

Exposures to gases and fumes increase the mortality from pneumonia

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Welding



Welding and pneumonia

Registrar General UK 1949-53

70 obs/31 exp

Newhouse, 1985 Welders (n=1027)

Mortality 1940 - 1968

Pneumonia (ICD 480-486)

10 obs/5.4 exp

Coggon et al. Lancet 1994

Occupational mortality from pneumonia

1959 – 1963

1970 – 1972

Men in working age (15-64 yrs)

SMR (death rates from the general population)

Coggon et al. Lancet 1994

Standardised mortality ratios for pneumonia

	1959-63	1970-72
Welders, cutters	184	157
Foundry-workers	178	142
Unskilled foundry	248	361

Coggon et al. Lancet 1994

Mortality (PMR) for pneumonia

	Lobar	Broncho pneumonia
Welders, cutters	255	126
Foundry-workers	292	111



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Exposure to Metal Fume and Infectious Pneumonia

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TABLE 2. Association between pneumonia and occupational exposure to metal fume, West Midlands, England, 1996–1999

Timing of exposure	Men with pneumonia (<i>n</i> = 525)		Controls (<i>n</i> = 1,122)		All (no.)	Adjusted* OR†	95% CI‡
	No.	%	No.	%			
Never exposed	325	61.9	742	66.1	1,067	1	
Last exposed more than 1 year before the effective date‡	142	27.0	309	27.5	451	1.1	0.8, 1.4
Last exposed from 8 days to 1 year before the effective date	11	2.1	12	1.1	23	1.8	0.8, 4.2
Last exposed within 7 days of the effective date	47	9.0	59	5.3	106	1.6	1.0, 2.4

* Odds ratios were adjusted for age (in five bands), hospital center, smoking history, history of chronic airways disease, diabetes, childhood pneumonia, steroids in 3 months before the effective date, and influenza vaccination in the year before the effective date.

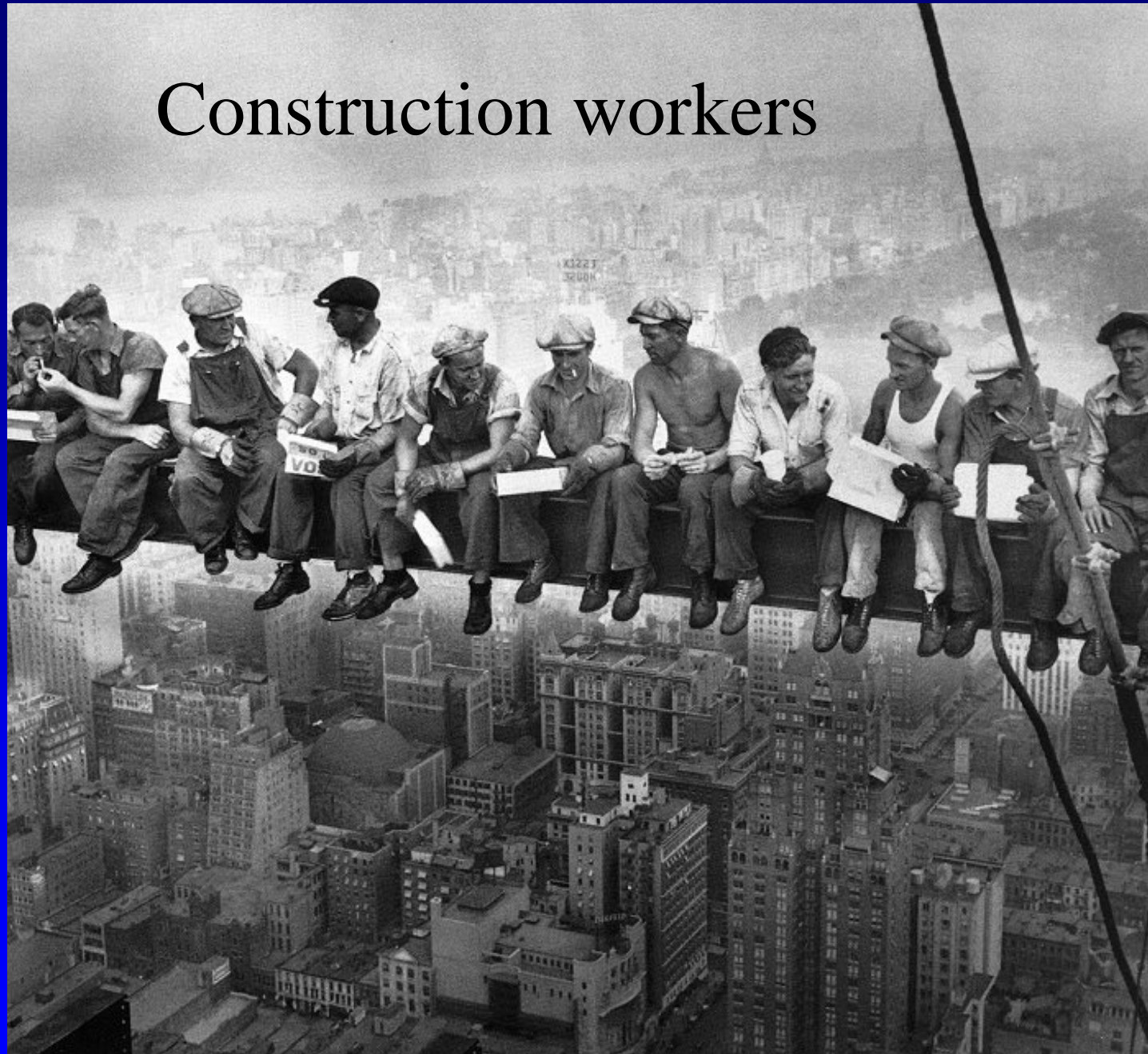
† OR, odds ratio; CI, confidence interval.

‡ Timings of all exposures were assessed relative to the effective date, that is, for cases, the day on which they had fallen ill; for controls, 6 months before the day of their admission.

Aim of the present study

To elucidate whether occupational exposure to gases, irritants or welding fumes increase the risk for pneumonia, especially lobar pneumonia

Construction workers



Construction worker



Large cohort of construction workers

Job exposure matrix (JEM)

Exposure medio 1970s

214 occupational codes

0 – 5

Level 3 corresponds to TLV in
middle of 1970s

Job exposure matrix (JEM)

Solvents

MMMMF

Diesel

Epoxy

Cement dust

Concrete dust

Welding fume

Asphalt smoke

Asbestos

Quartz

52,511 occupationally exposed to welding fumes, diesel exhausts, solvents and reactive chemicals

41,063 unexposed construction workers

Mortality 1971-2002

Pneumonia

ICD 9 480-483, 485-486, 487A

ICD 10 J10-J16, J18

Lobar pneumonia

ICD 481

ICD 10 J13, J18.1

Mortality 1971-2002

Internal control group

Standardised mortality rate ratios (SRR)

Stratifying for smoking, age (5 yrs), and hypertension

Mortality from pneumonia

	SRR (95% CI)	N
All pneumonia	1.7 (1.49-2.00)	218
Lobar pneumonia	5.7 (3.75-8.70)	20

Effect of Concentrated Ambient Particles on Macrophage Phagocytosis and Killing of *Streptococcus pneumoniae*

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Elevated levels of ambient air pollution increase the risk for hospital admission due to pneumonia

Alveolar macrophages

Soluble metals, especially iron, decreased the killing of *Streptococcus pneumoniae*

Conclusions

Occupational exposure to fumes and gases increases the risk for pneumonia, especially lobar pneumonia.

Iron particles in welding fume may inhibit the phagocytic activities of alveolar macrophages.

This may result in an overall diminished bacterial killing.