

*Occupational Health*

# The French National Program for Mesothelioma Surveillance

Principal results 1998-2006



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# The French National Program for Mesothelioma Surveillance

## Principal results 1998-2006

This purpose of this document is to report the principal annual results from the consolidated data of the French National Program for Mesothelioma Surveillance (PNSM). This first version thus covers data for incident mesothelioma cases from 1998 through 2006.

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# 1. Main features of the National Program for Mesothelioma Surveillance<sup>1</sup>

## 1.1 CONTEXT

Since the 1950s, the massive development of asbestos use in industrialized countries has been accompanied by a substantial and regular increase in the incidence of pleural mesothelioma in the industrialized countries [1]. Except for some environmental exposures of geologic origin observed in some regions of the world and exposure near industrial facilities manufacturing asbestos, both concerning localized populations, occupational exposure is currently responsible for nearly all the asbestos-induced cancers in these nations [2]. Despite substantial differences from one study to another, mainly because of the variability in exposure assessment methods and in the frequency of exposure in the populations studied, it is generally agreed that at least 80% of all pleural mesotheliomas in industrialized countries are due to occupational asbestos exposure [3,4]. The most highly exposed occupations have changed over time. In the 1960s, the incidence of pleural mesothelioma increased among workers in the industries that mined, transformed, and used asbestos [5]; since the 1980s, however, the incidence of asbestos-induced cancer has been highest among workers who repair or remove asbestos-containing materials. Numerous occupations are involved, especially in the construction industry, but also in a wide variety of other occupations [6,7].

Some countries took measures long ago to reduce the frequency and levels of asbestos exposure [8]; there, the rate of increase in pleural mesothelioma incidence and mortality has started to slow down, and the number of mesotheliomas has even begun to diminish [9-11]. Nonetheless, these trends are not homogeneous in all industrialized countries. In France, for example, models of mesothelioma mortality at the end of the 1990s projected that augmentation in the frequency of pleural mesothelioma would continue for at least two or three decades [12-13].

It was in this context that the National Program for Mesothelioma Surveillance (PNSM) began in 1998 at the request of the Ministries of Labor (DGT) and of Health (DGS). Bringing together several teams with complementary skills and coordinated by the Department of Occupational Health (DST) of the French Institute for Public Health Surveillance (InVS), this epidemiologic surveillance system monitors the health effects of asbestos on the French population, through the permanent observation of pleural mesothelioma.

## 1.2 OBJECTIVES

The principal objectives of PNSM are to:

- estimate the national incidence of mesothelioma in France and its trends over time;
- study the proportion of mesotheliomas in France attributable to asbestos exposure, especially occupational;
- contribute to research into other possible etiological factors (refractory ceramic fibers, mineral wool, ionizing radiation, SV40 virus, etc.);

- contribute to improving the pathologic diagnosis of mesothelioma;
- assess the recognition of pleural mesothelioma as an occupational disease for which workers compensation ought to be awarded; the effective implementation in 2002 of a National Compensation Fund for Asbestos Victims (FIVA) has expanded the scope of this objective.

## 1.3 METHODS

The methods set up within PNSM have evolved since it began. The initial setting up and launching of the program, from 1998 through 2003, is referred to as PNSM I; reorganization of procedures began in 2004, and the program was renamed PNSM II. This section describes the procedures currently used for PNSM II.

### 1.3.1 General organization

The organization of PNSM is based on its division into several components; (i) exposure-etiology; (ii) pathologic and clinical confirmation; and (iii) compensation assessment. Each component is coordinated by a National Center. The DST-InVS coordinates the scientific aspects of the entire program, chairs the Steering Center, and estimates the national incidence of mesothelioma. An independent Scientific Committee was established during the start-up phase and followed its development for the first five years of operation. The National Data Protection Authority (CNIL) has approved all of the PNSM procedures.

PNSM is based on the exhaustive recording since January 1, 1998, of incident primary pleural tumors in a limited number of French districts (the term "pleural mesothelioma" will be used hereafter, as it accounts for nearly all primary pleural tumors). The social, occupational, and demographic characteristics of the population covered by the PNSM are close to those of the overall French population.

In each district, an active procedure for reporting primary pleural tumors has been set up. A standardized procedure of pathologic and clinical confirmation is then followed for all cases.

A standardized questionnaire is administered for each reported case. The responses to each questionnaire are then analyzed by experts in industrial hygiene and environmental health.

### 1.3.2 Steering center and National incidence estimates

The PNSM depends on the exhaustive recording of incident primary pleural tumors in a limited number of French districts. This recording began on January 1, 1998. It initially included 17 districts;

<sup>1</sup> The PNSM has been described and its early results reported in: Goldberg M, Imbernon E, Rolland P, Gilg Soit Ilg A, Savès M, de Quillacq A, Frenay C, Chamming's S, Arveux P, Boutin C, Launoy G, Pairon JC, Astoul P, Galateau-Sallé F, Brochard P. The French National Mesothelioma Surveillance Program. *Occup Environ Med.* 2006;63:390-5.

coverage was later extended to several other districts to optimize its representativeness for France as a whole. Currently, PNSM includes 22 districts, with a population of approximately 18 million, that is, about 30% of the French population (figure 1 and table 1).

In each district, an active reporting procedure for cases of primary pleural tumors has been set up in liaison with all of the specialized medical facilities, to ensure exhaustive collection of cases rapidly after diagnosis. A standardized procedure of pathologic and clinical confirmation is then followed for all cases (described below).

Estimates of the incidence of mesothelioma are based on the calculation of mean incidence/mortality ratios by age group and sex for all of the PNSM districts and their subsequent application to the overall French mortality data for malignant pleural tumors (ICD9-163) for 1998 and 1999 and for pleural mesothelioma (ICD10-C45) thereafter. The mortality data from the National Death Statistics Office (CepiDc INSERM) thus far covers 1998 through 2006 and is provided separately for men and women, by 5-year age groups, and by district.

An initial estimate takes all the districts into account (scenario 1). A second estimate excludes the districts where the ratio of observed incidence to mortality (all ages) is less than 1/3, because this indicates that cases may have been under-recorded (scenario 2).

The estimates are calculated in two ways: first, by considering only the cases confirmed by the pathologic or clinical procedures, and second, by including the cases for which the diagnosis is uncertain (inconclusive or pending).

### 1.3.3 Center for exposure and etiology

A specially trained investigator collects information on each case directly from the subject, whenever possible, based on a standardized questionnaire during a face-to-face interview; when the subject has died, a shorter questionnaire is used to question a family member or close friend (relative interview). The interview makes it possible to construct a list of all of the homes resided in, schools attended, and jobs held, including the tasks performed during each job, during do-it-yourself home repair at home, and during technical training. Questions are also asked about other situations of potential asbestos exposure and other etiological factors during the subject's life. The responses to each questionnaire are then analyzed by experts in industrial hygiene and environmental health to obtain a semi-quantitative assessment of cumulative exposure to each risk factor that grades the duration, intensity and probability of exposure.

### 1.3.4 Center of pathologic and clinical confirmation

Each case reported in the districts included in the program undergoes a standardized procedure to confirm the diagnosis. When the pathologist responsible for the initial diagnosis of the pleural tumor collected samples (histologic slides or tumor blocks), they transmit them to the national group of pathologists specialized in mesothelioma, the national Mésopath panel. Three experts, blinded to the patient's asbestos exposure status, classify each case as confirmed, probable, or uncertain mesothelioma (or other malignant pleural tumor), or as excluded because of insufficient material or because of another diagnosis. If all three experts assess the diagnosis as confirmed, it is considered confirmed. When they disagree, the case is further assessed during monthly consensus meetings including at least 10 experts. It is then confirmed, excluded, or referred for expert clinical assessment and further discussion.

In the latter case, where pathologic confirmation is not possible because of diagnostic problems, or insufficient material, or no available sample, an expert clinical assessment is organized; it implies contact with the treating physician and review of the patient's records. If the physician does not respond or when the medical documents are too sparse, the case is considered non-assessable. When the record is considered sufficient, two specialists in pulmonary medicine independently assess it; if both agree, the case can be classified as very probably mesothelioma or unlikely to be mesothelioma. Otherwise it is considered impossible to determine.

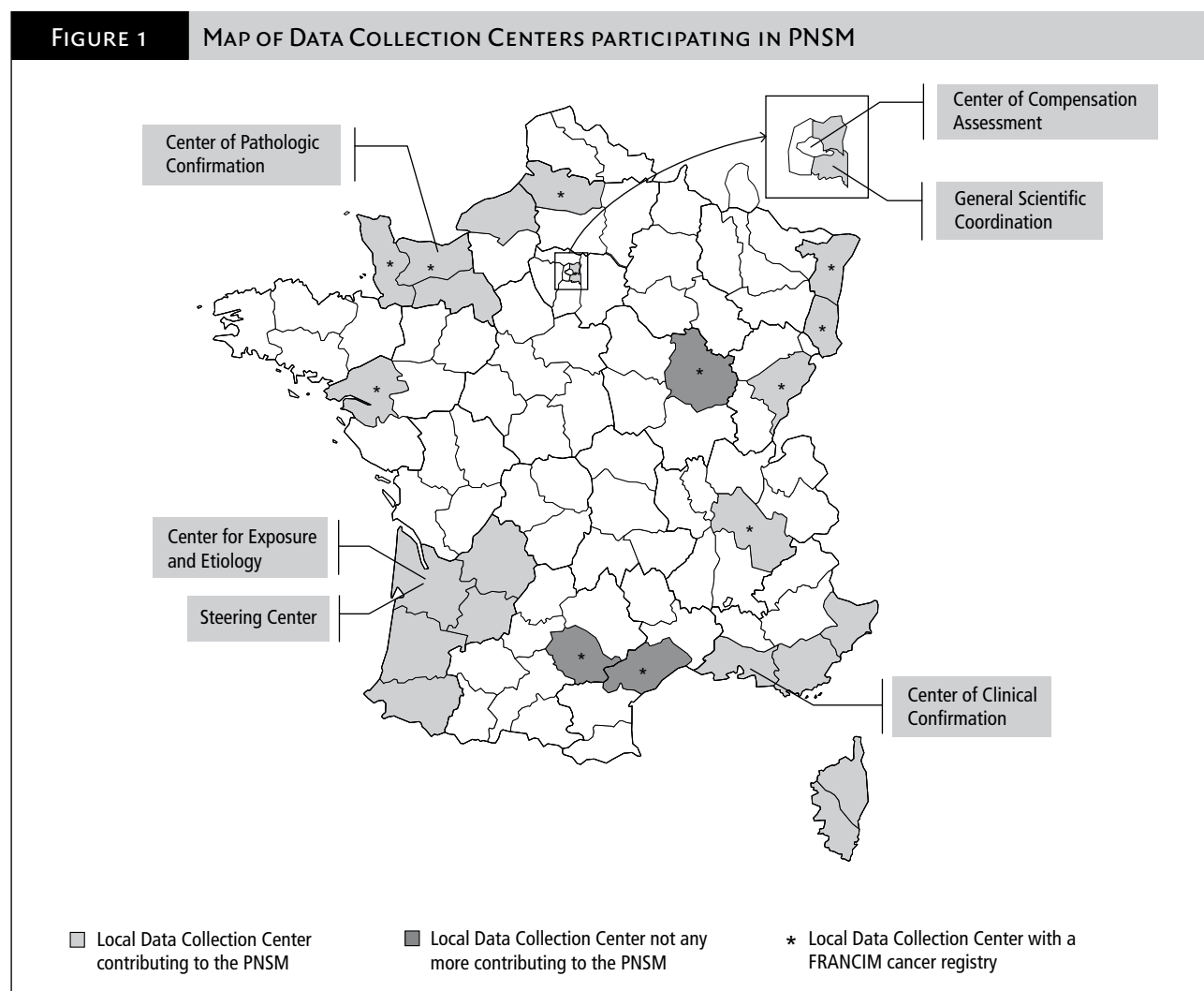
The permanent nature of the panel and the large number of cases it regularly analyzes allows another objective to be met: the identification of unusual histologic variants and the validation of new diagnostic immunohistochemical markers, predictive of transformation.

### 1.3.5 Center of compensation assessment

A study covering the period 1986-1993 estimated that in France, only 25% of the patients with pleural mesothelioma received workers compensation for an occupational disease; it also showed substantial geographic disparities in this compensation [14]. The principal objective of this component of the PNSM is to improve the proportion of patients with pleural mesothelioma receiving workers compensation for this occupational disease. Accordingly, compensation of the cases recorded by PNSM was studied.

The study covered the patients with cases diagnosed in the participating districts who are covered by the principal National Health Insurance Fund (the Régime Général de la Sécurité Sociale or RGSS, which is also responsible for workers' compensation), which covers more than 80% of the French population. A nominative list is drawn up of the mesothelioma cases not excluded by the confirmation procedure and recorded in each district. The following data were collected:

membership in the RGSS; filing of a claim for workers compensation and the date of the claim, the RGSS decision and its date, and if the claim was denied, the reason for denial. The proportion of patients from the RGSS and the proportion of subjects not filing a claim were compared in the four districts with the most cases of mesothelioma ( $n \geq 130$  for the entire study period).



There are 11 data collection centers, representing 22 districts distributed across France and covering approximately 30% of the French population.

<b>TABLE 1</b>		<b>PARTICIPATION OF LOCAL CENTERS IN PNSM ACTIVITIES (REPORTS/SURVEYS) (1998-2006)</b>							
<b>Local centers</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Total number of districts</b>	<b>17</b>	<b>20</b>	<b>20</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>18</b>	<b>18</b>	<b>22</b>
<b>PACA</b>									
Alpes-Maritimes (06)	-	-	-	-	-	-	-	-	++
Bouches-du-Rhône (13)	-	+	+	+	+	+	+	+	++
Corse-du-Sud (2A)	-	-	-	-	-	-	-	-	++
Haute-Corse (2B)	-	-	-	-	-	-	-	-	++
Var (83)	-	+	+	+	+	+	+	+	++
<b>Basse-Normandie</b>									
Calvados (14)	++	++	++	++	++	++	++	++	++
Manche (50)	++	++	++	++	++	++	++	++	++
Orne (61)	++	++	++	++	++	++	++	++	++
Côte-d'Or (21)	++	++	++	++	++	++	-	-	-
<b>Aquitaine</b>									
Dordogne (24)	++	++	++	++	++	++	++	++	++
Gironde (33)	++	++	++	++	++	++	++	++	++
Landes (40)	++	++	++	++	++	++	++	++	++
Lot-et-Garonne (47)	++	++	++	++	++	++	++	++	++
Pyrénées-Atlantiques (64)	++	++	++	++	++	++	++	++	++
Doubs (25)	++	++	++	++	++	++	++	++	++
Hérault (34)	++	++	++	++	++	++	-	-	-
Isère (38)	++	++	++	++	+	+	++	++	++
Loire-Atlantique (44)	++	++	++	++	++	++	++	++	++
Bas-Rhin (67)	++	++	++	++	++	++	++	++	++
Haut-Rhin (68)	++	++	++	++	++	++	++	++	++
Seine-Maritime (76)	-	-	-	-	-	-	-	-	++
Somme (80)	++	++	++	++	++	++	++	++	++
Tarn (81)	++	++	++	++	++	++	-	-	-
<b>Ile-de-France</b>									
Seine-St-Denis (93)	-	++	++	++	++	++	++	++	++
Val-de-Marne (94)	-	-	-	++	++	++	++	++	++
	-	No activity		+	Reporting cases only		++	Reporting and investigation of cases	

The total number of districts participating in PNSM has risen from 17 in 1998 to 22 in 2006. Not all districts participated in all of the different PNSM activities (case reporting and case investigation).



## 2. Main results

### 2.1 RECORDING AND CERTIFICATION OF CASES

TABLE 2 DISTRIBUTION OF CASES REPORTED SINCE 1998, BY STATUS OF DIAGNOSTIC CERTIFICATION AND YEAR OF DIAGNOSIS																				
Diagnostic certification	1998		1999		2000		2001		2002		2003		2004		2005		2006		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Certification process completed (n=2,030)	<b>n=156</b>		<b>n=198</b>		<b>n=217</b>		<b>n=242</b>		<b>n=236</b>		<b>n=241</b>		<b>n=248</b>		<b>n=228</b>		<b>n=264</b>		<b>n=2,030</b>	
Confirmed	125	80.1	156	78.8	163	75.1	191	78.9	192	81.4	209	86.7	211	85.1	193	83.7	233	88.3	1,673	82.4
by PC <sup>1</sup>	112	89.6	145	92.9	149	91.4	173	90.6	172	89.6	194	92.8	197	93.4	179	92.7	226	97.0	1,547	92.5
by CC <sup>2</sup>	13	10.4	11	7.1	14	8.6	18	9.4	20	10.4	15	7.2	14	6.6	14	7.3	7	3.0	126	7.5
Excluded	13	8.3	23	11.6	34	15.7	31	12.8	23	9.7	18	7.5	21	8.5	24	10.5	21	7.9	208	10.2
by PC	9	69.2	14	60.9	23	67.6	23	74.2	17	73.9	13	72.2	16	76.2	17	70.8	19	90.5	151	72.6
by CC	4	30.8	9	39.1	11	32.4	8	25.8	6	26.1	5	27.8	5	23.8	7	29.2	2	9.5	57	27.4
Uncertain	18	11.6	19	9.6	20	9.2	20	8.3	21	8.9	14	5.8	16	6.4	11	4.8	10	3.8	149	7.4
Not completed (n=125)	2		7		1		14		10		22		14		24		31		125	
<b>Total</b>	<b>158</b>		<b>205</b>		<b>218</b>		<b>256</b>		<b>246</b>		<b>263</b>		<b>262</b>		<b>252</b>		<b>295</b>		<b>2,155</b>	

<sup>1</sup> PC = Pathology Certification; <sup>2</sup> CC = Clinical Certification.

In all, 2,155 incident cases from 1998 through 2006 were collected from 1998 through 2008; 2,030 (94.2%) have already undergone diagnostic certification – either pathologic or clinical. Overall, the diagnosis of primary pleural tumors was confirmed in 82.4% of the certified cases, ruled out in 10.2%, and remained uncertain in 7.4%.

**TABLE 3 DISTRIBUTION OF CONFIRMED CASES, BY DATA COLLECTION CENTER, YEAR OF DIAGNOSIS, AND SEX**

Local centers	Year of diagnosis												Total									
	1998		1999		2000		2001		2002		2003		2004		2005		2006		M	W	T	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W				
<b>PACA</b>																						
Alpes-Maritimes (06)																						
Bouches-du-Rhône (13)																						
Corse-du-Sud (2A)																						
Haute-Corse (2B)																						
Var (83)																						
<b>Basse-Normandie</b>																						
Calvados (14)																						
Manche (50)																						
Orne (61)																						
<b>Aquitaine</b>																						
Dordogne (24)																						
Gironde (33)																						
Landes (40)																						
Lot-et-Garonne (47)																						
Pyrénées-Atlantiques (64)																						
<b>Ile-de-France</b>																						
Seine-Saint-Denis (93)																						
Val-de-Marne (94)																						
Côte-d'Or (21)																						
Doubs (25)																						
Hérault (34)																						
Isère (38)																						
Loire-Atlantique (44)																						
Bas-Rhin (67)																						
Haut-Rhin (68)																						
Seine-Maritime (76)																						
Somme (80)																						
Tarn (81)																						
<b>Total</b>	105	21	128	28	135	28	143	48	152	40	151	58	176	35	153	40	185	48	1,327	346	1,673	

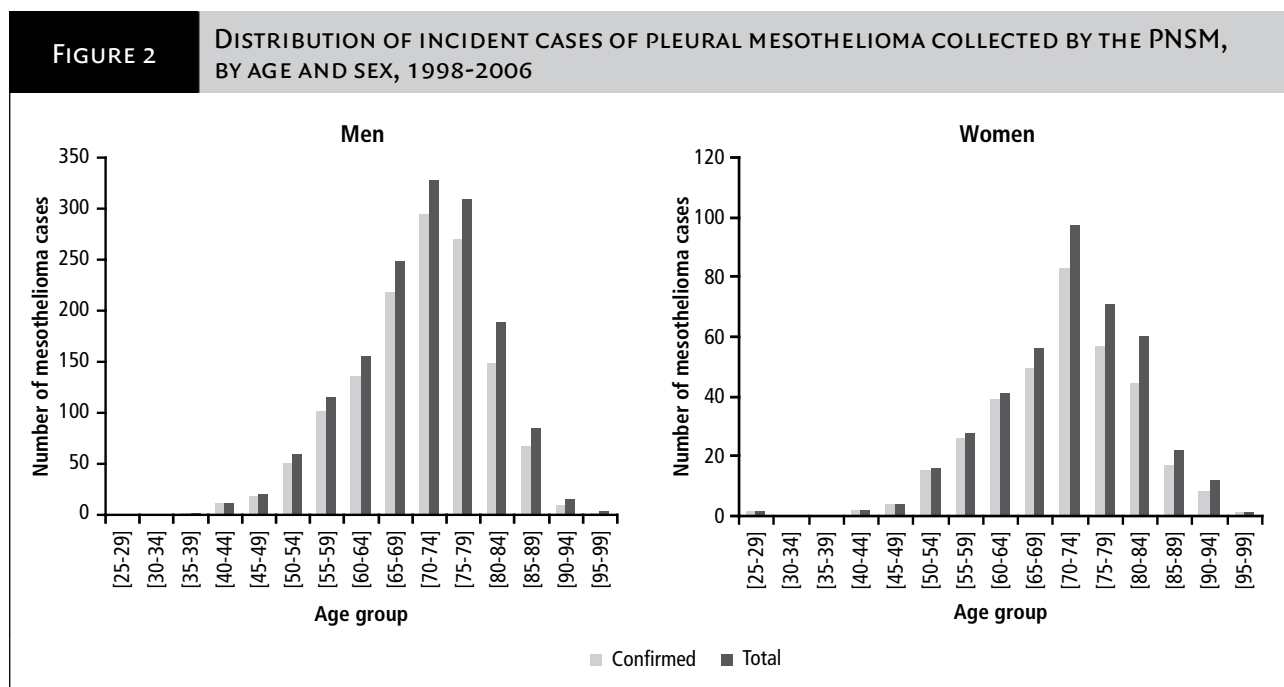
Overall, 1,673 incident cases diagnosed between 1998 and 2006 were confirmed between 1998 and 2006 (1,327 cases) of them men. The districts with the most cases were Bouches-du-Rhône with 258 confirmed cases (15.4% of the total), Loire-Atlantique (201 confirmed cases, 12.0%) and Gironde (180 confirmed cases, 10.8%). The district of Bouches-du-Rhône also had the highest number of cases confirmed per year (32), and Seine-Maritime (27 cases confirmed in 2006) ranked ahead of Loire-Atlantique (21.6 cases confirmed/year) and Gironde (20 cases confirmed/year).

**TABLE 4** PATHOLOGY CERTIFICATION BY YEAR OF DIAGNOSIS AND SEX

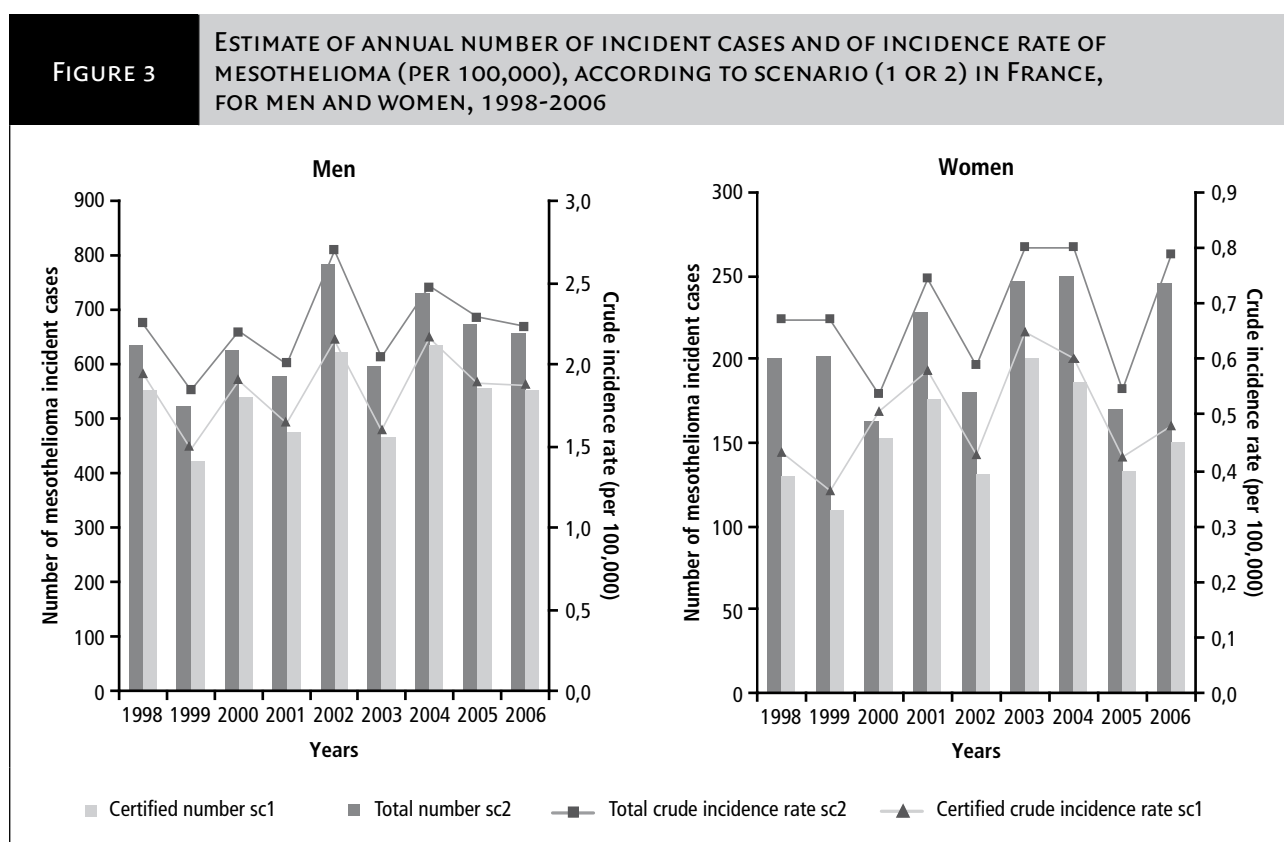
	1998		1999		2000		2001		2002		2003		2004		2005		2006		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Certified</b>	110	76	144	76	148	71	171	75	165	75	185	81	184	78	171	78	207	81	1,485	77
Malignant epithelioid mesothelioma	69	63	96	67	114	77	128	75	129	78	146	79	156	85	136	80	169	82	1,143	77
Mixed malignant mesothelioma	26	24	27	19	19	13	21	12	18	12	17	9	20	11	11	6	18	9	177	12
Malignant sarcomatoid mesothelioma	13	12	15	10	10	7	15	9	8	5	14	8	4	2	17	10	17	8	113	8
Malignant desmoplastic mesothelioma	2	1	2	1	4	3	3	2	4	2	6	3	3	2	7	4	3	1	34	2
Well-differentiated papillary mesothelioma	0	0	1	1	1	<1	3	2	4	2	2	1	1	<1	0	0	0	0	12	1
Adenomatoid tumor	0	0	3	2	0	0	1	<1	2	1	0	0	0	0	0	0	0	0	6	0
<b>Uncertain</b>	25	17	32	17	37	18	33	14	36	16	24	11	26	11	25	11	13	5	251	13
Pre-invasive mesothelioma	0	0	0	0	0	0	0	0	0	0	0	0	1	4	1	4	0	0	2	1
A typical mesothelial hyperplasia, suspected malignant	1	4	7	22	5	14	3	9	1	3	5	21	5	19	7	28	4	31	38	15
Organizing pleurisy	3	12	1	3	9	24	1	3	1	3	0	0	2	8	2	8	0	0	19	8
Insufficient material	19	76	15	47	13	35	10	30	20	56	5	21	6	23	7	28	3	23	98	39
Other uncertain diagnoses	2	8	9	28	10	27	19	58	14	38	14	58	12	46	8	32	6	46	94	37
<b>Expert assessment underway</b>	0	0	0	0	1	<1	1	0	2	1	5	2	12	5	7	3	21	8	49	3
<b>Excluded</b>	10	7	13	7	23	11	23	10	16	7	13	6	14	6	16	7	15	6	143	7
Other primary tumors	3	30	3	23	5	22	1	4	1	6	3	23	2	14	0	0	2	13	20	14
Metastases	6	60	9	69	15	65	15	65	10	63	7	54	8	57	9	56	7	47	86	60
Pseudomesotheliomatous adenocarcinoma	0	0	0	0	0	0	2	9	1	6	1	8	1	7	1	6	1	7	7	5
Unclassified tumors	1	10	1	8	3	13	5	22	4	25	2	15	3	22	6	38	5	33	30	21
<b>Total</b>	<b>145</b>	<b>100</b>	<b>189</b>	<b>100</b>	<b>209</b>	<b>100</b>	<b>228</b>	<b>100</b>	<b>219</b>	<b>100</b>	<b>227</b>	<b>100</b>	<b>236</b>	<b>100</b>	<b>219</b>	<b>100</b>	<b>256</b>	<b>100</b>	<b>1,928</b>	<b>100</b>

For the period 1998-2006, 1928 cases (94% of the incident cases) were assessed by the Center for pathology expertise. Approximately 77% of the incident cases assessed were certified by pathology expert assessments, 7% were excluded, and 16% not certified.

## 2.2 ESTIMATION OF NATIONAL INCIDENCE



Mean age at diagnosis was 69 years (median = 70) in women and 71 (median = 72) in men. Two patients were younger than 40 years at diagnosis (one man aged 38 and one woman aged 28). The highest incidence rates were observed in the oldest age groups (>74 years).



Globally, for the entire 1998-2006 period, no particular trend was observed, and the mean annual number of incident mesothelioma cases may be estimated from 535 to 645 in men and 152 to 210 in women. The crude incidence rates ranged respectively from 1.85 to 2.23 per 100,000 in men and 0.5 to 0.68 per 100,000 in women.

## 2.3 DESCRIPTION OF CASES - CHARACTERISTICS OF CASES AND EXPOSURES

TABLE 5	GENERAL CHARACTERISTICS OF CASE PATIENTS INTERVIEWED WHILE ALIVE (STANDARD) AND CASES FOR WHOM A RELATIVE WAS INTERVIEWED, SINCE 1998							
	Men (896)				Women (234)			
	Standard interview (702)		Relative interview (194)		Standard interview (180)		Relative interview (54)	
	n	%	n	%	n	%	n	%
<b>Districts</b>								
Alpes-Maritimes (06)	1	0.1	0	0.0	0	0.0	0	0.0
Bouches-du-Rhône (13)	6	0.8	1	0.5	0	0.0	0	0.0
Calvados (14)	46	6.6	10	5.2	9	5.0	4	7.4
Corse-du-Sud (2A)	0	0.0	0	0.0	0	0.0	0	0.0
Haute-Corse (2B)	0	0.0	0	0.0	0	0.0	0	0.0
Côte-d'Or (21)	10	1.4	4	2.1	4	2.2	1	1.9
Dordogne (24)	14	2.0	4	2.1	7	3.9	0	0.0
Doubs (25)	11	1.6	3	1.5	3	1.7	1	1.9
Gironde (33)	93	13.3	23	11.9	20	11.1	11	20.4
Hérault (34)	11	1.6	4	2.1	1	0.6	0	0.0
Isère (38)	63	9.0	10	5.2	13	7.2	1	1.9
Landes (40)	20	2.9	4	2.1	3	1.7	2	3.7
Loire-Atlantique (44)	109	15.5	47	24.1	18	10.0	11	20.3
Lot-et-Garonne (47)	10	1.4	5	2.6	4	2.2	0	0.0
Manche (50)	29	4.1	2	1.0	5	2.8	2	3.7
Orne (61)	10	1.4	4	2.1	5	2.8	0	0.0
Pyrénées-Atlantiques (64)	17	2.4	8	4.1	6	3.3	3	5.5
Bas-Rhin (67)	44	6.3	9	4.6	7	3.9	1	1.9
Haut-Rhin (68)	6	0.8	8	4.1	0	0.0	1	1.9
Seine-Maritime (76)	21	3.0	5	2.6	13	7.2	2	3.7
Somme (80)	9	1.3	3	1.5	0	0.0	1	1.9
Tarn (81)	8	1.1	1	0.5	3	1.7	2	3.7
Var (83)	4	0.6	1	0.5	1	0.6	0	0.0
Seine-Saint-Denis (93)	97	13.8	19	9.8	31	17.2	6	11.0
Val-de-Marne (94)	63	9.0	19	9.8	27	14.9	5	9.2
<b>Age</b>								
Mean (standard deviation)	69 (9.3)		74 (10.2)		69 (9.6)		73 (12.7)	
Min-Max	38-93		39-99		42-92		28-98	
<b>Educational level</b>								
Max. primary	326	46.4	-	-	83	46.1	-	-
Secondary or more	376	53.6	-	-	97	53.9	-	-
<b>Occupational category</b>								
	n=702		n=106		n=173*		n=21**	
Farmers	10	1.4	0	0.0	4	2.3	1	4.8
Tradespeople, shopkeepers, and small-business owners	67	9.5	6	5.7	7	4.0	0	0.0
Managers and professionals	82	11.7	8	7.6	5	2.9	0	0.0
Intermediate white-collar occupations	134	19.1	21	19.8	29	16.8	7	33.3
Offices and sales staff	38	5.4	7	6.6	93	53.8	8	38.1
Workers	371	52.9	64	60.4	35	20.2	5	23.8
<b>Asbestos exposure</b>								
	n=702		n=187		n=179		n=51	
<b>- Occupational</b>								
Unexposed	59	8.4	62	33.2	105	58.7	40	78.4
Possible	77	11.0	19	10.2	31	17.3	6	11.8
Probable	566	80.6	106	56.6	43	24.0	5	9.8
<b>- Non-occupational (no occupational exposure)</b>								
Unexposed	33	55.9	61	98.4	55	52.4	30	75.0
Exposed	26	44.1	1	1.6	50	47.6	10	25.0

\*7 women had never had any remunerated work; \*\*6 women had never had any remunerated work.

Since 1998, 882 "standard" interviews have been conducted for incident cases and 248 interviews of relatives. The districts with the most interviews are Gironde, Loire-Atlantique, Seine-Saint-Denis, and Val-de-Marne. Relatives were most often questioned for older patients, among both men ( $p<0.01$ ) and women ( $p=0.02$ ).

More than half the men belonged to the occupational category of workers, and the category of farmers had the lowest rate. The highest rate of standard interviews of women was for office and sales workers.

Occupational asbestos exposure was reported for 91.6% of the men with standard interviews and 66.8% of those whose relative was interviewed ( $p<0.01$ ). Among the men without occupational exposure, non-occupational exposure was reported for 44.1% of those with standard interviews and 1.6% of those where a relative was questioned ( $p<0.01$ ). Among women, 41.3% of those with standard interviews were occupationally exposed to asbestos, compared with 21.6% of those with relatives questioned ( $p<0.01$ ). Non-occupational exposure was also more common among women who were interviewed than those whose relative was interviewed instead.

	CHARACTERISTICS OF CASES ACCORDING TO OCCUPATIONAL ASBESTOS EXPOSURE							
	Men (702)				Women (179)			
	Exposed (643)		Not exposed (59)		Exposed (74)		Not exposed (105)	
	n	%	n	%	n	%	n	%
<b>Age</b>								
Mean (standard deviation)	70 (9.1)		67 (11.3)		69 (8.5)		68 (10.4)	
Min-Max	40-93		38-86		50-85		42-92	
<b>Educational level</b>								
Max. primary	312	48.5	14	23.7	40	54.1	42	40.0
Secondary or more	331	51.5	45	76.3	34	45.9	63	60.0
<b>Occupational category</b>	<b>n=98</b>							
Farmers	8	1.2	2	3.4	0	0.0	4	4.1
Tradespeople, shopkeepers and small-business owners	62	9.6	5	8.5	4	5.4	3	3.1
Managers and professionals	63	9.8	19	32.2	3	4.0	2	2.0
Intermediate white-collar occupations	126	19.6	8	13.6	6	8.1	23	23.5
Offices and sales staff	28	4.4	10	16.9	36	48.7	56	57.1
Workers	356	55.4	15	25.4	25	33.8	10	10.2

\*7 women had never had any remunerated work.

Men with occupational asbestos exposure were older than those without such exposure ( $p<0.01$ ) and had a lower educational level ( $p<0.01$ ). Among the exposed subjects, the highest percentage were workers, while among the non-exposed, the percentage was highest for the category of managers and professionals.

Exposed and non-exposed women, on the other hand, did not differ for age ( $p=0.5$ ) or educational level ( $p=0.06$ ). Office and sales staff accounted for the highest proportion of women, regardless of exposure.

**TABLE 7** DISTRIBUTION OF CASES INTERVIEWED WHILE ALIVE ACCORDING TO THE MAXIMUM PROBABILITY OF OCCUPATIONAL ASBESTOS EXPOSURE AND YEAR OF DIAGNOSIS

	1998		1999		2000		2001		2002		2003		2004		2005		2006		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Men</b>	<b>n=72</b>		<b>n=76</b>		<b>n=76</b>		<b>n=85</b>		<b>n=63</b>		<b>n=73</b>		<b>n=74</b>		<b>n=69</b>		<b>n=115</b>		<b>n=702</b>	
Unexposed	3	4.2	8	10.5	7	9.3	7	8.2	4	6.4	5	6.9	4	5.4	6	8.7	15	13.1	59	8.4
Possible	15	20.8	9	11.8	8	10.7	12	14.1	4	6.4	6	8.2	3	4.1	8	11.6	12	10.4	77	11.0
Probable	54	75.0	59	77.6	60	80.0	66	77.7	55	87.3	62	84.9	67	90.5	55	79.7	88	76.5	566	80.6
<b>Women</b>	<b>n=10</b>		<b>n=16</b>		<b>n=18</b>		<b>n=26</b>		<b>n=21</b>		<b>n=28</b>		<b>n=20</b>		<b>n=11</b>		<b>n=29</b>		<b>n=179</b>	
Unexposed	10	100.0	12	75.0	9	50.0	11	42.3	10	47.6	16	57.1	15	75.0	7	63.6	15	51.7	105	58.7
Possible	0	0.0	2	12.5	6	33.3	8	30.8	6	28.6	4	14.3	1	5.0	0	0.0	4	13.8	31	17.3
Probable	0	0.0	2	12.5	3	16.7	7	26.9	5	23.8	8	28.6	4	20.0	4	36.4	10	34.5	43	24.0

**TABLE 8** EXPOSURE INDICATORS FOR THE CASES INTERVIEWED WHILE ALIVE AND OCCUPATIONALLY EXPOSED TO ASBESTOS ACCORDING TO YEAR OF DIAGNOSIS [MEAN (STANDARD DEVIATION) MIN-MAX]

	1998		1999		2000		2001		2002		2003		2004		2005		2006		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Men</b>	<b>n=69</b>		<b>n=68</b>		<b>n=68</b>		<b>n=78</b>		<b>n=59</b>		<b>n=68</b>		<b>n=70</b>		<b>n=63</b>		<b>n=100</b>		<b>n=643</b>	
Duration of exposure (years)	22.7 (11.9)		21.7 (11.4)		22.3 (11.9)		21.2 (11.8)		21.8 (10.8)		23.0 (12.4)		25.0 (9.7)		25.0 (10.4)		24.2 (12.6)		23.0 (11.5)	
Age at 1 <sup>st</sup> exposure (years)	20 (6.4)		21 (7.3)		22 (7.7)		21 (7.9)		20 (5.2)		20 (5.6)		21 (7.0)		22 (7.8)		20 (5.0)		21 (6.7)	
Number of years since 1 <sup>st</sup> exposure (latency periods)	48.9 (9.4)		48.2 (10.9)		48.0 (11.2)		46.7 (11.0)		48.9 (9.4)		49.9 (9.6)		51.2 (9.5)		49.3 (9.1)		51.3 (10.4)		49.2 (10.2)	
<b>Women</b>	<b>n=0</b>		<b>n=4</b>		<b>n=9</b>		<b>n=15</b>		<b>n=11</b>		<b>n=12</b>		<b>n=5</b>		<b>n=4</b>		<b>n=14</b>		<b>n=74</b>	
Duration of exposure (years)			16.3 (14.4)		12.4 (11.0)		12.5 (10.8)		8.9 (6.7)		10.1 (7.0)		12.4 (9.6)		12.0 (13.2)		13.0 (9.6)		11.8 (9.5)	
Age at 1 <sup>st</sup> exposure (years)			21 (4.4)		24 (9.1)		27 (12.0)		26 (10.6)		27 (12.2)		30 (8.1)		17 (2.2)		27 (12.0)		26 (10.6)	
Number of years since 1 <sup>st</sup> exposure (latency periods)			41.0 (11.0)		44.4 (14.0)		42.9 (10.9)		42.2 (11.8)		49.9 (9.6)		51.2 (9.5)		55.5 (7.5)		43.1 (12.3)		43.2 (12.3)	

Nearly 81% of the men were probably occupationally exposed to asbestos. This figure varies according to year of diagnosis, ranging from 75% in 1998 to 90.5% in 2004. Nearly 60% of the women diagnosed between 1998 and 2006 were not occupationally exposed to asbestos. This figure also varies greatly according to year; it was 100% for the incident cases in 1998, but only 42.3% in 2001.

The indicators of occupational asbestos exposure for men did not vary much according to year of diagnosis. On average, the duration of exposure was 23 years, age at first exposure was 21 years, and the mean duration between first exposure and mesothelioma diagnosis was 49 years. The variations for women were greater but concerned much smaller numbers. The mean duration of exposure was 11 years, age at first exposure 23 years, and mean latency period 43 years.

## 2.4 DISTRIBUTION OF CASES BY OCCUPATION AND INDUSTRY

<b>TABLE 9</b>		
<b>DISTRIBUTION OF THE PRINCIPAL OCCUPATIONS IN WHICH ASBESTOS EXPOSURE WAS FOUND (ISCO, REVISION 1968). NUMBER OF CASES OF MEN NOT EXCLUDED WHO PRACTICED THE OCCUPATION AT LEAST ONCE (n=643)</b>		
<b>Occupations</b>	<b>n</b>	<b>%</b>
Sheet-metal workers-boilermakers (8-73)	87	13.5
Production supervisors and general foremen (7-00)	81	12.6
Plumbers and pipe fitters (8-71)	79	12.3
Military*	68	10.6
Machinery fitters, machine assemblers and precision instrument makers (except electrical) NEC (8-49)	65	10.1
Machinery fitters and machine assemblers (8-41)	43	6.7
Carpenters, joiners and parquetry workers (9-54)	42	6.5
Bricklayers, stonemasons and tile setters (9-51)	40	6.2
Laborers NEC** (9-99)	39	6.1
Electrical wiremen (8-55)	37	5.8
Welders and flame-cutters (8-72)	36	5.6
Motor vehicle mechanics (8-43)	29	4.5
Machine-tool operators (8-34)	27	4.2
Dockers and freight handlers (9-71)	27	4.2
Motor-vehicle drivers (9-85)	23	3.6
Structural metal preparers and erectors (8-74)	23	3.6
Stock clerks (3-91)	23	3.6
Construction workers NEC** (9-59)	22	3.4
Insulators (9-56)	21	3.3
Blacksmiths, toolmakers and machine-tool operators NEC** (8-39)	16	2.5
Painters, construction (9-31)	15	2.3
Non-metallic mineral product makers (9-43)	12	1.9
Draftsmen (0-32)	12	1.9
Metal molders and coremakers (7-25)	11	1.7
Electrical fitters (8-51)	11	1.7
Technical salesmen and service advisers (4-31)	10	1.6
Roofers (9-53)	10	1.6

\* NAF code 1992 (Nomenclature of French occupations) = 75.2C.

\*\* NEC: not elsewhere classified.

<b>TABLE 10</b>		
<b>DISTRIBUTION OF THE PRINCIPAL OCCUPATIONS IN WHICH OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISCO, REVISION 1968). NUMBER OF CASES OF WOMEN NOT EXCLUDED WHO PRACTICED THE OCCUPATION AT LEAST ONCE (n=74)</b>		
<b>Occupations</b>	<b>n</b>	<b>%</b>
Stenographers, typists and teletypists (3-21)	7	9.5
Launderers, dry-cleaners and pressers (5-60)	6	8.1
Bookkeepers and cashiers (3-31)	5	6.8



TABLE 11

DISTRIBUTION OF THE PRINCIPAL INDUSTRIES AND ACTIVITY SECTORS IN WHICH OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISIC REVISION 2). NUMBER OF CASES OF MEN NOT EXCLUDED WHO WORKED IN THIS INDUSTRY AT LEAST ONCE (n=643)

Activity sectors	n	%
Construction (5000)	230	35.7
Shipbuilding and repairing (3841)	97	15.1
Manufacture of structural metal products (3813)	72	11.2
National Defense*	68	10.6
Iron and steel basic industries (3710)	38	5.9
Railroad equipment (3842)	32	5.0
Asbestos processing**	31	4.8
Manufacture of motor vehicles (3843)	24	3.7
Automobile and motorcycle repair (9513)	24	3.7
Basic industrial chemicals except fertilizers (3511)	23	3.6
Fabricated metal products except machinery and equipment, NEC*** (3819)	22	3.4
Urban and suburban railroad transport (7111)	21	3.3
Petroleum refineries (3530)	19	3.0
Aircraft (3845)	17	2.6
Freight transport by road (7114)	17	2.6
Wholesale trade (6100)	16	2.5
Retail trade (6200)	16	2.5
Ocean and coastal transport (7121)	15	2.3
Supporting services to water transport (7123)	15	2.3
Public administration and Defense (9100)	15	2.3
Education services (9310)	14	2.2
Machinery and equipment except electric, NEC*** (3829)	13	2.0
Electric light and power (4101)	13	2.0
Non-ferrous metal basic industries (3720)	12	1.9
Electrical appliances and housewares (3833)	11	1.7
Sanitary and similar services (9200)	11	1.7
Metal and woodworking machinery (3823)	10	1.6
Electrical industrial machinery and apparatus (3831)	10	1.6
Research and scientific institutes (9320)	10	1.6

\* NAF code 1992 (Nomenclature of French occupations and industries) = 75.2C.

\*\* NAF code 1992 = 26.6J or 26.8A or 26.82 and ISIC = 3699.

\*\*\* NEC: not elsewhere classified.

TABLE 12

DISTRIBUTION OF THE PRINCIPAL INDUSTRIES AND ACTIVITY SECTORS IN WHICH OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISIC REVISION 2). NUMBER OF CASES OF WOMEN NOT EXCLUDED WHO WORKED IN THIS INDUSTRY AT LEAST ONCE (n=74)

Activity sectors	n	%
Manufacture of wearing apparel except footwear (3220)	8	10.8
Asbestos processing *	8	10.8
Retail trade (6200)	5	6.8
Laundries, laundry services, and cleaning and dyeing plants (9520)	5	6.8

\* NAF code 1992 = 26.6J, 26.8A or 26.82 and ISIC = 3699.

TABLE 13

DISTRIBUTION OF THE PRINCIPAL OCCUPATIONS IN WHICH NO OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISCO, REVISION 1968). NUMBER OF CASES OF MEN NOT EXCLUDED AND NOT OCCUPATIONALLY EXPOSED TO ASBESTOS WHO PRACTICED THE OCCUPATION AT LEAST ONCE (n=59)

Occupations	n	%
Military*	25	42.4
General farm workers (6-21)	8	13.6
Salesmen, shop assistants and demonstrators (4-51)	7	11.9
Motor vehicle drivers (9-85)	6	10.2
Working proprietors (wholesale and retail trade) (4-10)	6	10.2
Correspondence and reporting clerks (3-93)	5	8.5

\* NAF code 1992 (Nomenclature of French occupations) = 75.2C.

TABLE 14

DISTRIBUTION OF THE PRINCIPAL OCCUPATIONS IN WHICH NO OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISCO, REVISION 1968). NUMBER OF CASES OF WOMEN NOT EXCLUDED AND NOT OCCUPATIONALLY EXPOSED TO ASBESTOS WHO PRACTICED THE OCCUPATION AT LEAST ONCE (n=105)

Occupations	n	%
Stenographers, typists and teletypists (3-21)	25	23.8
Maids and related housekeeping service workers not elsewhere classified (5-40)	19	18.1
Salesmen, shop assistants and demonstrators (4-51)	16	15.2
Charworkers, cleaners and related workers (5-52)	15	14.3
Bookkeepers and cashiers (3-31)	12	11.4
Government executive officials (3-10)	10	9.5
Correspondence and reporting clerks (3-93)	10	9.5
Dockers and freight handlers (9-71)	9	8.6

TABLE 15

DISTRIBUTION OF THE PRINCIPAL INDUSTRIES AND ACTIVITY SECTORS IN WHICH NO OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISIC REVISION 2). NUMBER OF CASES OF MEN NOT EXCLUDED AND NOT OCCUPATIONALLY EXPOSED TO ASBESTOS WHO WORKED IN THIS INDUSTRY AT LEAST ONCE (n=59)

Activity sectors	n	%
National Defense*	25	42.4
Agriculture and livestock production (1110)	12	19.7
Retail trade (6200)	10	17.0
Public administration and Defense (9100)	8	13.6
Wholesale trade (6100)	7	11.9
Construction (5000)	6	10.2

\* NAF code 1992 (Nomenclature of French occupations and industries) = 75.2C.

TABLE 16

DISTRIBUTION OF THE PRINCIPAL INDUSTRIES AND ACTIVITY SECTORS IN WHICH NO OCCUPATIONAL ASBESTOS EXPOSURE WAS FOUND (ISIC REVISION 2). NUMBER OF CASES OF WOMEN NOT EXCLUDED AND NOT OCCUPATIONALLY EXPOSED TO ASBESTOS WHO WORKED IN THE INDUSTRY AT LEAST ONCE (n=105)

Activity sectors	n	%
Retail trade (6200)	19	18.1
Public administration and Defense (9100)	15	14.3
Household service workers (9530)	15	14.3
Education services (9310)	14	13.3
Medical, dental and other health services (9331)	10	9.5
Wholesale trade (6100)	9	8.6
Welfare institutions (9340)	9	8.6
Agriculture and livestock production (1110)	8	7.6
Manufacture of wearing apparel except footwear (3220)	7	6.7
Other financial institutions (8102)	7	6.7
Spinning, weaving & finishing textiles (3211)	5	4.8
Manufacture of radio, television and communication equipment and apparatus (3832)	5	4.8
Legal services (8321)	5	4.8


## 2.5 WORKERS COMPENSATION CLAIMS AND AWARDS

TABLE 17

WORKERS COMPENSATION (WC) CLAIMS AND AWARDS: DATA COLLECTION CENTERS PARTICIPATING IN THE PNSM COMPENSATION ASSESSMENT COMPONENT

Medicosocial component of the PNSM	PNSM 1					PNSM 2				
	1998	1999 (18)	2000 (18)	2001 (19)	2002 (16)	2003 (16)	2004 (16)	2005 (16)	2006 (22)	
Alpes-Maritimes (06)										
Bouches-du-Rhône (13)										
Calvados (14)										
Corse-du-Sud (2A) and Haute-Corse (2B)										
Côte-d'Or (21)										
Dordogne (24)										
Doubs (25)										
Gironde (33)										
Hérault (34)										
Isère (38)										
Landes (40)										
Loire-Atlantique (44)										
Lot-et-Garonne (47)										
Manche (50)										
Orne (61)										
Pyrénées-Atlantiques (64)										
Bas-Rhin (67) and Haut-Rhin (68)										
Seine-Maritime (76)										
Somme (80)										
Tarn (81)										
Var (83)										
Seine-St-Denis (93)										
Val-de-Marne (94)										

 Districts included in the compensation assessment component

 Districts not included in the compensation assessment component

The participation of Data Collection Centers in the compensation assessment component of the PNSM increased over the study period (1999-2006), from 18 to 19 districts from 1999 to 2001, 16 from 2002 to 2005, and 22 as of 2006.

**TABLE 18** DESCRIPTION OF THE SUBJECTS INCLUDED IN THE PNSM COMPENSATION ASSESSMENT COMPONENT (DIAGNOSIS 1999-2006)

Districts	06	13	14	2A	2B	21	24	25	33	34	38	40	44
Year of diagnosis	2006	2006	1999-2006	2006	2006	1999-2001	1999-2006	1999-2006	1999-2006	1999-2001	1999-2006	1999-2006	1999-2006
<b>Cases not excluded</b>	10	35	81	1	3	9	24	16	178	15	149	33	223
<b>RGSS cases</b>	7 (70%)	26 (74%)	55 (68%)	0	0	6 (67%)	16 (67%)	13 (81%)	108 (61%)	9 (60%)	114 (77%)	21 (64%)	162 (73%)
WC claim filed	3 (43%)	18 (69%)	39 (71%)	/	/	1 (17%)	6 (37%)	7 (54%)	72 (67%)	4 (44%)	82 (72%)	16 (76%)	125 (77%)
WC allowed*	3 (100%)	17 (94%)	38 (97%)	/	/	1 (100%)	6 (100%)	6 (86%)	58 (81%)	4 (100%)	70 (91%)	15 (94%)	116 (93%)
WC claim submitted but not yet decided	0	0	0	0	0	0	0	0	0	0	5	0	0
<b>Cases not from RGSS</b>	3	9	26	1	3	3	8	3	70	6	35	12	61
<b>Districts</b>	47	50	61	64	67	68	76	80	81	83	93	94	Total
Year of diagnosis	1999-2006	1999-2006	1999-2006	1999-2006	1999-2006	1999-2006	2006	1999-2006	1999-2006	2006	1999-2006	2001-2006	1999-2006
<b>Cases not excluded</b>	25	57	34	53	55	20	42	55	6	24	168	121	1,437
<b>RGSS cases</b>	14 (56%)	31 (54%)	25 (74%)	37 (70%)	43 (78%)	13 (65%)	40 (95%)	27 (49%)	2 (33%)	18 (75%)	142 (85%)	102 (84%)	1,031 (72%)
WC claims filed	7 (50%)	28 (90%)	13 (52%)	17 (46%)	29 (67%)	11 (85%)	28 (70%)	13 (48%)	0	11 (61%)	97 (68%)	55 (54%)	682 (66%)
WC allowed*	5 (71%)	28 (100%)	12 (100%)	15 (88%)	26 (93%)	8 (80%)	23 (85%)	13 (100%)	/	11 (100%)	94 (97%)	50 (91%)	622 (92%)
WC claim submitted but not yet decided	0	0	1	0	1	1	1	0	/	0	0	0	9
<b>Cases not from RGSS</b>	11	26	9	16	12	7	2	28	4	6	26	19	406

\* The data represented do not take the files currently submitted but not yet decided into account for the calculations of the percentages of WC (workers compensation) claims granted.  
WC: Workers compensation.

For 1999-2006, 72% of the 1,437 non-excluded cases came from the RGSS (principal health insurance fund). In this group, 66% have filed workers compensation claims, and 92% of these claims have been allowed. Note that the proportion of RGSS cases varies substantially from one district to another, as does the proportion of WC claims filed.

TABLE 19

DESCRIPTION OF MESOTHELIOMA CASES DIAGNOSED BETWEEN 1999 AND 2006  
IN THE 15 DISTRICTS PARTICIPATING THROUGHOUT THE STUDY PERIOD\*

Period	1999/2001		2002/2004		2005/2006		1999/2006	
Cases not excluded (n total)	n=427		n=462		n=282		n=1,171	
	n	%	n	%	n	%	n	%
<b>RGSS cases</b>	282	66	336	73	203	72	821	70
<b>WC claims filed</b>	188	67	235	70	139	68	562	68
Exposed	143	76	166	71	109	79	418	75
Not exposed	6	3	8	3	10	7	24	4
Not reported	39	21	61	26	20	14	120	21
<b>WC allowed**</b>	176	94	217	93	120	91	513	93
Exposed	135	77	157	72	98	82	390	76
Not exposed	3	2	4	2	6	5	13	2
Not reported	38	21	56	26	16	13	110	22
<b>WC denied**</b>	12	6	17	7	12	9	41	7
Exposed	8	67	9	53	6	50	23	56
Not exposed	3	25	3	18	3	25	9	22
Not reported	1	8	5	29	3	25	9	22
<b>WC claim submitted but not yet decided</b>	0	/	1	/	7	/	8	/
<b>No WC claim filed</b>	94	33	101	30	64	32	259	32
Exposed	36	38	37	36	25	39	98	38
Not exposed	23	25	24	24	15	23	62	24
Not reported	35	37	40	40	24	38	99	38
<b>Cases not from RGSS</b>	145	34	126	27	79	28	350	30

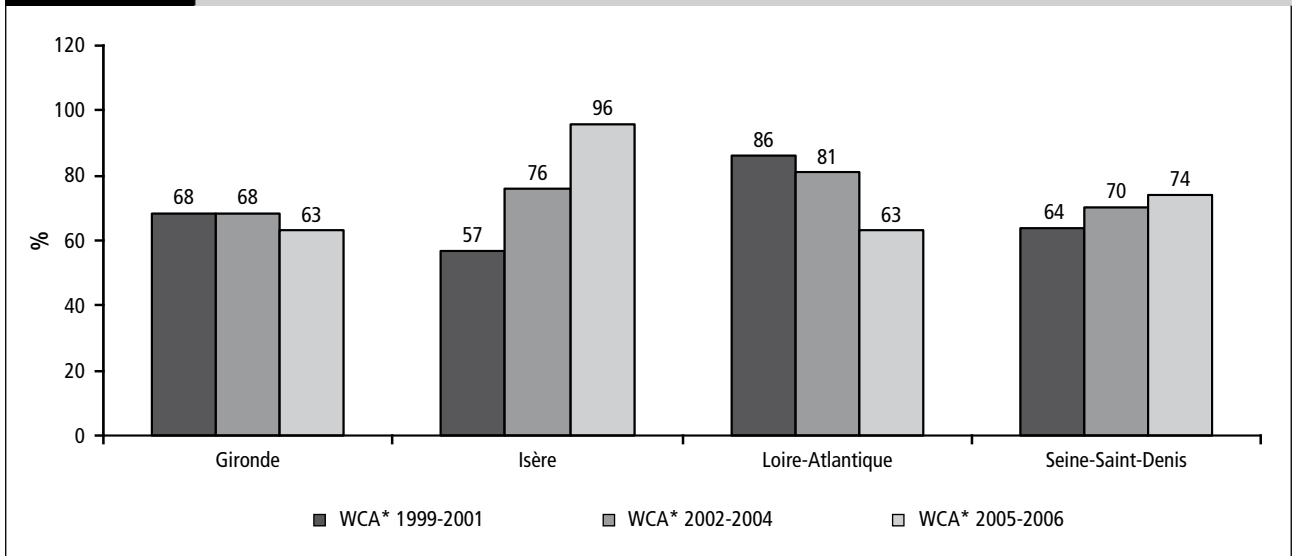
\* Calvados (14), Dordogne (24), Doubs (25), Gironde (33), Isère (38), Landes (40), Loire-Atlantique (44), Lot & Garonne (47), Manche (50), Orne (61), Pyrénées Atlantique (64), Bas-Rhin (67), Haut-Rhin (68), Somme (80), Seine Saint Denis (93).

\*\* The data presented do not take the cases currently submitted but not yet decided into account for the calculations of the percentages of WC claims granted.

Of the 15 districts that participated in PNSM during all three periods (1999-2001, 2002-2004 and 2005-2006), the proportion of WC claims allowed for RGSS members rose from 67% between 1999-2001 to 70% for the years 2002-2004. This proportion was 68% for 2005-2006. The proportion of WC claims allowed remained stable and high (>90%).

**FIGURE 4**

**TRENDS IN THE PROPORTION OF WC CLAIMS ALLOWED IN 4 DISTRICTS (1999-2006, n≥130 CASES)**



\* WCA: Workers Compensation Application.

	Gironde			Isère			Loire-Atlantique			Seine-Saint-Denis		
<b>With WC</b>												
Mean age	69	71	75	64	68	73	68	73	72	68	70	71
% men	89	88	79	97	86	88	97	95	97	77	90	87
% exposed ++ (when exposure is known)	96	100	87	94	92	90	96	100	96	94	94	96
<b>Without WC</b>												
Mean age	75	73	69	72	73	77	78	76	79	73	73	79
% men	69	67	82	64	33	100	83	50	53	40	47	63
% exposed ++ (when exposure is known)	17	67	22	44	/	/	60	50	67	65	54	43

There was an inter- and intra-district heterogeneity for the proportion of WC claims allowed. The subjects not filing WC claims were, on the whole, older than the subjects who did, had less asbestos exposure, and were less often men.

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## The French National Program for Mesothelioma Surveillance

### Principal results 1998-2006

The French National Mesothelioma Surveillance Program (PNSM) was established in 1998 by the national Institute for Public Health Surveillance (InVS). Its objectives are to estimate the trends in mesothelioma incidence and the proportion attributable to occupational asbestos exposure, to contribute to the research, to help improve its pathology diagnosis and to assess its compensation as an occupational disease.

The PNSM records incident pleural tumors in a population of approximately 18 million people according to standardized procedures. This report describes the organization of the PNSM and presents main results from 1998 to 2006 regarding the estimated number of annual incident cases in France, their pathological type, the highest risks industries and occupations, the attributable risk fraction for occupational asbestos exposure, and compensation.

The PNSM is a large scale epidemiologic surveillance system with several original aspects, providing important information to improve the knowledge of malignant pleural mesothelioma, such as monitoring the evolution of its incidence, of high risk occupations and economic sectors. It also contributes to the improvement of pathology techniques and of the compensation procedures.

**Key words:** Mesothelioma, Asbestos, Surveillance, Epidemiology, France

## Programme national de surveillance du mésothéliome

### Principaux résultats 1998-2006

Le Programme national de surveillance du mésothéliome (PNSM) a été mis en place en 1998 par l'Institut de veille sanitaire. Ses objectifs sont l'estimation des tendances de l'incidence et de la fraction attribuable aux expositions professionnelles, de contribuer à la recherche et à l'amélioration des techniques diagnostiques, et d'évaluer sa prise en charge médico-administrative.

Le PNSM enregistre les cas incidents dans une vingtaine de départements couvrant une population de 18 millions d'habitants selon des procédures standardisées. Ce rapport présente l'organisation du PNSM et une synthèse des principaux résultats acquis entre 1998 et 2006 concernant le nombre annuel de cas incidents de mésothéliome, leur répartition selon le type histologique, les secteurs industriels et les professions présentant le plus haut risque, ainsi que la fraction de risque de mésothéliome attribuable à une exposition professionnelle à l'amiante et l'évaluation du processus d'indemnisation au titre des maladies professionnelles.

Le PNSM est un système de surveillance à grande échelle présentant plusieurs aspects originaux, produisant d'importantes informations pour l'amélioration de la connaissance du mésothéliome pleural telles que le suivi de l'évolution de son incidence, des professions et secteurs industriels à risque, l'amélioration des techniques diagnostiques anatomopathologiques et de la prise en charge médico-administrative.

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