
Are people who claim compensation “cured by a verdict”? A longitudinal study of health outcomes after whiplash

Natalie M Spearing, Dorte Gyrd-Hansen, Louis H Pobereskin,
David S Rowell and Luke B Connelly*

This study examines whether the lure of injury compensation prompts whiplash claimants to overstate their symptoms. Claim settlement is the intervention of interest, as it represents the point at which there is no further incentive to exaggerate symptoms, and neck pain at 24 months is the outcome of interest. Longitudinal data on neck pain scores and timing of claim settlement were regressed, controlling for the effect of time on recovery, to compare outcomes in claimants who had and had not settled their compensation claims. The results show clearly that removing the financial incentive to over-report symptoms has no effect on self-reported neck pain in a fault-based compensation scheme, and this finding concurs with other studies on this topic. Policy decisions to limit compensation in the belief that claimants systematically misrepresent their health status are not supported empirically. Claimants do not appear to be “cured by a verdict”.

INTRODUCTION

There is a belief that the lure of financial recompense encourages the systematic over-reporting of symptoms in circumstances where compensable injuries are objectively unverifiable. Nowhere is this view that individuals engage in strategic behaviour more apparent than in the whiplash literature.¹

* Natalie M Spearing, PhD Candidate, Australian Centre for Economic Research on Health, The University of Queensland; Dorte Gyrd-Hansen, PhD, Professor of Health Economics, Australian Centre for Economic Research on Health, and Health Economics Research Unit, University of Southern Denmark and The Danish Institute for Health Services Research, The University of Queensland; Louis H Pobereskin, MD, Consultant Neurosurgeon, Department of Neurosurgery, Derriford Hospital, Plymouth, Devon, United Kingdom; David S Rowell, PhD, Australian Centre for Economic Research on Health, The University of Queensland, Herston, Queensland; Luke B Connelly, PhD, Professor of Health Economics, Australian Centre for Economic Research on Health, Centre of National Research on Disability and Rehabilitation Medicine and School of Economics, The University of Queensland, Herston, Queensland. *Details of author contributions, name of guarantor:* Study concept and design: Spearing, Gyrd-Hansen, Connelly; Literature search: Spearing; Acquisition of data (data extraction and quality assessment): Pobereskin; Analysis and interpretation of data: Spearing, Gyrd-Hansen, Pobereskin, Rowell, Connelly; Drafting of the manuscript: Spearing; Critical revision of the manuscript, and final approval: Spearing, Gyrd-Hansen, Connelly, Rowell, Pobereskin; Natalie Spearing takes final responsibility for the content and the decision to submit the manuscript. *Ethical approval:* Ethical approval for the collection of the de-identified survey data analysed in this study was obtained from the South West Research Ethics Committee in Devon by Dr Louis Pobereskin. *Details of funding:* Spearing is supported by stipends from the Australian Centre for Economic Research on Health (ACERH-UQ) and the Centre of Clinical Research Excellence in Spinal Pain, Injury and Health (CCRE Spine), both of which are independent research centres funded by the National Health and Medical Research Council (NHMRC). Gyrd-Hansen has joint appointments funded by the Australian Centre for Economic Research on Health (ACERH-UQ), and by Health Economics Research Unit, University of Southern Denmark and The Danish Institute for Health Services Research. Pobereskin’s appointment as a consultant neurosurgeon is funded by the Department of Neurosurgery, Derriford Hospital, National Health Service, Devon, United Kingdom. Rowell is supported by a stipend from the Australian Centre for Economic Research on Health (ACERH-UQ), and a scholarship from the Australian Prudential Regulatory Authority and the Reserve Bank of Australia. Connelly’s appointment is funded from an unrestricted grant from the Motor Accident Insurance Commission (MAIC) to The University of Queensland. MAIC is a statutory body established under the *Motor Accident Insurance Act 1994* (Qld) to regulate the compulsory third party insurance scheme in Queensland, Australia.

Correspondence to: Natalie M Spearing Australian Centre for Economic Research on Health, The University of Queensland, Edith Cavell Building, RBWH, Herston, Qld 4029, Australia; email n.spearing@uq.edu.au.

¹ Malleon A, *Whiplash and Other Useful Illnesses* (McGill University, Montreal, 2005).

Whiplash results in a range of symptoms, the most common of which is neck pain.² The diagnosis of whiplash relies on self-reported symptoms in the vast majority of cases³ as structural pathology is often indiscernible through (conventional) imaging techniques.⁴

While there is general acceptance that the injury causes short-term symptoms, the cause of the chronic whiplash symptoms reported by up to 50% of people⁵ is the subject of much speculation. Structural damage to the neck, the stress of the incident, and the potential for malingering (or moral hazard) have all been suggested. This article focuses on the third hypothesis, that the prospect of compensation induces individuals to describe an artificially poor health state in order to achieve financial gain. Such actions are often described in the health literature as “malingering”,⁶ which refers to a spectrum of behaviour ranging from conscious fabrication to symptom exaggeration in response to an external incentive or “secondary gain”.⁷ A parallel concept, moral hazard, is described in the economic literature. (Although malingering is one of several possible manifestations of moral hazard, the terms are used interchangeably in this article.)

Economic theory holds that by lowering the marginal cost of actions to minimise loss, insurance (compensation) may cause a behavioural change that increases the probability and/or size of a loss when it occurs. This is the classic problem of insurance, known as “moral hazard”, which insurers often equate with malingering or fraudulent behaviour.⁸ Arrow⁹ and Pauly¹⁰ proposed that moral hazard arises from an asymmetry in the information held by the insured and the insurer: the insured inevitably holds more information about their intentions and their actions than the insurer.

Asymmetric information may benefit the insured before or after an insured loss.¹¹ In the context of this article, the concept of ex post moral hazard – as it relates to the potential for insured individuals to falsify or exaggerate their injury or symptoms when their loss is unobservable¹² – is of interest because of the largely unverifiable nature of whiplash injuries. In situations where there is a high level of information asymmetry, utility maximisers may attempt to gain compensation over and above the loss they actually experienced.¹³ The degree of asymmetry, or the amount of information available to the insurer, affects the potential for moral hazard. Suspicions about the potential for moral

² Radanov BP, Sturzenegger M and Di Stefano G, “Long-term Outcome After Whiplash Injury. A 2-year Follow-up Considering Features of Injury Mechanism and Somatic, Radiologic, and Psychosocial Findings” (1995) 74(5) *Medicine* 281.

³ Hartling L, Brison RJ, Ardern C and Pickett W, “Prognostic Value of the Quebec Classification of Whiplash-associated Disorders” (2001) 26(1) *Spine* 36.

⁴ Elliott J, Noteboom JT, Flynn TW and Sterling M, “Characterization of Acute and Chronic Whiplash-associated Disorders” (2009) 39(5) *Orthop Sports Phys Ther* 312.

⁵ Carroll L, Holm L, Hogg-Johnson S et al, “Course and Prognostic Factors for Neck Pain in Whiplash-associated Disorders (WAD): Results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders” (2008) 33(4S) *Spine* S83.

⁶ American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* (4th ed, American Psychiatric Association, Washington DC, 2000).

⁷ Fishbain DA, Rosomoff HL, Cutler RB and Rosomoff RS, “Secondary Gain Concept: A Review of the Scientific Evidence” (1995) 11(1) *Clin J Pain* 6.

⁸ Pauly MV, “The Economics of Moral Hazard: Comment” (1968) 58 *Am Econ Rev* 531.

⁹ Arrow KJ, “Uncertainty and the Welfare Economics of Medical Care” (1963) 53 *Am Econ Rev* 941.

¹⁰ Pauly, n 8.

¹¹ Chiappori P, “Econometric Models of Insurance Under Asymmetric Information” in Dionne G (ed), *Handbook of Insurance* (Kluwer, Boston, 2000).

¹² Loughran D, “Deterring Fraud: The Role of General Damage Awards in Automobile Insurance Settlements” (2005) 72(4) *J Risk and Insur* 551.

¹³ Di Mauro C, “Ex Ante and Ex Post Moral Hazard in Compensation for Income Losses: Results from an Experiment” (2002) 31 *J Socio-Econ* 253; Cummins JD and Tennyson S, “Moral Hazard in Insurance Claiming: Evidence from Automobile Insurance” (1996) 12(1) *J Risk and Uncert* 29.

hazard are reflected in Kennedy's assertion that unverifiable injuries are "a state of mind, born out of fear, kept alive by avarice, stimulated by lawyers, and cured by a verdict".¹⁴

MEASURING MORAL HAZARD

The advent of compensation schemes in the 19th century gave rise to the now familiar tension between insured individuals seeking financial compensation for their losses and insurers seeking to maintain an adequate capital pool from which to make such payments. From a societal perspective, a reasonable balance must be struck between these interests,¹⁵ and the way that compensation schemes are designed may affect this balance. In particular, fault-based schemes, which usually compensate people for economic losses (eg lost wages) as well as non-economic losses (eg pain and suffering), may create uncertainty for insurers as the size of judgments – usually in relation to non-economic losses – is difficult to predict. Difficulties in pricing this risk, coupled with lower returns on investment, often precede calls for tort reform, such as caps on non-economic losses,¹⁶ to improve certainty about exposure to future liabilities. Additionally, concerns exist that individuals with unverifiable injuries may attempt to inflate their claims. Thus, research on moral hazard and its role in insurance schemes that contain provisions for the coverage of non-economic losses is naturally of great interest to all concerned: insurers, consumers, regulators, the legal fraternity and others.

There have been many attempts to detect moral hazard, including a raft of physical and psychological tests,¹⁷ crash simulations, and surveillance. Compensation claim rates, which some consider to be indicative of moral hazard, have also been studied, particularly in relation to whether or not rates change in response to increases or decreases in compensation benefits.¹⁸ There is evidence that the rate of whiplash claims decreases after switching from a fault-based to a no-fault compensation scheme design,¹⁹ which entails removing the ability to recover non-economic losses, and this has been interpreted as evidence of moral hazard.²⁰

However, while the propensity to claim is sometimes considered as a suitable proxy for moral hazard, it does not answer the question of whether the potential for financial gain leads to the exaggeration or falsification of self-reported health status.²¹ According to economic theory, changes in the propensity to claim are not necessarily indicative of moral hazard because, after a reduction in benefits, one would expect the claimant pool to differ owing to changes in the ability and/or willingness to exercise the right to claim. This may occur due to a rise in the threshold for claims²² and/or because the expected marginal cost of making a claim may exceed the expected marginal benefit of doing so.²³ When the former is true, would-be claimants are simply unable to claim and when the latter is true, would-be plaintiffs will choose not to litigate.²⁴ Neither of these scenarios

¹⁴ Kennedy F, "The Mind of the Injured Worker: Its Effect on Disability Periods" (1946) 1 *Compens Med* 19.

¹⁵ Australian Government, *Available and Affordable: Improvements in Liability Insurance Following Tort Law Reform in Australia* (Australian Government, Canberra, 2006).

¹⁶ Ambrose JM and Carroll A, "Medical Malpractice Reform and Insurer Claims Defense: Unintended Effects?" (2007) 32(5) *J Health Polit Policy Law* 843.

¹⁷ Fishbain DA, "Chronic Pain Disability Exaggeration/Malingering and Submaximal Effort Research" (1999) 15(4) *Clin J Pain* 244.

¹⁸ Biddle J and Roberts K, "Claiming Behaviour in Workers' Compensation" (2003) 70(4) *J Risk and Insur* 759.

¹⁹ Cassidy D, Carroll L, Côté P, Lemstra M, Berglund A and Nygren A, "Effect of Eliminating Compensation for Pain and Suffering on the Outcome of Insurance Claims for Whiplash Injury" (2000) 342(16) *NEJM* 1179; Spitzer WO, Skovron ML, Salmi LR et al, "Scientific Monograph of the Quebec Task Force on Whiplash-associated Disorders: Redefining 'Whiplash' and Its Management" (1995) 20(Suppl) *Spine* 1S.

²⁰ Cassidy et al, n 19; Spitzer et al, n 19.

²¹ Biddle and Roberts, n 18.

²² Teasell RW, "Compensation and Chronic Pain" (2001) 17(4S) *Clin J Pain* S46.

²³ Cummins and Tennyson, n 13.

²⁴ Shavell S, "On Moral Hazard and Insurance" (1979) 93(4) *Q J Econ* 541.

indicates that the incidence of whiplash or other injuries has increased or decreased as a result of changes to scheme design or benefit levels, or that the level of pain and disability has changed.²⁵

Another test for moral hazard, and the method applied in the present study, involves the comparison of pre- and post-settlement health. The aim in such studies is to measure the effect of settlement on the health status of individuals over time, holding other factors constant. Proponents of the moral hazard theory would anticipate that pain and other symptoms would cease once settlement has occurred as there is no further financial incentive to understate health status – that is, individuals would appear to be “cured by a verdict”. While a number of studies have employed the pre- and post-settlement health status design, the approach to data analysis has been somewhat rudimentary in most cases, with the majority comparing the rate or the mean scores of symptoms before and after settlement. Given that the question of moral hazard has important implications for injured people and insurers, this study attempts a more robust analysis to investigate the moral hazard hypothesis; this is the point of departure from previous studies.

METHODS

Study objective

The current authors performed an analysis of neck pain scores among compensation claimants prior to and following the settlement of their compensation claims. The aim was to determine whether there was any significant change in neck pain following claim settlement, which would be indicative of moral hazard. The null hypothesis, which assumes that ex post moral hazard is not present, is as follows:

H_0 : in fault-based compensation schemes, claim settlement has no effect on the health of claimants post-settlement.

A rejection of H_0 would be taken as evidence of moral hazard in this sample.

Sample description

The sample was obtained from de-identified data collected for a previously published study.²⁶ All individuals ($N = 1,147$) reporting a rear-end collision to the Devon and Cornwall Constabulary over a one-year period were contacted within two weeks of their road traffic crash and asked to participate in a study on whiplash. Individuals in a frontal- or side-impact road traffic crash, younger than 18 years of age, with a head injury, or requiring transport to hospital were excluded. The 503 people who consented to participate were significantly ($p < 0.005$) more likely to be female and older in age than non-respondents. Demographic, crash, treatment, employment, compensation and health status data were collected by postal survey at baseline, 6, 12 and 24 months. 265 of the 503 participants made a claim for compensation, and this pool of claimants (Figure 1) comprises the subgroup of interest in the present study. All of the individuals in the sample were exposed to the same fault-based motor accident insurance scheme. There were no missing data in the sample of claimants.

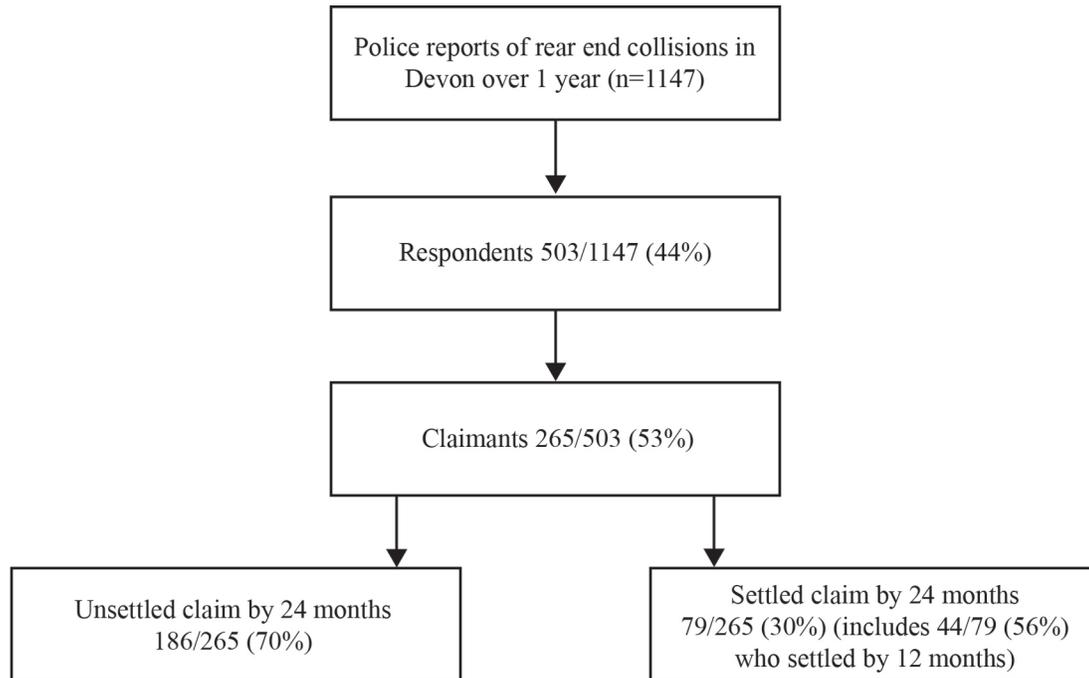
The dataset available for the analysis has several important attributes that are unusual in studies on whiplash (and compensation-related variables):

- it is relatively large in size;
- it involves a representative (population) sample of individuals exposed to the same compensation system;
- it spans sufficient time to detect the outcome of interest; and
- it contains data on both compensation-related factors and health outcomes.

²⁵ Teasell, n 22.

²⁶ Pobereskin LH, “Whiplash Following Rear End Collisions: A Prospective Cohort Study” (2005) 76(8) J Neurol Neurosurg Psychiatry 1146.

FIGURE 1 Participant flow-diagram



Construction of the variables

This study analyses data on the settlement of compensation claims, and data on neck pain reported by claimants.

Claim settlement

Claim settlement was the explanatory variable of interest. All claimants (N = 265) were assumed to be eligible for settlement and data on settlement were recorded (yes/no) at 12 and 24 months. By the end of the study period, 79 (30%) of the claimants had settled their claims (44 had done so within 12 months), while 186 had outstanding claims. Dummy variables reflecting time of settlement (S) were constructed for each individual with $S_{12} = 1$ if settlement took place within the first 12 months of observation, and $S_{24} = 1$ if settlement took place at any time within the 24 months.

The prevailing compensation system was a fault-based personal injury (automobile) compensation scheme, and claimants were therefore eligible for compensation for economic and non-economic losses. “Settlement” refers to the act of finalising a negotiated agreement to compensate a claim for damages for personal injury.²⁷ There was no indication of whether claims were settled in or out of court.

Health status

Health status at 24 months was the dependent variable of interest. Neck pain scores measured with the Visual Analogue Scale (VAS)²⁸ were used to indicate health status over time. The VAS is a validated instrument for measuring acute²⁹ and chronic pain³⁰ using scores ranging from 0 to 100mm, with

²⁷ Oxford Reference Online, http://www.oxfordreference.com/views/SEARCH_RESULTS.html?searchnumber=1&q=compensation%20claim%20settlement&timelines=0&category=s12&ssid=890820369&scope=subject&time=0.129869956829687 viewed 24 March 2011.

²⁸ Jensen MP, Karoly P and Braver S, “The Measurement of Clinical Pain Intensity: A Comparison of Six Methods” (1986) 27 *Pain* 117.

²⁹ Jensen et al, n 28.

worse pain represented by a higher score. As the scale is linear, changes in the score over time can be interpreted to represent relative change in pain severity,³¹ although an error of ~20mm exists in relation to acute pain measurement.³² Previous pain ratings do not appear to influence future ratings.³³

For each individual, VAS scores for neck pain were registered at baseline, 6 months, 12 months and 24 months. In order to test for differences in VAS scores across observation periods, as well as across individuals who had settled and not settled, respectively, a series of dummy variables were constructed. Dummy variables for neck VAS scores (N) were coded such that they captured the difference in VAS between the prior observation and the current observation. Regressors N_6 , N_{12} and N_{24} captured changes in neck VAS scores from baseline to observation at 6 months, from 6 months to 12 months, and from 12 months to 24 months, respectively. Interaction terms between N and S variables ($N_{12}*S_{12}$, $N_{24}*S_{12}$, $N_{24}*S_{24}$) were constructed to test for the (potentially) moderating effect of time of settlement on the neck VAS score.

The regression model

In order to test the hypothesis H_0 , the general econometric model of this study is specified as follows:

$$VAS = f(\text{constant}, N_6, N_{12}, N_{24}, N_{12}*S_{12}, N_{24}*S_{12}, N_{24}*S_{24}, \epsilon)$$

VAS = neck pain (VAS scores) over time

N = dummy variables for neck pain observations at 6, 12, 24 months

S = dummy variables for settlement at 12, 24 months

ϵ = a random error term.

Data were analysed using ordinary least squares (OLS) regression. It is worth noting that estimation of a repeated measures regression via OLS will result in unbiased parameter estimates even if the residuals generated by the same individuals are correlated. Positive correlation of residuals will, however, lead to narrower confidence intervals, and a greater likelihood that the null hypothesis will be rejected when it is true.³⁴ Applying OLS can in this instance be viewed as a conservative approach to testing the null hypothesis. Analyses were conducted using STATA/SE 11®.³⁵

RESULTS

Descriptive statistics

The characteristics of those who had and had not settled their claims are described in Table 1. The groups were compared on the basis of age, gender, previous neck pain, initial neck pain severity, and headache at baseline, as these are known to influence health outcomes after whiplash injuries.³⁶ In addition, the groups were compared in relation to employment status³⁷ and previous road traffic crash, two factors which may influence the propensity to claim and which may also influence the propensity to settle.

³⁰ Carlsson AM, “Assessment of Chronic Pain. I. Aspects of the Reliability and Validity of the Visual Analogue Scale” (1983) 16 *Pain* 87.

³¹ Myles P, Troedel S, Boquest M and Reeves M, “The Pain Visual Analog Scale: Is It Linear or Nonlinear?” (1999) 89 *Anesth Analg* 1517.

³² Revill SI, Robinson JO, Rosen M and Hogg MIJ, “The Reliability of a Linear Analogue for Evaluating Pain” (1976) 31 *Anaesthesia* 1191.

³³ Carlsson, n 30.

³⁴ Donner A, “Linear Regression Analysis with Repeated Measurements” (1984) 37(6) *J Chronic Diseases* 441.

³⁵ STATA/SE 11.2® Statistics/Data Analysis (Statacorp LP, College Station, Texas, 2009).

³⁶ Walton DM, Pretty J, MacDermid JC and Teasell RW, “Risk Factors for Persistent Problems Following Whiplash Injury: Results of a Systematic Review and Meta-analysis” (2009) 39(5) *J Orthop Sports Phys Ther* 334.

³⁷ Dunbar FC and Sabry F, “The Propensity to Sue: Why Do People Seek Legal Actions?” (2007) 42(2) *Business Econ* 31.

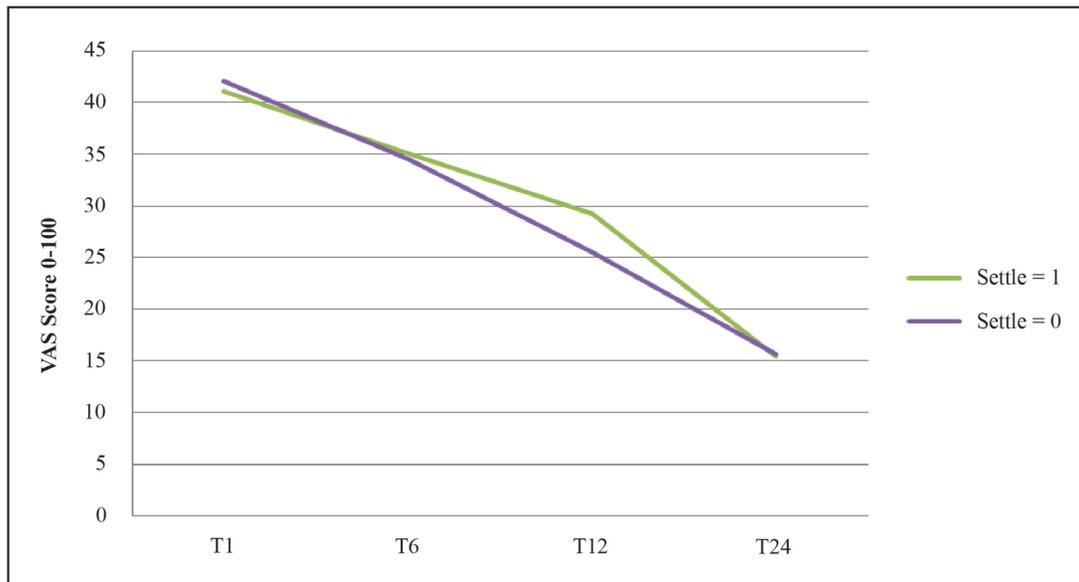
TABLE 1 Descriptive statistics

	Settled	Not settled	p-value	t
N	79	186	-	-
Age (mean, years)	42	41	0.187	-1.319
Female (yes)	74%	69%	0.135	-1.495
Neck pain at baseline*	41.12	42.15	0.469	0.723
Neck pain at 6 months*	35	34.55	0.890	-0.137
Neck pain at 12 months*	29.25	25.50	0.278	-1.086
Neck pain at 24 months*	15.48	15.66	0.953	0.058
Headache at baseline (yes)	92%	80%	0.000	-4.946
History of neck pain (yes)	26%	21%	0.065	-1.847
History of road traffic crash (yes)	14%	22%	0.001	3.178
Unemployed (yes)	8%	8%	0.728	-0.347

* Mean VAS score 0-100.

There was no statistically significant difference in the gender distribution, mean age, neck pain score at baseline or over time, history of neck pain, or employment status among the groups. Those who had settled their claims were significantly ($p < 0.05$) more likely to have a headache at the initial presentation but less likely to have had a previous road traffic crash.

FIGURE 2 Claimants have similar unadjusted neck pain scores (VAS) over time, irrespective of whether they have settled their claims or not



Regression analysis

Table 2 presents the results of the regression analysis. The results show that there is a steady and highly statistically significant improvement in neck VAS score in all individuals over time and that the rate of incremental improvement increases from 7.15 points in the first six months, to 7.19 from six months to 12 months, and 11.82 from 12 months to 24 months (bearing in mind that the negative sign indicates a reduction in the pain score, or improvement). The results also show that the interaction terms $N_{12} * S_{12}$, $N_{24} * S_{12}$, and $N_{24} * S_{24}$ are all statistically non-significant ($p = 0.146$; $p = 0.671$; $p = 0.318$, respectively), signifying that settlement does not have any impact on the improvement in neck VAS scores over time. These non-significant results are supported by sample size calculations performed for each interaction scenario, which indicate that very large samples would be required to detect significance at $\alpha = 0.05$ with 80% power. On the basis of these findings, one cannot reject the null hypothesis as the results strongly suggest that claim settlement does not affect post-settlement health: claimants experience similar improvements in their VAS scores over time regardless of whether their claim has been settled or not.

TABLE 2 The effect of settlement on neck pain over time (VAS)

Regressor	Coefficient	Std error	t	p-value	95% Conf interval	
N_6	-7.15094	2.03448	-3.51	0.000	-11.143	-3.15885
N_{12}	-7.19717	2.117913	-3.4	0.001	-11.353	-3.04136
N_{24}	-11.8285	2.31959	-5.1	0.000	-16.3801	-7.27698
$N_{12}S_{12}$	-5.96708	4.104683	-1.45	0.146	-14.0214	2.087213
$N_{24}S_{12}$	-2.83117	6.658736	-0.43	0.671	-15.8971	10.23473
$N_{24}S_{24}$	4.001802	4.0028	1	0.318	-3.85257	11.85617
_cons	41.84151	1.438595	29.08	0.000	39.01867	44.66435

Number of observations = 1060; R-squared = 0.1519; Degrees of freedom (residual) = 1053; Root MSE = 23.419; $F(6, 1053) = 31.44$ Prob > F = 0.0000.

It is noted that the proportion of variance of the dependent variable explained by the model (R^2) is 15%; however, the intention of this model is to consider the pattern of neck pain over time in relation to claim settlement, not to predict the level of neck pain over time. The F statistic for the three interaction dummies indicates that as a group these variables explain no part of the observed result ($F[3, 1053] = 1.64$, Prob > F = 0.1775). The model was also run with controls for baseline neck VAS scores among those who had settled at 12 months (S_{12}) and those who settled at 24 months (S_{24}). There was, however, no appreciable difference in the magnitude or the precision of any of the results. In particular, the F statistic for the three interaction dummies was still statistically insignificant for this formulation of the model ($F[3, 1053] = 1.64$, Prob > F = 0.1775).

DISCUSSION

The aim of this study was to determine whether claim settlement per se and the timing of claim settlement have an effect on neck pain. It sought to extend previous work by undertaking an analysis of longitudinal data on claim settlement and neck pain. It compared self-reported neck pain among claimants who had settled their claims with the level of neck pain reported by those who had not, controlling for the effect of time on recovery.

Data for the analysis were obtained from a representative sample of individuals who were exposed to the same type and mechanism of injury, and the same incentives and disincentives to claim compensation; the groups were relatively homogeneous. As this was a “within-scheme” study, it avoided the limitations inherent in cross-scheme comparisons. Importantly, the groups were similar

with respect to their baseline neck pain scores, as neck pain is the outcome of interest in this study. Initial neck pain is strongly associated with prognosis after whiplash injury.³⁸

The effect of settlement was analysed at two points in time (N = 12, N = 24) under the assumption that settlement prior to 12 months may have affected VAS scores at N = 12 and that settlement at any time prior to the 24 months may affect VAS scores at N = 24.

The results clearly demonstrate no statistically significant difference in neck VAS scores among those who had settled compared to those who had not yet settled their claims, after the effect of time on recovery is taken into account. The null hypothesis, which assumes settlement has no effect on measures of claimant health, cannot therefore be rejected.

Furthermore, the authors noted a steady decline in the level of neck pain among all claimants at each interval, irrespective of whether their compensation claims were settled or not. These similar recovery trajectories are evident in both the unadjusted (Table 1, Figure 2) and adjusted results (Table 2). Moreover, the small differences in VAS score and the high p-values for initial and endpoint neck pain lend additional support to the null hypothesis that claim settlement has no effect on health status. This similar pattern of recovery among claimants irrespective of whether or not their claims are settled runs counter to the popular belief that claimants are “cured by a verdict”.

These results reinforce the findings of other studies that have examined whether compensation claimants with unverifiable spinal injuries become symptom-free after they settle their claims. Reviews of studies comparing pre- and post-settlement health status have found no evidence that health improves as a result of settling a claim.³⁹ Individual studies that have compared pre- and post-settlement health after a whiplash injury⁴⁰ have all found that self-reported symptoms persist after claims are settled: between 36% and 100% of claimants still experience symptoms after settlement. Presently, there is apparently no empirical evidence that claimants deliberately and systematically exaggerate their symptoms when compensation is available.

Is the role of moral hazard unduly emphasised?

Despite the failure of empirical studies to demonstrate a relationship between the settlement of claims and the resolution of symptoms, the myth that people are “cured by a verdict” persists. There are several reasons why this is so. Of central importance is the juxtaposition of the competing interests of insureds and insurers, described earlier, which contributes to an environment of mutual suspicion and distrust regardless of the type of loss.⁴¹ Doubts among insurers about the veracity of injury claims were fuelled by Miller’s infamous case series⁴² describing a small, highly selected sample of people with severe head injuries involved in protracted legal disputes. As most of his patients did not recover until after their cases were settled, Miller concluded that litigants exaggerate their injuries to maximise their compensation payments and will therefore not respond to treatment. Despite its methodological

³⁸ Carroll et al, n 5.

³⁹ Mendelson G, “Compensation Neurosis Revisited: Outcome Studies of the Effects of Litigation” (1995) 39(6) *J Psychosom Res* 695; Weighill VE, “Compensation Neurosis: A Review of the Literature” (1983) 27(2) *J Psychosom Res* 97; Shapiro AP and Roth RS, “The Effect of Litigation on Recovery from Whiplash” (1993) 7 *Spine* 531.

⁴⁰ Pobereskin, n 26; Hohl M, “Soft-tissue Injuries of the Neck in Automobile Accidents. Factors Influencing Prognosis” (1974) 8 *J Bone Joint Surg (Am)* 1675; Kristjansson E and Jonsson H, “Symptom Characteristics in Women with Chronic WAD, Grades I-II, and Chronic Insidious Onset of Neck Pain: A Cross-sectional Study With an 18-Month Follow-up” (2004) 3(1) *J Whiplash Rel Disorders* 3; MacNab I, “The ‘Whiplash’ Syndrome” (1971) 2(2) *Orthop Clin North Am* 389; Maimaris C, Barnes MR and Allen MJ, “Whiplash Injuries of the Neck: A Retrospective Study” (1988) 19 *Injury* 393; Mendelson G, “Not ‘Cured by a Verdict’. Effect of Legal Settlement on Compensation Claimants” (1982) 2(3) *MJA* 132; Norris SH and Watt I, “The Prognosis of Neck Injuries Resulting From Rear-end Vehicle Collisions” (1983) 65(5) *J Bone Joint Surg (Br)* 608; Parmar HV and Raymakers R, “Neck Injuries From Rear Impact Road Traffic Accidents: Prognosis in Persons Seeking Compensation” (1993) 24(2) *Injury* 75; Sapir D and Gorup J, “Radiofrequency Medial Branch Neurotomy in Litigant and Nonlitigant Patients with Cervical Whiplash” (2001) 26(12) *Spine* E268.

⁴¹ Baldock T, *Insurance Fraud* (Trends and Issues in Crime and Criminal Justice, No 66, Australian Institute of Criminology, Australia, 1997).

⁴² Miller H, “Accident Neurosis” (1961) 5230 *BMJ* 919.

limitations, the results of this study are heralded as proof of moral hazard.⁴³ Miller’s findings have not been replicated in other studies comparing pre- and post-settlement health.⁴⁴

In addition to the inherent insured-insurer conflict, speculation about whether people with whiplash systematically over-report their symptoms is largely the result of the unverifiable nature of most whiplash injuries – and the subjective nature of its cardinal symptom, pain. The inability to identify a lesion or other verifiable cause of symptoms has led to suspicion about the veracity of claims for compensation.⁴⁵ This is reinforced by the broad psychiatric criteria for malingering and the proviso that such behaviour is to be “strongly suspected” in cases with a medico-legal context and where a discrepancy exists between self-reported symptoms and objective findings,⁴⁶ a description that would certainly apply to many people with whiplash who pursue compensation. Furthermore, sensationalist media portrayals, sometimes of genuinely fraudulent claimants, may create the impression that all claimants are attempting to cheat the system.⁴⁷ Indeed, there is some evidence that large proportions of health professionals believe this to be the case, even though there is little to support this perspective.⁴⁸ For example, although they may appear outwardly supportive, general practitioners are often scornful of people seeking compensation.⁴⁹ Around 35% of physiotherapists suspect that patients involved in litigation are insincere⁵⁰ and 60% of doctors⁵¹ believe that patients overstate their symptoms.

Still other studies have attempted to interpret cross-jurisdictional variations in the incidence of whiplash as evidence of moral hazard, although such studies are subject to the ecological fallacy.⁵² One such study⁵³ reports wide discrepancies in the incidence of whiplash across European countries. This is related to differences in compensation scheme design – and therefore in the incentives and disincentives to claim – and in the method used to diagnose whiplash. For example, compared to jurisdictions that accept self-reported whiplash symptoms as evidence of injury for compensation purposes, countries requiring radiological evidence of an injury as a means of “verifying” whiplash have very low rates of whiplash.⁵⁴ This finding is unsurprising as most whiplash injuries involve soft tissue, and are therefore not detectable by x-ray.⁵⁵

Notwithstanding the apparent lack of evidence of moral hazard in personal injury (automobile) cases, insurers traditionally work on the assumption that such behaviour exists and must be accounted for. Accordingly, insurers have estimated the risk of moral hazard (claim fabrication or “padding”) in

⁴³ Shapiro and Roth, n 39.

⁴⁴ Mendelson G and Mendelson D, “Malingering Pain in the Medicolegal Context” (2004) 20(6) *Clin J Pain* 423.

⁴⁵ Hackett TP, “Pain and Prejudice: Why Do We Doubt That the Patient is in Pain?” (1971) 99 *Med Times* 12; Mendelson and Mendelson, n 44; Merskey H and Teasell RW, “Problems With Insurance-based Research on Chronic Pain” (2007) 91(1) *Med Clin North Am* 31.

⁴⁶ American Psychiatric Association, n 6.

⁴⁷ Morris A, “Spiralling or Stabilising? The Compensation Culture and Our Propensity to Claim Damages for Personal Injury” (2007) 70(3) *Mod L Rev* 349.

⁴⁸ McGuire B, “Malingering and Symptom Magnification in Whiplash Associated Disorders” in Sterling M and Kenardy J (eds), *Whiplash: Evidence Base for Clinical Practice* (Churchill Livingstone, Chatswood, Australia, 2011) pp 168-179.

⁴⁹ Russell G and Nicol P, “‘I’ve Broken My Neck or Something!’ The General Practice Experience of Whiplash” (2009) 26 *Fam Pract* 115.

⁵⁰ Simmonds MJ, Barlow T and Kreth K, “Symptom Sincerity of Patients with Chronic Low Back Pain. Do Physical Therapists Believe Their Patients?”, presented at the 8th World Congress on Pain, Vancouver, Canada, 1996.

⁵¹ Leavitt F and Sweet JJ, “Characteristics and Frequency of Malingering Among Patients With Low Back Pain” (1986) 25 *Pain* 257.

⁵² Barnsley L, “Epidemiology of Whiplash” (2000) 59(5) *Ann Rheum Dis* 394.

⁵³ Chappuis G and Soltermann B, “Number and Cost of Claims Linked to Minor Cervical Trauma in Europe: Results from the Comparative Study by CEA, AREDOC and CEREDOC” (2008) 17(10) *Eur Spine J* 1350.

⁵⁴ Chappuis and Soltermann, n 53.

⁵⁵ Elliott et al, n 4.

compulsory third party injury claims as ranging between 5%⁵⁶ and 10%.⁵⁷ Notably, fraudulent behaviour among health professionals in the form of over-servicing,⁵⁸ and employer fraud in the form of underpayment of premiums is believed to be far more common and costly to insurers than claimant fraud.⁵⁹ While there is no means of verifying the accuracy of estimates of moral hazard and fraud, the risk of fraud is factored into insurance premiums and insurance contracts contain various disincentives for such behaviour.

Summary and implications

The study of whether and/or how eligibility for injury compensation affects self-reported health status is complicated. Among the methods, the comparison of health status with and without the financial incentive for misclassification appears to be the best option for detecting moral hazard. Following this broad approach, the authors applied a novel analytic method to test the effect of claim settlement (ie, removal of the financial incentive for moral hazard) on neck pain, using repeated measures of both variables.

They found no evidence of moral hazard in a sample of individuals with similar injuries and similar levels of self-reported neck pain at baseline. However, as the experience of pain is ultimately subjective, it is generally not possible to quantify the presence and extent of measurement error contained in self-reports of health status.

Despite the obvious difficulty of evaluating whether self-reported symptoms are simulated, the results of this study concord with previous work and suggest that moral hazard may not be as widespread as many appear to believe.⁶⁰ These results are important to convey to those who make decisions about injury compensation laws, the design of compensation systems, the allocation of compensation benefits, and the provision of treatment and health services.

CONCLUSIONS

Longitudinal data were analysed to test for moral hazard under a fault-based compensation scheme. The study found no evidence that removing the financial incentive to over-state symptoms has any effect on self-reported neck pain. This finding is at odds with the argument that claimants are “cured by a verdict”, but it accords with the empirical results of numerous studies on this topic. In future work, it would be useful to extend the analysis of longitudinal datasets on compensation-related factors and health outcomes using techniques such as generalised least squares and methods that exploit the panel properties of the dataset.

Despite consistent evidence that compensation does not cause people to exaggerate their symptoms, concerns about moral hazard are difficult to allay. Decisions to limit compensation benefits based on a belief that claimants systematically misrepresent their health status are, however, not supported by the published evidence or by the empirical results reported here.

⁵⁶ Transport Accident Commission, *Third Annual Report 1989* (The Commission, Melbourne, 1990).

⁵⁷ Baldock, n 41; Insurance Council of Australia, *Insurance Fraud in Australia* (ICA, Sydney, 1994).

⁵⁸ Carroll S and Abrahamse A, “The Frequency of Excess Auto Personal Injury Claims” (2001) 3(2) *Am Law Econ Rev* 228.

⁵⁹ Garnett S, *Workers’ Compensation Fraud – Vilifying Workers, OnLine Opinion*. <http://www.onlineopinion.com.au/view.asp?article=3108&page=1> viewed 10 January 2011.

⁶⁰ Malleson, n 1.