Safety Science 53 (2013) 134–152

Contents lists available at SciVerse ScienceDirect

Safety Science

journal homepage: www.elsevier.com/locate/ssci

Review

Economic evaluation of OSH and its way to SMEs: A constructive review

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ARTICLE INFO

Article history:
Received 28 February 2012
Received in revised form 14 May 2012
Accepted 31 August 2012
Available online 27 October 2012

Keywords:
Economic evaluation
Economic models
Safety management
Safety costs
Cost-benefit
Intervention costs
Incentives
SMEs

ABSTRACT

Aim: This paper reviews scientific work of the past decade dealing with the economic evaluation of Occupational Safety and Health (OSH). The focus is on the modelling approaches and practical tools (methods) used to carry out economic evaluations, with emphasis on Small and Medium-sized Enterprises (SMEs).
Methods: The search of relevant publications was performed mainly through international bibliographic databases and science search engines, and also by examining citations from other authors.
Results: The relevant features of currently available evaluation approaches are described. The main difficulties and/or methodological limitations in this domain are highlighted and discussed; emphasis is put on the needs and particular constraints of SMEs.
Conclusions: From this scrutiny, it seems fair to conclude that, no matter the complexity and/or the degree of convergence and divergence between the various approaches currently in use, it is nonetheless consensual that *economic evaluation of OSH* needs more multidisciplinary research. Moreover, it is also apparent that large corporate groups are already persuaded that "safety pays and rewards" and are engaging in systematic evaluation attempts; by contrast, much more needs to be done to make the case with the smaller enterprises.
Impact in future work: Stemming from the literature review, the paper ends with an overall vision (kind of meta-model) to assist the modelling of future tools and includes a research agenda for future work.

Contents

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0925-7535/$ - see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ssci.2012.08.016

1. Introduction

The burden of work-related injuries and illnesses is widely discussed in the media, and yet, the real numbers are not accurately known; according to the International Labour Organisation (ILO, 2003), using data of 2003, accidents at work and illnesses annually take some 2 million lives world-wide and they cost the global economy an estimated $1,250,000 million US dollars. More recent data from Europe (Eurostat, 2009) give account of around 4 million people injured at work resulting in more than 3 days of absence from work, occurred in the EU-15 in 2005, despite these numbers also represent a significant decreasing trend. This Eurostat (2009) report contains the first detailed analysis of causes and circumstances of accidents at work in the European Union (EU). It does not give information on costs and economic aspects, but it is known that Small- and Medium-sized Enterprises (SMEs)[1] represent the bulk of the problem; actually, the European Agency (EU-OSHA, 2011a online) acknowledges for the "old" EU-15 member-states nearly 19 million SMEs, employing just about 75 million people; these SMEs, *per se*, contribute to around 82% of all occupational injuries, rising to about 90% of fatal accidents.

Such large-scale estimates demonstrate the magnitude of the problem at the (global) societal macro-levels. Yet, the actual costs of non-safety and occupational illnesses are still very much hidden and difficult to evaluate objectively at the enterprise micro-level, despite the efforts to develop this field of knowledge. Likewise, the potential benefits (and economic value) of improving work conditions are also a fuzzy arena, very difficult to characterize.

In today's fiercely competitive and global economy, the construct of a solid "business case" depends upon the idea that the true value of anything is determined by how well it performs its expected function, i.e., achieves specific goals (effectiveness), in relation to its cost and use of resources (efficiency). In such a context, creating and demonstrating value is ever more a key issue in the dynamics of successful management; as stressed by the American Industrial Hygiene Association (AIHA, 2008), in many cases, to produce and demonstrate value is also a way out to survival. In business, the economic value argument explains, usually in monetary language, the tangible results of investing in specific strategies.

Preoccupations with the costing of health and safety at the workplace (especially the costs of accidents) can be traced back to the origin of "safety thinking", by the pioneering work of Herbert Heinrich since the early decades of 1920–1930 (Heinrich, 1931; Heinrich et al., 1980). Heinrich was himself an insurance superintendent and, for decades to come the *insurance-based models* were widely used for costing absenteeism due to work-related injuries and illnesses; the simplicity of this approach, which is still in use today, lays on the fact that they essentially account for data on workers compensation schemes, which are easily available within any insurer's information system. Oxenburgh and Marlow (2005) draw attention to the side effect of this simplicity, which also have serious limitations, since it does not measure, for instance, employee turnover, productivity losses neither other business' impacts; thus, using solely the traditional insurance model may lead to underestimation of both total injury costs and, likewise, underestimation of potential benefits, usually expressed as "savings" or "avoidance of costs". The costing information obtained through this approach might be useful (and occasionally sufficient) to the insurers, but it is quite short-sighted for their clients (enterprises), who need to – or should – address the Occupational Safety and Health (OSH) function on the same financial grounds as any other function of their business' strategy.

A much more embracing alternative is offered by the so called *cost-benefit models*, which broader frameworks are intended to measure all significant cost-items that contribute to a product or service (Oxenburgh and Marlow, 2005). This kind of modelling approach is more complex and also requires substantially more data (e.g.: total costs of employment and all categories of losses pertaining to injury or poorly designed workplaces); yet, it yields more meaningful results and gives better account of OSH economics within each specific organization.

In today's vision of OSH investments, their *strategic economic value* is a strong argument, but it can – and should – also be reinforced with the *moral, ethical and social arguments*; the latter being especially applicable to large enterprises and corporate groups, under the "umbrella" of CSR programs (Corporate Social Responsibility). However, demonstrating the economic value of OSH is probably the most powerful and best convincing argument within the SMEs context, where managers struggle with limited resources (monetary and human) and where the survival pressure is a constant challenge to the smaller business. Despite the recognition of ethical values, the legal argument and compliance pressure, on the other hand, also play an important role and should not be ignored as a real factor that drives small enterprises to improve their OSH conditions.

The aim of the paper is to review scientific work of the past decade dealing with the economic evaluation of Occupational Safety and Health (OSH). Special focus goes to the modelling approaches and practical tools (methods) used to carry out economic evaluations, but it bears a subsequent intention of identifying research questions for next developments, especially concerned with the particular needs and interests of SMEs. To this purpose, this paper also discusses a proposal for a "top-level" approach – or a meta-model – which brings to the evaluation strategy other points of view in addition to the important "economic" argument, and allows establishing a future research agenda.

This paper is structured into six main sections. Section 2 explains the search methodology and criteria applied, whilst Section 3 constitutes the "core" of this work, as it gives the main results of this literature review and it is subdivided into four sub-sections. Section 4 encompasses a discussion on the current state of affairs and it covers two main aspects: the principal difficulties and methodological shortfalls identified, as well as the key differences when approaching either large corporations or SMEs, establishing the contrast between their differentiated needs and particular requirements. The referred discussion leads to a new proposal (kind of general meta-model), presented in Section 5, on how to approach future modelling alternatives. The closing Section 6 sets up a research agenda for future work and includes some concluding remarks.

2. Methods and search criteria

This review covers essentially scientific work of the past decade (year 2000+). This time-line emerged naturally for two main reasons: (1) at the onset of the work, it became rapidly evident that the most important contemporary approaches were developed

[1] Considers essentially the "No. of employees"; follows the European Commission Recommendation 2003/361/EC of 6 May 2003, concerning the definition of micro, small and medium-sized enterprises. Official Journal L124 of 20-05-2003.