

Supplementary analysis of Costs to Britain data: using existing ill health appraisal values to estimate illustrative costs of work-related musculoskeletal disorders and stress

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Introduction

This short paper presents analysis using existing HSE unit costs or 'appraisal values' to estimate the costs to Great Britain from new cases of work-related musculoskeletal disorders (MSDs) and stress for 2013/14. These illustrative estimates are based on the HSE 'Costs to Britain' model and, because of limitations in the model, can only provide approximations of the associated costs.¹ However, they serve to provide an indication of the magnitude of costs arising from work-related MSDs and stress.

Method

HSE's 'Costs to Britain' model estimates the total costs of workplace fatalities, and new cases of work-related injuries and ill health in Great Britain. The model excludes long-latency illness, such as cancer. Costs to society are published annually alongside a breakdown of overall costs by cost-bearer (individuals, employers, and government).² HSE also publishes appraisal values from the model. These provide an average 'per case' cost for illness and injury by cost-bearer and severity (duration of time off work is used as a proxy for severity for non-fatal illness and injury).³

By multiplying the existing 'per case' cost for an average case of ill health (the appraisal value) by the number of cases of MSDs or stress for each severity category, we have estimated the costs to Britain from new cases of work-related MSDs and stress. The number of annual cases were obtained from an average of Labour Force Survey (LFS) estimates from 2011/12, 2013/14 and 2014/15.⁴ It is important to emphasise that the estimates presented in this note are based on existing estimates in the Costs to Britain model and that **no new research has been undertaken to inform this work.**

Cases of work-related MSDs and stress by severity category and average ill health appraisal values

Table 1 summarises the number of cases of work-related MSDs and stress by severity category (time off work). As explained above, these are average annual LFS estimates from 2011/12, 2013/14 and 2014/15. Overall, there are more cases of stress than MSDs. Cases of work-related stress also typically lead to a longer absence from work per episode: around 60% of work-related stress cases lead to absence from work of 7 days or more, compared to around 35% of MSD cases.

Table 1: Estimated new cases of work-related MSDs and stress by severity category, annual average for 2011/12, 2013/14 and 2014/15

Time off work category	Stress	Musculoskeletal Disorders
Up to 6 days absence	97,000	100,000
7 days or more absence*	140,000	60,000
Total	230,000	170,000

Note: Values are rounded to two significant figures. Consequently, columns may not sum due to rounding error.

*includes those who do not expect to return to work because of their condition

¹ The latest results from the 'Costs to Britain' model are available at: www.hse.gov.uk/statistics/pdf/cost-to-britain.pdf

² ibid

³ The latest appraisal values are available at: www.hse.gov.uk/economics/eauappraisal.htm

⁴ The LFS did not collect data on work-related ill health in 2012/13.

Table 2 provides the appraisal values from the latest publication of HSE's 'Costs to Britain' model. These are per case costs from cases of ill health to three different cost bearers: individuals, employers, and government. The per case costs to society provide the average of the total of all costs, net of transfers between groups (individuals, employers, and government), such as benefit payments, tax receipts, and compensation. The appraisal values are available by the duration of severity and capture both the financial costs from the conditions (loss of income / production, healthcare costs, administration and legal costs) and the non-financial human cost to individuals (loss of quality of life).

Table 2: Per Case Costs to Society, Individuals, Employers, and Government from cases of ill health, by severity - average appraisal value estimates (£ in 2013 prices)

	Time off work category	Non-Financial Human Cost	Financial Cost	Total Cost
Society	Up to 6 days absence	290	560	850
	7 days or more absence	20,100	17,300	37,400
Individuals	Up to 6 days absence	290	90	380
	7 days or more absence	20,100	690	20,800
Employers	Up to 6 days absence	-	120	120
	7 days or more absence	-	8,000	8,000
Government	Up to 6 days absence	-	360	360
	7 days or more absence	-	8,700	8,700

Source: HSE (2015) www.hse.gov.uk/economics/eauappraisal.htm

Results

Work-related stress

Table 3 summarises the costs to Great Britain in 2013/14 from new cases of work-related stress. **These estimates suggest that the costs of new cases of work-related stress could be in the region of £5.2 billion per year to society as a whole.** This is equivalent to around 55% of the total £9.4 billion costs of new work-related ill health cases in 2013/14. According to these estimates, individuals bear around 55% of the costs from work-related stress. Of the net costs to individuals, almost all (over 90%) are from non-financial human costs, a monetary estimate of the effects of the condition on the individual's quality of life.⁵ Business and government each bear just over 20% of the costs from work-related stress.

⁵ Loss of employment income is also an important cost to individuals in the model. However, the model also accounts for a range of benefits payments and Employers' Liability Compensation payments, which largely offset the loss of employment income in the aggregate.

Table 3: Illustrative costs of new cases of stress, depression, and anxiety in 2013/14 (2013 prices)

	Costs to Britain from new cases of stress, depression, and anxiety (£ millions, 2013 prices)			
	Society ^a	Individuals ^b	Employers ^c	Government ^d
Up to 6 days absence	80	37	12	35
7 days or more absence	5,100	2,800	1,100	1,200
Total	5,200	2,900	1,100	1,200

Note: Due to the level of uncertainty in these estimates, values are rounded to two significant figures. Consequently, columns may not sum due to rounding error.

^a Costs to society provide the total of all costs, net of transfers between groups, such as benefit payments, tax receipts, and compensation.

^b Costs to individuals include: the loss of income due to absence from work, net of benefits and compensation payments; a monetary estimate of quality of life effects; out of pocket healthcare expenses.

^c Costs to employers include: the costs of work-reorganisation due to worker absence; sickness payments; costs of Employers' Liability Compulsory Insurance (ELCI); administration and legal costs.

^d Costs to government include: state benefit payments; loss of tax receipts; NHS treatment costs

Work-related musculoskeletal disorders (MSDs)

Table 4 summarises the costs to Great Britain in 2013/14 from new cases of musculoskeletal disorders (MSDs). **These estimates suggest that the total costs to society are in the region of £2.3 billion per year**, or around 25% of the total £9.4 billion costs from all new cases of work-related ill health (excluding cancer and other long-latency illnesses). As with the costs from stress, described above, around 55% of the costs are borne by individuals, and business and government each bear just over 20% of the costs. Non-financial human costs, incurred by individuals, account for just over 50% of total costs to society as a whole.

Table 4: Illustrative costs of new cases of musculoskeletal disorders in 2013/14 (2013 prices)

	Costs to Britain from new cases of musculoskeletal disorders (£ millions, 2013 prices)			
	Society ^a	Individuals ^b	Employers ^c	Government ^d
Up to 6 days absence	89	40	13	38
7 days or more absence	2,300	1,300	480	520
Total	2,300	1,300	500	560

Note: Due to the level of uncertainty in these estimates, values are rounded to two significant figures. Consequently, columns may not sum due to rounding error.

a, b, c, d Refer to Table 3

Discussion

Based on this analysis, the combined annual costs of new cases of work-related MSD and stress in 2013/14 were around £7.5 billion, approximately 80% of the total £9.4 billion costs from all new cases of work-related ill health (excluding cancer and other long-latency illnesses). That MSDs and stress account for a high proportion of total illness costs is expected, given that these conditions accounted for around 80% of total new illness cases reported to the LFS over the period.

This analysis has produced a lower estimate of total costs for MSDs than stress. This is because a) there were fewer cases of MSDs per year over the period, and b) because a typical MSD case results in fewer days absent from work on average (meaning that the costs per case assigned to MSDs is lower). While there is considerable uncertainty around the absolute estimates due to the limitations described below, these results suggest that, in the aggregate, work-related stress places a greater economic burden on society than work-related MSDs, although the results do not reliably tell us how much greater. However, the results do not provide meaningful information on the relative costs per case of each condition, since generic appraisal values (for an 'average case of ill health') have been applied to both, differing only in the dimension of 'time off work'.

Limitations

HSE's Costs to Britain model is well-established and has been recognised in international research as a 'good practice' example for other regulators and researchers to follow.⁶ However, the model was designed to provide high-level, aggregated estimates of the economic burden of work-related injuries and illnesses, and was not designed to provide specific estimates for different types of illness. As a consequence, the results are best used to communicate the potential magnitude of costs from MSDs and stress, rather than to rank or compare ill health conditions, particularly for per case costs. HSE analysts are exploring ways to improve the specificity of the model with regards to work-related illnesses to provide more reliable and useful estimates by illness type.

The limitations of the model are outlined below, and should be considered when using these estimates:⁷

- **The key limitation is that the same appraisal values were used to obtain the estimates for both MSDs and stress: values for an average case of ill health.** This is because the data used in the model to estimate the different cost components are not specific to MSDs or stress but for a generic case of ill-health, due to data availability and the aims of the model when it was developed. Thus, the resulting cost estimates are not specific to MSDs or stress. For this reason, the results in Table 3 and Table 4 only differ in terms of the number of new cases of the respective condition, and the average duration of absence from work, rather than because of inherent differences between the conditions. The true economic costs of MSDs and stress may be higher or lower than presented. There are a number of reasons why we might expect that the costs from a MSD case and from a stress case are not equivalent. The largest cost component, non-financial human costs (as described further below), and healthcare costs may in particular differ considerably in nature between the conditions, and be only loosely correlated with time off work (the measure of severity used in the model), so are most problematic.
- **Values used for to estimate the largest cost component – non-financial human costs – are derived in the context of road transport injuries and are not specific to work-related illnesses.** The non-financial human cost element provides an estimate of the subjective value that individuals would be willing to pay to avoid adverse outcomes from an incident. This value goes beyond the financial costs incurred from an incident, and represents the loss of wellbeing from an event. The value used in HSE's model is based on the wellbeing effects of road transport injuries, with broad adjustments for a generic case of work-related illness by time off work category. Thus, the appraisal values for non-financial human costs are more suited for workplace injuries. There are substantial difficulties in mapping values from road safety literature to work-related ill health, and for some

⁶ See European Risk Observatory (2014). Estimating the cost of accidents and ill-health at work: A review of methodologies, European Agency for Safety and Health at Work (EU-OSHA). Available at: <https://osha.europa.eu/en/publications/reports/estimating-the-costs-of-accidents-and-ill-health-at-work/view>

⁷ A more detailed discussion on the model's limitations is available in Appendices 2 and 3 of the research report, at: www.hse.gov.uk/research/rrhtm/rr897.htm

illnesses in particular, such as MSDs and stress, 'time off work' is likely to be a poor proxy for severity. HSE analysts are focussing particular attention on improving this aspect of the cost model.

- **The costs of 'never return' cases (i.e. individuals who do not expect to return to work due to their condition) are particularly uncertain.** Never return cases are a key group in the Costs to Britain model, accounting for around 40% of the total costs to society, so this is an important consideration. Uncertainty arises from two sources: i) the number of people unable to return to work due to each condition is uncertain, owing to a small number of cases self-reported in the LFS each year; ii) the enduring experience of these 'never return' cases, leading to high ongoing costs (particularly non-financial human costs and, to a lesser extent, healthcare costs), is likely to differ considerably between conditions. Data limitations discussed earlier in this paper mean that the model is unable to differentiate lifetime costs by illness type.

Conclusion

This research provides illustrative estimates of the annual costs of new cases of work-related MSDs (£2.3 billion) and stress (£5.2 billion) in 2013/14, using existing values in HSE's 'Costs to Britain' model. These estimates can help to demonstrate the potential magnitude of the costs to Britain from these conditions, and a breakdown of these costs to individuals, government and businesses. However, given the limitations in how they have been derived, they cannot be meaningfully used for ranking purposes, i.e. to compare per case costs of MSDs and stress, and to draw firm conclusions about the relative importance of these conditions from such a comparison.