

# A starting point in the evaluation of the outcome of care: an example using cancer registry information

K. K. Cheng, T. W. Davies, J. S. T. Sham and A. J. Hedley

## Abstract

Many health services worldwide are paying increasing attention to the evaluation of care. However, most studies in the past have concentrated on *structure* and *process* instead of *outcome*. The objective of this paper is to show how a fairly simple technique can provide a possible feedback loop to a health service system. A study on patients with lung cancer in East Anglia, UK is used as an example. Using information which was more or less routinely collected in cancer registration, the study showed that there was no significant difference between the survival of patients seen in the eight districts in East Anglia. Adjustment by the use of proportional hazard modelling for prognostic factors including age, sex, histological type, stage and whether active treatment was given did not alter the outcome. This finding was slightly unexpected in view of the presumed (yet not documented) variation in enthusiasm and expertise among the districts. Such a result should be seen as a starting point for studies designed to examine the effects of the level of care provided and resource use on the length and quality of survival. While the methodology requires refinement and substantial local difficulties may arise, development of similar researches on the outcome of care should be encouraged in Hong Kong.

**Keywords:** Neoplasms; Survival analysis; Evaluation studies; Registries

## Introduction

In recent years, many health services worldwide have begun to grapple with the evaluation of the care they provide. This fashion is largely related to the soaring health expenditure which results from increasing public expectation, introduction of expensive technology and an ageing population. In the face of the seemingly insatiable demand on resources for health and medical care, the need to critically assess the extent to which services achieve their goals becomes more pressing. Hong Kong should be no exception in this respect, not least because the newly established

Hospital Authority is committed to providing high quality medical care.<sup>1</sup> Furthermore, an emphasis on evaluation will be an important step towards greater professional accountability and one which will be welcome in an increasingly open society.

There are three main areas of concern in evaluating the quality of care: structure, process and outcome.<sup>2</sup> Whereas most attention has been paid to the former two dimensions, assessment of outcome provides the most direct indicator as it is the impact on patients' health status with which we should be most concerned. However, outcome measures are usually more difficult to define and measure in comparison with the other two, partly because of the complexity of assessing health benefits, especially if they are not immediate. In this paper we would like to share with readers our recent experience of attempts to examine the outcome of management of patients with lung cancer in the health districts of East Anglia, UK. Our intention is not to treat the present paper as a report of our main findings in details as full results had been reported in an internal document (Davies et al., unpublished internal report to the East Anglian Regional Cancer Committee). Rather, we hope that this brief

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paper would provide an example of a possible approach which can be taken to measure outcomes in the treatment of cancer. Notwithstanding the differences between the health services in Hong Kong and Britain, this study may be of interest to local clinicians and managers involved in evaluative research. Application of some of the principles could lead to potentially useful results in a number of treatment programmes in Hong Kong.

## Background and methods

The survival of patients with lung cancer is very poor. In one large series of patients diagnosed in the period 1974-86 in Britain, only eight per cent survived for five years after diagnosis.<sup>3</sup> In East Anglia, the Regional Cancer Committee which is responsible for advising the Health Authority on strategies of cancer control, was concerned that because the prognosis is known to be so poor, doctors might take a pessimistic attitude and underestimate the value of radical treatment for some patients, thus depriving them of what little chance they had. The present study was therefore conducted to examine and compare the survival

of patients between the eight districts of East Anglia. It was hoped that the result would provide a starting point in studying the effects of care provided and resource use on the length and quality of survival.

A cohort of patients diagnosed as having carcinoma of the trachea, bronchus and lung in the year 1989 was identified from data kept at the local cancer registry. Their mortality experiences were followed until 30 September 1991.

## Results

There were 1,262 patients in the cohort. The number of patients in each district ranged from 89 to 280.

The follow-up study showed that there was no difference in the crude survival rates of patients from different districts (Fig. 1). By proportional hazard modelling,<sup>4</sup> adjustments were made for age group, sex, histological type, stage and whether active treatment (i.e. surgery, chemotherapy and radiotherapy with curative intent) was given. The picture remained the same in this further analysis: there was no significant difference in the risk of dying between residents of the districts.

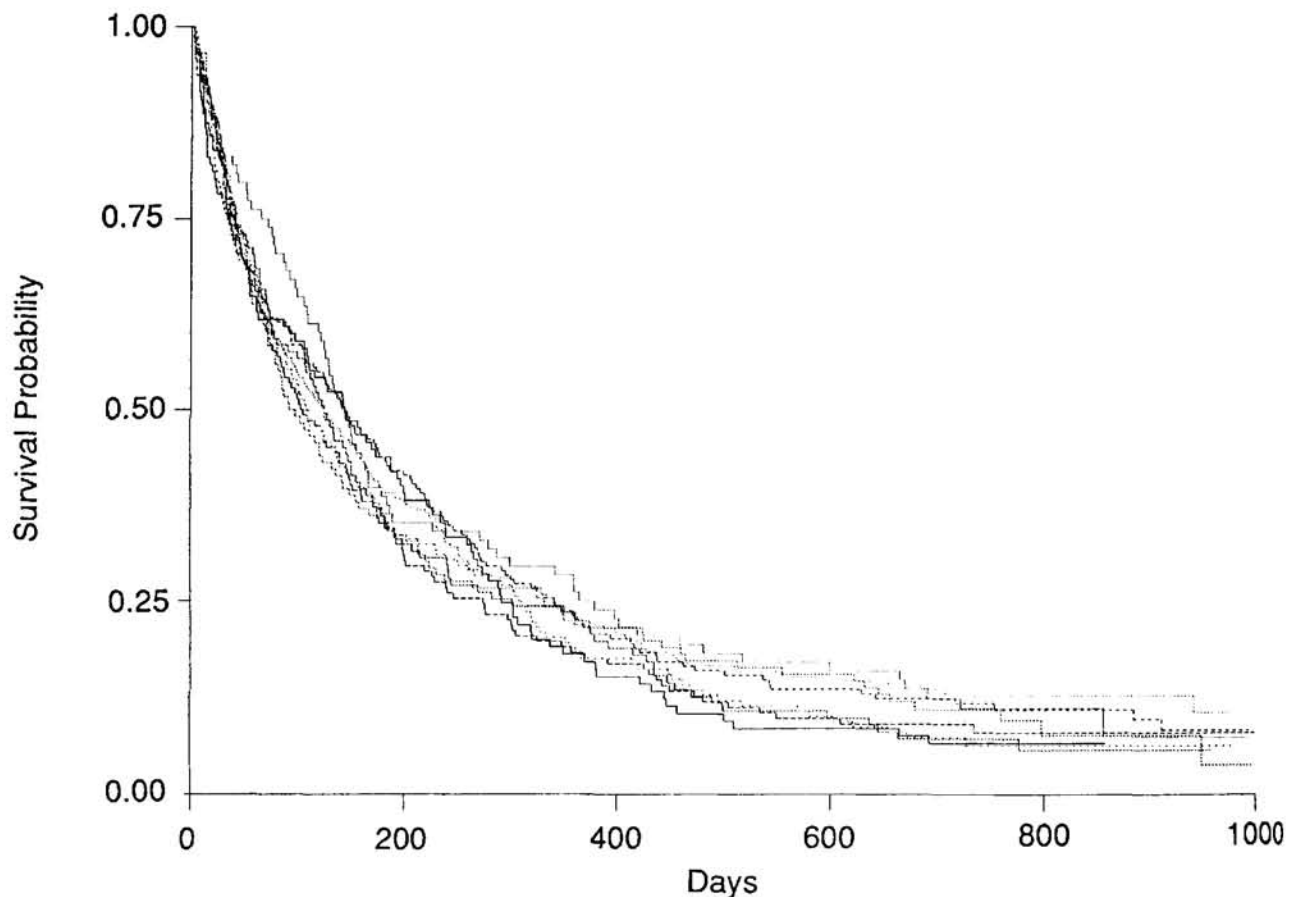


Fig. 1. Survival of lung cancer patients by district in East Anglia. The eight curves represent the districts which are unnamed.

## Discussion

The results were reassuring for patients but slightly surprising. Three of the eight districts have oncology centres and one of them has a teaching hospital. It was thought originally that this would mean differences in enthusiasm and expertise in treatment which would in turn lead to differences in survival. Of course, the study was not a controlled trial and would be unable to provide a definitive answer on the role of radical treatment in lung cancer. However, the absence of difference of survival among patients treated in different districts suggests that it may be worthwhile to examine in more details the use of different modes of therapy, especially in relation to the quality of survival and resource utilization. Radical oncological treatments are not only expensive, they often deprive patients of the enjoyment of their often short remaining lives. One direct corollary of this is that unproven radical measures should perhaps be restricted to research settings. A follow-up study on resource use and quality of life is now being planned in East Anglia.

What is the relevance of this type of study for Hong Kong? This study attempted to evaluate the effectiveness of care by looking at an important outcome indicator. We feel that the development of health services research in this direction should be given some priority locally. In order for our health service to function as a genuine *system*, it needs a proper feedback loop. Given the enormous resources devoted to health care activities, it is reasonable to ask whether our interventions work. The East Anglian study provides an example of a starting point, albeit not a very sophisticated one, of what can be done in this direction. It also demonstrates one possible utility of cancer registration in health services research. The local cancer registry is well-established and should be able to support evaluation research of this nature. Instead of the performance of districts, the unit of comparison could be, for example, hospitals in the local setting. With modification, there is also the potential for developing this into a tool for routine monitoring of the effectiveness of the oncology and possibly other services.

There are, however, problems in such studies, and in health services research in general. First, the methodology is still relatively undeveloped and needs refinement. Second, patients in Hong Kong often seek treatment from more than one hospital, which means

that it would be less straightforward in deciding the centre of treatment in some cases. Third, this kind of research has to be supported by an information system which is appropriately designed. Tackling these problems would require a multidisciplinary effort and should be given adequate attention in the planning of research and development in the health services. Last but not least, evaluative studies by outsiders are likely to be seen as challenges to vested interests, which may sometimes generate resistance and mistrust. It should be noted that in the early stage of the study in East Anglia, support from some clinicians was less than wholehearted. However, the choice of the disease to be examined did help to allay some anxiety: the prognosis of patients with lung cancer was considered to be so poor that such an evaluation would be less threatening. Its high incidence also helped to justify the choice. With time and the demonstration of what one can achieve, it is hoped that the principles of this type of evaluation will be accepted more readily. Opportunities must also be created for action to be taken on the results and for appropriate changes to be effectively implemented.

In the spirit of throwing a sprat to catch a mackerel, this report will have served its purpose if it helps to generate some interest, discussion and debate on the use and development of evaluative research in our health services.

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