FORECASTING THE RISE IN DIRECT AND INDIRECT COSTS FOR LUNG CANCER ON THE EXAMPLE OF POLAND

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OBJECTIVES

Lung cancer is one of the most common malignancies in Poland, ranking second only to breast cancer in women and prostate cancer in men. Unfortunately, forecasts for the coming years indicate a continued increase in both incidence and mortality from this disease[1,2]. The aim of this study was to assess the economic burden of lung cancer in Poland in 2040, including both direct healthcare expenditures and indirect costs.

METHODS

The analysis utilized a cost of illness approach, integrating data from national databases (National Health Fund, Social Insurance Institution)[3-5]. Direct costs included public expenditures on lung cancer treatment, particularly in drugs and hospital services. Indirect costs, related to productivity loss due to morbidity and premature death, were calculated using the human capital method. Additional patient-level costs, such as travel and caregiving, were derived from a survey of 120 lung cancer patients[5]. Estimations initially made in Polish złoty (PLN) and then converted to Euro using the 2023 exchange rate (€1 = PLN 4.54). A linear trend was selected for population forecasting, as it had a high R^2 coefficient. The cost growth forecast (Figure 1) was based on the inflation rate until 2040, assuming at least the coefficients published by the IMF (International Monetary Fund).

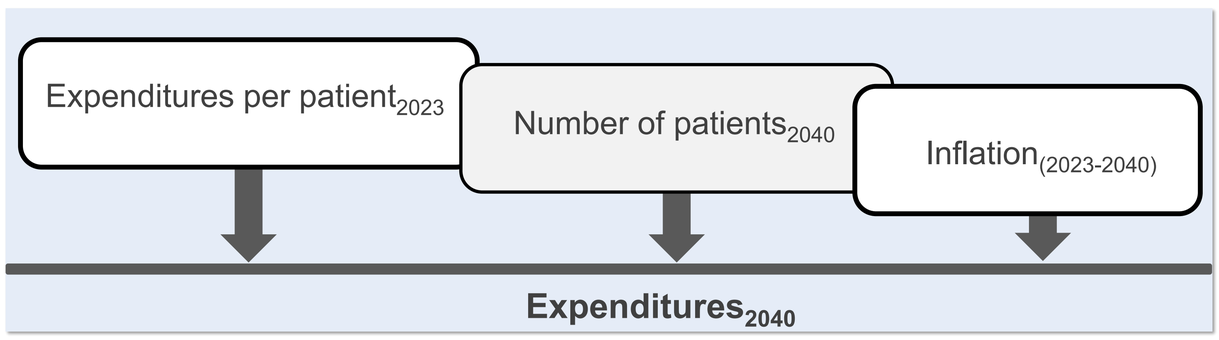

Figure 1. The expenditures growth forecast mode[5]

RESULTS

In 2040, the total projected expenditure related to lung cancer in Poland is estimated to reach €5.40 billion (Figure 2). Of this amount, €2.87 billion will be direct costs, including treatment and travel costs to healthcare facilities, while €2.52 billion will be indirect costs, mainly from absenteeism (patients' absence due to illness, premature deaths, and disabilities) and reduced household income. This represents a more than fivefold increase compared to the analyzed costs of illness in the base year 2023, which amounted to €1.05 billion (€0.56 billion direct costs and €0.49 billion indirect costs) (Table 1).

The presented indirect costs of lung cancer do not account for the value of lost productivity resulting from the reduction of unpaid work. Consequently, the reported indirect costs are underestimated, and the actual indirect costs may be higher.

Table 1. Costs of lung cancer in Poland in 2023 – summary[3-5]

	Area	Amount
Direct costs	Ambulatory Specialist Care, inpatient treatment, drugs, chemotherapy, radiotherapy, rehabilitation, palliative and hospice care – impacted National Health Fund	€494.3 million
	Costs of medical examinations and consultations to an oncologist, pulmonologist, cardiologist, dietitian, psychologist or pain management specialist – impacted patients	€28.8 million
	Travel costs to the treatment centre and additional costs related to the visit (cost of hiring care for children, accommodation or meals) – impacted patients	€35.7 million
	Totally: €558.8 million	
Indirect	Absenteeism, presenteeism, disability, informal care, premature deaths – impacted National Health Fund, Social Insurance Institution and national economy	€471.7 million
	Reduced household income – impacted patients and their families	€17.6 million
	Totally: €489.4 million	

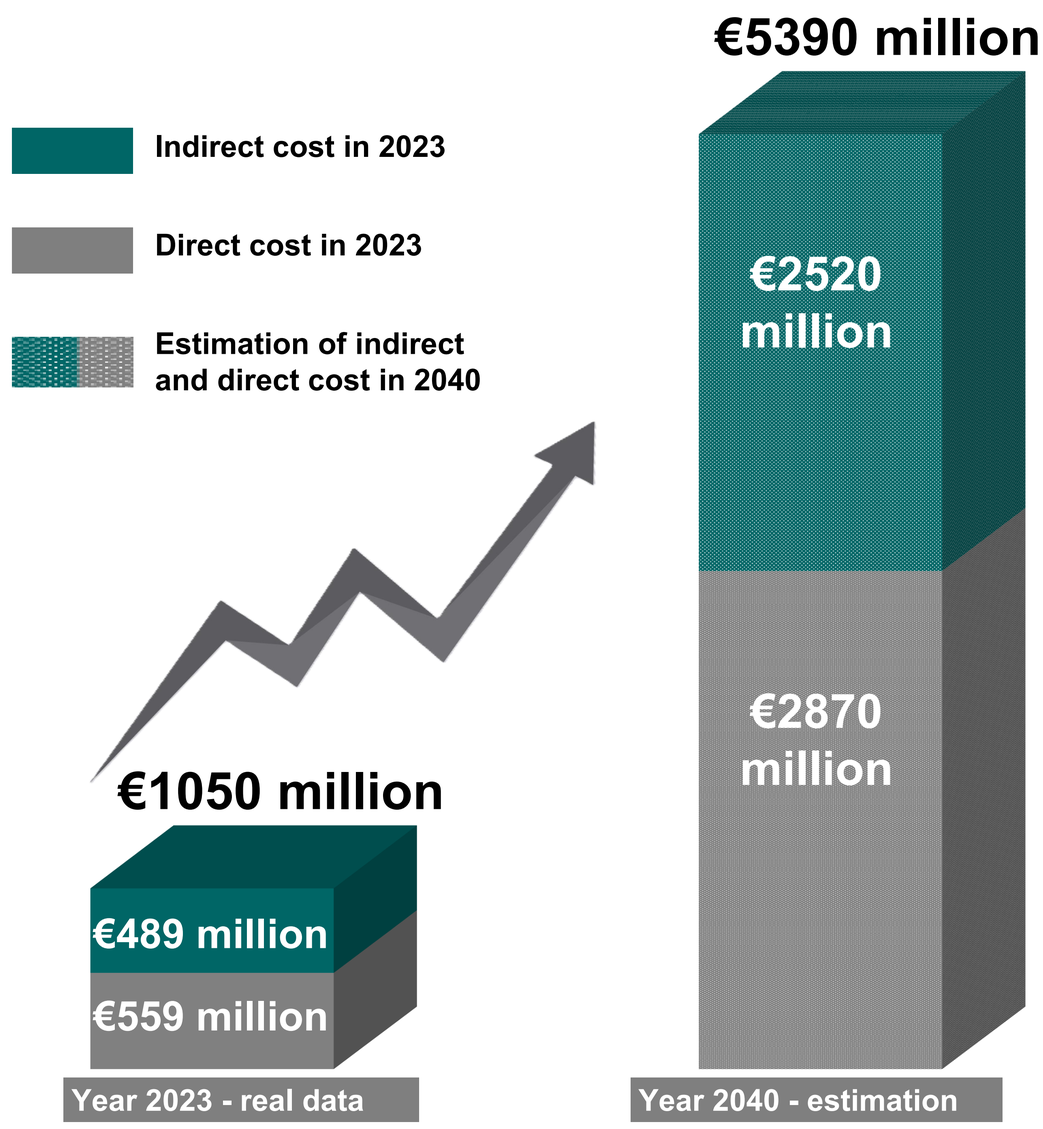

Figure 2. The total real and projected expenditure related to lung cancer in Poland, in € million

CONCLUSION

Lung cancer imposes a significant financial burden on the Polish healthcare system and society, with substantial contributions from both direct treatment costs and indirect productivity losses. These data can inform future health economic planning and prioritization of resources in oncology care, from a broader social perspective.

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