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# Seroprevalence of antibodies to *Legionella* among elderly people living in French nursing homes.

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## • INTRODUCTION and AIM OF THE STUDY

Elderly persons are at greater risk of legionellosis than younger people. Also, fatalities mostly occur among subjects older than 50 during legionnaires' disease epidemics. However, while *Legionella* is an important pathogen, the seroprevalence of antibodies is not well-documented. The epidemiological LEGION'AIR project aims at characterizing exposure of elderly people to *Legionella* while showering, and at studying the relationship between health (clinical and biological responses) and concentrations of *Legionella* in water and/or air. It focuses on the mild pathology caused by *Legionella* : the Pontiac Fever in order to ward off the occurrence of the more serious legionnaires' disease.

One objective of this project is to investigate the prevalence of *Legionella* antibodies among the elderly population.

## • MATERIAL AND METHOD

Participants are recruited in 25 nursing homes in East of France between October 2003 and December 2004. More than 500 subjects agreed to participate in the present study and provided blood samples (one blood sample/pers.) at the end of a 4 months follow-up period. Information on age, gender, smoking and disease histories (respiratory and immunizing) is also collected.

The anti-*Legionella* antibody titers measured by indirect immunofluorescence (Pr. J. Etienne Lyon, France) are : anti-*Legionella pneumophila* (serogroups 1 to 10), anti-*L. micdadei*, anti-*L. bozemanii*, anti-*L. dumoffii*, anti-*L. jordanis*, anti-*L. gormanii*, anti-*L. longbeachae* (serogroups 1 and 2) and anti-*L. anisa* antibodies. The antibody titers' detection limit is 1/16 for anti-*Legionella pneumophila* (serogroups 1 to 6) antibodies, and 1/64 for the others.

## • DESCRIPTION OF ELDERLY POPULATION

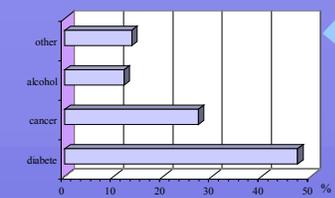
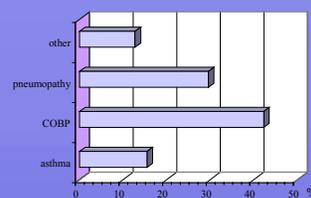
The voluntary subjects are on average 81.6 years old. More half of the population are women (71%) and nonsmokers (65%).

Characteristics	Category	% (n)
Age	< 50	0 (1)
	50 – 69	13 (74)
	70 – 89	63 (357)
	≥ 90	19 (107)
Sex	Men	28 (155)
	Women	71 (400)
Smoker	Yes	8 (41)
	No	65 (364)
Ex-smoker	Yes	8 (43)
	No	57 (319)

The majority of the population (53%) presents any disease history (neither respiratory, nor immunizing). The most found pathologies respiratory and immunizing are COBP (42%) and diabete (47%).

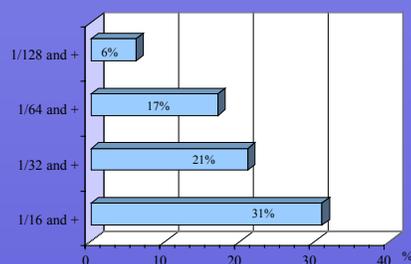
Disease histories	Category	% (n)
Respiratory	Unknown	30 (167)
	No	56 (311)
	Yes	15 (85)

Disease histories	Category	% (n)
Immunizing	Unknown	29 (162)
	No	53 (299)
	Yes	18 (102)

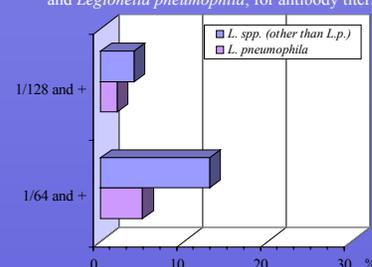


## • SEROPREVALENCE OF ANTIBODIES TO *Legionella*

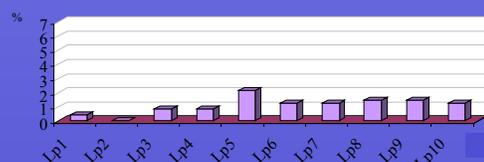
Prevalence for all antibodies to *Legionella*



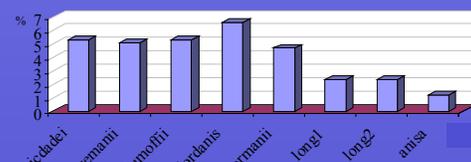
Prevalence for *Legionella spp.* and *Legionella pneumophila*, for antibody titers  $\geq$  1/64



69% of the elderly population have anti-*Legionella* antibody titers lowest than detection limit. Seroprevalence for all antibody titers of 1/32 or less was 14%, greater than prevalences observed in European studies of blood donors (< 10% : Bornstein et al. [1986]; 0.3% : Franzin and Scramuzza [1995]). For antibody titers  $\geq$  1/64, this elderly population has a higher prevalence for *Legionella spp.* (13%) than for *L. pneumophila* (5%). 6% of the subjects have an antibody titers  $\geq$  1/128 but no case of legionellosis was detected during the epidemiologic follow-up.



Mainly anti-*L.p.5* antibodies (2%), followed by anti-*L.p.8* antibodies (>1%) and anti-*L.p.9* antibodies (>1%) are identified, for antibody titers greater than 1/64.



Mainly anti-*L. jordanis* antibodies (7%), followed by anti-*L. dumoffii* antibodies (5%) and anti-*L. micdadei* antibodies (5%) are identified, for antibody titers greater than 1/64.

## • ACKNOWLEDGMENTS

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