



Editorial

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How do we know if monetary incentives are effective and efficient for controlling health and safety risks at work?

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How do we know if monetary incentives are effective and efficient for controlling health and safety risks at work?

Regulation is the mainstay of controlling occupational safety and health (OSH) problems in most countries. It is heavily relied upon even though its effectiveness is unclear (1). One of the problems with regulation to control OSH risks is that it requires an agency, such as a labor inspectorate, to check if employers are complying with the law. As most work is carried out in small workplaces, it is impossible to inspect all workplaces regularly due to their sheer number. Another issue is that OSH regulation in many countries is considered complex and bureaucratic, which is one of the reasons behind the lack of compliance (2). Taken all together, regulation could well be an ineffective and expensive way to control OSH risks. Research into more effective ways of risk control is, therefore, needed. One possibility being put forward is that it might be more efficient to take a supplementary non-regulatory approach and use incentives such as taxes, subsidies, or insurance premium differentiation to limit OSH risks. Such incentives may more efficiently promote safe and healthy workplaces because costs are an important driver for employers (3).

This special issue of the *Scandinavian Journal of Work, Environment and Health* compliments an earlier focus on the impact of OSH interventions on corporate performance (3–6). In this issue, Elser and colleagues (7) examine cases of economic incentives for the implementation of OSH interventions. While they find some indication that incentives can promote safety and health in the workplace, they conclude that these studies are of low quality; studies of higher quality are needed. Uegaki et al (8) present studies on the economic evaluation of OSH programs; like Elser et al, they find these to be of low quality and urgently call for improvement in this area.

This poses the interesting challenge of defining the methodological quality of these studies. What are the main problems in the evaluation of incentives? One is to control for trends over time that are not due to the intervention. For example, other OSH policies, changes in working life, or an economic recession could all work at the same time, in the same direction (9). A control group is one way to protect against this bias if there are two outcome measurements just as in the intervention group, one before and one after the intervention (10). However a non-random control group, as used in the case studies examined in this issue, does not prevent against selection bias. In the case studies, the individuals or firms who are going to make use of the incentives were volunteers and thus selected themselves as the intervention group. It is very well conceivable that the participants are much more motivated to control health and safety risks at work than non-participants. Thus, it is their higher motivation and not the incentives per se that cause the better outcomes. The best way to control for such a bias is randomization. When incentives are introduced in a jurisdiction or by an insurance company, it is difficult – but not impossible – to randomize intervention companies and “waiting list” controls. The next-best design to control for trends over time and selection bias would be an interrupted time series design, in which the outcome is measured many times before the intervention and many times after the intervention (11). Administrative data, such as injury reports to authorities or insurance companies, can be conveniently used for such studies (12). From such data, a trend over time before the intervention can be compared to the trend over time after the intervention. The difference between the trends can be statistically tested and thus it can be shown if the changes in outcome are independent of time and motivation.

All of the case studies collected by Elser et al (7) were evaluations commissioned by the government or an insurance institution that had issued the incentive. All the case studies concluded that incentives worked. However, only 1 of the 12 cases had been published in a scientific, peer-reviewed journal,

implying a possible conflict of interest in cases where those conducting the evaluation are in the difficult position of communicating unwanted results that could lead to a complete change of policy. For example, there are at least some indications that the Dutch case of covenants had to present a positive outcome as the spending of €300 million without positive results would have had political implications. Might this be an explanation for the low quality of research in this area? Low quality methodological research is difficult to interpret, which is convenient for politicians whose political career can depend on whether the results are positive or negative. Therefore, there is a clear need for better studies, published in peer-reviewed journals, and carried out by independent researchers.

Along the same line of thinking, it is sometimes argued that there is a difference between applied research, established to support policy, versus real scientific research, which is aimed for publication in scientific journals. Applied research would be meant to solve practical problems and scientific research would have little relevance for practice. However, I concur with Ramon y Cajal (13) who, when advising young researchers more than a hundred years ago, argued against this preoccupation with applied science. He showed how applications derive immediately from the discovery of fundamental principles and new data and not the other way around. The results of research are also meant to change our beliefs of how and if some intervention works. The stronger our beliefs, the more convincing the results of a research project have to be to make us change our view. In general, most of us agree that the better the methodological quality of a research project, the more we are inclined to change our beliefs. I think that the belief in the effectiveness of regulation is very strong. Thus, only high quality research would be able to make us consider a non-regulatory approach.

Others have argued that preventive policy measures would not need such high quality evidence as is necessary for the treatment of the ill. Here I would refer to Sackett (14) who angrily argued that the opposite is the case. When a very ill person with a life threatening disease asks for help, a doctor will use all means to help, not only evidence-based means. However, when you apply an intervention to healthy persons who did not even ask for the intervention, you have to be very sure that the intervention is beneficial and does no harm. Thus, in the case of prevention, a strong evidence base is needed, relying on high quality methodological research to ensure that no harm will be done.

The articles in this issue are the results of the EU funded project “the economic dimension of occupational safety and health”. The project has brought together researchers and policymakers from various disciplines with a joint interest in the economics behind healthy and safer workplaces. I think the articles in this and the previous issue are proof that the project has increased our knowledge on the topic. I hope that we can maintain the momentum and further improve the quality of research on the economics of OSH.

References

1. Tompa E, Trevithick S, McLeod C. Systematic review of the prevention incentives of insurance and regulatory mechanisms for occupational health and safety. *Scand J Work Environ Health*. 2007;33(2):85–95.
2. Su Z. Occupational health and safety legislation and implementation in China. *Int J Occup Environ Health*. 2003; 9(4):302–8.
3. Verbeek J, Pulliainen M, Kankaanpää E. A systematic review of occupational safety and health business cases. *Scand J Work Environ Health*. 2009;35(6):403–12.
4. Verbeek J. The Economic dimension of occupational safety and health [editorial]. *Scand J Work Environ Health*. 2009;35(6):401–2.
5. Köper B, Möller K, Zwetsloot G. The occupational safety and health scorecard – a business case example for strategic management. *Scand J Work Environ Health*. 2009;35(6):413–20.
6. Pot FD, Koningsveld EAP. Quality of working life and organizational performance – two sides of the same coin? [discussion paper]. *Scand J Work Environ Health*. 2009;35(6):421–8.
7. Elsler D, Treutlein D, Rydlewska I, Frusteri L, Krüger H, Veerman T, Van Den Broek K, Taylor TN. A review of case studies evaluating economic incentives to promote occupational safety and health. *Scand J Work Environ Health*. 2010;36(4):289–298.
8. Uegaki K, de Bruijne MC, Lambeek L, Anema JR, van der Beek AJ, van Mechelen W, van Tulder MW. Economic evaluations of occupational health interventions from a corporate perspective – a systematic review of methodological quality. *Scand J Work Environ Health*. 2010;36(4):273–288.

9. Darragh AR, Stallones L, Bigelow PL, Keefe TJ. Effectiveness of the HomeSafe Pilot Program in reducing injury rates among residential construction workers, 1994–1998. *Am J Ind Med.* 2004;45(2):210–7.
10. Shadish WR, Cook TD, Campbell DT. *Experimental and quasi-experimental designs for generalized causal inference.* Boston (MA): Houghton Mifflin Company; 2002.
11. Shadish WR, Cook TD, Campbell DT. Quasi-experiments: interrupted time-series designs. In: Shadish WR, Cook TD, Campbell DT, editors. *Experimental and quasi-experimental designs.* Boston (MA): Houghton Mifflin Company; 2002. p 171–206.
12. Lehtola MM, Rautiainen RH, Day LM, Schonstein E, Suutarinen J, Salminen S, et al. Effectiveness of interventions in preventing injuries in agriculture – a systematic review and meta-analysis. *Scand J Work Environ Health.* 2008;34(5):327–36.
13. Ramon y Cajal S. *Advice for a young investigator.* Cambridge (MA): The MIT Press; 1999.
14. Sackett DL. The arrogance of preventive medicine. *Can Med Assoc J.* 2002;167:363–4.

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