Exploring the Healthcare Cost Implications of Cancer Stage

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Background
There is a complex relationship between cancer stage and cost to the NHS in England. Here, we aim to explore the variation in modelled costs for selected cancers by stage at diagnosis and progression to metastatic disease.

Methods
Macmillan commissioned Monitor Deloitte to build a model of current and future cancer costs in England. Data on incidence (1995–2012), staging (in 2012) and survival (generally diagnosis in 2005–2008) were combined. It was then used as a basis to forecast prospective cancer cohorts up to 2020. This paper primarily describes a single year of the forecast – people diagnosed in 2015 with 15 years of costs post diagnosis.

The cancer cohorts where modelled through cancer-specific ‘archetypal’ care pathways of probabilities and costs. The care pathways were initially defined using NICE, NHS clinical guidelines, clinical audits and academic literature review. They were then refined to reflect current practice with clinical experts from across the Macmillan network. The pathways represent semi-optimised care rather than capturing the full variety of real-world clinical practice.

The role of systemic anti-cancer therapy is a key element in the modelling. Monitor Deloitte determined prescription rates by triangulating clinician feedback against NHS clinical guidelines, Systemic Anti-Cancer Therapy (SACT) ‘regimens’-by-tumour-site aggregate data, Cancer Drugs Fund guidance, clinical audits and prescription rates. Each chemotherapy or biological therapy node was costed as a ‘procurement’ episode and the appropriate number of ‘delivery’ episodes. The analysis was done in early 2015, so more complete SACT data may now be available and the coverage of the Cancer Drugs Fund has changed.

The model aims to consider total NHS costs rather than just chemotherapy costs. So unit costs were primarily based on 2013/14 NHS reference costs for spells of care, British National Formulary tariffs, and NICE technology appraisals.

Some of the assumptions are highly uncertain due to the lack of data, rapidly evolving treatment landscape and – in some cases – vast variation in clinical practice throughout England. However, we believe the analysis creates a foundation to stimulate debate in this area.

Results
Figure 1 shows total spend over 15 years post diagnosis on people diagnosed in 2015. Spend in the graph is grouped by known stage who were diagnosed at stage 4. Public Health England 2016. Stage breakdown by CCG 2014. www.rcn.org.uk/view?rid=3006

Conclusions
This model demonstrates the complex relationship between stage, survival and costs. The share of spend on people diagnosed with stage 4 disease varies by cancer type and is particularly high for colorectal, pancreatic and lung cancer. We have also seen how population survival varies by cancer type and is particularly high for colorectal, pancreatic and lung cancer.

Limitations
This modelling is based on assumptions about semi-optimised pathways so does not capture the full variety of clinical practice. More information and real data is needed to fully appreciate these relationships however the model demonstrates the complexity involved. It highlights that an early stage diagnosis doesn’t always lead to cheaper care despite generally being better for the person living with cancer.

Acknowledgments
This work is based upon original analysis commissioned by Macmillan Cancer Support from Monitor Deloitte. We also would like to thank the 22 clinicians who validated and provided the model with assumptions. For more information please contact Rachel White, rwhite@macmillan.org.uk or evidence@macmillan.org.uk

References