



"Fins on cal arribar per
reduir la contaminació
atmosfèrica?"

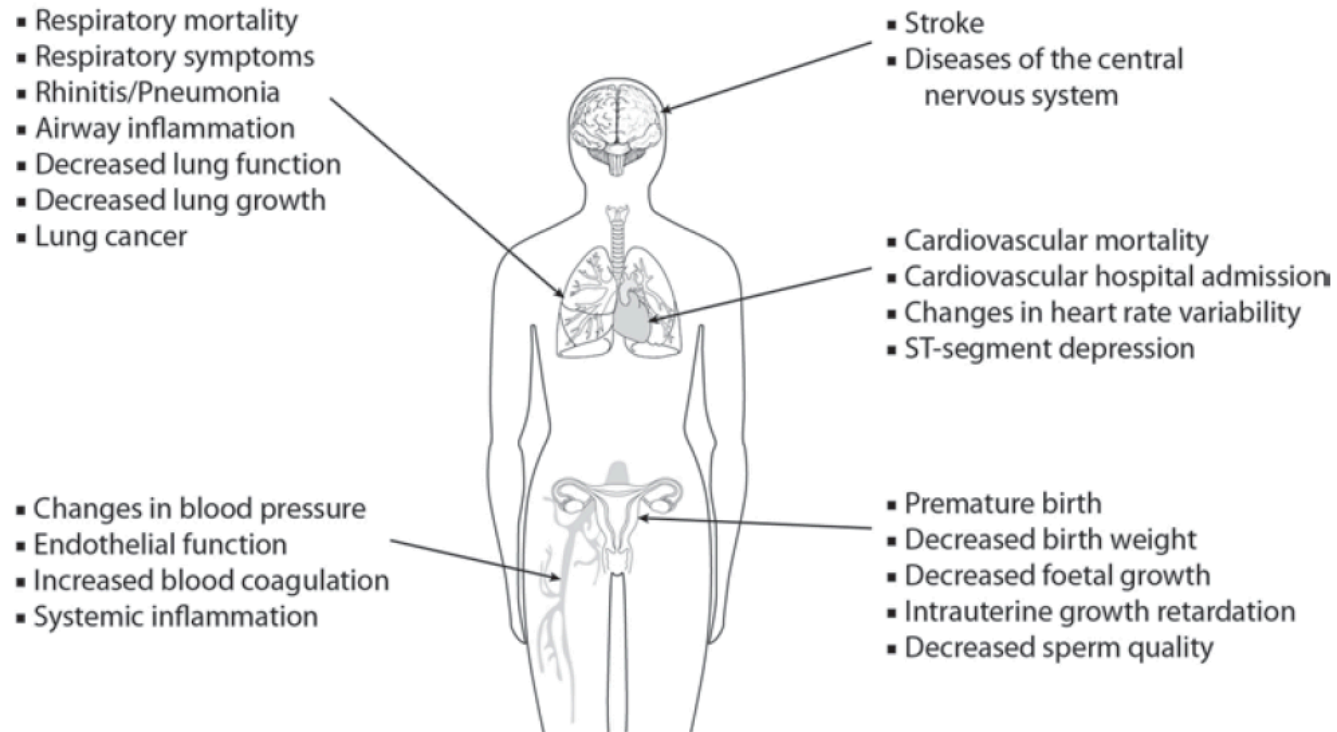
Contaminació i Malaltia

Barcelona, 21 de maig de 2013

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Malalties lligades a la contaminació atmosfèrica

Suppl):S8-S13).



Grau d'evidència de la relació entre contaminació i malalties

	Estudis exposició puntual	Estudis exposició continuada
Mortalitat	↑ ↑ ↑	↑ ↑
Malaltia Cardio-Vascular	↑ ↑ ↑	↑ ↑ ↑
Malalties Respiratòries	↑ ↑ ↑	↑ ↑
Hipertensió	↑ ↑ ↑	
Càncer de pulmó		↑ ↑
Hospitalitzacions	↑ ↑ ↑	↑ ↑
Prematur/pes al néixer	↑ ↑	

Mortalitat

Table 3
Population and annual average concentration of TSP, SO₂ and NO₂ in different megacities (Source: Gurjar et al., 2008).

Megacities in 2000	Population × 1000	TSP (µg m ⁻³)	SO ₂ (µg m ⁻³)	NO ₂ (µg m ⁻³)
Tokyo	34,000	40	19	55
Mexico city	18,500	201	47	56
New York	18,000	27	22	63
Sao Paulo	17,500	53	18	47
Mumbai (Bombay)	16,000	243	19	43
Kolkata (Calcutta)	13,500	312	19	37
Shanghai	13,000	246	53	73
Buenos Aires	12,500	185	20	20
Delhi	12,000	405	18	36
Los Angeles (long beach- Santa-ana)	11,500	39	9	66
Osaka-Kobe	11,500	34	19	45
Jakarta	11,000	271	35	120
Beijing	11,000	377	90	122
Rio de Janeiro	11,000	139	15	60
Cairo	10,500	593	37	59
Dhaka	10,000	516	120	83
Moscow	10,000	150	15	170
Karachi	10,000	668	13	30

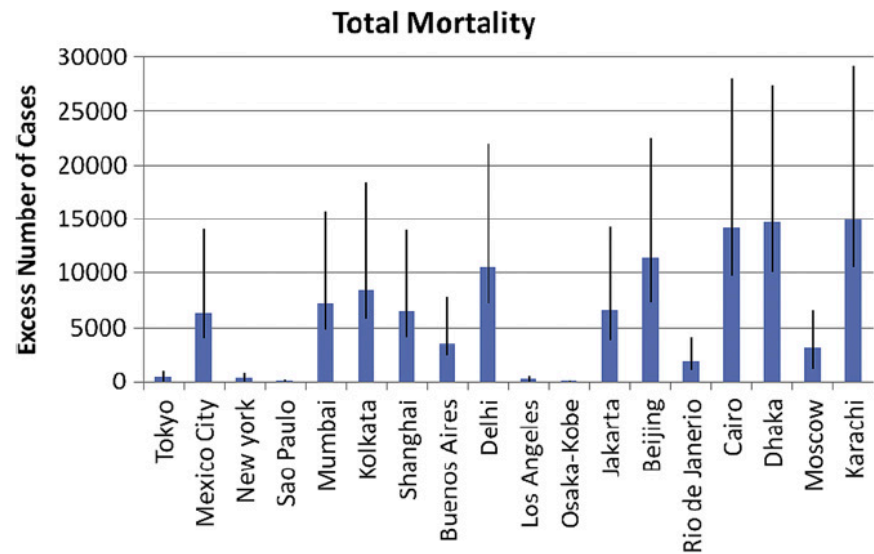
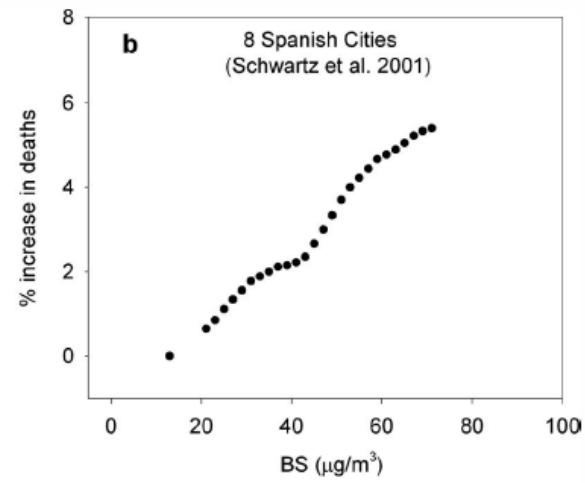
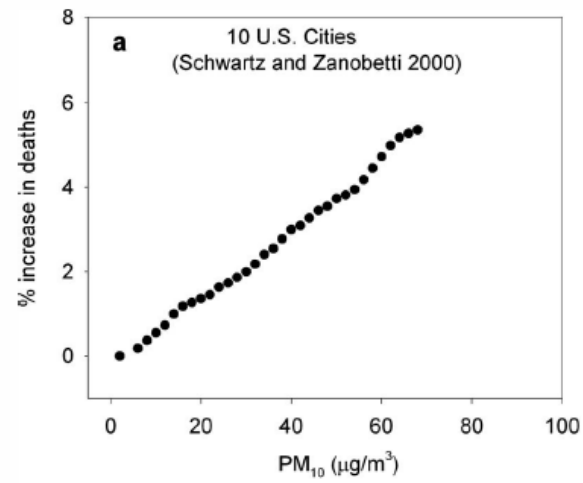
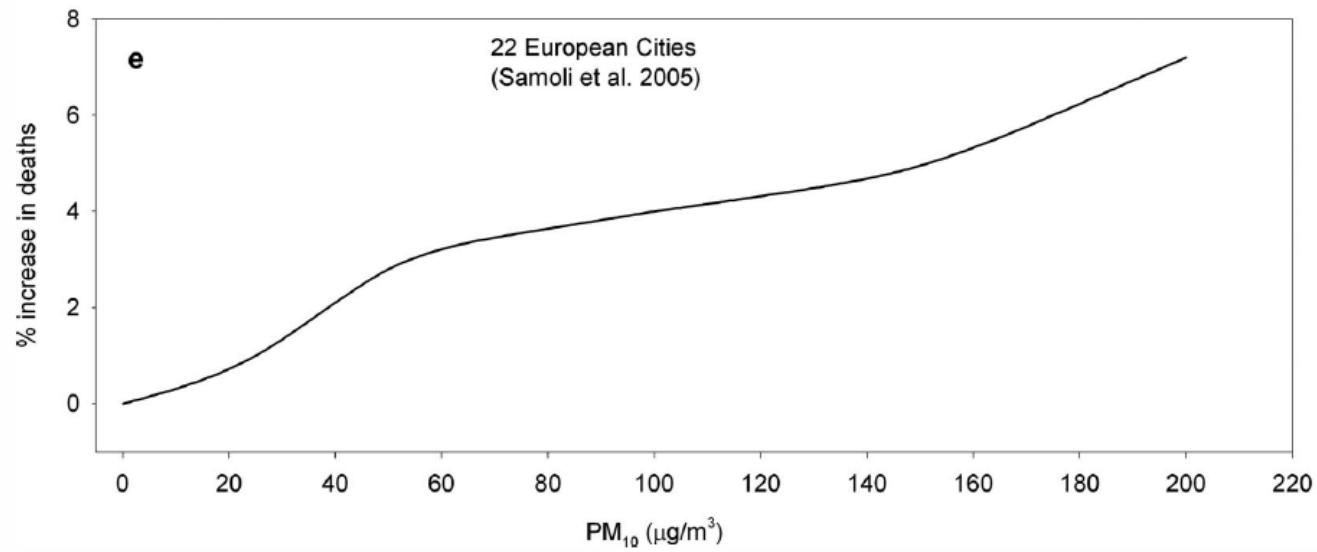


Fig. 3. Excess number of cases 'ΔN(c)' of total mortality/year representative of the late 1990s/2000.

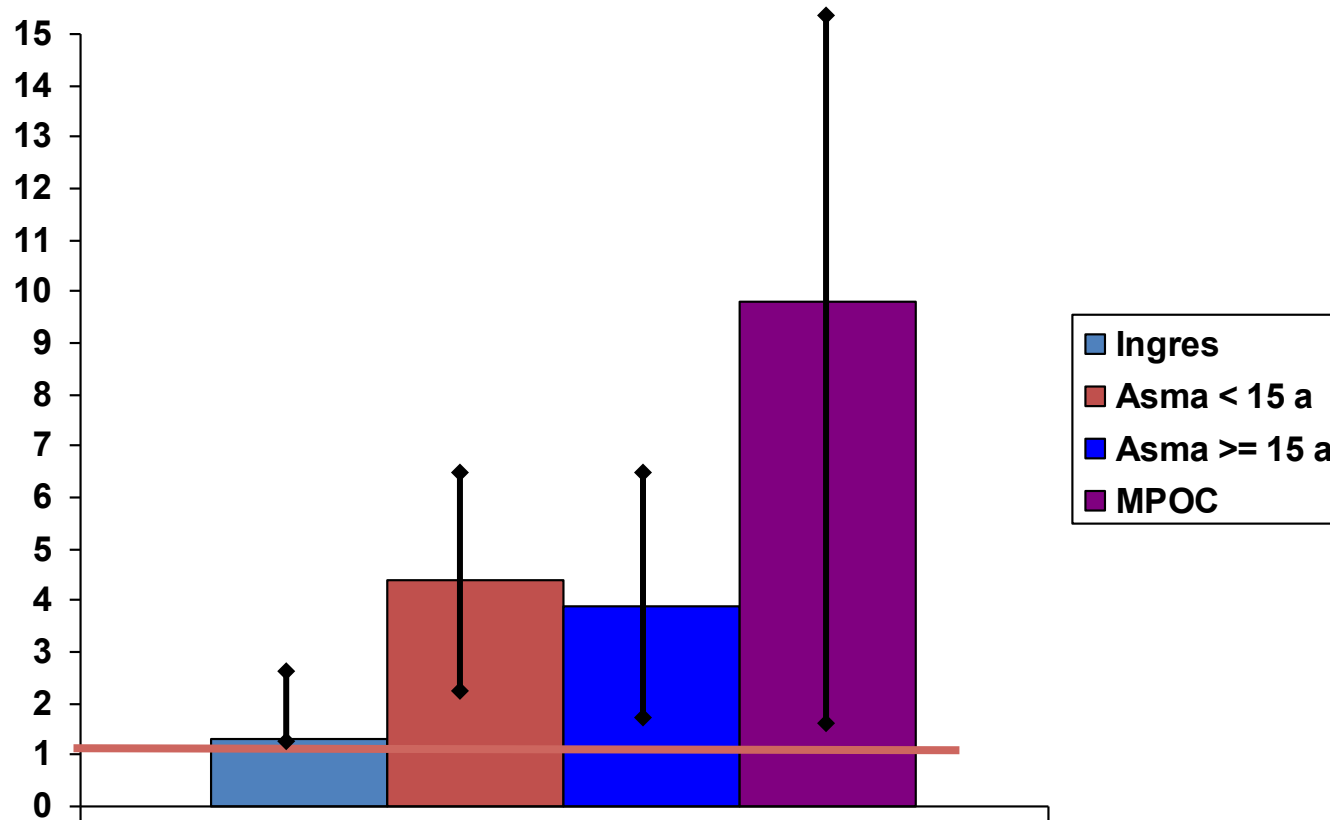
a high level of NO₂ in the atmosphere, and in several megacities the

Mortalitat



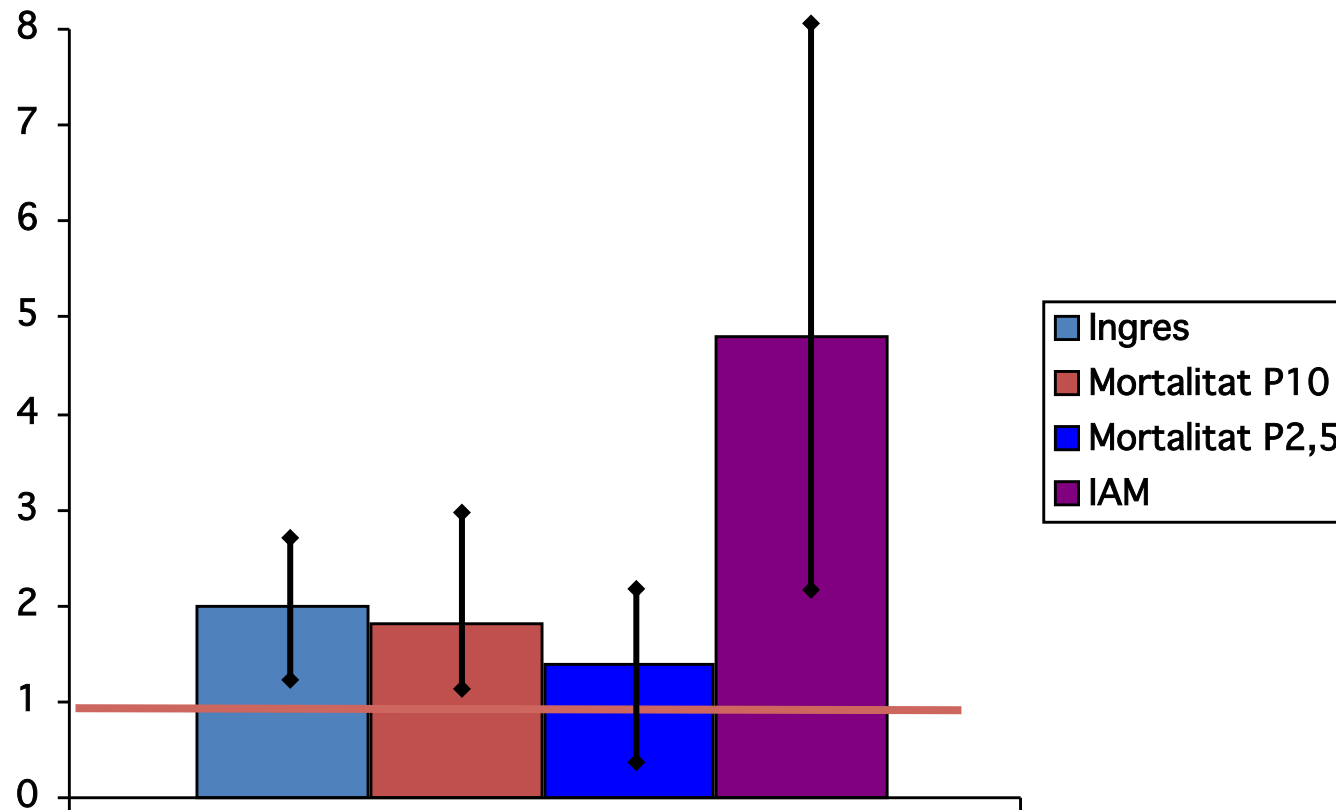
Malalties Respiratòries

Increment de risc per increment de 10 mcg/m³ de PM10

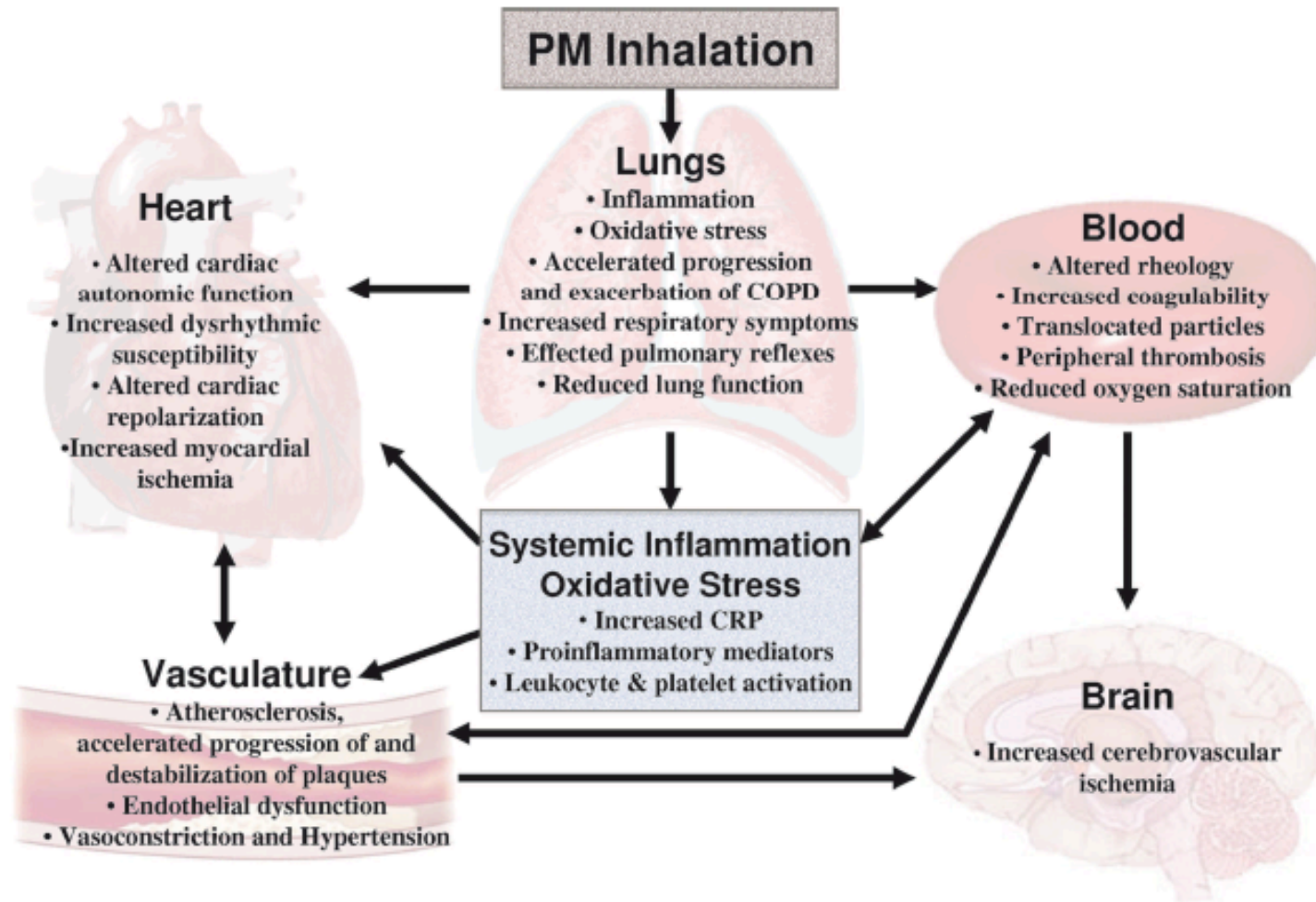


Malalties Cardiovasculars

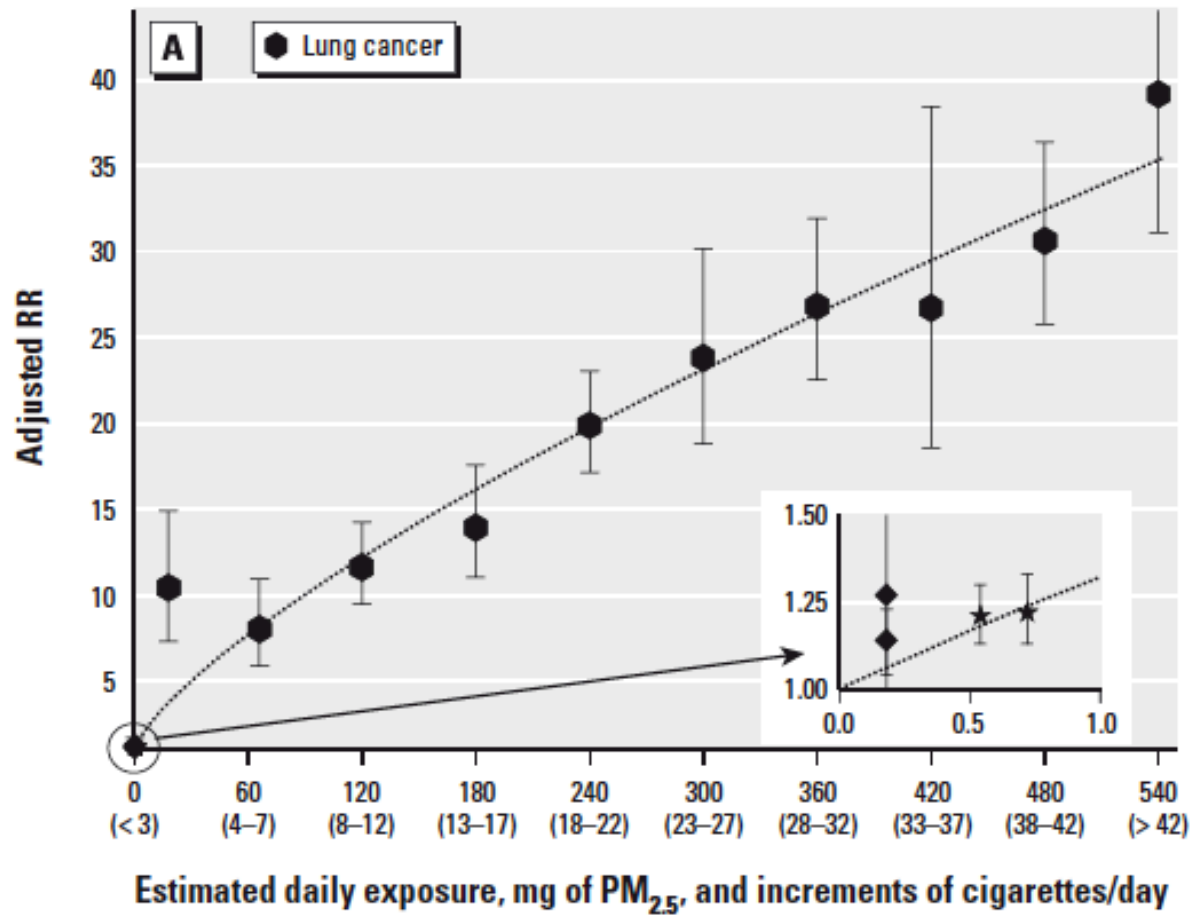
Increment de risc per increment de 20 mcg/m³ de PM10 i 10 mcg/m³ de P2.5



Mecanisme



Càncer de Pulmó

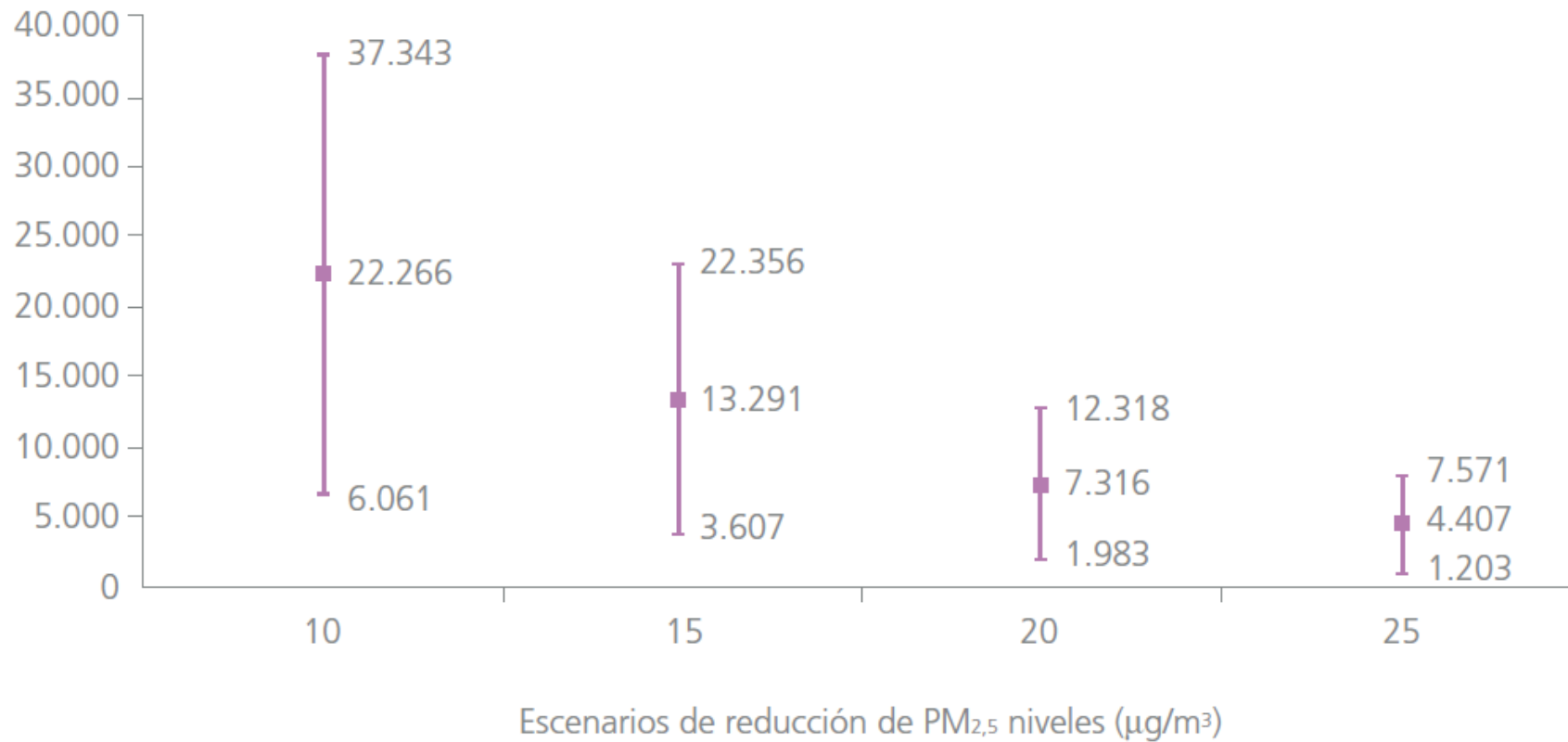


Font: Pope et al *Environ Health Perspect* 119:1616–1621 (2011).

Càncer de Pulmó

Air pollution indicator	Smoking status	
	Nonsmoker	Present smoker
NO _x concentration (µg/m ³) ^{b,c}		
< 17.2	1.00	1.00
17.2–21.8	1.07 (0.59–1.94)	1.09 (0.82–1.45)
21.8–29.7	0.83 (0.46–1.51)	0.95 (0.73–1.23)
> 29.7	1.91 (1.10–3.30)	1.21 (0.95–1.45)
Linear trend per 100 µg/m ³	1.51 (0.72–3.16)	1.02 (0.71–1.46)
p-Value for interaction ^d	0.34	
Major road ^e within 50 m		
No	1.00	1.00
Yes	1.83 (1.04–3.23)	1.12 (0.85–1.47)
Traffic load within 200 m (10 ³ vehicle km/day)		
< 0.88	1.00	1.00
0.88–2.61	1.22 (0.70–2.13)	0.93 (0.70–1.23)
2.61–6.73	0.91 (0.50–1.65)	1.08 (0.82–1.40)
> 6.73	1.20 (0.69–2.09)	1.15 (0.89–1.49)
Linear trend per 10 ⁴ vehicle km/day	1.21 (0.88–1.67)	1.00 (0.86–1.16)
p-Value for interaction ^d	0.30	

Morts evitables a 23 ciutats Europees



• Fuente: *Ballester F et al. ISEE-ISEA*

Cost

alisation cost per patient.

Total costs related to hospitalisation (€ 2005)	
Circulatory system	Respiratory system
3977	3201
5032	4814
3777	3777
3395	2425
703	618
5366	3526
3873	4024
587	511
2649	2248
3664	3189
3177	3177
9268	6504
4411	3840

ex 7, cost/bed/day corr.

n OECD (2010).

Table 2

Average length of stay, average cost per day and total hospitalisation cost per patient.

Country	Average length of stay in days in 2005 ^a		Average cost per day (€ 2005)		Total costs related to hospitalisation (€ 2005)	
	Circulatory system	Respiratory system	Hosp. all causes ^b	Work loss ^c	Circulatory system	Respiratory system
Austria	8.2	6.6	319	83	3977	3201
Belgium	9.2	8.8	351	98	5032	4814
France	7.1	7.1	366	83	3777	3777
Greece	7.0	5.0	389	48	3395	2425
Hungary	7.4	6.5	59	18	703	618
Ireland	10.5	6.9	349	81	5366	3526
Italy	7.7	8.0	379	62	3873	4024
Romania	8.5 ^d	7.4 ^d	57	6	587	511
Slovenia	8.6	7.3	240	34	2649	2248
Spain	8.5	7.4	321	55	3664	3189
Sweden	6	5.2	427	92	3666	3177
United Kingdom	11.4	8.0	581	116	9268	6504
Mean ^d	8.5	7.4	373	73	4411	3840

^a OECD (2010).

^b Commission of the European Communities (2008)), annex 7, cost/bed/day corr.

^c Eurostat (2003).

^d Population-weighted average, 2005 population data from OECD (2010).

Table 2

Average length of stay

Country	Average length of stay in days
	Circulatory system
Austria	8.2
Belgium	9.2
France	7.1
Greece	7.0
Hungary	7.4
Ireland	10.5
Italy	7.7
Romania	8.5 ^d
Slovenia	8.6
Spain	8.5
Sweden	6
United Kingdom	11.4
Mean ^d	8.5

^a OECD (2010).

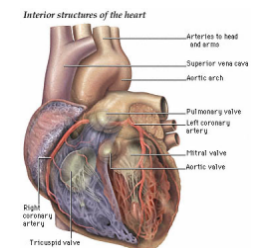
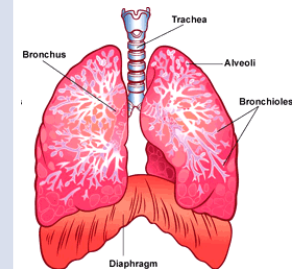
^b Commission of the

^c Eurostat (2003).

^d Population-weighted

Conclusions

Asma (aguditzacions)	PM _{2.5} SO ₂ NO ₂ O ₃
MPOC (aguditzacions,mortalitat) Càncer de Pulmó	PM ₁₀ SO ₂ NO ₂ PM _{2.5} NO ₂ ultrafines?
Cardiovascular (ingresos,mortalitat)	PM ₁₀ SO ₂ O ₃ PM _{2.5}



Moltes gràcies

