

HEALTH ASSESSMENT of NUCLEAR WORKERS from AREVA NC - La HAGUE: PRELIMINARY RESULTS

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Context and objectives

- A morbidity study of French nuclear workers is currently carried out in 5 specific sites in France : Ile de France (n=1,710 workers), Pierrelatte (n=4, 540 workers), Malvézi (n=378 workers), Marcoule and La Hague. Preliminary results for the site of La Hague are presented, Table 1.
- This study is largely based on data collected by occupational medical services of every French AREVA nuclear sites in a database called "Chimed" implemented since 1994. For each worker, all incident health events, as well as administrative data, were registered in the Chimed database, during medical visits with an occupational physician.
- This original system provides a unique opportunity to describe morbidity in a working population in France.

Materials and Methods

- The study included all workers having worked at least one year in a specific site of Areva since the implementation of the database "Chimed".
- Based on ICD-9, the main diseases categories analyzed were: traumatic lesions; diseases of the musculoskeletal system and connective tissue; of the circulatory system; endocrine, nutritional and metabolic diseases and immunity disorders; depressive disorders.
- Age and calendar year standardized incidence rates (IRs) were estimated for major categories of diseases.
- Cox regressions were performed to estimate the hazard ratios (HR) of these diseases associated with: duration of professional activity, medical history and shift work.

Results

- The study included 4,387 workers employed in the site of AREVA – La Hague between 1999 and 2009. Most employees were men (85%), Table 1.
- A total of 2,303 incident diseases were registered for 1,671 workers. Traumatic lesions were the most frequent for men (IRs=1,514 cases per 100,000 person-years). Diseases of the musculoskeletal system and connective tissue were the first major cause of disease for women and second for men (IRs=1,158 cases/ 100,000 p-y for women; IRs=1,306 cases/ 100,000 p-y for men), Figure 1.

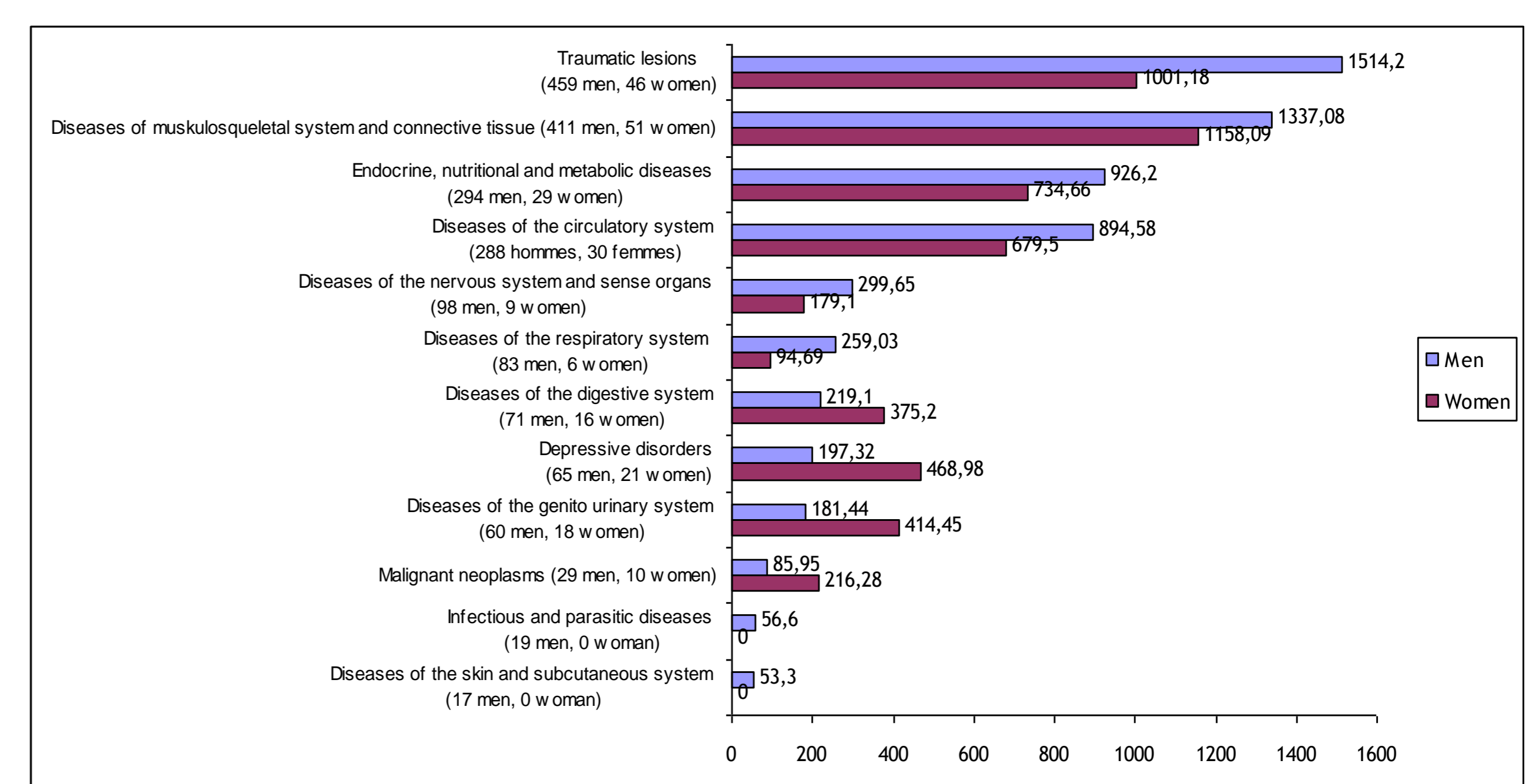


Figure 1: Results of the morbidity study among workers at the site of La Hague, period 1999-2009

Table 1 : Description of the population

	Total N=4,387	Men N=3,738 (85 %)	Women N=649 (15 %)
Age (mean ± standard deviation)			
At the beginning of follow up	36.7 ± 9.5	37.2 ± 9.4	34.1 ± 9.6
At the end of follow up	45.4 ± 9.7	46.0 ± 9.4	41.8 ± 10.8
Number of medical visits per year			
Mean ± standard deviation	1.82 ± 1.18	1.87 ± 1.18	1.50 ± 1.17
Shift work (n (%))			
Yes	1,943 (44.3 %)	1,912 (51.2 %)	31 (4.8 %)
No	2,444 (55.7 %)	1,826 (48.8 %)	618 (95.2 %)
Duration of activity at the site of La Hague			
Mean ± standard deviation	19.3 ± 9.4	19.9 ± 9.1	15.4 ± 10.1
Number of workers in activity at the end of follow 31/12/2009)	2,977 (67.9%)	2,549 (68.2%)	428 (65.9%)

- Traumatic lesions are more frequent among men. Depressive disorders, diseases of the genito urinary system and cancers are more frequent in women.



Discussion

- The Chimed database gives an overview of the health status of the Areva workers. At this stage, only workers with a statutory position were included in this analysis but it will be extended to all AREVA – La Hague workers.
- It is planned to undertake a joint analysis of our site-specific data in order to increase the statistical power of the study. File matching with exposure or work type database will give support to the conduction of analytical studies based on morbidity data, in particular to study the effect of exposure to ionising radiation. Other variation factors on the incidence of major diagnosed diseases (such as social class, shift work, duration of work ..) will be also further investigated.

- Finally, the feasibility of the epidemiological surveillance of these workers after retirement will be evaluated. In France, there is no national cancer registry. However, for the site of La Hague, it will be possible to use data from two Regional Cancer Registries: one dedicated to solid cancers and one dedicated to Haematopoietic Malignancies.