

Introduction

A.J. Culyer, B. Horisberger, B. Jönsson and F. Rutten

THE SOCIAL importance of cancer can scarcely be overrated. Despite great progress in recent decades, malignant diseases are far from overcome and cancer remains the number two killer in most industrialised countries, responsible for almost a quarter of all deaths in Europe, North America and Japan [1]. Physical suffering and psychological damage are widespread among sufferers and their families.

The economic importance of cancer is enormous, with some 5% of health care resources in industrialised countries devoted to its treatment and prevention. There are also major indirect costs, especially those due to premature death, which are much greater than in many other diseases [2].

In the past, however, little attention has been paid to the socio-economic dimensions of health care in general, or of cancer therapy in particular. Clinical considerations were paramount and there was an assumption that resources would be available to bring the benefits of technological and pharmaceutical innovation to all who could benefit from them. But with the escalating costs of health care, with increased demand from a better-informed population and with an increased need from an ageing one, resources everywhere have been stretched and spending constrained.

This scarcity of resources has led politicians, health care administrators and reimbursement agencies, as well as informed clinicians and opinion leaders, to subject medical practice—and particularly new and expensive therapeutic agents—to closer socio-economic scrutiny.

So far, studies on the economics of cancer and on the costs and benefits of different treatment modalities have been rare. This lack of interest in the socio-economic dimension can be explained in part by the rapid development of alternative treatments. As the possibilities of realistic alternatives grow, however, knowledge of costs as well as consequences is increasingly necessary so that rational choices can be made.

The burgeoning science of health economics has developed a number of techniques to evaluate the socio-economic parameters associated with health care procedures [5]. Some (cost–benefit and cost-minimisation analyses) seek to express costs and consequences in purely monetary terms, while others (cost-effectiveness analyses) incorporate non-monetary, but quantitative, effects such as lives saved or cases detected. The quality of lives saved may also be assessed through the concept of the quality-adjusted life year (QALY), computed from the views of people on different states of health. These are used in cost–utility analyses. Finally, in quality of life studies, the impact of one or more treatment alternatives on the social, physiological, mental,

intellectual and general well-being of patients is evaluated. All these techniques may be used in the assessment of cancer therapies and the impact of colony-stimulating factors.

Important discussions on the value of such evaluations, their limitations and the refinement of methods so that costs and consequences may be calculated more accurately, took place at the Fifth International Conference on System Science in Health Care held in Prague from June 29 to July 3, 1992, notably in two sessions on the Economics of Cancer and Economic Evaluation of Growth Factors in Cancer Therapy. The proceedings of these sessions are reported in this supplement.

Two years ago, an international Health Economics Advisory Panel (HEAP) was set up to advise industry on developing and coordinating research on socio-economic evaluation in the field of cancer, with particular emphasis on the assessment of growth factors. The purpose of the two special sessions in Prague was to describe the economic impact of malignant disease, to apply the methodology of socio-economic studies to the case of growth factors and to encourage researchers from different countries to communicate their results and to open an interdisciplinary, international dialogue in this field.

The need for a socio-economic perspective can be seen in sharp focus with the haematopoietic growth factors, achieved through progress in biomedical technology. One of their most important uses is in the prevention of febrile neutropenia, a common and life-threatening effect of myelosuppressive cancer chemotherapy. Febrile neutropenic events (FNEs) are a major limiting factor in the delivery of full-dose chemotherapy to schedule. They are also costly to treat.

Granulocyte colony-stimulating factor (G-CSF) and granulocyte–macrophage colony-stimulating factor (GM-CSF), through their capacity to reduce the incidence and duration of febrile neutropenia, open up a new window of opportunity in the treatment of cancer patients [3]. Their impact will considerably influence patient management (ability to complete full-dose chemotherapy cycles to timetable, reduction in neutropenic morbidity and mortality) and socio-economic outcome (reduced hospitalisation and use of antibiotics and of diagnostic and therapeutic facilities). Moreover, the patients' quality of life is likely to be remarkably improved by means of these achievements [4].

Of special interest to the practising oncologist were reports on studies of the adjunctive use of G-CSF in patients undergoing cancer chemotherapy for solid tumours and acute leukaemias. Such therapy is associated with a high risk of infections, as manifested by febrile neutropenia events (FNE), and the cost of treating one FNE ranged from some 2200 ECUs (European Currency Units) in England, to 4500 ECUs in Switzerland and 4800 ECUs in Finland.

Clinical trials have shown that G-CSF can reduce the incidence of infection, as manifested by FNE, by some 50%, bringing about major savings, notably in hospital costs and antibiotic use. Against this, of course, must be weighed the cost of the drug, but other surveys reported at the conference showed that this is considerably offset by the savings, and that in some instances there may be direct positive financial gains.

Correspondence to A.J. Culyer at the Department of Economics and Related Studies, University of York, Heslington, York YO1 5DD, U.K. B. Horisberger, is at the Interdisciplinary Research Centre for Public Health, Rorschacher Strasse 103c, CH9007 St. Gallen, Switzerland; B. Jönsson is at the Centre for Health Economics, Stockholm School of Economics, Box 6501, 113 83 Stockholm, Sweden; and F. Rutten is at the Institute for Medical Technology Assessment, Erasmus University Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands. The authors are members of the Health Economics Advisory Panel (HEAP).

These findings do not take into consideration the clinical advantages and potential quality of life improvements that are associated with adjunctive G-CSF use. These are the subject of further investigations.

Although the technical aspects of the socio-economic evaluation of medical practice and therapies can be described in scientifically defined analytical terms, the impact which studies of this type have on decision-making depends on a variety of judgements (including value judgements), expressed by many individuals in the entire medical, social, political and economic system of a country. In a complex field like cancer treatment, the various "actors" involved—doctors, nurses, patients, administrators, economists, sociologists, sick-funds, insurers and many others, including the patients' families—need to communicate well and to adopt a multidisciplinary approach [6].

For the clinician particularly, knowledge of the costs and economic benefits, as well as on efficacy and safety, will enable

improvement of patient management as a result of scientific evidence.

-
1. World Health Statistics 1990. *Causes of Death*. Geneva, WHO 1991.
 2. Jönsson B, Karlsson G. Economic evaluation of cancer treatment, ESO Monographs. In Domellöf L, ed. *Drug Delivery in Cancer Treatment III*. Berlin, Springer, 1990, 63–84.
 3. Denis L. *The Role of Haematopoietic Growth Factors*. Preface consultant series no 1. Gardiner-Caldwell Communications Ltd, 1990.
 4. Mertelsmann R, Rosenthal FM, Lindemann A, Herrmann F. Cytokines and hematopoietins: physiology, pathophysiology and potential as therapeutic agents. In Senn HJ, Glaus A, eds. *Recent Results in Cancer Research, Supportive Care in Cancer Patients II*. Berlin, Springer, 1991, 121–140.
 5. Luce BR, Elixhauser A. Standards for socioeconomic evaluation of health care products and services. In Culyer AJ, ed. *Health Systems Research*. Berlin, Springer, 1990.
 6. Horisberger B. Successful socioeconomic evaluation of health services. Postscript to [5]. In Culyer AJ, ed. *Health Systems Research*. Berlin, Springer, 1990, 163–178.