

Prevalence and Treatment of Sleep Apnea in Safety-Critical Railroad Employees

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Short Communication

On December 1, 2013 four passengers on a Metro North passenger train in New York City died and 70 were injured as the result of an over speed derailment [1]. Subsequently, it was announced by the National Transportation Safety Board (NTSB) that the locomotive engineer operating the train had sleep apnea [2]. Five NTSB recommendations following rail accidents since 2009 [3-7] have called for medical screening of safety-critical employees for sleep apnea. This short communication provides data on the prevalence and treatment of sleep apnea in three groups of safety-critical railroad employees in order to provide an estimate of the magnitude of this problem for the railroad industry.

Table 1 is a summary of data on sleep apnea in railroad employees from three surveys conducted between 2006 and 2009 [8-10] by the Federal Railroad Administration (FRA). The surveys collected information on railroad worker patterns of sleep and work in daily diaries as well as information about demographics and health. The surveys included the following yes/no questions: "Do you have sleep apnea?" and "Are you receiving medical treatment for your condition?" The surveys were conducted by mail with the assistance of railroad labor unions and were random samples of each labor union population. All surveys were approved by the Office of Management and Budget as required by U.S. law.

| Group | Number participants | of | Number with sleep apnea | Percent with sleep apnea [Mean (95% CI)] | Percent receiving treatment |
|------------------|---------------------|----|-------------------------|--|-----------------------------|
| Train and Engine | 250 | | 21 | 8.40 (8.34-8.46) | 66 |
| Dispatchers | 443 | | 33 | 7.45 (7.42-7.48) | 66 |
| Passenger T&E | 256 | | 15 | 5.86 (5.82-5.90) | 80 |
| TOTAL | 949 | | 69 | 7.27 (7.26-7.28) | 69.6 |
| U.S. Males | | | | 4.0 | |

Table 1: Sleep apnea in safety-critical railroad employees.

Table 1 shows the railroad group surveyed, the number of survey participants, the number with sleep apnea, the mean percent with sleep apnea, and the 95% confidence interval (CI) for the mean. At the time of this data collection, railroad employees in each group were subject to FRA hours-of-service regulations. The Train & Engine (T&E) group consists of locomotive engineers and conductors in freight service. The Passenger T&E group consists of locomotive engineers and conductors in passenger service. Dispatchers plan and control the movements of trains through the use of signals and radio communications. Locomotive engineers, conductors and dispatchers are the most safety-critical employees in the railroad industry.

7.27 percent of railroad employees surveyed reported having sleep apnea with a low of 5.86% for Passenger T&E and a high of 8.4% for T&E. By comparison, the estimated prevalence of sleep apnea among U.S. males is 4% [11] and 2% for the U.S. population [12]. Railroad employees are predominantly male. Among the three groups sampled, 9.4% were female. The 95% CI for sleep apnea for railroad employees does not overlap with the 4% estimate for U.S. males, which indicates that railroad employees have nearly twice the prevalence of sleep apnea of the U.S. male population.

Table 1 also shows the percent of railroad employees receiving treatment for sleep apnea. The mean for the three groups is 69.6%. Given the high prevalence of sleep apnea in these groups, the lack of treatment of a substantial number of known cases indicates that this issue is a serious concern for the U.S. railroad industry.

The estimate of prevalence in this report is probably an underestimate. Respondents who answer "no" to the question "Do you have sleep apnea?" may have sleep apnea even though they are not aware of it. The estimate of prevalence is based solely on that one question in the three surveys. A more accurate estimate of prevalence would require polysomnography.

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