# MULTI-MORBIDITIES AND COSTS

## Exploring the impact of multi-morbidities on costs of treating people with cancer

**Author:** Rachel White
Macmillan Cancer Support

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### Background

Multi-morbidity is an important consideration for people living with cancer as it impacts the treatments they receive, their survival, their relationships with the healthcare system and their care in the long term. It is also common: 70% people with cancer – 1.8 million people in the UK – are living with one or more other potentially serious long-term health conditions.[1] However, little is known about the impact of these conditions on healthcare costs as it is unlikely to be as simple as adding together the costs of treating each condition. Consequently this paper builds on insights developed through the *Routes from Diagnosis* (RfD) programme.[2] The RfD programme looked in detail at the trajectories of patients following a cancer diagnosis in terms of their survival, cancer status and non-cancer morbidities in order to understand how this diversity of outcome influences hospital use, costs and ultimately needs and experiences.

### Method

The RfD dataset includes people diagnosed with breast, lung and prostate cancer in 2004 and people diagnosed with a brain tumour in 2003–04. Healthcare activity in each patient's inpatient Hospital Episode Statistics (HES) record is linked to costs for seven years pre- and post-diagnosis. The impacts of multi-morbidity were investigated by considering how costs varied between those with and without morbidities, among patients with similar survival and cancer status.

The morbidities identified in the dataset were selected by the RfD clinical advisory group as clinically important for people living with each type of cancer. The selection was based on the following three inclusion criteria: common conditions likely to be more prevalent for people with that type of cancer compared with the general population; common conditions likely to affect treatment decisions; or common conditions related to complications or long-term consequences of cancer or its treatment. For example, the identified breast cancer morbidities include hypertensive heart disease, asthma, pneumonia and osteoporosis to name just a few. To be included, the diagnosis conditions must be recorded at least once in the patient's HES entry in the seven years post-diagnosis.

The costs include all episodes of inpatient care, including elective care, non-elective care, day cases and regular attendances coded in inpatient HES. The costs do not include outpatient clinics, primary care or accident and emergency. This means much of the radiotherapy, dialysis, oral and subcutaneous chemotherapy, initial consultation and diagnosis, and many monitoring appointments are not included. The costs should be seen as a cost to commissioners rather than a cost to providers; they are the amount hospitals are paid for activity rather than how much it costs hospitals to provide care. The costs are taken from the National Tariff (bundled costs) or the average national NHS reference costs (unbundled costs).

### Results

In all cases investigated care is more expensive, both before diagnosis and after, for those with the identified morbidities; the more morbidities the higher the cost. Even many years from diagnosis, costs are higher for those with morbidities. For example, for people who survive over seven years with a breast cancer diagnosis and no metastasis, second cancers or recurrences, the cost differences are stark: inpatient treatment for people with none of the identified breast cancer-specific morbidities costs an average of £4,400 for seven years of post-diagnosis care compared with £10,100 for those with multi-morbidities (Figure 1). This difference is mainly due to the cost of care for people after the first year of diagnosis and in survivorship: the average cost for people with none of the identified morbidities is £150 in the period between four and five years post-diagnosis, compared with £1,040 for those with multi-morbidities.

Results for prostate cancer (Figure 2) show that with each additional morbidity, the costs rise. For example, for men who survive over seven years with a prostate cancer diagnosis and no metastasis, second cancers or recurrences, costs rise by over £2,000 for each additional morbidity.

Another contrasting example is the cohort of people who live less than six months following the diagnosis of a brain tumour without having metastasis, recurrence or second cancers but who are still frequent users of inpatient care[3] (Figure 3). For those with none of the identified brain tumour-specific morbidities, post-diagnosis care costs £4,000 compared with £5,900 for those with multiple selected morbidities. This difference is also observed over the seven years before the diagnosis. A similar picture is observed for short survival (6 to 12 months) lung cancer patients (Figure 4): for those who do not have metastasis, second cancers or recurrences, costs increase by £3,800 for patients with the identified lung cancer-specific morbidities.

### Conclusion

The results highlight the patterns of inpatient activity and cost variation between cancer types and survival trajectories within cancer types. The costs comprise of all inpatient hospital costs, including the cost of treating identified morbidities, so the higher cost is to be expected. However, the magnitude and long-lasting impact over the seven years follow-up indicates the critical importance of taking these clinically significant morbidities into account when calculating and appreciating the costs of treating people with cancer.

This analysis of the RfD dataset highlighting the costs to commissioners is yet another reminder of the impact a cancer diagnosis has on an individual, their long-term outcomes following initial diagnosis, their likely ongoing needs and hence the importance of managing services to meet those needs. In the future, as the cancer population ages, morbidities are likely to become more common and, as a result, costs could increase at a far faster rate than the growth in cancer diagnosis. If current trends continue and services are reconfigured to become more integrated, this could also influence cost synergies.

This analysis is based on inpatient costs so excludes a large part of healthcare spending. Further work is needed to put these costs into the context of the wider system. It would also benefit the analysis to know how these costs relate to the cost of treating the identified morbidities in people without cancer.

**Figure 1: Inpatient commissioner costs for people before and after a breast cancer diagnosis**

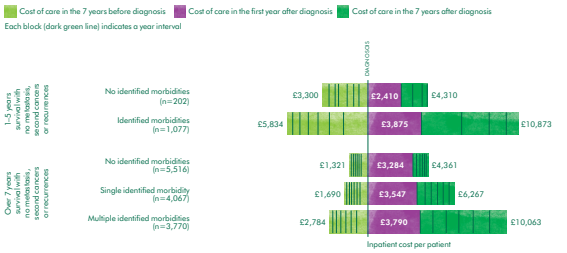


**Figure 2: Inpatient commissioner costs for people with prostate cancer**


**Figure 3: Inpatient commissioner costs for people with a brain tumour**


**Figure 4: Inpatient commissioner costs for people with a lung cancer**


*Note: the data label at the end of the bars is the total over all seven years after diagnosis, including the first year.*

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**References and notes**

1. Macmillan Cancer Support. The burden of cancer and other long-term health conditions. 2015. Research undertaken by Monitor Deloitte, commissioned by Macmillan Cancer Support. Available from: *http://www.macmillan.org.uk/Documents/Press/Cancerandotherlong-termconditions.pdf*
2. Macmillan Cancer Support. *Routes from Diagnosis: Painting the most detailed picture of cancer survivorship yet*. 2014. Available from: http://www.macmillan.org.uk/documents/aboutus/research/researchandevaluationreports/routes-from-diagnosis-report.pdf
3. More than 25% of their post-diagnosis survival time in an inpatient setting.

For more information please contact Rachel White, rwhite@macmillan.org.uk or evidence@macmillan.org.uk
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