

An Economic Analysis of Occupational Safety and Health (OSH) Interventions: A Net-Cost Model Approach

Faculty:

Supriya Lahiri

Occupational injury and disease are economic phenomena, the consequences of a fundamental human economic activity called work, i.e., a task performed by an employee for an employer. Thus, workers' health and safety largely depend on how technology, materials and work organisation are employed to produce products – and our efforts to protect workers from hazards. Much of the risks of these hazards can be reduced through appropriate interventions. However, these interventions require the allocation of scarce resources by the employers. The failure to recognise the economic aspects of occupational safety and health interventions could lead to an underestimation of the economic benefits of providing a safe and healthy work environment for the workers and undermine economic efficiency and the health and welfare of workers and society welfare as well. One of the main purposes of economic analysis of interventions for occupational safety and health is to determine if decisions on investments in interventions to protect and promote worker's health are economically efficient from the company's point of view, i.e., in a micro setting and from the societal welfare point of view in a macro or economy-wide setting either in the short run or in the long run.

Our workshop aims to discuss the economic aspects of evaluating interventions to protect worker health *at the micro level* by providing a framework for thinking about interventions as economists. In our workshop, we will illustrate the evaluation of interventions using a micro-level framework with data and show how we can modify such economic frameworks to accommodate the requirements of specific settings in the context of the real world.

Using a micro-level approach, we developed the 'net-cost model' [Lahiri et al., 2005 a, b.]. It provides a transparent framework that evaluates workplace interventions by incorporating the costs of investment in equipment and labour and the avoided costs of lost work time, productivity losses, relevant worker's compensation, and medical care. It is an economic tool for evaluating occupational health and safety interventions that have been utilised:

1. To evaluate ergonomic interventions in the USA manufacturing sector [Lahiri et al. 2005a, b]
2. To estimate the net cost of an ergonomic, safe resident handling program in a series of nursing home facilities in the USA [Lahiri et al. 2012].
3. It has also been adapted to estimate the net costs of an ergonomic training intervention to reduce morbidity among porters who carry loads without mechanical assistance in a developing country informal sector setting in India [Lahiri et al. 2016).

If these investments were profitable from a company's point of view, then it would be in the company's interest to implement these measures. In most cases, the net-cost estimates consistently show that appropriate workplace interventions can result in substantial company cost savings. Just making firms aware of the profitable possibilities of such interventions may be sufficient to yield "win-win" solutions to certain problems in occupational safety and health.

Learning objectives

Students will be able to:

1. Understand the conceptual foundation and analytics of the net cost model - describe and articulate it.
2. Understand how the model can be applied to evaluate the economics of interventions in different settings to prevent back pain and other musculoskeletal diseases, e.g.,
 - a. The manufacturing sector in the US,
 - b. Nursing homes in the US,
 - c. Manual material handling in the informal sector in India.
3. Be able to provide examples from their occupational setting where the model can be applied.
4. Read and understand the published research papers on the net-cost model and extract relevant information to help them apply the economic analysis in their relevant settings.

About Our Speakers:

Supriya Lahiri

Supriya Lahiri is an emeritus professor at the University of Massachusetts Lowell Department of Economics. Before joining the University of Massachusetts, she was a member of the sponsored research staff at MIT. She has done extensive collaborative research with the Work Environment Department members at the University of Massachusetts Lowell, the University of Connecticut and the WHO on economic analysis of occupational safety and health issues for developed and developing countries. She has developed and applied cost-effectiveness and ROI models both at the macro and micro level that are presently being used at various institutions, including in a research-to-practice initiative at CPH- NEW funded by the National Institute of Occupational Safety Health (NIOSH/CDC). She has also worked extensively on the economics of occupational health issues for developing countries in collaboration with several public health agencies in India (sponsored by WHO). She has collaborated with the ergonomics lab at the University of Calcutta under the sponsorship of the (US Department of HHS (CDC) and India's Ministry of Health and Family Welfare). Her principal expertise is in applied micro and macro modelling, focusing on health, energy, and environmental issues. She is an expert on Cost-Benefit and Cost Effectiveness Analysis. Her work has been published extensively in several scholarly journals and edited volumes. She has worked as a consultant with many

eminent organisations, including the Brookhaven National Laboratory, Meta Systems, Massachusetts Institute of Technology, the World Health Organization, and CPWR.