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Financing Cancer Control Programs in European Countries: A Comparative Analysis

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Abstract:

Purpose: *This article aims to analyze the level of financing of cancer control programs in European Union countries. There is a rationale behind selecting this particular research topic. Firstly, cancer is one of the leading causes of death in Europe. Moreover, cancer concerns affected individuals and national healthcare systems, welfare systems, national budgets, and economic efficiency and growth.*
Design/Methodology/Approach: *This article analyses literature on national cancer control programs in Europe. The source materials used in this article include websites of the European Commission and the national cancer control programs of selected countries (Belgium, the UK, Estonia, France, Lithuania, the Netherlands, Northern Ireland, Norway), as well as reports and studies compiled by research institutes, cancer societies, and peer-reviewed journals. This article analyses the level of direct cancer-related expenditure in European Union countries defined for this research as expenditures within the health care system. Graphical and tabular methods were used to present the estimated expenditures.*
Findings: *The conducted comparative analysis of direct cancer-related expenditure showed a significant variation between countries, which is indicative of the necessity of creating national cancer control programs which have their budgets and correspond to the specificity of a given country, enabling not only their monitoring in terms of medical, epidemiological and economic effectiveness and efficiency.*
Practical implications: *Although most European countries have cancer control programs, many of them lack or insufficiently address resource allocation, management, evaluation of the quality of outcomes, and financing, which are the critical elements for the efficiency of a health system and the effectiveness of each such program.*
Originality/Value: *The issues presented in this article regarding the level of financing of cancer control programs and their components may constitute an argument in a discussion on the need to improve the quality of such programs.*

Keywords: *Health care financing, health programs, cancer spending*.

JEL classification: *H51, I15, I18.*
Paper Type: *Research article.*

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1. Introduction

Neoplastic diseases, also referred to as "cancer," are a common and severe public health problem, causing over half of all deaths among patients. Cancer is among the leading causes of all deaths in the global population. It is now the third leading cause of death (12.62%), outranked by cardiovascular diseases (29.03%) and infectious diseases (16.19%) (Boyle and Levin, 2008). According to the World Health Organisation (WHO, 2008), in 2008, there were 12.4 million new cancer cases, 7.6 million deaths worldwide, and approximately 28 million people living with active cancer. According to WHO, by 2030, the number of new cases could rise to 27 million per year, the number of deaths will remain at 17 million, and there will be 75 million people living within five years of a cancer diagnosis. The reasons for the global increase in the number of patients with malignant tumours include primarily the following:

- Aging of the world's growing population, in 2000, there were about 6.1 billion people globally, in 2008 there were already about 6.7 billion. In recent years, a significant proportion of the population reaches the seventh, eighth, and ninth decade of life, which is the age at which cancer and cardiovascular diseases are the leading causes of death. The older population is generally at a higher risk of developing cancer. It is estimated that by 2030 the world's population will reach 8.3 billion, with the proportion of people over 65 years of age increasing from the current 5.3% to 9.8% in developing countries and from 14.6% to 22.6% in developed countries.
- Better diagnostics, imaging diagnostics (ultrasound, CT, MR) and nuclear medicine (PET), as well as genetic methods, are developing, which allows for improved cancer diagnosis.
- Increased exposure to carcinogens and persistence of negative behavior conducive to the development of cancer: the International Agency for Research on Cancer (IARC) included 99 agents (chemical and physical agents, groups of agents and mixtures) in group 1 (carcinogenic to humans).

Cancer is considered one of the leading causes of premature death in EU countries. It is the second most common cause of death, outranked only by cardiovascular diseases. In 2013, 26% of all deaths were attributable to cancer. In 2020, 2.7 million people in the European Union were diagnosed with cancer, and 1.3 million people died. By 2035, the number of cancer cases is expected to rise by almost 25%. These data suggest that the European Union must intensify its efforts to combat cancer by implementing specific political strategies.

Given that cancer concerns the affected individuals and national health systems and welfare systems, national budgets, and economic efficiency and growth, cancer control activities, usually in the form of structured strategies and programs, have been undertaken in many European countries for years.

2. Literature Review

As early as the 1980s, the European Union identified combating cancer as one of the most critical challenges for the well-being of Europeans. The European Code Against Cancer (European Cancer Leagues), developed in 1986, was an essential tool in the fight against cancer (Zatoński, 2010). Provisions on the fight against cancer were included in the Maastricht Treaty, and thanks to Europe Against Cancer program, it is estimated that the death rate on the old continent decreased by 10%.

The main objectives of the measures taken to combat cancer specified in the above documents are the following:

- primary prevention (discouraging smoking and excessive alcohol consumption, promoting a diet low in animal fats and rich in vegetables and fruit),
- mass preventive examinations, particularly screening for early stages of breast, cervical, as well as colon, rectal, and prostate cancer,
- accessibility of early diagnostic methods,
- widespread dissemination of scientifically proven methods of effective treatment,
- accessibility of palliative and terminal care (in the last phase of cancer).

In addition to the priority objectives enumerated above, EU experts recognize the need for national programs, including issues closely related to local realities (late diagnosis, lack of quick and universal access to standard specialized diagnostic methods, and standard combination therapies).

It should be noted that the USA, where the National Cancer Act was introduced in 1971, was the world's pioneer in the development and implementation of a national cancer control program. Europe followed suit almost three decades later. In 1995, initial efforts to adopt a national cancer control program were made in the UK, which resulted in publishing the so-called Calman-Hin report entitled "A policy framework for commissioning cancer services." A report by the expert advisory group on cancer to the chief medical officers of England and Wales. Following this report, the first NHS Cancer plan, an investment plan, a reform plan was announced in 2000. The current plan, Improving Cancer Outcomes is a Strategy for Cancer launched in 2011. The Charter of Paris Against Cancer was signed in France in the year 2000, resulting in the announcement of the National Cancer Plan, which revolutionized the French health care system for cancer patients. In 2014, its third version was announced. Denmark was introducing its cancer care reforms simultaneously as the UK and France, also announcing its first cancer plan in 2000, revised and supplemented in 2005 (http://www.walkazrakiem.pl/strategie-europejskie).

Currently, the European Partnership for Action Against Cancer (http://www.epaac.eu/), established by the European Commission in 2009,

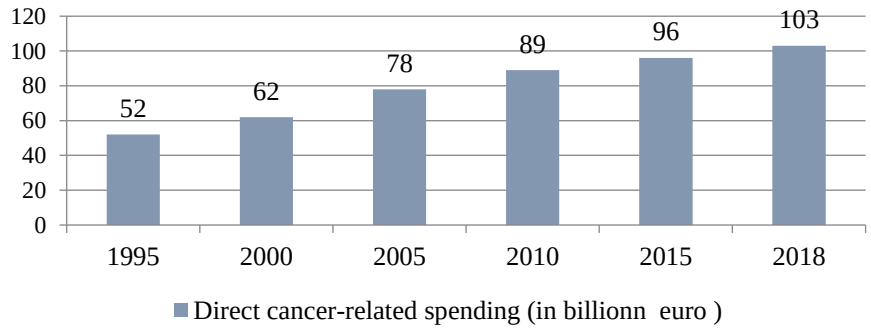
recommended that each EU member state should have developed its comprehensive cancer control program by the end of 2013.

In 2012, there were only 5 European countries without their cancer control program. In 24 countries, such projects were being implemented, with significant differences between them. Their scope and systemic nature varied to a large extent. Many of them lack or insufficiently address resource allocation, management, evaluation of the quality of outcomes, and financing, which are the critical elements for the functioning of the health system and the effectiveness of each such program.

3. Findings and Discussion

The level of expenditure on health care, in particular on cancer control, translates into the availability of cancer treatment. Comparative analyses of cancer treatment costs across Europe are carried out by Swedish researchers from the Karolinska Institute in cooperation with the Stockholm School of Economics. According to their estimates, total cancer-related expenditure amounted to EUR 52 billion in 1995 and increased to EUR 103 billion, i.e., by 98%, in 2018 (Figure 1).

Figure 1. *Direct cancer-related expenditure in Europe in the years 1995-2018*



Source: *Own compilation based on Hofmarcher, Lindgren, Wilking, Jonsson (2020: 46).*

It should be noted that throughout the period specified above, the percentage of cancer-related expenditure in total health care expenditure in Europe increased from 5.9% in 1995 to 6.2% in 2018.

Spending on health care, in particular on cancer control, varies considerably across countries (Table 1). Large differences in resources available for treatment between countries translate into huge inequalities in access to treatment. Although cancer entails a significant economic burden on society, few countries estimate how high these costs are. For a large part of the countries listed in Table 1, an estimated share determined since geographical proximity and similarity in gross domestic product (GDP) per capita is therefore provided. Conducted analyses show that the highest direct cancer-related spending per capita concerns the "old" EU countries, i.e.,

countries with a higher level of economic development than the "new" EU countries. Greece and Portugal were the exceptions with spending per capita of 88 and 96 euros, respectively. In Central and Eastern Europe, except the Czech Republic and Slovenia, cancer-related spending was much lower.

Table 1. *Direct oncology expenditure in European Union countries in 2018.*

Country	Direct cancer-related spending (in million euro/PPS)	Share of cancer-related spending in spending on health (in %)	Direct cancer-related spending per capita (in euro/PPS)
Old EU member states (EU 15)			
Austria	2 553	6.4*	289
Belgium	3,240	6.9*	284
Denmark	1,499	4.8	259
Finland	844	4.0	153
France	18,707	7.1	278
Greece	942	6.5	88
Spain	5,245	4.9	112
The Netherlands	5,309	6.9	308
Ireland	1,139	5.0*	234
Luxembourg	221	6.9*	363
Germany	25,537	6.8	308
Portugal	991	5.4	96
Sweden	1,907	3.7	187
Great Britain	11,691	5.0	176
Italy	10,374	6.7	172
New EU member states			
Bulgaria	320	7.1*	45
Croatia	249	6,8*	61
Cyprus	90	6.3	103
Czech Republic	1,084	7.0	102
Estonia	96	5.8	73
Lithuania	196	6.4*	70
Latvia	111	6.4*	57
Malta	74	6.5*	155
Poland	2,185	7.0	57
Romania	712	7.1*	36
Slovakia	428	7.1*	79
Slovenia	234	6.4	113
Hungary	618	7.1	63
Europe	**102,607**	**6.2**	**195**

Note: **Estimated share based on geographical proximity and similarity in gross domestic product (GDP) per capita*

Source: *Own compilation based on Hofmarcher, Lindgren, Wilking, Jonsson (2020, 44-45).*

As presented in Table 1, the resources allocated to treating cancer patients in Europe in 2018 were estimated at EUR 195 per capita, increasing 31.7% from €148 in 2007.

However, the dynamics of changes in the level of spending per capita varied considerably between countries (Table 2).

Table 2. *Changes in the level of direct cancer-related spending per capita in European Union countries between 2007 and 2018.*

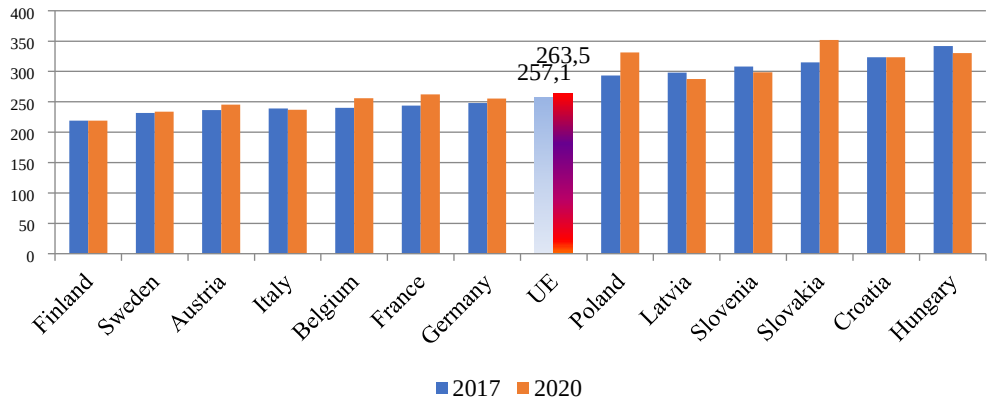
Country	Direct cancer-related spending per capita (in EUR/PPS)		**Change (%)**
	2007	**2018**	
Austria	207	289	39.6
Belgium	181	284	59.9
Denmark	185	259	40.0
Finland	95	153	61.0
France	205	278	35.6
Greece	185	88	-52.4
Spain	141	112	-20.5
The Netherlands	170	308	81.2
Ireland	193	234	21.2
Luxembourg	342	363	6.1
Germany	216	308	42.6
Portugal	122	96	-21.3
Sweden	207	187	-9.7
Great Britain	132	176	33.3
Italy	144	172	19.4
Bulgaria	29	45	55.2
Croatia	no data	61	no data
Cyprus	no data	103	no data
Czech Republic	92	102	10.9
Estonia	36	73	102.7
Lithuania	35	70	100.0
Latvia	37	57	54.0
Malta	no data	155	no data
Poland	41	57	39.0
Romania	22	36	63.0
Slovakia	48	79	64.6
Slovenia	75	113	50.7
Hungary	61	63	3.3
Europe	**148**	**195**	**31.7**

Source: *Own compilation based on Wilking, Jonsson, Hogberg (2009, p. 11); Hofmarcher, Lindgren, Wilking, Jonsson (2020: 44-45).*

Between 2007 and 2018, an upward trend in cancer-related spending was noticed in the vast majority of the countries (except for Greece, Spain, Portugal, and Sweden). In general, for more than ten years, the situation did not change visibly, i.e., countries with high cancer-related spending allocate even more, and the increase in spending in Central and Eastern Europe (even over 100% as in the case of Estonia and Lithuania) does not change the disparity in the level of cancer control financing between particular countries.

The development of the epidemiological situation measured by cancer mortality and CEE countries' trends is not favorable (Figure 2). Most people die of cancer in Hungary, Croatia, Slovakia, and Slovenia. Mortality rates in Latvia and Poland were also very similar. In the "old" EU countries, mortality rates are below the EU average. The figures for 2020 for both the EU average and most individual countries are increasingly high, which is partly attributable to the pandemic. The COVID-19 pandemic had a significant impact on the entire cancer care pathway. It disrupted cancer treatment, delayed screening, and affected access to medicines.

Figure 2. *Total cancer mortality in selected countries in the years 2017-2020 (Standardised death rate by 100 000 inhabitants)*



Source: *Own compilation based on ECIS (European Cancer Information System) https://ecis.jrc.ec.europa.eu.*

The dynamic increase in cancer incidence and mortality is mainly attributed to the progressive aging of the population. Age is a significant risk factor for many types of cancer, but other factors, such as lifestyle and environmental pollution, are also of importance. Assessing the effectiveness of interventions in individual countries solely based on mortality rates would be an oversimplification. In European countries, three coefficients are considered the metrics of health interventions' effectiveness at the population level: incidence, mortality, and 5-year survival rates (Hofmarcher, Gunnar, and Brådvik, 2019). Therefore, only in-depth analyses covering all the indicators mentioned above, individual types of cancer, and the population's age structure can provide a basis for evaluating cancer control measures.

The main reason for such disparity in the level of financing of cancer-related activities between the countries is the variation in health expenditure in Europe, which results from differences in the level of economic development measured by gross domestic product per capita. A significant relationship has been established based on numerous comparative studies of the resources allocated to health care in various countries, i.e., the level of such expenditure depends on the country's level of wealth. This makes it

even more important, as mentioned earlier, to develop and implement national cancer programs which would include issues closely related to the realities of a given country.

Comparative studies on the financing of cancer programs usually cover treatment and prevention. Focusing solely on cancer prevention is currently a difficult task. This is due to the quality of information collected in individual countries, whose scope varies, as indicated in the conducted analysis of national cancer plans in selected countries. The following countries were analyzed: Belgium, United Kingdom, Estonia, France, Lithuania, the Netherlands, Northern Ireland, and Norway. For all the analyzed countries, data on the sources of financing, planning, and implementation of cancer strategies were specified at the macro level. Only Belgium, the United Kingdom, and France estimated the total budget for implementing the planned actions under their programs. In Belgium, 380 million euros were allocated for the period 2008-2010. The United Kingdom allocated approximately 4.4 billion pounds per year to cancer treatment (without specifying the amounts for particular measures), while in France, the amount was 640 million euros (for 2007 in addition to funds already used for cancer treatment). The Netherlands indicated the amount of annual financing (1.5 billion euros) without defining any specific actions. These amounts cover different periods and a different range of activities, which makes comparisons very difficult.

Lack of budgets for cancer control plans, including prevention activities, is a cause for concern in many countries, suggesting that a significant proportion of these plans will be deprived of the pillars enabling them to achieve their objectives, some of which are very ambitious.

Detailed analysis of the countries revealed many common elements in the national plans, primarily in terms of the general areas of activity. Primary prevention, screening, treatment, and palliative care services constituted the critical areas of focus for all the countries. However, the specific fields of action varied to a great extent. The differences between national programs may result from differences between European countries regarding cancer incidence and mortality (Berrino *et al.*, 2007) or the socio-economic, political, and cultural differences observed in plans for other emerging health problems. The diversity is also partly understandable given the general differences between health care systems and the fact that there are no in-depth studies examining measures taken to combat cancer to facilitate comparisons.

Sources of financing amounts necessary to implement cancer control programs and to meet current and future demand for cancer treatment, and the areas to which these funds will be allocated must be specified for all actions. In more than half of the countries surveyed (Estonia, France, Lithuania, the Netherlands, Northern Ireland, and Norway), it was not specified how much money would be allocated, which elements, and why. Moreover, as already mentioned, only Belgium, the UK, and France estimated additional funds needed to implement the planned measures.

4. Conclusion

The conducted comparative analysis of direct cancer-related spending showed a significant variation across countries, which is indicative of the necessity of creating national cancer control programs which have their budget and correspond to the specificity of a given country, enabling not only their monitoring in terms of medical, epidemiological, and economic effectiveness and efficiency. The majority of European countries have developed and implemented cancer control programs; however, many of them lack, or insufficiently address, resource allocation, management, assessment of the quality of outcomes, and financing, which are the critical elements for the functioning of the health system and the effectiveness of each such program.

As mentioned before, the significant disparities in the level of financing of cancer-related activities across countries are due, among other things, to differences in the level of economic development. The current financial situation will further exacerbate this problem. The anticipated increase in the unemployment rate and growing deficits in the absence of new resources will make policymakers reluctant to authorize further spending.

Thus far, measures taken by the EU have been an essential source of standards and additional financing for national cancer plans. The fight against cancer remains one of the main priorities of the European Commission in the field of health. In her political guidelines, European Commission President Ursula von der Leyen announced that she would propose a "European cancer control plan to help member states improve cancer prevention and treatment." It will be related to other priorities of the new Commission. It is also supported by Members of the European Parliament, member states, and stakeholders working with the Commission to improve cancer prevention and care in Europe. Public consultations were launched in 2020, and Europe's Beating Cancer Plan was presented on 3 February 2021, showing a new approach to cancer prevention, treatment, and care by maximizing the potential of new technologies.

Furthermore, it was declared that it would include financial instruments to support member states. However, in the current situation, the European Commission's priority is to coordinate a typical European response to the COVID-19 pandemic. Action has already been taken to strengthen the public health sector and mitigate the socio-economic impact of the novel coronavirus in the EU by mobilizing resources to help member states coordinate measures taken on a domestic level. This is in line with the expectations of member states but may limit the allocation of resources to other health objectives in the longer term. Therefore, proponents of cancer control measures must emphasize even more strongly than before both the effectiveness and the necessity of taking appropriate action to combat the disease.

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