6 October 2018

Mr Trent Zimmerman, MP
Chair
Standing Committee on Health, Aged Care and Sport
Parliament House Canberra

Dear Mr Zimmerman,

Submission to Inquiry into Sleep Health Awareness in Australia:

ECONOMIC COST OF INADEQUATE SLEEP AND SLEEP DISORDERS

This letter contains a submission to the Inquiry into Sleep Health Awareness in Australia which is currently being undertaken by the national parliamentary Standing Committee on Health, Aged Care and Sport, under your chairmanship.

Background

This **submission specifically addresses** an important aspect of the first of the inquiry's terms of reference: the issue of the economic cost of inadequate sleep and sleep disorders to the Australian community. **My qualification for making this submission** is that, as chair or deputy chair of the Sleep Health Foundation ('the Foundation'), I have played a key role in initiating a series of analyses of these costs which have been undertaken by Deloitte Access Economics (previously Access Economics) over the last 12 years on commission from the Foundation and a start-up body that preceded the Foundation's establishment in 2010. Apart from the reports themselves, which are available on the Foundation website[1,2,3], each has resulted in a publication (*of which I have been first author*) in a leading peer-reviewed medical/sleep journal and which has subsequently been extensively cited by other workers in the field, attesting to their veracity and value.[4,5,6]

Costs of Inadequate Sleep in Australia

The most recent of these reports ("Asleep on the job: costs of inadequate sleep in Australia"[3]) analysed the financial and non-financial costs of inadequate sleep in all its forms for the 2016-17 financial year. This provides a contemporary detailed analysis of costs, which may be summarised as follows:

- Based on recent data from Adams et al[7], it is estimated that 39.8% of Australian adults regularly (several days a week or more) experience some form of inadequate sleep.
- This inadequate sleep can be partitioned into: (a) that causing *excessive daytime sleepiness because of an underlying clinical sleep disorder* (5.8% of Australian adults); (b) that causing *excessive daytime sleepiness from other sources of disturbed sleep* (13.3%); and (c) subjective *insufficient sleep* due to behaviours or other reasons that restrict sleep (20.7%).
- The costs associated with each of these categories varies, as they have different impacts on health and wakeful cognitive, psychomotor and emotional function and vigilance.
- These impacts adversely affect health, mood, wellbeing, productivity, and safety.
- The economic costs that arise from these impacts include: (1) financial costs associated with health care, informal care provided outside healthcare sector, productivity losses, non-medical work and vehicle accident costs, deadweight loss through inefficiencies relating to lost taxation revenue and welfare payments; and (2) the non-financial costs of loss of well-being.
- The analysis of these costs was undertaken using prevalence, financial and nonfinancial cost data derived from national surveys and databases, including from: the Australian Institute of Health and Welfare; the Bureau of Infrastructure, Transport and Regional Economics; the

Australian Bureau of Statistics; the Office of Best Practice Regulation, Department of Prime Minister and Cabinet; and the National Occupational Health and Safety Commission**. A detailed description of the analysis methodology is provided in the report and the peer-reviewed manuscript that was based on the report.[3,6]**

- The estimated overall cost of inadequate sleep in Australia in 2016–2017 was $66.29 billion. The financial cost component was $26.22 billion, comprised of as follows: direct health costs of $230 million for sleep disorders and $1.59 billion for associated conditions; productivity losses of $17.87 billion ($7.65 billion from reduced employment, $0.9 billion from premature death, $2.53 billion from absenteeism, and $6.79 billion from presenteeism); nonmedical accident costs of $3.64 billion; informal care costs of $0.61 billion; and deadweight loss of $2.28 billion. The nonfinancial cost of reduced well-being was $40.07 billion. **A detailed breakdown of these estimated costs is provided in the report (in AUD$) and the peer-reviewed manuscript (in $US) that was based on the report.[3,6] The following table summarizes them (in AUD$):**

Table: Breakdown of Costs of Inadequate Sleep in 2016-17 by its Various Causes

	Costs of Various Causes of Inadequate Sleep Including Costs of Conditions Attributable to Them			**TOTAL** (AUD$ billions)
	EDS - SD (AUD$ billions)	**Other EDS** (AUD$ billions)	**Insufficient Sleep** (AUD$ billions)	
FINANCIAL COSTS (AUD$ billions)				
• Health	0.74	0.76	0.32	1.82
• Productivity				
○ *Reduced Employment*	*1.86*	*3.94*	*1.85*	
○ *Premature Death*	*0.35*	*0.39*	*0.16*	
○ *Absenteeism*	*0.53*	*1.37*	*0.63*	
○ *Presenteeism*	*1.07*	*3.26*	*2.46*	
Subtotal	3.81	8.96	5.10	17.87
• Informal Care Total	0.16	0.27	0.18	0.61
• Other (non-medical accident costs)				
• *Workplace Accidents*	*0.08*	*0.23*	*0.12*	
• *MVAs*	*0.53*	*1.44*	*1.24*	
Subtotal	0.61	1.67	1.36	3.64
• Deadweight Loss	0.56	1.10	0.62	2.28
Total Financial Costs	**5.88**	**12.76**	**7.58**	**26.22**
NON-FINANCIAL COSTS (AUD$ billions)				
• **Loss of Wellbeing**	**31.38**	**7.54**	**1.15**	**40.07**
TOTAL COSTS (AUD$ billions)				
• **Financial + Non-Financial**	**37.26**	**20.30**	**8.73**	**66.29**

Conclusion

The financial and non-financial costs of inadequate sleep are substantial. The total financial costs of AUD$26.22 billion represent 1.55% of Australian gross domestic product. The non-financial cost of AUD$40.07 billion is 4.6% of the total Australian burden of disease costs for the year. These costs warrant substantial investment in preventive health measures to address the issue through education and regulation.

References:

1. Access Economics. Wake up Australia. The value of Healthy Sleep 2004. Canberra: Access Economics, 2004. https://www.sleephealthfoundation.org.au/files/Wake_Up_Australia_The_Value_of_Healthy_Sleep_2004.pdf Accessed September 25, 2018.
2. Deloitte Access Economics. Re-awakening Australia. The Economic Cost of Sleep Disorders in Australia, 2010. Canberra: Deloitte Access Economics, 2011. https://www.sleephealthfoundation.org.au/pdfs/news/Reawakening%20Australia.pdf Accessed September 25, 2018.
3. Deloitte Access Economics. Asleep on the Job. Costs of Inadequate Sleep in Australia. Canberra: Deloitte Access Economics, 2017.

https://www.sleephealthfoundation.org.au/files/Asleep_on_the_job/Asleep_on_the_Job_SHF_report-WEB_small.pdf Accessed September 25, 2018

4. Hillman DR, Scott-Murphy A, Antic R, Pezzullo L. The economic cost of sleep disorders. Sleep 2006; 29:299-305.
5. Hillman DR, Lack LC. Public health implications of sleep loss: the community burden. Med J Aust. 2013;199:S7-10.
6. Hillman D, Mitchell S, Streatfeild J, Burns C, Bruck D, Pezzullo L. The economic cost of inadequate sleep. Sleep. 2018 [Epub ahead of print].
7. Adams RJ, Appleton SL, Taylor AW, Gill TK, Lang C, McEvoy RD, Antic NA. Sleep health of Australian adults in 2016: results of the 2016 Sleep Health Foundation national survey. Sleep Health. 2017 Feb;3(1):35-42.

Definitions:

Excessive daytime sleepiness is formally defined using a validated instrument (the Epworth Sleepiness Scale) which quantifies the degree of daytime sleepiness according to the self-assessed chances of falling asleep while engaged in 8 different activities.

Cognitive relates to conscious intellectual activity, such as thinking, reasoning or remembering.

Psychomotor relates to movement or muscle activity initiated by mental activity, which incorporate coordination, manipulation, dexterity, strength and speed.

Financial costs are directly measurable economic costs.

Non-financial costs are notional costs related to loss of well-being which can be estimated on the basis of the value of statistical life years lost due to disability or death.

Burden of disease reflects the impact of a health problem as measured by the number of years lost due to disability or death.

Presenteeism is the act of being at work but, because of illness or other conditions, not fully functioning.

I would welcome any questions you or your committee may have regarding this report. *I append copies of the references referred to in it for your convenience.*

Yours sincerely,

[redacted]

David Hillman AM MBBS, FANZCA, FRCP(Edin) FRACP(Hon)

Clinical Professor, University of Western Australia
Sleep Physician, Sir Charles Gairdner Hospital
Perth, Australia