

## **On the possibility of using field and laboratory sleep disturbance due to vibration to derive a common dose response relationship.**

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### **ABSTRACT**

Exposure to nocturnal freight train vibrations may induce sleep disturbance and little is known of dose response relationships. Within the European FP7 project 'Cargovibes', sleep disturbance was evaluated in field and laboratory studies. Similar questions and metrics for exposure enables comparisons between the study settings. Two field studies (Poland) and (Netherlands) totals 233 valid responses, and three laboratory studies: totals 59 subjects and 350 person-nights. The odds ratios of sleep disturbance were analyzed in relation to night time vibration exposure (log 10 RMS) by ordinal logit regression, adjusting for moderating factors common for the settings. Outcome specific fractions (OSF) were calculated of 11 sleep outcomes. The results imply no significant impact of field versus laboratory settings, with adjusted odds of 1.37 (0.59-3.19), giving a combined association of exposure and sleep disturbance of OR=3.51 (2.6-4.73). Results of OSF supported the setting comparability. Adjusted odds of sleep disturbance was though higher in the Netherlands indicating unexplained differences. The possibilities to derive common dose response relationships will be discussed in light of limitations related to exposure assessments, study populations and cultural differences.

