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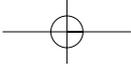
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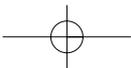
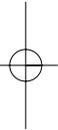
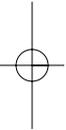
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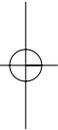
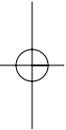
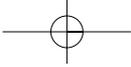
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Dream On

Sleep in the 24/7 society

Charles Leadbeater

A Demos report sponsored by IKEA

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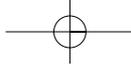


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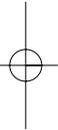
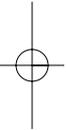
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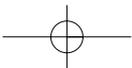
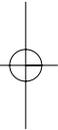
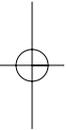
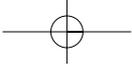
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1. Introduction

I don't know when I first felt this hopelessness, but it's really getting to me now. I have a job and I make money to support myself, though at times it seems I'm just working and making money to work harder. I don't sleep too well, and I only eat ready meals of questionable nutritional value but that's all I can get at the convenience store when I get home. I leave the apartment at 5.50am to get to the station for my train. I cannot remember the last time I saw the apartment in daylight. I am on the train by 6.15am. I see the same faces at the station every day but I do not know any of them. I wonder if they look as tired as I do.

I'm home with a takeaway meal and some kind of drink usually by 11pm, but it can be later. I get out of the train and realise I'll be back on it again in a few hours. Something in me almost hopes for an earthquake to shake things up a bit. At least then I'd be released from the monotony of my life now.

This extract from a diary of a 43-year-old office worker, presented at the Nasubi Gallery in Tokyo in 2000, may be a little extreme, but it will resonate with millions of people who feel that their lives are painfully squeezed by working too long and sleeping too little.

There is mounting evidence that extended and flexible hours of work are exacting a growing toll, especially on households in which both parents work. Not only is this having an impact on hard-

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working parents, it is also affecting children, who need regular and sound sleep even more than adults.

We are taking risks without knowing how to calculate the costs and benefits of our actions. Sleep is vital to brain development in children and remains vital to learning, emotion and memory in adults. A society which sees sleep as enforced downtime, a maintenance period to be minimised, is taking huge risks. More work, longer hours and less sleep does not mean higher productivity, better quality and more innovation. Often it means the opposite, especially in an economy in which how creatively we work matters as much as how long we work.

Sleep is one of the missing ingredients in the growing debate about the work–life balance. During his spell out of government, to spend more time with his family, Alan Milburn highlighted the need for new policies on working time to allow parents to sustain their families while also holding down demanding jobs. A string of recent books – among them Madeleine Bunting’s *Willing Slaves: how the overwork culture is ruling our lives* and Carl Honore’s *In Praise of Slow: how a worldwide movement is challenging the cult of speed* – have made the case for a sanctuary, away from the incessant pressures of work. For many, sleep is just that sanctuary.

Our lives are not just divided into work and leisure: sleep is the missing ingredient. How we sleep is a reflection of how we work and spend our leisure time. While we devote huge amounts of time, effort and money to work and leisure, sleep is largely treated as an afterthought. Yet as more people feel tired or exhausted by long work schedules and commuting, compounded by the demands of family life and the allure of the 24/7 society, it is clear that sleep should be central to the debate about our quality of life.

This poses a huge challenge for politicians. The chatter in the office or the wine bar, on the train and at home slumped on the sofa might be about feeling frayed at the edges and wanting a decent night’s sleep. Yet it is very difficult for politicians to connect with this low-level civil war between work, leisure and sleep being waged in daily life. There is no department for sleep, no budget or constituency. Sleep is one of those pervasive quality-of-life issues that everyone

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talks about – except politicians, in part because they fear that they will get the tone wrong. Politicians themselves are dreadful role models, working all hours. To admit that you need sleep is seen as a sign of weakness. Advocating measures to protect sleep suggests intervening in the bedroom or yet more regulating of hours of work. However, if sleep – or, rather, our lack of it – does not become central to the debate on work–life balance, we will be missing a vital aspect to our quality of life.

We devote at least 25 years to sleep, a third of the average lifetime. It is a necessity no one can escape. Millionaires cannot buy their way out of it. Both sexes and people of all religions do it. Yet why we sleep is pretty much a complete mystery. We know why we have sex, eat and drink. But exactly why we sleep – rather than simply take a rest – is still largely unexplained.

Like other biological restrictions that limit our options, we have a tendency to want to overcome the constraints that sleep puts on us. In a 24/7 society, it is often seen as a necessary evil. Who, given the choice, would not want to extend their waking lifespan by three or five years, by cutting down a bit on their sleep each night? We can fertilise eggs in a test tube and remake our faces with plastic surgery. A treatment that would allow us to function normally without sleeping so much would find a ready market. Our culture seems increasingly inhospitable to regular, sound sleep. It is as if we are fighting against slumber and darkness, to extend the frontiers of our waking lives.

For centuries, people lit their rooms with candles or oil lamps. Between the Romans and the early Victorians, there was little new in the way of artificial lighting. Only in the last century did millions of people acquire the capacity to keep lights burning till late at night, at the flick of a switch. This has enabled many of us to work longer hours than previous generations. At the same time, modern transport allows us to commute further to work.

Since the 1980s, working time has become increasingly flexible. These days, work can start early, stretch long into the night and encompass weekends. People used to work at the same time, in the

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same place on the same task. Now, thanks to international communications, they often work at different times, in different places. US and Japanese corporate culture is spreading round the world, it seems. Within that culture, going without sleep is seen as a sign of commitment to your corporation and career. People who sleep easily and a lot are mocked. People who sleep little, due either to work or to pleasure, are regarded as living life to the full.

Entertainment and shopping are available at all hours. Thirty years ago, pubs would shut at 10.30pm and television screens would shrink to a dot soon afterwards. Today clubs and pubs stay open late, multi-channel television never rests and some retailers are open every hour of the day. We are far more likely than our parents or grandparents to be woken by a pub closing, a train passing, a mini-cab dropping people off after a night out clubbing, a plane making its early morning arc into an airport or neighbours playing their music too loudly. Then, if we are left feeling tired, we consume drugs, if only caffeine, to pick ourselves up.

The night-time economy is likely to expand dramatically in the next 15 years, with rising living standards and growing spending on leisure and services, rather than on physical goods. A recent study by the Future Foundation found that, by 2020, perhaps 13 million people in the UK will be economically active between the hours of 6pm and 9am, many of them responding to the growing demand for round-the-clock service. Yet we know so little about sleep and what it does for us – and especially for children – that it will be difficult to know when the 24/7 society has gone too far. The damage caused by disrupted or truncated sleep may take years to be revealed.

There are many different theories about why we sleep. One is that our ancestors slept at night because that was the best way to stay out of the way of nocturnal predators equipped with better vision and smell. Those of our ancestors who slept at night, remaining quiet and still in a protected and familiar space, bred more and so were more successful in evolutionary terms than those who insisted on roaming around at night and so got eaten. If, however, that evolutionary inheritance explains why we sleep, we may be living out routines that

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made sense millions of years ago but not necessarily today. Early humans probably slept at night because that was the most unpromising time to hunt for food – again, not a consideration that makes sense in a society with fridges and 24-hour fast-food outlets.

A theory that does make sense in a modern setting is that we sleep to conserve energy because our metabolism slows when we sleep. Common sense tells us that we sleep to recuperate after exercise or hard work. But this is not the whole story. If you want to save energy, it is almost as effective simply to lie down, shut your eyes and have a rest. Sleep makes only a minimal additional contribution to energy conservation.

The most plausible theories suggest that sleep is far more important for our brains than our bodies. Sleep allows the brain to do things ‘off-line’ that it cannot do when it is preoccupied with avoiding predators, calculating risks, attending meetings or navigating landscapes. During sleep, the brain consolidates learning and memory; rehearses events during the day and makes connections between them; and digests skills and routines, such as tackling a new vocabulary, learning a route through a city or playing table tennis. By making connections while we sleep, our brain does not have to start from scratch the next time we confront a similar situation. We also speed up our learning by rehearsing what we do ‘off-line’ during sleep rather than waiting for the next time the same situation crops up. That is why sleep is so vital for the young. When we are learning more, we need more sleep to embed what we have been taught.

A parallel theory is that sleep is also vital for mood regulation. Our dreams allow us to replay and to deal with our anxieties and fears. When sleep is disturbed, we feel grouchy. That may be because we have not had enough sleep and are physically tired, but it may also be because our dreams have been disturbed and, as a result, we have not had the chance to deal with troubling emotions left over from the day.

In an economy in which we are far more likely to use our minds than our muscles, getting a good night’s sleep should be vital, not just to make us alert and punctual, but for learning and creativity, for innovation and striving for quality and to enable us to engage

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imaginatively with one another. The richer the information around us and the quicker we need to adjust to new situations and acquire new skills, the more our brains require downtime to make sense of everything that is going on. If our lives are being made more anxious because relationships and jobs are more insecure, then, arguably, we need more time to digest what that means for us.

The risks of sleep deprivation and disruption are particularly high for children. There is plenty of evidence across species that babies and children sleep more than adults, not just because they get tired more easily but because they are learning at such a prodigious rate. In the womb and their early months, babies' brains are developing hard wiring and need sleep to allow it to become organised. If babies and young children are deprived of sleep or have it disrupted, it could have long-term consequences.

How serious is our sense of fatigue and tiredness? A significant minority of people believe that they are sleep deprived and carry around a 'sleep deficit'. This report presents the findings of a UK survey which sheds new light on the extent and causes of this sleep deficit. It also addresses the steps that employers, the government, parents and teachers might take to make it easier for us to get the kind of sleep we need, in a way that is compatible with the demands of the modern economy.

First, we look in a little more detail at what sleep is and why it is so critical to us. Then we examine which people feel particularly sleep deprived – and why – before going on to consider what might be done to address the sleep deficit.

2. What is sleep?

*Weary with toil, I haste me to my bed,
The dear repose for limbs with travel tired;
But then begins a journey in my head
To work my mind when body's work's expired.*

William Shakespeare, Sonnet 27

Sleep is a commonplace. Every animal sleeps. Species eat and reproduce in a huge variety of ways. Sleep, in contrast, usually involves the same basic ingredients. Most animals go to the same place at the same time every day, usually at night – a place that is safe and secure, a nest, burrow, crevice or bedroom – to enjoy a period of immobility, when their responses to external stimuli markedly reduce. Some animals – for example, cows and elephants – can sleep some of the time while standing up (a trick that Masai warriors can also pull off), but even cows and elephants have to lie down to sleep deeply and dream. Deep sleep is only possible if we lie down – it is only then, when our muscles are relaxed and we are fully supported, that the brain can divert its attention from monitoring the state of the body. Most animals sleep during roughly the same period every 24 hours, which tends to be when they find it hardest to look for food. All animals – from fruit flies to humans – want to sleep more, to catch up, if they have been deprived of sleep. These basic ingredients of sleep – same time, same (protected) space, for a period of immobility,

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when response to external stimuli is dramatically reduced – are shared by most species.

We sleep as a result of two combined factors. The longer we are awake, no matter what the time of day, the more we need to go to sleep and the harder we find it to stay awake. We get tired and so we want to sleep. But we also sleep in response to a daily rhythm within us – a rhythm that may be hard-wired – which compels us to sleep for roughly the same number of hours at roughly the same time each day. When, in experiments, humans have been kept in unchanging conditions with no external stimuli, they have slept a little more than eight hours a day. (Most experiments of this kind involve people going down disused mines for several weeks – no one said sleep research was glamorous.) The time during which they slept drifted in and out of step with the outside world. The rhythm of their sleep was not imposed by an alarm clock or work routines, but by an internal clock located in two tiny groups of nerve cells in the brain, known as the *supra chiasmatic nuclei*, or SCN.

We sleep when we feel tired because we have been awake too long. But we also sleep because the SCN tell us to. Everything works fine when these two factors – tiredness and the SCN – are in harmony. Things go awry when they are not. As we develop a sleep deficit, through long hours at work or because of a journey across time zones, we feel like going to sleep but our inner clock objects to turning in at 11am and wants us to stay awake. Our need for sleep, in response to tiredness, is at odds with our body clocks. We associate jet lag with periods when we force ourselves to remain awake when our body clocks suggest we should be asleep.

Most people tend to think of sleep in crude and quantitative terms. To them, sleep can be good or bad, short or long, or simply a homogenous block of unconsciousness. Yet, sleep is a complex affair. During it, the brain passes through a cycle of different stages, probably as it is undertaking different tasks. A night's sleep is made up of rapid eye movement (REM) sleep during which our brains are remarkably active, and long-wave non-REM sleep, when our brains seem to be relatively inactive. The general consensus among sleep

What is sleep?

researchers is that sleep's value stems from the way that the REM and non-REM types of sleep are combined.

In an average night's sleep of eight hours, we will have about six hours of non-REM sleep, of which two hours will be very deep sleep. We will also have a total of about an hour and a half of REM sleep, broken up into perhaps four or five shorter periods. Each bout of REM sleep will be preceded by different stages of non-REM sleep. As the night unfolds, we make repeated attempts to move from non-REM to REM sleep.

REM and non-REM sleep are almost as different from one another as being awake and asleep. In non-REM sleep, dreams tend to be short and dull. In REM sleep, dreams tend to be vivid and powerful, complex and lengthy. REM sleep is a universal feature of animals with large brains, while reptiles that finished their evolution a long time ago have only non-REM sleep. Sleep researchers are not agreed about just why the combination of REM and non-REM sleep matters. Some argue that REM sleep is critical because that is when the brain is at its most active. One theory is that, during REM sleep, we play out scenarios in our head – arguments and routines, events and information – sorting things out that have made an impact on us during the day. That might explain why younger animals spend more time in REM sleep than older ones: REM sleep is vital to the brain's self-assembly.

More recently, however, the focus of sleep research has shifted to non-REM sleep. REM sleep is seen by some as just a gateway to consciousness, when we are closest to waking up. The revisionists argue that the brain does most of its hard work during long-wave, deep non-REM sleep. Support for these theories comes from the evidence of the handful of people who cannot enter REM sleep. The most famous case is a former soldier who, after a gunshot wound to the head, became unable to enter REM sleep. Yet, despite his injury, he could pass exams and practise as a lawyer – his ability to learn and structure his memory was unimpaired.

3. Why we sleep

Sleep rock thy brain.

William Shakespeare, *Hamlet*

The miracle is how, without any help from the sense organs, the brain replicates in the dream all the sensory information that creates the world we live in when we are awake.

William Dement, professor of sleep studies,
Stanford University

However sleep evolved – to avoid predators, to minimise unsuccessful hunting and/or to conserve energy – its main modern role is to serve the brain. We sleep to allow our brains to do jobs that they cannot do while we are awake. Neural activity while we are asleep helps to establish the brain's circuitry, and that helps to consolidate memory and learning. When we recall a dream, we get a brief insight into the intensity of the brain's work while we slumber.

There is growing evidence that people who are learning new skills do better if they sleep soundly for regular periods. For example, researchers at the University of Lübeck in Germany gave two groups the same list of eight numbers and asked them to sort them into a different list, using two simple rules to make the adjustment. The groups were not told that there was a third, hidden, rule that would make the job easier. One group was given eight hours of normal sleep

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a night; the other was deprived of REM sleep. The researchers discovered that the group that had had REM sleep was twice as likely to find the third, hidden rule. That simple experiment echoes the findings of a string of other experiments: if you are learning, you do better with eight hours of sound, uninterrupted sleep a night. Conversely, if people are learning and are sleep deprived, they are far less likely to recall what they have been studying.

Other studies suggest, however, that REM sleep needs to take place within 24 hours for the learning to be effective. Just sleeping more, as many students do, does not make you a genius. For example, one study of English-speaking students learning French found that, as they learned, they needed more REM sleep, and those who got adequate REM sleep learned far more quickly than those who did not. One of the most impressive studies, however, involved young male songbirds, who learn their courtship songs by copying mature adults and then add a few idiosyncratic twists of their own. Much of this learning is done while they are asleep. Scientists analysed the birds' brains and found that the portions of the brain active during song learning, while the bird was awake, were also active while the bird was asleep. The neurons in the brain that fired during the day, while the bird was copying and learning the song, fired in exactly the same order, over and over again, while the bird was asleep – as if it was rehearsing the song in its head. The implication is that we do much the same.

However, the only glimpse we get of the work the brain does silently on our behalf is when we dream. Dreaming plays a vital role in the brain's work during sleep. It may be explained, at least partially, by shifts in the brain's chemicals while we sleep. While we slumber, the brain's supply of the neurotransmitters that underpin our ability to make judgements, focus and pay attention is reduced and we become less able to exert our rational side. At the same time, our visual sense is excited by an increased supply of acetylcholine. That chemical shift could explain why we dream: our visual sense and imagination are excited, so our brain can generate images without external stimuli; at the same time, our faculty for judgement is

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reduced, which helps to explain why we make odd connections during our dreams. Our conventional waking logic system is turned upside down and social norms are loosened. That is why we are never quite sure where our minds will lead us while we sleep.

For some people, dreams are creative and visionary: Paul McCartney came up with the melody for his song 'Yesterday' in a dream. Indeed, a recent survey by the East of England Development Agency found that the most common place for people to have ideas is in bed: a third of people said that bed was where they had their most creative thoughts. Philippe Starck, the legendary French designer, says that he is at his most creative when he has just woken up and downloads all the ideas that have been swimming around in his head.

Most dream content, however, deals with anxieties and insecurities. Dreams may not be, as Freud argued, expressions of repressed sexual desire, but invariably they have a high quotient of anxious content. By dreaming, the brain is dealing with emotionally charged memories in a process of calming, ordering and cleansing. That may be why being able to dream is so vital for regulating our moods. If we dream richly, we are far more likely to wake up in a good mood than if we have disrupted dreams. What matters is not just how much we sleep, but how well.

Sleep may be an example of what the late evolutionary biologist Steven J Gould called an 'ex-adaptation': an adaptation that, having evolved for one purpose, takes on new value in another context. Gould's most famous instance of ex-adaptation was feathers. These first evolved to keep mammals warm, but when they were combined with extremely light bones, long arms and fast-running mammals, they became tools for aiding flight. An innovation created in one setting for one purpose (keeping mammals warm) took on a new value in another setting (helping birds to fly).

Sleep may have evolved as a way to conserve energy, when food was harder to find and predators were everywhere. But its real evolutionary advantage emerged when those that slept proved to be better learners. We may sleep at night because our ancestors did so to avoid sabre-tooth tigers, but as an unintended by-product they also

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became better learners and, in the long run, it was the capacity to learn that gave them the edge.

When we sleep less well, our brains perform less effectively and so do we. This is a particular problem in a society in which learning, creativity, problem-solving and imagination are so important. Sleep plays a vital role in underpinning all the factors that influence competitiveness in a modern economy.

Lack of sleep makes us more inefficient at work and more dangerous behind the wheel of a car. It undermines the quality of our lives and makes us more vulnerable to illness. It is also responsible for making us less able to respond creatively to problems and opportunities, and less original, flexible and divergent in our thinking and thus less likely to generate new ideas. Our capacity for non-verbal planning and strategy decreases, too. We have to go through things 'out loud' or on paper to get them straight. Everything takes longer. We find that we are more inflexible and unwilling to change strategies that we have already fixed on. We are more obstinate, less patient, more dogmatic and likely to be more grumpy.

A society that is sleep deprived – through long hours of work and stress – is biting the hand that feeds it. Sleep is vital to the learning and knowledge economy, not a drain on it. We are at our best when we are creative and innovative. And for creativity and innovation to thrive, we cannot take sleep for granted.

4. Are we sleep deprived?

The mere presence of an alarm clock implies sleep deprivation, and what bedroom lacks an alarm clock?

James Gleick, *Faster: the acceleration of just about everything*

The idea that we are suffering from a pandemic of fatigue is largely due to the work of Professor William Dement, dean of sleep study as a discipline at Stanford University in California. Dement argues that we are sleeping, on average, one-and-a-half hours less per night than people did a century ago, and that most of us are carrying around a sleep deficit of 25 to 30 hours, which we can only pay off by sleeping more at weekends and on holidays. That fatigue is responsible, according to Dement, for an epidemic of sleep disorders that we treat by using a wide variety of relaxants, therapies and pills to get us to sleep and stimulants to wake us up in the morning. Our expenditure on everything from sleeping pills, special pillows, herbal remedies and therapists is a sign of how far out of step we are with our natural rhythms.

Dement's conclusions – which are disputed by some sleep researchers – are largely based on an analysis of US sleep data. How far do they also apply to the UK? To find out we commissioned MORI, the research organisation, to poll a representative sample of British adults. A total of 1,006 British adults were interviewed by telephone in early June 2004.

Are we sleep deprived?

The findings (table 1) confirmed the conclusions of other studies: a significant minority of the population – especially those of working age who are likely to have children and work full time, probably with some managerial responsibility – probably carry around a troubling sleep deficit that disrupts their home life as well as their work.

When MORI asked people whether they got enough sleep, 39 per cent said no – about four in every ten people. While 58 per cent said they did get enough sleep, a significant minority of the population say they regularly get too little sleep.

This sleep deficit is concentrated among adults who are likely to have children and work full time. About 45 per cent of 25- to 34-year-olds, 48 per cent of 35- to 44-year-olds and 47 per cent of 45- to 54-year-olds said that they did not get enough sleep, compared with a national average of 39 per cent. The groups that said that they slept well tended to be the young (16- to 24-year-olds) and people over the age of 55.

Women were marginally more likely than men to say that they did not get enough sleep: 40 per cent of women said that they do not sleep well enough, compared with 37 per cent of men.

The sleep deficit also seems to be geographically concentrated in London and the South East, perhaps because this is where commuting is most common, working hours are longest and disturbances to sleep from noise most likely. About 44 per cent of Londoners said that they do not get enough sleep, and 40 per cent in the South East in general, compared with less than 39 per cent in the North, Midlands and Scotland.

The sleep deficit is concentrated among those working full time: 49 per cent – roughly half of those who make up the full-time British workforce – say that they are sleep deprived. As we shall see, this percentage rises with status and managerial responsibility. Parents are also far more likely to be sleep deprived: 49 per cent of them say that they do not get enough sleep, especially if they work long hours.

Sleep deprivation takes an inevitable toll not only on how people work but also on their families. To find out what impact lack of sleep has on people, respondents were asked what they did when they felt

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Table 1 Who doesn't get enough sleep?

	%
General adult population	39
Managers	51
White-collar workers*	37
Full-time workers	49
25- to 34-year-olds	45
35- to 44-year-olds	48
45- to 54-year-olds	47
London	44
South East	40
All parents	49
Single parents	46

* This group includes junior management and all other non-manual positions – for example, call-centre operatives.

Table 2 What do people do when they do not get enough sleep?

	%
Become irritable and shout	42
Argue with partner	22
Feel like sleeping at work	21
Make mistakes at work	13
Nearly have car accident	5

really tired (table 2). Quite a few suffering from sleep deprivation say that they become irritable and shout at their partners, families and workmates, make mistakes and/or want to doze off at work, and may have accidents while driving. Tired people are less productive and more quarrelsome, and they can be more dangerous because they are accident-prone.

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What is particularly worrying, however, is that the sleep deficit seems to have the biggest impact on those with the greatest responsibilities: parents and managers (table 3). About 51 per cent of managers and white-collar workers* say they do not get enough sleep – 12 per cent more than the average. And the consequences of sleep deprivation are particularly serious for these groups.

Table 3 What do managers and white-collar workers do when they do not get enough sleep?

	Managers %	White-collar workers* %
Become irritable and shout	50	46
Argue with partner	33	25
Feel like sleeping at work	22	28
Make mistakes at work	19	24
Nearly have car accident	9	7

* This group includes junior management and all other non-manual positions – for example, call-centre operatives.

The picture that emerges is one in which managers sleep too little, work too long, endure too much stress and, as a result, are far more likely to feel irritable and to express negative feelings at home and at work. It's difficult to conclude that this does not have a significant impact on the quality of working life of those for whom these managers are responsible. On any day, a quarter of British managers – that is, of the 51% who say they are sleep deprived, the 50% who also admit to becoming irritable and shouting – are likely to be in a bad mood because they have not slept well. These sleepy, accident-prone and shouting managers are responsible for millions of other people – hardly a recipe for good management. Moreover, managers who believe that they should work harder rather than sleep well are likely to pass on that value to the people they manage. Their extended work

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hours and sleep deprivation set the tone for everyone else. It becomes expected.

The other group that suffers a significant sleep deficit consists of parents. The toll on them and their families from lack of sleep is also worrying (table 4).

Table 4 What do parents do when they feel tired?

	%
Become irritable and shout	60
Argue with partner	34
Feel like sleeping at work	22
Make mistakes at work	17
Nearly have car accident	5

Working parents are caught in a vice, especially in households where both partners work. They are more likely to be sleep deprived than people without children, and when they are tired they are significantly more likely to be irritable and quarrelsome, at home and at work. They are also likely to fall asleep and make mistakes. The sleep squeeze is being felt most by full-time workers with managerial and leadership responsibilities, who are also raising families. People who desperately need sleep because of their responsibilities for others are precisely the people least likely to get a good night's sleep.

Not only are people over the age of 55 more likely to sleep well than those between the ages of 25 and 44, they are also likely to feel less harassed as a result of a bad night's sleep. About 58 per cent of 25- to 44-year-olds say that they get irritable and shout when they are tired, compared with 37 per cent of 55- to 64-year-olds and 13 per cent of people who are 65-plus. About 35 per cent of 25- to 44-year-olds argue with their partners when they are tired, compared with only 14 per cent of 55- to 64-year-olds and 6 per cent of people who are 65-plus. In contrast, 60 per cent of parents and 51 per cent of

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managers say that they are likely to become irritable and shout when they feel tired, presumably because the stress in their lives means that they feel the lack of sleep more keenly and are less able to catch up on lost sleep. It is not just that managers and parents sleep less well, but when they sleep badly, they are far more likely to feel irritable and/or make mistakes.

The conclusions of this part of the MORI research are:

- A significant minority of the population – four in every ten people – are not getting what they regard as enough sleep.
- This sleep deficit is most concentrated among people in the age bracket 25–54 – ie those of working age who are likely to have family responsibilities.
- Managers, white-collar workers and full-time workers are all significantly more likely to feel sleep deprived than the rest of the population.
- People say that, as a result of being sleep deprived, they are more likely to become irritable, shout, make mistakes at work and behind the wheel of a car, as well as falling asleep at work.
- A bad night's sleep has a far more serious impact on those who lead stressful lives and have responsibilities both at work and at home. Compared to the general public, parents and managers are far more likely to shout, make mistakes or become irritable as a result of feeling tired. Not only do they get less sleep, but when they do, the impact is likely to be more serious. It only takes a little lost sleep to tip stressful lives out of kilter. A lack of sleep will have multiple impacts: it's bad news for workmates and for kids as well.
- The best-slept groups – the 16- to 24-year-olds and older people – not only sleep more but find it easier to catch up on lost sleep and lead less stressful lives. A disrupted night's sleep will have less impact on them.

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Why don't people in Britain get enough sleep? A partial answer is provided by what people say about what disrupts their sleep (table 5). Forty-one per cent of parents – and 13 per cent of the population as a whole – say that their sleep is disrupted by children waking up, making it the most common reason for interrupted sleep. Worry about work affects 7 per cent of people, but a sign of the stress that some groups are under is the fact that 15 per cent of managers say that they worry about work. These people are also far more likely to worry about money. The other main reasons for sleep being disrupted are noise from the street, traffic, animals and neighbours. All these environmental causes of disrupted sleep are far more serious in London than elsewhere.

Snoring does not figure in the top ten causes of disrupted sleep, but there are marked gender differences: only 1 per cent of men say they are kept awake by snoring, compared with 5 per cent of women.

Table 5 What interrupts sleep?

	%
Kids waking	13 (41% of parents)
Worry about work	7 (15% of managers)
Noisy neighbours	6
Traffic	6
Anti-social behaviour	6
Animal noise	6
Noise within house	6
Injuries	5 (major factor among older people)
Room too hot/cold	5 (major factor among poorer people)
Alarms	4

These figures show why the sleep of some people is interrupted. They do not explain why people feel that they do not get enough sleep in general, regardless of whether it is interrupted. Our figures reveal that it is a combination of factors that matters: the amount and

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quality of sleep that people get, which is affected by the hours that they work; the likelihood of them being woken during the night, which increases with having children and living in a city; and the stress of their lives, which is affected by the scale of their responsibilities at work and at home.

Those likeliest to have the shortest sleeping hours have the longest and most stressful working hours: managers, white-collar workers and full-time workers. Those most likely to have a disrupted night's sleep are parents and people who live in dense urban areas with traffic and night-life. A small loss of sleep is likely to have a big impact on people who lead stressful lives with many responsibilities. Stressed-out parents, already not sleeping enough, are the most likely to have their sleep disrupted and are least able to recover quickly from a lack of sleep. It is this cocktail that needs to be dealt with to reduce the sleep deficit and its impact on families and workplaces.

5. The sleep deficit: what should be done?

Modern life is perpetually stressed out.

Tony Blair, Labour Party conference, 2004

What should be done about this widespread sense of fatigue and sleep deprivation? Some would say: 'Not very much.' Most evidence shows that, whatever they might believe, people actually sleep on average between seven-and-a-half and eight hours a night. The problem may be as much one of perception – why we feel tired – as of the time we spend asleep. Others would say that we need to restore the natural rhythms of our bodies which have been disrupted so badly by modernity. But that makes little sense in a world where, for at least a century, work, leisure and sleep have been regulated by work routines and the alarm clock.

Does the pervasive sense that we are not getting enough sleep justify sleep being counted a subject worthy of public policy? On the face of it, the case for the government becoming involved in how we sleep seems a ridiculous extension of the nanny state, making sure that we are tucked up in bed at night. (In Thomas More's *Utopia*, the island's population slept a solid eight hours every night, no less, no more.) How much people choose to work, rest and play, say critics, should be up to them as consenting and responsible adults. Working hours are primarily a matter to be decided between employers and employees, within a general framework of regulation. What people

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choose to do in their own bedrooms, including how much they and their children sleep, should be up to them. It is no concern of the state.

Indeed one reason we do not sleep as well as we might is that the consumer market is not as developed as it should be. Compare our attitudes towards food and sleep. In the past few decades, British views on food have been transformed. Spending on kitchens has increased and the kitchen has become the central room in many households. We spend more money than ever on cookbooks and more time than ever watching cookery programmes. As a result, we also spend far more than we used to on the hardware and software of our kitchens. In contrast, our bedrooms are barren zones. We spend less and care less about them despite spending 25 years of our lives in them, more than in any other room in the house.

Sleep is the final brand-free zone in our lives. Most normal people do not dream of brands, but nor can most identify a brand that they associate with sleep. We can usually rattle off the names of the brands of clothing, computers, mobile phones, household goods and cars we like. No self-respecting teenager would buy just any pair of trainers: they want Nike, Puma, Adidas or Diesel. But for most of us, a mattress is a mattress, a bed just a bed. The bedroom has been largely bypassed by the tide of consumerism that has swept through other aspects of our lives.

In part, this is due to the peculiar status of the British mattress. While it is possible to buy French, Italian and Scandinavian furniture for living rooms and kitchens, buying beds is a different matter. British mattresses still conform to imperial standards and measures. To buy an Italian bed, one also needs to buy a continental European mattress, which takes time to find and costs more money. This difference in standards between the British and the continental European mattress may be a subtle form of protectionism for the unreconstructed British bed industry. British beds are highly regarded by sleep researchers for their technical qualities, but the industry as a whole spends too little on design, branding and marketing. As Paul Martin puts it in *Counting Sheep*, his review of the science of sleep:

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‘Sleep is mired in the cultural equivalent of a 1950s British canteen meal, an inadequate and faintly unhealthy affair, indifferently concocted and eaten in haste rather than for pleasure. Too many people regard sleep as the equivalent of the brain’s fast food.’

Yet how much and when we sleep are not just matters of individual choice. They are the products of social factors, which also determine how and where we work. The choices we make about sleep are socially constrained and shaped. The consequences of the sleep deficit are also social. One person’s decision not to sleep properly can have a huge impact on other people’s lives if it leads to an accident. Sleep deprivation is a major cause of road accidents: perhaps 45,000 road accidents a year are tiredness related. The Selby rail crash of February 2001, in which ten people died, was caused by Gary Hart – who had just spent the night gossiping on the internet – falling asleep at the wheel of his Land Rover, which then veered off the M62 and on to the main East Coast rail line. Sleep researchers such as William Dement claim that many other accidents – among them the Exxon Valdez oil disaster and the near-meltdown of the Three Mile Island nuclear power plant – have been due to sleep deprivation.

At a more mundane level, if, as they claim, half the British workforce and half their managers feel the adverse effects of not getting enough sleep, that is bound to have a detrimental impact on their work, with lower productivity, less innovation, more mistakes and poorer quality as a result. Another implication is also clear: public policies to support sleep would pay social and economic dividends.

There are strong precedents for government intervention to limit working hours and promote sleep for some safety-critical occupations. Lorry drivers, for example, cannot drive more than a set number of hours without a break. Given the impact that sleep deprivation has on certain groups – for instance, working families with young children – the case for measures targeted to support them is particularly strong.

Finally, as the market itself throws up solutions to the sleep deficit, such as more powerful drugs to help us manage sleeping patterns, so

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it will become increasingly difficult for government to stand on the sidelines, and it will be called in as a regulator. What then might be the ingredients of a public policy on sleep?

Sleep drugs

The US Defense Research Projects Agency (Darpa), which funded much of the early work on the internet, recently commissioned a multi-million-dollar study on sleep with the aim of producing the ‘metabolically dominant’ soldier who could fight non-stop for several days at a stretch. Darpa’s sleep research programme encompasses several projects, including an investigation into how dolphins manage to send half of their brain to sleep at a time; they also seem to be able to stay awake for two nights on the trot without suffering any ill effects.

There is also growing interest in military circles in drugs that soldiers can take to help them stay awake for long periods in combat. French special forces are reported to have experimented with modafinil (brand names: Provigil, Alertec), which is said to allow commandos to operate for several days on very limited sleep. Other researchers are exploring genetic screens to identify people who need less sleep, while another team is examining how the brain works at a molecular level in response to such neurotransmitters as serotonin and dopamine.

If Darpa can produce a soldier who never sleeps, how long will it be before Goldman Sachs starts looking for the metabolically dominant banker or students cramming for exams start taking modafinil to get them through several sleepless nights of desperate revision? Imagine that you could take a daily supplement that would allow you to cut down on sleep and so extend your waking lifespan by, say, three years. It would be an offer many would find difficult to refuse. That is the kind of choice we could be facing within the next 10–20 years.

As neuroscientists find out more about what the brain does during sleep, the likelihood is that pharmaceutical companies will start marketing treatments based on those discoveries. These drugs would

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simply take the place of the cruder ones we ingest at the moment – caffeine among them. Three-quarters of the world's population takes caffeine in some form regularly, consuming about 120,000 tons a year. In addition, British doctors write 13 million sleeping pill prescriptions annually. As long hours and stress take a growing toll, the market for sleep treatments is only likely to grow.

We have grown used to medical science providing us with ways to improve the performance of our bodies, from IVF treatment to plastic surgery. We turn to it not just to cure us when we are ill, but also to give us choices about how we might live. In the near future, it is likely that those choices will include regulating how we sleep so that we can do without it and yet still feel all right.

However, using drugs to accommodate changes in our behaviour raises troubling issues about our dependence on drugs, doctors and pharmaceutical companies. Sleeping less and, as a result, dreaming less may also affect our mood and sense of well-being, even if we feel physically well rested. We are still a long way from understanding what happens in the brain during sleep, and so we are also a long way from understanding the long-term impact of extended sleep deprivation, especially if we are using drugs to compensate.

Teaching sleep

It is arguable that getting a good night's sleep should be seen as a part of our personal hygiene in the same way as washing ourselves and brushing our teeth. The focus on this should be parents and children. It seems likely that a significant minority of children are growing up without regular bedtimes and the routines that precede them. This may be because both parents work and eat late, or conversely because both parents do not work. If there is no work to get up for in the morning, there's no reason to go to bed at a particular time; besides, it is possible to nap during the day after a late night. Even when children do go to bed, their bedrooms are often filled with distractions – televisions, computers and games – which were not around 25 years ago.

Given the evidence that sleep is vital to learning, sleep hygiene – teaching good sleep habits – should be as important as teaching

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children about the importance of brushing their teeth. A simple Sleep Code, akin to the Highway Code, which children learn when they are young, should stress the importance of going to bed at a regular time, avoiding eating, drinking and other stimulants before doing so, and establishing a regular wind-down routine before bedtime. Teachers could also encourage children and parents to keep sleep diaries that might help kids to self-assess how their performance is affected by their sleep patterns. The Department for Education and Skills (DfES) should also commission research in schools to assess the impact of sleep on learning, including different strategies to promote better sleep, especially for children who are members of chaotic families.

Employer responsibilities

We need to devise ways to make it easier for people to get the sleep they need or – a slightly different goal – to allow them to recover from tiredness. Employers bear a large responsibility for this. One of the main tools in this strategy should be the workplace nap.

On February 2001, after 94 days at sea, Ellen MacArthur crossed the finish line in the Vendée Globe race and became the fastest woman to sail round the world single-handed. For 13 weeks, she had managed to sleep roughly five-and-half hours a day but only by dividing her sleep during the voyage into a total of 891 naps, each lasting an average of 36 minutes. In today's always-on society, we need to learn from MacArthur.

We should make it far easier for people to take naps during the day to catch up on sleep lost at night. That means allowing people nap time at work. Napping makes you smarter, sharper, more alert, happier and more energetic. A nap during the day gives most people a new burst of life. Moreover it's doubtful that sleeping much longer at night, regularly, leads to a proportionate increase in alertness during the day. People who sleep ten hours rather than eight are not 25 per cent more alert. If someone gets only four hours sleep at night, the best remedy is a short nap during the day. A nap of as little as 15 minutes' duration can be enough for people to recuperate. Astronauts, truck drivers and

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pilots all use napping as a device to get through long shifts. Some animals – starlings, for example – sleep entirely in short naps. Yet despite all this evidence, we are still warned ‘not to get caught napping’. Ironically, as the evidence in favour of napping mounts, the Spanish and Mexican governments are moving against the siesta and the Chinese government against its equivalent, the *xiuxi*.

In Britain, every day hundreds of thousands of people nap uncomfortably, head supported in the palm of the hand, neck cricked at an angle. People want to be able to nap. They search out little corners and benches to do so. We should make it easier for them to nap, rather than making them do it uncomfortably. Workplaces that have gyms and toilets, restaurants and sick rooms should also provide nap spaces, especially for parents with young children or people who start work early and finish late. Short napping during long working days should be encouraged, not frowned on. It would boost productivity.

Sleeping on the job was long regarded as a fugitive activity, a quiet rebellion against the time-and-motion regime of factory work. Of the 550 US companies contacted in a survey carried out by Circadian Technologies, a sleep management consultancy, 15 per cent permit or even openly encourage napping at work, 32 per cent allow discreet napping, 20 per cent forbid napping but do not punish employees who do it and 31 per cent discipline employees caught napping. Some companies, with 24-hour operations and shift work, such as the multinational Nova Chemicals, now have explicit napping procedures. An employee is allowed 10 minutes to find someone to cover for them, 20 minutes for a nap and 15 minutes to recover their alertness afterwards. Not long before, the company had been firing people who napped. The napping programme has been greeted as an investment in employee well-being and a boost for morale. (See Steve Kroll-Smith, ‘Napping at Work: shifting boundaries between public and private time’, unpublished paper, University of North Carolina, Greensboro.)

A complementary approach would be to make it easier for people to work from home, at least some of the time, especially if they are parents. This would help them sleep more because they would not

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have to get up so early to commute to work. They would also find it easier to have a quick nap during the day on a sofa or in bed. In addition, they would be able to get to bed earlier, in better shape, because they would not have to travel home. The more people can work from home, the better able they will be to regulate their kids' bedtimes. Even working from bed might become more common. Bed workers of the past include Cicero, Horace, Milton, Swift, Rousseau, Voltaire, Trollope, Proust, Rossini, Puccini and Pepys.

Beyond that, employers who expect people to work extended or irregular hours should be expected to help them sleep. Companies should be encouraged to help employees keep sleep diaries and to respond to their findings. People who work particularly long hours over extended periods, especially parents, should be given the right to request catch-up days, when they can sleep in later to make good their sleep deficit. As employers move towards extended-hours operations, they should be expected, at the very least, to provide shift workers with sleep management training. US studies show that people working long or irregular hours sleep far better if they are trained to cope with it. Shift workers who are trained in how to sleep during the day tend to get at least an hour's extra sleep as a result. That training, in turn, leads to fewer accidents. The same studies show that fatigue is less prevalent at companies that allow employees to select their own shift patterns.

Public napping

We should also make it easier for people to sleep in public spaces rather than forcing them to do so uncomfortably, sitting up. Cars, trains, airport lounges and offices should all be equipped with seats that recline into flat beds, like those belatedly introduced into business-class sections of long-haul flights. One possibility would be a self-cleaning pod – a Shut-Eye Pod – not unlike those containing public toilets. The user would pay a fee for an hour, which would allow them to lie down and sleep, perhaps with some music to send them off. A buzzer would wake them ten minutes before their time was up. Shut-Eye Pods could be installed in airports, libraries, railway

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stations, cafés and parks. People are telling us in their thousands every day that they want to be able to nap more easily. Those who design public spaces should respond.

Napping represents a new opportunity for the hotel business. Hotels sell rooms by the night. However, there is considerable evidence that some people want to be able to sleep for a few hours during an extended day. They just want a bed. An entrepreneur in Berlin has created a public 'dormatorium', a dormitory in which people can sleep in some privacy. They just get a bed, which they rent by the hour. These days we can rent virtually anything, often by the hour. We work in rented offices, and drive rented cars. It's ironic that the only people who rent beds by the hour are those who sleep with prostitutes. Why can't the rest of us rent a bed – Easy Sleep – for just the odd hour that we need one?

The standard format of the hotel industry, which traditionally rents rooms only for the whole night, is too rigid to accommodate the thousands of people who would benefit from sleeping during the day. But already there are some moves in this direction. The company that brought the sushi conveyor belt restaurant to the UK from Japan – YO! Sushi – is planning to introduce YO! Tel: sleeping pods modelled on the capsule hotels in Japanese railways stations which accommodate 'salarymen' (non-managerial white-collar workers in large companies) who have missed their last train home. In New York, a company called Metronaps is offering special sleep seats for \$14 an hour.

Tired people, who have not had enough sleep at night and work long hours, want to get flat to sleep during the day, if only for a short burst. We should make it easier for them. There is a gap in the market for a high-quality foldable and mobile bed, something between camping equipment (sleeping bags and air beds) and a fully fledged bed. While people need to get flat to sleep, they do not necessarily want to go to bed. In Japan, children often sleep during the day on duvets laid out over tatami mats. British workplaces could do with something similar: a bed roll that could be unfurled when needed. Edison, the inventor of the light bulb, among much else, was reputed

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to have worked non-stop in his Menlo Park, New Jersey laboratory, but he actually took frequent naps on a folding bed.

Regulating working hours

The government should examine whether the working – and thus the sleeping – hours of more groups should be specially regulated. They already are for pilots and lorry and bus drivers. But the same logic applies to anyone driving long distances and working long hours. Tiredness is a major cause of road accidents, which in turn impose a huge emotional and economic burden. Companies that expect employees, such as delivery drivers and sales staff, to work long hours and drive long distances are taking risks not just with their employees' lives but with other people's as well. They should bear some of the costs of their actions.

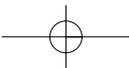
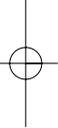
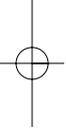
People at particularly vulnerable stages of their lives – especially parents of young children – should be given enhanced rights to insist on family- and sleep-friendly hours of work. Take just one example: parents of children under the age of five. They should be able to insist that they do not start work before 9am and to refuse to attend breakfast meetings. I would go further: no one should be expected to attend more than one breakfast meeting every two months, a maximum of six a year. When families are young, parents should be having breakfast with their kids rather than turning up on the corporate parade ground.

Finally, politicians should do their bit, even though they themselves are terrible role models. The norm, at least since Mrs Thatcher, is for government ministers to work most evenings, returning to their homes after dinner to deal with their papers till the early hours. One can only wonder at the role that sleep deprivation plays in some of the decisions that politicians take. It will be difficult to redress the wider sleep deficit if politicians, managers and other public figures don't show some responsibility by demonstrating that getting a decent night's sleep is an indication of good sense rather than of weakness.



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Who better to conclude with than Winston Churchill, wartime leader, ‘The Greatest Briton’ according to a BBC poll, bed worker and champion sleeper. When Churchill pledged to fight the Nazis on the beaches, he did not point out that he would have to break off in mid-afternoon to get into his pyjamas: ‘You must sleep sometime between lunch and dinner. Take off your clothes and go to bed. No half measures . . . Don’t think you will be doing less work because you sleep during the day. That’s a foolish notion held by people with no imagination. You will be able to accomplish more.’



6. Conclusions

Sleep deprivation is a form of torture used by the Indonesian secret police – and small babies.

John O'Farrell, *The Best a Man Can Get*

Sleep provides us with a different vantage point from which to examine lives we are used to seeing as divided solely into work and leisure. Without adequate sleep, those two spheres of activity would be torture.

Some people will regard it as silly or trivial to suggest that we should have a public debate about how and why we sleep, and even more ridiculous that sleep should be the object of public policy alongside culture, learning, transport, anti-social behaviour, child rearing, health, management, work and transport. Yet sleep touches all those areas of public policy and more besides.

The government says it wants to promote Britain as a high-skill, high-productivity, knowledge economy. Poorly slept and over-worked people are unlikely to be innovative, creative and flexible, especially if they are led by managers who are often so exhausted that they find it difficult to think straight, let alone laterally. Working more and more while sleeping less is a recipe for lower productivity, poorer quality and less innovation.

The government says it wants to help parents cope with the demands imposed by work in an always-on, globalised economy.

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However, there is lots of evidence, from our survey and others, that working parents are bearing the brunt of the sleep squeeze. They get less sleep, are more likely to have their sleep disrupted and are less able to catch up. That is likely to have a damaging impact on their partners, families and work mates. Sleep is a vital part of the work–life balance agenda.

The government says that education and learning are a priority. There is mounting evidence that sleep plays a vital role in consolidating memory, learning and skills, especially in children. A policy that promotes education but neglects to consider how well children are sleeping is missing a trick. Children who sleep well learn more effectively.

Our survey, which is far from totally comprehensive, suggests that 40 per cent of people regularly feel they do not get enough sleep, a figure that rises to 50 per cent for parents, people in full-time work and managers. Everyday life is a litany of stories about bleary-eyed early starts and late finishes. Yet politicians do not know how to connect with this sense of daily distress. Sleep does not fit into traditional political categories. A politician who seeks to address people's concerns about sleep would need to adopt a personal language, a language of care, which does not come easily to a profession schooled in putting up barriers to all personal issues. We are never going to face a collective choice over how we sleep akin to the ones we have over entering the European Monetary Union, changing the way higher education is financed or devolving power to the nations and regions.

Yet in many ways a collective choice is creeping up on us and it is not one we should leave to the winds of chance and self-interest. Our individual choices about how, when and for how long we sleep are socially constrained by how we work. Public policy can influence those constraints to make individual choices easier.

Do we want to drift towards the life of the Japanese office worker we started with: a society in which we work longer hours, leaving sleep to be squeezed into the few hours that remain after work has finished, a desperate, just-in-time maintenance period?

Conclusions

Do we want to allow, or even encourage, people to cope with that kind of distorted and unbalanced life by dealing with sleep deprivation and disorders by taking increasingly powerful drugs that will become more and more widely available, especially for companies that want 'metabolically dominant' workers?

Or instead do we want to make it easier – through public regulation, creativity and product and service innovation – for people to get the kind of sleep they need, even if that means we become a society of partial 'daysleepers' (to quote the aptly named group REM)? That would not mean rolling back the 24/7 society; it would not mean a nostalgic return to an era when we slept 'naturally'. But it would mean helping people, and especially working parents, to limit the impact of the 24/7 society on their sleep patterns and those of their children. It would mean providing them with a way to step off the treadmill and get flat.

People want choice and they recognise the need for flexibility at work, but they also want some sanctuary from the pace of life. Sleep is our sanctuary. We should protect it at all costs against further encroachments.

Further reading

I read several very useful books in compiling this report. The most accessible and comprehensive was Paul Martin's *Counting Sheep* (Flamingo, 2003), the reading of which set off this project.

I have also referred to and drawn from the following:

Coren, Stanley, *The Sleep Thieves*. New York: Free Press, 1996.

Dement, William C and Vaughan, Christopher, *The Promise of Sleep*.
New York: Dell, 2000.

Foster, Russell and Kreitzman, Leon, *Rhythms of Life*. London: Profile,
2004.

Rock, Andrea, *The Mind at Night*. New York: Basic Books, 2004.

In addition, I got useful resources from the sleep research centres at Surrey University (website: www.surrey.ac.uk/SBMS/SSRC/, email: sleep@surrey.ac.uk) and Loughborough University (website: www.lboro.ac.uk/departments/hu/groups/sleep/index.htm, email: SleepResearch@lboro.ac.uk) and from Circadian Technologies (website: www.circadian.com).

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