

# Internal and External Costs in Sustainable Development of the Healthcare System in Poland. Case Study of the John Paul II Specialist Hospital in Głucholązy

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## Abstract

*The article's goal is to study internal and external cost as part of the sustainable development paradigm. To illustrate such a problem the role and a scope of presented costs in the health care system are discussed. The practical example from Opolskie Voivodship—the John Paul II Specialist Hospital in Głucholązy—is presented. For achievement of this aim a literature review is conducted from the scope of health-care economics and its sustainable development as well as internal and external costs (desk research). An analysis of data (data analysis) is performed on the example of the specific hospital (case study). After such analysis it is possible to state that it is necessary to have knowledge regarding the occurrence of diseases in the population and the total (including external) values of social and economic costs of untreated diseases. In order to achieve this, it is necessary to, first of all, implement educational programs. This also applies to general medical practitioners, because, as practice shows, patients are often diagnosed at the stages of disease when effective treatment is nearly impossible.*

**Keywords:** sustainable development, internal costs, external costs, healthcare system, costs in hospital, health care system economics

**JEL:** E71, I110, I150

## Introduction

There is widespread opinion that there is no perfect healthcare system, that there is a lack of financial resources in every functioning system, and definitely that there are insufficient funds to ensure that every healthcare entity will be provided with necessary equipment. Social expectations for providing the highest level of healthcare force the implementation of new solutions which have been introduced directly from the world of science. On the one hand growing healthcare needs, and on the other hand—rapid progress in treatment methods and medical technologies imply constant increase in operating and development costs (investments) of the Healthcare System (HcS).

A research thesis has been formulated as follows: managing healthcare under the conditions of a rapidly growing demand for healthcare services and the need to invest in an improved medical infrastructure requires a constant search for solutions to improve the organization of HcS operations

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by improving the efficiency and effectiveness of their operation and development at the level of the whole system as well as a hospitals and clinics. The purpose of the long-term research will be to identify organizational and financial solutions aimed at improving the efficiency and effectiveness of sustainable operation and development of HcS at the level of healthcare entities. The subject of research will be SP ZOZ John Paul II Specialist Hospital of the MSWiA in Głuchołazy. Improvement of the efficiency and effectiveness of sustainable operation and development of HcS will be understood—for the purpose of the designed research—as a process of HcS systemic changes, thanks to which, with the planned expenditure, it will be possible to significantly increase the number and the structure of specialist medical procedures implemented by an entity whilst taking into account, as primary, the cases which pose the greatest risk to human health and life.

### 1 Sustainable development concept as the theoretical context of research

In general, the concept of sustainable development refers both to the implementation of integrated multidimensional objectives (Maj 2018, 4; Malik and Jasinska-Biliczak 2018, 14) of the operation and development of HcS, as well as to long-term maintenance sustainability of the system development due to effective investment in the development capital (human, social, economic, natural). Therefore, in order to implement sustainable development, one has to take into account the two mega-criteria in the policy/strategy of HcS sustainable development:

- Integrity of objectives of the operation and development of HcS in programming and obtaining effects that fit in with the ethical, social, economic and ecological dimensions (orderliness) of development.
- Sustainability of HcS operation and development capital, obtained as an effect of improving the efficiency (integrated) of investing in development capital: human, social, economic and natural.

The mega-criteria of the integration of development objectives refers to, according to the paradigm of sustainable development, multidimensional effectiveness-driven assessment of the designed projects. And effectiveness will be understood as the degree of achieving the programmed strategic/operational objectives and/or measures.

The mega-criteria of the development capital sustainability mean the imperative of not decreasing (or increasing) the value of assets of the system due to investing in:

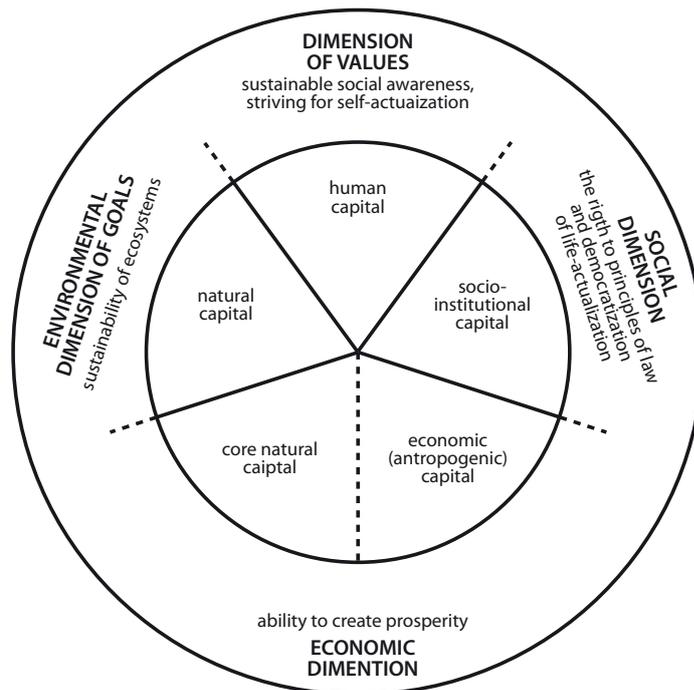


Fig. 1. Structure of capital and development orders according to the sustainable development concept

Source: Malik (2004, 63)

- human capital (health),
- social capital (amongst others the development of the Healthcare System institution),
- economic capital (labor resources, infrastructure and productivity), and
- natural capital (including clean environment and healthy food).

The mega-criteria of the sustainability of development refers to multidimensional efficiency assessments in the scope of particular types of development capital.

The elements of the development capital together with the corresponding orderliness (clusters of objectives) of development can be presented schematically (fig. 1). If the entire development capital, for example, of the region, is to grow, then it is strategically important to pursue complementary objectives of all development orderliness (the so-called integrated objectives order).

## 2 Methodological foundations and objectives of the designed research

### 2.1 Characteristics of research subject

SP ZOZ John Paul II Specialist Hospital in Głucholązy is an establishment providing medical services in terms of diagnostics, treatment and rehabilitation of pulmonary illnesses and tuberculosis. It consists of the pulmonological clinic, the department of pulmonology and tuberculosis, which has got one hundred beds, as well as seventy-two beds of pulmonologic rehabilitation. Furthermore, cardiologic rehabilitation has 80 beds in the hospital. The hospital hires highly-qualified medical staff, including provincial advisors and domestic advisors within the scope of physiotherapy. Five employees have the academic titles of PhD and habilitated doctor.

In the scientific and practical fields, the hospital cooperates with the Opole University of Technology and National Higher Vocational School in Nysa. The hospital undertakes scientific research and takes part in the trainings of medical staff in cooperation with these units. In 2018 the hospital was awarded the “Medical Pearl” in the category of “Event of the year” for initiating cooperation with the Opole University of Technology and for scientific research as well as for implementing virtual reality in rehabilitation.

### 2.2 Research methodology

A broadly designed research process has been pre-divided into 6 stages, which include (in terms of the process approach):

- identification of socially underestimated medical diseases due to understated (by externalities) costs of selected specialist medical procedures,
- correction of the costs valuation of sustainable operation and the development of the Healthcare System by making the number of patients more realistic and internalising the external costs of not treating specific diseases,
- recommendations of adjusted valuation rates for selected specialized medical procedures,
- proposal of changing the existing algorithm for the allocation of financing contracts,
- improving the effectiveness of the sustainable operation and development of the Healthcare System (integrated efficiency and effectiveness), and
- implementation of HcS policy/strategy of sustainable development.

The first research stage is mainly of a diagnostic nature. Stages 2–4 are in fact recommendations, whereas stage 2 is a methodological proposal and stages 3 and 4 implementation recommendations in the real milieu of healthcare. Stages 5 and 6 will be devoted, above all, to indicate the main social and economic benefits that constitute the premise and justification of the proposed systemic changes in HcS.

The presented study is an introduction to the whole of the designed research work (concept of work) and at the same time is a contribution to the first stage of research. The purpose of this research stage is the identification of the selected (specialist hospital case study) specialist medical procedures for the treatment of socially and economically underestimated costs. At this stage, a thesis about the existence (essential for operation and development of HcS) of a gap between the social and economic costs of specialist medical procedures and the costs included in the contracts

offered by the National Health Fund to healthcare entities was established. It was also assumed that the indicated gap in the cost estimate significantly burdens the existing financial resources allocation algorithm for HcS treatment units, which, by the indicated valuation failure, does not reflect the social and economic costs and benefits of investing in health capital and, therefore, is not optimal within the meaning of the Vilfredo Pareto definition—i.e., it does not provide the highest effects (health) within the assumed expenditure, *ceteris paribus*.<sup>1</sup> In this research context of the first stage, it was also assumed that the appropriate criterion for the legitimacy of the proposed systemic changes will be the assessment of the effectiveness and efficiency of sustainable development (the criterion of integrated effectiveness) (Malik 2004, 49). In accordance to this, the basic theoretical context of the research will be the sustainable development paradigm—the concept of sustainable development related to:

- the operation and development of HcS (as the key element of social capital),
- human health (human capital), and
- the method of financing the healthcare system (economy capital).

### 3 Internal costs of the Healthcare System

Always when analyzing the costs of healthcare system operation, it is necessary to pay attention to whether the funds spent are sufficient and whether they are properly allocated, especially since they are public funds. However, a question should be asked about which costs are taken into account in the valuation of medical procedures and whether are they reflected in the number and values of contracts offered by the National Health Fund to healthcare entities (hospitals, clinics). The costs of healthcare usually include only the internal costs, which should consist in the valuation of a medical service, that is, resulting from the use of resources of the healthcare system. These are medical costs such as:

- pharmacotherapy,
- general healthcare,
- hospital treatment,
- specialist care,
- rehabilitation, or
- home treatment, for example oxygen therapy or nursing and care services.

Internal costs also include non-medical costs, such as transport, nutrition and general overhead expenditures, such as the financial services, human resources and management costs. The question should be asked of what constitutes the sum of costs at particular stages of patient care (Benda-Prokeinova et al. 2017, 19) and what are these costs resulting from? What costs can be generated, for example, from hospital treatment?

The main component of internal costs are usually remuneration and surcharges for the salaries of doctors, nurses, paramedics, physiotherapists, laboratory employees, radiologists, service, management (Jasińska-Biliczak 2015, 75; Merkevicius et al. 2015, 208), etc. They usually range between 65% and 80% of the total hospital costs. Wage regulations (D'Auria et al. 2010, 69–72), market conditions (Jasińska-Biliczak and Sitkowska 2014, 60) and requirements set by the National Health Fund regarding the number and qualifications of employed staff, have a large impact on wages and their sum (Golicki et al. 2010, 42).<sup>2</sup> Depending on the specifics of hospital departments, important cost components are medicines and medical materials, specialist services, depreciation of facilities and medical equipment, food, IT and technical services, insurance, administrative services, media and more. Another factor that has an impact on these costs are the requirements determined by National Health Fund (NHF)—Narodowy Fundusz Zdrowia (NFZ)—which is the financier organization.

1. More specifically, according to the understanding of Pareto's efficiency, there is a different allocation of resources, allowing us—with the same cumulative expenditure—to achieve better results.

2. See also: *Metodyka pomiaru kosztów pośrednich w polskim systemie ochrony zdrowia*. Report by EY, 2013, Warszawa, page 81, [@:] [https://www.ey.com/Publication/vwLUAssets/Raport\\_Metodyka\\_pomiaru\\_kosztow\\_posrednich\\_17.09/\\$FILE/Raport\\_Metodyka%20pomiaru%20kosztow%20posrednich\\_17.09.pdf](https://www.ey.com/Publication/vwLUAssets/Raport_Metodyka_pomiaru_kosztow_posrednich_17.09/$FILE/Raport_Metodyka%20pomiaru%20kosztow%20posrednich_17.09.pdf).

The NHS requirements, concerning personnel, equipment or service conditions, guarantee a certain level of their implementation, but they also constitute a factor affecting the costs. Despite the fact that the requirements which must be clearly met have improved the quality of services provided, it is impossible not to get the impression that they are often put completely in isolation from the actual needs of improving the quality of medical services, without analyzing the available resources and sources of financing them. These are not isolated cases where there is a need for a clinic to work several times a week, whilst the contract allows just a few hours.

There was a case, broadly described in the media, of the Regulation of the Minister of Health August 30th 2009 (in the case of the guaranteed services from the scope of medical rehabilitation), introducing the requirement of additional employment of medical rehabilitation physicians in the number of one doctor for every 20 beds in cardiac rehabilitation departments.<sup>3</sup> Of course, the requirement of a cardiologist or a specialist in internal diseases remained at one doctor for every 20 beds. This resulted in the fact that the requirements for the employment of doctors in the cardiological rehabilitation departments were definitely higher than the requirements for surgical wards and other medical treatment wards. At that time, it was estimated that there were 1 200 medical rehabilitation physicians working in this specialization in Poland, however there were at least 5 000 entities that employed at least one such doctor. The financial impact of this regulation in the country is difficult to estimate, however it is known that in large hospitals it reached PLN several hundred thousand a year. Ultimately, this requirement was withdrawn in December 2016.

As the practice shows, the costs of meeting the successive requirements of the NHF most often fall on the creating bodies on which various subsidies, non-returnable loans or cover balance sheet losses are enforced. This is due to the need to maintain the functioning of healthcare entities for social reasons.

#### 4 External costs of the Healthcare System

Another category of costs described in the literature (Jasińska-Biliczak 2014, 119; Nichol 2001, 754; Patel, Nagar, and Dalal 2014, 298), unfortunately unnoticed by the financier in the Polish healthcare system are external costs. They are difficult to estimate, however the estimates presented in the literature show their large scale. They are often associated with economic or social costs or alternatively referred to as indirect costs.

These include all losses incurred by the third parties or the entire society not involved in the provision of services. This will primarily be the loss of volume of production and services due to incapacity to work. It is stated that the indirect costs—in this case economic—consist of the following categories of costs:<sup>4</sup>

- losses due to a reduction in production volume in the economy resulting from the absence of people due to sickness, on sick leave (so-called sickness absenteeism)
- losses due to the reduction in the volume and quality of production resulting from the reduction in labor productivity of people who work despite sickness (the so-called presentism)
- losses due to the reduction in the volume of production because of inability to work, certified by disability pension
- losses due to the reduction in the volume and quality of production caused by premature death (the need for additional training and retraining of employees)
- losses due to the reduction in the volume and quality of production resulting from informal care over the sick (absence of informal caregivers)

3. See: Rozporządzenie Ministra Zdrowia z dnia 30 sierpnia 2009 r. w sprawie świadczeń gwarantowanych z zakresu rehabilitacji leczniczej. DzU z 2009 r. nr 140 poz. 1145; Rozporządzenie Ministra Zdrowia z dnia 8 grudnia 2009 r. zmieniające rozporządzenie w sprawie świadczeń gwarantowanych z zakresu rehabilitacji leczniczej. DzU z 2009 r. nr 211 poz. 1644; Rozporządzenie Ministra Zdrowia z dnia 25 czerwca 2010 r. zmieniające rozporządzenie w sprawie świadczeń gwarantowanych z zakresu rehabilitacji leczniczej. DzU z 2010 r. nr 115 poz. 774 z późn. zm. w zakresie Załącznika nr 1 do ww. Rozporządzenia; Zarządzenie Nr 53/2010/DZOS Prezesa Narodowego Funduszu Zdrowia z 02.09.2010 r. w zakresie załącznika nr 3 do ww. Zarządzenia.

4. See: Koszty POChP w Polsce. Report by EY, luty 2017, Warszawa, page 58. [@:] [https://www.ey.com/Publication/vwLUAssets/Koszty\\_POChP\\_w\\_Polsce/\\$FILE/Raport-EY-Koszty-POChP.pdf](https://www.ey.com/Publication/vwLUAssets/Koszty_POChP_w_Polsce/$FILE/Raport-EY-Koszty-POChP.pdf).

In fact, external costs in the healthcare system constitute social losses as a result of disease. It may be damage to the health of third parties due to disease transmission, destruction or reduction of property value or infringement of values that are less intangible and hard to measure. The question should be asked: how much are external costs compared to internal costs? Of course, it will depend on the type of disease, but attempts to estimate it show that they can exceed the internal costs of the system by a dozen times.<sup>5</sup> These estimates prove the necessity of taking into account the external costs in the calculation of costs of medical procedures, because it will allow us to improve the efficiency of the allocation of the public financial resources.

## 5 Conditions and implications of underestimating costs in the Healthcare System

The basic problem in estimating healthcare costs in Poland is the lack of reliable data on the basis of which these costs could be estimated. The method of hospital treatment financial settlement, in which only one disease can be settled in the case of coexisting disease, results in the necessity of settling, and thus reporting, only the best-priced procedure from several diseases. This results in the exclusion of many less-priced diseases from the statistics. This gives a more blurred picture of the cost structure, indicating that the valuations of the procedures were not made on the basis of the actual costs of treatment. The disproportions between the incurred real costs and the National Health Fund payments in many cases are very large. For example, the cost of exacerbation of COPD (Chronic Obstructive Pulmonary Disease) treated in a hospital (group D46) according to the NHS valuation is PLN 1 947, while it is stated that the actual cost of treating exacerbation in a hospital is PLN 6 000. It is clear that there is a lack of statistical data or poor representation of less-priced diseases. This translates into decisions on the level of funding the prevention, screening or treatment due to the underestimation of disease. The falsified data have a further impact on the education of the medical staff as well as on decisions of choosing medical specialization of physicians.

Such a settlement method implies a deformed system of collecting statistical data of actually treated disease. Another problem is the lack of many medical screening programs. For example, the Polish Society of Lung Diseases reports that COPD is diagnosed in Poland in 10% of respondents over 40 years of age. Thus, it can occur in 2 million people. However, it is estimated that it is diagnosed at the early stage in less than 20% of patients. It is assumed that the number of exacerbations treated annually in hospitals in Poland is about 50 000. The question arises as to where and how the other patients are treated. It can be assumed that some of the patients are treated in Primary Healthcare (PH) — Podstawowa Opieka Zdrowotna (POZ) — while a large part of the patients identifies symptoms of COPD such as a decline in physical condition and dyspnea with ageing of the body and therefore do not get the proper treatment. Proper diagnosis would also allow us to reduce external costs by increasing the availability of pulmonary rehabilitation centers. A number of papers published in recent years, based on evidence, have confirmed the effectiveness of respiratory rehabilitation, which is indicated next to quitting smoking as the only factor inhibiting the development of the disease. It is also recommended in the guidelines of the Polish Society of Lung Diseases as well as by international experts. Therefore, the dissemination of rehabilitation may turn out to be the cheapest way to reduce the economic costs of this disease, which according to various sources is the third or fourth greatest cause of death in the world.

## Final remarks

So, what economic conditions must be met in order to optimize cash flows within the healthcare system? First and foremost, it is necessary to have knowledge regarding the occurrence of diseases in the population and the total (including external) values of social and economic costs of untreated diseases. In order to achieve this, it is necessary to, first of all, implement educational programs

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5. See: Przewlekła obturacyjna choroba płuc a zakażenia pneumokokami. Presentation by Iwona Damps-Konstańska, slide 16, [@:] <https://programyздrowotne.pomorskie.eu/documents/1452968/1715506/prezentacja+6/b9ef2744-6553-41b9-82ec-5ea37b4abc42>.

(Bedrunka and Malik 2017, 61). This also applies to general medical practitioners, because, as practice shows, patients are often diagnosed at the stages of diseases that makes effective treatment nearly impossible. This applies not only to oncological cases but also to such infectious diseases as tuberculosis, which until recently seemed to be under full control.

For the implementation of cost-effective treatment programs, it is necessary to extend the screening programs. Effective action can only be taken when the right diagnosis is made. Otherwise, only the most severe cases, and thus the most expensive, will be treated. Lack of proper procedure of HcS results in higher economic costs, such as those resulting from, for example, sickness absenteeism or presenteeism. Therefore, the financial resources contracted by the NHF should take into account the impact of the contract implementation on total social and economic costs reduction. Of course, these (external) costs cannot be reduced to zero, however, an analysis of the impact of increasing healthcare expenditures on the reduction, for this reason, of economic and social costs should be carried out, especially in the context of their scale presented in the literature.

Unfortunately, the postulates of a broaden approach to the analysis of the healthcare system expenditures in order to have socially efficient and effective contracting for the medical services are, in our conditions, so far, difficult to implement. It is good that the Agency for Health Technology Assessment and Tariff System was established, which on the basis of information gathered from healthcare entities, recommends valuation on the basis of actual costs. However, the valuation of all treatment procedures will take many years, taking into account rapid scientific and technological progress and the changing cost structure. For the time being, medical units have no choice but to accept the contracts which are based on historical data with often unjustified diversification of historical cost valuations. Establishing a network of hospitals and introducing a method of financing them, has so far consolidated this differentiation by setting limits on the percentage of contracts, which will not result in a permanent reduction of their amount and a strong reduction of payments of so-called surpluses service in the event of exceeding the performance of contracts.

The initiation of discussions on the use of increased public finances for healthcare, which is open to diverse opinions from different backgrounds, provides an opportunity to look more broadly at the economic and social aspects not only regarding spending money by the National Health Fund, but also the broadly understood sustainable strategy for the population's healthcare.

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