



Letter to the Editor

RE: "NEED FOR MORE INDIVIDUAL-LEVEL META-ANALYSES IN SOCIAL EPIDEMIOLOGY: EXAMPLE OF JOB STRAIN AND CORONARY HEART DISEASE"

We were surprised to read that longstanding debates on the association between job strain (high-demand and low-control work) and coronary heart disease "were resolved" as the result of 1 meta-analysis of 13 cohort studies using "an individual-participant data meta-analysis approach" (1, p. 1). In fact, the conservative estimate of association provided was likely the consequence of biases towards the null in the 13 studies that were unacknowledged in the meta-analysis (2). A previous review (3) documented that 15 of 17 cohort studies of job strain and cardiovascular disease were dominated by biases towards the null.

First, restriction of the range of exposure created a bias towards the null. Only 3 of the 13 cohort studies in the meta-analysis (2) were randomly selected from general working populations in which the participation rates were greater than 50%; most of the others were recruited from white-collar organizations (4). The prevalence of job strain is generally lower in white-collar occupations than in blue-collar occupations (5). Workers in the most stressful jobs (industrial, sweatshop, and temporary workers and undocumented immigrants) were much less likely to be included in the 13 studies. Workers with job strain are also less likely to participate in research studies (6). Although previous studies suggested that there was a stronger association between job strain and coronary heart disease in lower (vs. higher) socioeconomic groups (7, 8), the meta-analysis by Kivimäki et al. (2) suggested that there was a stronger association (although no significant effect modification) in higher socioeconomic groups, raising questions about the potential impact of restricted occupational variance in the 13 cohorts. Moreover, the meta-analysis included studies only from Northern Europe, thus severely limiting its external validity. The focus on Scandinavian cohorts (51% of person-years in the meta-analysis) is problematic, given the weaker associations observed between work stressors and depression symptoms in Scandinavian countries compared with other European countries (9). Therefore, the summary effect estimate of 1.23 (95% confidence interval: 1.10, 1.37) and population attributable risk of 3.4% are likely to be underestimates of the true effect not only in Northern European countries but also in other European countries and even more so in industrializing countries such as China, which are likely to have a much higher prevalence and severity of job strain.

Second, all 13 cohort studies suffered from 2 forms of exposure misclassification: the use of median cut points (which are arbitrary) for job demands and job control to define job strain and the measurement of job strain, an exposure that can change over time, only at baseline and not at follow-up. Additionally, in 9 of 11 studies in the meta-analysis in which such data were available, a proportion of the sample became 65 years of age or older during follow-up. Because job strain is associated

with earlier retirement (10, 11), this creates an additional bias toward the null. Although the authors (1) cited the Whitehall II study (1 of the 13 cohort studies) as an example of weaker associations between job strain and coronary heart disease associations in older (vs. younger) age groups (12), in fact, Whitehall II is an example of risk attenuation due to retirement. There is a much weaker association in the group aged approximately 62–72 years at the end of follow-up than in the group aged 49–61 years at the end of follow-up, a limitation acknowledged by the authors of that Whitehall II paper (12).

In summary, despite the promise of individual-participant data meta-analyses, such analyses are limited by the limitations of the included studies and may simply not be affordable or feasible in many areas of the world. Therefore, the longstanding debates in the job strain literature remain unresolved, awaiting a more comprehensive meta-analysis of the many existing cohort studies of this association that were not included in the current meta-analysis (3, 13).

ACKNOWLEDGMENTS

This work is supported by the Center for Social Epidemiology, Marina Del Rey, California.

Conflict of interest: none declared.

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DOI: 10.1093/aje/kwt193.