



## **Editorial**

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### **National variations in back pain: Ecological fallacy or cultural differences?**

by [Verbeek J](#), [Burdorf A](#)

**Affiliation:** Finnish Institute of Occupational Health, Kuopio, Finland.  
[jos.verbeek@ttl.fi](mailto:jos.verbeek@ttl.fi)

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## *National variations in back pain: Ecological fallacy or cultural differences?*

In this issue of the *Scandinavian Journal of Work, Environment & Health*, Farioli et al (1) describe that wealthier populations report more back and neck pain than poorer populations, contradicting the well-established consensus on presence and nature of socioeconomic differences in health. Their evidence is based on an analysis of the variation in prevalence of musculoskeletal pain across 34 European countries. The authors suggest that back pain is related to affluence, on the one hand, and culturally determined health beliefs, on the other hand. When this ecological association reflects causality at the individual level, current primary prevention strategies for musculoskeletal disorders must be completely overhauled. What could explain these remarkable findings of Farioli and colleagues?

Socioeconomic inequalities in health are well documented in all Western countries. Almost all important health problems and major causes of premature mortality are more common among persons with lower education, income, and occupational class. Typically, workers in manual jobs have 1.5 to 2-fold higher death rates than those in non-manual jobs and these inequalities are even larger when comparing unskilled workers with professionals (2). Similar differences are reported for self-assessed health, chronic conditions, and perceived disability. Most chronic diseases have a substantially higher prevalence in lower educational groups, but, interestingly for back disorders, only modest health inequalities have been reported (3). A recent study in the general working population in Oslo, Norway, reported marked socioeconomic gradients between lower occupational class and higher prevalence of musculoskeletal pain. Inequalities were larger among men than women and more pronounced for low-back and arm than for neck-shoulder pain. Physical job demands explained a substantial proportion of the absolute occupational class inequalities in low-back pain, while job autonomy was more important in explaining the inequalities in neck-shoulder and arm pain (4). In the GAZEL cohort of French workers, the prevalence of low-back pain lasting >30 days was significantly higher among blue-collar workers than their managers. Socioeconomic disparities reduced substantially after adjustment for mechanical load (5). In summary, all available evidence suggests a strong association between wealth and health: health determines wealth through a selection process and wealth influences health through a causation process (6).

An important issue to consider is whether the presented associations suffer from the “ecological fallacy” whereby associations observed between characteristics of populations do not have relevance for associations at the individual level (7). In other words, trends across countries may be different from those within each country. Interestingly, Farioli and colleagues (1) present some evidence in their analyses for the existence of this ecological fallacy. For both back and neck pain, the prevalence was somewhat higher among workers in lower occupational classes. After adjustment for educational level and occupation, no association was apparent with socioeconomic class. Thus, the analysis with individual data shows no health inequalities, whereas the comparison at country level shows reversed health inequalities.

Farioli et al's other explanation for their findings was that back pain is culturally determined. It is not unreasonable to assume such a psychological mechanism behind the high prevalence of back and neck pain. Already in the 1950s, Mechanic (8) found that symptom expression and healthcare-seeking behavior was highly influenced by cultural factors. In the 1960s, Engel (9) proposed the biopsychosocial model of healthcare that Waddell effectively applied to back pain in the 1980s (10). Psychological factors could play a causal role in back pain development, but it is more conceivable that they influence persistence of pain and occurrence and persistence of disability. The problem is that the available evidence is not in line with a simple psychological model. For example, a review of nine cohort studies concluded that there was

little evidence to link fear avoidance with poor prognosis of back pain (11). Also, the finding in Farioli's study that the highest prevalence of neck or upper-limb symptoms was reported in Finland does not seem to be in line with the psychological or cultural explanation. There is no indication that Finns are overly expressive about health symptoms or in healthcare-seeking behavior. It is also difficult to imagine how we should act upon this knowledge. Should a high prevalence of back or neck pain be simply disregarded as culturally determined health beliefs or should Finns be told to complain less?

One of the pitfalls in back pain research is that both back pain and its exposures can be simply assessed by a questionnaire. However, most of these measurements provide reliable and valid estimates of neither exposure nor outcome. In our view, this is one of the most important reasons for the continuing controversy about the causes of back pain, with some authors negating an association and others advocating important associations with work. In general, good evidence of a causal relation between factors at work and health outcomes requires a clear assessment of exposure, an unambiguous case definition of the disease at hand, and several well-conducted epidemiological studies to underpin the relation between exposure and health outcome (12).

The measurement of low-back pain is a daunting task because there is no generally accepted case definition and there are many dimensions that affect its severity such as the intensity, frequency, and duration of pain, presence of radiation, and disability. Hoy et al (13) recently systematically reviewed studies that reported prevalence of back pain. They found a mean one-year back pain prevalence of 38% with a standard deviation of 19.4% indicating a wide variation across populations. They also found that five of ten methodological factors significantly influenced the reported prevalence. Therefore, it seems that asking persons "Did you suffer from back pain last year?" does not seem to be a very reliable measure of back pain. Dionne et al (14) proposed a minimal case definition of back pain as "back pain in the past four weeks that limited activities or daily routine", based on a consensus of experts. They advocated the use of a broader definition that incorporated more of the elements mentioned above. It seems that we can still improve here.

From the preventive point of view, the high prevalence of back and neck pain reported by Farioli et al seems to confirm the idea that we are not doing very well with back pain. Also other studies indicate that pain rates seem to be stable or rising over time (15). At the moment, the only feasible preventive measure seems to be to decrease exposure to biomechanical risk factors. However, this is not a simple task because decreasing biomechanical exposure comes, very often, at the expense of productivity. There is still a long way to go both in terms of research methods and developing and evaluating intervention strategies for prevention of back pain.

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Jos Verbeek,  
Finnish Institute of Occupational Health  
Kuopio, Finland  
[E-mail: jos.verbeek@ttl.fi]

Alex Burdorf  
Department of Public Health, Erasmus MC  
Rotterdam, The Netherlands  
[E-mail: a.burdorf@erasmusmc.nl]

