

# Surveillance on self-report: a trial of health and safety monitoring in occupational settings

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A method for monitoring health and safety in the workplace, referred to as 'surveillance on self-report', is presented. This occupational health and safety monitoring method consists of a collection of data on certain aspects of health and safety obtained by dispensing self-administered questionnaires to employees or managers and supervisors in workplaces, and administering regular feedback on the responses. Based on the responses, a continual monitoring and improvement on certain aspects of health and safety were possible in two workplaces in New Zealand. This study has shown a methodology for the surveillance of hazard control and monitoring, injuries and illnesses, and organizational policies in occupational settings.

*Key words:* Self-report; surveillance; workplace.

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## INTRODUCTION

The workplace is a significant contributor to injuries and diseases. Although current health and safety regulations in workplaces may be regarded as significant progress in improving worker protection, the systems in place for surveillance of health and safety suffer from a number of limitations. The major limitations are the substantial constraints in the types of information currently available for evaluating the efficacy of occupational health and safety standards<sup>1</sup> and compliance of workplaces with occupational health and safety regulations and safety measures. Because of these limitations, it is difficult to appraise accurately the true scope and nature of occupational health and safety measures and compliance of the regulations that are carried out in workplaces to prevent diseases and injuries. However, surveillance is essential to successful, sustained public health intervention for the purposes of prevention.<sup>2</sup> In the past, a monitoring system for health and safety in the workplace appeared not feasible or achievable on a large scale. Furthermore, rigorous interventions were needed to achieve a certain standard of health and safety in the workplace that required a considerable amount of resources and manpower. Therefore, a cost effective surveillance system is needed for the workplace that will inform us of the health and safety problems in the

workplace, the direction of feedback, how well (or poorly) the feedback works, and if, over time, there is improvement or deterioration. This article presents guidelines for establishing a model system for surveillance of health and safety in the workplace by collecting and recording data on occupational health and safety policies, hazard control and monitoring measures, and the prevalence of injuries or illnesses.

## METHODS

The study was conducted in two engineering companies in Dunedin, New Zealand in 1999. These two workplaces were selected because workers in the engineering industry, particularly machine operators, assemblers and inspectors, are at a high risk of fatal injuries. Nowadays this risk is increasing in engineering compared to other industrial sectors.<sup>3</sup> Two types of questionnaire were given to managers of the two companies. The first type was served at the initial (0 month) and end (4 months) of the study. This first type of questionnaire included direct questions on health and safety policies, knowledge and training of employees in health and safety, health and safety practices, performance of health and safety, and record keeping. Positive or negative answers were possible. A second type of questionnaire included questions on the above health and safety aspects, but with the provision of answers to be rated from 1 to 10. This second type of questionnaire was administered regularly at intervals of 1 month from the beginning (0

month) to the end (4 months) of the study. Only one type of questionnaire was administered at intervals of 1 month (0 to 4 months) to supervisors in these two companies. These questionnaires included rating and direct questions on knowledge, training, and use of personal protective equipment (PPE); hazards and their preventive measures; accidents and injuries; and occupational diseases. Positive feedback and recommendations to improve safety and health in the companies were given, with regard to the responses to the questionnaires sent to both managers and supervisors. Questions and objective criteria for comparison of feedback with the initial responses were set following the New Zealand occupational health and safety standards.<sup>4,5</sup> Results of the study based on the questionnaire information and managers' appreciation of occupational health and safety.

## RESULTS

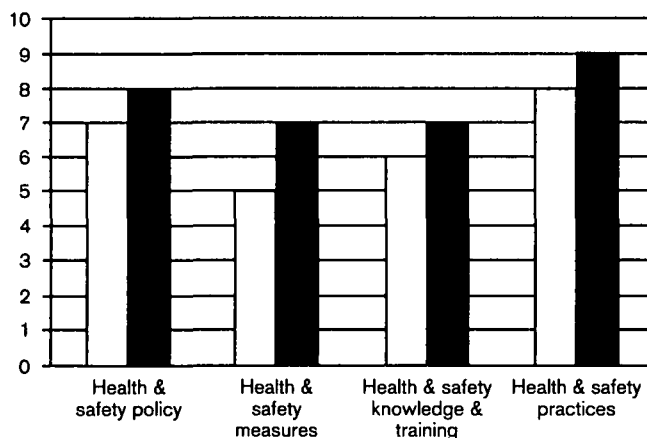
The study was conducted for 4 months, and the overall response rate was 100%. Fig. 1 shows the managers' appreciation of the degree of health and safety at pre-intervention (0 month) and at 4 months in the two Dunedin companies studied. Table 1 shows a comparison of the knowledge and practice of health and safety by 10 employees at pre- (0 month) and post-intervention (4 month). The paired *t*-test was performed to compare the results, which were found to correlate with the managers' appreciation of occupational health and safety. Self-report surveys may yield more positive results than do observational studies, but from previous

studies regarding health and safety (for example, Reference 6), it can be argued that such assessments are a reasonable method of evaluating the association of health and safety issues. In this study, the writer himself dispatched the questionnaires to the managers and supervisors, and as an occupational professional, provided necessary expertise on health and safety to the two companies. The study was cost-effective, and the results suggest that, by using this method of self-report, large-scale surveillance for health and safety in the workplace scale would be feasible. The range of questions enabled precise information to be obtained, and aspects of health and safety in workplaces to be evaluated. A computer database was prepared in order to compare and formulate follow-up procedures. The results indicate that there was a notable improvement in health and safety practices in both companies by the end of the study, and that the attitude and knowledge of managers and supervisors towards health and safety in the companies were more positive.

## DISCUSSION

Appropriate databases can assist occupational health practitioners in solving potential problems that arise in the workplace. An effective health surveillance system can be implemented if information on the aspects of health and safety is available on appropriate databases. However, the setting up of such databases must be feasible and cost-effective, and emphasis should be placed upon the user's needs and the evaluation of existing software. From this study, it appeared that development of a database concerning health and safety in the workplace is possible, and from the information contained within it, improvement to health and safety of the employees and employers is achievable. Health surveillance by re-analysis of the databases could, in principle, be carried out by computer. This might help to secure compliance with regulations; improve knowledge and understanding of health and safety, by the provision of appropriate information and advice; promote risk assessment and technical knowledge as the basis for setting standards and guiding enforcement activities; and operate statutory schemes, for example, aid the work of occupational health inspectors. In addition, these databases would be helpful in hazard surveillance; timely information on risks related to agents that cause chronic long latency disease would be available. Therefore, such databases could help general medical practitioners and occupational physicians in the care of patients, and provide current information for setting priorities and

**Figure 1.** Health and safety in a Dunedin industry. ■, Pre-intervention; ■, Post-intervention



**Table 1.** Knowledge and practice of health and safety by employees

Aspects of health & safety known by employees (n=10)	Pre-intervention (0 month) mean score (SD)	t-value	Post-intervention (4 months) mean score (SD)	95% CI
Knowledge of health & safety	6.1 (0.47)	-12.99	7.25 (0.48)	-1.35 to -.95
Practice of health & safety	7.63 (0.42)	-32.12	8.64 (0.43)	-1.08 to -.94

formulating hypotheses concerning future occupational risks. This study was performed following the New Zealand occupational health and safety standard, but the questions or intervals of follow-up could well be modified according to the needs of the surveillance proposed.

Employees consider that preventive action and the assistance of the Occupational Health Service in preventing health related problems is most important. However, employees do not expect to contact the service personally, because it is sometimes considered risky and could place blame on the supervisor or the employee.<sup>7</sup> An official reporting system could minimize the risk to employees or the supervisors, and solve this problem. Although such a system might produce negative side effects for a time, these can be minimized by making the new procedure as attractive as possible. The outcome of this study might help the Occupational Health Service to set up a reporting system, and to recommend the criteria for preventing diseases and hazardous conditions in the workplace. In addition, it would help to identify those occupations and workplaces that are particularly at risk, and could focus on interventions for preventing further occupational illnesses at these sites.

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