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Is There a Border Between the Public and Private Sectors in Health Care?

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Diseases and their treatment affect the economy and the society by means of complicated transmission mechanisms. They include costs of treatment, i.e. direct costs, and indirect costs, i.e. lost GDP. Their impact on public finance revenues and expenditures should also be taken into account. Due to the importance of the problem of health as well as the quality and efficiency of the operation of the health care system, additional measures like a deadweight loss and a loss of wellbeing are considered. The effects of the mutual interaction of health and economic growth cannot be overlooked. The complexity of the on-going processes is further exacerbated as a result of the influence of the public and private sectors, which cannot be clearly demarcated in health care.

Keywords: health care, indirect costs, deadweight loss, loss of well-being, economic growth.

Czy istnieje granica między sektorem publicznym i prywatnym w ochronie zdrowia?

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Oddziaływanie chorób i ich leczenia na gospodarkę i społeczeństwo odbywa się za pomocą skomplikowanych mechanizmów transmisji. Zalicza się do nich koszty leczenia, czyli bezpośrednie oraz koszty pośrednie, czyli niewytworzony PKB. Ponadto trzeba uwzględnić ich wpływ na dochody i wydatki finansów publicznych. Ze względu na rangę problem, jakim jest zdrowie i jakość oraz efektywność funkcjonowania ochrony zdrowia, uwzględniane są dodatkowe mierniki, jak strata dobrobytu oraz pogarszanie się jakości życia. Nie można pominąć skutków wzajemnego oddziaływania zdrowia i wzrostu gospodarczego. Złożoność zachodzących procesów dodatkowo komplikuje się na skutek oddziaływań sektora publicznego i prywatnego, między którymi nie można w sposób jednoznaczny wyznaczyć granicy w ochronie zdrowia.

Słowa kluczowe: koszty pośrednie, strata dobrobytu, pogorszenie jakości życia, rozwój gospodarczy.

JEL: I13, I14, I15, H21

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1. Introduction

A disease, especially a severe or chronic one, and its treatment represent a multidimensional, i.e. psychological, social and economic, event. The suffering of a sick person and their loved ones as well as the effect on the way of life of the whole family is obvious because health and human life are the greatest values. However, for the functioning, organisation, management and financing of health care to translate into the quality, safety and availability of treatment, as well as for the efficient use of public resources and finances, it is necessary to make use of tools of economic analysis to provide reliable knowledge to take optimal health decisions within the framework of the Health in All Policies approach (Leppo, Ollila, Pena, Wismar & Cook, 2013) currently continued by the World Health Organization [WHO] under the agenda *Health21 – The health for all policy framework for the WHO European Region* (WHO, 1999).

The submitted paper presents the financial, economic and social effects of diseases and their treatment from the perspective of: indirect costs, i.e. lost GDP, public finances, i.e. lost tax revenues and expenditures on social benefits, deadweight loss, loss of well-being, and the impact on economic growth and development. The research problem is to understand all mutual interactions as well as economic and financial mechanisms that occur in connection with the disease and the treatment process, as well as the consequences to which they lead.

2. Indirect Costs

Direct costs, i.e. costs of treatment, are borne by the public payer and commercial payers/insurers. They can be defined as total costs incurred in connection with the use of resources for prevention, diagnosis, treatment and rehabilitation.[1] It is unclear what is classified into these resources because, besides tangible goods used and in use as well as the work done, they can comprise other elements too. Pioneering papers defined them as expenditures not only on hospital and outpatient care, including personnel costs, professional home care, drug costs, but also costs of personnel training or clinical trials (Rice, 1967, pp. 424–440). Intuitively, the direct cost category is quite obvious; however, converting the definition of direct costs into tools used to calculate them is difficult, for example, because of the valuation of non-market resources, selection of a cost accounting period, selection of an interest rate to discount and account for changes in the time value of money (Drummond, Sculpher, Claxton, Stoddart & Torrance, 2015). Crucial for the obtained results is the method of data collection, data types and level of detail. All these and many other factors determine the quality and comparability of findings of individual studies.

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Indirect costs are a burden for the society and the economy of diseases and their treatment, and this burden is underestimated and neglected by decision-makers. According to the WHO definition, this is lost production because of reduced working time due to an illness (WHO, 2009). Indirect costs are therefore the production lost by the economy as a result of an illness, disability and premature death (Rice, 1967, pp. 424–440). Such widely accepted definitions cannot become the basis for their measurement. In view of the lack of a unified theoretical and methodological foundation, costs are calculated in a diversified manner.[2]

In an attempt to present the scope and basis for calculating indirect costs, it can be stated that at the microeconomic level patients and their informal caregivers are absent from work and thus do not generate GDP – this reason for indirect costs is termed absenteeism. Even if both sick people and their informal caregivers go to work, their productivity is limited, which leads to reduced production – this reason for indirect costs is referred to as presenteeism. Temporary and permanent unfitness to work leading to disability-related retirement or premature death exclude sick people from professional activity, which means they do not generate GDP (Hermanowski, 2013; EY, 2013; EY, 2015, chapter 4). The value of lost GDP represents macroeconomic effects felt by the society and the economy, which are reflected in the rate of economic growth and economic development. An additional effect for the economy is that reduced household income is accompanied by lower savings, which forces enterprises to limit investment and entails slower economic growth.

The size of the loss measured by lost GDP can be illustrated by calculations for breast, cervical and ovarian cancer in Poland in 2000–2014 (Nojszewska, 2016). The discussed report shows that in 2014 alone, the Polish National Health Fund incurred the cost of PLN 688,952,000 on account of these three diseases. All the reasons for indirect costs enumerated in the previous paragraph led in the same year to lost GDP of PLN 4,408,654,988 (Nojszewska, 2016, pp. 129–133).

The presented summary of direct and indirect costs reveals a problem for health policy because indirect costs were six times the direct costs in the five-year period under analysis. Direct costs are determined by the amount reimbursed by the National Health Fund for medical procedures. The potential offer covers the entire range of procedures: from the oldest to the most modern ones, which thus differ in efficiency and price. A dilemma arises whether to optimise costs in the short term, i.e. minimise direct costs without taking into account the escalation of indirect costs, or whether to streamline costs in the long run and minimise indirect costs all while incurring higher direct costs. What is more important: current costs of treatment at the expense of health, economic and social losses, or health and the economy at the expense of higher current expenditures. The problem

thus worded allows for formulating a question regarding the possibility of merging the Ministry of Health with the Ministry of Family, Labour and Social Policy so that one decision-maker determines the relationship between indirect and direct costs. Also, this creates space for cooperation with the Ministry of National Education, the Ministry of Sport and Tourism and, above all, the Ministry of Finance. The range of functions of the listed ministries gives rise to a virtually unrestricted interpenetration of decisions of the private and public sector entities that influence, among others, the lifestyle, social and economic determinants of health status affecting the size and growth of GDP. At the same time, economic development is one of the factors determining the state of health of the society.

Looking at the direct costs incurred in Poland by the public payer, a question may be posed whether they can be separated from the private sector, which is the source of contributions paid by the majority of the society for the financing of health care. On the other hand, indirect costs caused by illnesses, i.e. a personal factor, affect the level of GDP and its growth, translating in turn into the quality of life, including the health status, of every human being. The impacts of the public and private sectors interpenetrate one another. Each sector has its role to play, but can they be distinctly separated from one another?

3. Public Finances

Diseases and their treatment affect also public finances, as lost GDP implies lower disposable income of households of sick persons and their informal caregivers, which leads to the reduction of revenues from personal and corporate income taxes, and from direct taxes, i.e. VAT and the excise duty. In 2014 alone, as a result of diseases such as cervical cancer, breast cancer and ovarian cancer, the state budget did not receive tax revenues amounting to PLN 745,454,700 (Nojszewska, 2016, pp. 129–133). Since social insurance contributions, including health insurance, depend on the amount of income, a smaller stream of money for social transfers is channelled to the budget. In the same year, the amount of unpaid social insurance contributions stood at PLN 584,026,900, including health insurance – PLN 165,187,200 (Nojszewska, 2016, pp. 129–133). On the other hand, budget expenditures on patients' needs paid out in the form of social benefits go up. Again in 2014, due to the analysed diseases, PLN 311,744,200 was expended from the budget on pensions, sickness benefits, rehabilitation benefits, medical rehabilitation and social pensions (Nojszewska, 2016, pp. 129–133). It should be remembered that these transfers represent a stream of money flowing between entities (Jo, 2014, p. 334; Saha & Gerdtham, p. 3). Tax revenues and expenditures on benefits have a bearing on the budget deficit, which affects the economy by influencing the economic balance and economic growth.

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The volume of public sector revenues and spending depends on the size of income of individuals, households and enterprises, i.e. the private sector. The effects of this relationship create conditions for economic growth, for example through the impact of the budget deficit, as well as the health status of employees. Individual actions take place in both public and private sectors, but no demarcation line can be drawn between them.

4. Deadweight Loss

The most important criterion for assessing health policy from the economic point of view is efficiency. The tool used to measure the scale of inefficiency and the value of projects implemented by the state is the consumer and producer surplus (Stiglitz, 2004, chapter 5). The lion's share of health care is financed by the public sector, whose resources primarily come from contributions, i.e. tax-like charges and taxes.[3] (Generally, it can be concluded that there are the following sources of money for the government: tax increases, limiting expenditures on other projects within the budget, increasing money supply by the National Bank of Poland, taking domestic and foreign loans, with the increase of taxes still necessary to repay the principal and interest). It should be emphasised that the accumulation of income entails the necessity to incur various types of costs, such as the costs of tax collection or compliance with the law. Furthermore, consumers and producers are forced to change their decisions regarding their on-going and planned operations, which is accompanied by a loss of social surplus made up of consumer surplus, producer surplus and externalities. Hence, a deadweight loss, being a measure of tax inefficiency, arises. The efficiency of raising revenues, above all tax revenues, can be determined thanks to METB (marginal excess tax burden) (Robertson, 2007). This is the ratio of a deadweight loss arising from tax to tax revenues received. METB can be interpreted as a form of "shadow pricing" in order to take into account in the process of making economic decisions the consequences of the implemented project such as, for example, social benefit or direct financing from the state budget in the case of health care. If METB equals PLN 1.30, it means that PLN 1 of tax revenues imposes a cost of PLN 1.30 on the economy.[4] The most important factors affecting estimated METB values are: tax type, tax rate, flexibility of labour supply in relation to changes in the real tax rate after tax.

For instance, for New Zealand, METB = 20% is assumed in calculations regarding planned government projects as the standard deadweight loss caused by the tax on labour income (New Zealand Treasury, 2005, p. 18). In contrast, for analogous calculations in Australia, METB = 25% is adopted in relation to general taxation (Campbell, 1997, pp. 231–36). The calculations made for Australia and New Zealand for individual types of taxes show

that METB can reach up to 92% (New Zealand Treasury, 2005, p. 18; Campbell, 1997, pp. 231–36).

In addition, administrative costs of tax collection, accounting for 1.25% of tax revenues in Australia, need to be factored in. Furthermore, the distorting impact of taxes on labour and consumption was estimated at 27.5% of each dollar of tax revenues. Thus, the deadweight loss accounts for 28.7% of the value of lost tax (Campbell, 1997, pp. 231–36).

Taxes and transfers (e.g. disability pensions) do not constitute real economic costs as they are payment flows between units, and therefore they do not represent the net use of resources. However, the cost of raising revenues to finance transfers does not equal zero because taxes reduce the efficiency of employing economic resources. For example, an increase in the income tax rate leads to an increase in the relative price of labour in relation to free time and constitutes a disincentive to work.[5] Consequently, consumer and producer surplus declines, i.e. a deadweight loss arises.

Taxes impose a deadweight loss as they distort spending decisions and incentives to work, save and invest, leading to the reallocation of resources away from their most productive applications (Bates, 2001). The size of this loss depends on: the tax rate and substitution possibilities in consumption and production, i.e. the elasticity of demand and supply. The deadweight loss differs for individual taxes even if they provide the same tax revenues. Even if the demand and supply elasticities are relatively low, the deadweight loss becomes significant when the tax rate goes up. For example, if an average deadweight loss is 5% (5 cents per dollar of tax revenues) with a tax rate of 10%, the marginal loss is 10% (additional 10 cents per every dollar of tax revenues). With the same elasticities, the marginal deadweight loss rises to 37.5% for a tax rate of 30%, and goes up to 83.3% for a rate of 50%. As regards the personal income tax in the USA, the calculations show that the average deadweight loss is 32%, and the marginal deadweight loss equals 78% (Feldstein, 1999, pp. 676–677).

In the case of the deadweight loss, the interpenetration of causes and effects as well as microeconomic and macroeconomic mechanisms is particularly conspicuous. This is reflected in the interpenetration of impacts between the public and private sectors. The entities and institutions concerned are explicitly assigned to the sectors, but the transmission mechanisms and mutual interactions make it impossible to delimit the two sectors.

5. Loss of Well-Being

In addition to direct and indirect costs as well as effects on public finances, diseases and their treatment affect the patients themselves, leading to a deterioration of the quality of their life. Calculations to value the deterioration of the quality of life in monetary terms are made in few

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countries. The calculated value of loss of well-being caused by diabetic macular edema (DME) in Australia can serve as an example (Deloitte, 2015, p. 34). For this purpose, the methodology proposed by WHO (2008) was used. This method does not use the monetary valuation of pain, suffering and premature death, but relies on DALYs (Disability Adjusted Life Years) and assigns a monetary value to them in the next step.

In the DALY tool concept, the total disease burden is measured by the sum of mortality and morbidity (Murray & Lopez, 1996). The structure of this measure consists of two elements: YLD (Years Lost due to Disability) and YLL (Years of Life Lost to premature death). Summing up DALYs for all DME patients allows for arriving at the total DME burden for the society and the economy.

For Australia, the calculated DALY value for all DME patients was 7,720 years in 2015. Since the unit of measure is years, the result cannot be compared with indirect and direct costs or the deadweight loss. In order to assign a monetary value to DALY, the number of years should be multiplied by VSLY (Value of Statistical Life Year) in perfect health. The VSLY measure shows how much the society is ready to pay to curb the risk of premature death, expressed in terms of saving a statistical year of life. In countries where VSLY was estimated, different values were obtained for both VSL (Value of Statistical Life) and VSLY (Viscusi & Aldy, 2003, pp. 5–76; Access Economics, 2008). In Australia, the calculations were made by the Office of Best Practice Regulation; the Office determined the value of VSLY at $151,000 in 2007 dollars. This corresponds to $187,235 in 2015 value, after accounting for inflation. Taking the above results into account, the value of 7,720 DALYs in 2015 amounts to $1,445.5 million in 2015. Needless to say, it is not a direct cost for the economy. It is the value of a loss in the human capital resource for the society and the economy because it is human capital that is the most important factor of economic growth in developed countries.

It has again proved that the state of health, which is the most important factor of the quality of life of every human being, affects GDP and public finances, which makes it difficult to explicitly set the boundary between the sectors.

6. The Impact on Economic Growth and Development

The effects of the disease and its treatment on the economy and the society have been researched extensively for a relatively short period of time because in the second half of the 20th century the growth rate of health expenditures outpaced the GDP growth rate (Park, Braun, Carrin & Evans, 2007). Since health and education constitute human capital, which is the most important factor of economic growth (Becker, 1962, pp. 9–49), the impact of health on growth and economic development has become

the subject of many analyses. Quantitative studies confirm that health has a positive and statistically significant effect on economic growth – extension of life expectancy by five years leads to a 4% increase in production (Bloom, Canning & Sevilla, 2004). Many analyses have been carried out by, among others, the World Bank (World Bank, 1980), explicitly confirming the existence of such dependence (Suhrcke, McKee, Sauto Arce, Tsolova & Mortensen, 2005), because the results showed a positive and significant effect of health measured by life expectancy and adult mortality on the rate of economic growth. For example, extension of life expectancy by 5 years leads to 0.3–0.5% rise in the annual GDP growth rate (Zamora, 2000). Robert Fogel made a quantitative analysis of the impact of health on economic development in 1780–1980 and found that the improvement of human health and diet contributed to about 30% increase in income in the United Kingdom, which translated into an approx. 1.5% per capita rise per annum in the analysed period (Fogel, 1994, pp. 369–395). The interaction between health and economic growth is bidirectional because health supports economic growth and, at the same time, healthy life is possible thanks to the economic development. Underinvestment in public goods and well-being and the existence of inequalities in the standard of living lead to a greater diversification of the state of health and at the same time slows down the economy (Fiscella & Franks, 1997, pp. 1724–1727). On the other hand, the influence of socio-economic factors, such as education and income, differentiates the state of health among social groups and territories, resulting in uneven economic development (Nojszewska, 2016a, pp. 59–74). The direct effect of health care on the economy and its development can also be taken into account. EU data show that the share of health care production in the EU-15 economies reaches 7% of GDP, health care employees account for 8.8% of all EU-15 workforce, and the contribution of the financial sector and retail trade exceeds 5% (O'Mahony & Van Ark, 2003).

The size of the public sector and public finances depends on the condition of enterprises and households forming the private sector.

7. Conclusions

The submitted paper examined the effect of diseases and their treatment on the economy and the society and attempted to determine the processes taking place between the public and private sectors. Diseases, their treatment and consequences affect the economy and the society by means of complicated transmission mechanisms. The ones that are most often analysed include the generation of direct and indirect costs, as well as the impact on the state of public finances. Owing to demographic and epidemiological factors as well as budgetary constraints encountered by health care in many countries, such as Australia or New Zealand, additional tools are used to determine the effects in monetary terms, such as the

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deadweight loss and the loss of well-being as a result of diseases. The impact of health on economic growth cannot be overlooked. In case of each of these measures or methods, the interaction between the public and private sectors proves so multifaceted and complex that it is impossible to draw a clear dividing line between these sectors.

Endnotes

1 To learn more about direct costs see EY, 2013, p. 10.

2 In Poland, individual analysts also use slightly different calculation methods, as evidenced by their publications, for example: INFARMA, 2014; EY, 2013; Smaga, Mikułowska, Komorowska, Falkiewicz & Gryglewicz, 2014; Władysiuk, Hałdaś, Bebrysz, Fedyna & Rutkowski, 2015, pp. 145–206.

3 Since 1999, primary health care, outpatient specialist health care and inpatient services contracted by the National Health Fund have been financed from the public health insurance. The state budget finances: specialist medical procedures, drug policy programmes, emergency medical services, public blood service, sanitary inspections and part of health insurance contributions for people who do not receive income. Local government units finance the organisation of health care at the local and regional level, including: infrastructural investments and transformations, covering debts and continued financing of Independent Public Health Care Centres that generate losses.

4 The value of this cost can be determined for all the tools of revenue collection by the state including, for example, the issue of Treasury bills..

5 An increase in the tax rate reduces pay after tax (price of free time) and makes additional free time more attractive. Of course, lower pay after tax brings down disposable income, which renders free time less attractive. The substitution and income effects work in opposite directions, but it turns out that, in the economy, lowering pay after tax limits the supply of labour.

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