

Estimation of underreporting of musculoskeletal diseases (MSDs) in France

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Introduction

In industrial countries, studies suggest under-reporting of occupational diseases, particularly for MSDs. In France, the financial compensation of occupational disease relies on lists, based on presumption of causality, which define the necessary and sufficient conditions. These occupational diseases were compensated by the Social Security.

Otherwise, in order to estimate the frequency of the non compensated work related diseases (nc-WRD), the French Institute for Public Health Surveillance (InVS) has developed a surveillance program through a network of volunteer occupational physicians (7 regions included in 2007).

Objective

The aim of this study was to evaluate underreporting of three sites of MSDs: shoulder, hand-wrist-fingers (including carpal tunnel syndrome) and lumbar spine by using data from the surveillance system of nc-WRD and the system of compensation of occupational disease.

Method

The physicians involved in the epidemiological surveillance of nc-WRD notified the non compensated WRD they have observed during the period of two weeks, repeated every six-month periods. Data on age, gender and economic sector were collected for all the employees visited by the same physicians during the same period. Nc-WRD are all the non compensated diseases from occupational origin. They could be not reported, reported but refused or in process of compensation. For this study, only MSDs which corresponded exactly to the compensation system lists were used*. Prevalence rates of MSD were calculated with this 95% confidence interval.

The under-reporting rate (%) is defined as: $\frac{\text{number of non-reported MSDs}}{\text{number of reported MSDs and not reported MSDs}} \times 100$

An indicator of under-reporting rate (T) was approached as following:

$$T = \frac{\text{Number of non reported MSDs}^1 \text{ in nc-WRD}}{\text{Number of compensated MSDs}^2 + \text{number of rejected and in process of compensation MSDs}^3 \text{ in nc-WRD} + \text{number of not reported MSDs}^1 \text{ in nc-WRD}} \times 100$$

1/ The number of non reported MSDs was calculated by extrapolate the prevalence rate of non reported MSDs in nc-WRD system and its confidence interval to the number of regional employees by using data for the employees of the 7 regions from the Insee national employment survey (Insee 2007) and by using the mean number of MSDs by employees.

2+3/ The number of reported MSDs was approached by adding compensated MSDs and refused or in process MSDs in nc-WRD system.

2/ The number of compensated MSDs was available directly in the database of the social security.

3/ The numbers of refused or in process MSDs were obtained by extrapolate the prevalence rate of refused or in process MSDs in nc-WRD system and their confidence interval to the number of regional employees by using data for the employees of the 7 regions (Insee 2007) and by using the mean number of MSDs by employees.

As it was difficult to construct a confidence interval for T because it included several random variables, extreme values were calculated to reflect uncertainty by using the limits of the confidence interval of prevalence rates of MSDs in nc-WRD.

Lastly, agriculture, education, health care and administration were excluded because they were insured by another special compensation system.

For each site, T was analysed by gender, age and economic sectors.

*Lumbar spine (M511). Shoulder (M750 M751-M752). Hand-wrist-fingers (G560 M653 M654 M658.4 M778.3 M778.4)

Results

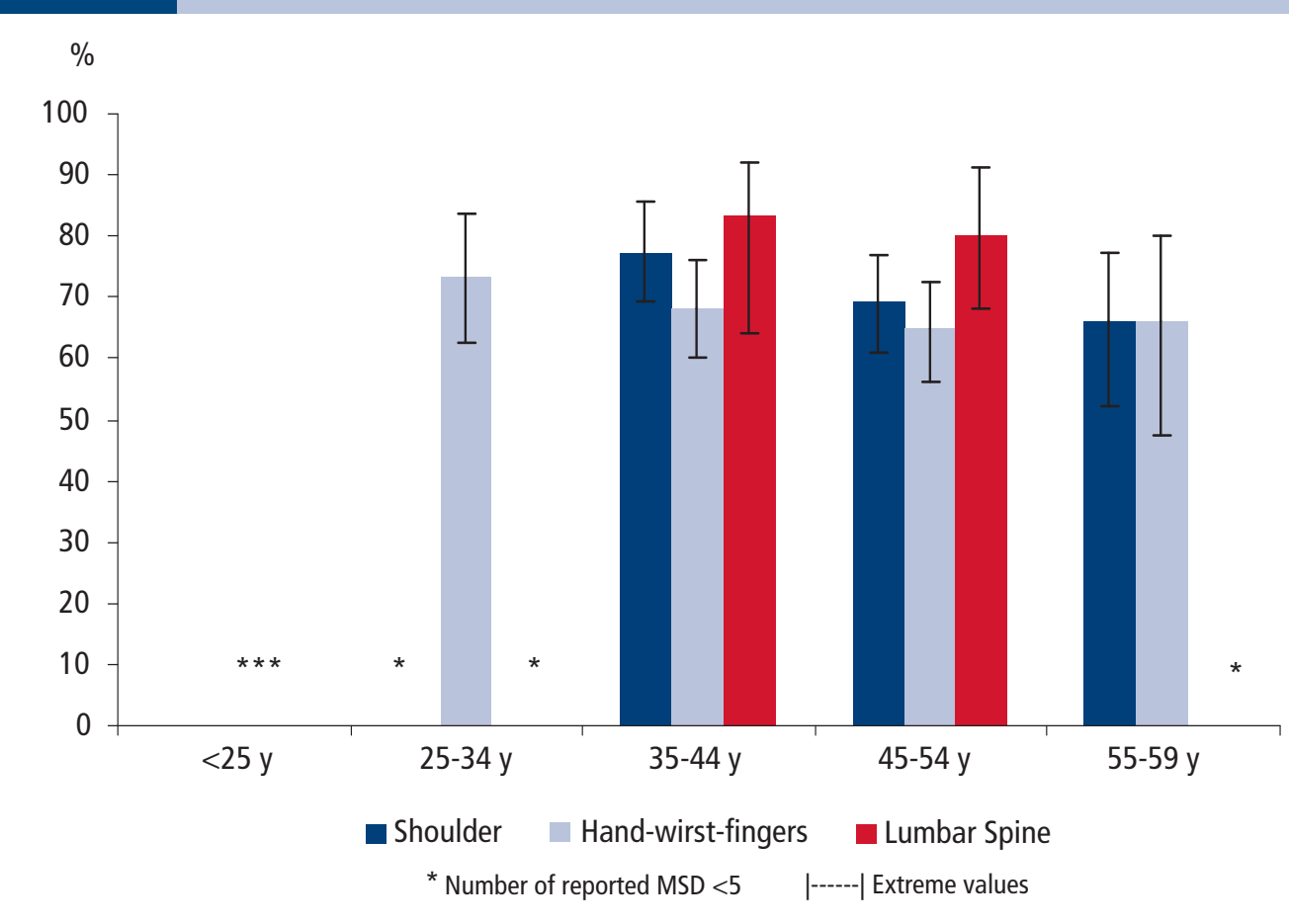
- Employees of the 7 regions selected for the study represented 28% of the French employees.
- Among the 4,356,441 employees (Insee 2007), the number of compensated MSD was 3,829 (frequency: 0.09%) for hand-wrist-fingers, 2,733 (0.06%) for shoulder and 489 (0.01%) for lumbar spine.
- Among the 80,101 employees included in nc-WRD surveillance system by the 32% of participating occupational physicians, the prevalence rate was 0.6% [0.54-0.65] for hand-wrist-fingers (n=477), 0.6% [0.50-0.60] for shoulder (n=438) and 0.2% [0.16-0.22] for lumbar spine (n=156).
- The employees included in nc-WRD system were younger (37.1 ± 10.6 yrs vs 45.4 ± 3.9 yrs), more often men (65% vs 60%), and worked more often in the support service activities and professional, scientific technical & administrative activities (19% vs 14%) and less often in manufacturing, mining & quarrying & other industrial activities (23% vs 25%) than the employees from the Insee national employment survey ($p < 0.05$).

	Shoulder underreporting rate (%) [extreme values]	Hand-wrist-fingers underreporting rate (%) [extreme values]	Lumbar spine underreporting rate (%) [extreme values]
Both genders	74 [69-78]	68 [63-72]	80 [72-89]
Women	71 [63-77]	66 [60-72]	Nc
Men	76 [70-82]	71 [64-77]	77 [68-85]

Nc: not calculated, number of reported MSDs <5.

Underreporting rate was higher for lumbar spine than for hand-wrist-fingers. Few variations were observed according to gender.

FIGURE 1 UNDERREPORTING RATE BY LOCALISATION ACCORDING TO AGE



Underreporting rate of MSDs tended to decrease with age for shoulder (77% to 66%). Few variations were observed for lumbar spine or hand-wrist-fingers according with age.

TABLE 2 UNDERREPORTING RATE FOR HAND-WRIST-FINGERS AND SHOULDER ACCORDING TO MAIN ECONOMIC SECTORS

	Shoulder % [extreme values]		Hand-wrist-fingers % [extreme values]	
	Women	Men	Women	Men
Manufacturing, mining & quarrying & other industrial activities	69 [54-80]	78 [66-87]	63 [50-74]	74 [62-84]
Construction	*	77 [64-86]	*	71 [55-84]
Wholesale and retail trade	68 [49-83]	78 [61-91]	70 [56-82]	*
Accommodation and food service activities	*	*	61 [34-81]	*
Support service activities and professional, scientific technical & administrative activities	*	71 [47-92]	69 [52-83]	*
Other services activities	*	*	58 [24-87]	*

*Number of rejected, in process or non-reported MSD <5.

Few variations were observed according to economic sectors.

Discussion - Conclusion

- This indicator is not an accurate estimation of underreporting although it contributed to assess the importance of the phenomenon.
- This indicator has several limitations:
 - the prevalence of nc-WRD are estimated from restricted periods (2 weeks/semester). However, the prevalence rates in our programme, stable from one period to the other, must be close to the annual rate;
 - the employees included in nc-WRD system are not totally representative of the employees from the Insee national employment survey. The observed differences reflect the specificity of the occupational medicine in France (visits periodicity according to risk). These differences could lead to an under or over estimation of the underreporting rate;
 - other factors involved in the reporting process for compensation are not taken into account (such as refunding time limit).
- However, the uncertainty is limited because a variation of the annual number of nc-WRD of 10% leads to an indicator variation of 1%. The results are consistent with a French study which found an underreporting rate of carpal tunnel syndrome under surgery of 47% (Ha *et al.* 2011). Moreover, the main results show:
 - highest underreporting rate for the lumbar spine: the balance between the benefits (medical and social) and the risks (employment) is less favourable than for hand-wrist-finger MSDs;
 - moderate variations according to gender or economic sectors: underreporting is a widespread phenomenon;
 - decrease in under-reporting rate for shoulder with age: the compensation is more attractive and the disease more serious for an older subject.

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References

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