

## Issue # 5: Cost-Effectiveness of Workplace Interventions to Reduce Employee Morbidity

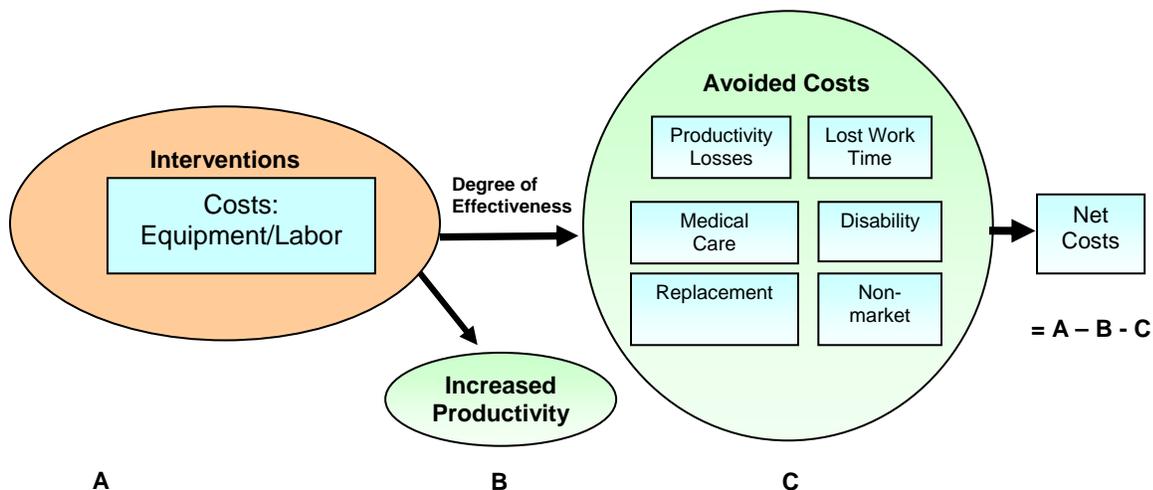
*Contributed by Supriya Lahiri, Professor, Department of Economics, University of Massachusetts Lowell*

Discussions of occupational health and safety interventions to improve employee health often hinge upon a critical factor, the costs of these interventions. Successful workplace interventions to reduce occupational injuries and diseases can require substantial investment on the part of the employer. The question is: Is it worthwhile for the employer to make such investments?

We developed a “net-cost model”<sup>1,2</sup> for use at the level of an individual organization. The model has three essential components (Figure 1): 1) the cost of equipment and labor to implement the program; 2) the degree of effectiveness of the intervention(s); and 3) any increase in productivity that might result from new technology or work practices. Both the second and third factors help to reduce the real cost of the intervention to the employer. Obviously, effectiveness is key: the higher it is, the more injuries and illnesses are avoided - reducing the net costs of implementing the intervention.

Three interventions to reduce back and other musculoskeletal disorders in U.S. manufacturing companies have been studied with this model. The net-cost estimates consistently showed substantial cost savings for the companies resulting from appropriate ergonomics training and engineering controls. Annualized cost savings ranged from \$111 to \$1,556 per employee, with benefit/cost ratios ranging from 5 to 84 and pay-back periods all less than one year.<sup>1</sup> The greatest economic savings came from improved productivity, resulting from advanced technological design of the ergonomic interventions. Our analyses suggest that it is in the economic interest of manufacturing employers to prevent musculoskeletal disorders. We also recommend incorporating a protocol for employers to collect cost and effectiveness data at the beginning of any occupational health intervention to facilitate evaluation. The net-cost model is now also being applied to evaluation of combined ergonomic and health promotion interventions in health care and other sectors.

**Figure 1: Net Cost Model for Workplace Interventions**



Although other studies have also found that workplace health and safety interventions are economically sound<sup>3</sup>, there remain many workplaces that have not abated actual hazards.<sup>4</sup> The primary barrier seems to be a misalignment of incentives to the different stakeholders in the system (employers, employees, insurers, and health care providers).<sup>5,6</sup> As a result, society is not realizing the full extent of health outcome benefits that could be achieved with broader implementation of workplace interventions.

In the U.S., third party payers (the insurance companies) typically act as an intermediary among the workers, the employer, and the health care providers and monitor the behavior of all participants through an incentive system. To implement workplace interventions, employers often have to make large capital expenditures without always capturing the full financial benefits (unless they are self-insured) because most of the avoidable cost gained goes to the third party payers. Workers Compensation insurance premiums paid by the employers are not always adjusted accordingly, resulting in a vicious circle of ever-increasing health care costs and productivity losses. This misalignment of incentives causes employees to face occupational hazards and experience negative health outcomes. The employees are not always aware of the risks due to lack of transparency of occupational risk factors. Workers compensation coverage is often inadequate, leading to out of pocket expenses and wage losses for the workers.<sup>7</sup> Meanwhile, insurers face rising workers compensation expenses and are unable to control and manage workplace risks in ways that would be to their financial advantage. Companies are concerned about the disincentives of rising premiums that result from higher injuries. Due to the inability of third party payers and employers to control risks, costs are often shifted to health care providers, workers, and to the society in general.

To mitigate these effects, we need a systems based incentives approach via a new paradigm for insurance reimbursement concentrated on prevention and health promotion. In this paradigm, the interests of the different stakeholders could be aligned through a new reimbursement mechanism of cost sharing using health outcomes analysis, which would contribute towards the welfare of each participant in the system.

[Supriya Lahiri](#) is an economist with extensive international experience in evaluating cost effectiveness of ergonomic interventions in a variety of industries. In addition to the economic analyses within CPH-NEW, her current work includes applying the net-cost model to ergonomic interventions in Brazil and India.

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