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Interest of a multi-level epidemiological surveillance system of work-related lowback pain to target industry sectors requiring in priority prevention programs – The French Pays de la Loire study

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Objective

Low-back pain (LBP) is the leading cause of musculoskeletal morbidity in the workplace. Almost 50% of European workers report suffering from back pain. In France, radiculalgia due to a herniated disc caused by vibration or handling of materials is the only work-related LBP recognized by the workers' compensation system. For several years, the compensation system was the only source of information to describe the epidemiology of MSDs. The French Public Health Agency therefore implemented a pilot epidemiological surveillance system for work-related musculoskeletal disorders (MSDs) in the Pays de la Loire region in 2002. This program combined three main components:

1. epidemiological surveillance of the main MSDs in the workplace;
2. registration of uncompensated work-related diseases;
3. epidemiological surveillance of sentinel health events in the general population.

The objective of this study was to compare the data of French workers' compensation system (WCS) and three monitoring networks in a French region, and to determine the possibility of identifying the industry sectors requiring in priority prevention programs of LBP.

Methods

This study compared four databases and two types of indicators in a French west central region:

- surveillance of musculoskeletal symptoms in the working population in 2007-2009 (LBP and disc-related sciatica (DRS) indicators; Cosali study);
- surveillance of the uncompensated work-related diseases (UWRD) in 2008-2010 (LBP and DRS indicators);
- surveillance of lumbar disc surgery (LDS) in the general population in 2007-2008 (DRS indicator);
- registration of radiculalgia due to herniated disc caused by vibration or handling of materials compensated as occupational disease (OD-Radiculalgia) by the French WCS in 2009-2010 (DRS indicator).

People aged 20-59 were studied.

The **prevention index (PI)** was used to rank industry sectors according to two types of ranking information: the **frequency** and the **rate of incidence or prevalence**. Ranking was determined according to the industry sector with the highest incidence or prevalence (ranked 1) down to the sector with the lowest incidence or prevalence (last ranking equal to the number of sectors considered). The ranking of the absolute frequencies of LBP or DRS (i.e. ranking of the number of cases) observed was applied in the same way. Using the information on the frequencies and the incidence or prevalence, the PI can be calculated as the mean of two ranks (see formula below):

$$PI = \frac{\text{Frequency ranking} + \text{Incidence/prevalence ranking}}{2}$$

Only sectors with more than 5 cases were ranked according to the PI. Results are presented only **for men** here.

Results

Construction was the main sector for the two indicators (LBP and DRS) in terms of PI for all sources, except for the Cosali study (Table).

Construction also presented a rate ratio higher than 1 for all studies and indicators (varying between 1.17 and 2.86).

The **manufacturing industry** also appeared to be a priority sector for both indicators, except according to the LDS study (PI ranking=4 and Rate ratio<1).

Transportation was also associated with high PI according to the Cosali and the LDS studies and **agriculture** according to UWRD surveillance and OD-radiculalgia.

Public administration and defence was associated with high PI in the LDS study, and **real estate, renting and business services** in the Cosali study (for DRS indicator only).

Specific epidemiologic surveillance networks (LDS and Cosali studies) allowed **ranking the most important number of sectors** out of the 17 existing. Considering DRS indicators, LDS study ranked 13 sectors. Concerning LBP indicators, Cosali study ranked 8 sectors.

TABLE 1	PREVENTION INDEX RANK AND RATE RATIO OF LOW BACK PAIN (LBP) AND DISC-RELATED SCIATICA (DRS) ACCORDING TO INDUSTRY SECTORS FOR MEN ^α																	
	Low back pain indicators						Disc-related sciatica indicators											
Industry sectors (using the 17 sections of the Nomenclature d’Activités Française [NAF] codes of 2003)	Cosali study			UWRD surveillance			Cosali study			UWRD surveillance			LDS study			OD-Radiculalgia		
	n	Rate ratio	PI ^β rank	n	Rate ratio	PI ^β rank	n	Rate ratio	PI ^β rank	n	Rate ratio	PI ^β rank	n	Rate ratio	PI ^β rank	n	Rate ratio	PI ^β rank
• Agriculture, hunting and forestry	2			13	2,08	3	0			6	2,48	3	38	0,94	8	38	1,95	3
• Fishing, aquaculture and related service				0						0			5	3,18	8			
• Mining and quarrying	1			2			0			2			2			4		
• Manufacturing	97	1,02	2	58	1,19	2	36	1,14	2	20	1,06	2	127	0,82	4	71	1,03	2
• Electricity, gas and water conditioning supply	2			0			0			0			3					
• Construction	22	1,17	3	31	1,58	1	8	1,28	4	13	1,71	1	115	1,53	1	100	2,86	1
• Wholesale and retail trade; repair of motor vehicles and household goods	22	0,94	6	25	0,98	4	7	0,90	5	8	0,81	4	67	0,82	5	27	0,70	4
• Accommodation and food service activities	1			4			0			1			13	0,82	11			
• Transportation and communication	25	1,38	1	11	0,84	5	9	1,44	1	5	0,99	5	64	1,41	2	21	1,03	5
• Financial activities	6	0,50	8	1			0			0			21	1,53	5	2		
• Real estate, renting and business services	21	1,09	4	12	0,45	5	8	1,32	2	5	0,48	6	35	0,47	12	17	0,47	6
• Public administration and defence; compulsory social security	23	0,95	4	6	0,89	5	6	0,72	6	4			62	1,41	3	2		
• Education	2			3			0			0			33	1,18	10			
• Human health and social work activities	10	0,97	7	0			4			0			38	1,18	5	4		
• Collective, social and personal services	2			1			1			0			11	0,59	13	8	0,89	7
• Activities of households as employers				1						1			1					
• Activities of extraterritorial organisations and bodies				0						0			0					

^α Only sectors with more than five cases are presented in the analysis ^β Prevention index

Discussion

Using four independent population-based data sources on the frequency of low back pain and disc-related sciatica, this study detected sectors most in need of prevention, i.e. construction, manufacturing, transportation and agriculture sectors. Results show the complementarity of the four surveillance programs for men like for women (data non shown). The regional WCS alone is insufficient to describe accurately the phenomenon. A surveillance network in general population seems to be more appropriate to describe accurately workrelated LBP or DRS according to industry sectors, especially those not covered by the occupational health system.

Thematic file of the Santé publique France website: <http://invs.santepubliquefrance.fr/Dossiers-thematiques/Travail-et-sante/Troubles-musculo-squelettiques-TMS>
LEEST website: <http://leest.univ-angers.fr>

