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# **The Value of Lost Productivity from Workplace Bullying in Ireland**

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## **Abstract**

**Background:** Workplace bullying is a pervasive problem with significant personal, social and economic costs. Estimates of the resulting lost productivity provide an important societal perspective on the impact of the problem, while understanding where these economic costs fall is relevant for policy.

**Aims:** We estimated the value of lost productivity to the economy from workplace bullying in the public and private sectors in Ireland.

**Methods:** We used nationally representative survey data and multivariable negative binomial regression to estimate the independent effect of workplace bullying on days absent from work. We applied the human capital approach to derive an estimate of the annual value of lost productivity due to bullying by sector and overall in 2017.

**Results:** Bullying was independently associated with an extra 1.00 (95% CI: 0.38 to 1.62) days absent from work over a four-week period. This differed for public and private sector employees: 0.69 (95% CI: -0.12 to 1.50) versus 1.45 (95% CI: 0.50 to 2.40) days respectively. Applying official data, we estimated the associated annual value of lost productivity to be €51.8 million in the public sector, €187.6 million in the private sector, and €239.3 million overall.

**Conclusion:** The economic value of lost productivity from workplace bullying in Ireland is significant. Although bullying is more prevalent in the public sector, it has a larger effect on

absences in the private sector. Given this, along with the greater overall share of employees, productivity losses from bullying are considerably larger in the private sector in Ireland.

**Key words:** Workplace bullying; lost productivity; economic costs.

## **Introduction**

Workplace bullying is a pervasive problem with significant personal, social and economic costs. These include important deleterious effects on both physical and mental health, which can range from stress and unpleasant but manageable anxiety, to post traumatic stress disorder [1-3]. Other personal effects include poor concentration, increased propensity to accidents, lowered commitment and performance, increased consumption of alcohol and increased strain on personal relationships [4].

As a result of these impacts, there are a range of direct and indirect costs associated with workplace bullying, which affect both the individual and the organisation [4]. Direct costs to an individual may include loss of income, medical costs, legal costs, and/or early retirement. Indirect costs may include reduced well-being and quality of life, poorer job performance and satisfaction, as well as lost opportunities. For the organisation or employer, direct bullying-related costs can include sickness absence, replacement costs, legal costs, and HR-related costs. There can also be indirect costs to the organisation, where there are effects on bystanders or witnesses, reputational costs, and lower morale.

While all of these costs are important and relevant, the cost of bullying can also be considered at a wider societal level. One key component of this societal perspective involves estimating the value of lost productivity that directly results from bullying. Lost productivity occurs when an individual takes time out of the workforce due to illness, injury or for some other reason, and while this likely represents a loss to the individual, it also represents a loss to society in the form of reduced economic activity. Productivity losses may be temporary, such as taking time off to undergo treatment, or permanent, where it results in, say, early retirement. Moreover, if an individual returns to work after an illness or some event but is less productive than before, the associated loss is referred to as presenteeism [5].

Estimates of lost productivity provide information on the burden in monetary terms, can help identify key cost drivers to aid resource allocation decisions [6] and illustrate how the economic burden associated with one health condition compares with others, thus aiding prioritization by policy makers [7-8]. The traditional approach for estimating lost productivity is the human capital approach (HCA), though other approaches exist (e.g. the friction cost approach). The HCA assumes that individuals have the potential to produce a stream of economic outputs (i.e. productivity) over their working life and measures lost productivity as the amount of time by which working life is reduced due to illness or some event. This 'work time lost' is then valued at the market wage, which economists assume, in a competitive market, reflects the value of that work to society.

In terms of previous research, while the human and social costs of bullying to the individual are well documented, the associated wider economic costs have received much less attention. Bullying has a well-established impact on sickness absence, increasing the risk of sickness absence by 58% [3]. In Ireland, the context for this paper, 20% of bullied workers have reported taking sick leave as a result [9]. Although between country comparisons must be made cautiously, UK-based studies report estimates of costs due to lost productivity ranging from £1.5 to £9.14 billion [4, 10-11]. Most recently, total bullying-related costs of £2.28 billion have been estimated for the National Health Service (NHS) in England [12], using NHS data for bullying prevalence, sickness absence, employee turnover, diminished productivity, presenteeism, compensation, litigation and industrial relations costs.

In this paper, we apply the HCA to estimate the value of lost productivity from workplace bullying in Ireland. Regardless of the specific approach adopted, a key step involves measuring the loss in work time due to bullying. While time absent from work can be measured in a number of ways, we add to the literature by using nationally representative survey data and multivariable negative binomial regression to estimate the independent

effects of workplace bullying on days absent from work and do so for both the public and private sectors. Given our data we focus solely on temporary absences, which are likely to be most relevant for bullying [11]. We then apply the HCA using official data on the number and earnings of employees by sector in 2017 to derive an estimate of the annual value of lost productivity due to bullying by sector, as well as overall.

## **Methods**

The key parameter in estimating the value of lost productivity is the number of days absent from work as a result of bullying. To estimate this, we use data from the National Workplace Survey (NWS) 2009, a large-scale nationally representative study of Irish employees and employers. The NWS employee survey targeted employees in both the public and private sectors who were aged fifteen years or over and, following a pilot survey, a national telephone survey was conducted from March to June 2009. The sample for the survey was generated on a stratified random basis from a database of landline telephone numbers and sub-group quotas were used to ensure the sample was representative of the target population i.e. the national working population of Ireland. Overall there were 5,110 completed and usable interviews, representing a response rate of 50% of those eligible for the survey. For full details of all survey related issues, including the sampling approach, please see O'Connell et al. (2009) [13].

The NWS employee survey was designed to capture a comprehensive range of information on the nature of the job and the organisation of work. It therefore includes a number of variables of relevance for the analysis in this article. First, survey respondents were asked the following question:

*“Please think back over the last four working weeks, not including holiday weeks.*

*How many days, if any, were you absent from work because of illness or other*

*reasons (except holidays) over the last four weeks?”*

to which they provided an answer in days. Responses to this question form the basis for the dependent variable (*Days Absent*) in our model used to estimate bullying-related absences.

Respondents were also asked:

*“In the past six months, have you personally been subjected to bullying or harassment at work? By this I mean repeated and persistent inappropriate behaviour whether verbal, physical or otherwise, conducted by one or more individuals at the place of work?”*

to which they could respond *yes* or *no*. Answers to this question are used to derive the key explanatory variable (*Bullied*) in our model.

In addition, a range of other relevant variables from the NWS dataset were identified and included in our multivariable analysis. The explanatory variables are grouped into variables relating to ‘bullying’, ‘personal’, ‘work/job’, and ‘employer’. The large sample size available in the NWS employee survey also facilitates an analysis of the relationship between days absent and bullying across a number of dimensions e.g. for public and private sector employees.

The dependent variable in our multivariable regression analysis is a count data variable representing how many days an employee was out of work in the last four weeks. Count data take discrete non-negative integer values representing a count of events, where the variable is measured in a natural unit on a fixed scale and the difference in the numerical values is meaningful. An important feature of count data is that it tends to be skewed, often with a large proportion of zeros and a long right tail. In such cases linear regression is generally not appropriate and standard modelling approaches include Poisson and negative binomial regression. The latter is used in situations where the conditional variance is greater than the conditional mean of the dependent variable – this is known as overdispersion and can be

tested for. Since we find this to be case in our analysis (see details below), we estimate negative binomial models of *Days Absent* to examine its independent relationship with being bullied and also do so separately for public and private sector employees. Model selection is informed by the Akaike Information Criterion (AIC) test statistic.

Once estimated, we apply the HCA to generate our estimates of the value of bullying-related lost productivity. Specifically, the average number of days absent in the last four weeks as a result of bullying is combined with data on the total number of employees in Ireland and estimates of the proportion of employees that experience bullying. This provides us with an estimate of the total number of days absent from work in the past year as a direct result of bullying. We then combine this estimate with data on average earnings in order to calculate the economic value of lost productivity from bullying-related absenteeism.

## **Results**

Table 1 presents sample descriptive statistics for all variables used in our analysis. The average numbers of days absent from work over the last four weeks was 0.7 (SD: 3.0), while 7% of the sample self-reported being bullied. Both days absent and experience of bullying were higher in the public sector, on average. Figure 1 shows differences in the distribution of *Days Absent* for those who reported they were and were not bullied, suggesting that those who reported being bullied missed more days from work on average.

[Insert Table 1 and Figure 1 about here]

Results from three multivariable negative binomial models of *Days Missed* are presented in Table 2. In relation to the appropriateness of a negative binomial model over a Poisson model, this is confirmed by the three separate tests of the significance of the so-called overdispersion parameter  $\alpha$ , which confirm the presence of overdispersion ( $p < 0.001$ ). The first model includes the full sample and suggests that after we control for a wide range of

personal, work/job and employer variables, the estimated independent effect of being bullied is an additional 1.0 (95% CI: 0.4 to 1.6) work days missed in the last four weeks, on average. Table 2 also presents separate models estimated for public sector and private sector employees. For public sector employees, the estimated effect of being bullied is an extra 0.7 (95% CI: -0.1 to 1.5) missed days per four weeks, while for private sector employees it was 1.5 (95% CI: 0.5 to 2.4) extra days missed. Both models also include a wide range of relevant controls. While there is a considerable difference in the estimated point estimates for public and private sector employees, it should be noted that the estimated 95% confidence intervals do overlap. However, when an interaction term between *Bullied* and *Public* was added to the full model, a practically and statistically significant difference in days missed from bullying between sectors was found (full details available from the authors).

[Insert Table 2 about here]

The estimated annual value of lost productivity from workplace bullying is presented in Table 3. It is calculated by estimating the value of lost productivity in the public and private sectors separately and combining them. Data on the average number of days absent in the last four weeks due to bullying are taken from Table 2 and combined with estimates of the total number of employees in Ireland in the second quarter of 2017 [14] and estimates of the proportions of employees that reported being bullied from Table 1. This provides an estimate of the total number of days absent in the last year as a result of bullying and is equal to 276,473 days in the public sector and 1.42 million days in the private sector. Data on average daily earnings [15] are then used to estimate the annual value of lost productivity from bullying-related absenteeism. This is estimated at €51.8 million in the public sector (22%) and €187.6 million in the private sector (78%) per annum, giving an overall estimate of annual productivity losses from workplace bullying of €239.3 million in Ireland.

[Insert Table 3 about here]

## **Discussion**

This article presents estimates of the economic cost of workplace bullying in terms of lost productivity using self-reported data on employees' experience of being bullied and days absent due to illness or other reasons. In particular, the annual value of lost productivity is evaluated using the HCA and data on average daily earnings from 2017. We find that those who reported being bullied missed more days from work on average. Controlling for a wide range of confounding variables, the estimated independent effect of being bullied is an additional 1.00 work day missed in the last four weeks, with significant differences for public sector (0.69 days) and private sector employees (1.45 days). This leads to estimated annual costs of €52 million in the public sector and €188 million in the private sector, and overall annual productivity losses of €239 million.

In terms of strengths, our study is one of the first to cost work-related hazards in Ireland using national data. Work-related stress has doubled in Ireland since 2013 with workplace bullying identified as one of the key stressors impacting Irish workers [16]. Therefore, our estimates of the days lost in both the private and public sectors as a result of bullying are likely to be useful to both employers and policy makers, when prioritizing actions in the face of resource constraints. Moreover, our estimate of the value of lost productivity from workplace bullying is substantial. In comparative terms, it is more than half the total cost of asthma to the Irish tax payer [17], and about one-third the cost of musculoskeletal disorders (MSDs) [18], clearly highlighting the need for a concerted effort to address the problem. As with many work-related problems, the indirect and unquantifiable costs add significant weight to the argument. In the case of workplace bullying, the impact on marital relationships, job change, and forced retirement are particular issues that have a societal impact and underscore the urgent need to tackle the issue [19]. Finally, the findings presented

here also offer interesting insights into the difference in the impact of bullying in the public and private sectors. Our results indicate higher bullying-related absences and costs in the private sector, despite the fact that bullying, and the use of anti-bullying policies, is more prevalent in the public sector.

In terms of limitations, it is important to acknowledge that our estimates are likely to be an under-estimate of the overall economic cost of workplace bullying, as we do not consider costs where bullying results in presenteeism or in early retirement. In relation to retirement, although the literature refers to situations where workers leave the workforce as a result of being bullied, there is very little quantification of this. Certainly, the association between experience of bullying and turnover intention is well established, but the few studies that attempt to establish actual quit rates find that few actually do, and these do not distinguish whether targets took up work elsewhere or quit the workforce. For example, O'Connell et al.'s (2007) national study [9] found that 57% of targets reported an intention to quit, while only 15% actually did so. In addition, we do not estimate the indirect costs to individuals, organisations and society. Moreover, while the survey data that we use is relatively old, our bullying prevalence estimate is broadly consistent with estimates from later studies [20-21].

Furthermore, it is important to note that there are a number of ways to value lost productivity and there is ongoing debate as to the best method [6]. Traditionally the HCA has dominated the literature, but the friction cost approach has emerged as an alternative. The latter assumes that costs relate solely to the period of time necessary to re-establish the initial production level (i.e. the friction period) and that workers leaving employment and creating vacancies are replaced by previously unemployed individuals. This means that the calculation of costs for a single, typically short, friction period may result in underestimation [6]. Therefore, we believe that in the context of valuing short-term work absences, the HCA is more appropriate here.

Finally, in considering our results, it is important to note that there may be alternative explanations for our findings in relation to days absent and being bullied, such as differences in individual-level characteristics for those who did and those who did not report being bullied. Indeed, individual-level variables as an explanation for self-labelled bullying have been discussed in the literature. However, the empirical evidence on personality differences between targets and non-targets suggests that these are minimal and it is generally agreed that they do not contribute significantly to bullying [22]. Where any relation does exist between personality traits and bullying it is with conscientiousness [23], and this would be unlikely to bias upwards our results. In addition, a further limitation of our analysis is that it, by necessity, combines data on absences and bullying from the 2009 NWS with data on employment and earnings from 2017. While not ideal, as long as the relationship between days absent and bullying did not change significantly over the period, we believe this approach is reasonable.

In terms of public prevention policies in Ireland, while there is currently no dedicated legislation addressing the issue of workplace bullying, there are a number of ‘codes of practice’. These are non-binding measures that encourage employers to take action at the organisational level, which, while an advance on weakly co-ordinated policies such as found in some other countries [24], are nonetheless still problematic [25-27]. Indeed, robust context-sensitive policy at the level of the organisation may be a more useful avenue to pursue in protecting workers. However, workplace bullying is notoriously difficult to deal with within organisations and the evidence base for effective interventions is thin [28]. Anti-bullying policy is the most common organisational intervention to address workplace bullying [29-30], but these are complex interventions in complex settings. As a result, tailor-made interventions, in addition to policy, that are adjusted to the specific context of the organisation, are therefore likely required.

To conclude, the economic value of lost productivity from workplace bullying in Ireland is significant. Although bullying is more prevalent in the public sector, it has a larger effect on absences at an individual level in the private sector. Given this, along with the greater overall share of employees, productivity losses from bullying are considerably larger in the private sector in Ireland.

## **Key learning points**

### *What is already known about this subject*

- Workplace bullying is a pervasive problem imposing a range of direct and indirect costs on both individuals and organisations.
- Little is known about the economic value of lost productivity from workplace bullying in Ireland
- Little is known internationally about the differential impacts of workplace bullying on lost productivity in the public and private sectors.

### *What this study adds*

- We estimate the number of missed days and the value of lost productivity arising from workplace bullying in both the public and private sectors in Ireland.
- Overall bullying is independently associated with an extra 1.00 (95% CI: 0.38 to 1.62) days absent from work over a four-week period, leading to estimated annual productivity losses of €239 million.
- Although bullying is more prevalent in the public sector, it has a larger effect on absences in the private sector.

*What impact this may have on practice or policy*

- In addition to general anti-bullying policy, specific tailor-made interventions that are adjusted to the specific context of the organisation are likely to be required to tackle the problem of workplace bullying.

**Competing Interests**

The authors declare no competing interests.

**Funding**

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Table 1: Variable Definitions and Sample Descriptive Statistics

Variable	Definition	% or Mean (SD)		
		All	Public	Private
<b><i>Dependent Variable</i></b>				
<i>Days Absent</i>	Number of days absent from work because of illness or other reasons over the last four weeks	0.68 (3.00)	0.79 (3.32)	0.61 (2.80)
<b><i>Explanatory Variable – Bullying</i></b>				
<i>Bullied</i>	= 1 if self-reports being bullied; 0 else	7%	9%	6%
<b><i>Explanatory Variables – Personal</i></b>				
<i>Female</i>	= 1 if female; 0 else	52%	63%	46%
<i>Age</i>	= age in years	40.6 (11.8)	44.0 (10.7)	38.6 (12.0)
<i>Age Squared</i>	= age squared in years	1,790 (972)	2052 (943)	1631 (954)
<i>Marital Status</i>	= 0 if married	67%	74%	63%
	= 1 if lives with partner	6%	5%	6%
	= 2 if separated/divorced	3%	5%	3%
	= 3 if widowed	1%	2%	1%
	= 4 if single	22%	15%	27%
<i>Children</i>	= 1 if has children; 0 else	61%	63%	60%
<i>Education</i>	= 0 if lower secondary	15%	13%	16%
	= 1 if upper secondary	25%	20%	28%
	= 2 if certificate/diploma	22%	20%	23%
	= 3 if degree	24%	26%	22%
	= 4 if postgraduate	14%	21%	10%
	= . if missing	0%	0%	0%
<i>Region</i>	= 0 if Dublin	30%	28%	32%
	= 1 if Leinster (ex. Dublin)	25%	24%	25%
	= 2 if Munster	28%	27%	28%
	= 3 if Connacht/Ulster	18%	21%	15%
	= . if missing	0%	0%	0%
<b><i>Explanatory Variables – Work/Job</i></b>				
<i>Job Level</i>	= 0 if senior management	9%	7%	10%
	= 1 if middle management	16%	19%	14%

	= 2 if supervisor = 3 if employee	11% 64%	11% 64%	12% 64%
<i>Job Status</i>	= 0 if permanent = 1 if temporary/contract = 2 if casual	84% 12% 4%	84% 14% 2%	85% 10% 5%
<i>Supervise</i>	= 1 if supervise/manage any personnel; 0 else	36%	38%	34%
<i>Skills Match</i>	= 0 if skills much higher than needed = 1 if skills a bit higher than needed = 2 if skills the same as needed = 3 if skills lower than needed	20% 36% 42% 2%	20% 36% 43% 2%	21% 36% 42% 2%
<i>Union</i>	= 1 if union member; 0 else	44%	74%	26%
<b><i>Explanatory Variables – Employer</i></b>				
<i>Size</i>	= 0 if 1-4 people = 1 if 5-19 people = 2 if 20-25 people = 3 if 26-49 people = 4 if 50-99 people = 5 if 100-499 people = 6 if 500+ people = . if missing	9% 23% 9% 12% 11% 19% 15% 2%	6% 18% 9% 13% 12% 20% 18% 3%	11% 27% 8% 11% 10% 19% 12% 1%
<i>Industry</i>	= 0 if construction or production = 1 if wholesale or retail = 2 if hotels, restaurants, other services = 3 if transport, storage and communication = 4 if financial and other business = 5 if public admin and defence = 6 if education = 7 if health	19% 12% 8% 7% 16% 8% 12% 18%	3% 0% 2% 6% 3% 22% 39% 33%	28% 20% 11% 7% 24% 0% 2% 9%
<i>Public</i>	= 0 if private sector = 1 if public or commercial semi-state sector	62% 38%	N/A	N/A
<i>Policy</i>	= 1 if formal policy on respect and dignity at work (e.g. an anti-bullying policy); 0 else	82%	93%	76%
Observations		5,110	1,929	3,181

*Source:* Analysis of NWS 2009 data.

Table 2: Negative Binomial Models of *Days Missed* – Estimated Average Marginal Effects

	<b>Dependent Variable: <i>Days Missed</i></b>		
	<b>All</b>	<b>Public</b>	<b>Private</b>
<i>Bullied</i>	1.00***	0.69*	1.45***
	(0.38, 1.62)	(-0.12, 1.50)	(0.50, 2.40)
Personal explanatory variables included	Yes	Yes	Yes
Work/job explanatory variables included	Yes	Yes	Yes
Employer explanatory variables included	Yes	Yes	Yes
<b><i>Test for Overdispersion</i></b>			
$\alpha$	14.23	13.62	13.67
SE ( $\alpha$ )	0.73	1.04	0.97
LR Test of $\alpha = 0$	$p < 0.001$	$p < 0.001$	$p < 0.001$
<b><i>Model Statistics</i></b>			
Log Likelihood (Model)	-3294.26	-1351.44	-1923.96
AIC	6676.52	2784.87	3929.92
Observations	4,527	1,706	2,821

*Source:* Analysis of NWS 2009 data.

*Notes:* All three models include the full sets of personal, work/job, and employer explanatory variables listed in Table 1. 95% confidence intervals in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 3: Estimated Value of Lost Productivity from Workplace Bullying

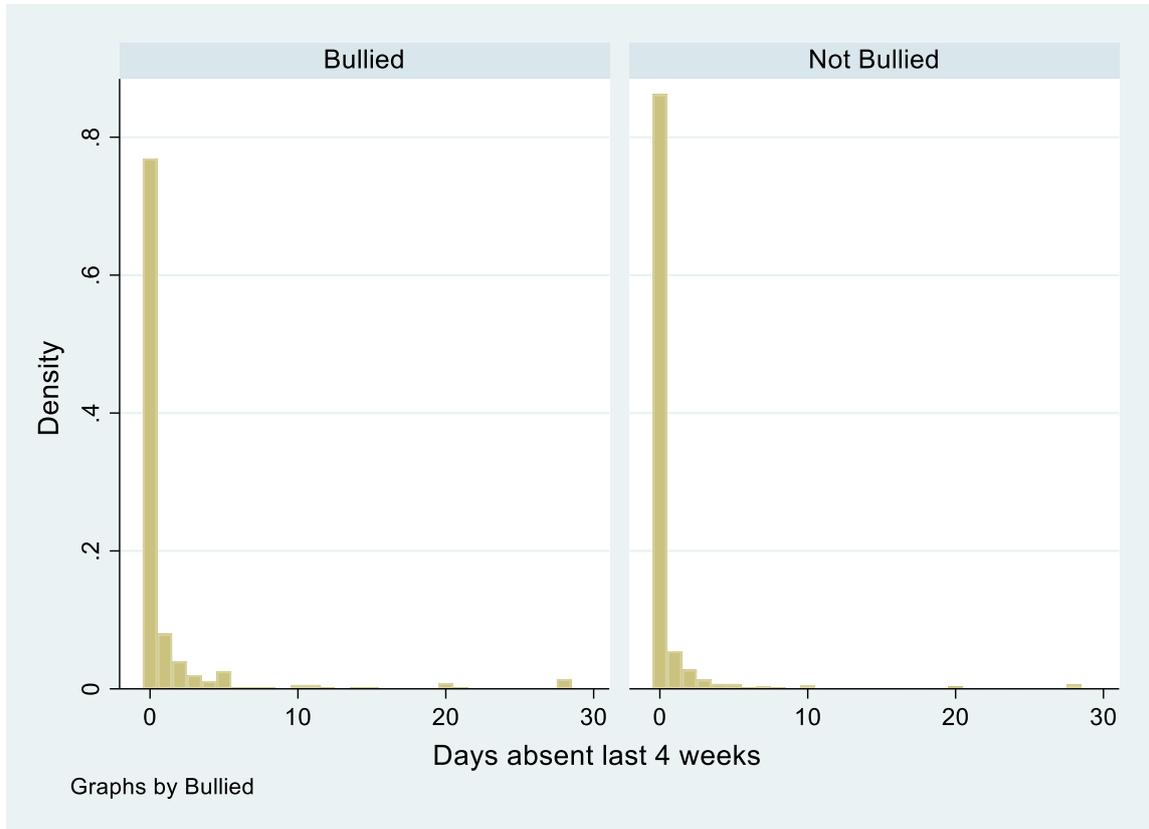
	<b>Public</b>	<b>Private</b>	<b>Total</b>	<b>Source</b>
Average days absent in last 4 weeks due to bullying (a)	0.69	1.45		From Table 2
Total number of employees in Ireland (Q2, 2017) (b)	393,200	1,311,200		CSO (2017a)
% employees experiencing bullying (c)	9%	6%		From Table 1
Total number of employees experiencing bullying (Q2, 2017) (d)	34,838	84,966		= (b)*(c)
Total number of days absent in last year due to bullying (e)	276,473	1,422,096		= (a)*(d)*(46.14/4) <sup>1</sup>
Average daily earnings (€, Q2 2017) (f)	€187.26	€131.90		CSO (2017b) <sup>2</sup>
Estimated annual value of lost productivity due to bullying (g)	€51,771,846	€187,568,793	€239,340,638	(e)*(f)

Source: Analysis of NWS 2009 data, CSO (2017a) and CSO (2017b).

Notes: <sup>1</sup> Assumes an average of 6 weeks holidays per year. <sup>2</sup> Assumes a five day working week.

**FIGURE**

Figure 1: Comparison of Distribution of *Days Absent* by *Bullied*



Source: Analysis of NWS 2009 data.