

Cancer and Economics: With a Special Focus on Cancer Drugs



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In 2008, the International Agency for Research on Cancer (IARC) estimated that there were more than 12 million new cancer cases diagnosed worldwide, and it is expected that 27 million new cases will be diagnosed in 2030 [1]. In 2007, cancer caused about 7.6 million deaths globally, which is ~ 13% of all human deaths [2].

Global pharmaceutical research and development expenditure is estimated to exceed \$90 billion (€68 billion) annually world-wide [3]. Developing new drugs is a lengthy and costly process. In the recent report of Adams and Brantner [4], they estimated the total development cost per new chemical entity to be €803 million (based on 2005 year value).

The annual direct medical costs for cancer care in Europe have been estimated at \$99 billion (€72 billion) by Wilking and Jönsson in 2007 [5]. The direct cost of cancer is estimated by calculating share of health expenditure for cancer. Direct costs of cancer per capita are presented with purchasing power parity (PPP) adjustment in Figure 1. The indirect costs are generally estimated to be more than the direct costs [6]; see Figure 2.

Disability adjusted life-years lost (DALYs)

Apart from the human suffering related to cancer, there is also an economic burden in terms of costs of treatment and loss of production when people are unable to work. The patients and their relatives also face an economic burden due to reduced income and costs related to formal and informal care, as well as adjustments to disability. The most common measure of the cancer burden is DALYs. This is a measure combining the burden of mortality and disability, which has been developed by the World Health Organisation (WHO) and the World Bank. One DALY represents one lost year of 'healthy' life and the burden of disease as a measurement of the gap between actual health status and an ideal situation where everyone lives into old age free of disease and disability [5]. Table 1 illustrates the loss of DALYs to cancer in different countries.

Use of cancer drugs

There are major variations in the use of oncology drugs. We present herein data for some European countries. France has the highest use, followed by Spain. Germany, Italy and Sweden have similar levels of use and the UK has by far the lowest use. This should be put in relation to the incidence and mortality in cancer (see previous chapter); the cancer incidence in Spain is ~30% lower than in the other countries in such a comparison

The role of health economics in market access for new oncology drugs

Decision makers in the healthcare sector need to balance a short-term need to keep within a limited budget with the economic benefits in the long-term of introducing and using new technologies.

The leading European countries in using health economic evidence as a basis for reimbursing new

drugs are the UK and Scandinavia. There is no parallel in the US to the European tendency to use health economic evidence for national guidance or control, and even if private health plans in the US make use of cost-effectiveness analysis, the decision-makers are still accountable to their members, which is not the case with a centralised decision-making system.

For countries with formal decision processes, the reimbursement decisions mostly include a negotiation on or setting of a fixed price. In the UK, the Pharmaceutical Price Regulation Scheme (PPRS) of the Department of Health controls company profits and can ask for price cuts and paybacks from companies.

In certain European countries (including Belgium, Finland, the Netherlands, Norway, and Sweden), there is a formalised decision-making process where economic evaluation and the issue of cost-effectiveness influence national reimbursement decisions, and the reimbursement decision process includes a discussion of the price and often the expected sales. In other countries, cost-effectiveness evidence is not a formalised part of reimbursement decisions [5].

Hospital budgets and patient access to drugs

Hospital budgets are more rigid than the budgets of ambulatory care, and it is necessary to plan several years in advance in order to make budgetary space for new treatment alternatives for inpatient care. Therefore, the ability of patients to access cancer drugs is highly dependent on the allocation of appropriate and adequate funding, and on the availability of financial resources within the healthcare systems.

Another issue for hospital budgets is the persistence of what has been called 'budget silos', which prevents the shift of money from one budget to another (at least, in the short term) [7]. The introduction of a new drug could increase hospital costs, but could also produce additional benefits to patients, as well as result in savings in ambulatory care, hospitalisation cost, and savings in social insurance payments.

In many countries, cancer drugs used in hospitals are immediately available once the marketing authorisation is granted. It should also be noted that the measure of patient delay, the formal reimbursement process for cancer drugs, is not applicable to all countries.

The role of health technology assessments

Health technology assessments (HTA) in Europe are increasing in importance and the public agencies responsible for HTA have been established in most countries. The use of HTAs varies greatly within Europe. In the Central and Eastern European countries, there is no tradition in the use of HTA and requirements of economic evidence in the formal reimbursement and pricing decisions. However, in recent years most of these countries have

Table 1. WHO estimated total DALYs per country for 2004

Country	All Causes	Cancer share of DALY's lost	Stomach share of all cancers	Colorectal share of all cancers	Lung share of all cancers	Breast share of all cancers	Prostate share of all cancers
Japan	12,997	18.5%	14.5%	14.2%	15.5%	6.5%	2.1%
US	41,372	12.3%	2.1%	10.7%	24.5%	12.0%	4.4%
France	7,434	18.2%	3.2%	11.1%	19.9%	10.7%	4.3%
Germany	10,358	16.9%	5.1%	13.1%	19.2%	11.3%	4.3%
Italy	6,575	18.3%	6.2%	11.4%	19.8%	10.2%	3.2%
Spain	4,858	16.7%	5.7%	13.2%	20.3%	8.6%	4.0%
Sweden	1,033	14.6%	3.8%	12.4%	15.2%	9.8%	7.7%
UK	7,718	15.6%	3.6%	11.5%	19.6%	12.2%	5.2%

Source: WHO Global burden of disease 2009.

established national HTA agencies.

Europe plays a major role in the production of HTA reports and economic evaluations. In particular, the UK is the leader in terms of the number of HTA reports produced, and of being the country for which a majority of economic evaluation studies are undertaken. This reflects the leading role the UK has taken in developing health economics in Europe and, in particular, the methodology of economic evaluation. In other European countries, HTA activity is at differing stages of development. Countries such as the Netherlands, Norway, and Sweden also have well established groups and economic evaluations have a certain influence on prescription patterns and treatment guidelines, although the groups differ in their sphere of activity, methods used, and relationship with government [8]. In particular in the UK, economic evaluations have played a very important role in the work by NICE, the All Wales Medicines Strategy Group and the Scottish Medicines Consortium. In France, Italy and Spain, health-economic evidence has a relatively low significance for decision-making in medical care in general, although in France, like Germany, economic evidence is seen as important in taking decisions on expensive innovative drugs. It is expected that the influence of health economic data will increase in these countries [8].

Another potential issue to consider with the quality-adjusted life years (QALYs) is the threshold value used to determine whether a drug is cost-effective. Different countries may use different QALY values, which are either published or recognised unofficially. For example, the Netherlands has an unofficial threshold cost per QALY gained of €18,000, while NICE's threshold cost is acknowledged to be £20,000-£30,000 per gained QALY. In the US, \$50,000/QALY gained is a figure that has been widely quoted as a cost-effectiveness ratio [9]. A different approach in setting cost-effectiveness thresholds proposed by the World Health Organisation [10] is that interventions costing less than three times GDP per capita for each DALY saved would be considered cost-effective.

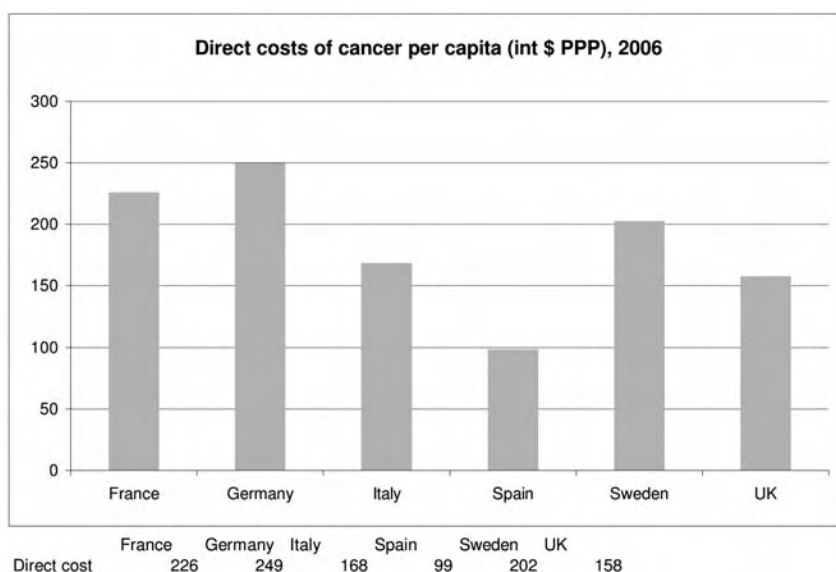


Figure 1: Direct costs of cancer per capita PPP in 2006.

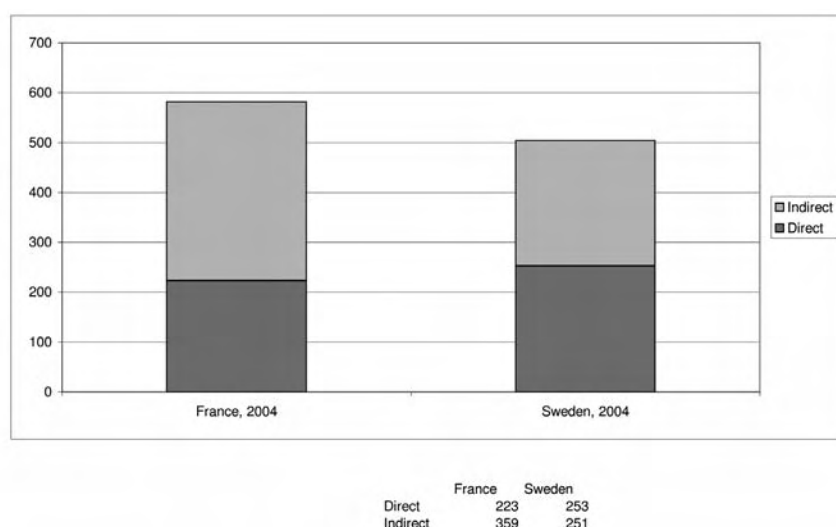


Figure 2: Direct and indirect costs for cancer in France and Sweden in 2004.

Since HTA is based on a common pool of scientific studies, there are possible advantages of collaboration over national borders, at least in the collection and assessment of available scientific information. It can be expected that different countries may draw different conclusions from the results. However, it is a safe prediction that there will be more

international cooperation in this field in the future.

Discussion

Although oncology drugs account for a minor part, 10-20%, of the total healthcare expenditures for cancer and represent 3-7% of total drug costs, they are an easily identified target for cost-containment

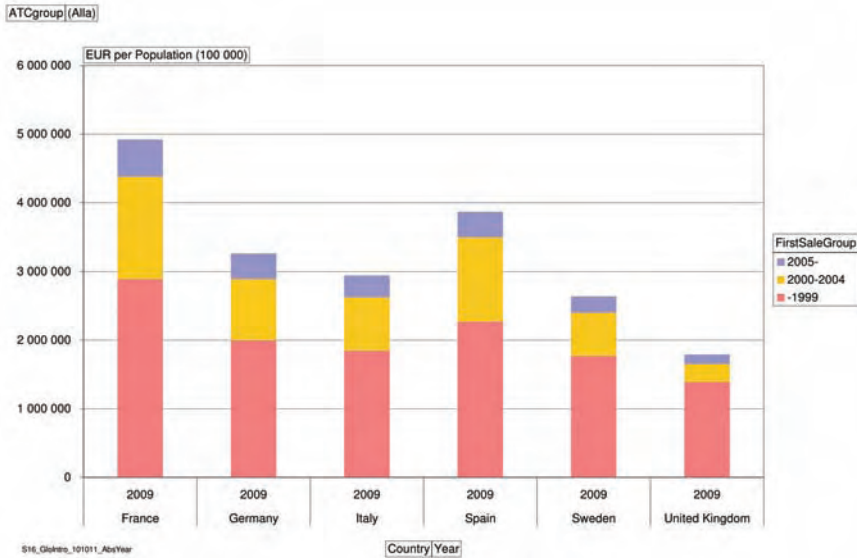


Figure 3: Sale of oncology drugs (Euros/100 000 inhabitants) in France, Germany, Italy, Spain, Sweden and the UK in 2009. Sales are subdivided according to first year of any global approval being before year 2000; between 2000-2004 and 2005 or later.

policies. Scarce resources and limited budgets are two of the most important hinderers to the use and uptake of new cost-effective drugs. It is therefore important to consider how healthcare systems and especially hospital budgets should be organised, to accommodate the introduction of new cancer drug therapies.

Increasingly stretched healthcare budgets are faced with growing needs and demands

of the population, leading to increasing use of cancer drugs. New drugs also bring higher costs than older drugs. The increased costs of cancer drugs creates a need for better clinical and economic evaluations for decision makers who are required to balance patients' needs within a limited budget. At the same time there is a need to balance short-term budget constraints and long-term savings from using cost-effective

treatment methods. Cancer patients are dependent on reimbursement and publicly funded healthcare that function well in allocating appropriate budgetary resources to existing and new drug therapies. ■

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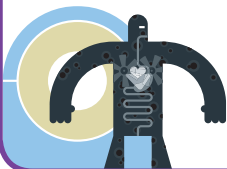
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