



Measuring the effectiveness of workplace health management programs: An Australian example

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ARTICLE INFO

Keywords:

Health and injury management
Measurement
Reporting
Insurance

ABSTRACT

The workplace can provide opportunities to support workers in adopting and sustaining health enhancing behaviours. Health promotion programs based at the workplace need not only to achieve this goal but also the continuing support of the employers. This can best be achieved by demonstrating a return on their investment. The aim of this study therefore was to develop an integrated workplace health management program which could be associated with measurable outcomes related to benefitting the institution's "bottom line". This program was based in a metropolitan surgical hospital in Melbourne, Australia from 2006 to 2010 with a total workforce of 1400 employees aged 18–74 years (86% female 14% male). The program followed two key principles of 1) building safe and familiar support networks in order to build a workplace culture where all the workers felt valued. 2) Providing time for individual workers to focus on themselves as a means to achieve early intervention and management of injuries. Insurance data generated by the Workers Compensation Authority identified the following 'bottom line' benefits over three years: injury management costs reduced by 56%; number of compensation injury claims dropped by 46%; time to return to work post injury reduced by 68%, and; a reduction.

in premiums of 43% achieved over a six-year period. Insurers world-wide calculate workers' compensation insurance premiums on injury claims history. It is concluded that such data as these can offer a reliable and 'persuasive' measure of health and injury outcomes, in workplace interventions of this nature.

1. Introduction

To identify as viable and competitive enterprises, workplaces need healthy and satisfied workers to be productive and efficient. It is therefore, arguably, essential for employers to examine how they can best fulfil their legal and leadership roles to promote the well-being of employees (Macik-Frey et al., 2007). Employers' growing appreciation of the economic impact of workplace injuries and employee ill-health has given rise to an enhanced interest in workplace based preventative strategies. While health education interventions have been shown to be effective (Conn et al., 2009; Cooper and Dewe, 2008), models to gather and analyse outcome data are generally either ad hoc or time consuming and expensive (Chu and Dwyer, 2002).

1.1. The need for cost effective and sustainable programs

The workplace can provide opportunities to support workers to adopt and sustain health enhancing behaviours to prevent injuries and ill-health and to mitigate the physiological changes associated with

ageing. In a recent systematic review examining the efficacy of lifestyle health promotion interventions for nurses, Chan and Perry (2012) confirmed that the workplace is a potentially fruitful location for such programs and suggested potential benefits to workers' welfare and well-being that may accrue from well-designed interventions.

However, without evidence to demonstrate that workplace health promotion programs have an economic benefit, Australian employers will continue to find it difficult to justify increased investment in them. In the United States where employers are responsible for the healthcare costs of employees, companies have demonstrated a compelling business case for health promotion programs. Johnson and Johnson estimated that its health promotion programs have saved \$250 million in healthcare costs during the past decade (Berry et al., 2010).

A recent systematic review of the literature on the financial costs and savings associated with workplace health programs by Baicker et al. (2010) found evidence across 22 studies that medical costs fall by \$3.27 and absenteeism costs fall by about \$2.73 for every dollar spent. The researchers argued that such return on investment suggests the wider adoption of such programs could prove beneficial for budgets and

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<https://doi.org/10.1016/j.pmedr.2018.04.018>

Received 16 October 2017; Received in revised form 20 March 2018; Accepted 21 April 2018

Available online 23 April 2018

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productivity as well as health outcomes.

A UK based study has reported almost 30 million days were lost because of work-related illness in 2006/7. Stress, depression or anxiety accounted for 13.8 million days lost or 46% of all reported illnesses. Together they account for the single largest cause of all absences attributable to work-related illness (Cooper and Dewe, 2008). This measure of “absenteeism” has been a variable analysed in many studies attempting to quantify the outcomes of health behaviour change (Bernaards et al., 2007; Berry et al., 2010; Proper et al., 2006). It is a variable that employers can identify with, given the clear relationship between productivity and the cost of workers failing to attend work. It is however a measure that can prove vulnerable to a broad range of confounding recruitment variables as was reflected in the worldwide flu epidemics in 2009.

1.2. The workplace health management program (WHM)¹

The study reported here was undertaken in a large metropolitan hospital. The injury management team developed and evaluated multiple pilot programs across the hospital prior to this study in their quest to develop a fully integrated WHM program. The program brought together strategies to prevent and manage workplace injuries and to assist injured workers to return to work. The immediate goal was to improve the health management practices of the workforce to enhance their health status. If change could be achieved, workers would consequently be less susceptible to work place injuries and more able to return to work sooner if they did sustain an injury. Recognising the relationship between the physical, social and psychological needs of workers, the WHM program was built upon a biopsychosocial approach to health promotion and injury prevention.

The program incorporated a six-minute daily group exercise program to bring managers and workers together before a work shift to complete a series of exercise activities. These “take-a-break” sessions included health education, relaxation and posture education, joint range of movement and soft tissue stretches, balance and strengthening work and opportunities for social interaction. The focus was on having fun together in a team. Any worker in any unit at take-a-break time was invited to join the group, cleaners, kitchen staff delivering meals, pastoral workers, nurses, doctors and the occasional visitor. In the operating theatres patients waiting for surgery would join in from their hospital beds.

Strategically timed for the beginning of a work shift to bring workers together, a core idea behind the take-a-break sessions was to help each worker focus on themselves. With an 86% female workforce, many workers had multiple responsibilities beyond work including caring for families and ageing parents. A questionnaire completed during the development phase of the program identified lack of time as a barrier to worker fitness. In paid work time workers were therefore encouraged to stop for 6 min to prepare physically, psychologically and socially for the work ahead. Feeling valued was integral to the philosophy of the WHM program.

Coming together to exercise as a team was specifically designed to 1) improve awareness of the importance of general fitness in the prevention and management of workplace injuries, 2) encourage workers and managers to identify and pre-emptively report injuries and ill-health 3) better understand how to support each other when injuries occurred and 4) provide injured workers with a safe and familiar support network when returning to work.

Participation in the group activity was voluntary. Group leaders (who were not unit managers) were trained as program champions. For workers deemed unable to return to work, individually designed functional restoration programs conducted by skilled clinicians at the

hospital helped workers to regain their work capacity. These workers were able to maintain contact with their colleagues by participating in the daily group exercise program in their unit while recovering from and receiving rehabilitation for their injury. Non-injured colleagues observing the restrictions of injured colleagues could help to identify suitable duties and encourage the injured worker to return to work. These programs sought to facilitate a supported early return to work with the involvement of clinician, supervisors and work colleagues. The implementation plan challenged the previous practice of resting following a workplace injury and waiting for an injury to heal before returning to work.

The WHM program aimed to educate workers in the fundamental principles of health self-management to both prevent and recover from workplace injuries.

1.3. Measuring outcomes

For workplace personnel and health professionals to promote health at the workplace, they need to have a sound basis upon which to evaluate the benefits of any program initiatives. Numerous identified health and safety indicators for different types of workplace interventions by different disciplines or organisations can be found. However, at present there is no widely and generally accepted set of indicators available to measure the health of a workplace. There is also an associated need for an information system to create, accumulate and disseminate knowledge and information for the measurement and improvement of the health and wellbeing of the workforce (Chu et al., 1997).

In the search for a reliable set of measures that reflect positive health and injury outcomes, the designers of the workplace health management (WHM) program reported here turned to the recording and reporting systems used to monitor and cost workplace injuries. In Australia this is a mandatory process undertaken by workers' compensation insurers on behalf of each state's Workers Compensation Authority (Safe Work Australia, 2012). In common with insurers worldwide, they calculate workers' compensation insurance premiums based on the injury claims history of the company seeking the insurance. Employers utilising these data can have confidence in the efficacy of the process and independence and transparency of the reporting. It also defrays the actual cost of any data collection and analysis to the employer yet allows for reliable within-industry comparisons.

Two of the key parameters closely monitored by insurers are 1) return to work duration and 2) lost time Injury. Both outcome measures appear to reflect the effectiveness of workplace processes to manage the health and well-being of workers. Changes in either parameter in the absence of any identifiable confounding variable could provide a clear indication of the cost benefit of a new strategy or intervention.

The term “return to work” implies that an injured worker has stopped work for some period and then undertaken to return to work. The time taken between these two points is referred to as “lost time” and the measure of lost time is the reference point for discerning the effectiveness of the management of an injury. Return-to-work (RTW) outcomes and duration of disability are increasingly used as performance measures for health care providers, vocational rehabilitation services, and workers compensation insurers. Frequency and duration of work disability are also indicators of the economic and social impact of occupational injury and illness.

Return to work outcomes have also been used in international studies as a measure of the efficacy of health interventions in a variety of workplace settings (Hunt et al., 2005; Krause et al., 2001). The inverse relationship between time away from work and the likelihood of a successful return to work has been well supported in the literature (Staal et al., 2003; Waddell and Burton, 2001; Waddell et al., 2008). Time to return to work post injury is therefore seen as a measure of productivity, morale and financial cost. A speedier return to work is an outcome valued by employers who recognise the beneficial relationship

¹ Work Health Management (WHM) Victorian Workers Compensation Authority (VWA) Lost time injury (LTI).

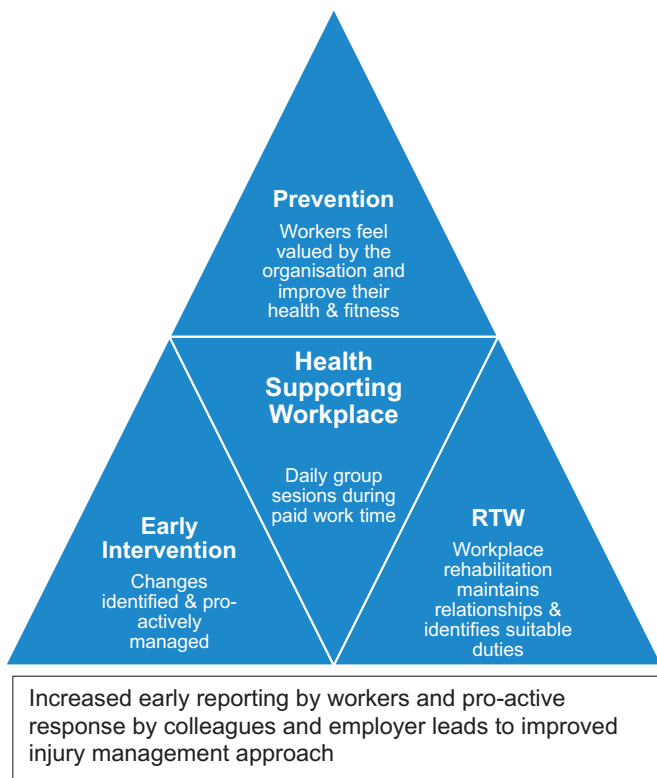


Fig. 1. Conceptual plan for the Integrated Work Health Management Program.

between reduced time away from work and productivity. Early return to work is therefore an easily recognisable positive outcome for workplace interventions.

From the recording and reporting systems used by workers' compensation insurers to monitor and cost workplace injuries, the WHM team focused on a range of measures that impact upon productivity such as lost time injury days and time to return to work. A major theme then also emerged around the potential impact of the program on insurance premiums.

2. Method

The aim of this study was to examine whether cumulative injury costs, number of compensation claims, lost time injury days and premium costs were reduced following the implementation of an integrated WHM program in a major Australian metropolitan surgical hospital. Comparisons were made for the three years prior to the program implementation (pre-program) and the three years from the commencement of the program (post-program) (Fig. 1).

2.1. Participants

The workforce consisted of approximately 1400 workers (86% female 14% male), from all departments of the hospital. The injury management data of all 1400 employees was used in the evaluation. The organisational units involved included operating theatres, kitchens, engineering, cleaning, nursing wards, pathology, angiography, intensive care, maternity, administration and the executive. All workers were encouraged to participate.

2.2. Analysis

Injury management outcome measures for the hospital were analysed and reported by the hospital's workers' compensation insurer and audited by the state's workers compensation authority (VWA). Pre- and

post-program measures of the 1) incidence of compensation injury claims 2) costs associated with workplace injuries, 3) timeframe to return to work post injury and 4) the hospital's workers' compensation insurance premiums were compared.

The premiums were also compared with those of 300 other hospitals and health services in the state, including large public and private hospitals and rural and regional health services, rehabilitation and psychiatric hospitals. From these data an 'industry average' was established enabling a comparison between the injury management performance of the hospital in which the intervention was conducted and all other hospitals in the state. Specific details of the methodologies employed in these calculations can be found on the WorkSafe website (WorkSafe, 2018).

In order to compare the relative claims performance of a specific employer the size of the organisation based on their rateable remuneration (wages) needs to be considered. A statistical case estimate (SCE) provides individual estimates of future claim costs using the individual characteristics of each claim (WorkSafe, 2018). Such predictive claims models perform three key tasks in providing 1) a stronger link between changes in the claims processes and reserving; 2) estimates of future claims costs arising from existing claims; and 3) an understanding and quantification of the drivers of a claim.

3. Results

The following series of figures show some of the key changes reported by the workers compensation insurer for the three years prior to and three years post implementation of the WHM program (Gallagher Bassett, 2010). Fig. 2 reports the number of compensation injury claims accepted by the insurer that exceeded the employers' excess. These decreased by 30% for the three years of the program's implementation when compared with the three years prior, when 119 claims were accepted compared to 88 claims in the post period.

Perhaps a more important measure for the purpose of this study is provided by an analysis of the total costs of the claims made which is reported in Fig. 3. Paid claims costs including medical treatment and wages reduced from \$350,000 in the year prior to the program to \$150,000 in the year following the program's implementation. The insurers SCE estimate for future costs to the employer in managing the accumulated claims reduced by 56% over the three years of the program's implementation. The reduction in SCE following the introduction of the program reflects a reduction in predicted future costs.

Changes in lost time injury (LTI) days over the same period are reported in Fig. 4. LTI days are the number of days an injured worker was away from work due to a workplace injury. LTI days reduced considerably from over 1600 in the year prior to the program to just over 400 and 200 respectively in the two subsequent years. This means that when a worker sustained a compensable injury, the time to return to work reduced (on average) from 80 days to less than 20 days. When workers required time away from work to recover from an injury, the duration of their recovery and the timeframe to return to work was reduced by 68%.

Fig. 5 illustrates changes in the premium payable as a percentage of the total remuneration for the six-year period. Although total remuneration rose from 42 million to 63 million dollars over the six-year period, over the same period a reduction of 43% in premiums payable was achieved. This clearly represents a significant saving to the hospital over the period of the integrated WHM program.

Finally Fig. 6 compares changes in the premium paid by the hospital with the average of the premiums paid by the three hundred other hospitals in the state over the period covering three years pre-program and two years post program. The calculation of an 'industry average' made possible by reference to the insurer's data enables a comparison between the injury management performance of the hospital in this study and all other hospitals in the state. It was the significant disparity between the performance of the hospital and the industry norm that

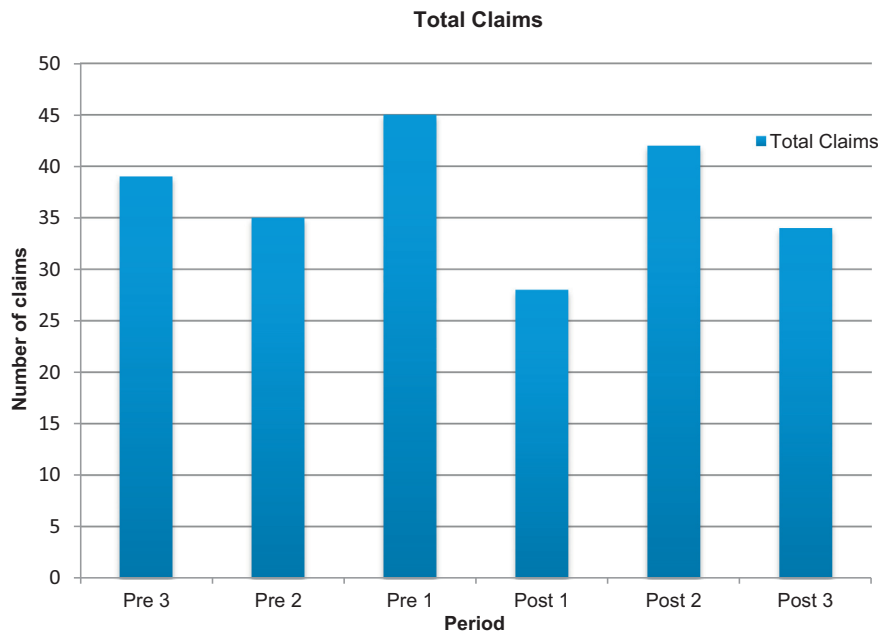


Fig. 2. Total number of compensation claims for the period of the study.

provided the initial impetus for this study. The narrowing of the gap shown prior to the start of the program probably reflected increasing attention to this issue within the organisation. Nonetheless the continuing “downward tracking” with the industry norm could be seen as further support for the decision to implement this program.

4. Discussion

The WHM program adopted a biopsychosocial approach to health promotion and injury prevention. The daily “take-a-break” sessions were designed to 1) improve workers' awareness of the importance of general fitness in the prevention and management of workplace injuries, 2) encourage workers and managers to identify and pre-emptively report injuries and ill-health 3) develop a better understanding of how workers could support each other when ill-health and injuries occurred and 4) provide injured workers with a safe and familiar

support network when returning to work.

Strategically timed for the beginning of a work shift to bring workers together, a key principle behind these sessions was to help workers focus on themselves. With an 86% female workforce, many workers had multiple responsibilities beyond work including caring for families and ageing parents. A questionnaire completed during the development phase of the program indicated that not having time to exercise was a barrier to maintaining workers' fitness. The take-a-break sessions were integral to questioning that perception as well as building a workplace culture where all workers felt valued.

That workers were encouraged to take a more pro-active approach to managing their own health and wellbeing was believed to be a key mediating variable in the finding that workplace injuries and ill-health were reduced. The WHM program encouraged workers and managers to identify and pre-emptively report injuries and ill-health to a support network of skilled clinicians within the hospital. This concept was

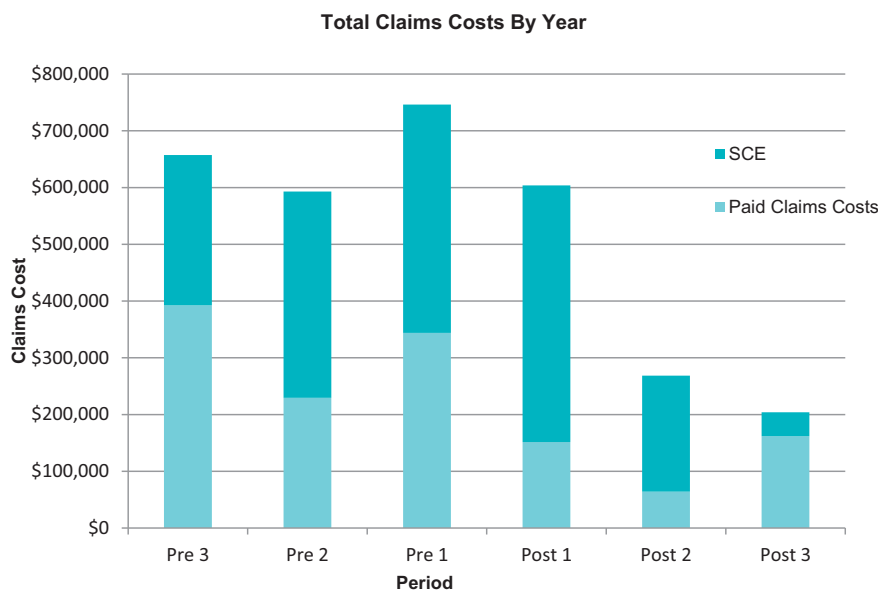


Fig. 3. Total claims costs by year Pre- and Post-program implementation.

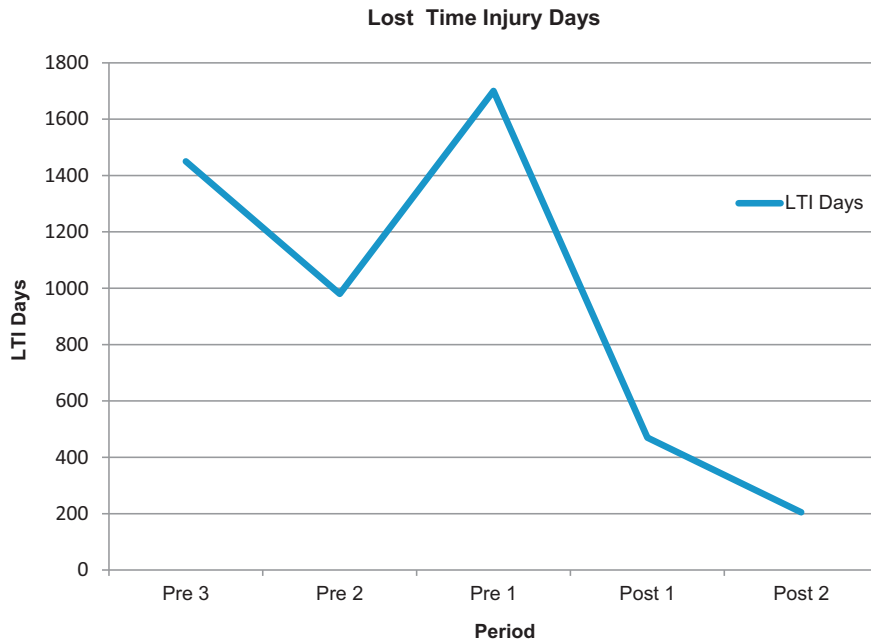


Fig. 4. Lost time injury days by year Pre- and Post-program implementation (third-year post program calculations unavailable).

introduced and reinforced daily during the take-a-break activities. The reporting term adopted was “incident” rather than “accident.” All workers were encouraged to take responsibility for reporting an “incident” rather than an “accident.” This deliberate attempt to redefine what constituted a workplace injury and to broaden the concept to include ill-health encouraged workers to seek help for themselves and their colleagues in the early stages of a potential problem. Further, with their rehabilitation programs being conducted at the workplace, injured workers were able to continue to participate in the take-a-break program. They remained physically, psychologically and socially connected to their work colleagues.

Workers became more aware of the precursors to injury as was noted when they encouraged colleagues to seek help for reduced range of movement in joints or indications of pain during the group exercise activities. Unit managers also observed that workers reported changes in their own functional capacity and experiences of pain more consistently and without having experienced a specific ‘injury’ per se.

Although during the 3 years post program there was a 45% increase in incident reporting there was also a concurrent 46% reduction in the cost of workplace injury compensation claims. This reflected the change in the organisation’s culture of early reporting. Other studies have also reported correlations between early injury management interventions and reductions in claims and compensation costs (Carroll et al., 2010; Iles et al., 2012; Waddell et al., 2008). Similarly, early return to work has also been shown to contribute to decreases in lost time to injury (Williams et al., 2007).

During the period of this study the early intervention and management of injuries became associated with a decrease in the number and severity of injury compensation claims reducing the cumulative cost of injuries to the hospital. These improved figures resulted in the annual cost of the hospital’s workers compensation insurance premium being reduced by 43%. This equated to approximately one million dollars per year for three consecutive post-program years and also brought the hospital’s premium down to a comparable level with

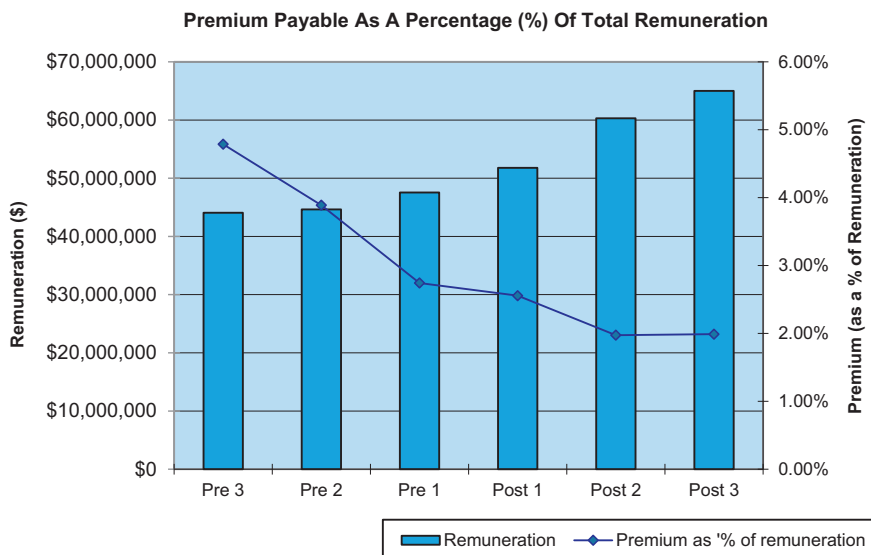


Fig. 5. Premium payable as a percentage of total remuneration.

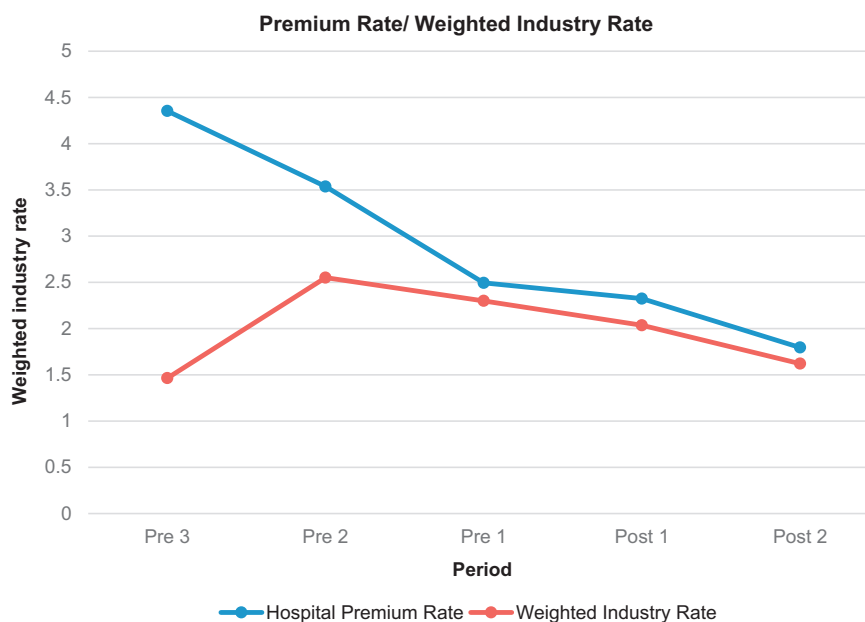


Fig. 6. Comparison of insurance premium costs between the study hospital and all other hospitals in the state.

industry peers as seen in Fig. 6.

5. Conclusion

The complexity of the settings in which workplace health management interventions are developed, implemented and evaluated make the generation of objective measures of outcomes achieved difficult and costly at best and almost inevitably irreproducible. This can make their benefits difficult to sell to administrators who understandably have a primary eye on their bottom line. In this Australian study implemented in a major metropolitan surgical hospital, widely available existing data from a respected source was accessed to provide a cost effective, independent, reliable and transparent measure of benefits accruing to the institution. Importantly these measures have the potential to be incorporated into ongoing evaluations and even real-time analysis of beneficial outcomes.

Results indicated that the implementation of the program was associated with reduced cumulative injury costs, number of compensation claims, lost time injury days and premium costs. These findings were able to clearly demonstrate a bottom line benefit associated with the program's implementation. We would argue that the use of these data provides a credible baseline measure with which to support the argument for the efficacy of an intervention such as ours. At the very least it can 'buy' credibility with administrators and support the continuing allocation of resources to WHM programs such as that reported here. Ensuring the continuation of such programs then allows for further and important questions to be asked such as in establishing explanatory links between the observed improved outcomes and some of the key strategies of the program itself.

Conflicts of interest

The authors have no conflicts of interest to disclose.

Funding

This work was supported by the Victorian WorkCover Authority (WorkSafe Victoria) Return to Work Fund 2007-208. \$253,000.

Acknowledgments

The executive and staff at the intervention hospital.
WorkSafe Victoria.
Gallagher Bassett Insurance.
The Health Services Union (HSU).
Services Industry Advisory Group (SIAG).

References

- Baicker, K., Cutler, D., Song, Z., 2010. Partnering for prevention with workplace health promotion programs. *86* (4), 335–337. <http://dx.doi.org/10.4065/mcp.2010.0803>.
- Bernaards, C., Proper, K., Hildebrandt, V., 2007. Physical activity, cardiorespiratory fitness, and body mass index in relationship to work productivity and sickness absence in computer workers with pre-existing neck and upper limb symptoms. *J. Occup. Environ. Med.* 49 (Number 6), 633–640 June 2007, 49(6).
- Berry, L., Mirabito, A., Baun, W., 2010. What's the hard return on employee wellness programs? *Harv. Bus. Rev.* 1–9 (December).
- Carroll, C., Rick, J., Pilgrim, H., Cameron, J., Hillage, J., 2010. Workplace involvement improves return to work rates among employees with back pain on long-term sick leave: a systematic review of the effectiveness and cost-effectiveness of interventions. *Disabil. Rehabil.* 32 (8), 607–621. <http://dx.doi.org/10.3109/09638280903186301>.
- Chan, C., Perry, L., 2012. Lifestyle health promotion interventions for the nursing workforce: a systematic review. *J. Clin. Nurs.* 21 (15–16), 2247–2261. <http://dx.doi.org/10.1111/j.1365-2702.2012.04213.x>. (Aug).
- Chu, C., Dwyer, S., 2002. Employer role in integrative workplace health management: a new model in progress. *Dis. Manag. Health Out.* 10 (3), 175–186.
- Chu, C., Driscoll, T., Dwyer, S., 1997. The health promoting workplace: An integrative perspective. *Aust. N. Z. J. Public Health* 21 (4), 377–385.
- Conn, V., Hafidahl, A., Cooper, P., Brown, L., Lusk, S., 2009. Meta-analysis of workplace physical activity interventions. *Am. J. Prev. Med.* 37, 300–339.
- Cooper, G., Dewe, P., 2008. Well-being, absenteeism, presenteeism, costs and challenges. *J. Occup. Med.* 58 (8), 522–524. <http://dx.doi.org/10.1093/occmed/kqn124>.
- Gallagher Bassett, 2010. In: G. B. W. C. Insurer (Ed.), (Name of Hospital) Return to Work Outcome Report, (Melbourne).
- Hunt, M., Lederman, K., Stoddard, A., et al., 2005. Process evaluation of an integrated health promotion/occupational health model in WellWorks-2. *Health Educ. Behav.* 32 (10), 10–26. <http://dx.doi.org/10.1177/1090198104264216>.
- Krause, N., Frank, J., Dasinger, L., Sullivan, T., Sinclair, S., 2001. Determinants of duration of disability and return-to-work after work-related injury and illness: challenges for future research. *Am. J. Ind. Med.* 40, 464–484.
- Iles, R., Wyatt, M., Pransky, G., 2012. Multi-faceted case management: reducing compensation costs of musculoskeletal work injuries in Australia. *J. Occup. Rehabil.* 4 (4), 478–488. <http://dx.doi.org/10.1007/s10926-012-9364-2>.
- Macik-Frey, M., Quick, J., Nelson, D., 2007. Advances in occupational health: from a stressful beginning to a positive future. *J. Manag.* 33, 809–840. <http://dx.doi.org/10.1177/0149206307307634>.
- Proper, K., van den Heuvel, S., De Vroome, E., Hildebrandt, V., Van der Beek, A., 2006. Dose-response relation between physical activity and sick leave. *Br. J. Sports Med.* 40, 173–178.

- Safe Work Australia, 2012. Cost of Work-related Injury and Disease Report 2012–13 Canberra, ACT: Safe Work Australia Retrieved from. <https://www.safeworkaustralia.gov.au/cost-work-related-injury-and-disease-report-2012-13-now-available>.
- Staal, J., Hlobil, H., van Tulder, M., et al., 2003. Occupational health guidelines for the management of low back pain: an international comparison. *Occup. Environ. Med.* 60 (9), 618–626.
- Waddell, G., Burton, A., 2001. Occupational health guidelines for the management of low back pain at work: evidence review. *Occup. Med.* 51, 124–135.
- Waddell, G., Burton, A., Kendall, N., 2008. Vocational Rehabilitation: What Works, for Whom, and When? British Health, London.
- Williams, R., Westmorland, M., Lin, C., Schmuck, G.M.C., 2007. Effectiveness of work-place rehabilitation interventions in the treatment of work-related low back pain: a systematic review. *Disabil. Rehabil.* 29, 607–624.
- WorkSafe, V, 2018. Claims Estimates and Worksafe Premiums. WorkSafe Victoria, Melbourne, Australia Retrieved from. https://www.worksafe.vic.gov.au/_data/assets/pdf_file/0005/209750/ISBN-Claim-estimates-and-WorkSafe-premiums-2013-11.pdf.