"AMIANTO: la prevenzione"

Il rischio di mesotelioma da esposizione ambientale ad amianto
Cosa possiamo dire oggi

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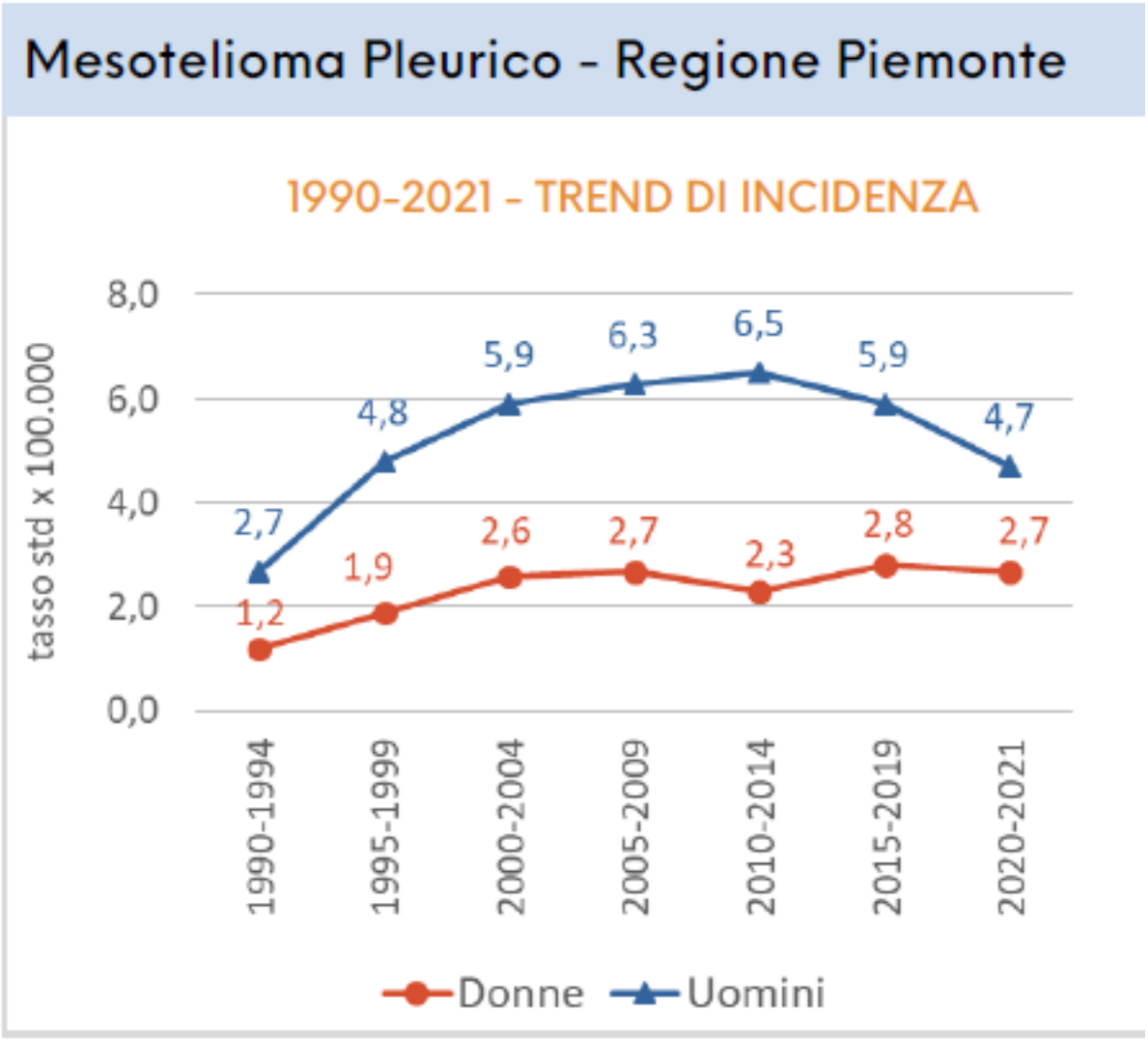
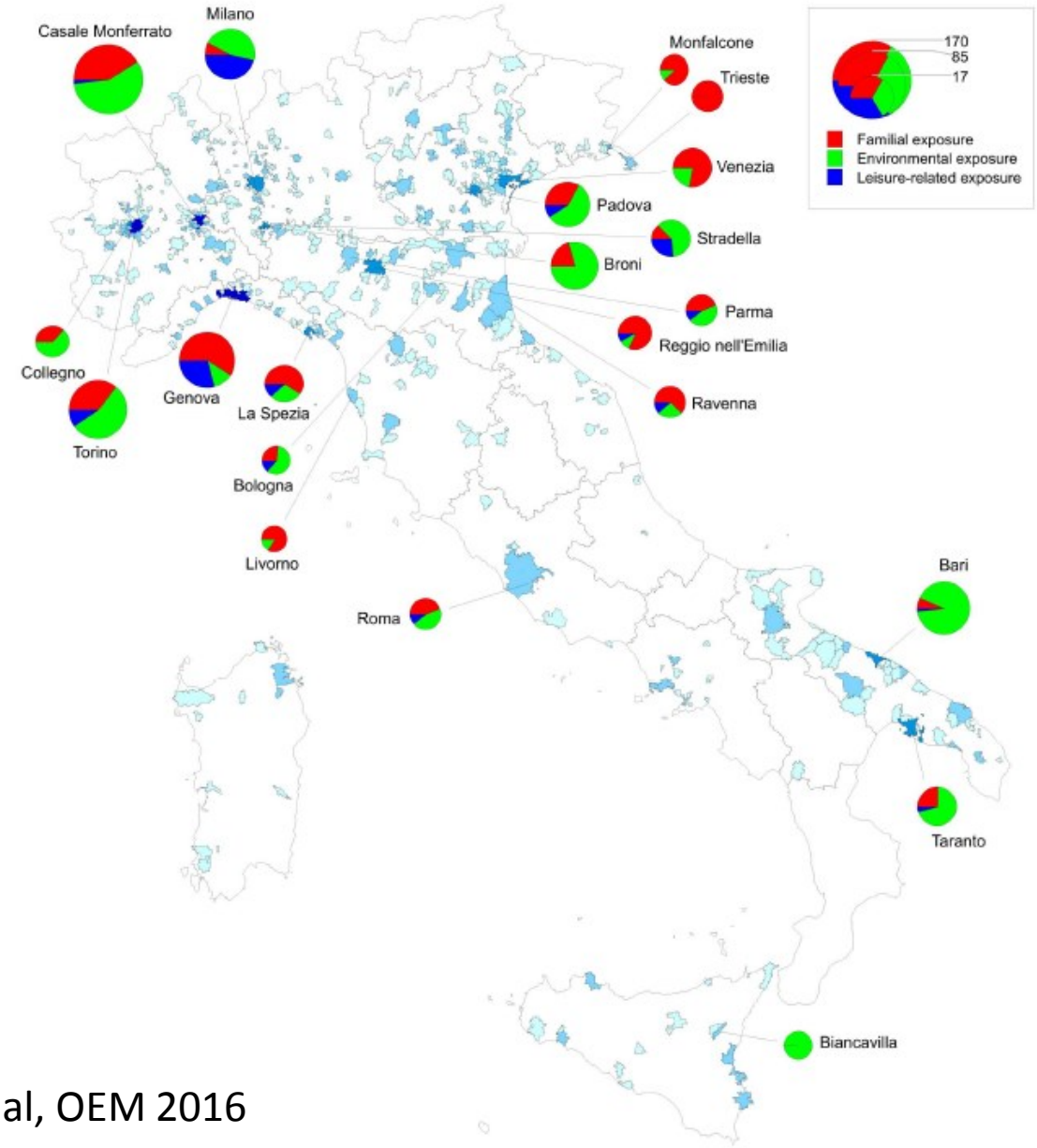
Università del Piemonte Orientale e Collegium Ramazzini

Anni ‘80 - 90

Anni 2000

Mesotelioma Pleurico - Regione Piemonte





Marinaccio et al, OEM 2016

Malignant mesothelioma (MM) cases in young (≤50 years old at diagnosis) and not young adults (>50 years) in the Italian national mesothelioma registry (ReNaM), Italy, 1993–2018

	MM cases (≤50 years old)		MM cases (>50 years old)	
	Observed	Expected	Observed	Expected
Occupational	497	700.6	16403	16199.3
Paraoccupational	85	52.4	1180	1212.6
Environmental	93	44.0	969	1018.0
Leisure activities related	26	15.3	343	353.7
Unknown, unlikely	302	202.3	4579	4678.7
Not defined	275	263.3	6076	6087.7
	1278		29550	

es in the hypothesis of independence.

Marinaccio A, *et al*. *Occup Environ Med* 2023;**80**:603–609. doi:10.1136/oemed-2023-1

Coorte delle mogli dei lavoratori Eternit

Mortalità nel 1965-2009

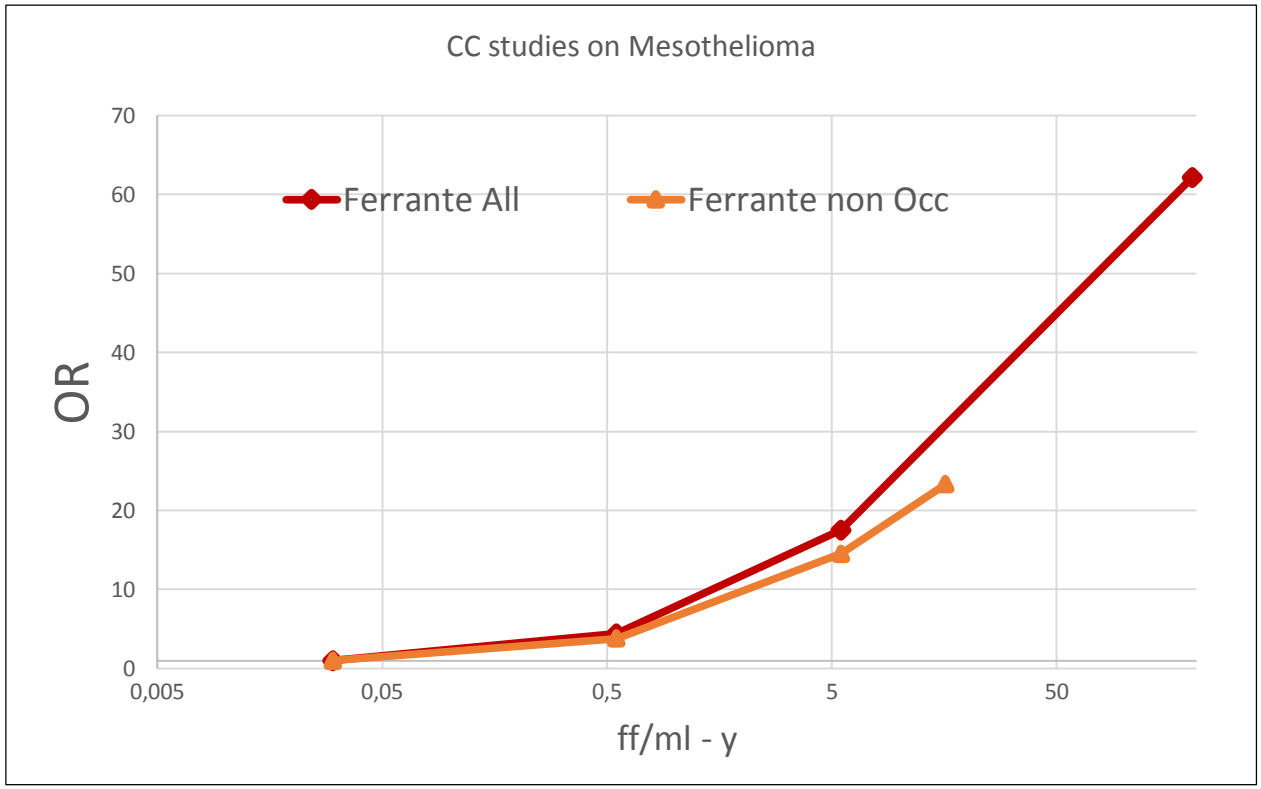
	OSS	SMR
MM peritoneo	3	1.43 (0.30-4.19)
MM pleura	36	18.11**(12.68-25.07)
MM polmone	23	1.39 (0.88-2.08)

Incidenza nel 1990-2008

	OBS	SIR	95%CI
TOT	14	18.56**	(10,15 – 31,14)

**p<0.01

Ferrante D e Magnani C. Com Pers



Ferrante et al, 2016

Type of exposure	Cases	Controls	OR[c] (95% CI)
Asbestos-cement (AC) roof	55 (30.5)	72 (21.2)	2.5 (1.4 to 4.5)
Use of utensils of asbestos material	39 (21.7)	86 (25.4)	1.2 (0.7 to 2.2)
Garden or courtyard pavement with AC tailings	16 (8.9)	12 (3.5)	3.6 (1.4 to 9.2)
AC buildings in the garden or courtyard	91 (50.5)	142 (41.9)	2.1 (1.2 to 3.4)
Any of the above categories	137 (76.1)	214 (63.1)	2.0 (1.2 to 3.2)
None of the above categories	43 (23.9)	125 (36.9)	1 (ref)

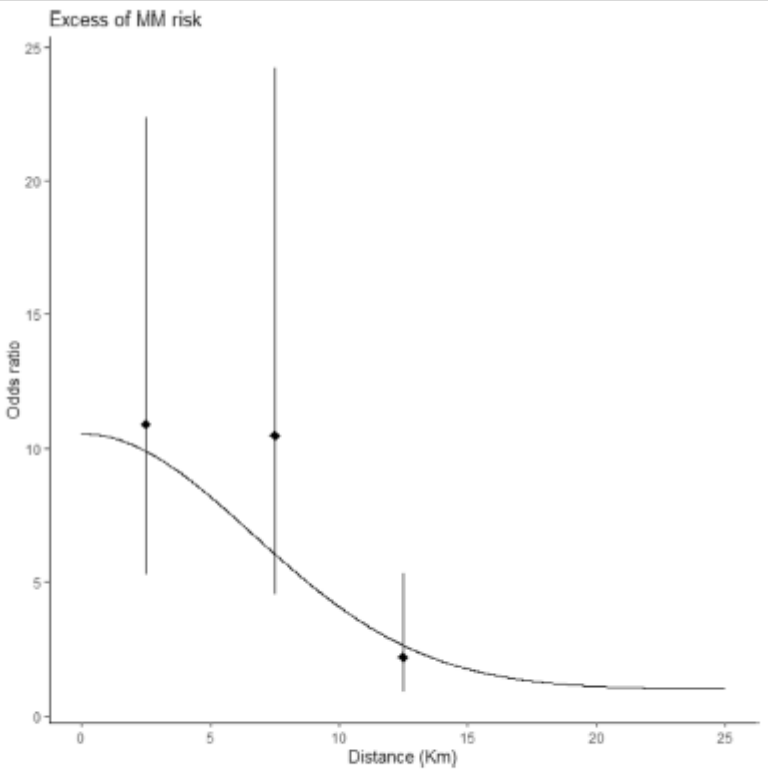
Ferrante et al, 2016

To cite: Dalsgaard SB, Würtz ET, Hansen J, *et al*. *Occup Environ Med* Epub ahead of print: [please include Day Month Year]. doi:10.1136/oemed-2018-105392

Table 3 Risk of malignant mesothelioma in relation to school attended near an asbestos cement plant

	Overall school	School A	School B	School C	School D
Cohort, n (%)	12 111	3792	2304	3134	3690
Distance from the asbestos plant, m		100	250	750	750
Mesothelioma HR (95% CI)*	7.15 (4.54 to 11.27)	8.21 (4.25 to 15.84)	10.65 (5.82 to 19.48)	7.71 (3.82 to 15.57)	6.07 (2.92 to

796 former pupils went to more than one school. They have been counted at each school attended and thereby counted more than once.
*Adjusted for occupational asbestos exposure and familial occupational asbestos exposure.



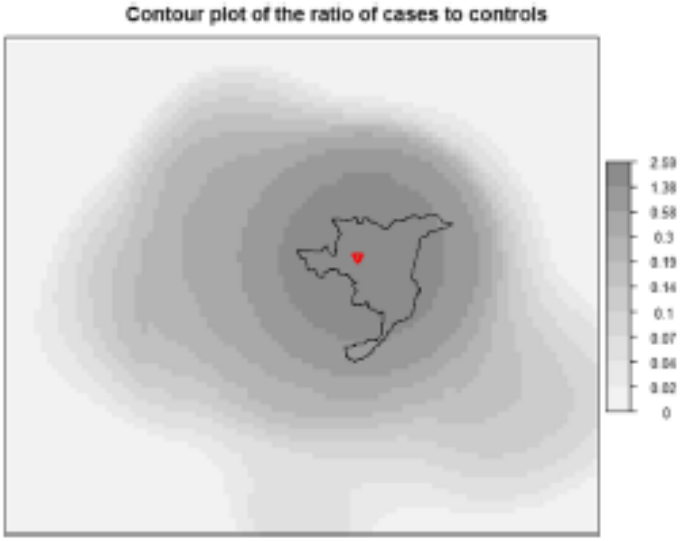


Fig. 4 Case control study on MM in Casale Monferrato area. Risk of MM of the pleura in Casale Monferrato in relation to the distance of individuals' longest-held residence (after exclusion of 20 years before the date of diagnosis) from the AC plant. Risk estimates are adjusted for age, sex, type of interview. Odds ratios and 95% confidence intervals estimated through the logistic model are represented by error bars while those estimated through the model with exponential decay of the risk by distance are shown as a smooth line

Airoldi *et al. Environ Health (2021) 20:103*

Residential Distance from Plant (*m*)	Estimated Population at Risk as of 1975	No. of Deceased in 1995–2006	SMR (*95% CI*)
Men			
0 to <300	4,213	7	13.9 (5.6–28.7)
300 to <600	17,963	12	5.6 (2.9–9.8)
600 to <900	28,259	7	2.1 (0.8–4.3)
900 to <1,200	27,891	4	1.2 (0.3–3.1)
1,200 to <1,500	32,568	5	1.3 (0.4–3.0)
Subtotal	110,894	35	2.6 (1.8–3.7)
Women			
0 to <300	4,175	6	41.4 (15.2–90.1)
300 to <600	17,804	7	11.3 (4.5–23.3)
600 to <900	28,010	7	7.2 (2.9–14.8)
900 to <1,200	27,646	8	8.3 (3.6–16.4)
1,200 to <1,500	32,280	10	8.9 (4.3–16.4)
Subtotal	109,915	38	9.9 (7.0–13.7)

STANDARDIZED MORTALITY RATIO OF 73 MESOTHELIOMA DEATHS BY SEX AND RESIDENTIAL DISTANCE FROM THE PLANT. Kurumatani et al Crit Care Med 2008

Table 4. Comparison of lung asbestos body count and fibre burden in the three groups of women with MPM and non-occupational exp
significant figures).

Asbestos exposure	*N*	Asbestos body count (fibres per gram) (GM/GSD)	Crude GM ratio	95% CI[a]	A
Group 1. Familial *Fincantieri*	7	6100 (9.6)	1.00	Reference	
Group 2. Familial + Environmental *Fibronit* - Broni	6	13 800 (10.4)	2.25	0.14–36.5	
Group 3. Environmental *Fibronit* - Broni	2	8400 (1.1)	1.37	0.03–70.7	
		Asbestos fibre count (millions of fibres per gram) (GM/GSD)			
Group 1. Familial *Fincantieri*	7	0.6 (2.1)	1.00	Reference	
Group 2. Familial + Environmental *Fibronit* - Broni	6	7.9 (2.1)	12.7	5.00–32.2	
Group 3. Environmental *Fibronit* - Broni	2	6.0 (2.3)	9.73	2.54–37.2	

Barbieri et al. *Annals of Work Exposures and Health*, 2020

Table 2 Necropsy cases in the hospital at Casale Monferrato (1985–8)

	Occupational exposure to asbestos	
	Yes	*No*
Subjects (n)	10	31
Asbestos fibres (total) (10^6 fibres/gdw):		
0	3	17
<0.5	2	14
0.5–<1	2	0
⩾1	3	0
Arithmetic mean	1.032	0.024
SD	1.222	0.032
Median	0.563	0.0
Asbestos bodies (light microscope)(AB/gdw):		
0	2	6
<500	0	12
500–1000	0	7
>1000	8	6
Arithmetic mean	96285	1064
SD	117662	1797
Median	45523	321

Magnani et al, 1998

La ricerca delle fonti di esposizione ambientale a volte è semplice e a volte no ma costituisce un elemento essenziale per condurre studi epidemiologici

«Complessivamente, dai dati oggi disposizione, la progressione delle bonifiche è di circa l'1% all'anno dell'amianto presente in Italia nel 1992. I dati riguardano ovviamente l'amianto rimosso legalmente, più difficile se non impossibile, risulta la stima delle rimozioni abusive. E' ragionevole pensare che a vent'anni dalla messa al bando restino ancora da bonificare circa i tre quarti del totale e con il ritmo che si è tenuto in venti anni siano necessari ancora 60 anni di lavoro.»

(Silvestri S. II conf naz Amianto, 2013)

Table 5. Average concentration of asbestos fibres (f/m³) in relation to type of area

Area	Concentration (f/m³)		Sampling sites with fibres concentrations below the limit of detection	
	arithmetic mean	95% CI	n	%
Standard	472	445–502	120	7.9
After hurricane	585*	403–850	1	2.5
Asbestos-cement plant vicinity	732**	527–1 016	7	7.8

SZESZENIA-DĄBROWSKA et al. IJOMEH 2012

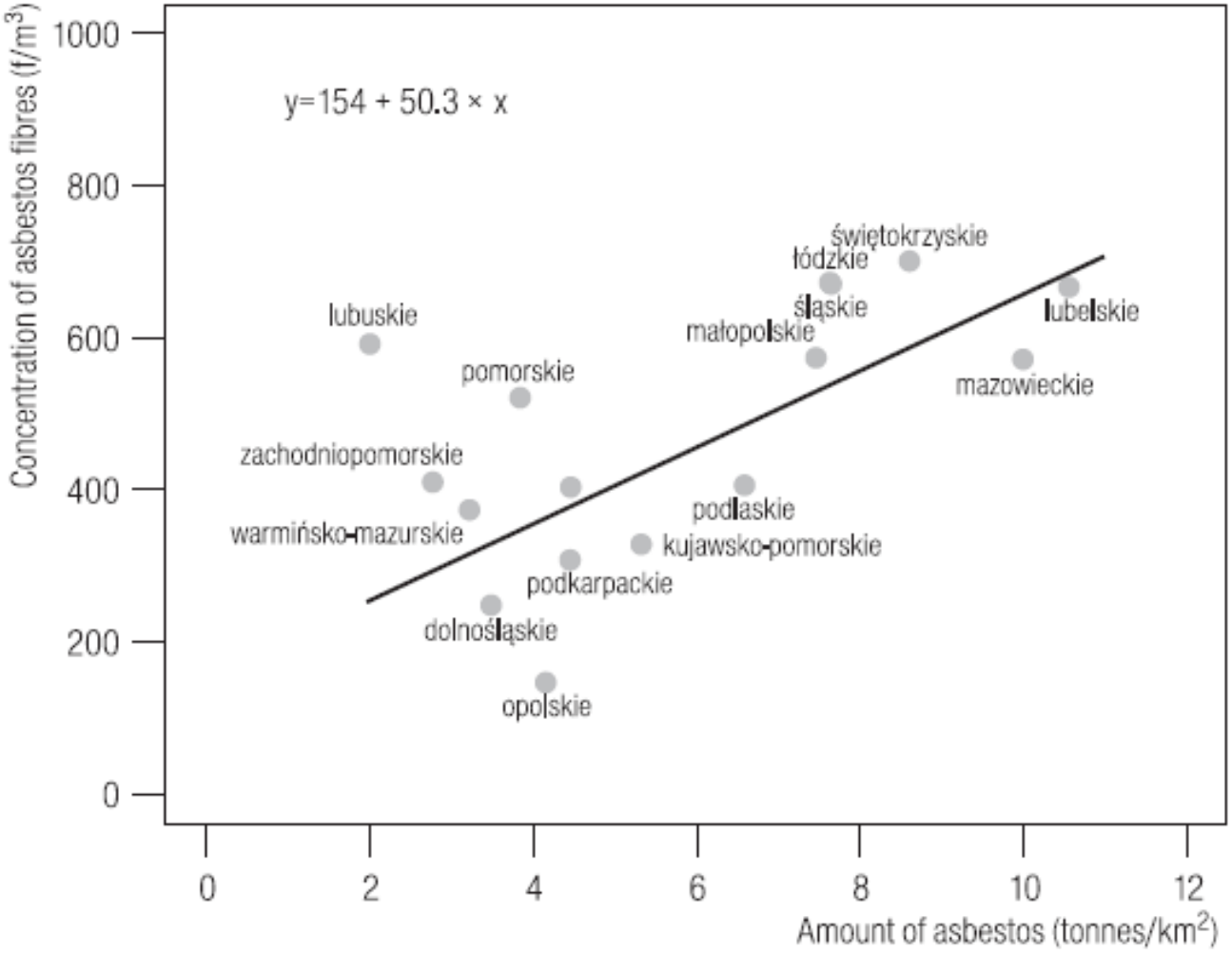


Fig. 5. Relationship between amount of asbestos in the installed building materials and concentration of asbestos fibres in the air by provinces

SZESZENIA-DĄBROWSKA et al. IJOMEH 2012

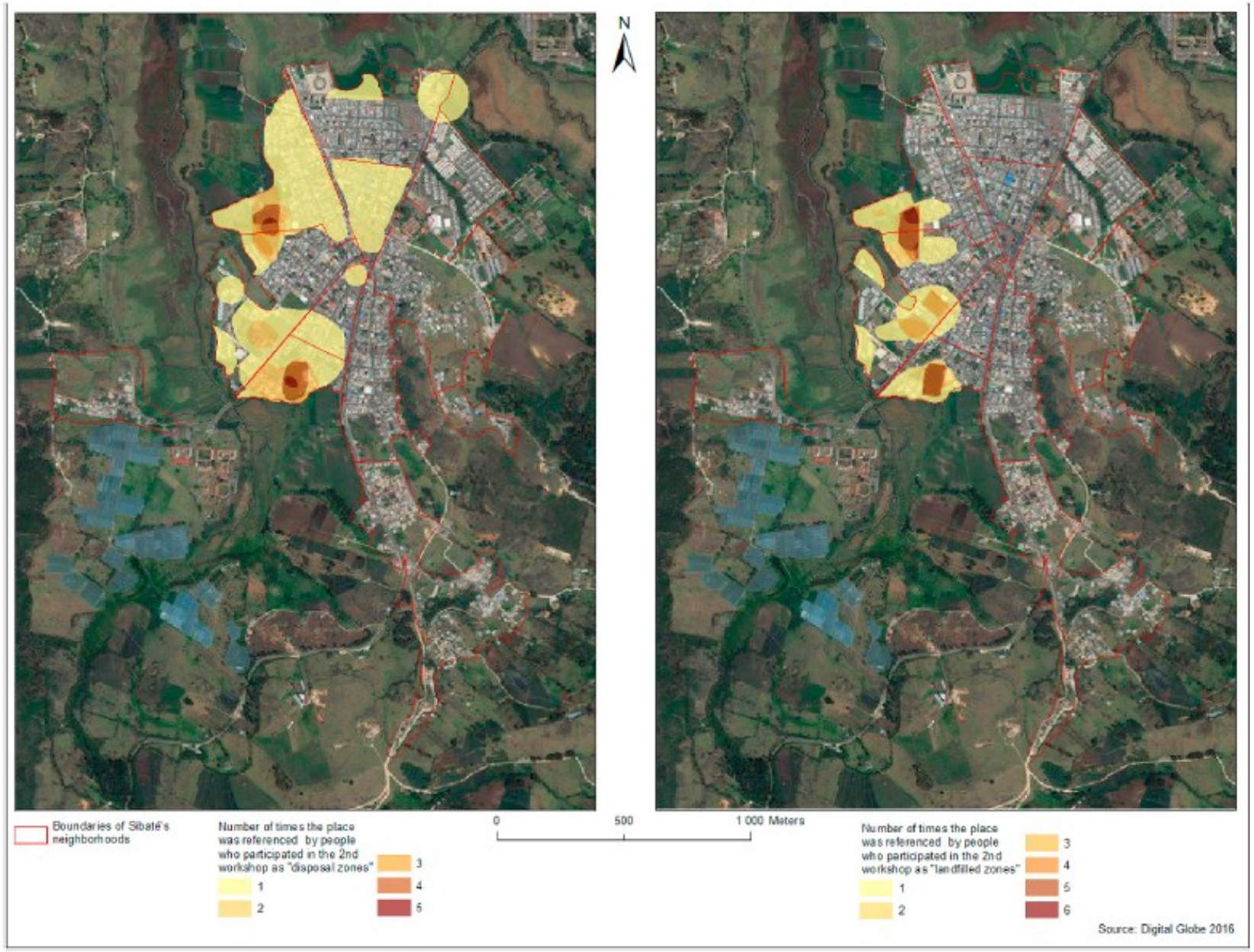


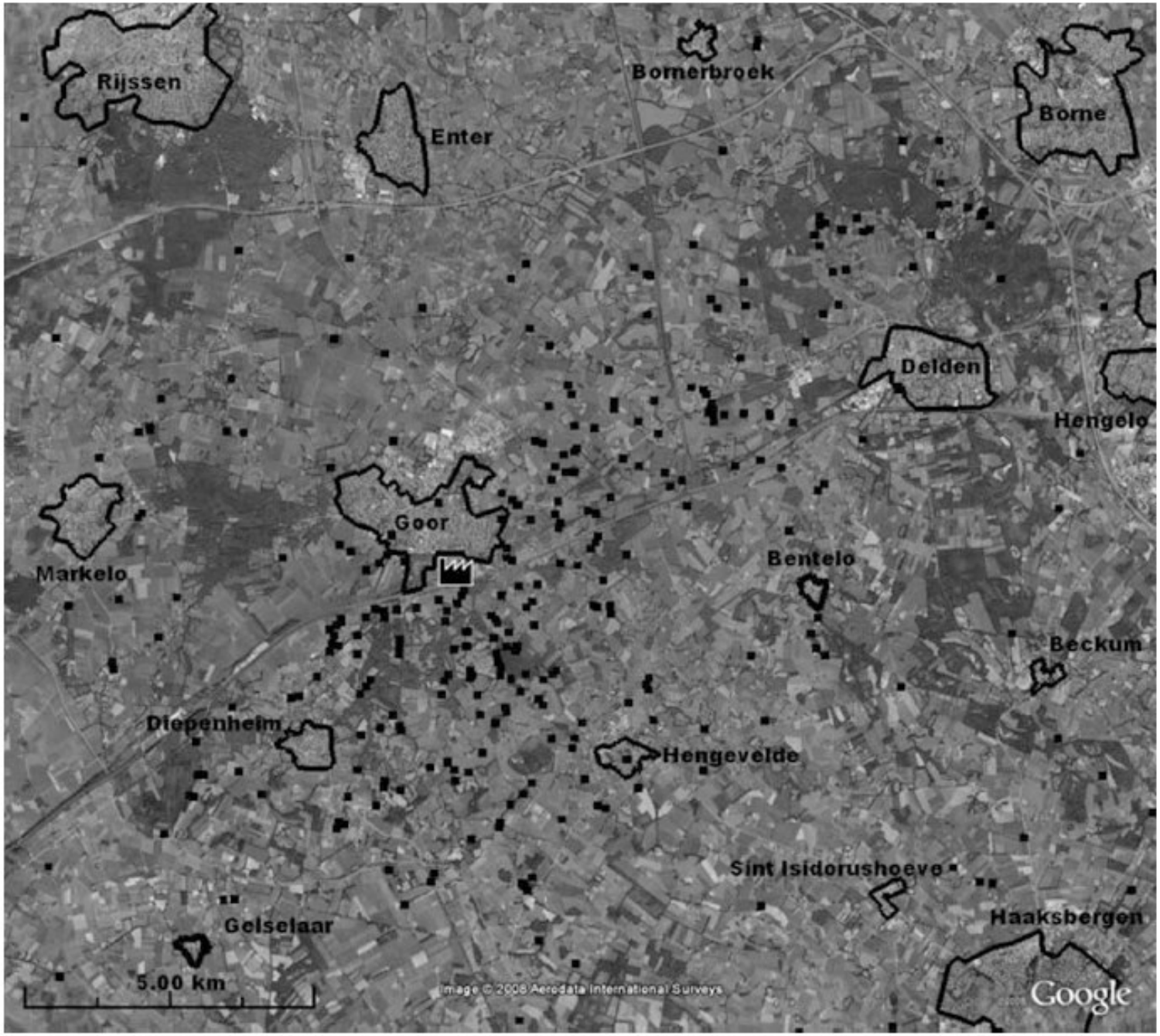
Fig. 6. Location of the "disposal zones" (left) and "landfilled zones" (right) according to the participants of the 2nd workshop.

Sibaté, Colombia. Lysaniuk et al, Env Res 2020

Table 1. Characteristics of the local sites with asbestos pollution in the soil ($n = 416$) in the surroundings of an asbestos factory.

	Sites (n)	Percentage of all sites
Sites with asbestos pollution (n = 416)	*416*	
Surface closed (asphalt, concrete, pavement)	13	3.1
No asbestos in surface layer	110	26.4
Sites with asbestos present at open surface ($n = 293$)		
Daily active use by inhabitants	*195*	*66.6*
Friable waste products	112	57.4
Containing crocidolite and chrysotile	150	76.9
Containing only amosite	0	0
Containing only chrysotile	42	21.5
No daily active use by inhabitants	*98*	*33.4*
Friable waste products	60	61.2
Containing crocidolite and chrysotile	75	76.5
Containing only amosite	0	0
Containing only chrysotile	22	22.5

Hof van Twente (Olanda) Driece et al. J Exp Science & Envir Epidemiology (2010)



Hof van Twente (Olanda) Driece et al. J Exp Science & Envir Epidemiology (2010)

In ogni caso ricordiamo sempre che a ogni esposizione ambientale si accompagna un esposizione lavorativa (e viceversa)

Table 3 Descriptive statistics of asbestos exposure by job task and calendar period (SIREP, 1996–2016)

Job task No. of measurements	1996–98 GM (GSD) AM (SD)	1999–2001 GM (GSD) AM (SD)	2002–04 GM (GSD) AM (SD)	2005–07 GM (GSD) AM (SD)	2008–10 GM (GSD) AM (SD)	2011–13 GM (GSD) AM (SD)	2014–16 GM (GSD) AM (SD)
Asbestos fibre-cement removal operators	19.6 (27.3)	43.3 (7.5)	16.3 (12.6)	4.5 (9.2)	8.2 (8.9)	6.8 (12.6)	7.7 (19.4)
$N = 14\,595$	597 (1252)	198 (379)	112 (271)	28.3 (143)	40.8 (111)	38.6 (86.6)	54.3 (93.5)
Insulation removal operators	–	53.2 (3.5)	50.1 (3.0)	6.7 (5.9)	8.3 (5.2)	3.2 (3.1)	15.3 (8.5)
$N = 3666$	–	79.1 (41.5)	72.0 (41.1)	20.5 (31.6)	30.4 (81.0)	7.9 (19.4)	54.5 (50.4)
Asbestos-containing materials disposal workers	5.1 (1.9)	5.7 (4.2)	29.3 (5.0)	8.4 (6.4)	12.2 (9.8)	13.4 (7.0)	11.8 (8.4)
$N = 882$	6.5 (5.8)	20.3 (36.3)	63.0 (46.8)	35.3 (46.3)	51.8 (48.6)	47.9 (48.2)	45.9 (48.9)

AM, arithmetic mean (f l^{-1}); SD, standard deviation; GM, geometric mean (f l^{-1}); GSD, geometric standard deviation, only the most common job tasks are shown.

Scarselli et al Eur J Public Hlt. 2020

Grazie per l’attenzione