

HEALTH AND SAFETY ECONOMICS: LIMITATIONS OF ECONOMIC APPRAISAL OF OCCUPATIONAL HEALTH SERVICES ACTIVITIES IN POLAND

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Abstract. Methods of economic appraisal developed for evaluating activities in health care system may as well be successfully used for evaluating occupational health service activities. This involves the problem of resources management and cost containment not only at the company level, but also at different managerial and institutional levels. The decision makers have to know what resources are spent on occupational health, what is the effectiveness and efficiency of investing in employees health. The key issue of good understanding of the theory and practice of economic appraisal is a precise definition of costs, effectiveness and benefits. Another important area is the identification of information sources and barriers of economic appraisal. The results of the project carried out by the Nofer Institute of Occupational Medicine have provided evidence that defining costs, effectiveness and benefits of preventive activities need to be developed. It becomes even more clear after an analysis of existing limitations of economic appraisal in Polish enterprises.

Key words:

Economic appraisal, Occupational health services, Resources allocation, Information system

INTRODUCTION

Considerations on economic aspects of occupational health should be started with the very basic questions: Why should economists and other professionals deal with health-related subjects? Why should economic appraisal be used in the process of decision making and setting priorities in health care and resources allocation? There are two main reasons for economic appraisal of occupational health and safety. First, health is not a priceless commodity and the consequences of ill-health can influence the whole national economy [1]; so the problem reveals itself on the macroeconomic and microeconomic scales. The second reason results from the importance of economic efficiency of occupational health and safety criteria for

decision-making in enterprises [2]. The managerial staff is aware of some costs of occupational health (measurements, examinations, protection etc.). Moreover, basic information on, e.g. opportunity costs is still beyond the reach and control of managers. Occupational physicians are well informed about the health issues and these two approaches hardly meet with each other in an enterprise. The need for a new understanding of economic appraisal in the area of occupational health is required in Poland under the market economy. Namely, an efficient investment in workers' health should be regarded by the employers as an important factor influencing the overall efficiency of the enterprise.

A major shift has to be made in attitudes of managers, physicians and other stakeholders providing occupational

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health services. It involves the responsibility for the resources management, human resources management, and cost containment in the enterprise. That is why the methods of economic appraisal, which ensure the choice of the most effective options should be applied. The decision-makers should have an access to information on economic consequences of their decisions regarding the investments in the employees' health. The managers responsible for the allocation of resources and its outcome, must hold a complete knowledge of what health services are provided, what resources are incurred and what is the effectiveness and efficiency of current or future activities and programs. The situation becomes more clear if employers' free-choice (according to the Polish law) of health care provider among competing health care institutions is considered. So, the results of economic appraisal should be regarded as an essential element of the managerial process in enterprises.

Why should economic appraisal be applied at all levels of the national economy? It is to provide support in the process of decision-making at each level (cost containment by measuring how preventive measures can reduce the costs of enterprises). At the enterprise level, it is essential for its effective management (for individual enterprises it is important to estimate the relation between potential benefits and money invested in prevention); at the regional level it is essential for defining economic consequences of policy appraisal; and at the national level, it is essential for evaluating the consequences of the introduction or amendment of legislation and occupational health policy [3].

BASIC CONCEPTS OF ECONOMIC APPRAISAL

As generally accepted, the key concepts of economic appraisal methodology are as follows:

- **effectiveness** – achievement of outcome goal attributable to the program or given activities; usually it is measured in natural units, for example, number of accidents avoided;
- **outcome** – condition which is desired (the reason why the program is undertaken) and measured in final health effects;

■ **output** – instrumental or intermediate objective to achieve the outcome (e.g. given health services or health program, number of examined workers, number of trained employees);

■ **input** – different resources (personnel, funds, materials etc.) or costs;

■ **costs** – measurable and immeasurable in values for money, direct and indirect values, fixed and variable values [4].

The special attention should be turned to the concept of efficiency as a function of both, effectiveness and inputs or costs. Efficient is choice that maximizes the health outcome gained from given resources. There are three approaches to efficiency: technical, productive and allocative [5]. Technical efficiency is a function of resources and health outcome but it cannot be applied to compare alternative interventions. It refers to the same type of intervention but to different uses of the one resource. This problem may be solved by using the productive efficiency criterion. The intervention is effective if the health outcomes can be maximized at a given cost. Allocative efficiency combines the productive efficiency and the way in which the outcomes are distributed among the population. When resources are allocated in order to maximize the welfare of the community, they are allocated according to allocative efficiency criterion.

There are two possible perspectives of economic appraisal regarding the timing:

1. *ex ante* approach (appraisal before preventive measures are taken) to planned, initiated or rejected activities; and
2. *ex post* approach (appraisal after measures are introduced) to ongoing, completed, modified, continued, rejected or reinitiated activities.

The list of costs of preventive activities/programs may include the costs of: time used to take preventive examinations during the paid work time; prevention of accidents at work; transfer of workers to new work posts due to recommendation of physician (health reasons); workers' travels to OHS units; preventive examinations incurred by employers; accommodation, heating, energy, medical equipment; consumable medical materials, medical personnel salaries (if the employer is the owner of an

OHS unit); the co-operation with other units in the area of prevention; exposure monitoring; workers' extramural education; workplace modernization; and individual protective measures.

Generally, the financial benefits for employers resulting from the prevention activities can be expressed in terms of avoided financial losses due to productivity losses or savings in financial outlays or production costs. The global financial benefits, which could be taken into account have been defined as: avoided cost of sickness absence, avoided cost of accidents at work (loss of materials, paid work time, salaries for overtime, loss of production), avoided financial loss through transferring workers to new work posts, avoided cost of organizational changes due to returning to job under supervision or other organizational changes following the physician's recommendations, financial savings due to OHS actions: savings on time of the personnel in different departments of the enterprise, and compensations paid to the employees.

CRITERIA FOR MAKING CHOICE

However the specificity of OHS economic appraisal is undoubtful, the methods well known in health economics can be successfully applied in this field. The most useful tools of economic appraisal are [6]:

- Cost-effectiveness analysis
- Cost-benefit analysis.

The discounted (if necessary) cost/effectiveness ratio provides the information on the relationship between the unit cost and effectiveness measures (e.g. cost of absence day avoided). The program with a lower ratio should be selected. The second analysis provides the information on net benefits (benefits minus costs), or on benefits/cost ratio, and answers the question on how much financial benefit is possible to obtain from one monetary unit invested in health. The discounted values should be considered if the appraised activities are carried out for more than one year. If, for example, the two programs which yield benefits b_1 and b_2 and use resources c_1 and c_2 are respectively considered, the decision-maker has to choose between them. If the programs are compared on the basis

of benefit/cost ratios, the program with greater ratio should be selected. If the programs are compared on the basis of net benefits, the program with greater net benefits should be selected. A program involving higher costs can be chosen if its marginal benefits exceed its marginal costs [7].

The choices are much more complicated if they refer to more than two alternatives. It may be reasonable to select three or four options. The marginal account is helpful in this kind of situation because it enables to calculate the efficiency on the basis of marginal values.

MATERIALS AND METHODS

This study was performed as a part of a broad project on economic appraisal in Polish enterprises. The three main goals of the economic appraisal studies can be defined. First, to estimate economic consequences of preventive activities (cost/benefit ratio, net benefits, cost/effectiveness ratio) in order to convince the managers of their significant role. Second, to elaborate and improve instructions on the use of economic tool in practice to decide on the form of delivery and the range of preventive activities at a given level of management. Third, to recognize the limitations of economic evaluation, mainly statistical, and to formulate further activities in this area.

This report is devoted to actual limitations of economic appraisal in Polish enterprises. Each enterprise was visited, managerial staff was interviewed, and routine documentation on economic and prophylactic issues was analyzed. Should the need have arisen supplementary information was obtained from account managers, safety engineers and occupational physicians. If the information was still insufficient additional reports were requested and obtained from the enterprise. In order to analyze the practical aspects, the general study design was based on the following questions [8]:

- Does the economic appraisal make an impact on the decision whether the OHS activities should be introduced?
- Is the economic appraisal done on a routine basis before and/or after taking the measures?

- Are the cost information and effectiveness indicators available on a routine basis?
- Is there willingness to make decisions based on the economic appraisal.

RESULTS

Twelve Polish enterprises were included into the study, as they provided complete information on all issues and declared full participation in the project on the cost-benefit analysis. They represented different branches of the national economy: construction, industry and services. The details of the study were reported elsewhere [9,10]. The special attention was paid to barriers of economic appraisal at the company level in order to propose the methods how to overcome them in future undertakings. The information on costs (in value of money terms) and financial benefits, resulting from preventive activities/programs had to be collected from different routine financial, medical and other documentation. The direct data were obtained from the enterprises and OHS statistics (e.g. costs accounts, salaries reports, bills, investment reports, production reports, reports on absenteeism, results of workplace monitoring, information on workers health status and work posts, etc.). This method of collecting data for economic appraisal of the OHS in enterprises was not sufficient. Several special reports on technological, organizational and managerial changes had to be prepared. One of the most difficult issues of appraisal was the effectiveness measurement. Usually it is considered as the reduced number of absence days and the reduced number of cases of occupational (or work-related) diseases. But they are only indirect measures of health effects.

DISCUSSION

The findings of the study show the main limitations of economic appraisal at the company level. Mainly, the limitations result from the lack of knowledge how to appraise the intervention and how to use information on economic efficiency. Moreover, the analysis of the Polish statistics and reporting system at the company level allow to identi-

fy the information limitations. The most important of them include:

- the dispersion of financial reports on different preventive activities in enterprises;
- the overlapping information on the same events (in different breakdowns) in different departments at the company level (e.g. material losses, personnel engaged, productivity losses due to accidents at work);
- the aggregation of financial data on the official company statistics;
- the lack of financial information on preventive activities (organizational and technological);
- the subjective indicators of the effectiveness of preventive measures;
- the difficulties in estimating effectiveness and benefits due to the nature of prevention results (they are apparent after a long time);
- the lack of absenteeism reports meeting the requirements of economic appraisal.

The above mentioned limitations seem to be independent of the sectors and branches of the national economy. Enterprises of different types, sizes and activities displayed almost the same limitations in finding appropriate occupational health units, and contracting prophylactic services and/or in evaluating the effectiveness.

Economic appraisal as an economic tool of decision-making (setting priorities in preventive activities, allocating resources) at the company level needs to have the methodology and information system developed. It is possible to indicate some problems which have to be solved in order to bring economic appraisal into practice in Polish enterprises. They are as follows:

- The scope of the appraisal varies with the type of activities undertaken and the health priorities consideration; a uniform list of costs, effectiveness indicators and benefits does not exist;
- The estimation of benefits seems to be most difficult in economic evaluation due to the lack of the data on the prevention activities results which are apparent after some time;
- Insufficient official statistics necessary to evaluate costs, benefits and effectiveness;

- The need for developing simple models of cost-benefit and cost-effectiveness analyses for everyday practice;
- The scarce financial resources in small and medium-sized enterprises, as well as limited awareness and understanding of costs and benefits estimation at the company level hinder economic appraisal.

CONCLUSIONS

1. Economic appraisal of occupational health services in Polish enterprises requires further investigations, appropriate modeling and tailored services.
2. Better use of available information would improve effectiveness of the OHS in enterprises.
3. Awareness and capacities of managerial staff are the most important factors, which play a decisive role in this field.

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