Cancer Spend: How much? And on what?

Dr David Lemon and Rabia Khan
NHS Dorset, Public Health
david.lemon@dorset-pct.nhs.uk

Introduction

Efficient use of resources is a defining characteristic of high-performing healthcare systems. Pressures of an ageing population, technological developments and increasing patient expectations are focusing attention on affordability, value for money, efficiency and sustainability. The main question arising is "To what extent does additional healthcare spending improve health outcomes?"

The aim of this study is to examine the relationship between local programme spending on cancer in secondary care and health outcomes within Dorset PCT. This study is unique as Dorset PCT has one of the highest proportions of over 75 year olds in England and has good cancer outcomes.

Methods

Data sources: The data used in this study is based on routinely collected data from financial programme budgeting as well as health datasets including SUS and UKCIS. 2010/11 Payment by Results (PbR) business rules & HRG4 tariffs were applied. All C44 cases, patients aged over 100 years and those with no tariffs were excluded.

Cost of treatment: We calculated the cost of treatment per person by age group, gender and deprivation to examine the cost of treating each individual. A generalised linear regression was performed to assess what factors influence the cost of treatment.

Cost per life year left: Assuming a patient would have died without treatment and that they would live to the expected age based on life tables. We used the life tables and the age at admission to derive the patients estimated life years left. We calculated the cost per year of life saved, cost/LYL, (the cost for each remaining year the patient would live to).

Using some a-priori knowledge, gained from the PbR business rules, we perform a non-linear regression analysis fitting a polynomial with the variables :

$$Log_{10}\left(\frac{cost}{LYL}\right) = \alpha_1 + \alpha_2 DOTP^{\alpha_3} + \alpha_4 AGE^{\alpha_5}$$

Results

In 2010/11, the total secondary care spend on cancer was approximately £15 million (£3732 per cancer patient). The median spell cost appears to increase for the oldest cases, whilst the number of spells per person decreases with age.

The cost per person significantly decreases with age (P=0.003), with no significant difference between the sexes. The change in cost per person is non-linear and found to be proportional to 10(-0.004xAGE). This results in a 20% drop in spend for 80 year olds compared to 50 year olds.

Additionally, there is a significant (P=0.004) increase of mean spell cost with deprivation (coefficient=24±14, 95% CI). However, the confidence intervals are so large we did not include this in any further analysis.

For both males and females a quadratic form yields the best fit to the cost per life year left data.

The secondary care cost per person and the median cost decreases with age

Age band (yrs)	Number of patients	Total cost (£)	Cost(£)/ person	Median Person Cost (£)
0-50	378	1,757,377	4649	3118
51-60	512	2,153,764	4207	2974
61-70	1080	4,091,067	3788	2822
71-80	1252	4,541,962	3628	2794
81+	828	2,561,824	3094	2273
All	**4050**	**15,105,994**	**3730**	**2764**

Table 1: Costs in the Cancer programme by age group for NHS Dorset, 2010/2011

The average cost per life year left increases with age

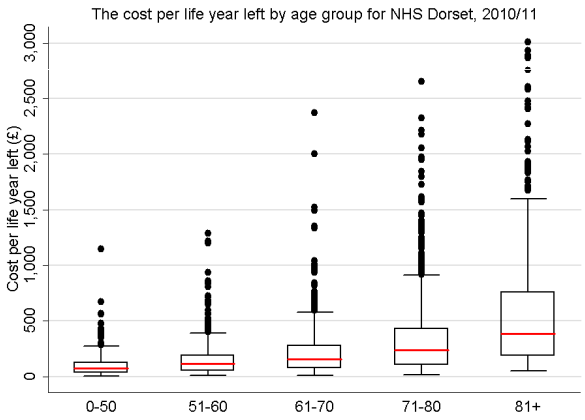

Figure 1: The cost per life year left by age group for NHS Dorset, 2010/2011

Conclusions

The cancer secondary care cost of treatment and the median cost per person decreases with age. However, the average cost per life year left increases with age. This is explained by older cancer patients having less spells of care but the median cost of a spell is higher. Despite this, the cost per person is lower for older people, due to the larger number of spells for younger people. Factors influencing the relationship between the costs and health outcomes include days over trim point/excess bed days and the admission method.

This study illustrates how routinely collected hospital admissions and programme budgeting data can be used to assess the links between health expenditure and health outcomes. This type of analysis can be used to inform commissioning and where limited budgets are best spent.