

Fatigue Risk Management Info sheet:

The business case for ensuring your employees are sleeping well.



Why read this?

It is easy to assume that to be successful and productive, it is necessary to work long hours and sacrifice sleep. However, this assumption is overly simplistic and ignores the financial losses that are incurred when people do not obtain adequate sleep. Sleep loss increases the rates of accidents, workplace injuries and absenteeism. We are simply not able to perform at our best, and our mood and relationships at work and at home suffer, when we have not had enough sleep.

Here we describe the financial losses that accompany sleep loss and why prioritising sleep makes good business sense.

Accidents and injuries

People who are not obtaining adequate sleep, for example because they are working shifts that are too long or working excessive overtime, are at a higher risk of accident. The crash risk is almost 3 times higher when drivers have slept for less than 5 hours in the previous 24-hour period.¹ In a large 20-year prospective study of nearly 50,000 people in Sweden, those who reported disturbed sleep were nearly twice as likely to die in a work-related accident.² A review of 27 observational studies, estimated that sleep problems increase the risk of being injured at work by 62%.³ The study also estimates that about 13% of work injuries can be attributed to sleep problems.

Tired workers are less able to concentrate on workplace safety guidelines as demonstrated by a survey of construction workers from two public works agencies in a US metropolitan area.⁴ Construction workers with more insomnia symptoms, i.e. difficulty falling asleep and staying asleep, on average experienced more lapses in attention, memory, and action at work which resulted in less compliance with safety protocols and procedures, less voluntary willingness to promote the safety programme within the organization, and higher rates of minor injuries at work.

Impaired performance

‘Work smarter, not harder’ is a common business maxim, but this is difficult to do when we are sleep deprived and the pre-frontal cortex, the part of the brain that is involved in decision making, is not fully functional. Tired workers are more likely to make poor decisions because of increased risk-taking behaviour⁵ and also use more simplistic strategies to arrive at solutions, such as examining fewer cues or integrating less information.⁶

When we are tired we don’t communicate well and have problems in both receiving and transmitting complex messages.⁷ Tired individuals remain quiet and somewhat withdrawn, but also display outbursts due to the relaxing of social inhibitions and triggering of biases and prejudices.⁸ After a night of sleep loss, we feel low, have fewer positive emotions and a bias towards negativity, and perceive that we are less able to manage our emotions well.⁹



The cost of inadequate sleep

The Rand Corporation¹⁰ evaluated the financial impact of inadequate sleep using data from 62000 people in five major economies (the UK, US, Canada, Germany and Japan). The research explored the relationship between insufficient sleep i.e. sleeping less than 6 hours per day on average with absenteeism and presenteeism. Absenteeism is when people may be unwell more often than average and take time off. Presenteeism is when people are present in the workplace, but the quantity and/or quality of their work is impacted.

Assuming there are 250 working days in a year, sleeping less than 6 hours is associated with a loss of around 6 working days more per year than sleeping 7 to 9 hours.(9) A worker who sleeps 6 to 7 hours loses on average about 3.7 working days more per year. The economic cost of being less productive or absent from work linked to inadequate sleep amounted to almost 2% of GDP.

Japan and the US were the most affected economically by sleep loss, whereas Canada was the least affected:

Share of people sleeping less than 7 hours in:

- Japan (56%)
- U.S. (45%)
- UK (35%)
- Germany (30%)
- Canada (26%)

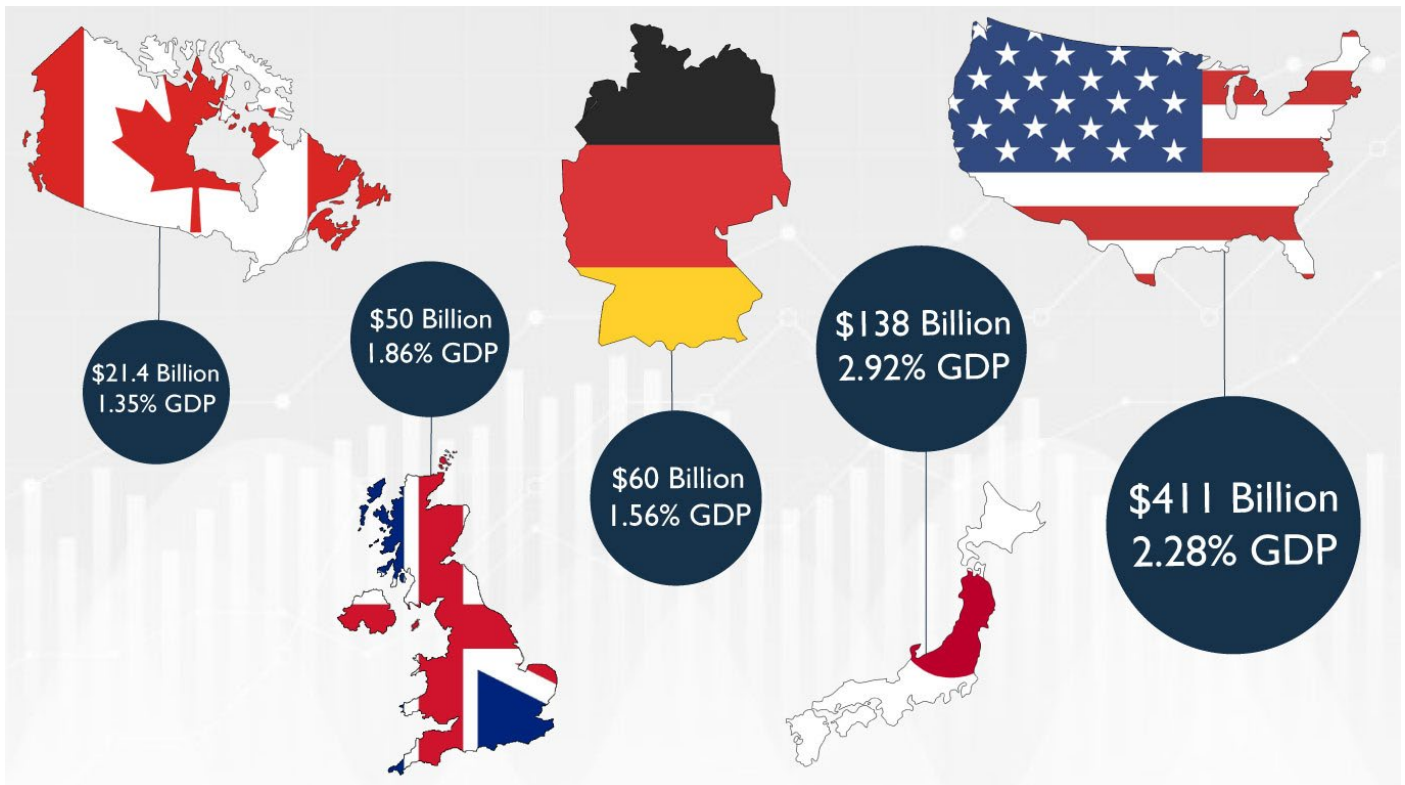
Total working days lost per year (full and part-time workers)

- US – 1.23 million
- Japan – 0.6 million
- UK – 0.2 million
- Germany – 0.2 million
- Canada – 0.08 million

Annual costs, absolute and relative to the size of the overall economy (%GDP)

- US - up to \$411 billion a year = 2.28% of its GDP
- Japan - up to \$138 billion a year = 2.92% of its GDP
- UK - up to \$50 billion = 1.86% of its GDP
- Germany - up to \$60 billion = 1.56% of its GDP
- Canada - up to \$21.4 billion = 1.35% of its GDP

Economic Costs of inefficient sleep across 5 OECD Countries:



Making the business case for investment in initiatives to improve sleep

The costs of initiatives to improve sleep are usually obvious and easy to measure. For example, the cost of extra personnel to reduce the use of extended hours, or the cost of providing hotel rooms for the night before employees depart for an offshore tour. In contrast, it is more complex to calculate the financial losses a business unit is currently incurring due to absenteeism and presenteeism or quantify the financial benefits of sleep initiatives. Consequently, the funding for sleep initiatives can be rejected on the basis that they are 'clearly too expensive', when in reality, the benefits have not been properly calculated. In this way, business units miss out on opportunities to invest in sleep and reduce some of the financial losses associated with a poor sleep.

The Rand Corporation⁹ research concluded that that small changes to sleep duration could have a big impact on the economy. If workers who slept under 6 hours were to sleep 6 to 7 hours, then this could add \$226.4 billion to the economy in the U.S. It could add \$75.7 billion to the Japanese economy, \$34.1 billion to the German economy, \$29.9 billion to the UK economy and \$12 billion to the Canadian economy.

How much does fatigue cost your organisation?

To effectively gauge the cost of sleep loss, it is first necessary to measure the risk of fatigue-related incident or injury. If a fatigue-related accident or fatality has not occurred in your organisation, this might be perceived as evidence that fatigue risk is being well managed, or even as a rationale for not doing more to address fatigue. A lack of fatigue-related events does not give confidence that a fatigue-related event won't happen tomorrow, next week or next year.

To enable informed investment in sleep, it is necessary to do better at quantifying how much fatigue is costing now via absenteeism and presenteeism. First, look carefully at existing data streams, for example payroll and work hour records. Think about how this data can be used to start to estimate the cost of fatigue and what new data is needed to get a better gauge on sleep and fatigue.

Once the losses have been estimated, it will then be possible to calculate the Return on Investment (ROI) of different initiatives to improve. For example, overtime hours can be both fatiguing and costly, how many extra people are needed to remove the 'open shifts' and improve both? How many workdays could a sleep initiative save from being spent compensating for fatigue-related illness, or repeating work ineffectively undertaken by tired employees? Business cases can therefore be built for different initiatives and examining different outcomes which describe measurable benefits in both safety and performance.

Conclusion

Adequate sleep is the foundation for optimal work performance and physical and mental health. When people work long hours and experience sleep loss, they can appear 'busy' but, in part, this is because they are compensating for work they could have done more efficiently if they had obtained adequate sleep. Don't fall into the trap of assuming that working longer hours and sleeping less is at the heart of increased productivity. Research has shown that sleep loss is not an effective strategy for business success and, in fact, leads to increased accidents and significant losses due to absenteeism and presenteeism. The return on investment to promote healthy sleep is multi-factorial and includes incremental productivity benefits, via reduced absenteeism and presenteeism.

What to read next?

The following may be of interest:

- [How sleep changes as we get older: for adults 26-64 years old](#)
- [Extended hours](#)
- [Daily routines and sleep](#)

References

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About the author

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Dr Alexandra Holmes is Research Director at Baines Simmons, specialising in scientific safety cases and the implementation of Fatigue Risk Management Systems (FRMS) in aviation. With a PhD exploring the health effects of sleep loss and shift work, Alex is a current member of the ICAO Helicopter Fatigue Management Task Force and assists the UK CAA and Irish CAA to evaluate FRMS applications and safety cases.

About the reviewers

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Dr Cristina Ruscitto is a Senior Researcher at Baines Simmons. She specialises in the psycho-behavioural predictors of jet lag and fatigue in the aviation sector. Her role involves fatigue management training, the development of fatigue surveys and survey analysis, the scientific study of roster patterns to quantify fatigue risk as well as writing evidence-based recommendations to improve sleep in different operational settings. Cristina is a Chartered member of the British Psychological Society and an Associate Fellow of the Higher Education Academy.

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Sarah Booth is a Research Manager at Baines Simmons. A specialist in human performance in the aviation and aerospace environments, Sarah has worked with aviation operators to develop and implement Fatigue Risk Management Systems (FRMS) across multiple regulatory environments. A regular speaker at both academic and industry conferences, Sarah is also a trainer, delivering to operators in the implementation of Fatigue Risk Management, as well as courses in the use of biomathematical modelling.

Our Fatigue Risk Management Team help organisations manage the risks associated with fatigue and workload and specialise in delivering fatigue risk management solutions for companies whose employees are involved in safety critical work, such as aviation, the petrochemical industry, road transport and the emergency services. Their work provides organisations with the evidence needed to ensure that the business is operating within an acceptable risk threshold.

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