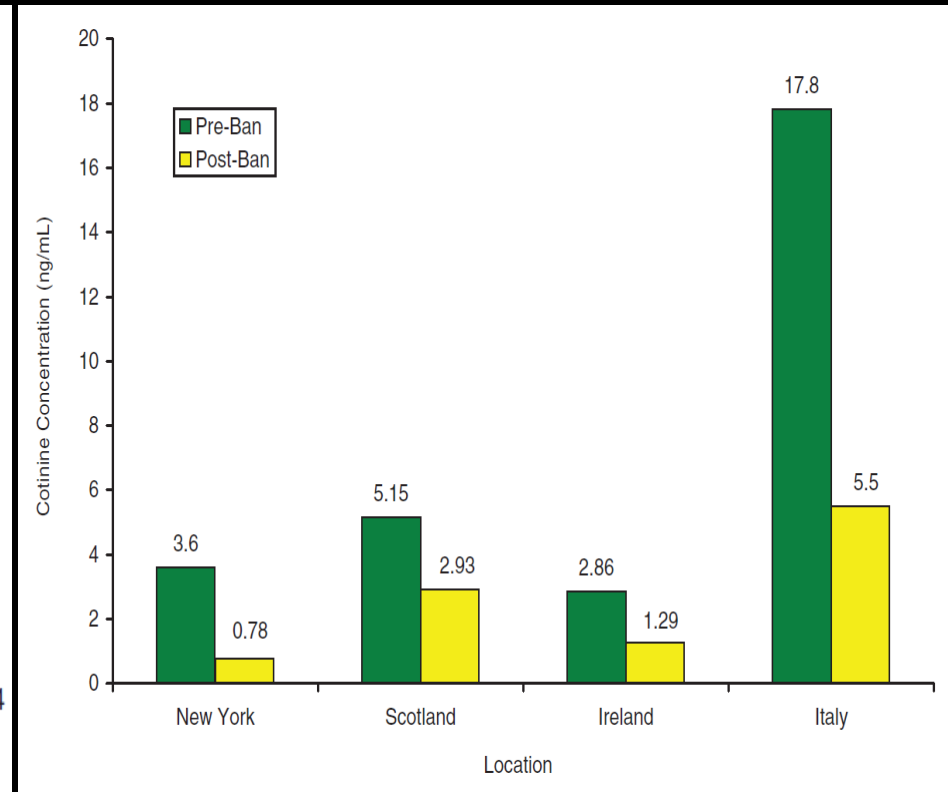
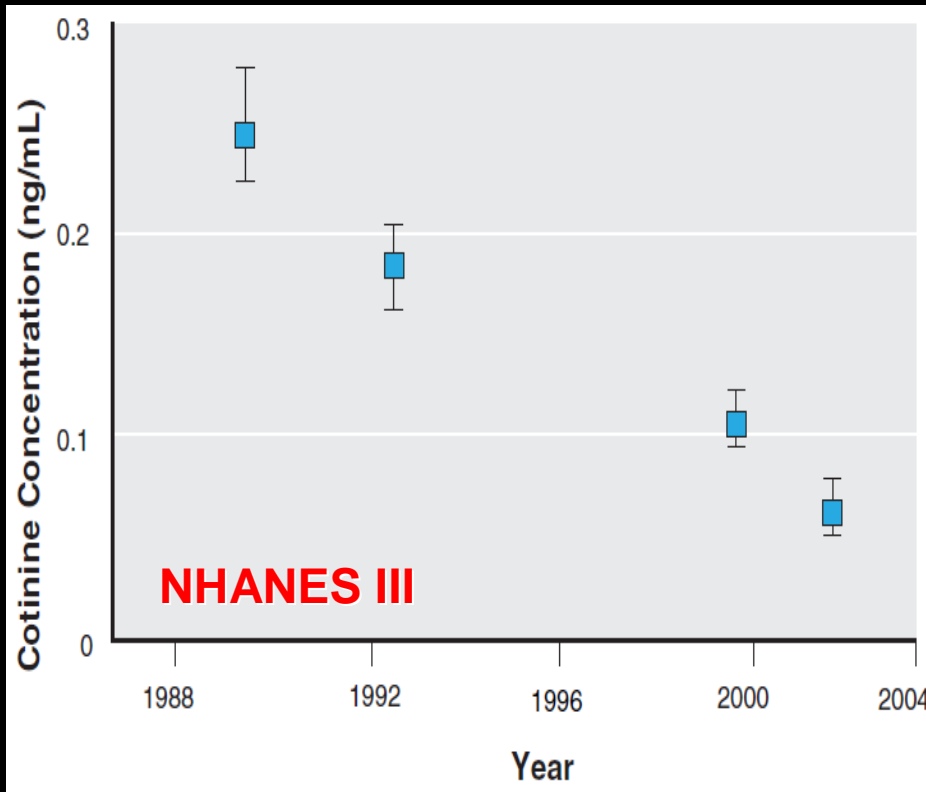
# Airborne PM<sub>2.5</sub> concentrations in public places before and after implementation of smoking bans



**Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence.**  
National Academy of Sciences 2010.

Data from Akbar-Khanzadeh et al., 2004; Alpert et al., 2007; CDC, 2004; Ellingsen et al., 2006; Semple et al., 2007; and Valente et al., 2007.

# Serum and saliva cotinine levels in non-smokers and in workers in public establishments

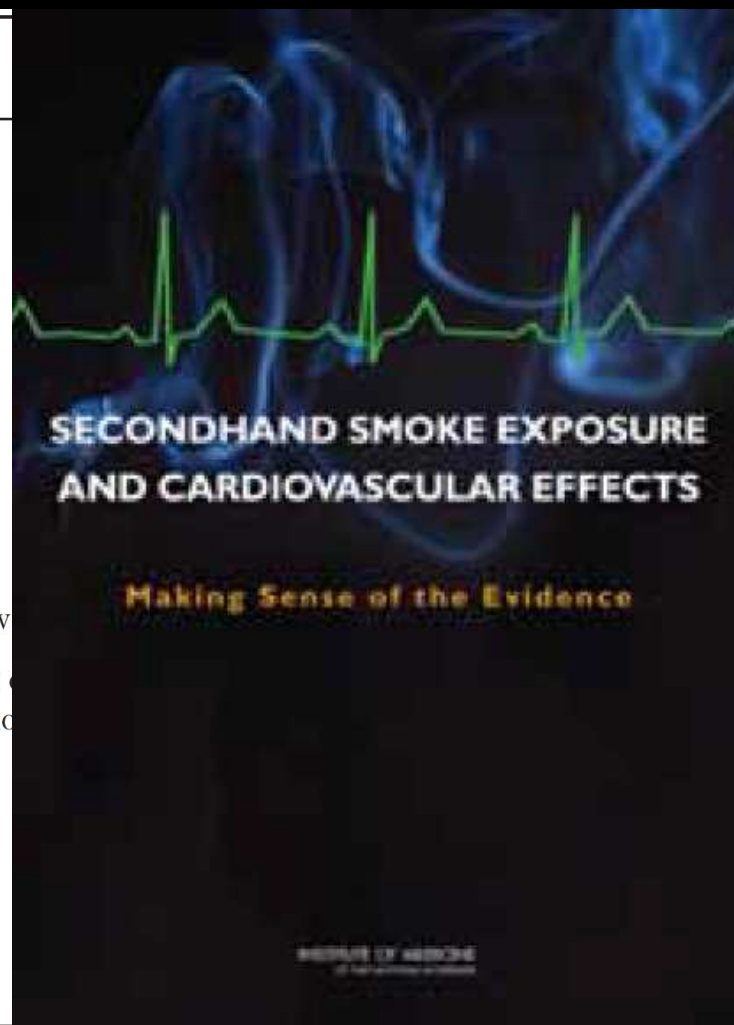


**Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence.**  
National Academy of Sciences 2010.

Data from Pirkle et al., 2006; Farrelly et al., 2005; Menzies et al., 2006;  
Mulcahy et al., 2005; Pell et al., 2008; and Valente et al., 2007

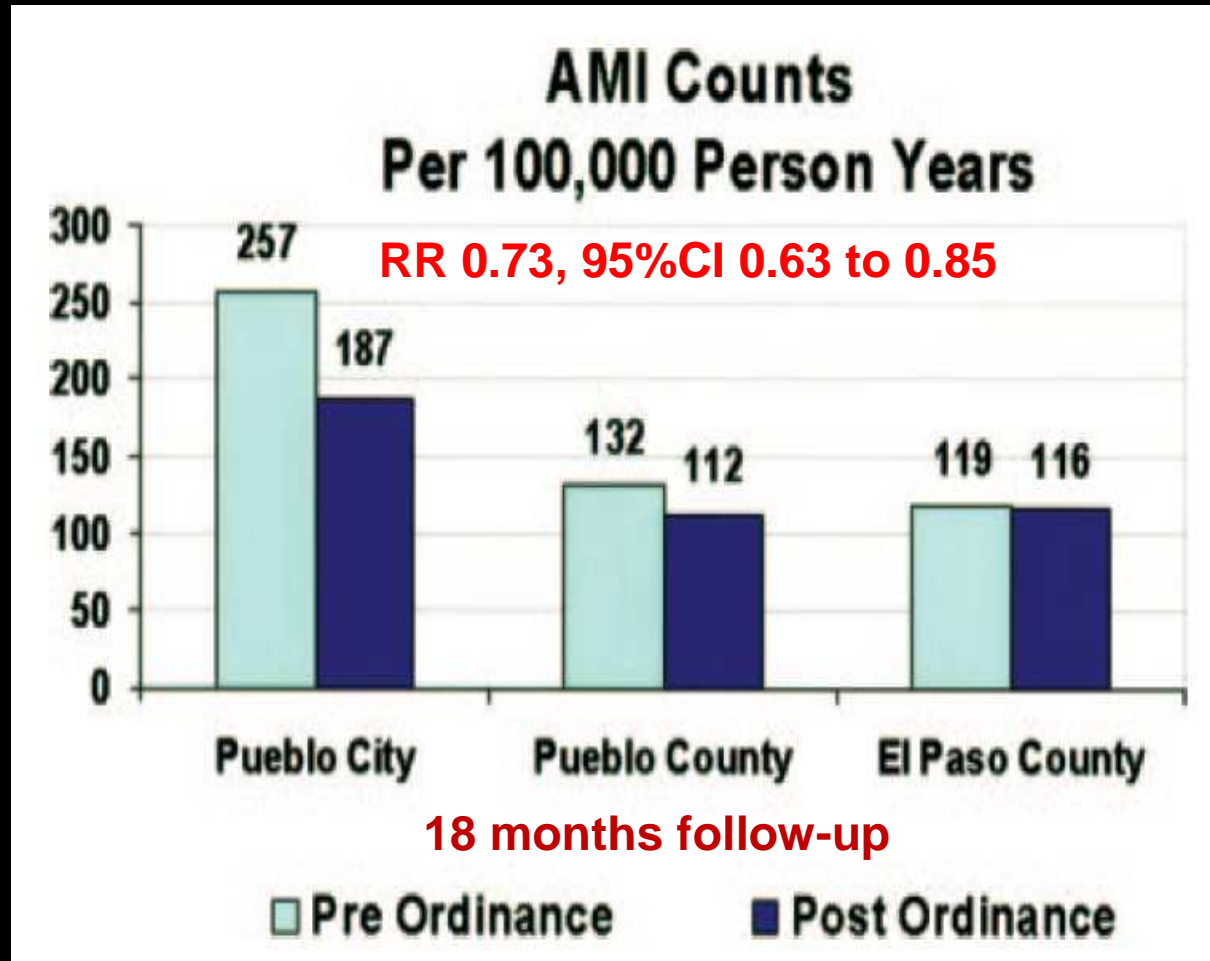
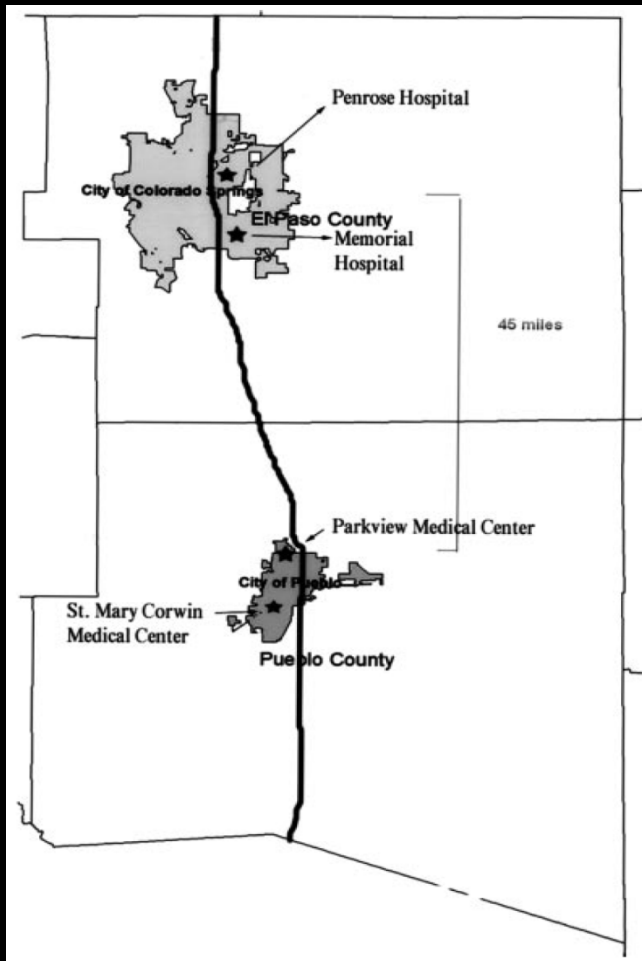
# Characteristics of Smoking Bans Assessed in Key Surveillance Studies

Location	References <sup>a</sup>	Effective Date	Restaurants	Bars
Helena, Montana <sup>b</sup>	Sargent et al., 2004	6/05/2002	✓	✓
Italy	Barone-Adesi, 2006; Cesaroni et al., 2008; Vasselli et al., 2008	1/10/2005	✓	✓
Pueblo, Colorado	Bartecchi et al., 2006; CDC, 2009	7/01/2003	✓	✓
Monroe County, Indiana	Seo and Torabi, 2007	8/01/2003	✓	✓ (effective)
Bowling Green, Ohio	Khuder et al., 2007	03/2002	✓ (except isolated bar, isolated smoking area)	Bars at discretion
New York state <sup>c</sup>	Juster et al., 2007	7/24/2003	✓	✓
Saskatoon, Canada	Lemstra et al., 2008	7/01/2004	✓	✓
Scotland <sup>d</sup>	Pell et al., 2008	03/2006	✓	✓

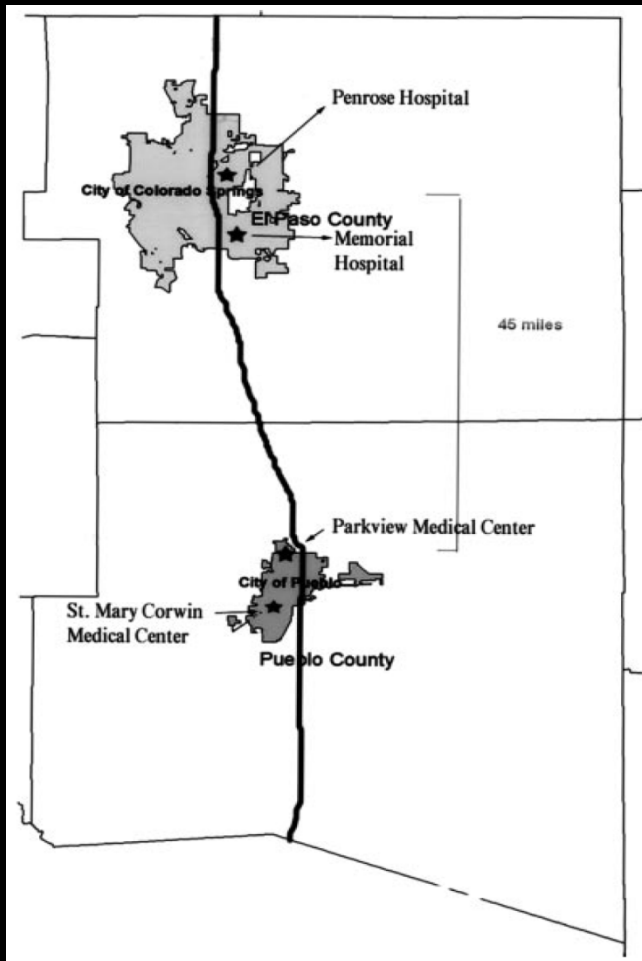


**Secondhand Smoke Exposure and Cardiovascular Effects: Making Sense of the Evidence. National Academy of Sciences 2010.**

# Reduction in the Incidence of Acute Myocardial Infarction after a Citywide Smoking Ordinance



# Reduction in the Incidence of Acute Myocardial Infarction after a Citywide Smoking Ordinance



## A public smoking ban drastically cut heart attacks.

Pueblo, Colorado banned smoking in work places and all public areas in July 2003. The number of people hospitalized for heart attacks dropped 41 percent in 3 years.

**257 heart attacks per 100,000**



**187 heart attacks per 100,000**



**152 heart attacks per 100,000**



Smoking ban

January 2002 - June 2003

July 2003 - December 2004

January 2005 - June 2006

**18-36 months follow-up**  
**41% decrease**  
**(RR, 0.59; 95% CI, 0.49–0.70)**

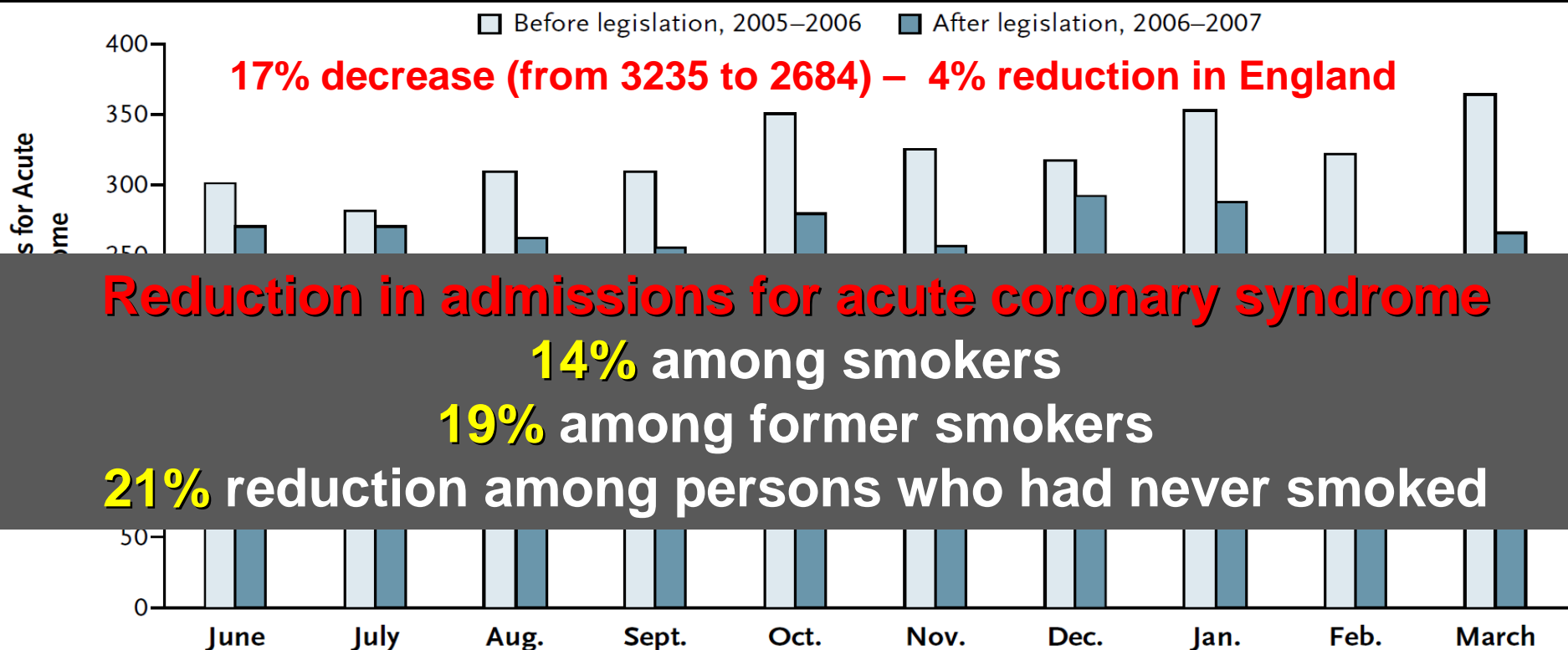
# Effect of the Italian Smoking Ban on Population Rates of Acute Coronary Events

Year	35–64 y*				65–74 y†				75–84 y*			
	n	Rate (×1000)	RR	95% CI	n	Rate (×1000)	RR	95% CI	n	Rate (×1000)	RR	95% CI
2000	2433	2.05	1.00	...	2093	7.30	1.00	...	1783	11.44	1.00	...
2001	2363	1.98	0.97	0.92–1.03	2131	7.33	1.02	0.96–1.09	1922	11.91	1.06	1.00–1.13
2002	2538	2.13	1.04	0.98–1.10	2239	7.66	1.08	1.01–1.14	2158	12.69	1.15	1.08–1.22
2003	2324	1.95	0.96	0.91–1.02	2336	7.86	1.12	1.06–1.19	2365	13.15	1.20	1.13–1.28
2004	2281	1.92	0.92	0.87–0.98	2227	7.39	1.03	0.97–1.10	2382	12.65	1.15	1.08–1.22
2005	2136	1.80	0.87	0.82–0.92	2126	6.95	0.97	0.91–1.03	2477	12.59	1.15	1.08–1.23
Post-smoking ban (2005) vs pre-smoking ban (2000–2004)	...	...	0.89	0.85–0.93	...	...	0.92	0.88–0.97	...	...	1.02	0.98–1.07

## Age-standardized rate ratios

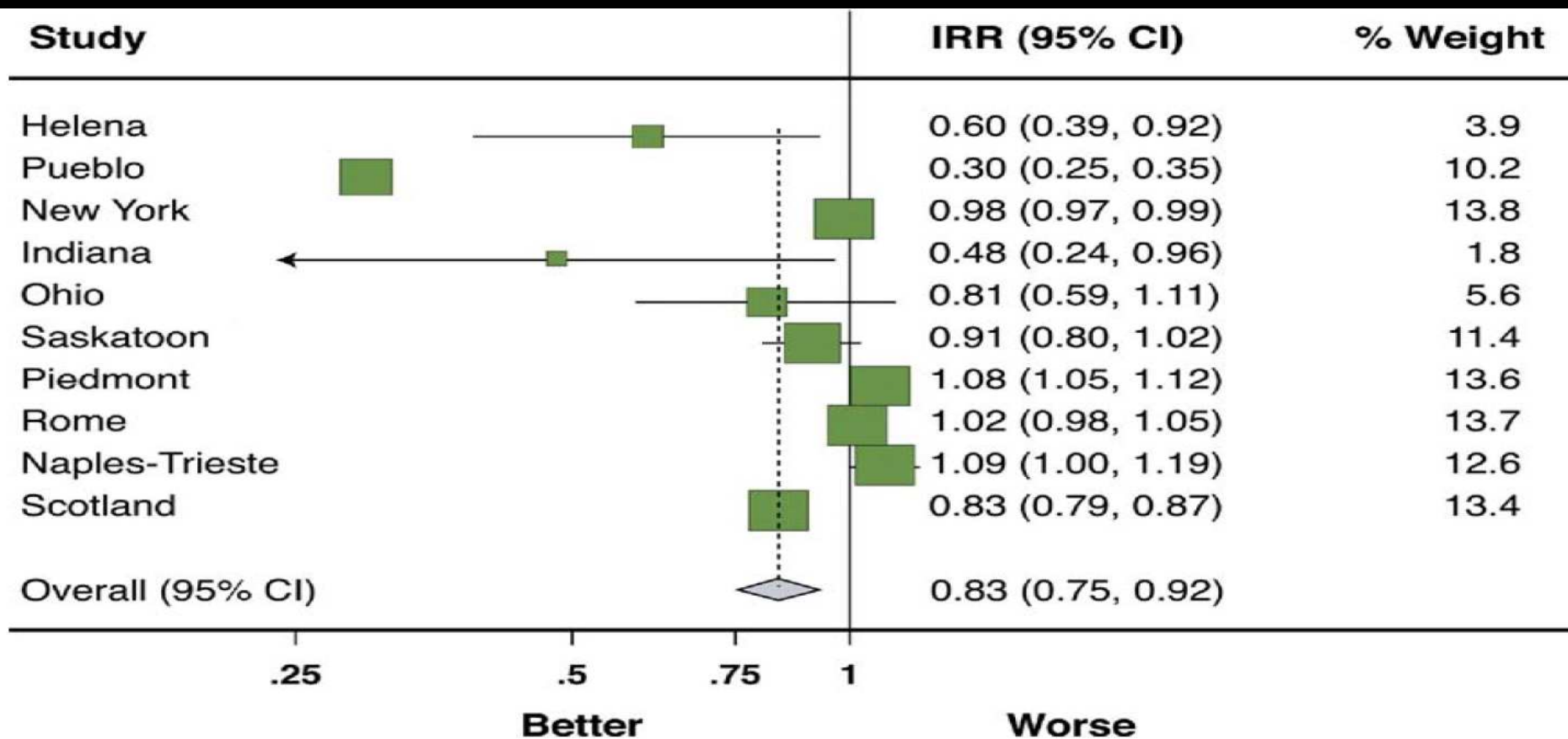
The reduction tended to be greater in men and in lower socioeconomic groups

# Smoke-free Legislation and Hospitalizations for Acute Coronary Syndrome in Scotland



Persons who had never smoked reported a decrease in the weekly duration of exposure to secondhand smoke ( $p < 0.001$ ) that was confirmed by a decrease in concentration of serum cotinine from 0.68 to 0.56 ng per milliliter ( $p < 0.001$ )

# Effects of Community Smoking Bans on Incident Acute Myocardial Infarction



Meta-analysis results for 11 studies in 10 geographic locations  
 CI: confidence interval; IRR: incidence rate ratio

# Παθητικό Κάπνισμα και Καρδιαγγειακά Νοσήματα

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- Μετά τη διακοπή της έκθεσης
- Γιατί συζητάμε ακόμα;

## **Countries with comprehensive legislation that prohibits smoking in enclosed public areas**



**this protects approximately 226 million people, which only represents 3.4% of the world's total population**



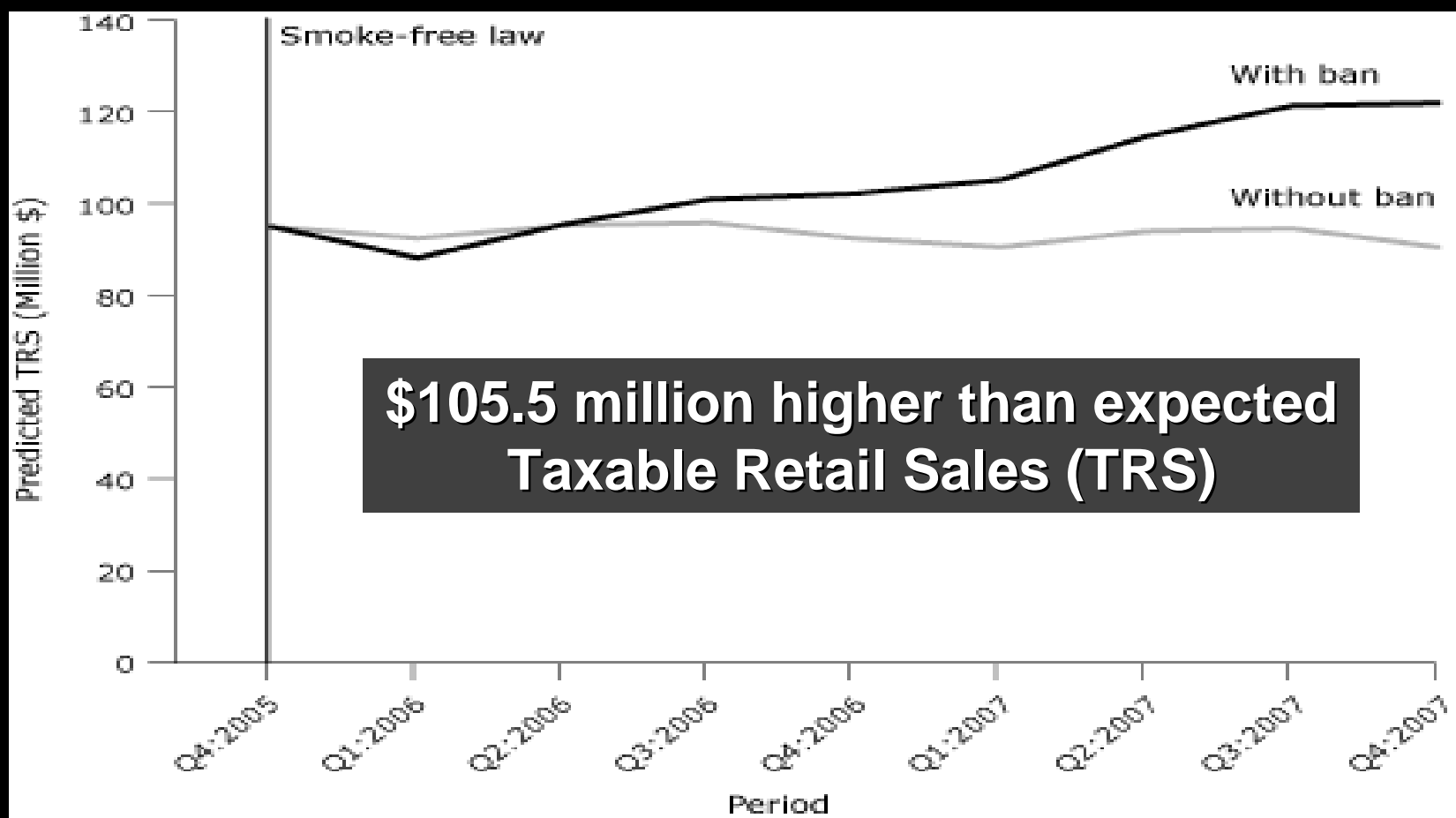
# Secondhand Smoke Exposure

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- **There is no risk-free level of exposure to tobacco smoke**

**U.S. Department of Health and Human Services. The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006**

# Smoke-Free Law Associated With Higher-Than-Expected Taxable Retail Sales



## Bars and Taverns in Washington State

**"Knowing is not enough; we must apply.  
Willing is not enough; we must do."**

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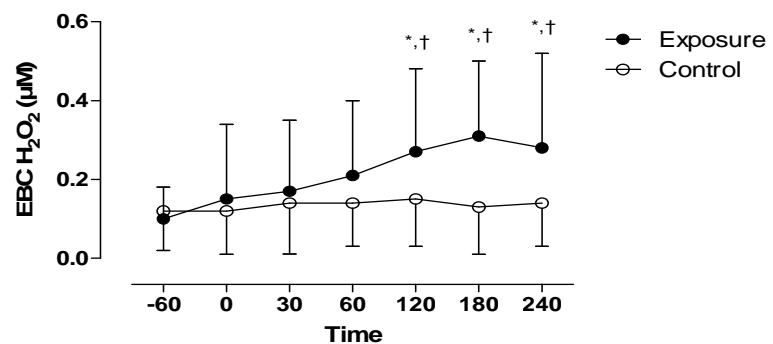
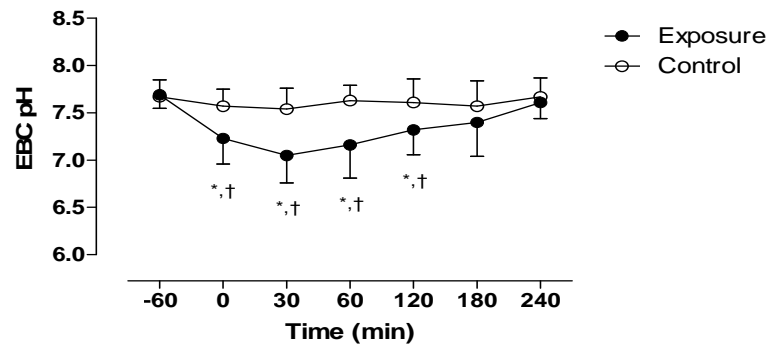
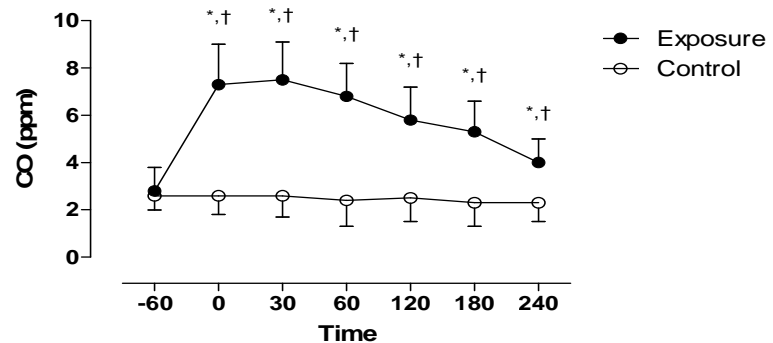
**GOETHE**

# Steven Paul Jobs

(February 24, 1955 - October 5, 2011)



# SECONDHAND SMOKE EXPOSURE ACUTELY INDUCES AIRWAY ACIDIFICATION AND OXIDATIVE STRESS IN NEVER-SMOKERS (Kostikas K, Minas M et al. *submitted*)



*In memoriam*

**Mark Minas**

17/03/1983 - 07/11/2011